

**NDE Qualification of Bobbin Detection and +Point
Detection/Sizing for Axial PWSCC
at Dented TSP Intersections**

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J. H. Arhar (PG&E)
M. H. Cothron (TVA)
W. K. Cullen (WNSD)
S. L. DePaoli (WNSD)
L. R. Exner (PG&E)
D. F. Goetcheus (TVA)
R. J. Jacko (WSTC)
W. R. Junker (WSTC)
J. H. Kang (PG&E)
D. M. Malinowski (WNSD)
T. A. Pitterle (WNSD)
G. E. Rudd (WSTC)
A. Sagar (WNSD)
C. B. Webber (TVA)

Westinghouse Electric Corporation
Nuclear Services Division
P.O. Box 158
Madison, Pennsylvania 15663-0158

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1.0 INTRODUCTION

This report presents a summary of the qualification efforts performed for bobbin coil detection of axially oriented primary water stress corrosion cracking (PWSCC) at dented tube support plate (TSP) intersections with dent voltages ≤ 2 volts, and for Plus Point (+Point) coil detection and sizing over all dent voltages. The +Point coil length and depth sizing qualifications of this report extend the results of Reference 8.2 to the full range of maximum depths. Depth sizing for the + Point coil is based on developing the complete length versus depth profile for an axial indication. Qualification is defined as acceptance by an industry expert peer review, as described in Appendix H of Revision 5 of the EPRI ISI guidelines (Reference 8.1).

To supplement the available pulled tube database for axial PWSCC at dented TSP intersections, an extensive set of laboratory specimens (40 TSP intersections with 56 indications) were prepared including destructive exam results. These laboratory specimens are shown to provide very good simulations of field NDE response and pulled tube crack morphology. NDE data collection for the laboratory specimens included bobbin, + Point and Cecco-5 coils.

Blind NDE analyses by up to four analysts were performed on the PWSCC database prior to destructive examination of the specimens. The blind analyses were used to refine the NDE procedures of Reference 8.2. The blind analyses are used to develop probability of detection (POD) and NDE uncertainty as a function of maximum and average depth for axial PWSCC at dented TSP intersections including both technique and analyst variability uncertainties. It is intended that the PODs and NDE uncertainties for average and maximum depths be used for steam generator (SG) tube integrity evaluations for burst pressure and leakage, respectively. The resulting PODs and NDE uncertainties from the blind analyses are compared with the Appendix H results. The qualified NDE techniques for detection and sizing developed in this report are further extended to validated techniques in Reference 8.33 through a NDE Performance Test of field analysts to further refine the POD and NDE uncertainty correlations with average and maximum depth. The final NDE uncertainties and PODs should be obtained from the NDE Performance Test results. Reference 8.3 also extends the application of the sizing techniques to an alternate repair criteria (ARC) for axial PWSCC at dented TSP intersections.

To improve production time during an outage, it is desirable to utilize the bobbin coil for detection of axial PWSCC indications compared to a rotating, surface riding probe. However, the bobbin coil detection capabilities can be affected by the magnitude of the dent voltage. The bobbin detection qualification was conservatively limited to dent voltages up to 2 volts although the database included dents up to 5 volts. Bobbin detection eliminates the need to detect and size small dents and significantly reduces the number of TSP intersections requiring + Point inspection.

The available pulled tube database is described in Section 3. Preparation of the laboratory specimens including demonstration of their applicability for simulating field data is given in Section 4. Section 5 describes the NDE analyses including analysis guidelines, development of the length and depth adjustment procedures, PODs for maximum and average depths resulting from the blind analyses for the bobbin, + Point and Cecco-5 probes, and comparisons of the NDE and destructive examination profiles. NDE uncertainties for length, average depth and maximum depth resulting from the blind analyses are given in Section 6. Section 7 describes the results from the Appendix H qualification peer review.



2.0 SUMMARY AND CONCLUSIONS

This report describes the results of an extensive laboratory program to qualify bobbin and + Point coil detection and + Point sizing for axial PWSCC at dented TSP intersections.

Laboratory corrosion specimens were prepared to supplement pulled tube destructive examination results in order to develop an extensive data base for qualification of bobbin and + Point coil detection and + Point sizing. The laboratory specimens were mechanically dented and ovalized with cracking obtained in a doped steam environment at elevated temperature. Following cracking, the laboratory tube to TSP crevices were packed with magnetite to simulate the NDE response of packed crevices in operating SGs. Pulled tubes with + Point data include 3 TSP intersections with 4 axial PWSCC indications and the laboratory database includes 40 TSP intersections with 56 indications. The database spans maximum depths from about 8% to about 100% and lengths from about 0.1 to 2.5 inch. The laboratory specimens are shown to be very representative of field indications and pulled tubes with respect to NDE response and crack morphology.

Blind NDE analyses were performed for the specimens by up to four analysts for each indication. These analyses were completed prior to the destructive examination in order to develop estimates of PODs and NDE uncertainties including both technique uncertainty and analyst variability. These results were used to refine NDE analysis procedures for further application to validation of the sizing techniques based on a NDE Performance Test as described in Reference 8.3. Reference 8.3 also includes application of the detection and sizing techniques to an ARC for axial PWSCC at dented TSP intersections. Procedures are defined for adjusting + Point lengths for coil lead-in and lead-out effects which tend to increase the crack lengths and depths near the ends of the cracks. Adjustment procedures are also defined for adjusting depths for low voltage (≤ 1.0 volt) to correct for overestimation of depths and for high voltage (≥ 4.5 volts) to correct for a tendency to underestimate throughwall crack depths. The NDE techniques were qualified to Appendix H of the EPRI ISI guidelines (Reference 8.1). The Appendix H peer review provided qualification of bobbin detection for indications in up to two volt dents, + Point detection for all dent sizes and + Point sizing of length versus depth profiles. The qualifications are documented in the EPRI Performance Demonstration Database as ETSS 96012 for bobbin detection and ETSS 96703 for + Point detection and sizing.

The blind analyses were performed for all available specimens and included the length and depth adjustments. The Appendix H peer review evaluated a subset of the available indications and included the length adjustment but not the depth adjustments. Consequently, the blind analyses provide the best estimates for NDE uncertainties and show very good agreement with destructive examination results. The resulting + Point NDE uncertainties with mean error based on destructive exam minus NDE are:

NDE Uncertainties from Blind Analyses			
	<u>Mean Error</u>	<u>Standard Deviation</u>	<u>+95% Uncertainty</u>
Length	-0.04"	0.11"	0.14"
Average Depth	-3.53%	7.16%	8.27%
Maximum Depth	-4.98%	11.95%	14.75%

These results provide acceptable sizing capability for tube integrity assessments and alternate repair criteria applications. The blind analyses NDE results include application of the procedures for length adjustments and depth adjustments for low (≤ 1.0 volt) and high (≥ 4.5 volts) voltage indications. Even with application of the depth adjustment procedure, the NDE analyses tend to overestimate crack depths

particular for shallow indications with maximum voltages less than about one volt. Destructive examination depths are based upon corrections for uncorroded ligaments and are averaged over the 0.16" + Point coil field length consistent with the recommendations in Section H.2.2.1g of Appendix H of the EPRI ISI guidelines (Reference 8.1) and the needs for tube integrity evaluations.

The PODs obtained from the blind and Appendix H analyses are in very good agreement as shown below. The detection procedures used for the blind and Appendix H analyses were identical. However, the Appendix H evaluations were based on a subset of the available specimens.

	POD at 90% Confidence			
	Blind Analyses		Appendix H Review	
	<u>Bobbin</u>	<u>+ Point</u>	<u>Bobbin</u>	<u>+ Point</u>
Max. Depth > 34%	0.88		0.89	
Max. Depth > 30%	0.85	0.939		0.94
Avg. Depth > 30%	0.87	0.944		

The bobbin coil PODs for small dent voltages are 0.88 and 0.89 at 90% confidence for maximum depths > 34% from the blind and Appendix H analyses, respectively. The blind analyses show a bobbin coil POD of 0.87 for average depths > 30% compared to a corresponding value of 0.85 for maximum depth over the same depth range. Both the blind and Appendix H results show a + Point POD of 0.94 at 90% confidence for maximum depths > 30%. The blind analyses show a + Point coil POD of 0.944 for average depths > 30% compared to a corresponding value of 0.939 for maximum depth over the same depth range.

NDE data were also collected for most of the laboratory specimens with the Cecco-5 coil. The resulting Cecco-5 PODs at 90% confidence for depths > 30% are 0.92 for maximum depth and 0.98 for average depth which show detectability comparable to the + Point coil for depths > 30%. The existing Appendix H qualification (ETSS of the Cecco-5 probe for detection of axial PWSCC was not extended to include the specimens of this report. All the resulting PODs exceed the EPRI ISI guidelines for detection qualification of 0.80 at 90% confidence.

PODs and NDE uncertainties are evaluated separately for average and maximum depth. Average and maximum depth values are intended for tube integrity analyses of burst pressure and leakage, respectively.

3.0 PULLED TUBE DATABASE

3.1 Introduction

This section describes tube pulls for PWSCC at dented TSP intersections that have provided crack length versus depth profiles for use in comparisons with NDE predictions. The pulled tubes also define the associated crack morphology for comparisons with laboratory specimens simulating PWSCC at dented intersections. Depth profiles have been obtained by destructive exam for three pulled tubes with four indications pulled in 1995 from Diablo Canyon Unit 1, and destructively examined in 1996. One of these (R12 C32-1H) was originally archived in 1996, but eventually destructively examined in 1998. In 1993, tube R21 C64, which contained an axial PWSCC indication at 1H, was pulled from Sequoyah Unit 1. PlusPoint inspection techniques were not available in 1993, and therefore, this indication is not included in the +Pt sizing or detection databases.

3.2 Diablo Canyon Unit 1 Pulled Tubes

In 1995, three tubes were removed from Diablo Canyon Unit 1 for axial PWSCC indications at dented TSP intersections. The tubes were R10 C22, R12 C32, and R21 C43.

3.2.1 R10 C22 1H

There was no reported dent voltage at this elevation. Field bobbin and +Point data was NDD. Destructive examination showed no SCC.

3.2.2 R10 C22 TSP 2H

Field bobbin and +Point inspection detected axial PWSCC indications at this elevation. The dent voltage was 2.4 volts. The field call using the +Point probe was a 0.31" long SAI. Blind analysis (Analyst 3) field +Point data indicates a flaw length of 0.16" and 49% max depth using the length and depth adjustment procedures given in Sections 5.7 and 5.8. Burst pressure was reported as 12437 psi. Destructive examination identified the burst crack as 0.122" long, 38% max depth, 23% average depth. The flaw extended from 0.358" below the top of the TSP to 0.480" below the top of the TSP, or slightly below the centerline of the TSP. No uncorroded ligaments were found in the burst crack. Figure 3-1 presents the destructive examination length vs. depth profile for the flaw as well as +Point sizing analysis results (blind analysis). No secondary flaws were observed in the destructive examination. The non-degraded freespan burst pressure for the tube was 12554 psi. Based on the difference between the flawed and unflawed burst pressures of only 0.93%, it is judged that the degradation present had virtually no effect upon the burst pressure. R10 C22 TSP 2H is the smallest indication of the available pulled tube results.

3.2.3 R12 C32 TSP 1H

This intersection was originally archived, and was not destructively examined until 1998. Field bobbin and +Point inspection detected axial PWSCC indications at this elevation. Dent voltage was 1.1 volts. The field call using the +Point probe was a 0.75" long SAI. Blind analysis (Analyst 3) field +Point data indicates a flaw length of 0.67" and 75% max depth using the length and depth adjustment procedures given in Sections 5.7 and 5.8. Elevated temperature laboratory leak testing was performed at 616° F, and pressure differentials up to 2555 psi. No leakage was reported. Burst pressure was reported at 7940 psi.

Destructive examination identified the burst crack as 0.702" long, 97% max depth, 58% average depth. At the maximum depth region, >90% deep degradation was reported for approximately 0.10". As no leakage was reported during the leak testing, the non-degraded portions did not tear during the freespan leakage testing. The crack extended from the top edge of the TSP down to 0.702" below the TSP top. The macrocrack was comprised of 7 intergranular microcracks that were parallel and aligned in a narrow axial band. Of the 6 ligaments separating these 7 microcracks, 4 had ductile features, that is, they were determined to be torn during the burst test. Figure 3-2 presents the destructive examination length vs. depth profile for the flaw as well as +Point depth sizing blind analysis results.

3.2.4 R21 C43 TSP 1H

Field bobbin and +Point inspection detected axial PWSCC indications at this elevation. The dent voltage was 3.9 volts. The field call using the +Point probe was a MAI, with crack lengths of 0.35" and 0.97". Blind analysis (Analyst 3) field +Point data indicates a flaw length of 0.97" and 63% max depth for flaw 1 and length of 0.29" and 43% max depth for flaw 2. Ovalization limits based on field UT indicate a maximum ovalization of 0.016" (0.08" radial ovalization) was present. Laboratory leak testing was not performed. Burst pressure was reported as 7837 psi. Destructive examination of the burst crack indicated a macrocrack length for flaw 1 of 0.991", 98% max depth, 50% average depth. The indication was > 85% deep only over about 0.15" length, and the maximum depth of 98% extended for 0.048". The second indication about 180° from the burst opening was found by destructive exam to be 0.277" long, 39.4% average depth and 50% maximum depth. Depth versus length profiles for these two indications were obtained from the destructive exam and are given in Figures 3-3 and 3-4. Four uncorroded ligaments totalling 0.033" wide were found in the burst crack and two ligaments totalling 0.022" wide were found in the secondary crack. These ligaments are a small fraction of the corrosion lengths and adjustments to the average depths for the ligaments would be only a few percent. The burst crack extended from 0.14" above the TSP to 0.101" below the TSP.

The destructive examination measured a 4 mil radial dent. Field UT (Figure 4-14) measured a radial dent of 8 mils at this intersection. In some tube pulls at dented intersections, the pulling operations distort the field dent due to the high pull forces through the dent and the hard magnetite may act to distort the original dent profile. Thus, it can only be concluded that the dent was likely between 4 and 8 mils. The PWSCC axial cracks at dented intersections tend to form at the minor axis of tubes ovalized by denting. This is shown by the UT inspection results of Figure 4-14 which shows the two axial indications about 180° apart at the minor axis of the tube. The two macrocracks were identified with no other degradation.

3.3 Sequoyah Unit 1 Pulled Tubes

Tube R21 C64 was removed from Sequoyah Unit 1 in 1993. This tube contained a 14 volt dent at TSP 1 hot. Field RPC evaluation (0.080" mid range coil) indicated a 4.8 volt axial indication, 0.4" long, located just above the top of the TSP. Review of the field data indicated a second axial indication 180° from the first indication, approximately 0.3" long and extending from the top of the TSP down. After tube pull, the dent was present for approximately 4 inches above the TSP, indicating that the denting at the TSP caused geometric deformation of the tube and the axial flaw during tube pull. Laser micrometry indicated that just below the TSP, the tube was a uniform OD of 0.874". Just above the bottom of the TSP, there was highly localized denting with a radial displacement (from nominal) of 0.012". At just below and just above the top of the TSP, the denting was more ovalized, and affected the tube over a

larger angle. The difference between the maximum and minimum diameters of the ovalized region were 0.024" for these two locations.

Laboratory eddy current testing was performed. The bobbin dent voltage was reduced to 7.7 volts, and the ID flaw voltage was reduced to 2.3 volts by RPC.

After tube removal, the TSP 1 hot region of R21 C64 was leak and burst tested in a freespan mode, that is, the intersection was burst tested with no TSP restraint present. Leak testing was performed at a temperature of 613° F at pressure differentials of 1500 psi and 2650 psi. No leakage was detected. The measured burst pressure was 8161 psi. The burst opening length and width was 1.331", and 0.285", respectively.

Following burst testing, the burst crack was examined. The total crack length was 0.32" with a maximum depth near the center of the flaw of 96% throughwall and average depth of 62% over the length of the crack. There were no ductile ligaments in the macrocrack network.

3.4 Corrections to Depth Profiles for Uncorroded Ligaments

The prototypic crack morphology for PWSCC at dented TSP intersections is crack initiation as narrow bands of short microcracks which grow together to form well defined axial macrocracks. Uncorroded ligaments may remain within the macrocrack either in the plane or out of the plane of the macrocrack. The remaining uncorroded ligaments tend to reduce the eddy current response, reduce the effective average depth of the crack relative to no ligaments and increase the burst pressure of the indication. In general, the extent and effects of uncorroded ligaments are greater for ODSCC (particularly circumferential ODSCC) than for axial PWSCC at dented TSP intersections. For the laboratory specimens of this report, all uncorroded ligaments were sized so that the effects on average depth could be quantified, as discussed in this section. Tabulations of the destructive examination depths including ligaments are given in Appendix B.

Given the uncorroded ligament areas, the average crack depths can be adjusted for the ligament area. The ligament adjustment is applied as a reduction of the corroded crack area which requires that the corroded area and ligament area be averaged over some axial length to make the correction. The field spread of the + Point coil is at least 0.16 inch. The destructive exam depth profiles and ligament areas were developed as running averages over the 0.16" coil field spread. The use of running averages over the coil field spread to compare destructive exam with NDE helps to identify the meaningful differences between profiles by eliminating the more rapid fluctuations in the data. For tube burst considerations, the ligaments perpendicular to the plane of the crack would fail in shear. The structural effectiveness of ligaments in shear is about 60% that of uncorroded area in tension. Therefore, the ligament adjustment reduces the uncorroded ligament area by a factor of 0.6 when developing the ligament adjusted running average depths.

The uncorroded ligament area for the prototypic laboratory crack specimens (excluding specimen 13) was found to be the largest in specimen 8, crack 2. This indication is used to show the effects of the ligament adjustment process. Figure 3-5 compares the as-reported destructive exam crack depth with the 0.16" running average of the reported depth. As expected, the running average smooths out the reported fluctuations in the experimental depth profile. The ligament area and ligament corrected depth profile are also shown in Figure 3-5. The ligament correction of -4.34% to average depth for this indication bounds the other laboratory specimens. Figure 3-6 (for pulled tube R12 C32) includes the ligament

corrections to the reported running average of the reported depth. The ligament correction of -1.88% bounds the other pulled tube specimens. The ligament corrections, while small for the PWSCC indications at dented TSPs, tend to improve the agreement between NDE and destructive exam. The impact of the running average destructive exam upon the as-found destructive exam for pulled tube R21 C43, Crack 1 is presented in Figure 3-7. Ligament corrections are not available for this pulled tube.

Ligament corrections for specimen 13, which has microcracks not joined by corrosion to form a well-defined macrocrack, are shown for crack 5 in Figure 3-8 and crack 1 in Figure 3-10. Without the running average of the depths, the local depths vary sharply over the length of the crack. The ligament correction to crack 5, the burst crack for this specimen, is 5% on average depth. This sample clearly demonstrates the importance of a running average for comparisons of destructive exam and NDE results. The specimen has a point that is 100% deep while the running average maximum depth is 51.3% as corrected for ligaments. As shown in Figure 3-9, the running averages from destructive exam and NDE lead to excellent agreement on the maximum depth (51% vs 51.3%). Similar results are seen for Crack 1 in Figures 3-10 and 3-11.

The destructive exam, maximum and average depths with and without ligament corrections for each laboratory specimen are given in Appendix B. The ligament corrections to average depth vary from a few tenths of a percent for most specimens to the maximum of -4.34% for prototypic sample P8-2, and 5% for non-prototypic sample P13-5. Both of these samples were from the 1996 sample set, which targeted the production of large PWSCC indications. The ligament correction to the maximum depth is often more affected by the running average over 0.16" than by the ligament correction. The running average reduces local 100% depths to less than throughwall unless the length of the throughwall is continuously > 100% for 0.16" or more. This is typically not the case and the running average maximum depths are < 100%.

3.5 Crack Depth Profiles for Pulled Tubes

Four pulled tube indications with crack length/depth profiles for axial PWSCC at dented TSP intersections are currently available for this program as described in Section 3. Destructive exams for a few other pulled tubes provided only maximum crack depth and are not used in this program. The NDE analyses for the four Diablo Canyon indications were performed by two analysts as "blind" analyses completed before the destructive exam results were available. Tabulated crack depth profiles for these indications are given in Appendix C while a graphical representation of the destructive examination depth profiles are also presented for each of the pulled tube depth profiles in Figures 3-1 thru 3-4.

Figures 3-1, 3-2, 3-3, and 3-4 provide comparisons of the NDE depth profiles with destructive examination results for the four pulled tube indications. Field UT depth profiles are also given where analyzed for supplemental information although not used in this report. Results are given for the as measured NDE profiles and as adjusted for end effects of the flaw on the NDE response. The length adjustment procedure for end effects is described in more detail in Section 5.7 and the adjusted results are included in this section for ease of comparison.

It is seen that the agreement between NDE and destructive exam is quite good for length (< 0.1" differences) and average depth (typically < 5% difference) when the length adjustment is made. For the smallest indication in R10C22 (Figure 3-1), the NDE results tend to overestimate the destructive exam results for average depth and length. For the larger indications, such as R12 C32 1H Flaw 1 and R21 C43 1H Flaw 1 (Figures 3-2 and 3-3), the NDE results tend to underestimate the destructive exam

results particularly for maximum depth and length. The comparison between average depths for destructive exam and blind analyses shows excellent comparison.

3.6 PWSCC Crack Morphology for Pulled Tubes

The pulled tube results for axial PWSCC at dented TSP intersections show a common crack morphology. The indications form as one or two macrocracks about 180° apart. The individual microcracks forming the macrocrack are typically longer than ODSCC microcracks, and well aligned axially such that circumferential ledges or ligaments between microcracks forming the macrocrack are short. The narrow bands of microcracks indicate a process that is more stress driven than initiation of ODSCC which shows bands of microcrack initiation sites distributed extensively around the tube circumference. The indications are found at the minor axis of dent ovalized tubes where the ID hoop stresses are a maximum. Only two of the four macrocracks depth profiled were found to have remaining uncorroded ligaments and these ligaments were a small fraction of the macrocrack length.

In summary, the crack morphology for PWSCC at dented intersections is that of one or two macrocracks well aligned axially with only a few uncorroded ligaments and little or no other ID axial cracking at the intersection. This relatively simple morphology is conducive to obtaining good accuracy in NDE sizing of these indications.

Figure 3-1: Destructive Exam and Blind Analyses +Point Depth Profiles for R10C22, TSP2 - Crack 1

Comparison of Length Adjusted +Point Profiles with Destructive Exam

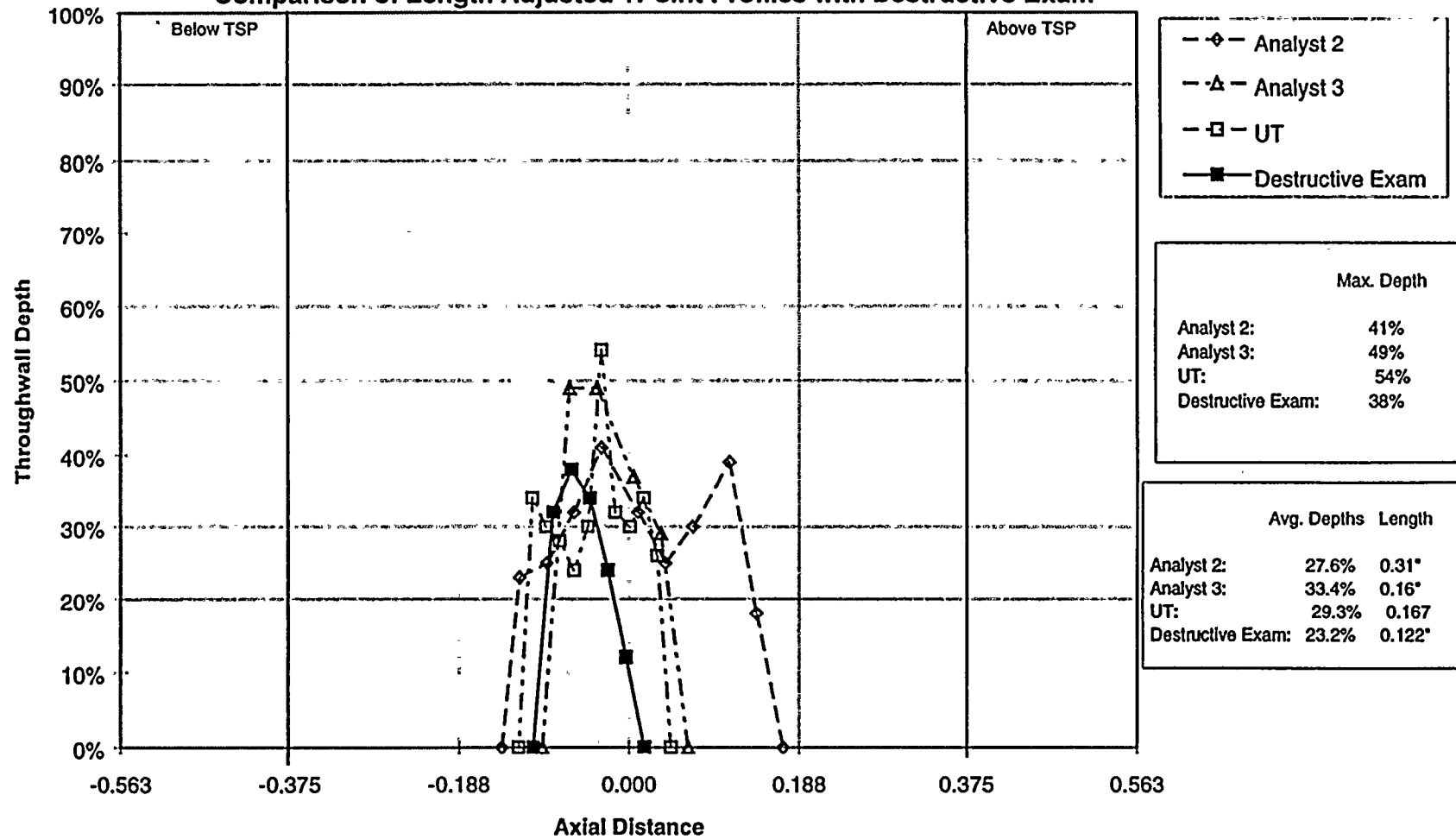


Figure 3-2: Destructive Exam and Blind Analyses +Point Depth Profiles for
R12C32, TSP 1H-Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

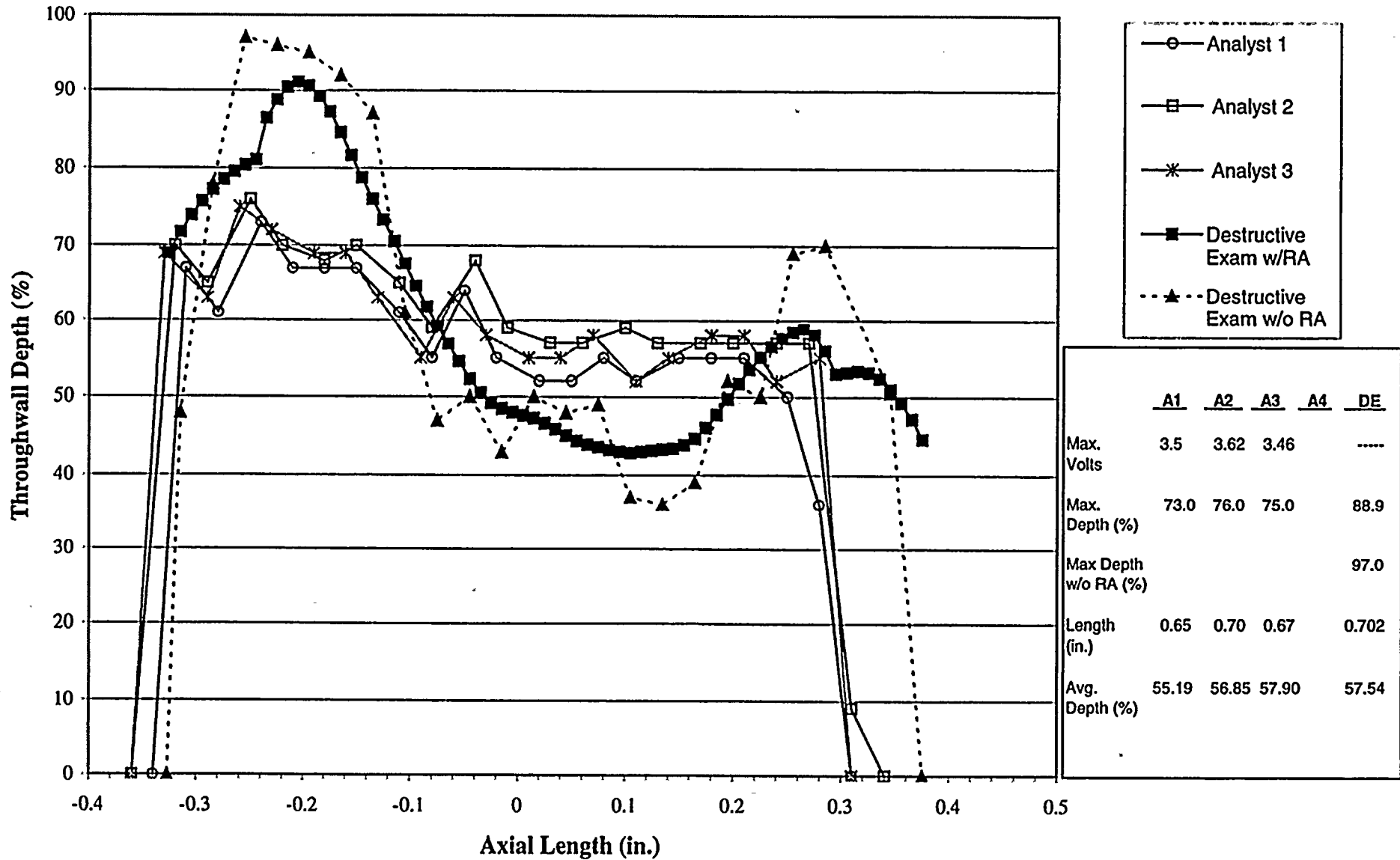


Figure 3-3: Destructive Exam and Blind Analyses +Point Depth Profiles for R21C43, TSP 1H - Crack 1
Comparison of Length Adjusted +Point Profiles with Destructive Exam

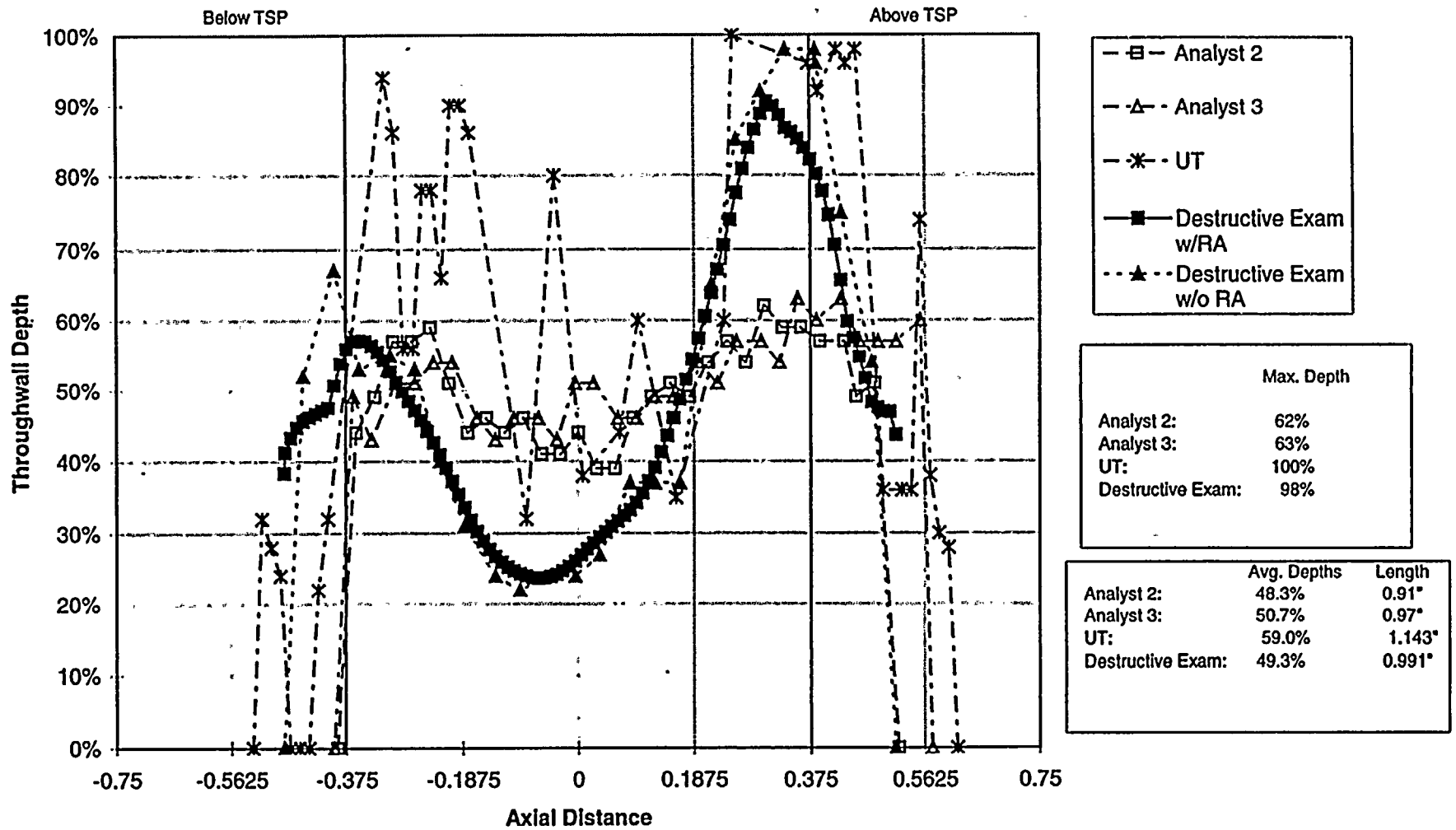


Figure 3-4: Destructive Exam and Blind Analyses +Point Depth Profiles for
R21C43, TSP 1H - Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

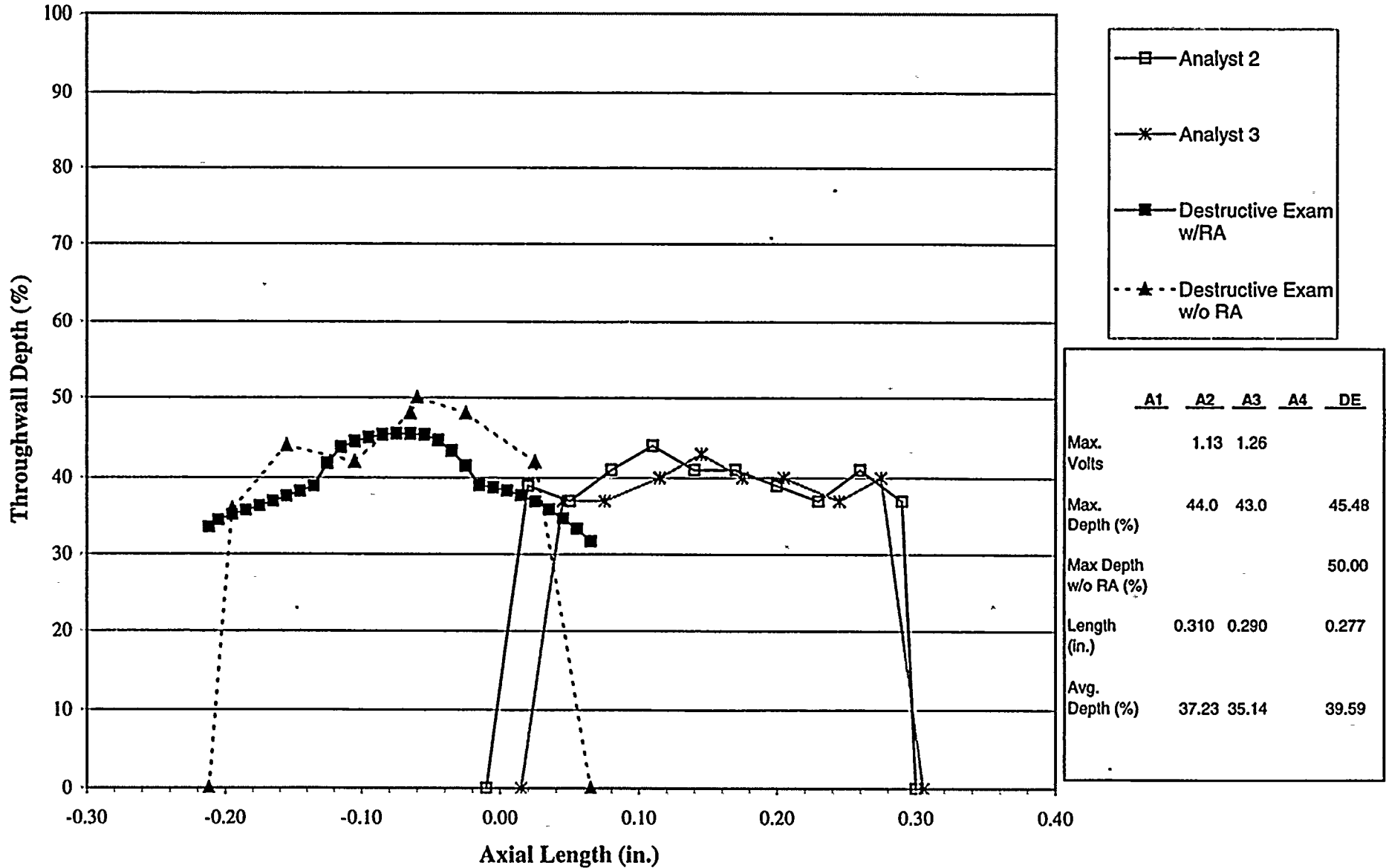
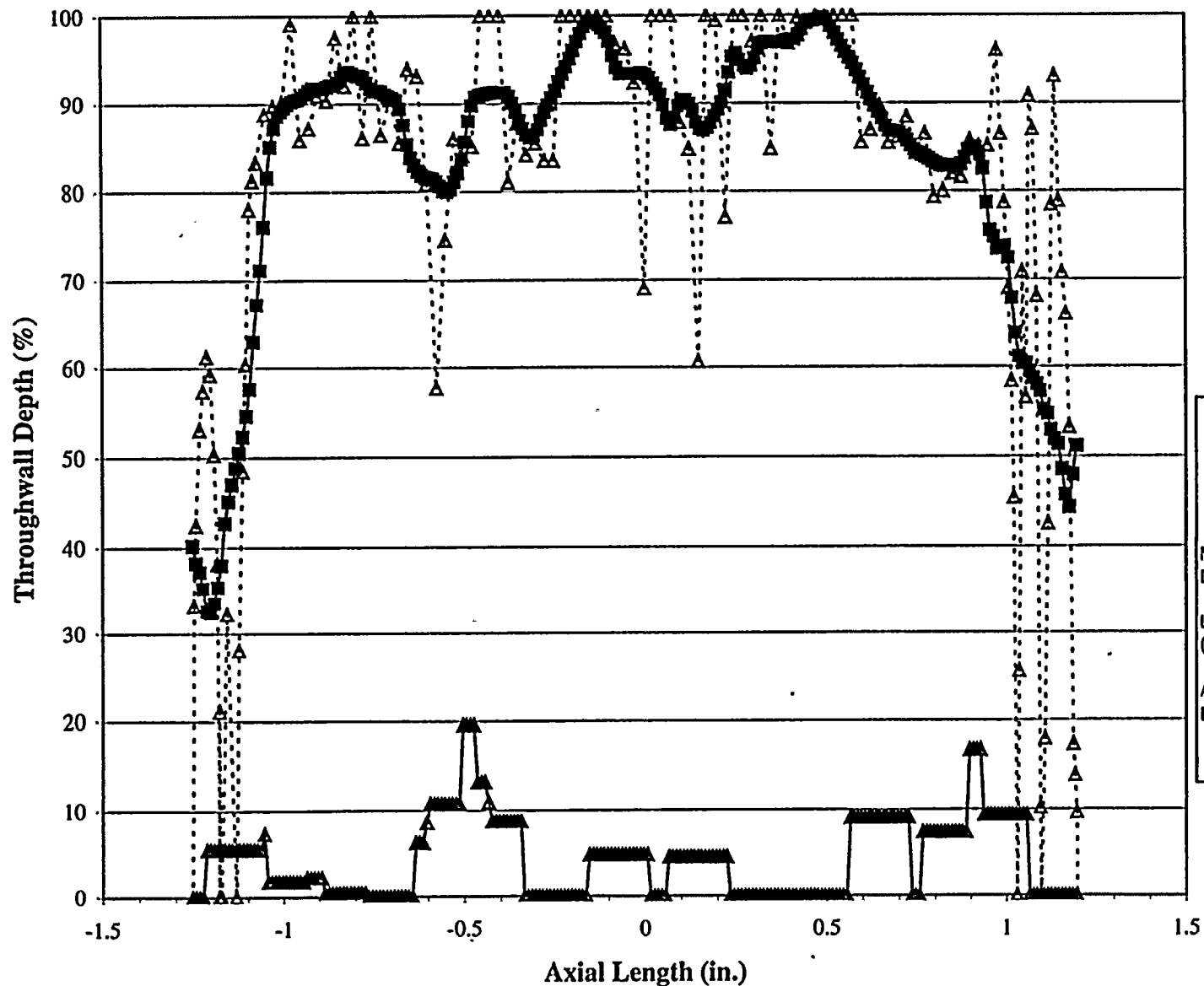


Figure 3-5: Comparison of As-Reported Destructive Exam Depth with the 0.16" Running Average of the Reported Depth; 1996 Lab Sample P8 - Crack 2
Mid-Range +Point, 300 kHz

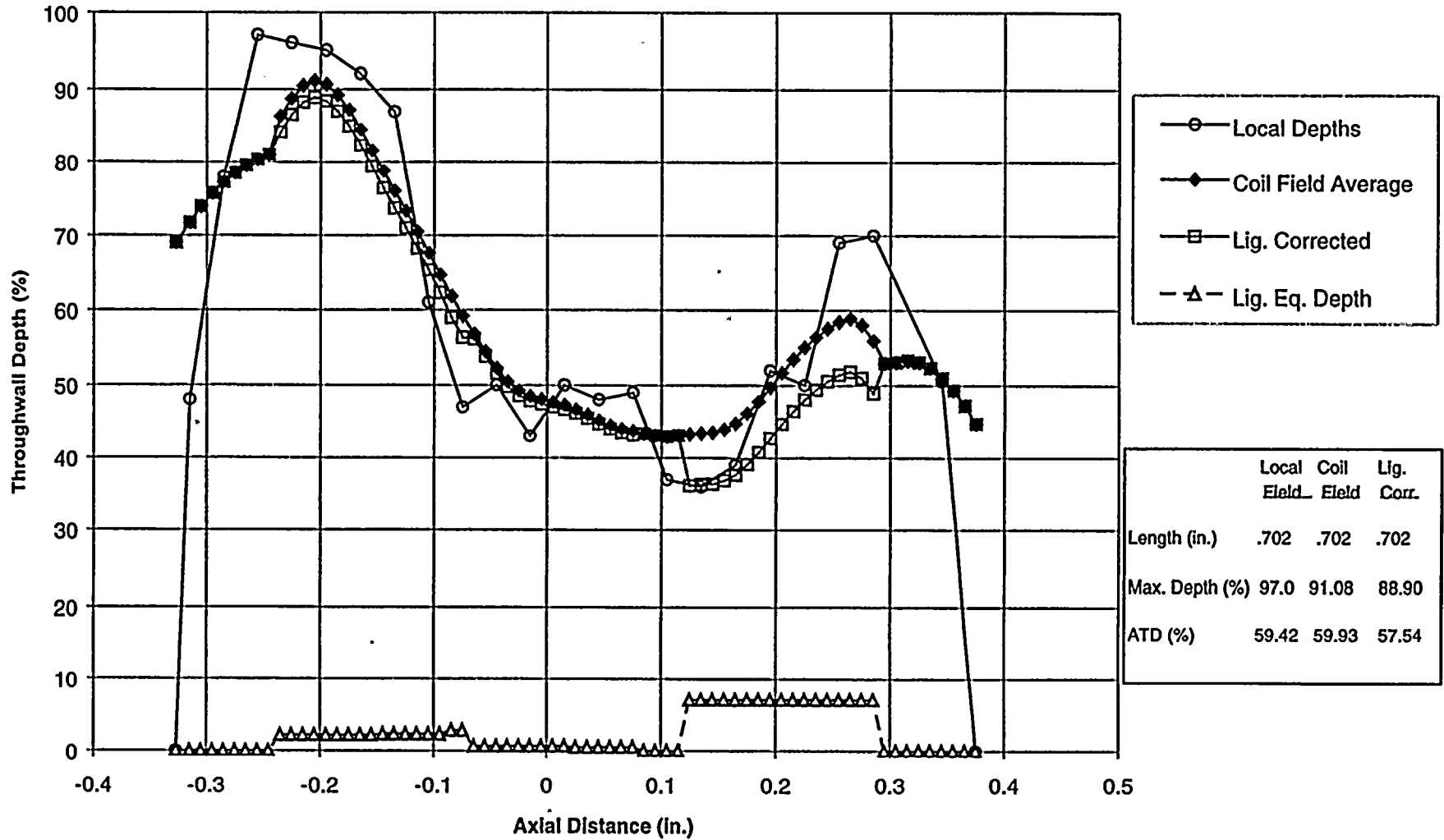
NDE Depth vs. Axial Length with Destructive Exam



--△--	Destructive Exam w/o RA
—■—	Destructive Exam w/RA & Lig. Corr.
—△—	Lig. Eq. Depth

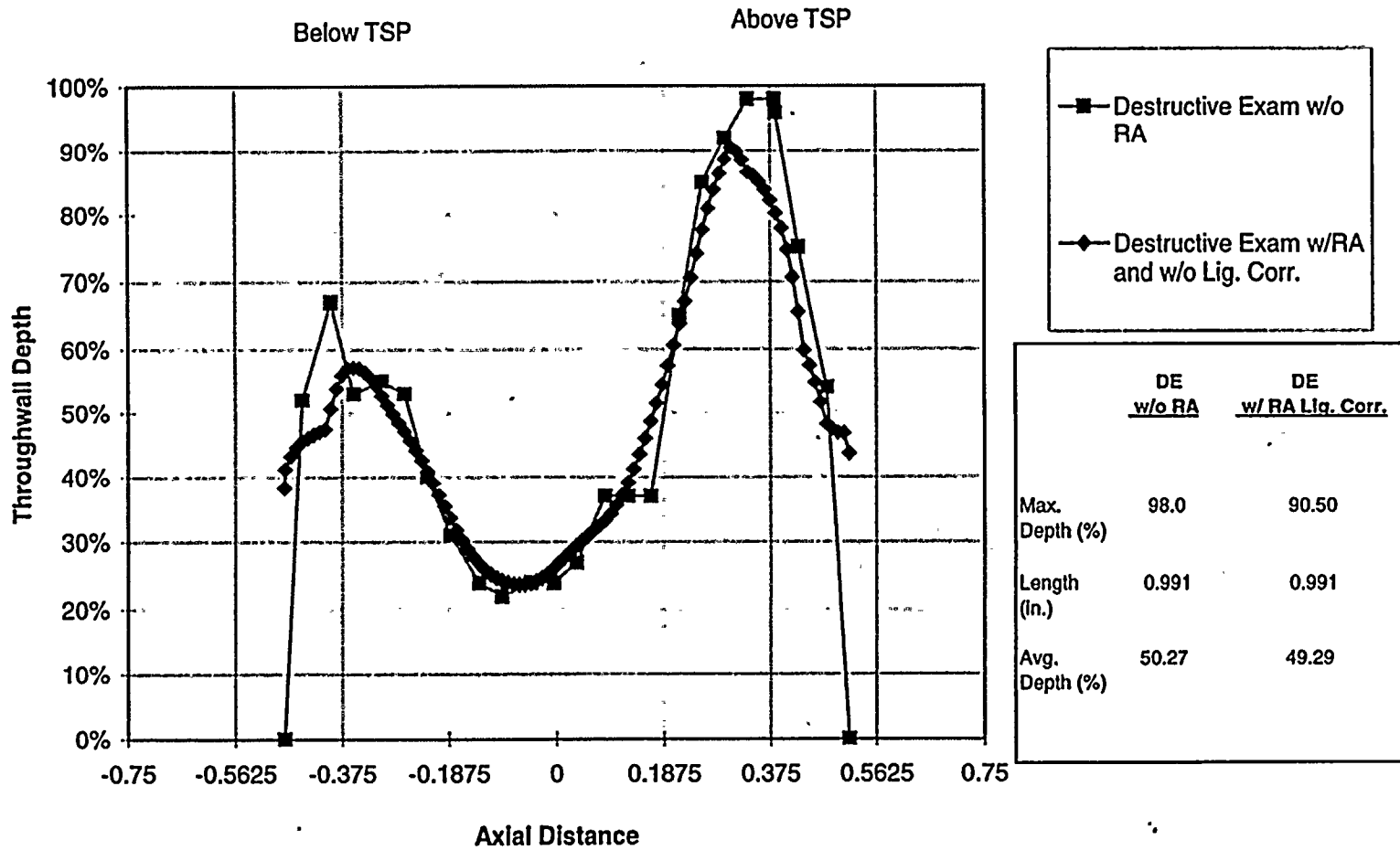
	DE w/o RA	DE w/ RA Lig. Corr.
Max. Depth (%)	100.0	99.73
Length (in.)	2.452	2.452
Avg. Depth (%)	83.99	79.41

**Figure 3-6: Ligament Area and Ligament Corrected Depth Profile Example for
Pulled Tube R12C32
Destructive Exam Local and Coil Field Averaged Depths**

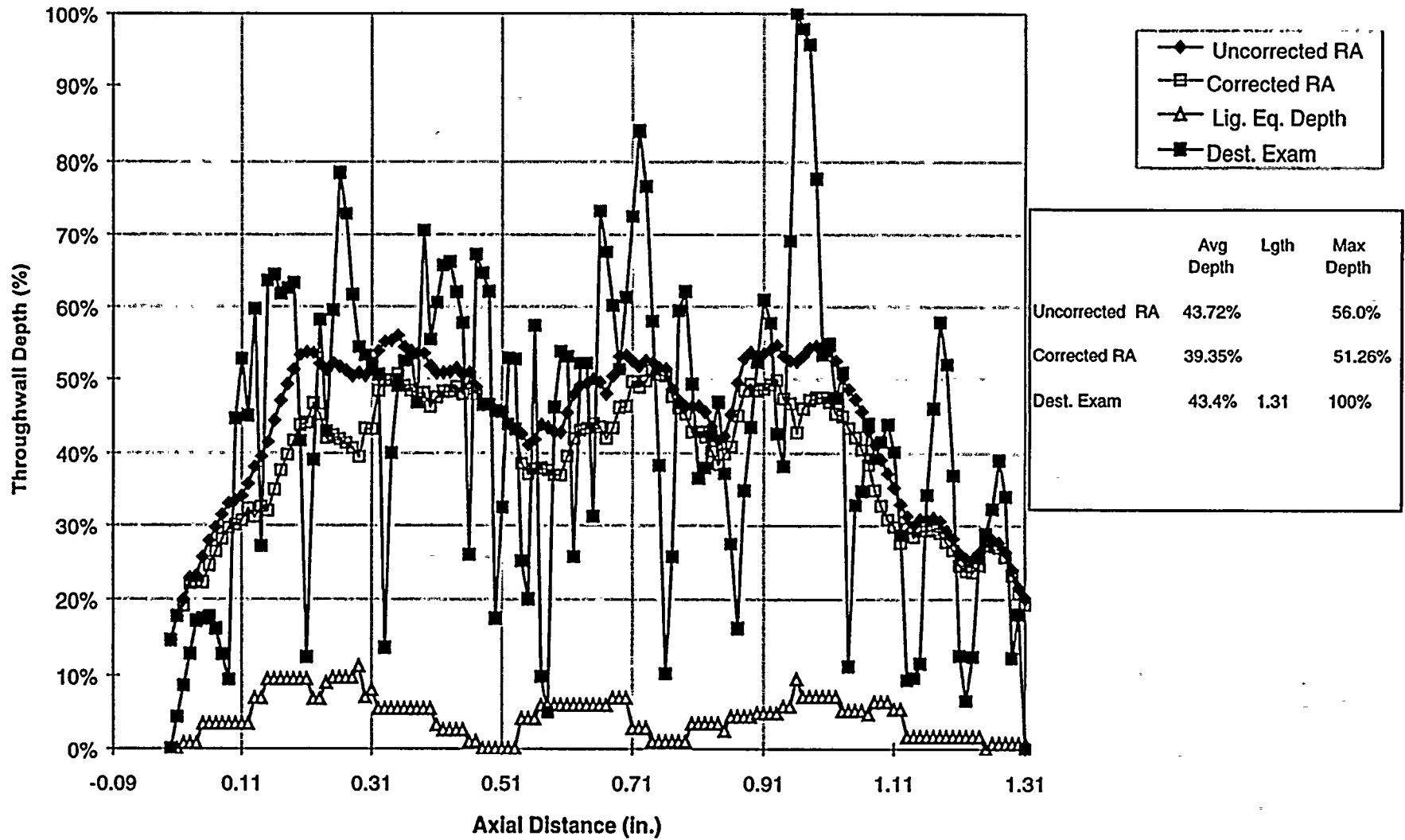


**Figure 3-7: Effect of Ligament Corrections Upon Destructive Exam Profile
R21C43 - Crack 1**

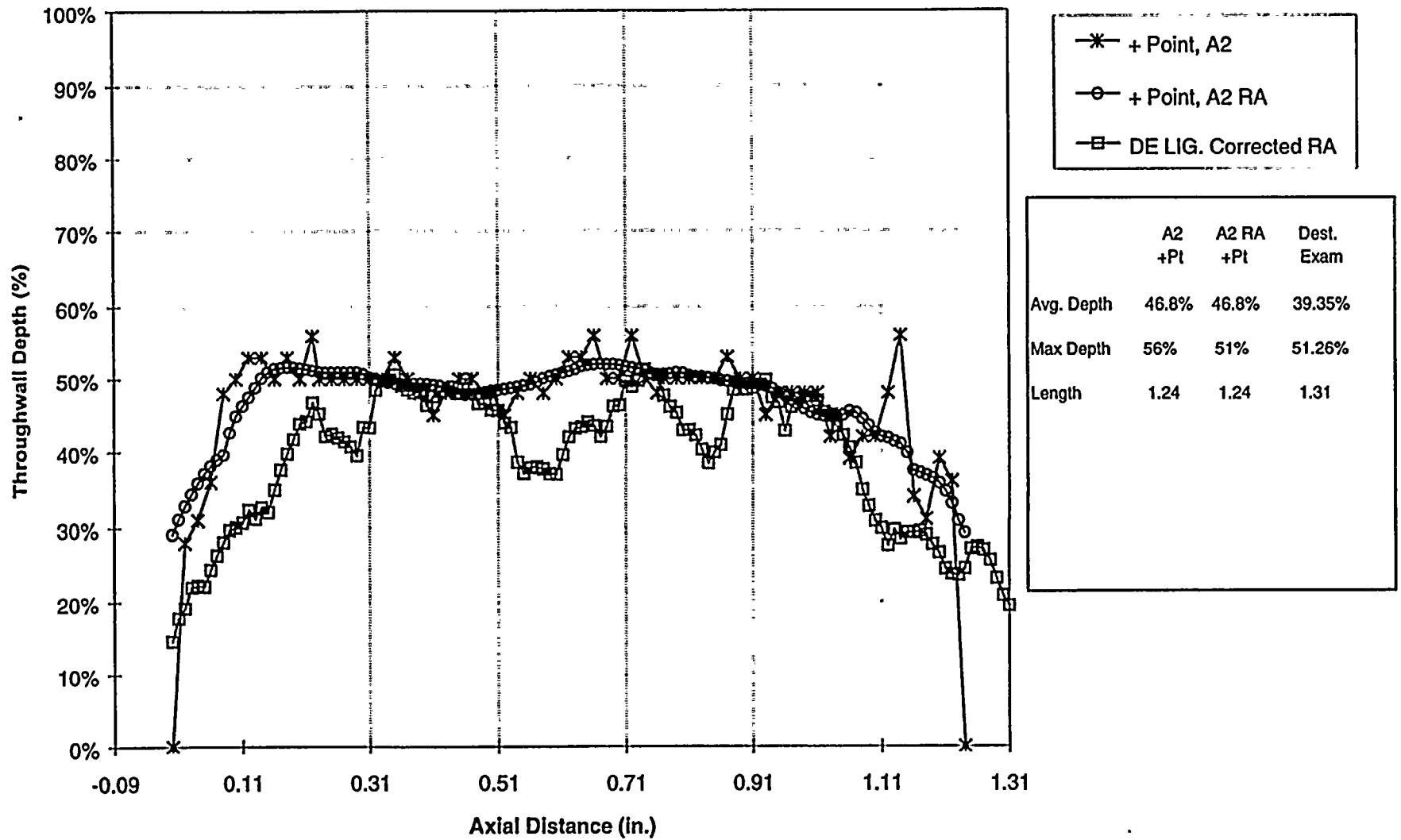
Destructive Exam vs. Running Average w/o Ligament Corrected Depth Profile



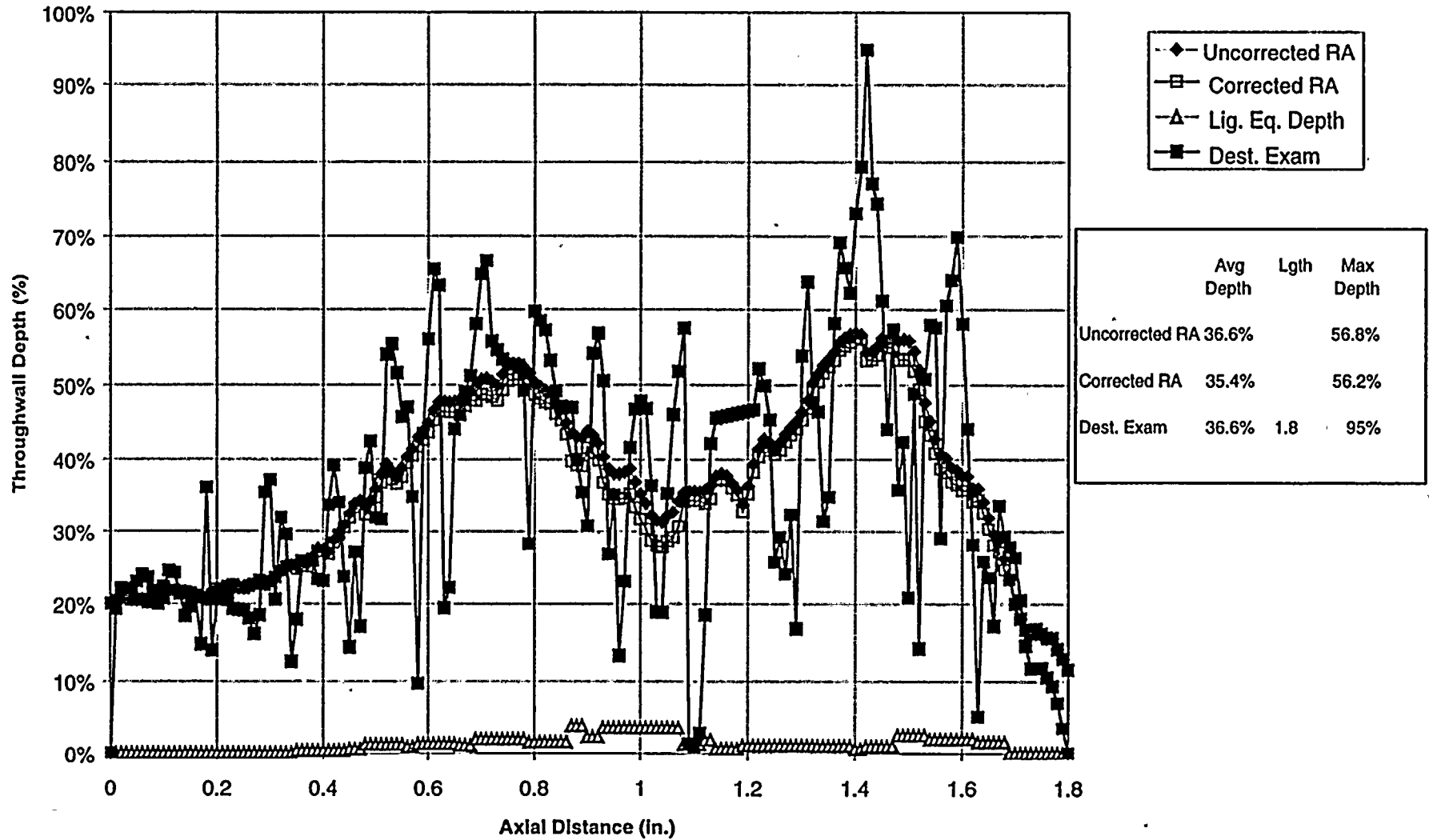
**Figure 3-8: Laboratory Specimen 13 Crack 5
Comparison of Depth Profiles With and Without Ligament Correction**



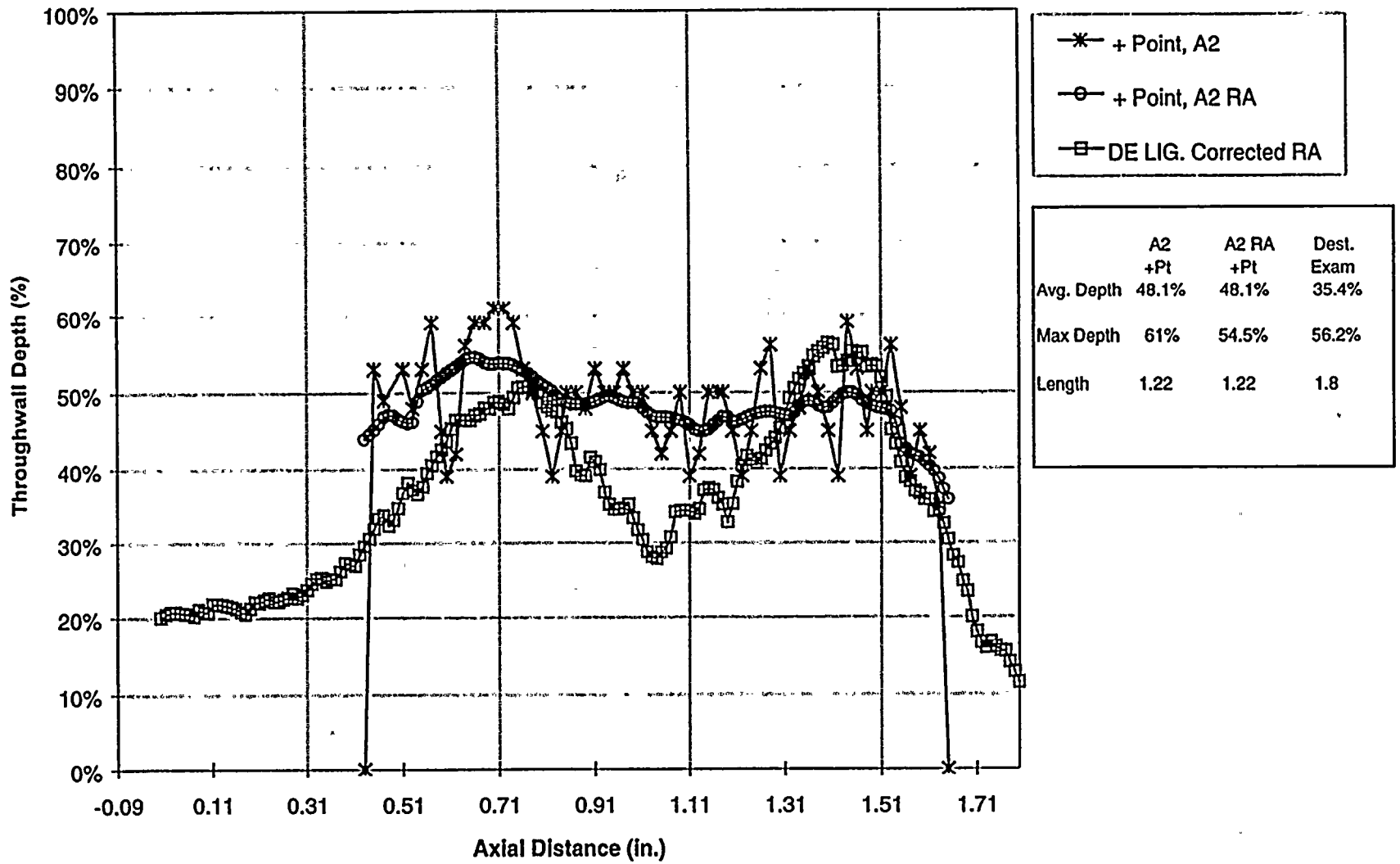
**Figure 3-9: Laboratory Specimen 13 Crack 5
Comparison of NDE with Ligament Corrected Depth Profile**



**Figure 3-10: Laboratory Specimen 13 Crack 1
Comparison of Depth Profiles With and Without Ligament Correction**



**Figure 3-11: Laboratory Specimen 13 Crack 1
Comparison of NDE with Ligament Corrected Depth Profile**



4.0 LABORATORY SPECIMEN DATABASE

4.1 Introduction

Laboratory specimens were prepared to reduce the financial and radiological dose impacts associated with tube removal, as well as to expand the range of parameters which characterize axial PWSCC flaws at dented TSPs. The intent of the laboratory specimen program was to produce flaws of varying length and depth, in varying sized dents, which are considered to be representative of the pulled tube database both in flaw characterization and dent profile. Two sets of laboratory specimens were prepared; one from 1996 produced predominantly ovalized dent shapes, and one from 1997 which produced a combined ovalized/locally exaggerated dent shape.

4.2 Preparation of Laboratory Specimens

4.2.1 1996 Laboratory Samples

The 1996 laboratory samples were prepared by ovalizing the tubes in a clamp device which used 2 rounded edge flat steel plates to transfer the denting force to the tube. The samples were ovalized, and the clamp then removed during exposure to the corrosion media. Difficulty in initiating PWSCC flaws was encountered, and a revised approach was undertaken in order to generate the desired flaws. The clamp device used to cause the initial ovalization was left on the tubes during the exposure to the ID cracking media. The application of the clamp during cracking exposure retained high residual stresses in the tubes by preventing springback of the tube due to material elasticity. The flaws generated in this portion of the program were significant, with typical lengths approaching one inch and typical average depths approaching or exceeding 90%, with most of the flaws experiencing 100% throughwall degradation. The objective for this phase of the program was to develop large flaws to support +Pt sizing qualification for indications potentially challenging to tube integrity limits. Following cracking, TSP simulant collars were placed at the approximate midpoint of the ovalized area and the tube to TSP simulant crevice was packed with a magnetite/copper slurry. After packing, the sample was baked at low temperature (400° F) to solidify the slurry product, thereby adhering the TSP simulant collar to the tube.

4.2.2 1997 Laboratory Samples

The objective for preparation of this group was to obtain a wide range of depths for NDE sizing qualification and to obtain low voltage dents (principally <2 volts) for qualification of bobbin detection. The 1997 laboratory samples were prepared using a more localized denting force application. These samples used a 3/4" thick carbon steel TSP simulant with an enlarged tube hole diameter of 0.900" (compared to the typical TSP hole diameter of approximately 0.891"). At the center of the 3/4" TSP thickness, a screw thread was applied through the thickness of the TSP, normal to the longitudinal axis of the tube. A set screw was used to apply a denting force to the tube. The set screw sizes ranged from a 6-32 (0.112" major thread diameter) to a 5/16-16 threadform (0.312" major thread diameter).

Specimen "strings" were used to reduce the total number of samples and tube length required. These strings were comprised of a 7/8" OD tube section approximately 21" long. Five separate TSP simulants spaced on 3" centers were applied to the tube. A schematic of the specimen string is provided in Figure 4-1. Most of the strings used a consistent set screw size for each of the TSP simulants on the string. For most of the strings, a consistent torque was applied to each TSP on the string. This acted to produce similar sized flaws in each TSP intersection of the string. In some cases, set screw sizes as well as torque

levels were varied for each TSP intersection on the string. The tips of the set screws were machined flat to the minor thread diameter for smaller set screws and machined flat to a diameter of 0.130" for the set screws with minor diameters larger than 0.130". The flat tips of the set screws were produced to more accurately recreate the field dent shapes based on UT results. After exposure to the cracking media, the tube to TSP crevices were packed with a magnetite/copper slurry. To ensure adequate packing, the tubes were vibrated while the slurry was pressed into the crevice using a specially designed device. The packed crevice conditions were utilized to produce a crevice condition which best simulated actual plant conditions.

The laboratory specimens were prepared using mill annealed Alloy 600 tubing of 7/8 inch OD and nominal 50 mil wall. Material certifications for the tubing are given in Appendix F. The tubing used for the 1997 specimens was selected from heat 2650, which is highly sensitive to cracking. The available tubing from this heat had wall thicknesses towards the upper tolerance range with typical thicknesses in the range of 52 to 54 mils.

4.3 Dent Profiles

The axial and circumferential dent profiles for the 1997 laboratory samples were judged to represent an equal or more challenging profile compared to the pulled tubes. The pulled tubes exhibited an ovalized pattern in the circumferential direction, with a localized area of circumferential deformation. Profilometry of field dents show dent shapes ranging from only ovalization to varying degrees of ovalization with local deformation superimposed on the ovalization. The flaws typically developed in this locally deformed area, with a secondary flaw sometimes observed approximately 180° from the main flaw, at the minor axis of the ovalized region. The circumferential denting pattern in the 1997 laboratory samples resulted in small amounts of ovalization, particularly in the samples with the smaller set screws, and pronounced local deformation at the set screw with respect to arc length extent affected. In the axial direction, the set screw interaction resulted also in a more pronounced localized deformation, whereas the pulled tubes tended to exhibit a more uniform denting profile which typically extended for nearly the entire TSP thickness. This more pronounced tube deformation, in both the circumferential and axial directions, has a tendency to increase liftoff effects in surface riding probes, as well as reduce bobbin probe detection capability compared to more generalized ovalization conditions, as seen in the field conditions. Table 4-1 presents a summary of the dent sizes both at the set screw and 180° from the set screw, or at the minor axis. Thus, the laboratory dents simulate the field dents that are more challenging with regard to NDE detection and sizing. Dent profiles for the laboratory specimens were obtained by laser profilometry for the ID silastic molds (Section 4.4) of the specimens. The laser profilometry dent profiles are given in Appendix H of this report. Most specimens were also ID profiled using UT. The UT dent profiles are given in Appendix G of this report.

4.4 Silastic Mold Crack Indications

Following corrosion testing, silastic molds were used to provide for a general indication of crack length and distribution and to assess general crack production (1 or 2 flaws). Dye penetrant was applied to the tube ID surface, permitting the penetrant to enter the crack faces. Liquid silastic rubber was then poured into the tube to a height which bounded the TSP intersection. The dye penetrant in the crack became absorbed by the liquid silastic. After the silastic cured, it was removed from the tube. The general crack shape is observed on the OD of the silastic mold. The crack shapes were then transferred to paper backing by applying a transparent tape over the crack location and then peeling off the tape. The liquid penetrant was then transferred to the tape, and the tape then applied to a paper backing. The silastic mold crack tracings are shown in Appendix G.

4.4.1 Silastic Mold Laser Profilometry Dent Profiles

Laser profilometry was also performed on the silastic molds to determine the denting shapes. The laser profilometry results are provided in Appendix H. From these plots, the general ovalization shape and localized denting due to the set screw are provided. The plot for sample 3-1H, is the first entry in Appendix H. Laser profilometry was not performed for samples 1-1H thru 1-5H or 2-1H thru 2-5H. The major axis of the ovalization is identified, as well as the minor axis, and set screw location. The radial ovalization plots shown are somewhat exaggerated due to the plotting scale setup and therefore are not exact representations of the ovalized dimensions. If the radial ovalization plots were provided at true scale, the dents would be difficult to discern. The deflection full scale range setup for the laser profilometry is 0.030", therefore, a tube ovalized 30 mils in the radial direction on the minor axis would appear in the radial profile plot to be closed at the minor axis, forming a figure "8" shape. The second page of the laser profilometry data for each sample provides the nominal ID radius away from the dent as well as the absolute minimum and maximum radial dent values at the set screw and minor axis. For the samples which used smaller set screws, the localized dent at the set screw has a tendency to be greater than the minor axis denting extent, while for the samples which used larger set screws, the denting extents at the set screw and at the minor axis tended to be similar.

4.5 Simulation of Packed Crevices

The tube to TSP crevices were packed with a magnetite/copper/zinc oxide slurry after cracking to simulate field crevices and obtain prototypic NDE responses for the tube/TSP intersections. The sludge composition was approximately 75% magnetite, 17% copper/copper oxide, and 8% zinc oxide. The powdered magnetite mixture was combined with a binder solution, containing mainly sodium hydroxide and water, packed into the crevice, and baked in an inert furnace to solidify the slurry. The denting force applied by the set screw was present during the crevice packing and was present during the corrosion cracking phase. The device used to hold the samples during packing conserved the slurry product. By doing this, the exact quantity of slurry introduced could be weighed, and by adding predetermined amounts of slurry, the crevice was assured to be completely packed. Following packing, the samples were baked at 400° F to solidify the slurry.

4.6 NDE Data Collection

Both bobbin and +Pt data were collected after dent production (prior to crack initiation), and following cracking and crevice packing. By collecting NDE data prior to crack initiation, additional NDD data used for the performance test was developed. Bobbin dent voltages were recorded and are summarized in Appendix D, Table D-1. The dent voltage data of Table D-1 represents the mathematical average of the recorded dent voltage by the analysts participating in the performance test. Bobbin and +Pt data were collected following crack initiation (exposure to the cracking media), and this data was also utilized for the performance test.

The key focus of this program is the qualification of crack length and depth profile sizing using +Pt data and bobbin coil detection. To meet this objective, it is necessary to establish the overall accuracy of methods used for sizing axial cracks at dented TSP intersections. Additionally, crack length versus depth profiles are required to support tube burst analyses and potential leakage estimates.

To provide the desired data base, the laboratory dented samples were subjected to extensive NDE examination during the course of this program. NDE procedures are discussed in Section 5. Data for

the 1996 laboratory samples was collected for the following coils: bobbin, two mid-range +Pt coils, mag biased +Pt, high frequency +Pt, gimbaled +Pt, 80 mil high frequency pancake, and 115 mil pancake. Data collection for the 1997 samples included bobbin, mid-range +Pt, 80 mil pancake, 115 mil pancake, Cecco, and Ghent coils. No qualification or evaluation of data was performed for the Cecco or Ghent coils. The length of cable was utilized to maintain compliance with the requirements of Appendix H of the EPRI Eddy Current Qualification guidelines during the data acquisition phase.

In addition to the utilization of a variety of eddy current probes, the data was acquired using both ANSER and EDDYNET software to obtain a broad data base and facilitate evaluation of the sensitivity of NDE sizing uncertainties to the software system. NDE analysis results are discussed in Section 5 and tabulated in Appendices C, D, and E for +Pt, bobbin, and Cecco coil results, respectively.

4.7 Destructive Examination Results

Following cracking, the samples were burst tested. Nine samples were leak tested at room temperature conditions using the Westinghouse in situ testing equipment. Some of the samples were burst tested using the in situ equipment, and some were burst tested at the Westinghouse Science and Technology Center (STC).

Following burst testing, the samples were cut into workable lengths, typically 1.5 inches long. Scanning electron microscope (SEM) fractography was performed to obtain length vs. depth profiles of the burst face for each sample. Flaws which did not burst were flattened and reverse bent to open the flaw face. SEM fractography was also performed on these flaws. For a few samples with no well defined secondary flaw for opening by bending, depth profiles were obtained by radial grinds through the thickness of the specimen. A summary of the depth profile evaluation of each flaw evaluated is provided in Appendix B.

4.8 PWSCC Crack Morphology for Laboratory Specimens

In general, the morphology of the laboratory specimens is characterized as axially oriented PWSCC macrocrack networks. A primary flaw was initiated at the set screw, and in many cases, a secondary flaw located approximately 180° from the primary flaw, at the minor axis of the ovalized shape, was observed. In all cases, the primary flaw was more severe than the secondary flaw. For the shallower flaws, the morphology was characterized by numerous co-linear initiation sites with ductile, non-degraded ligaments separating the individual flaws. The deeper, more significant flaws exhibited far fewer ductile ligaments, indicating that the advanced corrosion process involved linking of the individual initiation sites by continued corrosion until the ligament was effectively removed. Examples of the length vs. depth profiles for some of the laboratory specimens is provided in figures 4-1 thru 4-3. In these figures, the deepest portion of the flaw is observed either at the approximate midpoint of the flaw, or occurred at two distinct peaks on either side of the midpoint of the flaw, forming a saddle shape. This saddle shape was observed in the samples utilizing larger sized (1/4" and 5/16" diameter) set screws. These depth profiles can be compared with the depth profiles of the pulled tubes, and show good agreement. In the pulled tubes, the deepest portions of the flaw tend to coincide with the most severe denting profiles. Length vs. depth profiles for the pulled tube indications is provided in Figures 4-4 thru 4-8.

4.9 Prototypicality of Laboratory Dented PWSCC Specimens for Simulating Field Data

4.9.1 Dent Shapes

A comparison of the dent shapes supports the conclusion that the dent profiles for the 1997 laboratory samples was similar to the pulled tube profiles. With regard to eddy current data analysis, it is judged that the laboratory samples, particularly those which used smaller sized set screws for generation of the denting force, presented a more challenging condition compared to the pulled tubes. This is due to the more localized denting effect with small ovalization. Additionally, the presence of the set screw can reduce detection sensitivity. The set screw causes an offset (non-concentricity) of the plate relative to the tube, resulting in tube to plate contact 180° from the screw and includes an additional tube to carbon steel contact point at the set screw. This can make the detection of small signals more difficult than in the true in-generator condition where the denting is typically caused by the constriction of the tube by the magnetite deposits, thereby filling any gap between the tube and the support. In the plant, the tube would be expected to contact the plate either at one point only, or not at all, for the case where the crevice is filled 360° around the tube circumference. The presence of the set screw can act to produce a loose part signal using some techniques.

Dent profiles for the 1996 and 1997 laboratory samples as well as pulled tubes are presented in Appendix H. The UT dent sizes indicate that the maximum and minor axis dent values for the 1997 laboratory samples are typical of the pulled tubes. It should be stressed that the influence of the set screw in the 1997 samples acted to give more localized denting in some cases than the field dents. Examples of the UT profile results for some of the laboratory samples are presented in Figures 4-9 and 4-10.

4.9.1.1 General

TSP denting results from in-service crevice corrosion of the carbon steel TSP material and the resultant deformation of the tube. In axial profile, dents typically begin as a gradual diameter reduction (ovalization) outside the TSP, exhibit a marked further reduction at the TSP edge, and a gradual increase toward the TSP axial center. A local indentation or deformation may be superimposed upon the overall ovality. As a relatively rare occurrence, denting causes a relatively uniform diameter reduction with little ovality. The change at the TSP edges and within the TSP result from expansion forces acting directly on the tube; the ovalization outside the TSP is characteristic of the transition from the unaffected tube farther from the TSP. With a differential bobbin probe the initial gradual diameter reduction is usually not detected, but the sharper changes at the edges are very clearly observed; in early stages it is not unusual to observe a separate liftoff signal at each TSP edge. In cases of minor denting, i.e., dents apparent but without secondary structural consequences, the nominal diameter bobbin probe, (0.720" diameter) passes without difficulty through the dented TSP intersections. The amplitude of the dent signal produced when the bobbin probe passes the dented intersection is not generally proportional to the degree of diameter reduction; rather it is the combination of liftoff signals formed at the TSP edges and the gradual diameter changes (ovalization) that accompany denting. In some cases this combination produces no liftoff signal, even though measurable diameter change is present. As a rule of thumb, a 5 volt dent signal measured at the calibration settings of the Voltage Based Repair Criteria represents a 0.001" uniform diameter reduction. However, there is no well defined correlation of voltage with dent diameter reduction for the more common denting with ovalization and/or local deformation.

PWSCC Detection in Dented TSP Intersections

The phase angle of a dent response is equivalent to that of the liftoff response (e.g., probe wobble) and is usually set horizontal (180°). The bobbin phase response for PWSCC lies in the range of 0 to 40° , measured clockwise from the horizontal when the 100% ASME hole is set at 40° . Shallow PWSCC signal phase angles may overlap, within analyst variability, with those of the dent signals. For TSP intersections that exhibit small dent signals (< 3 volts), the detectability of crack signals depends on the crack depth and location of the flaw endpoints, relative to the entrance and exit lobes of the dent signal. Large flaw signals (> 3 volts) usually represent deep penetration flaws, which will produce gross distortion of a small dent signal even if they are coincident with the dent; these would be obviously detectable since the phase angle from the flaw would dominate the resulting TSP signature. For small flaw signals in small dents, careful evaluation of the data for the dented intersection permits identification of flaw signals if at least one end of the crack is more than the order of 0.2" from the dent signal entrance/exit lobes. A separation distance is necessary to prevent full vectorial combination of a larger dent component with the flaw component. The gradual diameter change between the entrance and exit lobes of the dent causes negligible effect on the flaw signal visibility. To the extent that the dent signal lobes and flaw signals overlap, the strength of the flaw signal relative to that of the dent (signal to noise) governs the visibility (detectability) of the flaw. Signal strength is, to a first approximation, proportional to depth for constant length cracks; thus POD increases with depth.

4.9.1.2 Laboratory Sample Morphology

The 70 laboratory specimens prepared to simulate the field PWSCC/denting phenomenon provide a population that closely resembles the degradation morphologies observed in tubes pulled from operating steam generators. As these samples were specifically optimized to produce PWSCC, the shallow OD flaws also observed in some of the pulled tube morphologies were not replicated; however for the purposes of this study, the absence of ODSCC does not pose a relevant difference. The typical PWSCC morphology for both the pulled tubes and laboratory specimens is characterized by the presence of one or two dominant axial cracks (two cracks about 180° apart). The cracks have few small, uncorroded ligaments except in shallow cracks; for the shallow cracks, coalescence of aligned microcrack initiation sites may not have yet occurred. Morphology among the laboratory specimens varies from a single macrocrack to cases with a macrocrack associated with a few or a narrow band of small microcracks. The parallel microcracks were commonly shallow, but their presence tends to increase the difficulty of sizing compared to the simpler case of a single macrocrack. A single macrocrack or a macrocrack with only a few adjacent microcracks is typical of that found in pulled tubes to date.

Overall, it is concluded that the laboratory specimen crack morphology is a very good simulation of that found in pulled tubes. A single macrocrack or two macrocracks about 180° apart dominate the crack morphology. Some of the laboratory specimens include a narrow band of microcracks on each side of the macrocrack. The parallel microcracks are typically very shallow and their effect on NDE response, if any, would be to slightly increase the uncertainty in sizing the depth of the macrocrack.

4.9.1.3 Bobbin Signals

The character of the bobbin signals generated from the lab PWSCC/denting samples were compared with a field population of tubes plugged for PWSCC/denting. Further, the range of the bobbin dent voltages observed on the lab samples encompassed those observed on pulled tubes. The crack distribution observed for field samples was not markedly different from the lab samples. Table 4-2 presents a summary of the pattern of signals observed in each of populations. These results show a

similar distribution of crack and dent signals across the height of the TSP. The types of lissajous patterns observed for the laboratory specimens were similar to those found on the pulled tubes. These included (1) Dent at the center of the TSP-Flaw at the edges, (2) Dent-Flaw-Dent, (3) Dent-Flaw, and (4) Distorted Dent. Figures 4-15 to 4-18 illustrate comparative examples for several of these cases as found in the lab samples and in field indications. Interpretation of the bobbin data is most difficult when crack and dent maxima coincide; this occurs in less than 10% of the cases and more often in the laboratory specimens than the field data. The identification of crack components in the composite TSP signals requires more detailed examination of bobbin signals for segments diverging from horizontal orientation.

Overall, it is concluded that the bobbin responses are very similar between the laboratory specimens and field indications. The laboratory specimen bobbin data are a very good simulation of the field data for axial PWSCC at dented TSP intersections.

4.9.1.4 Interpretation/Analysis of the Signals

As a matter of general impression, the field population was judged to be easier to analyze for the presence of flaws than were the lab samples. This is attributed to the greater likelihood that the short cracks and dents coincide in the lab samples, producing distorted dents and difficult flaw calls. The set screw used to produce the dents caused a local indentation at which small cracks were found. The local indentation created additional profile variation. In the lab specimens, it was more likely that the dent would lie in the middle of the TSP than it was in the field samples; the visibility of cracks is more difficult under these circumstances, since the dent signals were more dominant (lower signal to noise).

The lab samples also appeared to have more mix residual due to sludge packed in the crevices although the alloy property change contribution to the mix residual does not occur in laboratory specimens. As the mix residuals represent a support plate length artifact of weaker strength than the TSP signal itself, the discontinuity represented by an ID flaw (assuming the flaw ends away from TSP edge) is expected to have adequate visibility, given the tendency of the alloy property residuals to fall in the OD phase angle range. Thus the relative strength of alloy property residuals is expected to have little influence on the detection of PWSCC in dented TSP intersections. In cases where a shallow flaw also persists over the full TSP length, the resultant vector may be indistinguishable from the alloy property residual.

These relative signal to noise trends result in the laboratory samples representing a moderately greater challenge to PWSCC detection by bobbin probes than is normally expected for small dent influenced flaws in the steam generator.

4.9.1.5 Conclusions

Based on the above assessments, it is concluded that the laboratory specimens provide a good simulation of field axial PWSCC at dented intersections with regard to crack morphology, bobbin signal characteristics and influence of mixed residuals. Qualification of the bobbin probe for PWSCC detection in intersections with small dents, achieved by performance demonstration on a sample population consisting of the appropriate lab and field samples, will result in a suitably conservative technique.

4.10 Data Exclusion Criteria

The object of data exclusion criteria is to eliminate from databases, test or measurement data that are unacceptable or inadequate due to errors in obtaining the data or the data are inappropriate for the application. The general categories for data exclusion are:

1. Invalid or Inadequate Test
2. Morphology Related Criteria
3. Test Measurement Error
4. Destructive Exam Crack Depth Profile Related Criteria

The exclusion criteria defined are based on the data exclusion criteria developed for application of the ARC for ODSCC at TSP intersections under NRC GL 95-05, with application specific to axial PWSCC at dented TSP intersections. A complete discussion of these data exclusion criteria are given in Reference 8.3.

**Table 4-1
Summary of Dent Sample Physical Characteristic Data**

Sample	Set Screw Size	Pre-Crack Dent Volts ⁽¹⁾	Post-Crack Dent Volts ⁽²⁾ (from Perf. Test)	Max Depth (DE local)	Bobbin Call	UT Dent Size - mils (3)		Laser Dent Size - mils	
						Maximum Dent	180Degrees	Maximum Dent	180 Degrees
1996 Samples									
P-7	NA		Note 4	100%	DSI	2.57	2.06	4.6	
P-8	NA		Note 4	100%	DSI	3.92	3.21	5.2	
P-9	NA		Note 4	100%	DSI	3.31	3.0	4.0	
P-10	NA		Note 4	100%	DSI	3.59	1.06	3.5	
P-11	NA		Note 4	100%	DSI	1.62	0.56	2.1	
P-12	NA		Note 4			2.56	1.73	2.9	
1997 Samples									
1-1	6-32	2.75				7.01	1.26	6.4	4.0
1-2	6-32	2.41				7.16	1.36	7.0	3.4
1-3	6-32	2.63	2.78	48%	DDI	7.1	1.39	6.4	3.8
1-4	6-32	2.32	1.84	54%	DDI	5.1	3.16	6.1	3.7
1-5	6-32	2.17				3.73	3.63	5.0	4.2
2-1	10-32	3.87	3.73	33%	DDI	7.15	3.12	7.0	4.2
2-2	10-32	2.08				6.97	3.73	4.6	3.4
2-3	10-32	2.21	2.16	22%	DDI	5.05	4.31	6.1	3.1
2-4	10-32	1.84	1.3	48%	DNT/DDI	4.29	2.53	4.6	3.1
2-5	10-32	2.32	2.88	36%	DDI	7.02	1.95	5.3	3.3
3-1	¼-20	6.17				not acquired	not acquired	12.4	4.6
3-2	¼-20	5.40				not acquired	not acquired	9.0	4.8
3-3	¼-20	5.68	6.17	29%	DNT	6.7 post crack	5.3 post crack	9.9	4.6
3-4	¼-20	4.62	5.22	8%	DNT	10.2 post crack	2.3 post crack	8.5	4.8
3-5	¼-20	12.30				19.4 post crack	2.7 post crack	16.1	5.7
4-1	5/16-16	1.79				not acquired	not acquired	8.5	4.8
4-2	5/16-16	4.16				not acquired	not acquired	9.2	5.0
4-3	5/16-16	7.62				10.9 post crack	6.1 post crack	12.3	5.5
4-4	5/16-16	5.14	6.29	15%	DNT/DDI	8.3 post crack	5.4 post crack	10.6	4.4
4-5	5/16-16	3.23				not acquired	not acquired	9.0	4.0
5-1	5/16-16	2.42	2.28	40%	DDI	6.3 post crack	2.0 post crack	6.3	3.8
5-2	¼-20	2.27				6.7 post crack	1.7 post crack	5.1	3.4
5-3	10-32	2.25				not acquired	not acquired	5.1	3.3

**Table 4-1
Summary of Dent Sample Physical Characteristic Data**

Sample	Set Screw Size	Pre-Crack Dent Volts ⁽¹⁾	Post-Crack Dent Volts ⁽²⁾ (from Perf. Test)	Max Depth (DE local)	Bobbin Call	UT Dent Size - mils (3)		Laser Dent Size - mils	
						Maximum Dent	180Degrees	Maximum Dent	180 Degrees
						6.2 post crack	1.2 post crack		
5-4	10-32	2.60				2.9 post crack	3.6 post crack	5.6	3.0
5-5	6/32	1.65				4.5 post crack	2.1 post crack	3.5	2.7
6-1	5/16-16	2.03	1.05	84%	DDI/DSI	5.64	3.17	6.3	4.3
6-2	5/16-16	1.89	1.84	74%	DDI	6.14	3.05	6.1	4.2
6-3	¼-20	2.24	0.8	67%	DSI	7.04	1.42	5.6	4.6
6-4	10-32	2.18	1.12	64%	DDI	4.81	3.02	6.2	4.9
6-5	10-32	1.98	1.06	78%	DDI	5.79	2.73	5.7	3.3
7-1	5/16-16	5.03	4.4	30%	DDI	10.8 post crack	2.8 post crack	11.3	5.4
7-2	¼-20	2.15				5.4 post crack	1.2 post crack	4.3	2.9
7-3	¼-20	4.28	3.7	34%	DDI	9.2 post crack	2.3 post crack	9.3	4.3
7-4	6-32	1.99				5.5 post crack	1.5 post crack	5.2	2.8
7-5	6-32	2.22				6.1 post crack	2.0 post crack	4.5	3.2
8-1	10-32	1.42	Note 4	58%	DSI	3.9	3.6	5.4	2.6
8-2	¼-20	1.52	0.93	46%	DDI	3.1	2.7	4.6	2.3
8-3	¼-20	1.61		44%	DSI	5.7	0.1	4.6	2.7
8-4	5/16-16	2.04				2.8	1.8	2.7	1.2
8-5	5/16-16	1.67				2.61	1.33	2.1	1.7
9-1	¼-20	1.34	Note 4	49%	DSI	2.9	1.6	3.1	3.2
9-2	¼-20	1.24	Note 4	88%	DSI	4.2	2.5	6.4	1.7
9-3	¼-20	1.23	Note 4	85%	DSI	6.1	1.4	6.5	3.7
9-4	¼-20	1.21	1.2	70%	DDI	2.7	2.7	7.7	7.3
9-5	¼-20	1.31	0.93	75%	DDI/DSI	5.4	1.9	4.4	2.4
10-1	10-32	1.45				4.0	1.6	4.4	3.2
10-2	10-32	1.53				5.78	2.66	5.7	3.8
10-3	10-32	1.28	0.74	96%	DDI	4.22	2.26	4.8	3.6
10-4	10-32	1.70	0.95	82%	DDI	3.67	2.41	6.0	5.5
10-5	10-32	1.49				5.47	1.44	7.2	5.0
11-1	5/16-16	1.33				2.75	2.65	3.5	2.6
11-2	5/16-16	1.49	0.78	97%	DDI	3.89	2.88	4.4	3.2
11-3	5/16-16	1.34	Note 4	89%	DSI	4.97	2.78	4.7	3.2
11-4	5/16-16	1.95	2.49	94%	DSI/DDI	6.07	1.78	8.4	7.4

**Table 4-1
Summary of Dent Sample Physical Characteristic Data**

Sample	Set Screw Size	Pre-Crack Dent Volts ⁽¹⁾	Post-Crack Dent Volts ⁽²⁾ (from Perf. Test)	Max Depth (DE local)	Bobbin Call	UT Dent Size - mils (3)		Laser Dent Size - mils	
						Maximum Dent	180Degrees	Maximum Dent	180 Degrees
11-5	5/16-16	1.47				3.89	2.57	6.3	4.5
12-1	5/16-16	1.47				2.3 post crack	<1 post crack	3.2	2.7
12-2	¼-20	1.38	1.54	23%	DNT	4.3 post crack	2.2 post crack	6.2	5.7
12-3	10-32	1.22	1.31	16%	DNT/DDI	5.7 post crack	<1 post crack	6.1	5.5
12-4	5/16-16	1.39	1.18	26%	DNT/DDI	4.4 post crack	2.2 post crack	4.8	3.5
12-5	¼-20	1.30				3.7 post crack	1.9 post crack	4.5	2.9
13-1	10-32	1.47				5.3 post crack	2.4 post crack	3.5	2.3
13-2	¼-20	1.73				3.6 post crack	1.7 post crack	4.2	3.2
13-3	5/16-16	1.19	0.91	23%	DDI	4.3 post crack	1.8 post crack	4.8	3.2
13-4	10-32	1.29				4.0 post crack	2.7 post crack	5.0	3.3
13-5	¼-20	1.49				3.9 post crack	2.5 post crack	3.7	2.8
14-1	10-32	1.72				1.4 post crack	<1 post crack	2.5	1.1
14-2	10-32	1.56				1.1 post crack	<1 post crack	1.9	0.8
14-3	¼-20	1.51				1.0 post crack	<1 post crack	3.1	1.1
14-4	¼-20	1.94				<1 post crack	<1 post crack	2.1	0.4
14-5	¼-20	1.30				<1 post crack	<1 post crack	1.4	0.6
Pulled Tubes									
R10 C22-2H			2.31			5.14	5.14		
R12 C32-1H			1.1			7.27	1.64		
R21 C43-1H			3.2			5.93	3.01		

Notes:

- (1): Pre-Crack dent voltage based on Westinghouse STC lab analysis
- (2): Post-Crack dent voltage based on average of resolution analysts from NDE Performance Test
- (3): UT dent shapes prior to cracking not obtained for some samples. Post crack dent shapes used for these samples.
- (4): Original dent signal obscured by large flaw signal

**Table 4-2
Dent/PWSCC Bobbin Data Prototypicality Considerations**

Populations Compared:

Lab samples: 70 intersections on 14 tubes with 5 TSPs each. Dents induced with screw displacement.

Field samples: 51 intersections from tube population repaired for PWSCC indications

Observation	Cracks Only	Dents Only	Both	Neither
Lab Specimens				
Upper TSP Signal	36	6	0	28
Center TSP Signal	10	60	6	0
Lower TSP Signal	29	5	0	36
Field Indications				
Upper TSP Signal	32	10	0	9
Center TSP Signal	15	34	2	2
Lower TSP Signal	17	18	0	16

Figure 4-1
1997 Laboratory Set Screw Specimen String

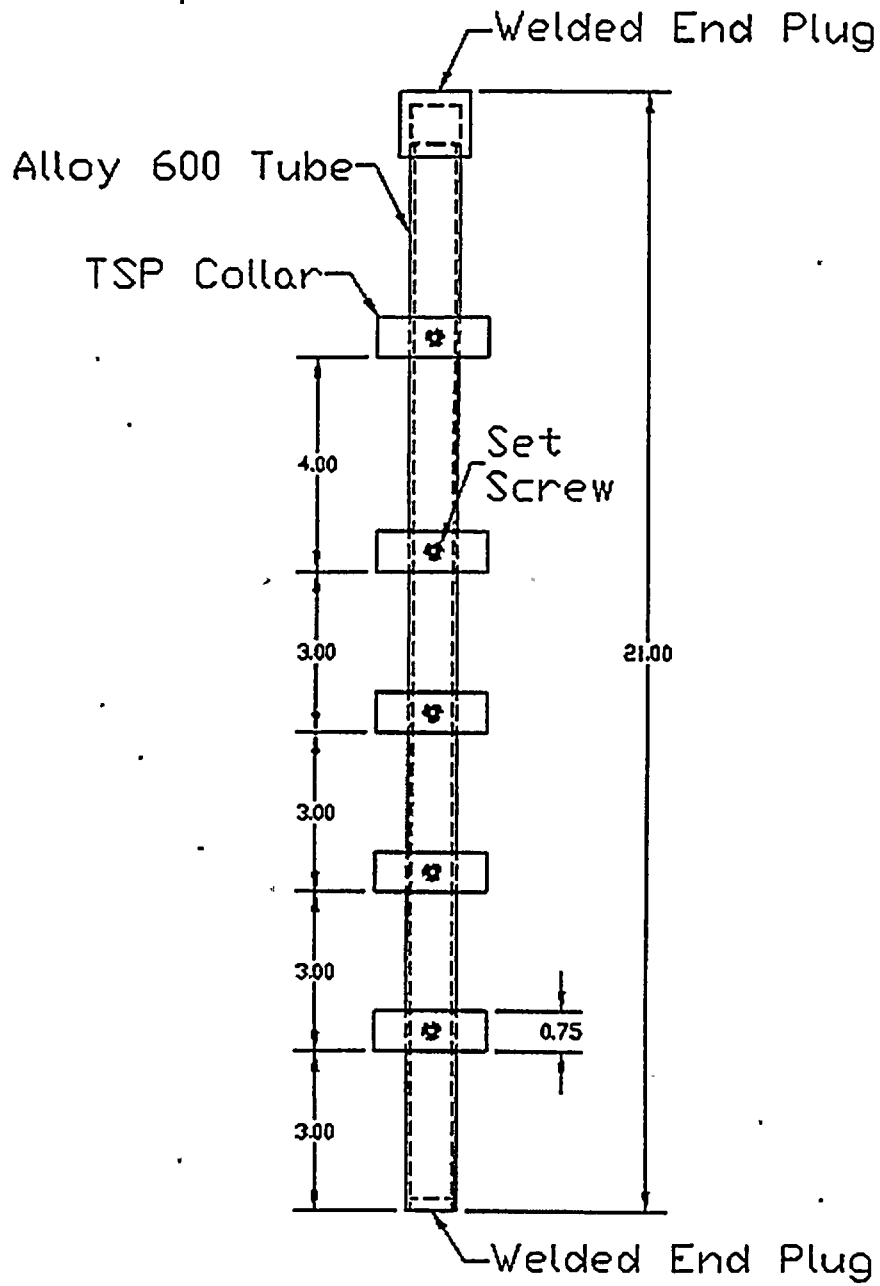
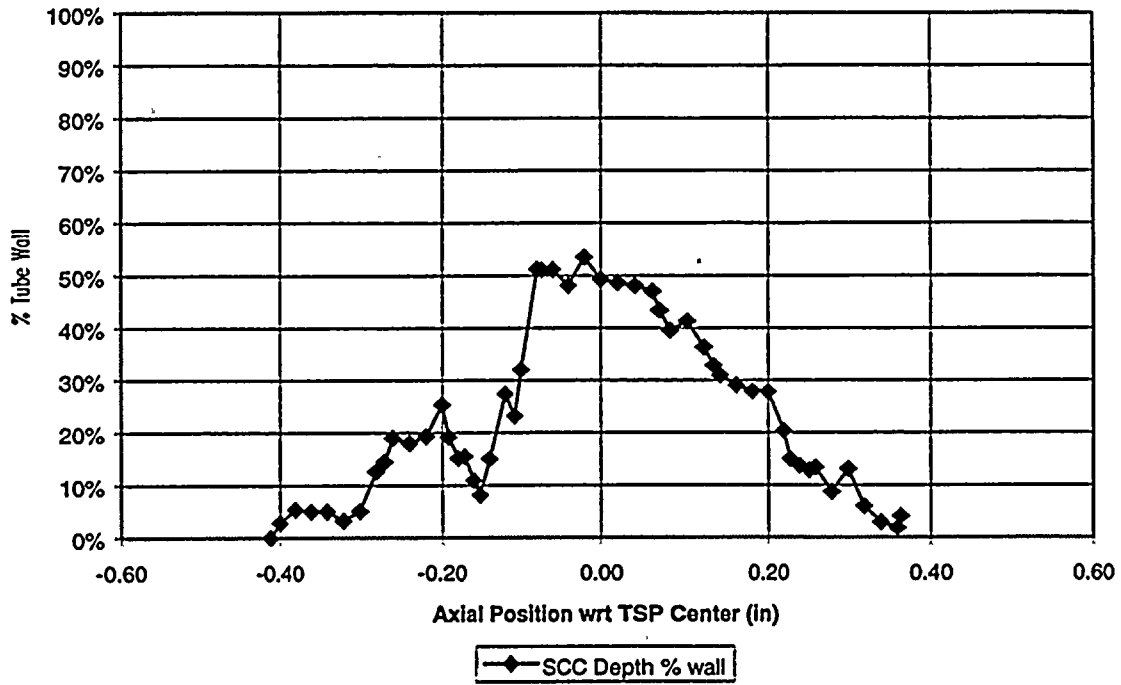


Figure 4-2
 1997 Lab Sample 2-4 Length vs Depth Profile from Destructive Exam

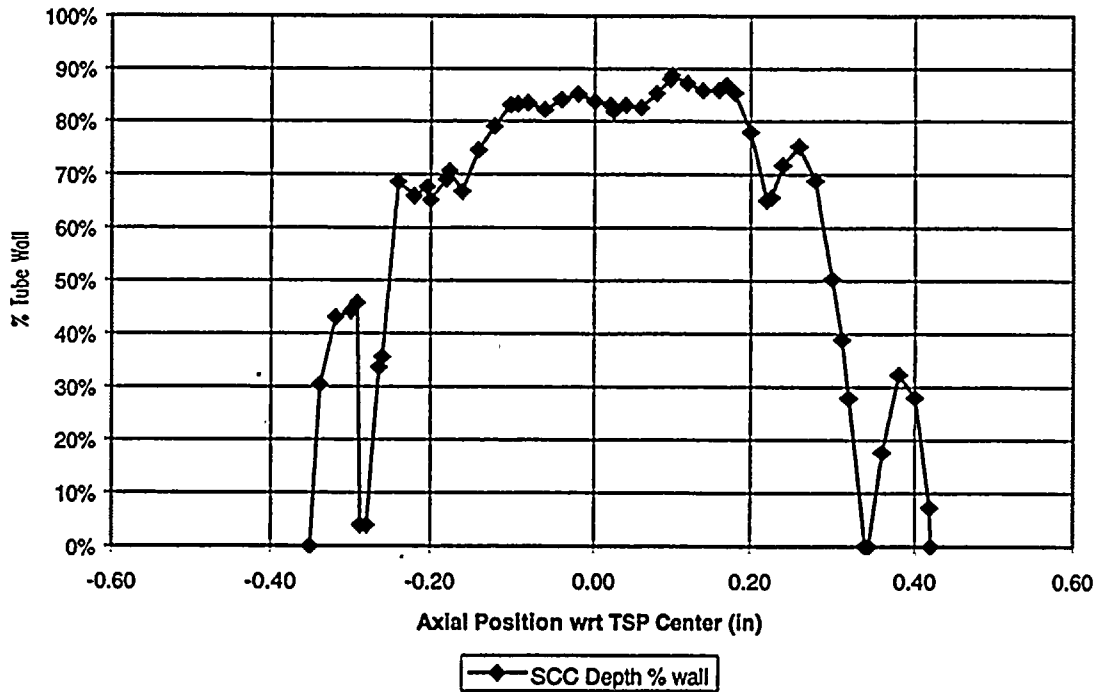
Results of Destructive Exam



Length of major SCC Crack	0.782
Tip to tip length of Crack Array	0.782
Average Depth over major SCC crack	22%
Maximum Depth	53%

Figure 4-3
 1997 Lab Sample 6-1 Length vs Depth Profile from Destructive Exam

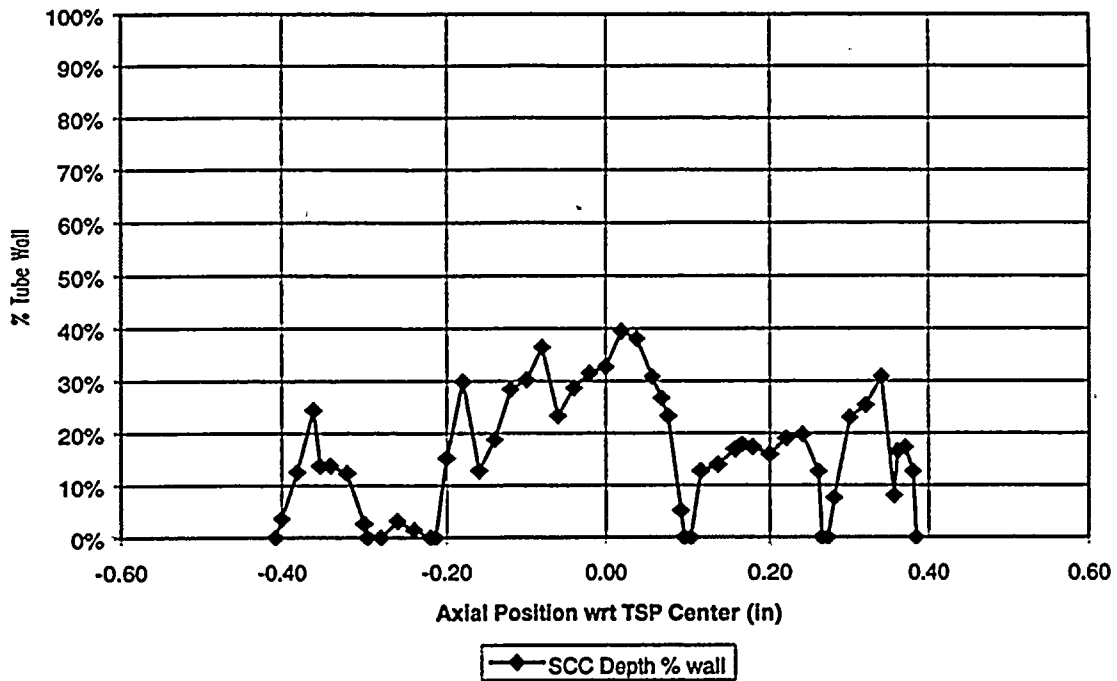
Results of Destructive Exam



Length of major SCC Crack	0.692
Tip to tip length of Crack Array	0.772
Average Depth over major SCC crack	67%
Maximum Depth	89%

Figure 4-4
 1997 Lab Sample 7-1 Length vs Depth Profile from Destructive Exam

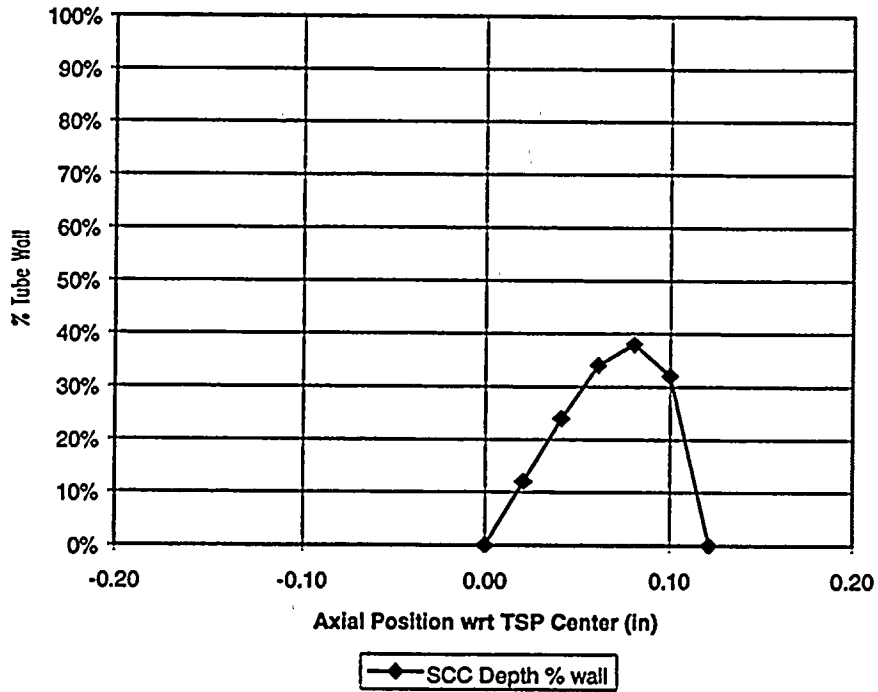
Results of Destructive Exam



Length of major SCC Crack	0.380
Tip to tip length of Crack Array	0.792
Average Depth over major SCC crack	22%
Maximum Depth	39%

Figure 4-5
 Pulled Tube R10 C22-2H Length vs Depth Profile from Destructive Exam

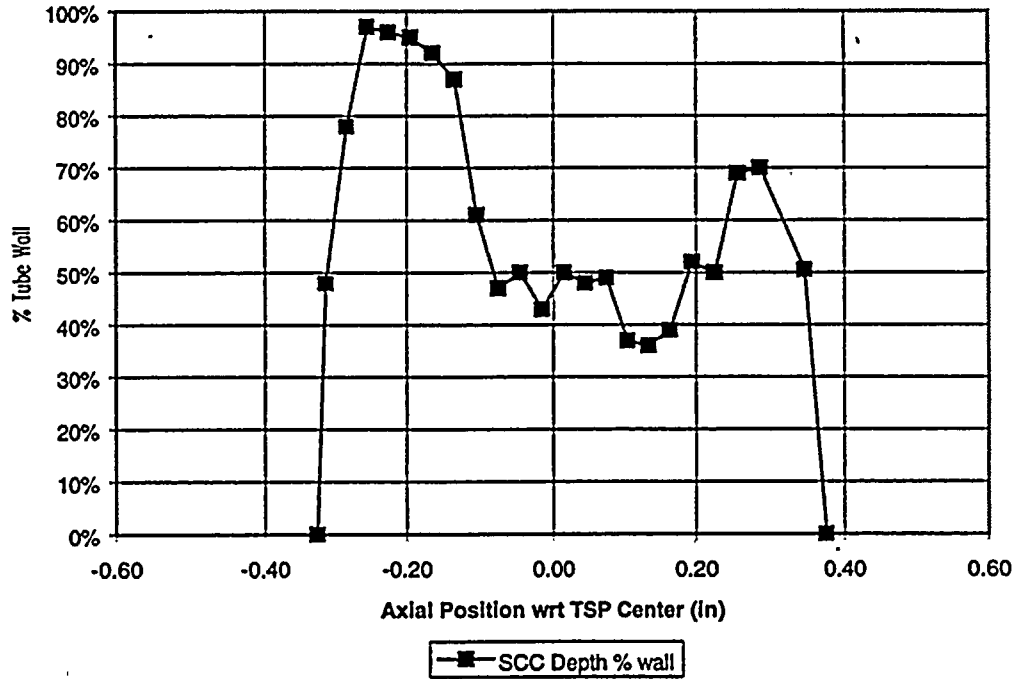
Results of Destructive Exam



Length of major SCC Crack	0.122"
Tip to tip length of Crack Array	0.122"
Average Depth over major SCC crack	23%
Maximum Depth	32%

Figure 4-6
 Pulled Tube R12 C32-1H Length vs Depth Profile from Destructive Exam

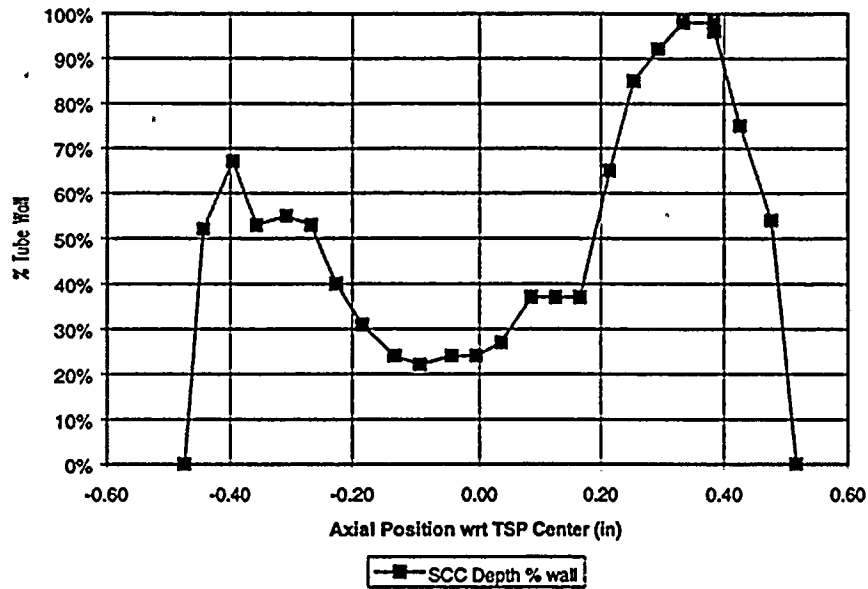
Results of Destructive Exam



Length of major SCC Crack	0.702
Tip to tip length of Crack Array	0.702
Average Depth over major SCC crack	59%
Maximum Depth	97%

Figure 4-7
 Pulled Tube R21 C43-1H Flaw 1 Length vs Depth Profile from Destructive Exam

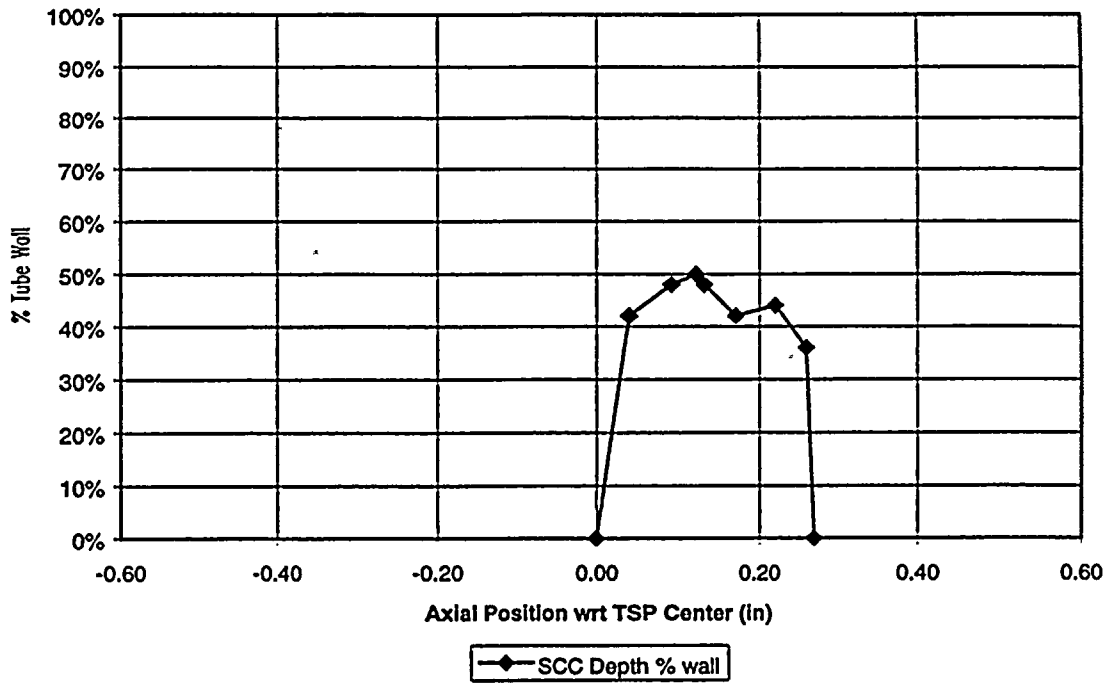
Results of Destructive Exam



Length of major SCC Crack	0.991
Tip to tip length of Crack Array	0.991
Average Depth over major SCC crack	50%
Maximum Depth	98%

Figure 4-8
 Pulled Tube R21 C43-1H Flaw 2 Length vs Depth Profile from Destructive Exam

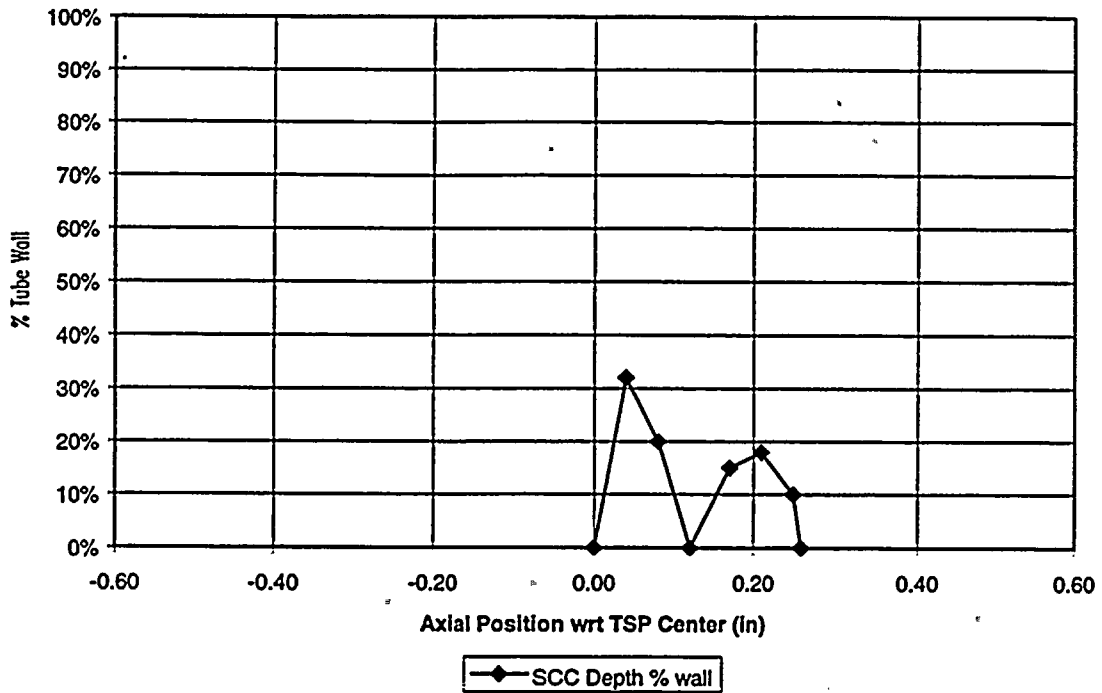
Results of Destructive Exam



Length of major SCC Crack	0.277
Tip to tip length of Crack Array	0.277
Average Depth over major SCC crack	37%
Maximum Depth	50%

Figure 4-9
 Pulled Tube R21 C43-2H Length vs Depth Profile from Destructive Exam

Results of Destructive Exam



Length of major SCC Crack	0.255
Tip to tip length of Crack Array	0.255
Average Depth over major SCC crack	13%
Maximum Depth	32%

Figure 4-10
 UT Circumferential Dent Profile for Sample 2-4

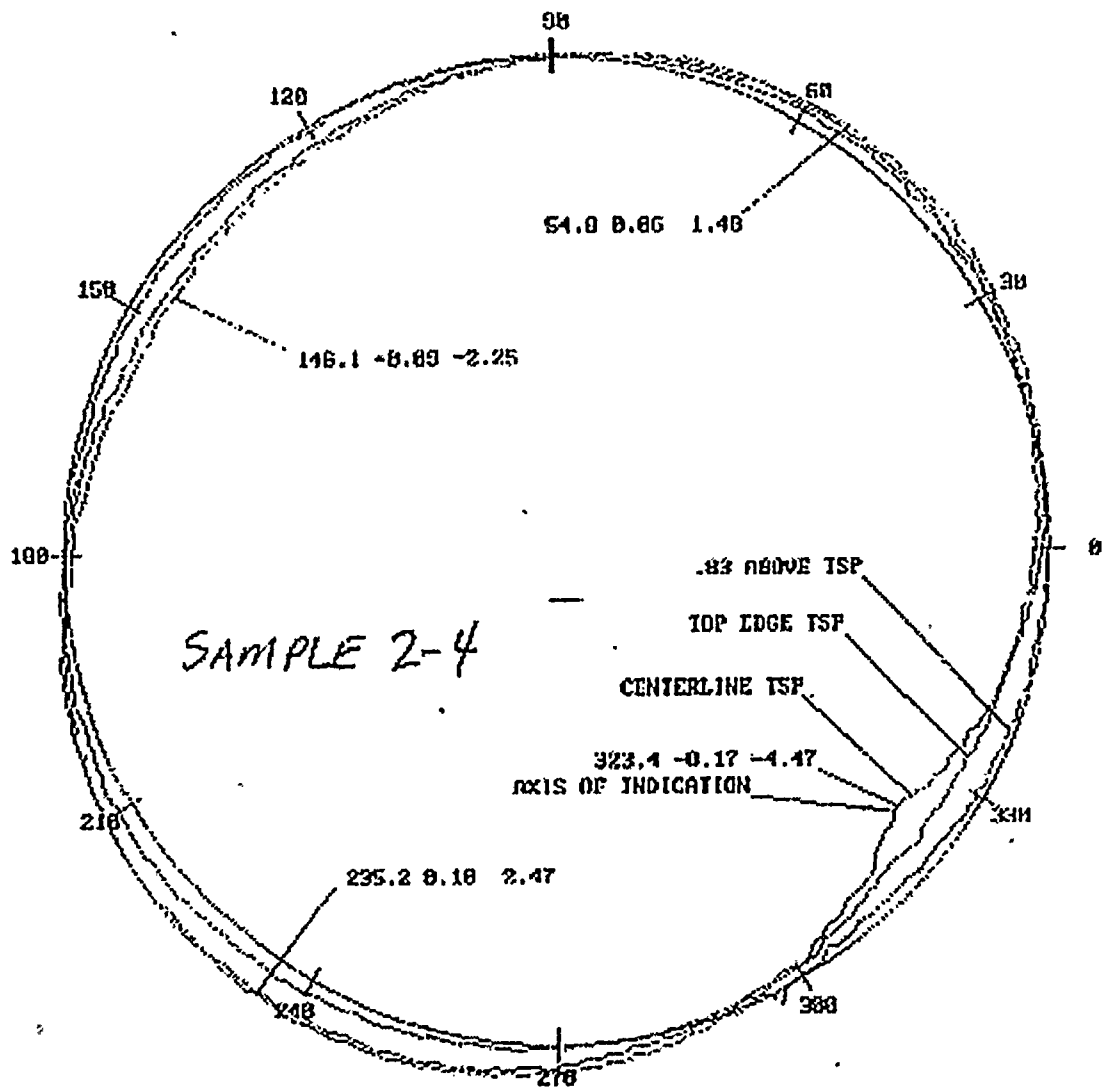


Figure 4-11
 UT Circumferential and Axial Dent Profile for Sample 6-1

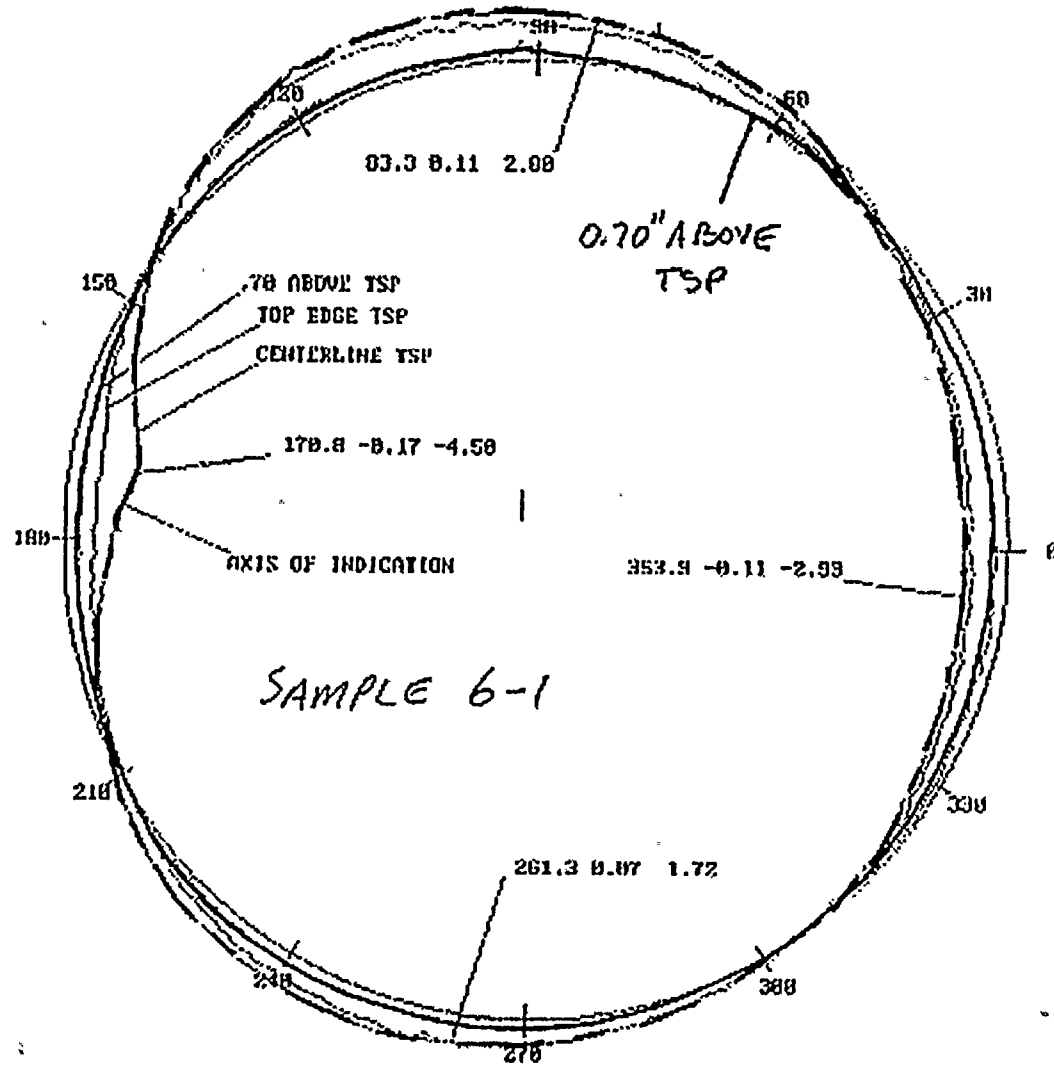


Figure 4-12
Field UT Circumferential Dent Profile for Pulled Tube R10 C22

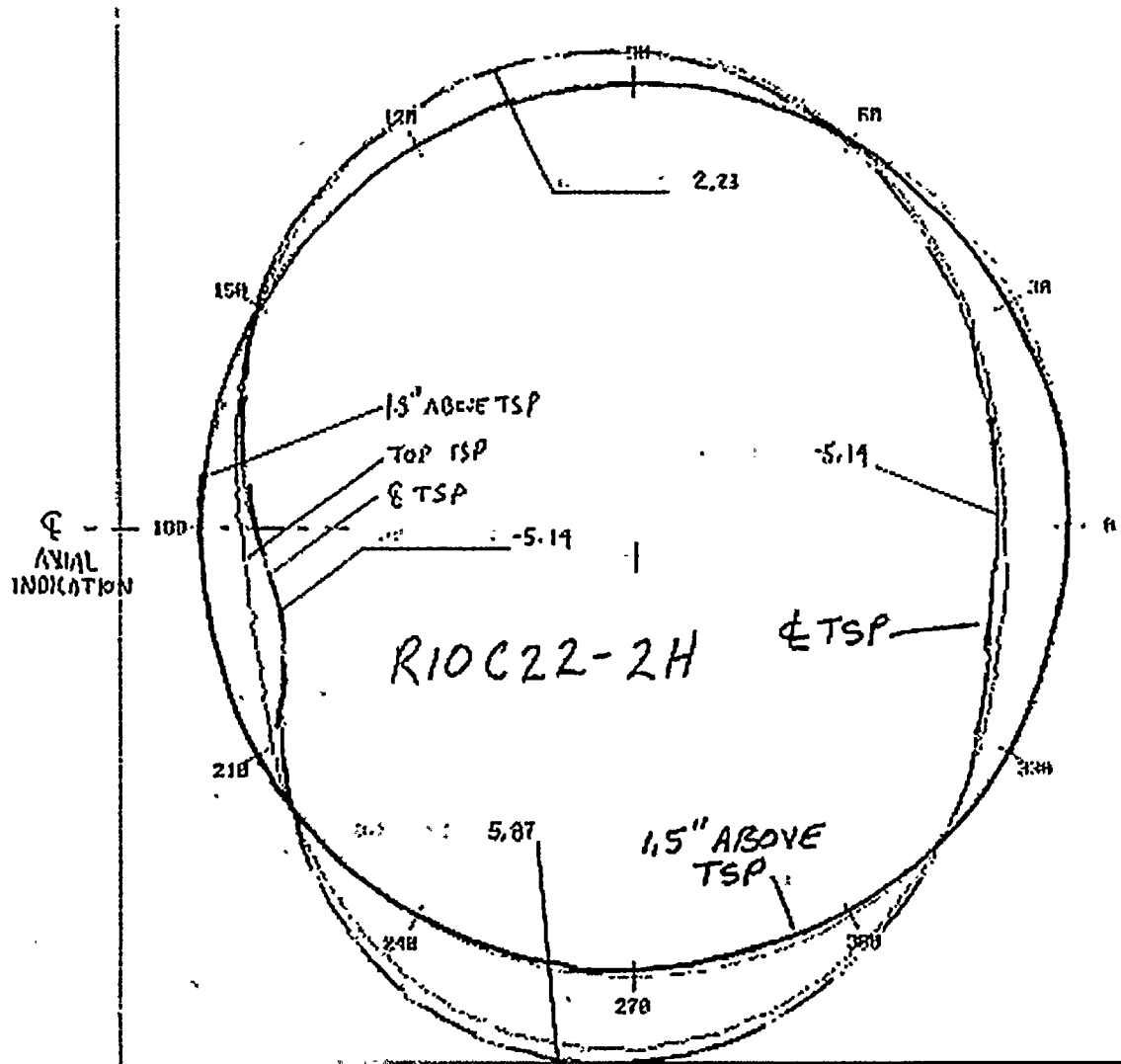


Figure 4-13
Field UT Circumferential Dent Profile for Pulled Tube R12 C32 1H

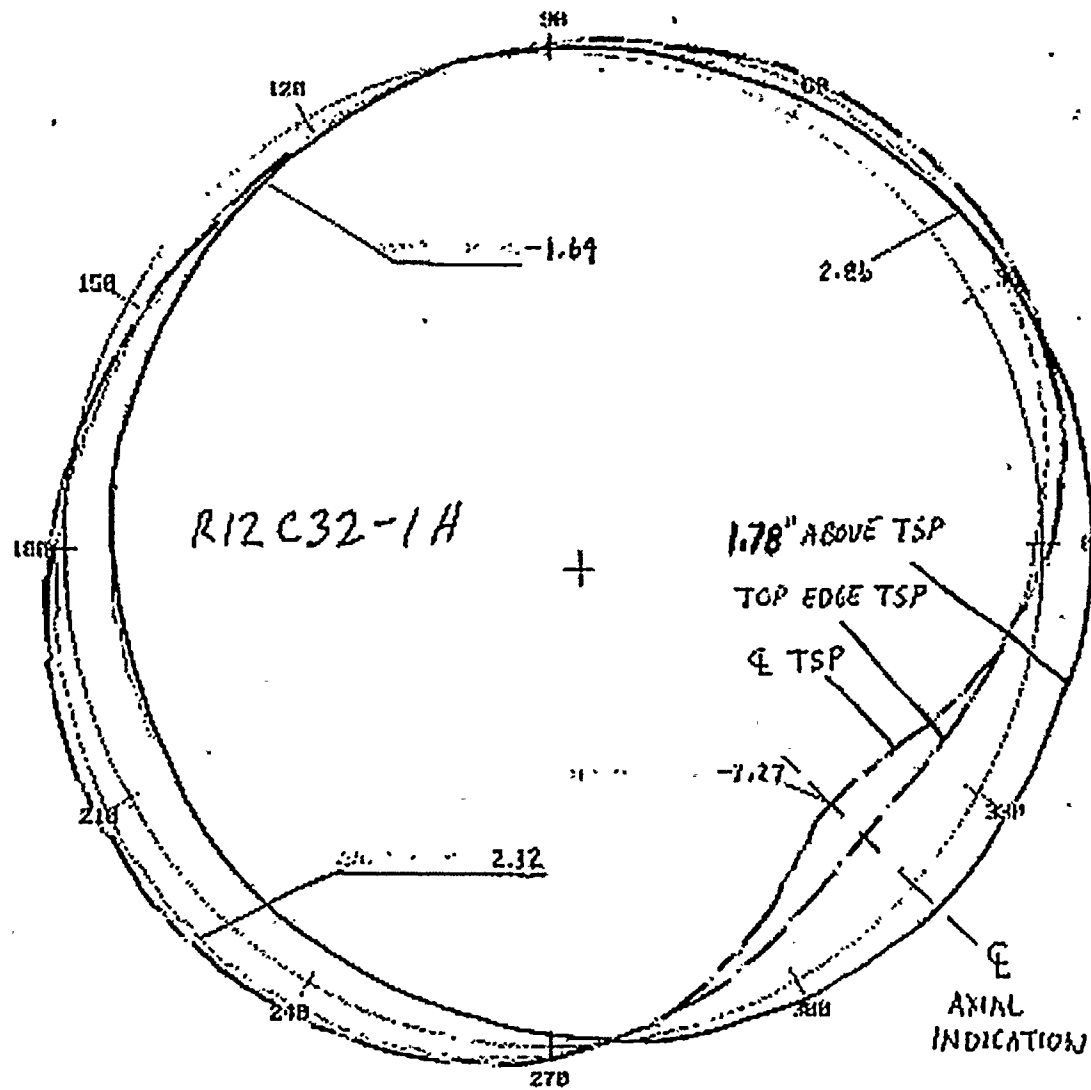


Figure 4-14
Field UT Circumferential Dent Profile for Pulled Tube R21 C43 1H

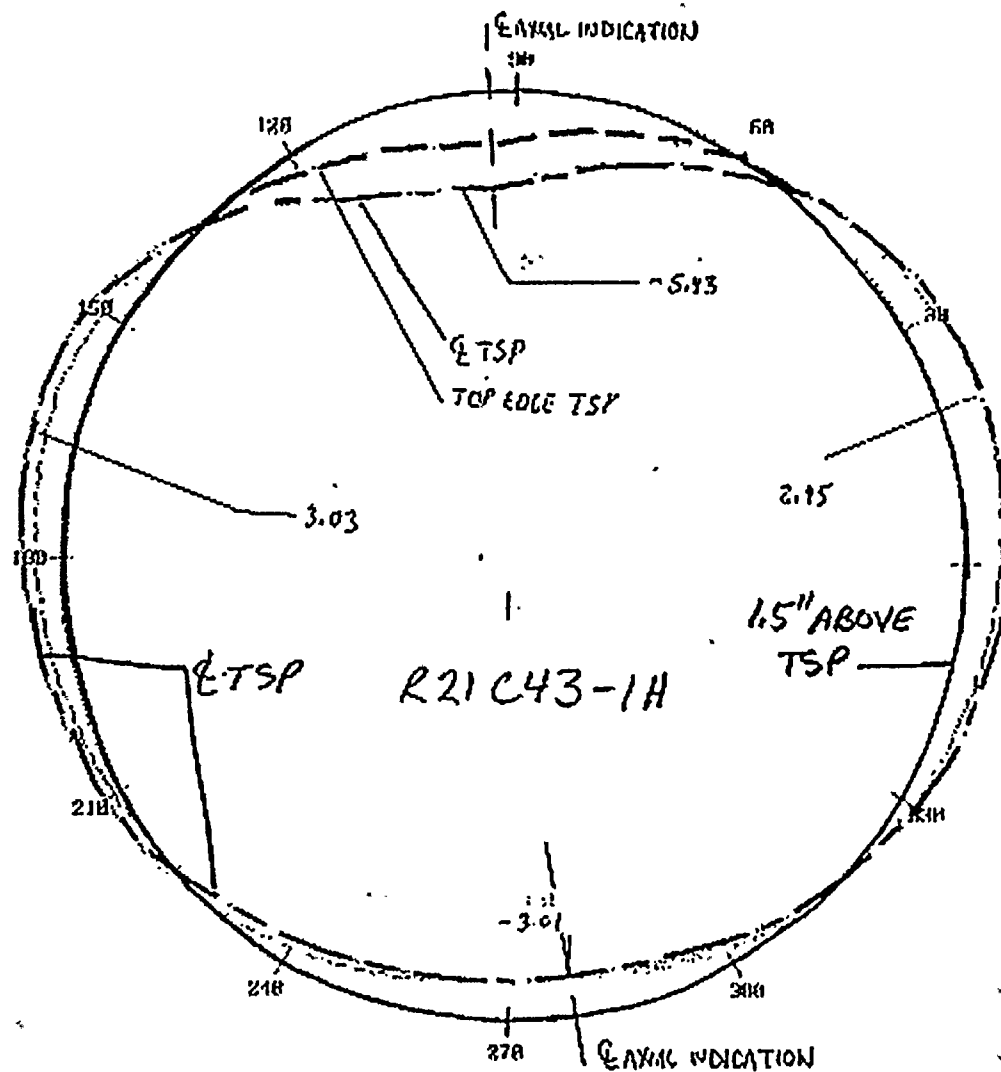


Figure 4-15a
 Field Tube: Dent at Center of TSP; Flaw at Edge of TSP

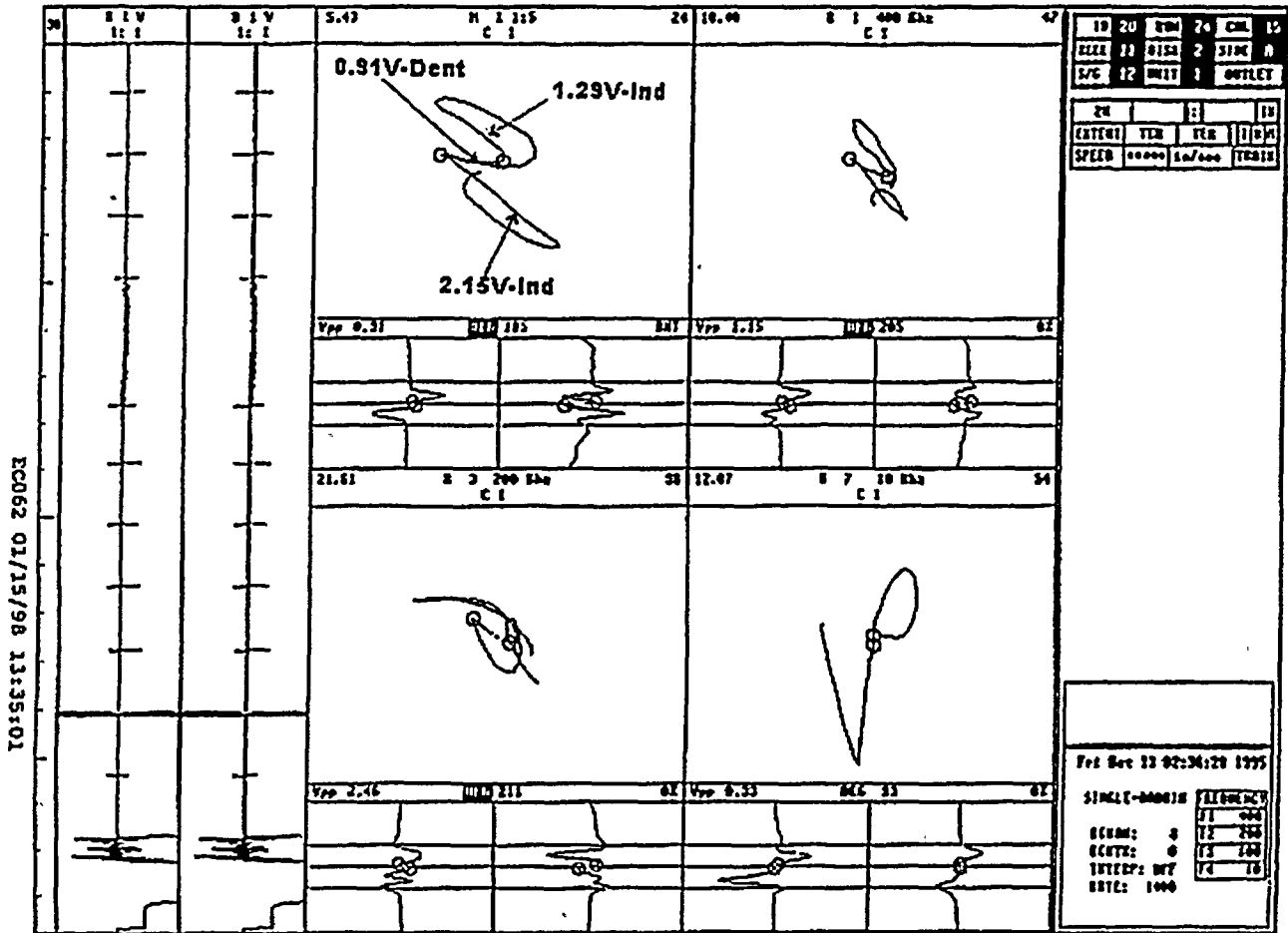


Figure 4-15b
 Lab Sample: Dent at Center of TSP; Flaw at Edge of TSP

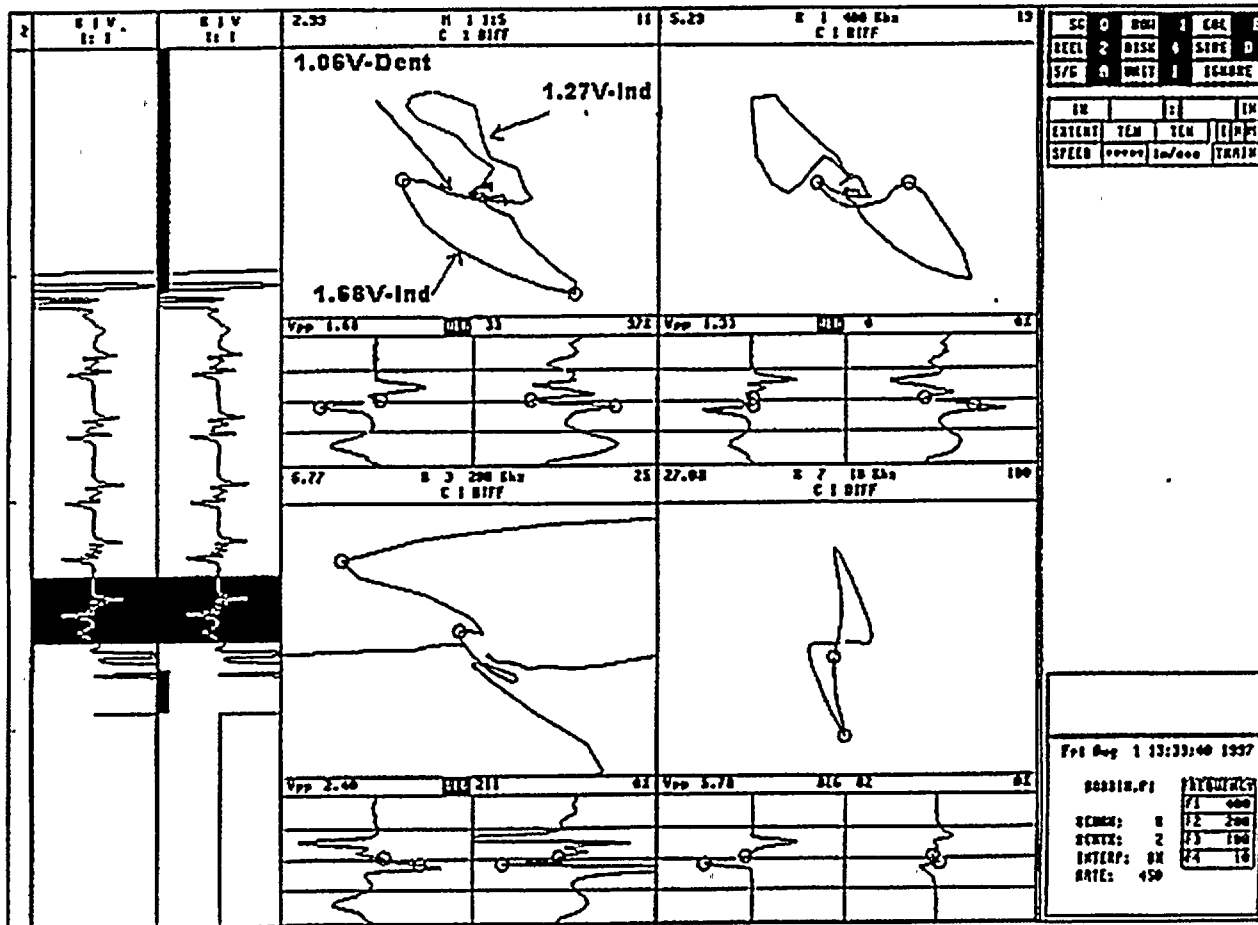


Figure 4-16a
Field Tube: Dent - Flaw - Dent

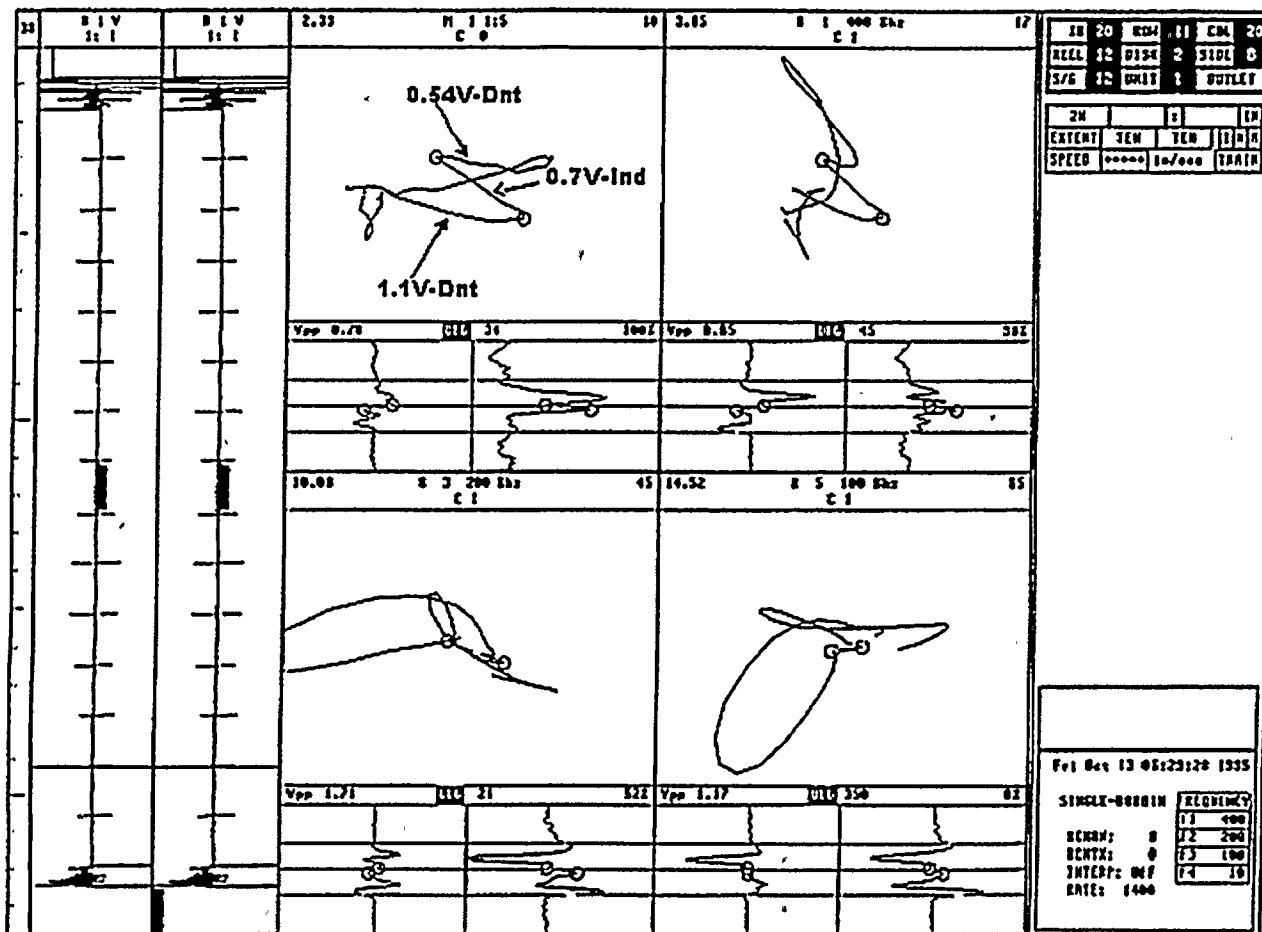


Figure 4-16b
 Lab Sample: Dent - Flaw - Dent

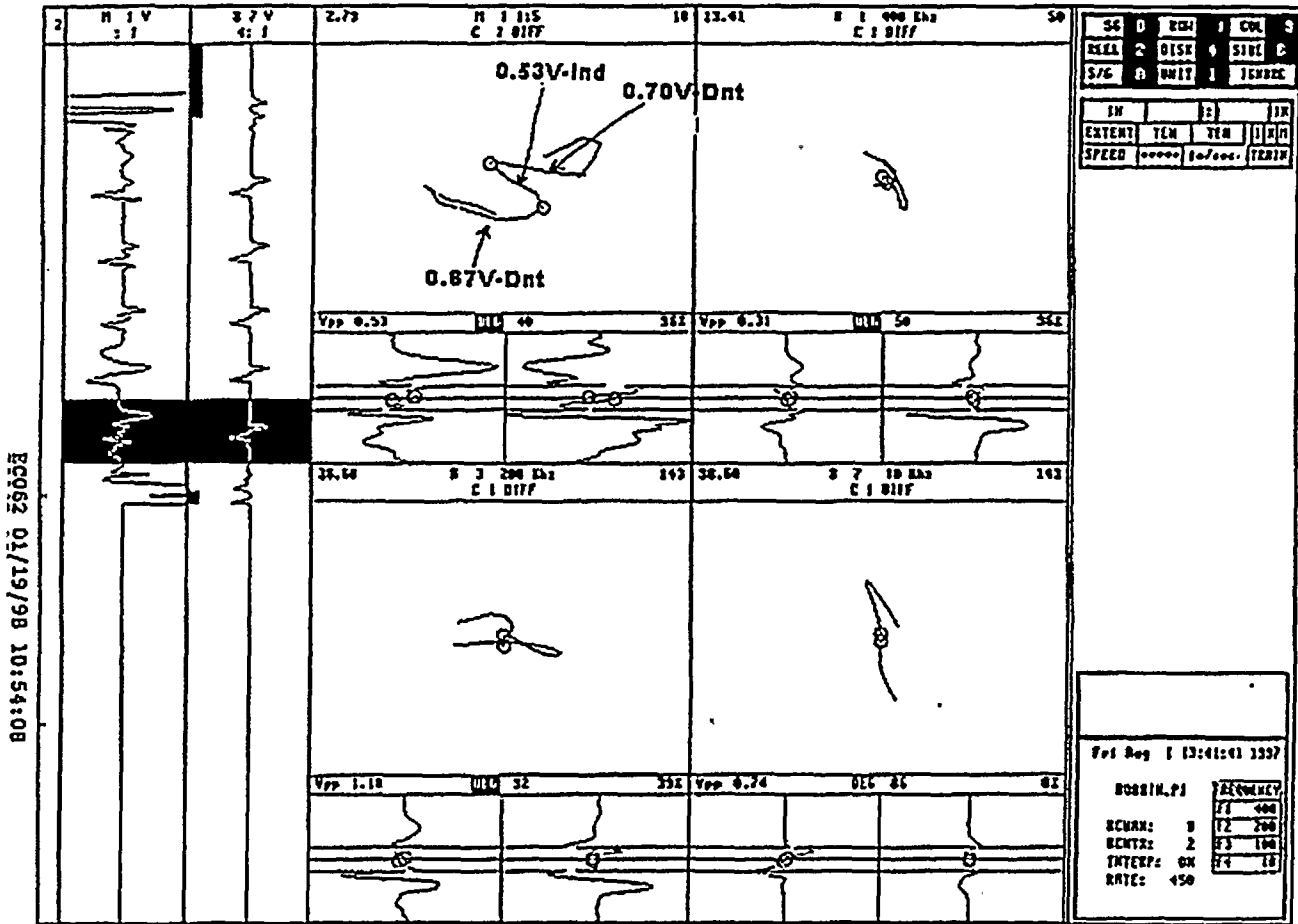


Figure 4-17a
Field Tube: Dent - Flaw

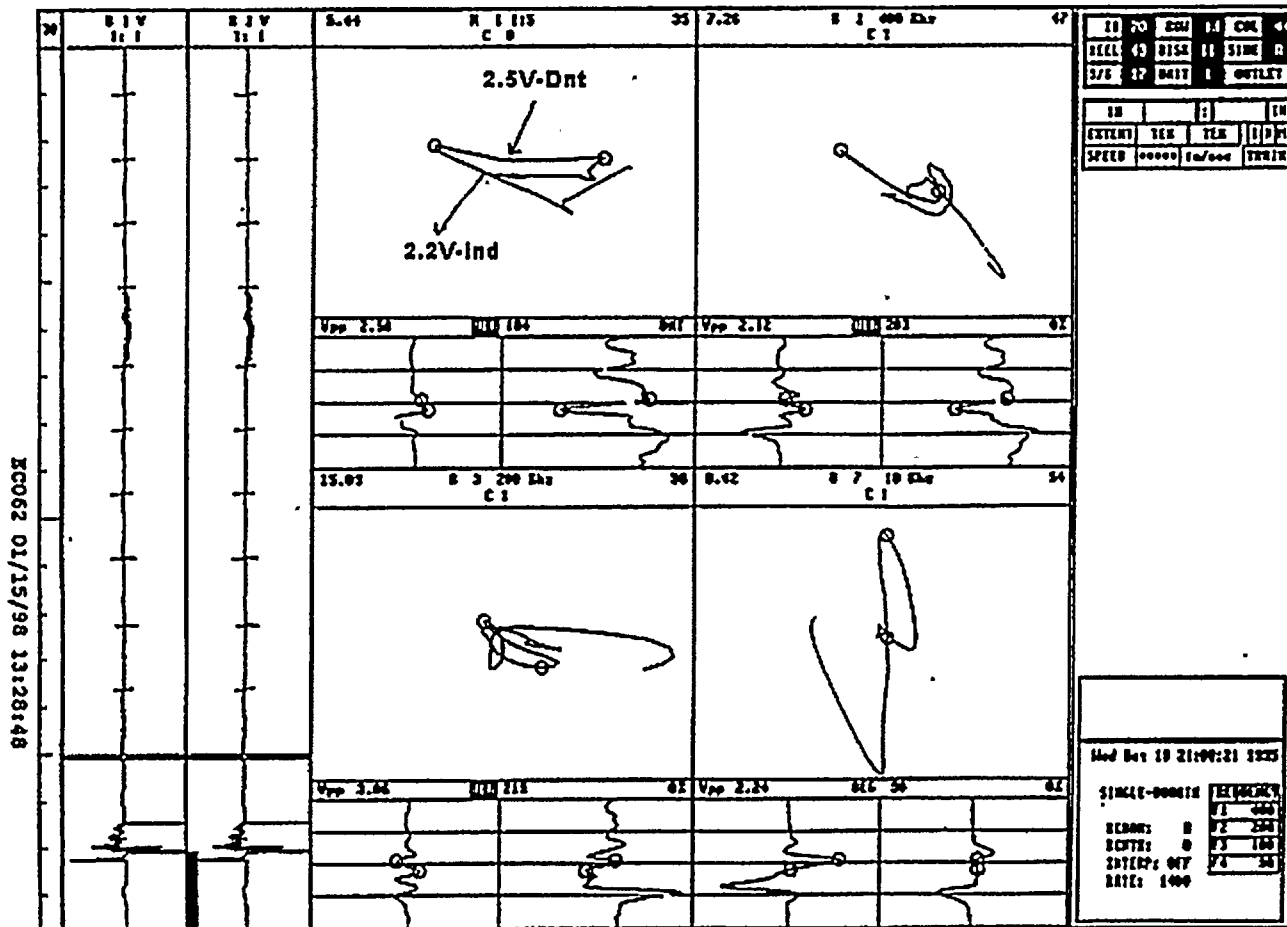


Figure 4-17b
Lab Sample: Dent - Flaw

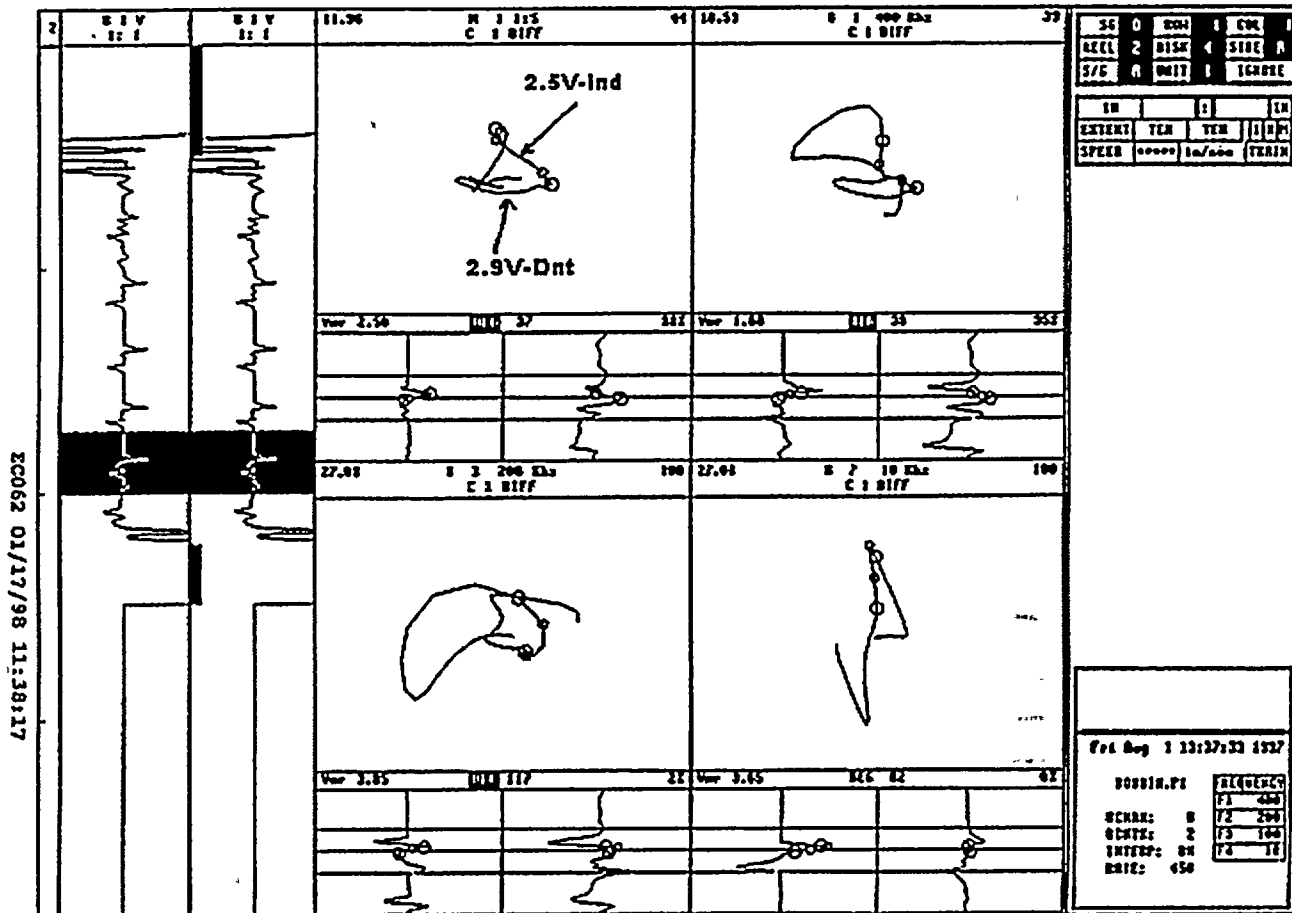


Figure 4-18a
Field Tube: Distorted Dent

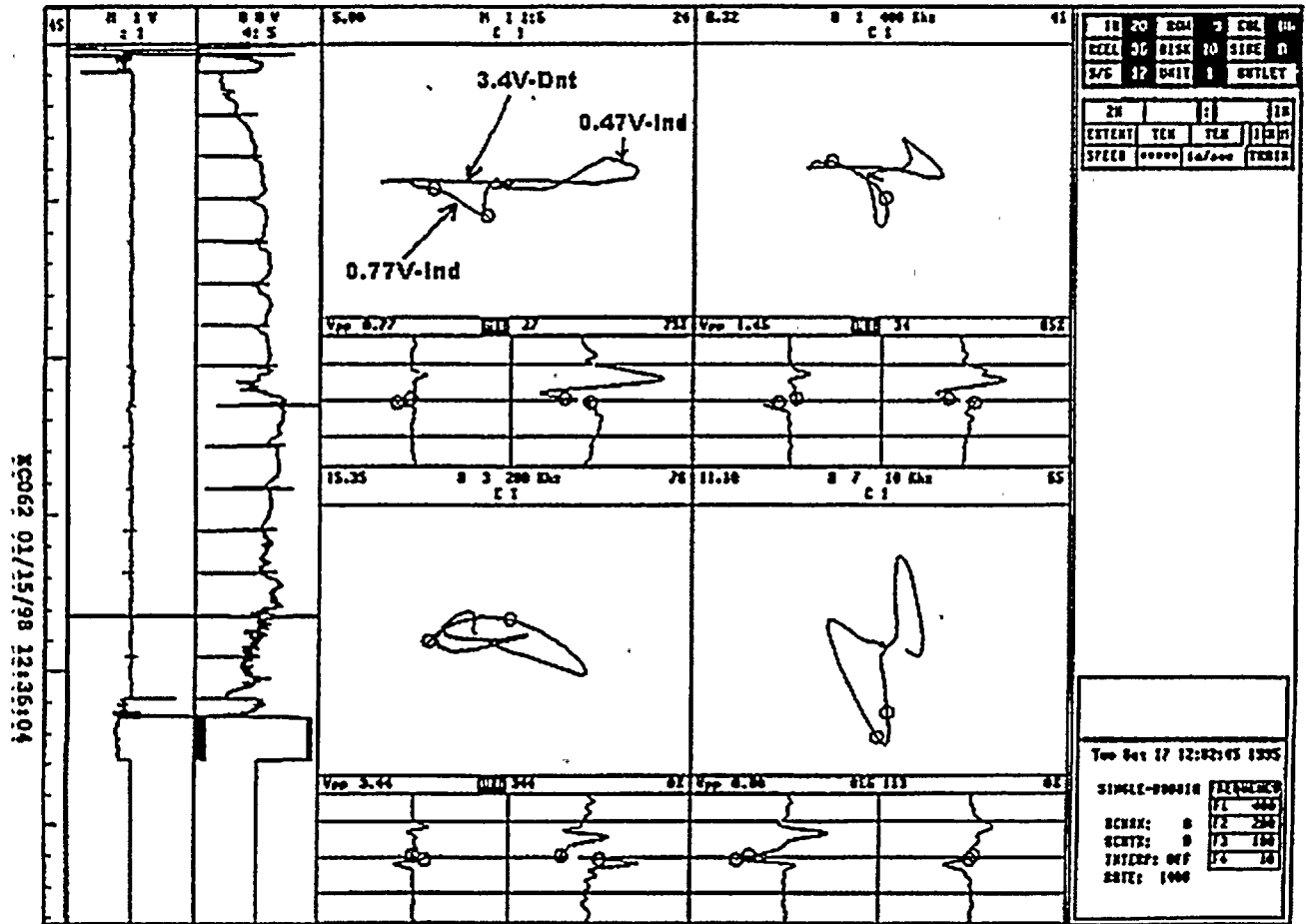
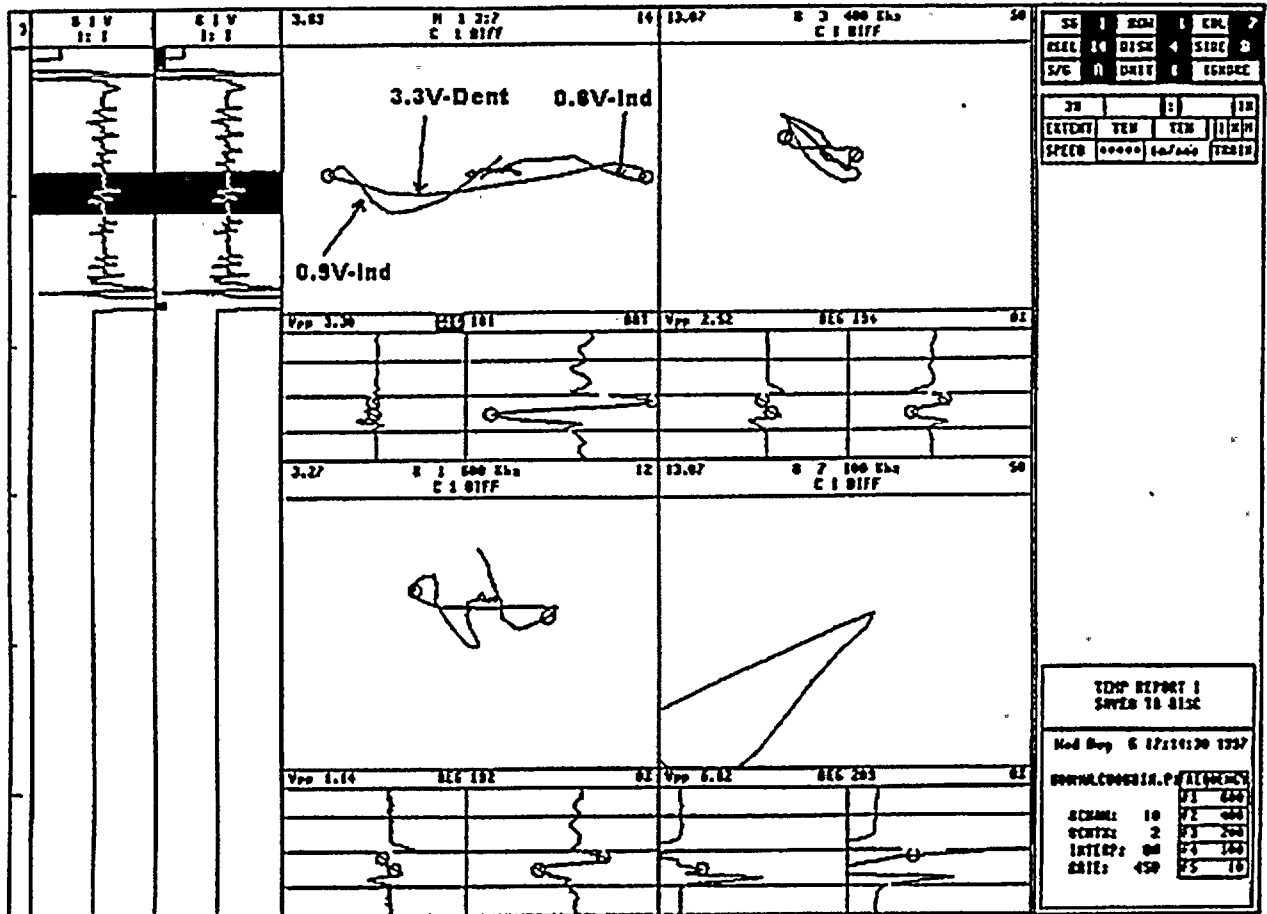


Figure 4-18b
 Lab Sample: Distorted Dent



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5.0 NDE ANALYSES

5.1. Introduction

The laboratory specimens prepared for inclusion in EPRI ISI Guidelines Appendix H qualification testing for axial PWSCC at dented TSP intersections were used to assess the capability of the proposed NDE techniques. This effort is targeted for qualifying the bobbin coil for detection at dented intersections up to at least 2.0 volts and qualifying the + Point coil for detection and sizing at dented TSP intersections. The goal for both bobbin and +Point detection was to determine the detection sensitivity for maximum and average depths and to establish the depths above which Appendix H POD criteria were satisfied. Maximum depths for the specimens are based on averaging the destructive examination crack profile over a length equal to the + Point coil field of 0.16" as recommended in the EPRI ISI Guidelines, Rev. 5 (Reference 8.1). The goal for + Point sizing was to extend the range of the existing Appendix H sizing qualification to shallow depth values.

Blind NDE analyses were performed by up to four analysts prior to destructive examination of the laboratory specimens. NDE analysts included representatives from Pacific Gas & Electric, Tennessee Valley Authority, Westinghouse and EPRI. The blind analyses were used to evaluate the NDE techniques prior to the EPRI Appendix H qualification (Section 7.0 of this report). The blind analyses performed to qualify the NDE techniques are summarized in Table 5-1, which contains the +Point, bobbin and Cecco-5 analysis results for the PWSCC/dent samples and Diablo Canyon 1 pulled tubes. The results of the blind analyses are discussed in this section and used to develop NDE uncertainty estimates in Section 6.

The NDE techniques developed in this report are further extended to "validated" sizing techniques based on an NDE Performance Test and applied to alternate repair criteria in Reference 8.3.

5.2. NDE Analysis Guidelines

The NDE guidelines developed from the qualification work were prepared as an evolution of existing techniques, some already in use as field procedures or previously qualified to EPRI Appendix H performance demonstration criteria. Blind analyses of the laboratory PWSCC specimens were used to test and refine the guidelines. Guidelines were developed for bobbin, Cecco and + Point coil detection as well as sizing by depth profiling for the + Point coil.

In some cases, the + Point coil phase response for a point or points along a flaw show separation or different phase angles between the entrance and exit legs which could be called a split phase response. In many depth profiling applications, the conservative deeper depth is assigned to the point or a convention to use either the entrance or exit legs is adopted. The NDE guidelines applied to the sizing qualification for the + Point coil permit the analyst to enter duplicate data entries when a split phase response is found. The data points must be entered at the same elevation or within 0.01 inch of each other. When the analyst provides duplicate entries, the depths, voltages and positions are averaged to obtain the depth profile for the indication. This practice has been found to significantly improve agreement with destructive exam results as shown for some examples in Section 5.10. This is not a mandatory practice and varies between analysts. The effects of this option are part of analyst variability included in the NDE uncertainties. For the blind analyses, one of the three analysts applied this option.

5.2.1. Bobbin Coil Detection Application

The bobbin detection guidelines applied for the Appendix H Peer Review are included in Appendix A of this report. These guidelines represent the techniques qualified during the blind analysis phase of the program. Numerous examples of dent/flaw signal resultants were incorporated into the guidelines, along with instruction for analysts to extend the scope of the prevailing flaw recognition principles, to permit discrimination among small dent signals with and without flaw components. The signals corresponding to the laboratory sample TSP intersections were classified into categories to assist analysts in discriminating among those with and without flaws.

5.2.2. + Point Detection

Previous work (Reference 8.2) had established the adequacy of +Point coils for detection of PWSCC in dented TSP intersections. ETSS#96703, originally published in 1997, documented the detection performance and sizing methods for crack length and average depth. The current work incorporated new laboratory crack samples with shallow depths of penetration, permitting extension of the average depth-sizing methods to below 30% and initial qualification of maximum depth sizing. With regard to sizing, updated guidelines were developed to improve the correlation between destructive examination results and NDE measurements. Length adjustments were clarified and methods for adjusting depth values for flaws with maximum amplitudes greater than 4.5 volts or less than 1.0 volts were added. The methods for adjusting length and depth profiles are described in Sections 5.7 and 5.8.

NDE guidelines for + Point detection are included in Appendix A of this report. Appendix A also includes calibration standard drawings for the pulled tube and laboratory specimens included in the database.

5.3. Bobbin Coil Detection Analyses

The "Blind Analysis" results are given in Table 5-1 as the fraction of analysts calling a flaw out of the total analyses (typically 1/1, 2/3, 3/3, 3/4, or 4/4) and percent detection for each specimen. Appendix D (Table D-1) contains a breakdown of the bobbin detection data reported by each of the analysts individually; where appropriate Table D-2 provides the dent voltage and the detected flaw voltage reported together with the alphanumeric code used to report the indication. It should be noted that each of the independent blind analysts used the nomenclature particular to their organization's conventions.

When a TSP intersection includes two flaws, only the deepest crack is used for the bobbin detection evaluation. The total fractions detected are 118/144 for all 43 specimens, 116/136 for maximum depths > 20% with 40 specimens, 108/118 for maximum depths > 30% with 35 specimens and 97/103 for maximum depths > 34% with 31 specimens. These specimens include dent voltages > 5 volts for which the maximum depths are \leq 30%. The results indicate a dependence on dent voltages above about 5 volts (specimens 3-3H, 3-4H, 4-4H and 7-1H) although these specimens have shallow depths as well as the highest dent voltages. However, most samples have dent voltages < 2.6 volts so dependence on dent voltages above about 2.6 volts is not well defined. The number of samples is adequate to support application to detection qualification up to 2.6 volts. Up to at least 2.6 volts, the detection results show

no identifiable dependence on dent voltage. At 90% confidence, the resulting PODs are 77% for all samples, 80% for maximum depths > 20%, 87% for maximum depths > 30% and 90% for maximum depths > 34%. These results would indicate that the EPRI Appendix H qualification requirement of 80% probability at 90% confidence would be satisfied for bobbin detection at maximum depths > 30%. As shown in Section 7, the result of the Appendix H qualification is a POD of 89% at 90% confidence for depths > 34% which is essentially the same as the blind test result of 90%.

Figure 5-1 shows the bobbin POD for dent voltages ≤ 5.0 volts as a function of maximum depth and compares the bobbin results with the + Point and Cecco probes. The average PODs in this figure represent the fraction of flaw calls divided by the total number of blind NDE analyses for each indication with the results totaled (binned) into 10% depth intervals. The bobbin results show very good detection for maximum depths > 30% with 100% detection reached at 50% depth. It can be noted that between 70% and 100% maximum depths, the bobbin POD from these analyses is less than 1.0. This result led to an improvement in the bobbin analysis guidelines. One analyst evaluated for detection requiring the presence of a flaw in both the mix and absolute channels. The deep indications were not clear flaws in the absolute channel. The bobbin NDE guidelines were changed to require reporting as a flaw if detected in either the mix or the absolute channel. With the revised guidelines, the bobbin POD would be 1.0 at all maximum depths > 50%.

The total fractions detected based on average depths are 110/128 for average depths > 20% with 38 specimens and 87/91 for average depths > 30% with 28 specimens. At 90% confidence, the resulting PODs are 81% for average depths > 20% and 91% for average depths > 30%.

5.4. + Point Detection Analyses

A total of 60 flaws were evaluated by + Point analyses with 194 flaw calls in 211 analyses. The "Blind Analysis" results for total fractions detected are 189/201 for maximum depths > 20% with 57 flaws and 165/171 for maximum depths > 30% with 49 flaws. At 90% confidence, the resulting PODs are 89.9% for all samples, 91.2% for maximum depths > 20%, 93.9% for maximum depths > 30%. The + Point coil shows significant improvement over the bobbin coil for detection below about 40% maximum depth.

The total fractions detected based on average depths are 181/189 for average depths > 20% with 54 flaws and 139/143 for average depths > 30% with 42 flaws. At 90% confidence, the resulting PODs are 93.2% for average depths > 20% and 94.4% for average depths > 30%. Figure 5-1 shows a comparison of the average (mean value of POD from multiple analyses) POD as a function of maximum depth for the + Point, bobbin and Cecco probes. The improved detectability of the + Point coil is seen for depths < 30%.

Since the qualification for +Point also included sizing performance, the data collected for these specimens were analyzed for NDE uncertainties associated with length, maximum depth, and average depth. The resulting NDE uncertainties are evaluated in Section 6 for the blind analyses.

5.5. Cecco-5 Coil Detection Analyses

Cecco-5 coil detection of PWSCC for the dented TSP samples was not subject to the EPRI Peer Review process; nevertheless, the results obtained from the "Blind Analysis" by 5 analysts are also included in Table 5-1. A total of 34 specimens were analyzed by 5 analysts with flaw calls for 144 out of a possible 170 calls. For flaws with $\geq 20\%$ maximum depth, flaws were detected in 129 out of 155 analyses for 31 specimens which indicates a POD of 78.7% at 90% confidence. For flaws with $\geq 30\%$ maximum depth, flaws were detected in 129 out of 135 analyses for 27 specimens which indicates a POD of 92.3% at 90% confidence. If specimen 5-1H with a maximum depth in the 30 to 35% range is excluded from the analysis, flaws were detected in 128/130 analyses for a POD of 95.9% at 90% confidence. For maximum depths above about 30%, the Cecco-5 and + Point coils appear to have comparable detection capability for axial PWSCC. For average depths $> 30\%$, flaws were detected in 100/100 analyses for 20 specimens which corresponds to a POD of 97.7% at 90% confidence. The maximum dent amplitude in the destructively examined samples subjected to Cecco-5 probe analysis was 6.17 volts (29.1 % maximum depth).

For maximum depths $> 30\%$, the Cecco detection results show PODs about the same as the + Point coil (See Figure 5-1). For maximum depths $< 30\%$, the + Point probe appears to show slightly better detection than the Cecco probe with the Cecco probe slightly better than the bobbin probe. Appendix D, Tables D-3 provides the individual detection performance for the 5 Cecco analysts, while Table D-4 provides information on the relative values for the NDE parameters utilized to report the detected flaws.

5.6. NDE Analyses for Crack End Effects Based on EDM Notches

RPC and + Point coils are known to overestimate crack lengths for flaws that are deep near the edges of the crack. These crack end effects result from the electric field spread of the coil. The + Point coil tends to have a larger field (about 0.16 to 0.2 inch) than found for the conventional pancake coils. Thus it can be expected that the + Point coil would result in larger overestimates of the length for deep flaws than the pancake coils. Typically, when only crack length is a concern, the end effects can be accounted for by a reduction of the crack length, which commonly has been about 0.1" for pancake coils. However, when depth profiling is also performed, it is necessary to explicitly exclude data points near the ends of the crack to exclude the appropriately associated depth call. Thus, it is necessary to understand the phase angle behavior associated with the end effects in order to develop a guideline for excluding data points for end effects. To aid understanding of the end effects, + Point analyses of EDM slots of varying depths were performed as described in this section. Application of the results of this section to defining guidelines for end effect data exclusion is given in Section 5.7.

Figures 5-2 to 5-4 show the voltage, phase angle (set at 30° for 100% depth) and depth calls from + Point analyses of ID EDM slots of 100%, 60% and 40% depth. The EDM slots were 0.5" long, and the end points of the slots are shown by dark vertical lines in the figures. For the 100% deep slot of Figure 5-2, it is seen that voltage can be > 1 volt for almost 0.2" outside each end of the slot. Phase angles increase sharply outside the edges of the slot, and can become OD phase angles ($> 30^\circ$); large depths can be assigned outside the slot. Results are similar for the 60% slot shown in Figure 5-3 and trends are similar but shorter in extent outside the flaw for the 40% depth of Figure 5-4.

The key indicator to identify signals outside the crack length is sharply increasing phase angles which may include the occurrence of OD phase angles. When the phase angles remain in the ID plane, the increasing phase results in sharply increasing depth calls and significant overestimates of the depth. The associated deep calls occur at voltages much lower than found for the same depth within the flaw. It can be seen that the required length adjustments can be as large as 0.4" with an adjustment of 0.2" at each end of the flaw. The same effects are found for deep corrosion cracks. These effects of OD phase angles, rapidly increasing ID phase/depth and deep calls at low voltages are used in Section 5.8 to develop guidelines for adjusting the length/depth profiles from NDE analyses.

The same trends of crack length overestimation, phase angle increases at the edge and outside the flaw, and deep calls at low voltages also occur for OD axial indications. This is shown in Figure 5-5 for an 80% deep OD slot.

5.7. Adjustments to NDE Length for End Effects

Length adjustments for coil lead-in and lead-out effects (i.e., the + Point coil provides a signal response prior to entering the start and after leaving the end of the crack) must be made to estimate true crack length. The length adjustment procedure is based upon the fact that coil responses show an increase in the phase angle as the coil approaches or leaves the crack. This increasing phase angle leads to sharply increasing depths at the low voltage tails of the NDE crack profile and the PWSCC phase angles sometimes increase to OD phase angles. The requirements for this procedure are:

Length Adjustment

NDE data points satisfying the requirements given below (a and b) are deleted from the ends of the crack. The maximum length reduction for the length correction applied to either end of the original NDE profile shall not exceed 0.2". The adjustment shall not reduce the length of the crack to less than 0.05" with at least 3 data points remaining to define the crack. Data points are progressively checked against the requirements starting at the end of the crack and proceeding 0.2" or up to approximately the center of the crack.

a. Adjustments For OD Phase Angles At Each End Of Crack (Phase Angle > Value At 100% Depth)

If the data point has an OD phase angle, cut off the data point from the profile if the voltage is < 40% of the maximum voltage or if the depth is > 75% with the voltage < 1.0 volt. Data points are cut off from the crack tip (first or last reading) to the point at which the phase angles change from ID to OD. The depth at the point of the phase change is reset to 0% to define the new end of the crack. This adjustment is not applied if the crack exhibits primarily OD phase angles over the length of the crack. When progressing from one end of the crack, the adjustments are terminated for that end of the crack if a data point having a voltage exceeding the above cut off thresholds is found. This limits the length adjustment to the low voltage tail of the NDE profile.

b. Adjustments for increasing depth points at the end of the crack

If the data point has a depth increase of $\geq 10\%$ relative to the next innermost 0.05" of the crack, such that it reverses a decreasing or near constant depth trend, and the voltage is $\leq 35\%$ of the maximum voltage

or ≤ 0.35 volt, the data point shall be ignored. The point of the $\geq 10\%$ depth increase is set to 0% depth to define the new end of the crack. When progressing from one end of the crack, the adjustments are terminated for that end of the crack if a data point having a voltage exceeding the above cut off thresholds is found.

5.8 Adjustments to NDE Depth Profiles for Very High and Small Voltage Indications

NDE cracks satisfying the voltage requirements given below have depth adjustments applied to the NDE depths. For shallow cracks with low signal to noise ratio, the most reliable depth call is expected to be the depth at the maximum voltage response for the crack. The depth adjustment for cracks with a maximum voltage ≤ 1.0 is based on this consideration. When the maximum voltage is ≥ 4.5 , there is a high probability that the crack has throughwall penetration and the depth adjustment given below reflects this consideration. These depth adjustments are applied after the length adjustment described above.

a. Maximum Depth Adjustment Only if the Maximum Voltage is ≥ 4.5 Volt

- Adjust all depths by the ratio of 100% to the maximum depth from phase analyses ($D_{\phi\max.}$) in the NDE depth profile. That is, $D_{i, \text{adj.}} = D_i \times (100\% / D_{\phi\max.})$.

b. Low Voltage Adjustment Only if the Maximum Voltage is ≤ 1.0 Volt

- Adjust all depths by the ratio of the depth at maximum volts ($D_{V\max}$) for the crack to the maximum depth from phase analyses ($D_{\phi\max.}$) in the NDE depth profile. That is, $D_{i, \text{adj.}} = D_i \times (D_{V\max} / D_{\phi\max.})$.

5.9. Optional Burst Length Adjustment Procedure

In some cases (more significant for ODS_{CC} than PW_{SCC}), a crack may have shallow tails that do not contribute to the structural integrity of the indication. The average depth over the total crack length may then lead to an underestimate of the tube burst pressure. To avoid this potential lack of conservatism, the crack length can be adjusted to the part of the total crack length that has the lowest burst pressure. Burst pressures can be evaluated for all potential lengths within the total crack length to obtain the start and end points with the lowest burst pressure. The start and end points for the lowest burst pressure then define the burst adjusted crack profile, length, average and maximum depths. Burst length adjustments are not evaluated in this report. Reference 8.3 includes an evaluation of the burst length adjustment procedure for axial PW_{SCC} at dented TSP intersections.

5.10. Comparisons of NDE and Destructive Exam Depth Profiles

This section provides examples of comparisons between NDE and destructive examination results. The comparisons in Sections 5.10.1 to 5.10.4 are examples showing applications of the NDE adjustment procedures described in Sections 5.7 and 5.8. The NDE data for these comparisons was taken from an NDE Performance Test using field analysts as described in Reference 8.3. Section 5.10.4 shows examples resulting from the averaging of duplicate NDE data entries as described in Section 5.2.

Section 5.10.5 provides comparisons of the different NDE analyst's results from the blind analyses as examples of the negligible analyst variability for axial PWSCC indications.

5.10.1. Length Adjustment Examples

Figures 5-6 and 5-7 show examples of the length adjustments described in Section 5.7. For Figure 5-6, the deep points at the ends of the crack are cutoff by the adjustment procedure for OD phase angles at < 1 volt data points. It is clear from the comparison with destructive examination that the depth increases near the ends of the flaw are not valid and result from coil end effects. The exclusion of the end points shown in the figure clearly improve the agreement with destructive exam. Intuitively, one additional data point at each end of the crack should also be excluded from the adjusted crack length. However, the adjustment procedure of Section 5.7 is rigidly applied and the points retained at the ends are ≥ 1.0 volt and are not excluded from the adjusted profile. Figure 5-7 is an example of the length adjustment for increasing depth points at the ends of the crack. The points cutoff for the adjusted profile have depth increases $> 10\%$ and voltages < 0.35 volt. The two points at the right of the plot near 0.26" require additional explanation since it is not apparent why the point at about 36% depth was cut off for the adjusted profile. The point and the point at about 54% depth were reported by the NDE analyst with a spacing of 0.01 inch. As noted in Section 5.2, when the spacing is ≤ 0.01 ", the data points are averaged with regard to depth and voltage prior to applying the adjustment procedure. The average of these two points results in a depth of 45% which exceeds the 10% depth increase.

These examples show the importance of correcting the NDE profiles for coil end effects. This correction is not only important for crack length but the high depths at the ends of the crack also influence the average depths. Although not shown by examples, there are occurrences at which the end effects result in the maximum depth for an indication at a point of very low voltage.

5.10.2. Low Voltage Adjustment Examples

Figures 5-8 to 5-10 show examples of the depth adjustment of Section 5.8 for indications with maximum voltage ≤ 1.0 volt. This procedure adjusts the depth profile from phase analysis to a maximum depth corresponding to the depth at maximum volts. For Figure 5-8, the point of maximum volts occurs at -0.08 " with a depth of 60%. The largest depth from phase analysis is 72% at 0.28". The adjustment procedure then adjusts all depths from phase analysis by the ratio of 60/72 to obtain the adjusted depth profile. The adjustment improves the agreement with destructive exam for this example, but the adjusted NDE continues to overestimate the destructive exam results. It can be also noted from Figure 5-8 that the shape of the depth profile from phase analysis is in closer agreement with destructive examination than the shape of the voltage profile. This is the most frequent occurrence and the basis for retaining the phase based crack shape in the adjustment procedure rather than applying a voltage based shape to the depth profile. Figure 5-9 is an example for which the depth adjustment from 67% maximum depth to 44% results in good agreement with destructive exam maximum and average depths.

Figure 5-10 provides an additional example of the improvement obtained with the low voltage adjustment procedure. This example includes points averaged due to duplicate data entries (See also Section 5.10.4) followed by application of the adjustment procedure. The adjusted results are very good for a low voltage, shallow (21.5% maximum depth) indication. The underestimate of the crack length for this sample is due to the shallow depths (about 10%) at the end of the crack above about 0.2".

5.10.3. High Voltage Adjustment Examples

Figure 5-11 is an example of the high voltage (> 4.5 volts) adjustment procedure that adjusts the NDE profile to force the NDE depth to 100% at the point of maximum depth from phase analysis. In most cases, this adjustment is small as shown in the figure for which the NDE depth profile is adjusted by the ratio of 100/96. While this adjustment is generally small, the adjusted depth of 100% draws clear attention to the indication as a possible leaking indication.

5.10.4. Duplicate Data Entry Examples

Figures 5-12a and 5-12b compare NDE analyses for sample 12-4H for which one of the NDE analysts used the option for entering duplicate data entries. As noted in Section 5.2, this option is provided for occurrences in the + Point phase response of split phase angles between the entrance and exit signals. The analyst for Figure 5-12a did not use the duplicate entry option and the resulting depths, even after the depth adjustment procedure is applied, are very high compared to destructive exam results. The analyst for Figure 5-12b used the duplicate entry option which results in averaging of the depths obtained for each leg of the split phase response. It is seen that the use of duplicate entries for significant separation of the phase angle legs results in considerable improvement with destructive exam. This result has been found to be consistently the case since the conventional trend with split phase angles is to apply the deeper depth phase angle which almost always results in an overestimate of the crack depth. Figure 5-13 shows an additional example from application of the duplicate data entry option for the NDE analysts. Again the agreement with destructive exam is improved compared to the use of the more conservative phase angle response even though the NDE profile is flatter than the destructive exam profile at the shallow (< 20% depth) ends of the crack.

5.10.5. Comparisons of Multiple NDE Analysts Results

Up to four NDE analysts evaluated the PWSCC laboratory specimens. The results of these analyses can be used to assess the trends for variations in depth sizing between analysts. The results for pulled tube R12C32 have been given in Figure 3-2. Good agreement is seen between analysts although all analysts underestimate the maximum depth for this example.

Figures 5-14 and 5-15 show examples of high voltage indications (> 3 volts). The agreement between analysts is excellent with essentially no differences across the depth profile. Both figures show the tendency for NDE to overestimate the depths near the ends of the crack; that is, the NDE profile tends to be flatter than the destructive exam profile. When this occurs, the + Point results tend to overestimate the average depth as shown in Figure 5-14. Figure 5-15 is one of the largest underestimates of the deep crack length in the database. In this case, the maximum voltage is lower for a deeper flaw than Sample 9-2H in Figure 5-14. Even though sample 11-2H in Figure 5-15 is one of the largest depth underestimates, the maximum depth and average depth underestimates are only about 15% and 10%, respectively.

Figures 5-16 and 5-17 show profiles for flaws near two volts. The agreement between analysts remains excellent. Figure 5-16 shows one of the largest overestimates of maximum depth by NDE and the NDE also shows a flatter profile than the destructive exam. Figure 5-17 shows good agreement between NDE and destructive exam for maximum and average depths, which is typical of flaws in this voltage range.

Figures 5-18 to 5-21 show profiles for flaws between about 1.0 and 1.5 volt. The agreement between analysts is again very good although starting to show some differences for the shallow flaw (maximum depth of 30%) in Figure 5-21. The agreement between NDE and destructive exam is very good for sample 6-4H in Figure 5-18 and NDE tends to overestimate the flaws shown in Figures 5-19 and 5-20. These samples show the general trend for NDE to overestimate the depth for low voltage flaws. The differences in NDE lengths between analysts in Figure 5-21 appears to be due to variations in the evaluation of the shallow tail beyond the 0% depth ligaments at about 0.1" and 0.27". For the deeper part of the flaw, three of the four NDE analysts are in good agreement with the fourth analyst tending to overestimate the depth.

Figures 5-22 to 5-25 show profiles for low voltage flaws for which the NDE adjustment procedure has not been applied to the NDE data. Differences between analysts tend to increase for these low voltage and shallow flaws, particularly for the flaws < 40% maximum depth in Figures 5-23 to 5-25. The general trend for NDE to overestimate the depths of the shallow flaws is shown for these samples with sample 7-3H in Figure 5-23 as an exception to the general trend. Figure 5-25 is an example of a flaw near the + Point detection threshold with the flaw having a local maximum depth of 22.7%, an average depth of 16.0% and a flaw length of 0.13". This indication was called as NDD in two of the four blind NDE analyses. The two sizing efforts for this low voltage indication significantly overestimated the crack length and depths, but the low voltage adjustment procedure improves the agreement between NDE and destructive exam for the depths.

Overall, it is concluded that there is very little analyst variability in developing the PWSCC crack depth profiles, particularly for indications having a maximum voltage greater than one volt. As a result, the NDE sizing uncertainty would be largely due to NDE technique uncertainty with only a small contribution from analyst variability. Below about 1.0 maximum volt, analyst variability tends to increase although the low voltage adjustment procedure tends to reduce the effects since analyst consistency is the greatest at the maximum voltage for the indication.

Table 5-1. Summary of +Point, Bobbin and Cecco Detection for Axial PWSCC at Dented TSPs

Specimen	TSP	Crack No.	Dent Voltage ⁽¹⁾	Fraction of Analyst Reporting a Flaw Call						Destructive Exam			
				Calls +Point	Percent Detected +Point	Calls Bobbin	Percent Detected Bobbin	Calls Cecco	Percent Detected Cecco	Length (inches)	Local Max. Depth (%)	Coil Field Avg. Max. Depth (%)	Avg. Depth Lig. Corr. (%)
10/22	2H	1	2.39	2/2	100	3/3	100			0.122	38.0	23.21	23.21
21/43	1H	1	3.89	2/2	100	3/3	100			0.991	98.0	90.50	49.29
21/43	1H	2		2/2	100					0.277	50.0	45.48	39.59
12/32	1H	1	1.21	3/3	100	2/2	100			0.702	97.0	88.90	57.54
P7	1H	1		3/3	100	1/1	100			0.870	100.0	99.78	94.32
P7	1H	2		3/3	100					0.658	100.0	89.68	82.48
P7	1H	3		3/3	100					0.126	65.2	46.23	46.23
P8	1H	1		2/2	100	1/1	100			2.644	100.0	99.55	84.77
P8	1H	2		2/2	100					2.452	100.0	99.73	79.41
P9	1H	1		2/2	100	1/1	100			1.868	100.0	99.48	75.26
P9	1H	2		2/2	100					1.589	100.0	99.42	86.59
P10	1H	1		3/3	100	1/1	100			2.563	100.0	100.00	88.70
P10	1H	2		3/3	100					2.146	100.0	90.91	69.03
P11	1H	1		2/2	100	1/1	100			0.675	100.0	100.00	95.61
P11	1H	2		2/2	100					0.568	95.8	90.30	74.58
P12	1H	1		3/3	100	1/1	100			1.286	100.0	99.80	77.27
P12	1H	2		3/3	100					0.548	82.8	64.86	29.90
P12	1H	5		3/3	100					0.181	90.3	74.68	69.44
1	3H	1	2.63	4/4	100	3/4	75	5/5	100	0.660	55.7	47.88	39.40
1	4H	1	2.32	4/4	100	4/4	100	5/5	100	0.708	68.4	54.32	36.72
2	1H	1	3.87	4/4	100	1/4	25	5/5	100	0.876	48.0	33.42	21.76
2	3H	1	2.21	4/4	100	4/4	100	5/5	100	0.472	31.7	21.53	15.22
2	4H	1	1.84	4/4	100	4/4	100	5/5	100	0.580	53.5	47.62	29.03
2	5H	1	2.32	4/4	100	3/4	75	5/5	100	0.860	41.0	35.50	18.34
3	3H	1	5.68	3/4	75	0/3: >5v dent	0	1/5	20	0.188	30.0	29.12	23.40
3	4H	1	4.62	3/4	75	0/3	0	0/5	0	0.183	16.0	7.72	6.41
4	4H	1	5.14	0/2	0	0/1: >5v dent	0	1/5	20	0.551	28.0	14.99	9.57
5	1H	1	2.42	2/4	50	2/3	67	1/5	20	0.294	42.0	35.00	20-30
6	1H	1	2.03	4/4	100	4/4	100	5/5	100	0.772	88.8	83.72	60.54
6	2H	1	1.89	4/4	100	4/4	100	5/5	100	0.692	80.2	73.72	59.09
6	3H	1	2.24	4/4	100	4/4	100	5/5	100	0.588	74.1	67.26	56.14
6	4H	1	2.18	4/4	100	4/4	100	5/5	100	0.416	75.0	64.29	49.41
6	5H	1	1.98	4/4	100	4/4	100	5/5	100	0.604	85.1	77.89	54.09
7	1H	1	5.03	4/4	100	4/4	100	4/5	80	0.598	39.5	30.14	20.12
7	3H	1	4.28	4/4	100	4/4	100	5/5	100	0.560	45.5	34.43	24.95
8	1H	1	1.42	4/4	100	4/4	100	5/5	100	0.420	58.0	52.24	40.73
8	2H	1	1.52	4/4	100	4/4	100	5/5	100	0.380	54.7	45.77	37.13
8	3H	1	1.61	4/4	100	4/4	100	5/5	100	0.460	50.0	44.21	31.81
9	1H	1	1.34	4/4	100	4/4	100	5/5	100	0.424	49.1	38.82	30.88
9	1H	2		4/4	100					0.168	34.5	24.36	25.48
9	2H	1	1.24	4/4	100	4/4	100	5/5	100	1.010	97.1	95.09	67.37
9	2H	2		4/4	100					0.786	61.5	46.26	35.62
9	3H	1	1.23	4/4	100	4/4	100	5/5	100	0.850	89.0	84.64	60.89
9	3H	2		4/4	100					0.717	66.2	54.10	40.75
9	4H	1	1.21	4/4	100	3/4	75	5/5	100	0.840	82.1	70.18	56.38
9	4H	2		0/4	0					0.328	36.0	23.14	10-20
9	5H	1	1.31	4/4	100	4/4	100	5/5	100	0.632	86.5	74.63	57.46
9	5H	2		4/4	100					0.120	38.0	26.69	26.75
10	3H	1	1.28	4/4	100	2/4	50	5/5	100	0.760	99.4	96.18	73.22
10	3H	2		4/4	100					0.490	47.6	37.97	31.71
10	4H	1	1.70	3/4	75	3/4	75	5/5	100	0.698	89.4	81.81	63.63
11	2H	1	1.49	4/4	100	4/4	100	5/5	100	0.837	99.2	96.83	81.40
11	2H	2		2/4	50					0.160	43.0	32.75	32.75
11	3H	1	1.34	3/4	75	3/4	75	5/5	100	1.072	95.5	91.30	68.41
11	4H	1	1.95	4/4	100	4/4	100	5/5	100	1.009	98.1	95.25	68.67
11	4H	2		4/4	100					0.790	46.3	44.03	36.59
12	2H	1	1.38	3/4	75	0/4	0	3/5	60	0.242	34.0	23.40	20.75
12	3H	1	1.22	2/4	50	2/4	50	3/5	60	0.129	22.7	16.07	16.04
12	4H	1	1.39	4/4	100	1/4	25	2/5	40	0.360	33.1	26.29	20.24
13	3H	1	1.19	4/4	100	4/4	100	4/5	80	0.336	45.6	37.31	27.25

Notes: 1. Dent voltages based on Westinghouse analyses for lab specimen prior to callings and PG&E for field indications

Figure 5-1
Blind Analyses Test Results
Average +Point POD as a Function of Avg. Maximum Depth

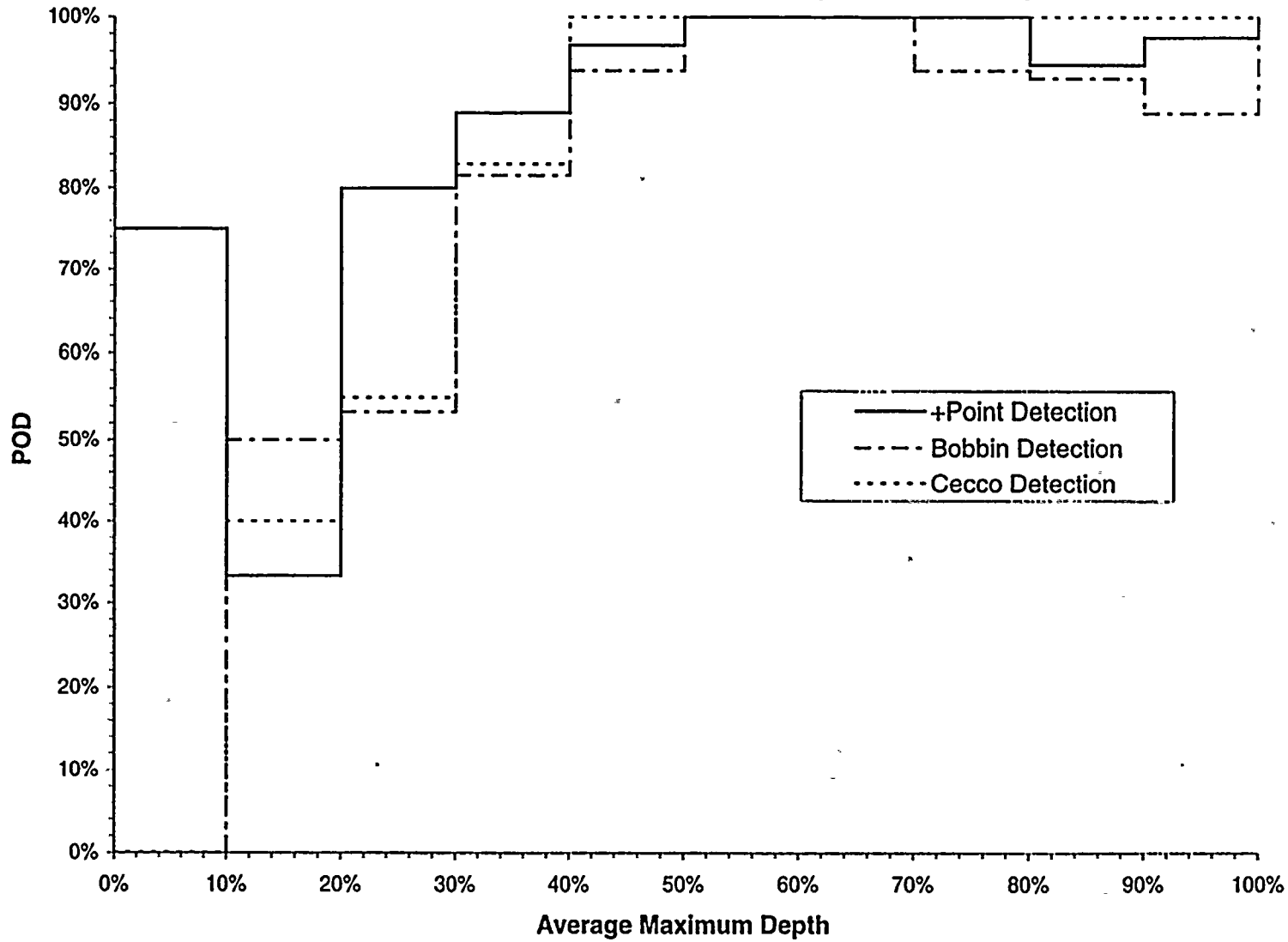


Figure 5-2
100% TW Slot, 0.5" Long - Eddynet, + Point

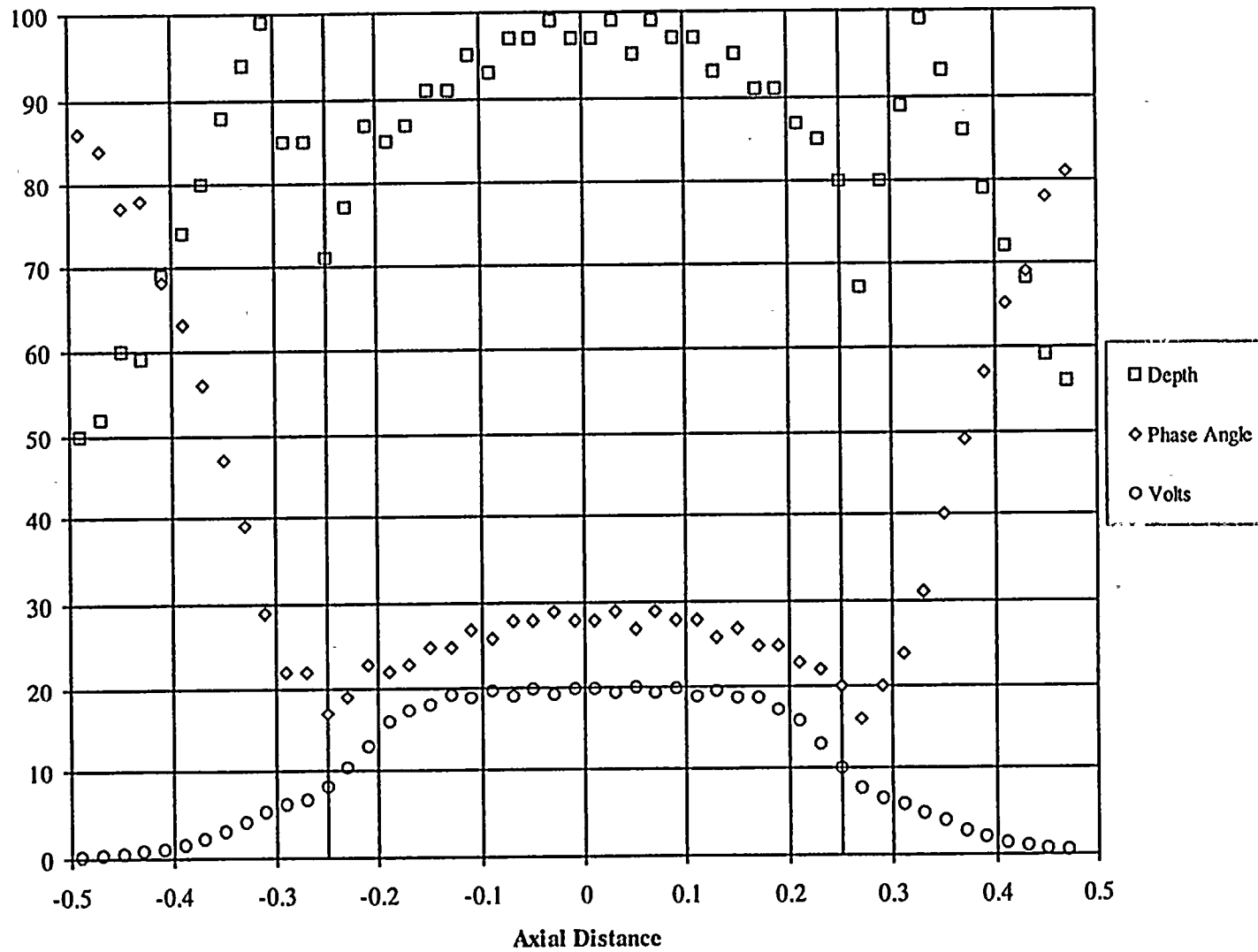


Figure 5-3
60% TW ID Slot, 0.5" Long - EddyNet + Point

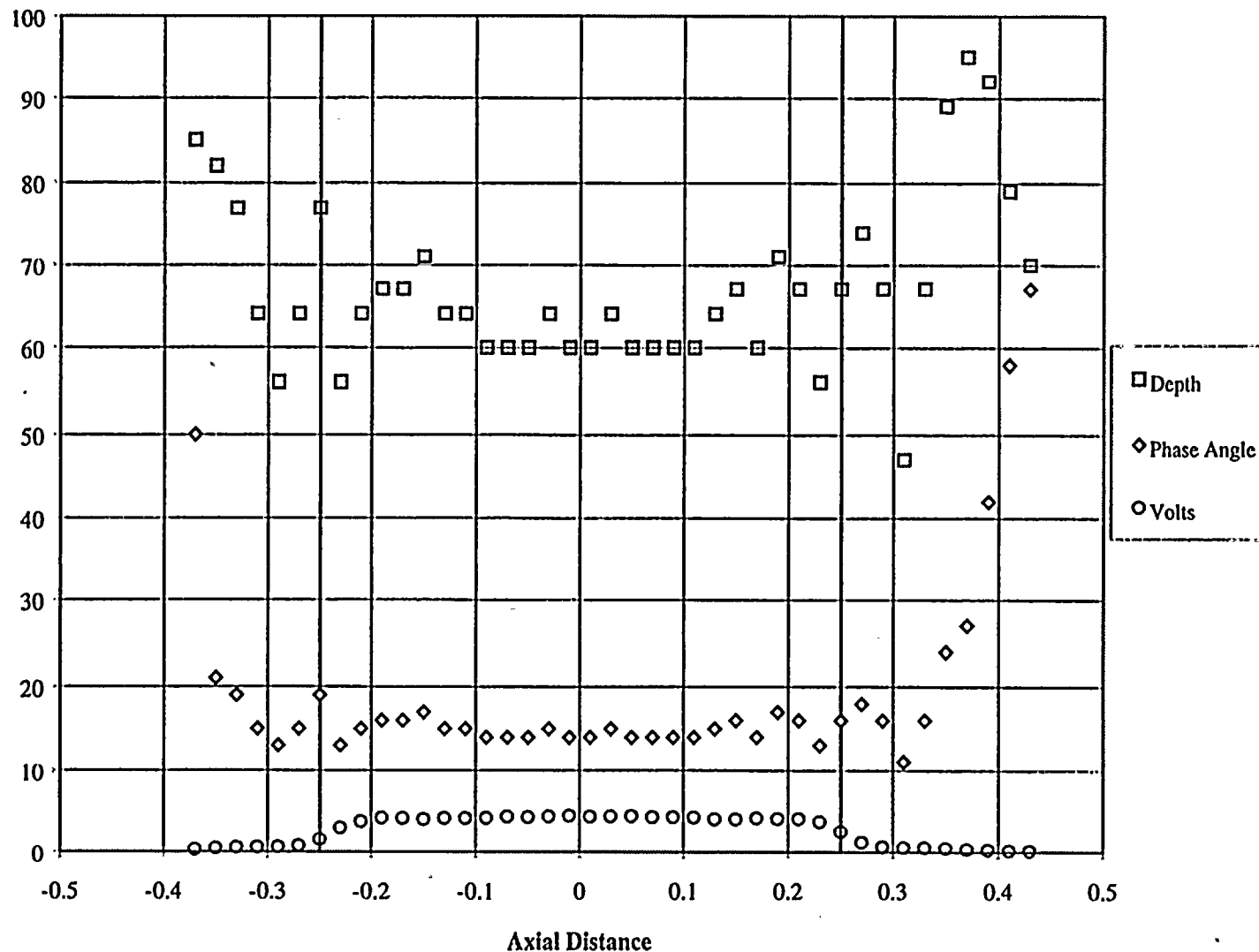


Figure 5-4
 40% TW ID Slot, 0.5" Long - Eddytest, + Point

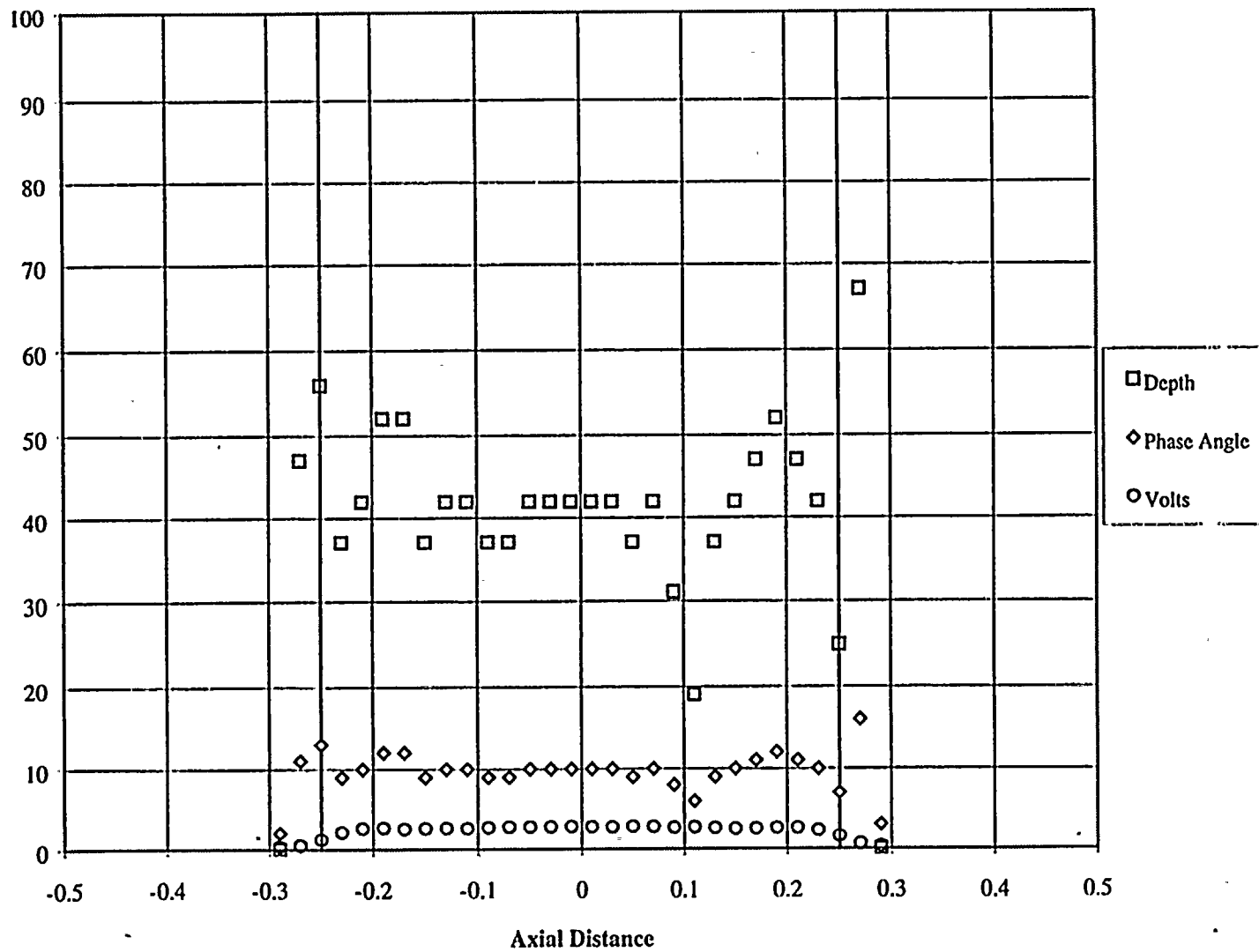


Figure 5-5
80% TW OD Slot, 0.5" Long - Eddynet, + Point

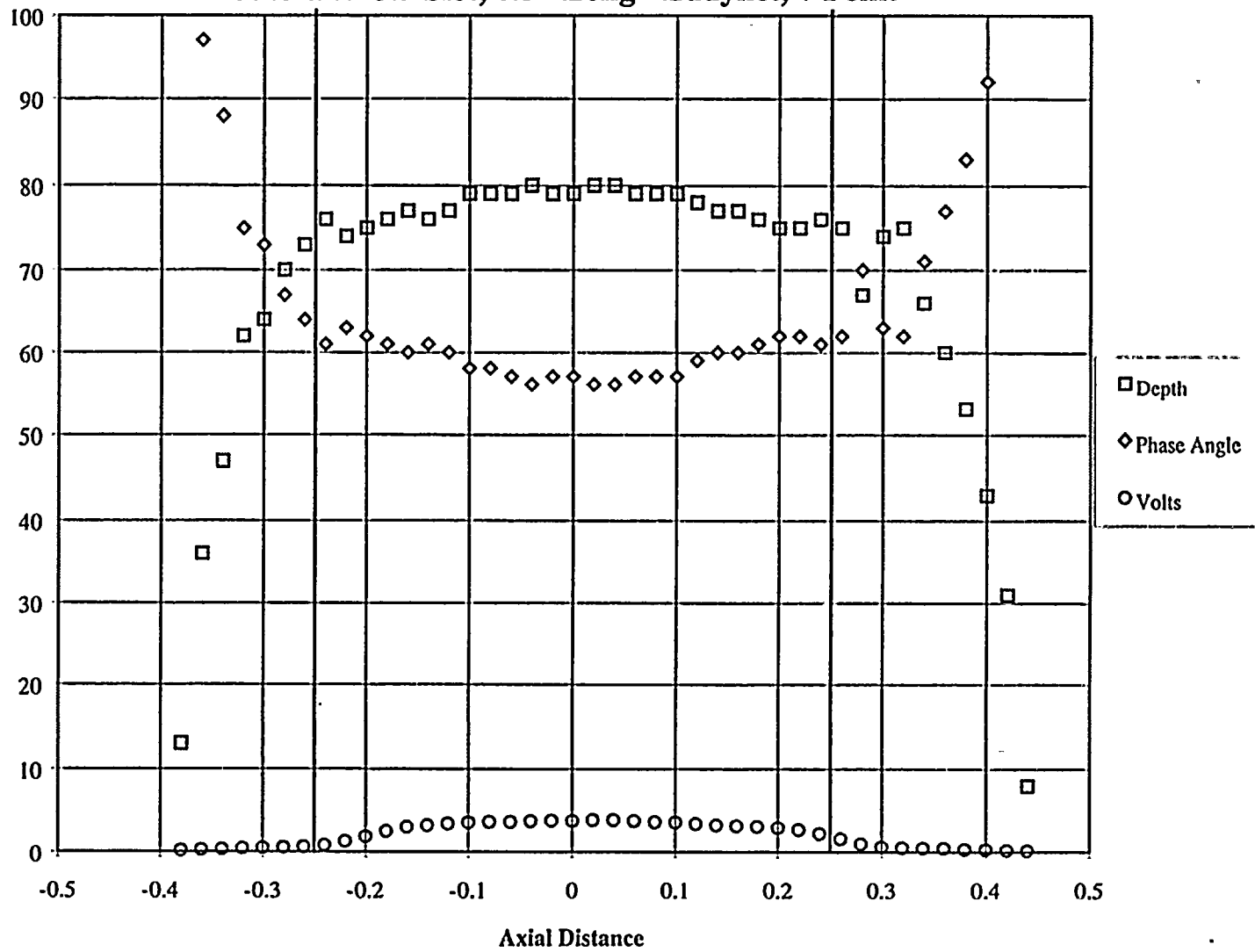
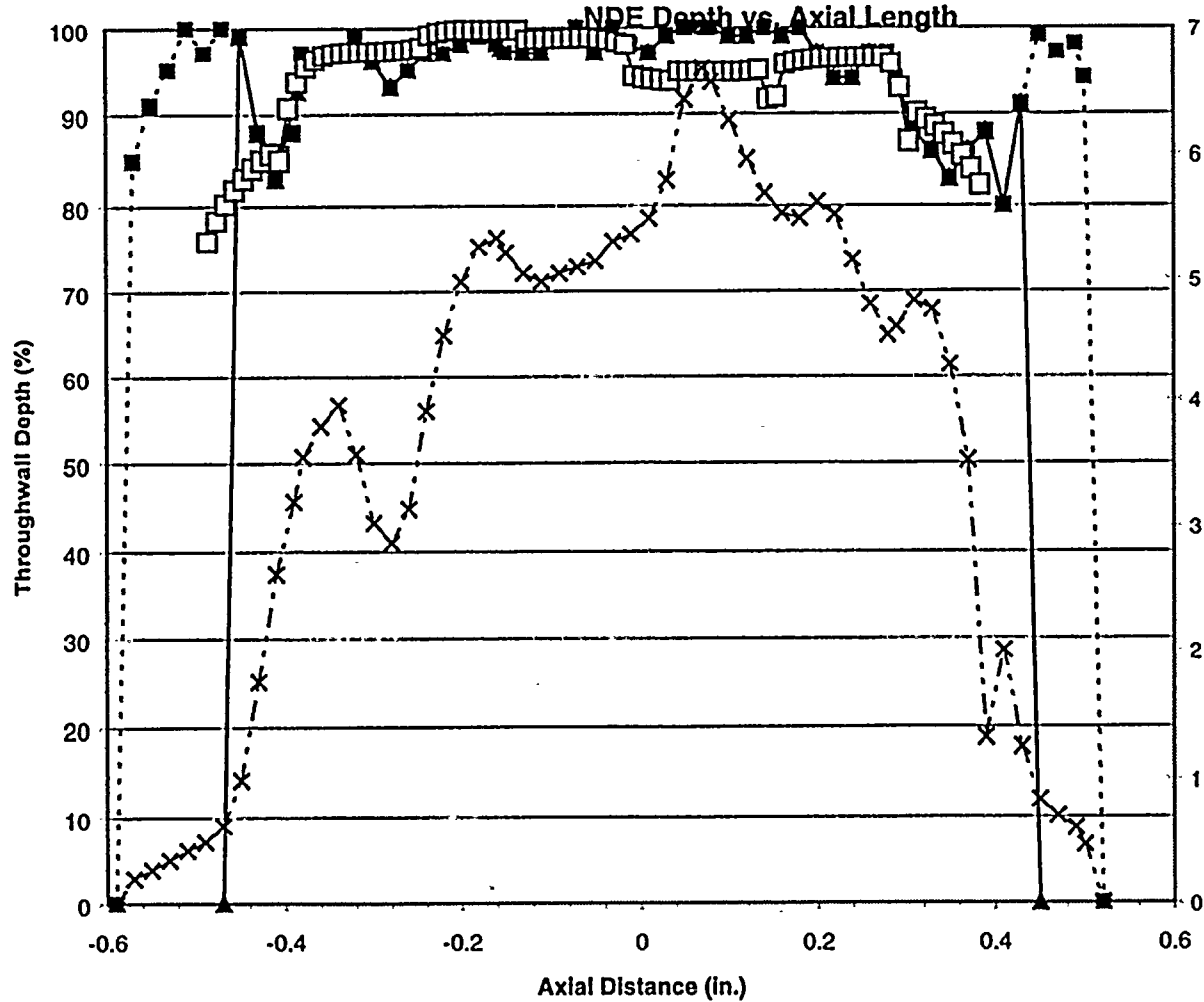


Figure 5-6
 Lab Sample P7 - Crack 1
 Comparison of Unadjusted, Adjusted and Voltage with Exam

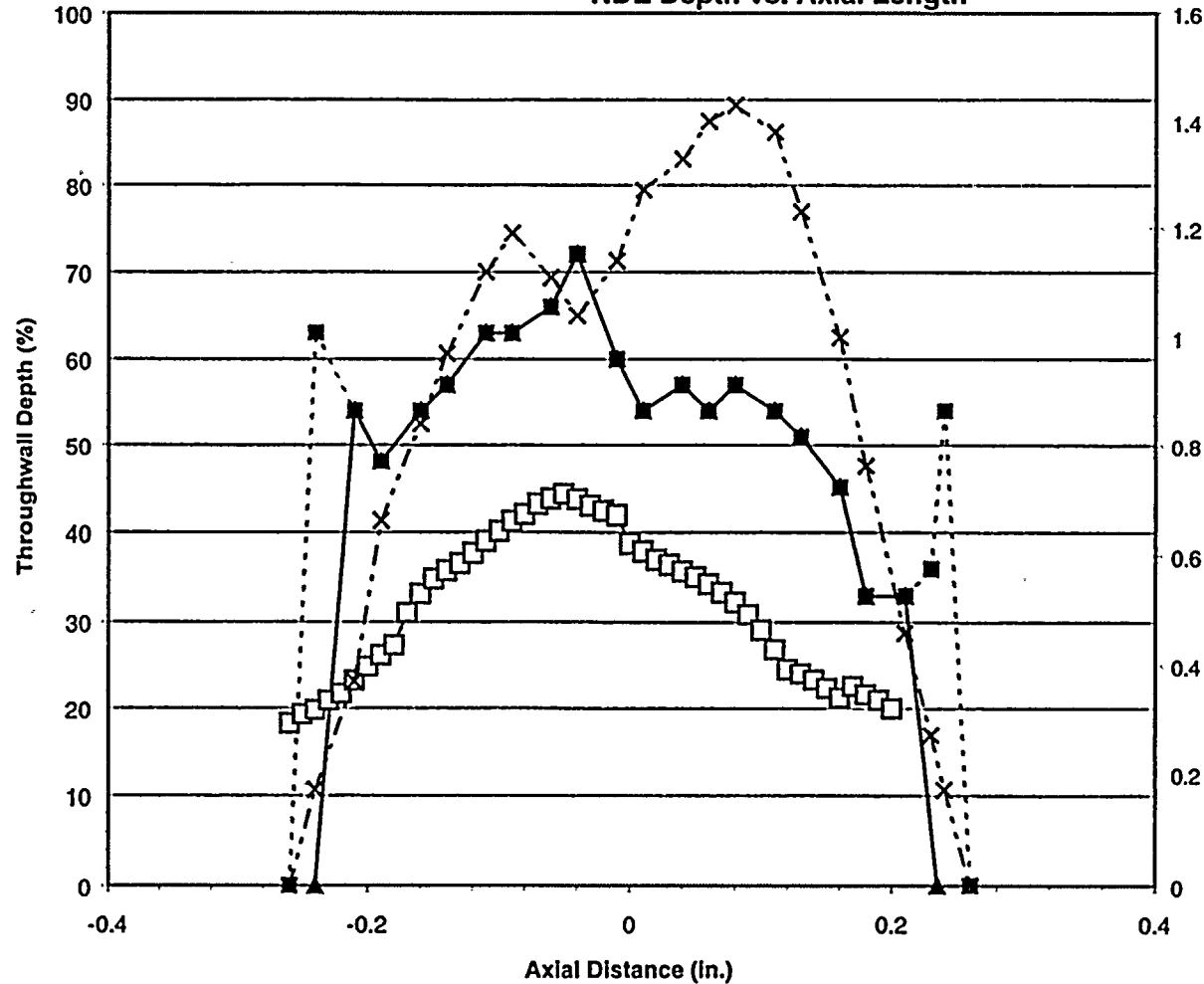


Unadjusted		
	S4373	Exam
Length	1.11	0.87
Max. Volts	6.66	
Max. Depth (%)	100.0	99.8
Avg. Depth (%)	93.5	94.3

Adjusted		
	S4373	Exam
Length	0.92	0.87
Max. Volts	6.61	
Max. Depth (%)	100.0	99.8
Avg. Depth (%)	93.0	94.3

---■--- Analyst S4373 - Unadjusted —▲— Analyst S4373 - Adjusted —□— Exam -×- Analyst S4373 - Voltage

Figure 5-7
 Lab Sample 8 - 3H - Crack 1
 Comparison of Unadjusted, Adjusted and Voltage with Exam
 NDE Depth vs. Axial Length

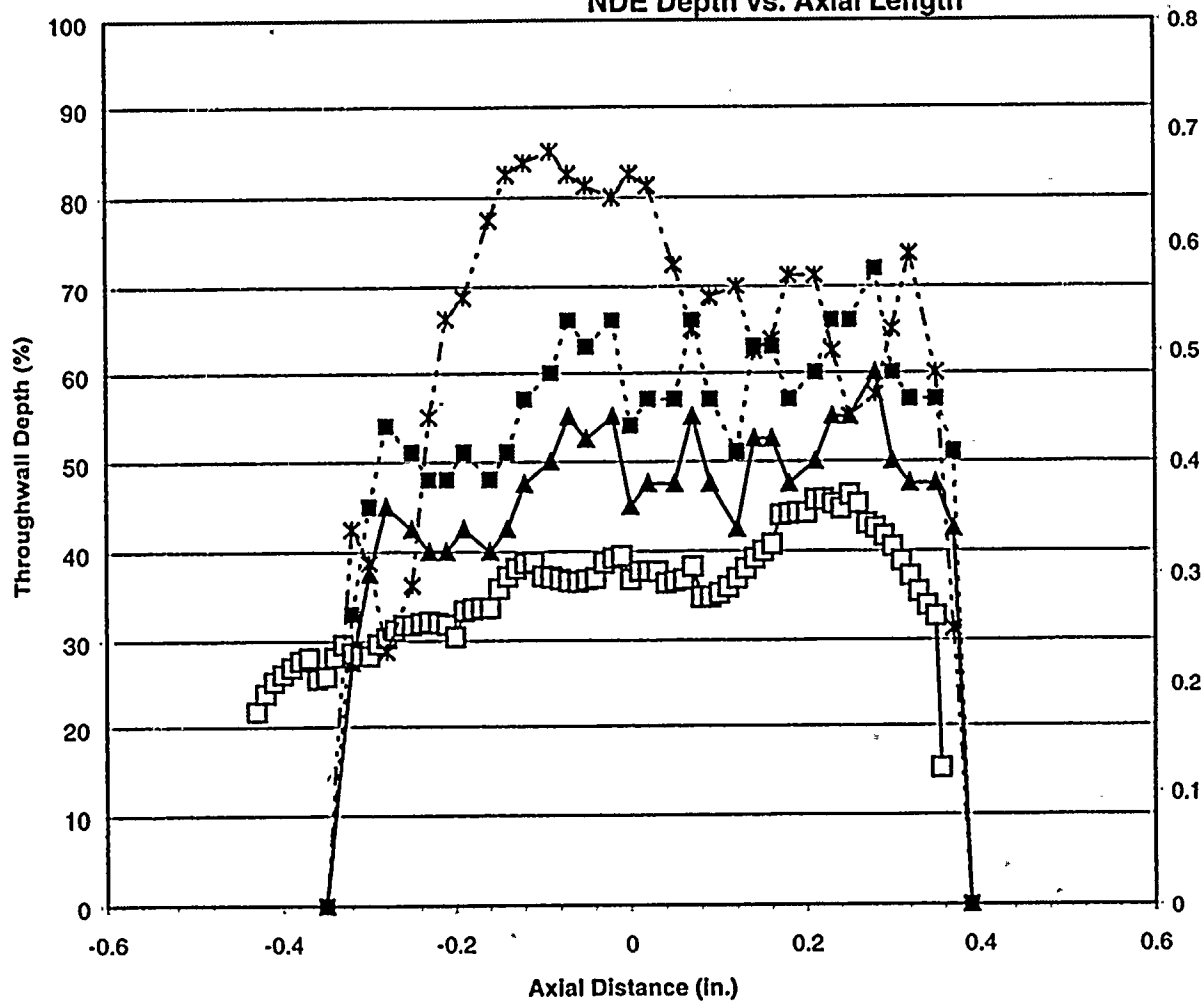


Unadjusted		
	S4373	Exam
Length	0.52	0.46
Max. Volts	1.43	
Max. Depth (%)	72.0	44.2
Avg. Depth (%)	52.0	31.8

Adjusted		
	S4373	Exam
Length	0.47	0.46
Max. Volts	1.43	
Max. Depth (%)	72.0	44.2
Avg. Depth (%)	50.9	31.8

---■--- Analyst S4373 - Unadjusted —▲— Analyst S4373 - Adjusted —□— Exam -X- Analyst S4373 - Voltage

Figure 5-8
 Lab Sample 9 - 2H - Crack 2
 Comparison of Unadjusted, Adjusted, Burst and Voltage with Exam
 NDE Depth vs. Axial Length

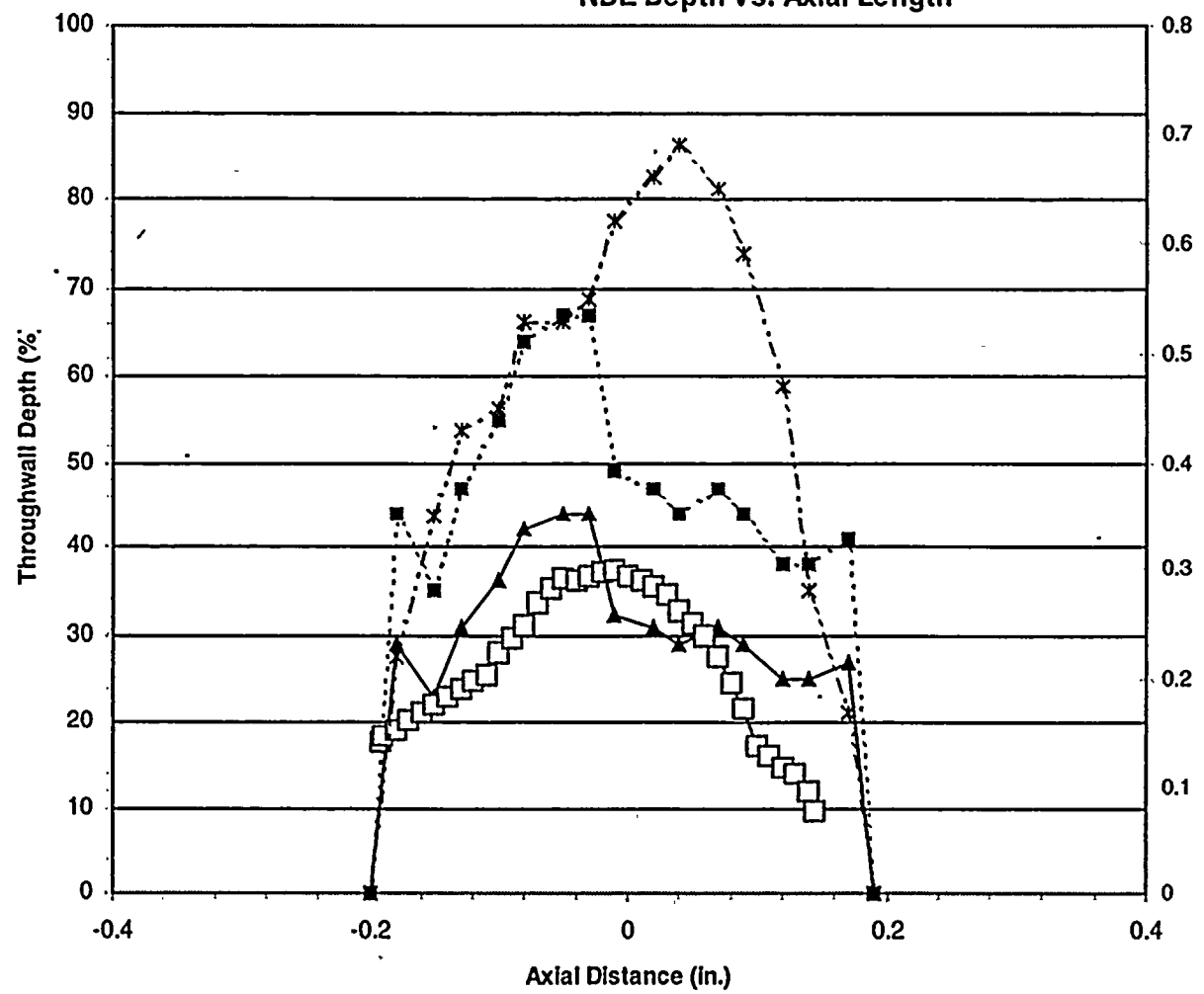


Unadjusted		
	T9093	Exam
Length	0.74	0.79
Max. Volts	0.68	
Max. Depth (%)	72.0	46.3
Avg. Depth (%)	54.7	35.6

Adjusted		
	T9093	Exam
Length	0.74	0.79
Max. Volts	0.68	
Max. Depth (%)	60.0	46.3
Avg. Depth (%)	45.6	35.6

---■--- Analyst T9093 - Unadjusted —▲— Analyst T9093 - Adjusted —□— Exam —*— Analyst T9093 - Voltage

Figure 5-9
 Lab Sample 13 - 3H - Crack 1
 Comparison of Unadjusted, Adjusted, Burst and Voltage with Exam
 NDE Depth vs. Axial Length



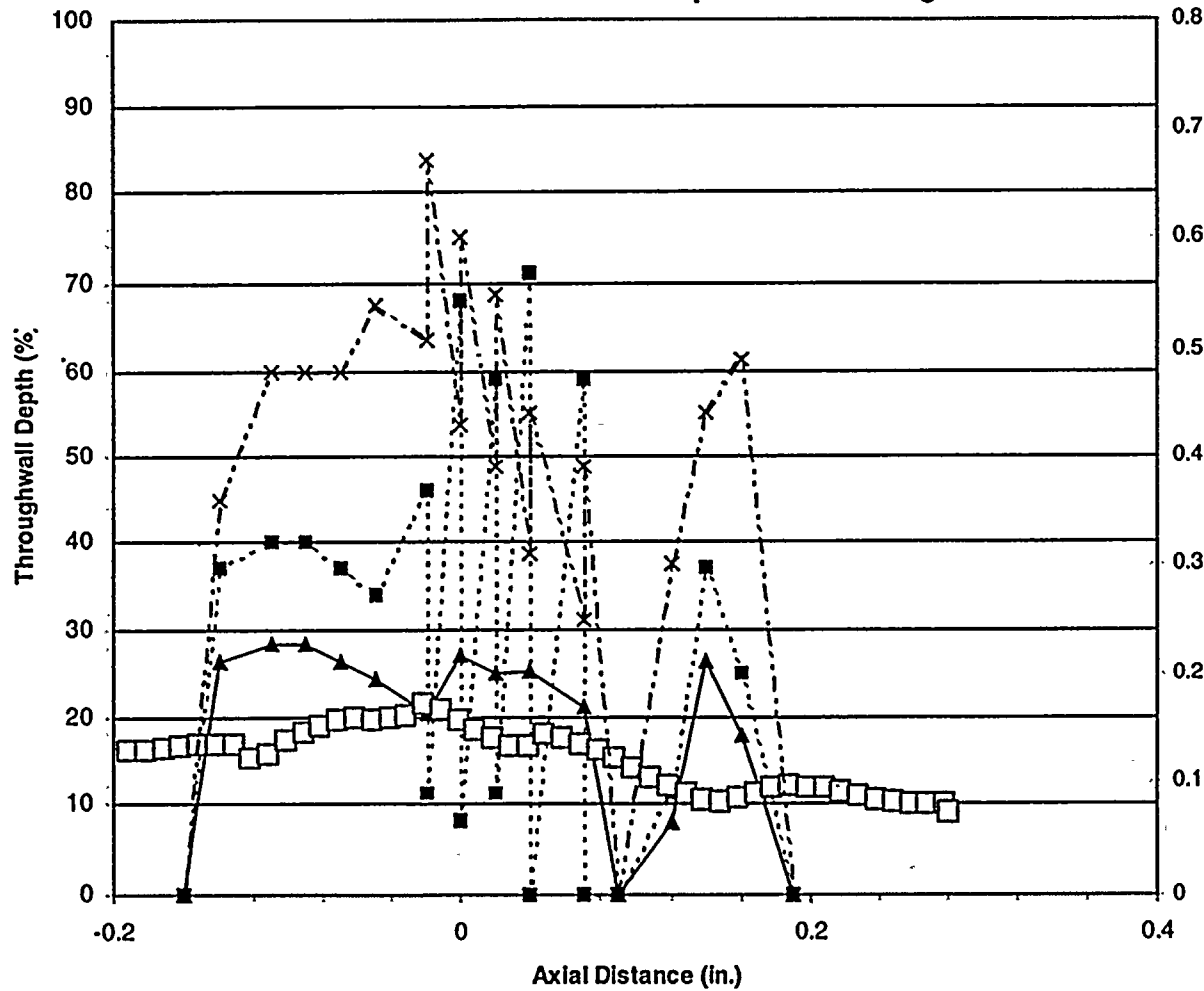
Unadjusted		
D9674		
Exam		
Length	0.39	0.34
Max. Volts	0.69	
Max. Depth (%)	67.0	37.3
Avg. Depth (%)	45.7	27.3

Adjusted		
	D9674	Exam
Length	0.39	0.34
Max. Volts	0.69	
Max. Depth (%)	44.0	37.3
Avg. Depth (%)	30.0	27.3

---■--- Analyst D9674 - Unadjusted —▲— Analyst D9674 - Adjusted —□— Exam - -x- - Analyst D9674 - Voltage

Figure 5-10
 Lab Sample 2 - 3H - Crack 1
 Comparison of Unadjusted, Adjusted and Voltage with Exam
 NDE Depth vs. Axial Length

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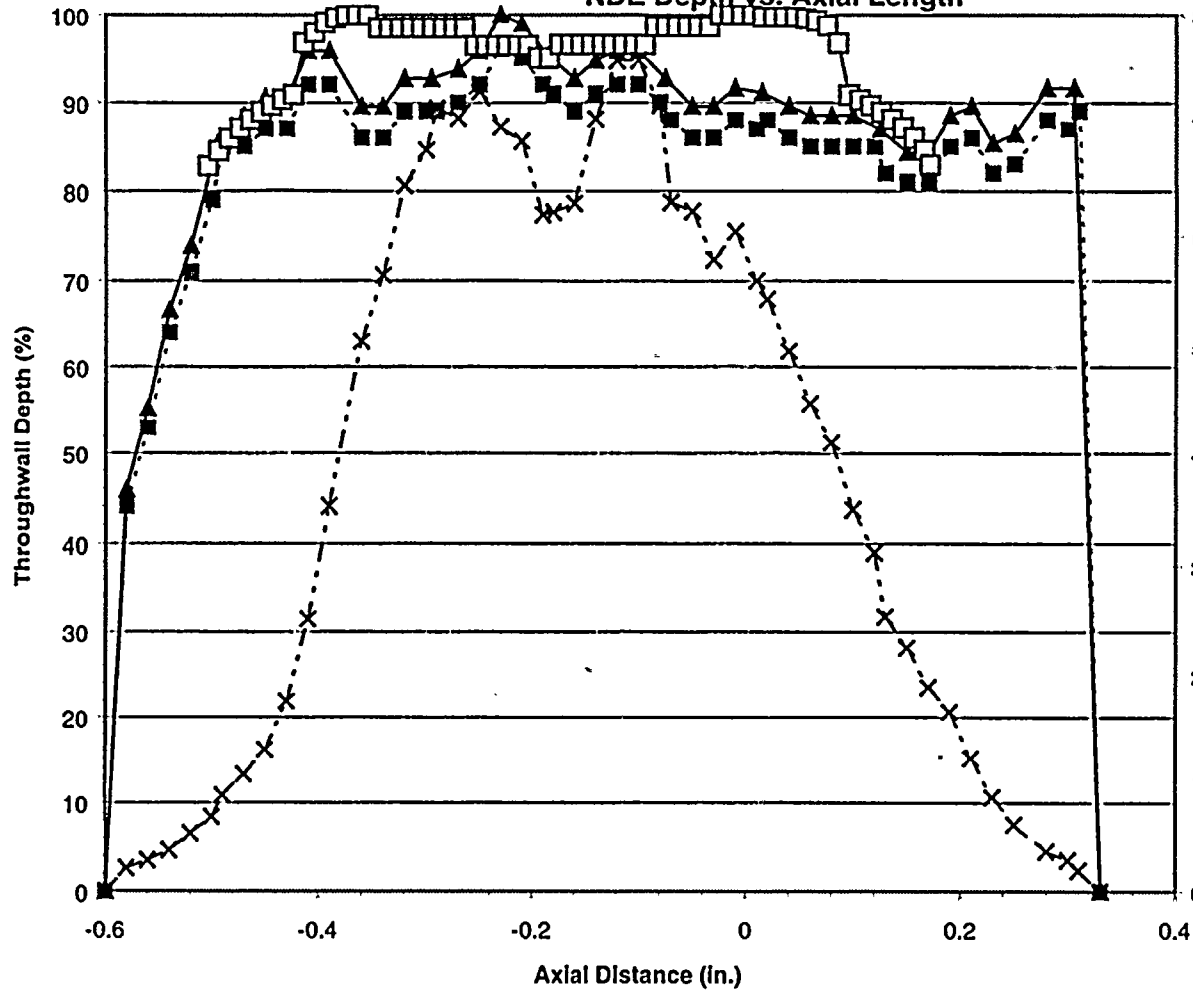


Unadjusted		
T9093		
Exam		
Length	0.35	0.47
Max. Volts	0.67	
Max. Depth (%)	71.0	21.5
Avg. Depth (%)	28.0	15.2

Adjusted		
	T9093	Exam
Length	0.35	0.47
Max. Volts	0.59	
Max. Depth (%)	28.5	21.5
Avg. Depth (%)	19.9	15.2

---■--- Analyst T9093 - Unadjusted —▲— Analyst T9093 - Adjusted —□— Exam - -x- - Analyst T9093 - Voltage

Figure 5-11
 Lab Sample P11 - Crack 1
 Comparison of Unadjusted, Adjusted and Voltage with Exam
 NDE Depth vs. Axial Length

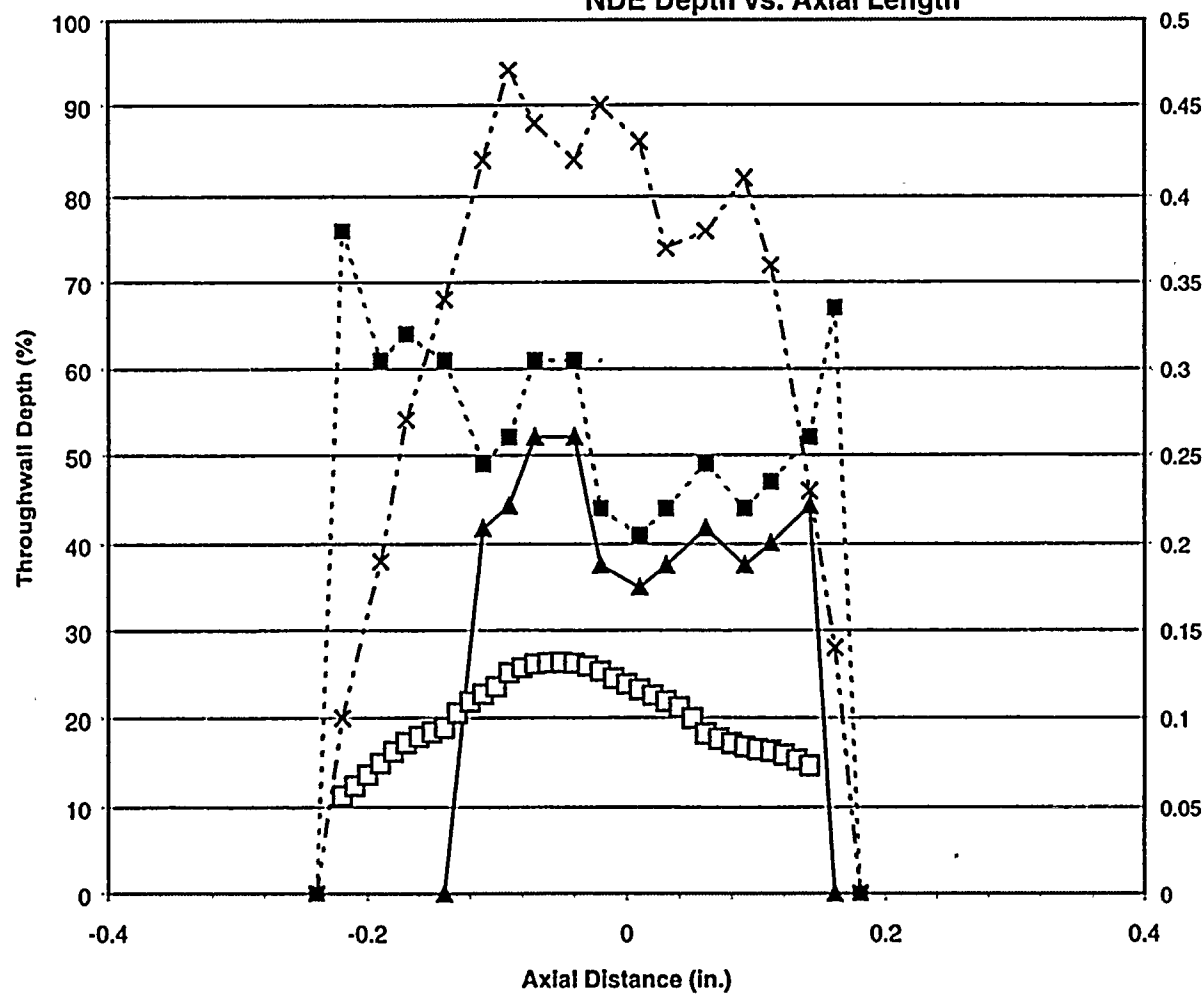


Unadjusted		
	T9093	Exam
Length	0.93	0.68
Max. Volts	7.58	
Max. Depth (%)	96.0	100.0
Avg. Depth (%)	83.1	95.6

Adjusted		
	T9093	Exam
Length	0.93	0.68
Max. Volts	7.58	
Max. Depth (%)	100.0	100.0
Avg. Depth (%)	86.3	95.6

---■--- Analyst T9093 - Unadjusted ---▲--- Analyst T9093 - Adjusted ---□--- Exam ---×--- Analyst T9093 - Voltage

Figure 5-12a
Lab Sample 12 - 4H - Crack 1
Comparison of Unadjusted, Adjusted and Voltage with Exam
NDE Depth vs. Axial Length

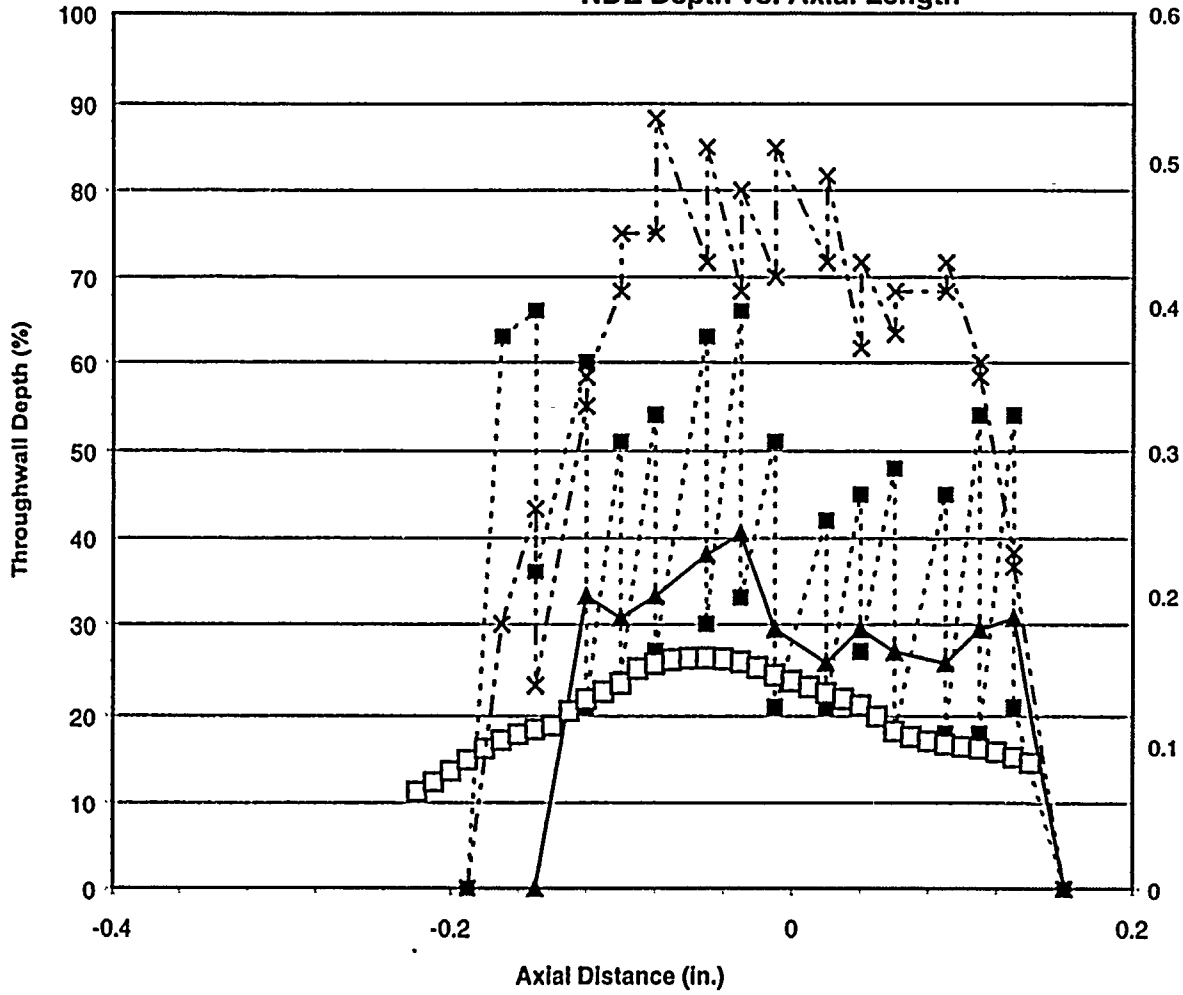


Unadjusted		
	S4373	Exam
Length	0.42	0.36
Max. Volts	0.47	
Max. Depth (%)	76.0	26.3
Avg. Depth (%)	51.9	20.2

Adjusted		
	S4373	Exam
Length	0.30	0.36
Max. Volts	0.47	
Max. Depth (%)	52.0	26.3
Avg. Depth (%)	38.6	20.2

---■--- Analyst S4373 - Unadjusted —▲— Analyst S4373 - Adjusted —□— Exam -X- Analyst S4373 - Voltage

Figure 5-12b
 Lab Sample 12-4H - Crack 1
 Comparison of Unadjusted, Adjusted and Voltage with Exam
 NDE Depth vs. Axial Length

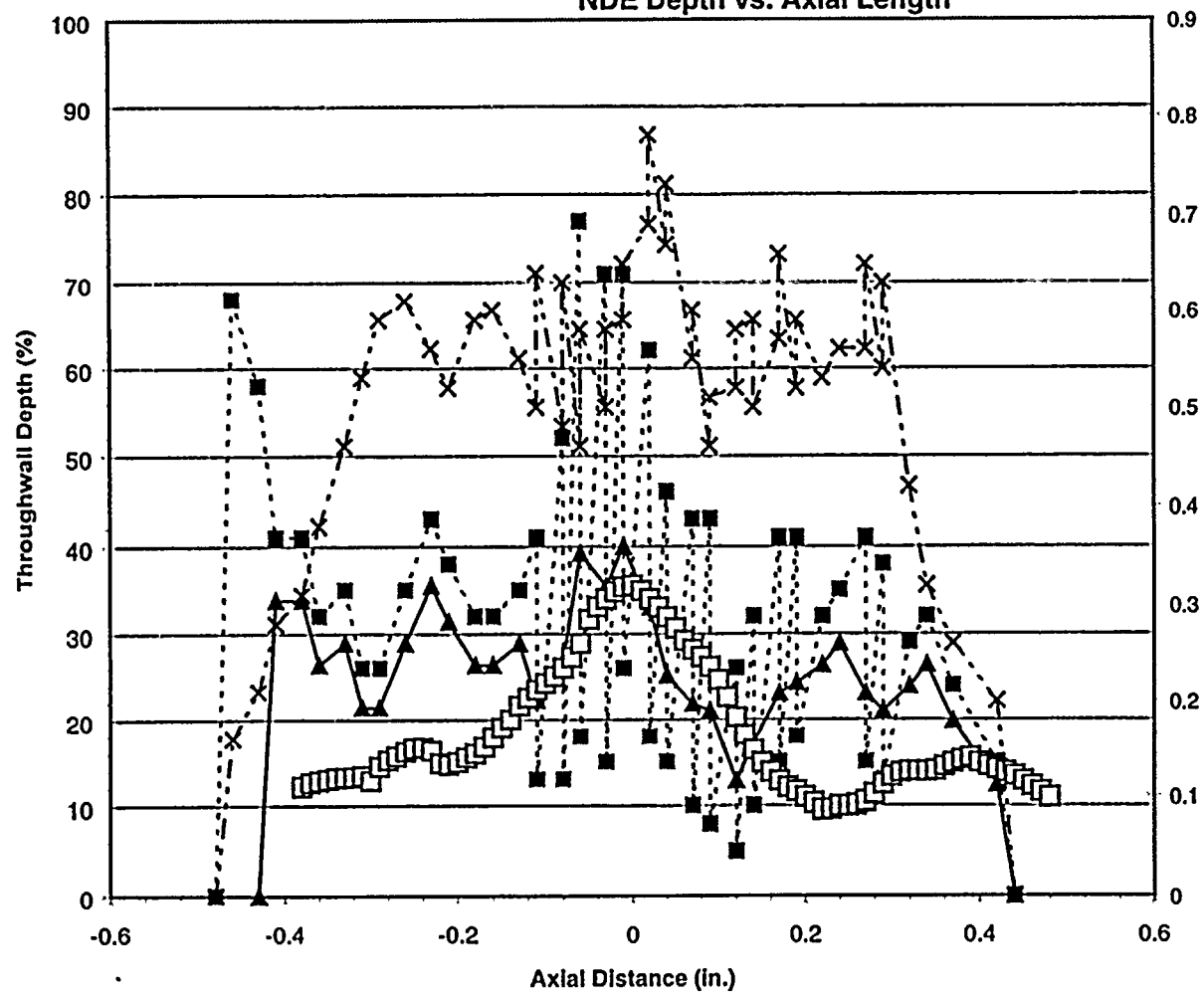


Unadjusted		
	D9674	Exam
Length	0.35	0.36
Max. Volts	0.53	
Max. Depth (%)	66.0	26.3
Avg. Depth (%)	37.8	20.2

Adjusted		
	D9674	Exam
Length	0.31	0.36
Max. Volts	0.49	
Max. Depth (%)	40.5	26.3
Avg. Depth (%)	28.0	20.2

---■--- Analyst D9674 - Unadjusted —▲— Analyst D9674 - Adjusted —□— Exam -X- Analyst D9674 - Voltage

Figure 5-13
 Lab Sample 2 - 5H - Crack 1
 Comparison of Unadjusted, Adjusted and Voltage with Exam
 NDE Depth vs. Axial Length



Unadjusted		
	S4373	Exam
Length	0.92	0.86
Max. Volts	0.78	
Max. Depth (%)	77.0	35.5
Avg. Depth (%)	32.2	18.3

Adjusted		
	S4373	Exam
Length	0.87	0.86
Max. Volts	0.73	
Max. Depth (%)	40.0	35.5
Avg. Depth (%)	25.4	18.3

---■--- Analyst S4373 - Unadjusted —▲— Analyst S4373 - Adjusted —□— Exam -x- Analyst S4373 - Voltage

Figure 5-14

Sample 9, TSP 2H - Crack 1
 Mid-Range +Point, 300 kHz
 NDE Depth vs. Axial Length with Destructive Exam
 (No NDE Adjustment Applied)

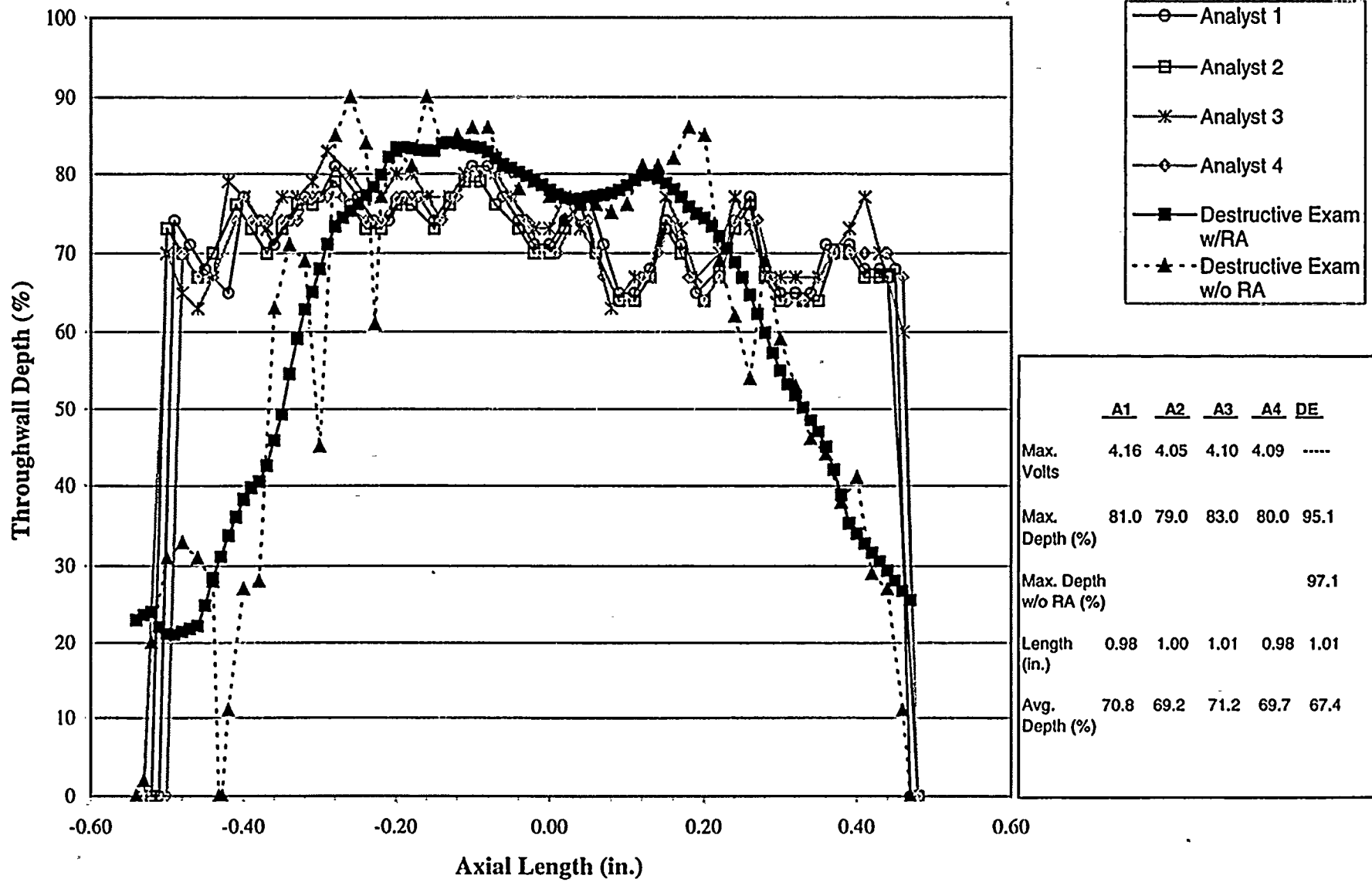


Figure 5-15
Sample 11, TSP 2H- Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

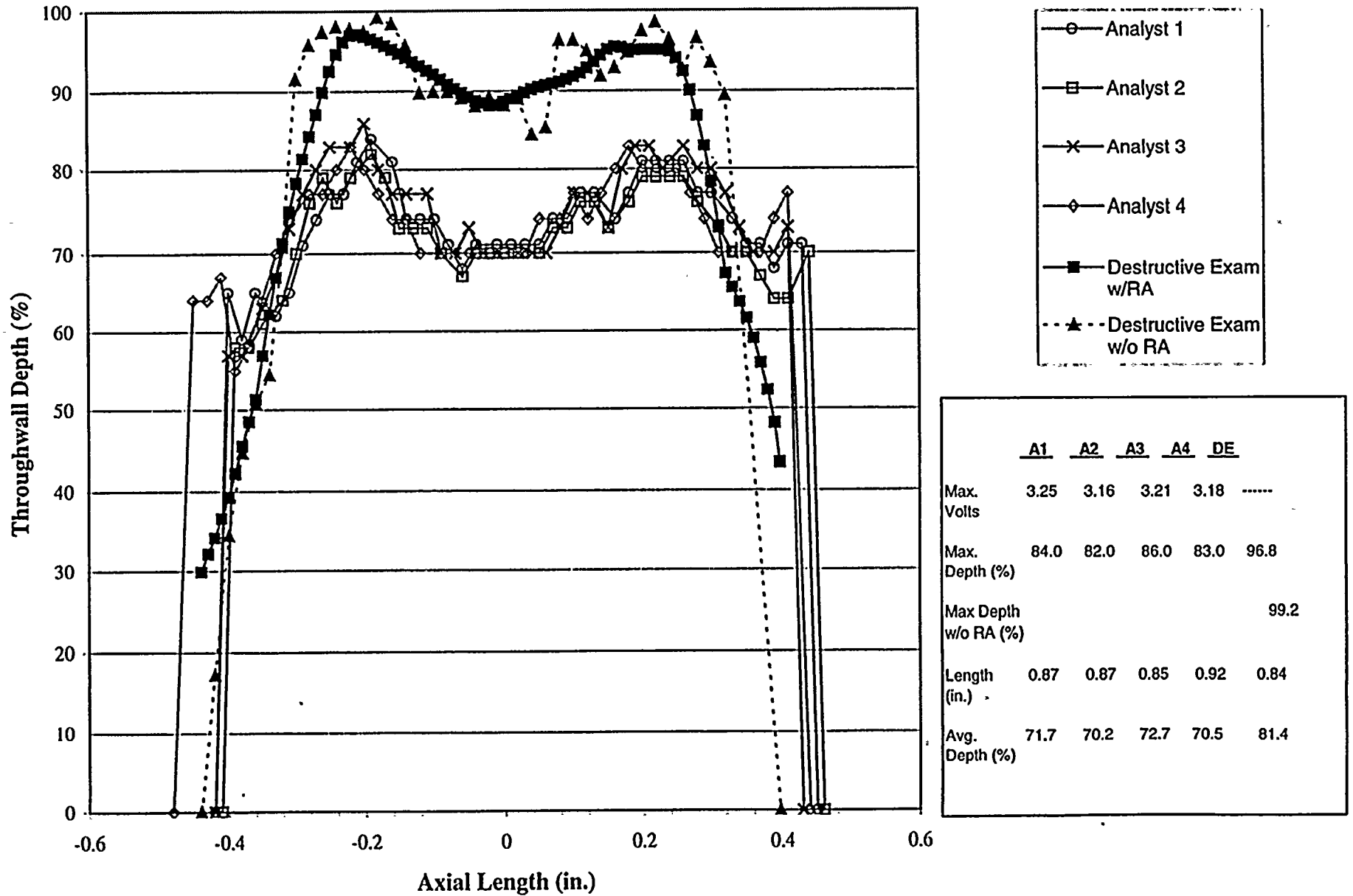


Figure 5-16
Sample 1, TSP 4H
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

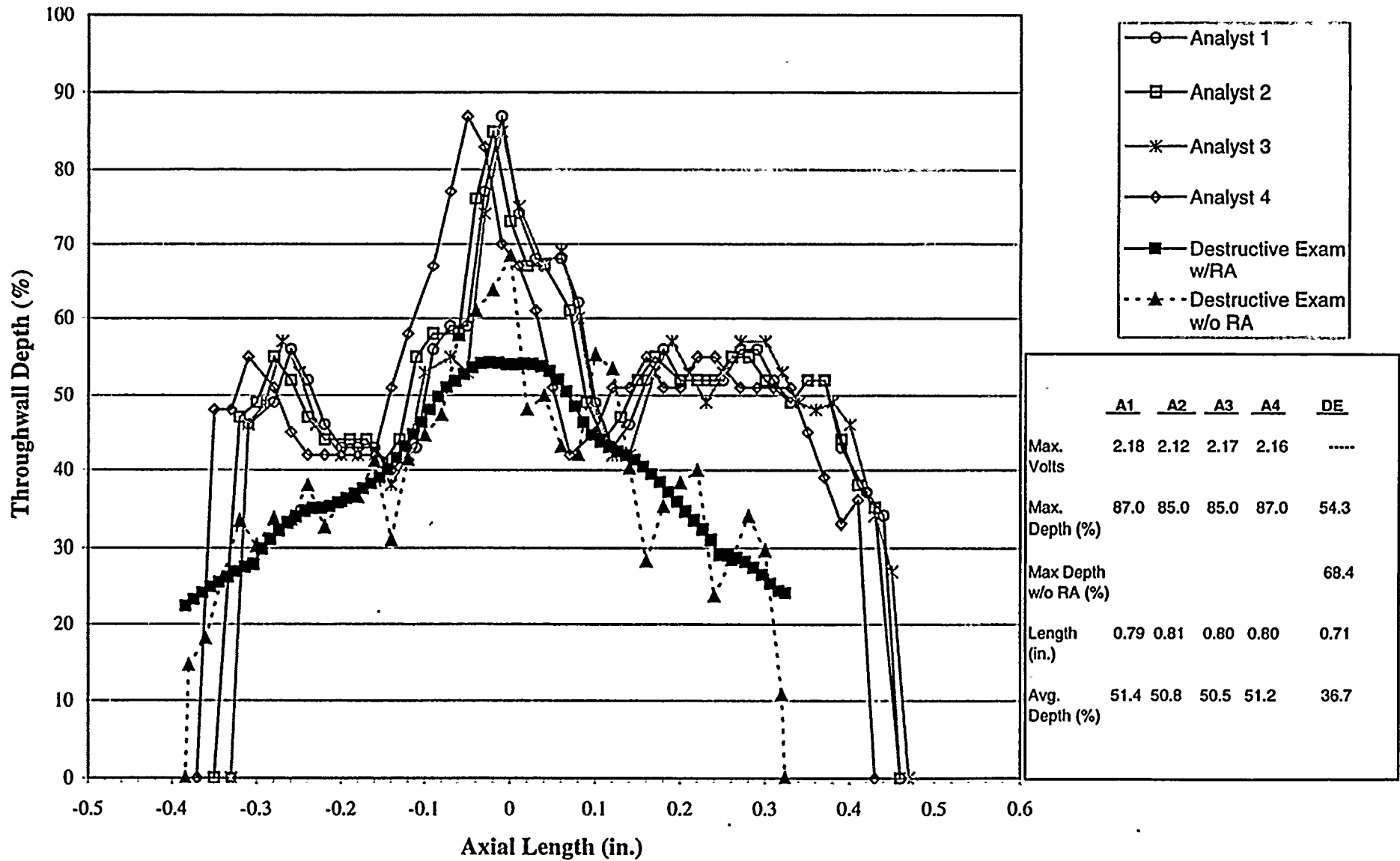


Figure 5-17
Sample 6, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

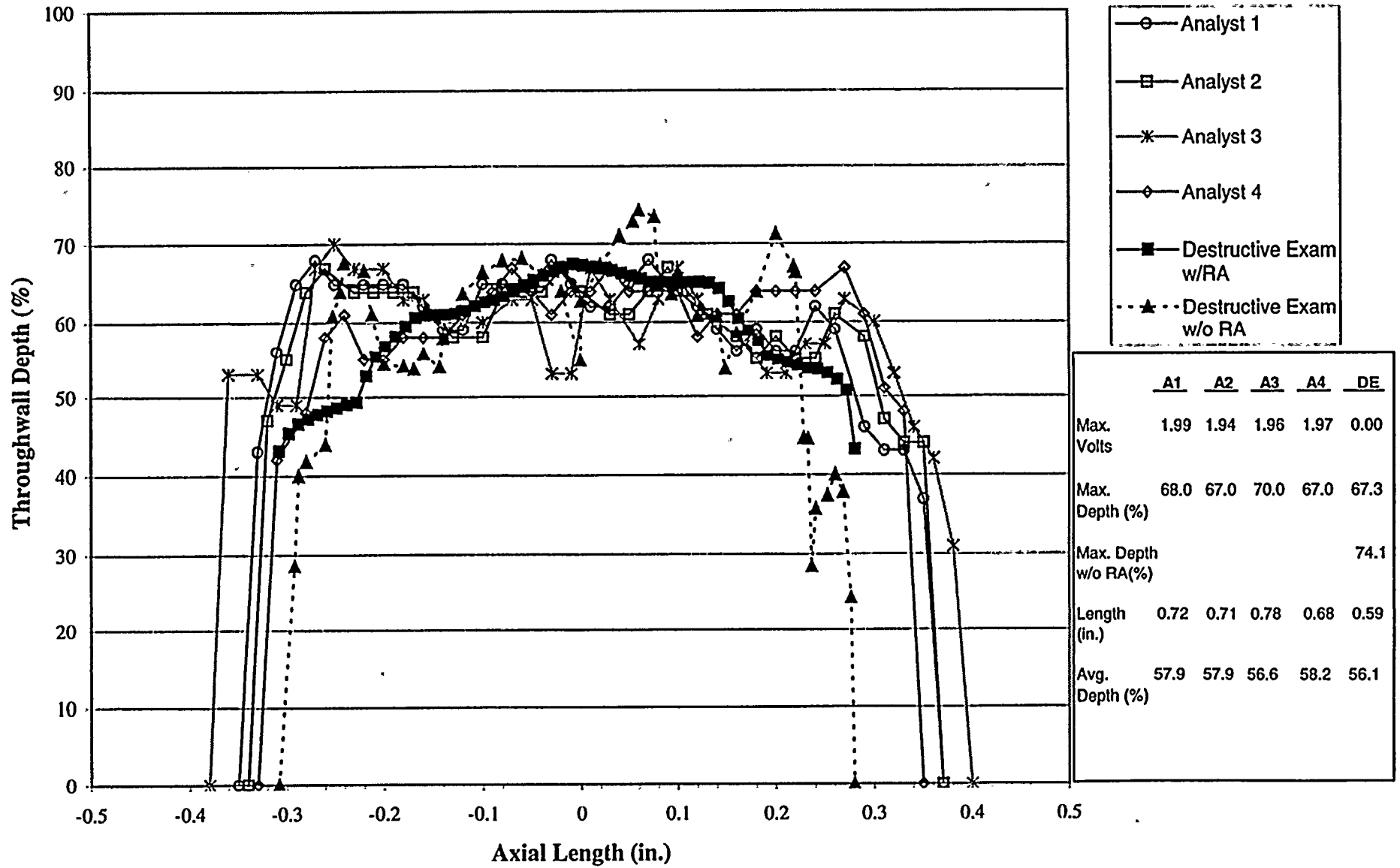


Figure 5-18
Sample 6, TSP 4H - Crack 1
Mid-Range +Point, 300 kHz
Length NDE Depth vs. Axial Length with Destructive Exam

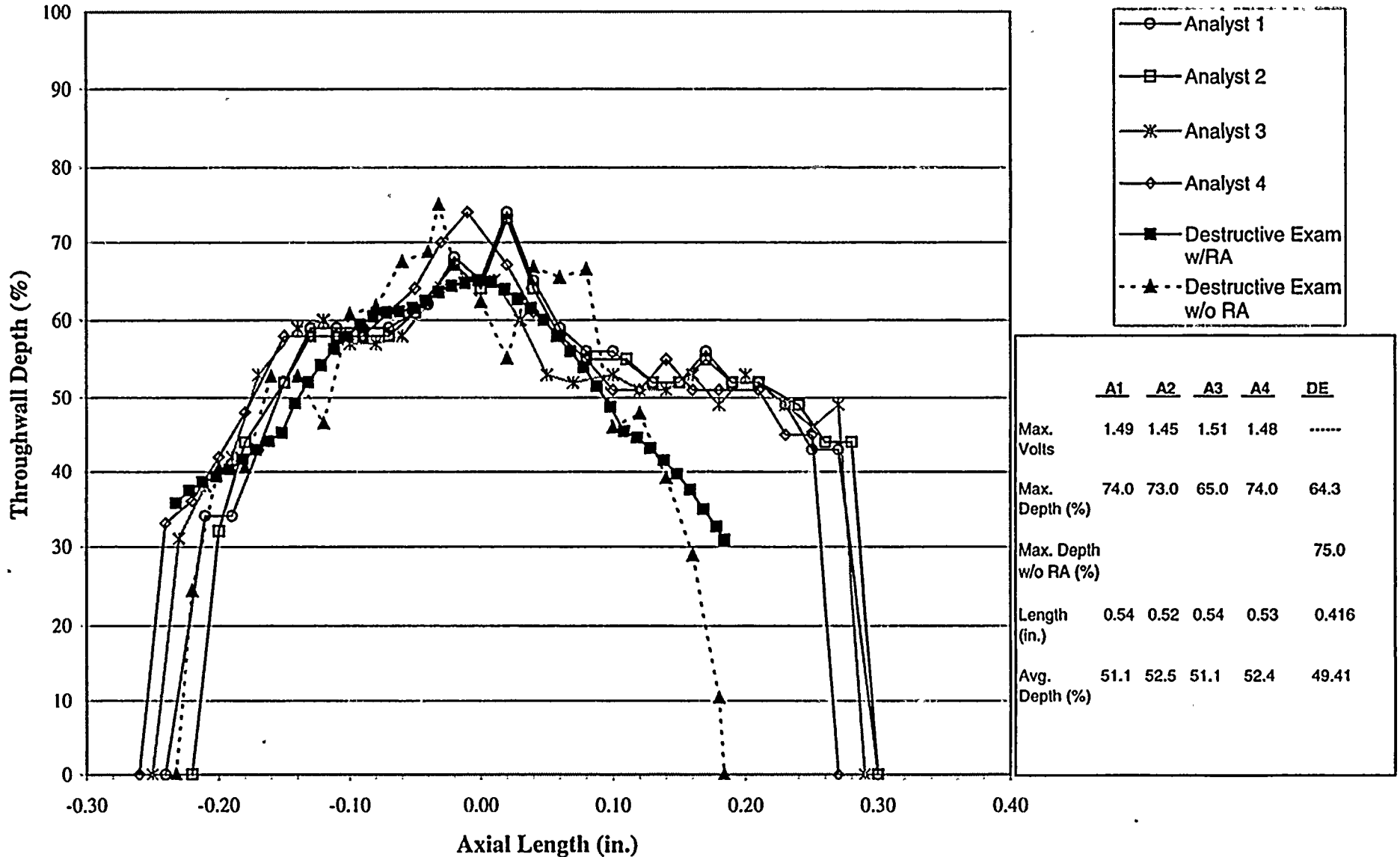


Figure 5-19
Sample 8, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

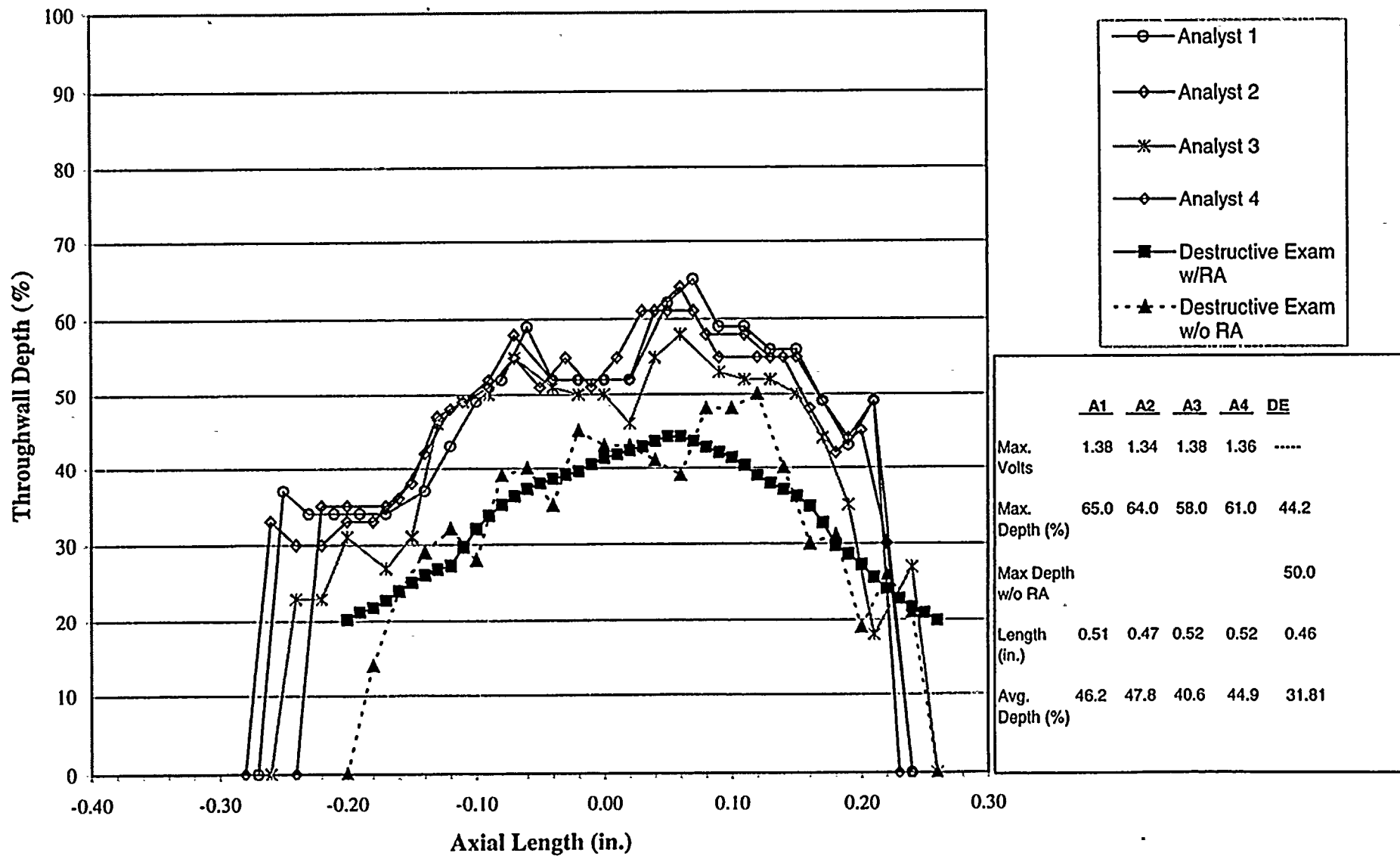


Figure 5-20
Sample 2, TSP 4H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

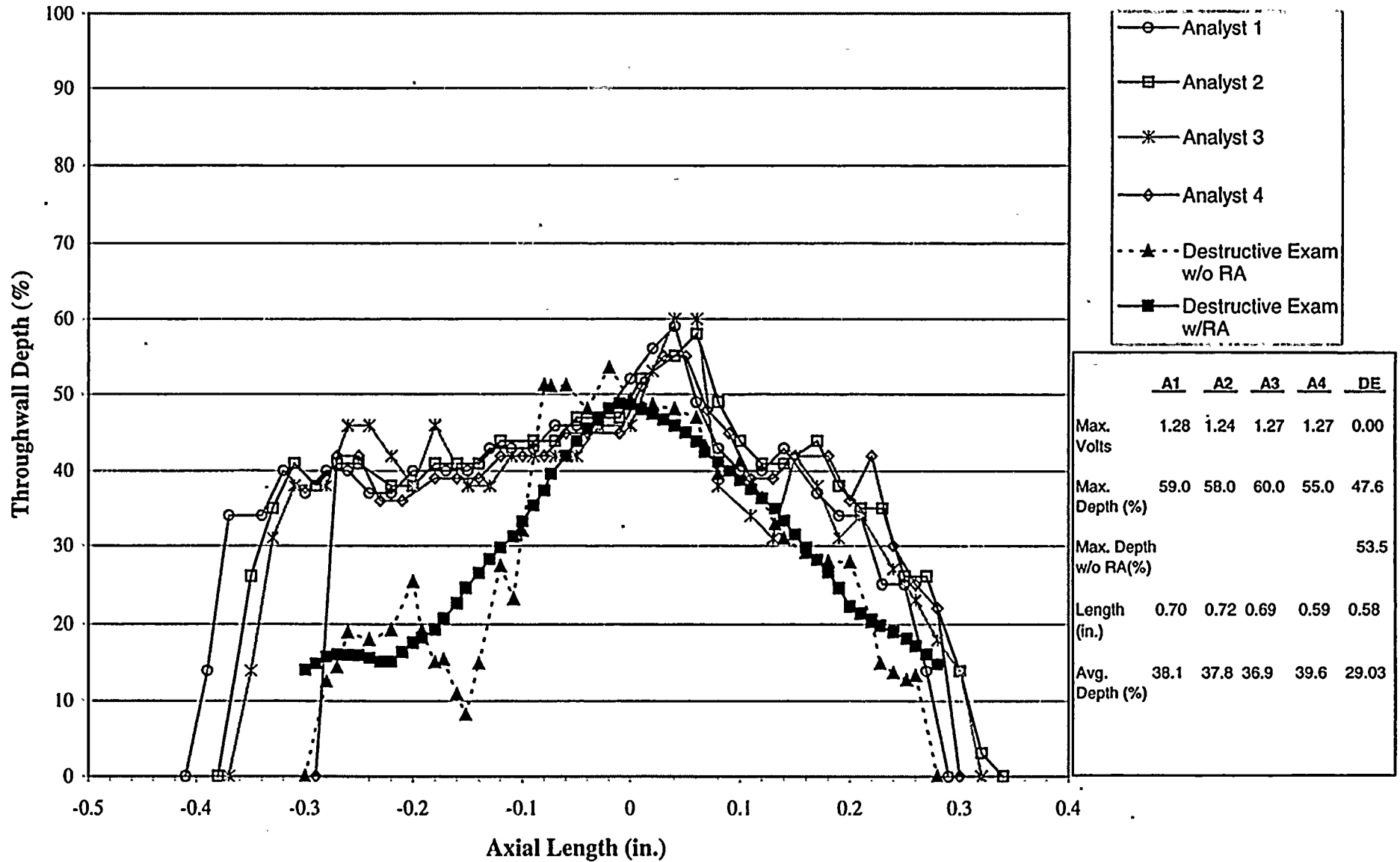
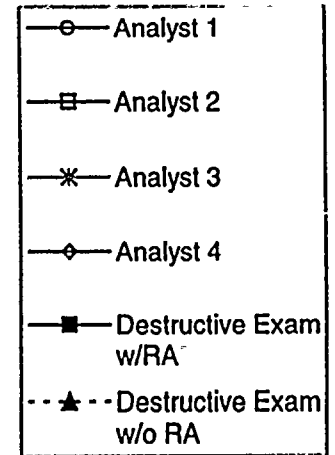
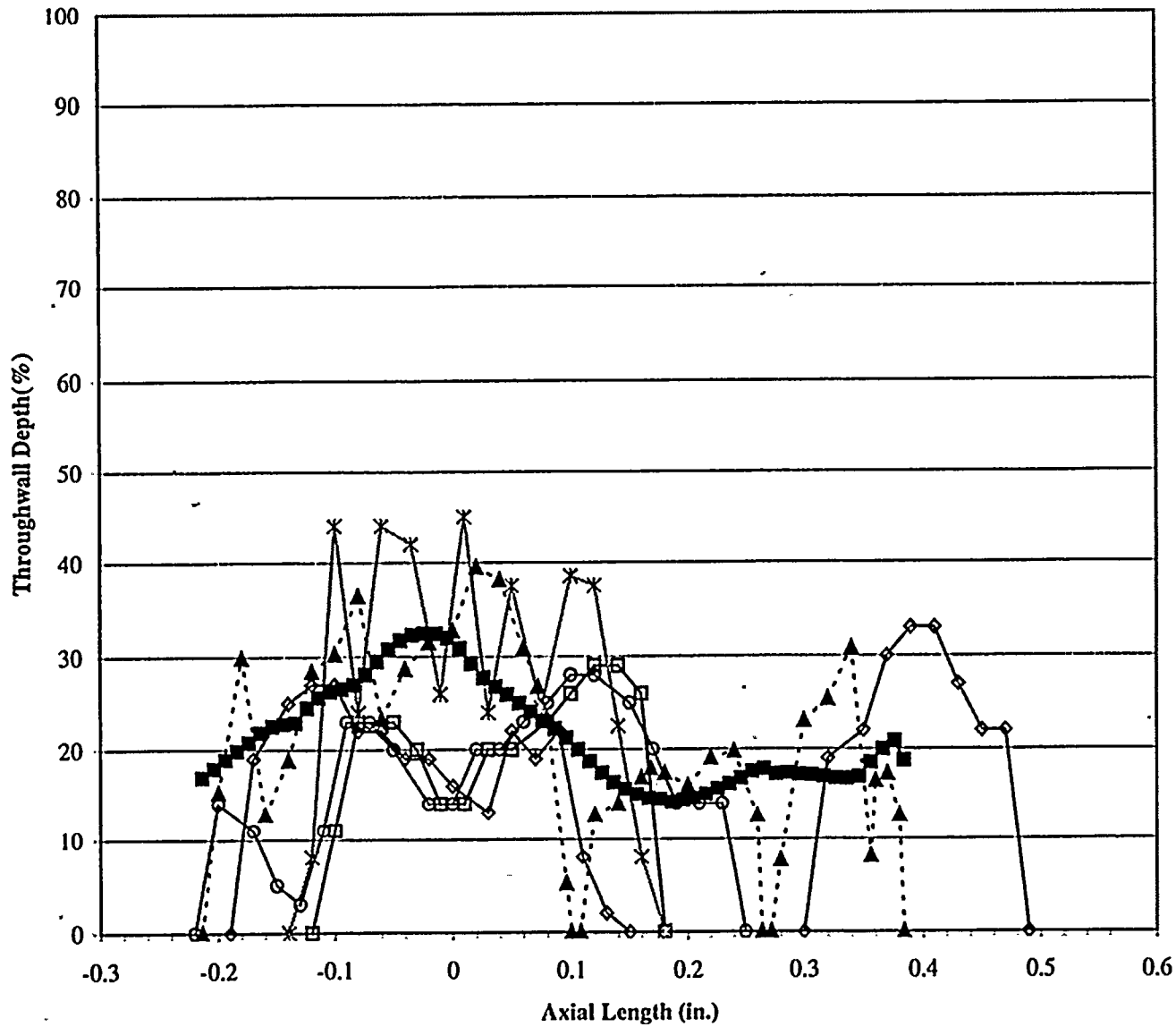


Figure 5-21
Sample 7, TSP 1H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

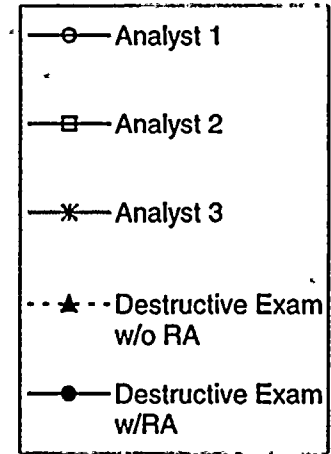
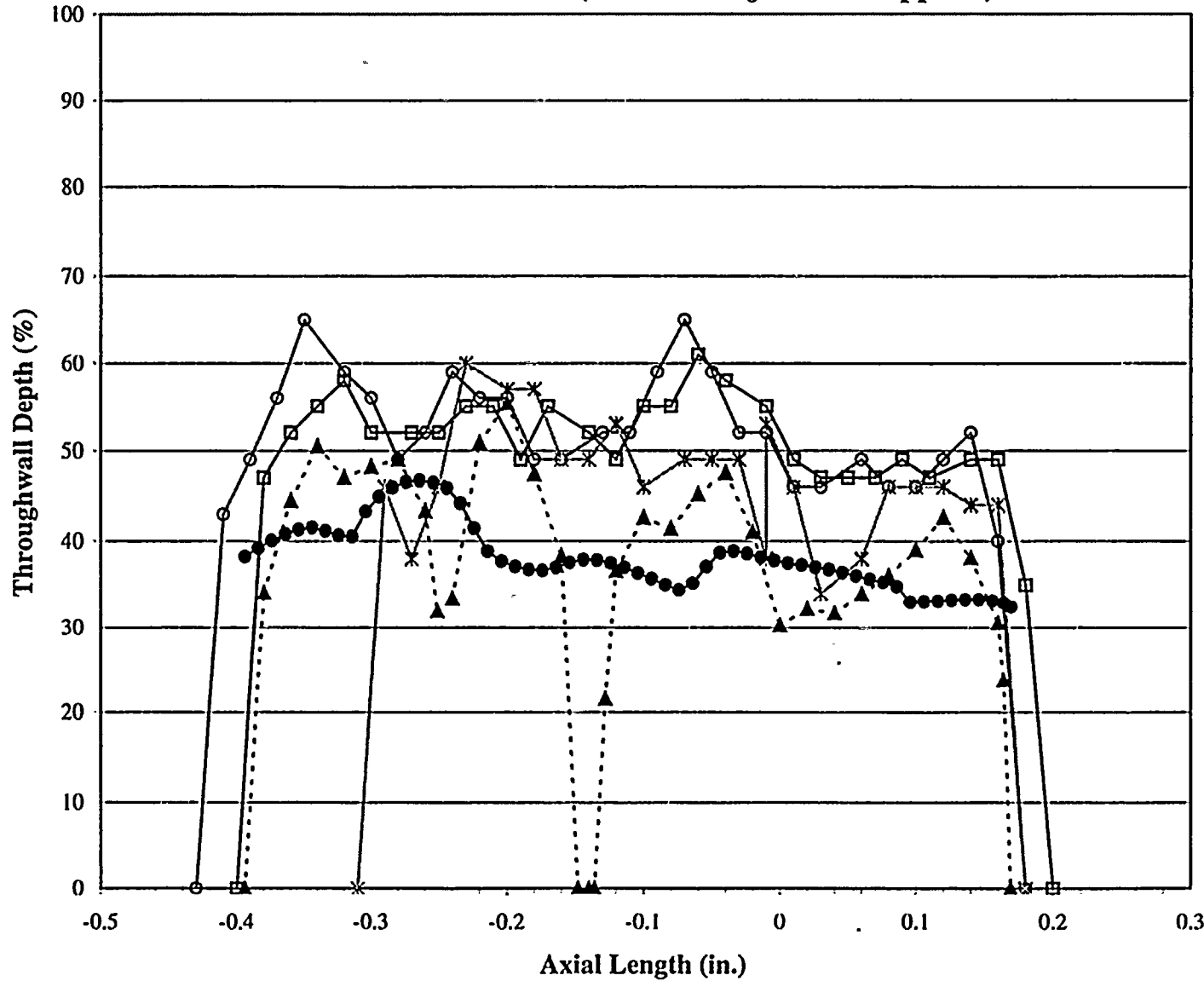


	<u>A1</u>	<u>A2</u>	<u>A3</u>	<u>A4</u>	<u>DE</u>
Max. Volts	1.24	1.20	0.75	1.21	0.00
Max. Depth (%)	28.0	29.0	45.0	33.0	30.1
Max. Depth w/o RA (%)					39.49
Length (in.)	0.47	0.30	0.32	0.68	0.598
Avg. Depth (%)	16.9	20.0	28.77	15.25	20.12

Figure 5-22

Sample 11, TSP 3H - Crack 2
Mid-Range +Point, 300 kHz

NDE Depth vs. Axial Length with Destructive Exam
(No NDE Adjustment Applied)



	A1	A2	A3	DE
Max. Volts	0.63	0.61	0.62	0.00
Max. Depth (%)	65.0	61.0	60.0	46.74
Max. Depth w/o RA(%)				55.35
Length (in.)	0.61	0.60	0.49	0.563
Avg. Depth (%)	50.6	49.7	45.2	38.23

Figure 5-23
Sample 2, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam
(No NDE Adjustment Applied)

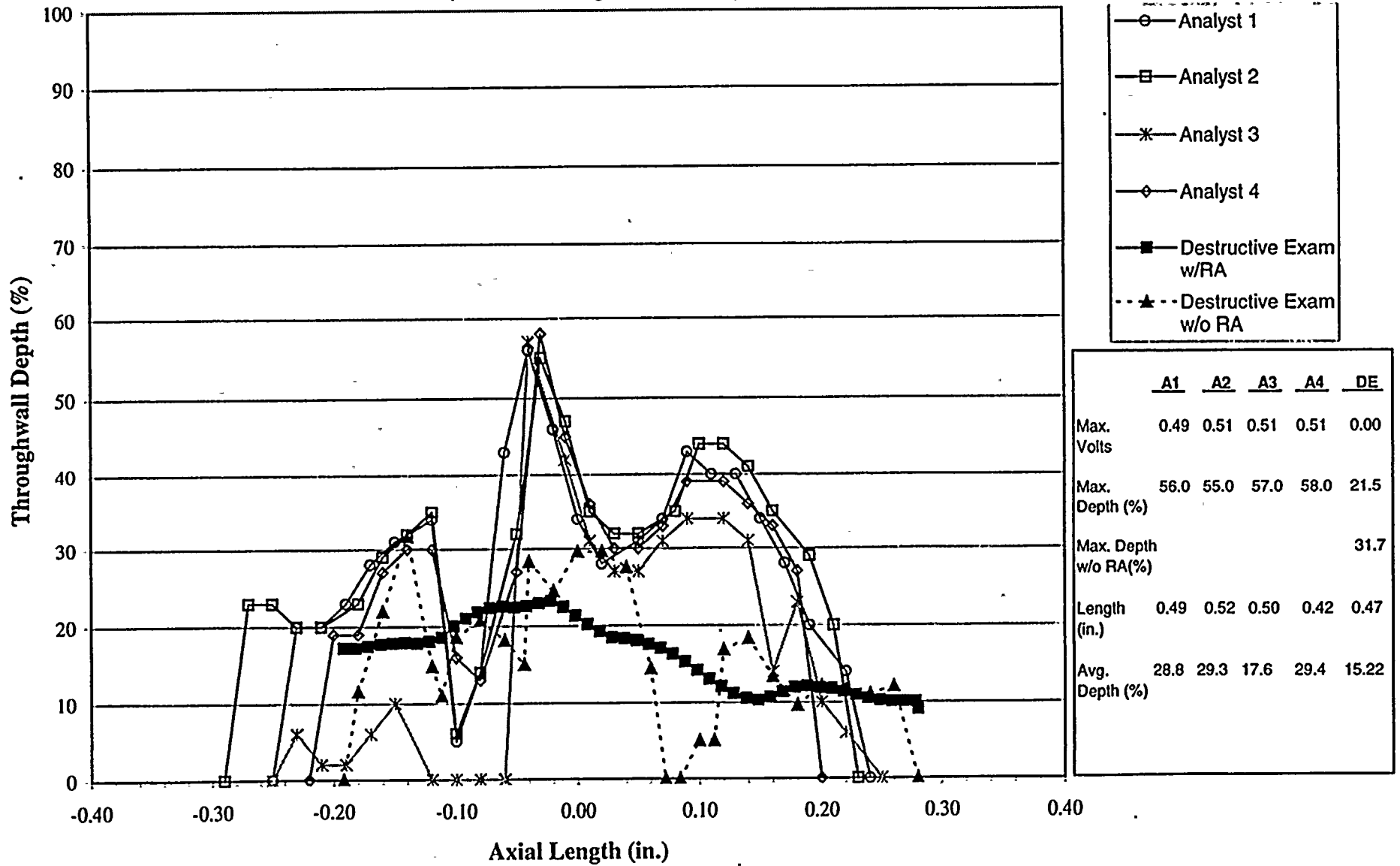


Figure 5-24
Sample 7, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam
(No NDE Adjustment Applied)

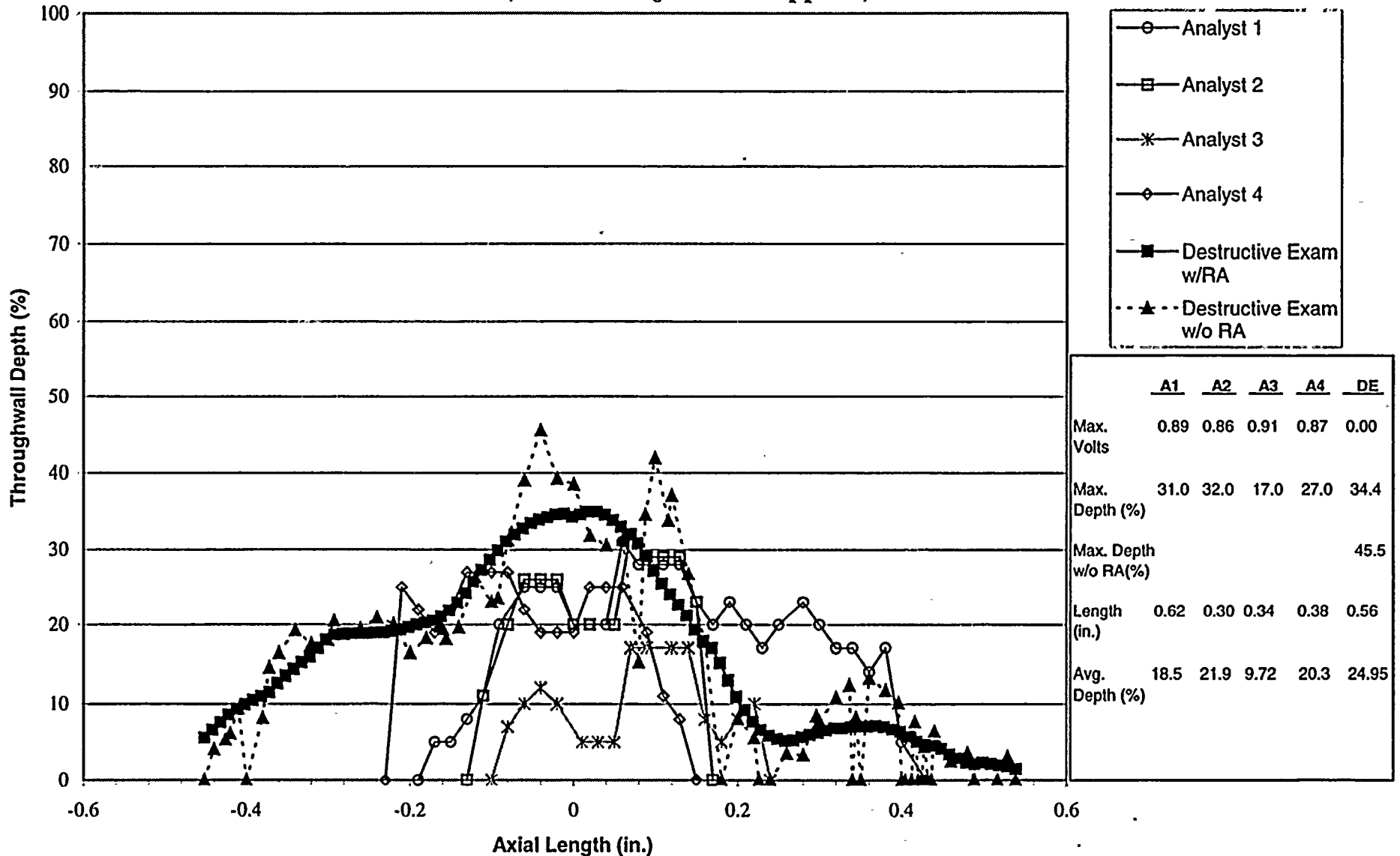
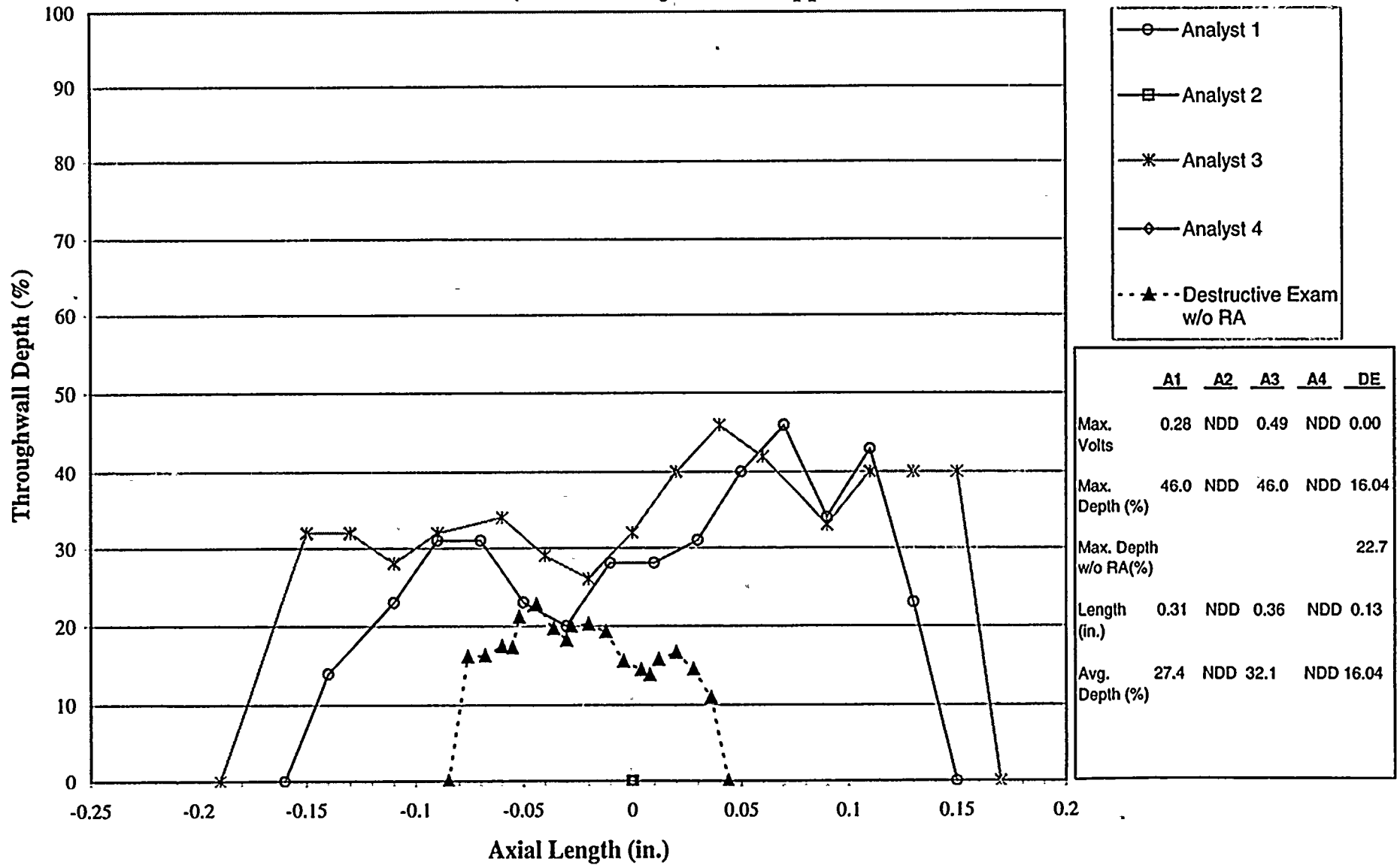


Figure 5-25
Sample 12, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam
(No NDE Adjustment Applied)



6.0 NDE UNCERTAINTY ESTIMATES FROM "BLIND" NDE ANALYSES

6.1 Introduction

This section describes the + Point NDE uncertainties developed from blind analyses for sizing axial PWSCC at dented TSP intersections. The blind analyses were performed by up to four analysts prior to destructive examination of the laboratory specimens. The + Point sizing uncertainties are developed for crack length, average depth, maximum depth based on averaging destructive exam data over the coil field length and local maximum depth based on the point of maximum depth from the destructive exam. Maximum depth uncertainties based on coil field averaging are recommended for tube integrity analyses and for NDE sizing evaluation per the EPRI ISI guidelines, Revision 5, Appendix H, paragraph H.2.2.1g. Section 5 described the length and depth adjustments applied to the + Point data. The reference analyses recommended for tube integrity applications include these adjustments. To show the impact of the depth adjustment on sizing uncertainty, the reference uncertainties are compared to results obtained with no depth adjustments. The database used for + Point sizing includes 3 pulled tube TSP intersections with 4 indications and 40 laboratory specimens with 57 indications.

The results of the blind analyses and the destructive exam results are given in Table 6-1 for each analyst and each specimen. The NDE as-measured and adjusted depths are given in the table. The NDE lengths are given as the adjusted lengths. The differences of destructive exam minus NDE are given in the table for length, local maximum depth, running average (over coil field of 0.16 inch) maximum depth and average depth are also included in the table. The mean, standard deviation and upper 95% confidence level for the NDE uncertainties are given at the bottom of the table. These uncertainties are discussed in the following sections.

6.2 NDE Uncertainty for Crack Length

Figure 6-1 shows the trends of destructive exam versus NDE for the adjusted axial length. The mean error of $-0.04''$ is small as well as the standard deviation of $0.11''$. The regression fit to the data has close to the ideal 45° slope and is only slightly below the theoretical 45° line. Overall, the agreement of NDE and destructive exam lengths is very good.

6.3 NDE Uncertainty for Average Depth

The trend of destructive exam versus NDE for the adjusted average depth is shown in Figure 6-2. The mean error of -3.36% and standard deviation of 7.25% result in an upper 95% confidence on the NDE uncertainty of 8.60% . The regression curve slightly underestimates the ideal 45° slope. Even with the depth adjustment applied, the mean of the average depths is overestimated. The overall agreement between NDE and destructive exam is more than adequate for applications to tube integrity assessments.

The comparison of the unadjusted average depth with destructive exam is shown in Figure 6-3. It is seen that the uncertainties increase to a mean error of -5.61% with a standard deviation of 8.83% . The depth adjustment procedure significantly improves the mean error from -5.61% to -3.36% and moderately improves the standard deviation from 8.83% to 7.25% .

6.4. NDE Uncertainty for Maximum Depth

Figure 6-4 shows the trend of destructive exam versus adjusted maximum depth based on averaging the destructive exam data over the 0.16 inch + Point coil field length. Even with the depth adjustments, the NDE maximum depths overestimate the destructive exam results with a mean error of -4.98% and a standard deviation of 11.95%. The NDE uncertainty at 95% confidence is 14.75%. The slope of the regression line is slightly underestimated compared to the ideal 45° line. The results without the depth adjustment applied are shown in Figure 6-5. Comparing Figures 6-4 and 6-5, it is seen that for destructive exam depths less than about 50%, the NDE results without the depth adjustment are considerably overestimated (shifted to right in Figure 6-5 compared to Figure 6-4). The NDE uncertainties without the depth adjustment are increased to a mean error of -9.02% and a standard deviation of 15.73%. These results demonstrate the importance of the low voltage depth adjustment procedure which has a larger impact on maximum depth than on average depth.

NDE uncertainties for maximum depth based on the coil field average of the destructive exam data are recommended for tube integrity analyses. However, it is of interest to assess the NDE uncertainties associated with the local or point maximum depth from the destructive exam. Figure 6-6 shows the resulting NDE uncertainties based on local maximum depth. In this case, the mean error is positive at 2.86% with a standard deviation of 11.46% and a 95% confidence value of 21.77%. For the mean error, NDE slightly underestimates the local maximum depth while slightly overestimating the coil field averaged maximum depth. Without depth adjustments, the NDE uncertainty for local maximum depth is shown in Figure 6-7. The mean error shifts to a small negative value while the standard deviation increases to 15.02%.

6.5. Conclusions

The blind + Point sizing analyses result in very good agreement with destructive examination results. The resulting + Point NDE uncertainties for mean error based on destructive exam minus NDE are:

	Mean Error	Standard Deviation	+95% Uncertainty
Length	-0.04"	0.11"	0.14"
Average Depth	-3.36%	7.25%	8.60%
Maximum Depth	-4.98%	11.95%	14.75%

These results provide acceptable sizing capability for tube integrity assessments and alternate repair criteria applications. The NDE results include application of procedures for length adjustments and depth adjustments for low (≤ 1.0 volt) and high (≥ 4.5 volts) voltage indications. Destructive examination depths are based upon corrections for uncorroded ligaments and are averaged over the 0.16" + Point coil field length.

Defining NDE uncertainties based on mean and standard deviation provides a basis for comparing NDE uncertainties between different assessments and leads to an uncertainty that is independent of the NDE parameter. While adequate for tube integrity analyses, the use of the regression fit to the data and uncertainties on the regression fit provides the dependence of the NDE uncertainties on the NDE parameters and would be the preferred method for computerized tube integrity analyses such as Monte Carlo Analyses. NDE uncertainties based on regression analyses are given in Reference 8.3.

Table 6-1
Summary of +Point "Blind" NDE Results Comparison with Destructive Exam
Dented Tube Support Plate NDE Evaluations for Axial PWSCC

Sample Number	TSP Location	Crack Number	Analyst	NDE Length Adjusted Only				Adjusted Depth		Destructive Exam				Destructive Exam - Adjusted NDE			
				Length (Inches)	Max Depth (%)	Avg Depth (%)	Max. Volts	Adj. Max. Depth	Adj. Average Depth	Length (Inches)	Max Depth (%)	Running Avg. Max. Depth (%)	Avg. Depth Lg. Corr. (%)	Length (Inches)	Max Depth (%)	RA Max Depth (%)	Avg Depth (%)
10/22	0	1	2	0.310	41.0	27.56	0.63	41.00	27.56	0.122	38.0	23.21	23.21	-0.188	-3.0	-17.8	-4.35
10/22	0	1	3	0.160	49.0	33.44	0.55	29.00	19.79	0.122	38.0	23.21	23.21	-0.038	9.0	-5.8	3.42
21/43	0	1	2	0.910	62.0	48.29	3.09	62.00	48.29	0.991	98.0	90.50	49.29	0.081	36.0	28.5	1.00
21/43	0	1	3	0.970	63.0	50.66	2.82	63.00	50.66	0.991	98.0	90.50	49.29	0.021	35.0	27.5	-1.37
21/43	0	2	2	0.310	44.0	37.23	1.13	44.00	37.23	0.277	50.0	45.48	39.59	-0.033	6.0	1.5	2.36
21/43	0	2	3	0.290	43.0	35.14	1.26	43.00	35.14	0.277	50.0	45.48	39.59	-0.013	7.0	2.5	4.45
21/64	0	1	3	0.380	86.0	58.29	0			0.320	96.0	83.80	60.40				
12/32	0	1	1	0.650	73.0	55.19	3.5	73.00	55.19	0.702	97.0	88.90	57.54	0.052	24.0	15.9	2.35
12/32	0	1	2	0.700	76.0	56.85	3.62	76.00	56.85	0.702	97.0	88.90	57.54	0.002	21.0	12.9	0.69
12/32	0	1	3	0.670	75.0	57.9	3.48	75.00	57.90	0.702	97.0	88.90	57.54	0.032	22.0	13.9	-0.36
P7	0	1	2	0.840	100.0	90.96	6.47	100.00	90.96	0.870	100.0	99.78	94.32	0.030	0.0	-0.2	3.36
P7	0	1	3	0.970	100.0	92.31	6.57	100.00	92.31	0.870	100.0	99.78	94.32	-0.100	0.0	-0.2	2.01
P7	0	1	1P	1.010	100.0	91.85	6.54	100.00	91.85	0.870	100.0	99.78	94.32	-0.140	0.0	-0.2	2.47
P7	0	2	2	0.630	90.0	80.48	4.8	100.00	89.42	0.658	100.0	89.68	82.48	0.028	0.0	-10.3	-6.94
P7	0	2	3	0.740	93.0	83.71	4.89	100.00	90.01	0.658	100.0	89.68	82.48	-0.082	0.0	-10.3	-7.53
P7	0	2	1P	0.930	100.0	82.08	4.84	100.00	82.08	0.658	100.0	89.68	82.48	-0.272	0.0	-10.3	0.40
P7	0	3	2	0.150	58.0	46.37	1.68	58.00	46.37	0.126	65.2	46.23	46.23	-0.024	7.2	-11.8	-0.14
P7	0	3	3	0.250	70.0	45.02	1.65	70.00	45.02	0.126	65.2	46.23	46.23	-0.124	-4.8	-23.8	1.21
P7	0	3	1P	0.270	72.0	50.69	1.61	72.00	50.69	0.126	65.2	46.23	46.23	-0.144	-6.8	-25.8	-4.48
P8	0	1	2	2.400	100.0	84.77	7.68	100.00	84.77	2.644	100.0	99.55	84.77	0.244	0.0	-0.5	0.00
P8	0	1	1P	2.580	100.0	86.15	7.66	100.00	86.15	2.644	100.0	99.55	84.77	0.064	0.0	-0.5	-1.38
P8	0	2	2	2.180	98.0	79.38	6.05	100.00	82.68	2.452	100.0	99.73	79.41	0.262	0.0	-0.3	-3.27
P8	0	2	1P	2.420	97.0	81.01	6.08	100.00	83.51	2.452	100.0	99.73	79.41	0.032	0.0	-0.3	-4.10
P9	0	1	2	1.700	100.0	84.05	9.84	100.00	84.05	1.868	100.0	99.48	75.26	0.168	0.0	-0.5	-8.79
P9	0	1	1P	1.810	100.0	85.32	10.18	100.00	85.32	1.868	100.0	99.48	75.26	0.058	0.0	-0.5	-10.06
P9	0	2	2	1.780	100.0	79.14	5.36	100.00	79.14	1.589	100.0	99.42	86.59	-0.191	0.0	-0.6	7.45
P9	0	2	1P	1.930	100.0	82.72	5.36	100.00	82.72	1.589	100.0	99.42	86.59	-0.341	0.0	-0.6	3.87
P10	0	1	2	2.560	100.0	76.65	6.87	100.00	76.65	2.563	100.0	100.00	88.70	0.003	0.0	0.0	12.05
P10	0	1	3	2.530	100.0	81.04	7.02	100.00	81.04	2.563	100.0	100.00	88.70	0.033	0.0	0.0	7.66
P10	0	1	1P	2.740	100.0	79.69	8.88	100.00	79.69	2.563	100.0	100.00	88.70	-0.177	0.0	0.0	9.01
P10	0	2	2	2.170	78.0	58.84	5.12	100.00	77.42	2.146	100.0	90.91	69.03	-0.024	0.0	-9.1	-8.39
P10	0	2	3	2.300	82.0	61.99	5.2	100.00	75.60	2.146	100.0	90.91	69.03	-0.154	0.0	-9.1	-6.57
P10	0	2	1P	2.260	78.0	61.83	5.13	100.00	79.27	2.146	100.0	90.91	69.03	-0.114	0.0	-9.1	-10.24
P11	0	1	2	0.720	98.0	90.06	7.34	100.00	91.89	0.675	100.0	100.00	95.61	-0.045	0.0	0.0	3.72
P11	0	1	1P	0.840	97.0	88.38	7.47	100.00	91.11	0.675	100.0	100.00	95.61	-0.165	0.0	0.0	4.50
P11	0	2	2	0.500	89.0	93.85	5.22	100.00	94.80	0.568	95.8	90.30	74.58	0.068	-4.2	-9.7	-20.22
P11	0	2	1P	0.560	89.0	93.54	5.1	100.00	94.48	0.568	95.8	90.30	74.58	0.008	-4.2	-9.7	-19.90
P12	0	1	2	1.230	100.0	90.3	7.13	100.00	90.30	1.286	100.0	99.80	77.27	0.056	0.0	-0.2	-13.03
P12	0	1	3	1.400	100.0	90.55	7.22	100.00	90.55	1.286	100.0	99.80	77.27	-0.114	0.0	-0.2	-13.28
P12	0	1	1P	1.330	100.0	90.96	7.07	100.00	90.96	1.286	100.0	99.80	77.27	-0.044	0.0	-0.2	-13.69

Table 6-1 (continued)
Summary of +Point "Blind" NDE Results Comparison with Destructive Exam
Dented Tube Support Plate NDE Evaluations for Axial PWSCC

Sample Number	TSP Location	Crack Number	Analyst	NDE Length Adjusted Only				Adjusted Depth		Destructive Exam				Destructive Exam - Adjusted NDE			
				Length (Inches)	Max Depth (%)	Avg Depth (%)	Max. Volts	Adj. Max. Depth	Adj. Average Depth	Length (Inches)	Max Depth (%)	Running Avg. Max. Depth (%)	Avg. Depth Llg. Corr. (%)	Length (Inches)	Max Depth (%)	RA Max Depth (%)	Avg Depth (%)
P12	0	2 (3+4)	1P	0.570	57.0	35.04	1.21	57.00	35.04	0.548	82.8	64.86	29.90	-0.022	25.8	7.9	-5.14
P12	0	2 (3+4)	2	0.440	50.0	24.39	1.24	50.00	24.39	0.548	82.8	64.86	29.90	0.108	32.8	14.9	5.51
P12	0	2 (3+4)	3	0.530	76.0	36.6	1.27	76.00	36.60	0.548	82.8	64.86	29.90	0.018	6.8	-11.1	-6.70
P12	0	5	2	0.240	80.0	54.73	2.15	80.00	54.73	0.181	90.3	74.68	69.44	-0.059	10.3	-5.3	14.71
P12	0	5	3	0.200	82.0	56.6	2.15	82.00	56.60	0.181	90.3	74.68	69.44	-0.019	8.3	-7.3	12.84
P12	0	5	1P	0.240	84.0	60.75	2.17	84.00	60.75	0.181	90.3	74.68	69.44	-0.059	6.3	-9.3	8.69
1	3H	1	1	0.840	81.0	54.48	2.5	81.00	54.48	0.660	55.7	47.88	39.40	-0.180	-25.3	-33.1	-15.08
1	3H	1	2	0.810	79.0	54.85	2.41	79.00	54.85	0.660	55.7	47.88	39.40	-0.150	-23.3	-31.1	-15.45
1	3H	1	3	0.810	77.0	54.39	2.46	77.00	54.39	0.660	55.7	47.88	39.40	-0.150	-21.3	-29.1	-14.99
1	3H	1	4	0.790	83.0	55.47	2.43	83.00	55.47	0.660	55.7	47.88	39.40	-0.130	-27.3	-35.1	-16.07
1	4H	1	1	0.790	87.0	51.35	2.18	87.00	51.35	0.708	68.4	54.32	36.72	-0.082	-18.6	-32.7	-14.63
1	4H	1	2	0.810	85.0	50.8	2.12	85.00	50.80	0.708	68.4	54.32	36.72	-0.102	-16.6	-30.7	-14.08
1	4H	1	3	0.800	85.0	50.54	2.17	85.00	50.54	0.708	68.4	54.32	36.72	-0.092	-16.6	-30.7	-13.82
1	4H	1	4	0.800	87.0	51.2	2.16	87.00	51.20	0.708	68.4	54.32	36.72	-0.092	-18.6	-32.7	-14.48
2	1H	1	1	1.000	46.0	27.6	0.75	34.00	20.40	0.876	48.0	33.42	21.76	-0.124	14.0	-0.6	1.36
2	1H	1	2	0.870	41.0	29.13	0.73	35.00	24.86	0.876	48.0	33.42	21.76	0.006	13.0	-1.6	-3.10
2	1H	1	3	0.850	38.0	20.79	0.74	31.00	16.96	0.876	48.0	33.42	21.76	0.026	17.0	2.4	4.80
2	1H	1	4	0.870	45.0	29.78	0.73	33.00	21.84	0.876	48.0	33.42	21.76	0.006	15.0	0.4	-0.08
2	3H	1	1	0.490	56.0	28.8	0.49	31.00	15.94	0.472	31.7	21.53	15.22	-0.018	0.7	-9.5	-0.72
2	3H	1	2	0.520	55.0	29.27	0.51	32.00	17.03	0.472	31.7	21.53	15.22	-0.048	-0.3	-10.5	-1.81
2	3H	1	3	0.500	57.0	17.55	0.51	27.00	8.31	0.472	31.7	21.53	15.22	-0.028	4.7	-5.5	6.91
2	3H	1	4	0.420	58.0	29.36	0.51	30.00	15.18	0.472	31.7	21.53	15.22	0.052	1.7	-8.5	0.04
2	4H	1	1	0.700	59.0	38.07	1.28	59.00	38.07	0.580	53.5	47.62	29.03	-0.120	-5.6	-11.4	-9.04
2	4H	1	2	0.720	58.0	37.81	1.24	58.00	37.81	0.580	53.5	47.62	29.03	-0.140	-4.6	-10.4	-8.78
2	4H	1	3	0.690	60.0	36.93	1.27	60.00	36.93	0.580	53.5	47.62	29.03	-0.110	-6.6	-12.4	-7.90
2	4H	1	4	0.590	55.0	39.57	1.27	55.00	39.57	0.580	53.5	47.62	29.03	-0.010	-1.6	-7.4	-10.54
2	5H	1	1	0.910	71.0	34.31	0.73	46.00	22.23	0.860	41.0	35.50	18.34	-0.050	-5.0	-10.5	-3.89
2	5H	1	2	0.940	70.0	33.5	0.71	47.00	22.49	0.860	41.0	35.50	18.34	-0.080	-6.0	-11.5	-4.15
2	5H	1	3	0.820	73.0	25.51	0.74	30.00	10.48	0.860	41.0	35.50	18.34	0.040	11.0	5.5	7.86
2	5H	1	4	0.230	67.0	40.63	0.72	42.00	25.47	0.860	41.0	35.50	18.34	0.630	-1.0	-6.5	-7.13
3	3H	1	1	NDD	NDD	NDD	NDD				0.188	35.0	29.12	23.40			
3	3H	1	2	NDD	NDD	NDD	NDD				0.188	35.0	29.12	23.40			
3	3H	1	3	NDD	NDD	NDD	NDD				0.188	35.0	29.12	23.40			
3	4H	1	1	NDD	NDD	NDD	NDD				0.183	16.0	7.72	6.41			
3	4H	1	2	NDD	NDD	NDD	NDD				0.183	16.0	7.72	6.41			
3	4H	1	3	NDD	NDD	NDD	NDD				0.183	16.0	7.72	6.41			
3	4H	1	4	NDD	NDD	NDD	NDD				0.183	16.0	7.72	6.41			

Table 6-1 (continued)
Summary of +Point "Blind" NDE Results Comparison with Destructive Exam
Dented Tube Support Plate NDE Evaluations for Axial PWSCC

Sample Number	TSP Location	Crack Number	Analyst	NDE Length Adjusted Only				Adjusted Depth		Destructive Exam				Destructive Exam - Adjusted NDE			
				Length (Inches)	Max Depth (%)	Avg Depth (%)	Max. Volts	Adj. Max. Depth	Adj. Average Depth	Length (Inches)	Max Depth (%)	Running Avg. Max. Depth (%)	Avg. Depth Lig. Corr. (%)	Length (Inches)	Max Depth (%)	RA Max Depth (%)	Avg Depth (%)
4	4H	1	1	NDD	NDD	NDD	NDD			0.551	28.0	14.99	9.57				
4	4H	1	3	NDD	NDD	NDD	NDD			0.551	28.0	14.99	9.57				
5	1H	1	1	NDD	NDD	NDD	NDD			0.294	42.0	35.00					
5	1H	1	2	0.390	50.0	36.33	0.55	35.00	25.43	0.294	42.0	35.00		-0.096	7.0	0.0	
5	1H	1	3	0.400	27.0	18.83	0.58	15.00	10.46	0.294	42.0	35.00		-0.106	27.0	20.0	
5	1H	1	4	NDD	NDD	NDD	NDD			0.294	42.0	35.00					
6	1H	1	1	0.740	74.0	62.83	2.35	74.00	62.83	0.772	88.8	83.72	60.54	0.032	14.8	9.7	-2.29
6	1H	1	2	0.740	73.0	60.4	2.29	73.00	60.40	0.772	88.8	83.72	60.54	0.032	15.8	10.7	0.14
6	1H	1	3	0.760	70.0	59.63	2.58	70.00	59.63	0.772	88.8	83.72	60.54	0.012	18.8	13.7	0.91
6	1H	1	4	0.760	74.0	62.75	2.33	74.00	62.75	0.772	88.8	83.72	60.54	0.012	14.8	9.7	-2.21
6	2H	1	1	0.710	74.0	61.56	2.51	74.00	61.56	0.692	80.2	73.72	59.09	-0.018	6.2	-0.3	-2.47
6	2H	1	2	0.720	73.0	60.82	2.45	73.00	60.82	0.692	80.2	73.72	59.09	-0.028	7.2	0.7	-1.73
6	2H	1	3	0.740	70.0	57.82	2.52	70.00	57.82	0.692	80.2	73.72	59.09	-0.048	10.2	3.7	1.27
6	2H	1	4	0.750	77.0	60.89	2.48	77.00	60.89	0.692	80.2	73.72	59.09	-0.058	3.2	-3.3	-1.80
6	3H	1	1	0.720	68.0	57.86	1.99	68.00	57.86	0.588	74.1	67.26	56.14	-0.132	6.1	-0.7	-1.72
6	3H	1	2	0.710	67.0	57.87	1.94	67.00	57.87	0.588	74.1	67.26	56.14	-0.122	7.1	0.3	-1.73
6	3H	1	3	0.780	70.0	56.56	1.96	70.00	56.56	0.588	74.1	67.26	56.14	-0.192	4.1	-2.7	-0.42
6	3H	1	4	0.680	67.0	58.19	1.97	67.00	58.19	0.588	74.1	67.26	56.14	-0.092	7.1	0.3	-2.05
6	4H	1	1	0.540	74.0	51.09	1.49	74.00	51.09	0.416	75.0	64.29	49.41	-0.124	1.0	-9.7	-1.68
6	4H	1	2	0.520	73.0	52.53	1.45	73.00	52.53	0.416	75.0	64.29	49.41	-0.104	2.0	-8.7	-3.12
6	4H	1	3	0.540	65.0	51.05	1.51	65.00	51.05	0.416	75.0	64.29	49.41	-0.124	10.0	-0.7	-1.64
6	4H	1	4	0.530	74.0	52.39	1.48	74.00	52.39	0.416	75.0	64.29	49.41	-0.114	1.0	-9.7	-2.98
6	5H	1	1	0.630	71.0	51.84	1.3	71.00	51.84	0.604	85.1	77.89	54.09	-0.026	14.1	6.9	2.25
6	5H	1	2	0.540	70.0	54.15	1.26	70.00	54.15	0.604	85.1	77.89	54.09	0.064	15.1	7.9	-0.06
6	5H	1	3	0.620	67.0	52.46	1.35	67.00	52.46	0.604	85.1	77.89	54.09	-0.016	18.1	10.9	1.63
6	5H	1	4	0.600	67.0	53.43	1.28	67.00	53.43	0.604	85.1	77.89	54.09	0.004	18.1	10.9	0.66
7	1H	1	1	0.470	28.0	16.89	1.24	28.00	16.89	0.598	39.5	30.14	20.12	0.128	11.5	2.1	3.23
7	1H	1	2	0.300	29.0	20.02	1.2	29.00	20.02	0.598	39.5	30.14	20.12	0.298	10.5	1.1	0.10
7	1H	1	3	0.320	45.0	28.77	0.75	45.00	28.66	0.598	39.5	30.14	20.12	0.278	-5.5	-14.9	-8.54
7	1H	1	4	0.680	33.0	15.25	1.21	33.00	15.25	0.598	39.5	30.14	20.12	-0.082	6.5	-2.9	4.87
7	3H	1	1	0.620	31.0	18.46	0.89	20.00	11.91	0.560	45.5	34.43	24.95	-0.060	25.5	14.4	13.04
7	3H	1	2	0.300	32.0	21.92	0.86	32.00	21.92	0.560	45.5	34.43	24.95	0.260	13.5	2.4	3.03
7	3H	1	3	0.340	17.0	9.72	0.91	17.00	9.72	0.560	45.5	34.43	24.95	0.220	28.5	17.4	15.23
7	3H	1	4	0.380	27.0	20.29	0.87	22.00	16.53	0.560	45.5	34.43	24.95	0.180	23.5	12.4	8.42
8	1H	1	1	0.460	71.0	43.67	1.25	71.00	43.67	0.420	58.0	52.24	40.73	-0.040	-13.0	-18.8	-2.94
8	1H	1	2	0.490	70.0	42.03	1.22	70.00	42.03	0.420	58.0	52.24	40.73	-0.070	-12.0	-17.8	-1.30
8	1H	1	3	0.480	73.0	40.25	1.29	73.00	40.25	0.420	58.0	52.24	40.73	-0.060	-15.0	-20.8	0.48
8	1H	1	4	0.440	70.0	42.58	1.24	70.00	42.58	0.420	58.0	52.24	40.73	-0.020	-12.0	-17.8	-1.85

Table 6-1 (continued)
 Summary of +Point "Blind" NDE Results Comparison with Destructive Exam
 Dented Tube Support Plate NDE Evaluations for Axial PWSCC

Sample Number	TSP Location	Crack Number	Analyst	NDE Length Adjusted Only				Adjusted Depth		Destructive Exam				Destructive Exam - Adjusted NDE			
				Length (Inches)	Max Depth (%)	Avg Depth (%)	Max. Volts	Adj. Max. Depth	Adj. Average Depth	Length (Inches)	Max Depth (%)	Running Avg. Max. Depth (%)	Avg. Depth Llg. Corr. (%)	Length (Inches)	Max Depth (%)	RA Max Depth (%)	Avg Depth (%)
8	2H	1	1	0.470	56.0	45.33	1.36	56.00	45.33	0.380	54.7	45.77	37.13	-0.090	-1.3	-10.2	-8.20
8	2H	1	2	0.410	55.0	44.17	1.32	55.00	44.17	0.380	54.7	45.77	37.13	-0.090	-0.3	-9.2	-7.04
8	2H	1	3	0.490	57.0	41.76	1.34	57.00	41.76	0.380	54.7	45.77	37.13	-0.110	-2.3	-11.2	-4.63
8	2H	1	4	0.500	58.0	44.12	1.33	58.00	44.12	0.380	54.7	45.77	37.13	-0.120	-3.3	-12.2	-6.99
8	3H	1	1	0.510	65.0	46.18	1.38	65.00	46.18	0.460	50.0	44.21	31.81	-0.050	-15.0	-20.8	-14.37
8	3H	1	2	0.470	64.0	47.83	1.34	64.00	47.83	0.460	50.0	44.21	31.81	-0.010	-14.0	-19.8	-16.02
8	3H	1	3	0.520	58.0	40.62	1.38	58.00	40.62	0.460	50.0	44.21	31.81	-0.060	-8.0	-13.8	-8.81
8	3H	1	4	0.520	61.0	44.93	1.36	61.00	44.93	0.460	50.0	44.21	31.81	-0.060	-11.0	-16.8	-13.12
9	1H	1	1	0.470	52.0	42.7	1.04	52.00	42.70	0.424	49.1	38.82	30.88	-0.046	-2.9	-13.2	-11.82
9	1H	1	2	0.460	55.0	45.26	1.01	55.00	45.26	0.424	49.1	38.82	30.88	-0.036	-5.9	-16.2	-14.38
9	1H	1	3	0.480	55.0	40.29	1.02	55.00	40.29	0.424	49.1	38.82	30.88	-0.056	-5.9	-16.2	-9.41
9	1H	1	4	0.510	58.0	39.11	1.02	58.00	39.11	0.424	49.1	38.82	30.88	-0.086	-8.9	-19.2	-8.23
9	1H	2	1	0.410	59.0	35.05	0.42	49.00	29.11	Not Determined	34.5	25.40			-14.5	-23.6	
9	1H	2	2	0.150	49.0	32.7	0.43	44.00	29.36	Not Determined	34.5	25.40			-9.5	-18.6	
9	1H	2	3	0.420	80.0	42.24	0.42	53.00	27.98	Not Determined	34.5	25.40			-18.5	-27.6	
9	1H	2	4	0.340	51.0	32.9	0.42	42.00	27.09	Not Determined	34.5	25.40			-7.5	-16.6	
9	2H	1	1	0.980	81.0	70.83	4.16	81.00	70.83	1.010	97.1	95.09	67.37	0.030	16.1	14.1	-3.46
9	2H	1	2	1.000	79.0	69.18	4.05	79.00	69.18	1.010	97.1	95.09	67.37	0.010	18.1	16.1	-1.81
9	2H	1	3	1.010	83.0	71.24	4.1	83.00	71.24	1.010	97.1	95.09	67.37	0.000	14.1	12.1	-3.87
9	2H	1	4	0.980	80.0	69.7	4.09	80.00	69.70	1.010	97.1	95.09	67.37	0.030	17.1	15.1	-2.33
9	2H	2	1	0.830	68.0	51.87	0.74	49.00	37.38	0.786	61.5	46.26	35.62	-0.044	12.5	-2.7	-1.76
9	2H	2	2	0.820	67.0	51.14	0.72	49.00	37.40	0.786	61.5	46.26	35.62	-0.034	12.5	-2.7	-1.78
9	2H	2	3	0.800	63.0	48.93	0.69	57.00	44.27	0.786	61.5	46.26	35.62	-0.014	4.5	-10.7	-8.65
9	2H	2	4	0.850	64.0	50.97	0.7	55.00	43.80	0.786	61.5	46.26	35.62	-0.064	6.5	-8.7	-8.18
9	3H	1	1	0.870	81.0	68.87	2.69	81.00	68.87	0.850	89.0	84.64	60.89	-0.020	8.0	3.6	-7.98
9	3H	1	2	0.930	79.0	66.66	2.62	79.00	66.66	0.850	89.0	84.64	60.89	-0.080	10.0	5.6	-5.77
9	3H	1	3	0.890	83.0	68.02	2.71	83.00	68.02	0.850	89.0	84.64	60.89	-0.040	6.0	1.6	-7.13
9	3H	1	4	0.840	80.0	69.19	2.63	80.00	69.19	0.850	89.0	84.64	60.89	0.010	9.0	4.6	-8.30
9	3H	2	1	0.910	74.0	57.23	1.00	74.00	57.23	0.717	66.2	54.10	40.75	-0.193	-7.8	-19.9	-16.48
9	3H	2	2	0.910	73.0	55.47	0.97	61.00	46.35	0.717	66.2	54.10	40.75	-0.193	5.2	-6.9	-5.60
9	3H	2	3	0.910	73.0	56.26	0.99	60.00	46.24	0.717	66.2	54.10	40.75	-0.193	6.2	-5.9	-5.49
9	3H	2	4	0.820	74.0	59.36	0.97	64.00	51.34	0.717	66.2	54.10	40.75	-0.103	2.2	-9.9	-10.59
9	4H	1	1	0.800	77.0	66.91	1.82	77.00	66.91	0.840	82.1	70.18	56.38	0.040	5.1	-6.8	-10.53
9	4H	1	2	0.840	76.0	65.32	1.77	76.00	65.32	0.840	82.1	70.18	56.38	0.000	6.1	-5.8	-8.94
9	4H	1	3	0.840	77.0	65.79	1.82	77.00	65.79	0.840	82.1	70.18	56.38	0.000	5.1	-6.8	-9.41
9	4H	1	4	0.800	77.0	67.03	1.78	77.00	67.03	0.840	82.1	70.18	56.38	0.040	5.1	-6.8	-10.65

Table 6-1 (continued)
 Summary of +Point "Blind" NDE Results Comparison with Destructive Exam
 Dented Tube Support Plate NDE Evaluations for Axial PWSCC

Sample Number	TSP Location	Crack Number	Analyst	NDE Length Adjusted Only				Adjusted Depth		Destructive Exam				Destructive Exam - Adjusted NDE			
				Length (Inches)	Max Depth (%)	Avg Depth (%)	Max. Volts	Adj. Max. Depth	Adj. Average Depth	Length (Inches)	Max Depth (%)	Running Avg. Max. Depth (%)	Avg. Depth Lig. Corr. (%)	Length (Inches)	Max Depth (%)	RA Max Depth (%)	Avg Depth (%)
9	5H	1	1	0.810	81.0	58.98	2.27	81.00	58.98	0.632	86.5	74.63	57.46	-0.178	5.5	-6.4	-1.52
9	5H	1	2	0.790	79.0	58.81	2.21	79.00	58.81	0.632	86.5	74.63	57.46	-0.158	7.5	-4.4	-1.35
9	5H	1	3	0.790	77.0	59.28	2.3	77.00	59.28	0.632	86.5	74.63	57.46	-0.158	9.5	-2.4	-1.82
9	5H	1	4	0.830	77.0	58.37	2.23	77.00	58.37	0.632	86.5	74.63	57.46	-0.198	9.5	-2.4	-0.91
9	5H	2	1	0.090	43.0	31.78	0.5	40.00	29.56	0.120	38.0	26.69	26.75	0.030	-2.0	-13.3	-2.81
9	5H	2	2	0.090	44.0	30.44	0.49	41.00	28.37	0.120	38.0	26.69	26.75	0.030	-3.0	-14.3	-1.62
9	5H	2	3	0.130	54.0	34.53	0.55	33.50	21.42	0.120	38.0	26.69	26.75	-0.010	4.5	-6.8	5.33
9	5H	2	4	0.100	48.0	34.2	0.46	39.00	27.79	0.120	38.0	26.69	26.75	0.020	-1.0	-12.3	-1.04
10	3H	1	1	0.740	93.0	78.3	1.8	93.00	78.30	0.760	99.4	96.18	73.22	0.020	6.4	3.2	-5.08
10	3H	1	2	0.800	85.0	69.37	1.61	85.00	69.37	0.760	99.4	96.18	73.22	-0.040	14.4	11.2	3.85
10	3H	1	3	0.780	89.0	70.17	1.66	89.00	70.17	0.760	99.4	96.18	73.22	-0.020	10.4	7.2	3.05
10	3H	1	4	0.760	87.0	70.25	1.62	87.00	70.25	0.760	99.4	96.18	73.22	0.000	12.4	9.2	2.97
10	3H	2	1	0.530	80.0	56.38	0.38	53.00	56.38	0.490	47.6	37.97	31.71	-0.040	-5.4	-15.0	-24.67
10	3H	2	2	0.560	73.0	56.83	0.41	58.00	45.15	0.490	47.6	37.97	31.71	-0.070	-10.4	-20.0	-13.44
10	3H	2	3	0.610	70.0	55.47	0.45	46.00	36.45	0.490	47.6	37.97	31.71	-0.120	1.6	-8.0	-4.74
10	3H	2	4	0.550	70.0	55.92	0.41	42.00	33.55	0.490	47.6	37.97	31.71	-0.060	5.6	-4.0	-1.84
10	4H	1	1	0.720	88.0	72.5	1.54	88.00	72.50	0.698	89.4	81.81	63.63	-0.022	1.4	-6.2	-8.87
10	4H	1	2	0.760	82.0	65.02	1.44	82.00	65.02	0.698	89.4	81.81	63.63	-0.062	7.4	-0.2	-1.39
10	4H	1	3	0.730	80.0	66.88	1.45	80.00	66.88	0.698	89.4	81.81	63.63	-0.032	9.4	1.8	-3.25
10	4H	1	4	NDD	NDD	NDD	NDD			0.698	89.4	81.81	63.63				
11	2H	1	1	0.870	84.0	71.68	3.25	84.00	71.68	0.837	99.2	96.83	81.40	-0.033	15.2	12.8	9.72
11	2H	1	2	0.870	82.0	70.2	3.16	82.00	70.20	0.837	99.2	96.83	81.40	-0.033	17.2	14.8	11.20
11	2H	1	3	0.850	86.0	72.71	3.21	86.00	72.71	0.837	99.2	96.83	81.40	-0.013	13.2	10.8	8.69
11	2H	1	4	0.920	83.0	70.53	3.18	83.00	70.53	0.837	99.2	96.83	81.40	-0.083	16.2	13.8	10.87
11	2H	2	1	0.170	49.0	34.85	0.25	43.00	30.59	0.160	43.0	32.75	32.75	-0.010	0.0	-10.3	2.16
11	2H	2	2	NDD	NDD	NDD	NDD			0.160	43.0	32.75	32.75				
11	2H	2	3	0.200	46.0	33.38	0.25	46.00	33.38	0.160	43.0	32.75	32.75	-0.040	-3.0	-13.3	-0.63
11	2H	2	4	NDD	NDD	NDD	NDD			0.160	43.0	32.75	32.75				
11	3H	1	1	1.120	90.0	76.25	3.5	90.00	76.25	1.072	99.5	91.30	68.41	-0.048	9.5	1.3	-7.84
11	3H	1	2	1.070	88.0	74.37	3.34	88.00	74.37	1.072	99.5	91.30	68.41	0.002	11.5	3.3	-5.96
11	3H	1	3	1.190	92.0	74.61	3.45	92.00	74.61	1.072	99.5	91.30	68.41	-0.118	7.5	-0.7	-6.20
11	3H	1	4	NDD	NDD	NDD	NDD			1.072	99.5	91.30	68.41				
11	3H	2	1	0.610	65.0	50.59	0.63	49.00	38.14	0.563	55.4	46.74	38.23	-0.047	6.4	-2.3	0.09
11	3H	2	2	0.600	61.0	49.7	0.61	49.00	39.92	0.563	55.4	46.74	38.23	-0.037	6.4	-2.3	-1.69
11	3H	2	3	0.490	60.0	45.25	0.62	49.00	36.95	0.563	55.4	46.74	38.23	0.073	6.4	-2.3	1.28
11	4H	1	1	1.000	90.0	72.62	3.34	90.00	72.62	1.009	98.1	95.25	68.67	0.009	8.1	5.3	-3.95
11	4H	1	2	1.030	91.0	71.47	3.26	91.00	71.47	1.009	98.1	95.25	68.67	-0.021	7.1	4.3	-2.80
11	4H	1	3	1.010	92.0	71.92	3.33	92.00	71.92	1.009	98.1	95.25	68.67	-0.001	6.1	3.3	-3.25
11	4H	1	4	0.990	94.0	73.03	3.29	94.00	73.03	1.009	98.1	95.25	68.67	0.019	4.1	1.3	-4.36

Table 6-1 (continued)
Summary of +Point "Blind" NDE Results Comparison with Destructive Exam
Dented Tube Support Plate NDE Evaluations for Axial PWSCC

Sample Number	TSP Location	Crack Number	Analyst	NDE Length Adjusted Only				Adjusted Depth		Destructive Exam				Destructive Exam - Adjusted NDE						
				Length (Inches)	Max Depth (%)	Avg Depth (%)	Max. Volts	Adj. Max. Depth	Adj. Average Depth	Length (Inches)	Max Depth (%)	Running Avg. Max. Depth (%)	Avg. Depth Lig. Corr. (%)	Length (Inches)	Max Depth (%)	RA Max Depth (%)	Avg Depth (%)			
11	4H	2	1	0.950	81.0	60.92	0.7	65.00	48.88	0.790	46.3	44.03	36.59	-0.160	-18.7	-21.0	-12.29			
11	4H	2	2	0.970	79.0	60.16	0.66	64.00	48.74	0.790	46.3	44.03	36.59	-0.180	-17.7	-20.0	-12.15			
11	4H	2	3	0.960	83.0	60.42	0.7	60.00	43.67	0.790	46.3	44.03	36.59	-0.170	-13.7	-16.0	-7.08			
11	4H	2	4	0.930	80.0	60.97	0.68	64.00	48.77	0.790	46.3	44.03	36.59	-0.140	-17.7	-20.0	-12.18			
12	2H	1	1	0.290	46.0	35.38	0.41	28.00	21.54	0.242	34.0	23.40	20.75	-0.048	6.0	-4.6	-0.79			
12	2H	1	2	0.340	52.0	36.91	0.4	41.00	29.10	0.242	34.0	23.40	20.75	-0.098	-7.0	-17.6	-8.35			
12	2H	1	3	0.320	31.0	20.97	0.48	18.00	12.18	0.242	34.0	23.40	20.75	-0.078	16.0	5.4	8.57			
12	2H	1	4	NDD	NDD	NDD	NDD			0.242	34.0	23.40	20.75							
12	3H	1	1	0.310	46.0	27.37	0.28	31.00	18.45	0.129	22.7	16.04	16.04	-0.181	-8.3	-15.0	-2.41			
12	3H	1	2	NDD	NDD	NDD	NDD			0.129	22.7	16.04	16.04							
12	3H	1	3	0.360	46.0	32.07	0.49	42.00	29.28	0.129	22.7	16.04	16.04	-0.231	-19.3	-26.0	-13.24			
12	3H	1	4	NDD	NDD	NDD	NDD			0.129	22.7	16.04	16.04							
12	4H	1	1	0.410	59.0	45.2	0.47	49.00	37.53	0.360	33.1	26.29	20.24	-0.050	-15.9	-22.7	-17.29			
12	4H	1	2	0.390	58.0	42.9	0.46	49.00	36.24	0.360	33.1	26.29	20.24	-0.030	-15.9	-22.7	-16.00			
12	4H	1	3	0.340	57.0	34.93	0.5	33.00	20.22	0.360	33.1	26.29	20.24	0.020	0.1	-6.7	0.02			
12	4H	1	4	0.430	55.0	40.93	0.47	48.00	35.72	0.360	33.1	26.29	20.24	-0.070	-14.9	-21.7	-15.48			
13	3H	1	1	0.370	52.0	38.81	0.71	40.00	29.85	0.336	45.6	37.31	27.25	-0.034	5.6	-2.7	-2.60			
13	3H	1	2	0.400	52.0	36.95	0.69	41.00	29.13	0.336	45.6	37.31	27.25	-0.064	4.6	-3.7	-1.88			
13	3H	1	3	0.420	53.0	34.52	0.78	38.00	24.75	0.336	45.6	37.31	27.25	-0.084	7.6	-0.7	2.50			
13	3H	1	4	0.400	55.0	37.89	0.7	42.00	28.93	0.336	45.6	37.31	27.25	-0.064	3.6	-4.7	-1.68			
													Mean				-0.04	2.86	-4.98	-3.36
													Standard Deviation				0.11	11.46	11.95	7.25
													95% Uncertainty				0.14	21.77	14.75	8.60

*Not Included in Mean & Standard. Deviation

Figure 6-1
Dented TSP Axial PWSCC
Axial Length - +Point Coil
Destructive Exam vs. NDE Trends

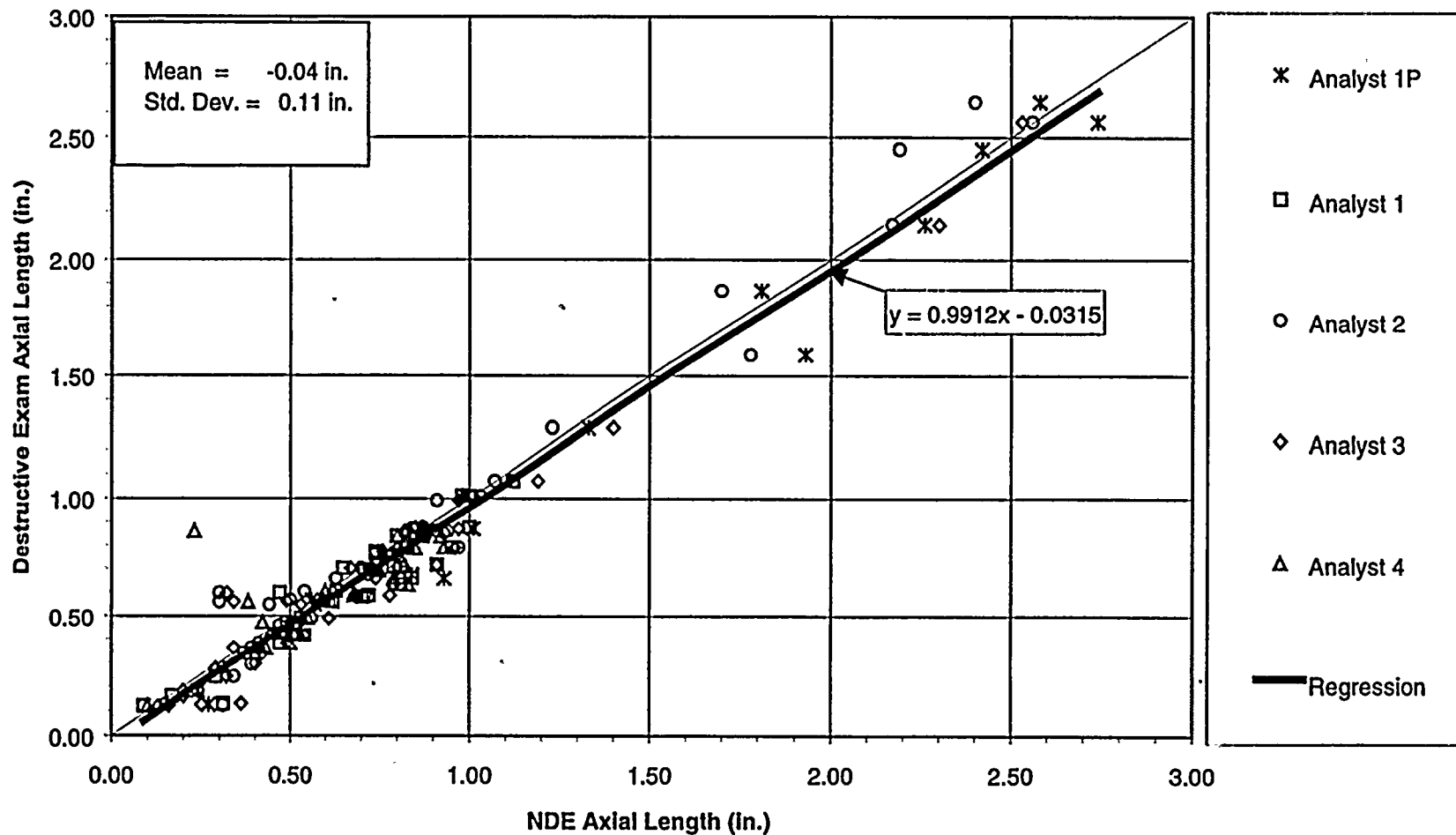


Figure 6-2
Dented TSP Axial PWSCC
Average Depth - +Point Coil
Destructive Exam vs. NDE Trends

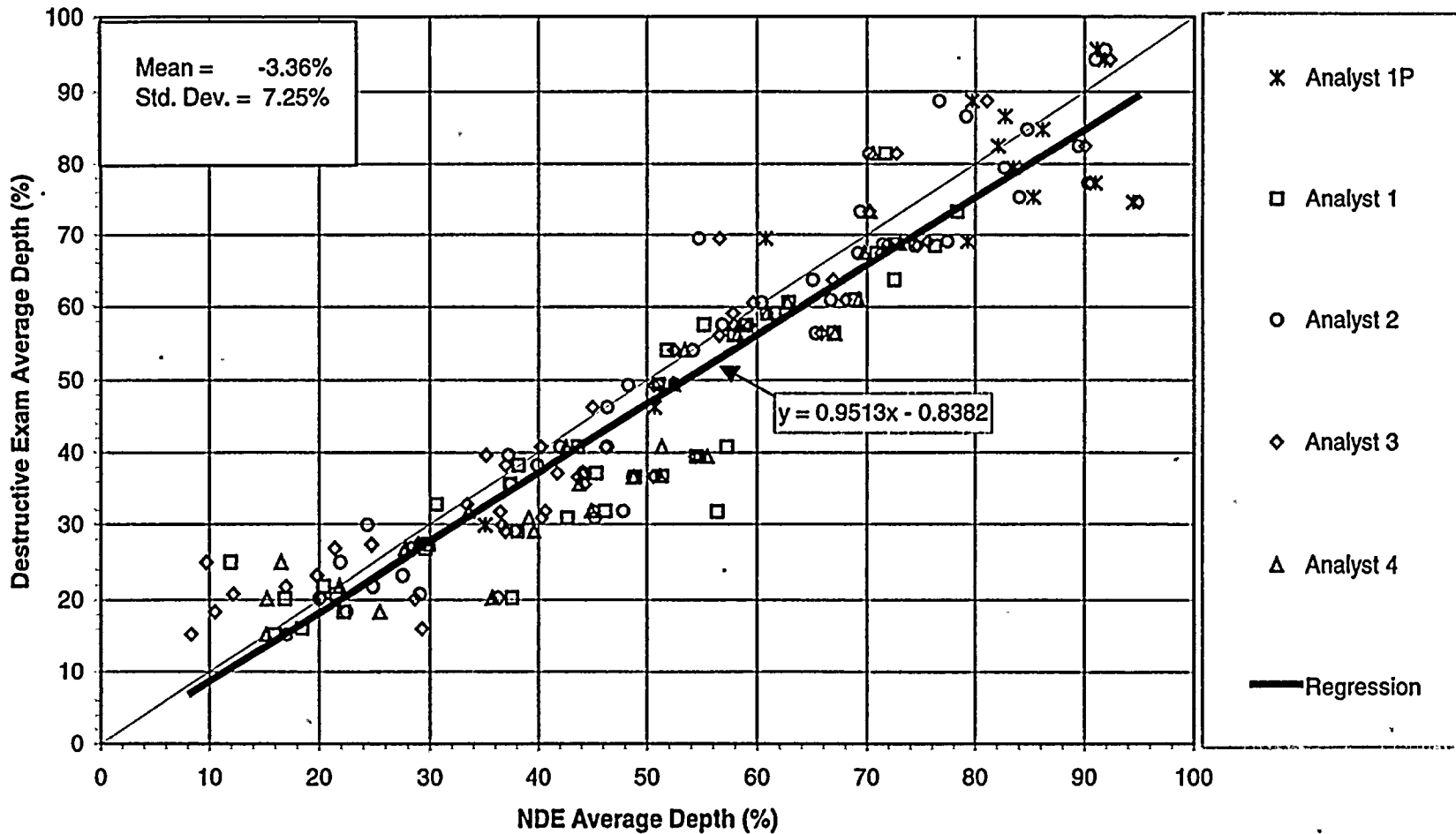


Figure 6-3
Dented TSP Axial PWSCC
Average Depth - +Point Coil
Without Depth Adjustment
Destructive Exam vs. NDE Trends

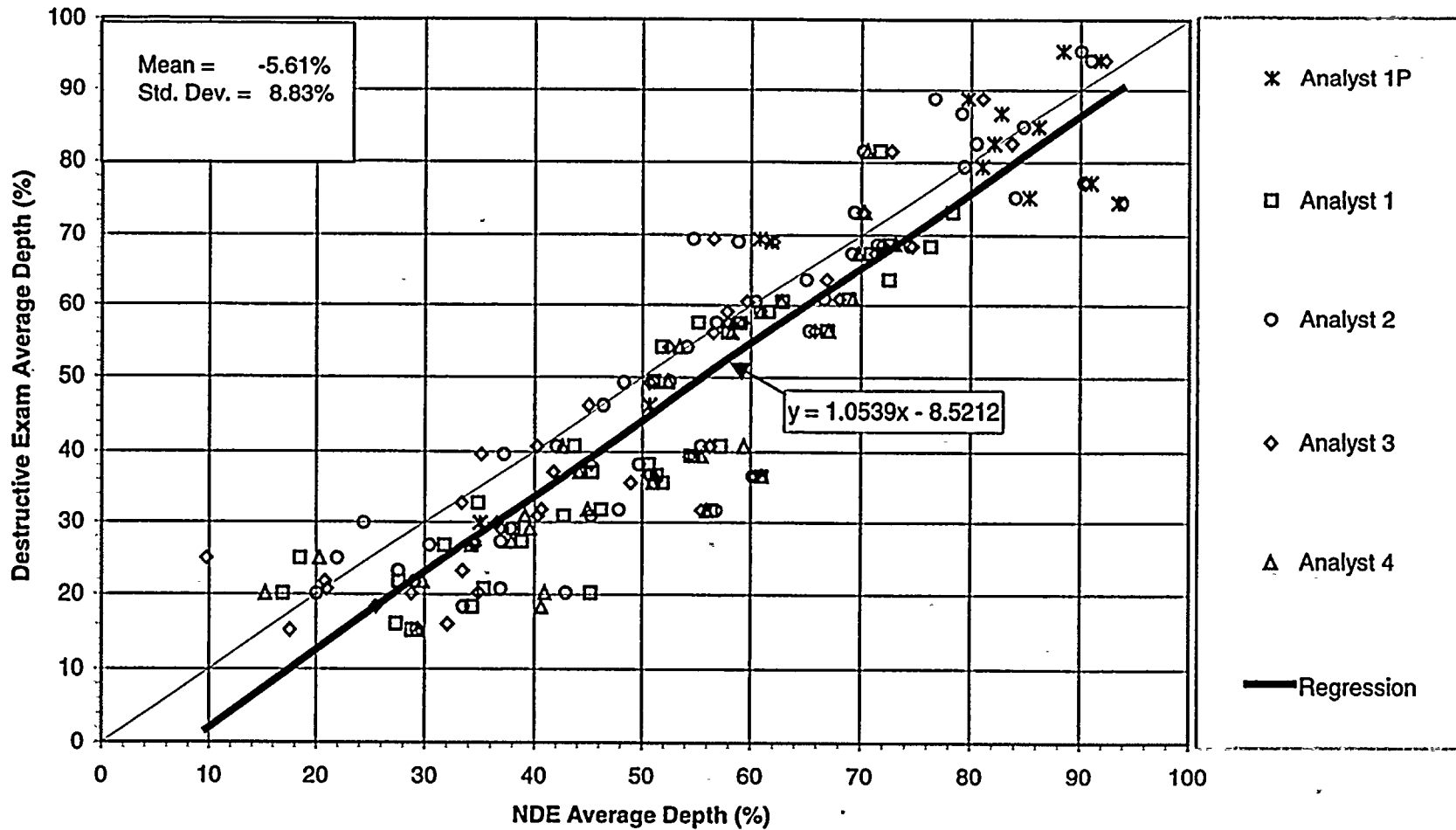


Figure 6-4
Dented TSP Axial PWSCC
Coil Field (0.16") Average Maximum Depth - +Point Coil
Destructive Exam vs. NDE Trends

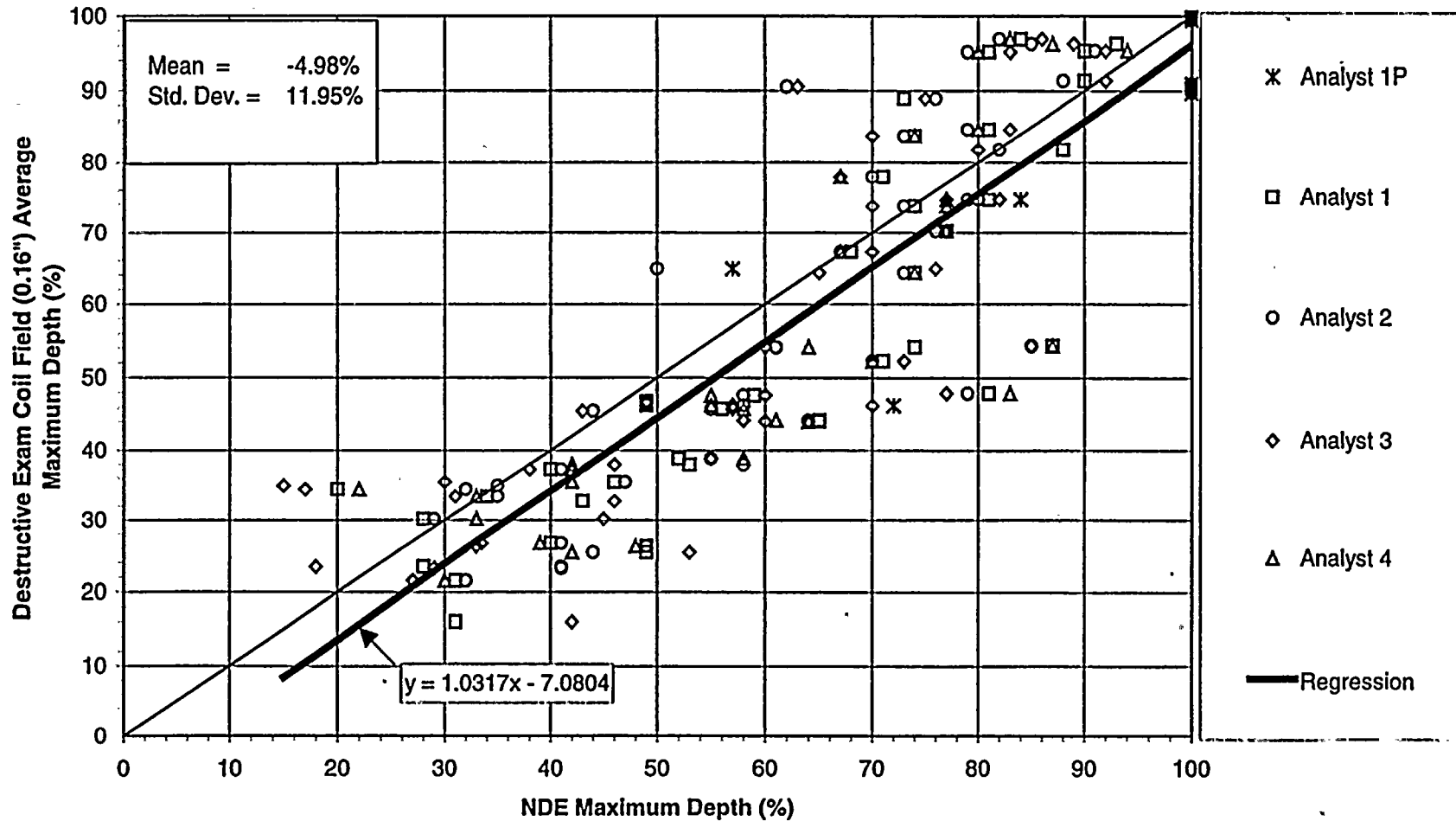


Figure 6-5
Dented TSP Axial PWSCC
Coil Field (0.16") Average Maximum Depth - +Point Coil
Without Depth Adjustment
Destructive Exam vs. NDE Trends

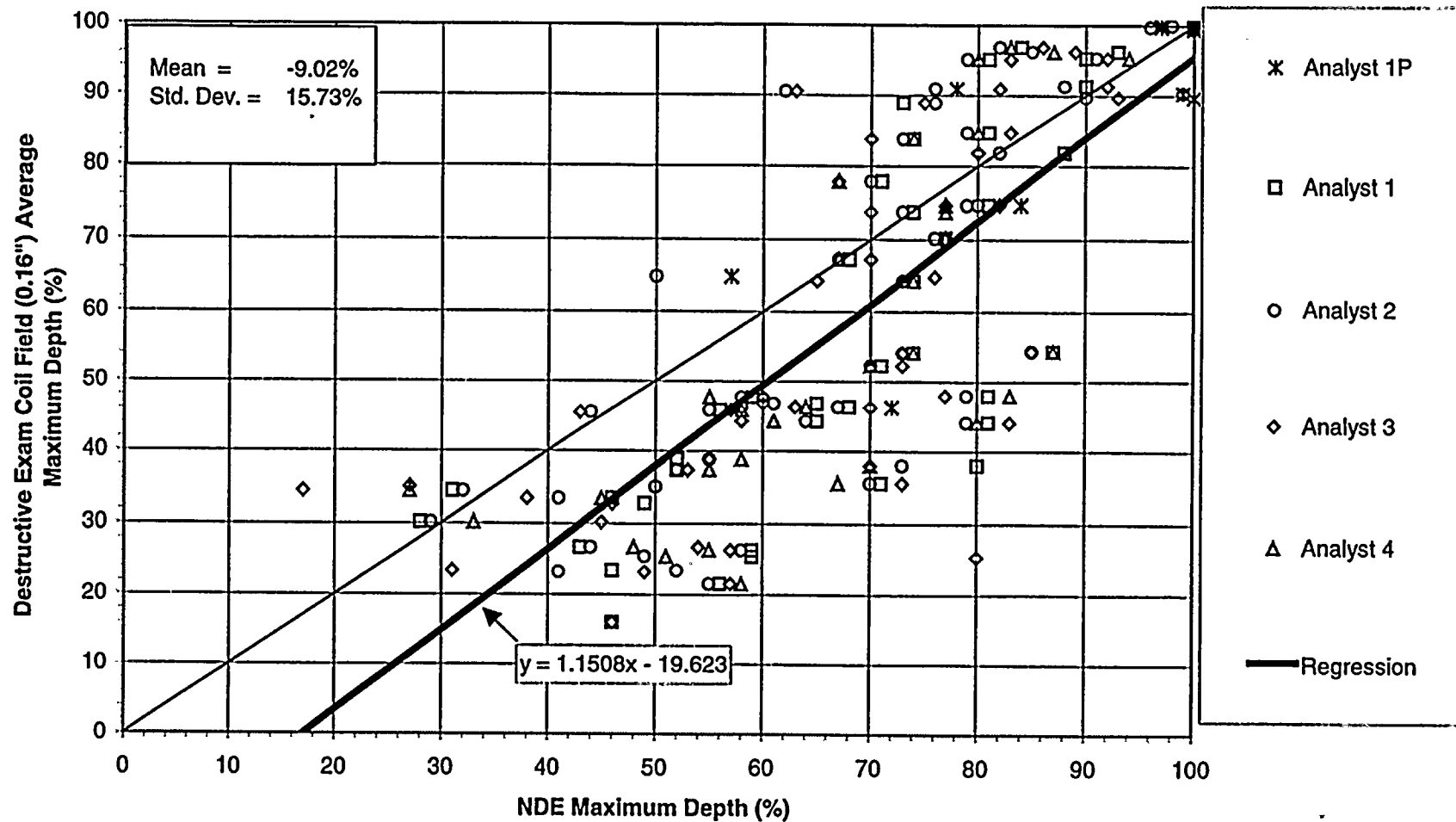


Figure 6-6
Dented TSP Axial PWSCC
Local Maximum Depth - +Point Coil
Destructive Exam vs. NDE Trends

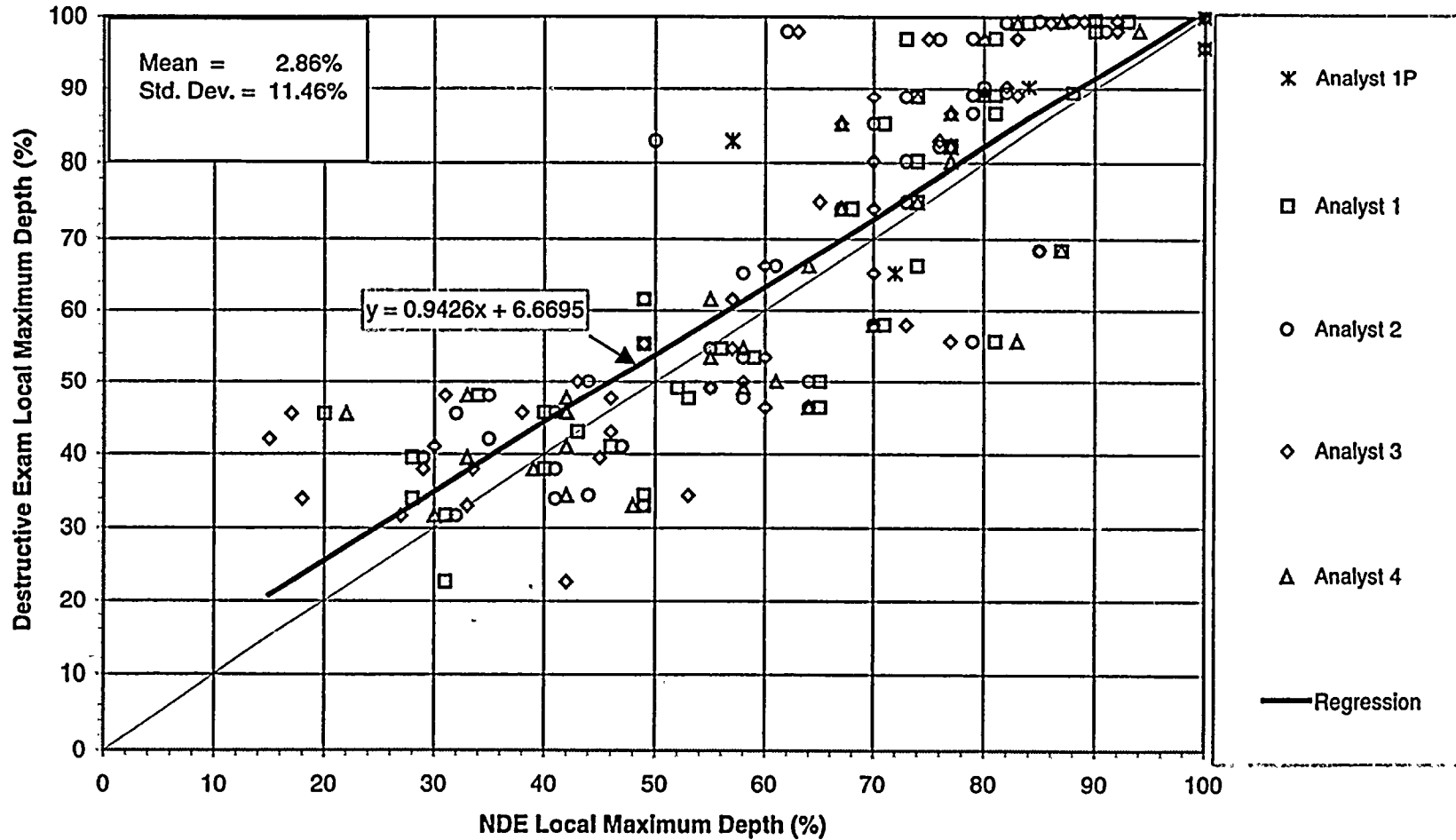
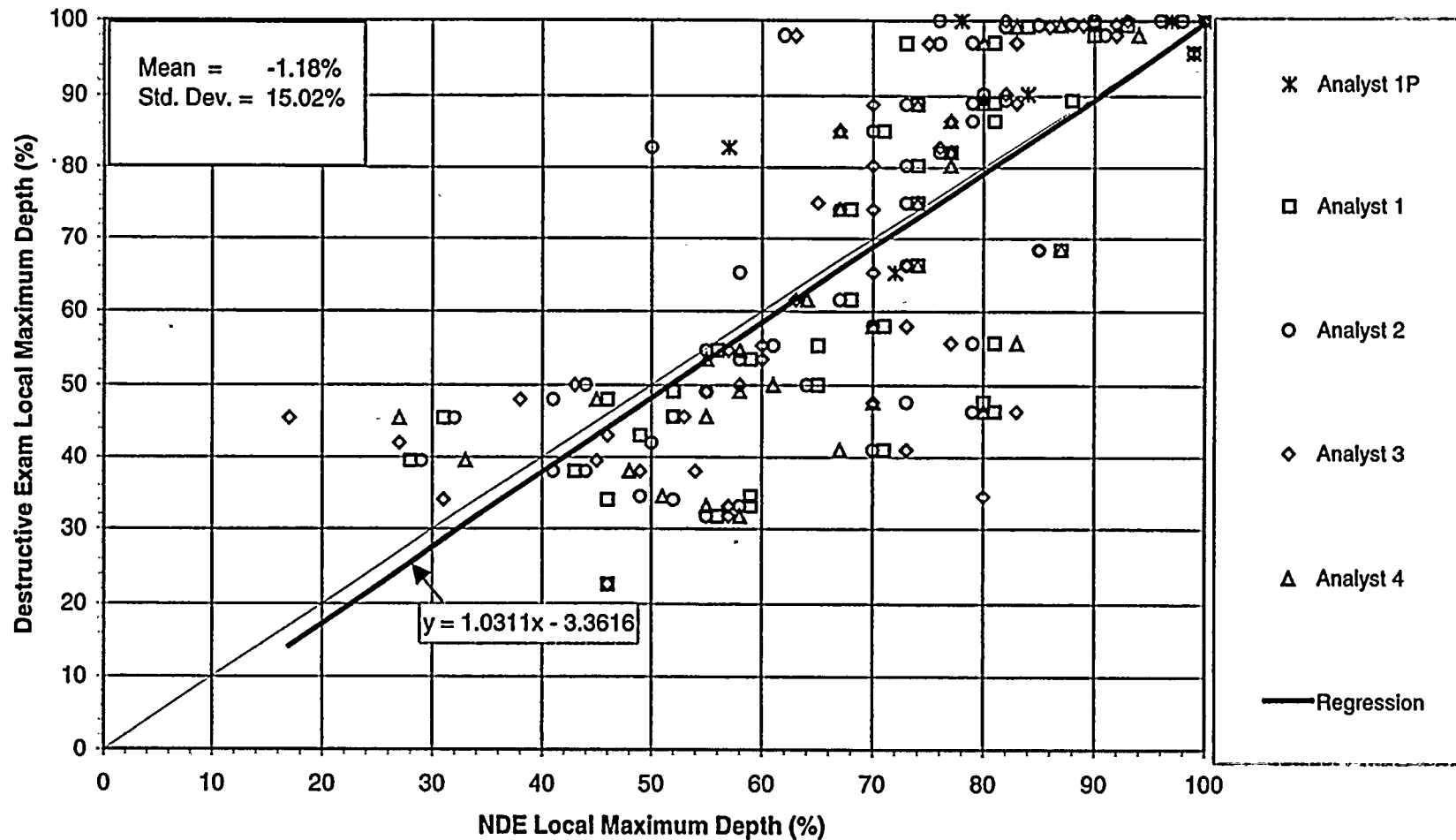


Figure 6-7
Dented TSP Axial PWSCC
Local Maximum Depth - +Point Coil
Without Depth Adjustment
Destructive Exam vs. NDE Trends





7.0 EPRI ISI GUIDELINES APPENDIX H QUALIFICATION

7.1 NDE Guidelines

In conjunction with the industry peer review team for Appendix H qualification, Westinghouse provided the EPRI NDE Center a qualification data package. The qualification package included the opticals containing the raw ECT data for the pulled tube and laboratory specimen database, the detailed hardcopy documentation of the NDE and destructive examination results, the NDE guidelines, and various spreadsheet analyses illustrating the impact of the adjustment routines on the NDE uncertainties. This package documented the work that had been completed to establish the basis for qualification of both the bobbin and +Point techniques. The proposed NDE guidelines attached in Appendix A as A-1 (bobbin) and A-3 (+Point), became the basis for the EPRI Peer Review. The depth adjustment incorporated in the proposed +Point guidelines were not implemented in the Peer Review analyses due to time constraints for the peer review group. The crack end adjustment guidelines in the 1997 version of ETSS#96703 were used without modification. Differences between the length adjustments of ETSS #96703 and the procedures of the report are small. As a consequence, the NDE uncertainties obtained from Appendix H qualification are somewhat higher than obtained for other analyses applying the adjustment procedures. After editing the proposed guidelines to EPRI format and incorporating changes, the guidelines were made part of the EPRI Performance Demonstration Database as ETSS#96012 and ETSS#96703. The EPRI ETSS documents are attached as Appendix A, items A-2 and A-4, respectively, for the bobbin and the +Point techniques.

Five QDAs were invited by EPRI to examine the data package and to evaluate the EC test data. Under EPRI auspices, a Westinghouse representative and the Level III analysts from the sponsoring utilities explained the guidelines to the participating reviewers. The results of the Industry Peer Review established that the POD satisfied the detection criteria of Appendix H, i.e., $\geq 80\%$ at the 90% confidence level, for both bobbin and + Point coil detection techniques.

7.2 Bobbin Coil Detection

The results obtained from the EPRI Peer Review for the bobbin coil technique performance are documented in the Performance Demonstration Data Base as ETSS#96012 (April 6, 1998). A total of 39 samples, including 4 pulled tube and 35 laboratory specimens, were the subject of the Peer Review process; each sample consisted of a TSP intersection affected by denting and PWSCC. The dent amplitudes ranged from 0 (one TSP intersection) to 14.18 volts, and the maximum depths of penetration from 21.53% to 96.93%. Thirty-three (33) of 34 samples with maximum depths exceeding 34% were detected using the subject bobbin technique; this yields a 97% detection fraction, equivalent to a probability of detection (POD) of 0.89 @ 90% confidence level. The reviewers determined that detection was effective with TSP dents up to 2 volts, since there were only 3 samples – all detected – with dent amplitudes exceeding 2 volts. The bobbin technique POD satisfies the Appendix H detection criteria for PWSCC flaws in dented TSP intersections with dent amplitudes up to 2 volts and for flaws $\geq 34\%$ throughwall depth. It can be noted that the specimen 9-2H reported with zero dent volts was measured to have a 1.24 volt (Table 5-1) dent prior to cracking. Dent profiles in Appendix H show the physical dimensions of the dents.

7.3 +Point Detection

The detection performance of the +Point coil technique in the EPRI Peer Review was, as expected, virtually perfect for the 36 samples, 4 pulled tube and 32 laboratory specimens, which were the subject of the evaluation. The 36/36 detection performance is equivalent to 93.8% POD @ 90% confidence level for maximum depth values from 29% to 100% throughwall penetration. The + Point technique POD also satisfied the Appendix H detection criteria for PWSCC flaws in dented TSPs; this result is documented in ETSS#96703.

7.4 +Point Sizing

Sizing parameters for the +Point technique were evaluated by the Appendix H peer review group and the results were found to be acceptable. A revision to the previous qualification (ETSS#96703) was issued for the +Point technique, extending the range for average depth determination to shallow flaws, qualifying the maximum depth parameter, and re-qualifying the length determination parameter. Due to time constraints in conducting the peer review, not all of the laboratory specimens with destructive exam data were included in the sizing analyses.

The results of the peer review are summarized in Table 7-1. Appendix H results are reported as RMSE values. For tube integrity assessments, the mean error and standard deviation are needed to define confidence levels. These values are included in Table 7-1 for comparison with the RSME values. The RMSE and standard deviation are almost the same parameter differing in definition by division by N (number of samples) for RMSE and by N-1 for the standard deviation. EPRI Appendix H recommends the use of destructive exam results averaged over the coil field length, which is the running average of this report. These data are included in Table 7-1.

To provide more direct comparisons between the Appendix H results and the blind analyses (Section 6) for NDE uncertainties, the Appendix H results were recalculated as given in Table 7-2. In finalizing the destructive examination results for this report, a few of the values were revised and these revisions are included in Table 7-2. The resulting NDE uncertainties, including the running average for maximum depth, are tabulated at the bottom of the table. Figures 7-1 to 7-4 show the trends of destructive examination versus + Point results for comparison with the corresponding curves for the blind analyses given in Section 6.

7.5 Comparisons of NDE Uncertainties and PODs from Blind Analyses with Appendix H Results

The NDE uncertainties from the blind analyses described in Section 6 are compared with the Appendix H results in Table 7-3. The blind analysis results include up to four sizing analyses performed by experienced analysts from PG&E, TVA, EPRI and Westinghouse. The Appendix H results are a single analysis representing the consensus of the peer review group. The blind analyses include more samples and the depth adjustments described in Section 5 which are not included in the Appendix H analyses.

The length uncertainties for the blind analyses are smaller than the Appendix H results even though the blind analyses include analyst variability. This may be due to more experienced application of the length adjustment procedure for the blind analyses than for the newly introduced procedure to the Appendix H peer review group.

Comparisons of the +Point depth sizing uncertainties between the blind and Appendix H analyses are consistent evaluations when based upon use of the blind analyses without adjustments in Table 7-3. With this consideration, the blind and Appendix H NDE uncertainties are in good agreement with the Appendix H results slightly smaller. Analyst variability together with more shallow depth specimens in the blind analyses likely contribute to the modest increase in the depth sizing uncertainties for the blind analyses.

The influence of the depth adjustment procedure on the sizing uncertainties can be seen by comparing the blind analyses with and without depth adjustments. The depth adjustments reduce the mean errors by 3-4% and the standard deviations by 1.5 to 4%. The NDE uncertainties show the trend for the NDE analyses to overestimate PWSCC crack depths. Table 7-3 also provides comparisons of the NDE uncertainties for maximum depth based upon comparing NDE with destructive exam depths obtained as averages over the coil field length of 0.16 inch and as the local or pointwise maximum depths. The use of maximum depths for destructive exam data averaged over the coil field is recommended in Appendix H, Paragraph H.2.2.1g and is also appropriate for tube integrity analyses. Short, such as the 0.16 inch +Point coil field width, variations in depth have negligible influence on burst pressure and potential leakage. Throughwall crack lengths up to 0.1 to 0.15 inch frequently do not leak in laboratory tests. From Table 7-3, it is seen that the NDE analyses on average overestimate the coil field averaged maximum depths and slightly underestimate the local maximum depths. The standard deviations are not significantly different for coil averaged and local maximum depths.

Overall, it is concluded that +Point sizing for axial PWSCC at dented TS intersections is quite good and more than adequate for tube integrity and ARC applications. The NDE uncertainties are further evaluated in Section 6 of this report.

Table 7-3 also includes comparisons of the PODs obtained from the blind analyses (Section 5) with the Appendix H results. The blind analyses include more specimens and more analysts (up to 4) than the Appendix H evaluation. The PODs at 90% confidence are seen to be essentially identical between the blind and Appendix H analyses. This consistency supports the bobbin and +Point techniques for detection. The bobbin detection qualification from Appendix H is limited to dent voltages up to 2.0 volts due to the modest number of samples above 2 volts. Thirteen samples with dent voltages between 2 and 5 volts are included in the blind analyses (see Table 5-1). These thirteen samples include four samples with dent voltages between 2.6 and 5.0 volts.

Table 7-1
Appendix H Peer Review Results
+Point Measurement Uncertainty Values for PWSCC in Dented TSP Intersections

Parameter	Length	Maximum Depth	Average Depth
Mean Error	0.071"	-6.34%	-4.27%
RMSE (ETSS#96703)	0.107"*	13.53%*	9.46%*
Standard Deviation	0.108"	13.74%	9.61%

* The RMSE values given differ from those reported in ETSS#96703 based on recalculation of the results for this report, using the data tabulated in ETSS#96703.

Table 7-2. EPRI Appendix H + Point Sizing Qualification Results and NDE Uncertainties

Sample Number	TSP Location	Crack Number	Analyst	Adjusted NDE			Destructive Exam				Destructive Exam - NDE			
				Length (Inches)	Max Depth (%)	Avg Depth (%)	Length (Inches)	Max Depth (%)	Running Avg. Max. Depth (%)	Avg. Depth Lig. Corr. (%)	Length (Inches)	Max Depth (%)	RA Max Depth (%)	Avg Depth (%)
10/22		1	Qual H	0.220	48.0	28.23	0.122	38.0	23.21	23.21	-0.098	-10.0	-24.8	-5.02
12/32		1	Qual H	0.620	73.0	55.82	0.702	97.0	88.90	57.54	0.082	24.0	15.9	1.72
21/43		1	Qual H	0.970	60.0	44.45	0.991	98.0	90.50	49.29	0.021	38.0	30.5	4.84
21/43		2	Qual H	0.290	40.0	31.28	0.277	50.0	45.48	39.59	-0.013	10.0	5.5	8.31
P7		1	Qual H	0.870	100.0	93.90	0.870	100.0	99.78	94.32	0.000	0.0	-0.2	0.42
P7		2	Qual H	0.600	99.0	88.85	0.658	100.0	89.68	82.48	0.058	1.0	-9.3	-6.37
P7		3	Qual H	0.100	64.0	43.20	0.126	65.2	46.23	46.23	0.026	1.2	-17.8	3.03
P8		1	Qual H	2.320	99.0	90.55	2.644	100.0	99.55	84.77	0.324	1.0	0.5	-5.78
P8		2	Qual H	2.330	100.0	92.66	2.452	100.0	99.73	79.41	0.122	0.0	-0.3	-13.25
P9		1	Qual H	1.590	100.0	90.84	1.868	100.0	99.48	75.26	0.278	0.0	-0.5	-15.58
P9		2	Qual H	1.710	100.0	88.04	1.589	100.0	99.42	86.59	-0.121	0.0	-0.6	-1.45
P10		1	Qual H	2.360	100.0	83.33	2.563	100.0	100.00	88.70	0.203	0.0	0.0	5.37
P10		2	Qual H	2.040	87.0	67.04	2.146	100.0	90.91	69.03	0.106	13.0	3.9	1.99
P11		1	Qual H	0.730	95.0	85.49	0.675	100.0	100.00	95.61	-0.055	5.0	5.0	10.12
P11		2	Qual H	0.460	99.0	89.74	0.568	95.8	90.30	74.58	0.108	-3.2	-8.7	-15.16
P12		1	Qual H	1.690	100.0	86.89	1.286	100.0	99.80	77.27	-0.404	0.0	-0.2	-9.62
P12		2 (3+4)	Qual H	0.410	64.0	38.29	0.548	82.8	64.86	29.90	0.138	18.8	0.9	-8.39
P12		5	Qual H	0.210	83.0	59.29	0.181	90.3	74.68	69.44	-0.029	7.3	-8.3	10.15
1	4H	1	Qual H	0.810	85.0	50.83	0.708	68.4	54.32	36.72	-0.102	-16.6	-30.7	-14.11
2	3H	1	Qual H	0.510	55.0	29.25	0.472	31.7	21.53	15.22	-0.038	-23.3	-33.5	-14.03
6	2H	1	Qual H	0.720	73.0	60.40	0.692	80.2	73.72	59.09	-0.028	7.2	0.7	-1.31
6	3H	1	Qual H	0.700	67.0	57.96	0.588	74.1	67.26	56.14	-0.112	7.1	0.3	-1.82
6	4H	1	Qual H	0.540	73.0	52.09	0.416	75.0	64.29	49.41	-0.124	2.0	-8.7	-2.68
7	1H	1	Qual H	0.400	29.0	18.38	0.598	39.5	30.14	20.12	0.198	10.5	1.1	1.74
7	3H	1	Qual H	0.380	32.0	21.34	0.560	45.5	34.43	24.95	0.180	13.5	2.4	3.61
8	1H	1	Qual H	0.430	70.0	45.28	0.420	58.0	52.24	40.73	-0.010	-12.0	-17.8	-4.55
8	3H	1	Qual H	0.490	64.0	47.10	0.460	50.0	44.21	31.81	-0.030	-14.0	-19.8	-15.29
9	2H	2	Qual H	0.790	73.0	56.44	0.786	61.5	46.26	35.62	-0.004	-11.5	-26.7	-20.82
11	2H	2	Qual H	0.110	49.0	35.27	0.160	43.0	32.75	32.75	0.050	-6.0	-16.3	-2.52
12	3H	1	Qual H	0.180	32.0	24.44	0.129	22.7	16.04	16.04	-0.051	-9.3	-16.0	-8.40
12	4H	1	Qual H	0.310	58.0	42.77	0.360	33.1	26.29	20.24	0.050	-24.9	-31.7	-22.53
13	3H	1	Qual H	0.380	52.0	38.87	0.336	45.6	37.31	27.25	-0.044	-6.4	-14.7	-11.62
Mean											0.02	0.70	-6.87	-4.66
Standard Deviation											0.14	12.86	13.94	8.65
95% Uncertainty											0.25	21.91	16.13	9.61

Table 7-3. Comparison of NDE Uncertainties and POD Results for "Blind Analyses" and Appendix H Peer Review

NDE Uncertainties			
NDE Analysis and Parameters	Mean Error (DE - NDE)	Standard Deviation	NDE Error at 95% Confidence
"Blind" Analyses⁽¹⁾			
• Length	-0.04"	0.11"	0.14"
• Average Depth	-3.36%	7.25%	8.60%
• Maximum Depth Averaged over Coil Field (0.16")	-4.98%	11.95%	14.75%
• Local Maximum Depth	2.86%	11.5%	21.8%
"Blind" Analyses Without Adjustments			
• Length	Not Evaluated	-	-
• Average Depth	-5.61%	8.83%	8.97%
• Maximum Depth Averaged over Coil Field (0.16")	-9.02%	15.73%	16.95%
• Local Maximum Depth	-1.18%	15.0%	23.6%
Appendix H Peer Review Analyses⁽²⁾			
• Length	0.02"	0.14"	0.25"
• Average Depth	-4.66%	8.65%	9.61%
• Maximum Depth Averaged over Coil Field (0.16")	-6.87%	13.9%	16.1%
• Local Maximum Depth	0.70%	12.9%	21.9%
POD Results			
NDE Analysis and Detection Probe	POD at 90% Confidence		
"Blind" Analyses			
• Bobbin Coil POD for Maximum Depth	0.88 for depths > 34%		
• + Point POD for Maximum Depth	0.939 for depths > 30%		
Appendix H Peer Review			
• Bobbin Coil POD for Maximum Depth	0.89 for depths > 34%		
• + Point POD for Maximum Depth	0.938 for depths > 29%		
Notes:			
1. Blind analyses include results for multiple analysts (up to 4 for "blind" analyses) and a larger number of specimens than the Appendix H review.			
2. Appendix H analyses include length adjustments but not depth adjustments. Results are for a single consensus analysis of the peer review group.			

Figure 7-1
APPENDIX H QUAL - Dented TSP Axial PWSCC
Average Depth Destructive Exam vs. NDE Trends

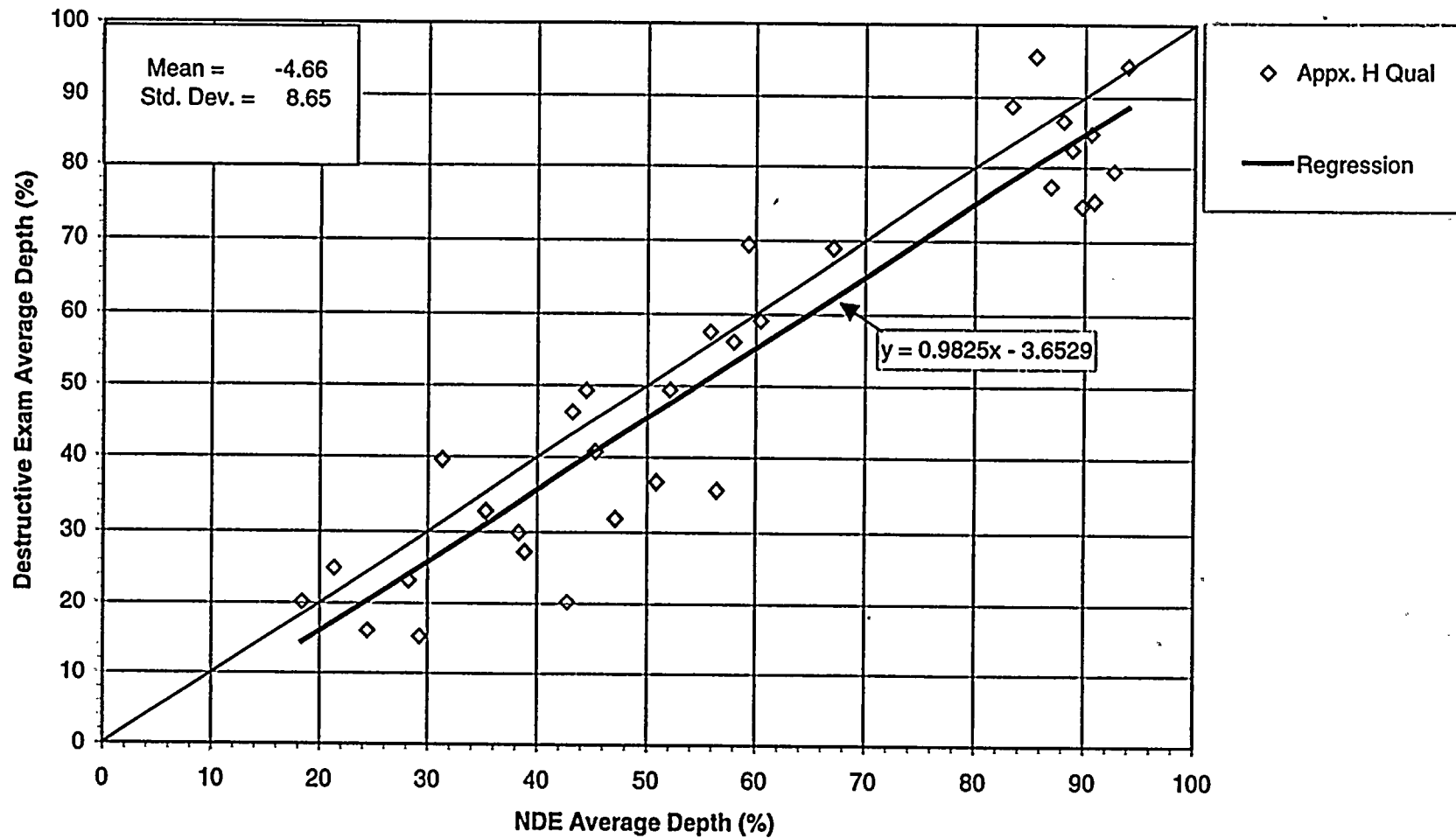


Figure 7-2
APPENDIX H QUAL - Dented TSP Axial PWSCC
Axial Length Destructive Exam vs. NDE Trends

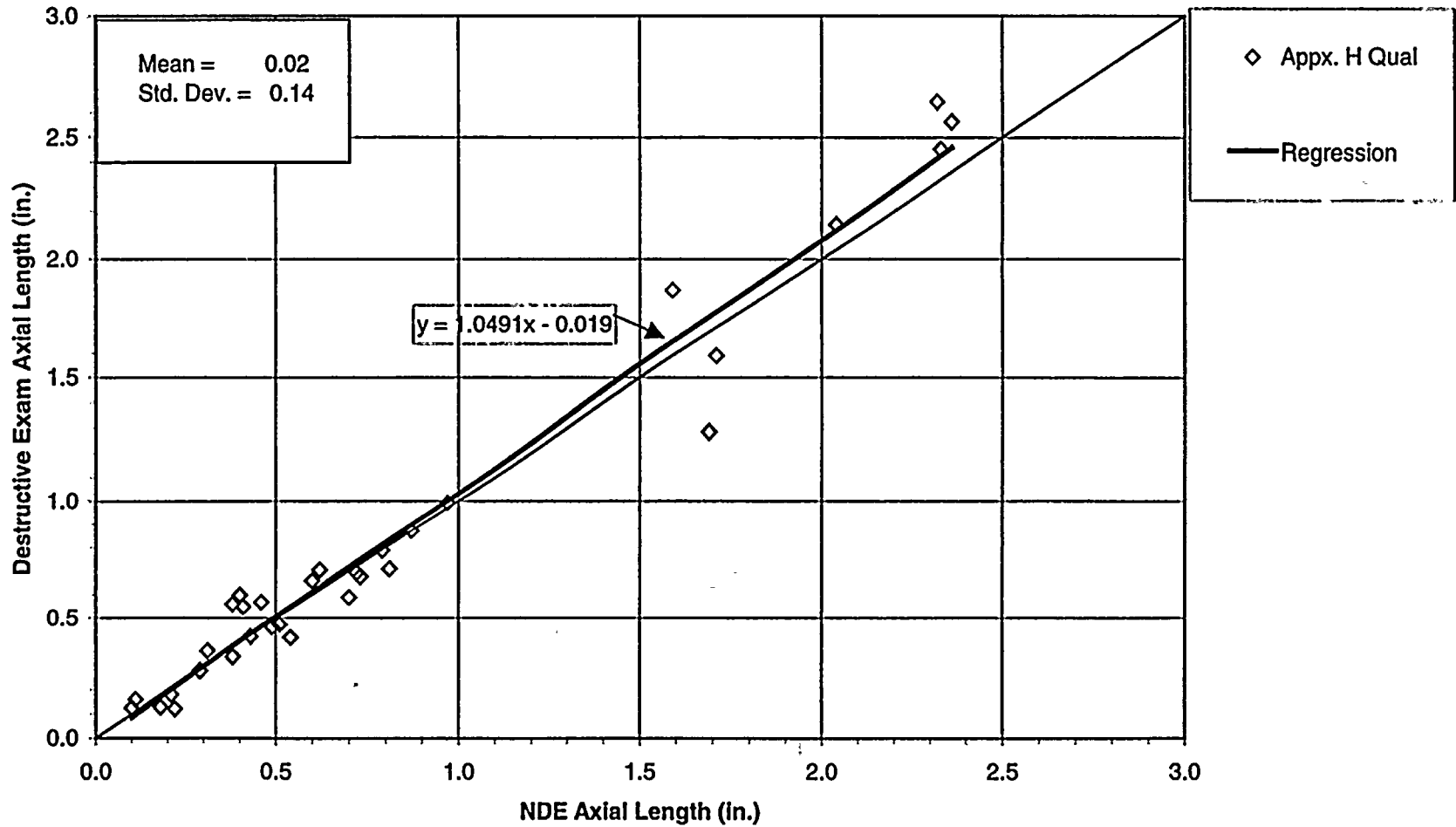


Figure 7-3
APPENDIX H QUAL - Dented TSP Axial PWSCC
Maximum Depth Destructive Exam vs. NDE Trends

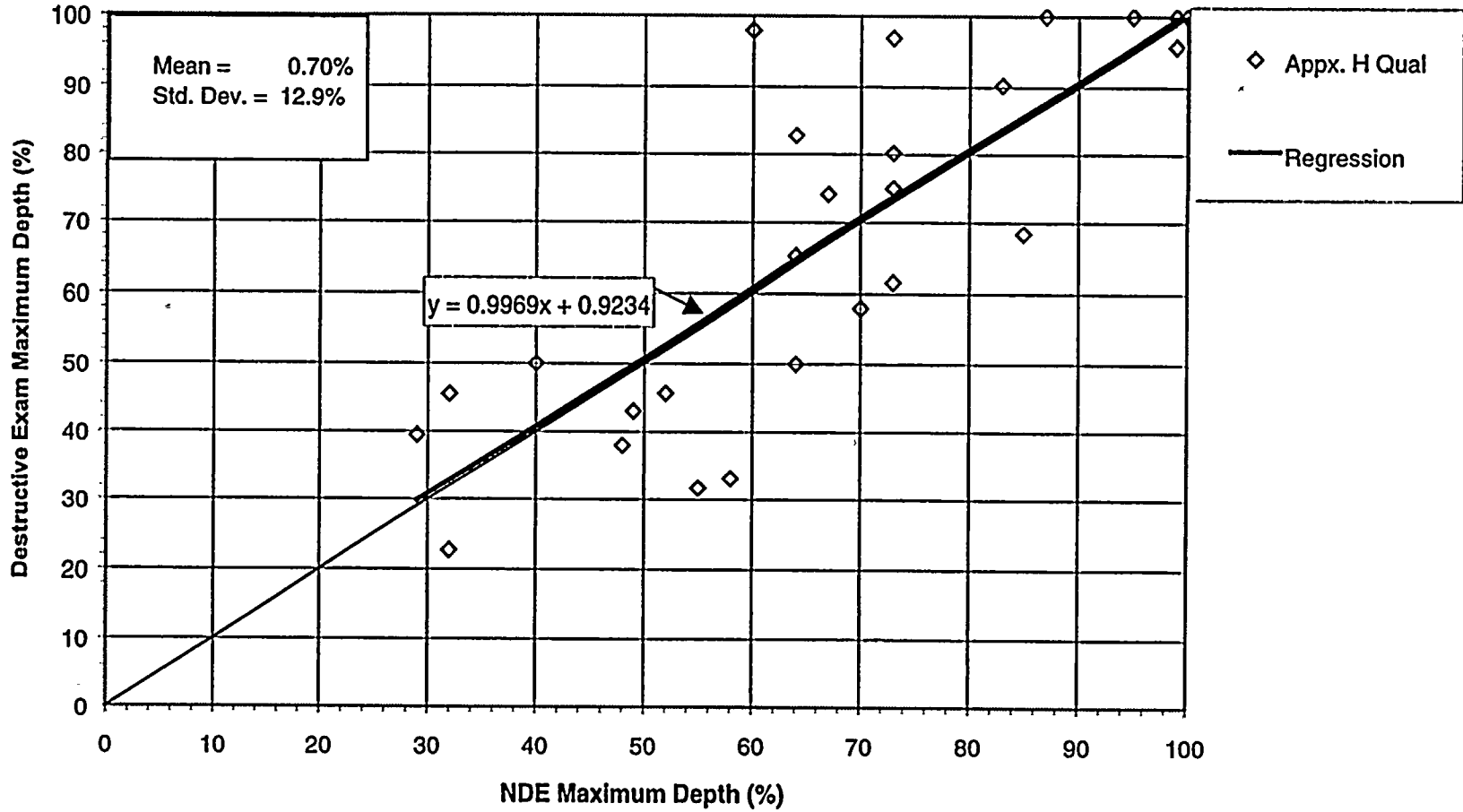
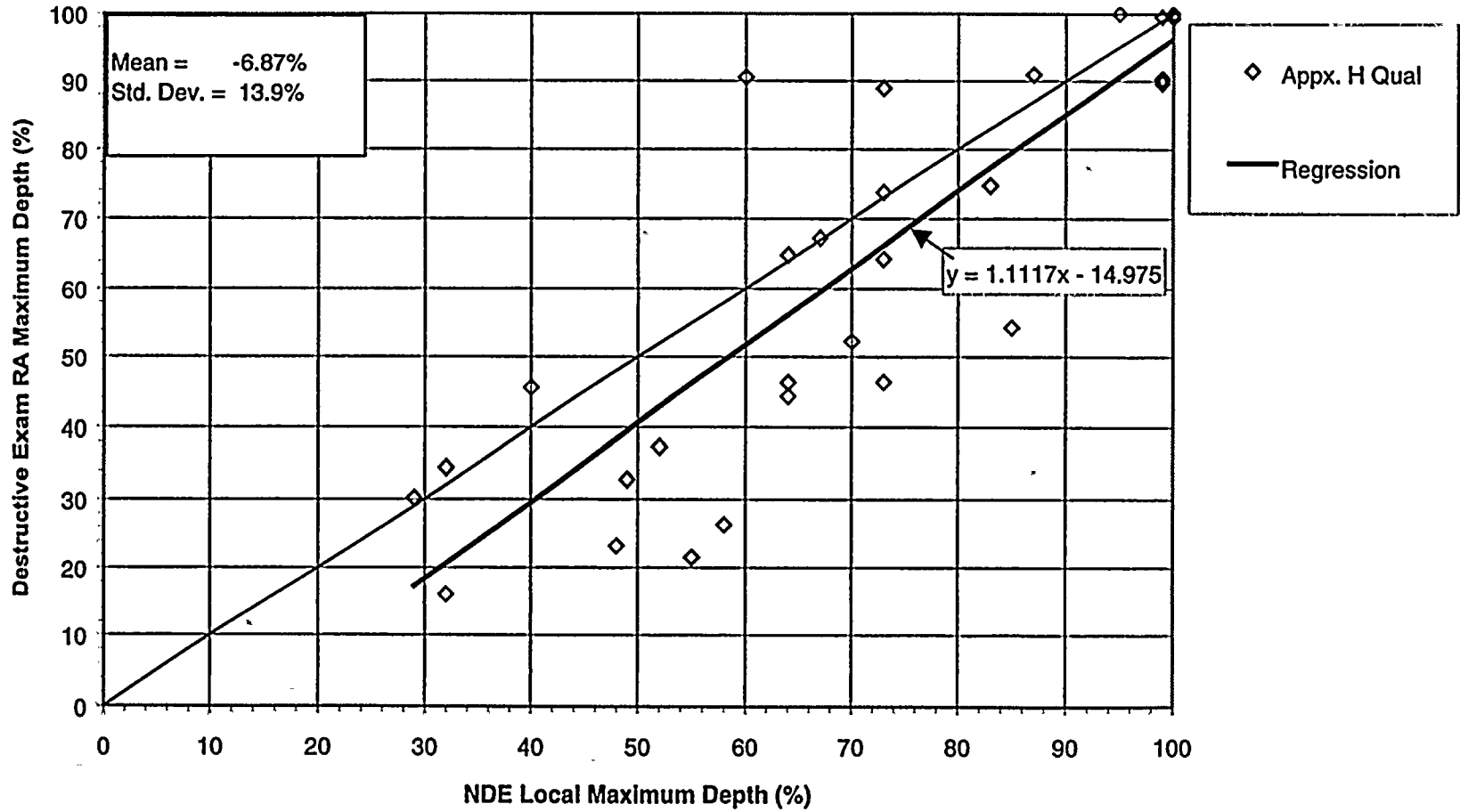


Figure 7-4
APPENDIX H QUAL - Dented TSP Axial PWSCC
Local Max. Depth for NDE and RA Max. Depth for DE
Destructive Exam vs. NDE Trends



8.0 REFERENCES

- 8.1 EPRi Report, TR-107569-V1R5, "PWR Steam Generator Examination Guidelines: Revision 5 Volume 1: Requirements", September, 1997.
- 8.2 SG-97-007, "Qualification of Rotating Coil Depth Sizing for Axial PWSCC at Dented TSP Intersections," Westinghouse Electric Corporation, December, 1997.
- 8.3 WCAP-15128, "Depth-Based SG Tube Repair Criteria for Axial PWSCC at Dented TSP Intersections", Westinghouse Electric Company, January, 1999.



APPENDIX A

NDE Analysis Guidelines



APPENDIX A-1

DAT-PWSCC-1 Rev.0
Examination Procedure for Bobbin Detection
of PWSCC in Dented Intersections

5/19/98



Examination Procedure for Bobbin Detection of PWSCC in Dented Intersections

Prepared by: AGP Date: 5/19/98

Reviewed by: G. Craig Power Date: 5/19/98

Reviewed by: Joon H. Kang Date: 5/19/98
JOON H. KANG

Engineering: R. Malinowski Date: 5/19/98



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1.0 SCOPE

This procedure provides instruction and guidance for the detection and reporting of potential PWSCC indications in the presence of small dents using a bobbin probe. This procedure is limited in scope and is meant for use in performance demonstrations of the technique or for inclusion, in part or whole, into a site specific analysis procedure.

2.0 PERSONNEL QUALIFICATIONS

- 2.1 Personnel performing production analysis shall be certified to a minimum of Level II in electromagnetic testing with additional training in the analysis of data from non-ferromagnetic steam generator tubing per Section XI of the ASME Boiler and Pressure Vessel Code. Additionally, the analysis personnel must also be qualified data analysts (QDA) in accordance with Appendix G of the EPRI PWR Steam Generator Examination Guidelines, Rev. 5.
- 2.2 Personnel performing resolution analysis shall be certified to Level III in electromagnetic testing with additional training in the analysis of data from non-ferromagnetic steam generator tubing per Section XI of the ASME Boiler and Pressure Vessel Code. Additionally, the resolution personnel must also be qualified data analysts (QDA) in accordance with Appendix G of the EPRI PWR Steam Generator Examination Guidelines, Rev. 5.
- 2.3 Personnel performing report comparison and data reduction functions (engineering or data management) do not require specific qualification.

3.0 RESPONSIBILITIES

- 3.1 The Primary and Secondary Analysts are responsible for the evaluation of dented intersections for the presence of signals which may indicate the presence of PWSCC.
- 3.2 The Resolution Analyst is responsible for resolving discrepancies between the primary and secondary analyst reports.
- 3.3 When a performance demonstration is in progress, Engineering shall process the resolved results in order to determine the POD for the technique.
- 3.4 When the data being processed relate to an outage, Data Management shall process the resolved report in accordance with the pre-defined job data flow.

4.0 CALIBRATION

- 4.1 Calibration of the probe shall be performed in accordance with the Technique Specification Sheet in Appendix A.
- 4.2 If calibrations are provided, as in a performance demonstration, the analysts shall review the calibration for conformance to the Technique Specification Sheet.

5.0 FLAW IDENTIFICATION CRITERIA

Refer to ETSS: *PWSCC in Small Dents*.

6.0 REPORTING REQUIREMENTS

- 6.1 Dents shall be recorded as DNT. There is no voltage threshold for the reporting of dents.
- 6.2 Dented tube support plate intersections which exhibit flaw-like behavior shall be documented as DDI.
- 6.3 Support plate intersections which exhibit flaw-like behavior with no dent signal shall be documented as DSI.
- 6.4 Support plate intersections which exhibit no dent and no degradation signal shall be documented as NDD.

7.0 EVALUATION

Refer to ETSS: 96012 - *Bobbin PWSCC*.

8.0 RECORDING

- 8.1 All indication codes shall include the tube identification, the support and indication location, the test extent, the indication amplitude, the phase angle and the indication code.
- 8.2 For the purposes of the performance demonstration, all supports are to be considered to be 1H for location.

9.0 RESOLUTIONS

- 9.1 When one analyst reports an indication (DSI or DDI), and the other does not, resolutions are required. If the resolution analyst does not concur with the indication call, he/she must obtain the concurrence of another Level III analyst before rejecting the call.
- 9.2 When both analysts report an indication (DSI or DDI), the resolution analyst shall review the call. If the resolution analyst does not concur, he/she must obtain the concurrence of another Level III analyst before rejecting the call.

10.0 APPENDICES

10.1 APPENDIX A - ETSS

PERFORMANCE DEMONSTRATION DATA BASE

Appendix A Technique Specification Sheets

April 6, 1998

ETSS # 96012 Bobbin PWSCC		Page 1 of 5
TUBING		
Material: Inconel 600	OD: 0.875"	Wall: 0.050"
EXAMINATION SCOPE		
<p>Test Application: This bobbin probe technique meet the requirements for detection of axial Primary Water Stress Corrosion Cracking (PWSCC) at dented (≤ 2 volts with 4x20% ASME holes set at 2.75 volts in Mix 1) tube support plate intersections. The 2 volt criteria was a consensus value determined by the peer review team based on the number of data points in the area of interest. This technique meet the requirements of Appendix H by using both differential (Mix 1) and absolute (Mix 2) mix channels (400/100 kHz). Caution: Specific training on recognition of open residuals accompanied by a sharp left-going transition should precede implementation of this technique.</p> <p>This technique received peer review 4/16/98.</p>		
ACQUISITION TECHNIQUE		
Bobbin Probe <input checked="" type="checkbox"/> Rotating Probe <input type="checkbox"/> Other <input type="checkbox"/>		
DATA ACQUISITION		
Instrument		Probe
Manufacturer: Tecrad Model: TC6700		Manufacturer: Zetec Diameter/Coil Dimensions: 0.720"
Acquisition System Software		Part Number: A-720-MULC (Zetec)
Manufacturer: Westinghouse		Probe Cable Length: 100'
Description or Title: ANSER		Analog Probe Extension
		Manufacturer: Zetec Universal 36 pin low loss cable
Version/Revision: ANSER 8.1 or equivalent		Length: 100'
Frequencies/Coil Excitation Modes		
Mode: Differential and Absolute		
Channel/Frequencies/Instrument/Drive voltage/Gain		
Process or Mix: 400/100 kHz/ Tecrad 6700:35 dB, 3V (peak)		
Data Recording Equipment		
Manufacturer: Hewlett Packard or equivalent		Model: 650 Mb Re-writable or equivalent

PERFORMANCE DEMONSTRATION DATA BASE

Appendix A Technique Specification Sheets

April 6, 1998

Examination Technique Specification Sheet									
ETSS # 96012 Bobbin PWSCC					Page 2 of 5				
Digitizing Rate, Scan Direction & Scan Pattern									
Bobbin Probe									
Digitizing Rate Min. (DR): * 37 samples/ inch									
Sample Rate Min. (SR): Tecrad 6700 - 450/sec.									
Probe Speed (PS): must meet minimum DR. (Performed at nominal 12"/s)									
Scan Direction: Pull / Withdrawal									
<ul style="list-style-type: none"> Note: Digitizing rate applies in the axial direction. SR min. = DR min. x PS max 									
DATA ANALYSIS									
Instrument					Analysis System Software				
Manufacturer: Hewlett Packard					Manufacturer: Westinghouse / Zetec				
Model: 725 or equivalent					Title/Rev.: ANSER 8.1 or equivalent/ EddyNet@95-Ver 3 or equivalent				
Analysis Channels									
Frequency Sequence		Probe Coil / Channel Select							
	Type	Differential						Absolute	
#	Frequency	Coil 1	Coil 2	Coil 3	Coil 4	Coil 5	Coil 6	Coil 7	Coil 8
1	400 kHz	1				2			
2	200 kHz	3				4			
3	100 kHz	5				6			
4	10-30 kHz	7				8			
5*	600 kHz	9				10			
Process Channel		400/100 kHz Differential (Mix 1)			400/100 kHz Absolute (Mix 2)				
Span Setting		20% OD FBH ~ 4 div.			20% OD FBH; 2-3 div.				
Phase Rotation		100% at ~ 32°; noise horizontal			100% at ~ 32°; noise horizontal				
Calibration Std		100%, 60%, 20% OD FBH; 0% ID= 0%			100%, 60%, 20% OD FBH; 0% ID= 0%				
Calibration Curve		Phase based curve			Phase based curve				
Volts		2.75 volts in Mix 1 for 20% FBHs			2.75 volts in Mix 1 for 20% FBHs				

* Optional

PERFORMANCE DEMONSTRATION DATA BASE

Appendix A Technique Specification Sheets

April 6, 1998

Examination Technique Specification Sheet	
ETSS # 96012 Bobbin PWSCC	Page 3 of 5
<p>Analysis Guidelines</p> <p>Voltage normalization is performed in the main lissajous window and is set on the 20% flat bottom holes in Mix 1 (400/100 kHz differential) at 2.75 volts (or at an equivalent voltage established via normalization/transfer to the Alternate Plugging Criteria laboratory standard). Adjust the span so that the signal occupies 50% of screen height. Set the noise component horizontal; this should result in approximately 32° phase angle for the 100% FBH. Depth analysis is not required; use the 100%, 60%, and 20% holes to establish a phase curve to support flaw identification.</p> <p>Flaw signals shall be identified from either the differential mix channel (Mix 1) or the absolute mix channel (Mix 2), with particular emphasis on looking for flaw indications at the edges of small dents or residuals contained within the TSP. Both Mix 1 (400/100 kHz differential) and Mix 2 (400/100 kHz absolute) should be screened for possible indications, and reported separately with no requirement for confirmation between them.</p> <p>Mix 1 (differential) shall be evaluated according to the guidelines for evaluating ODSCC at TSP intersections with the following caution: Whether the phase angle of an identified possible flaw signal appears to be OD or ID in origin, such signals shall be reported as flaw indications. If a dent signal is identified, its voltage shall be measured and reported. If more than one dent signal is observed, report the maximum peak to peak amplitude from Mix 1. The measurement shall be the horizontal component at approximately 180° ± 6°.</p> <p>Industry experiences with the use of the Mix 2 channel (absolute 400/100 kHz) for flaw identification is very limited. Features such as a more open residuals and sharp transitions to the left may be indicative of the presence of ID flaws in TSP intersections with small voltage dent components. Each flaw indication identified, whether from Mix 1 or Mix 2, shall be recorded as a Distorted Dent Indication (DDI).</p> <p>The use of a high frequency, e.g., 600 kHz (optional), may be useful to help clarify signals that are difficult to analyze; the higher frequency responds more acutely to the ID flaws and the dents but less to the TSP and deposit effects. The low frequency locator channel (10-30kHz) permits identification of the relative position of Mix 1 signal components with respect to the TSP center and edges.</p> <p>Signal to Noise Value: For each DDI reported, obtain the root mean square (RMS) noise value (Eddynt) for the portions of the dent (or TSP residual) signal not included in the flaw signal. This is accomplished by designating the neighboring responses in the TSP Mix response, not from the straight tube region above and below the dented TSP. This measurement is not essential to the qualification of the technique; it provides supplemental information relative to the similarity of conditions between the lab and field data.</p>	
Technique Performance	
Detection Probability ≥ 34% TW (@ 90% CE)	RMSE Sizing Error
Combined Mix 1/Mix 2 (400/100 kHz): .89	Not Applicable

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Appendix A Technique Specification Sheets

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Examination Technique Specification Sheet

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Training Guidance

Particular care must be exercised to minimize the Mix 1 and Mix 2 residuals. The residual from Mix 1 should approximate more closely a rough dot in the center of the display than a small signal with observable phase angle. EddyNet®95 software requires that the data be nulled in the clear section of tubing prior to performing the mix. This measure taken at the outset will help to limit the number of false calls reported in the evaluation of TSP data. Figures 6-1 illustrates an imperfect result of the mixing when the clear section nulling is omitted; Figure 6-2 represents a proper mix residual.

The range of typical dents signals observed in SG TSP intersections is very broad. This procedure is expected to be applicable only to TSP intersections with dent voltages up to 2 volts. Examples of flaw/dent combinations over the range expected will be shown and/or available on optical discs for practice. A few pulled tube examples are included, but the body of the "truth" examples will be laboratory samples; operating SG examples confirmed by +Point examination are used to illustrate application of the analysis technique. Several classes of PWSCC/Dent signal patterns are described below; two sets of figures, one for lab samples (Series 2) and one for field data from Plant Y-1 (Series 1) are attached; figures designated with a following "a" are +Point confirmations of the bobbin calls.

- A. **Dominant flaws plus central dent:** Flaw signals are visible above and below a dent signal. The absence of visible flaw indications in the center does not necessarily indicate 2 axially separate cracks; rather it may mean the dent makes the crack less visible in this region. Figures 1-1 to 1-3 and Figures 2-1 to 2-3.
- B. **Flaw in the axial center of the dent:** Crack signal is dominant relative to dent components above and below the flaw. This signal forms before/after the edge loops of the dent. Figures 1-4 to 1-6 and Figures 2-4 to 2-6.
- C. **Flaw at or near dent/TSP edge:** Flaw transition will be visible but not necessarily complete before the dent component appears; the converse is also true, i.e., the dent signal is visible but not necessarily complete before the flaw signal appears. Figures 1-7, 1-8 and Figures 2-7, 2-8.
- D. **Dominant dent plus weak flaw:** At one or both edges of a dent, a weak flaw-like component is visible. This category is considered conservative; some degree of false calls should be expected. It is possible that in some cases the mix residual resulting from deposits, probe wobble, or other influences may present a flaw-like response. Figures 1-9 to 1-14 and Figures 2-9 to 2-12.
- E. **Flaw and dent coincide over entire length:** Shallow cracks (< 40%) may not be identifiable. Flaws with average depth $\geq 50\%$ have phase angles $> 15^\circ$ and amplitudes > 2 volts. Combination of such a flaw with dents (180°) below 3 volts (p-p) will rotate by at least 10° ; the combination phase angle will be positive relative to 180° . Call "rotated dents" ($< 170^\circ$ in quadrant 2) as possible flaws.

For categories A through D, the flaw components lie in the expected flaw plane; for Category E, the presence of the flaw is inferred from the rotation of the combined signal. Figure 1-15 shows a field indication near the TSP center accompanied by small horizontal signals and a residual signal; the flaw, a 0.7" ID +Point SAI, was mistaken for a dent and the intersection declared NDD. Figure 2-13 shows a similar signal on a flawed (0.84", 82.1% max.depth) lab specimen.

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Appendix A Technique Specification Sheets

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Examination Technique Specification Sheet

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Training Guidance

In the figures designated Series 3, Figures 3-1 to 3-4 illustrate two lab samples' behavior that should be reported as flaws; in these cases the Mix 1 data is more convincing than Mix 2, but an indication in either channel requires a flaw call. It should be observed that the positions of the dots on the Mix 2 signal will not necessarily correspond exactly to the Mix 1 positions. Additional comparisons of Mix 1 and Mix 2 are given in Figures 3-5 to 3-10.

Review the characteristics of the lab samples and the field samples; there is great similarity between the 2 sets of data, but some differences will be noted.

1. The lab samples exhibit more frequent coincidence of flaw and dent signals than is observed for the field data.
2. The tendency for flaws to occur in the center of the intersection is reduced for the lab samples, since the dent is dominant in this region by design of the samples.

The mix residuals in both populations create some ambiguity. The effect seems to be more pronounced for the lab sample than for the field data. Figures 4-1 and 4-2 represent mix residuals with no apparent flaws; these types may cause false calls.

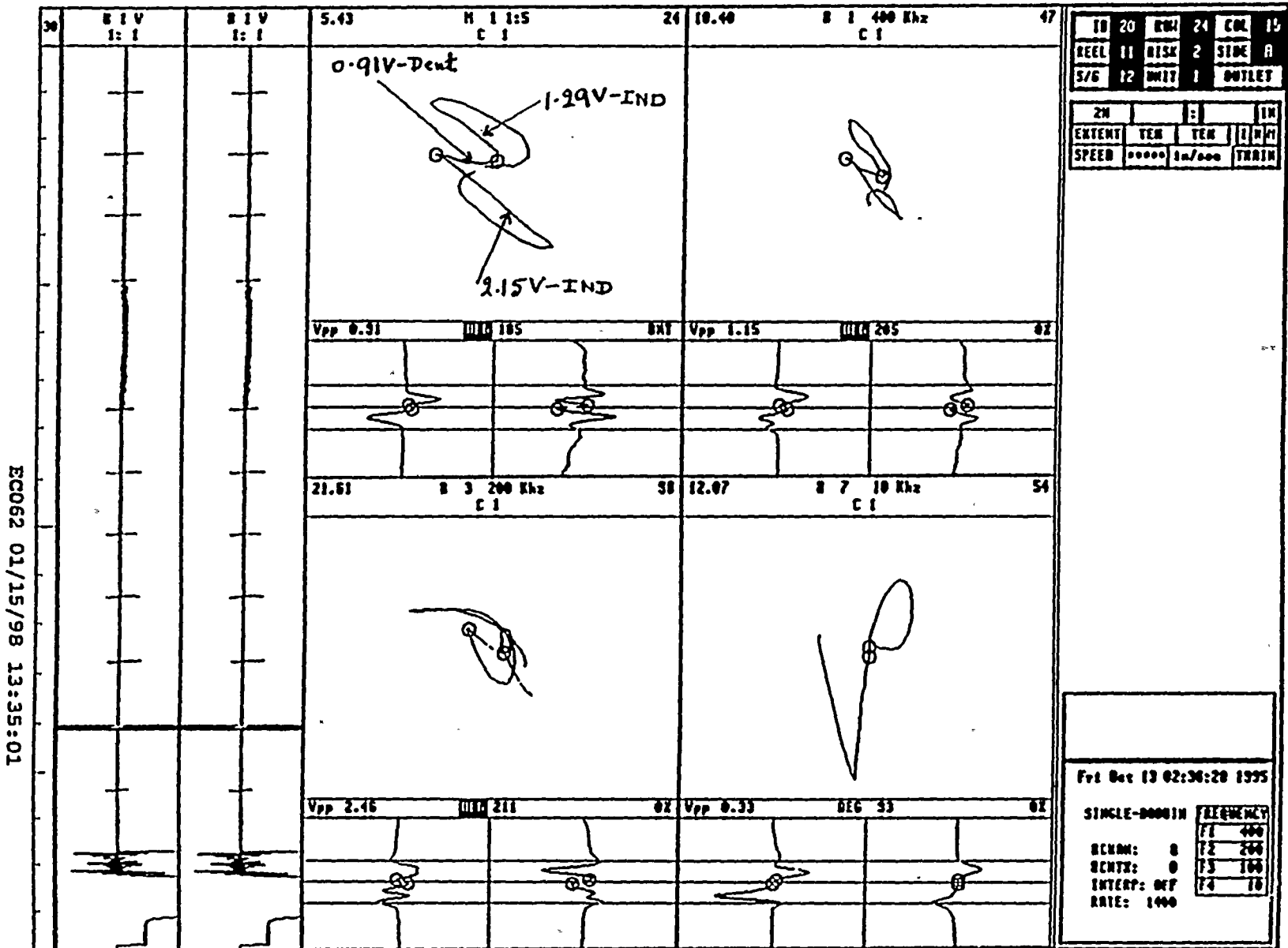
Some similarities are apparent between field signals confirmed by +Point coil and laboratory sample intersections also confirmed by +Point and/or confirmed by tube metallography. The Series 5 figures, the first 2 field signals (5-1 and 5-2) and the latter 3 lab samples (5-3 to 5-5) illustrate the types of signals that have been related to PWSCC but might be difficult to recognize as flaws without knowledge of confirming +Point or metallography. It is appropriate to call these types of bobbin signals as flaws, even though an increased level of false calls might result.

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Appendix A Technique Specification Sheets

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Sample #	Dent Value	Met (Max De			
2-3H-C1	1.9	21.53	0		
12-3H-C1	1.15	22.69	1		
12-4H-C1	1.19	26.29	0		
7-1H-C1	4.1	30.14	1		
2-1H-C1	3.4	33.42	0		
7-3H-C1	3.26	34.43	1		
9-1H-C2	0.94	34.47	1	x	
2-5H-C1	2.03	35.5	0		
13-3H-C1	0.75	37.31	1		
10-3H-C2	0.65	37.97	1	x	
9-1H-C1	0.94	38.82	1	x	
11-2H-C2	0.73	43	1	x	
11-4H-C2	1.17	44.03	1	x	
8-3H-C1	0.46	44.21	1		
8-2H-C1	0.8	45.77	1		
9-2H-C2	0	46.26	1	x	
2-4H-C1	1.15	47.62	1		
1-3H-C1	2.5	47.88	1		
8-1H-C1	0.41	52.24	1		
9-3H-C2	1.29	54.1	1	x	
1-4H-C1	1.79	54.32	1		
6-4H-C1	1.15	64.29	1		
6-3H-C1	0.96	67.26	1		
9-4H-C1	1.25	70.18	1		
6-2H-C1	1.98	73.72	1		
9-5H-C1	0.85	74.63	1		
6-5H-C1	0.79	77.89	1		
10-4H-C1	0.82	81.81	1		
6-1H-C1	1.01	83.72	1		
9-2H-C1	0	84.09	1	x	
9-3H-C1	1.29	84.64	1	x	
Diablo 12-32 C	1.17	88.9	1		
11-3H-C1	1.1	89.25	1		
11-4H-C1	1.17	95.25	1	x	
10-3H-C1	0.65	96.18	1	x	
11-2H-C1	0.73	96.93	1	x	
Diablo 10-2	1.91	38	1		
Diablo 21-4	3.23	90.5	1		
eq. 21-64-1	14.18	83.8	1		
	Detected	Fraction	OD@.90 C/L		
>34%	33/34	0.97	.89		
<34%	2/5	0.4	.1		



EC062 01/15/98 13:35:01

Figure 1-1

EC062 01/15/98 07:41:56

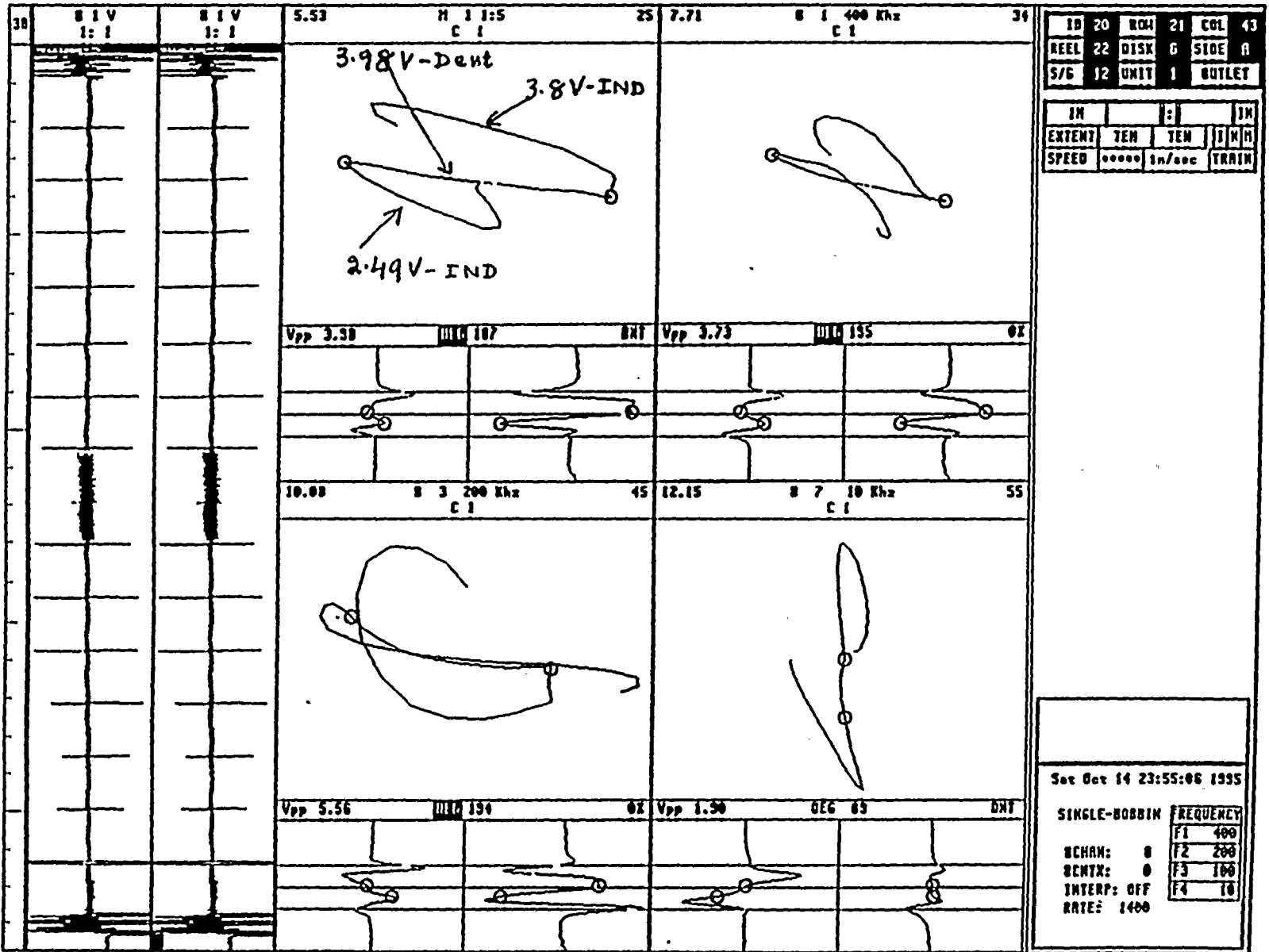


Figure I-2

EC062 01/14/98 15:09:57

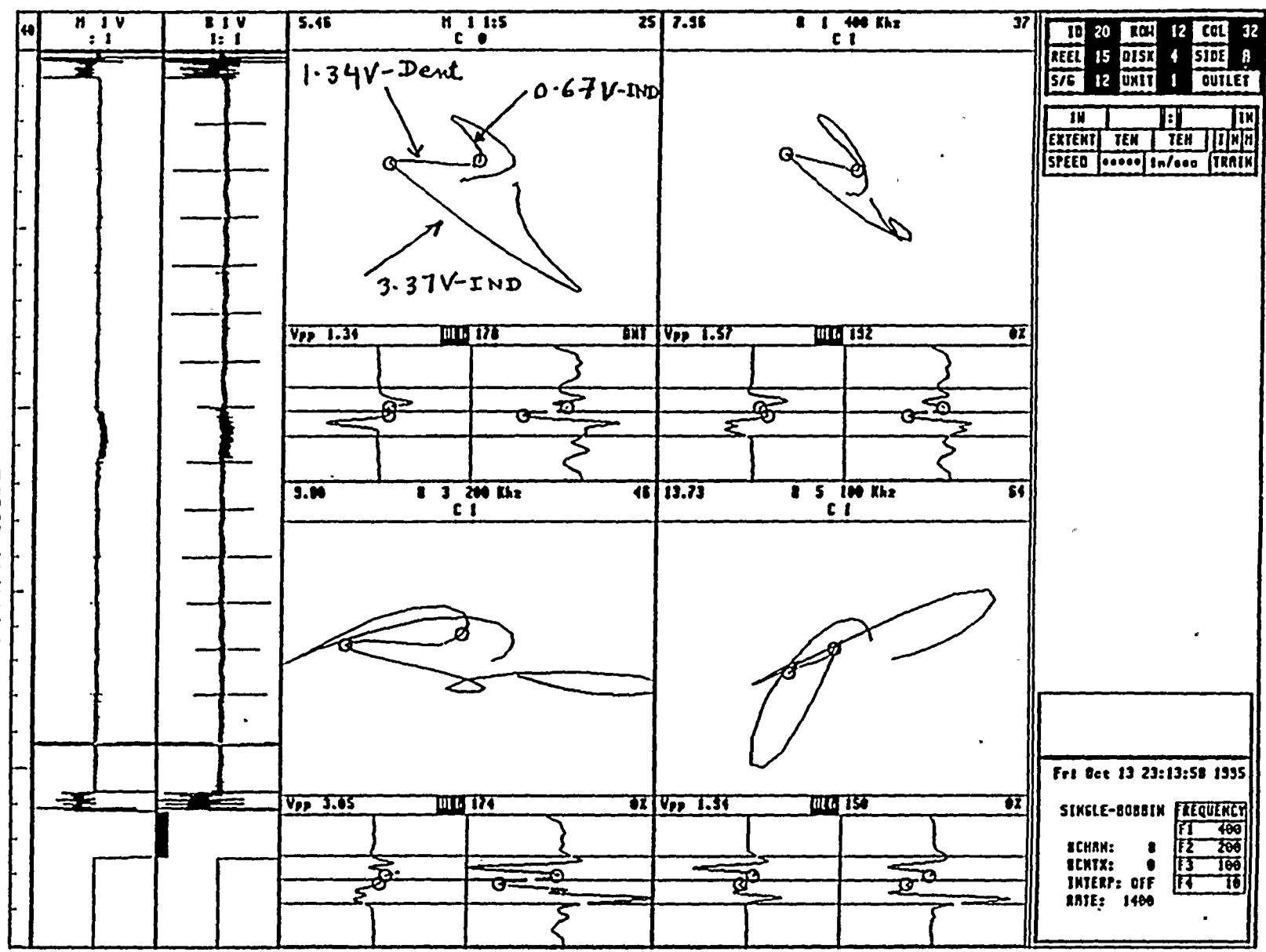


Figure I-3

EC062 01/15/98 07:27:58

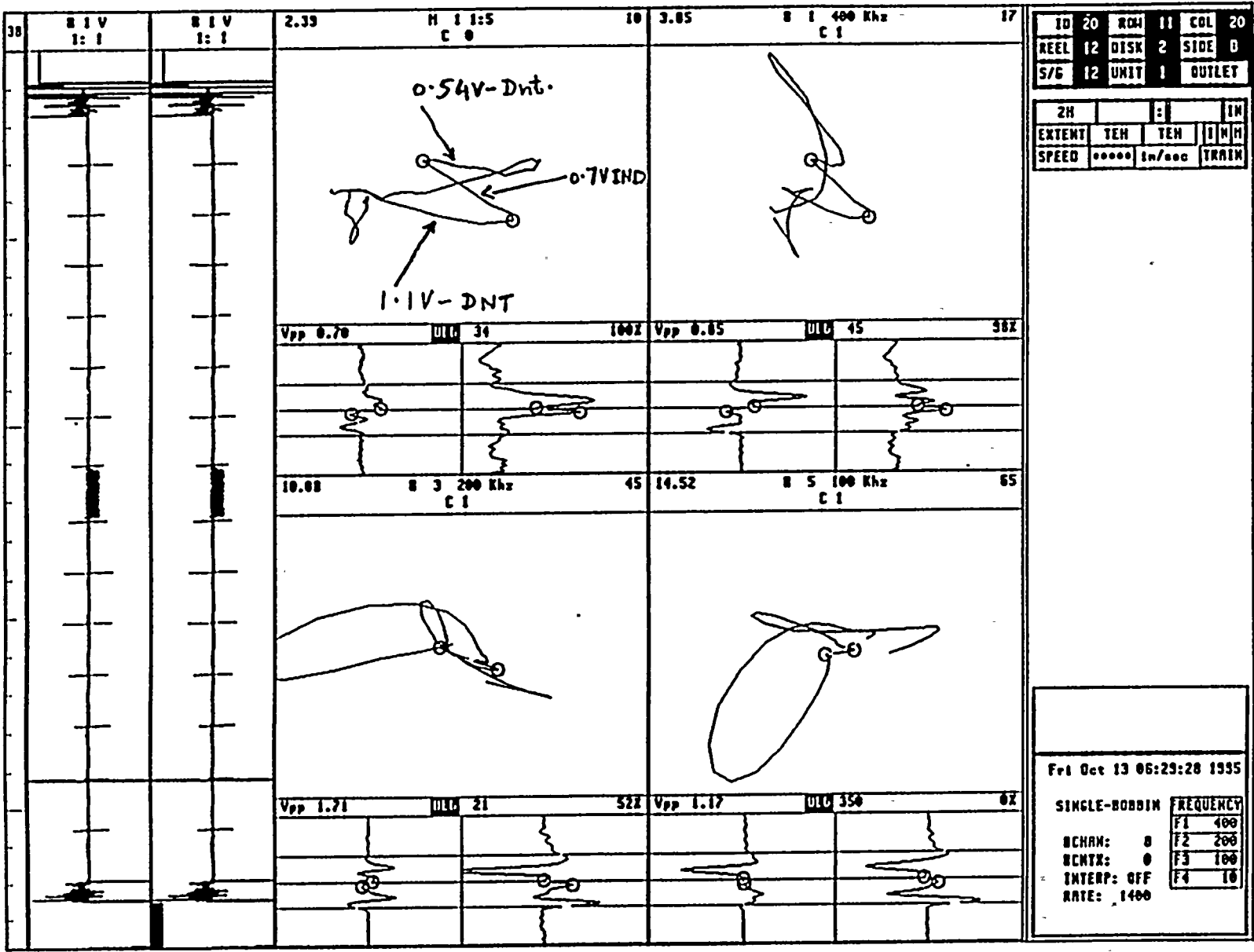


Figure 1-5

EC062 01/15/98 08:56:24

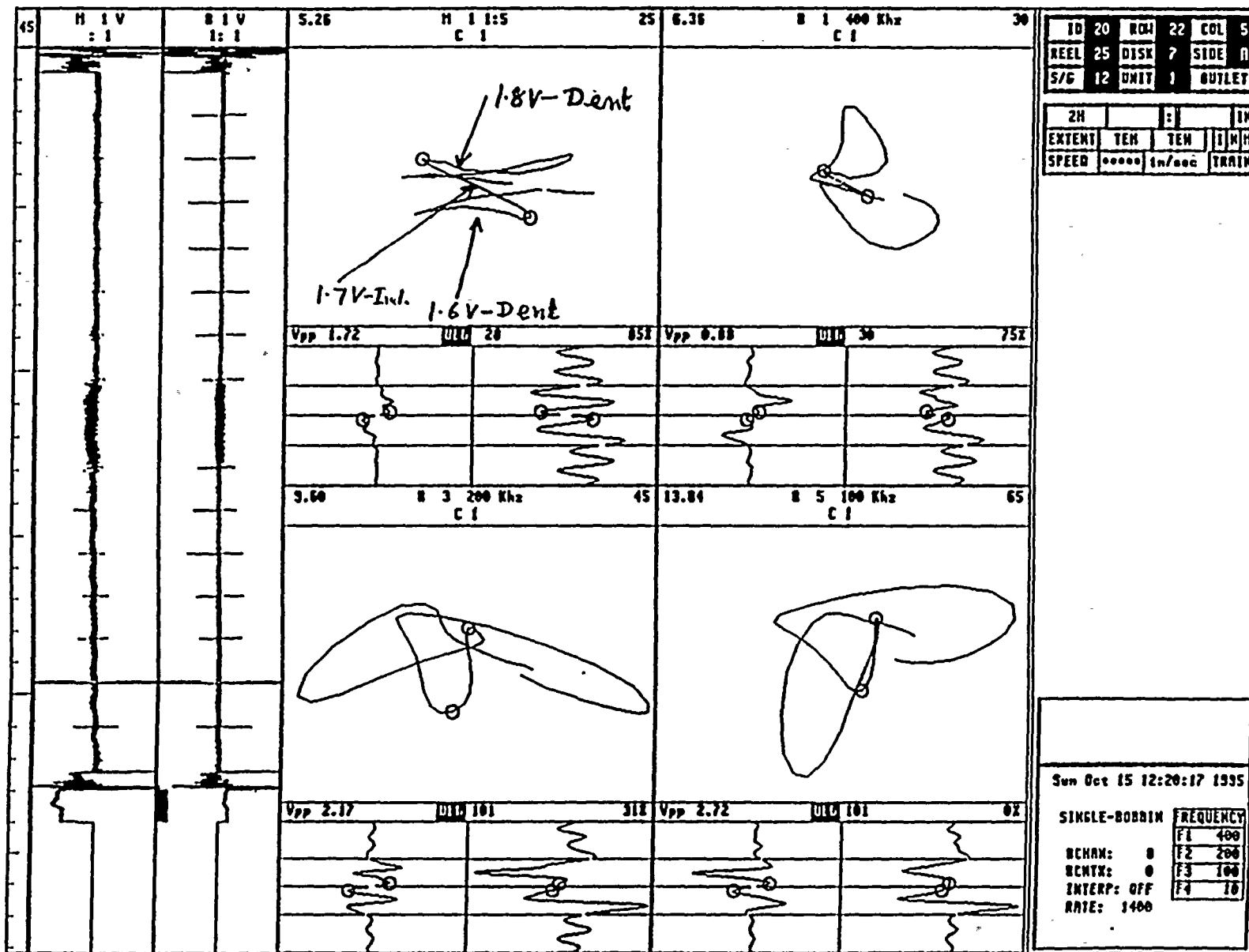


Figure 1-6

EC062 01/15/98 13:28:48

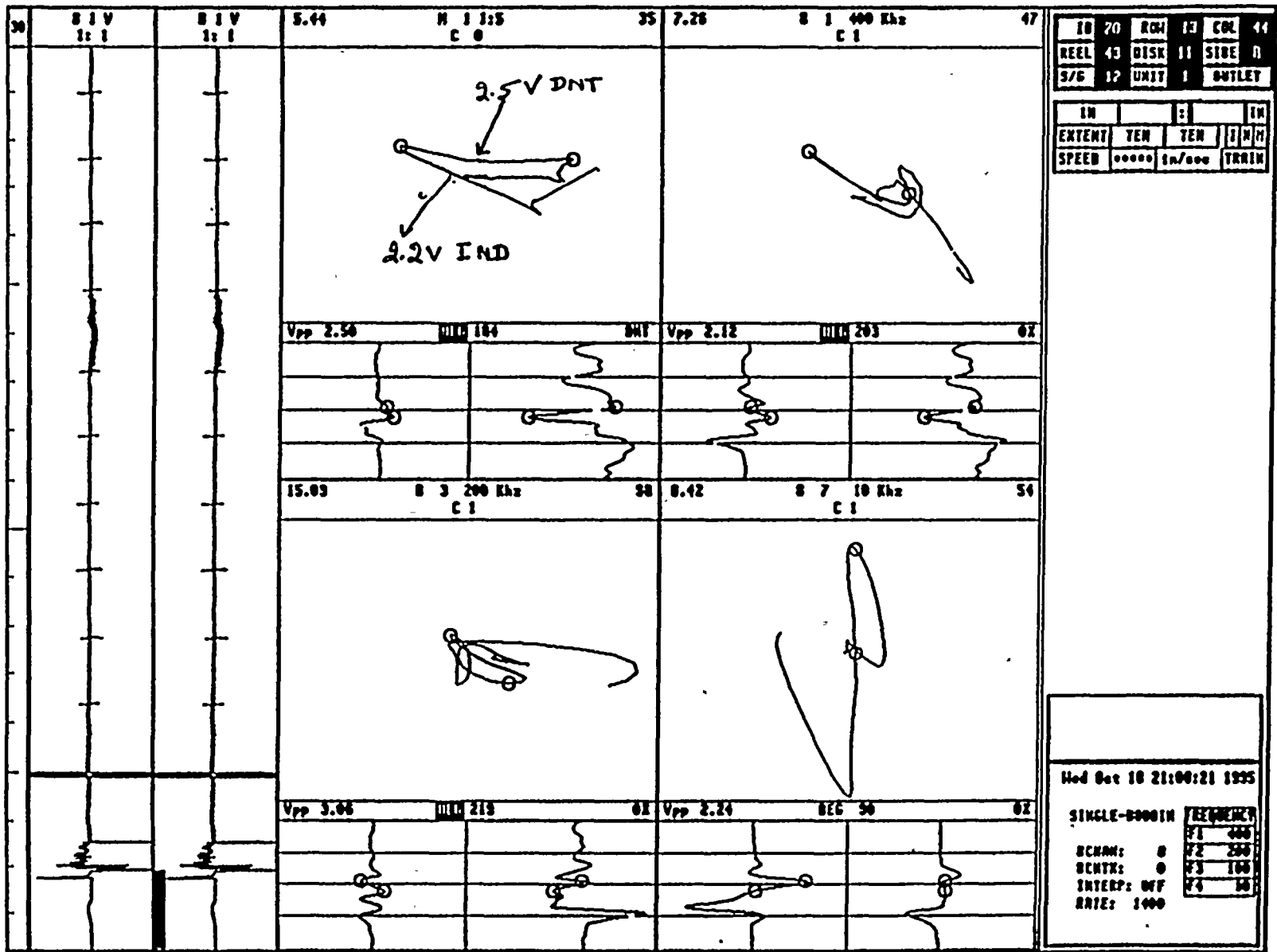


Figure 1-7

EC062 01/14/98 15:13:43

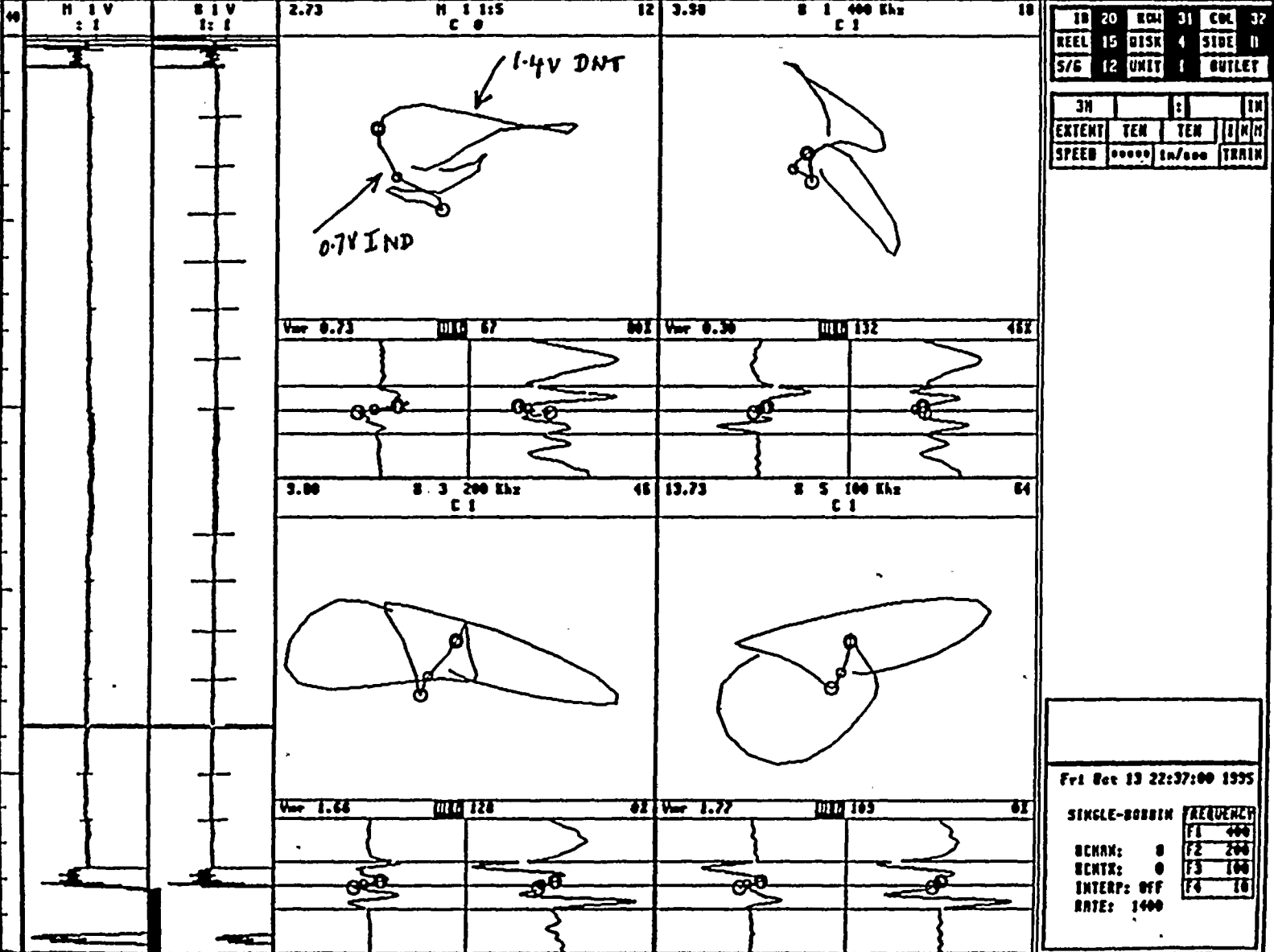


Figure 1-8

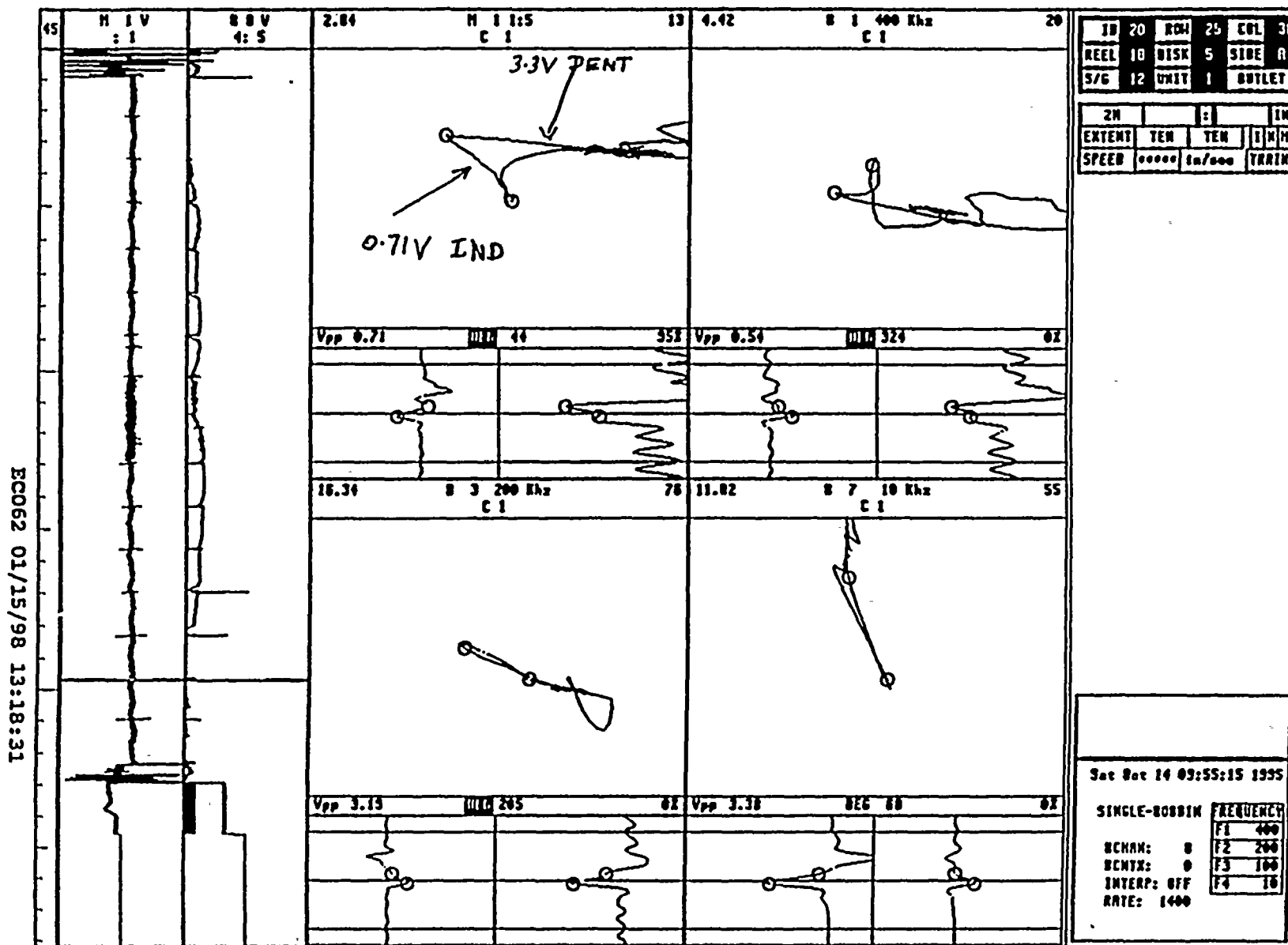


Figure 1-9

EC062 01/15/98 07:56:55

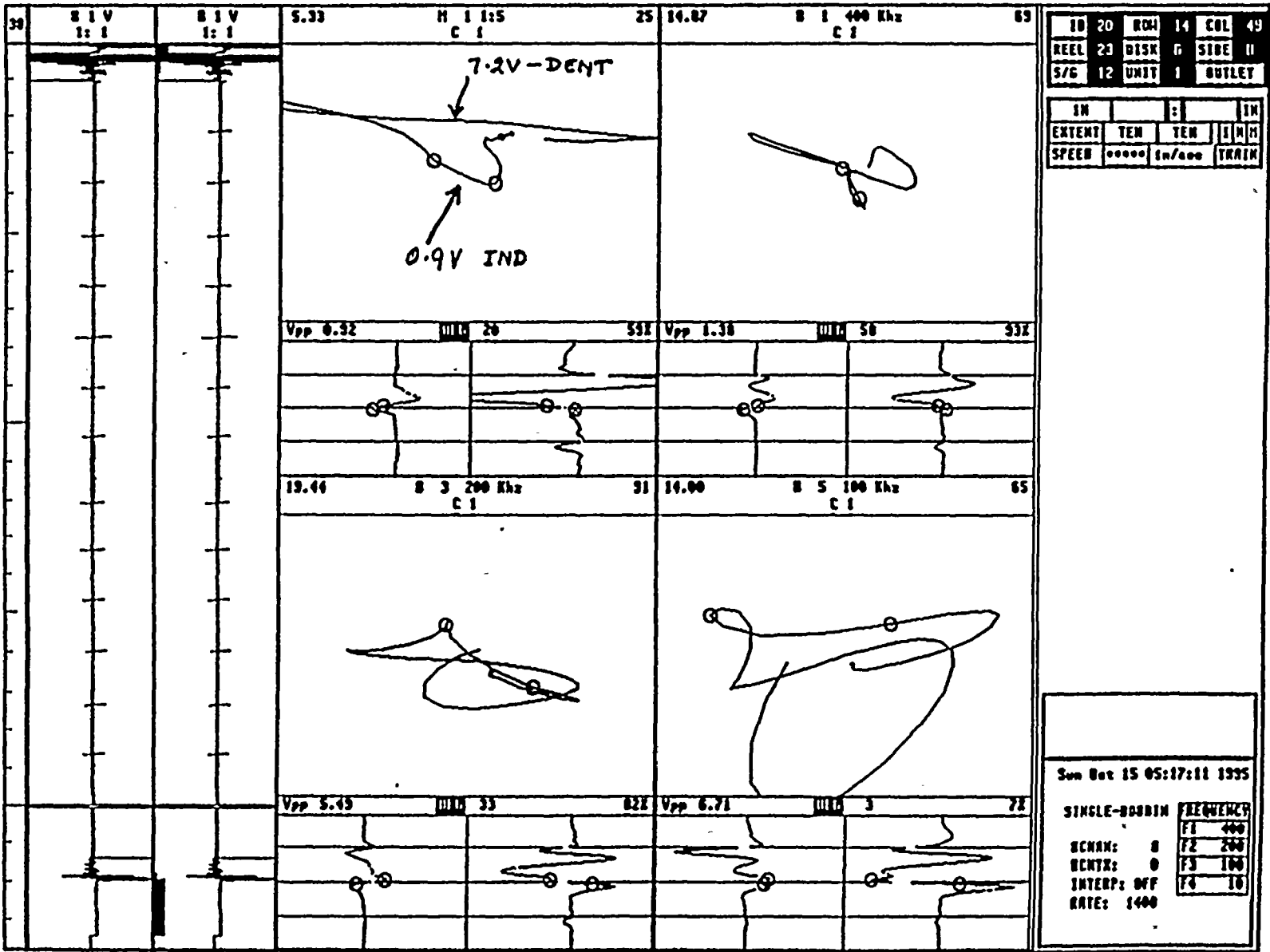


Figure 1-10

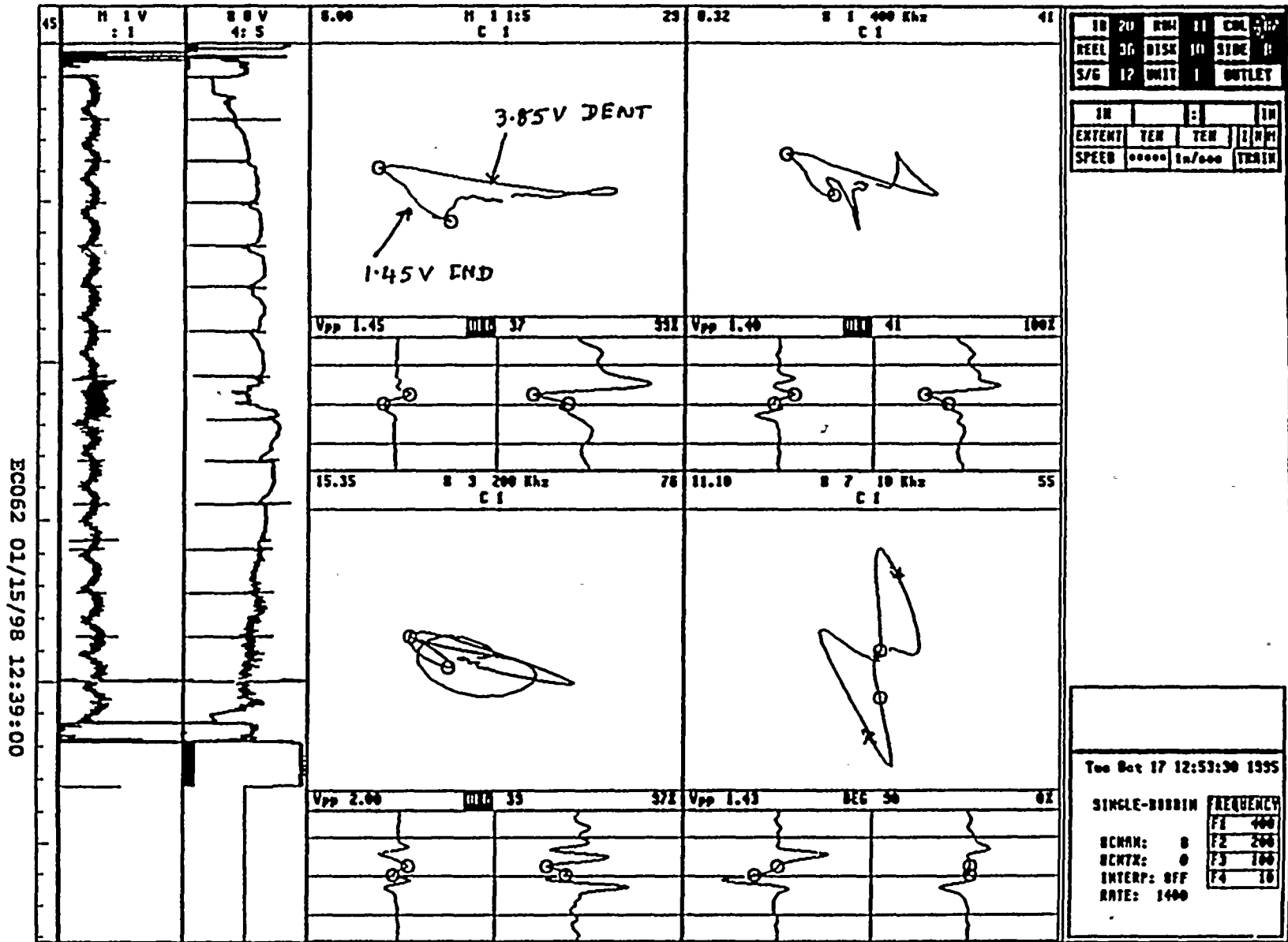


Figure 1-11

RC062 01/15/98 12:36:04

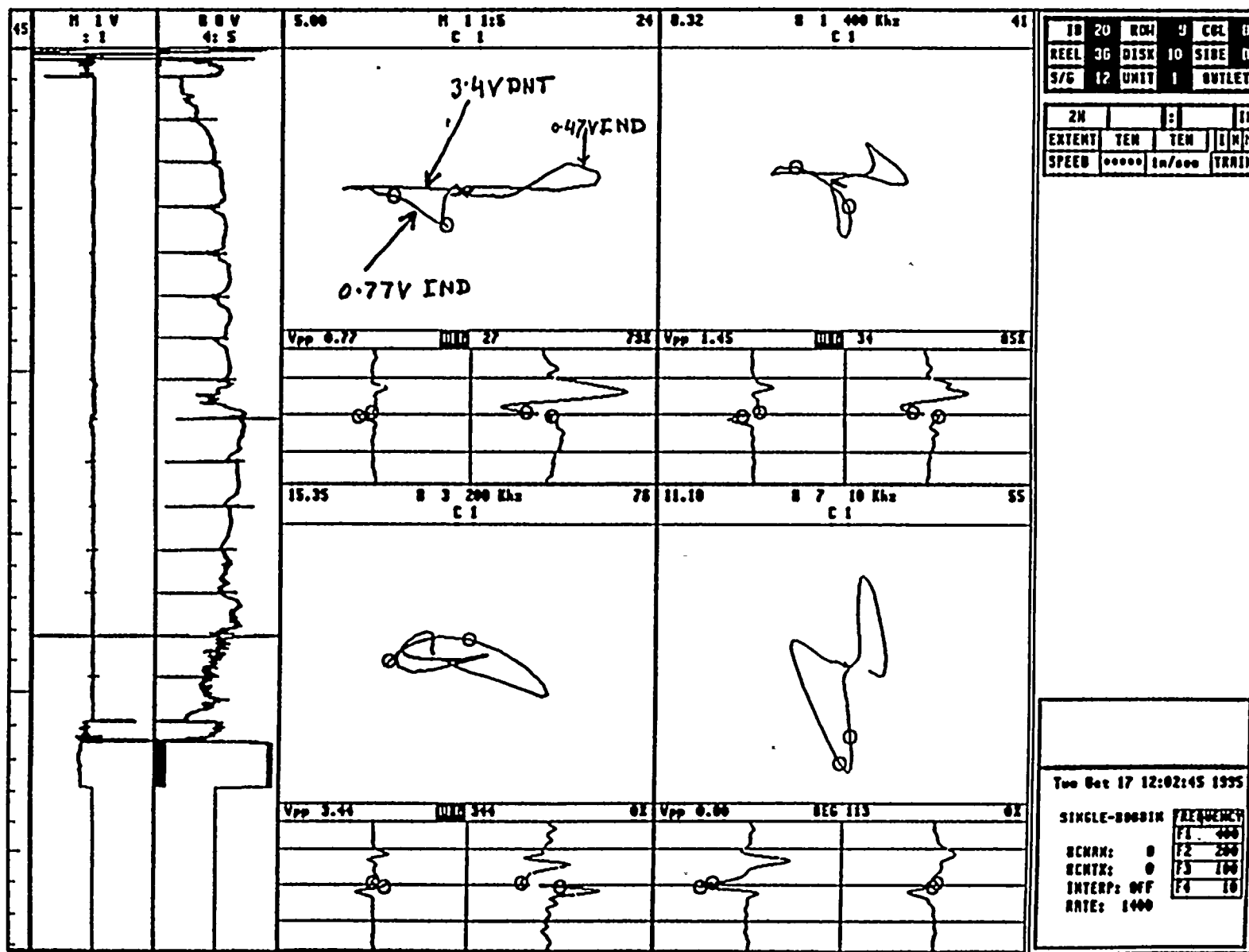


Figure 1-12

EC062 01/15/98 08:16:00

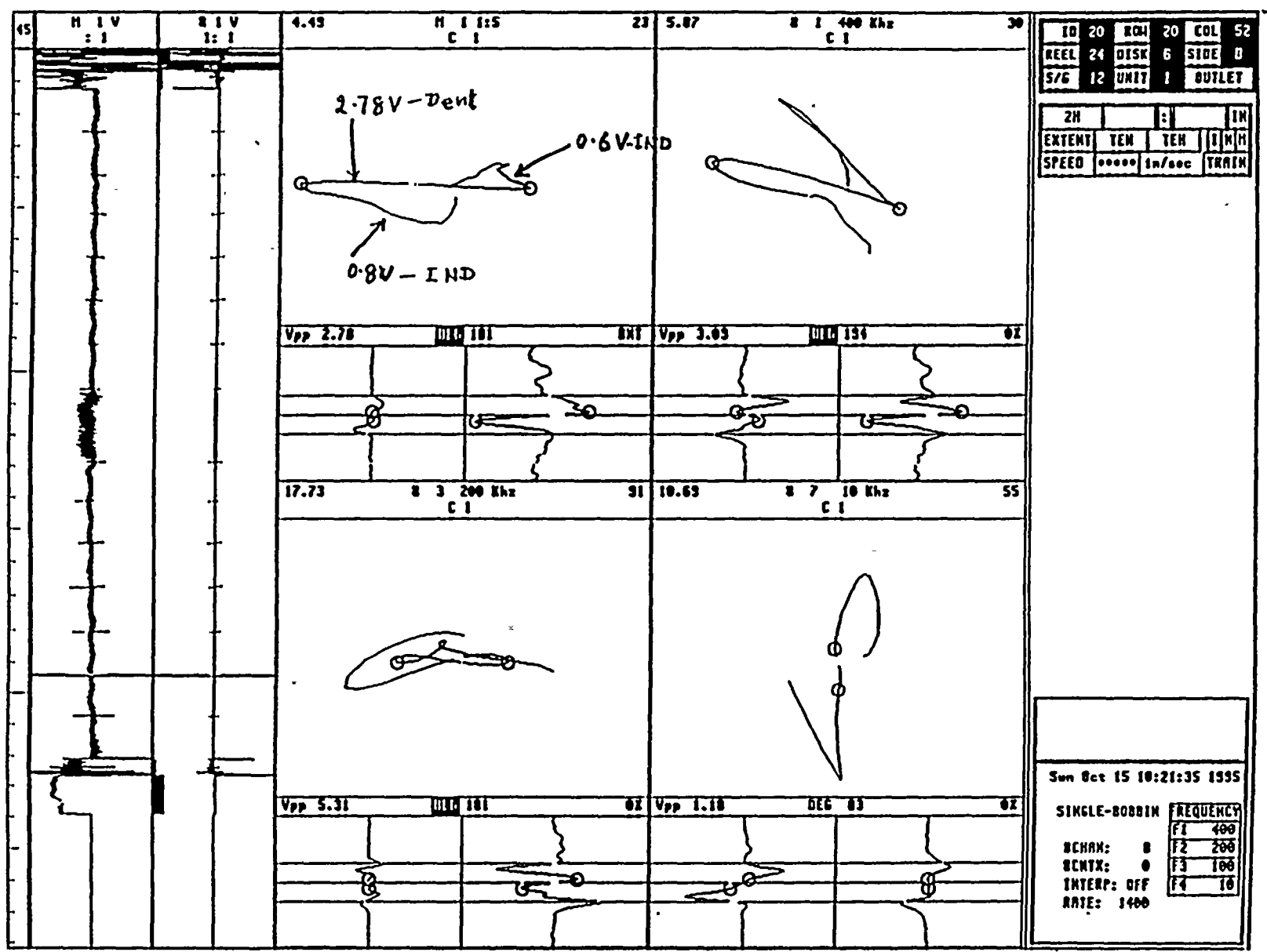


Figure 1-13

EC062 01/16/98 07:30:04

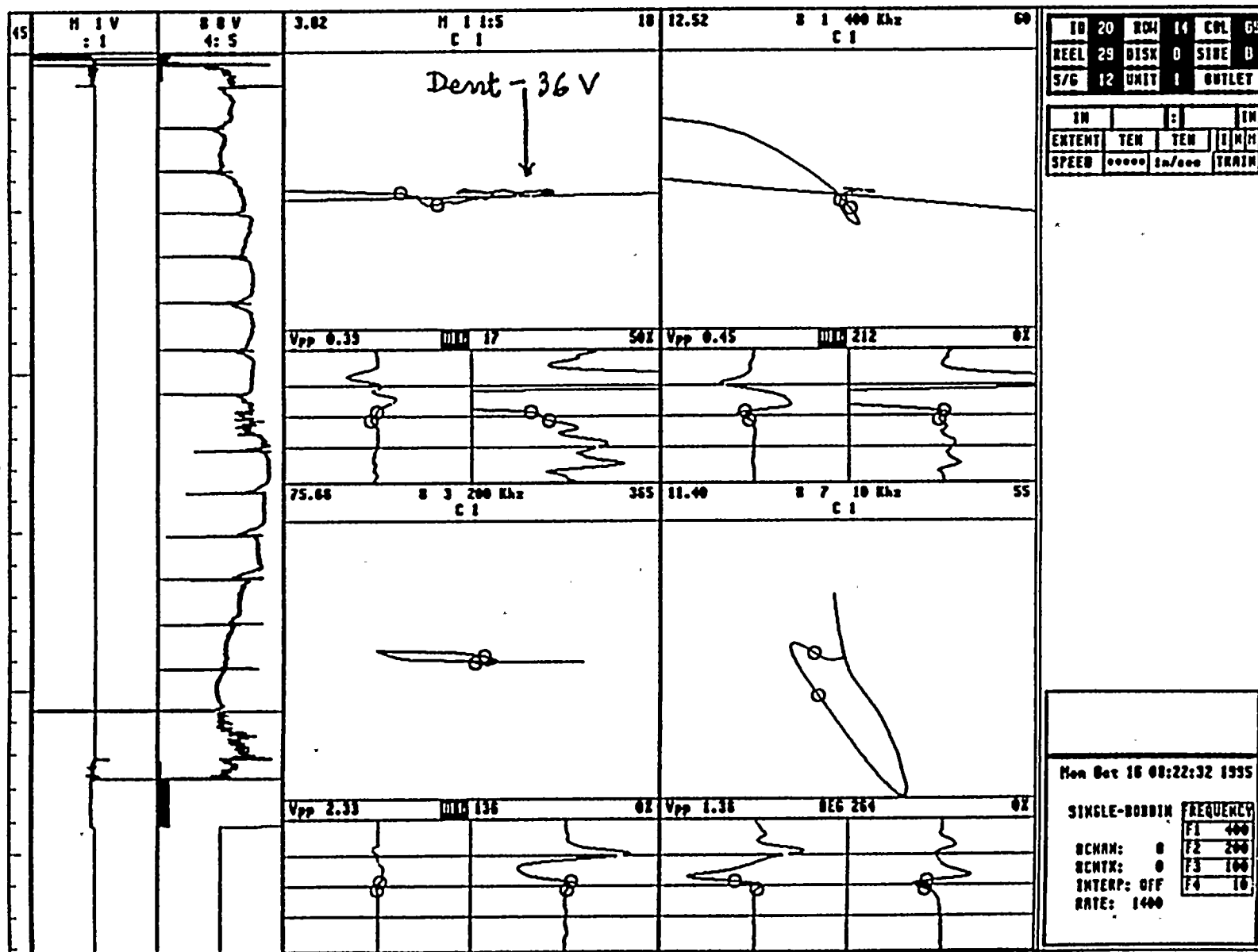


Figure 1-14

File Analysis System Tools Layout Add Displays Help

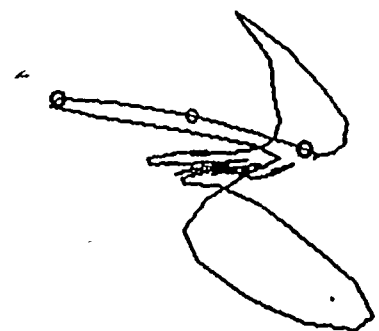
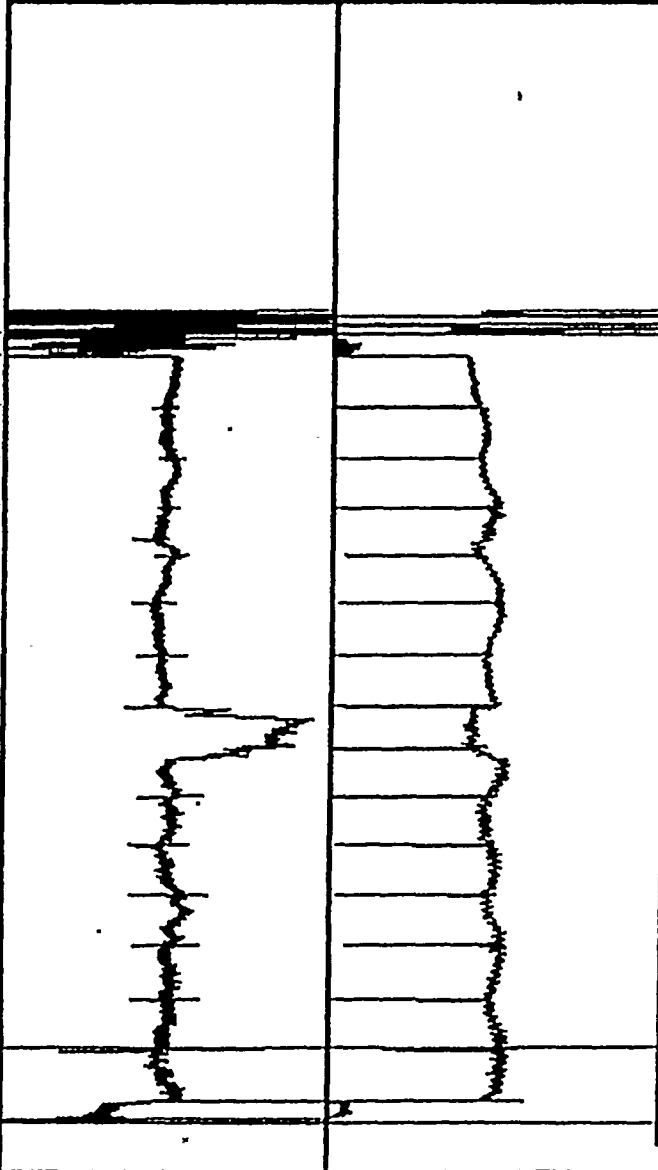
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HDD

SG22CCAL00013 MON 16:44:08 APR-22-96 SG 22 ROW 9 COL 28 I192

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	G0	C0	Vert	G1	C5	Vert	0.31 v/d	span 16	rot 15		

TEC-
TSC-
1C-
2C-
3C-
4C-
5C-
6C-
7C-
7H-
6H-
5H-
4H-
3H-
2H-
1H-
TSH-
TEH-



Vpp	MxR	Vmx	GAn	180
1.36 volts 191 deg DNT				chan
1H + 0.06				> <

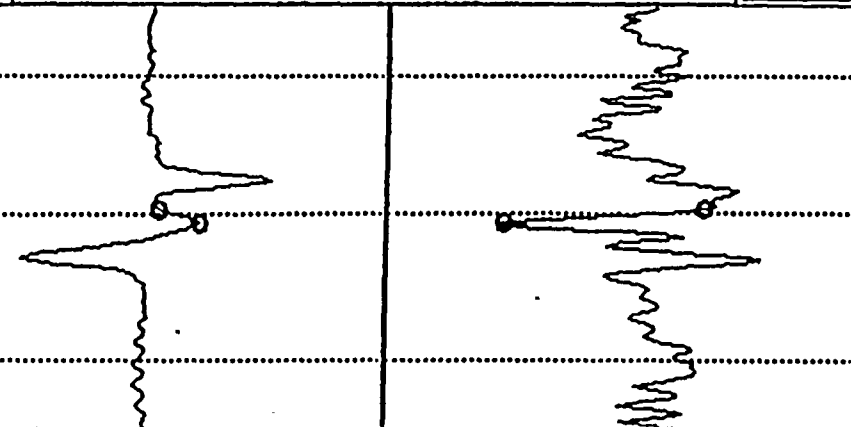
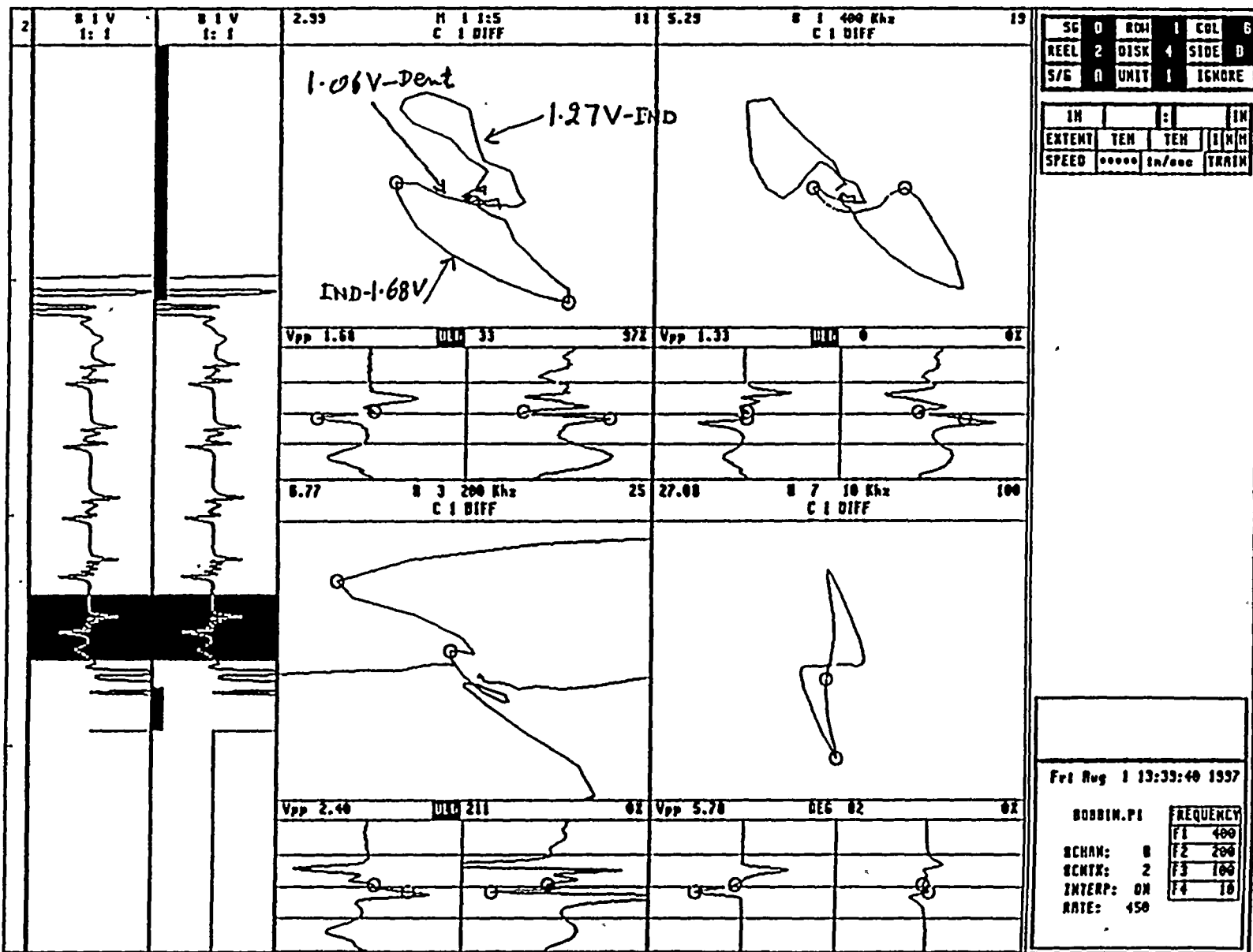


Figure I-15

EC062 01/17/98 11:57:32



ENG _____ 08/01/97 IGNORE UNIT: 1 SG: A REEL: 2 PRI

Figure 2-1

EC062 01/17/98 11:48:10

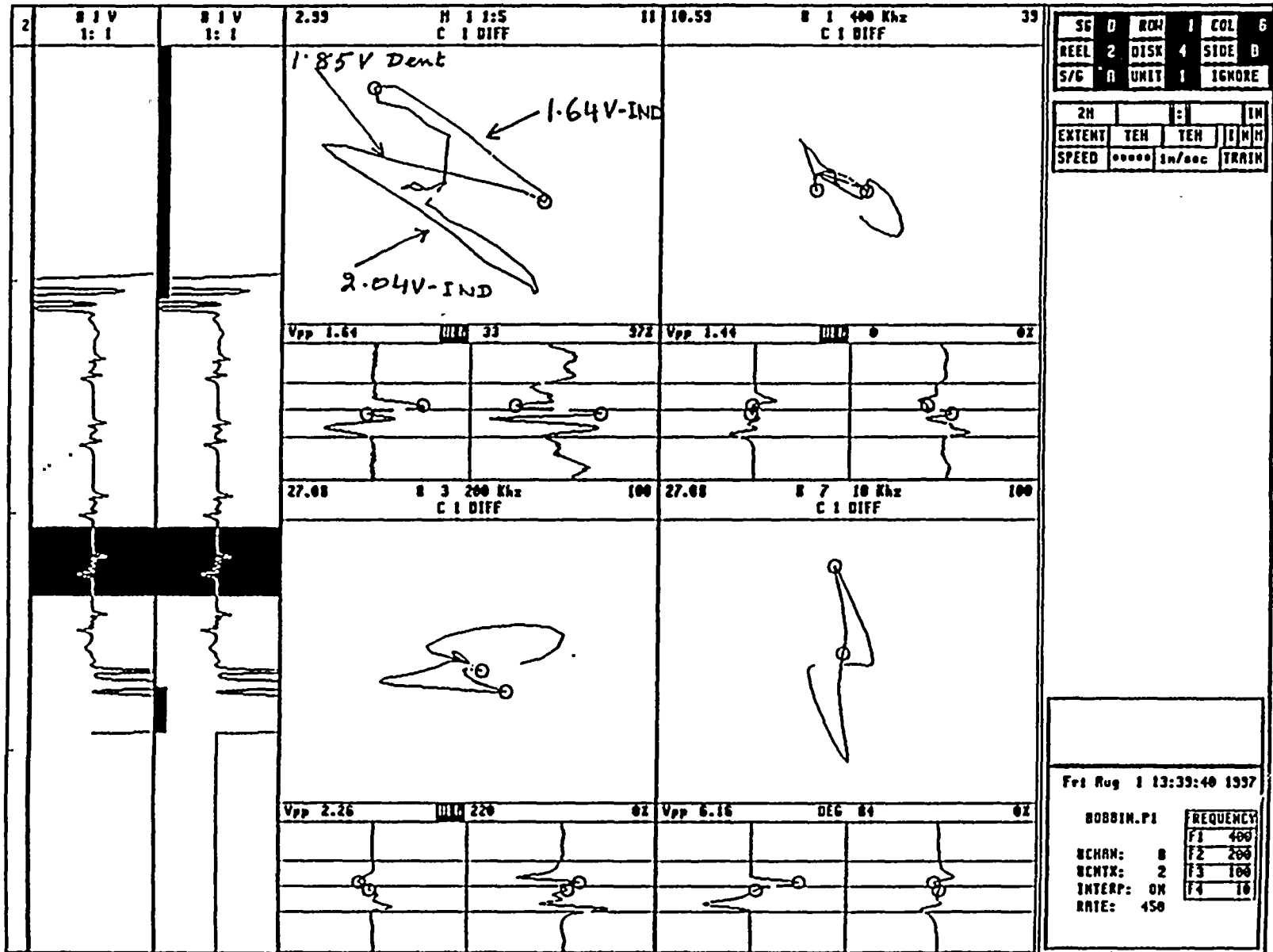
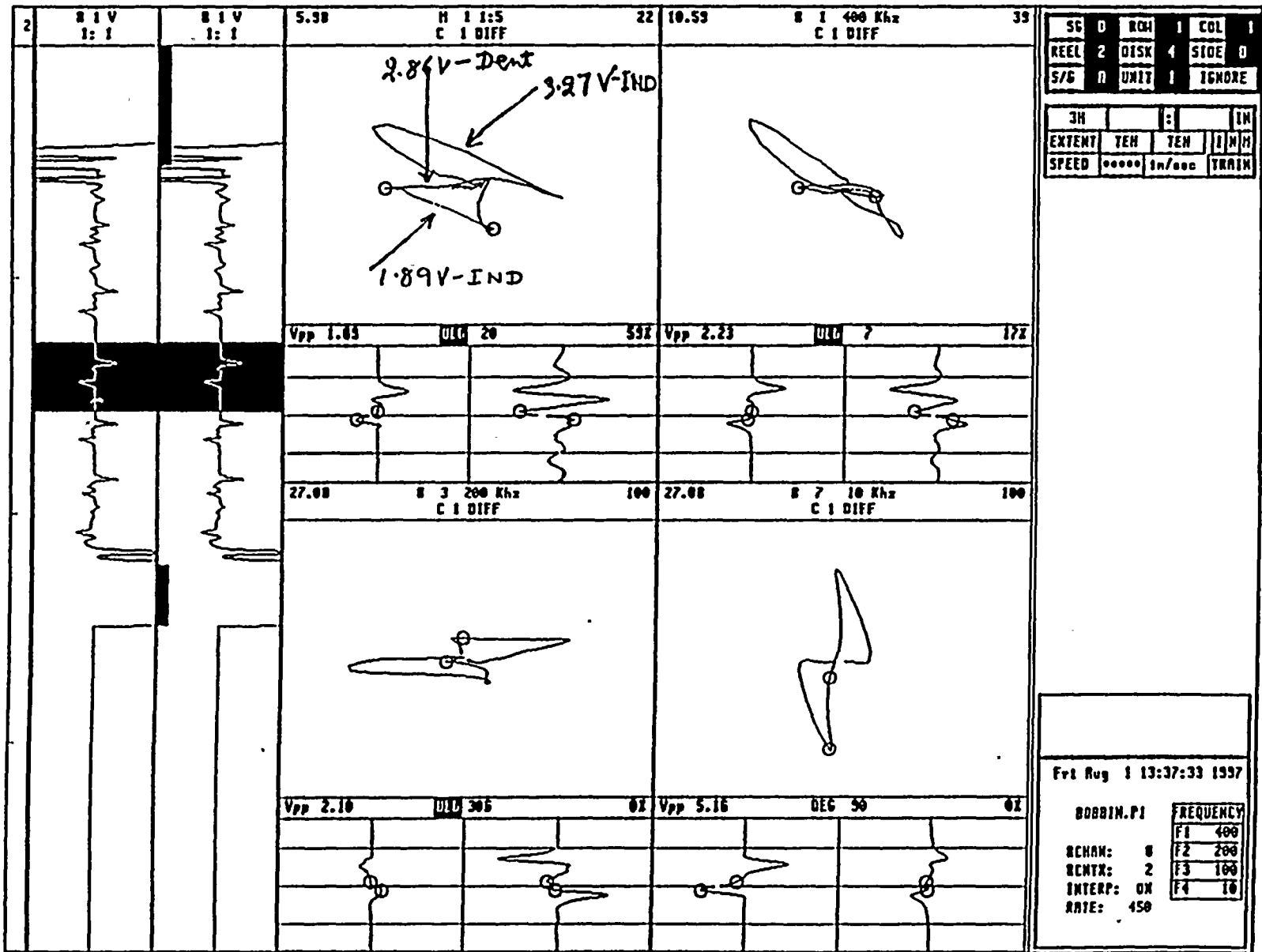


Figure 2-2

ENG 08/01/97 IGNORE UNIT: 1 SG: A REEL: 2 PRI

EC062 01/17/98 11:41:28



ENG _____ 08/01/97 IGNORE UNIT: 1 SG: A REEL: 2 PRI

Figure 2-3

EC062 01/19/98 10:54:08

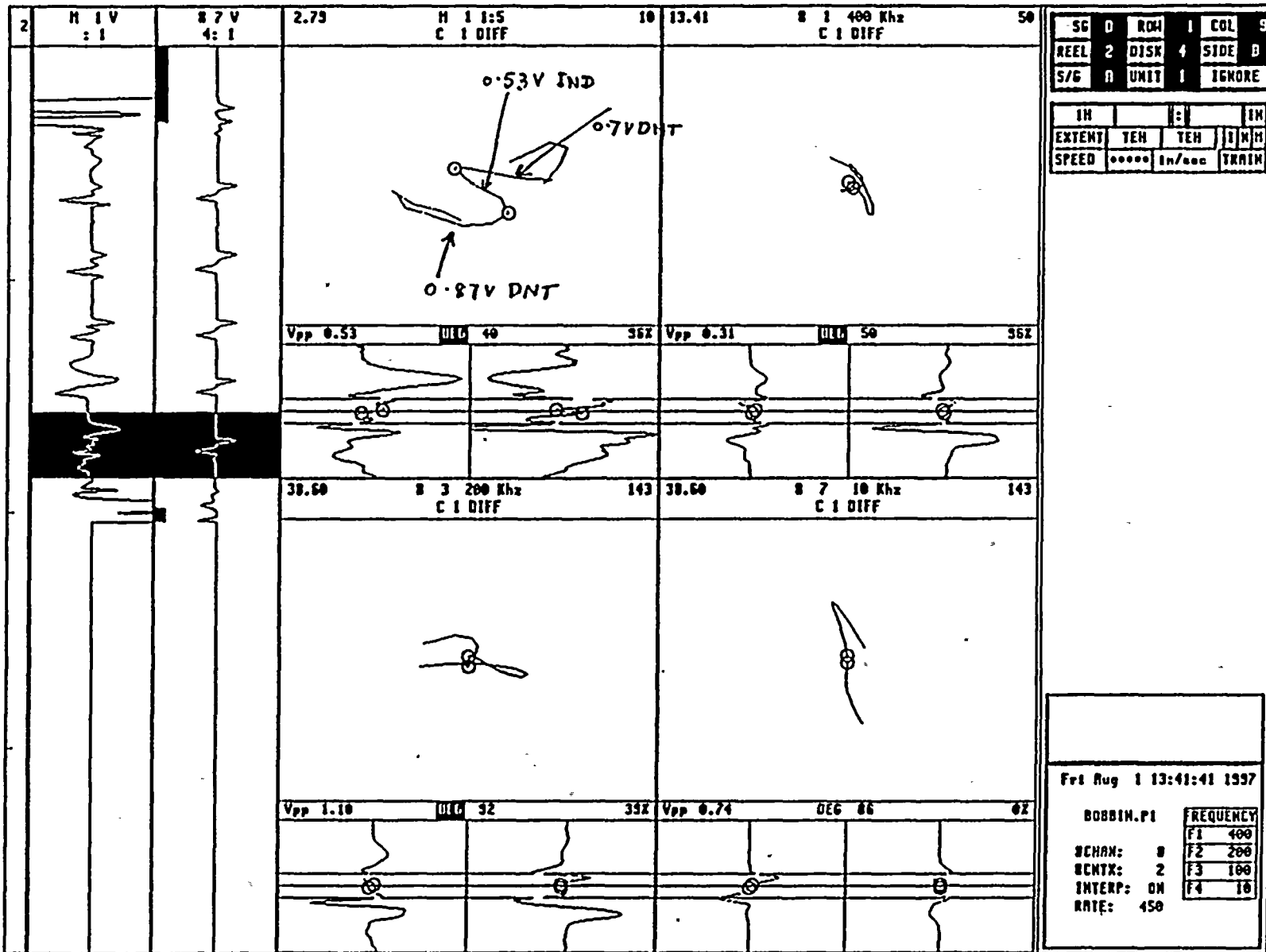


Figure 2-4

ENG

08/01/97 IGNORE UNIT: 1 SG: A REEL: 2 RES

CONFIGURATION

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Vpp 10.0 Hz 180
01H * 0.07

SET VOLT UNITS | SET CAL CURVES

Vpp 10.0 Hz 180
01H * 0.07

Eddymat95: REPORT EDITOR (F: Prnt) 48 03/24/97

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21	1	9	0.25	13	46	0	01H	+0.19	01H01H
21	1	9	0.35	9	31	0	01H	+0.21	01H01H
21	1	9	0.30	15	57	0	01H	+0.23	01H01H
21	1	9	0.24	18	63	0	01H	+0.26	01H01H
21	1	9	0.25	14	49	0	01H	+0.28	01H01H
21	1	9	0.23	11	38	0	01H	+0.30	01H01H
21	1	9	0.21	11	38	0	01H	+0.32	01H01H
21	1	9	0.16	10	34	0	01H	+0.34	01H01H
21	1	9	0.11	9	31	0	01H	+0.37	01H01H
21	1	9	0.42	14	49	0	01H	+0.06	01H01H
21	1	9	0.37	14	49	0	01H	+0.04	01H01H
21	1	9	0.28	11	38	0	01H	+0.01	01H01H
21	1	9	0.16	6	18	0	01H	-0.01	01H01H
21	1	9	0.18	10	34	0	01H	-0.01	01H01H

Edit Clear Recall Tube Delete

Filter: OFF Pta/Scan: 91 XTrans: 0 YTrans: 0 XRot: 75 ZRot: 135

55.4

NO MEAS

01H * 0.07

Eddymat95: Analysis [C]-1989, 00 User: 100 primary: [MB]

Tube Comments: 4 mol 9

01H -0.34

0.34

EC062 01/17/98 12:10:48

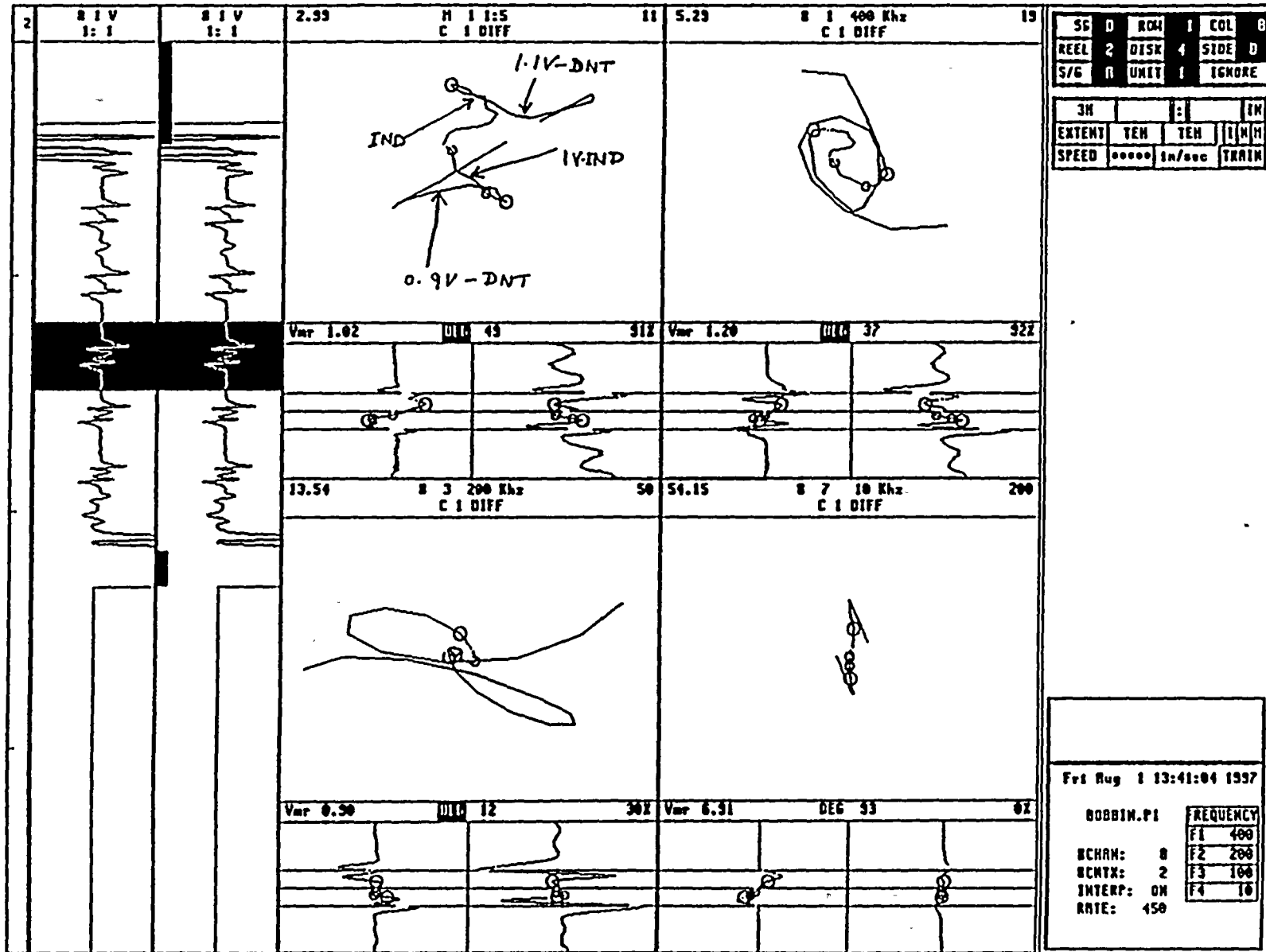


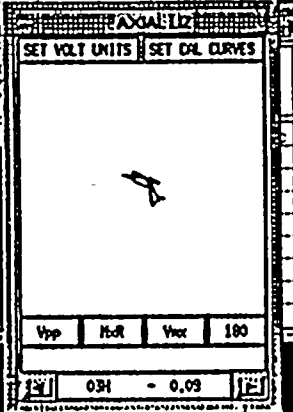
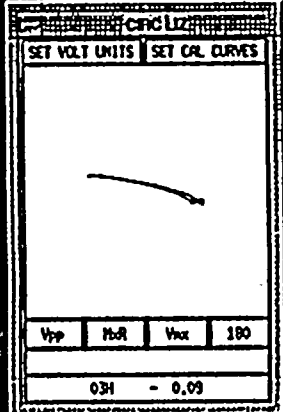
Figure 2-5

ENG
08/01/97 IGNORE UNIT: 1 SG: A REEL: 2 PRI

File Edit View Analysis Parameters Utility Help

Eddyplus: Analysis Control Panel

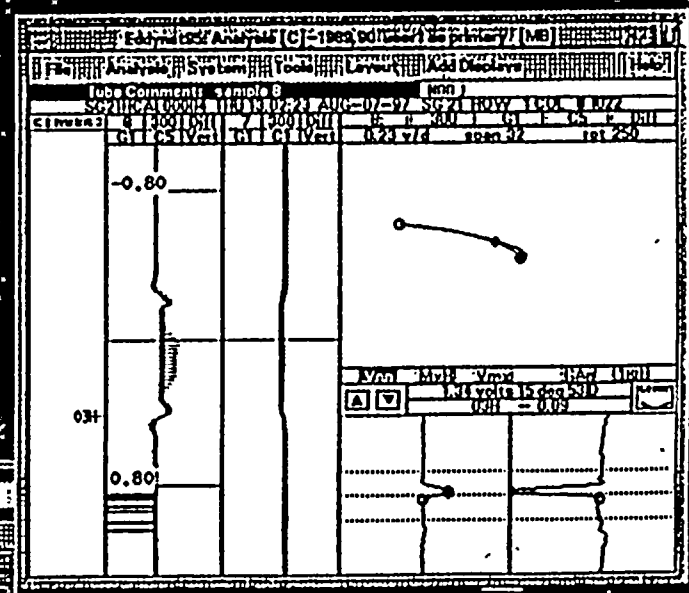
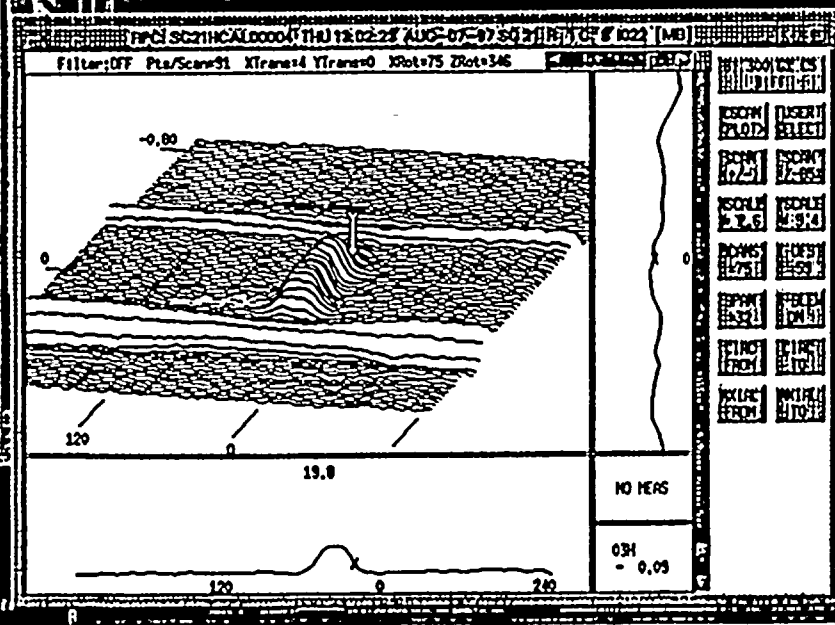
File Edit View Analysis Parameters Utility Help



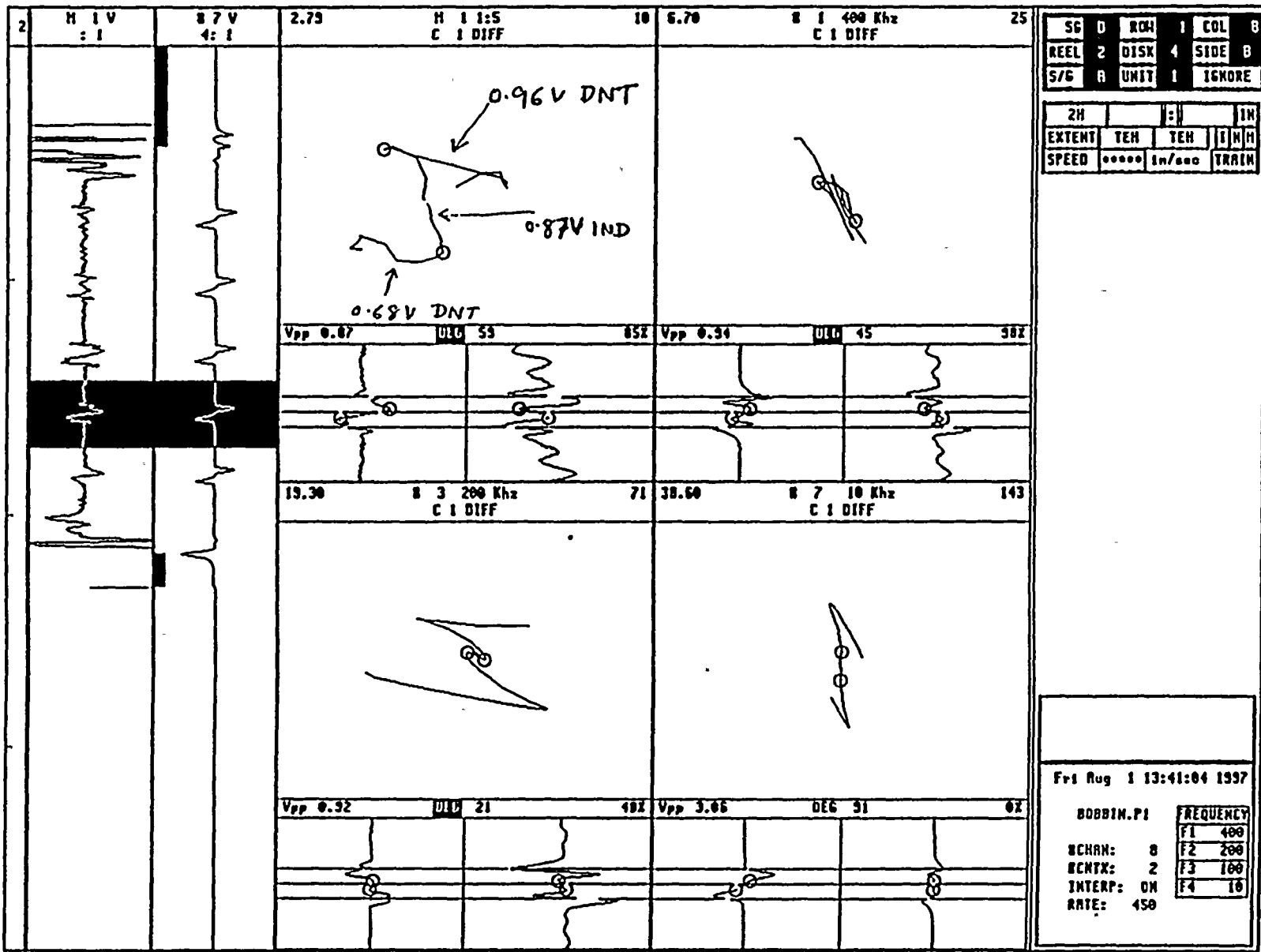
Eddyplus: REPORT EDITOR

Run	Time	Peak	Height	Area	Width	Height	Area
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21	1	8	1.40	13	46	8	0.09
21	1	8	1.34	15	53	8	0.09
21	1	8	1.18	14	49	8	0.11
21	1	8	0.97	13	46	8	0.13
21	1	8	0.74	9	31	8	0.15
21	1	8	0.60	8	27	8	0.17
21	1	8	0.52	9	31	8	0.20
21	1	8	0.39	7	23	8	0.22
21	1	8	0.33	7	23	8	0.24
21	1	8	0.28	9	31	8	0.26
21	1	8	0.15	20	70	8	0.28
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Edit Clear Recall Tube Delete



EC062 01/19/98 10:57:11



ENG 08/01/97 IGNORE UNIT: 1 SG: A REEL: 2 RES

Figure 2-6

EC062 01/17/98 11:38:17

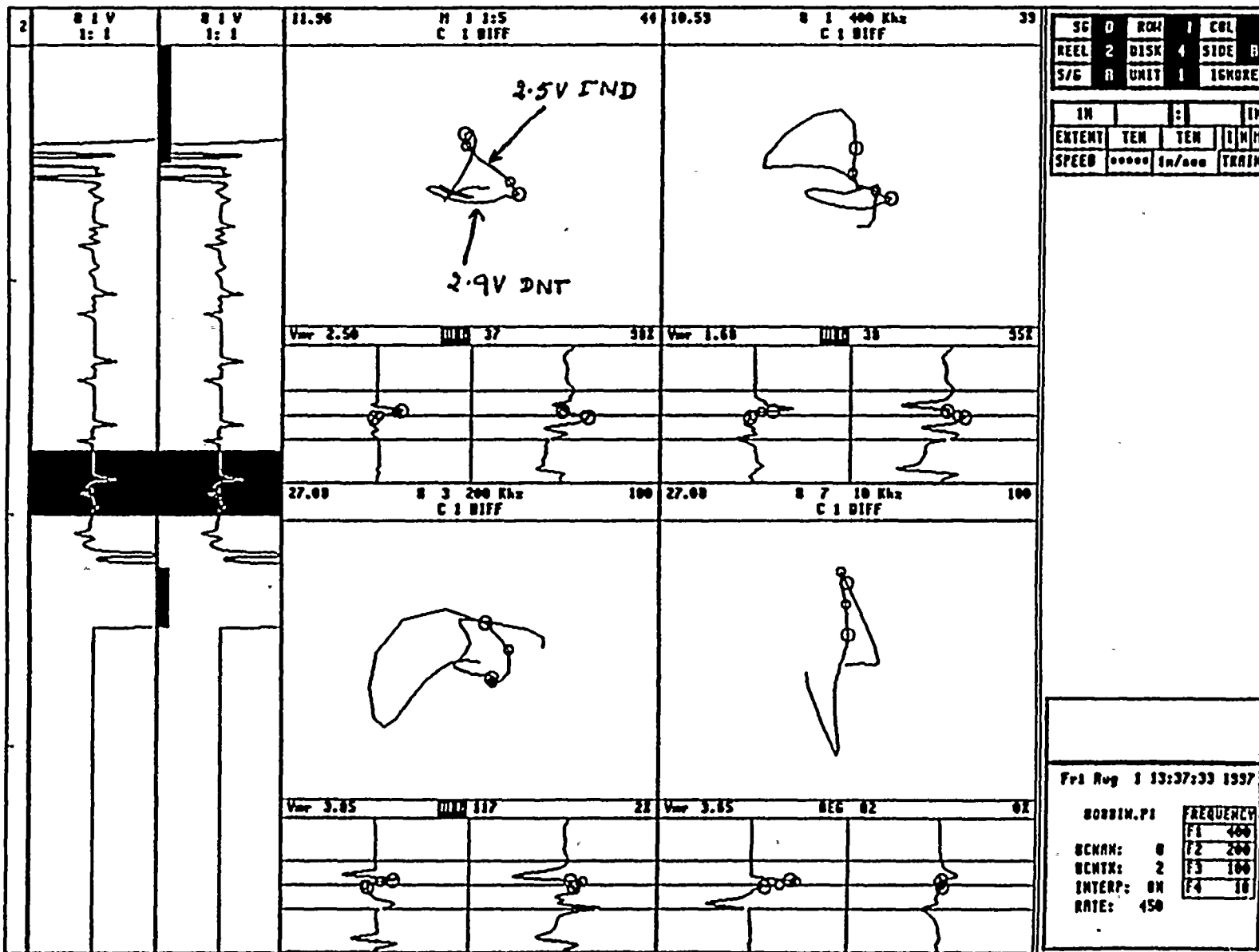
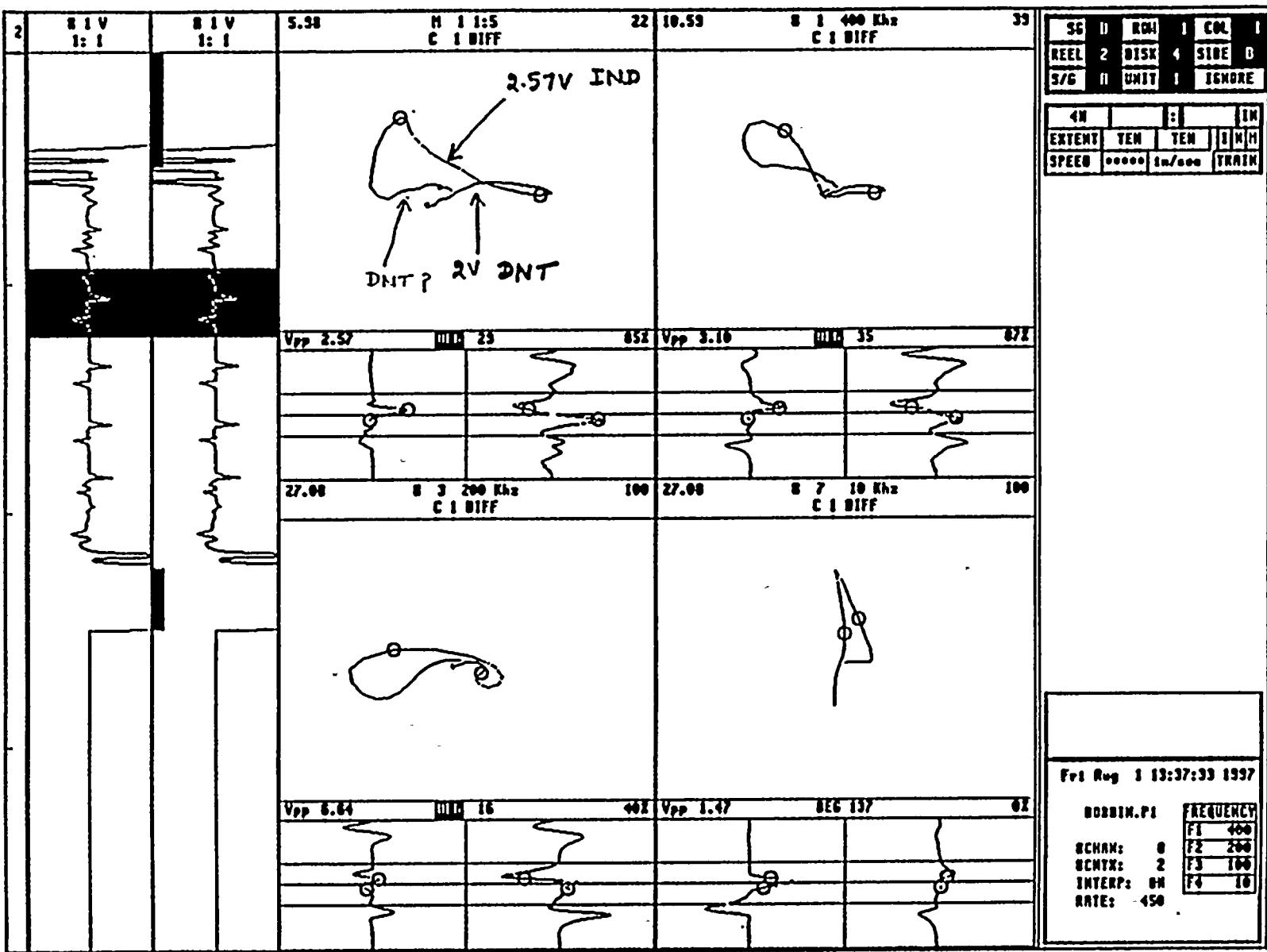


Figure 2-7

EC062 01/17/98 11:43:56



ENG 08/01/97 IGNORE UNIT: 1 SG: A REEL: 2 PRI

Figure 2-8

EC062 01/17/98 13:11:41

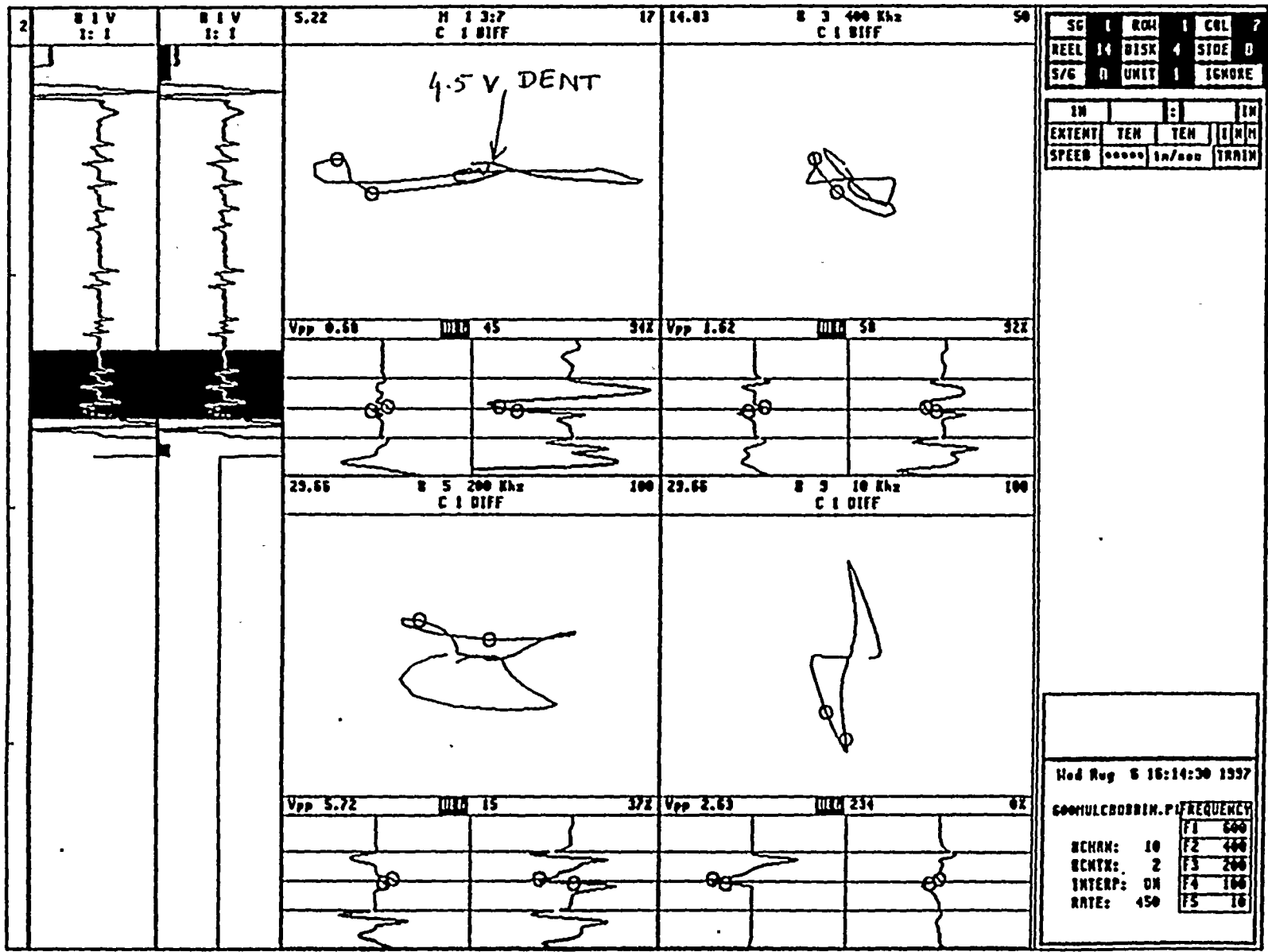
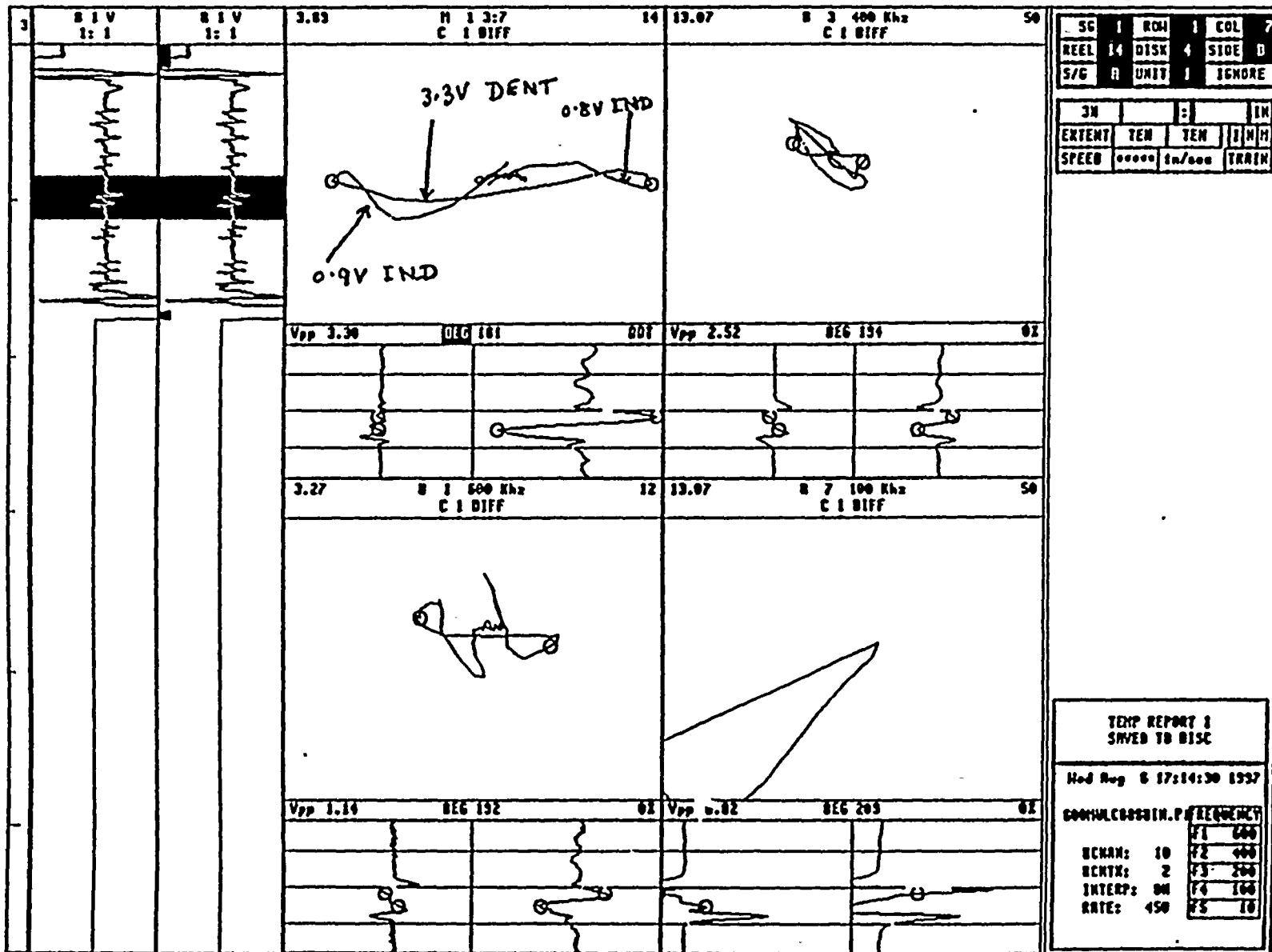


Figure 2-9

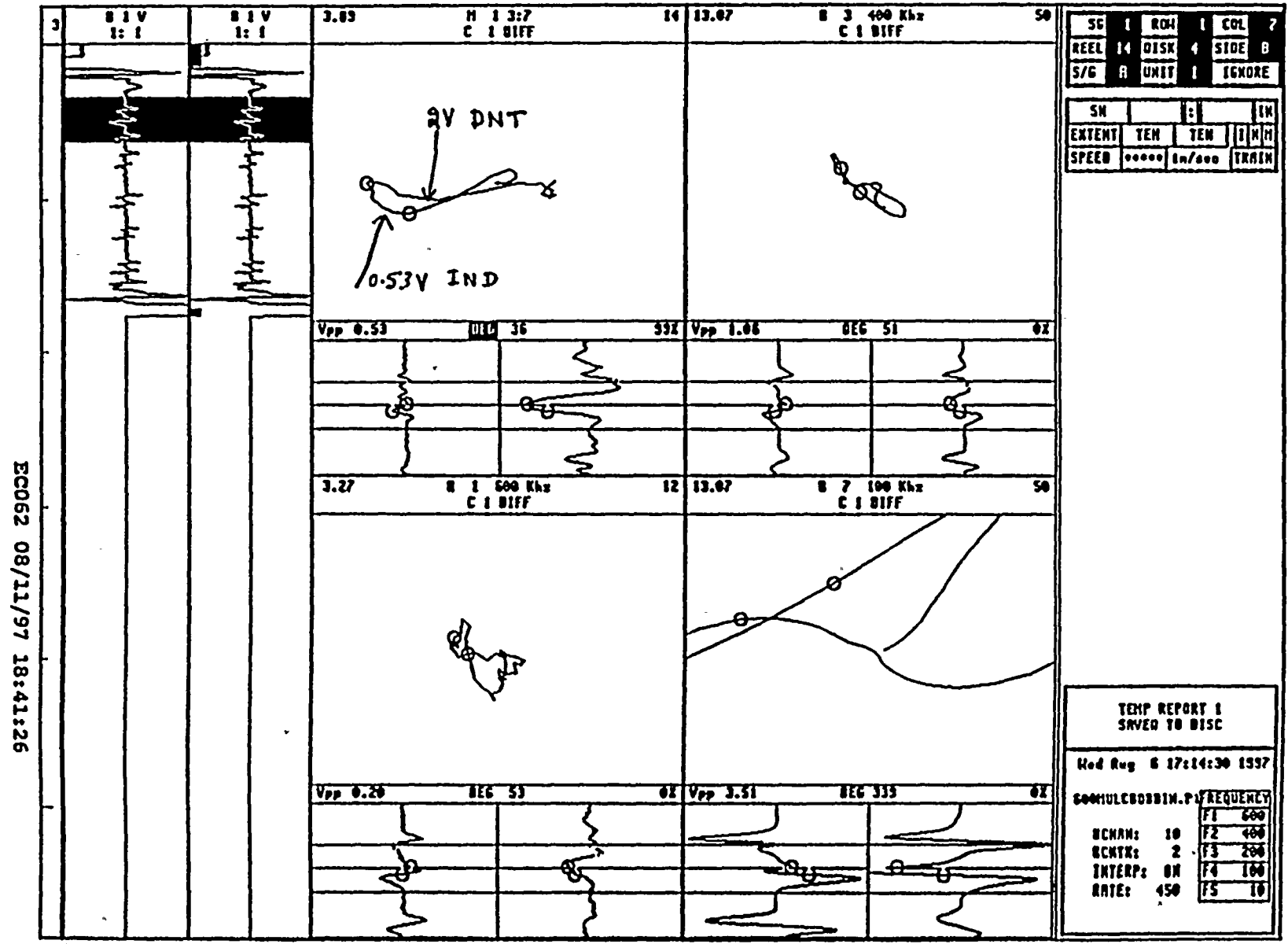
EC062 08/11/97 18:37:44



ENG
08/06/97 IGNORE UNIT: 1 SG: A REEL: 14 PRI

Figure 2-10

ENG _____ 08/06/97 IGNORE UNIT: 1 SG: A REEL: 14 PRI



EC062 08/11/97 18:41:26

Figure 2-11

EC062 08/11/97 18:45:57

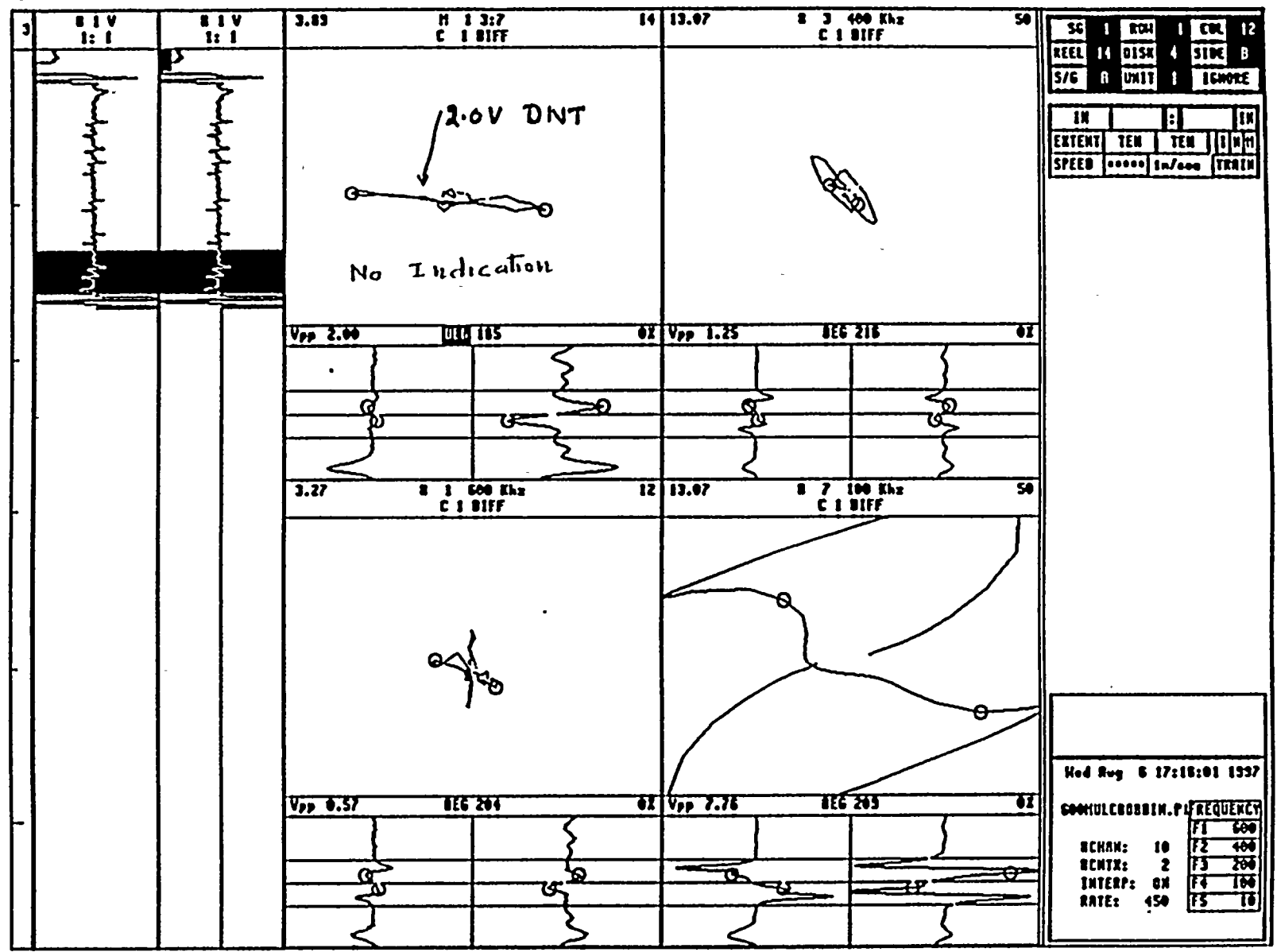


Figure 2-12

EC062 03/20/98 13:03:16

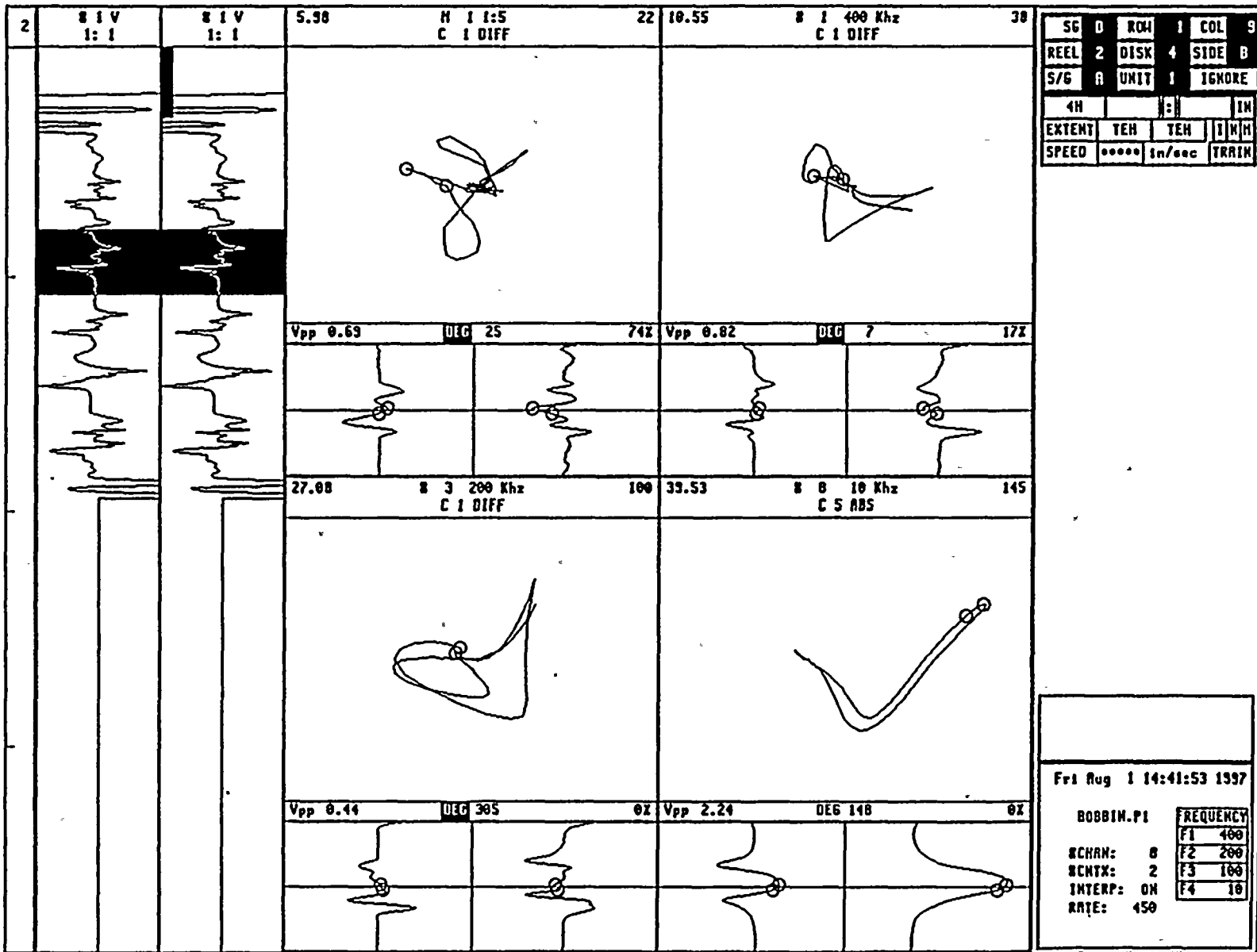
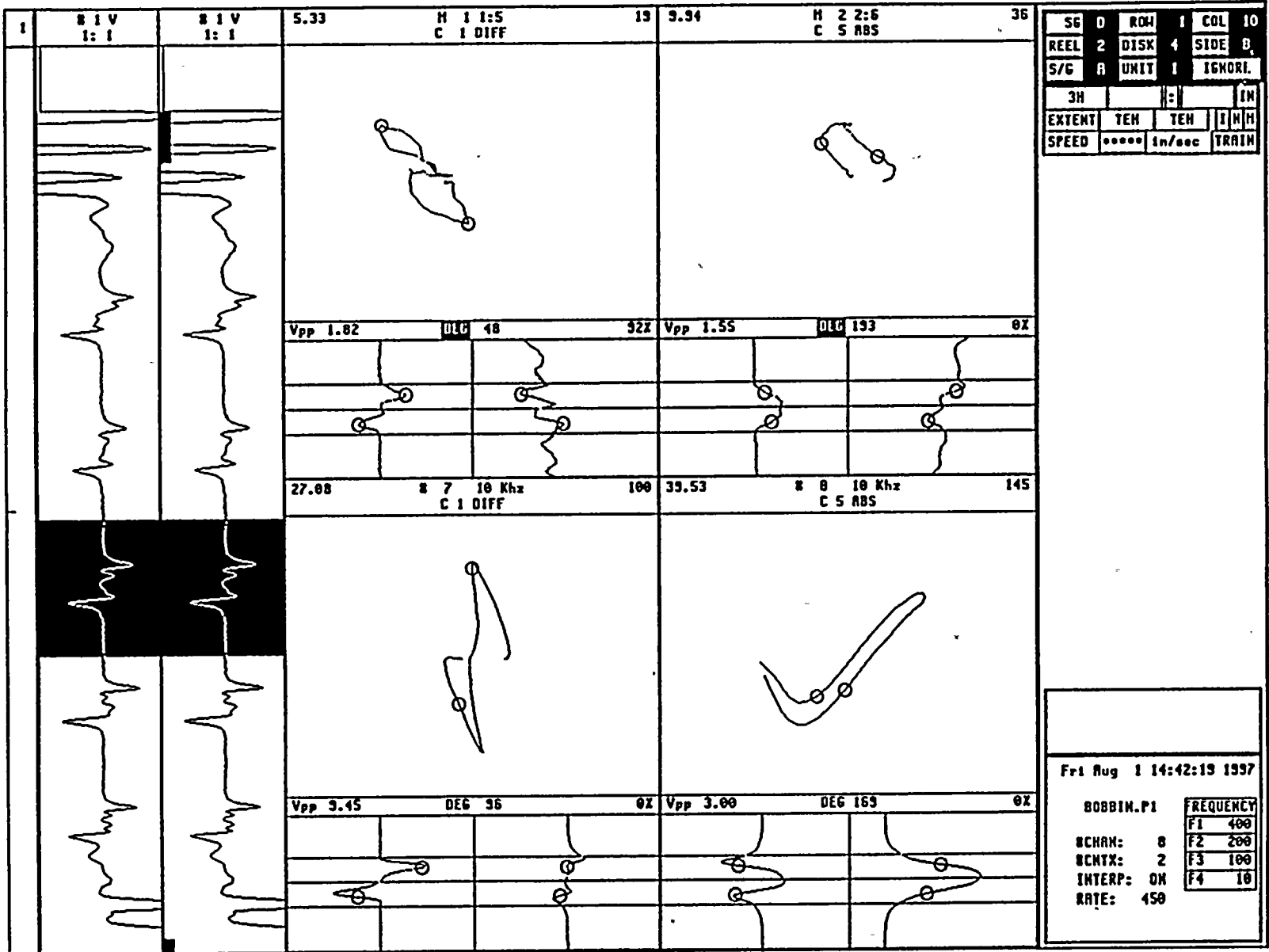


Figure 2-13

EC062 03/18/98 09:51:31



ENG _____ 08/01/97 IGNORE UNIT: 1 SG: A REEL: 2 PRI

Figure 3-1

EC062 03/18/98 09:52:00

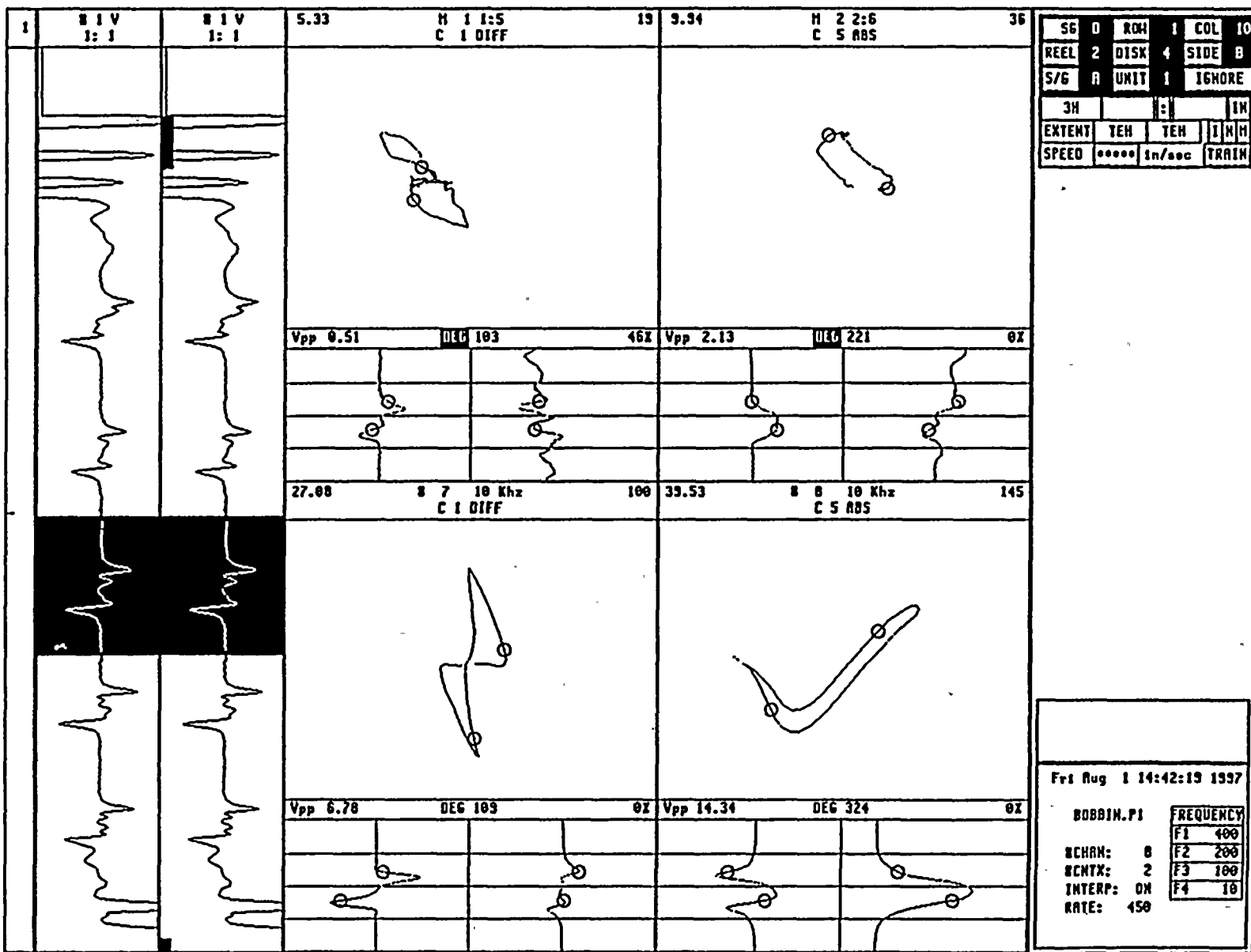
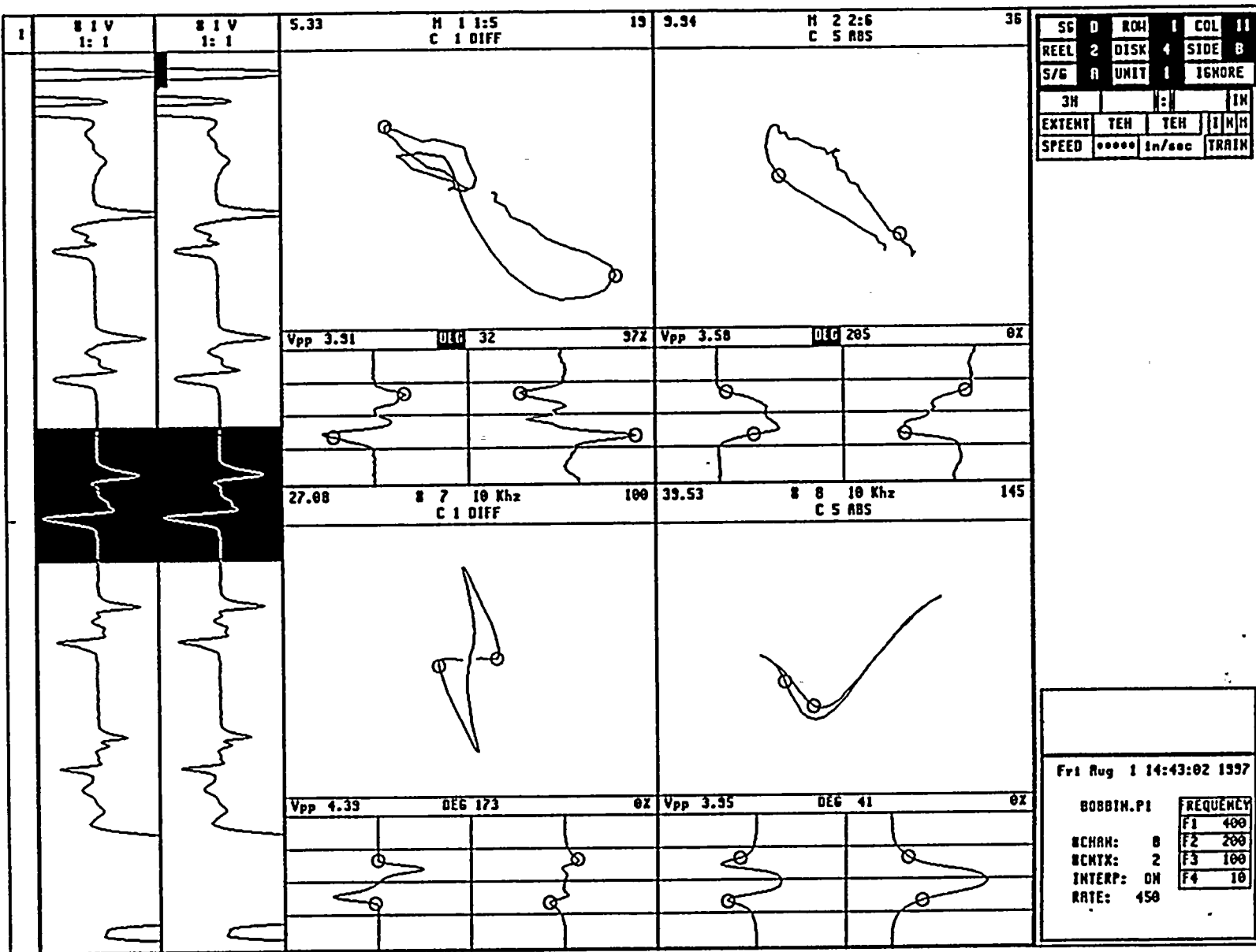


Figure 3-2

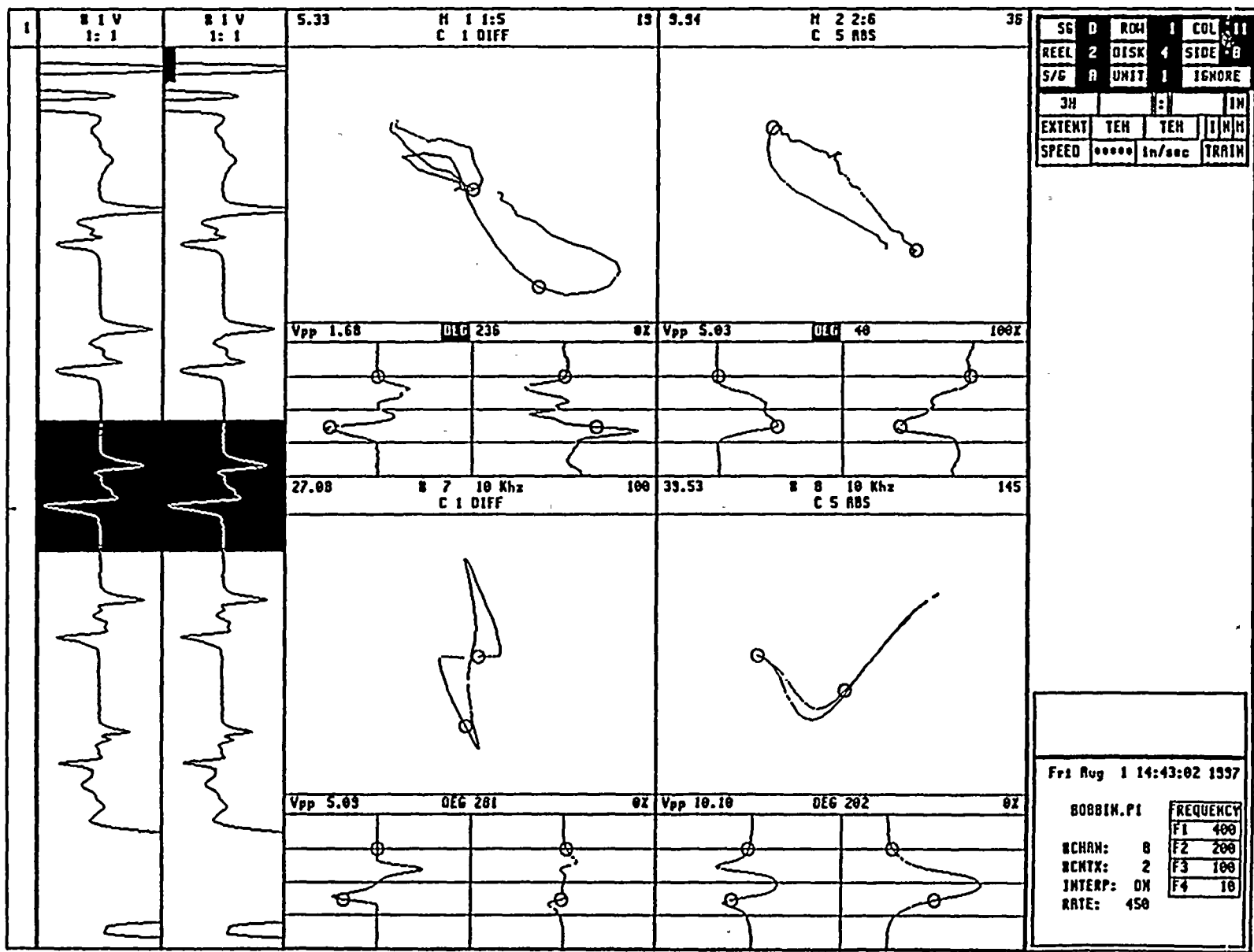
EC062 03/18/98 09:52:48



ENG _____ 08/01/97 IGNORE UNIT: 1 SG: A REEL: 2 PRI

Figure 3-3

EC062 03/18/98 09:53:06

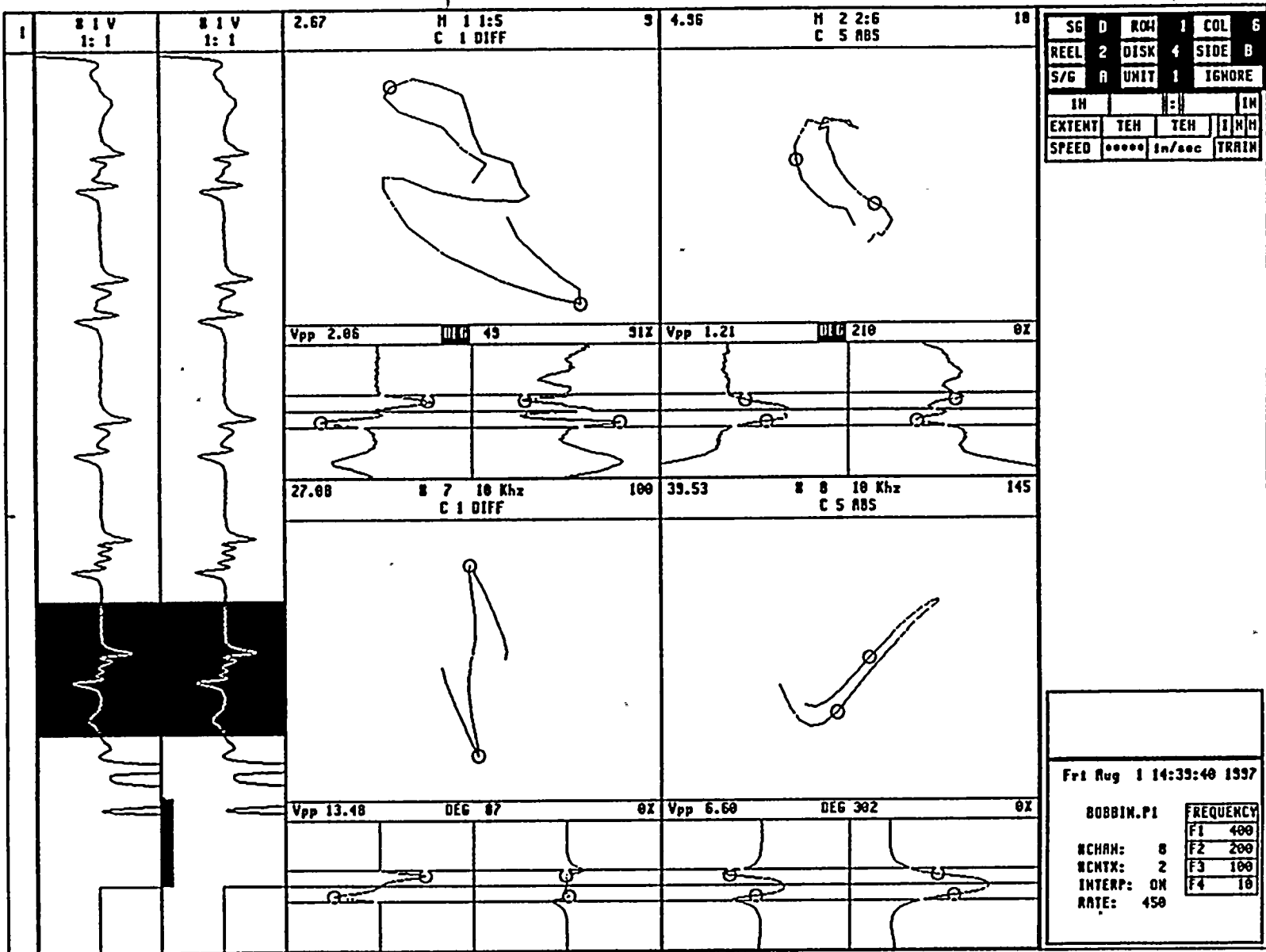


SG	D	ROM	1	COL	11
REEL	2	DISK	4	SIDE	8
S/G	A	UNIT	1	IGNORE	
3H		:		IM	
EXTENT	TEH	TEH	I	M	M
SPEED	*****	in/sec	TRIM		

Fri Aug 1 14:43:02 1997	
BOBBIN.P1	FREQUENCY
NCHAN: 8	F1 400
NCHTX: 2	F2 200
INTERP: ON	F3 100
RATE: 450	F4 10

Figure 3-4

EC062 03/18/98 10:54:01



ENG _____ 08/01/97 IGNORE UNIT: 1 SG: A REEL: 2 PRI

Figure 3-5

EC062 03/18/98 10:53:56

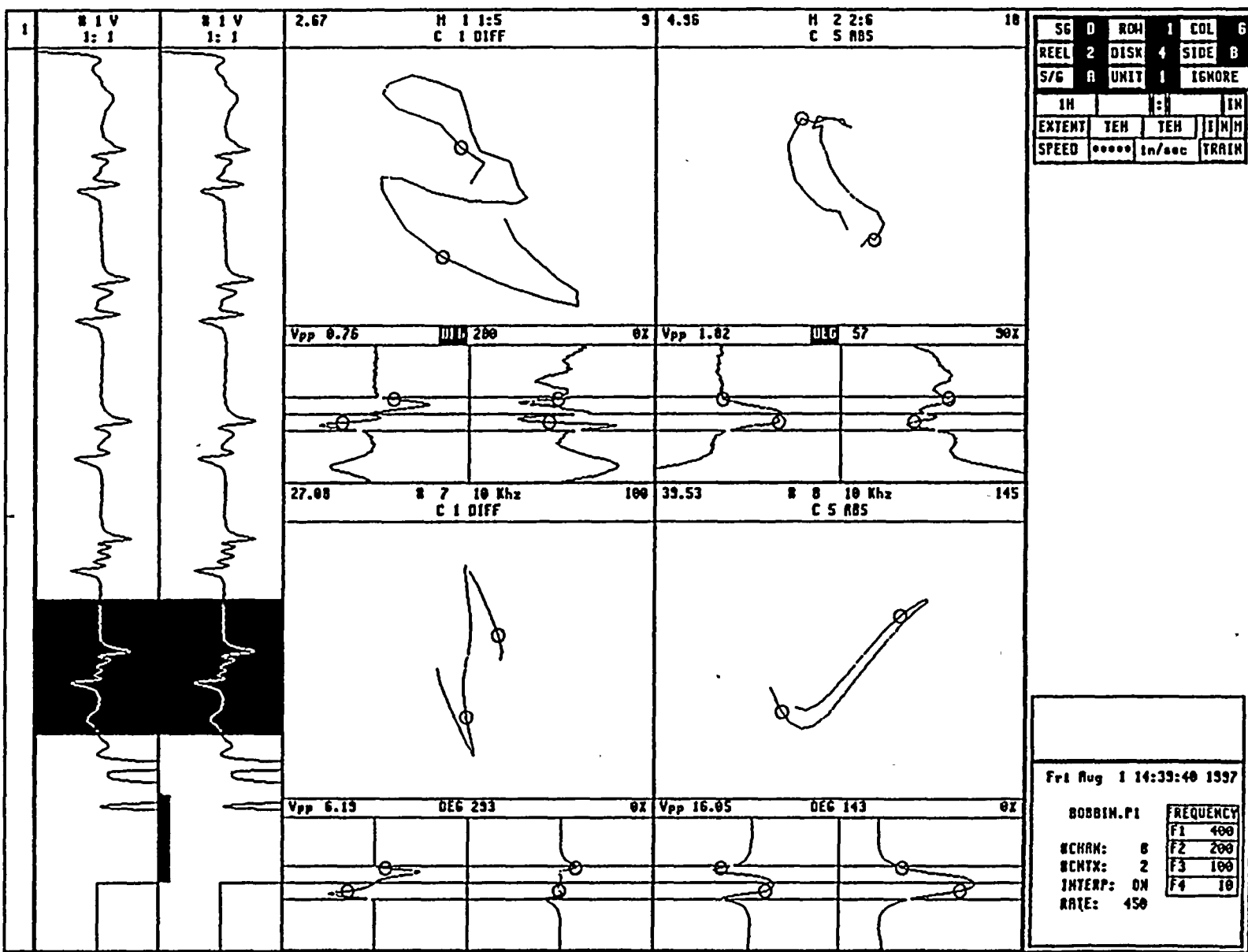
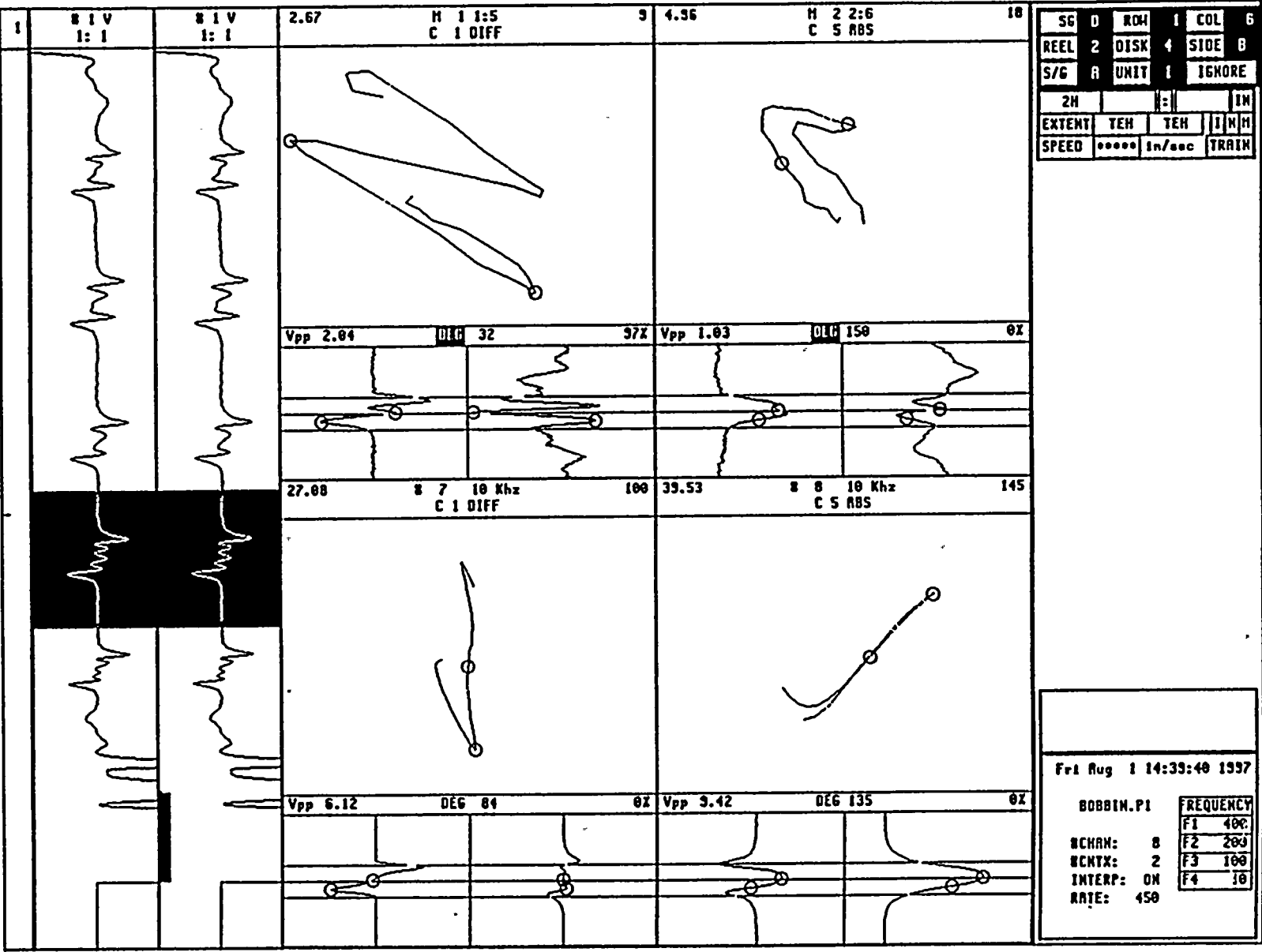


Figure 3-6

EC062 03/18/98 10:54:44



ENG 08/01/97 IGNORE UNIT: 1 SG: A REEL: 2 PRI

Figure 3-7

EC062 03/18/98 10:55:11

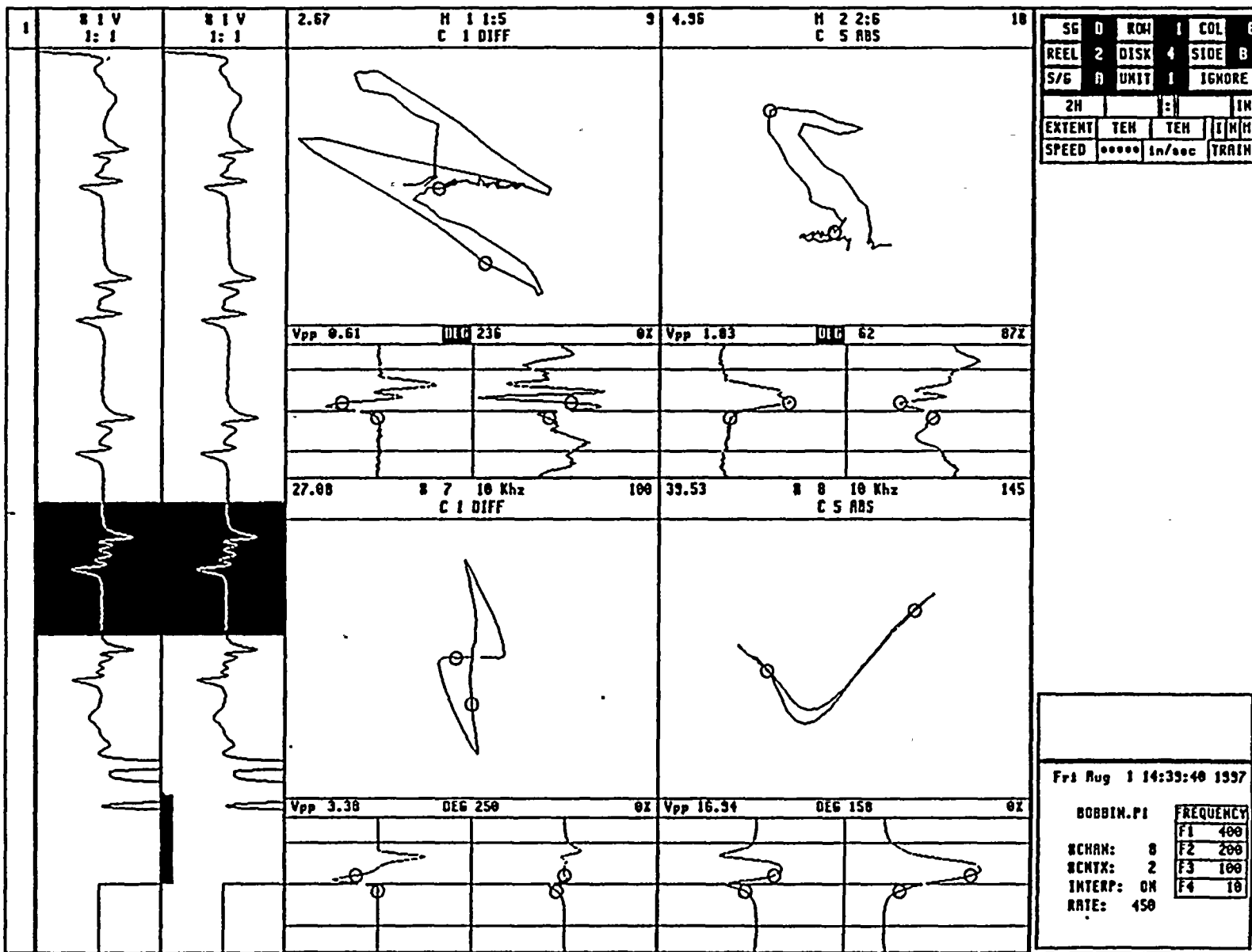


Figure 3-8

EC062 03/18/98 10:56:23

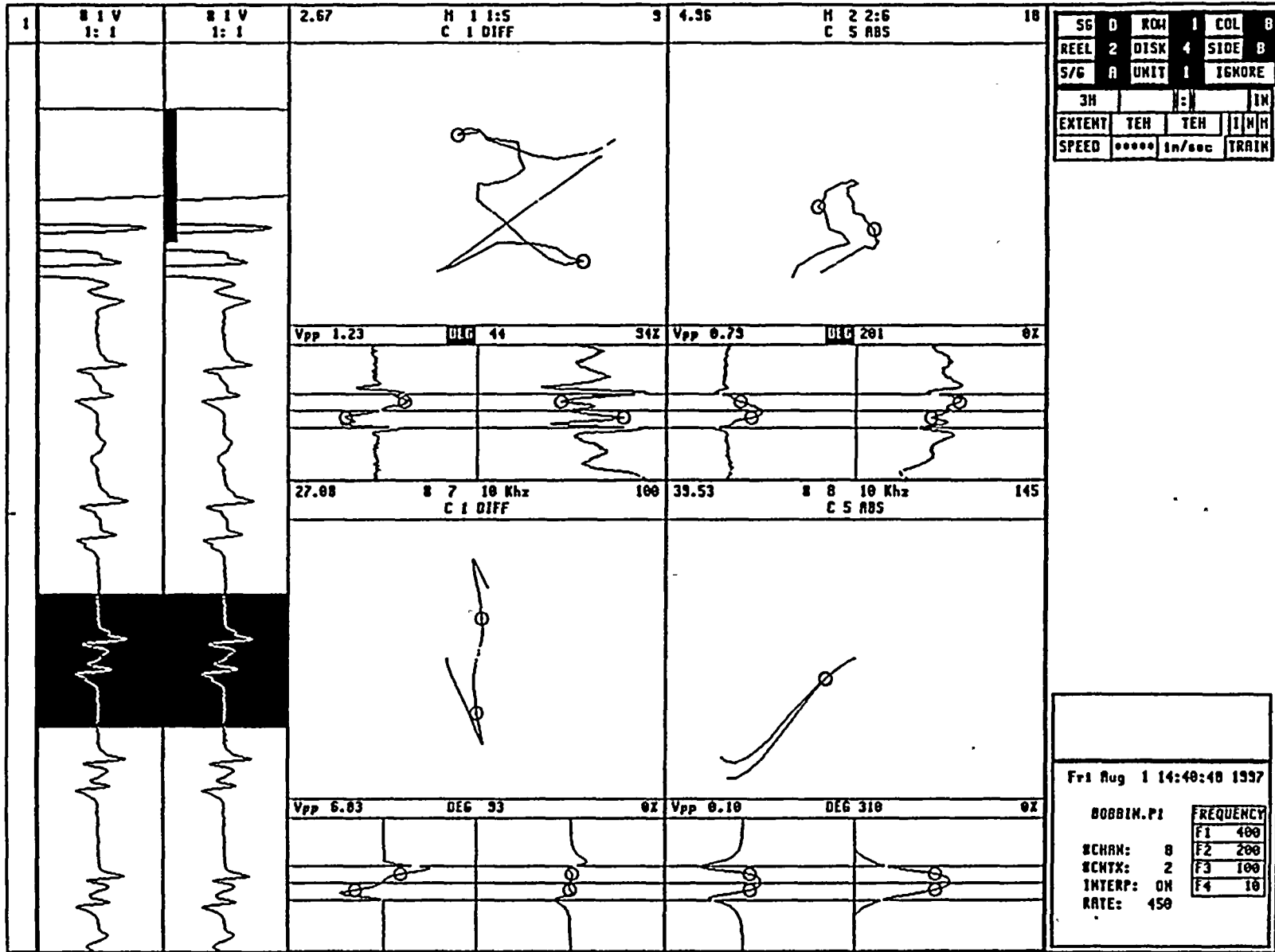


Figure 3-9

EC062 03/18/98 10:56:40

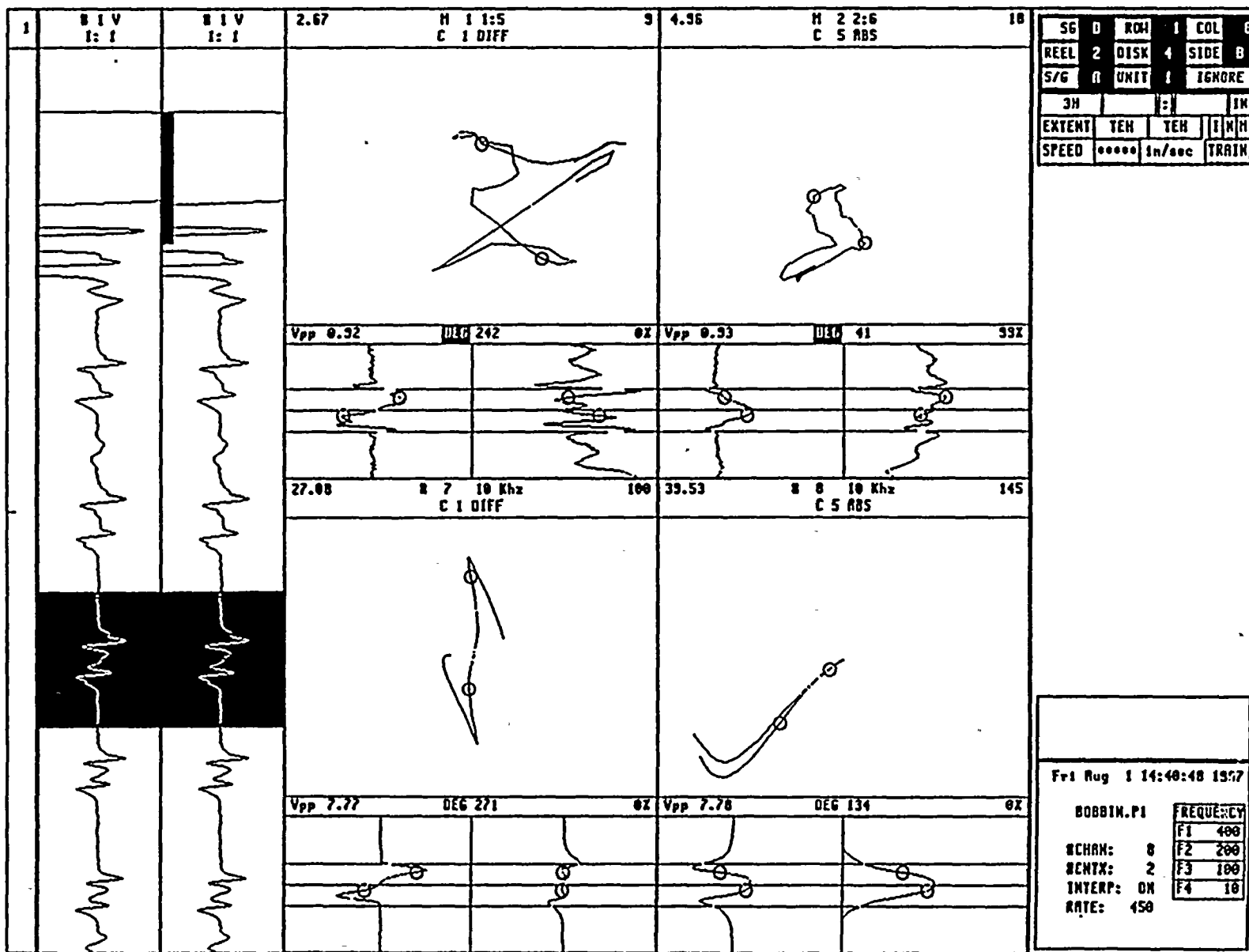


Figure 3-10

ENG

08/01/97 IGNORE UNIT: 1 SG: A REEL: 2 PRI

EC062 03/18/98 10:57:05

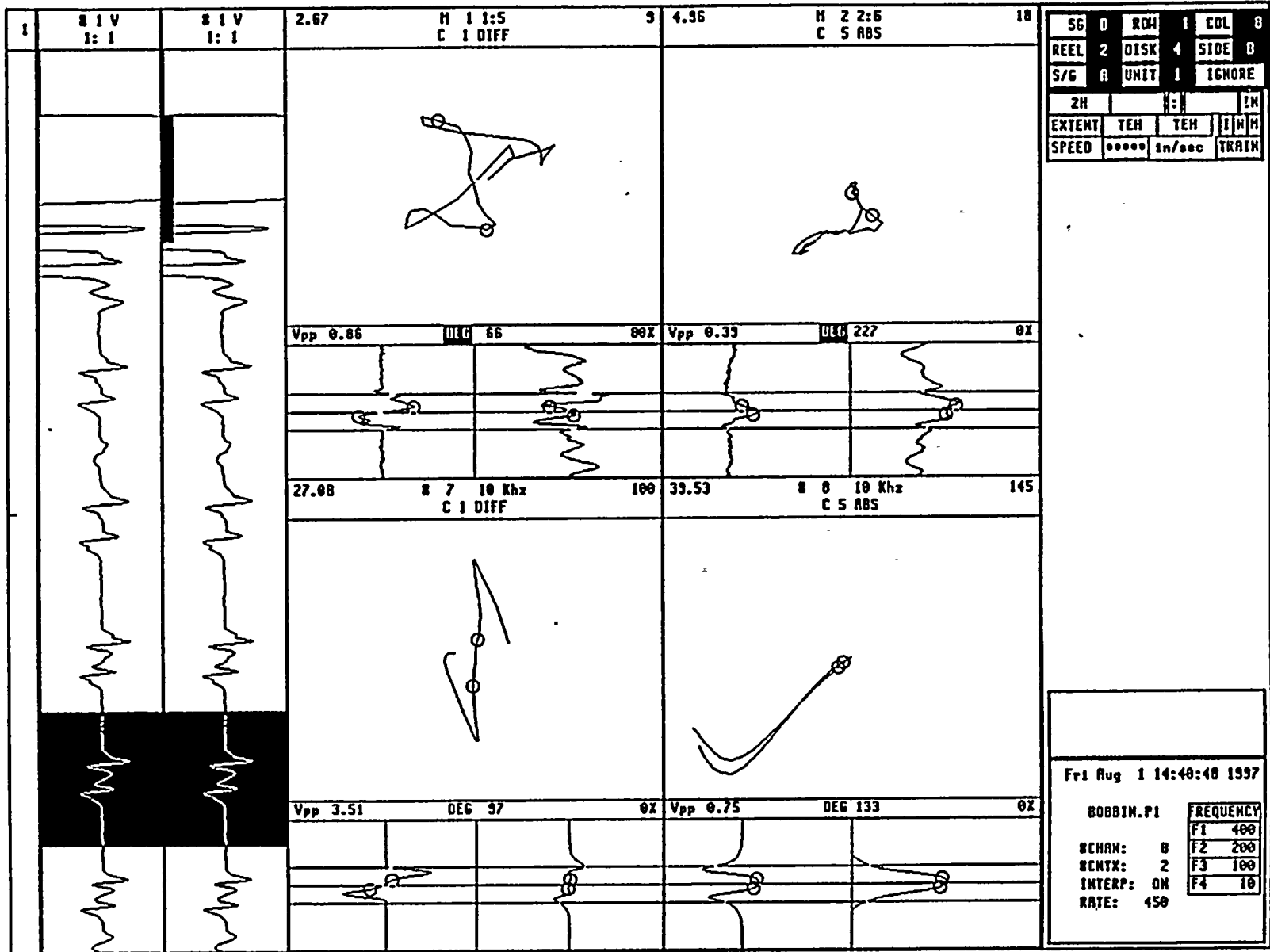


Figure 3-11

EC062 03/18/98 10:57:32

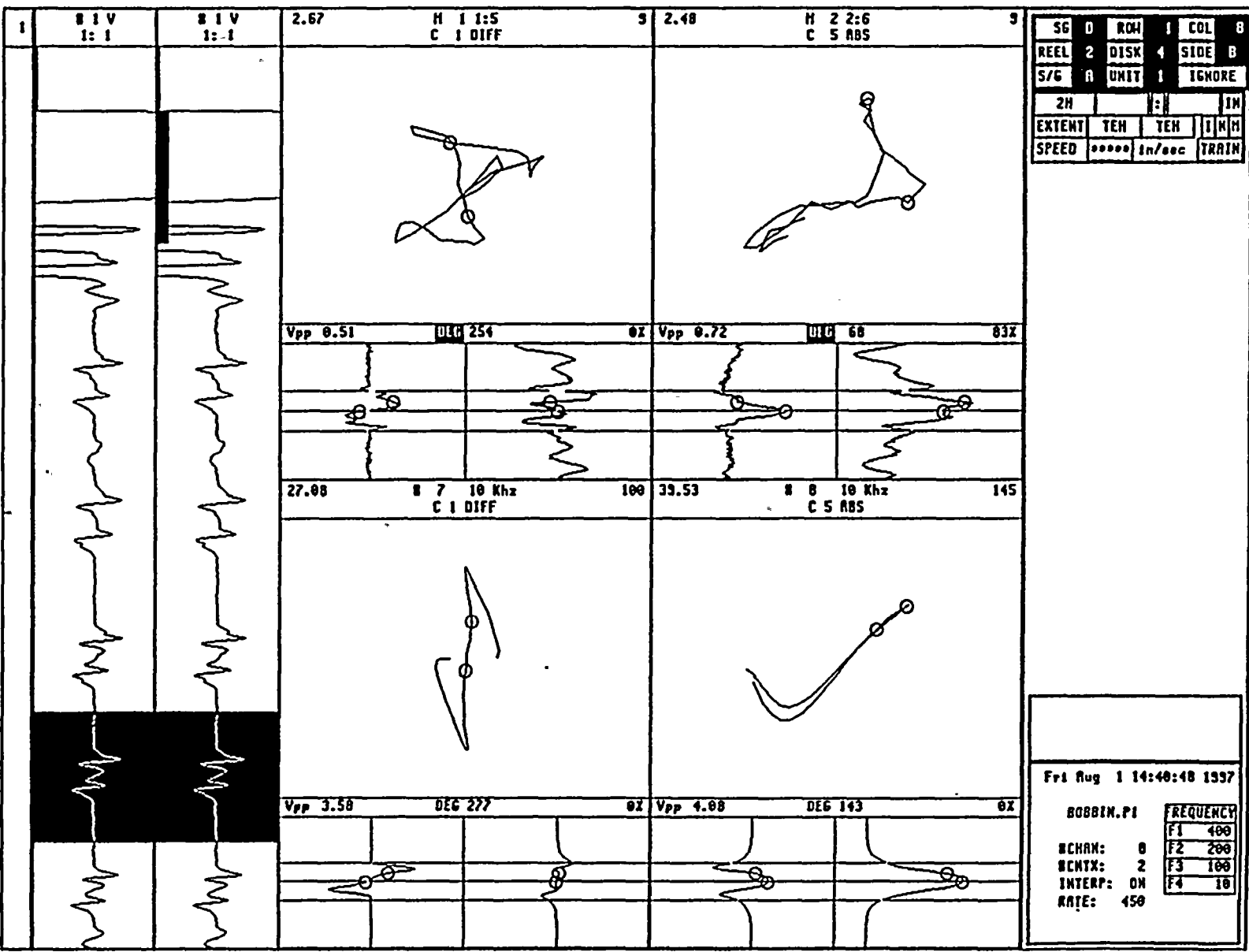


Figure 3-12

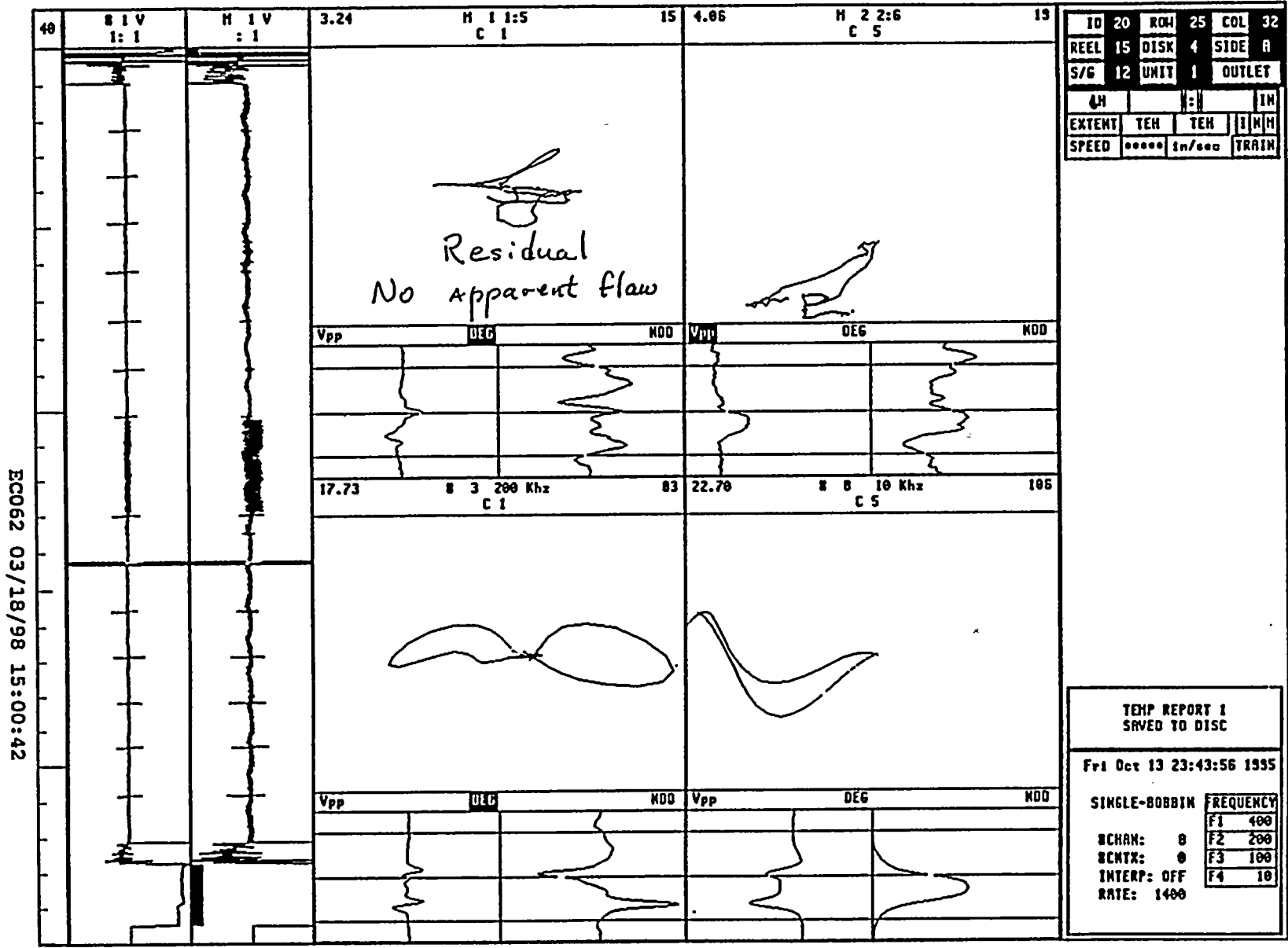


Figure 4-1

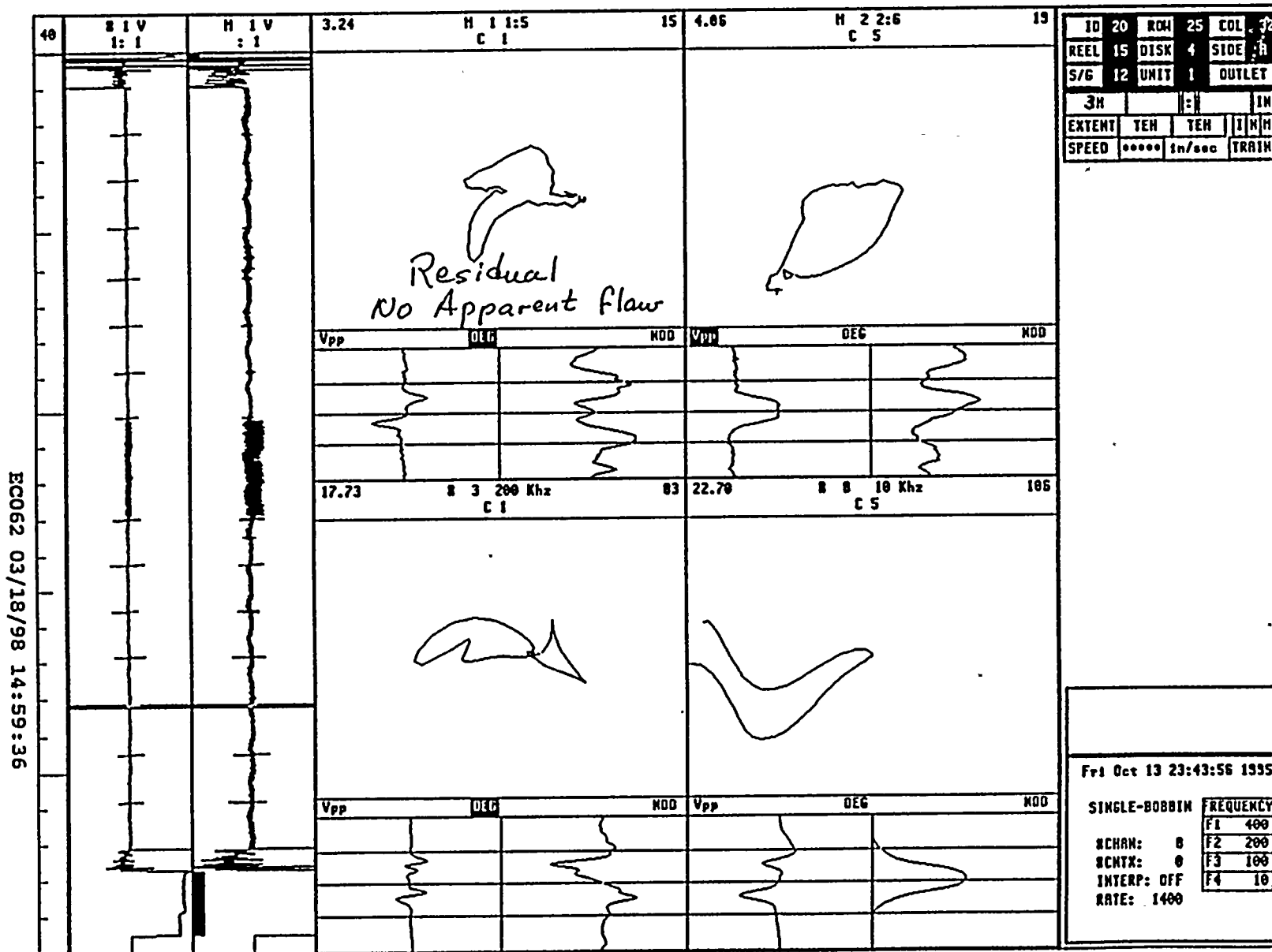


Figure 4-2

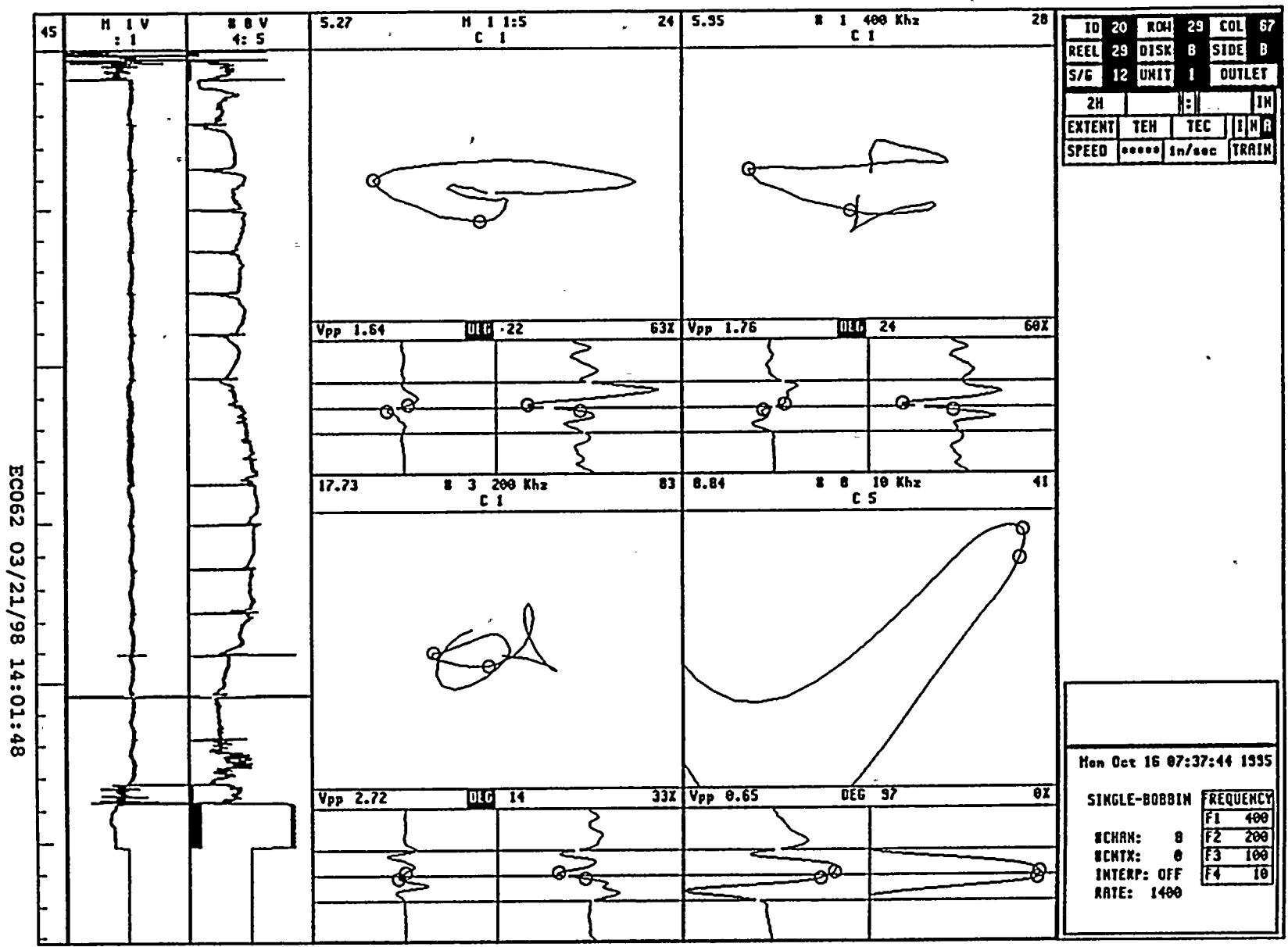


Figure 5-1

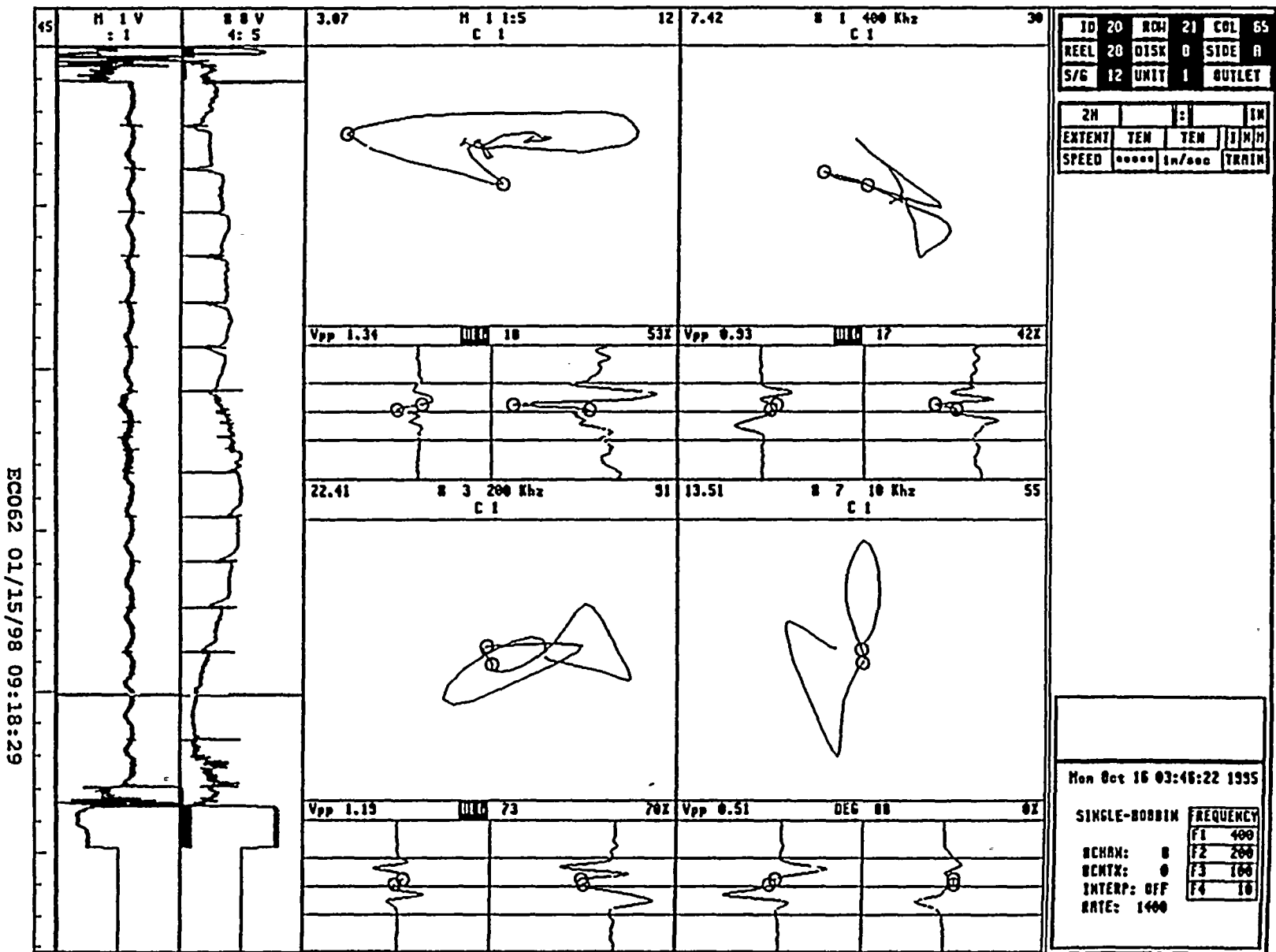


Figure 5-2

EC062 03/15/98 15:32:02

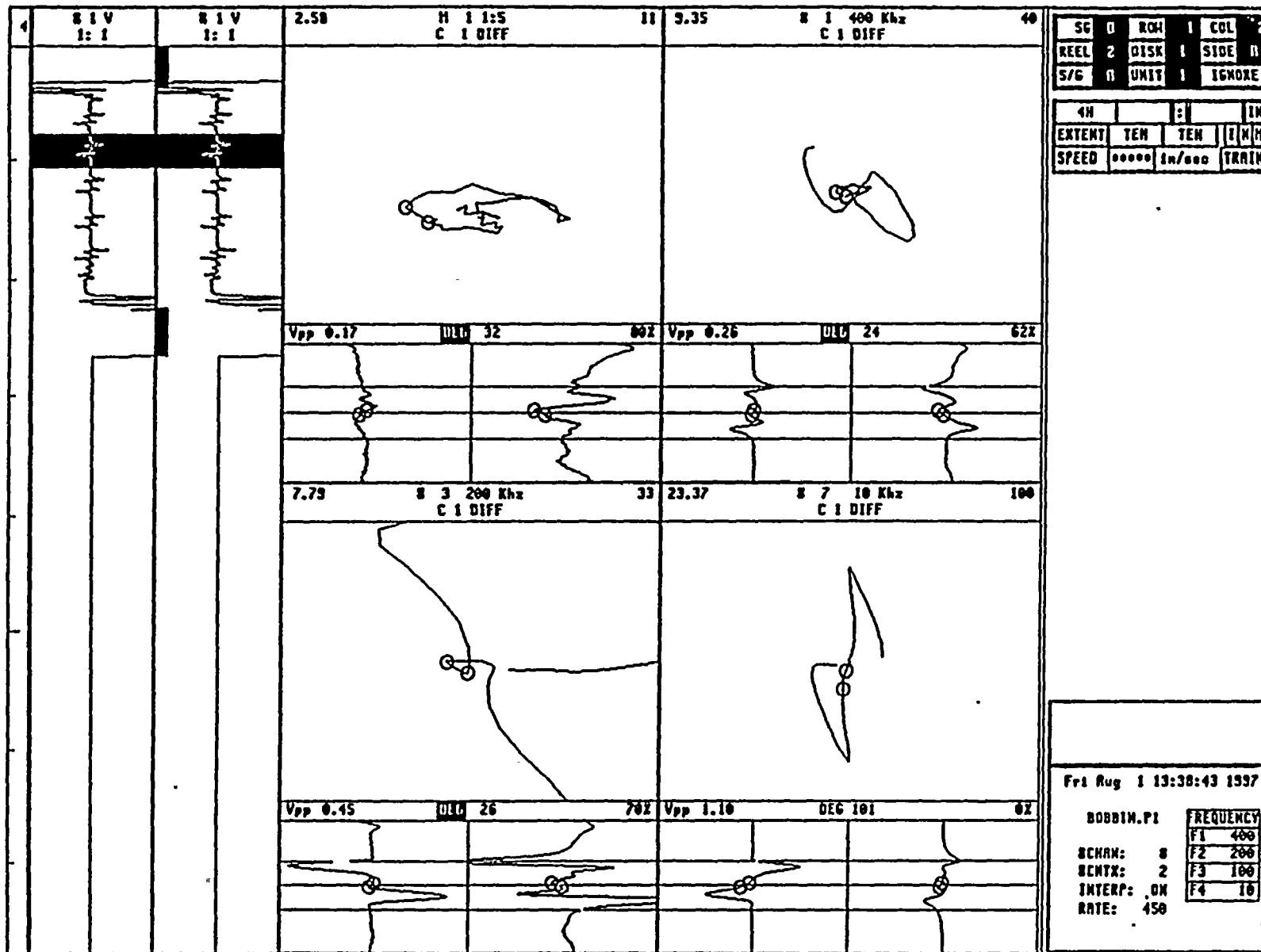


Figure 5-3

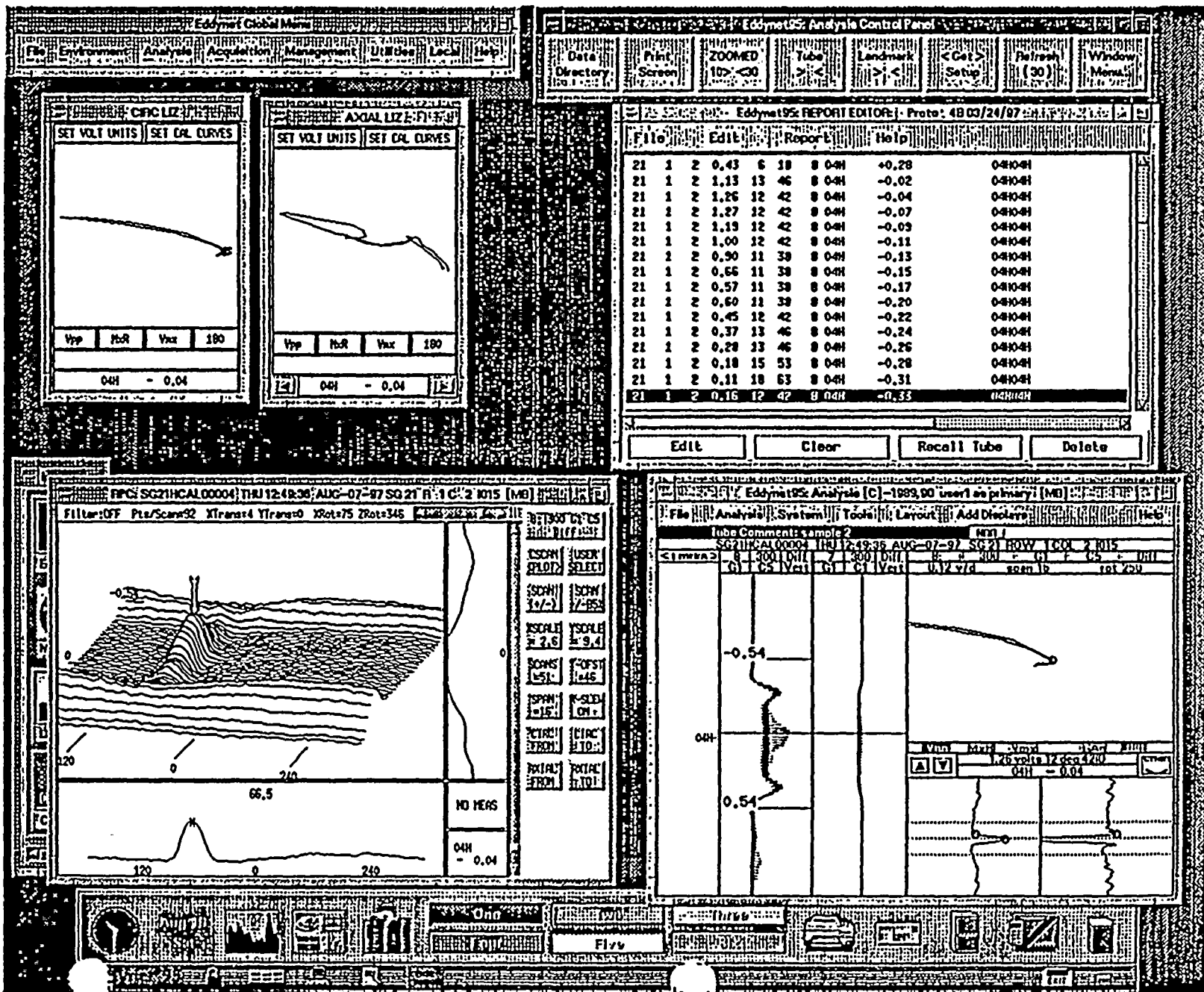


Figure 5-3a

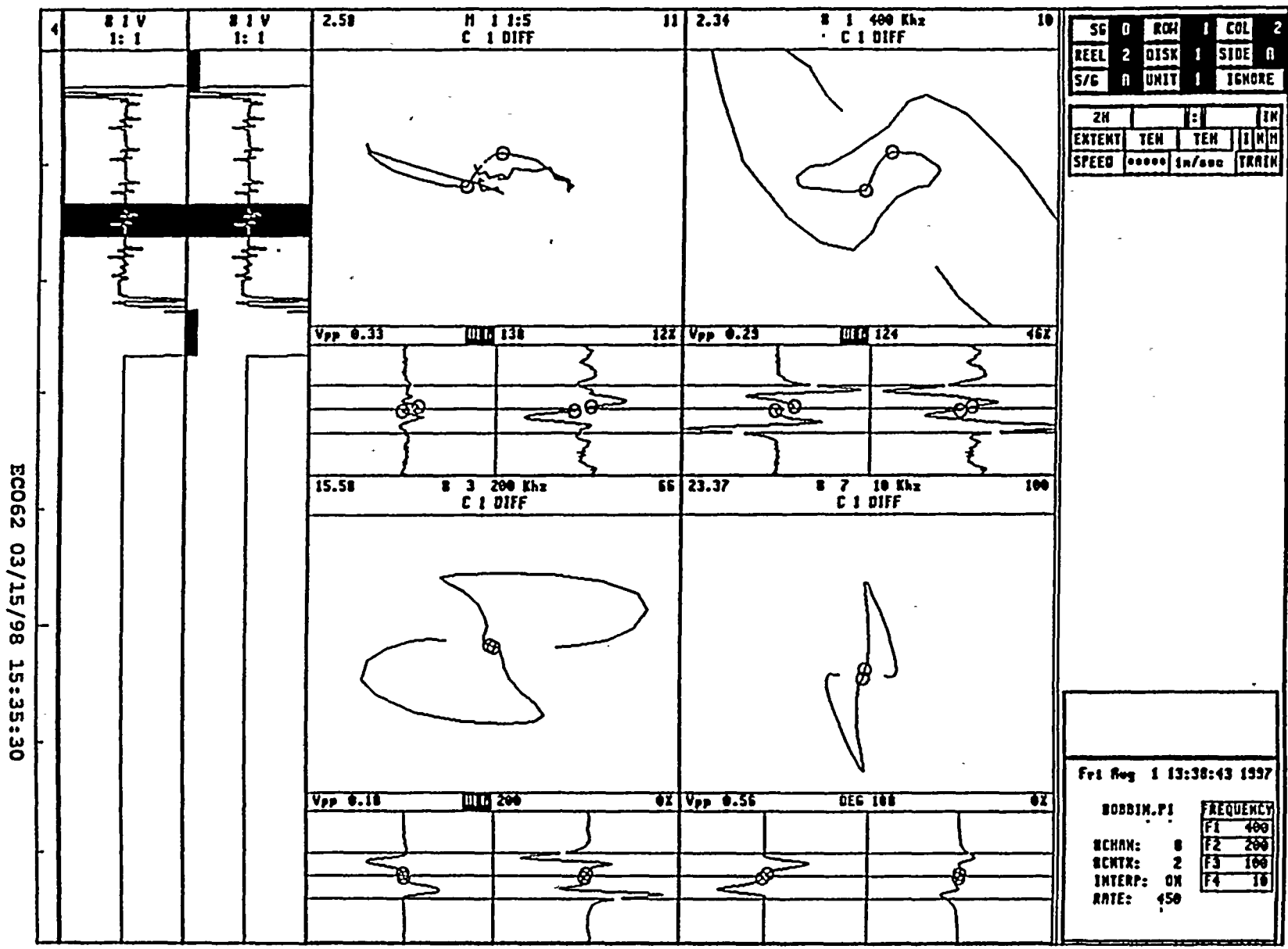


Figure 5-4

EC062 03/15/98 15:24:04

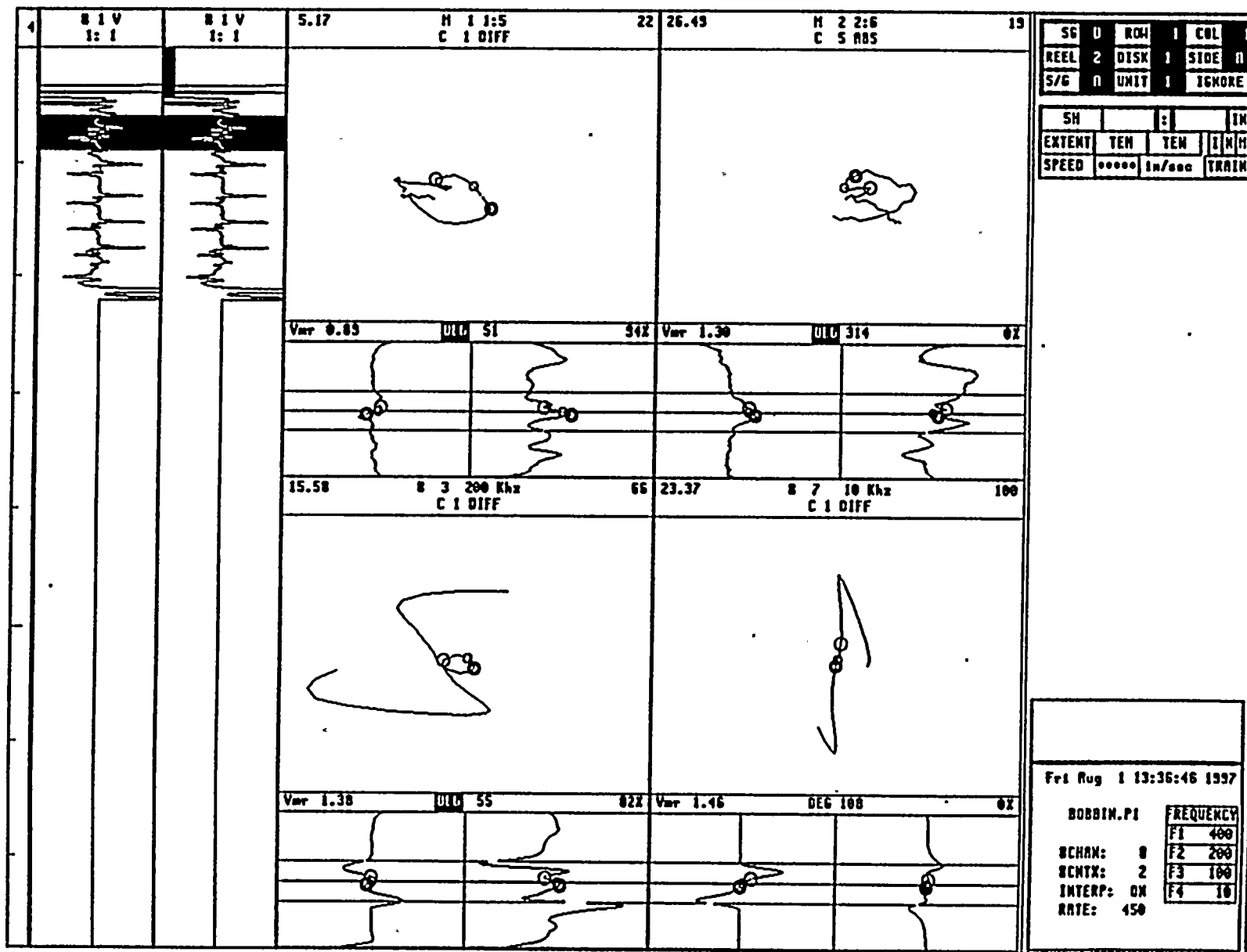


Figure 5-5

Eddymet Global Menu

File Environment Analysis Acquisition Management Utilities Local Help

Eddymet95: Analysis Control Panel

Data Directory Print Screen Zoom 10> <30 Tube > < Landmark > < <Get> Setup Refresh (4) Window Menu...

SG14HCAL00093 THU12:34:58 MAY-08-97 SQ 14 R 999 C 999 1002

File Tools Layout Help

↑ ↓

+ 1268

1	400	G2	C1	Diff	3	200	G2
1.91 w/d		32		rot 14		2.55 w/d span 42	

Eddymet95: Analysis [C]-1989.00 user1 as primary [MB]

File Analysis System Tools Layout Add Displays Help

Tube Comment: 100

SG14HCAL00093 THU12:34:58 MAY-08-97 SQ 14 ROW 999 COL 999 1002

3	200	Diff	1	400	Diff	P1:1-5	400	G2	C1	Diff	
G2		C1	Vert	G2		C1	Vert	1.91 v/d		span 35	rot 14

LOCRL

c201d0e0
c201d1e0
c201d2e0
c201d3e0
c201d4e0
c201d5e0
c201d6e0
cb00d6e0

Vpp Max Vxc GAn 180 Vpp Se

Adjust Mix Menu

Active Data Channel: P1:1-5 Diff

Clear Mix Suppress Signal

Save Adjust Filter Cancel

LOCRL

Vpp Max Vmx GAn 180

+ 1268

Icon

Eddymet

Menu

FRQ

400
200
100
18
20
20
20
20

Mnt

idur 20

One Two Three

Four Five Six

Eddyjet Global Menu

File Environment Analysis Acquisition Management Utilities Local Help

Eddyjet95: Analysis Control Panel

Data Directory Print Screen Zoom 100 <30 Tube >< Landmark >< <Get> Setup Refresh (4) Window Menu..

SG14HCAL00093 THU 12:34:58 MAY-08-87 SG 14 R 999 C 999 1002

File Tools Layout Help

↑ ↓

• 1266

1	400	G2	C1	Diff	3	200	G2
1.91 v/d				rot 14	2.55 v/d		span 42

Vpp H-R Vcc Gm 180 Vpp So

Eddyjet95: Analysis [C]-1989.90 user1 as primary [MB]

File Analysis System Tools Layout Add Displays Help

Tube Comment: MDQ

SG14HCAL00093 THU 12:34:58 MAY-08-87 SG 14 ROW 999 COL 999 1002

3	200	D11	1	400	D11	P1:1-5	400	G2	C1	D11
G2	C1	Vert	G2	C1	Vert	1.91 v/d		open 35		rot 14

Vpp H-R Vcc Gm 180

+ 1266

chan ><

Icon

Eddyjet

Menu

FREQ

400
200
100
18
20
20
20

LICE

Mnt

20

20

20

LOCAL

Adjust Mix Menu

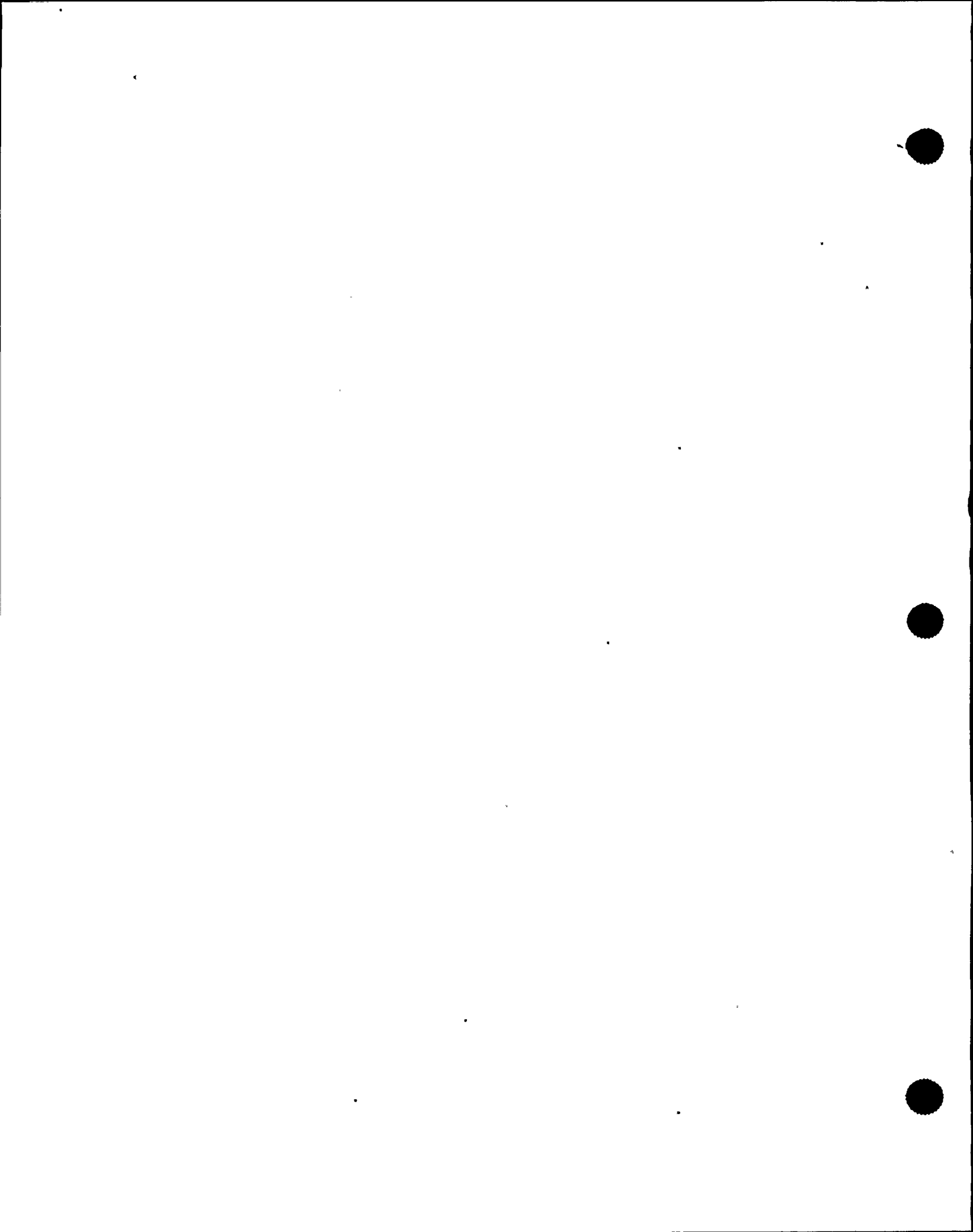
Active Data Channel: P1:1-5 D11

Clear Mix Suppress Signal

Save Adjust Filter Cancel

Mar 28 Thu

One Two Three Four Five Six



APPENDIX A-2

**ETSS#96012 Rev.1
Bobbin PWSCC**

5/20/98



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Appendix A TECHNIQUE SPECIFICATION SHEETS



May 20 1998 Revision 1

Examination Technique Specification Sheet			
ETSS # 96012 Bobbin PWSCC		Page 1 of 32	
TUBING			
Material: Inconel 600		OD: .875"	Wall: .050"
EXAMINATION SCOPE			
<p>Test Application: Test Application: This bobbin probe technique meet the requirements for detection of axial Primary Water Stress Corrosion Cracking (PWSCC) at dented (≤ 2 volts with 4x20% ASME holes set at 2.75 volts in Mix 1) drilled tube support plate intersections. The ≤ 2 volt criteria was a consensus value determined by the peer review team based on the number of data points in the area of interest. This technique meet the requirements of Appendix H by using both differential (Mix 1) and absolute (Mix 2) mix channels (400/100 kHz). Caution: Specific training on recognition of open residuals accompanied by a sharp left-going transition should precede implementation of this technique. This technique received peer review 4/16/98.</p>			
ACQUISITION TECHNIQUE			
Bobbin Probe <input checked="" type="checkbox"/> Rotating Probe _____ Other _____			
DATA ACQUISITION			
Instrument		Probe	
Manufacturer: Tecrad		Manufacturer: Zetec	
Model: TC6700		Diameter/Coil Dimensions: .720"	
Acquisition System Software		Part Number: A-.720-MULC (Zetec)	
Manufacturer: Westinghouse		Probe Cable Length: 100'	
Description or Title: Anser		Analog Probe Extension	
		Manufacturer: Zetec universal 36 pin low loss cable	
Version/Revision: Anser 8.1 or equivalent		Length: 100'	
Frequencies/Coil Excitation Modes			
Differential Mode		Absolute Mode	
Coil/Frequencies/Gain/Drive Voltage		Coil/Frequencies/Gain/Drive Voltage	
400 kHz/38 dB/3V(peak)		400 kHz/38 dB/3V(peak)	
200 kHz/38 dB/3V(peak)		200 kHz/38 dB/3V(peak)	
100 kHz/38 dB/3V(peak)		100 kHz/38 dB/3V(peak)	
10-30 kHz/38 dB/3V(peak)		10-30 kHz/38 dB/3V(peak)	
*600 kHz/38 dB/3V(peak)		600 kHz/38 dB/3V(peak)	
Data Recording Equipment			
Manufacturer: Hewlett Packard or equivalent		Model: 650 Mb Re-writable or equivalent	

* optional

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Appendix A TECHNIQUE SPECIFICATION SHEETS



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Examination Technique Specification Sheet			
ETSS # 96012 Bobbin PWSCC		Page 2 of 32	
Digitizing Rate, Scan Direction & Scan Pattern			
Bobbin Probe		Rotating Probe	
Digitizing Rate Min (DR):*37 samples/inch		Digitizing Rate Min (DR)*	
Sample Rate Min (SR) 450 samples/sec		Sample Rate Min (SR)	
Probe Speed (PS) 12 ips		Withdrawal Speed Max (WS)	
Scan Direction		Rotation Speed Max (RPM)	
* Note: Digitizing rate applies in the axial direction. SR min = DR min x PS max		* Note: Digitizing rate applies in both the axial and circumferential directions; for the circumferential direction, SR min = DR min x (1/RPM) x (1/tube diameter) x 19.09	
DATA ANALYSIS			
Instrument		Analysis System Software	
Manufacturer:Hewlett Packard		Manufacturer:Westinghouse / Zetec	
Model:725 or equivalent		Description or Title:ANSER 8.1 or equivalent/ Eddynet@95-Ver 3 or equivalent	
Analysis Channels			
Process Channel	Channel 400/100 Diff Mix	Channel 400/100 Abs Mix	Channel ____ Diff/Abs
Span Setting	20% OD FBH - 4 div.	20% OD FBH - 4 div.	
Phase Rotation	100% at ~ 32°; noise horizontal	100% at ~ 32°; noise horizontal	
Calibration Std.	100%, 60%, 20% OD FBH	100%, 60%, 20% OD FBH	
Calibration Curve	Phase based curve	Phase based curve	
Volts	2.75 volts in Mix 1 for 20% FBHs	2.75 volts in Mix 1 for 20% FBHs	
Mixing Frequencies	400/100 Differential Mix	400/100 Absolute Mix	
Filtering	None	None	



Examination Technique Specification Sheet	
ETSS # 96012 Bobbin PWSCC	Page 3 of 32
<p>Analysis Guidelines: (Note: As a minimum, channels used for detection, confirmation, and sizing should be described as well as other special analysis instructions.) Voltage normalization is performed in the main lissajous window and is set on the 20% flat bottom holes in Mix 1 (400/100 kHz differential) at 2.75 volts (or at an equivalent voltage established via normalization/transfer to the Alternate Plugging Criteria laboratory standard). Adjust the span so that the signal occupies 50% of screen height. Set the noise component horizontal; this should result in approximately 32° phase angle for the 100% FBH. Depth analysis is not required; use the 100%, 60%, and 20% holes to establish a phase curve to support flaw identification. Flaw signals shall be identified from either the differential mix channel (Mix 1) or the absolute mix channel (Mix 2), with particular emphasis on looking for flaw indications at the edges of small dents or residuals contained within the TSP. Both Mix 1 (400/100 kHz differential) and Mix 2 (400/100 kHz absolute) should be screened for possible indications, and reported separately with no requirement for confirmation between them. Mix 1 (differential) shall be evaluated according to the guidelines for evaluating ODSCC at TSP intersections with the following caution: Whether the phase angle of an identified possible flaw signal appears to be OD or ID in origin, such signals shall be reported as flaw indications. If a dent signal is identified, its voltage shall be measured and reported. If more than one dent signal is observed, report the maximum peak to peak amplitude from Mix 1. The measurement shall be the horizontal component at approximately 180° ± 6°. Industry experiences with the use of the Mix 2 channel (absolute 400/100 kHz) for flaw identification is very limited. Features such as a more open residuals and sharp transitions to the left may be indicative of the presence of ID flaws in TSP intersections with small voltage dent components. Each flaw indication identified, whether from Mix 1 or Mix 2, shall be recorded as a Distorted Dent Indication (DDI). The use of a high frequency, e.g., 600 kHz (optional), may be useful to help clarify signals that are difficult to analyze; the higher frequency responds more acutely to the ID flaws and the dents but less to the TSP and deposit effects. The low frequency locator channel (10-30kHz) permits identification of the relative position of Mix 1 signal components with respect to the TSP center and edges. Signal to Noise Value: For each DDI reported, obtain the root mean square (RMS) noise value (EddyNet) for the portions of the dent (or TSP residual) signal not included in the flaw signal. This is accomplished by designating the neighboring responses in the TSP Mix response, not from the straight tube region above and below the dented TSP. This measurement is not essential to the qualification of the technique; it provides supplemental information relative to the similarity of conditions between the lab and field data.</p>	
Combined 400/100 Differential and Absolute Technique Performance	
Detection Probability at >34% TW and <2.0 volt Dent (90% CL)	RMSE Sizing Error, % through-wall
____.89____, POD	____N/A____, % TW

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Appendix A TECHNIQUE SPECIFICATION SHEETS



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Describe other pertinent information:

TRAINING GUIDANCE:

Particular care must be exercised to minimize the Mix 1 and Mix 2 residuals. The residual from Mix 1 should approximate more closely a rough dot in the center of the display than a small signal with observable phase angle. EddyNet 395 software requires that the data be nulled in the clear section of tubing prior to performing the mix. This measure taken at the outset will help to limit the number of false calls reported in the evaluation of TSP data. Figures 6-1 illustrates an imperfect result of the mixing when the clear section nulling is omitted; Figure 6-2 represents a proper mix residual.

The range of typical dents signals observed in SG TSP intersections is very broad. This procedure is expected to be applicable only to TSP intersections with dent voltages up to 3 volts. Examples of flaw/dent combinations over the range expected will be shown and/or available on optical discs for practice. A few pulled tube examples are included, but the body of the "truth" examples will be laboratory samples; operating SG examples confirmed by +Point examination are used to illustrate application of the analysis technique. Several classes of PWSCC/Dent signal patterns are described below; two sets of figures, one for lab samples (Series 2) and one for field data from Plant Y-1 (Series 1) are attached; figures designated with a following "a" are +Point confirmations of the bobbin calls.

A. Dominant flaws plus central dent: Flaw signals are visible above and below a dent signal. The absence of visible flaw indications in the center does not necessarily indicate 2 axially separate cracks; rather it may mean the dent makes the crack less visible in this region. Figures 1-1 to 1-3 and Figures 2-1 to 2-3.

B. Flaw in the axial center of the dent: Crack signal is dominant relative to dent components above and below the flaw. This signal forms before/after the edge loops of the dent. Figures 1-4 to 1-6 and Figures 2-4 to 2-6.

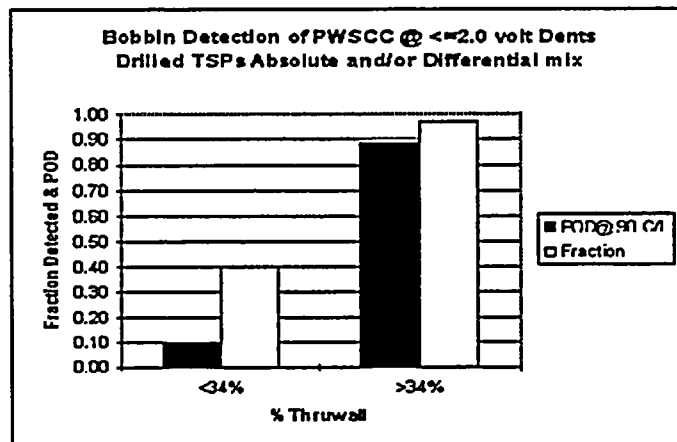
C. Flaw at or near dent/TSP edge: Flaw transition will be visible but not necessarily complete before the dent component appears; the converse is also true, i.e., the dent signal is visible but not necessarily complete before the flaw signal appears. Figures 1-7, 1-8 and Figures 2-7, 2-8.

D. Dominant dent plus weak flaw: At one or both edges of a dent, a weak flaw-like component is visible. This category is considered conservative; some degree of false calls should be expected. It is possible that in some cases the mix residual resulting from deposits, probe wobble, or other influences may present a flaw-like response. Figures 1-9 to 1-14 and Figures 2-9 to 2-12.

E. Flaw and dent coincide over entire length: Shallow cracks (< 40%) may not be identifiable. Flaws with average depth 50% have phase angles > 15° and amplitudes > 2 volts. Combination of such a flaw with dents (180°) below 3 volts (p-p) will rotate by at least 10°; the combination phase angle will be positive relative to 180°. Call "rotated dents" (<170° in quadrant 2) as possible flaws.

For categories A through D, the flaw components lie in the expected flaw plane; for Category E, the presence of the flaw is inferred from the rotation of the combined signal. Figure 1-15 shows a field indication near the TSP center accompanied by small horizontal signals and a residual signal; the flaw, a 0.7 ID +Point SAI, was mistaken for a dent and the intersection declared NDD. Figure 2-13 shows a similar signal on a flawed (0.84, 82.1% max.depth) lab specimen.

In the figures designated Series 3, Figures 3-1 to 3-4 illustrate two lab samples' behavior that should be reported as flaws; in these cases the Mix 1 data is more convincing than Mix 2, but an indication in either channel requires a flaw call. It should be observed that the positions of the dots on the Mix 2 signal will not necessarily correspond exactly to the Mix 1 positions. Additional comparisons of Mix 1 and Mix 2 are given in Figures 3-5 to 3-10. Review the characteristics of the lab samples and the field samples; there is great similarity between the 2 sets of data, but some differences will be noted. 1. The lab samples exhibit more frequent coincidence of flaw and dent signals than is observed for the field data. 2. The tendency for flaws to occur in the center of the intersection is reduced for the lab samples, since the dent is dominant in this region by design of the samples. The mix residuals in both populations create some ambiguity. The effect seems to be more pronounced for the lab sample than for the field data. Figures 4-1 and 4-2 represent mix residuals with no apparent flaws; these types may cause false calls. Some similarities are apparent between field signals confirmed by +Point coil and laboratory sample intersections also confirmed by +Point and/or confirmed by tube metallography. The Series 5 figures, the first 2 field signals (5-1 and 5-2) and the latter 3 lab samples (5-3 to 5-5) illustrate the types of signals that have been related to PWSCC but might be difficult to recognize as flaws without knowledge of confirming +Point or metallography. It is appropriate to call these types of bobbin signals as flaws, even though an increased level of false calls might result. In the figures designated Series 3, Figures 3-1 to 3-4 illustrate two lab samples' behavior that should be reported as flaws; in these cases the Mix 1 data is more convincing than Mix 2, but an indication in either channel requires a flaw call. It should be observed that the positions of the dots on the Mix 2 signal will not necessarily correspond exactly to the Mix 1 positions. Additional comparisons of Mix 1 and Mix 2 are given in Figures 3-5 to 3-10. Review the characteristics of the lab samples and the field samples; there is great similarity between the 2 sets of data, but some differences will be noted. 1. The lab samples exhibit more frequent coincidence of flaw and dent signals than is observed for the field data. 2. The tendency for flaws to occur in the center of the intersection is reduced for the lab samples, since the dent is dominant in this region by design of the samples. The mix residuals in both populations create some ambiguity. The effect seems to be more pronounced for the lab sample than for the field data. Figures 4-1 and 4-2 represent mix residuals with no apparent flaws; these types may cause false calls. Some similarities are apparent between field signals confirmed by +Point coil and laboratory sample intersections also confirmed by +Point and/or confirmed by tube metallography. The Series 5 figures, the first 2 field signals (5-1 and 5-2) and the latter 3 lab samples (5-3 to 5-5) illustrate the types of signals that have been related to PWSCC but might be difficult to recognize as flaws without knowledge of confirming +Point or metallography. It is appropriate to call these types of bobbin signals as flaws, even though an increased level of false calls might result.



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Sample #	Dent Value	% Met(Max Depth)		
2-3H-C1	1.9	21.53	0	
12-3H-C1	1.15	22.69	1	
12-4H-C1	1.19	26.29	0	
7-1H-C1	4.1	30.14	1	
2-1H-C1	3.4	33.42	0	
7-3H-C1	3.26	34.43	1	
9-1H-C2	0.94	34.47	1	x
2-5H-C1	2.03	35.5	0	
13-3H-C1	0.75	37.31	1	
10-3H-C2	0.65	37.97	1	x
9-1H-C1	0.94	38.82	1	x
11-2H-C2	0.73	43	1	x
11-4H-C2	1.17	44.03	1	x
8-3H-C1	0.46	44.21	1	
8-2H-C1	0.8	45.77	1	
9-2H-C2	0	46.26	1	x
2-4H-C1	1.15	47.62	1	
1-3H-C1	2.5	47.88	1	
8-1H-C1	0.41	52.24	1	
9-3H-C2	1.29	54.1	1	x
1-4H-C1	1.79	54.32	1	
6-4H-C1	1.15	64.29	1	
6-3H-C1	0.96	67.26	1	
9-4H-C1	1.25	70.18	1	
6-2H-C1	1.98	73.72	1	
9-5H-C1	0.85	74.63	1	
6-5H-C1	0.79	77.89	1	
10-4H-C1	0.82	81.81	1	
6-1H-C1	1.01	83.72	1	
9-2H-C1	0	84.09	1	x
9-3H-C1	1.29	84.64	1	x
Diablo12-32 C-1	1.17	88.9	1	
11-3H-C1	1.1	89.25	1	
11-4H-C1	1.17	95.25	1	x
10-3H-C1	0.65	96.18	1	x
11-2H-C1	0.73	96.93	1	x
Diablo 10-22	1.91	38	1	
Diablo 21-43	3.23	90.5	1	
Seq. 21-64- 1H	14.18	83.8	1	
% TW	POD@.90 C/L	Fraction	Detected	
<34%	0.10	0.4	2/5	
>34%	0.89	0.97	33/34	

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Appendix A TECHNIQUE SPECIFICATION SHEETS



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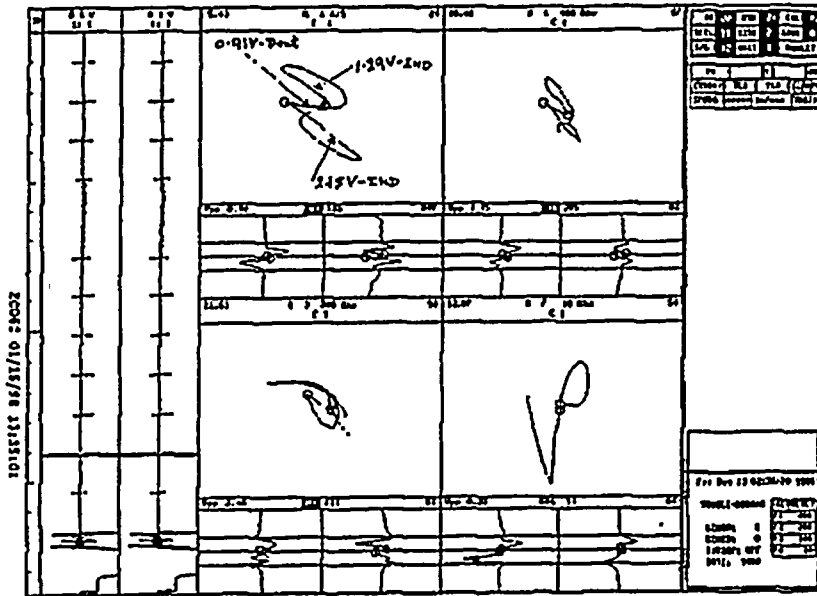


Figure 1-1

Disable Campon PP 10/13/98 ORTIST UNIT: 3 SCR 12 RSTLS 12 98X

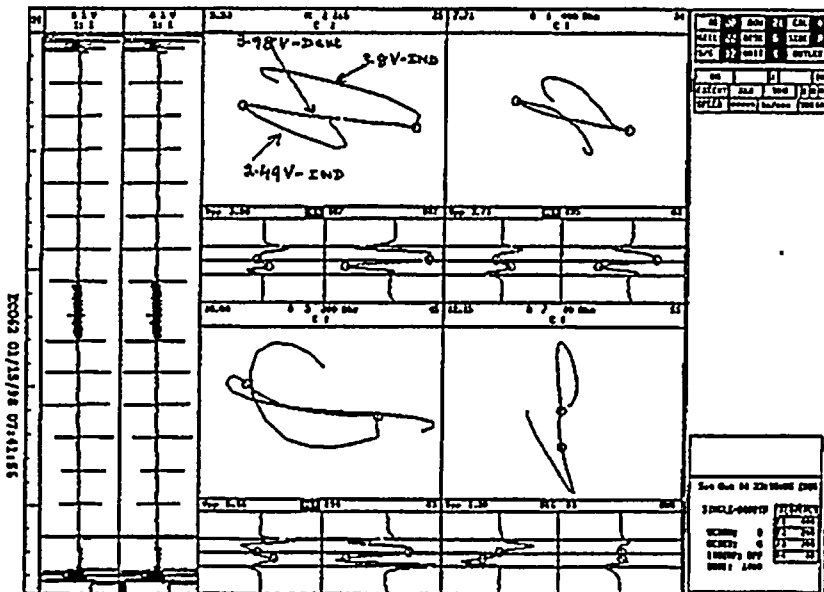


Figure 1-2

Disable Campon PP 10/13/98 ORTIST UNIT: 3 SCR 12 RSTLS 12 98X

PERFORMANCE DEMONSTRATION DATA BASE

Appendix A TECHNIQUE SPECIFICATION SHEETS



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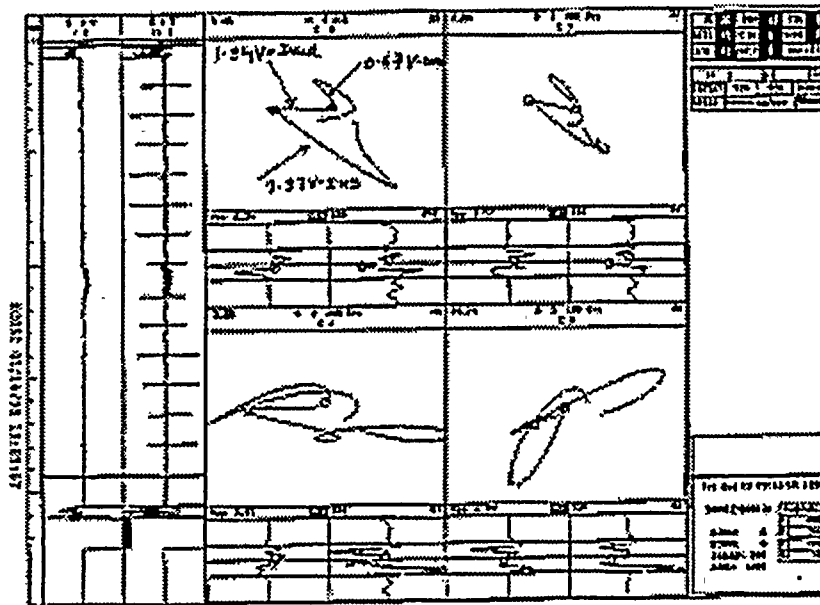


Figure 1-3

024010 4/20/98 PP 10/15/95 CENTER UNIT, 3 EQ, 13 SHEET, 33 PAGES

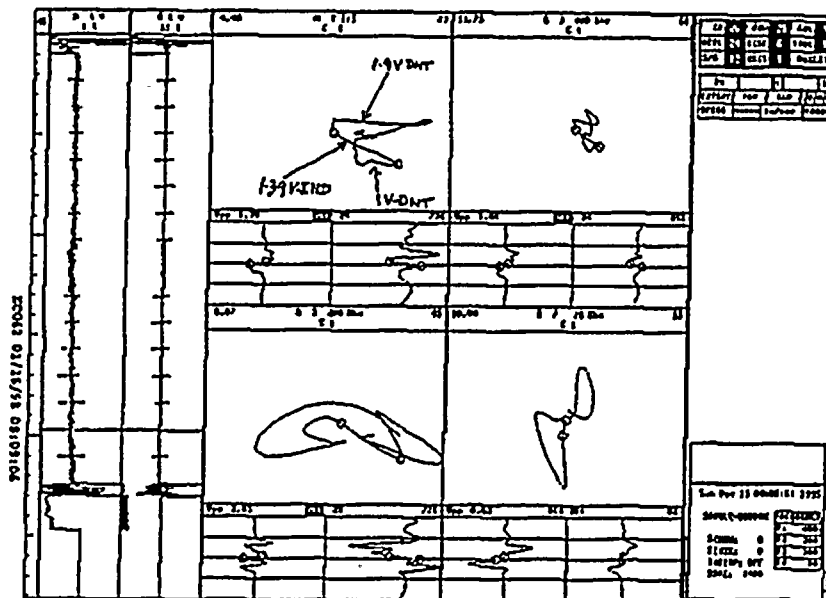


Figure 1-4

024010 4/20/98 PP 10/15/95 CENTER UNIT, 3 EQ, 13 SHEET, 33 PAGES

PERFORMANCE DEMONSTRATION DATA BASE

Appendix A TECHNIQUE SPECIFICATION SHEETS



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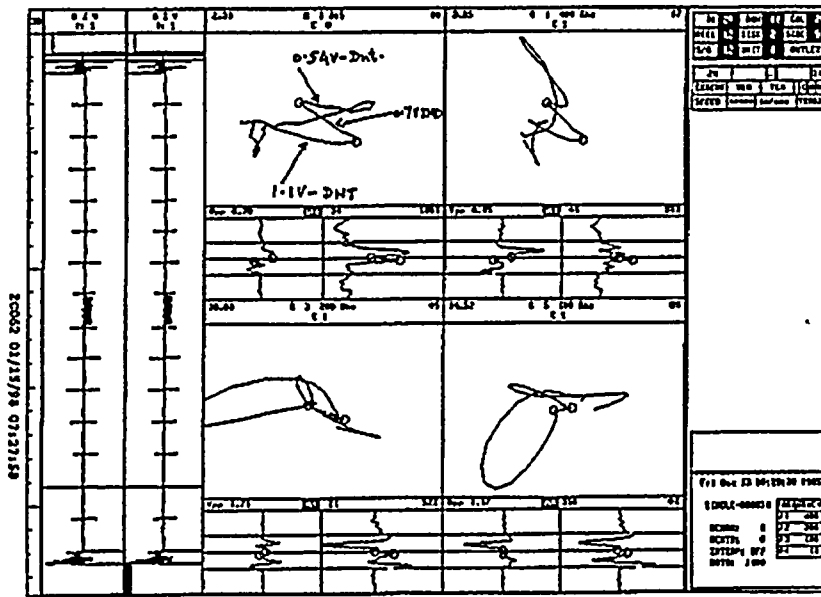


Figure 1-5

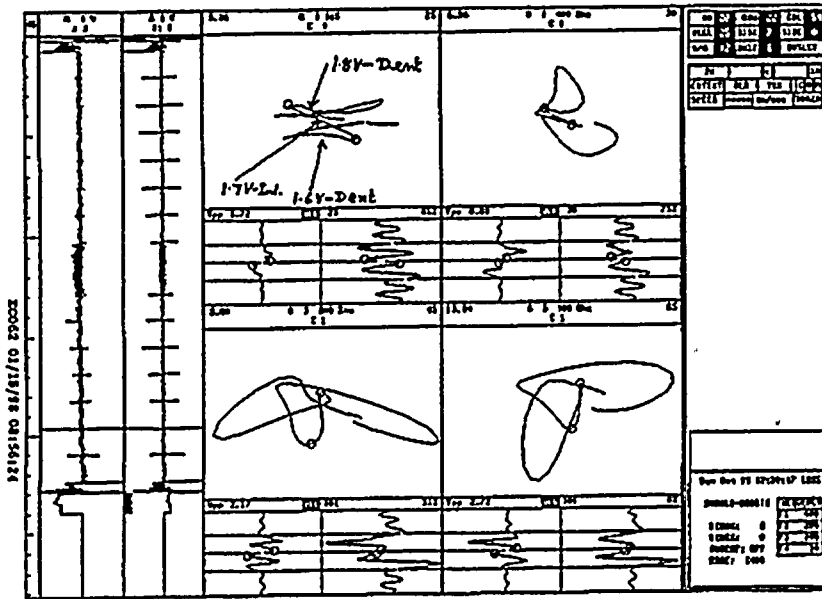
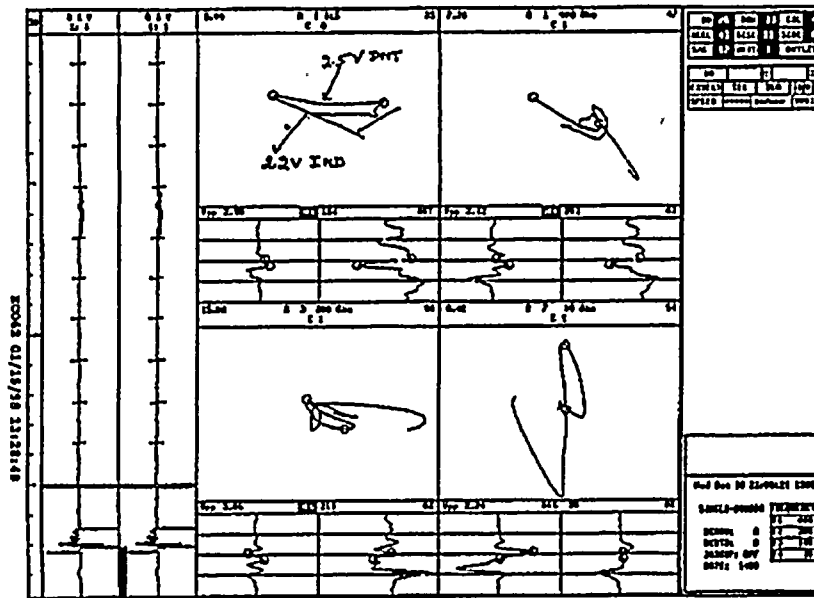


Figure 1-6

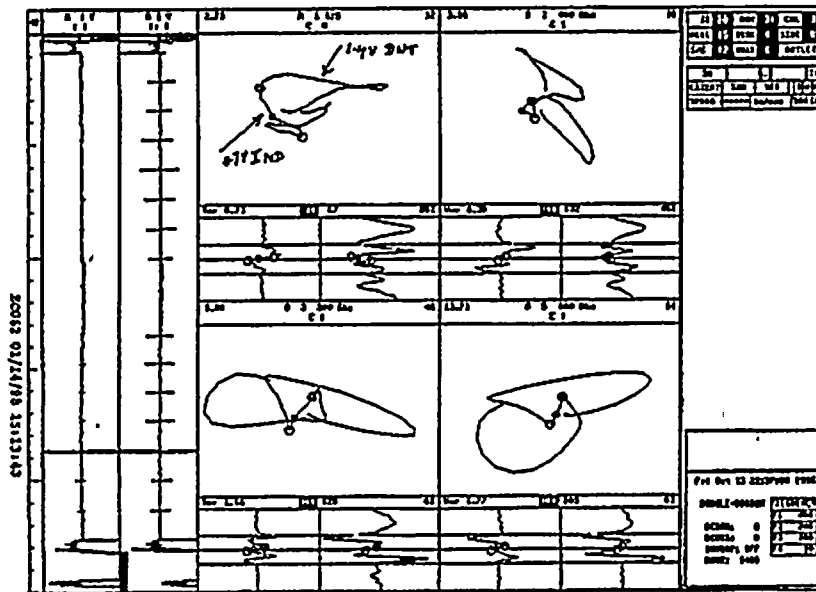
Disable Canyon 22 10/13/98 ORBITER UNIT: 3 801 12 SERIAL: 12 201

Disable Canyon 22 10/13/98 ORBITER UNIT: 1 801 12 SERIAL: 12 201



Diablo Canyon 22 10/19/98 OUTLINE UNIT: 1 501 12 SERIAL: 43 701

Figure 1-7



Diablo Canyon 22 10/13/98 OUTLINE UNIT: 1 501 12 SERIAL: 18 701

Figure 1-8

PERFORMANCE DEMONSTRATION DATA BASE

Appendix A TECHNIQUE SPECIFICATION SHEETS



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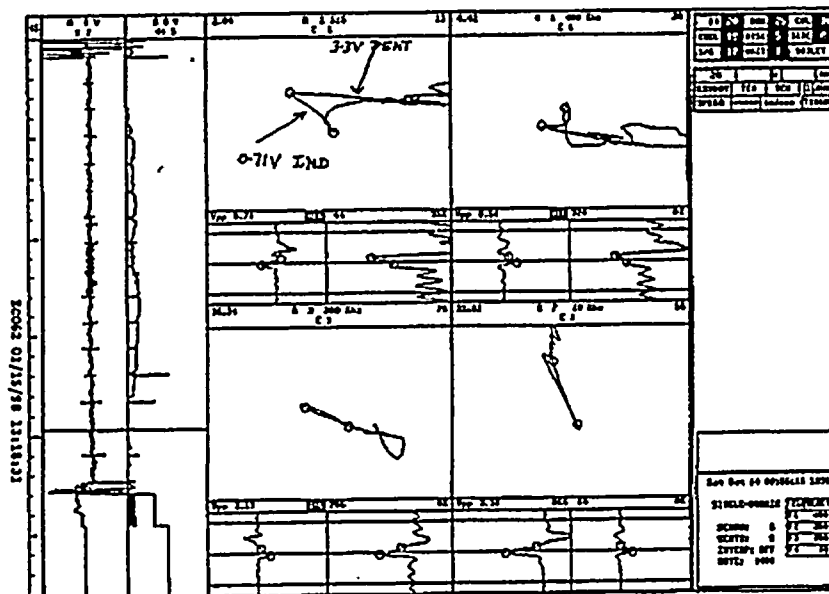


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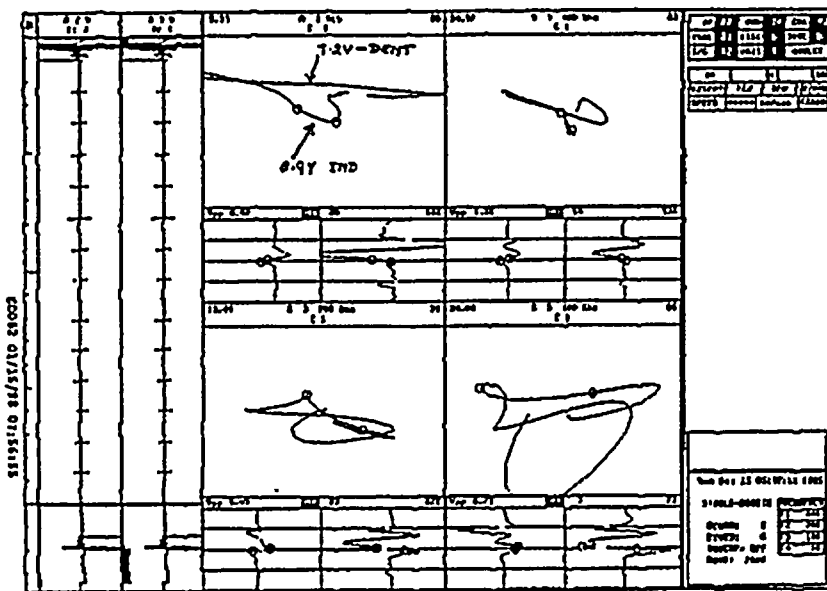


Figure 1-10

DIALO GRYON PP 10/15/95 CUTTER UNIT 1 SQ 12 REEL 28 PWT

PERFORMANCE DEMONSTRATION DATA BASE

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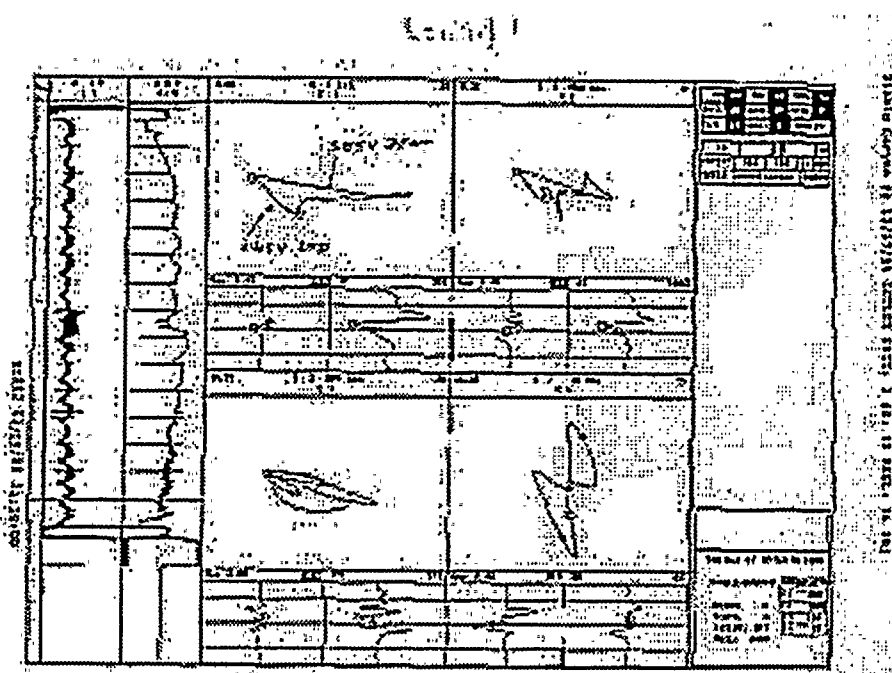


Figure 1

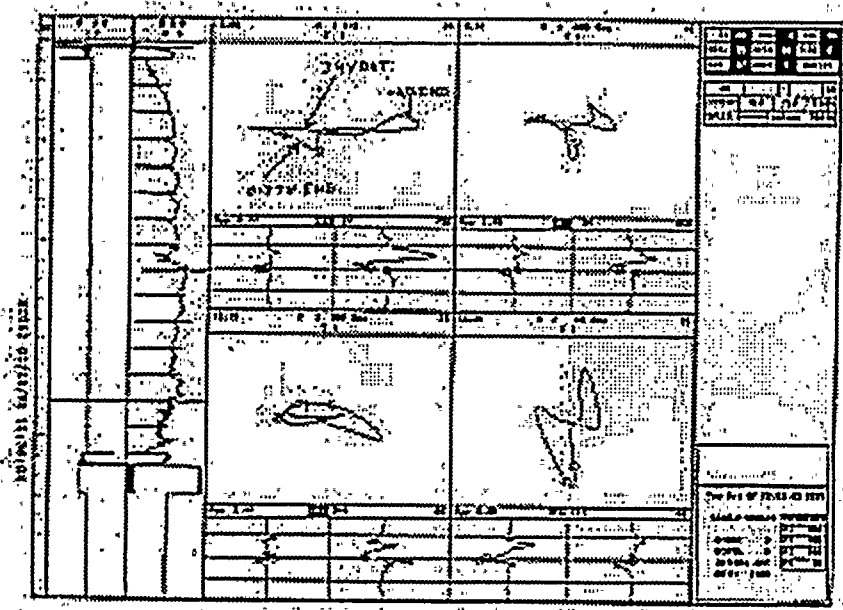


Figure 2

PERFORMANCE DEMONSTRATION DATA BASE

Appendix A TECHNIQUE SPECIFICATION SHEETS



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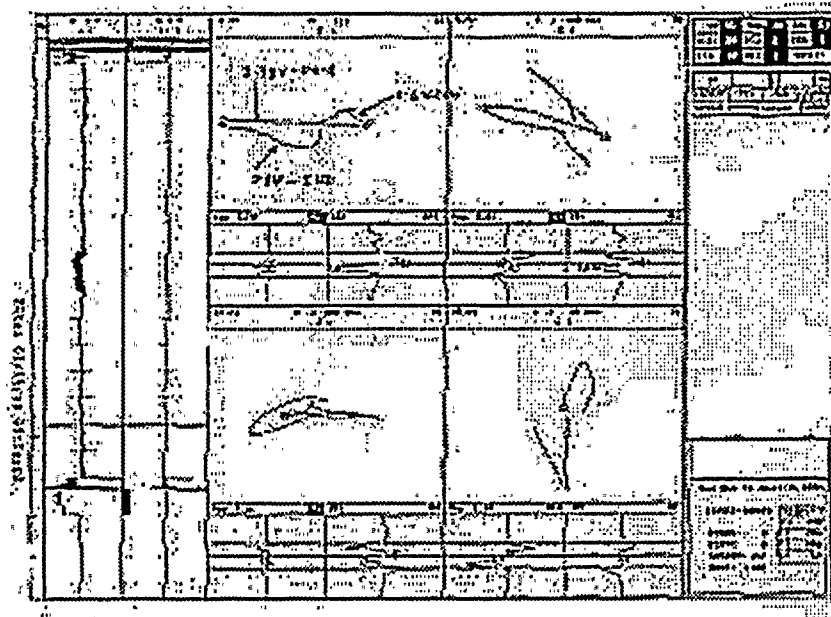


Figure 614

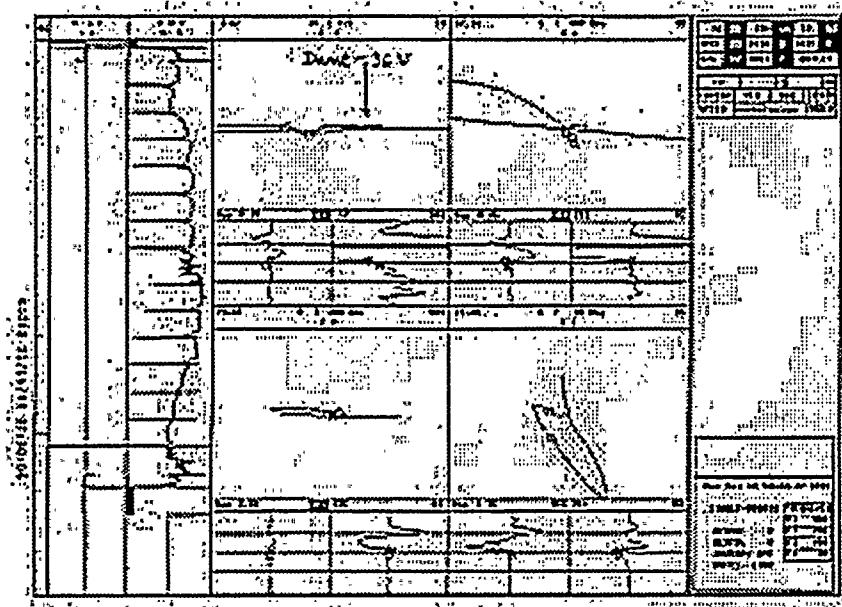


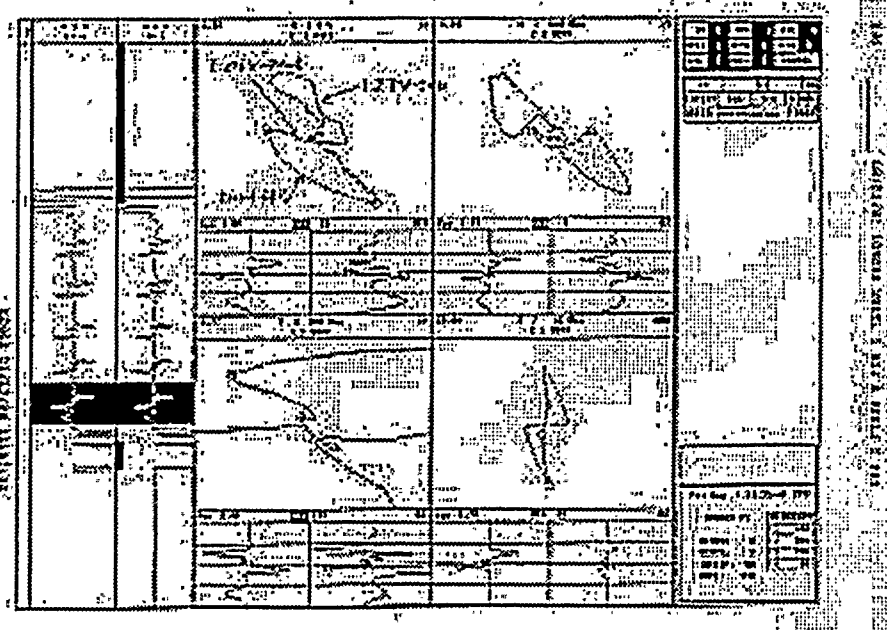
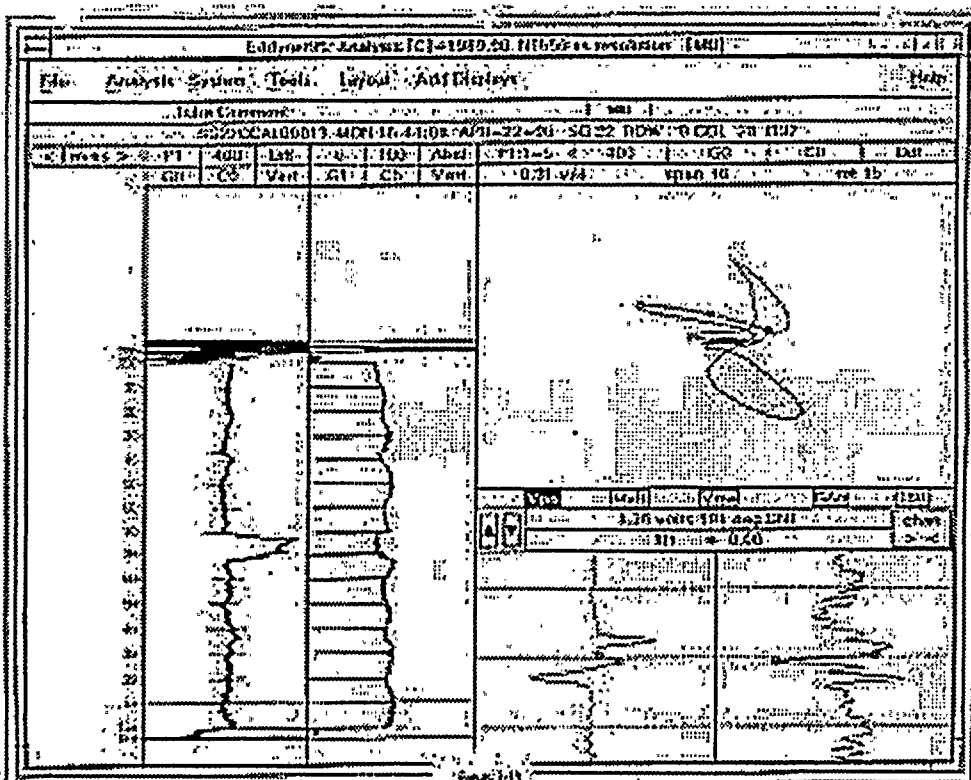
Figure 615

PERFORMANCE DEMONSTRATION DATA BASE

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Appendix A TECHNIQUE SPECIFICATION SHEETS



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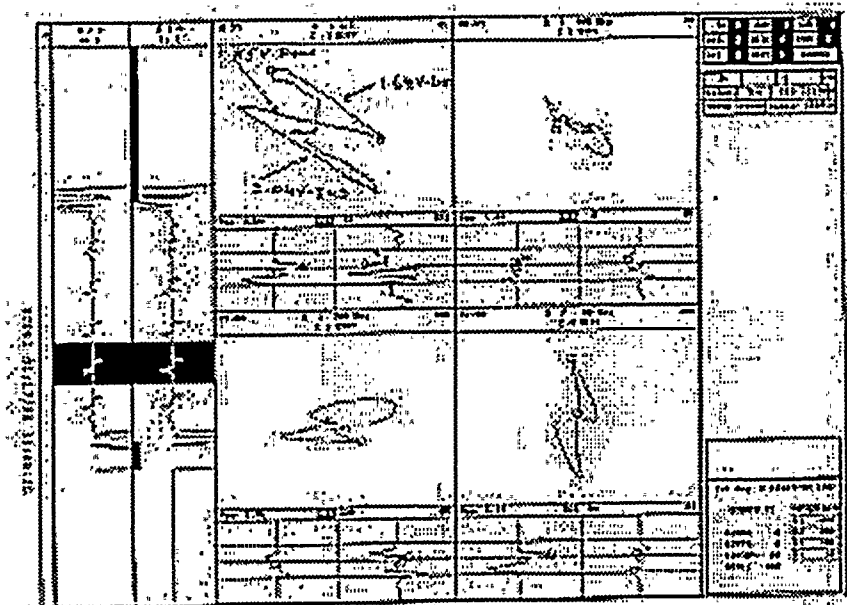


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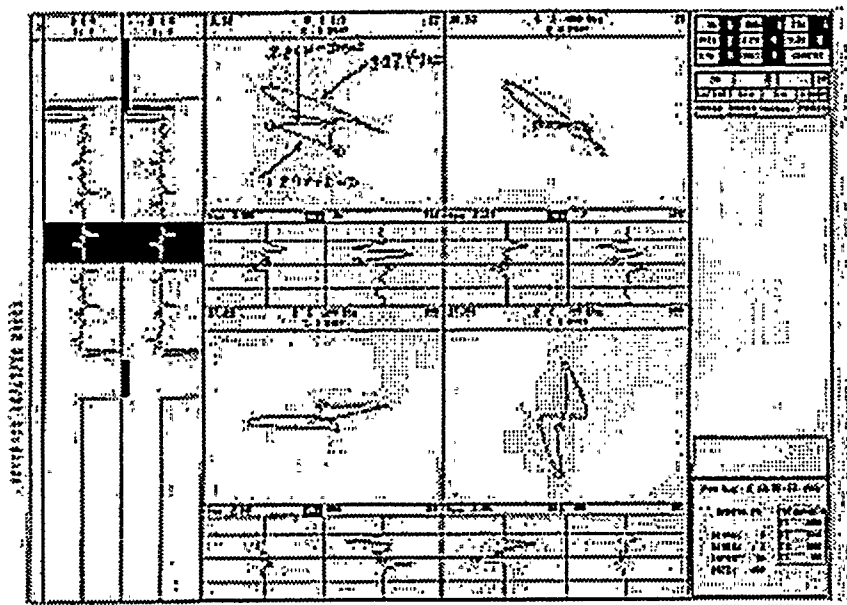
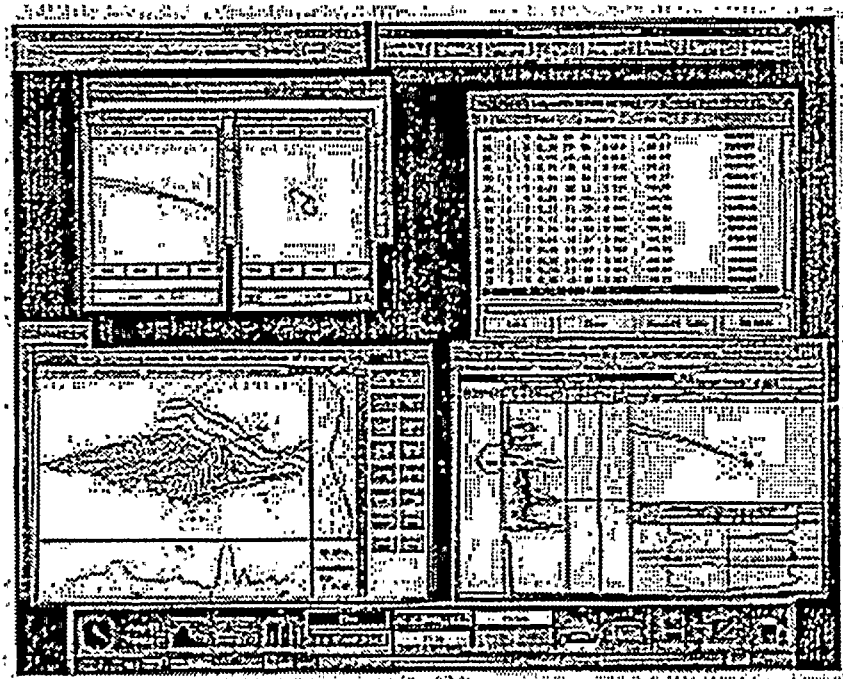
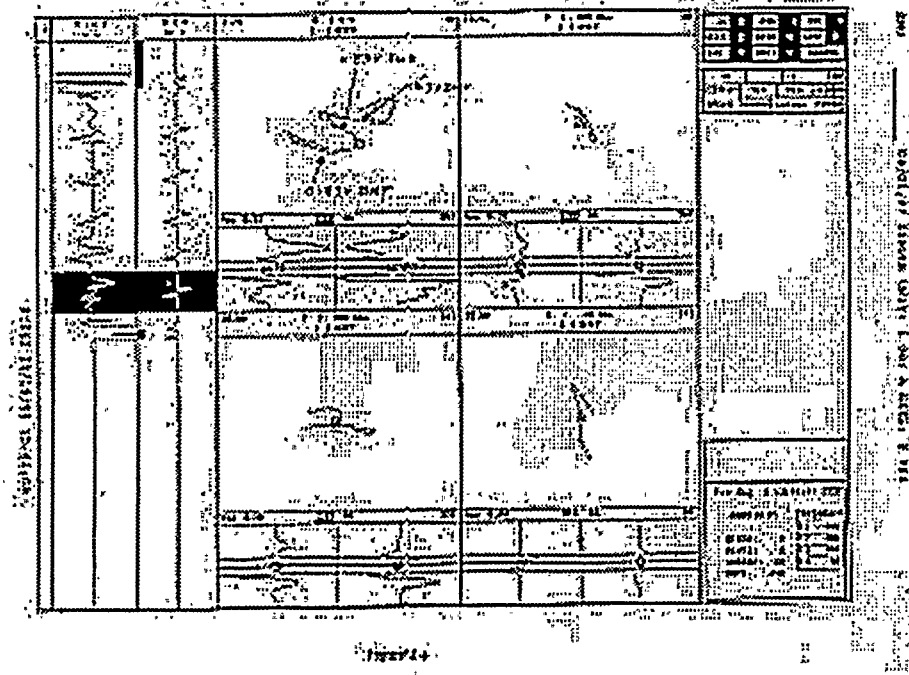


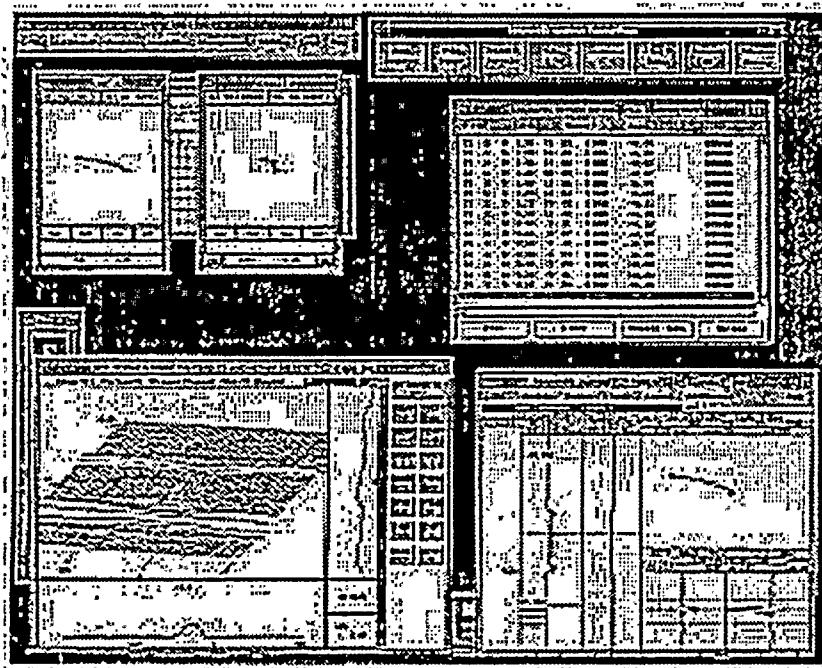
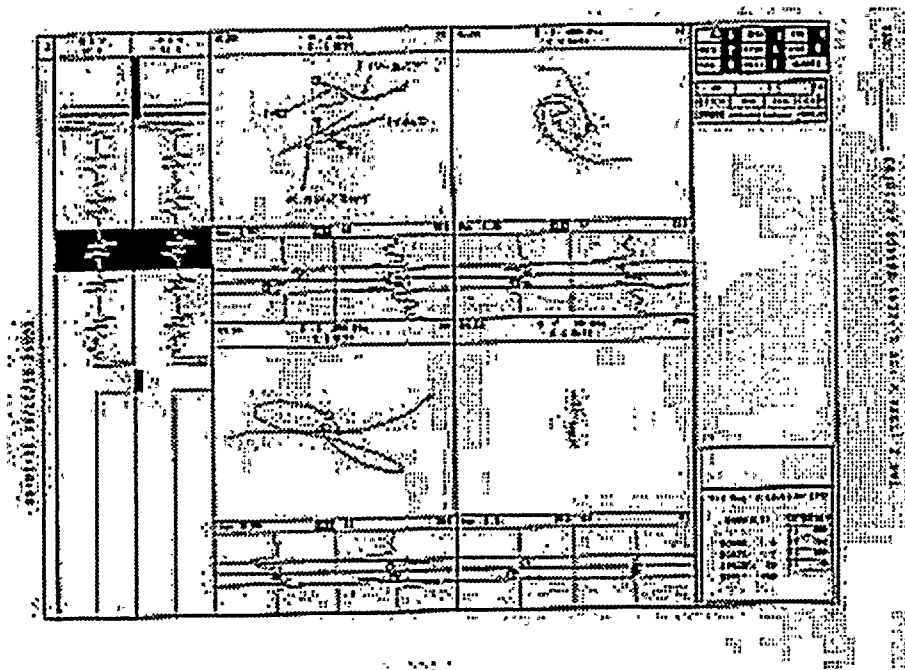
Figure 23



PERFORMANCE DEMONSTRATION DATA BASE

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PERFORMANCE DEMONSTRATION DATA BASE

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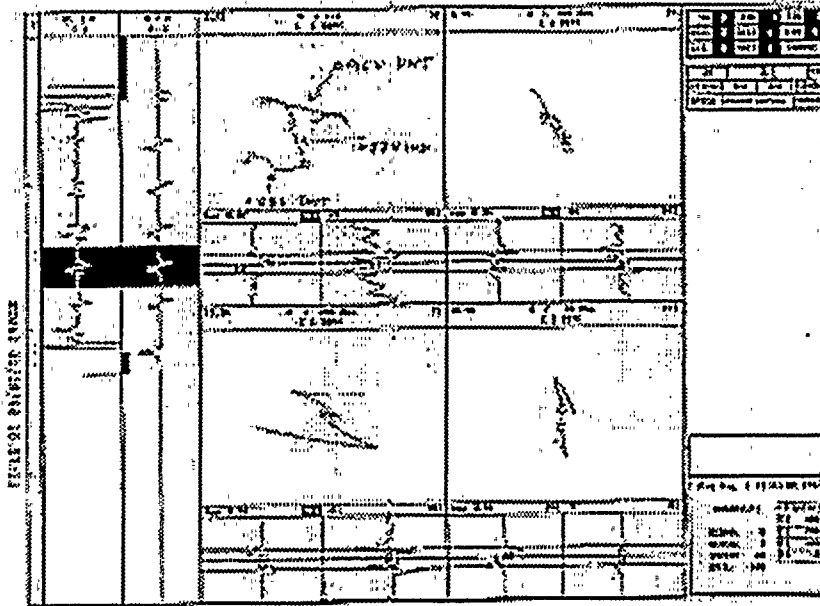


Figure 46

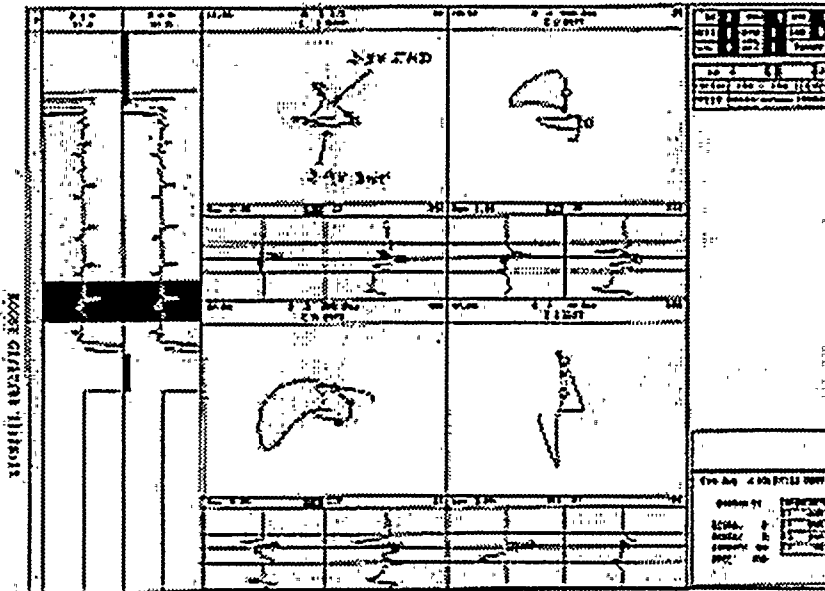


Figure 47

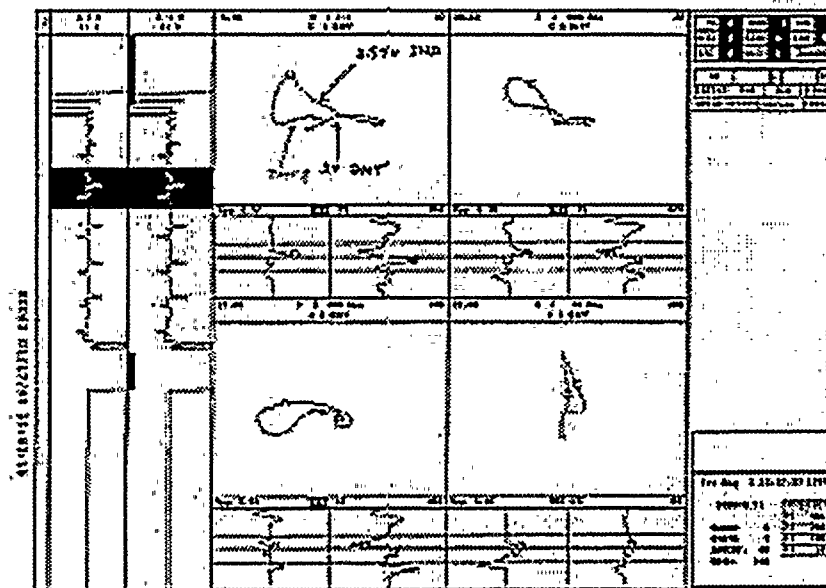


FIGURE 19

FIGURE 19

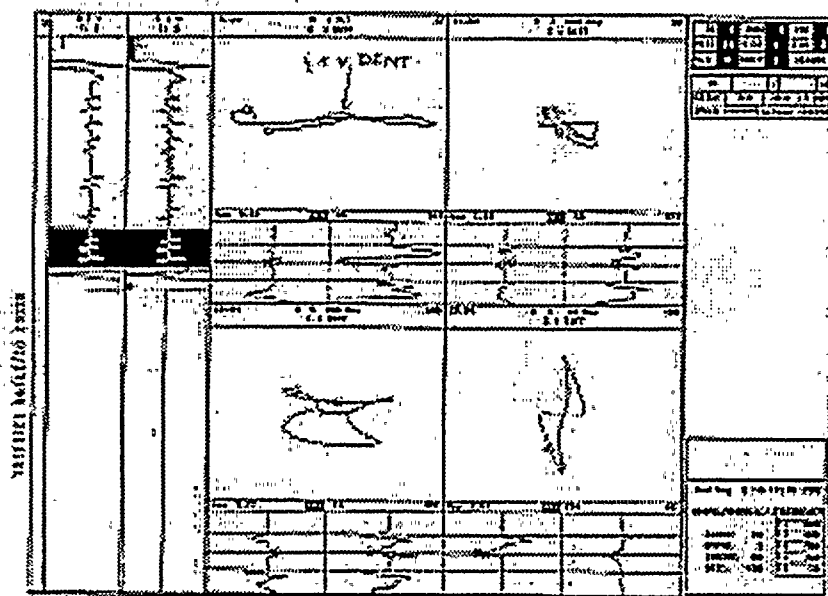


FIGURE 20

FIGURE 20

PERFORMANCE DEMONSTRATION DATA BASE

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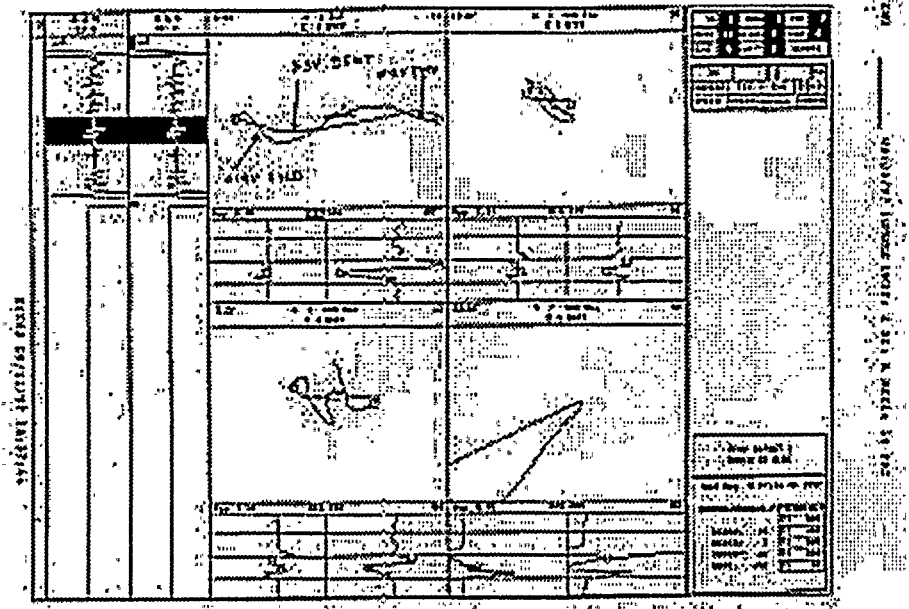


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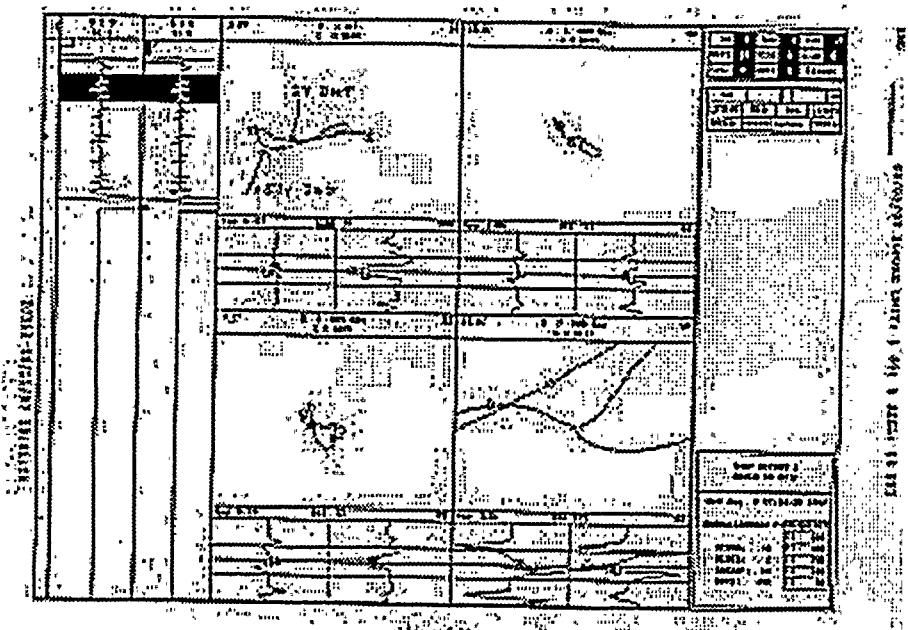


Figure 2

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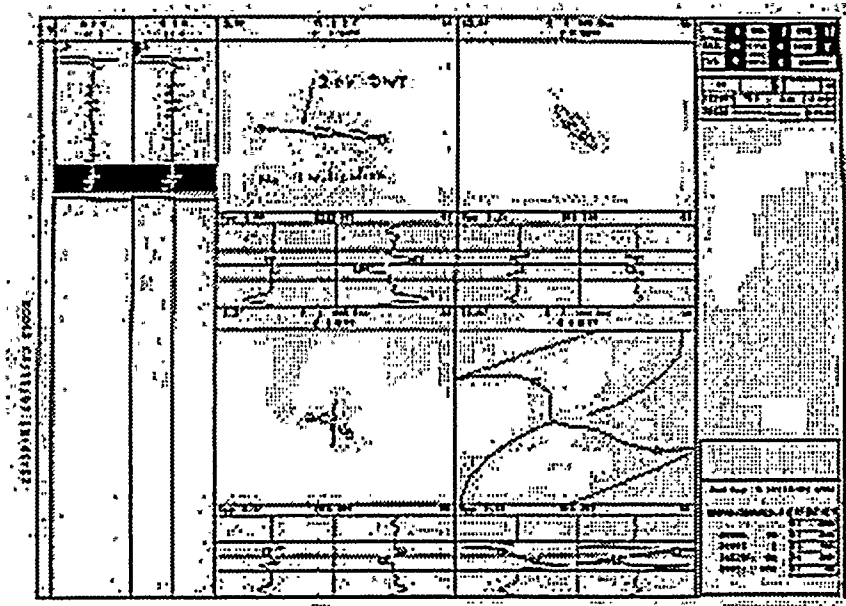


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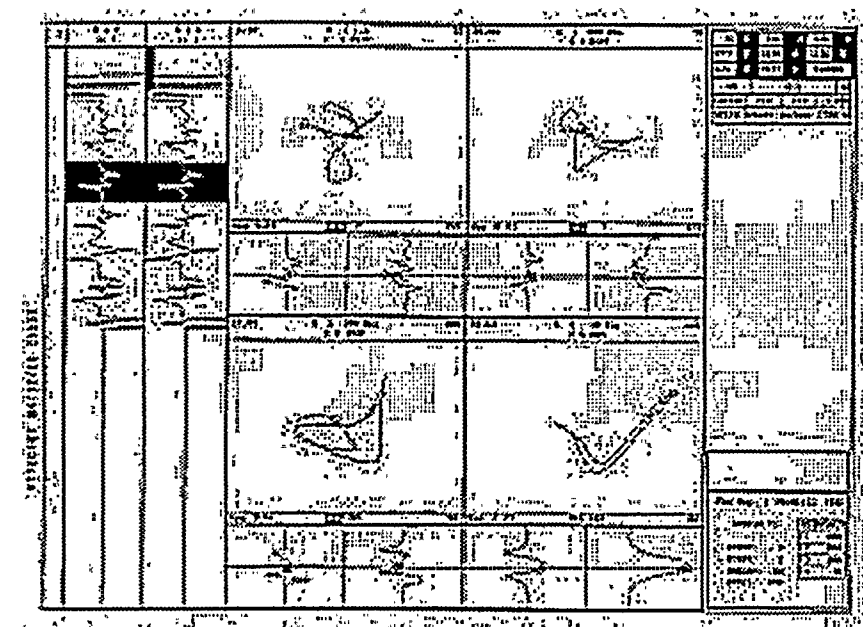


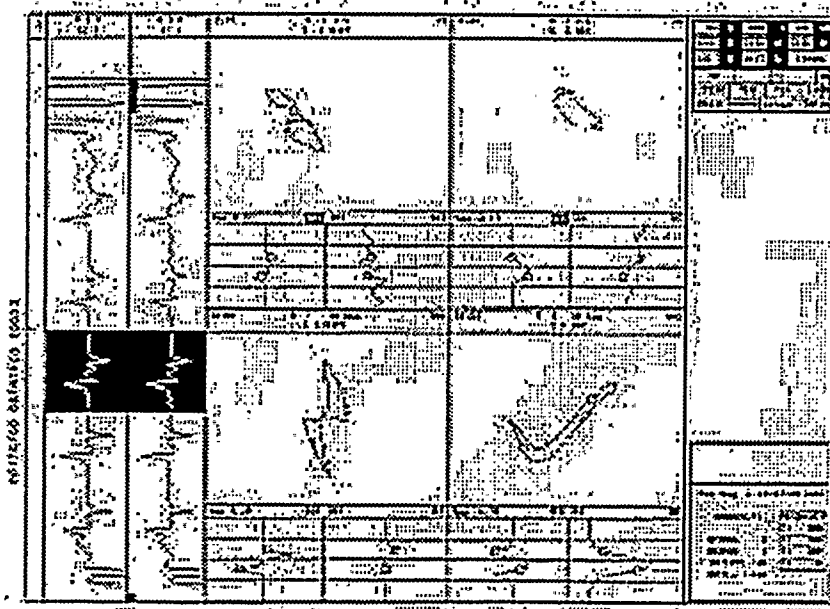
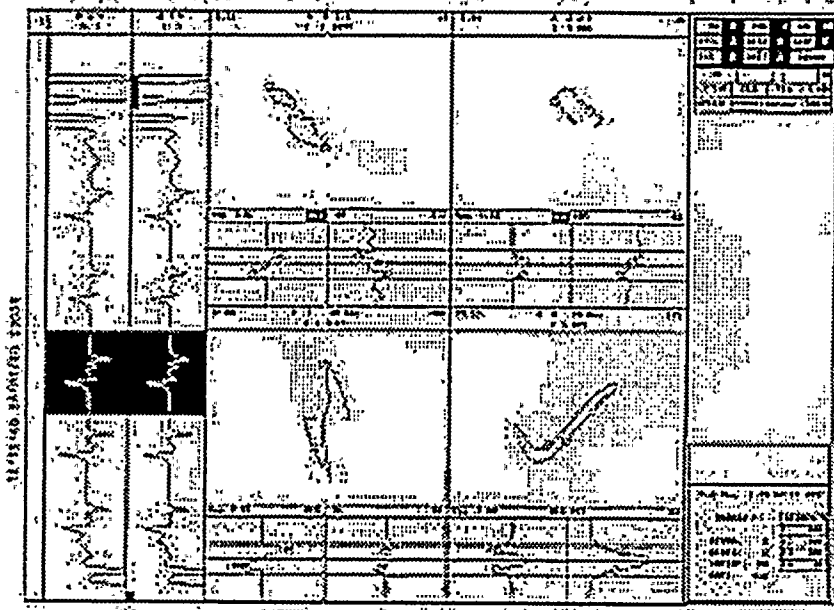
Figure 2

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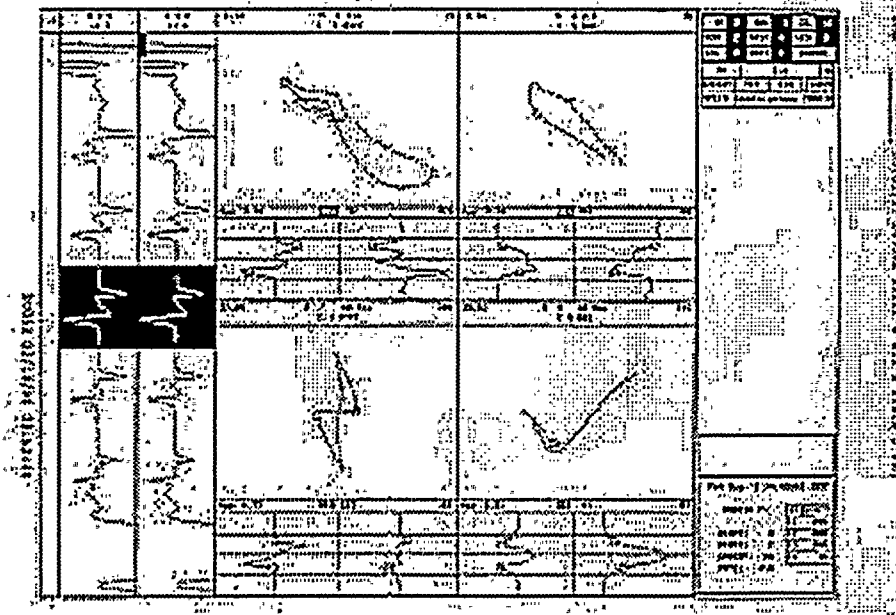


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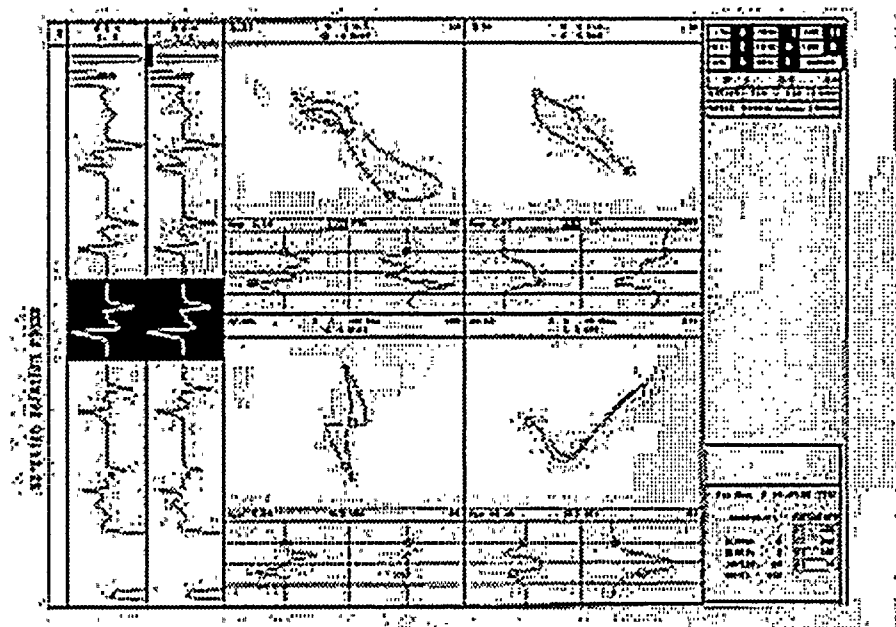


Figure 2

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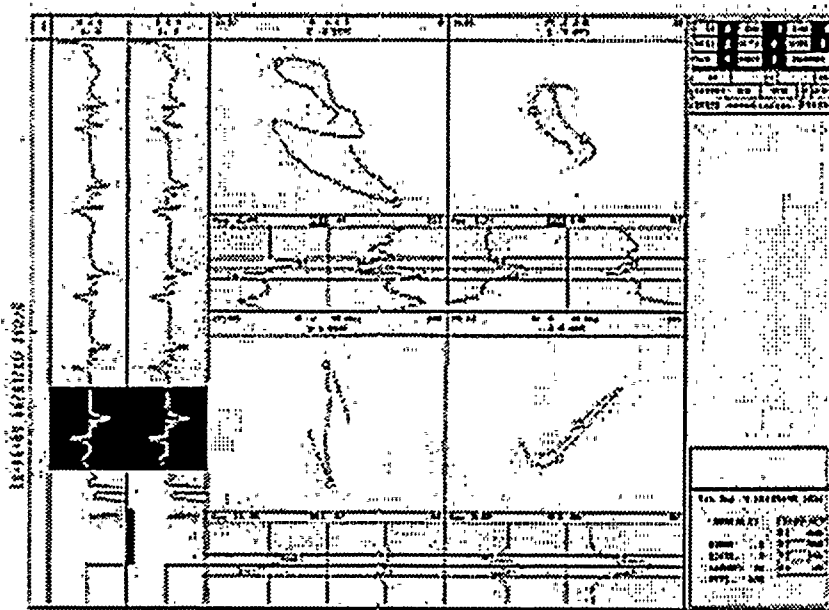


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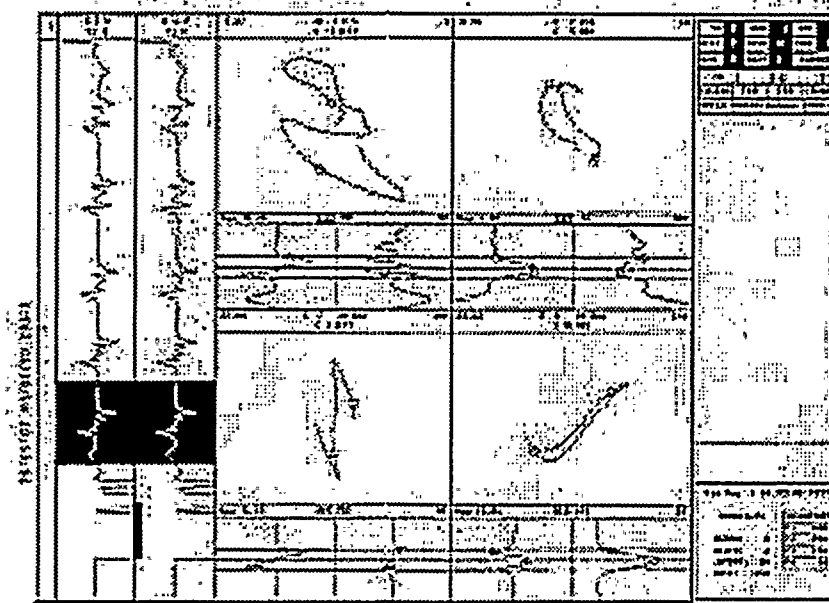


Figure 2

PERFORMANCE DEMONSTRATION DATA BASE

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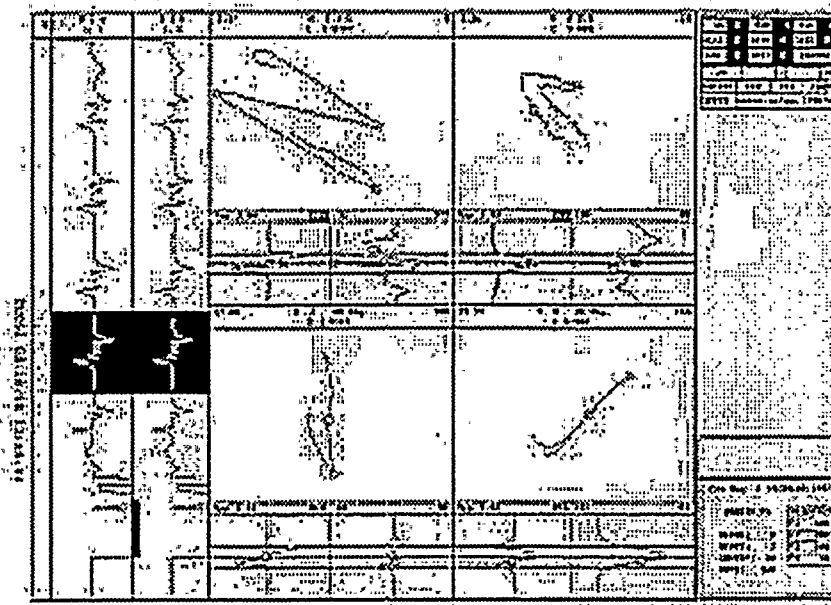


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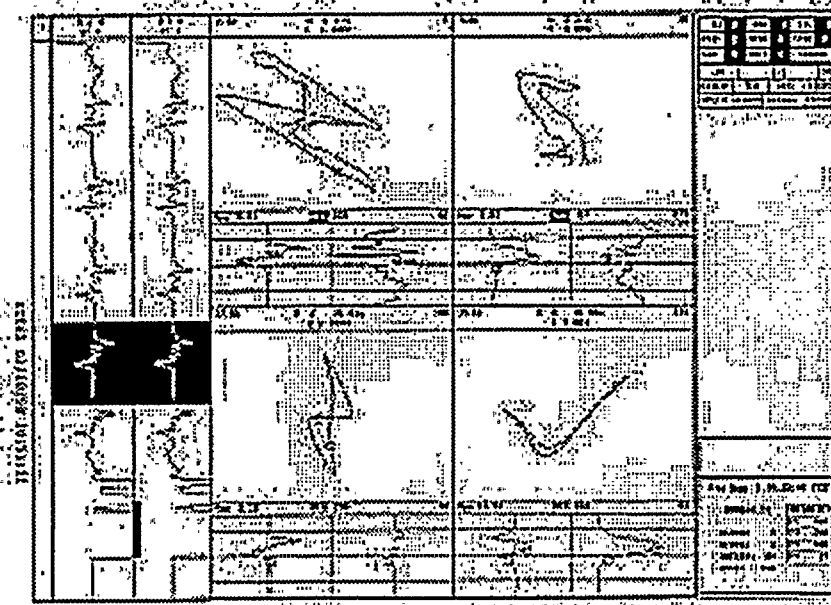


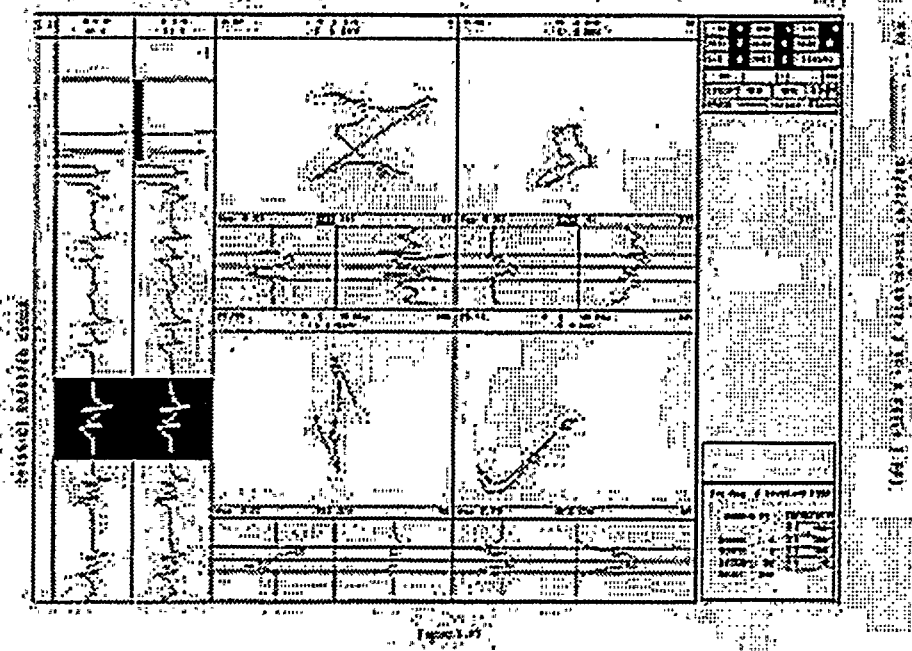
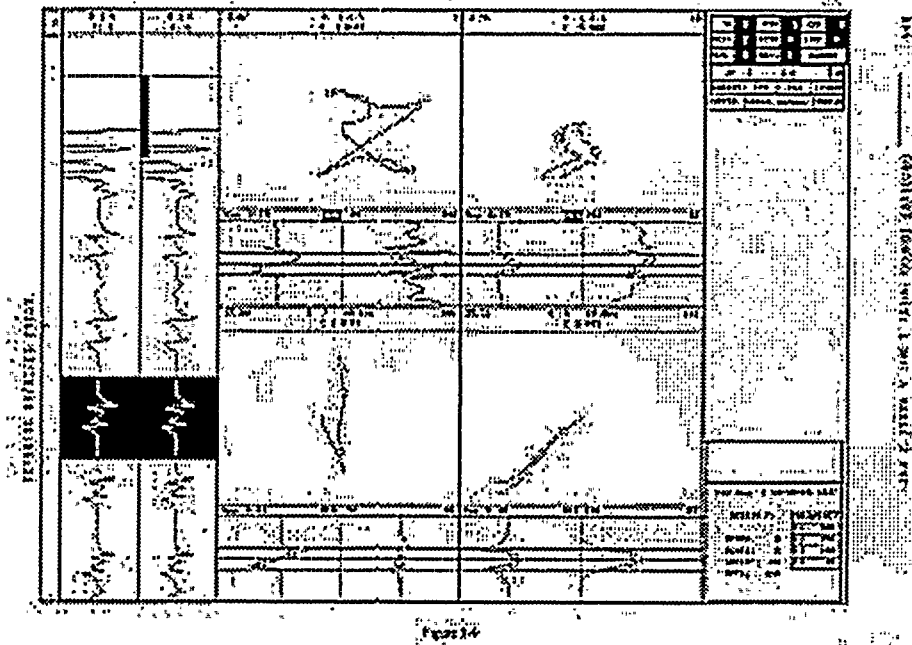
Figure 2

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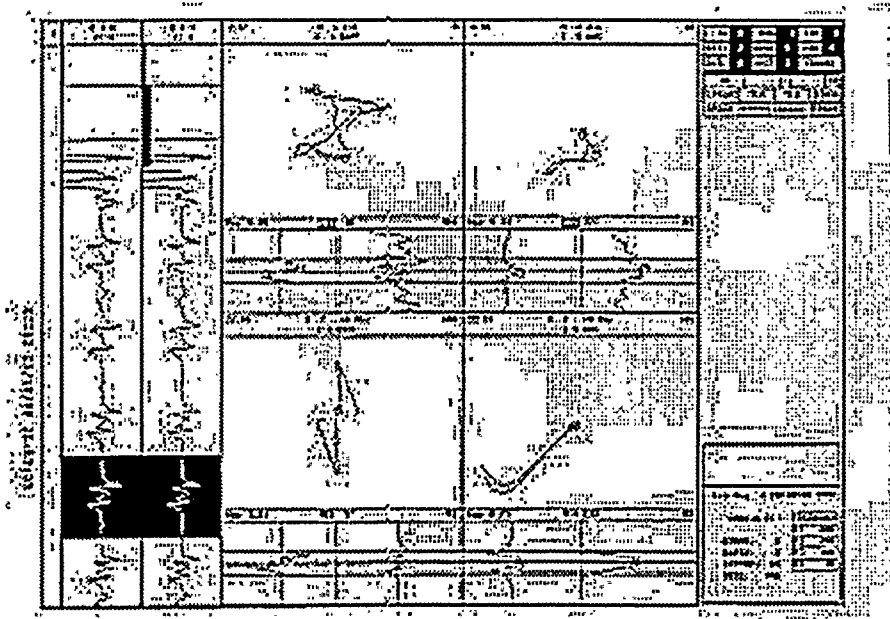


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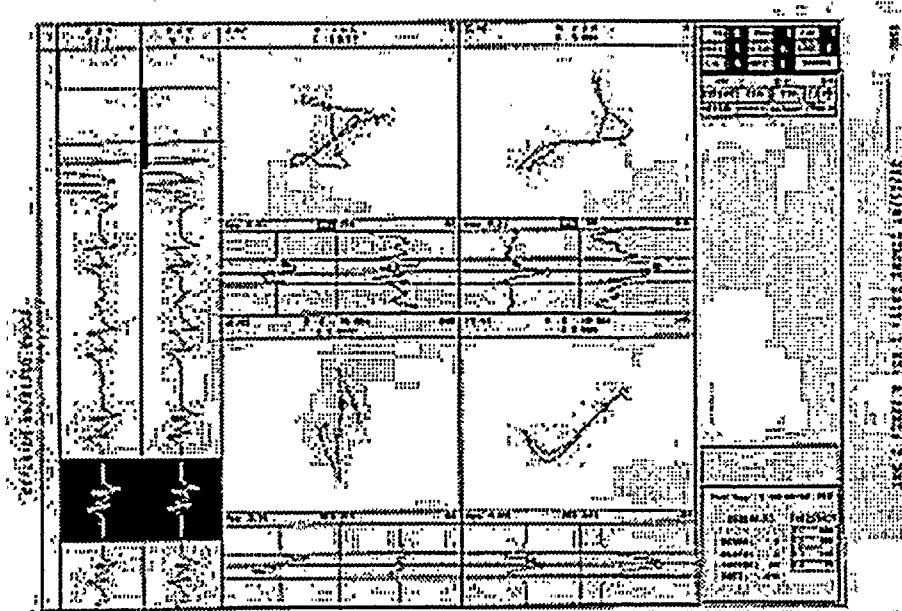


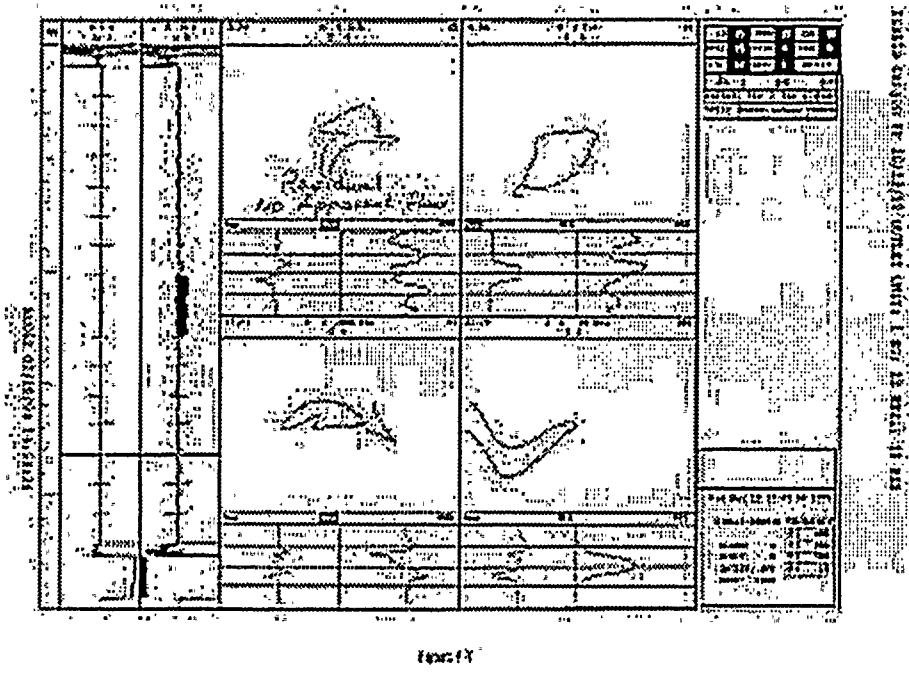
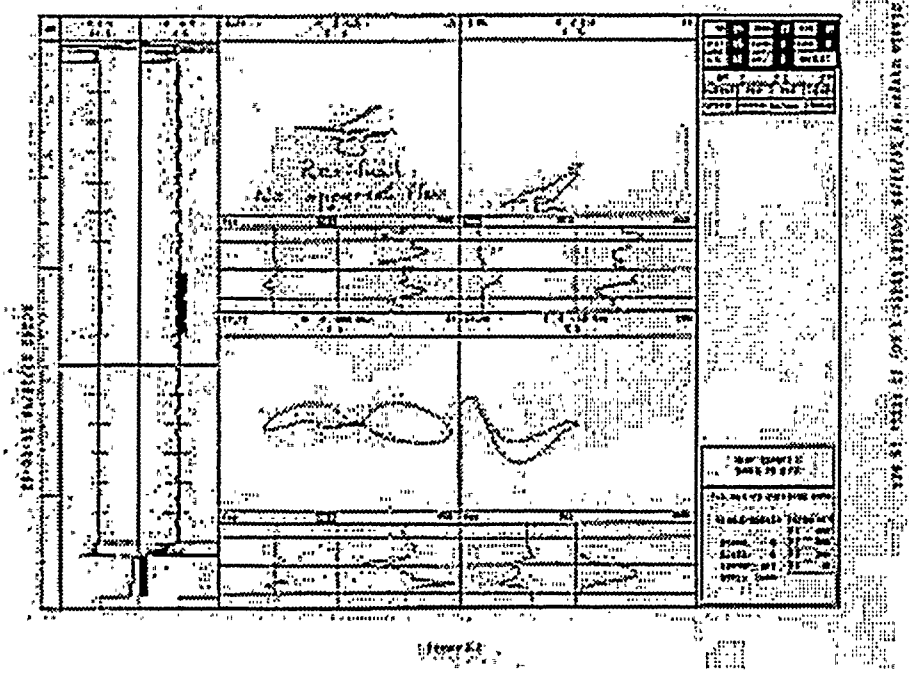
Figure 2

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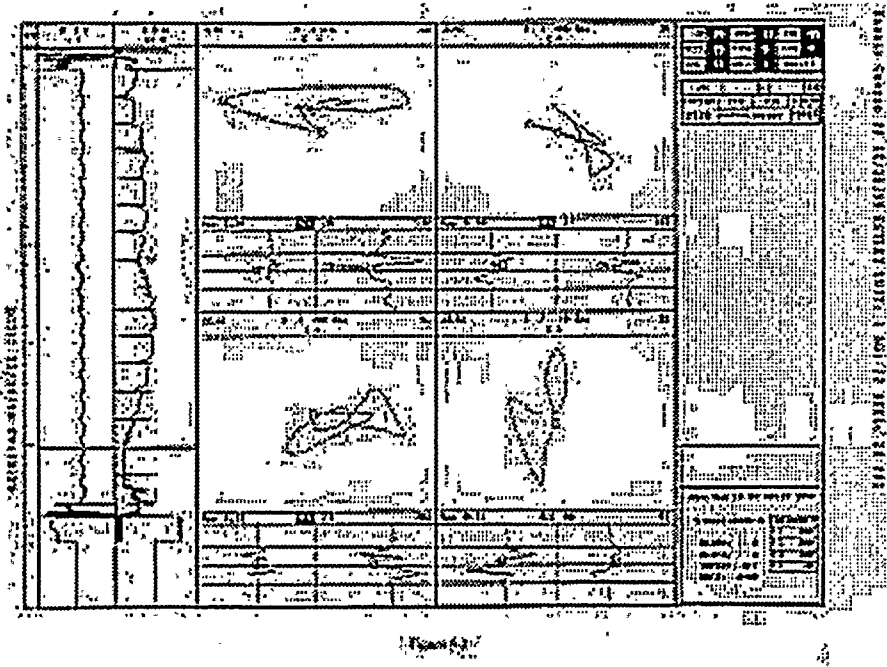
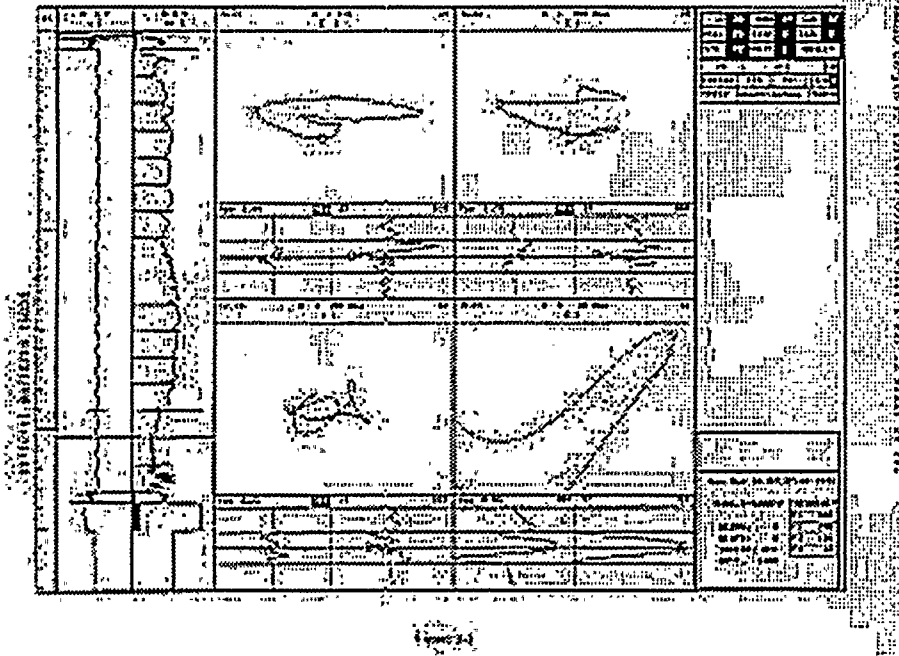


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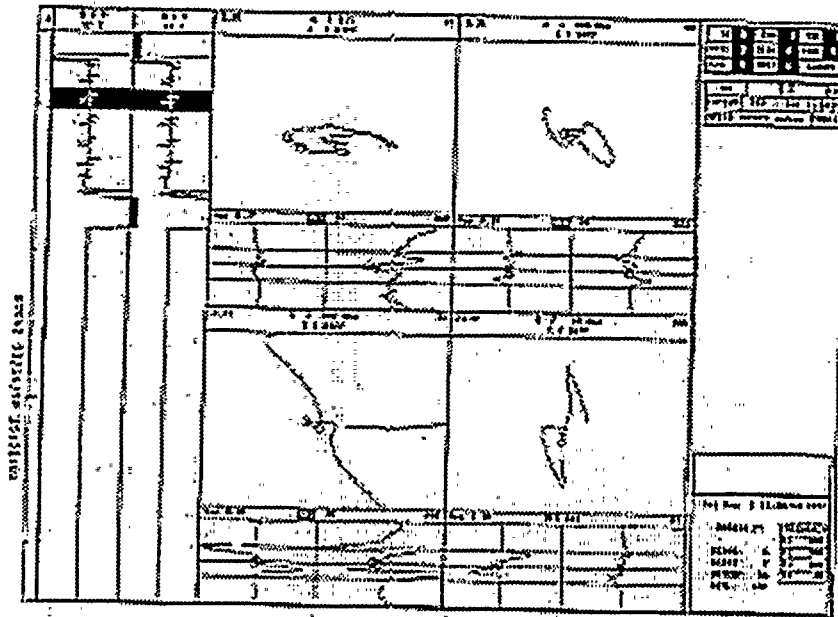


Figure 54

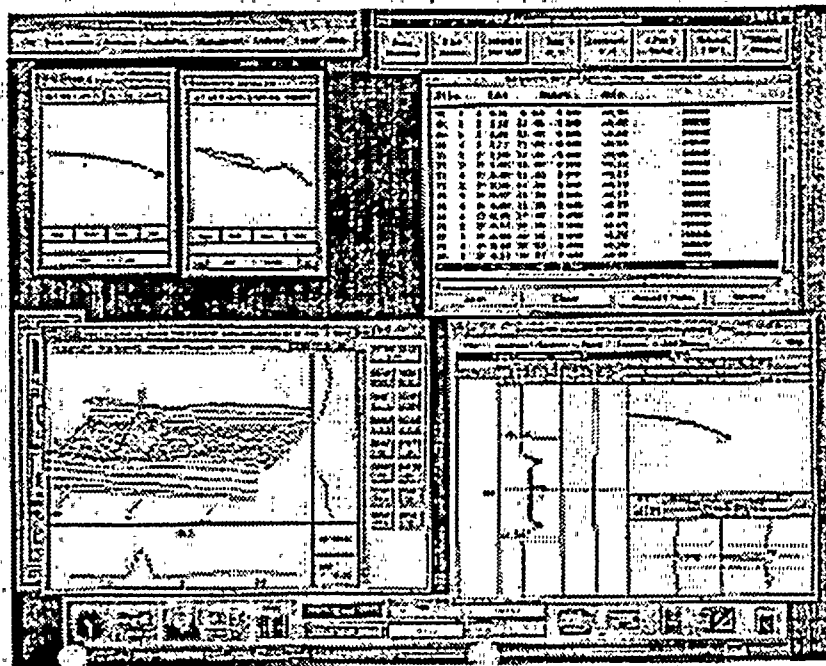


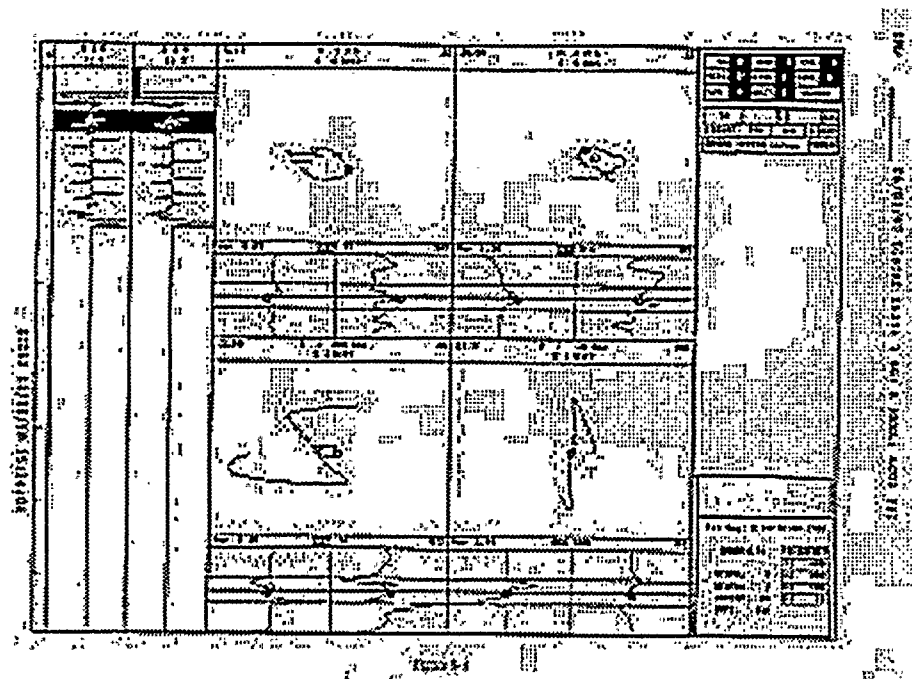
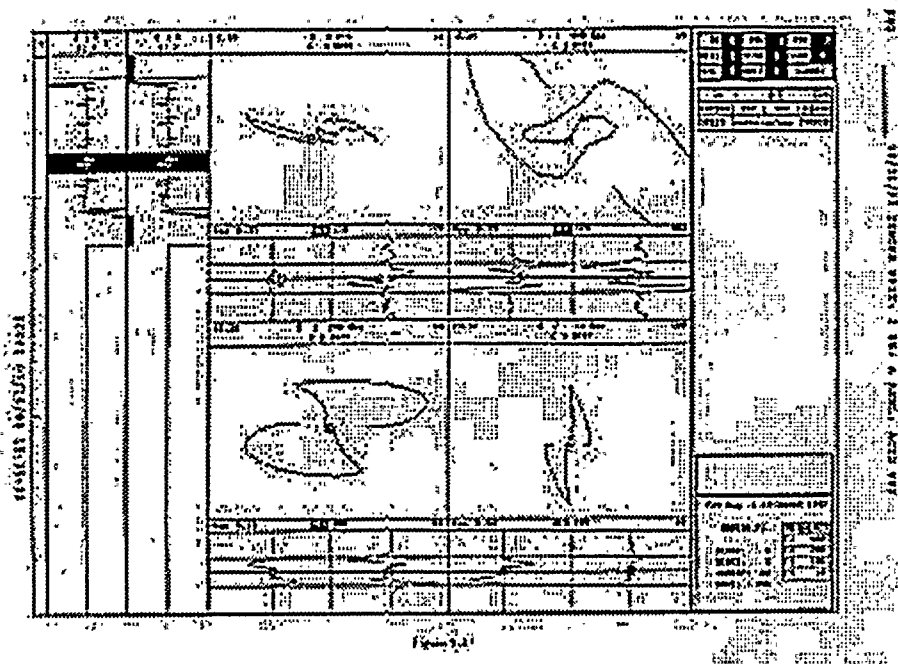
Figure 55

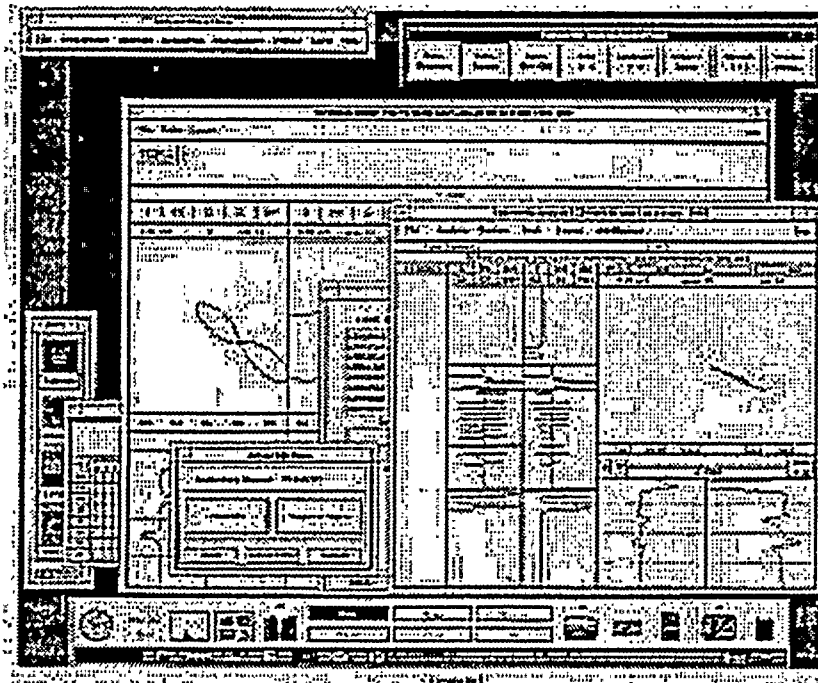
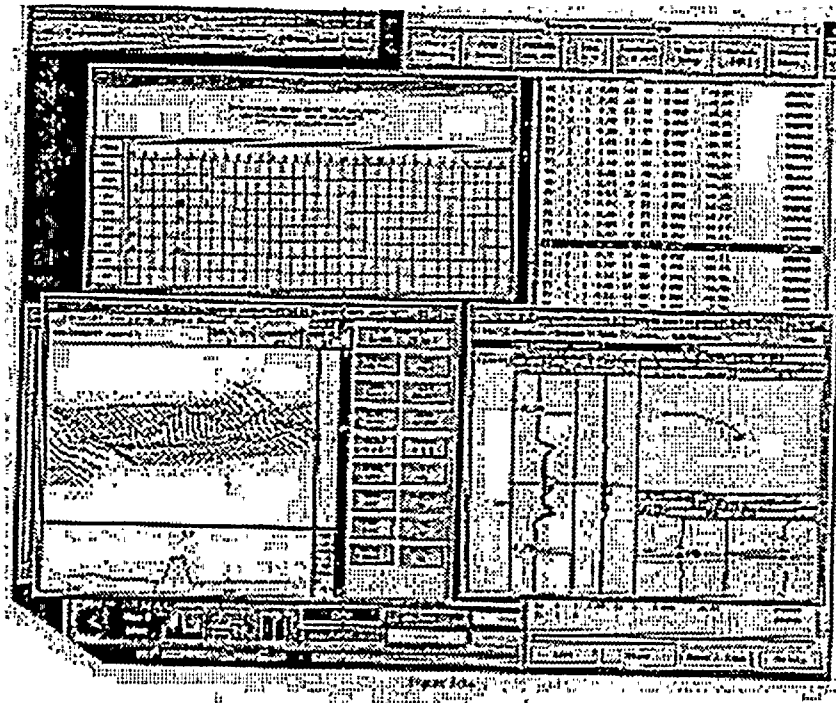
PERFORMANCE DEMONSTRATION DATA BASE

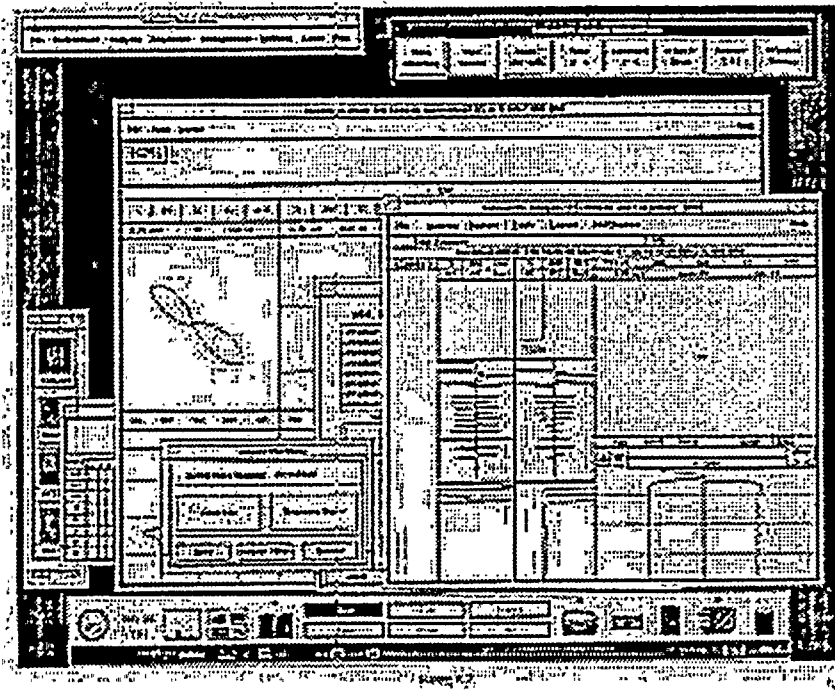
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APPENDIX A-3

DAT-PWSCC-2 Rev.0
Examination Procedure for Plus-Point Detection
And Sizing of Axial PWSCC in Dented Intersections

5/20/98



**Examination Procedure for Plus Point Detection
and Sizing of Axial PWSCC in Dented Intersections**

Prepared by: *A. P. P.* Date: 5/20/98

Reviewed by: *D. Craig Bower* Date: 5/20/98

Reviewed by: *Joon H. Kang* Date: 5/20/98
JOON H. KANG

Engineering: *R. Malinowski* Date: 5/20/98



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- 2.0 PERSONNEL QUALIFICATIONS
- 3.0 RESPONSIBILITIES
- 4.0 CALIBRATION
- 5.0 FLAW IDENTIFICATION CRITERIA
- 6.0 REPORTING REQUIREMENTS
- 7.0 EVALUATION
- 8.0 RECORDING
- 9.0 RESOLUTIONS
- 10.0 APPENDICES
 - 10.1 APPENDIX A -PG&E 2R8 ETSS#2 Rev. 2
 - 10.2 APPENDIX B - EPRI ETSS # 96510 and #96703

1.0 SCOPE

This procedure provides instruction and guidance for the detection and sizing of PWSCC indications in the presence of small dents using a Plus Point probe. This procedure is limited in scope and is meant for use in performance demonstrations of the technique or for inclusion, in part or whole, into a site specific analysis procedure.

2.0 PERSONNEL QUALIFICATIONS

- 2.1 Personnel performing production analysis shall be certified to a minimum of Level II in electromagnetic testing with additional training in the analysis of data from non-ferromagnetic steam generator tubing per Section XI of the ASME Boiler and Pressure Vessel Code. Additionally, the analysis personnel must also be qualified data analysts (QDA) in accordance with Appendix G of the EPRI PWR Steam Generator Examination Guidelines, Rev. 5.
- 2.2 Personnel performing resolution analysis, independent technical review or serving as a Utility Analyst shall be certified to Level III in electromagnetic testing with additional training in the analysis of data from non-ferromagnetic steam generator tubing per Section XI of the ASME Boiler and Pressure Vessel Code. Additionally, the resolution personnel must also be qualified data analysts (QDA) in accordance with Appendix G of the EPRI PWR Steam Generator Examination Guidelines, Rev. 5.
- 2.3 Personnel performing report comparison and data reduction functions (engineering or data management) do not require specific qualification.

3.0 RESPONSIBILITIES

- 3.1 The Primary and Secondary Analysts are responsible for the evaluation of dented intersections for the detection of signals which may indicate the presence of PWSCC.
- 3.2 The Resolution Analyst is responsible for resolving discrepancies between the primary and secondary analyst reports (detection only).
- 3.3 The Sizing Analyst is responsible for performing the line-by-line length and depth measurements of the PWSCC indications resulting from the resolved detection report.
- 3.4 The Independent Technical Reviewer (ITR) reviews the sizing analyst's results and, if deemed necessary, produces a separate set of length and depth measurements.
- 3.5 The Utility Analyst is responsible for interpretation of the procedure, guidance of analysts, and acceptance of the final results.
- 3.6 When a performance demonstration is in progress, Engineering shall process the resolved results in order to determine the POD for the technique.
- 3.7 When the data being processed relates to an outage, Data Management shall process the resolved report in accordance with the pre-defined job data flow.

4.0 CALIBRATION

- 4.1 Calibration of the probe shall be performed in accordance with the Technique Specification Sheet in Appendix A (pages 3 -5 of ETSS).

4.2 If calibrations are provided, as in a performance demonstration, the analysts shall review the calibration for conformance to the Technique Specification Sheet.

4.3 Scale setting shall be performed on support plates per PG&E 2R8 ETSS #2 (Appendix A).

5.0 FLAW DETECTION CRITERIA

Refer to PG&E 2R8 ETSS: # 2

6.0 DETECTION REPORTING REQUIREMENTS

6.1 Axially oriented indications exhibiting flaw-like behavior shall be reported as SAI. If there is more than one indication at an intersection, each shall be reported as an SAI at that location. MAI is not an acceptable call. If circumferential indications are detected, they shall be reported as SCI.

6.2 Support plate intersections which exhibit no degradation signal shall be documented as NDD.

6.3 All indication codes shall include the tube identification, the support and indication location, the test extent, the indication amplitude, the phase angle and the indication code.

6.4 For the purposes of the performance demonstration, all supports are to be considered to be 1H for location.

7.0 FLAW SIZING CRITERIA

7.1 Refer to PG&E 2R8 ETSS: # 2 pages 5 and 6.

7.2 Sizing shall be performed using the main Lissajous window (EddyNet). Each flaw shall be sized separately from beginning to end (see sample report in PG&E 2R8 ETSS # 2).

7.3 The Analysts performing sizing shall not make the adjustments recommended in the ETSS. These will be applied by Engineering.

8.0 SIZING REPORTING REQUIREMENTS

8.1 The first report entry for each calibration group shall be the phase and amplitude of the through-wall axial EDM notch on the standard. The indication code used shall be STD.

8.2 A report entry shall be made for each scan line from one scan line preceding the indication (0%) to one scan line past the indication (0%).

8.3 Multiple indications shall be reported separately noting the azimuthal location of each of the signals reported on a scan line.

8.4 All reported indications shall also include the tube identification, the support and indication location, the test extent, the indication amplitude, the indication percent through-wall and the phase angle.

- 8.5 For the purposes of the performance demonstration, all supports are to be considered to be 1H for location.

9.0 RESOLUTIONS

9.1 Detection

- 9.1.1 When one analyst reports an indication (SAI or SCI), and the other does not, resolutions are required. If the resolution analyst does not concur with the indication call, he/she must obtain the concurrence of another Level III analyst before rejecting the call.
- 9.1.2 When both analysts report an indication (SAI or SCI), the resolution analyst shall review the call. If the resolution analyst does not concur, he/she must obtain the concurrence of another Level III analyst before rejecting the call.

9.2 Sizing

- 9.2.1 The ITR shall review the Sizing Analyst's report and review the data for the flaw(s) reported. The ITR shall verify, as a minimum, the following:
- 9.2.1.1 The phase rotation of the standard (40% axial ID EDM notch at 15°).
 - 9.2.1.2 The voltage scale setting (20 Vpp for 100% axial EDM notch).
 - 9.2.1.3 The 4 point calibration curve (0% - 100% ID EDM notches).
 - 9.2.1.4 The axial scale setting, specifically 0.75 inch from half-ramp to half-ramp on the support signal (typically performed using low frequency channel).
 - 9.2.1.5 The location of the center of the support (e.g. 1H + 0.00 inch)
 - 9.2.1.6 The location of the first and last hits of the PWSCC indication.
 - 9.2.1.7 The depth (% through-wall) at the maximum signal amplitude.

NOTE: This is not typically the maximum depth measurement of all signals by phase measurement.

- 9.2.1.8 Sample check of measured depth values. This check shall include the maximum depth point where the amplitude is $\geq 50\%$ of the maximum amplitude signal from 9.2.1.7.
- 9.2.2 The ITR should plot the sizing report using the EPRI Draw program, or an equivalent utility, to help determine the acceptance of the sizing results.
- 9.2.3 If the ITR determines that the sizing results are not acceptable, he/she should discuss the reason with the Sizing Analyst. Re-sizing should then be performed by either the Sizing Analyst (preferred) or the ITR.
- 9.2.4 The Utility Analyst should perform the functions described in 9.2.1 and 9.2.2 if the ITR performs re-sizing.

10.0 APPENDICES

10.1 APPENDIX A - PG&E 2R8 ETSS # 2

NOTE: This ETSS has been evaluated in light of the EPRI peer reviewed ETSS (#96703) and exceeds the criteria of the EPRI ETSS. It is being used in lieu of the EPRI ETSS since it contains a more prescriptive methodology to ensure the consistency of the results.

Examination Technique Specification Sheet

ETSS # 2 - 3-Coil RPC (.115/+PT/.080hf) Revision 2 Page: 1 of 17
 Site: Diablo Canyon Unit 2 Outage 8 (02-98)

Examination Scope

Applicability: Tubesheets, Dented and non-dented support plates, free span dings, tube support ligament and free span bobbin indications.

Instrument		Tubing	
Manufacturer/Model: Zetec MIZ-30 or MIZ-30A		Material Type: Inconel 600	
Data Recording Equipment		OD/Wall (inch): 0.875 OD X 0.050 Wall	
Manuf./Media: HP Hard Drive 1.3Gb Optical or Equiv.		Calibration Standard	
Software		Type: EDM notch	
Manufacturer: Zetec		Analog Signal Path	
Version/Revision: EddyNet 95, Ver.4.14 or Later		Probe Extension Manuf.: Zetec	
Examination Procedure		Extension Type & Length: 36 pin Cat #945-1740, 75 ft.	
Number/Revision: 54-ISI-400-07		Slip Ring Model Number: 508-2052	

Scan Parameters

Scan Direction: Pull or Push (See Special Instructions)

Digitization Rate, Samples Per Inch (minimum):		Axial Direction	30	Circ. Direction	30
Probe Speed	Sample Rate	RPM Set	RPM Min	RPM Max	
.40 inch/sec Nominal	1185	800	720	826	

Probe/Motor Unit

Description (Model/Diameter/Coil Dimensions)	Manufacturer/Part Number	Length
.720 3-C Delta 115MB/+PT/.080hf (Shielded)	Zetec D # 3531-1-A	N/A
610 9D MRPC 52 M/U 36 Pin	Zetec CAT # 810-4055	83 ft.

Data Acquisition

Calibration Coil 1 (.115" Pancake) Channels

Channel & Frequency	Ch 5 & 8 300 kHz	Ch 11 & 13 200 kHz	Ch 15 & 19 100 kHz	Ch 23 & 24 15 kHz
Phase Rotation	Probe motion horizontal, flaws up	Probe motion horizontal, flaws up	Probe motion horizontal, flaws up	Support Ring 90 degrees
Span Setting	40% ID Axial 3 divisions	40% ID Axial 3 divisions	40% ID Axial 3 divisions	Support Ring 3 divisions

Calibration Coil 5 (+PT) and Coil 8 (Encoder) Channels

Channel & Frequency	Ch 6 & 9 300 kHz	Ch 12 & 14 200 kHz	Ch 17 & 21 100 kHz	Ch 18 & 22 100 kHz
Phase Rotation	100% Axial Notch approximately 40 degrees	100% Axial Notch approximately 40 degrees	100% Axial Notch approximately 40 degrees	Pulse 90 Degrees
Span Setting	40% ID Axial 3 divisions	40% ID Axial 3 divisions	40% ID Axial 3 divisions	Pulse 4 divisions

Calibration Coil 7 (.080" Pancake) and Coil 4 (Trigger) Channels

Channel & Frequency	Ch 1 & 2 800 kHz	Ch 3 & 4 600 kHz	Ch 7 & 10 300 kHz	Ch 16 & 20 100 kHz
Phase Rotation	Probe motion horizontal, flaws up	Probe motion horizontal, flaws up	Probe motion horizontal, flaws up	Trigger Pulse Main Pulse Up
Span Setting	40% ID Axial 3 divisions	40% ID Axial 3 divisions	40% ID Axial 3 divisions	Trigger Pulse 4 divisions

Examination Technique Specification Sheet

ETSS # 2 - 3-Coil RPC (.115/+PT/080hf)

Revision 2

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Configuration Board Settings

ing: off	down	configarabon # 0								name : Dual Plus Point								samples / sec : 1185								rec. media =								Hard Drive							
tester =		board # 1				board # 2				board # 3				board # 4				board # 5				board # 6				board # 7				board # 8											
# of channels =	24	probe # 1				probe # 1				probe # 2				probe # 2				probe # 1				probe # 1				probe # 1				probe # 1											
		DRIVE				DRIVE				DRIVE				DRIVE				DRIVE				DRIVE				DRIVE															
		A	D	B	C	A	D	B	C	A	D	B	C	A	D	B	C	A	D	B	C	A	D	B	C	A	D	B	C	A	D	B	C	A	D	B	C				
Drive Polarity		N			N	N			N	N			N	N			N	N			N	N			N	N			N	N			N								
Group Number		1			1	1			1	1			1	2			2	2			2	2			2																
Coil Number		1			4	5			7	8			1				4	5			7	8																			
FREQ #1	Time Slot # 1																																								
800 kHz	G: x 2 12.0 V								D								D																								
FREQ #2	Time Slot # 2																																								
600 kHz	G: x 2 12.0 V								D								D																								
FREQ #3	Time Slot # 3																																								
300 kHz	G: x 2 12.0 V	D				D		D		D				D		D																									
FREQ #4	Time Slot # 4																																								
200 kHz	G: x 2 12.0 V	D				D				D				D																											
FREQ #5	Time Slot # 5																																								
100 kHz	G: x 2 12.0 V	D				D		D		D				D		D		D																							
FREQ #6	Time Slot # 6																																								
15 kHz	G: x 2 12.0 V	D											D																												
FREQ #7	Time Slot # 7																																								
FREQ #8	Time Slot # 8																																								

Special Instructions Acquisition

1. Enter a message at the beginning of each calibration group indicating that the data is being acquired with either single or dual probes. If dual probes are being used state which calibration group is the primary probe and which is the secondary probe.
2. The tubesheet shall be scanned on the PUSH TTS - 3.5" to + 2.0" above the expansion transition.
 - 2a. NTE tubesheet anomalies shall be scanned from tube end to TTS + 2.0 ".
 - 2b. PTE tubesheet anomalies shall be scanned from TTS -6.0" to TTS + 2.0".
3. Support plates may be scanned on the PULL or PUSH \pm 1 inch from center of support.
4. For free span dings and bobbin indications that require RPC exam, the scan area shall be from structure to structure.
5. Other locations may be scanned on the PULL or PUSH and shall be adequate to cover the target location plus a few inches. Care should be taken to insure that the proper location is scanned with adequate data past the target location to account for any variations in probe speed or axial scaling.
6. Data should typically be recorded on the PULL. When data is recorded on the PUSH (with the exception of the tubesheet region) the operator shall state so in a message.
7. One calibration standard may be recorded at the beginning and end of each cal group provided it is a successful scan of the standards complete length.
8. Tubes which have been mis-encoded should be corrected by entering a message to void that entry and re-examining the tube with the proper encode. This is required to maintain an accurate DSR database.
9. Calibration standard run is required every 4 hours.

Examination Technique Specification Sheet						
ETSS # 2 - 3-Coil RPC (.115/+PT/.080hf)				Revision 3		Page: 3 of 17
Data Analysis						
Calibration Coil 1 (.115" Pancake) Channels						
Channel & Frequency	Ch 3 300 kHz 115	Ch 6 200 kHz 115	Ch 8 100 kHz 115	Ch 12 15 kHz 115		
Phase Rotation	40% ID Axial 15 degrees	40% ID Axial 15 degrees	40% ID Axial 15 degrees	100% axial notch 90 degrees		
Span Setting Minimum	40% ID Axial 5 divisions	40% ID Axial 5 divisions	40% ID Axial 5 divisions	100% axial notch 3 divisions		
Calibration Coil 5 (+PT) Channels						
Channel & Frequency	Ch 4 300 kHz +Pax	Ch 7 200 kHz +Pax	Ch 10 100 kHz +Pax	N/A		
Phase Rotation	40% ID Axial 15 degrees	40% ID Axial 15 degrees	40% ID Axial 15 degrees			
Span Setting Minimum	40% ID Axial 5 divisions	40% ID Axial 5 divisions	40% ID Axial 5 divisions			
Calibration Coil 7 (.080" Pancake), Coil 4 (Trigger) Channels						
Channel & Frequency	Ch 1 800 kHz 80HF	Ch 2 600 kHz 80HF	Ch 5 300 kHz 80HF	Ch 9 100 kHz TRIG		
Phase Rotation	40% ID Axial 15 degrees	40% ID Axial 15 degrees	40% ID Axial 15 degrees	Trigger Pulse Main Pulse Up		
Span Setting Minimum	40% ID Axial 5 divisions	40% ID Axial 5 divisions	40% ID Axial 5 divisions	Trigger Pulse 4 divisions		
Calibration Process Channels						
Channel & Frequency	Ch P1 300 kHz +Pcirc	Ch P2 200 kHz +Pcirc	Ch P3 100 kHz +Pcirc			
Adjust Parameters	N/A	N/A	N/A			
Phase Rotation	40 % ID Circ 15 degrees	40 % ID Circ 15 degrees	40 % ID Circ 15 degrees			
Span Setting Minimum	40% ID Circ 5 divisions	40% ID Circ 5 divisions	40% ID Circ 5 divisions			
Coil 8 (Channel 11) Encoder not used for analysis, no calibration required						
Voltage Normalization				Calibration Curves		
CH	Signal	Set	Normalize	Type	CH	Set Points
3	100% axial notch	20 Vp-p	Coil 1	Curves are set by Sizing Analyst described on pages 5,6,& 7 of this ETSS		
4	100% axial notch	20 Vp-p	Coil 5			
1	100% axial notch	20 Vp-p	Coil 7			
Data Screening						
Left Strip Chart			Right Strip Chart		Lissajous	
Ch P1			Ch 12		Ch 4	
Reporting Requirements						
Condition/Region		Report	Ch.	Comment		
Axial Indication		SAI	4	Use the Vp-p measurement method. Evaluate each indication. Do not use multiple indication codes		
Circumferential Indication		SCI	P1			
Volumetric Indication		VOL	4			

3

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Special Instructions Analysis

1. Span, Phase and Volts are to be set using the center of the notch
2. Rotate data using "Data Slew Menu" so coils 5 and 7 are aligned with Coil 1. Label the coils using the acronyms shown in the "channel & frequency" column of the data analysis calibration section.
3. Use the tube outside diameter (0.875") in user selects for tube diameter.
4. To achieve more accurate location measurements the axial scale should be set using a known distance of greatest length. It is recommended that the axial scale be set between two TSP locations or between the ends of the calibration standard. It is not recommended to set the scale within a single TSP as this may lead to distance inaccuracies as the length of data increases. Manual scales shall be checked and, if needed, reset on each data record which provides structure to structure response.
5. The examination location shall be verified by counting the landmarks present in both the examination data and subsequent probe "run-out" data record, when performed. In the event that proper probe location cannot be verified, reruns shall be requested.
6. Monitor the configuration widget for proper data sampling. In the System Menu under "Additional Selectables" set the warning dialog to 30 axial samples and 30 circumferential samples. When the configuration widget shows less than this, investigate the data to determine if it is undersampled in the area of interest. Use the scan length display to insure the area of interest contains 82.5 or more samples per scan. When the C scan plot area is set to ± 1.0 " there should be at least 60 scans present. When these minimums are not met, reject the data and notify the lead analyst immediately so that the problem can be corrected.
7. The evaluation shall consist of reviewing lissajous, strip chart and C-Scan displays to the extent that all tube wall degradation and other conditions are reported.
8. All indications indicative of degradation shall be reported, with no minimum voltage threshold. All types of degradation shall be reported with a characterization code in the %TW column.
9. Data shall be screened for indications of loose parts using the 15 kHz pancake coil channel. This screening may be performed by reviewing the strip chart presentation. C-Scan plots of the 15 kHz channel shall be used to further disposition PLP calls reported with the bobbin coil technique.
10. For "Special Interest" (special interest is any exam not in the original scope of examination. i.e., free span bobbin indications or dents and dings not previously reported) examinations where no degradation is detected within ± 1 inch of the bobbin call location, the DNF code shall be reported along with the bobbin call location so as to clear that location from the examination database.
11. When evaluating bobbin coil special interest use the +Point coil for reporting. For example if bobbin reported FSD (FSI) or MBM (MBI) and no degradation is seen in the +Point coil report DNF
12. Required extent for tube support plate exam $\pm 1/-1$ inch from the center of TSP.
13. An entry for each intersection is required when data is collected using auto sequencing
14. Required extent for free span bobbin indications and free span dings is structure to structure.
15. Most of the axial PWSCC indications can be detected by the plus point coil however, some PWSCC indications have been detected only by the 0.080" high frequency coil.
16. C-scan plotting is required for Chs 4 and P1 over the entire data. In addition, C-scan plotting is required for CHs 1 and 3 in the area of interest.
17. If an ODSCC signal extends outside the support plate, notify the Lead Analyst immediately.

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Primary and secondary production analysts are primarily responsible for detecting tube degradation. Additional analyses will be required for degradation assessment, condition monitoring, operational assessment, and in support of ARC implementation. These additional analyses include, but are not limited to, the following:

Additional analysis To be performed by

PWSSC sizing at tubesheet	Sizing analyst
PWSSC sizing at dented TSP	Sizing analyst
ODSCC sizing at TSP as required	Sizing analyst
TSP integrity	Designated analyst
History review	Designated analyst
Loose part	Designated analyst
TSP ligament gap sizing	PG & E Level III

Axial PWSSC sizing

1. Sizing should be performed on a line by line basis.
2. The 300 kHz +Point data should be used for sizing.
3. Phase angle should be measured peak to peak and on the entrance leg.
4. A calibration curve should be established based on the phase angle using the as-built dimensions. The ID curve should be, as a minimum, a three point curve based on: ID3 at 100%, ID2 at 40%, and ID1 at 0%. A fourth point, such as 60% or 20%, may be added to improve the accuracy. NOTE: EPRI ETSS #96703 requires 100%, 60%, 40%.
5. The OD curve should be a three point curve based on: 100%, 60%, and 40%.
6. Verify that axial scale is accurate.
7. Verify that the direction of axial scale is in agreement with that of data acquisition.
8. Beginning at the lower end of a crack, find the first hit of the crack. Scroll one rotation backwards. Enter 0% at that location into the report.
9. Scroll up to the first hit. Enter the % through-wall depth at that location into the report.
10. Continue the line-by-line measurements until all hits have been entered into the report.
11. Scroll one rotation past the last hit. Enter 0% at that location into the report.
12. Crack sizing should be performed for each crack if multiple cracks exist.
13. Inherent field spread about the eddy current coil may cause a phase shift from ID to OD flaw plane. Also the field spread may cause a small amplitude signal to read an unusually high % through-wall depth. Nevertheless they should be reported as is.
14. The crack length should be determined from the line-by-line depth measurements. A from-to measurement technique should not be used.
15. The crack length is calculated by subtracting the beginning location from the ending location. For example, if the crack begins at (0% depth) 1H - 0.36, and ends at (0%) 1H + 0.54, the overall crack length is 0.54 - (-0.36) = 0.90 inch.
16. The average crack depth is determined by adding all line-by-line % through-wall depths and dividing it by the number of lines including the 0% lines.
17. The percent degraded area (PDA) may be determined by using the EPRI Draw program.
18. If desired, corrections for field spread may be made as follows:

2
2

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OD Phase Angle Near Ends of Crack

Data points near the crack edges from the start of OD phase angles to the end of the crack are ignored in defining the adjusted crack length as long as they are within 0.2" of the indicated end of the crack. The end of the adjusted 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. When the phase angles are largely OD over most of the crack, this guideline cannot be applied.

Near Through-wall ID Phase Angles Near Ends of Crack

Near through-wall ID phase depths of $\geq 85\%$ with voltages < 1 volt are ignored in defining the adjusted crack length as long as they are within 0.2" of the indicated end of the crack. The adjusted 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 Depth 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 adjusted crack length as long as they are within 0.2" of the indicated end of the crack. The adjusted 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.

19. The sizing data should be saved in the report. See a sample report.
20. C-scan graphics are required.
21. Crack profiles should be plotted using the EPRI Draw.

Circumferential PWSCC sizing

1. Sizing should be performed in increments of about 4 degrees.
2. The 300 kHz +Point data should be used for sizing.
3. Phase angle should be measured peak to peak and on the entrance leg.
4. A calibration curve should be established in the Axial Liz window based on the phase angle using the as-built dimensions. The ID curve should be, as a minimum, a three point curve based on: ID3 at 100%, ID2 at 40%, and ID1 at 0%. A fourth point, such as 60% or 20%, may be added to improve the accuracy.
5. The OD curve should be a three point curve based on: 100%, 60%, and 40%.
6. Verify that axial scale is accurate.
7. Verify that the direction of axial scale is in agreement with that of data acquisition.
8. Find the first hit of the crack in the Axial Liz window. Scroll one increment backwards. Enter 0% at that circumferential position into the report.
9. Click mouse button to the first hit. Enter the % through-wall depth at that circumferential position into the report.
10. Continue the incremental depth measurements around the tube circumference until all hits have been entered into the report.
11. Click mouse button one increment past the last hit of the crack. Enter 0% at that circumferential position into the report.
12. Crack sizing should be performed for each crack if multiple circ cracks exist.
13. The extent of a circumferential crack should be determined from the incremental depth measurements. A from-to measurement technique for a quick answer is not recommended.

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14. Depth measurements may also be performed using an amplitude curve as follows:
- 14.1. At the peak amplitude signal response measure the % through-wall using the phase angle curve.
 - 14.2. Create a new process channel P10 which is the duplicate of the 300 kHz +Point data with the circumferential notch response going in the positive direction. In P10, establish a two-point linear curve using the amplitude and % through-wall values extrapolated to zero.

NOTE: Do not use the 1pt magnitude curve in the EddyNet95 software to create the amplitude curve.

- 14.3. Each crack should be measured using a new linear peak to peak amplitude curve based on the voltage and the phase % at the peak amplitude.
15. The sizing data should be saved in the report. See a sample report.
 16. C-scan graphics are required.
 17. Crack profiles should be plotted using the EPRI Draw.

TSP Integrity

The following guidelines should be used when evaluating the +Point data for tube support plate integrity, i.e., missing or cracked ligament. The tubing shall be evaluated for crack like indications using 300 kHz Plus-Point coil. All SAI and SCI indications shall be evaluated for TSP integrity.

1. The 100 kHz +Point data should be reviewed for a potential TSP degradation signal.
2. The data should be reviewed by C-scan plotting the support plate.
3. Enter the appropriate channel volts p-p into the report. Type SLC in the % column.
4. C-scan graphics is required. See an example.
5. TSP ligament gap measurement will be performed by PG&E Level III Analyst as follows:

The extent of absent ligament is best measured by reference to the 115 mil midrange pancake coil response at low frequency (10-30 kHz). Set up the pancake coil flaw response to yield a positive vertical excursion. If there is missing carbon steel, the trace will persist over the length of the affected arc and return to nominal when ligament presence is restored. Measure the distance in degrees arc length between the initial departure of the scan trace from the nominal TSP response to its return.

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Discrepancy Resolution

1. All resolutions shall be performed by the designated resolution analysts from the primary and secondary teams.
2. The resolution analysts will perform comparison between the primary and secondary as defined by the comparison parameters.
3. If an indication is reported by either party, or both, which indicates a repairable condition, then to add or delete this indication will require the agreement of both the primary and secondary resolution analysts. In the event the primary and secondary resolution analysts can not agree, conservatism shall prevail.
4. When a repairable indication is accepted or overruled the primary and secondary resolution analysts will initial the compare sheet and use Form 5 to document overruling . All repairable indications that were accepted or overruled by resolution analysts shall be reviewed and approved by the Lead Level III or his designee and by PG&E Level III.
5. Resolution analyst will make a graphic of all ODSCC reported by the rotating coil probe.

Lead Analyst Review (LAR)

The Lead Analyst will review all VOL calls reported that are not cold leg thinning, and change the reported code to SVI and complete Form 6 Justification for SG Tube Repair. He or She will also enter LAR in the UTIL 2 column for each VOL that was changed to SVI.

3

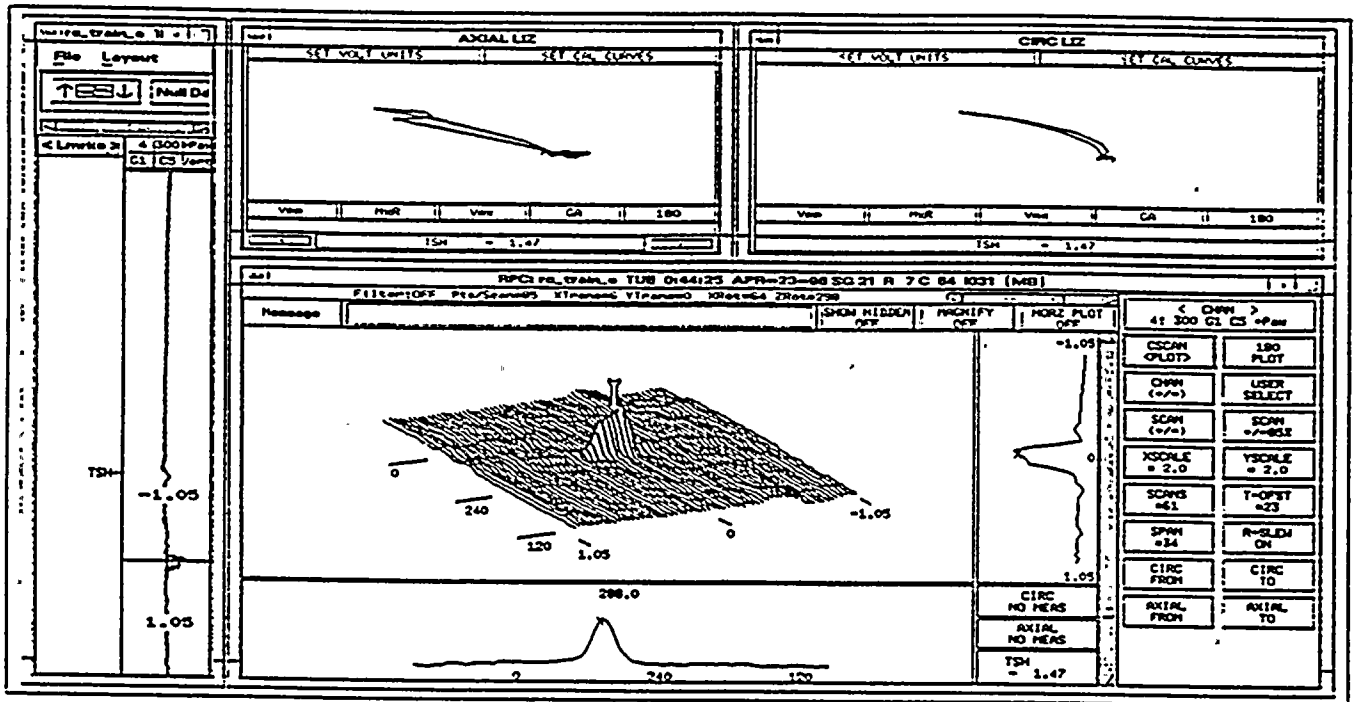
3

Examination Technique Specification Sheet

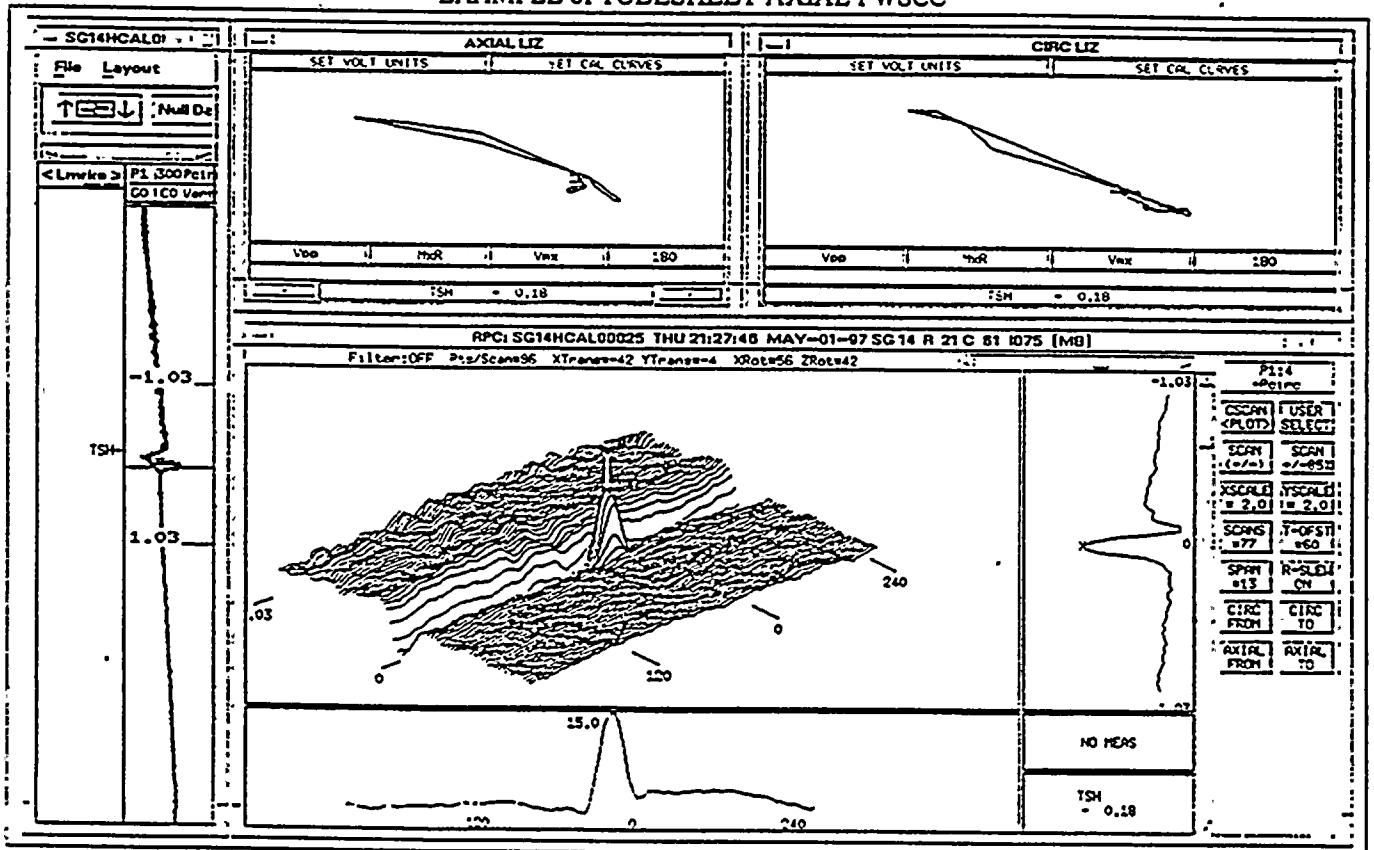
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EXAMPLE of TUBESHEET AXIAL PWSCC



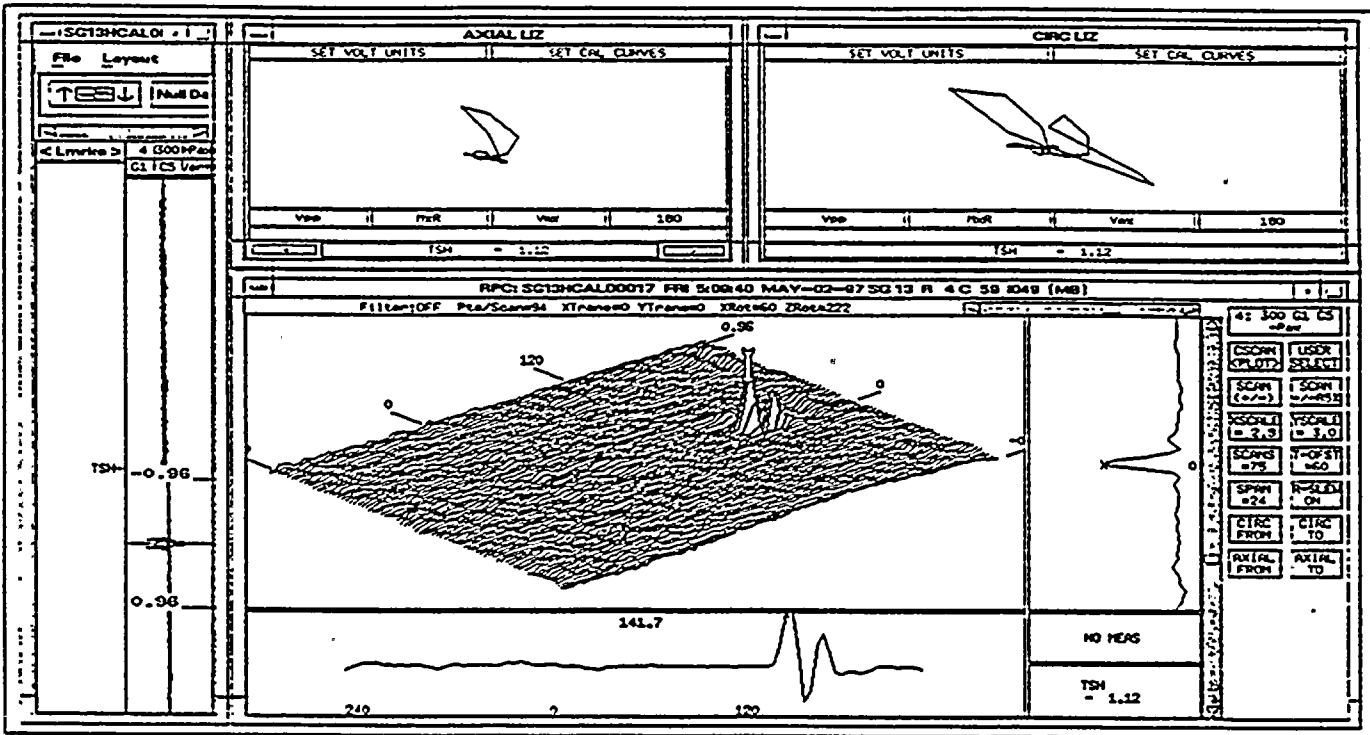
EXAMPLE of TUBESHEET CIRCUMFERENTIAL PWSCC

Examination Technique Specification Sheet

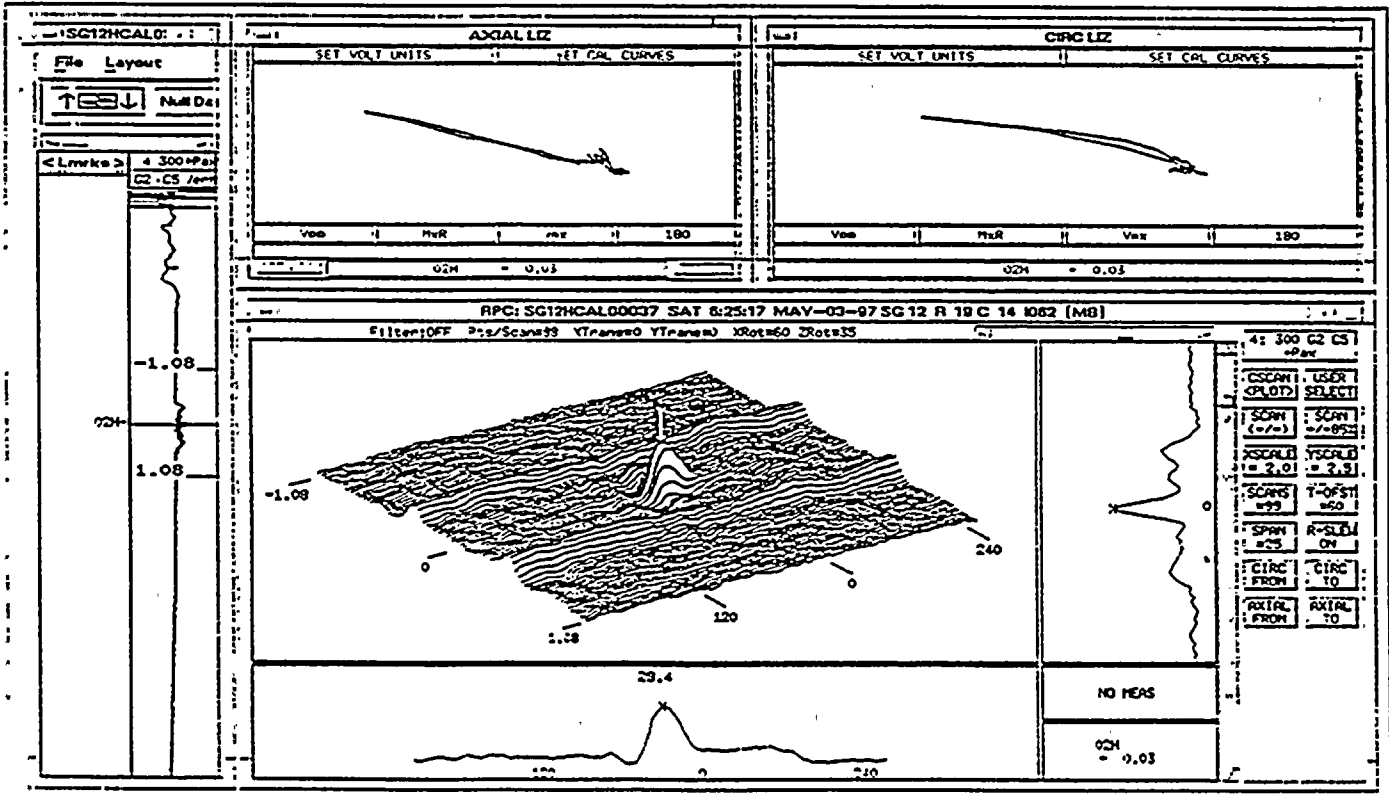
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EXAMPLE of TUBESHEET VOLUMETRIC INDICATION



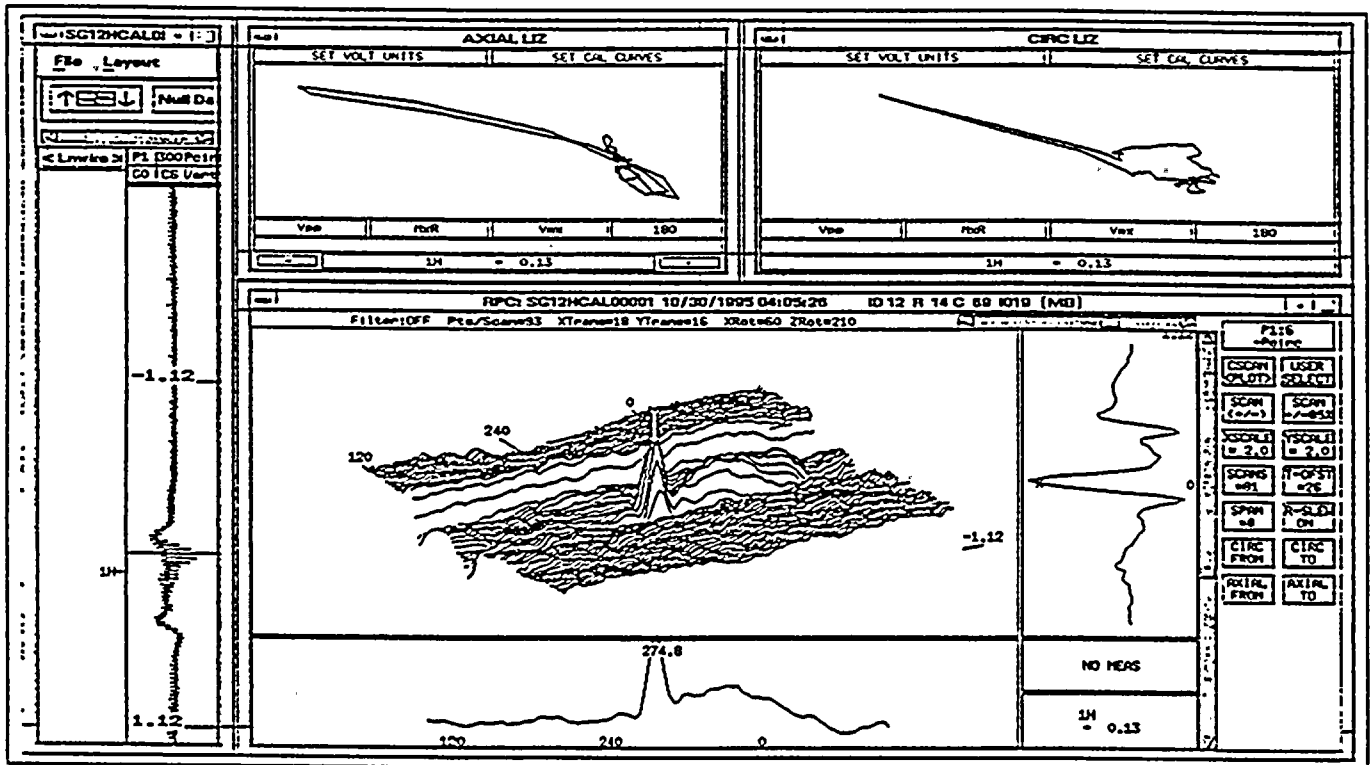
EXAMPLE of AXIAL PWSCC at DENTED SUPPORT PLATE

Examination Technique Specification Sheet

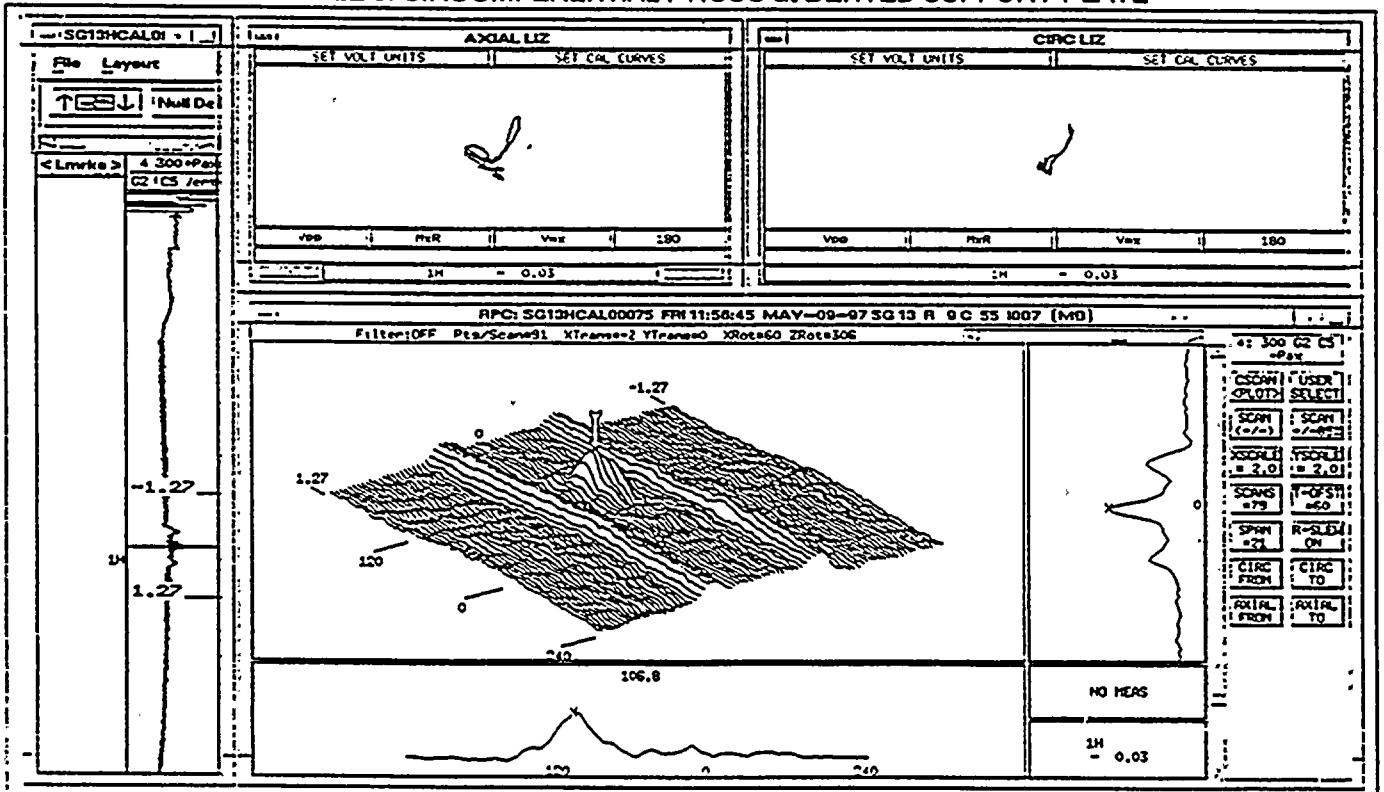
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EXAMPLE of CIRCUMFERENTIAL PWSCC at DENTED SUPPORT PLATE



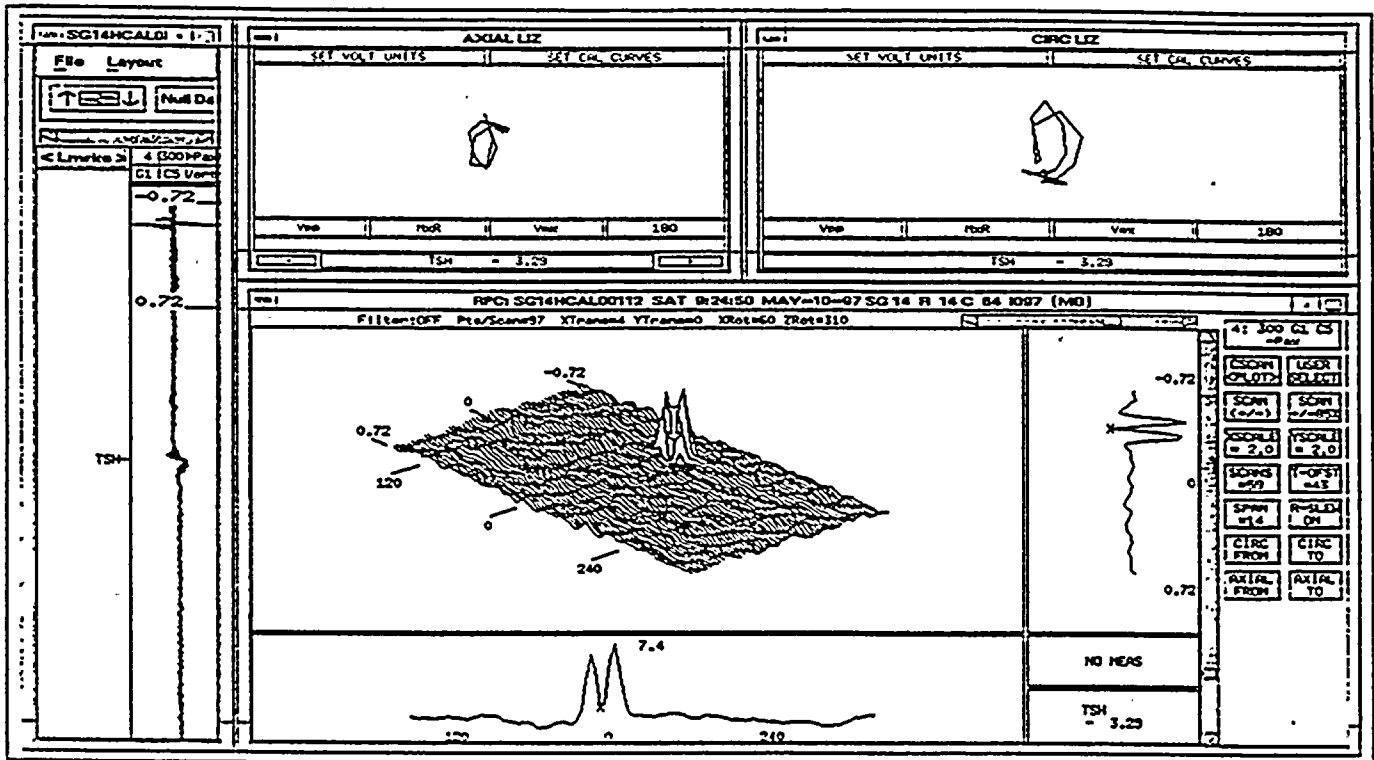
EXAMPLE of ODSCC at SUPPORT PLATE

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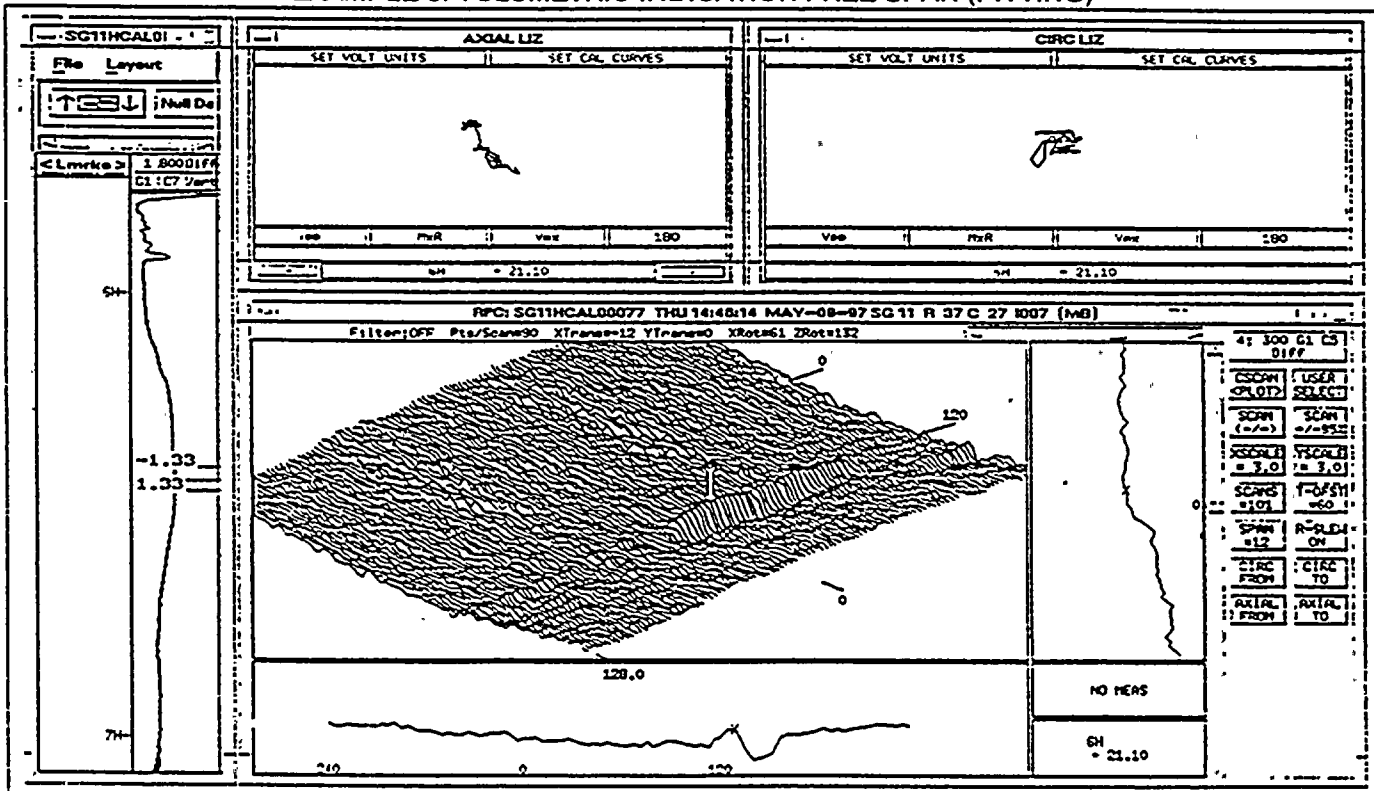
ETSS # 2 - 3-Coil RPC (.115/+PT/.080hf)

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EXAMPLE of VOLUMETRIC INDICATION FREE SPAN (PITTING)



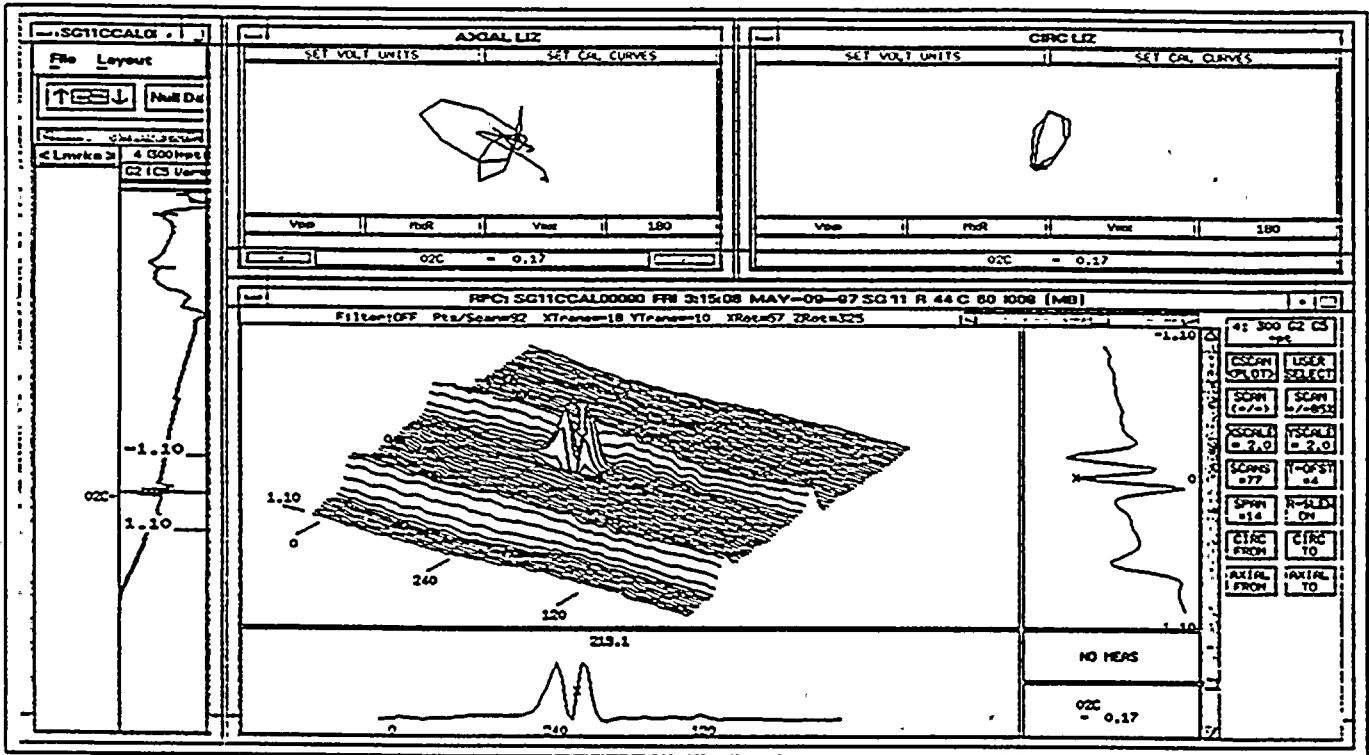
EXAMPLE of DNF (MBM REPORTED by BOBBIN COIL)

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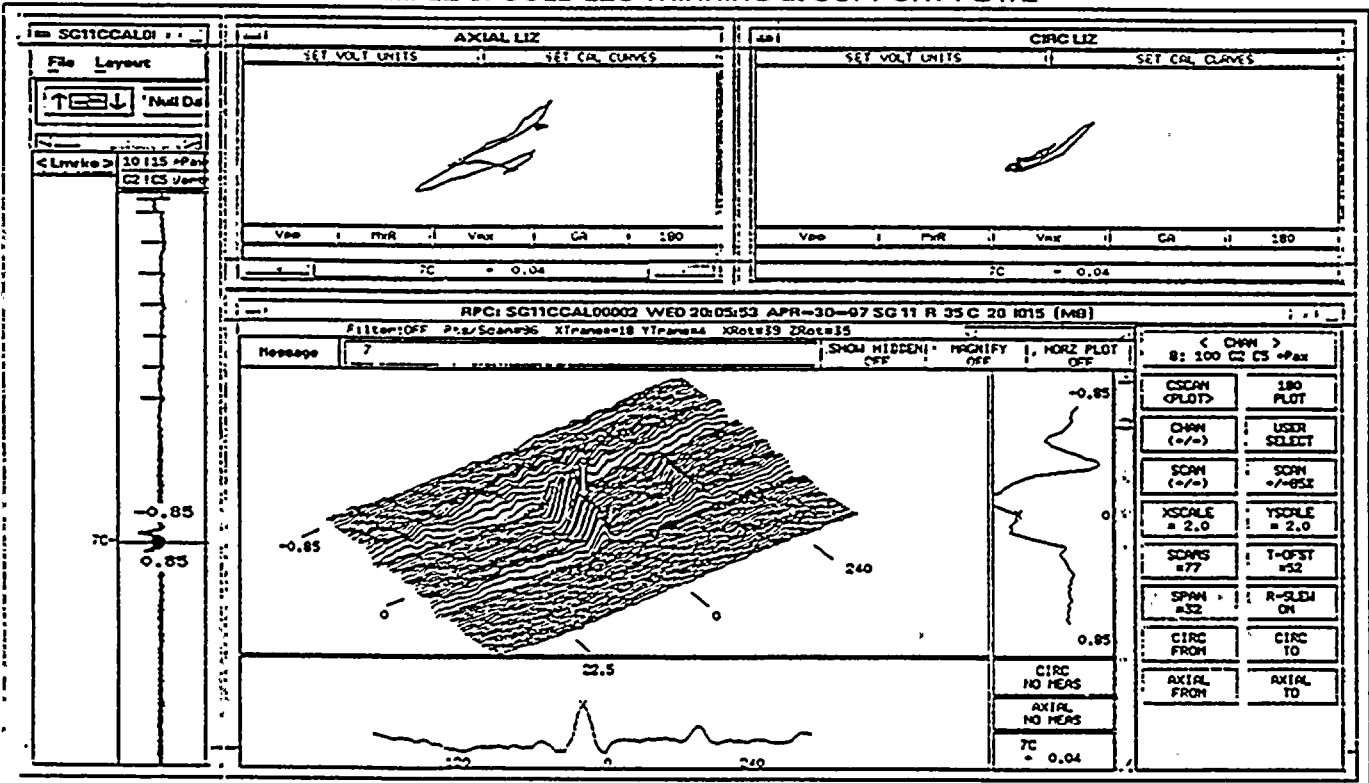
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EXAMPLE of COLD LEG THINNING at SUPPORT PLATE



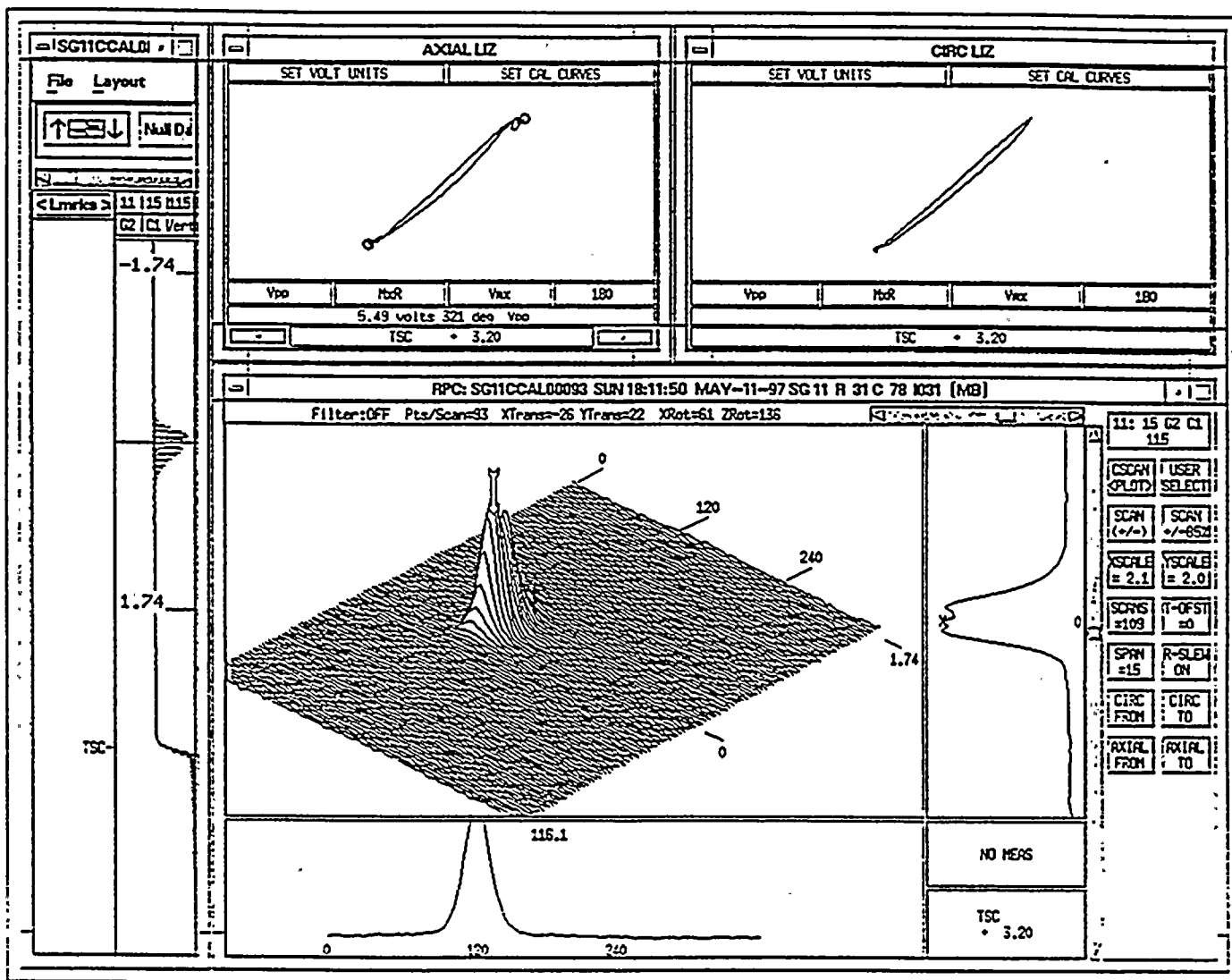
EXAMPLE of SUSPECT LIGAMENT CRACK

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EXAMPLE of LOOSE PART

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Eddynet95: REPORT EDITOR: Proto 4G 09/02/97

File Edit Report Help

File=/rod0102/resolution/rpc_hl_train_a User=X1234 Date=12/29/97 14:58

Disk Label= Unknown

22	999	999	0234	IC	CAL00093				720+P	X1234
22	24	42							TSHTSH	
22	22	41	1.44	26 SAI	4 TSH	-1.88			TSHTSH	
22	22	42	2.63	12 SCI P 1	TSH	-0.02			TSHTSH	
22	20	43		RBD						
22	22	43	1.35	9 SAI	4 4H	+0.17			4H 4H	
22	24	43	0.85	8 SAI	4 1H	+0.01			1H 1H	
22	19	23							4H 4H	
22	13	29	1.15	90 VOL	4 TSH	-3.11			TSHTSH	
22	999	999	0425	FC	CAL00093				720+P	X1234

Edit Clear Recall Tube Delete

EXAMPLE REPORT for ROTATING COIL EXAM

Analysis Compare Parameter Setup Screen

Enter Parameter Setup Name

Compare Fields:		Tolerances:
Voltage:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="text" value="0.00"/>
Phase Angle:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="text" value="0"/>
Percent:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="text" value="10"/>
Location:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="text" value="1.00"/>
	Elevation Range:	<input type="text" value="1.00"/>
Channel:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Utility Field 1 Codes:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Utility Field 2 Codes:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Suppression Indication Codes:	<input type="text" value="Add..."/>	<input type="text" value="Remove..."/>
→		
Highlight Indication Codes:	<input type="text" value="Add..."/>	<input type="text" value="Remove..."/>
→ DSS DTS PLP SAI SCI SLC VOL FSD FSI MBI MBM DNI		
Percentage Suppression Threshold: <		<input type="text" value="0"/>
Percentage Highlight Threshold: >		<input type="text" value="0"/>
<input type="text" value="Save"/>	<input type="text" value="Cancel"/>	<input type="text" value="Help"/>

ROTATING COIL EXAM RESOLUTION PARAMETERS

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Eddynet95: REPORT EDITOR: Proto JE 10/28/96

File Edit Help

File=/rod0102/sizing/SG12HCAL00008 User=X1234 Date=7/31/97 9:03
Disk Labels Unknown

PHASE CURVE										720°P		RG452		
CAL00008														
12	999	999	1620	IC										
12	6	61	0.00	0	0	4	TSH	-1.07			TSHTSH			
12	6	61	0.33	26	57	4	TSH	-1.05			TSHTSH			
12	6	61	0.58	21	53	4	TSH	-1.02			TSHTSH			
12	6	61	0.32	24	51	4	TSH	-0.99			TSHTSH			
12	6	61	0.00	0	0	4	TSH	-0.96			TSHTSH			
AMPLITUDE CURVE														
12	6	61	0.00	0	0	P14	TSH	-1.07			TSHTSH			
12	6	61	0.33	26	43	P14	TSH	-1.05			TSHTSH			
12	6	61	0.58	21	43	P14	TSH	-1.02			TSHTSH			
12	6	61	0.32	24	42	P14	TSH	-0.99			TSHTSH			
12	6	61	0.00	0	0	P14	TSH	-0.96			TSHTSH			
12	999	999	1807	FC							720°P			RG452

Edit Clear Recall Tube Delete

EXAMPLE REPORT for SIZING of AXIAL PWSCC INDICATION

Eddynet95: REPORT EDITOR: Proto JE 10/28/96

File Edit Help

File=/rod0102/sizing/SG12HCAL00007 User=X1234 Date=7/28/97 16:02
Disk Labels Unknown

PHASE CURVE										720°P		S4373		
CAL00007														
12	999	999	1619	IC										
12	14	67	0.00	0	0	P 1	TSH	-0.11	TO=165.5		TSHTSH			
12	14	67	0.23	15	42	P 1	TSH	-0.11	TO=161.4		TSHTSH			
12	14	67	0.58	18	50	P 1	TSH	-0.11	TO=157.2		TSHTSH			
12	14	67	0.96	20	55	P 1	TSH	-0.11	TO=153.1		TSHTSH			
12	14	67	1.09	19	53	P 1	TSH	-0.11	TO=149.0		TSHTSH			
12	14	67	0.73	17	47	P 1	TSH	-0.11	TO=144.8		TSHTSH			
12	14	67	0.31	11	30	P 1	TSH	-0.11	TO=140.7		TSHTSH			
12	14	67	0.00	0	0	P 1	TSH	-0.11	TO=136.6		TSHTSH			
AMPLITUDE CURVE														
12	14	67	0.00	0	0	P 1	TSH	-0.14	TO=165.5		TSHTSH			
12	14	67	0.24	15	10	P 1	TSH	-0.14	TO=161.4		TSHTSH			
12	14	67	0.58	18	27	P 1	TSH	-0.14	TO=157.2		TSHTSH			
12	14	67	0.96	20	47	P 1	TSH	-0.14	TO=153.1		TSHTSH			
12	14	67	1.09	19	33	P 1	TSH	-0.14	TO=149.0		TSHTSH			
12	14	67	0.73	17	33	P 1	TSH	-0.14	TO=144.8		TSHTSH			
12	14	67	0.31	11	13	P 1	TSH	-0.14	TO=140.7		TSHTSH			
12	14	67	0.00	0	0	P 1	TSH	-0.14	TO=136.6		TSHTSH			
12	999	999	1656	FC							720°P			S4373

Edit Clear Recall Tube Delete

EXAMPLE REPORT for SIZING of CIRCUMFERENTIAL PWSCC INDICATION

Level III Approval

D. Michael Chambers 2-20-98
Signature / Date

Customer Approval

John H. Fry 2-20-98
Signature / Date

10.2 APPENDIX B - EPRI ETSS #96510 and #96703

PERFORMANCE DEMONSTRATION DATA BASE

Appendix A TECHNIQUE SPECIFICATION SHEETS



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Examination Technique Specification Sheet			
ETSS # 96510 Pwsc10.doc		Page 1 of 7	
TUBING			
Material: Inconel 600		OD: 0.875, 0.750	Wall: 0.050", 0.048"
EXAMINATION SCOPE			
<p>Test Application: This technique is qualified for the detection of axial and circumferential Primary Water Stress Corrosion Cracking (PWSCC) at dented and non-dented locations with and without structures and expansion transitions. This technique meets the requirements for Appendix H detection at 400 and 200 kHz.</p>			
ACQUISITION TECHNIQUE			
Bobbin Probe _____ Rotating Probe <input checked="" type="checkbox"/> Other _____			
DATA ACQUISITION			
Instrument		Probe	
Manufacturer: Westinghouse		Manufacturer: Zetec	
Model: TC-6700		Diameter/Coil Dimensions: Plus point	
Acquisition System Software		Part Number: D#3371-4-A, D#3371-5-A	
Manufacturer: Westinghouse		Probe Cable Length: .610 MRPC/52MU-50'	
Description or Title: TC 1_2.3 or equivalent		Analog Probe Extension	
		Manufacturer: Zetec (Low Loss Cable)	
Version/Revision:		Length: 50'	
Frequencies/Coil Excitation Modes			
Absolute Mode		Absolute Mode	
Channel/Coil/Frequencies/Gain/Drive Voltage		Channel/Coil/Frequencies/Gain/Drive Voltage	
	5 / 5 / 400kHz / 5volts/38db	9 / 5 / 200kHz / 5volts/38db	
Data Recording Equipment			
Manufacturer: Hewlett Packard		Model: 650 Re-writable optical	

PERFORMANCE DEMONSTRATION DATA BASE

Appendix A TECHNIQUE SPECIFICATION SHEETS

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Examination Technique Specification Sheet

ETSS # 96510 Pwsc10.doc

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Digitizing Rate, Scan Direction & Scan Pattern

Bobbin Probe	Rotating Probe
Digitizing Rate Min (DR):*	Digitizing Rate Min (DR)*30 samples/inch circumferentially, .040 pitch axially
Sample Rate Min (SR)	Sample Rate Min (SR)400 samples/sec
Probe Speed (PS)	Withdrawal Speed Max (WS)0.2"/sec
Scan Direction	Rotation Speed Max (RPM) 300/rpm
* Note: Digitizing rate applies in the axial direction. SR min = DR min x PS max	* Note: Digitizing rate applies in both the axial and circumferential directions; for the circumferential direction, SR min = DR min x (1/RPM) x (1/tube diameter) x 19.09

DATA ANALYSIS

Instrument	Analysis System Software
Manufacturer:Hewlett Packard	Manufacturer:Zetec
Model: 9000/700	Description or Title:EddyNet95 ver 1 or equal.

Analysis Channels

Single Frequency	400 kHz	200 kHz	
Span Setting	40% Circ. OD notch visible	40% Circ. OD notch visible	
Phase Rotation	40% ID circ. at 15 degrees (circ flaws going up)	40% ID circ. at 15 degrees (circ flaws going up)	
Calibration Std.	Circ and axial ID EDM notches 100, 60,40, and 20%. OD 60 and 40%	Circ and axial ID EDM notches 100, 60,40, and 20%. OD 60 and 40%	
Calibration Curve	none required	none required	
Volts	20 volts on 100% axial Notch	20 volts on 100% axial Notch	

Analysis Channels

Single Frequency	Process 400 kHz	Process 200 kHz	
Span Setting	40% Axial OD notch visible	40% Axial OD notch visible	
Phase Rotation	40% ID Axial . at 15 degrees (axial flaws going up)	40% ID Axial at 15 degrees (axial flaws going up)	
Calibration Std.	Circ and axial ID EDM notches 100, 60,40, and 20%. OD 60 and 40%	Circ and axial ID EDM notches 100, 60,40, and 20%. OD 60 and 40%	
Calibration Curve	none required	none required	
Volts	20 volts on 100% axial Notch	20 volts on 100% axial Notch	



Note: If process channels are not available additional data collected with the plus point is acceptable.

Analysis Guidelines:

(Note: As a minimum, channels used for detection, confirmation, and sizing should be described as well as other special analysis instructions)

The plus point coil is tuned for approximately 200 kHz with a fifty foot low loss cable attached. Caution should be used when evaluating ID initiated indications. The flaw plane is very close to the horizontal plane and indications could be mis-interpreted as geometry.

Data should be collected on a push for expansion zones.

Adjust the gain or span value such that the 40 percent ID notch is visible. Monitor the strip chart on the mid range frequencies (400 or 200 kHz). Scroll the region of interest while viewing the lissajous on the 200 kHz channel. Terrain plot the raw and process channels in the area of interest. This technique is qualified for detection 400 and 200 kHz.

With the raw channels set so circumferential indications form in the positive direction, axial indications will form in the negative direction on the same channel. It is possible for the indication to form in both directions. Before dispositioning these to volumetric indications, be aware that two closely spaced indications may provide a similar response.

400 kHz .050" wall Technique Performance EDM Notches	
Detection Probability >46% TW(90% CL)	RMSE Sizing Error, % through-wall
.81 POD @ .90 C/L	_N/A_____, % TW
200 kHz .050" wall Technique Performance EDM Notches & Pulled Tubes	
Detection Probability >50% TW(90% CL)	RMSE Sizing Error, % through-wall
.82 POD @ .90 C/L	_N/A_____, % TW



Table 1: PWSCC 200 kHz .050" wall

EDM Notches, & Pulled Tubes				
PLANT	TUBE#	MET %TW	DETECT	EC %TW
Diablo C I	12-32	20	N	NDD
LAB/EDM	WSID2	20	Y	SAI
LAB/EDM	C43	20	Y	SAI
LAB/EDM	TVA5A	20	Y	SCI
LAB/EDM	TVA4C	22	Y	SCI
LAB/EDM	TVA5B	22	Y	SCI
LAB/EDM	TVA5D	22	Y	SCI
LAB/EDM	TVA2C	24	Y	SCI
LAB/EDM	TVA3D	24	Y	SCI
LAB/EDM	TVA6B	34	Y	SCI
LAB/EDM	TVA6A	36	Y	SCI
Diablo C I	10-22	38	Y	SAI
LAB/EDM	TVA18F	38	Y	SCI
LAB/EDM	TVA13D	40	Y	SCI
LAB/EDM	TVA18G	40	Y	SCI
LAB/EDM	TVA6C	46	Y	SCI
Diablo C I	14-69	50	Y	SCI
LAB/EDM	TVA15D	52	Y	SCI
LAB/EDM	C44	58	Y	SAI
LAB/EDM	C45	60	Y	SAI
LAB/EDM	C46	62	Y	SAI
LAB/EDM	TVA8A	72	Y	SCI
LAB/EDM	TVA7A	78	Y	SCI
LAB/EDM	TVA8C	78	Y	SCI
LAB/EDM	TVA8B	80	Y	SCI
LAB/EDM	TVA8D	82	Y	SCI
LAB/EDM	TVA7D	84	Y	SCI
Diablo C I	21-43	98	Y	MAI



Table 1: PWSCC 200 kHz .050" wall

EDM Notches, & Pulled Tubes				
PLANT	TUBE#	MET %TW	DETECT	EC %TW
TOTAL	DETECTED	% THRU-WALL	FRACTION	POD @ 90%
			DETECTED	C/L
0	0	0 - 19%	0	0
13	12	20 - 39%	0.92	0.73
3	3	40 - 49%	1	0.46
12	12	>=50%	1	0.82

Table 2: PWSCC 400 kHz .050" wall

EDM Notches				
PLANT	TUBE#	MET %TW	DETECT	EC %TW
LAB/EDM	WSID2	20	Y	SAI
LAB/EDM	C43	20	Y	SAI
LAB/EDM	TVA5A	20	Y	SCI
LAB/EDM	TVA4C	22	N	NDD
LAB/EDM	TVA5B	22	Y	SCI
LAB/EDM	TVA5D	22	Y	SCI
LAB/EDM	TVA2C	24	Y	SCI
LAB/EDM	TVA3D	24	Y	SCI
LAB/EDM	TVA6B	34	Y	SCI
LAB/EDM	TVA6A	36	Y	SCI
LAB/EDM	TVA18F	38	Y	SCI
LAB/EDM	TVA13D	40	Y	SCI
LAB/EDM	TVA18G	40	Y	SCI
LAB/EDM	TVA6C	46	Y	SCI
LAB/EDM	TVA15D	52	Y	SCI
LAB/EDM	C44	58	Y	SAI
LAB/EDM	C45	60	Y	SAI
LAB/EDM	C46	62	Y	SAI
LAB/EDM	TVA8A	72	Y	SCI
LAB/EDM	TVA7A	78	Y	SCI
LAB/EDM	TVA8C	78	Y	SCI
LAB/EDM	TVA8B	80	Y	SCI
LAB/EDM	TVA8D	82	Y	SCI

PERFORMANCE DEMONSTRATION DATA BASE

Appendix A TECHNIQUE SPECIFICATION SHEETS



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Table 2: PWSCC 400 kHz .050" wall

EDM Notches				
PLANT	TUBE#	MET %TW	DETECT	EC %TW
LAB/EDM	TVA7D	84	Y	SCI
	400 kHz			
TOTAL	DETECTED	% THRU-WALL	FRACTION	POD @ 90%
			DETECTED	C/L
0	0	0 - 19%	0	0
11	10	20 - 39%	0.91	0.68
2	2	40 - 45%	1	0.31
11	11	>=46%	1	0.81

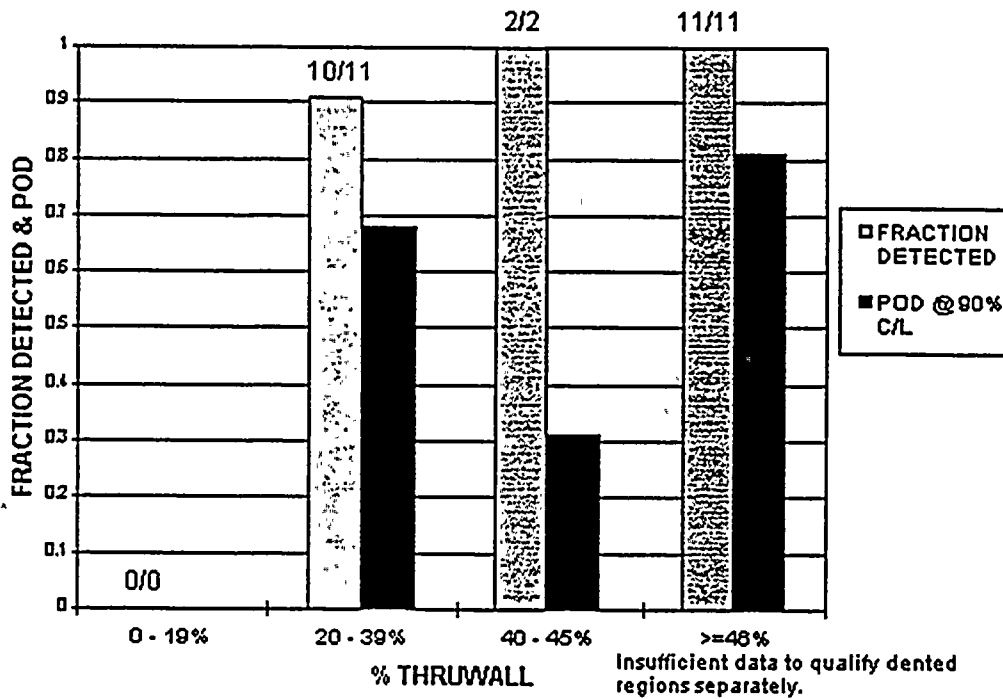
PERFORMANCE DEMONSTRATION DATA BASE

Appendix A TECHNIQUE SPECIFICATION SHEETS

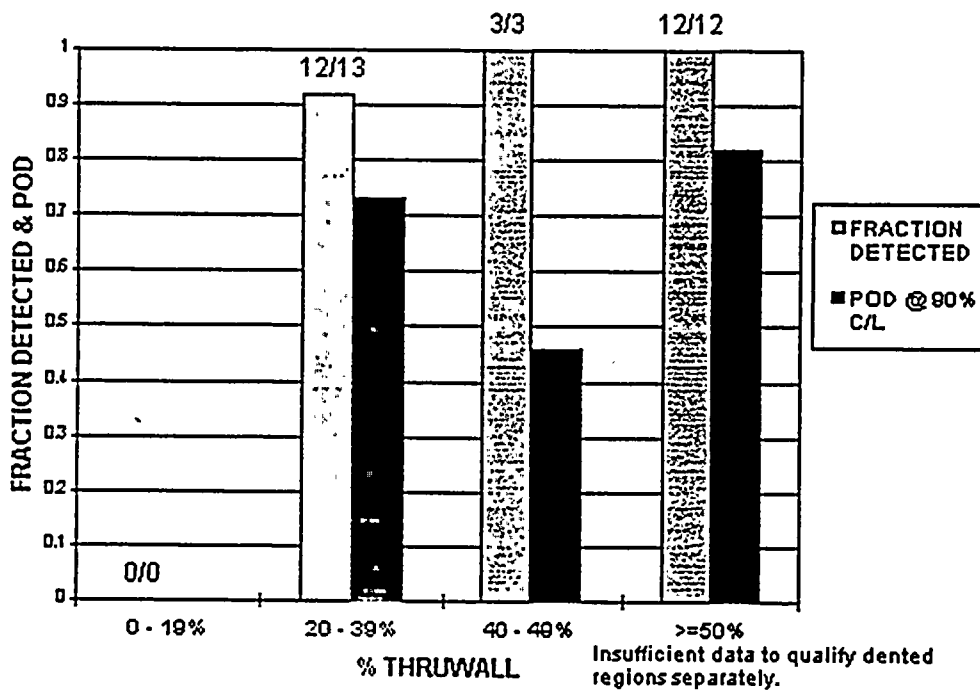


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PWSCC FRACTION DETECTED & POD MR+PT, TC-6700, 400 kHz(.050wall) ALL LOCATIONS (EXCEPT U-BENDS)



PWSCC FRACTION DETECTED & POD MR+PT, TC-6700, 200 kHz(.050wall) ALL LOCATIONS (EXCEPT U-BENDS)



SUMMARY OF QUALIFIED TECHNIQUES

EXAMINATION SCOPE

Test Application: This technique is qualified for the detection of circumferential and axial PWSCC at dented and non-dented locations with or without support structures and at expansion transitions. Sizing by depth or length is not qualified with this technique. This techniques meets the requirements of detection for Appendix H at 400 and 200 kHz.

Technique Qualification File Name: 96510 Pwsc10.doc

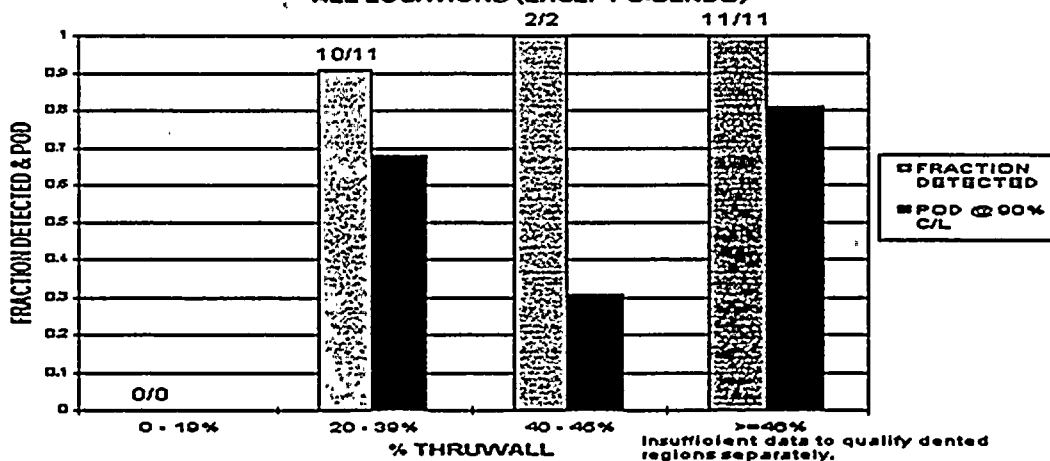
Probe: MRPC , Zetec, MR Plus-Point coil, 50' probe with 50' probe extension cable

Instrument: Westinghouse TC-6700

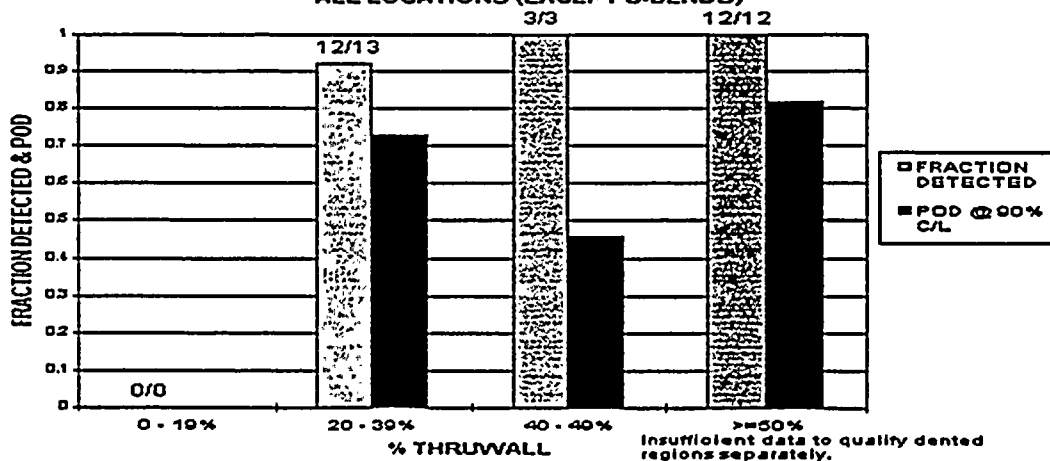
Analysis Frequencies Required: 400 and 200 kHz

Calibration Standards Required: Axial 100%, Ax & Circ 60% & 40% ID EDM Notches

PWSCC FRACTION DETECTED & POD
MR+PT, TC-6700, 400 kHz(.050wall)
ALL LOCATIONS (EXCEPT U-BENDS)



PWSCC FRACTION DETECTED & POD
MR+PT, TC-6700, 200 kHz(.050wall)
ALL LOCATIONS (EXCEPT U-BENDS)





Examination Technique Specification Sheet	
ETSS #96703 Pwscc_Axial_sizing.doc	Page 1 of 7
TUBING	
Material: Inconel 600	OD: .875" Wall: .050"
EXAMINATION SCOPE	
<p>Test Application: This technique is qualified for detection and sizing by length or depth percent thru-wall of axial Primary Water Stress Corrosion Cracking (PWSCC) at dents. This technique meets the requirements for detection and sizing the performance indices are properly reflected per Appendix H at 300 kHz. Caution: Specific training on sizing by length and depth should precede implementation of this technique. This technique received industry peer review on 4/15/98.</p>	
ACQUISITION TECHNIQUE	
Bobbin Probe _____ Rotating Probe <input checked="" type="checkbox"/> Other _____	
DATA ACQUISITION	
Instrument	Probe
Manufacturer: Zetec/Tecrad	Manufacturer: Zetec
Model: MIZ 30 / TC6700	Diameter/Coil Dimensions: MR Plus-Point
Acquisition System Software	Part Number: Plus pt .610-.720MRPC/FH-52 PH
Manufacturer: Zetec / Westinghouse	Probe Cable Length: 83'- MRPC-52 MU
Description or Title: EddyNet95™ /ANSER	Analog Probe Extension
	Manufacturer: Zetec (Low Loss Cable)
Version/Revision: 3 or equivalent / Anser 8.1	Length: 50'
Frequencies/Coil Excitation Modes	
Absolute Mode	Absolute Mode
Channel/Coil/Frequencies	Channel/Coil/Frequencies
	7/5/300 kHz 16V X 1 3.0 vp and 38db of gain
Data Recording Equipment	
Manufacturer: Hewlett Packard or equivalent	Model: 650 Mb Re-writable or equivalent



Examination Technique Specification Sheet			
ETSS #96703 Pwsccl_Axial_sizing.doc		Page 2 of 7	
Digitizing Rate, Scan Direction & Scan Pattern			
Bobbin Probe		Rotating Probe	
Digitizing Rate Min (DR):*		Digitizing Rate Min (DR)* 30 samples/inch . circumferentially and axially	
Sample Rate Min (SR)		Sample Rate Min (SR) 400 samples/sec	
Probe Speed (PS)		Withdrawal Speed Max (WS) .1 ips	
Scan Direction		Rotation Speed Max (RPM) 300 RPM	
* Note: Digitizing rate applies in the axial direction. SR min = DR min x PS max		* Note: Digitizing rate applies in both the axial and cir- cumferential directions; for the circumferential direction, SR min = DR min x (1/RPM) x (1/tube diameter) x 19.09	
DATA ANALYSIS			
Instrument		Analysis System Software	
Manufacturer: Hewlett Packard		Manufacturer: Zetec	
Model: 710 or equivalent		Title/Rev.: EddyNet95/Ver 3 or equivalent	
Analysis Channels			
Single Frequency	300 kHz		
Span Setting	40% OD axial 1 div		
Phase Rotation	40% ID axial at 15 degrees (axial flaws going up)		
Calibration Std	100% , 60% , & 40% axial ID, 40% axial OD		
Calibration Curve	Phase curve, circ lissa- jous, axial 100, 60, & 40% ID notches		
Volts	20 volts on 100% axial		
Single Frequency			
Span Setting			
Phase Rotation			
Calibration Std			
Calibration Curve			
Volts			



Examination Technique Specification Sheet

ETSS #96703 Pwscs_Axial_sizing.doc	Page 3 of 7
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Analysis Guidelines:

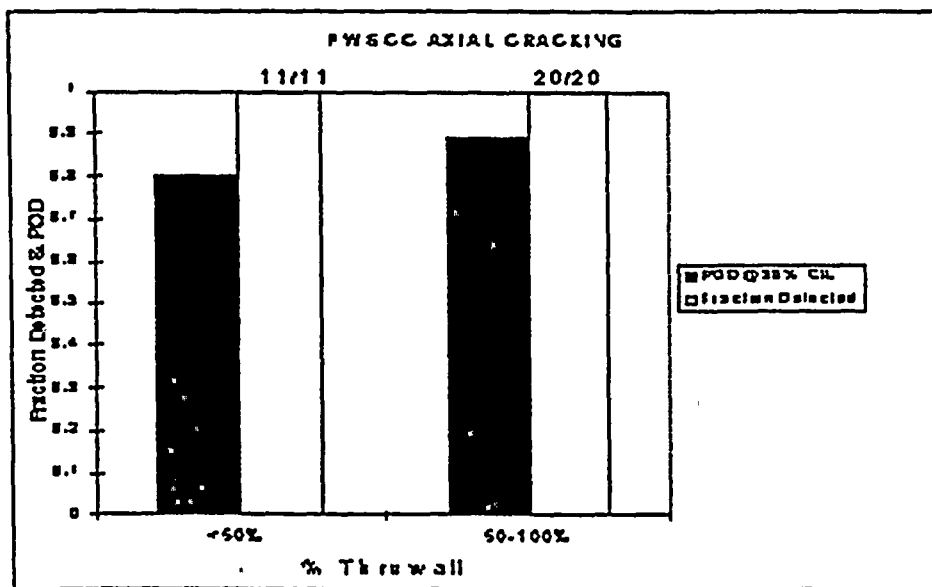
Voltage normalization is performed in the main or circ. lissajous window and is set on the 100% axial notch at 20 volts. Adjust the span such that the 40% OD axial notch is 1 div. at 300 kHz. Set phase so that the 40% ID axial notch is 15 degrees at 300 kHz. A phase curve is established on the 300 kHz raw channel using 100, 60 and 40% ID axial notches.

Terrain plot the 300 kHz raw channel in the area of interest. Axial indications will form in the positive direction.

Dent responses may also form in the same plane as the flaw response. Careful analysis should be performed watching specifically for any change in the lissajous signal.

Phase and amplitude measurements are performed on the lissajous response from the main or circumferential lissajous window. Record only those indications which provide a flaw-like lissajous response. Apply a circ. from-to, if in the circ. lissajous window, to isolate the indication and minimize the number of data points in the lissajous. The main lissajous simply reduce the view area in the expanded strip chart region. Use the strip chart to step through one scan line at a time along the length of the indication. Record a call for each step along the length of the indication. Record a zero percent call prior to and as near the first call of the indication and after the last call.

Filters are acceptable for detection but are not applied for sizing.





Examination Technique Specification Sheet

ETSS #96703 Pwsc_Axial_sizing.doc	Page 4 of 7
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Analysis Guidelines:

Adjustment Procedure

At the completion of the initial analysis process, adjustment for data points at the ends of the cracks is required. Data points within 0.2" of the indicated crack ends will be adjusted as follows:

a) Ignore all data points from the 1st reading to the point at which phase angles change from ID to OD.

(Paragraph A is not applied if the crack exhibits primarily OD phase angles over its length)

b) Less than 1 volt data points, with ID phases indicating 85% thru-wall and greater will be ignored from the first reading to that point provided within 0.2" from the first reading.

c) Less than 1 volt, ID phase data points exhibiting depth increases of greater than 10% through wall over approximately a 0.05" span will be ignored.

300 kHz Technique Performance

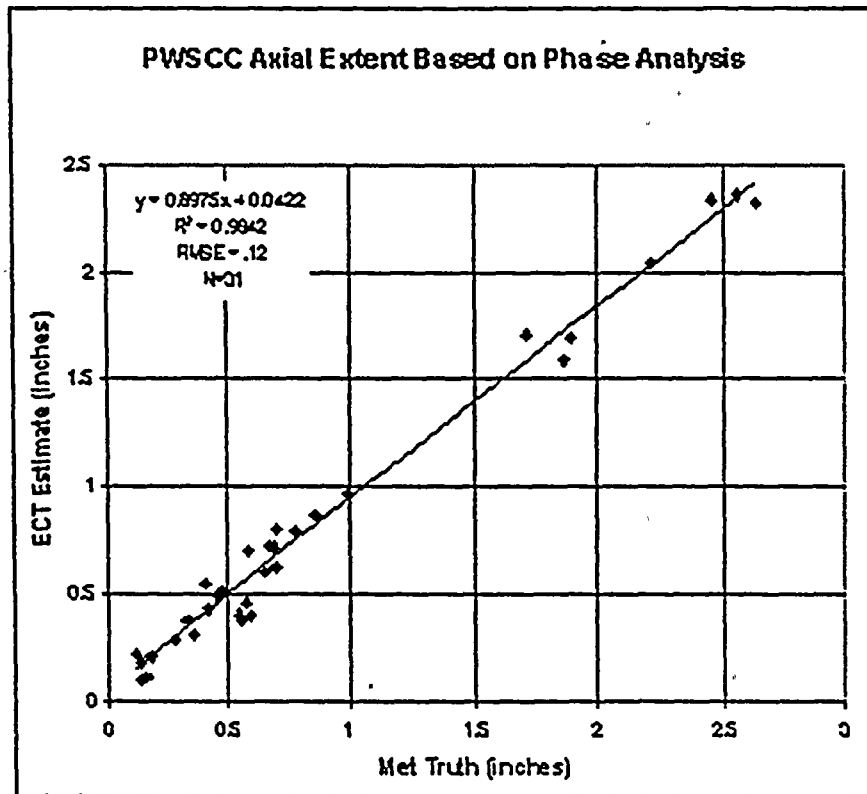
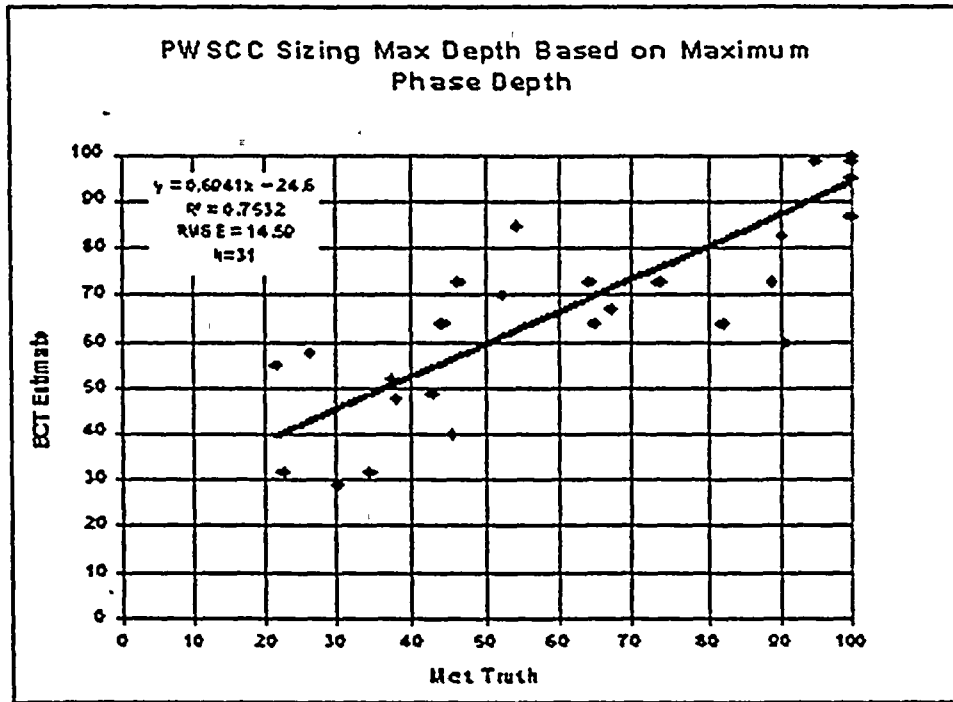
Detection Probability at 50%TW (90% CL)	RMSE Sizing Error
0.89, POD @ 90% CL	<u>9.57</u> , PDA (Percent Degraded Area) ERROR <u>.12</u> , Length Error inches <u>14.59</u> , Maximum Depth Error Percentage

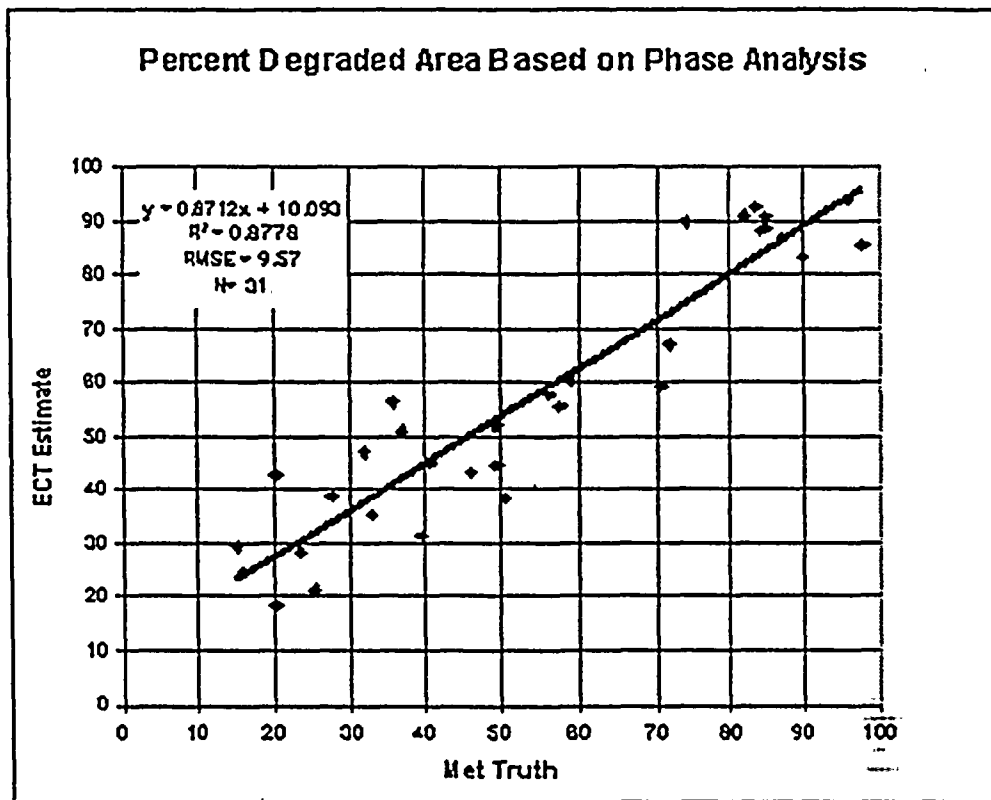


Examination Technique Specification Sheet

ETSS #96703
 Pwsc_Axial_sizing.doc

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Axial Pwsc Based on Phase Angle Measurements @ Dented Intersections

Sample	Length		Max Depth		Area		RMSE	Coef
	Met	Est.	Met	Est	Met	Est		
& Crack #	Met	Est.	Met	Est	Met	Est	%TW	
Diablo 21-43 1H C1	0.99	0.97	98	60	50.22	44.45	21.59	0.79
Diablo 21-431H C2	0.28	0.29	50	40	37.62	31.28	9.61	0.99
Sample 7 C1	0.87	0.87	100	100	96.28	93.9	9.04	0.95
Sample 7 C2	0.66	0.6	100	99	84.79	88.85	30.97	0.78
Sample 7 C3	0.13	0.1	65	64	46.14	43.2	18.06	0.85
Sample 8 C1	2.64	2.32	100	99	84.97	90.55	29.02	0.77
Sample 8 C2	2.45	2.33	100	100	83.56	92.66	24.59	0.72
Sample 9 C1	1.87	1.59	100	100	82.08	90.84	26.8	0.74
Sample 9 C2	1.71	1.71	100	100	84.25	88.04	21.17	0.87

PERFORMANCE DEMONSTRATION DATA BASE
 Appendix A TECHNIQUE SPECIFICATION SHEETS



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Sample & Crack #	Length		Max Depth		Area		RMSE	Coef
	Met	Est.	Met	Est	Met	Est	%TW	
Sample 10 C1	2.56	2.36	100	100	89.94	83.33	24.14	0.91
Sample 10 C2	2.21	2.04	100	87	71.5	67.04	17.9	0.79
Sample 11 C1	0.68	0.73	100	95	98	85.49	17.33	0.66
Sample 11 C2	0.58	0.46	95	99	73.96	89.74	20.34	0.92
Sample 12 C1	1.9	1.69	100	100	87.3	86.89	42.26	0.35
Sample 12 C2	0.55	0.41	82	64	50.55	38.29	37.48	0.09
Sample 12 C5	0.18	0.21	90	83	70.47	59.29	19.37	0.81
Sample 2-3H-c1	0.472	0.51	21.53	55	15.22	29.25	18.86	.1
Sample 12-3H-c1	0.129	0.18	22.69	32	16.07	24.44	11.01	0.55
Sample 12-4H-c1	0.36	0.31	26.29	58	20.24	42.77	21.29	0.73
Sample 7-1H-c1	0.598	0.4	30.14	29	20.21	18.38	11.26	0.74
Sample 7-3H-c1	0.56	0.38	34.43	32	24.95	21.34	12.58	0.81
Sample 13-3H-c1	0.336	0.38	37.31	52	27.25	38.87	13.47	0.92
Sample 11-2H-c2	0.16	0.11	43	49	32.75	35.27	16.86	0.7
Sample 8-3H-c1	0.46	0.49	44.21	64	31.81	47.1	17.3	.86
Sample 9-2H-c2	0.786	0.79	46.26	73	35.62	56.44	23.22	0.6
Sample 8-1H-c1	0.42	0.43	52.24	70	40.73	45.28	10.37	0.86
Sample 1-4H-c1	0.708	0.81	54.32	85	36.72	50.83	18.66	0.72
Sample 6-4H-c1	0.416	0.54	64.29	73	49.41	52.09	12.8	0.83
Sample 6-3H-c1	0.588	0.17	67.26	67	56.14	57.96	10.81	0.73
Sample 6-2H-c1	0.692	0.72	73.72	73	59.09	60.4	10.3	0.79
Diablo 10-22 2H C1	0.12	0.22	38	48	23.21	28.23	15.61	.8
Diablo 12-32 1H c1	0.702	0.62	88.9	73	57.54	55.82	24.44	0.4
RMSE	0.12		14.59		9.57		19.33	0.72
	% Thru-wall	POD@90 % CL	Fraction Detected					
	<50%	0.80	1.00	(16/16)				
	50-100%	0.89	1.00	(20/20)				



APPENDIX A-4

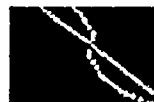
**ETSS#96703 Rev.2
PWSCC Axial Sizing**

April 1998



PERFORMANCE DEMONSTRATION DATA BASE

Appendix A TECHNIQUE SPECIFICATION SHEETS



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Examination Technique Specification Sheet			
ETSS #96703 Pwsccl_Axial_sizing.doc		Page 1 of 7	
TUBING			
Material: Inconel 600		OD: .875"	Wall: .050"
EXAMINATION SCOPE			
<p>Test Application: This technique is qualified for detection and sizing by length or depth percent thru-wall of axial Primary Water Stress Corrosion Cracking (PWSCC) at dents. This technique meets the requirements for detection and sizing the performance indices are properly reflected per Appendix H at 300 kHz. Caution: Specific training on sizing by length and depth should precede implementation of this technique. This technique received industry peer review on 4/15/98.</p>			
ACQUISITION TECHNIQUE			
Bobbin Probe _____ Rotating Probe <input checked="" type="checkbox"/> Other _____			
DATA ACQUISITION			
Instrument		Probe	
Manufacturer: Zetec/Tecrad		Manufacturer: Zetec	
Model: MIZ 30 / TC6700		Diameter/Coil Dimensions: MR Plus-Point	
Acquisition System Software		Part Number: Plus pt .610-.720MRPC/FH-52 PH	
Manufacturer: Zetec / Westinghouse		Probe Cable Length: 83'- MRPC-52 MU	
Description or Title: EddyNet95™ /ANSER		Analog Probe Extension	
		Manufacturer: Zetec (Low Loss Cable)	
Version/Revision: 3 or equivalent / Anser 8.1		Length: 50'	
Frequencies/Coil Excitation Modes			
Absolute Mode		Absolute Mode	
Channel/Coil/Frequencies		Channel/Coil/Frequencies	
	7/5/300 kHz 16V X 1 3.0 vp and 38db of gain		
Data Recording Equipment			
Manufacturer: Hewlett Packard or equivalent		Model: 650 Mb Re-writable or equivalent	

PERFORMANCE DEMONSTRATION DATA BASE

Appendix A TECHNIQUE SPECIFICATION SHEETS

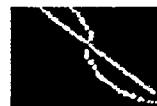


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Examination Technique Specification Sheet			
ETSS #96703 Pwsc_Axial_sizing.doc		Page 2 of 7	
Digitizing Rate, Scan Direction & Scan Pattern			
Bobbin Probe		Rotating Probe	
Digitizing Rate Min (DR):*		Digitizing Rate Min (DR)* 30 samples/inch circumferentially and axially	
Sample Rate Min (SR)		Sample Rate Min (SR) 400 samples/sec	
Probe Speed (PS)		Withdrawal Speed Max (WS) .1 ips	
Scan Direction		Rotation Speed Max (RPM) 300 RPM	
* Note: Digitizing rate applies in the axial direction. SR min = DR min x PS max		* Note: Digitizing rate applies in both the axial and circumferential directions; for the circumferential direction, SR min = DR min x (1/RPM) x (1/tube diameter) x 19.09	
DATA ANALYSIS			
Instrument		Analysis System Software	
Manufacturer: Hewlett Packard		Manufacturer: Zetec	
Model: 710 or equivalent		Title/Rev.: EddyNet95/Ver 3 or equivalent	
Analysis Channels			
Single Frequency	300 kHz		
Span Setting	40% OD axial 1 div		
Phase Rotation	40% ID axial at 15 degrees (axial flaws going up)		
Calibration Std.	100% , 60% , & 40% axial ID, 40% axial OD		
Calibration Curve	Phase curve, circ lissajous, axial 100, 60, & 40% ID notches		
Volts	20 volts on 100% axial		
Single Frequency			
Span Setting			
Phase Rotation			
Calibration Std.			
Calibration Curve			
Volts			

PERFORMANCE DEMONSTRATION DATA BASE

Appendix A TECHNIQUE SPECIFICATION SHEETS



April 1998 Rev 2

Examination Technique Specification Sheet

ETSS #96703
Pwsc_Axial_sizing.doc

Page 3 of 7

Analysis Guidelines:

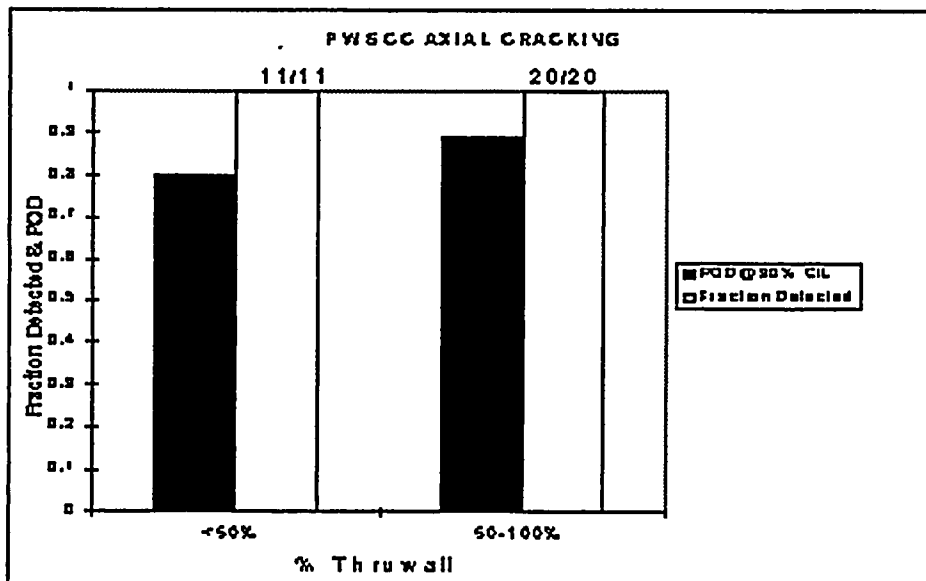
Voltage normalization is performed in the main or circ. lissajous window and is set on the 100% axial notch at 20 volts. Adjust the span such that the 40% OD axial notch is 1 div. at 300 kHz. Set phase so that the 40% ID axial notch is 15 degrees at 300 kHz. A phase curve is established on the 300 kHz raw channel using 100, 60 and 40% ID axial notches.

Terrain plot the 300 kHz raw channel in the area of interest. Axial indications will form in the positive direction.

Dent responses may also form in the same plane as the flaw response. Careful analysis should be performed watching specifically for any change in the lissajous signal.

Phase and amplitude measurements are performed on the lissajous response from the main or circumferential lissajous window. Record only those indications which provide a flaw-like lissajous response. Apply a circ. from-to, if in the circ. lissajous window, to isolate the indication and minimize the number of data points in the lissajous. The main lissajous simply reduce the view area in the expanded strip chart region. Use the strip chart to step through one scan line at a time along the length of the indication. Record a call for each step along the length of the indication. Record a zero percent call prior to and as near the first call of the indication and after the last call.

Filters are acceptable for detection but are not applied for sizing.





Examination Technique Specification Sheet	
ETSS #96703 Pwsc_Axial_sizing.doc	Page 4 of 7

Analysis Guidelines:

Adjustment Procedure

At the completion of the initial analysis process, adjustment for data points at the ends of the cracks is required. Data points within 0.2" of the indicated crack ends will be adjusted as follows:

a) Ignore all data points from the 1st reading to the point at which phase angles change from ID to OD.

(Paragraph A is not applied if the crack exhibits primarily OD phase angles over its length)

b) Less than 1 volt data points, with ID phases indicating 85% thru-wall and greater will be ignored from the first reading to that point provided within 0.2" from the first reading.

c) Less than 1 volt, ID phase data points exhibiting depth increases of greater than 10% through wall over approximately a 0.05" span will be ignored.

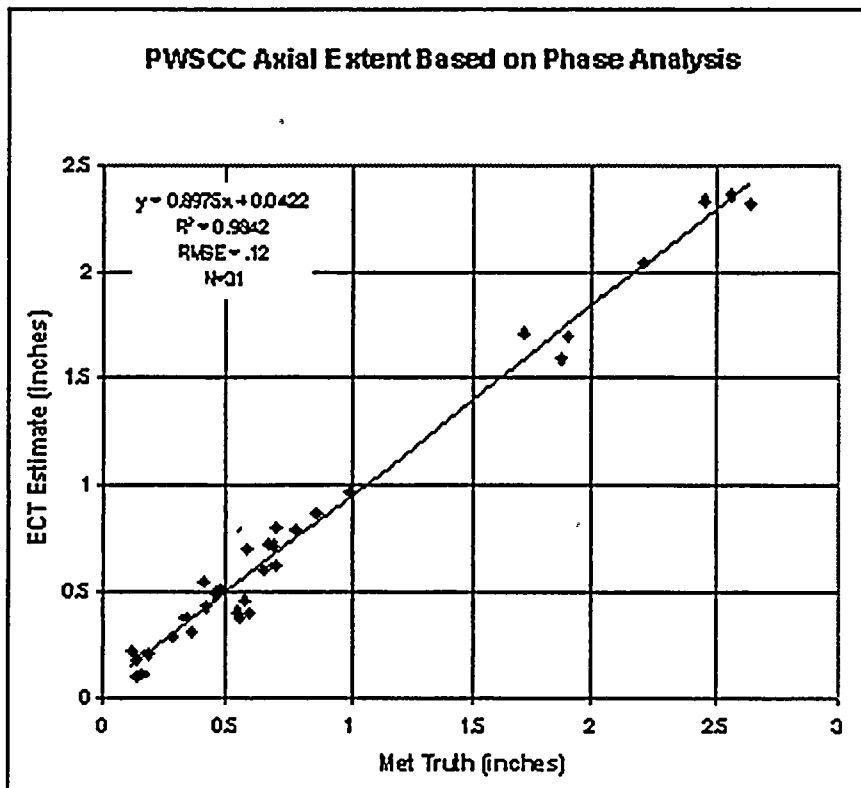
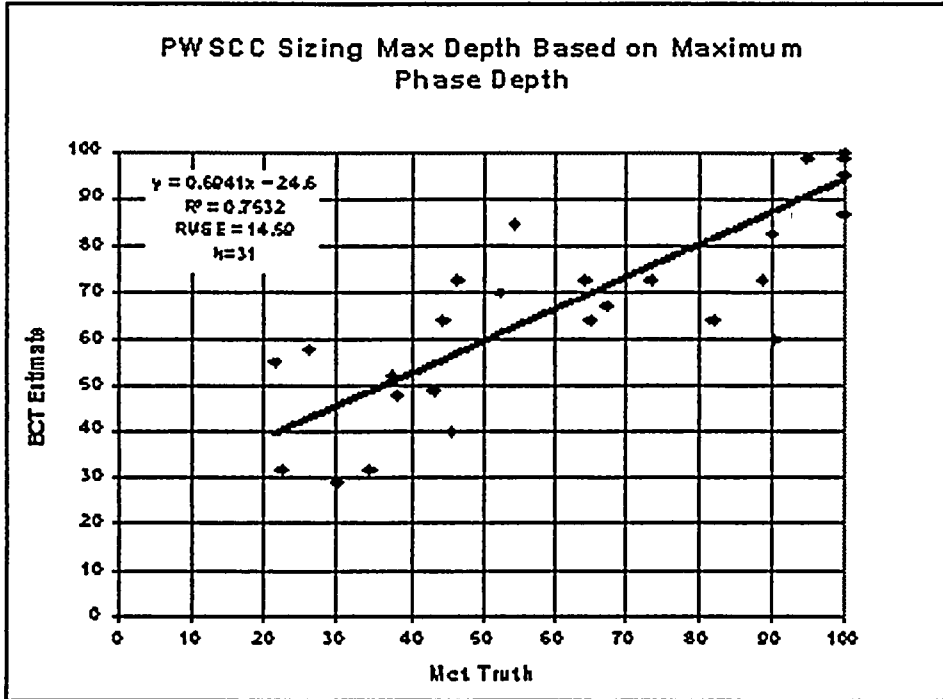
300 kHz Technique Performance	
Detection Probability at 50%TW (90% CL)	RMSE Sizing Error
0.89, POD @ 90% CL	<u>9.57</u> , PDA (Percent Degraded Area) ERROR <u>.12</u> , Length Error inches <u>14.59</u> , Maximum Depth Error Percentage

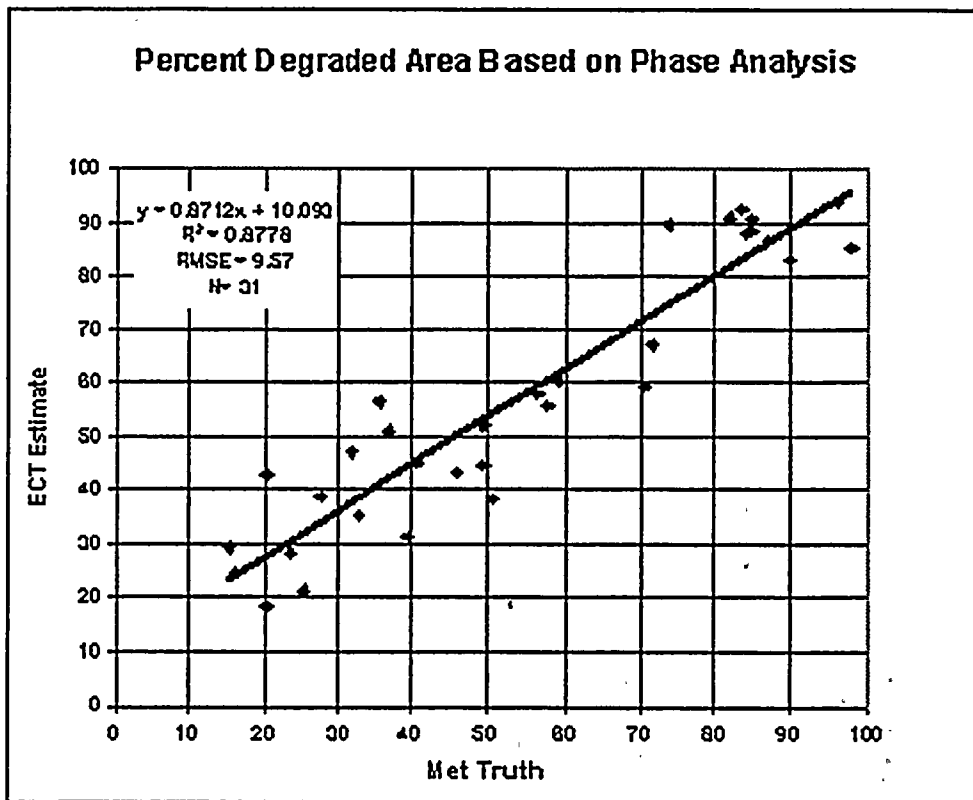


Examination Technique Specification Sheet

ETSS #96703
 Pwscs_Axial_sizing.doc

Page 5 of 7



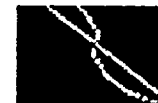


Axial Pwsc Based on Phase Angle Measurements @ Dented Intersections

Sample	Length		Max Depth		Area		RMSE	Coef
	Met	Est.	Met	Est	Met	Est		
& Crack #	Met	Est.	Met	Est	Met	Est	%TW	
Diablo 21-43 1H C1	0.99	0.97	98	60	50.22	44.45	21.59	0.79
Diablo 21-431H C2	0.28	0.29	50	40	37.62	31.28	9.61	0.99
Sample 7 C1	0.87	0.87	100	100	96.28	93.9	9.04	0.95
Sample 7 C2	0.66	0.6	100	99	84.79	88.85	30.97	0.78
Sample 7 C3	0.13	0.1	65	64	46.14	43.2	18.06	0.85
Sample 8 C1	2.64	2.32	100	99	84.97	90.55	29.02	0.77
Sample 8 C2	2.45	2.33	100	100	83.56	92.66	24.59	0.72
Sample 9 C1	1.87	1.59	100	100	82.08	90.84	26.8	0.74
Sample 9 C2	1.71	1.71	100	100	84.25	88.04	21.17	0.87

PERFORMANCE DEMONSTRATION DATA BASE

Appendix A TECHNIQUE SPECIFICATION SHEETS



April 1998 Rev 2

Sample & Crack #	Length		Max Depth		Area		RMSE	Coef
	Met	Est.	Met	Est	Met	Est	%TW	
Sample 10 C1	2.56	2.36	100	100	89.94	83.33	24.14	0.91
Sample 10 C2	2.21	2.04	100	87	71.5	67.04	17.9	0.79
Sample 11 C1	0.68	0.73	100	95	98	85.49	17.33	0.66
Sample 11 C2	0.58	0.46	95	99	73.96	89.74	20.34	0.92
Sample 12 C1	1.9	1.69	100	100	87.3	86.89	42.26	0.35
Sample 12 C2	0.55	0.41	82	64	50.55	38.29	37.48	0.09
Sample 12 C5	0.18	0.21	90	83	70.47	59.29	19.37	0.81
Sample 2-3H-c1	0.472	0.51	21.53	55	15.22	29.25	18.86	.1
Sample 12-3H-c1	0.129	0.18	22.69	32	16.07	24.44	11.01	0.55
Sample 12-4H-c1	0.36	0.31	26.29	58	20.24	42.77	21.29	0.73
Sample 7-1H-c1	0.598	0.4	30.14	29	20.21	18.38	11.26	0.74
Sample 7-3H-c1	0.56	0.38	34.43	32	24.95	21.34	12.58	0.81
Sample13-3H-c1	0.336	0.38	37.31	52	27.25	38.87	13.47	0.92
Sample11-2H-c2	0.16	0.11	43	49	32.75	35.27	16.86	0.7
Sample 8-3H-c1	0.46	0.49	44.21	64	31.81	47.1	17.3	.86
Sample 9-2H-c2	0.786	0.79	46.26	73	35.62	56.44	23.22	0.6
Sample 8-1H-c1	0.42	0.43	52.24	70	40.73	45.28	10.37	0.86
Sample1-4H-c1	0.708	0.81	54.32	85	36.72	50.83	18.66	0.72
Sample6-4H-c1	0.416	0.54	64.29	73	49.41	52.09	12.8	0.83
Sample6-3H-c1	0.588	0.17	67.26	67	56.14	57.96	10.81	0.73
Sample6-2H-c1	0.692	0.72	73.72	73	59.09	60.4	10.3	0.79
Diablo10-22 2H C1	0.12	0.22	38	48	23.21	28.23	15.61	.8
Diablo 12-32 1H c1	0.702	0.62	88.9	73	57.54	55.82	24.44	0.4
RMSE	0.12		14.59		9.57		19.33	0.72
	% Thru-wall	POD@90 % C/L	Fraction Detected					
	<50%	0.80	1.00	(16/16)				
	50-100%	0.89	1.00	(20/20)				



APPENDIX A-5
Calibration Standards



CALIBRATION STANDARDS BY DATA SET

All training data sets use Cal. Standard X-001-95 except as noted below:

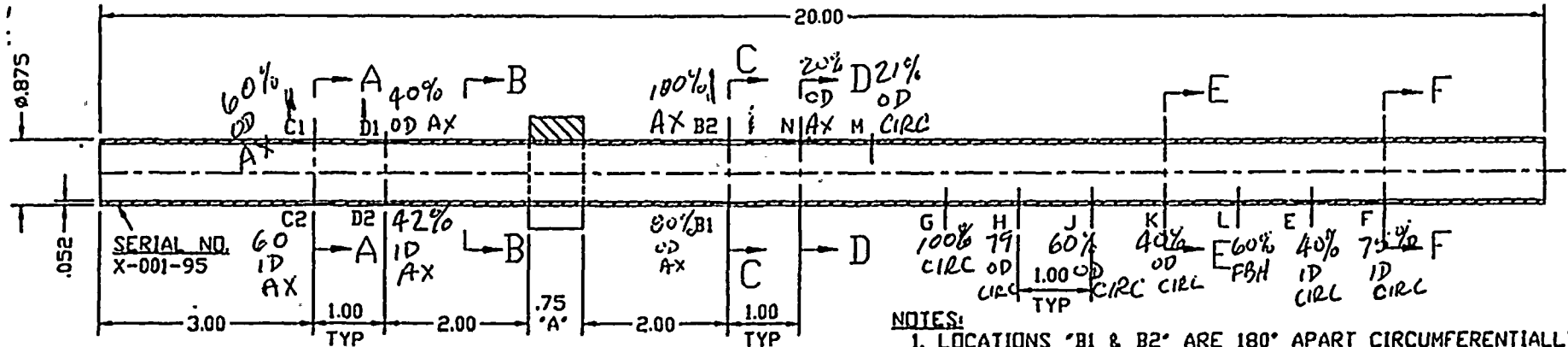
Data sets 305, 329, 672, 831 and 1076 use Z-14231

Data sets 87, 184, 448, 566, 720, 774, 813, 876, 886 and 905 use Z-14232

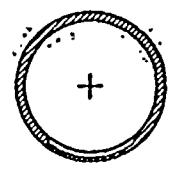
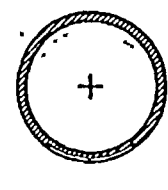
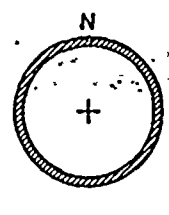
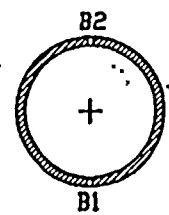
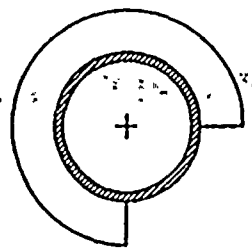
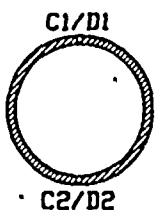
Data set 210 uses MGT-013-91



LOCATION:	B1	B2	C1	C2	D1	D2	E	F	G	H	J	K	L	M	N	MATERIAL: INCONEL 600
TYPE OF EDM NOTCH:	O.D. AXIAL	THRU-WALL AXIAL	O.D. AXIAL	I.D. AXIAL	O.D. AXIAL	I.D. AXIAL	I.D. CIRC.	I.D. CIRC.	THRU-WALL CIRC.	O.D. CIRC.	O.D. CIRC.	O.D. CIRC.	FLAT BOTTOM HOLE	O.D. CIRC.	O.D. AXIAL	SPECIFICATION: SB-163
DEPTH % OF AVG. WALL THICKNESS:	81%	100%	60%	60%	40%	42%	40%	75%	100%	79%	60%	40%	60%	21%	21%	SERIAL NO.: X-001-95
WIDTH OF DEFECT:	.006	.007	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	N/A	.006	.006	HEAT NO.: NX1284
LENGTH OF DEFECT:	.500	.500	.500	.500	.500	.500	.500	.500	.501	.500	.500	.500	.110 ϕ	.500	.500	CHARACTERIZATION FREQ: 400KHZ
ACTUAL DEPTH:	.042	THRU	.031	.031	.021	.022	.021	.039	THRU	.041	.031	.021	.031	.011	.011	AVG. WALL THICKNESS: .052
																NOM. WALL THICKNESS: .050
																WORK ORDER NO.: 137368



- NOTES:
1. LOCATIONS "B1 & B2" ARE 180° APART CIRCUMFERENTIALLY. THE SAME IS TRUE FOR THE PAIRS "C1, C2" & "D1, D2".
 2. LOCATION "A" IS A CARBON STEEL RING THAT EXTENDS 270° CIRCUMFERENTIALLY AROUND THE TUBE.
 3. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.



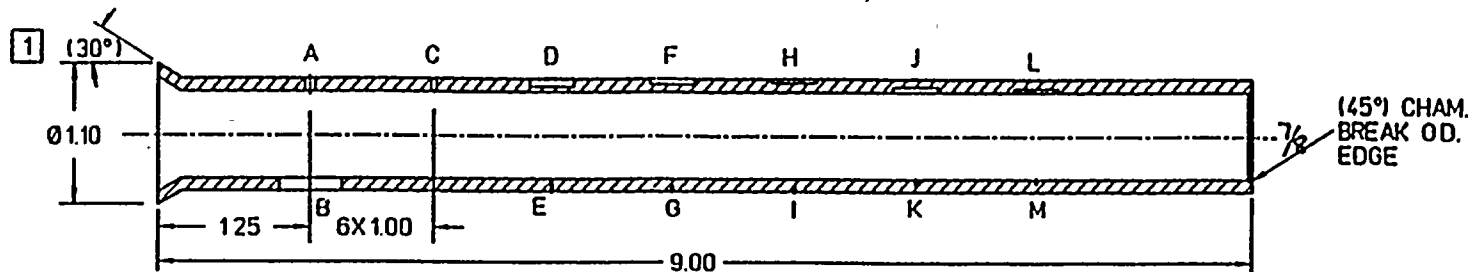
SECTION A-A (ENLARGED) (LOC. C1/C2 & D1/D2)
 SECTION B-B
 SECTION C-C (ENLARGED) (LOC. B2/B1)
 SECTION D-D (ENLARGED) (LOC. N)
 SECTION E-E (ENLARGED) (LOC. G/H/J/K/M)
 SECTION F-F (ENLARGED) (LOC. E/F)

REVISION 2 IT. CHANGE	UNLESS OTHERWISE SPECIFIED	DATE	BY	APPROVED	DATE	BY
	TOLERANCES	5/11/95	AJF	5/11/95	5/11/95	BE
	UNLESS OTHERWISE SPECIFIED	TOLERANCE & MACHINE NOTES (UNLESS OTHERWISE SPECIFIED)		NUCLEAR SERVICES DIVISION SERVICE TECHNOLOGY SECTION		
		UNLESS OTHERWISE SPECIFIED		RPC TUBE STANDARD CIR. CRACK EVAL. FOR 7/8" TUBING (AS-BUILT)		
		UNLESS OTHERWISE SPECIFIED		1B79055		
		UNLESS OTHERWISE SPECIFIED		66:1 079 1 1		

1 -1 AS SHOWN
-2 WITHOUT FLARED END

REV. STATUS OF SHEETS		REVISIONS			APVD	CK	DR
LTR	DATE	DESCRIPTION					
A	9-24-95	ADDED NOTE		<i>DB</i>	<i>JD</i>	KZ	

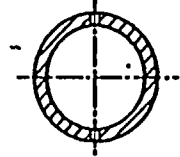
LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M
PHYSICALLY MEAS. DEPTH	THRU	THRU	THRU	.0310	.0325	.0210	.0210	.0105	.0100	.0200	.0205	.0110	.0105
DEPTH IN % OF WALL	100%	100%	100%	60%	63%	41%	41%	20%	19%	39%	40%	21%	20%
ET PHASE ANGLE MEAS	NA												



NOTE: ALL EDM NOTCHES
.500 LONG X .005 WIDE MAX.

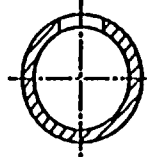
MATERIAL INCONEL 600
AVERAGE MEAS. WALL THK. .0515
NOMINAL WALL THK. .049
HEAT LOT NO. NX4861
TEST FREQ. USED NA
SERIAL NO Z-14232
P.O. NO 078640
REL. NO. NA
QUALITY REL. NO NA
DATE MFG. 10-4-95
O.A. INSP. Hug Allen
CUSTOMER Pacific Gas & Electric
RECORDED NA
PROBE USED NA
REVIEWED BY: [Signature]

LOC.A
SHOWS 100% DEFECT



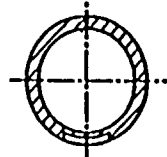
LOC.B
SHOWS OD AXIAL EDM FLAW

LOC.C



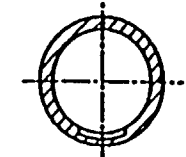
SHOWS OD CIRC. EDM FLAW

LOC.D THRU I
SHOWS OD AXIAL EDM FLAW



SHOWS OD CIRC. EDM FLAW

LOC.J THRU M
SHOWS ID AXIAL EDM FLAW



SHOWS ID CIRC. EDM FLAW

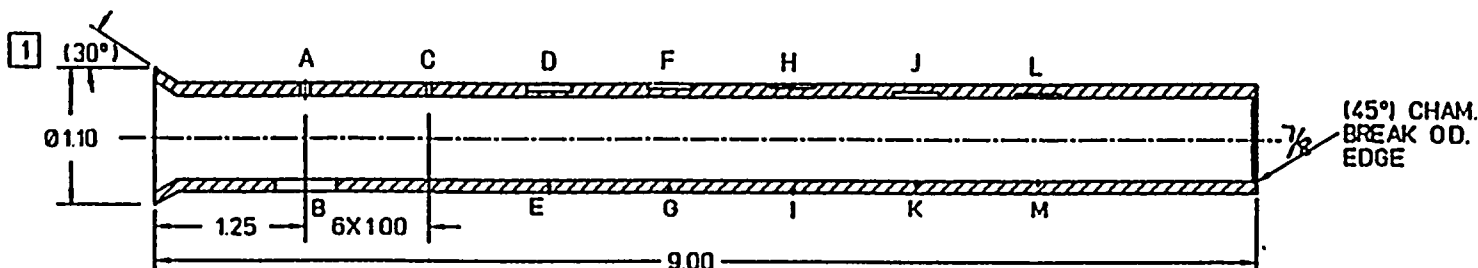
NOTE:

UNL. OTHERWISE SPECIFIED DIM ARE IN INCHES TOLERANCES DECIMAL FRACT. 1/16 XXXX ±.003 XXX ±.015 XX ±.050 X ±.003 ANGULAR ±3° FINISH	DRAWN K ZEKE	DATE 08/24/95	ZETEC INC. POST OFFICE BOX 180 ISSAQUAH WASHINGTON 98272-0180 USA TELEPHONE 1100 392-9310	
	CHECK JZ.	DATE 8/31/95		TITLE GUIDE TUBE STD. W/EDM DEFECTS
	DESIGN	APVD. O.A.	8/31/95	SIMLAR
	O.A.	8/31/95	SCALE NTS	DWG NO 2-415-1039 USED ON SHT 1 OF 2

1 -1 AS SHOWN
-2 WITHOUT FLARED END

REVISES		REV STATUS OF SHEETS		REVISIONS										APVD	CK	DR
LTR	DATE	DESCRIPTION														
A	9-24-95	ADDED NOTE										<i>[Signature]</i>	<i>[Signature]</i>	KZ		

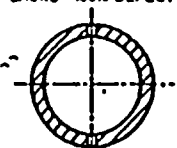
LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M
PHYSICALLY MEAS. DEPTH	THRU	THRU	THRU	.0310	.0310	.0210	.0205	.0105	.0100	.0195	.0200	.0105	.0100
DEPTH IN % OF WALL	100%	100%	100%	60%	60%	41%	40%	20%	19%	38%	39%	20%	19%
ET PHASE ANGLE MEAS	NA												



NOTE: ALL EDM NOTCHES
.500 LONG X .005 WIDE MAX.

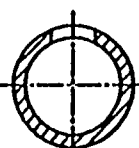
MATERIAL INCONEL 600
AVERAGE MEAS. WALL THK. .0515
NOMINAL WALL THK. .049
HEAT LOT NO. NX4861
TEST FREQ. USED NA
SERIAL NO. Z-14231
P.O. NO. 078640
REL. NO. NA

LOC.A
SHOWS 100% DEFECT



LOC.B
SHOWS OD AXIAL EDM FLAW

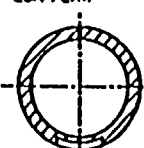
LOC.C



SHOWS OD CIRC. EDM FLAW

LOC.D THRU I

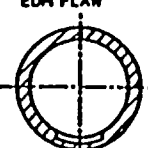
SHOWS OD AXIAL EDM FLAW



SHOWS OD CIRC. EDM FLAW

LOC.J THRU M

SHOWS ID. AXIAL EDM FLAW



SHOWS ID. CIRC. EDM FLAW

NOTE:

UNLESS OTHERWISE SPECIFIED
DIM ARE IN INCHES
TOLERANCES
DECIMAL FRACT. ± 1/16
XXXX ± .003
XXX ± .015
XX ± .050
X ± .003
ANGULAR ± 3°
FINISH

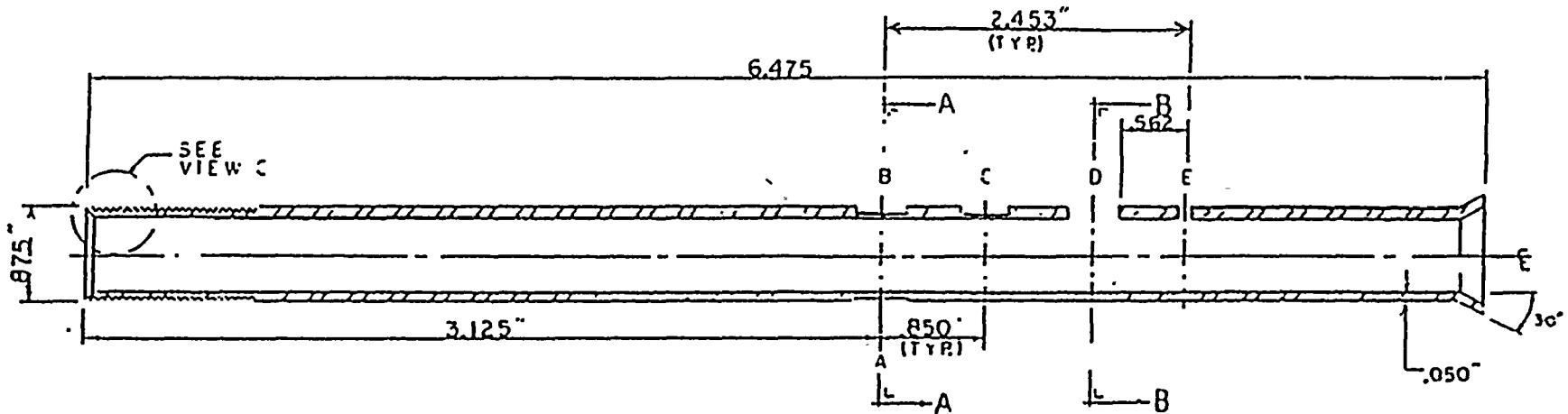
DRAWN	K ZEGKE	DATE	08/24/95
CHECK	JZ.	DATE	8/31/95
DESIGN			
APVD OR	G.A.	DATE	8/31/95

ZETEC INC		POST OFFICE BOX 18 ISSAQUAH WASH-0104 9827-040 USA TELEPHONE 1208 287-3118	
TITLE GUIDE TUBE STD. W/EDM DEFECTS			
SMILAR	DWG NO	2-415-1039	
SCALE	NTS	USED ON	SHT 1 OF 2

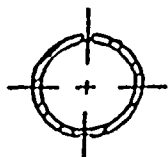
QUALITY REL. NO. NA
DATE MFG. 10-4-95
O.A. INSP. Hug Allen
CUSTOMER PACIFIC GAS & ELECTRIC
RECORDED NA
PROBE USED NA
REVIEWED BY. *[Signature]*

LOCATION	A	B	C	D	E
PHYSICAL MEASURED DEPTHS	.019"	.028"	.041"	THRU	THRU
DEPTH % OF AVG WALL THICKNESS	38%	56%	82%	100%	100%
DEPTH % OF NOMINAL WALL THICKNESS	N/A	N/A	N/A	N/A	N/A
DIA. OR WIDTH OF DEFECT	.006"	.006"	.007"	.007"	.067"
LENGTH OF DEFECT	.353"	.353"	.352"	.354"	N/A

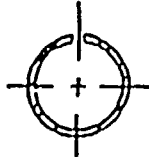
MATERIAL INCONEL 600
 SPECIFICATION 2656A94 REV. 1
 SERIAL NO MGT-013-91
 HEAT NO NX1015
 CHARACTERIZATION FREQ 400 KHZ
 AVERAGE WALL THICKNESS .050
 NOMINAL WALL THICKNESS .050
 WORK ORDER NO. 141846



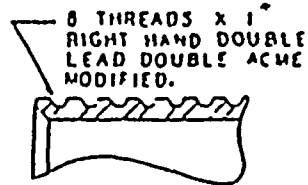
NOTES: ALL FLAW DEPTH DIMENSIONS SHALL BE WITHIN ±20%
 OR ±.003" WHICH EVER IS LESS OF THAT SPECIFIED.
 ALL OTHER DIMENSIONS SHALL BE WITHIN ±.010".
 NOTCHES A, B, C, ARE FLAT BOTTOM NOTCHES.
 NOTCH A IS 190° FROM NOTCH B.



SECTION A-A
TWO NOTCHES



SECTION B-B
ONE THROUGH
NOTCH



VIEW C
DETAIL THREADS

SAFETY FIRST

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 IS THE PROPERTY OF ECHORAM TECHNOLOGY,
 INC. AND IS PROPRIETARY AND MUST NOT BE
 MADE PUBLIC OR COPIED UNLESS AUTHORIZED
 BY THEM. THIS DRAWING TO BE RETURNED UPON
 REQUEST.

TITLE		MRPC GUIDE TUBE STANDARD (AS-BUILT)	
DR BY E.O.S.	DATE 4-17-91	SCALE NONE	CUST. NO. N/A
CHK BY <i>[Signature]</i>			DWG NO. UGT-
APP BY <i>[Signature]</i>			A-013-21
			SH 1 OF 1

ECHORAM
 Technology, Inc.

Appendix B
Destructive Exam Depth Profiles



Sample P7 - Crack 1

Destructive Exam

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Height (mm)	Notes
---------------------------	------------------------	--------------------	---	----------------------------	-------

No Exclusion Criterion Applied

-0.488	0%				
-0.480	38%				
-0.470	61%				
-0.460	80%				
-0.450	90%				
-0.440	94%				
-0.430	98%				
-0.420	98%				
-0.410	100%				
-0.400	100%	L-03			SCC
-0.375	99%				
-0.350	98%				
-0.325	94%	L-02	0.103	0.140	ductile
-0.300	98%				
-0.275	100%				
-0.250	100%				
-0.225	100%				
-0.200	100%				
-0.175	99%				
-0.150	100%				
-0.125	100%				
-0.100	99%				
-0.075	100%				
-0.050	100%	L-01	0.103	0.109	ductile
-0.025	100%				
0.000	100%				
0.025	100%	L+01			SCC
0.050	96%				
0.075	94%	L+02	0.306	0.322	ductile
0.100	98%				
0.125	99%				
0.150	100%				
0.175	100%				
0.200	100%				
0.225	100%	L+03	0.323	0.324	ductile
0.250	100%				
0.275	100%				
0.300	100%				
0.325	100%				
0.335	100%				
0.345	100%				
0.355	100%				
0.360	97%				
0.365	86%				
0.370	71%				
0.375	48%				
0.380	40%				
0.384	0%				
Length	0.87				
Max Depth	100.00				
Avg. Depth	96.31				

Notes:

Specimen was burst without TSP present. Center of TSP location estimated.
 Low Magnification optical photographs. Two orientations
 Crack depth and wall thickness measurements made on STC microscope SN-387AP
 SEM Images taken as TIFF files
 Ligament Analysis by both TIFF files and photos
 Ligament Dimensions off micrographs in mm.

Final Data

Length	0.16" Average	Lig. Corrected
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-0.488	75.96	75.96
-0.476	78.34	78.34
-0.466	80.24	80.24
-0.456	81.77	81.77
-0.446	83.05	83.05
-0.436	84.15	84.15
-0.426	85.05	85.05
-0.416	85.72	85.72
-0.406	86.20	85.04
-0.396	91.79	90.64
-0.386	94.71	93.56
-0.376	96.45	95.30
-0.366	97.35	96.20
-0.356	97.84	96.69
-0.346	98.10	96.95
-0.336	98.21	97.06
-0.326	98.28	97.12
-0.316	98.28	97.12
-0.306	98.29	97.14
-0.296	98.33	97.18
-0.286	98.39	97.24
-0.276	98.45	97.30
-0.266	98.51	97.36
-0.256	98.60	97.45
-0.246	98.82	97.67
-0.236	99.16	99.16
-0.226	99.44	99.44
-0.216	99.62	99.62
-0.206	99.73	99.73
-0.196	99.78	99.78
-0.186	99.76	99.76
-0.176	99.73	99.73
-0.166	99.71	99.71
-0.156	99.71	99.71
-0.146	99.71	99.71
-0.136	99.71	99.71
-0.126	99.72	98.56
-0.116	99.74	98.57
-0.106	99.76	98.60
-0.096	99.80	98.64
-0.086	99.84	98.68
-0.076	99.88	98.72
-0.066	99.90	98.74
-0.056	99.91	98.75
-0.046	99.83	98.67
-0.036	99.65	98.49
-0.026	99.41	98.25
-0.016	99.14	97.98
-0.006	98.83	94.23
0.004	98.59	93.99
0.014	98.43	93.83
0.024	98.33	93.73
0.034	98.25	93.65
0.044	98.19	94.75
0.054	98.15	94.71
0.064	98.14	94.70
0.074	98.14	94.70
0.084	98.14	94.70
0.094	98.14	94.70
0.104	98.14	94.70
0.114	98.14	94.70
0.124	98.22	94.78
0.134	98.40	94.96
0.144	98.65	91.59
0.154	98.95	91.88
0.164	99.29	95.66
0.174	99.54	95.91
0.184	99.71	96.08
0.194	99.81	96.18
0.204	99.89	96.26
0.214	99.95	96.32
0.224	99.99	96.36
0.234	100.00	96.37
0.244	100.00	96.37
0.254	100.00	96.37
0.264	100.00	96.37
0.274	100.00	96.37
0.284	99.30	95.67
0.294	96.49	92.87
0.304	90.61	86.98
0.314	90.03	90.03

Sample P7 - Crack 1

Destructive Exam

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
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No Exclusion Criterion Applied

Final Data

Length	0.16" Average	Lig. Corrected
0.324	89.36	89.36
0.334	88.60	88.60
0.344	87.72	87.72
0.354	86.70	86.70
0.364	85.49	85.49
0.374	84.04	84.04
0.384	82.27	82.27
Length	0.87	0.87
Max Depth	100	99.78
Avg. Depth	95.15	94.32

Sample P7 - Crack 2

Destructive Exam

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes
No Exclusion Criterion Applied						
-0.353	0%					Crack 2
-0.350	29%					
-0.340	60%					
-0.330	66%					
-0.320	72%					
-0.310	82%					
-0.300	88%					
-0.275	89%					
-0.250	87%	L-03				SCC
-0.225	88%					
-0.200	83%	L-02				SCC
-0.175	87%					
-0.150	95%					
-0.125	93%					
-0.100	88%					
-0.075	89%	L-01	0.348	5.37E-04	0.269	ductile
-0.050	94%					
-0.025	92%					
0.000	92%					
0.025	100%	L+01				SCC
0.050	100%					
0.075	87%	L+02	0.239	3.71E-04	0.190	ductile
0.100	80%					
0.125	88%					
0.15	84%					
0.175	85%					
0.2	85%					
0.225	83%	L+03				SCC
0.25	84%					
0.26	82%					
0.27	76%					
0.28	69%					
0.285	61%					
0.29	55%					
0.295	47%					
0.3	23%					
0.305	0%					
Length	0.658					
Max Depth	100.00					
Avg. Depth	84.67					

Final Data

Length	0.16" Average	Lig. Corrected
-0.353	68.42	68.42
-0.343	70.37	70.37
-0.333	71.92	71.92
-0.323	73.20	73.20
-0.313	74.31	74.31
-0.303	75.26	75.26
-0.293	75.95	75.95
-0.283	76.45	76.45
-0.273	76.92	76.92
-0.263	81.98	81.98
-0.253	84.17	84.17
-0.243	85.74	85.74
-0.233	87.11	87.11
-0.223	87.97	87.97
-0.213	88.39	88.39
-0.203	88.65	88.65
-0.193	88.78	88.78
-0.183	88.79	88.79
-0.173	88.81	88.81
-0.163	88.88	88.88
-0.153	88.99	85.10
-0.143	89.21	85.31
-0.133	89.55	85.66
-0.123	90.00	86.11
-0.113	90.51	86.62
-0.103	90.94	87.05
-0.093	91.28	87.39
-0.083	91.51	87.61
-0.073	91.70	87.80
-0.063	91.91	88.02
-0.053	92.26	88.37
-0.043	92.65	88.76
-0.033	93.10	89.21
-0.023	93.44	89.54
-0.013	93.57	89.68
-0.003	93.45	85.66
0.007	93.15	85.37
0.017	92.66	88.77
0.027	92.13	88.24
0.037	91.66	87.77
0.047	91.32	87.43
0.057	90.94	87.05
0.067	90.51	86.61
0.077	90.06	86.17
0.087	89.63	85.74
0.097	89.08	85.19
0.107	88.34	84.44
0.117	87.44	83.55
0.127	86.53	82.63
0.137	85.57	81.68
0.147	84.81	80.92
0.157	84.37	80.48
0.167	84.22	84.22
0.177	84.16	84.16
0.187	83.97	83.97
0.197	83.31	83.31
0.207	81.71	81.71
0.217	78.77	78.77
0.227	73.71	73.71
0.237	73.04	73.04
0.247	72.30	72.30
0.257	71.43	71.43
0.267	70.42	70.42
0.277	69.22	69.22
0.287	67.81	67.81
0.297	66.15	66.15
0.305	64.18	64.18
Length	0.658	0.658
Max Depth	93.57	89.68
Avg. Depth	84.49	82.48

Sample P7 - Crack 3

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Ligament Height (mm)	Notes
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Length	0.16" Average	Lig. Corrected
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No Exclusion Criterion Applied Also No Avg. Over Length of Crack, Avg. Max. Depth = Avg. Depth = 46.23%

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Ligament Height (mm)	Notes
						Crack 3
-0.801	0%					
-0.800	4%					
-0.795	21%					
-0.790	37%					
-0.785	39%					
-0.780	45%					
-0.775	47%					
-0.770	49%					
-0.765	47%					
-0.760	51%					
-0.755	55%					
-0.750	59%					
-0.745	62%					
-0.740	64%					
-0.735	65%					
-0.730	64%					
-0.725	63%					
-0.720	62%					
-0.715	61%					
-0.710	55%					
-0.705	54%					
-0.700	50%					
-0.695	45%					
-0.690	32%					
-0.685	22%					
-0.680	13%					
-0.675	0%					
Length	0.126					
Max Depth	65.17					
Avg. Depth	46.23					

Sample P8 - Crack 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Height (mm)	Notes	Ligament angle (deg)	Adjusted Destructive Exam				Final Data			
							Length	Depth	Ligament Number	Length	Depth	Length	0.16" Average	Ljg. Corrected
-1.500	0%						-1.330	0.0	Exclusion	-1.500	0	-1.330	60.38	60.38
-1.329	0%						-1.320	28.8	Cnterion			-1.320	64.14	64.14
-1.319	32%						-1.310	45.5	1b Applied			-1.310	67.22	67.22
-1.309	47%						-1.300	56.9				-1.300	69.78	69.78
-1.299	58%	L-10			SCC		-1.290	67.0				-1.290	71.95	71.95
-1.289	68%						-1.280	78.8				-1.280	73.81	73.81
-1.279	80%						-1.270	82.7				-1.270	75.43	75.43
-1.269	83%						-1.260	85.7				-1.260	76.84	76.84
-1.259	86%						-1.250	98.0				-1.250	78.08	78.08
-1.250	98%						-1.240	98.0				-1.240	83.85	83.85
-1.200	98%						-1.230	98.0				-1.230	87.92	87.92
-1.150	98%						-1.220	98.0				-1.220	91.01	91.01
-1.100	98%	L-09			SCC		-1.210	98.0				-1.210	93.42	93.42
-1.050	100%						-1.200	98.0				-1.200	95.25	95.25
-1.000	98%						-1.190	98.0				-1.190	96.38	96.38
-0.900	73%	L-08	0.67966719	0.558	ductile	90	-1.180	98.0				-1.180	97.28	97.28
-0.850	47%	L-07			SCC		-1.170	98.0				-1.170	98.02	98.02
-0.800	76%						-1.160	98.0				-1.160	98.07	98.07
-0.750	64%	L-06	0.17380563	0.182	ductile	80	-1.150	98.0				-1.150	98.14	98.14
-0.700	100%						-1.140	98.0				-1.140	98.24	98.24
-0.650	97%						-1.130	98.0				-1.130	98.35	98.35
-0.600	100%						-1.120	98.0				-1.120	98.45	98.45
-0.550	97%						-1.110	98.0				-1.110	98.52	98.52
-0.500	92%	L-05	0.1682807	0.166	ductile	90	-1.100	98.0				-1.100	98.56	98.56
-0.450	81%	L-04	0.42292046	0.490	ductile	70	-1.090	98.4				-1.090	98.59	98.59
-0.400	79%	L-02, L-03			SCC		-1.080	98.8				-1.080	98.59	98.59
-0.350	82%						-1.070	99.2				-1.070	98.44	98.44
-0.300	84%						-1.060	99.6				-1.060	98.15	98.15
-0.250	85%						-1.050	100.0				-1.050	97.71	97.71
-0.200	99%						-1.040	99.6				-1.040	97.12	97.12
-0.150	93%	L-01			SCC		-1.030	99.2				-1.030	96.38	96.38
-0.100	100%						-1.020	98.8				-1.020	95.50	95.50
-0.050	98%						-1.010	98.4				-1.010	94.47	94.47
0.000	100%						-1.000	98.0				-1.000	93.27	93.27
0.050	100%						-0.990	95.5				-0.990	91.90	91.90
0.100	100%						-0.980	93.0				-0.980	90.36	82.72
0.150	86%	L+01			SCC		-0.970	90.5				-0.970	88.49	80.85
0.200	88%	L+02			SCC		-0.960	88.0				-0.960	86.29	78.65
0.250	58%				Ligs cross		-0.950	85.5				-0.950	83.81	76.17
0.300	85%	L+03			SCC		-0.940	83.0				-0.940	81.04	73.40
0.350	87%						-0.930	80.5				-0.930	77.99	70.36
0.400	89%	L+04			SCC		-0.920	78.0				-0.920	75.31	67.67
0.450	90%						-0.910	75.5				-0.910	72.99	65.36
0.500	100%						-0.900	73.0				-0.900	71.18	63.53
0.550					Tear separation		-0.890	67.8				-0.890	69.82	62.19
0.600	100%	L+05	0.37620409	0.405	ductile	80	-0.880	62.6				-0.880	68.97	61.33
0.650	100%	L+06			SCC		-0.870	57.4				-0.870	68.12	60.49
0.700	100%						-0.860	52.2				-0.860	67.28	59.64
0.750	74%						-0.850	47.0				-0.850	66.45	58.81
0.800	95%						-0.840	52.8				-0.840	65.62	57.98
0.850	98%						-0.830	58.6				-0.830	64.79	55.20
0.900	93%	L+07	0.07121978	0.099	ductile	90	-0.820	64.4				-0.820	64.54	54.95
0.950	100%	L+08	0.05798992	0.092	ductile	90	-0.810	70.2				-0.810	64.86	62.91
1.000	100%						-0.800	76.0				-0.800	65.91	63.95
1.050	100%						-0.790	73.6				-0.790	67.68	65.73
1.100	97%						-0.780	71.2				-0.780	70.19	68.24
1.150	67%						-0.770	68.8				-0.770	72.06	71.01
1.227	0%	L+09			SCC		-0.760	66.4				-0.760	78.01	74.06
1.242	0%						-0.750	64.0				-0.750	78.68	76.73
1.247	39%						-0.740	71.2				-0.740	80.98	79.02
1.252	45%						-0.730	78.4				-0.730	82.89	80.94
1.257	45%						-0.720	85.6				-0.720	84.51	82.55
1.267	53%						-0.710	92.8				-0.710	85.81	83.86
1.277	51%						-0.700	100.0				-0.700	87.29	85.34
1.287	50%						-0.690	99.4				-0.690	88.95	87.00
1.297	44%						-0.680	98.8				-0.680	90.79	88.84
1.302	37%						-0.670	98.2				-0.670	92.73	90.78
1.307	23%						-0.660	97.6				-0.660	94.78	94.78
1.312	6%						-0.650	97.0				-0.650	96.36	96.36
1.314	0%						-0.640	97.6				-0.640	97.49	97.49
Length	2.643						-0.630	98.2				-0.630	98.16	98.16
Max Depth	100						-0.620	98.8				-0.620	98.35	98.35
Avg. Depth	86.20						-0.610	99.4				-0.610	98.06	98.06
							-0.600	100.0				-0.600	97.74	97.74
							-0.590	99.4				-0.590	97.40	97.40
							-0.580	98.8				-0.580	97.04	95.14
							-0.570	98.2				-0.570	96.58	94.69
							-0.560	97.6				-0.560	96.02	94.13
							-0.550	97.0				-0.550	95.31	93.41
							-0.540	96.0				-0.540	94.42	92.53
							-0.530	95.0				-0.530	93.38	86.73

Notes:

Specimen was burst with TSP present. Center of TSP location accurately defined.
 Low Magnification optical photographs. Two orientations
 Crack depth and wall thickness measurements made on STC microscope SN-387AP
 No SEM images for crack depth/morphology

Sample P8 - Crack 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Height (mm)	Notes	Ligament angle (deg)	Exclusion Criterion 1b Applied				Length	0.16" Average	Lig. Corrected			
							Length	Depth	Ligament Number	Length	Depth					
SEM Ligament Analysis by both TIFF files and photos							-0.520	94.0					-0.520	92.27	85.63	
Ligament Dimensions off micrographs in mm.							-0.510	93.0						-0.510	91.11	84.46
Major ligaments identified, most judged as SCC on microscope							-0.500	92.0						-0.500	89.95	83.31
Ductile and questionable ligaments identified and examined on SEM							-0.490	89.8						-0.490	88.81	82.17
Ductile ligaments photographed on SEM, Eyeball estimate of angle							-0.480	87.6						-0.480	87.68	81.04
Relative depth determined by point - by - point ratio to projected SCC/projected width.							-0.470	85.4						-0.470	86.62	79.98
No angle corrections applied.							-0.460	83.2						-0.460	85.64	78.99
						-0.450	81.0						-0.450	84.74	78.10	
						-0.440	80.6						-0.440	83.94	77.30	
						-0.430	80.2						-0.430	83.24	76.59	
						-0.420	79.8						-0.420	82.61	75.97	
						-0.410	79.4						-0.410	82.07	77.32	
						-0.400	79.0						-0.400	81.68	76.93	
						-0.390	79.6						-0.390	81.45	76.69	
						-0.380	80.2						-0.380	81.36	76.61	
						-0.370	80.8						-0.370	81.42	76.67	
						-0.360	81.4						-0.360	81.62	81.62	
						-0.350	82.0						-0.350	81.86	81.86	
						-0.340	82.4						-0.340	82.13	82.13	
						-0.330	82.8						-0.330	82.44	82.44	
						-0.320	83.2						-0.320	82.93	82.93	
						-0.310	83.6						-0.310	83.61	83.61	
						-0.300	84.0						-0.300	84.42	84.42	
						-0.290	84.2						-0.290	85.36	85.36	
						-0.280	84.4						-0.280	86.44	86.44	
						-0.270	84.6						-0.270	87.40	87.40	
						-0.260	84.8						-0.260	88.26	88.26	
						-0.250	85.0						-0.250	89.02	89.02	
						-0.240	87.8						-0.240	89.69	89.69	
						-0.230	90.6						-0.230	90.27	90.27	
						-0.220	93.4						-0.220	90.91	90.91	
						-0.210	96.2						-0.210	91.60	91.60	
						-0.200	99.0						-0.200	92.36	92.36	
						-0.190	97.8						-0.190	93.20	93.20	
						-0.180	96.6						-0.180	94.11	94.11	
						-0.170	95.4						-0.170	94.98	94.98	
						-0.160	94.2						-0.160	95.81	95.81	
						-0.150	93.0						-0.150	96.46	96.46	
						-0.140	94.4						-0.140	96.92	96.92	
						-0.130	95.8						-0.130	97.19	97.19	
						-0.120	97.2						-0.120	97.32	97.32	
						-0.110	98.6						-0.110	97.31	97.31	
						-0.100	100.0						-0.100	97.39	97.39	
						-0.090	99.6						-0.090	97.56	97.56	
						-0.080	99.2						-0.080	97.84	97.84	
						-0.070	98.8						-0.070	98.18	98.18	
						-0.060	98.4						-0.060	98.59	98.59	
						-0.050	98.0						-0.050	98.92	98.92	
						-0.040	98.4						-0.040	99.16	99.16	
						-0.030	98.8						-0.030	99.33	99.33	
						-0.020	99.2						-0.020	99.41	99.41	
						-0.010	99.6						-0.010	99.41	99.41	
						0.000	100.0						0.000	99.44	99.44	
						0.010	100.0						0.010	99.48	99.48	
						0.020	100.0						0.020	99.55	99.55	
						0.030	100.0						0.030	99.48	99.48	
						0.040	100.0						0.040	99.27	99.27	
						0.050	100.0						0.050	98.87	98.87	
						0.060	100.0						0.060	98.28	98.28	
						0.070	100.0						0.070	97.51	97.51	
						0.080	100.0						0.080	96.73	96.73	
						0.090	100.0						0.090	95.95	95.95	
						0.100	100.0						0.100	95.20	95.20	
						0.110	97.2						0.110	94.47	94.47	
						0.120	94.4						0.120	93.76	93.76	
						0.130	91.6						0.130	92.71	92.71	
						0.140	88.8						0.140	91.29	91.29	
						0.150	86.0						0.150	89.53	89.53	
						0.160	86.4						0.160	87.41	87.41	
						0.170	86.8						0.170	84.94	84.94	
						0.180	87.2						0.180	82.79	82.79	
						0.190	87.6						0.190	80.95	80.95	
						0.200	88.0						0.200	79.60	79.60	
						0.210	82.0						0.210	78.73	78.73	
						0.220	76.0						0.220	78.34	78.34	
						0.230	70.0						0.230	78.14	78.14	
						0.240	64.0						0.240	78.13	78.13	
						0.250	58.0						0.250	76.12	76.12	
						0.260	63.4						0.260	78.11	78.11	
						0.270	68.8						0.270	78.09	78.09	
						0.280	74.2						0.280	78.08	78.08	

Sample P8 - Crack 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Destructive Exam							Adjusted Destructive Exam				Final Data			
Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes	Ligament angle (deg)	Ligament Number				Length	0.16" Average	Lig. Corrected	
							Length	Depth	Exclusion Criterion 1b Applied		Length	Depth		
							0.290	79.6			0.290	78.07	78.07	
							0.300	85.0			0.300	78.44	78.44	
							0.310	85.4			0.310	79.18	79.18	
							0.320	85.8			0.320	80.29	80.29	
							0.330	86.2			0.330	81.78	81.78	
							0.340	86.6			0.340	83.62	83.62	
							0.350	87.0			0.350	85.16	85.16	
							0.360	87.4			0.360	86.40	86.40	
							0.370	87.8			0.370	87.33	87.33	
							0.380	88.2			0.380	88.05	88.05	
							0.390	88.6			0.390	88.59	88.59	
							0.400	89.0			0.400	89.21	89.21	
							0.410	89.2			0.410	89.93	89.93	
							0.420	89.4			0.420	90.74	90.74	
							0.430	89.6			0.430	91.53	91.53	
							0.440	89.8			0.440	92.29	92.29	
							0.450	90.0			0.450	93.04	93.04	
							0.460	92.0			0.460	93.75	93.75	
							0.470	94.0			0.470	94.45	94.45	
							0.480	96.0			0.480	95.12	95.12	
							0.490	98.0			0.490	95.76	95.76	
							0.500	100.0			0.500	96.40	96.40	
							0.510	100.0			0.510	97.02	97.02	
							0.520	100.0			0.520	97.64	93.41	
							0.530	100.0			0.530	98.24	94.01	
							0.540	100.0			0.540	98.82	94.60	
							0.550	100.0			0.550	99.29	95.07	
							0.560	100.0			0.560	99.65	95.42	
							0.570	100.0			0.570	99.88	95.65	
							0.580	100.0			0.580	100.00	95.77	
							0.590	100.0			0.590	100.00	95.77	
							0.600	100.0			0.600	100.00	95.77	
							0.610	100.0			0.610	100.00	95.77	
							0.620	100.0			0.620	100.00	95.77	
							0.630	100.0			0.630	99.69	95.47	
							0.640	100.0			0.640	99.08	94.85	
							0.650	100.0			0.650	98.16	93.94	
							0.660	100.0			0.660	96.94	92.71	
							0.670	100.0			0.670	95.41	91.18	
							0.680	100.0			0.680	94.13	89.90	
							0.690	100.0			0.690	93.09	93.09	
							0.700	100.0			0.700	92.31	92.31	
							0.710	94.8			0.710	91.76	91.76	
							0.720	89.6			0.720	91.47	91.47	
							0.730	84.4			0.730	91.21	91.21	
							0.740	79.2			0.740	90.99	90.99	
							0.750	74.0			0.750	90.80	90.80	
							0.760	78.2			0.760	90.65	90.65	
							0.770	82.4			0.770	90.53	90.53	
							0.780	86.6			0.780	90.35	90.35	
							0.790	90.8			0.790	90.12	90.12	
							0.800	95.0			0.800	90.13	90.13	
							0.810	95.6			0.810	90.39	90.39	
							0.820	96.2			0.820	90.89	90.89	
							0.830	96.8			0.830	91.79	90.99	
							0.840	97.4			0.840	93.07	92.27	
							0.850	98.0			0.850	94.19	93.39	
							0.860	97.0			0.860	95.14	94.34	
							0.870	96.0			0.870	95.93	94.48	
							0.880	95.0			0.880	96.47	95.02	
							0.890	94.0			0.890	96.76	95.31	
							0.900	93.0			0.900	97.02	95.57	
							0.910	94.4			0.910	97.25	95.80	
							0.920	95.8			0.920	97.44	95.98	
							0.930	97.2			0.930	97.59	96.14	
							0.940	98.6			0.940	97.71	96.25	
							0.950	100.0			0.950	97.88	96.43	
							0.960	100.0			0.960	98.12	96.67	
							0.970	100.0			0.970	98.41	96.96	
							0.980	100.0			0.980	98.73	97.28	
							0.990	100.0			0.990	99.07	98.42	
							1.000	100.0			1.000	99.29	98.64	
							1.010	100.0			1.010	99.40	98.75	
							1.020	100.0			1.020	99.39	98.74	
							1.030	100.0			1.030	98.94	98.29	
							1.040	100.0			1.040	98.06	98.06	
							1.050	100.0			1.050	96.82	96.82	
							1.060	99.4			1.060	95.24	95.24	
							1.070	98.8			1.070	93.29	93.29	
							1.080	98.2			1.080	90.84	90.84	
							1.090	97.6			1.090	87.88	87.88	

Sample P8 - Crack 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes	Ligament angle (deg)
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Length		Depth		Ligament Number	Length	Depth
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Length	0.16" Average	Lig. Corrected
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Exclusion Criteron 1b Applied							
Length	Depth	Ligament Number	Length	Depth	Length	0.16" Average	Lig. Corrected
1.100	97.0		1.100		1.100	84.40	84.40
1.110	91.0		1.110		1.110	80.41	80.41
1.120	85.0		1.120		1.120	75.91	75.91
1.130	79.0		1.130		1.130	70.90	70.90
1.140	73.0		1.140		1.140	65.37	65.37
1.150	67.0		1.150		1.150	59.53	59.53
1.160	58.3		1.160		1.160	53.72	53.72
1.170	49.6		1.170		1.170	50.44	50.44
1.180	40.9		1.180		1.180	47.49	47.49
1.190	32.2		1.190		1.190	44.87	44.87
1.200	23.5		1.200		1.200	42.50	42.50
1.210	14.8		1.210		1.210	40.33	40.33
1.220	6.1		1.220		1.220	38.03	38.03
1.230	0.0		1.230		1.230	34.49	34.49
1.240	0.0		1.240		1.240	32.45	32.45
1.250	42.6		1.250		1.250	30.73	30.73
1.260	47.4		1.260		1.260	29.38	29.38
1.270	52.4		1.270		1.270	28.50	28.50
1.280	50.7		1.280		1.280	28.19	28.19
1.290	48.2		1.290		1.290	28.62	28.62
1.300	39.8		1.300		1.300	30.00	30.00
1.310	12.8		1.310		1.310	32.66	32.66
1.314	0.0		1.314		1.314	29.39	29.39
Length		2.644	Length		2.644	2.644	
Max Depth		100	Max Depth		100.00	99.55	
Avg. Depth		86.15	Avg. Depth		88.18	84.81	

Sample P8 - Crack 2

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)	Length	0.16" Average	Lig. Corrected
No Exclusion Criterion Applied										
-1.254	0%					Sep. crack		-1.254	40.19	40.19
-1.249	33%							-1.244	38.18	38.18
-1.244	42%							-1.234	37.18	37.18
-1.234	53%							-1.224	35.26	35.26
-1.224	57%							-1.214	32.65	27.10
-1.214	61%							-1.204	32.46	26.91
-1.204	59%					Two other sig. cracks parallel to main crack within 0.10 inch of main crack		-1.194	33.61	28.06
-1.194	50%							-1.184	35.39	29.84
-1.184	38%							-1.174	37.92	32.37
-1.180	0%							-1.164	42.71	37.16
-1.179	21%							-1.154	45.11	39.57
-1.174	0%							-1.144	47.03	41.48
-1.158	32%							-1.134	48.82	43.28
-1.133	0%	L-15	0.494	7.65E-04	0.627	ductile		-1.124	50.46	44.91
-1.125	28%							-1.114	52.23	46.69
-1.115	48%							-1.104	54.55	49.00
-1.105	60%							-1.094	57.59	52.05
-1.095	78%							-1.084	62.89	57.35
-1.085	81%							-1.074	67.14	61.59
-1.075	83%							-1.064	71.18	65.63
-1.050	89%							-1.054	76.14	68.78
-1.025	90%							-1.044	81.54	79.73
-1.000	90%							-1.034	84.95	83.13
-0.975	99%	L-14	0.162	2.50E-04	0.163	ductile		-1.024	87.09	85.27
-0.950	86%							-1.014	88.52	86.71
-0.925	87%							-1.004	89.04	87.23
-0.900	91%							-0.994	89.48	87.66
-0.875	90%							-0.984	89.88	88.07
-0.850	97%	L-13	0.038	5.96E-05	0.070	ductile		-0.974	90.18	88.37
-0.825	92%							-0.964	90.34	88.53
-0.800	100%							-0.954	90.43	88.62
-0.775	86%	L-12						-0.944	90.68	88.86
-0.750	100%							-0.934	91.07	88.82
-0.725	86%							-0.924	91.43	89.19
-0.700	90%	L-11						-0.914	91.66	89.42
-0.675	85%							-0.904	91.66	89.42
-0.650	94%							-0.894	91.64	89.40
-0.625	93%							-0.884	91.66	91.22
-0.600	81%	L-09						-0.874	91.86	91.43
-0.575	58%							-0.864	92.04	91.61
-0.550	75%	L-08	0.560	8.68E-04	0.394	ductile		-0.854	92.07	91.64
-0.525	86%	L-07a	0.206	3.20E-04	0.188	ductile		-0.844	92.40	91.96
-0.500	84%	L-07	0.191	2.96E-04	0.180	Another sig. crack parallel to main		-0.834	93.02	92.58
-0.475	85%							-0.824	93.48	93.05
-0.450	100%							-0.814	93.54	93.11
-0.425	100%	L-06	0.783	1.21E-03	0.620	ductile		-0.804	93.28	92.85
-0.400	100%							-0.794	93.14	92.71
-0.375	81%							-0.784	93.09	92.66
-0.350	88%							-0.774	92.84	92.41
-0.325	84%							-0.764	92.30	92.30
-0.300	85%							-0.754	91.68	91.68
-0.275	83%	L-05						-0.744	91.40	91.40
-0.250	83%							-0.734	91.41	91.41
-0.225	100%							-0.724	91.30	91.30
-0.200	100%	L-04						-0.714	90.99	90.99
-0.175	100%							-0.704	90.75	90.75
-0.150	100%	L-03						-0.694	90.55	90.55
-0.125	100%							-0.684	90.34	90.34
-0.100	100%	L-02						-0.674	89.35	89.35
-0.075	97%	L-01	0.435	6.75E-04	0.428	ductile		-0.664	87.48	87.48
-0.050	96%							-0.654	85.22	85.22
-0.025	92%							-0.644	83.69	83.69
0.000	69%					Another crack parallel to main		-0.634	82.83	76.54
0.025	100%							-0.624	82.20	75.90
0.050	100%	L+01						-0.614	81.73	75.43
0.075	100%							-0.604	81.52	72.91
0.100	88%	L+02						-0.594	81.40	70.64
0.125	85%							-0.584	81.31	70.56
0.150	61%	L+03	0.409	6.34E-04	0.443	ductile		-0.574	81.03	70.27
0.175	100%							-0.564	80.56	69.80
0.200	99%							-0.554	80.09	69.33
0.225	77%							-0.544	79.98	69.22
0.250	100%							-0.534	80.28	69.52
0.275	100%							-0.524	81.00	70.24
0.300	97%					From 0.30 to 0.90 inch, many other deep significant cracks parallel to main crack within 0.10 inch of main crack		-0.514	82.01	71.25
0.325	100%	L+04						-0.504	83.46	63.93
0.350	85%							-0.494	85.46	65.93
0.375	100%							-0.484	87.92	68.38
0.400	97%							-0.474	89.70	70.17
0.425	100%							-0.464	90.64	77.40
0.450	99%							-0.454	90.87	77.63

Sample P8 - Crack 2

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)
No Exclusion Criterion Applied							
0.475	100%	L+05					
0.500	100%						
0.525	100%						
0.550	100%						
0.575	100%						
0.600	85%						
0.625	87%						
0.650	90%	L+06	0.806	1.25E-03	0.784	ductile	
0.675	85%						
0.700	86%						
0.725	88%						
0.750	84%						
0.775	86%						
0.800	79%						
0.825	80%						
0.850	82%	L+06a	0.656	1.02E-03	0.719	ductile	
0.875	82%						
0.900	86%						
0.925	85%						
0.950	85%						
0.975	96%	L+07	0.832	1.29E-03	0.565	ductile	
0.985	86%						
0.995	79%						
1.005	69%						
1.015	58%						
1.020	45%						
1.030	0%					beg/end cracks	
1.035	25%						
1.045	71%						
1.055	57%						
1.065	91%						
1.075	87%						
1.085	68%						
1.095	10%						
1.097	0%	L+08					
1.107	18%						
1.117	43%						
1.127	76%						
1.137	93%						
1.147	79%						
1.157	71%						
1.167	66%						
1.177	53%						
1.187	17%						
1.192	14%						
1.197	10%						
1.198	0%						
Length	2.452						
Max Depth	100						
Avg. Depth	83.99						

Length	0.16" Average	Lig. Corrected
-0.444	90.99	77.75
-0.434	91.04	80.12
-0.424	91.14	82.37
-0.414	91.20	82.43
-0.404	91.19	82.42
-0.394	91.19	82.42
-0.384	91.16	82.39
-0.374	90.77	81.99
-0.364	89.97	81.20
-0.354	88.99	80.22
-0.344	88.01	79.24
-0.334	87.03	87.03
-0.324	86.28	86.28
-0.314	85.93	85.93
-0.304	86.20	86.20
-0.294	86.92	86.92
-0.284	88.02	88.02
-0.274	88.97	88.97
-0.264	89.76	89.76
-0.254	90.54	90.54
-0.244	91.40	91.40
-0.234	92.34	92.34
-0.224	93.25	93.25
-0.214	94.13	94.13
-0.204	95.02	95.02
-0.194	95.96	95.96
-0.184	96.94	96.94
-0.174	97.87	97.87
-0.164	98.73	98.73
-0.154	99.27	94.38
-0.144	99.41	94.52
-0.134	99.19	94.30
-0.124	98.91	94.02
-0.114	98.54	93.65
-0.104	98.03	93.14
-0.094	96.98	92.08
-0.084	95.37	90.48
-0.074	93.98	89.09
-0.064	93.33	88.43
-0.054	93.33	88.43
-0.044	93.33	88.43
-0.034	93.33	88.43
-0.024	93.33	88.43
-0.014	93.33	88.43
-0.004	93.35	88.45
0.006	93.15	88.26
0.016	92.75	92.75
0.026	92.19	92.19
0.036	91.58	91.58
0.046	90.90	90.90
0.056	89.74	89.74
0.066	88.16	83.57
0.076	87.46	82.86
0.086	88.23	83.63
0.096	89.62	85.02
0.106	90.26	85.66
0.116	90.23	85.63
0.126	89.88	85.28
0.136	89.01	84.41
0.146	87.72	83.12
0.156	86.96	82.37
0.166	86.78	82.18
0.176	87.10	82.50
0.186	87.70	83.11
0.196	88.46	83.87
0.206	89.22	84.62
0.216	90.03	85.44
0.226	91.42	86.82
0.236	93.45	93.45
0.246	95.17	95.17
0.256	95.61	95.61
0.266	94.85	94.85
0.276	94.18	94.18
0.286	93.89	93.89
0.296	94.23	94.23
0.306	95.02	95.02
0.316	96.15	96.15
0.326	96.76	96.76
0.336	96.90	96.90
0.346	96.88	96.88
0.356	96.86	96.86

Notes:

Specimen was burst with TSP present. Center of TSP location accurately defined.
 Low Magnification optical photographs. Two orientations
 Crack depth and wall thickness measurements made on STC microscope SN-387AP
 No SEM Images for crack depth/morphology
 SEM Ligament Analysis by both TIFF files and photos
 Ligament Dimensions off micrographs in mm.

Sample P8 - Crack 2

Destructive Exam

Axial Position Inch	SCG Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)
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No Exclusion Criterion Applied

Final Data

Length	0.16" Average	Lig. Corrected
0.366	96.82	96.82
0.376	96.86	96.86
0.386	96.99	96.99
0.396	97.13	97.13
0.406	97.19	97.19
0.416	97.21	97.21
0.426	97.60	97.60
0.436	98.36	98.36
0.446	99.04	99.04
0.456	99.36	99.36
0.466	99.37	99.37
0.476	99.46	99.46
0.486	99.61	99.61
0.496	99.73	99.73
0.506	99.42	99.42
0.516	98.71	98.71
0.526	97.90	97.90
0.536	97.14	97.14
0.546	96.41	96.41
0.556	95.72	95.72
0.566	95.09	86.03
0.576	94.43	85.37
0.586	93.67	84.60
0.596	92.81	83.75
0.606	91.97	82.91
0.616	91.14	82.07
0.626	90.34	81.28
0.636	89.61	80.55
0.646	88.91	79.85
0.656	88.12	79.06
0.666	87.27	78.20
0.676	86.74	77.68
0.686	86.62	77.56
0.696	86.64	77.58
0.706	86.46	77.40
0.716	86.09	77.02
0.726	85.58	76.52
0.736	85.03	85.03
0.746	84.52	84.52
0.756	84.17	84.17
0.766	83.94	76.55
0.776	83.72	76.33
0.786	83.48	76.08
0.796	83.19	75.80
0.806	82.95	75.56
0.816	82.76	75.37
0.826	82.70	75.30
0.836	82.72	75.32
0.846	82.73	75.34
0.856	82.69	75.30
0.866	82.63	75.23
0.876	82.88	75.49
0.886	83.56	76.17
0.896	84.47	67.72
0.906	84.81	68.07
0.916	84.68	67.93
0.926	83.92	67.17
0.936	82.40	73.05
0.946	78.66	69.31
0.956	75.62	66.27
0.966	74.90	65.55
0.976	73.52	64.17
0.986	73.65	64.49
0.996	73.82	64.47
1.006	72.47	63.12
1.016	67.77	58.42
1.026	63.73	54.37
1.036	61.09	51.73
1.046	60.34	50.98
1.056	60.31	50.96
1.066	59.45	59.45
1.076	58.62	58.62
1.086	57.96	57.96
1.096	57.17	57.17
1.106	55.12	55.12
1.116	54.67	54.67
1.126	52.90	52.90
1.136	51.87	51.87
1.146	51.33	51.33
1.156	48.53	48.53
1.166	45.73	45.73

Sample P8 - Crack 2

Destructive Exam

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)
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No Exclusion Criterion Applied

Final Data

Length	0.16" Average	Lig. Corrected
1.176	44.35	44.35
1.186	47.92	47.92
1.196	51.09	51.09
1.198	52.32	52.32
Length	2.452	2.452
Max Depth	99.73	99.73
Avg. Depth	83.75	79.41

Sample P9 - Crack 1

Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)	Exclusion Criterion 1b Applied		
								Length	0.16" Average	Lig. Corrected
-1.143	0%					End of SCC		-1.143	21.48	52.81
-1.125	59%							-1.133	25.07	53.60
-1.100	63%							-1.123	28.23	54.17
-1.075	67%							-1.113	30.89	54.65
-1.050	60%							-1.103	33.01	55.06
-1.025	60%							-1.093	34.69	55.38
-1.000	59% L-12		0.236	0.00037	0.361	ductile		-1.083	36.17	52.97
-0.975	48% L-11					SCC		-1.073	39.70	52.98
-0.950	87%							-1.063	43.22	52.73
-0.925	88%							-1.053	46.71	55.73
-0.900	78% L-10					SCC, Crack on 3 planes		-1.043	50.17	57.74
-0.875	98%							-1.033	53.38	59.09
-0.850	99%							-1.023	56.32	60.65
-0.825	100%							-1.013	59.05	62.14
-0.800	100%							-1.003	60.75	63.48
-0.775	100%							-0.993	62.35	64.45
-0.750	100%							-0.983	63.89	65.09
-0.725	100%							-0.973	65.36	66.17
-0.700	95%							-0.963	66.59	67.95
-0.675	95% L-09		0.219	0.00034	0.223	ductile		-0.953	67.44	70.21
-0.650	90%							-0.943	68.04	72.47
-0.625	76%							-0.933	69.34	74.76
-0.600	78% L-08 bottom		0.219	0.00034	0.281	ductile, 0.1mm difference in crack		-0.923	71.33	77.10
-0.600	96%							-0.913	73.58	82.14
-0.575	30% L-07 top		0.485	0.00075	0.911	ductile		-0.903	75.86	84.74
-0.550	83%							-0.893	78.16	87.59
-0.525	100% L-06					SCC		-0.883	80.51	90.46
-0.500	100%							-0.873	82.92	92.41
-0.475	100%							-0.863	85.59	93.43
-0.450	97%							-0.853	88.52	94.16
-0.425	99%							-0.843	91.11	94.89
-0.400	82% L-05 bottom		0.048	0.00007	0.120	1 mm difference in crack planes		-0.833	92.78	95.66
-0.375	83% L-04 top					SCC		-0.823	93.52	96.71
-0.350	90%							-0.813	94.26	98.05
-0.325	96%							-0.803	94.98	99.09
-0.300	99%							-0.793	95.83	99.48
-0.275	97%							-0.783	96.97	99.33
-0.250	97%							-0.773	98.40	99.12
-0.225	100%							-0.763	99.24	98.89
-0.200	100% L-03		0.126	0.00020	0.412	ductile 0.3mm difference in crack		-0.753	99.44	96.16
-0.175	93%							-0.743	99.24	95.73
-0.150	93%							-0.733	99.03	95.16
-0.125	100%							-0.723	98.80	94.32
-0.100	97%							-0.713	98.48	93.17
-0.075	100% L-02					SCC		-0.703	98.01	91.82
-0.050	90%							-0.693	97.39	90.72
-0.025	90%							-0.683	96.47	87.42
0.000	100%		0.246	0.00038	0.199	ductile		-0.673	95.22	85.71
0.025	95% L+01					SCC		-0.663	93.97	82.65
0.050	94%							-0.653	93.03	73.31
0.075	94% L+02					SCC		-0.643	92.41	70.66
0.100	91%							-0.633	90.39	69.29
0.125	82%							-0.623	86.95	68.69
0.150	68%							-0.613	83.44	68.63
0.175	67%							-0.603	81.17	68.92
0.200	65% L+03		1.097	0.00170	0.863	ductile		-0.593	80.20	69.21
0.225	82%							-0.583	79.76	71.99
0.250	88% L+04					SCC		-0.573	79.85	72.44
0.275	90%							-0.563	80.15	73.02
0.300	90%							-0.553	80.44	73.84
0.325	84%							-0.543	80.80	74.92
0.350	48%							-0.533	81.29	76.12
0.350	70%							-0.523	81.90	77.09
0.375	67% L+05		1.137	0.00176	0.928	ductile		-0.513	82.80	80.31
0.400	89%							-0.503	83.95	81.90
0.425	86%							-0.493	85.03	84.42
0.450	83%							-0.483	85.85	92.27
0.475	75%							-0.473	86.40	93.87
0.500	73% L+06		0.263	0.00041	0.289	ductile		-0.463	86.18	94.25
0.525	59%							-0.453	90.96	94.03
0.550	53%							-0.443	93.40	93.57
0.565	43% L+07		0.125	0.00019	0.249	ductile		-0.433	94.63	92.94
0.575	0%					End of SCC		-0.423	94.65	92.46
0.600	0%					Mech tear		-0.413	94.36	92.13
0.625	0%					Mech tear		-0.403	93.82	91.93
0.640	0%					Mech tear		-0.393	93.24	91.78
0.650	46%					Mech tear		-0.383	92.80	91.70
0.660	62%					Separate Crack		-0.373	92.52	91.69
0.670	66%							-0.363	92.33	91.71
0.680	69%							-0.353	92.20	91.69
								-0.343	92.16	91.62

Sample P9 - Crack 1

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)	Length	0.16" Average	Lig. Corrected
0.690	66%							-0.333	92.16	91.59
0.700	58%							-0.323	92.19	92.02
0.710	46%							-0.313	92.15	93.45
0.720	25%							-0.303	92.07	94.50
0.725	0%					End of SCC		-0.293	92.16	95.52
0.725	0%	End of SCC						-0.283	92.73	95.06
								-0.273	93.78	95.82
								-0.263	94.82	96.37
								-0.253	95.82	96.73
								-0.243	96.73	96.94
								-0.233	97.43	97.01
								-0.223	97.92	97.06
								-0.213	98.24	97.11
								-0.203	98.40	97.20
								-0.193	98.45	97.26
								-0.183	98.50	97.28
								-0.173	98.55	97.32
								-0.163	98.62	97.42
								-0.153	98.67	97.48
								-0.143	98.67	97.24
								-0.133	98.73	96.73
								-0.123	98.85	96.13
								-0.113	98.82	96.94
								-0.103	98.50	93.64
								-0.093	97.91	93.40
								-0.083	97.31	93.43
								-0.073	96.69	93.48
								-0.063	96.23	93.43
								-0.053	96.07	93.25
								-0.043	96.18	92.98
								-0.033	96.20	92.66
								-0.023	96.12	92.39
								-0.013	95.91	92.18
								-0.003	95.63	91.93
								0.007	95.31	91.55
								0.017	95.06	91.11
								0.027	94.87	90.74
								0.037	94.58	90.39
								0.047	94.17	89.88
								0.057	93.78	89.05
								0.067	93.41	90.62
								0.077	93.07	89.06
								0.087	92.46	87.21
								0.097	91.55	85.33
								0.107	90.20	83.50
								0.117	88.55	69.38
								0.127	86.62	67.88
								0.137	84.75	66.82
								0.147	82.94	66.11
								0.157	81.14	65.54
								0.167	79.77	65.14
								0.177	78.83	64.87
								0.187	78.17	64.72
								0.197	77.65	64.78
								0.207	77.30	65.06
								0.217	77.07	65.58
								0.227	76.95	66.32
								0.237	77.08	67.23
								0.247	77.42	67.98
								0.257	78.04	67.94
								0.267	78.84	67.11
								0.277	79.60	67.17
								0.287	80.44	80.26
								0.297	80.54	68.51
								0.307	80.12	69.18
								0.317	80.40	69.56
								0.327	81.37	69.77
								0.337	82.29	69.78
								0.347	82.86	69.65
								0.357	83.21	69.38
								0.367	83.36	69.00
								0.377	83.31	68.45
								0.387	83.14	67.70
								0.397	82.84	66.89
								0.407	82.43	66.19
								0.417	81.82	62.80
								0.427	81.01	62.93
								0.437	80.24	63.56
								0.447	79.57	63.05
								0.457	79.24	61.77
								0.467	79.14	72.60

Length 1.868
Max Depth 100
Avg. Depth 79.76

Sample P9 - Crack 1

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)	Length	0.16" Average	Lig. Corrected
Exclusion Criterion 1b Applied										
								0.477	79.27	70.30
								0.487	78.52	65.72
								0.497	77.01	60.55
								0.507	75.01	55.43
								0.517	72.58	50.37
								0.527	68.63	45.39
								0.537	63.47	40.49
								0.547	58.37	35.74
								0.557	53.34	31.20
								0.567	48.38	28.70
								0.577	43.50	27.70
								0.587	38.82	30.14
								0.597	34.33	30.09
								0.607	32.65	30.30
								0.617	31.94	30.41
								0.627	31.50	30.04
								0.637	31.63	28.73
								0.647	31.87	27.58
								0.657	31.88	28.62
								0.667	31.35	30.66
								0.677	29.70	33.02
								0.687	26.97	35.77
								0.697	27.30	39.03
								0.707	29.12	42.93
								0.717	31.20	47.70
								0.725	33.60	42.93
								Length	1.868	1.868
								Max Depth	99.48	99.48
								Avg. Depth	79.55	75.26

Sample P9 - Crack 2

Destructive Exam

Adjusted Destructive Exam

Final Data

Destructive Exam							Adjusted Destructive Exam				Final Data				
Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)	Length	Depth	Ligament Number	Length	Depth	Length	0.16" Average	Lig. Corrected
Tails Excluded By 4C Criterion															
-0.918	0%					crack 1		-0.825	0	-0.918	0.00		-0.825	64.29	64.29
-0.917	8%							-0.800	80.31	-0.917	7.83		-0.815	65.03	65.03
-0.916	10%							-0.775	83.11	-0.916	10.18		-0.805	65.26	65.26
-0.915	8%							-0.750	78.13	-0.915	8.02		-0.795	65.68	65.68
-0.914	16%							-0.725	67.51	-0.914	15.85		-0.785	66.26	66.26
-0.911	16%							-0.700	74.56	-0.911	15.85		-0.775	66.91	66.91
-0.908	23%							-0.675	79.06	-0.908	23.48		-0.765	67.60	67.60
-0.903	24%							-0.650	79.84	-0.903	23.68		-0.755	68.32	68.32
-0.898	24%							-0.625	81.76	-0.898	23.68		-0.745	68.97	68.97
-0.892	17%							-0.600	90.87	-0.892	17.03		-0.735	73.66	73.66
-0.889	14%							-0.575	95.96	-0.889	14.48		-0.725	76.49	76.49
-0.886	0%							-0.550	100.00	-0.886	0.00		-0.715	77.47	77.47
-0.889	0%							-0.525	79.59	-0.889	0.00		-0.705	77.52	77.52
-0.888	11%					crack 2		-0.500	88.75	-0.888	10.76		-0.695	77.73	77.73
-0.887	17%							-0.475	94.26	-0.887	16.63		-0.685	78.08	78.08
-0.886	22%							-0.450	95.66	-0.886	21.53		-0.675	78.71	78.71
-0.885	23%							-0.425	90.98	-0.885	22.50		-0.665	79.58	79.58
-0.880	25%							-0.400	89.48	-0.880	25.44		-0.655	80.75	80.75
-0.875	28%							-0.375	94.67	-0.875	28.38		-0.645	82.27	82.27
-0.870	33%							-0.350	100.00	-0.870	32.88		-0.635	84.14	84.14
-0.865	32%							-0.325	97.77	-0.865	32.29		-0.625	85.64	85.64
-0.860	29%							-0.300	98.37	-0.860	28.57		-0.615	86.50	86.50
-0.855	27%							-0.275	100.00	-0.855	26.81		-0.605	86.74	86.74
-0.852	23%							-0.250	94.70	-0.852	23.48		-0.595	87.10	87.10
-0.847	12%							-0.225	100.20	-0.847	11.74		-0.585	87.56	87.56
-0.844	0%							-0.200	92.55	-0.844	0.00		-0.575	88.17	88.17
-0.850	0%					crack 3		-0.175	100.00	-0.850	0.00		-0.565	88.90	88.90
-0.848	11%							-0.150	94.80	-0.848	11.15		-0.555	89.73	89.73
-0.846	16%							-0.125	100.39	-0.846	15.66		-0.545	90.54	90.54
-0.844	16%							-0.100	97.50	-0.844	16.44		-0.535	91.34	91.34
-0.842	17%							-0.075	100.00	-0.842	17.42		-0.525	91.89	91.89
-0.840	19%							-0.050	100.00	-0.840	18.59		-0.515	92.11	92.11
-0.838	19%							-0.025	97.10	-0.838	18.98		-0.505	92.06	92.06
-0.836	18%							0.000	100.39	-0.836	17.61		-0.495	91.85	91.85
-0.834	17%							0.025	98.46	-0.834	16.63		-0.485	91.49	91.49
-0.832	14%							0.050	100.39	-0.832	14.29		-0.475	91.07	91.07
-0.830	13%							0.075	97.67	-0.830	12.72		-0.465	90.69	90.69
-0.825	0% L-11					SCC		0.100	99.02				-0.455	90.61	90.61
-0.820	80%							0.125	100.20				-0.445	91.15	91.15
-0.775	83%							0.150	100.00				-0.435	92.28	92.28
-0.750	78%							0.175	100.00				-0.425	93.24	93.24
-0.725	68%							0.200	98.43				-0.415	93.93	93.93
-0.700	75% L-10					SCC		0.225	98.23				-0.405	94.40	94.40
-0.675	79%							0.250	67.13				-0.395	94.75	94.44
-0.650	80%							0.275	96.06				-0.385	94.98	94.67
-0.625	82%							0.300	99.41				-0.375	95.21	94.90
-0.600	91% L-09					SCC		0.325	99.80				-0.365	95.44	95.13
-0.575	96%							0.350	100.00				-0.355	95.75	93.07
-0.550	100%							0.375	99.61				-0.345	96.05	93.37
-0.525	80% L-08					SCC		0.400	98.43				-0.335	96.33	93.65
-0.500	89%							0.425	100.00				-0.325	96.65	93.97
-0.475	94%							0.450	100.00				-0.315	97.13	94.45
-0.450	96%							0.475	97.83				-0.305	97.69	95.01
-0.425	91%							0.500	94.49				-0.295	97.96	95.28
-0.400	89%							0.525	92.70				-0.285	97.92	95.24
-0.375	95%							0.550	93.49				-0.275	97.76	90.18
-0.350	100% L-07					SCC		0.575	93.31				-0.265	97.85	90.07
-0.325	98% L-06		0.028	0.000043	0.063	ductile		0.600	85.43				-0.255	97.67	90.09
-0.300	98%							0.625	88.58				-0.245	97.63	90.05
-0.275	100% L-05		0.211	0.000327	0.173	ductile		0.650	92.34				-0.235	97.52	90.25
-0.250	95%							0.675	84.83				-0.225	97.39	83.54
-0.225	100%							0.700	63.27				-0.215	97.39	83.54
-0.200	93% L-04		0.436	0.000676	0.393	ductile		0.710	0.00				-0.205	97.46	80.43
-0.175	100%							0.712	11.98				-0.195	97.46	80.42
-0.150	95% L-03		0.588	0.000908	0.471	ductile		0.714	37.92				-0.185	97.34	82.68
-0.125	100% L-02		0.283	0.000439	0.209	ductile		0.716	31.14				-0.175	97.35	82.69
-0.100	97%							0.720	45.51				-0.165	97.54	82.88
-0.075	100%							0.725	46.91				-0.155	97.79	83.12
-0.050	100% L-01					SCC		0.730	44.71				-0.145	97.91	83.24
-0.025	97%							0.735	39.92				-0.135	97.91	83.24
0.000	100%							0.738	36.13				-0.125	98.04	83.37
0.025	98%							0.741	23.95				-0.115	98.29	83.62
0.050	100%							0.744	23.95				-0.105	98.47	88.70
0.075	98%							0.764	0.00				-0.095	98.55	88.78
0.100	99%												-0.085	98.53	88.77
0.125	100%							Length	1.589				-0.075	98.65	88.89
0.150	100%							Max Depth	100.00				-0.065	98.85	89.09
0.175	100% L+01					SCC		Avg. Depth	89.64				-0.055	99.00	95.82
0.200	98%												-0.045	99.07	95.89
0.225	98%												-0.035	99.07	99.07
0.250	67% L+02					SCC							-0.025	99.10	99.10

Sample P9 - Crack 2

Destructive Exam

Adjusted Destructive Exam

Final Data

Destructive Exam							Adjusted Destructive Exam				Final Data				
Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes	Ligament Number		Length	Depth	Length	Depth	Length	0.16" Average	Lig. Corrected
							Tails Excluded By 4C Cntenon								
0.275	96%												-0.015	99.14	99.14
0.300	99%												-0.005	99.12	99.12
0.325	100% L+03					SCC							0.005	99.08	99.08
0.350	100%												0.015	99.01	99.01
0.375	100%												0.025	98.96	98.96
0.400	98%												0.035	98.95	98.95
0.425	100%												0.045	98.98	98.98
0.450	100% L+04		0.158	0.000245	0.147	ductile							0.055	99.08	99.08
0.475	98%												0.065	99.25	99.25
0.500	94% L+05		0.320	0.000496	0.269	ductile							0.075	99.35	99.35
0.525	93%												0.085	99.36	99.36
0.550	93%												0.095	99.36	99.36
0.575	93%												0.105	99.37	99.37
0.600	85% L+05a		0.453	0.000702	0.399	ductile							0.115	99.39	99.39
0.625	89%												0.125	99.34	99.34
0.650	92%												0.135	99.24	99.24
0.675	85%												0.145	99.14	99.14
0.700	63% L+06		0.261	0.000404	0.326	ductile							0.155	98.38	98.38
0.710	0%												0.165	96.95	96.95
0.712	12%												0.175	95.46	95.46
0.714	38%												0.185	94.62	94.62
0.716	31%												0.195	94.43	94.43
0.720	46%												0.205	94.30	94.30
0.725	47%												0.215	94.22	94.22
0.730	45%												0.225	94.19	94.19
0.735	40%												0.235	94.17	94.17
0.738	36%												0.245	94.16	94.16
0.741	24%												0.255	94.15	94.15
0.744	24%												0.265	94.15	94.15
0.764	24%												0.275	94.18	94.18
						saw kerf through the end of the SCC crack							0.285	94.24	94.24
													0.295	94.32	94.32
													0.305	94.36	94.36
													0.315	94.39	94.39
													0.325	95.15	95.15
													0.335	96.68	96.68
													0.345	98.27	98.27
													0.355	99.19	99.19
													0.365	99.42	99.42
													0.375	99.55	97.77
													0.385	99.54	97.77
													0.395	99.45	97.67
													0.405	99.26	97.49
													0.415	98.99	97.21
													0.425	98.65	93.28
													0.435	98.26	92.89
													0.445	97.84	92.47
													0.455	97.44	92.07
													0.465	97.07	91.70
													0.475	96.74	91.37
													0.485	96.43	91.06
													0.495	96.11	90.74
													0.505	95.57	90.19
													0.515	94.80	89.43
													0.525	93.98	83.52
													0.535	93.24	82.78
													0.545	92.59	83.91
													0.555	92.08	83.40
													0.565	91.72	83.03
													0.575	91.38	82.70
													0.585	90.95	82.27
													0.595	90.41	85.32
													0.605	89.39	84.31
													0.615	87.92	82.83
													0.625	84.31	76.29
													0.635	80.85	72.83
													0.645	78.11	70.10
													0.655	74.96	66.95
													0.665	70.81	62.80
													0.675	66.15	58.13
													0.685	61.03	53.01
													0.695	59.46	56.53
													0.705	57.60	54.68
													0.715	55.39	52.46
													0.725	52.72	49.80
													0.735	49.48	46.56
													0.745	45.73	42.80
													0.755	41.51	38.59
													0.764	36.70	33.77
													Length	1.589	1.589

Length 1.682
Max Depth 100.00
Avg. Depth 89.64

Sample P9 - Crack 2

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)
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Ligament Number			
Length	Depth	Length	Depth

Tails Excluded By 4C Criteron

Length	0.16" Average	Up. Corrected
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Max Depth	99.55	99.42
Avg. Depth	89.83	86.59

Sample P10 - Crack 1

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)	Length	0.16" Average	Lig. Corrected
-1.189	0%							Exclusion Criterion 1b Applied		
-1.179	36%					sep. crack		-1.189	40.40	40.40
-1.169	39%							-1.179	41.10	41.10
-1.159	42%							-1.169	41.65	41.65
-1.149	46%							-1.159	42.09	42.09
-1.139	49%							-1.149	42.44	42.44
-1.129	49%							-1.139	42.72	42.72
-1.114	54%							-1.129	43.00	43.00
-1.104	48% L-09					SCC		-1.119	43.71	43.71
-1.050	46%							-1.109	44.77	44.77
-1.000	83%							-1.099	48.84	48.84
-0.910	84%							-1.089	51.26	51.26
-0.900	92% L-08		0.084	0.000131	0.140	ductile		-1.079	53.87	53.87
-0.850	95%							-1.069	56.32	56.32
-0.800	100%							-1.059	58.55	58.55
-0.750	100% L-07		0.082	0.000126	0.093	ductile		-1.049	60.56	60.56
-0.700	97%							-1.039	62.57	62.57
-0.650	100% L-06		0.130	0.000202	0.216	ductile		-1.029	64.40	64.40
-0.600	100%							-1.019	66.33	66.33
-0.550	100% L-05					SCC		-1.009	68.47	68.47
-0.500	100%							-0.999	70.62	70.62
-0.450	100% L-04					SCC		-0.989	72.84	72.84
-0.400	94% L-03					SCC		-0.979	74.59	74.59
-0.350	90% L-02					SCC		-0.969	78.28	77.33
-0.300	91%							-0.959	81.01	80.06
-0.250	98%							-0.949	83.33	82.39
-0.200	100%							-0.939	85.24	84.30
-0.150	100% L-01		0.394	0.000611	0.448	ductile		-0.929	86.75	85.80
-0.100	100%							-0.919	87.87	86.93
-0.050	100%		0.160	0.000248	0.240	ductile		-0.909	88.67	87.72
0.000	100%							-0.899	89.53	88.58
0.050	99%							-0.889	90.45	89.50
0.100	99%							-0.879	91.42	90.47
0.150	100%							-0.869	92.39	91.44
0.200	100%							-0.859	93.35	92.41
0.250	97%							-0.849	94.32	93.37
0.300	99%							-0.839	95.28	94.33
0.350	100% L+01					SCC		-0.829	96.23	94.34
0.400	97%							-0.819	97.10	95.20
0.450	99% L+02					SCC		-0.809	97.47	96.52
0.500	99%							-0.799	97.78	96.83
0.550	93%							-0.789	98.04	97.09
0.600	84% L+03		0.139	0.000216	0.103	ductile		-0.779	98.24	97.29
0.650	100% L+04		0.181	0.000281	0.210	ductile		-0.769	98.45	97.50
0.700	99%							-0.759	98.66	97.71
0.750	88% L+05		0.258	0.000400	0.224	ductile		-0.749	98.84	97.90
0.800	100%							-0.739	99.00	98.05
0.850	90%							-0.729	99.12	96.70
0.900	87% L+06		0.303	0.000469	0.134	ductile		-0.719	99.17	96.76
0.950	99%							-0.709	99.17	96.76
1.000	100%							-0.699	99.17	96.76
1.050	97%							-0.689	99.17	96.76
1.100	76%							-0.679	99.17	96.76
1.150	57% L+07		0.114	0.000176	0.260	ductile		-0.669	99.17	96.76
1.200	87%							-0.659	99.18	97.71
1.250	95%							-0.649	99.21	97.75
1.300	72%							-0.639	99.28	97.82
1.322	53%					small crack, hi plane		-0.629	99.39	97.92
1.332	51%							-0.619	99.52	98.05
1.342	51%							-0.609	99.68	98.22
1.352	48%							-0.599	99.81	98.35
1.362	36%							-0.589	99.91	98.44
1.367	28%							-0.579	99.97	98.50
1.374	0%					end of small crack		-0.569	100.00	98.53
								-0.559	100.00	100.00
								-0.549	100.00	100.00
								-0.539	100.00	100.00
								-0.529	99.99	99.99
								-0.519	99.91	99.91
								-0.509	99.76	99.76
								-0.499	99.53	99.53
								-0.489	99.22	99.22
								-0.479	98.85	98.85
								-0.469	98.43	98.43
								-0.459	97.97	97.97
								-0.449	97.46	97.46
								-0.439	96.92	96.92
								-0.429	96.33	96.33
								-0.419	95.76	95.76
								-0.409	95.21	95.21
								-0.399	94.66	94.66
								-0.389	94.14	94.14

Length 2.563
Max Depth 100
Avg. Depth 80.12

Sample P10 - Crack 1

Destructive Exam

Final Data

Axial Position inch	SCC Depth % well	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)	Length	0.16" Average	Lig. Corrected
								Exclusion Criteron 1b Applied		
								-0.379	93.63	93.63
								-0.369	93.20	93.20
								-0.359	92.86	92.86
								-0.349	92.66	92.66
								-0.339	92.62	92.62
								-0.329	92.72	92.72
								-0.319	92.91	92.91
								-0.309	93.20	93.20
								-0.299	93.55	93.55
								-0.289	93.97	93.97
								-0.279	94.45	94.45
								-0.269	94.98	94.98
								-0.259	95.55	95.55
								-0.249	96.11	96.11
								-0.239	96.66	96.66
								-0.229	97.20	97.20
								-0.219	97.73	97.73
								-0.209	98.24	98.24
								-0.199	98.67	98.67
								-0.189	99.02	99.02
								-0.179	99.30	99.30
								-0.169	99.50	99.50
								-0.159	99.63	99.63
								-0.149	99.74	99.74
								-0.139	99.82	99.82
								-0.129	99.89	99.89
								-0.119	99.93	99.93
								-0.109	99.95	99.95
								-0.099	99.97	99.97
								-0.089	99.99	99.99
								-0.079	99.99	99.99
								-0.069	99.99	99.99
								-0.059	99.98	99.98
								-0.049	99.95	99.95
								-0.039	99.93	99.93
								-0.029	99.89	99.89
								-0.019	99.85	99.85
								-0.009	99.81	99.81
								0.001	99.77	99.77
								0.011	99.72	99.72
								0.021	99.68	99.68
								0.031	99.64	99.64
								0.041	99.61	99.61
								0.051	99.59	99.59
								0.061	99.59	99.59
								0.071	99.59	99.59
								0.081	99.59	99.59
								0.091	99.59	99.59
								0.101	99.59	99.59
								0.111	99.61	99.61
								0.121	99.63	99.63
								0.131	99.61	99.61
								0.141	99.57	99.57
								0.151	99.49	99.49
								0.161	99.37	99.37
								0.171	99.23	99.23
								0.181	99.11	99.11
								0.191	99.03	99.03
								0.201	98.97	98.97
								0.211	98.94	98.94
								0.221	98.92	98.92
								0.231	98.90	98.90
								0.241	98.88	98.88
								0.251	98.87	98.87
								0.261	98.86	98.86
								0.271	98.86	98.86
								0.281	98.82	98.82
								0.291	98.74	98.74
								0.301	98.67	98.67
								0.311	98.61	98.61
								0.321	98.55	98.55
								0.331	98.56	98.56
								0.341	98.63	98.63
								0.351	98.69	98.69
								0.361	98.76	98.76
								0.371	98.82	98.82
								0.381	98.84	98.84
								0.391	98.84	98.84
								0.401	98.83	98.83
								0.411	98.82	98.82
								0.421	98.79	98.79

Sample P10 - Crack 1

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)
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Length	0.16" Average	Lig. Corrected
Exclusion Criterion 1b Applied		
0.431	98.68	98.68
0.441	98.50	98.50
0.451	98.28	98.28
0.461	98.02	98.02
0.471	97.72	97.72
0.481	97.36	97.36
0.491	96.91	96.91
0.501	96.33	96.33
0.511	95.62	95.62
0.521	94.80	93.24
0.531	94.14	92.57
0.541	93.63	92.07
0.551	93.32	91.75
0.561	93.18	91.62
0.571	93.22	89.62
0.581	93.24	89.64
0.591	93.26	89.66
0.601	93.34	89.74
0.611	93.48	89.87
0.621	93.66	90.06
0.631	93.80	90.20
0.641	93.89	90.29
0.651	93.96	90.36
0.661	94.01	90.41
0.671	94.08	87.58
0.681	94.38	87.89
0.691	94.90	89.97
0.701	95.37	90.44
0.711	95.79	90.85
0.721	96.13	91.20
0.731	96.17	91.24
0.741	95.93	93.04
0.751	95.59	92.70
0.761	95.15	92.25
0.771	94.62	91.72
0.781	94.06	91.16
0.791	93.48	90.59
0.801	93.00	90.10
0.811	92.60	89.71
0.821	92.31	86.01
0.831	92.27	85.97
0.841	92.47	89.07
0.851	92.66	89.26
0.861	92.85	89.44
0.871	93.02	89.62
0.881	93.07	89.67
0.891	93.04	89.64
0.901	93.13	89.73
0.911	93.35	89.95
0.921	93.70	90.30
0.931	94.14	90.74
0.941	94.65	91.25
0.951	95.16	91.76
0.961	95.68	92.28
0.971	96.19	92.78
0.981	96.48	93.08
0.991	96.54	96.54
1.001	96.23	96.23
1.011	95.53	95.53
1.021	94.46	94.46
1.031	93.03	93.03
1.041	91.26	91.26
1.051	89.24	89.24
1.061	86.99	86.99
1.071	84.55	83.27
1.081	82.44	81.17
1.091	80.67	79.40
1.101	79.28	78.01
1.111	78.27	77.00
1.121	77.61	76.34
1.131	77.08	75.81
1.141	76.70	75.43
1.151	76.66	75.39
1.161	76.97	75.69
1.171	77.58	76.30
1.181	78.17	76.89
1.191	78.73	77.46
1.201	79.25	77.98
1.211	79.73	78.45
1.221	80.14	78.86
1.231	80.24	78.97

Sample P10 - Crack 1

Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)
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Length	0.16" Average	Lig. Corrected
Exclusion Criteron 1b Applied		
1.241	80.00	80.00
1.251	79.24	79.24
1.261	78.14	78.14
1.271	78.51	78.51
1.281	73.91	73.91
1.291	69.49	69.49
1.301	64.26	64.26
1.311	62.62	62.62
1.321	60.66	60.66
1.331	58.29	58.29
1.341	55.48	55.48
1.351	52.59	52.59
1.361	49.58	49.58
1.371	46.43	46.43
1.374	43.09	43.09
Length	2.563	2.563
Max Depth	100	100
Avg. Depth	90.07	88.70

Sample P10 - Crack 2

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)
-0.719	0					end of SCC	
-0.716	18%						
-0.711	37%						
-0.701	45%						
-0.676	40% L-07		0.055	0.0000853	0.124	ductile	
-0.651	45%						
-0.626	50%						
-0.601	51%						
-0.576	44%						
-0.566	31%						
-0.561	31%						
-0.556	31%						
-0.531	48%						
-0.506	50% L-06		0.316	0.0004899	0.381	ductile	
-0.481	62%						
-0.456	47%						
-0.446	47%						
-0.441	43%						
-0.436	27%						
-0.431	23%						
-0.430	23%						
-0.425	38%						
-0.420	46%						
-0.415	47%						
-0.395	57%						
-0.370	63%						
-0.345	70%						
-0.335	61%						
-0.325	59%						
-0.315	56%						
-0.310	43%						
-0.305	37%						
-0.300	22% L-05		0.237	0.0003668	0.282	ductile	
-0.275	22% L-04		0.333	0.0005167	0.521	ductile	
-0.250	75%						
-0.225	77%						
-0.200	81% L-03		0.155	0.0002408	0.103	ductile	
-0.175	82%						
-0.150	87%						
-0.125	84%						
-0.100	84%						
-0.075	72% L-02		0.080	0.0001238	0.080	ductile	
-0.050	86%						
-0.025	85%						
0.000	54% L-01, L+01		0.287	0.0004443	0.436	ductile	
0.025	54%						
0.050	79%						
0.075	74%						
0.100	70%						
0.125	91%						
0.150	54% L+02					SCC	
0.175	88%						
0.200	85%						
0.225	88%						
0.250	79%						
0.275	74%						
0.300	78% L+03					SCC	
0.325	79%						
0.350	73%						
0.375	72% L+04					SCC	
0.400	85%						
0.425	100%						
0.450	85% L+05					SCC	
0.475	73%						
0.500	75% L+06		0.801	0.0012411	0.926	ductile	
0.525	76%						
0.550	88%						
0.575	89% L+07		0.040	0.0000612	0.069	ductile	
0.600	91%						
0.625	93%						
0.650	81%						
0.675	87% L+08		0.465	0.0007211	0.337	ductile	
0.700	86%						
0.725	93%						
0.750	88%						
0.775	86%						
0.800	92% L+09		0.123	0.0001907	0.147	ductile	
0.825	93%						
0.850	83%						
0.875	91% L+10					SCC	
0.900	91% L+11					SCC	

Tails Excluded By 4C Criterion			
Length	Depth	Ligament Number	Depth
-0.719	0.00		1.466
-0.716	16.42		1.469
-0.711	36.64		1.474
-0.701	44.94		1.479
-0.676	40.49	L-07	1.484
-0.651	45.34		1.487
-0.626	49.60		1.488
-0.601	50.61		
-0.576	44.33		
-0.566	31.25		
-0.561	30.65		
-0.556	31.00		
-0.531	47.82		
-0.506	49.90	L-06	
-0.481	62.20		
-0.456	47.25		
-0.446	47.42		
-0.441	42.92		
-0.436	27.21		
-0.431	23.00		
-0.43	22.73		
-0.425	38.12		
-0.42	45.84		
-0.415	47.19		
-0.395	56.63		
-0.37	63.29		
-0.345	69.82		
-0.335	60.80		
-0.325	59.33		
-0.315	56.47		
-0.31	43.12		
-0.305	36.71		
-0.3	22.00	L-05	
-0.275	21.33	L-04	
-0.25	74.85		
-0.225	77.11		
-0.2	80.72	L-03	
-0.175	81.65		
-0.15	86.90		
-0.125	83.67		
-0.1	84.39		
-0.075	71.87	L-02	
-0.05	86.17		
-0.025	85.11		
0	54.26	L-01, L+01	
0.025	54.00		
0.05	78.72		
0.075	74.47		
0.1	69.96		
0.125	90.97		
0.15	53.59	L+02	
0.175	88.30		
0.2	85.42		
0.225	87.58		
0.25	79.47		
0.275	74.16		
0.3	78.43	L+03	
0.325	79.02		
0.35	73.14		
0.375	72.29	L+04	
0.4	85.34		
0.425	100.00		
0.45	85.17	L+05	
0.475	72.60		
0.5	75.00	L+06	
0.525	76.20		
0.55	86.35		
0.575	89.00	L+07	
0.6	91.13		
0.625	93.06		
0.65	81.26		
0.675	86.56	L+08	
0.7	86.26		
0.725	92.53		
0.75	87.88		
0.775	86.07		
0.8	91.74	L+09	
0.825	92.78		
0.85	83.30		
0.875	90.52	L+10	
0.9	91.10	L+11	

Length	0.16" Average	Lig. Corrected
-0.719	38.38	37.76
-0.709	39.45	38.83
-0.699	40.40	39.78
-0.689	41.22	40.60
-0.679	41.90	41.29
-0.669	42.31	41.69
-0.659	42.50	41.88
-0.649	42.04	41.42
-0.639	41.38	40.76
-0.629	43.48	42.86
-0.619	43.72	43.10
-0.609	43.92	43.30
-0.599	44.27	43.66
-0.589	44.78	41.23
-0.579	45.46	41.91
-0.569	46.31	42.76
-0.559	47.21	43.66
-0.549	47.66	44.11
-0.539	47.66	44.11
-0.529	47.51	43.96
-0.519	46.71	43.15
-0.509	45.28	41.73
-0.499	45.19	41.64
-0.489	45.48	41.93
-0.479	46.63	43.08
-0.469	46.25	44.69
-0.459	49.73	46.17
-0.449	50.97	47.42
-0.439	52.04	48.49
-0.429	53.21	49.66
-0.419	54.08	54.08
-0.409	54.47	54.47
-0.399	54.43	54.43
-0.389	53.30	53.30
-0.379	51.38	48.70
-0.369	49.76	47.10
-0.359	48.24	41.83
-0.349	48.10	41.70
-0.339	49.86	43.45
-0.329	51.56	45.15
-0.319	53.07	46.67
-0.309	54.37	47.96
-0.299	55.53	49.13
-0.289	56.62	50.22
-0.279	57.63	49.48
-0.269	58.51	50.36
-0.259	59.26	51.11
-0.249	60.35	52.20
-0.239	61.83	53.68
-0.229	63.54	55.39
-0.219	66.11	57.96
-0.209	69.77	64.28
-0.199	73.42	67.93
-0.189	77.10	75.35
-0.179	80.01	78.27
-0.169	81.38	79.63
-0.159	81.32	78.67
-0.149	81.28	78.64
-0.139	81.53	78.89
-0.129	82.01	79.37
-0.119	82.38	79.74
-0.109	82.65	81.75
-0.099	82.45	81.55
-0.089	81.50	80.60
-0.079	79.81	75.69
-0.069	78.00	73.88
-0.059	76.07	71.95
-0.049	74.57	70.45
-0.039	73.72	69.61
-0.029	73.41	69.29
-0.019	72.98	68.87
-0.009	72.47	68.35
0.001	72.15	68.03
0.011	72.01	68.79
0.021	71.75	68.53
0.031	71.64	68.42
0.041	71.73	68.51
0.051	71.51	68.29
0.061	70.44	67.22
0.071	69.10	65.88
0.081	69.31	66.08

Sample P10 - Crack 2

Destructive Exam

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)
0.925	89%						
0.950	91%						
0.975	91%						
1.000	92%						
1.025	92%						
1.050	86%						
1.075	86% L-12					SCC	
1.100	90%						
1.125	83%						
1.150	82%						
1.175	87%						
1.200	74% L-13	0.74364412	0.0011527		0.718	ductile	
1.225	69%						
1.250	72%						
1.275	46% L-14	0.4470253	0.0006929		0.360	ductile	
1.300	75%						
1.325	62%						
1.350	67%						
1.375	69%						
1.400	55%						
1.405	51%						
1.410	45%						
1.415	37%						
1.420	28%						
1.425	9%						
1.427	0%					sep. crack	
1.466	0%						
1.469	19%						
1.474	28%						
1.479	28%						
1.484	21%						
1.487	15%						
1.488	0%						
Length	2.207						
Max Depth	100						
Avg. Depth	70.95						

Adjusted Destructive Exam

Ligament Number		Ligament Number	
Length	Depth	Length	Depth
Tails Excluded By 4C Criterion			
0.925	89.21		
0.95	90.87		
0.975	91.18		
1	92.44		
1.025	92.05		
1.05	85.77		
1.075	86.10	L+12	
1.1	90.48		
1.125	82.82		
1.15	82.19		
1.175	87.45		
1.2	73.64	L+13	
1.225	68.66		
1.25	71.86		
1.275	46.31	L+14	
1.3	74.56		
1.325	62.13		
1.35	67.26		
1.375	69.03		
1.4	55.42		
1.405	51.28		
1.41	44.58		
1.415	37.48		
1.42	27.61		
1.425	9.47		
1.427	0.00		
Length	2.146		
Max Depth	100.00		
Avg. Depth	72.76		

Final Data

Length	0.16" Average	Lg. Corrected
0.091	70.98	70.98
0.101	72.95	72.95
0.111	74.86	74.86
0.121	76.36	76.36
0.131	77.34	77.34
0.141	77.85	77.85
0.151	78.36	78.36
0.161	78.79	78.79
0.171	79.13	79.13
0.181	79.46	79.46
0.191	79.71	79.71
0.201	79.47	79.47
0.211	78.84	78.84
0.221	78.63	78.63
0.231	79.32	79.32
0.241	80.73	80.73
0.251	81.24	81.24
0.261	80.80	80.80
0.271	79.95	79.95
0.281	79.14	79.14
0.291	78.37	78.37
0.301	77.73	77.73
0.311	77.34	77.34
0.321	77.36	77.36
0.331	77.91	77.91
0.341	78.99	78.99
0.351	80.13	80.13
0.361	81.04	81.04
0.371	81.60	81.60
0.381	81.76	81.76
0.391	81.53	81.53
0.401	81.21	81.21
0.411	80.93	80.93
0.421	80.78	71.78
0.431	80.79	71.80
0.441	80.96	71.97
0.451	81.34	72.34
0.461	82.02	73.02
0.471	82.78	73.78
0.481	83.25	74.25
0.491	83.42	73.98
0.501	83.29	73.85
0.511	82.86	73.42
0.521	82.55	73.11
0.531	82.64	73.20
0.541	83.12	73.67
0.551	83.74	74.30
0.561	84.38	74.94
0.571	84.67	75.43
0.581	85.42	75.98
0.591	86.05	80.38
0.601	86.70	81.02
0.611	87.31	81.63
0.621	87.74	82.07
0.631	88.04	82.37
0.641	88.22	82.55
0.651	88.39	82.71
0.661	88.42	83.20
0.671	88.32	83.10
0.681	88.13	82.90
0.691	87.84	82.62
0.701	87.58	82.35
0.711	87.40	82.17
0.721	87.49	80.88
0.731	87.88	81.27
0.741	88.54	81.93
0.751	88.94	82.33
0.761	89.00	87.62
0.771	88.83	87.45
0.781	88.84	87.46
0.791	89.01	87.62
0.801	89.10	87.72
0.811	89.06	87.68
0.821	89.04	87.66
0.831	89.08	87.70
0.841	89.18	87.80
0.851	89.33	87.95
0.861	89.56	88.18
0.871	89.77	88.38
0.881	89.84	88.46
0.891	89.81	89.81

Sample P10 - Crack 2
Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)
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Ligament Number			
Length	Depth	Length	Depth

Length	0.16" Average	Lig. Corrected
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Tails Excluded By 4C Cntenon

0.901	89.76	89.76
0.911	89.73	89.73
0.921	89.84	89.84
0.931	90.17	90.17
0.941	90.67	90.67
0.951	90.91	90.91
0.961	90.83	90.83
0.971	90.54	90.54
0.981	90.25	90.25
0.991	89.96	89.96
1.001	89.77	89.77
1.011	89.74	89.74
1.021	89.77	89.77
1.031	89.58	89.58
1.041	89.18	89.18
1.051	88.69	88.69
1.061	88.18	88.18
1.071	87.64	87.64
1.081	87.20	87.20
1.091	86.86	86.86
1.101	86.38	86.38
1.111	85.59	85.59
1.121	84.58	76.23
1.131	83.61	75.25
1.141	82.65	74.29
1.151	81.68	73.32
1.161	80.78	72.42
1.171	79.82	71.46
1.181	78.15	69.80
1.191	75.81	62.43
1.201	73.81	60.43
1.211	72.66	59.28
1.221	72.15	58.77
1.231	71.37	57.99
1.241	70.29	56.91
1.251	69.05	55.67
1.261	67.80	54.42
1.271	66.81	53.43
1.281	66.19	52.81
1.291	65.91	60.89
1.301	65.58	60.56
1.311	65.04	60.02
1.321	64.17	59.15
1.331	62.55	57.52
1.341	59.79	54.77
1.351	56.23	51.20
1.361	56.59	56.59
1.371	56.82	56.82
1.381	56.28	56.28
1.391	54.92	54.92
1.401	53.74	53.74
1.411	52.79	52.79
1.421	51.74	51.74
1.427	50.22	50.22
Length	2.146	2.146
Max Depth	90.91	90.91
Avg. Depth	72.65	69.03

Sample P11 - Crack 2

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)	Length	0.16" Average	Lig. Corrected
No Exclusion Criterion Applied										
-0.400	0.0%							-0.400	27.33	27.33
-0.380	10%	Several cracks <10% may extend beyond the main at different orientations								
-0.380	13%							-0.390	32.84	32.84
-0.352	13%	L-04					SCC, 90 deg	-0.380	37.37	34.55
-0.340	44%							-0.37	41.26	38.43
-0.320	82%							-0.36	44.64	41.81
-0.300	83%	L-03	0.252	3.90E-04	0.236	ductile, 90 deg		-0.35	47.60	44.77
-0.280	85%							-0.34	50.22	47.39
-0.260	87%							-0.33	52.47	49.65
-0.240	86%							-0.32	54.43	51.60
-0.220	91%	L-02	0.082	1.28E-04	0.136	some ductile, 30 deg		-0.31	59.62	56.80
-0.200	90%							-0.3	64.67	60.92
-0.180	91%							-0.29	69.42	65.67
-0.160	95%							-0.28	74.06	70.31
-0.140	91%							-0.27	78.64	74.88
-0.120	83%							-0.26	82.95	79.20
-0.100	87%	L-01	0.166	2.57E-04	0.247	some ductile, 20 deg		-0.25	85.87	82.12
-0.080	87%							-0.24	87.78	84.01
-0.060	91%							-0.23	88.39	84.63
-0.040	85%							-0.22	88.88	85.13
-0.020	87%							-0.21	89.13	88.20
0.000	96%							-0.2	89.07	88.14
0.020	89%							-0.19	89.08	88.13
0.040	93%							-0.18	89.13	86.34
0.060	91%							-0.17	89.15	86.36
0.080	92%							-0.16	89.20	86.42
0.100	85%							-0.15	89.41	86.62
0.120	71%							-0.14	89.59	86.80
0.132	54%							-0.13	89.45	87.58
0.140	46%							-0.12	89.15	87.29
0.148	30%							-0.11	88.92	87.06
0.156	19%							-0.1	88.71	86.84
0.164	11%							-0.09	88.71	86.85
0.168	0%	Several cracks <10% may extend beyond the main tip at diff. orientations								
								-0.08	88.87	87.00
								-0.07	88.71	86.84
								-0.06	88.48	86.60
								-0.05	88.46	86.60
								-0.04	88.82	86.96
								-0.03	89.36	87.50
								-0.02	89.72	87.85
								-0.01	89.96	89.96
								0	90.23	90.23
								0.01	90.30	90.30
								0.02	90.06	90.06
								0.03	89.29	89.29
								0.04	88.30	88.30
								0.05	86.61	86.61
								0.06	84.24	84.24
								0.07	80.70	80.70
								0.08	76.18	76.18
								0.09	70.54	70.54
								0.1	69.18	69.18
								0.11	67.87	67.87
								0.12	66.23	66.23
								0.13	64.17	64.17
								0.14	61.85	61.85
								0.15	59.18	59.18
								0.16	55.95	55.95
								0.168	51.97	51.97
Length	0.568							Length	0.568	0.568
Max Depth	95.81							Max Depth	90.30	90.30
Avg. Depth	75.08							Avg. Depth	76.27	74.58

Sample P12 - Crack 1.

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)	Length	0.16" Average	Lig. Corrected
No Exclusion Criterion Applied										
-0.371	0%							-0.371	67.77	67.77
-0.350	72%							-0.361	70.04	70.04
-0.325	84%							-0.351	72.08	72.08
-0.300	89%							-0.341	74.06	74.06
-0.275	91%	L-03				SCC		-0.331	76.00	76.00
-0.250	100%							-0.321	77.61	77.61
-0.225	97%	L-02				SCC		-0.311	78.93	78.93
-0.200	97%							-0.301	80.04	80.04
-0.175	95%							-0.291	81.03	81.03
-0.150	96%							-0.281	86.72	86.72
-0.125	96%							-0.271	90.37	90.37
-0.100	95%	L-01	0.113	1.75E-04	0.116	ductile		-0.261	91.97	91.97
-0.075	95%							-0.251	93.10	93.10
-0.050	96%							-0.241	93.93	93.93
-0.025	96%							-0.231	94.55	94.55
0.000	97%							-0.221	95.07	95.07
0.025	96%							-0.211	95.48	95.48
0.050	98%							-0.201	95.84	95.84
0.075	96%							-0.191	96.12	96.12
0.100	97%							-0.181	96.28	95.01
0.125	99%	L-01				SCC		-0.171	96.24	94.97
0.150	100%							-0.161	96.01	94.74
0.175	100%							-0.151	95.82	94.55
0.200	100%							-0.141	95.70	94.43
0.225	100%							-0.131	95.63	94.36
0.250	97%							-0.121	95.57	94.30
0.275	95%	L-02				SCC		-0.111	95.51	94.24
0.300	74%	L-03	0.123	1.90E-04	0.107	ductile		-0.101	95.50	94.23
0.325	60%							-0.091	95.55	94.28
0.350	22%							-0.081	95.63	94.36
0.358	0%							-0.071	95.69	94.42
0.400	0%							-0.061	95.72	94.45
0.425	0%							-0.051	95.75	94.48
0.450	0%							-0.041	95.84	94.57
0.495	0%							-0.031	95.99	94.71
0.500	0%							-0.021	96.10	94.83
0.525	96%							-0.011	96.18	96.18
0.550	97%							-0.001	96.23	96.23
0.575	100%	L-04	0.249	3.88E-04	0.191	ductile		0.009	96.31	96.31
0.600	100%							0.019	96.40	96.40
0.625	98%							0.029	96.54	96.54
0.650	99%							0.039	96.71	96.71
0.675	100%							0.049	96.92	96.92
0.700	100%							0.059	97.14	97.14
0.725	100%							0.069	97.36	97.36
0.750	100%							0.079	97.57	97.57
0.775	100%	L-05				SCC		0.089	97.76	97.76
0.800	100%							0.099	97.97	97.97
0.825	100%	L-06	1.400	2.17E-03	1.120	ductile		0.109	98.20	98.20
0.850	91%	L-07	0.029	4.52E-05	0.045	ductile		0.119	98.43	98.43
0.875	85%							0.129	98.60	98.60
0.900	83%							0.139	98.71	98.71
0.915	0%							0.149	98.83	98.83
0.950	0%							0.159	98.92	98.92
0.975	0%							0.169	98.95	98.95
1.000	0%							0.179	98.93	98.93
								0.189	98.84	98.84
								0.199	98.49	97.11
								0.209	97.60	96.22
								0.219	96.19	94.81
								0.229	94.39	93.01
								0.239	92.22	90.84
								0.249	89.47	88.10
								0.259	85.83	84.46
								0.269	81.30	79.92
								0.279	75.42	74.04
								0.289	69.53	68.16
								0.299	63.66	62.28
								0.309	57.78	56.41
								0.319	51.95	50.57
								0.329	46.18	44.80
								0.339	40.49	39.11
								0.349	34.84	33.46
								0.359	29.22	27.84
								0.369	23.82	22.44
								0.379	18.91	17.53
								0.389	14.49	13.11
								0.399	10.44	9.06
								0.409	6.73	6.73
								0.419	3.59	3.59
								0.429	3.40	3.40
Length	1.286									
Max Depth	100									
Avg. Depth	80.60									

Sample P12 - Crack 1

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)	Length	0.16" Average	Lig. Corrected
No Exclusion Criterenon Applied										
								0.439	6.37	6.37
								0.449	12.03	12.03
								0.459	17.71	17.71
								0.469	23.41	23.41
								0.479	29.18	26.38
								0.489	35.02	32.22
								0.499	40.90	38.10
								0.509	46.79	43.99
								0.519	52.67	49.87
								0.529	58.51	55.71
								0.539	64.30	61.50
								0.549	70.07	67.28
								0.559	75.87	73.07
								0.569	81.69	78.89
								0.579	87.54	84.74
								0.589	93.41	90.61
								0.599	97.23	94.43
								0.609	98.80	96.00
								0.619	99.03	96.23
								0.629	99.23	96.43
								0.639	99.41	96.61
								0.649	99.52	96.72
								0.659	99.56	96.76
								0.669	99.56	96.76
								0.679	99.56	96.76
								0.689	99.56	96.76
								0.699	99.61	96.81
								0.709	99.70	96.90
								0.719	99.80	97.00
								0.729	99.89	97.10
								0.739	99.95	97.16
								0.749	99.90	97.11
								0.759	99.61	96.82
								0.769	99.10	96.31
								0.779	98.45	95.66
								0.789	97.65	94.86
								0.799	96.75	93.96
								0.809	95.80	93.01
								0.819	94.80	92.01
								0.829	90.84	88.05
								0.839	84.96	82.17
								0.849	84.02	81.23
								0.859	82.95	80.16
								0.869	81.73	78.94
								0.879	80.33	77.54
								0.889	78.69	75.90
								0.899	76.75	73.96
								0.909	74.43	71.64
								0.915	71.75	68.96
								Length	1.286	1.286
								Max Depth	99.95	99.80
								Avg. Depth	80.50	77.27

Sample P12 - Crack 2 (3+4)

Destructive Exam

Final Data

Axial Position Inch	SCG Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes	Length	0.16" Average	Lig. Corrected
No Exclusion Criterion Applied								
-0.240	0%					-0.240	58.09	
-0.235	29%					-0.230	58.71	
-0.222	55%					-0.220	58.30	
-0.209	62%					-0.210	56.94	
-0.196	70%					-0.200	54.30	
-0.183	80%				C3, no ligaments	-0.190	50.42	
-0.170	77%					-0.180	47.06	
-0.157	71%					-0.170	44.12	
-0.144	58%					-0.160	41.52	
-0.131	43%					-0.150	41.52	
-0.118	18%					-0.140	39.22	
-0.112	0%					-0.130	35.90	
-0.052	0%					-0.120	33.97	
-0.047	0%					-0.110	32.16	
-0.042	27%					-0.100	29.67	
-0.037	32%					-0.090	25.63	
-0.031	34%				C2b, no ligaments	-0.080	21.09	
-0.026	27%					-0.070	16.83	
-0.021	13%					-0.060	13.05	
-0.016	0%					-0.050	9.87	
0.000	0%					-0.040	7.39	
0.125	0%					-0.037	6.07	
0.131	5%					-0.030	6.07	
0.136	29%					-0.020	6.07	
0.141	33%					-0.010	6.07	
0.146	34%					0.000	6.07	
0.151	35%				C2a, no ligaments	0.010	6.07	
0.157	31%					0.020	6.07	
0.162	22%					0.030	6.07	
0.167	0%					0.040	4.38	
0.183	0%					0.050	2.76	
0.188	0%					0.060	2.78	
0.196	34%					0.070	4.11	
0.209	60%					0.080	6.13	
0.222	70%					0.090	7.63	
0.235	79%					0.100	7.63	
0.248	82%					0.110	7.63	
0.261	83%				C4, no ligaments	0.120	8.12	
0.274	80%					0.130	10.09	
0.287	68%					0.140	12.56	
0.300	44%					0.141	16.17	
0.308	0%					0.150	20.20	
0.313	0%					0.160	24.63	
						0.170	29.33	
						0.180	34.15	
						0.190	39.02	
						0.196	43.78	
						0.200	47.87	
						0.210	49.58	
						0.220	50.21	
						0.230	48.19	
						0.240	49.60	
						0.250	52.91	
						0.260	56.69	
						0.270	60.41	
						0.280	62.65	
						0.290	64.53	
						0.300	64.86	
						0.308	64.44	
Length	0.548					Length	0.548	
Max Depth	82.78					Max Depth	64.86	
Avg. Depth	29.90					Avg. Depth	29.90	

Sample P12 - Crack 5

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament Type/area (in ²)	Ligament Height (mm)	Notes	Ligament angle (deg)	Length	0.15" Average	Lig. Corrected
No Exclusion Criterion Applied										
-0.896	0%							-0.896	65.45	
-0.886	21%							-0.886	67.96	
-0.876	52%							-0.876	69.88	
-0.847	74%							-0.866	71.73	
-0.837	79%							-0.856	73.21	
-0.827	85%							-0.846	74.16	
-0.817	85%							-0.836	74.68	
-0.807	88%							-0.826	73.80	
-0.797	87%							-0.816	71.79	
-0.787	90%							-0.806	68.85	
-0.777	90%							-0.796	67.73	
-0.767	86%							-0.786	64.68	
-0.757	83%							-0.776	65.00	
-0.715	0%							-0.766	64.85	
								-0.756	64.15	
								-0.746	62.98	
								-0.736	61.16	
								-0.726	58.99	
								-0.716	56.08	
								-0.715	52.63	
Length	0.181							Length	0.181	
Max Depth	90.25							Max Depth	74.68	
Avg. Depth	64.80							Avg. Depth	69.44	

Sample 10/22 - Crack 1

Destructive Exam

Final Data

	0.16"	Lig.
Length	Average	Corrected

Axial Position Depth

No Exclusion Criterion Applied Also No Avg. Over Length of Crack, Avg. Max. Depth = Avg. Depth = 23.21%

0.000	0.00
0.020	12.00
0.040	24.00
0.060	34.00
0.080	38.00
0.100	32.00
0.122	0.00
 Length	 0.122
Max Depth	38.00
Avg. Depth	23.21

Sample 21/43 - TSP 1H - Crack 1

Destructive Exam		Final Data	
Axial Posson	Depth	Length	0.16" Average
No Exclusion Criterenon Applied			
0.515	0.00	0.515	43.67
0.475	0.54	0.505	46.80
0.425	0.75	0.495	46.89
0.385	0.96	0.485	47.40
0.383	0.98	0.475	48.23
0.335	0.98	0.465	51.64
0.295	0.92	0.455	54.73
0.255	0.85	0.445	57.44
0.215	0.65	0.435	59.82
0.165	0.37	0.425	65.59
0.125	0.37	0.415	70.56
0.085	0.37	0.405	74.65
0.035	0.27	0.395	77.85
-0.005	0.24	0.385	80.18
-0.045	0.24	0.375	82.16
-0.095	0.22	0.365	83.80
-0.135	0.24	0.355	85.09
-0.185	0.31	0.345	86.03
-0.225	0.40	0.335	86.62
-0.265	0.53	0.325	88.51
-0.305	0.55	0.315	89.81
-0.355	0.53	0.305	90.50
-0.395	0.67	0.295	88.68
-0.445	0.52	0.285	86.41
-0.476	0.00	0.275	83.81
		0.265	80.88
		0.255	77.62
		0.245	74.03
Length	0.991	0.235	70.53
Max Depth	98.00	0.225	67.12
Avg. Depth	50.27	0.215	63.79
		0.205	60.56
		0.195	57.43
		0.185	54.40
		0.175	51.47
		0.165	48.65
		0.155	46.00
		0.145	43.53
		0.135	41.24
		0.125	39.12
		0.115	37.21
		0.105	35.59
		0.095	34.26
		0.085	33.21
		0.075	32.44
		0.065	31.68
		0.055	30.91
		0.045	30.15
		0.035	29.38
		0.025	28.59
		0.015	27.78
		0.005	26.95
		-0.005	26.09
		-0.015	25.32
		-0.025	24.71
		-0.035	24.24
		-0.045	23.91
		-0.055	23.74
		-0.065	23.69
		-0.075	23.76
		-0.085	23.96
		-0.095	24.29
		-0.105	24.71
		-0.115	25.25
		-0.125	25.93
		-0.135	26.74
		-0.145	27.70
		-0.155	28.88
		-0.165	30.23
		-0.175	31.73
		-0.185	33.55
		-0.195	35.38
		-0.205	37.20
		-0.215	39.02
		-0.225	40.85
		-0.235	42.57
		-0.245	44.18
		-0.255	45.68
		-0.265	47.08
		-0.275	48.38

Sample 21/43 - TSP 1H - Crack 1

Destructive Exam		Final Data		
Axial Position	Depth	Length	0.16" Average	Lig. Corrected
		-0.285	49.75	
		-0.295	51.19	
		-0.305	52.70	
		-0.315	54.29	
		-0.325	55.51	
		-0.335	56.40	
		-0.345	57.00	
		-0.355	57.12	
		-0.365	57.03	
		-0.375	55.93	
		-0.385	53.80	
		-0.395	50.67	
		-0.405	47.46	
		-0.415	47.03	
		-0.425	46.58	
		-0.435	46.10	
		-0.445	45.57	
		-0.455	44.65	
		-0.465	43.26	
		-0.475	41.24	
		-0.476	38.37	
		Length	0.991	
		Max Depth	90.50	
		Avg. Depth	49.25	

Sample 21/43 - TSP 1H - Crack 2

Destructive Exam		Final Data	
Axial Position	Depth	Length	0.16" Average
No Exclusion Criteron Applied			
0.065	0.00	0.065	31.67
0.025	0.42	0.055	33.30
-0.025	0.48	0.045	34.69
-0.060	0.50	0.035	35.89
-0.065	0.48	0.025	36.96
-0.105	0.42	0.015	37.74
-0.155	0.44	0.005	38.33
-0.195	0.36	-0.005	38.75
-0.212	0.00	-0.015	39.03
		-0.025	41.50
Length	0.277	-0.035	43.37
Max Depth	50.0	-0.045	44.65
Avg. Depth	39.37	-0.055	45.34
		-0.065	45.44
		-0.075	45.48
		-0.085	45.34
		-0.095	45.01
		-0.105	44.50
		-0.115	43.79
		-0.125	41.80
		-0.135	38.91
		-0.145	38.24
		-0.155	37.59
		-0.165	36.95
		-0.175	36.33
		-0.185	35.74
		-0.195	35.17
		-0.205	34.44
		-0.212	33.51
		Length	0.277
		Max Depth	45.48
		Avg. Depth	39.35

Sample 21/64 - Crack 1

Destructive Exam		Final Data	
Axial Position	Depth	Length	0.16" Average
			Ug. Corrected
Exclusion Criterion 1a Applied			
0	0	0.00	40.67
0.01	20	0.01	44.33
0.03	32	0.02	47.45
0.05	48	0.03	50.17
0.08	76	0.04	52.77
0.11	80	0.05	55.29
0.14	92	0.06	57.73
0.16	96	0.07	60.00
0.16	96	0.08	62.12
0.17	88	0.09	67.76
0.2	88	0.10	71.76
0.23	56	0.11	75.41
0.26	40	0.12	78.71
0.29	24	0.13	81.53
0.31	20	0.14	83.25
0.32	0	0.15	83.80
		0.16	83.18
Length	0.320	0.16	81.69
Max Depth	96.0	0.17	79.80
Avg. Depth	58.56	0.18	77.53
		0.19	74.86
		0.20	71.65
		0.21	67.88
		0.22	63.76
		0.23	59.41
		0.24	53.76
		0.25	51.13
		0.26	48.67
		0.27	45.86
		0.28	42.62
		0.29	38.83
		0.30	35.33
		0.31	32.20
		0.32	29.56
		Length	0.32
		Max Depth	83.80
		Avg. Depth	60.40

Sample 12/32 - Crack 1

Destructive Exam

Final Data

Axial Positon	Depth	Ligament area (in ²)	Final Data		
			Length	0.16" Average	Lig. Corrected
		No Exclusion Criterion Applied			
0.375	0.00		0.375	44.69	44.69
0.345	50.50		0.365	47.23	47.23
0.285	70.00		0.355	49.27	49.27
0.255	69.00		0.345	50.94	50.94
0.225	50.00		0.335	52.33	52.33
0.195	52.00	2.24E-02	0.325	53.07	53.07
0.165	39.00		0.315	53.28	53.28
0.135	36.00		0.305	53.08	53.08
0.105	37.00		0.295	52.94	52.94
0.075	49.00		0.285	55.96	48.92
0.045	48.00		0.275	58.02	50.99
0.015	50.00		0.265	58.85	51.82
-0.015	43.00	1.60E-03	0.255	58.43	51.39
-0.045	50.00		0.245	57.56	50.53
-0.075	47.00	6.00E-04	0.235	56.44	49.41
-0.105	61.00		0.225	55.07	48.04
-0.135	87.00		0.215	53.46	46.42
-0.165	92.00	6.20E-03	0.205	51.67	44.63
-0.195	95.00		0.195	49.71	42.67
-0.225	96.00		0.185	47.78	40.75
-0.255	97.00		0.175	46.12	39.09
-0.285	78.00		0.165	44.71	37.67
-0.315	48.00		0.155	43.90	36.87
-0.327	0.00		0.145	43.45	36.42
			0.135	43.35	36.32
Length	0.702		0.125	43.20	36.16
Max Depth	97.00		0.115	43.04	43.04
Avg. Depth	59.42		0.105	42.88	42.88
			0.095	43.02	43.02
			0.085	43.27	43.27
			0.075	43.65	43.14
			0.065	43.94	43.43
			0.055	44.43	43.92
			0.045	45.12	44.61
			0.035	45.92	45.41
			0.025	46.65	46.14
			0.015	47.29	46.64
			0.005	47.65	46.99
			-0.005	48.04	47.39
			-0.015	48.47	47.82
			-0.025	49.20	48.54
			-0.035	50.45	49.80
			-0.045	52.24	51.58
			-0.055	54.49	53.84
			-0.065	56.80	56.15
			-0.075	59.18	56.35
			-0.085	61.78	58.96
			-0.095	64.59	62.27
			-0.105	67.59	65.27
			-0.115	70.51	68.19
			-0.125	73.31	70.99
			-0.135	76.00	73.68
			-0.145	78.76	76.44
			-0.155	81.61	79.43
			-0.165	84.53	82.35
			-0.175	87.20	85.02
			-0.185	89.22	87.04
			-0.195	90.59	88.41
			-0.205	91.08	88.90
			-0.215	90.47	88.30
			-0.225	88.76	86.59
			-0.235	86.37	84.20
			-0.245	81.06	81.06
			-0.255	80.38	80.38
			-0.265	79.53	79.53
			-0.275	78.50	78.50
			-0.285	77.23	77.23
			-0.295	75.72	75.72
			-0.305	73.91	73.91
			-0.315	71.70	71.70
			-0.327	68.96	68.96
			Length	0.702	0.702
			Max Depth	91.08	88.90
			Avg. Depth	59.93	57.54

Sample 1 - TSP 3H - Crack 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Destructive Exam					Adjusted Destructive Exam					Final Data			
Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes	Length	Depth	Ligament Number	Length	Depth	Length	0.16" Average	Lig. Corrected
Tails Excluded By 4C Criterion													
-0.364	0%				end of first crack	-0.316	0.00		-0.364	0	-0.316	24.86	
-0.360	14%					-0.300	14.84	L8	-0.360	14	-0.306	27.10	
-0.350	14%					-0.280	22.04		-0.350	14	-0.296	29.05	
-0.346	14%					-0.260	37.31		-0.346	14	-0.286	30.40	
-0.340	0%					-0.240	40.87	L9	-0.340	0	-0.276	31.37	
-0.324	0%					-0.220	49.96	L10	-0.324	0	-0.266	32.19	
-0.316	0%				end of continuous crack array	-0.200	43.13				-0.256	32.85	
-0.300	15%	L8				-0.180	42.69				-0.246	33.33	
-0.280	22%					-0.160	39.71				-0.236	33.74	
-0.260	37%					-0.140	42.25	L7			-0.226	36.18	
-0.240	41%	L9				-0.120	36.87	L6			-0.216	38.06	
-0.220	50%	L10				-0.100	38.04	L11			-0.206	39.36	
-0.200	43%					-0.080	42.84				-0.196	40.38	
-0.180	43%					-0.060	42.04	L5			-0.186	41.12	
-0.160	40%					-0.040	46.40				-0.176	41.49	
-0.140	42%	L7				-0.020	54.33				-0.166	41.68	
-0.120	37%	L6				0.000	53.89	L4			-0.156	41.85	
-0.100	38%	L11			overlapping cracks, different planes	0.020	51.93				-0.146	41.83	
-0.080	43%					0.040	44.36				-0.136	41.57	
-0.060	42%	L5			overlapping cracks, different planes	0.060	37.82				-0.126	41.37	
-0.040	46%					0.080	44.65				-0.116	41.53	
-0.020	54%					0.100	43.78	L3			-0.106	42.06	
0.000	54%	L4				0.120	54.55				-0.096	42.73	
0.020	52%					0.140	43.13	L2			-0.086	43.43	
0.040	44%					0.160	55.71				-0.076	44.19	
0.060	39%					0.180	33.89	L1			-0.066	44.91	
0.080	45%					0.200	48.87	L12			-0.056	45.44	
0.100	44%	L3			overlapping cracks, different planes	0.220	34.25				-0.046	45.76	
0.120	55%					0.240	32.15				-0.036	46.03	
0.140	43%	L2			overlapping cracks, different planes	0.260	31.71	L13	0.370	0	-0.026	46.18	
0.160	56%					0.280	33.31		0.375	12	-0.016	46.27	
0.180	34%	L1			overlapping cracks, different planes	0.300	31.93		0.380	0	-0.006	46.48	
0.200	49%	L12				0.320	16.44	L16	0.388	0	0.004	46.67	
0.220	34%					0.340	14.55		0.394	11	0.014	46.75	
0.240	32%					0.344	0.00		0.398	0	0.024	46.96	
0.260	32%	L13			overlapping cracks, different planes						0.034	47.46	
0.280	33%					Length	0.66				0.044	47.88	
0.300	32%					Max Depth	55.71				0.054	47.79	
0.320	16%	L16				Avg. Depth	39.18				0.064	47.42	
0.340	15%										0.074	47.29	
0.344	0%				end of continuous crack array						0.084	47.13	
0.370	0%										0.094	46.36	
0.375	12%										0.104	45.44	
0.380	0%										0.114	45.09	
0.388	0%										0.124	45.05	
0.394	11%										0.134	44.79	
0.398	0%				end of last crack						0.144	44.44	
											0.154	44.06	
											0.164	43.44	
											0.174	42.70	
											0.184	41.99	
											0.194	41.22	
											0.204	40.14	
											0.214	38.97	
											0.224	37.93	
											0.234	36.48	
											0.244	34.37	
											0.254	32.24	
											0.264	29.86	
											0.274	29.42	
											0.284	28.43	
											0.294	27.18	
											0.304	26.29	
											0.314	25.67	
											0.324	25.02	
											0.334	24.32	
											0.344	23.48	
											Length	0.66	
											Max Depth	47.88	
											Avg. Depth	39.40	

Sample 1 - TSP 4H - Crack 1

Destructive Exam

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
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No Exclusion Criterion Applied

-0.384	0%				End of SCC
-0.380	15%				Ligament areas to be supplied later
-0.360	18%				
-0.340	26%				
-0.320	33%				
-0.300	30%	L4	0.038	0.112	DUCTILE
-0.280	34%				
-0.260	34%	L3	0.096	0.16	DUCTILE
-0.240	38%				
-0.220	33%	L2	0.12	0.25	DUCTILE
-0.200	36%				
-0.180	36%				
-0.160	41%				
-0.140	31%				
-0.120	41%				
-0.100	45%				
-0.080	47%				
-0.060	58%				
-0.040	61%				
-0.020	64%				
0.000	68%				
0.020	48%				
0.040	50%				
0.060	43%				
0.080	42%				
0.100	55%	L5	0.264	0.417	DUCTILE
0.120	53%				
0.140	40%				
0.160	28%	L6	0.287	0.629	DUCTILE
0.180	35%				
0.200	38%				
0.220	40%				
0.240	24%				
0.260	29%				
0.280	34%	L1	0.134	0.28	DUCTILE
0.300	30%				
0.320	11%				
0.324	0%				End of SCC
Length		0.708			
Max D		68.36			
ATD		38.95			

Final Data

Length	0.16" Average	Lig. Corrected
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-0.384	22.42	22.42
-0.374	23.30	22.88
-0.364	24.18	23.75
-0.354	24.96	24.54
-0.344	25.62	24.12
-0.334	26.28	24.77
-0.324	27.00	25.49
-0.314	27.58	26.07
-0.304	27.93	25.08
-0.294	29.91	27.05
-0.284	31.06	28.20
-0.274	32.15	29.30
-0.264	33.08	30.22
-0.254	33.85	31.00
-0.244	34.55	31.69
-0.234	34.91	32.06
-0.224	34.95	32.09
-0.214	35.14	32.71
-0.204	35.61	33.19
-0.194	36.17	33.74
-0.184	36.78	34.35
-0.174	37.47	36.12
-0.164	38.17	36.82
-0.154	38.96	37.61
-0.144	40.10	38.76
-0.134	41.58	41.58
-0.124	43.16	43.16
-0.114	44.72	44.72
-0.104	46.31	46.31
-0.094	48.00	48.00
-0.084	49.75	49.75
-0.074	51.04	51.04
-0.064	51.86	51.86
-0.054	52.78	52.78
-0.044	53.69	53.69
-0.034	54.19	54.19
-0.024	54.32	54.32
-0.014	54.25	54.25
-0.004	54.06	54.06
0.006	54.02	54.02
0.016	54.15	51.18
0.026	54.09	51.13
0.036	53.80	50.83
0.046	53.16	50.20
0.056	52.05	49.09
0.066	50.50	47.53
0.076	48.48	42.29
0.086	46.30	40.11
0.096	44.63	38.43
0.106	43.68	37.49
0.116	43.04	36.85
0.126	42.41	36.22
0.136	41.92	35.73
0.146	41.37	35.18
0.156	40.44	34.25
0.166	39.44	33.25
0.176	38.36	32.16
0.186	37.04	33.81
0.196	35.75	32.52
0.206	34.50	31.28
0.216	33.39	30.16
0.226	32.28	29.05
0.236	30.97	27.75
0.246	29.17	29.17
0.256	29.09	29.09
0.266	28.78	28.78
0.276	28.26	28.26
0.286	27.54	27.54
0.296	26.60	26.60
0.306	25.42	25.42
0.316	24.45	24.45
0.324	24.17	24.17
Length	0.708	0.708
Max Depth	54.32	54.32
Avg. Depth	38.88	36.72

Sample 2 - TSP 1H - Crack 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Destructive Exam					Adjusted Destructive Exam					Final Data			
Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes	Length	Depth	Ligament Number	Length	Depth	Length	0.16" Average	Lig. Corrected
-0.47	0.00				start of crack and array	-0.440	0.00		-0.470	0.00	-0.440	10.59	10.54
-0.46	0.02					-0.420	8.95		-0.460	1.96	-0.430	10.57	10.52
-0.44	0.03					-0.400	15.85				-0.420	10.38	10.12
-0.42	0.09					-0.380	13.60	L23			-0.410	10.50	10.24
-0.40	0.16					-0.360	12.36				-0.400	10.87	10.61
-0.38	0.14	L23	0.005	7.4E-06		-0.340	8.44	L24			-0.390	11.22	10.96
-0.36	0.12					-0.320	15.27				-0.380	11.55	11.29
-0.34	0.08	L24	0.018	2.8E-05		-0.300	16.22				-0.370	11.75	11.49
-0.32	0.15					-0.292	14.55	L25			-0.360	11.96	11.14
-0.30	0.16					-0.280	15.42	L24			-0.350	12.21	11.39
-0.29	0.15	L25	SCC			-0.260	17.31				-0.340	12.46	11.65
-0.28	0.15	L24	0.050	7.8E-05		-0.250	15.27				-0.330	12.62	11.79
-0.26	0.17					-0.240	23.20	L21			-0.320	13.12	12.20
-0.25	0.15					-0.220	19.78	L20			-0.310	13.50	12.58
-0.24	0.23	L21	0.009	1.3E-05		-0.200	21.38	L19			-0.300	13.77	12.86
-0.22	0.20	L20	SCC			-0.180	21.31	L18			-0.290	14.06	13.19
-0.20	0.21	L19	0.027	4.2E-05		-0.160	21.89				-0.280	14.35	13.18
-0.18	0.21	L18	0.015	2.3E-05		-0.152	23.49	L17			-0.270	15.20	14.04
-0.16	0.22					-0.140	22.33	L16			-0.260	15.88	14.54
-0.15	0.23	L17	0.011	1.7E-05		-0.120	21.24	L15			-0.250	16.38	15.25
-0.14	0.22	L16	SCC			-0.100	28.00				-0.240	16.76	15.63
-0.12	0.21	L15	SCC			-0.090	29.31	L14			-0.230	17.06	15.81
-0.10	0.28					-0.080	20.36				-0.220	17.37	16.11
-0.09	0.29	L14	SCC			-0.060	25.31				-0.210	17.69	16.44
-0.08	0.20					-0.050	26.40	L13			-0.200	18.02	16.77
-0.06	0.25					-0.040	24.51	L12			-0.190	18.51	17.82
-0.05	0.26	L13	SCC			-0.020	28.95	L11			-0.180	19.22	18.53
-0.04	0.25	L12	0.005	7.7E-06		-0.012	33.45	L10			-0.170	20.05	19.36
-0.02	0.29	L11	0.009	1.4E-05		0.000	35.78	L9			-0.160	20.39	19.70
-0.01	0.33	L10	SCC			0.020	26.18	L8			-0.150	20.69	20.10
0.00	0.36	L9	SCC			0.026	34.84				-0.140	21.08	20.48
0.02	0.26	L8	SCC			0.040	48.00				-0.130	21.48	20.89
0.03	0.35					0.060	45.09				-0.120	21.88	21.23
0.04	0.48					0.080	37.89	L7			-0.110	22.33	21.98
0.06	0.45					0.100	37.24	L6			-0.100	22.83	22.38
0.08	0.38	L7	SCC			0.120	29.96	L5			-0.090	23.49	23.21
0.10	0.37	L6	SCC			0.140	36.95				-0.080	24.31	24.03
0.12	0.30	L5	0.007	1.2E-05		0.160	29.96				-0.070	24.63	24.34
0.14	0.37					0.180	22.69				-0.060	24.81	24.65
0.16	0.30					0.200	18.47				-0.050	25.57	25.41
0.18	0.23					0.220	14.76		0.446	0.00	-0.040	26.66	26.50
0.20	0.18					0.240	14.98	L4	0.452	8.44	-0.030	27.67	27.51
0.22	0.15					0.260	27.71		0.460	9.24	-0.020	28.62	28.46
0.24	0.15	L4	0.032	4.9E-05		0.280	31.71		0.470	7.27	-0.010	29.43	29.27
0.26	0.28					0.300	19.42	L3	0.480	6.25	0.000	30.08	29.92
0.28	0.32					0.320	27.93		0.484	0.00	0.010	30.71	30.54
0.30	0.19	L3	0.030	4.6E-05		0.340	24.87		0.506	0.00	0.020	31.26	31.10
0.32	0.28					0.360	6.47	L2	0.512	5.82	0.030	31.71	31.55
0.34	0.25					0.380	21.75		0.520	9.96	0.040	32.04	31.80
0.36	0.06	L2	0.093	1.4E-04		0.400	19.71		0.530	4.58	0.050	32.53	32.34
0.38	0.22					0.420	13.89		0.540	4.58	0.060	33.02	32.83
0.40	0.20					0.436	0.00		0.544	0.00	0.070	33.24	33.16
0.42	0.14										0.080	33.27	33.18
0.44	0.00				end of main crack	Length	0.876				0.090	33.51	33.42
0.45	0.00					Max Depth	48				0.100	33.50	33.42
0.45	0.08	L1	0.005	7.1E-06		Avg. Depth	22.71				0.110	33.31	33.23
0.46	0.09				Shallow separate crack						0.120	32.99	32.91
0.47	0.07										0.130	32.68	32.59
0.48	0.06										0.140	32.20	32.12
0.48	0.00										0.150	31.64	31.55
0.51	0.00										0.160	30.88	30.44
0.51	0.06										0.170	30.30	29.87
0.52	0.10				Shallow separate crack						0.180	30.17	29.73
0.53	0.05										0.190	30.31	29.88
0.54	0.05										0.200	30.04	29.60
0.54	0.00				end of crack array						0.210	29.14	28.79
											0.220	28.06	27.37
Length	1014										0.230	27.20	26.51
Max Depth	48.00										0.240	26.66	25.97
Avg. Depth	20.17										0.250	26.20	25.51
											0.260	25.69	25.00
											0.270	24.83	24.14
											0.280	23.74	22.01
											0.290	23.11	21.37
											0.300	22.64	20.91
											0.310	21.99	20.26
											0.320	21.44	19.71
											0.330	20.91	19.54
											0.340	20.42	19.04
											0.350	19.72	18.34
											0.360	18.89	17.52

Sample 2 - TSP 1H - Crack 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
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		Ligament Number	
Length	Depth	Length	Depth

Tails Excluded By 4C Criterion

Length	0.16" Average	Lig. Corrected
0.370	18.91	17.53
0.380	19.01	17.63
0.390	19.21	18.16
0.400	19.41	18.37
0.410	19.63	18.59
0.420	19.54	18.50
0.430	19.09	18.04
0.436	18.46	17.42
Length	0.876	0.876
Max Depth	33.51	33.42
Avg. Depth	22.43	21.76

Sample 2 - TSP 3H - Crack 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm ²)	Ligament area (inch ²)	Notes
-0.281	0%				end of SCC
-0.280	5%				
-0.260	0%				
-0.240	0%				
-0.228	0%				
-0.224	1%				end of main crack
-0.220	2%				
-0.200	6%	L4	0.012	1.9E-05	
-0.192	2%				
-0.180	12%				
-0.160	22%				
-0.140	32%				
-0.120	15%				
-0.112	11%	L3	9%	0.000143298	
-0.100	19%				
-0.080	21%				
-0.060	18%				
-0.044	15%	L2	15%	0.000233857	
-0.040	28%				
-0.020	25%				
0.000	30%				
0.020	30%				
0.040	27%				
0.060	14%				
0.072	0%				
0.084	0%				
0.100	5%				
0.112	5%	L1	0.009	0.000	
0.120	17%				
0.140	18%				
0.160	13%				
0.180	10%				
0.200	12%				
0.220	12%				
0.240	11%				
0.260	12%				
0.280	6%				
0.300	9%				
0.320	5%				
0.340	6%				
0.360	7%				
0.380	10%				
0.400	4%				
0.420	5%				end of main crack
0.433	0%				
0.448	0%				
0.460	1%				
0.480	2%				
0.492	0%				end of SCC
Length	0.773				
Max Depth	31.71				
Avg. Depth	11.52				

Length		Depth		Ligament Number	
Tails Excluded By 4C Cntenon					
-0.192	0.00	-0.281	0		
-0.180	11.56	-0.260	5		
-0.160	21.96	-0.260	0		
-0.140	31.71	-0.240	0		
-0.120	14.84	-0.228	0		
-0.112	10.98	-0.224	1	L3	
-0.100	18.62	-0.220	2		
-0.080	20.73	-0.200	6		
-0.060	18.18				
-0.044	15.05			L2	
-0.040	28.29				
-0.020	24.51				
0.000	29.60				
0.020	29.60				
0.040	27.49				
0.060	14.47				
0.072	0.000				
0.084	0.000	0.300	9		
0.100	5.00	0.320	5		
0.112	5.00	0.340	6	L1	
0.120	16.87	0.360	7		
0.140	18.33	0.380	10		
0.160	13.38	0.400	4		
0.180	9.60	0.420	5		
0.200	12.15	0.433	0		
0.220	11.71	0.448	0		
0.240	11.05	0.460	1		
0.260	12.07	0.480	2		
0.280	0.00	0.492	0		
Length	0.472				
Max Depth	31.71				
Avg. Depth	16.28				

Length	0.16" Average	Lig. Corrected
-0.192	17.26	16.22
-0.180	17.27	16.23
-0.172	17.47	16.43
-0.162	17.72	16.68
-0.152	17.88	16.84
-0.142	17.92	16.88
-0.132	17.83	16.79
-0.122	18.07	15.33
-0.112	18.58	15.85
-0.102	20.05	17.31
-0.092	21.04	18.31
-0.082	21.83	19.09
-0.072	22.34	19.60
-0.062	22.56	19.82
-0.052	22.44	19.71
-0.042	22.60	19.87
-0.032	22.94	20.21
-0.022	23.22	21.53
-0.012	22.49	20.79
-0.002	21.34	19.65
0.008	20.21	18.51
0.018	19.31	17.61
0.028	18.52	16.71
0.038	18.36	16.56
0.048	18.11	16.00
0.058	17.60	17.50
0.068	17.10	16.99
0.078	16.35	16.25
0.088	15.34	15.24
0.098	14.19	14.08
0.108	13.07	12.97
0.118	12.08	11.97
0.128	11.15	11.05
0.138	10.53	10.43
0.148	10.28	10.17
0.158	10.65	10.54
0.168	11.32	11.22
0.178	11.95	11.85
0.188	12.12	12.02
0.198	11.90	11.90
0.208	11.77	11.77
0.218	11.40	11.40
0.228	10.91	10.91
0.238	10.49	10.49
0.248	10.21	10.21
0.258	10.06	10.06
0.268	10.07	10.07
0.278	10.01	10.01
0.28	9.01	9.01
Length	0.472	0.472
Max Depth	23.22	21.53
Avg. Depth	16.23	15.22

Sample 2 - TSP 4H - Crack 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
-0.412	0%				End of SCC
-0.400	3%				
-0.380	5%				
-0.360	5%				
-0.340	5%				
-0.320	3%				
-0.300	5%	L1	0.008	1.3E-05	
-0.280	13%				
-0.270	14%	L2	0.007	1.0E-05	
-0.260	19%				
-0.240	18%				
-0.220	19%	L3	0.007	1.2E-05	
-0.200	25%	L4	0.052	8.1E-05	Overlapping cracks
-0.192	19%	L5	0.022	3.4E-05	Overlapping cracks
-0.180	15%				
-0.172	15%	L6	SCC		Overlapping cracks
-0.160	11%				
-0.152	8%				
-0.140	15%				
-0.120	27%				
-0.108	23%	L7	0.000	1.6E-07	
-0.100	32%	L8	0.001	1.7E-06	
-0.080	51%	L9	0.110	1.7E-04	Overlapping cracks
-0.074	51%				
-0.060	51%				
-0.040	48%				
-0.020	53%				
0.000	49%				
0.020	49%				
0.040	48%				
0.060	47%				
0.068	43%	L10	0.038	5.8E-05	Overlapping cracks
0.080	40%				
0.100	41%	L11	SCC		
0.120	36%				
0.132	33%	L12	SCC		Overlapping cracks
0.140	31%				
0.160	29%	L13	0.048	7.5E-05	
0.180	28%				
0.200	28%				
0.220	20%	L14	0.007	1.1E-05	
0.228	15%	L15	0.009	1.4E-05	
0.240	14%				
0.252	13%	L16	0.006	9.9E-06	
0.260	13%				
0.280	9%				
0.300	13%				
0.320	6%				
0.340	3%				
0.360	2%				
0.364	4%				
0.368	2%				
0.370	0%				End of SCC
Length	0.782				
Max Depth	53.45				
Avg. Depth	23.59				

Tails Excluded By 4C Criterion			
Length	Depth	Ligament Number	Length
-0.300	0.00	L1	-0.412
-0.260	12.58		-0.400
-0.270	14.47	L2	-0.380
-0.260	18.98		-0.360
-0.240	18.04		-0.340
-0.220	19.27	L3	-0.320
-0.200	25.31	L4	
-0.192	19.20	L5	
-0.180	15.13		
-0.172	15.49	L6	
-0.160	10.91		
-0.152	8.15		
-0.140	14.98		
-0.120	27.35		
-0.108	23.20	L7	
-0.100	32.00	L8	
-0.080	51.20	L9	
-0.074	51.05		
-0.060	51.13		
-0.040	48.07		
-0.020	53.45		
0.000	49.31		
0.020	48.65		
0.040	48.07		
0.060	48.98		
0.068	43.35	L10	
0.080	39.58		
0.100	41.31	L11	
0.120	36.36		
0.132	32.87	L12	
0.140	30.98		
0.160	29.09	L13	
0.180	27.93		
0.200	27.85		0.300
0.220	20.36	L14	0.320
0.228	14.98	L15	0.340
0.24	13.7455		0.360
0.252	12.8	L16	0.364
0.26	13.3818		0.368
0.28	0		0.370
Length	0.58		
Max Depth	53.45		
Avg. Depth	29.77		

Length	0.15" Average	Lig. Corrected
-0.30	14.09	13.84
-0.29	14.91	14.66
-0.28	15.85	15.02
-0.27	16.13	15.05
-0.26	16.06	14.97
-0.25	16.02	14.93
-0.24	15.68	14.59
-0.23	15.20	14.12
-0.22	15.19	14.11
-0.21	16.44	15.45
-0.20	17.67	16.68
-0.19	18.30	17.31
-0.18	19.33	18.40
-0.17	20.66	19.73
-0.16	22.58	20.42
-0.15	24.53	22.36
-0.14	26.44	24.27
-0.13	28.22	26.14
-0.12	29.74	27.66
-0.11	31.23	29.74
-0.10	33.25	32.00
-0.09	35.38	34.13
-0.08	37.37	36.12
-0.07	39.61	38.36
-0.06	41.99	40.74
-0.05	43.96	42.71
-0.04	45.54	44.29
-0.03	46.73	45.48
-0.02	48.13	46.88
-0.01	48.79	47.13
0.00	48.67	47.01
0.01	48.04	47.62
0.02	47.47	47.04
0.03	46.74	46.32
0.04	45.97	45.54
0.05	45.07	44.65
0.06	43.91	43.48
0.07	42.53	42.11
0.08	41.22	40.25
0.09	40.00	39.03
0.10	38.76	37.79
0.11	37.54	36.57
0.12	36.33	35.36
0.13	34.92	33.95
0.14	33.32	32.27
0.15	31.44	30.29
0.16	29.70	28.97
0.17	28.12	27.33
0.18	26.53	25.74
0.19	24.50	23.70
0.20	22.21	21.42
0.21	21.33	20.53
0.22	20.56	19.76
0.23	19.81	19.02
0.24	19.03	18.23
0.25	18.19	17.94
0.26	17.25	17.00
0.27	16.18	15.93
0.28	14.88	14.63
Length	0.58	0.58
Max Depth	48.79	47.62
Avg. Depth	30.04	29.03

Sample 2 - TSP 5H - Crack 1

Destructive Exam

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
-0.460	0%				End of SCC
-0.440	6%				
-0.420	10%				
-0.400	12%				
-0.380	3% L1		0.051	0.23	DUCTILE
-0.360	11%				
-0.340	13%				
-0.320	19%				
-0.300	19%				
-0.280	15%				
-0.260	16%				
-0.240	14%				
-0.220	17% L3		0.061	0.19	DUCTILE
-0.200	18%				
-0.180	21%				
-0.160	18%				
-0.140	8% L2		0.074	0.23	DUCTILE
-0.120	23%				
-0.100	24%				
-0.080	34%				
-0.060	32%				
-0.040	34%				
-0.020	33%				
0.000	36%				
0.020	41%				
0.040	40%				
0.060	37%				
0.080	31%				
0.100	17%				
0.120	14%				
0.140	10%				
0.160	20%				
0.180	13%				
0.200	0%				
0.220	9%				
0.240	15%				
0.260	12%				
0.280	5%				
0.300	0%				
0.320	21%				
0.340	19%				
0.360	20%				
0.380	19%				
0.400	15%				
0.420	13%				
0.440	16%				
0.460	9%				
0.480	0%				END OF SCC
Length	0.94				
Max Depth	41.0				
Avg. Depth	17.70				

Adjusted Destructive Exam

Length		Depth		Ligament Number
Tails Excluded By 4C Cntenon				
-0.380	0.00	L1	-0.460	0.00
-0.360	11.00		-0.440	5.53
-0.340	13.00		-0.420	10.25
-0.320	19.00		-0.400	11.56
-0.300	19.00			
-0.280	15.00			
-0.260	16.00			
-0.240	14.00			
-0.220	17.00	L3		
-0.200	18.00			
-0.180	21.00			
-0.160	18.00			
-0.140	8.00	L2		
-0.120	23.00			
-0.100	24.00			
-0.080	34.00			
-0.060	32.00			
-0.040	34.00			
-0.020	33.00			
0.000	36.00			
0.020	41.00			
0.040	40.00			
0.060	37.00			
0.080	31.00			
0.100	17.00			
0.120	14.00			
0.140	10.00			
0.160	20.00			
0.180	13.00			
0.200	0.00			
0.220	9.00			
0.240	15.00			
0.260	12.00			
0.280	5.00			
0.300	0.00			
0.320	21.00			
0.340	19.00			
0.360	20.00			
0.380	19.00			
0.400	15.00			
0.420	13.00			
0.440	16.00			
0.460	9.00			
0.480	0.00			
Length	0.86			
Max Depth	41			
Avg. Depth	18.83			

Final Data

Length	0.16" Average	Lig. Corrected
-0.380	12.72	12.15
-0.370	13.15	12.57
-0.360	13.32	12.74
-0.350	13.50	12.92
-0.340	13.69	13.12
-0.330	13.79	13.21
-0.320	13.80	13.22
-0.310	13.91	13.33
-0.300	14.09	12.83
-0.290	15.12	14.44
-0.280	15.85	15.17
-0.270	16.35	15.67
-0.260	16.88	16.20
-0.250	17.26	16.58
-0.240	17.38	16.70
-0.230	17.03	16.35
-0.220	16.38	14.87
-0.210	16.18	14.66
-0.200	16.53	15.02
-0.190	17.03	15.52
-0.180	17.53	16.02
-0.170	18.29	16.78
-0.160	19.41	17.90
-0.150	20.53	19.02
-0.140	21.50	19.99
-0.130	22.44	21.61
-0.120	23.41	22.58
-0.110	24.32	23.49
-0.100	25.12	24.29
-0.090	25.91	25.08
-0.080	26.88	26.05
-0.070	28.09	27.26
-0.060	29.74	28.90
-0.050	31.65	31.65
-0.040	33.09	33.09
-0.030	34.00	34.00
-0.020	34.79	34.79
-0.010	35.38	35.38
0.000	35.50	35.50
0.010	34.91	34.91
0.020	33.97	33.97
0.030	33.00	33.00
0.040	31.88	31.88
0.050	30.59	30.59
0.060	29.21	29.21
0.070	28.15	28.15
0.080	27.29	27.29
0.090	26.15	26.15
0.100	24.65	24.65
0.110	22.62	22.62
0.120	20.24	20.24
0.130	18.15	18.15
0.140	16.41	16.41
0.150	14.94	14.94
0.160	13.82	13.82
0.170	12.79	12.79
0.180	12.09	12.09
0.190	11.59	11.59
0.200	10.97	10.97
0.210	10.29	10.29
0.220	9.59	9.59
0.230	9.62	9.62
0.240	9.97	9.97
0.250	9.97	9.97
0.260	10.12	10.12
0.270	10.50	10.50
0.280	11.29	11.29
0.290	12.44	12.44
0.300	13.29	13.29
0.310	13.76	13.76
0.320	13.94	13.94
0.330	13.88	13.88
0.340	13.85	13.85
0.350	14.00	14.00
0.360	14.44	14.44
0.370	14.88	14.88
0.380	15.26	15.26
0.390	15.53	15.53
0.400	14.91	14.91
0.410	14.53	14.53
0.420	14.17	14.17

Sample 2 - TSP 5H - Crack 1

Destructive Exam

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes

Adjusted Destructive Exam

Ligament Number			
Length	Depth	Length	Depth
Tails Excluded By 4C Cntenon			

Final Data

Length	0.16" Average	Lig. Corrected
0.430	13.82	13.82
0.440	13.38	13.38
0.450	12.83	12.83
0.460	12.23	12.23
0.470	11.55	11.55
0.480	10.94	10.94
Length	0.86	0.86
Max Depth	35.5	35.5
Avg. Depth	18.70	18.34

Sample 3 - TSP 3H - Crack 1

Destructive Exam

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (in ²)	Notes
No Exclusion Criterion Applied				
0.000	18			
0.011	26			
0.029	26			
0.031	31	L1	0.00016	
0.033	35			
0.084	35			
0.093	26			
0.099	18			
0.119	10			
0.1195	14	L2	0.0003	
0.120	18			
0.138	26			
0.158	26			
0.181	18			
0.188	10			
Length	0.188			
Max Depth	35.00			
Avg. Depth	25.73			

Final Data

Length	0.16" Average	Lig. Corrected
0.00	30.28	29.12
0.01	30.15	28.99
0.02	28.98	27.82
0.03	27.69	26.53
0.04	26.94	23.61
0.05	26.62	23.29
0.06	26.58	23.24
0.07	26.54	23.21
0.08	26.47	23.13
0.09	26.70	23.36
0.10	26.29	22.95
0.11	26.31	22.97
0.12	26.18	24.00
0.13	25.55	23.37
0.14	24.82	22.64
0.15	23.97	21.80
0.16	22.97	20.79
0.17	21.76	19.59
0.18	20.96	18.79
0.19	19.86	17.69
Length	0.188	0.188
Max Depth	30.00	29.12
Avg. Depth	25.68	23.40

Sample 3 - TSP 4H - Crack 1

Destructive Exam

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (in ²)	Notes
No Exclusion Criterion Applied				
0.00	2			
0.04	8			
0.06	16			
0.08	8			
0.09	6			
0.097	4	L1	0.0001	
0.11	2			
0.13	8			
0.15	8			
0.152	8	L2	0.00005	
0.153	8			
0.18	8			
0.183	0			
Length	0.183			
Max Depth	16.00			
Avg. Depth	7.28			

Final Data

Length	0.16" Average	Lig. Corrected
0.00	6.99	6.99
0.01	7.72	7.72
0.02	7.80	7.08
0.03	7.58	6.85
0.04	7.19	6.47
0.05	6.87	6.14
0.06	6.83	6.11
0.07	6.91	5.83
0.08	6.99	5.90
0.09	7.39	6.30
0.10	7.70	6.61
0.11	7.91	6.82
0.12	8.05	6.96
0.13	8.10	7.01
0.14	7.88	6.79
0.15	7.19	6.10
0.16	6.56	5.47
0.17	6.32	5.23
0.18	6.43	5.34
0.18	6.10	5.74
Length	0.183	0.183
Max Depth	8.10	7.72
Avg. Depth	7.30	6.41

Sample 4 - TSP 4H - Crack 1

Destructive Exam					Final Data			
Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes	Length	0.16" Average	Lig. Corrected
No Tails Excluded								
0.000	4.00					0	4.00	4.00
0.072	4.00					0.01	4.00	3.57
0.087	4.00					0.02	4.00	3.57
0.102	4.00					0.03	4.00	3.57
0.130	4.00					0.04	4.00	3.57
0.168	6.00					0.05	4.00	3.57
0.170	5.00					0.06	4.04	3.60
0.172	4.00					0.07	4.10	3.66
0.178	6.00					0.08	4.19	3.75
0.187	12.00					0.09	4.24	2.94
0.202	12.00					0.1	4.44	3.14
0.217	6.00					0.11	4.91	3.61
0.222	17.00					0.12	5.38	4.08
0.227	28.00					0.13	5.66	4.36
0.242	28.00					0.14	6.17	4.60
0.293	12.00					0.15	7.58	6.02
0.318	6.00					0.16	8.99	7.43
0.334	6.00					0.17	10.26	8.69
0.339	12.00					0.18	11.34	10.21
0.356	12.00					0.19	12.23	11.10
0.357	6.00					0.2	12.94	11.81
0.365	9.00					0.21	13.47	12.34
0.373	12.00					0.22	13.84	12.71
0.414	28.00					0.23	14.04	12.91
0.432	28.00					0.24	14.10	12.96
0.435	18.00					0.25	14.12	12.99
0.439	12.00					0.26	14.53	14.27
0.446	9.00					0.27	14.81	14.55
0.453	6.00					0.28	14.52	14.26
0.494	6.00					0.29	14.45	13.95
0.551	4.00					0.3	14.80	14.30
						0.31	15.16	14.92
						0.32	14.84	14.60
Length	0.55					0.33	14.74	14.51
Max Depth	28					0.34	14.89	14.65
Avg. Depth	10.16					0.35	15.22	14.99
						0.36	14.77	14.54
						0.37	14.26	13.71
						0.38	13.85	13.31
						0.39	13.60	13.05
						0.4	13.48	12.94
						0.41	13.48	12.94
						0.42	13.47	12.93
						0.43	13.08	12.54
						0.44	12.68	12.13
						0.45	12.54	11.99
						0.46	12.16	11.85
						0.47	11.53	11.22
						0.48	11.08	10.78
						0.49	10.32	10.01
						0.5	9.17	8.86
						0.51	7.72	7.41
						0.52	6.03	5.72
						0.53	5.52	5.22
						0.54	5.35	5.35
						0.55	5.27	5.27
						0.551	5.15	5.15
						Length	0.551	0.551
						Max Depth	15.22	14.99
						Avg. Depth	10.22	9.57

Length
Max Depth
Avg. Depth

Sample 5 - TSP 1H - Crack 1

Destructive Exam

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (in ²)	Notes
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Data Exclusion Criterion 4b Applied

Final Data

Length		
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Length = 0.294" (-0.131 to 0.163)
 Max Depth = 42%
 0.063" @ 42% depth, extending from 0.230" to 0.294"

Notes

Data Developed from Radial Grnds at Surface and 40% Depth

Length = 0.294"
 Local Max depth = 42%
 Avg. Max Depth = Estimated at 30-35%. Use 35%.
 Avg. Depth = Estimated at 20-30%

Data Exclusion Criterion 4b Applies

- Data valid for length and range of max. and avg. depth noted
- Results can be used for POD
- Results can be used for length and max. depth NDE uncertainties only
- Inadequate data to estimate average depth for NDE uncertainties

Sample 6 - TSP 1H - Crack 1

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
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Length	0.16" Average	Ljg. Corrected
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No Exclusion Criteron Applied					
-0.352	0%				end of scc
-0.340	30%				
-0.320	43%	LS			
-0.300	44%				
-0.292	46%		0.511	7.92E-04	step
-0.288	4%				
-0.280	4%				
-0.264	34%				
-0.260	36%		0.058	8.93E-05	step
-0.240	69%				
-0.220	66%				
-0.204	68%		0.058	9.04E-05	back step
-0.200	65%				
-0.180	69%				
-0.176	71%		0.033	5.12E-05	back step
-0.160	67%				
-0.140	75%				
-0.120	79%				
-0.100	83%				
-0.092	83%		0.030	4.63E-05	back step
-0.080	83%				
-0.060	82%				
-0.040	84%				
-0.020	85%				
0.000	84%				
0.020	83%				
0.024	82%		0.183	2.83E-04	step
0.040	83%				
0.060	83%				
0.080	85%				
0.098	88%		0.107	1.65E-04	back step
0.100	89%				
0.120	87%				
0.140	86%				
0.160	86%				
0.170	87%		0.007	1.04E-05	back step
0.180	85%				
0.200	78%				
0.220	65%				
0.226	66%		0.044	6.79E-05	back step
0.240	72%				
0.260	75%				
0.280	69%				
0.300	50%				
0.312	39%		0.034	5.29E-05	step
0.320	28%				
0.340	0%				end of main crack
0.344	0%				area between separate
0.360	18%				
0.380	32%				
0.400	28%				
0.418	7%				no ligament, near end
0.420	0%				end of SCC
Length	0.772				
Max Depth	83.80				
Avg. Depth	62.94				

-0.352	28.70	22.95
-0.342	29.29	22.90
-0.332	31.06	24.67
-0.322	33.92	27.53
-0.312	36.51	30.12
-0.302	38.64	32.25
-0.292	40.52	34.13
-0.282	42.14	35.09
-0.272	43.59	36.55
-0.262	47.63	40.59
-0.252	50.24	42.82
-0.242	52.12	44.70
-0.232	53.78	46.36
-0.222	55.56	48.14
-0.212	57.47	50.05
-0.202	59.40	52.73
-0.192	63.92	62.24
-0.182	67.67	66.00
-0.172	70.53	69.17
-0.162	72.57	71.21
-0.152	73.60	72.24
-0.142	74.47	73.10
-0.132	75.44	74.08
-0.122	76.44	75.08
-0.112	77.50	76.80
-0.102	78.58	77.87
-0.092	79.51	78.81
-0.082	80.35	80.01
-0.072	81.30	80.97
-0.062	82.08	81.74
-0.052	82.57	80.18
-0.042	82.96	80.57
-0.032	83.21	80.81
-0.022	83.32	80.93
-0.012	83.38	80.99
-0.002	83.49	81.43
0.008	83.67	81.61
0.018	83.96	80.71
0.028	84.31	81.06
0.038	84.57	81.32
0.048	84.74	81.49
0.058	84.82	81.57
0.068	84.87	81.62
0.078	84.94	81.62
0.088	85.11	81.78
0.098	85.24	81.91
0.108	85.20	81.87
0.118	84.99	83.72
0.128	84.40	83.13
0.138	83.44	82.16
0.148	82.50	80.73
0.158	81.74	79.98
0.168	81.04	79.28
0.178	80.36	78.59
0.188	79.45	78.89
0.198	78.36	77.79
0.208	76.83	76.26
0.218	74.80	74.23
0.228	72.26	71.30
0.238	69.01	68.06
0.248	64.94	64.07
0.258	60.01	59.13
0.268	55.23	54.35
0.278	51.28	50.41
0.288	48.04	47.16
0.298	45.57	44.69
0.308	43.46	42.59
0.318	41.22	40.84
0.328	38.18	37.78
0.338	34.29	33.91
0.348	31.75	31.37
0.358	29.03	28.64
0.368	26.14	25.75
0.378	23.42	23.04
0.388	21.03	20.65
0.398	19.06	19.06
0.408	17.90	17.90
0.418	18.03	18.03
0.42	17.72	17.72
Length	0.772	0.772

Sample 6 - TSP 1H - Crack 1

Destructive Exam

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
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No Exclusion Criterion Applied

Final Data

Length	0.16" Average	Lig. Corrected
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Max Depth	85.24	83.72
Avg. Depth	62.99	60.54

Sample 6 - TSP 2H - Crack 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
-0.292	0%				End of SCC
-0.284	37%				
-0.280	49%	L3	0.045	7.0E-05	
-0.260	58%				
-0.240	51%				
-0.220	47%	L1	SCC		
-0.200	43%				
-0.180	35%		0.015	2.3E-05	
-0.192	38%				
-0.160	39%				
-0.152	41%	L2	0.560	8.7E-04	Overlapping cracks
-0.144	48%				
-0.140	60%				
-0.120	72%				
-0.100	72%	L7	0.023	3.6E-05	
-0.080	77%				
-0.072	76%	L5	0.026	4.0E-05	Overlapping cracks
-0.060	73%				
-0.040	68%				
-0.020	74%				
0.000	79%	L6	0.023	3.5E-05	Overlapping cracks
0.020	80%				
0.040	72%				
0.060	72%				
0.080	71%				
0.100	69%				
0.120	72%				
0.140	73%				
0.160	70%				
0.180	71%				
0.200	77%				
0.220	77%				
0.228	76%	L9	0.043	6.7E-05	
0.240	77%				
0.260	72%				
0.264	69%	L8	0.281	4.4E-04	Overlapping cracks
0.280	69%				
0.300	71%				
0.312	61%	L10	0.034	5.2E-05	
0.320	61%				
0.332	52%	L11	0.044	6.9E-05	
0.340	50%				
0.360	33%				
0.364	34%	L12	0.033	5.1E-05	Overlapping cracks
0.380	35%				
0.400	15%				
0.420	5%				
0.424	0%				End of SCC
Length	0.716				
Max Depth	80.22				
Avg. Depth	60.52				

Length		Depth		Ligament Number	Length	Depth
Tails Excluded By 4C Cntenon						
-0.292	0.00	-0.292	0.00			
-0.284	37.02	-0.284	37.02			
-0.280	48.65	-0.280	48.65	L3		
-0.260	57.53	-0.260	57.53			
-0.240	51.35	-0.240	51.35			
-0.220	47.27	-0.220	47.27	L1		
-0.200	42.91	-0.200	42.91			
-0.192	37.53	-0.192	37.53			
-0.180	35.35	-0.180	35.35			
-0.160	38.55	-0.160	38.55			
-0.152	40.51	-0.152	40.51	L2		
-0.144	48.00	-0.144	48.00			
-0.140	60.36	-0.140	60.36			
-0.120	72.29	-0.120	72.29			
-0.100	72.00	-0.100	72.00	L7		
-0.080	77.38	-0.080	77.38			
-0.072	76.00	-0.072	76.00	L5		
-0.060	73.31	-0.060	73.31			
-0.040	67.71	-0.040	67.71			
-0.020	74.11	-0.020	74.11			
0.000	78.84	0.000	78.84	L6		
0.020	80.22	0.020	80.22			
0.040	71.64	0.040	71.64			
0.060	72.15	0.060	72.15			
0.080	70.69	0.080	70.69			
0.100	69.24	0.100	69.24			
0.120	72.29	0.120	72.29			
0.140	72.58	0.140	72.58			
0.160	69.53	0.160	69.53			
0.180	70.55	0.180	70.55			
0.200	76.95	0.200	76.95			
0.220	76.58	0.220	76.58			
0.228	76.29	0.228	76.29	L9		
0.240	76.58	0.240	76.58			
0.260	72.44	0.260	72.44			
0.264	68.87	0.264	68.87	L8		
0.280	68.58	0.280	68.58			
0.300	61.13	0.300	61.13			
0.312	61.45	0.312	61.45	L10		
0.320	61.24	0.320	61.24			
0.332	51.71	0.332	51.71	L11		
0.340	49.67	0.340	49.67			
0.360	32.73	0.360	32.73			
0.364	33.67	0.364	33.67	L12		
0.380	35.35	0.380	35.35		0.420	4.65
0.400	0.00	0.400	0.00		0.424	0.00
Length	0.692	Length	0.692			
Max Depth	80.22	Max Depth	80.22			
Avg. Depth	62.10	Avg. Depth	62.10			

Length	0.16" Average	Ug. Corrected
-0.292	44.62	44.12
-0.282	44.50	43.99
-0.272	43.86	43.36
-0.262	43.18	42.51
-0.252	42.68	42.00
-0.242	42.36	41.69
-0.232	42.24	35.27
-0.222	42.98	36.02
-0.212	44.29	37.32
-0.202	48.47	41.50
-0.192	50.20	43.74
-0.182	51.36	44.64
-0.172	52.39	45.67
-0.162	53.67	46.95
-0.152	55.09	48.07
-0.142	56.50	49.49
-0.132	57.88	50.86
-0.122	59.21	52.20
-0.112	60.80	53.78
-0.102	62.91	55.90
-0.092	65.28	58.44
-0.082	67.74	60.64
-0.072	70.16	63.06
-0.062	72.49	71.68
-0.052	73.82	73.01
-0.042	74.25	73.44
-0.032	74.29	73.49
-0.022	74.29	73.48
-0.012	74.26	73.72
-0.002	74.07	73.52
0.008	73.67	73.13
0.018	73.28	73.03
0.028	73.09	72.83
0.038	73.14	72.89
0.048	73.38	73.13
0.058	73.52	73.26
0.068	73.39	73.14
0.078	73.03	72.78
0.088	72.54	72.54
0.098	72.01	72.01
0.108	71.60	71.60
0.118	71.57	71.57
0.128	71.82	71.82
0.138	72.11	72.11
0.148	72.35	71.87
0.158	72.64	72.16
0.168	72.88	72.40
0.178	73.05	72.56
0.188	73.01	69.36
0.198	72.90	69.26
0.208	72.76	69.12
0.218	72.67	69.02
0.228	72.21	68.18
0.238	71.62	67.59
0.248	70.74	66.21
0.258	69.58	65.05
0.268	67.96	63.43
0.278	65.68	61.15
0.288	63.20	58.30
0.298	60.75	55.85
0.308	57.85	52.95
0.318	54.38	49.96
0.328	50.77	46.36
0.338	49.26	44.85
0.348	47.69	43.28
0.358	46.18	44.93
0.368	44.46	43.20
0.378	42.36	41.11
0.388	39.77	38.52
0.398	37.28	36.40
0.4	34.61	33.74
Length	0.692	0.692
Max Depth	74.29	73.72
Avg. Depth	62.11	59.09

Sample 6 - TSP 3H - Crack 1

Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
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Length	0.16" Average	Lig. Corrected
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No Exclusion Criterion Applied

-0.308	0%				end of scc
-0.292	29%				
-0.288	40%				
-0.280	42%				
-0.260	44%				
-0.252	61%				
-0.244	64%				
-0.240	68%				
-0.220	67%				
-0.212	61%				
-0.200	54%				
-0.180	54%				
-0.170	54%	L8	0.033	5.06E-05	step
-0.160	56%				
-0.144	54%				
-0.140	58%	L1	0.090	1.39E-04	step
-0.120	64%				
-0.100	66%				
-0.080	68%				
-0.060	68%				
-0.040	66%				
-0.020	64%				
-0.001	55%				
0.000	63%				
0.020	67%	L2	0.020	3.16E-05	back step
0.040	71%				
0.054	73%				
0.060	74%				
0.076	73%				
0.080	65%				
0.094	64%	L7	0.044	6.82E-05	step
0.096	65%	L3	0.035	5.35E-05	back step
0.100	66%				
0.120	61%				
0.140	61%	L6	0.714	1.11E-03	step
0.148	54%				
0.160	58%	L4	0.014	2.23E-05	front step
0.180	64%				
0.200	71%				
0.218	67%	L5	0.012	1.86E-05	back step
0.220	66%				
0.228	45%				
0.232	45%				
0.236	28%				
0.240	36%				
0.252	37%				
0.260	40%				
0.268	38%				
0.276	24%				
0.280	0%				end of scc
Length	0.588				
Max Depth	74.11				
Avg. Depth	59.33				

-0.308	43.11	43.11
-0.298	45.33	45.33
-0.288	46.55	46.55
-0.278	47.20	47.20
-0.268	47.73	47.73
-0.258	48.18	48.18
-0.248	48.57	48.20
-0.238	49.00	48.63
-0.228	49.32	48.95
-0.218	52.75	51.38
-0.208	55.31	53.94
-0.198	56.72	55.35
-0.188	58.10	56.72
-0.178	59.49	58.11
-0.168	60.62	59.25
-0.158	60.95	59.57
-0.148	60.98	59.60
-0.138	61.03	59.66
-0.128	61.13	59.75
-0.118	61.55	60.17
-0.108	62.17	60.79
-0.098	62.69	61.32
-0.088	62.94	61.57
-0.078	63.47	62.47
-0.068	64.06	63.05
-0.058	64.84	63.61
-0.048	65.50	65.27
-0.038	66.08	65.85
-0.028	66.58	66.35
-0.018	67.09	66.86
-0.008	67.49	67.26
0.002	67.34	67.11
0.012	67.09	66.37
0.022	66.96	65.85
0.032	66.67	65.56
0.042	66.30	65.19
0.052	66.00	64.89
0.062	65.65	64.51
0.072	65.19	64.05
0.082	65.24	64.59
0.092	65.15	64.86
0.102	65.10	65.81
0.112	65.14	66.07
0.122	65.21	66.14
0.132	65.05	65.84
0.142	64.37	65.17
0.152	62.64	63.43
0.162	60.43	61.23
0.172	58.83	59.63
0.182	57.40	58.69
0.192	55.35	57.03
0.202	54.87	56.55
0.212	54.48	56.16
0.222	54.03	55.71
0.232	53.66	55.36
0.242	53.53	55.23
0.252	53.03	54.90
0.262	52.16	54.02
0.272	50.77	53.64
0.280	43.19	43.05
Length	0.588	0.588
Max Depth	67.49	67.26
Avg. Depth	59.26	56.14

Sample 6 - TSP 4H - Crack 1

Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
No Exclusion Criterion Applied					
-0.232	0%				End of SCC
-0.220	25%				
-0.200	41%	L5	0.197	0.360	DUCTILE
-0.180	41%				
-0.160	53%				
-0.140	53%	L6	0.031	0.120	DUCTILE
-0.120	47%				
-0.100	61%				
-0.080	62%	L4	0.036	0.130	DUCTILE
-0.060	67%				
-0.040	69%				
-0.032	75%				
-0.020	67%				
0.000	62%				
0.020	55%				
0.040	67%	L3	0.043	0.130	DUCTILE
0.060	65%				
0.080	66%				
0.100	46%	L2	0.060	0.170	DUCTILE
0.120	48%	L1	0.042	0.120	DUCTILE
0.140	39%	L7	0.158	0.320	DUCTILE
0.160	29%				
0.180	10%				
0.184	0%				End of SCC
Length	0.416				
Max Depth	75				
Avg. Depth	51.25				

Length	0.16" Average	Ug. Corrected
-0.232	35.71	33.49
-0.222	37.41	34.85
-0.212	38.59	36.02
-0.202	39.30	36.74
-0.192	40.30	37.73
-0.182	41.65	39.09
-0.172	42.95	40.39
-0.162	44.12	41.15
-0.152	45.29	42.32
-0.142	49.22	46.25
-0.132	52.02	49.05
-0.122	54.23	51.26
-0.112	56.35	55.59
-0.102	57.98	57.22
-0.092	59.43	58.67
-0.082	60.45	59.69
-0.072	60.91	60.15
-0.062	61.09	60.33
-0.052	61.50	61.09
-0.042	62.39	61.50
-0.032	63.51	62.62
-0.022	64.29	63.40
-0.012	64.67	63.78
-0.002	64.98	64.09
0.008	64.78	64.29
0.018	63.84	62.68
0.028	62.65	61.50
0.038	61.46	59.84
0.048	60.03	58.41
0.058	57.97	54.58
0.068	56.02	52.62
0.078	53.95	50.55
0.088	51.52	48.13
0.098	48.75	45.35
0.108	45.46	42.06
0.118	44.57	41.17
0.128	43.17	40.26
0.138	41.53	38.61
0.148	39.68	36.77
0.158	37.51	34.59
0.168	34.89	31.97
0.178	32.56	29.64
0.184	30.84	28.59
Length	0.416	0.416
Max Depth	64.98	64.29
Avg. Depth	51.53	49.41

Sample 6 - TSP 5H - Crack 1

Destructive Exam

Final Data

No Exclusion Criterion Applied								
Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes	Length	0.16" Average	Lig. Corrected
-0.372	0%				End of crack array	-0.372	18.62	17.86
-0.368	25%					-0.362	19.48	18.72
-0.360	32%				separate crack	-0.352	17.71	16.95
-0.350	38%					-0.342	16.24	14.38
-0.340	36%					-0.332	14.99	13.13
-0.332	33%					-0.322	16.58	14.73
-0.324	0%					-0.312	18.79	16.93
-0.320	0%	L1	0.068	1.1E-04	really between 2 cracks	-0.302	21.10	19.25
-0.312	0%					-0.292	22.90	17.78
-0.308	0%					-0.282	25.74	20.61
-0.304	4%					-0.272	27.17	22.04
-0.300	14%					-0.262	28.72	23.59
-0.288	26%				separate crack	-0.252	30.65	25.52
-0.280	28%					-0.242	33.06	27.94
-0.276	24%					-0.232	37.63	33.27
-0.272	0%					-0.222	42.38	38.02
-0.260	0%	L2	0.097	1.5E-04	really between 2 cracks	-0.212	46.52	42.15
-0.252	0%					-0.202	49.73	45.37
-0.240	45%				start of main crack	-0.192	52.57	48.20
-0.220	57%					-0.182	56.98	52.60
-0.208	49%	L3	0.291	4.5E-04	overlapping cracks	-0.172	61.91	58.50
-0.200	48%					-0.162	66.79	63.38
-0.180	65%					-0.152	69.30	65.74
-0.160	75%					-0.142	71.33	67.77
-0.140	81%					-0.132	73.01	69.45
-0.120	76%					-0.122	74.87	74.58
-0.100	75%					-0.112	76.84	76.55
-0.092	84%	L4	0.012	1.9E-05	overlapping cracks	-0.102	78.34	76.99
-0.080	83%					-0.092	79.09	77.74
-0.076	78%	L5	0.014	2.1E-05	overlapping cracks	-0.082	79.24	77.89
-0.060	85%					-0.072	79.09	77.74
-0.040	83%					-0.062	78.82	76.11
-0.020	80%	L6	0.094	1.5E-04	overlapping cracks	-0.052	78.54	75.82
0.000	71%					-0.042	78.53	75.81
0.020	73%	L7	0.122	1.9E-04	overlapping cracks	-0.032	78.71	76.00
0.040	80%					-0.022	78.97	75.86
0.060	80%	L8	0.035	5.5E-05		-0.012	78.98	75.86
0.080	67%					-0.002	78.05	75.07
0.100	70%					0.008	77.20	74.22
0.120	68%					0.018	76.60	73.77
0.124	67%	L9	0.065	1.0E-04		0.028	75.71	72.88
0.140	64%					0.038	74.75	71.93
0.160	64%					0.048	73.73	70.17
0.180	55%					0.058	72.72	69.16
0.200	47%					0.068	71.77	69.27
0.220	30%					0.078	71.05	68.55
0.228	17%					0.088	70.37	67.87
0.232	0				end of crack and array	0.098	69.42	66.92
						0.108	68.15	67.02
						0.118	66.50	65.36
						0.128	64.22	63.09
						0.138	61.41	60.28
						0.148	57.70	56.97
						0.158	56.83	55.90
						0.168	55.84	55.11
						0.178	54.95	54.22
						0.188	53.81	53.07
						0.198	52.53	51.79
						0.208	51.12	50.38
						0.218	49.63	49.63
						0.228	47.98	47.98
						0.232	45.96	45.98
Length	0.604					Length	0.604	0.604
Max Depth	85.09					Max Depth	79.24	77.89
Avg. Depth	56.63					Avg. Depth	56.58	54.09

Sample 7 - TSP 1H Crack 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm^2)	Ligament Type/Area (in^2)	Notes
-0.408	0%				End of first crack
-0.400	4%				
-0.380	13%				
-0.360	24%				
-0.352	14%				
-0.340	14%				
-0.320	12%				
-0.300	3%	L8	SCC		
-0.296	0%				End of first crack
-0.280	0%				
-0.260	3%				very shallow scc
-0.240	1%				
-0.220	0%				
-0.214	0%				
-0.200	15%	L7	SCC		Start of major crack seg
-0.180	30%				
-0.160	13%				
-0.140	19%				
-0.120	28%				
-0.100	30%				
-0.080	36%	L3	SCC		Overlapping cracks on d
-0.060	23%	L6	SCC		
-0.040	29%	L5	SCC		Overlapping cracks on d
-0.020	31%				
0.000	33%				
0.020	39%	L2	0.205	3.2E-04	Overlapping cracks on d
0.040	38%				
0.060	31%				
0.072	27%				
0.080	23%				
0.096	5%	L4	0.191	3.0E-04	Overlapping cracks on d
0.100	0%				end of center cracks
0.108	0%				
0.120	13%				separate crack
0.140	14%				
0.160	17%				
0.168	18%	L1	0.038	5.9E-05	
0.180	17%				
0.200	16%				
0.220	19%				
0.240	20%				
0.260	13%				
0.264	0%				
0.272	0%				
0.280	8%				separate crack
0.300	23%				
0.320	25%				
0.340	31%				
0.356	8%				
0.360	17%				
0.370	17%				
0.380	13%				
0.384	0%				end of crack array
Length	0.79				
Max Depth	39.49				
Avg. Depth	17.99				

Length		Depth		Ligament Number	Length		Depth	
Tails Excluded By 4C Criterion								
-0.214	0.00				-0.408	0.00		
-0.200	15.27	L7			-0.400	3.64		
-0.180	29.89				-0.380	12.51		
-0.160	12.80				-0.360	24.44		
-0.140	18.84				-0.352	13.75		
-0.120	28.44				-0.340	13.82		
-0.100	30.25				-0.320	12.36		
-0.080	36.44	L3			-0.300	2.69		
-0.060	23.35	L6			-0.296	0.00		
-0.040	28.65	L5			-0.280	0.00		
-0.020	31.49				-0.260	3.13		
0.000	32.73				-0.240	1.45		
0.020	39.49	L2			-0.220	0.00		
0.040	38.11							
0.060	30.84							
0.072	26.76							
0.080	23.27							
0.096	5.16	L4						
0.100	0.00							
0.108	0.00							
0.120	12.73							
0.140	13.96							
0.160	16.87							
0.168	17.89	L1						
0.180	17.38							
0.200	18.00							
0.220	19.05							
0.240	19.78							
0.260	12.65							
0.264	0.00							
0.272	0.00							
0.280	7.64							
0.300	23.05							
0.320	25.38							
0.340	30.84							
0.356	8.07							
0.360	16.51							
0.370	17.31							
0.380	12.65							
0.384	0.00							
Length	0.598							
Max Depth	39.49							
Avg. Depth	21.53							

Length	0.16" Average	Lig. Corrected
-0.214	16.94	16.94
-0.204	17.90	17.90
-0.194	18.91	18.91
-0.184	19.82	19.82
-0.174	20.77	20.77
-0.164	21.80	21.80
-0.154	22.51	22.51
-0.144	22.73	22.73
-0.134	22.86	22.86
-0.124	24.48	24.48
-0.114	25.57	25.57
-0.104	26.24	26.24
-0.094	26.53	26.53
-0.084	26.96	26.96
-0.074	28.07	28.07
-0.064	29.45	27.15
-0.054	30.72	28.41
-0.044	31.70	29.39
-0.034	32.25	29.95
-0.024	32.44	30.14
-0.014	32.38	30.08
-0.004	31.96	29.66
0.006	30.86	28.56
0.016	29.25	24.80
0.026	27.73	23.28
0.036	26.76	22.31
0.046	25.91	21.46
0.056	24.98	20.53
0.066	24.03	19.58
0.076	23.11	18.66
0.086	22.24	17.37
0.096	21.23	16.35
0.106	19.98	17.41
0.116	18.64	16.07
0.126	17.38	14.81
0.136	16.35	13.78
0.146	15.59	13.01
0.156	15.05	12.48
0.166	14.61	12.04
0.176	14.47	11.90
0.186	14.17	13.74
0.196	14.39	13.97
0.206	14.61	14.19
0.216	15.02	14.59
0.226	15.61	15.18
0.236	16.20	15.78
0.246	16.83	16.41
0.256	17.55	17.55
0.266	17.82	17.82
0.276	17.30	17.30
0.286	17.34	17.34
0.296	17.20	17.20
0.306	17.12	17.12
0.316	16.98	16.98
0.326	16.79	16.79
0.336	16.73	16.73
0.346	16.95	16.95
0.356	18.49	18.49
0.366	19.95	19.95
0.376	20.81	20.81
0.384	18.73	18.73
Length	0.598	0.598
Max Depth	32.44	30.14
Avg. Depth	21.50	20.12

Sample 7 - TSP 3H - Crack 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
-0.452	0%				End of crack array
-0.440	4%	L1	0.004	6.4E-06	
-0.426	5%				
-0.420	6%				
-0.410	9%	L3	0.004	5.6E-06	
-0.400	0%	L2	0.005	7.1E-06	main crack
-0.380	8%	L4	SCC		
-0.372	15%	L5	SCC		
-0.360	16%				
-0.340	19%				
-0.320	18%				
-0.300	18%				
-0.292	21%	L6	SCC		
-0.280	19%				
-0.260	19%				
-0.240	21%				
-0.220	20%				
-0.200	18%				
-0.180	18%				
-0.164	20%	L7	SCC		
-0.160	19%	L8	SCC		
-0.156	18%				
-0.140	20%				
-0.120	26%				
-0.100	23%				
-0.092	23%	L9	SCC		
-0.080	31%				
-0.060	39%				
-0.040	45%	L10	0.030	4.7E-05	Significant overlap
-0.020	39%				
0.000	39%				
0.020	32%				
0.040	31%	L12	SCC		
0.060	31%				
0.080	15%				
0.088	35%	L11	0.095	1.5E-04	Significant overlap
0.100	42%				
0.116	34%	L13	SCC		
0.120	37%				
0.140	27%				
0.160	18%	L14	SCC		
0.180	0%	L15	SCC		end of main crack
0.200	8%	L16	SCC		
0.220	6%				
0.226	0%				
0.240	0%				
0.260	3%				
0.280	3%	L17	SCC		
0.296	8%	L18	0.024	3.7E-05	
0.300	8%				
0.320	11%	L21	SCC		
0.336	12%				
0.340	0%				
0.344	8%	L22	SCC		
0.350	0%				
0.360	13%	L23	SCC		
0.380	12%				
0.396	10%	L19	SCC		
0.400	0%				
0.404	0%				
0.412	0%				
0.416	8%	L20	SCC		
0.420	0%				
0.424	0%				
0.428	4%				
0.432	0%				
0.438	0%				
0.440	6%				
0.460	2%				
0.480	4%				
0.488	0%				
0.516	0%				
0.528	3%				
0.538	0%				End of crack array
Length	0.99				
Max Depth	45.45				
Avg. Depth	16.29				

Length		Depth		Ligament Number	Length	Depth
Tails Excluded By 4C Criterion						
-0.380	0	L4	-0.452	0.00	-0.380	15.56
-0.372	15	L5	-0.440	4.00	-0.370	16.03
-0.360	16		-0.426	5.31	-0.360	16.28
-0.340	19		-0.420	6.11	-0.350	16.51
-0.320	18		-0.410	9.38	-0.340	16.74
-0.300	18		-0.400	0.00	-0.330	16.99
-0.292	21	L6	0.200	8.07	-0.320	17.25
-0.280	19		0.220	5.53	-0.310	17.46
-0.260	19		0.226	0.00	-0.300	17.62
-0.240	21		0.240	0.00	-0.290	18.69
-0.220	20		0.260	3.49	-0.280	18.78
-0.200	16		0.280	3.27	-0.270	18.84
-0.180	18		0.296	8.44	-0.260	18.86
-0.164	20	L7	0.300	7.78	-0.250	18.86
-0.160	19	L8	0.320	10.76	-0.240	18.92
-0.156	18		0.336	12.36	-0.230	18.99
-0.140	20		0.340	0.00	-0.220	19.10
-0.120	26		0.344	8.22	-0.210	19.39
-0.100	23		0.350	0.00	-0.200	19.75
-0.092	23	L9	0.360	13.24	-0.190	20.09
-0.080	31		0.380	11.71	-0.180	20.33
-0.060	39		0.396	10.11	-0.170	20.64
-0.040	45	L10	0.400	0.00	-0.160	21.28
-0.020	39		0.404	0.00	-0.150	22.12
0.000	39		0.412	0.00	-0.140	23.20
0.020	32		0.416	7.64	-0.130	24.51
0.040	31	L12	0.420	0.00	-0.120	26.11
0.060	31		0.424	0.00	-0.110	27.63
0.080	15		0.428	4.36	-0.100	28.93
0.088	35	L11	0.432	0.00	-0.090	30.14
0.100	42		0.436	0.00	-0.080	31.28
0.116	34	L13	0.440	6.40	-0.070	32.21
0.120	37		0.460	2.47	-0.060	32.98
0.140	27		0.480	3.56	-0.050	33.65
0.160	18	L14	0.488	0.00	-0.040	34.10
0.180	0	L15	0.516	0.00	-0.030	34.37
			0.528	3.05	-0.020	34.76
			0.538	0.00	-0.010	34.77
Length	0.56				0.000	34.20
Max Depth	45.45				0.010	34.40
Avg. Depth	25.18				0.020	34.45
					0.030	34.61
					0.040	34.29
					0.050	33.80
					0.060	33.19
					0.070	32.45
					0.080	31.47
					0.088	30.25
					0.090	28.70
					0.100	26.83
					0.110	26.56
					0.120	26.30
					0.130	25.97
					0.140	25.56
					0.150	25.75
					0.160	26.71
					0.170	25.92
					0.180	24.82
Length	0.56					0.56
Max Depth	45.45					34.43
Avg. Depth	25.18					24.95

Length	0.16" Average	Lig. Corrected
-0.380	15.56	15.56
-0.370	16.03	16.03
-0.360	16.28	16.28
-0.350	16.51	16.51
-0.340	16.74	16.74
-0.330	16.99	16.99
-0.320	17.25	17.25
-0.310	17.46	17.46
-0.300	17.62	17.62
-0.290	18.69	18.69
-0.280	18.78	18.78
-0.270	18.84	18.84
-0.260	18.86	18.86
-0.250	18.86	18.86
-0.240	18.92	18.92
-0.230	18.99	18.99
-0.220	19.10	19.10
-0.210	19.39	19.39
-0.200	19.75	19.75
-0.190	20.09	20.09
-0.180	20.33	20.33
-0.170	20.64	20.64
-0.160	21.28	21.28
-0.150	22.12	22.12
-0.140	23.20	23.20
-0.130	24.51	24.51
-0.120	26.11	25.77
-0.110	27.63	27.30
-0.100	28.93	28.59
-0.090	30.14	29.80
-0.080	31.28	30.94
-0.070	32.21	31.87
-0.060	32.98	32.64
-0.050	33.65	33.31
-0.040	34.10	33.76
-0.030	34.37	34.03
-0.020	34.76	34.42
-0.010	34.77	34.43
0.000	34.20	33.86
0.010	34.40	34.06
0.020	34.45	33.04
0.030	34.61	33.21
0.040	34.29	32.89
0.050	33.80	32.74
0.060	33.19	32.12
0.070	32.45	31.39
0.080	31.47	30.41
0.088	30.25	29.18
0.090	28.70	27.64
0.100	26.83	25.77
0.110	26.56	25.50
0.120	26.30	25.23
0.130	25.97	24.90
0.140	25.56	24.49
0.150	25.75	24.69
0.160	26.71	25.65
0.170	25.92	24.86
0.180	24.82	24.82
Length	0.56	0.56
Max Depth	34.77	34.43
Avg. Depth	25.36	24.95

Sample 8 - TSP 1H - Crack 1

Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
No Exclusion Criterion Applied					
-0.200	0%				End of SCC
-0.180	21%				
-0.160	22%				
-0.140	34%	L34			SCC?
-0.120	40%				
-0.100	53%				
-0.080	58%				
-0.060	56%				
-0.040	49%				
-0.020	52%				
0.000	52%				
0.020	54%				
0.040	49%				
0.060	44%				
0.080	44%	L31			SCC?
0.100	48%				
0.120	43%	L01	0.013	0.06	ductile
0.140	38%	L32			SCC?
0.160	33%				
0.180	31%				
0.200	24%	L33			SCC?
0.220	0%				End of SCC
Length	0.42				
Max Depth	58.00				
Avg. Depth	40.24				

Length	0.16" Average	Ug. Corrected
-0.2	23.78	23.78
-0.19	26.05	26.05
-0.18	28.50	28.50
-0.17	30.75	30.75
-0.16	32.85	32.85
-0.15	34.57	34.57
-0.14	36.00	36.00
-0.13	37.03	37.03
-0.12	37.74	37.74
-0.11	40.71	40.71
-0.1	43.15	43.15
-0.09	44.97	44.97
-0.08	46.76	46.76
-0.07	48.59	48.59
-0.06	50.12	50.12
-0.05	51.15	51.15
-0.04	51.85	51.85
-0.03	52.24	52.24
-0.02	52.09	52.09
-0.01	51.56	51.56
0	50.88	50.88
0.01	50.18	50.18
0.02	49.65	49.65
0.03	49.03	49.03
0.04	48.47	48.32
0.05	47.97	47.82
0.06	47.24	47.08
0.07	46.26	46.11
0.08	45.15	45.00
0.09	43.97	43.82
0.1	42.68	42.53
0.11	41.12	40.97
0.12	39.50	39.35
0.13	37.32	37.17
0.14	34.59	34.44
0.15	34.00	33.85
0.16	33.33	33.18
0.17	32.57	32.42
0.18	31.54	31.39
0.19	30.17	30.02
0.2	28.77	28.62
0.21	27.35	27.35
0.22	25.89	25.89
Length	0.42	0.42
Max Depth	52.24	52.24
Avg. Depth	40.79	40.73

Sample 8 - TSP 2H - Crack 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
-0.232	0%				End of SCC
-0.220	3%				
-0.200	11%				
-0.180	9%				
-0.160	18%				
-0.140	29%	L1	0.094	0.267	DUCTILE
-0.120	35%				
-0.100	41%				
-0.080	38%				
-0.060	42%	L4	0.039	0.080	DUCTILE
-0.040	44%				
-0.020	50%	L2	0.193	0.253	DUCTILE
0.000	50%				
0.020	55%	L31			SCC?
0.040	51%				
0.060	46%				
0.080	48%				
0.100	45%	L3	0.192	0.400	DUCTILE
0.120	47%				
0.140	43%				
0.160	37%				
0.180	23%				
0.200	15%				
0.220	10%				
0.240	0%				End of SCC
Length	0.472				
Max Depth	54.70				
Avg. Depth	33.45				

Ligament Number			
Length	Depth	Length	Depth
Tails Excluded By 4C Criteron			
-0.18	0.00	-0.232	0.00
-0.16	18.04	-0.22	3.05
-0.14	28.58	-0.2	10.91
-0.12	35.20	-0.18	9.09
-0.1	40.73		
-0.08	38.18		
-0.06	41.82	L4	
-0.04	44.15		
-0.02	49.82	L2	
0	49.82		
0.02	54.70	L31	
0.04	50.69		
0.06	46.40		
0.08	48.15		
0.1	45.02	L3	
0.12	47.49		
0.14	43.49		
0.16	36.65		0.2 14.69
0.18	22.91		0.22 10.40
0.2	0.00		0.24 0.00
Length	0.38		
Max Depth	54.70		
Avg. Depth	39.04		

Length	0.16" Average	Lig. Corrected
-0.18	24.97	23.91
-0.17	26.42	25.36
-0.16	27.49	26.43
-0.15	28.53	27.47
-0.14	29.55	28.05
-0.13	30.51	29.01
-0.12	31.42	29.92
-0.11	32.39	30.90
-0.1	33.42	29.76
-0.09	36.35	32.69
-0.08	38.75	35.09
-0.07	40.76	37.10
-0.06	42.61	38.95
-0.05	44.03	41.42
-0.04	45.13	42.53
-0.03	45.92	43.32
-0.02	46.41	43.81
-0.01	46.80	44.20
0	47.31	44.71
0.01	47.80	45.20
0.02	48.10	43.34
0.03	48.36	44.04
0.04	48.63	44.30
0.05	48.70	44.38
0.06	48.50	44.18
0.07	47.93	45.77
0.08	47.15	44.99
0.09	45.97	43.82
0.1	44.25	42.09
0.11	41.70	39.55
0.12	38.60	36.45
0.13	37.85	35.69
0.14	37.13	34.98
0.15	36.47	34.32
0.16	35.64	33.48
0.17	34.60	32.44
0.18	33.51	31.35
0.19	32.36	32.36
0.2	30.82	30.82
Length	0.38	0.38
Max Depth	48.70	45.77
Avg. Depth	39.60	37.13

Sample 8 - TSP 3H - Crack 1

Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
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Length	0.16" Average	Lig. Corrected
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No Exclusion Criterion Applied					
-0.200	0%				End of SCC
-0.180	14%				
-0.160	24%				
-0.140	29%				
-0.120	32%	L7	0.023	0.067	DUCTILE
-0.100	28%				
-0.080	39%	L6	0.230	0.453	DUCTILE
-0.060	40%				
-0.040	35%				
-0.020	45%	L31			SCC?
0.000	43%	L32			SCC?
0.020	43%				
0.040	41%				
0.060	39%	L33			SCC?
0.080	48%	L34			SCC?
0.100	48%				
0.120	50%				
0.140	40%	L3	0.044	0.120	DUCTILE
0.160	30%	L2	0.031	0.107	DUCTILE
0.180	31%	L1	0.036	0.145	DUCTILE
0.200	19%				
0.220	26%				
0.240	21%	L5	0.029	0.125	DUCTILE
0.260	0%	L4	0.079	0.160	DUCTILE, end of SCC End of SCC
Length	0.46				
Max Depth	50				
Avg. Depth	33.26				

-0.20	20.22	19.96
-0.19	21.20	20.94
-0.18	21.82	21.56
-0.17	22.79	22.53
-0.16	24.04	21.20
-0.15	25.14	22.30
-0.14	26.13	23.29
-0.13	26.84	24.00
-0.12	27.32	24.48
-0.11	29.68	26.84
-0.10	31.91	29.07
-0.09	33.68	30.84
-0.08	35.09	32.25
-0.07	36.21	33.37
-0.06	37.18	34.34
-0.05	37.94	35.10
-0.04	38.56	35.72
-0.03	39.03	36.45
-0.02	39.56	36.98
-0.01	40.47	37.89
0.00	41.32	38.74
0.01	41.85	41.85
0.02	42.35	42.35
0.03	42.88	42.88
0.04	43.62	43.62
0.05	44.21	44.21
0.06	44.21	43.71
0.07	43.62	43.12
0.08	42.79	41.95
0.09	42.06	41.22
0.10	41.35	40.11
0.11	40.29	39.05
0.12	38.94	37.70
0.13	37.85	36.61
0.14	37.03	35.79
0.15	36.12	34.88
0.16	34.79	33.22
0.17	32.59	31.02
0.18	29.76	27.31
0.19	28.63	26.17
0.20	27.27	24.81
0.21	25.64	23.18
0.22	24.15	21.69
0.23	22.83	20.87
0.24	21.73	19.77
0.25	20.90	19.28
0.26	19.83	18.22
Length	0.46	0.46
Max Depth	44.21	44.21
Avg. Depth	33.55	31.81

Sample 9 - TSP 1H - Crack 1

Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
No Exclusion Criterion Applied					
-0.136	0%				End of SCC
-0.120	39%				
-0.100	43%	L2	0.053	0.120	DUCTILE
-0.080	42%				
-0.060	47%				
-0.040	49%				
-0.020	45%	L31			SCC?
0.000	40%				
0.020	44%	L1	0.370	0.517	DUCTILE
0.040	41%	L3	0.058	0.086	DUCTILE
0.060	38%				
0.080	23%	L4	0.078	0.208	DUCTILE
0.100	29%	L5	0.475	0.880	DUCTILE
0.120	46%				
0.140	41%				
0.160	28%				
0.164	0%	L6	0.078	0.208	DUCTILE
0.168	0%				
0.180	35%				
0.200	40%				
0.220	32%				
0.240	36%				
0.260	37%				
0.280	30%				
0.288	0%				End of SCC
Length	0.424				
Max Depth	49.09				
Avg. Depth	36.61				

Length	0.16" Average	Lig. Corrected
-0.136	35.09	34.50
-0.13	36.41	35.81
-0.12	37.56	36.97
-0.11	38.37	37.77
-0.1	38.91	38.31
-0.09	39.18	38.59
-0.08	39.24	38.65
-0.07	39.41	38.82
-0.06	39.67	34.92
-0.05	42.16	37.41
-0.04	43.70	38.30
-0.03	43.72	38.32
-0.02	43.57	38.16
-0.01	42.83	38.03
0	41.68	35.97
0.01	40.69	35.00
0.02	39.76	28.74
0.03	39.20	28.17
0.04	39.09	28.06
0.05	38.79	27.76
0.06	38.44	27.41
0.07	37.80	26.77
0.08	35.29	23.38
0.09	33.28	21.37
0.1	32.89	20.99
0.11	32.54	24.80
0.12	32.43	24.68
0.13	32.14	25.04
0.14	31.66	24.57
0.15	31.38	24.28
0.164	31.67	24.58
0.17	32.47	28.25
0.18	33.11	26.89
0.19	33.36	32.48
0.2	32.89	32.01
0.21	30.18	29.28
0.22	29.30	28.42
0.23	28.49	27.61
0.24	28.07	27.19
0.25	30.22	30.22
0.26	32.25	32.25
0.27	31.96	31.96
0.28	31.37	31.37
0.288	30.36	30.36
Length	0.424	0.424
Max Depth	43.72	38.82
Avg. Depth	35.63	30.88

Sample 9 - TSP 1H - Crack 2

Destructive Exam

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
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4a Criterion Applied

-0.120	20%				
-0.100	16%				
-0.080	25%	L1	0.406	0.567	DUCTILE
-0.060	31%				
-0.040	30%				
-0.020	34%				
0.000	29%				
0.020	25%				
0.036	0%	← Length limited by specimen cut in DE			End of SCC
Partial Length	0.156				
Max Depth	34.47				
Avg. Depth	25.48				

Final Data

Length	0.16" Average	Lig. Corrected
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-0.120		19.56
-0.100		16.29
-0.080		25.09
-0.060		31.49
-0.040		29.89
-0.020		34.47
0.000		28.87
0.020		25.38
0.036		0.00
Partial Length		0.156
Max Depth		34.47
Running Avg. Max. Depth		25.40

Data Exclusion Criterion 4a Applies

- Section cut in destructive exam for fractography - does not include total crack length as confirmed by pictures of tube ID
 - Data useful for only +Pt POD as function of max. depth or training of NDE personnel
- Crack length - not determined
 Average depth - not determined
 Local max. Depth = 34.5%
 Running avg. max. depth = 25.4%

Sample 9 - TSP 2H - Crack 1

Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
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Length	0.16" Average	Lig. Corrected
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No Exclusion Criteron Applied								
-0.54	0.00					-0.54	29.82	29.82
-0.53	24.73					-0.53	29.67	29.67
-0.52	34.91					-0.52	29.49	29.49
-0.51	35.64	L31			SCC	-0.51	28.61	28.61
-0.50	38.55					-0.50	27.22	27.22
-0.49	37.82	L32			SCC?, OVERLAPPING SCC, LOWER	-0.49	26.83	26.83
-0.48	37.09					-0.48	27.35	27.35
-0.47	30.55					-0.47	27.68	27.68
-0.46	29.09					-0.46	29.26	29.26
-0.45	28.36					-0.45	33.07	33.07
-0.44	27.64					-0.44	35.69	35.69
-0.43	18.91					-0.43	38.25	38.25
-0.42	10.55					-0.42	40.43	40.43
-0.41	21.82					-0.41	42.48	42.48
-0.40	34.55					-0.40	44.36	44.36
-0.39	32.73	L1	0.396	0.383	DUCTILE	-0.39	44.49	44.49
-0.38	54.55					-0.38	45.13	40.68
-0.37	64.73					-0.37	48.34	43.89
-0.36	72.73					-0.36	51.68	47.23
-0.35	74.91	L33			SCC	-0.35	55.29	50.84
-0.34	72.73					-0.34	59.66	55.21
-0.33	73.45					-0.33	64.55	60.10
-0.32	69.82					-0.32	68.63	64.37
-0.31	39.27					-0.31	72.39	67.94
-0.30	41.45					-0.30	76.10	71.65
-0.29	83.64					-0.29	78.56	74.11
-0.28	85.09					-0.28	80.47	76.01
-0.27	89.09					-0.27	81.88	77.43
-0.26	93.10					-0.26	83.14	78.69
-0.20	97.11					-0.25	84.50	80.05
-0.16	95.54					-0.24	85.80	81.35
-0.12	93.95					-0.23	87.29	82.84
-0.08	93.49	L34			SCC	-0.22	90.55	86.10
-0.04	89.50					-0.21	93.67	93.67
0.00	93.13					-0.20	94.27	94.27
0.04	94.91					-0.19	94.79	94.79
0.08	88.53					-0.18	95.06	95.06
0.12	94.53	L2	0.343	0.343	DUCTILE	-0.17	95.09	95.09
0.16	88.00					-0.16	95.07	95.07
0.18	87.60					-0.15	94.96	94.96
0.19	89.09					-0.14	94.75	94.75
0.20	90.18					-0.13	94.44	94.44
0.21	89.45					-0.12	94.03	94.03
0.22	86.55					-0.11	93.63	93.63
0.23	80.00	L3	0.288	0.360	DUCTILE	-0.10	93.32	93.32
0.24	67.13					-0.09	93.07	93.07
0.25	62.55					-0.08	92.91	92.91
0.26	61.09					-0.07	92.79	92.79
0.27	52.73	L4	0.134	0.210	DUCTILE	-0.06	92.73	92.73
0.28	68.36					-0.05	92.71	92.71
0.29	72.00					-0.04	92.75	92.75
0.30	70.55					-0.03	92.71	92.71
0.31	69.09					-0.02	92.58	92.58
0.32	61.09					-0.01	92.37	92.37
0.33	67.27					0.00	92.07	92.07
0.34	55.27					0.01	91.87	91.87
0.35	46.55					0.02	91.81	91.81
0.36	40.73					0.03	91.90	91.90
0.37	46.55					0.04	92.14	88.29
0.38	49.45					0.05	92.34	88.49
0.39	47.27					0.06	92.39	88.54
0.40	45.82					0.07	92.29	88.44
0.41	40.00					0.08	92.04	88.19
0.42	35.64					0.09	91.73	87.88
0.43	20.36					0.10	91.38	87.52
0.44	29.09					0.11	91.09	87.23
0.45	20.00					0.12	90.84	86.98
0.46	11.64					0.13	90.51	86.66
0.47	0.00					0.14	90.12	86.26
Length	1.01					0.15	89.43	85.57
Max Depth	97.11					0.16	88.07	84.22
Avg. Depth	69.51					0.17	86.54	82.69
						0.18	84.84	77.75
						0.19	82.56	75.47
						0.20	81.11	74.02
						0.21	79.78	76.55
						0.22	78.47	75.23
						0.23	77.16	73.93
						0.24	75.49	72.25
						0.25	74.27	71.03
						0.26	72.35	67.61
						0.27	69.94	65.19
						0.28	67.09	62.35
						0.29	64.53	59.78
						0.30	62.17	57.43

Sample 9 - TSP 2H - Crack 1

Destructive Exam

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
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No Exclusion Criterion Applied

Final Data

Length	0.16" Average	Ug. Corrected
0.31	59.86	55.12
0.32	57.85	53.11
0.33	56.26	51.51
0.34	54.67	49.93
0.35	52.28	50.77
0.36	50.89	49.38
0.37	48.04	46.53
0.38	44.49	42.98
0.39	40.34	38.83
0.40	38.55	37.04
0.41	37.04	35.53
0.42	34.88	33.37
0.43	33.31	33.31
0.44	32.21	32.21
0.45	31.44	31.44
0.46	29.93	29.93
0.47	27.76	27.76
Length	1.01	1.01
Max Depth	95.09	95.09
Avg. Depth	69.57	67.37

Sample 9 - TSP 2H - Crack 2

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
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Length		Depth		Ligament Number	Length		Depth	
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Length	0.16" Average	Lig. Corrected
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-0.482	0%				End of SCC
-0.472	5%				
-0.482	0%				
-0.430	0%				End of SCC main crack
-0.420	16%	L6	0.07	1.1E-04	DUCTILE
-0.400	27%				
-0.380	29%	L7	0.10	1.6E-04	DUCTILE
-0.380	27%				
-0.340	44%				
-0.320	38%				
-0.300	39%				
-0.280	32%	L5	0.23	3.6E-04	DUCTILE
-0.260	38%				
-0.240	15%	L8	0.05	7.3E-05	DUCTILE
-0.220	27%				
-0.200	40%				
-0.180	45%				
-0.160	44%				
-0.140	36%				
-0.120	36%	L4	0.12	1.8E-04	DUCTILE
-0.100	39%				
-0.080	41%	L3	0.07	1.1E-04	DUCTILE
-0.060	45%				
-0.040	42%				
-0.020	44%	L9	0.15	2.3E-04	DUCTILE
0.000	41%				
0.020	39%				
0.040	40%				
0.060	45%				
0.080	42%	L10	0.25	3.9E-04	DUCTILE
0.100	42%				
0.120	46%	L2	0.13	2.0E-04	DUCTILE
0.140	46%				
0.160	37%	L1	0.28	4.3E-04	DUCTILE
0.180	47%				
0.200	56%				
0.220	62%				
0.240	57%				
0.260	45%				
0.280	44%				
0.300	46%				
0.320	31%				
0.328	7%				
0.340	25%				
0.356	0%				End of SCC main crack

Tails Excluded By 4C Criterion

-0.43	0.00					-0.482	0.00
-0.42	16.00	L6				-0.472	5.45
-0.40	26.91						0.00
-0.38	29.38	L7					
-0.36	27.20						
-0.34	44.44						
-0.32	37.60						
-0.30	39.05						
-0.28	32.15	L5					
-0.26	38.18						
-0.24	15.35	L8					
-0.22	27.27						
-0.20	39.93						
-0.18	45.02						
-0.16	44.38						
-0.14	35.85						
-0.12	35.56	L4					
-0.10	38.76						
-0.08	40.65	L3					
-0.06	44.51						
-0.04	41.96						
-0.02	44.15	L9					
0.00	41.09						
0.02	39.20						
0.04	39.64						
0.06	44.95						
0.08	42.33	L10					
0.10	42.33						
0.12	46.11	L2					
0.14	45.82						
0.16	36.85	L1					
0.18	46.84						
0.20	55.56						
0.22	61.53						
0.24	56.58						
0.26	44.58						
0.28	44.07						
0.30	46.25						
0.32	31.42						
0.33	7.27						
0.34	24.51						
0.36	0.00						
Length	0.786						
Max Depth	61.53						
Avg. Depth	38.59						

-0.430	23.69	21.77
-0.420	25.76	23.85
-0.410	27.15	25.23
-0.400	28.02	26.10
-0.390	28.81	26.90
-0.380	29.55	27.63
-0.370	29.95	28.03
-0.360	30.09	28.54
-0.350	30.39	28.84
-0.340	32.63	29.09
-0.330	33.26	29.51
-0.320	32.90	28.62
-0.310	32.58	28.29
-0.300	32.52	28.23
-0.290	32.77	29.61
-0.280	33.46	30.30
-0.270	34.36	31.20
-0.260	34.90	31.74
-0.250	34.91	31.75
-0.240	35.11	31.95
-0.230	35.26	32.10
-0.220	35.11	31.95
-0.210	34.91	31.75
-0.200	34.91	30.42
-0.190	35.21	33.34
-0.180	35.42	33.55
-0.170	35.51	33.64
-0.160	36.33	33.65
-0.150	37.93	35.78
-0.140	39.29	37.15
-0.130	40.23	38.09
-0.120	40.72	38.58
-0.110	40.91	38.76
-0.100	41.01	37.19
-0.090	40.86	37.05
-0.080	40.65	36.84
-0.070	40.40	36.59
-0.060	40.35	36.54
-0.050	40.56	36.75
-0.040	40.79	36.98
-0.030	41.19	38.71
-0.020	41.64	39.17
-0.010	41.93	39.45
0.000	42.09	36.80
0.010	42.18	37.71
0.020	42.17	37.70
0.030	42.15	37.68
0.040	42.32	36.37
0.050	42.58	36.61
0.060	42.72	36.77
0.070	42.55	38.27
0.080	42.20	34.80
0.090	42.24	34.84
0.100	42.63	35.23
0.110	43.33	35.94
0.120	44.28	36.89
0.130	45.40	38.00
0.140	46.53	39.13
0.150	47.38	39.96
0.160	48.12	40.72
0.170	48.61	44.01
0.180	48.74	44.14
0.190	48.66	44.26
0.200	48.85	44.25
0.210	48.79	45.67
0.220	48.81	45.69
0.230	48.40	45.28
0.240	47.82	44.70
0.250	46.28	46.26
0.260	45.25	45.25
0.270	43.03	43.03
0.280	42.52	42.52
0.290	41.65	41.65
0.300	40.45	40.45
0.310	38.82	38.82
0.320	37.14	37.14
0.330	35.37	35.37
0.340	33.85	33.85
0.350	32.66	32.66
0.356	15.07	15.07

Length 0.838
Max Depth 61.53
Avg. Depth 36.26

Sample 9 - TSP 2H - Crack 2

Destructive Exam

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes

Adjusted Destructive Exam

		Ligament Number	
Length	Depth	Length	Depth
Tails Excluded By 4C Criterion			

Final Data

Length	0.16" Average	Lig. Corrected
Length	0.786	0.786
Max Depth	48.86	46.26
Avg. Depth	39.02	35.62

Sample 9 - TSP 3H - Crack 1

Destructive Exam

Axial Position Inch	SCC Depth %wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
-0.378	0%				end of scc
-0.376	7%				
-0.368	13%				
-0.360	21%				
-0.352	22%				
-0.340	19%	L12	0.046	7.19E-05	step
-0.330	31%				
-0.320	38%				
-0.300	49%	L11	0.088	1.33E-04	mid step
-0.280	56%				
-0.260	40%	L10	0.281	4.36E-04	back step
-0.250	38%				
-0.240	75%				
-0.220	88%				
-0.200	85%				
-0.180	89%				
-0.160	89%				
-0.156	87%	L9	0.074	1.15E-04	back step
-0.140	89%				
-0.120	86%				
-0.100	89%				
-0.084	84%	L8	0.067	1.04E-04	mid step
-0.080	81%				
-0.070	82%	L7	0.030	4.65E-05	back step
-0.060	82%				
-0.040	79%				
-0.020	84%				
0.000	80%				
0.020	84%				
0.040	83%				
0.060	80%				
0.080	80%				
0.100	82%				
0.120	75%				
0.140	67%				
0.150	67%	L6	0.245	3.80E-04	step
0.160	74%				
0.180	82%				
0.200	82%				
0.220	83%				
0.240	74%				
0.260	63%				
0.268	61%	L5	0.077	1.19E-04	mid step
0.280	53%				
0.300	47%	L4	0.587	9.10E-04	step
0.320	65%				
0.340	59%				
0.360	53%				
0.380	38%				
0.388	38%	L3	0.254	3.93E-04	step
0.400	36%				
0.420	27%				
0.440	27%				
0.460	23%				
0.472	0%				end of man crack
0.488	0%				
0.496	10%	L2	0.093	1.45E-04	front step
0.500	14%				
0.504	10%				
0.508	4%	L1	0.031	4.74E-05	front step
0.512	9%				
0.516	0%				end of scc
Length	0.894				
Max Depth	89.45				
Avg. Depth	61.6				

Adjusted Destructive Exam

Ligament Number			
Length	Depth	Length	Depth
Tails Excluded By 4C Criterion			
-0.378	0.00	0.488	0.00
-0.376	7.27	0.496	10.00
-0.368	13.45	0.500	14.00
-0.360	20.80	0.504	10.00
-0.352	22.18	0.508	4.00
-0.340	19.05	0.512	9.00
-0.330	31.42	0.516	0.00
-0.320	37.60		
-0.300	48.73	L11	
-0.280	56.29		
-0.260	40.44	L10	
-0.250	37.69		
-0.240	74.55		
-0.220	88.29		
-0.200	84.95		
-0.180	89.02		
-0.160	88.95		
-0.156	87.49	L9	
-0.140	88.80		
-0.120	86.04		
-0.100	89.45		
-0.084	84.07	L8	
-0.080	81.31		
-0.070	81.53	L7	
-0.060	81.75		
-0.040	79.35		
-0.020	83.78		
0.000	79.85		
0.020	83.71		
0.040	83.27		
0.060	80.00		
0.080	80.00		
0.100	82.11		
0.120	74.69		
0.140	66.76		
0.150	66.55	L6	
0.160	73.89		
0.180	81.75		
0.200	81.96		
0.220	83.27		
0.240	73.60		
0.260	63.49		
0.268	60.51	L5	
0.280	53.16		
0.300	46.55	L4	
0.320	64.65		
0.340	59.42		
0.360	52.73		
0.380	38.25		
0.388	38.11	L3	
0.400	36.22		
0.420	26.76		
0.440	27.20		
0.460	22.69		
0.472	0.00		
Length	0.85		
Max Depth	89.01		
Avg. Depth	64.49		

Final Data

Length	0.16" Average	Lig. Corrected
-0.378	26.93	25.44
-0.368	29.57	28.08
-0.358	31.85	30.36
-0.348	33.10	31.61
-0.338	33.62	28.97
-0.328	34.45	29.80
-0.318	37.21	32.57
-0.308	40.08	35.41
-0.298	42.88	38.23
-0.288	47.96	43.31
-0.278	52.18	47.54
-0.268	56.08	51.43
-0.258	60.07	55.43
-0.248	64.04	59.91
-0.238	67.31	62.35
-0.228	70.22	65.26
-0.218	72.82	67.86
-0.208	75.04	71.05
-0.198	76.98	72.99
-0.188	78.95	74.96
-0.178	81.42	77.43
-0.168	84.09	82.51
-0.158	86.22	84.64
-0.148	86.55	84.63
-0.138	86.48	84.56
-0.128	86.03	84.11
-0.118	85.64	83.73
-0.108	85.45	83.53
-0.098	85.21	83.29
-0.088	84.77	82.85
-0.078	84.25	82.33
-0.068	83.90	82.81
-0.058	83.63	82.54
-0.048	83.33	82.25
-0.038	83.09	82.00
-0.028	82.79	81.70
-0.018	82.31	81.23
-0.008	81.80	80.71
0.002	81.49	81.15
0.012	81.48	81.15
0.022	81.47	81.47
0.032	81.25	81.25
0.042	80.87	80.87
0.052	80.29	80.29
0.062	79.39	79.39
0.072	78.49	75.73
0.082	78.09	75.33
0.092	77.99	75.24
0.102	77.97	75.21
0.112	77.86	75.11
0.122	77.78	75.03
0.132	77.77	75.02
0.142	77.83	75.07
0.152	77.68	74.93
0.162	77.25	74.49
0.172	76.50	73.74
0.182	75.41	72.66
0.192	74.04	70.42
0.202	72.56	68.94
0.212	71.11	67.49
0.222	69.84	59.62
0.232	69.29	59.07
0.242	69.06	61.60
0.252	68.29	60.83
0.262	67.12	59.66
0.272	65.57	58.11
0.282	63.77	56.31
0.292	61.53	54.07
0.302	58.91	51.45
0.312	56.28	45.96
0.322	53.79	43.48
0.332	51.32	41.01
0.342	48.92	38.61
0.352	46.62	36.51
0.362	44.98	35.53
0.372	43.33	33.88
0.382	41.55	32.10
0.392	38.71	35.85
0.402	37.54	34.69
0.412	35.77	32.91
0.422	33.93	31.07

Sample 9 - TSP 3H - Crack 1

Destructive Exam

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes

Adjusted Destructive Exam

Ligament Number		Ligament Number	
Length	Depth	Length	Depth
Tails Excluded By 4C Cntenon			

Final Data

Length	0.16" Average	Lig. Corrected
0.432	32.02	29.16
0.442	30.07	27.22
0.452	28.14	25.29
0.462	26.55	23.70
0.472	25.25	22.40
Length	0.85	0.85
Max Depth	86.55	84.64
Avg. Depth	64.77	60.89

Sample 9 - TSP 3H - Crack 2

Destructive Exam						Adjusted Destructive Exam				Final Data			
Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/area (mm^2)	Ligament area (inch^2)	Notes	Length	Depth	Ligament Number	Length	Depth	Length	0.16" Average	Lig. Corrected
-0.433	0%				End of SCC	-0.320	0.00		-0.433	0.00	-0.32	26.01	25.14
-0.420	6%					-0.300	33.09		-0.420	6.11	-0.31	27.77	26.90
-0.416	1%					-0.280	34.98		-0.416	1.45	-0.30	29.46	28.59
-0.400	26%					-0.268	19.93	L8	-0.400	26.18	-0.29	30.64	29.77
-0.384	5%	L9	0.14	2.09E-04	between small cracks	-0.260	36.58		-0.384	4.73	-0.28	31.43	30.56
-0.380	11%					-0.244	2.91	L7	-0.380	10.76	-0.27	32.11	31.24
-0.372	9%					-0.240	40.87		-0.372	9.45	-0.26	32.69	31.82
-0.360	1%					-0.220	46.33		-0.360	1.45	-0.25	33.31	32.44
-0.340	4%					-0.200	40.95		-0.340	3.78	-0.24	33.96	33.09
-0.320	4%					-0.180	40.87				-0.23	34.46	33.59
-0.300	33%					-0.160	44.29				-0.22	37.89	37.02
-0.280	35%					-0.140	40.87				-0.21	38.24	37.37
-0.268	20%	L8	0.03	4.25E-05	back ligament	-0.120	37.09				-0.20	38.42	37.55
-0.260	37%					-0.108	31.35	L6			-0.19	38.26	36.97
-0.244	3%	L7	0.05	7.70E-05	back ligament	-0.100	37.60				-0.18	39.15	38.17
-0.240	41%					-0.080	53.24				-0.17	39.67	38.69
-0.220	46%					-0.060	44.51				-0.16	41.89	40.90
-0.200	41%					-0.056	42.84	L5			-0.15	42.38	41.93
-0.180	41%					-0.040	40.22				-0.14	42.41	41.25
-0.160	44%					-0.020	39.49				-0.13	42.15	40.98
-0.140	41%					-0.016	37.24	L10			-0.12	41.95	40.78
-0.120	37%					0.000	36.29				-0.11	41.89	40.72
-0.108	31%	L6	0.04	5.89E-05	back ligament	0.008	41.75	L4			-0.10	41.80	39.49
-0.100	38%					0.020	58.40				-0.09	41.57	39.25
-0.080	53%					0.040	55.64				-0.08	41.20	38.88
-0.060	45%					0.060	64.95				-0.07	41.21	38.15
-0.056	43%	L5	0.07	1.02E-04	front ligament	0.080	66.18				-0.06	42.14	39.08
-0.040	40%					0.088	64.73	L3			-0.05	43.09	40.03
-0.020	39%					0.100	63.93				-0.04	44.07	41.01
-0.016	37%	L10	0.10	1.58E-04	front ligament	0.112	59.20	L11			-0.03	45.44	42.38
0.000	36%					0.120	53.31				-0.02	47.38	44.72
0.008	42%	L4	0.07	1.03E-04	front ligament	0.132	51.20	L12			-0.01	49.00	46.37
0.020	58%					0.140	46.84				0.00	50.22	47.59
0.040	56%					0.144	48.87	L2			0.01	50.89	48.01
0.060	65%					0.160	63.35				0.02	51.78	48.89
0.080	66%					0.180	60.22				0.03	52.69	48.22
0.088	65%	L3	0.02	3.47E-05	back ligament	0.200	49.60				0.04	53.38	48.89
0.100	64%					0.212	38.25	L13			0.05	54.03	48.72
0.112	59%	L11	0.21	3.21E-04	full ligament	0.220	39.85				0.06	54.44	47.36
0.120	53%					0.240	48.95				0.07	55.31	49.38
0.132	51%	L12	0.07	1.15E-04	full ligament	0.240	48.95	L1			0.08	56.86	50.94
0.140	47%					0.260	43.71				0.09	58.36	52.44
0.144	49%	L2	0.16	2.44E-04	full ligament	0.268	40.07	L14			0.10	59.29	54.10
0.160	63%					0.280	46.33				0.11	59.08	53.90
0.180	60%					0.300	46.55				0.12	58.65	53.46
0.200	50%					0.320	47.13				0.13	57.73	52.03
0.212	38%	L13	0.05	7.15E-05	back ligament	0.340	39.42				0.14	56.53	50.83
0.220	40%					0.360	31.93				0.15	55.32	49.62
0.240	49%					0.364	27.35				0.16	54.35	45.69
0.240	49%	L1	0.26	4.07E-04	full ligament	0.368	2.18	L16			0.17	53.18	44.52
0.260	44%					0.376	26.76	L15			0.18	51.95	43.55
0.268	40%	L14	0.03	5.21E-05	front ligament	0.380	29.53				0.19	50.61	41.83
0.280	46%					0.397	0.00				0.20	49.80	43.35
0.300	47%										0.21	49.40	42.95
0.320	47%										0.22	49.11	43.49
0.340	39%					Length	0.717				0.23	49.11	45.26
0.360	32%					Max Depth	66.18				0.24	48.68	44.84
0.364	27%					Avg. Depth	43.34				0.25	47.50	43.66
0.368	2%	L16	0.04	5.95E-05	front ligament						0.26	46.19	42.34
0.376	27%	L15	0.10	1.57E-04	front ligament						0.27	44.74	40.90
0.380	30%										0.28	43.39	39.54
0.397	0%				end of crack						0.29	40.96	36.69
											0.30	40.94	35.44
Length	0.830										0.31	38.71	33.81
Max Depth	66.18										0.32	38.35	33.45
Avg. Depth	38.48										0.33	37.65	35.70
											0.34	37.03	35.08
											0.35	36.51	34.57
											0.36	36.13	34.56
											0.37	35.20	33.63
											0.38	34.08	32.51
											0.39	32.70	31.12
											0.40	27.49	25.92
											Length	0.717	0.717
											Max Depth	59.29	54.10
											Avg. Depth	44.03	40.75

Sample 9 - TSP 4H - Crack 1

Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
No Exclusion Cntenon Applied					
-0.400	0%				end of scc
-0.380	25%				
-0.360	36%				
-0.340	49%				
-0.320	48%				
-0.300	43%				
-0.280	49%				
-0.260	38%				
-0.240	47%				
-0.220	75%				
-0.200	80%				
-0.180	80%				
-0.160	72%				
-0.152	71%	L11	0.038	5.91E-05	back step
-0.140	65%				
-0.120	54%	L10	0.064	9.90E-05	mid step
-0.100	65%				
-0.084	68%	L1	0.138	2.14E-04	back step
-0.080	70%				
-0.060	59%				
-0.046	54%	L9	0.078	1.22E-04	step
-0.040	70%				
-0.020	74%				
0.000	72%				
0.020	65%				
0.040	61%	L2	0.065	1.01E-04	step
0.060	67%				
0.080	66%				
0.100	68%				
0.120	67%	L8	0.032	5.02E-05	mid step
0.140	68%				
0.160	79%				
0.180	76%				
0.200	69%				
0.220	71%				
0.228	69%	L7	0.082	1.27E-04	back step
0.240	66%				
0.252	82%	L6	0.025	3.84E-05	back step
0.260	80%				
0.280	50%	L5	0.060	9.30E-05	back step
0.300	67%				
0.320	41%				
0.330	33%	L3	0.031	4.83E-05	front step
0.340	47%				
0.360	52%				
0.370	47%	L4	0.006	9.40E-06	front step
0.380	41%				
0.400	32%				
0.420	19%				
0.440	0%				end of scc
Length	0.84				
Max Depth	62.11				
Avg. Depth	57.48				

Length	0.16" Average	Lig. Corrected
-0.4	32.16	32.16
-0.39	33.48	33.48
-0.38	34.33	34.33
-0.37	35.30	35.30
-0.36	36.34	36.34
-0.35	36.85	36.85
-0.34	36.92	36.92
-0.33	37.28	37.28
-0.32	37.87	37.87
-0.31	41.48	41.48
-0.3	45.19	45.19
-0.29	48.31	48.31
-0.28	51.22	51.22
-0.27	53.83	53.83
-0.26	56.07	56.07
-0.25	57.70	57.70
-0.24	59.13	59.13
-0.23	60.43	60.00
-0.22	61.56	61.13
-0.21	62.53	62.10
-0.2	63.02	61.87
-0.19	63.66	62.51
-0.18	64.95	63.80
-0.17	66.67	65.52
-0.16	68.25	65.56
-0.15	69.25	66.55
-0.14	69.10	66.41
-0.13	67.94	64.37
-0.12	67.49	63.91
-0.11	67.05	63.47
-0.1	66.72	63.14
-0.09	66.30	62.72
-0.08	66.04	62.46
-0.07	65.79	62.21
-0.06	65.48	62.33
-0.05	65.38	62.21
-0.04	65.42	61.55
-0.03	65.98	62.82
-0.02	66.39	63.23
-0.01	66.44	63.28
0	66.36	63.20
0.01	66.19	64.58
0.02	66.40	64.79
0.03	66.90	65.29
0.04	67.57	66.48
0.05	67.43	66.34
0.06	67.19	66.10
0.07	67.13	66.04
0.08	67.45	66.36
0.09	67.78	66.68
0.1	68.25	67.15
0.11	68.72	67.63
0.12	69.10	68.00
0.13	69.66	69.30
0.14	70.10	69.74
0.15	70.19	68.90
0.16	70.18	68.89
0.17	70.98	69.42
0.18	71.74	70.18
0.19	71.56	70.00
0.2	70.53	68.29
0.21	70.03	68.15
0.22	70.00	68.12
0.23	69.18	67.31
0.24	67.30	65.42
0.25	64.60	62.38
0.26	62.84	60.61
0.27	61.26	59.04
0.28	60.03	57.80
0.29	58.73	56.44
0.3	57.05	54.75
0.31	55.02	52.73
0.32	52.90	51.52
0.33	50.52	49.15
0.34	46.98	45.89
0.35	42.87	41.78
0.36	39.06	37.97
0.37	38.38	37.96
0.38	37.04	36.62
0.39	34.90	34.48
0.4	33.42	33.00

Sample 9 - TSP 4H - Crack 1

Destructive Exam

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
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No Exclusion Criterion Applied

Final Data

Length	0.15" Average	Lig. Corrected
0.41	32.76	32.34
0.42	32.75	32.69
0.43	31.29	31.22
0.44	29.26	29.20
Length	0.84	0.84
Max Depth	71.74	70.18
Avg. Depth	57.79	56.38

Sample 9 - TSP 5H Crack - 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm^2)	Ligament Type/Area (in^2)	Notes
-0.280	0%				end of crack array
-0.272	17%				
-0.260	18%				
-0.240	14%				
-0.232	0%				end of crack
-0.228	0%				end of main crack
-0.220	15%	L13	0.026	4.1E-05	front step
-0.212	16%				
-0.200	29%				
-0.190	33%				
-0.180	36%				
-0.160	40%	L12	0.112	0.000	front step
-0.144	33%	L11	0.195	3.0E-04	step
-0.140	35%				
-0.120	31%				
-0.100	57%				
-0.080	72%				
-0.068	79%	L10	0.065	0.000101181	front step
-0.060	76%				
-0.040	73%	L9	0.161	2.5E-04	step
-0.020	71%				
-0.010	70%	L8	0.088	0.000	step
0.000	69%				
0.020	73%				
0.040	74%				
0.060	76%				
0.080	75%				
0.090	73%				
0.100	74%	L7	0.134	2.1E-04	step
0.120	74%				
0.140	74%				
0.160	71%				
0.168	71%	L6	0.154	2.4E-04	back step
0.180	73%	L5	0.048	7.40206E-05	back step
0.200	80%	L4	0.025	3.93421E-05	front step
0.220	79%				
0.240	84%				
0.250	86%	L3	0.024	3.7E-05	mid step
0.260	82%				
0.280	78%				
0.300	64%				
0.320	48%				
0.340	43%				
0.348	40%	L2	0.090	0.00013688	step
0.360	34%				
0.370	37%				
0.380	41%				
0.390	36%				
0.400	29%				
0.404	4%	L1	0.078	0.000120418	step
0.408	19%				
0.416	12%				
0.420	0%				end of main crack
Length	0.70				
Max Depth	86.47				
Avg. Depth	55.97				

Ligament Number			
Length	Depth	Length	Depth
Tails Excluded By 4C Criterion			
-0.228	0.00		
-0.220	14.98	L13	
-0.212	15.71		
-0.200	28.51		
-0.190	32.58		
-0.180	37.75		
-0.160	40.00	L12	
-0.144	32.58	L11	
-0.140	34.78		
-0.120	31.35		
-0.100	57.24		
-0.080	71.56		
-0.068	78.55	L10	
-0.060	76.00		
-0.040	72.58	L9	
-0.020	71.42		
-0.010	69.82	L8	
0.000	69.09		
0.020	72.65		
0.040	74.40		
0.060	75.56		
0.080	75.35		
0.090	73.45		
0.100	74.11	L7	
0.120	73.89		
0.140	74.25		
0.160	71.42		
0.168	71.42	L6	
0.180	72.80	L5	
0.200	79.93	L4	
0.220	79.49		
0.240	83.56		
0.250	86.47	L3	
0.260	81.60		
0.280	77.82		
0.300	64.36		
0.320	48.29		
0.340	43.42		
0.348	39.64	L2	
0.360	34.25		
0.370	37.31		
0.380	41.09		
0.390	36.29		0.408 19.35
0.400	29.45		0.416 11.85
0.404	0.00	L1	0.420 0.00
Length	0.632		
Max Depth	86.47		
Avg. Depth	60.62		

Length	0.16" Average	Lig. Corrected
-0.228	27.63	23.89
-0.218	28.31	24.57
-0.208	28.71	24.97
-0.198	29.14	25.40
-0.188	30.51	26.77
-0.178	32.52	28.78
-0.168	34.74	31.00
-0.158	37.11	33.37
-0.148	39.55	35.08
-0.138	44.00	39.53
-0.128	47.46	43.28
-0.118	50.55	44.56
-0.108	53.05	47.06
-0.098	55.26	49.26
-0.088	57.12	50.14
-0.078	58.91	51.93
-0.068	60.80	55.07
-0.058	63.06	59.52
-0.048	65.37	61.83
-0.038	67.83	64.29
-0.028	70.25	66.71
-0.018	71.93	68.40
-0.008	72.92	69.38
0.002	73.46	69.92
0.012	73.51	69.97
0.022	73.24	68.94
0.032	73.15	68.84
0.042	73.14	68.84
0.052	73.24	70.75
0.062	73.36	70.87
0.072	73.45	70.96
0.082	73.55	72.05
0.092	73.70	70.46
0.102	73.83	70.06
0.112	74.08	70.31
0.122	74.44	70.39
0.132	74.75	70.69
0.142	75.03	70.97
0.152	75.40	71.35
0.162	75.92	71.86
0.172	76.54	70.76
0.182	76.99	72.67
0.192	77.29	74.48
0.202	77.44	74.63
0.212	77.20	74.38
0.222	76.53	73.71
0.232	75.39	72.58
0.242	73.94	71.13
0.252	72.41	69.59
0.262	70.68	69.59
0.272	68.58	67.02
0.282	66.10	64.54
0.292	63.64	62.36
0.302	61.31	60.04
0.312	58.66	57.39
0.322	54.71	53.44
0.332	52.87	50.73
0.342	50.70	48.82
0.352	48.52	46.64
0.362	46.15	44.27
0.372	43.62	41.74
0.382	41.24	39.36
0.392	39.09	37.21
0.402	37.36	35.48
0.404	33.62	31.74
Length	0.632	0.632
Max Depth	77.44	74.63
Avg. Depth	60.65	57.46

Sample 9 - TSP 5H Crack - 2

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
0.000	0				
0.008	22				
0.014	27				
0.035	38				
0.051	38				
0.0545	38	L1		0.00025	
0.058	38				
0.074	38				
0.076	33	L2		0.00013	
0.078	27				
0.090	27				
0.092	22				
0.120	0				
Length	0.12				
Max Depth	38.00				
Avg. Depth	26.75				

Length	0.16" Average	Lig. Corrected
0.000		0
0.008		22
0.014		27
0.035		38
0.051		38
0.0545		38
0.058		38
0.074		38
0.076		33
0.078		27
0.090		27
0.092		22
0.120		0
Length ¹		0.12
Max Depth		38.00
Avg. Depth		26.69

Sample 9 - TSP 5H Crack - 3

Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
0.183	0				
0.203	22				
0.240	22				
0.260	22				
0.280	22				
0.297	22				
0.303	22				
0.309	22				
0.321	22				
0.325	22				
0.328	22				
0.363	22				
0.367	22				
0.371	22				
0.394	22				
0.425	0				
Length	0.242				
Max Depth	22.00				
Avg. Depth	19.68				

Length	0.16" Average	Lig. Corrected
0.183	17.60	14.41
0.190	18.04	14.85
0.200	18.40	15.21
0.210	18.70	15.51
0.220	18.95	14.31
0.230	19.17	14.53
0.240	19.36	14.72
0.250	19.53	13.44
0.260	19.67	13.58
0.270	20.96	14.87
0.280	21.81	15.72
0.290	22.00	13.01
0.300	22.00	13.01
0.310	22.00	13.01
0.320	21.75	12.76
0.330	21.08	12.09
0.340	20.00	11.01
0.350	19.87	14.07
0.360	19.73	13.93
0.370	19.57	13.77
0.380	19.38	13.58
0.390	19.16	14.81
0.400	18.90	14.55
0.410	18.59	14.24
0.420	18.22	15.32
0.425	15.77	12.87
Length	0.242	0.242
Max Depth	22.00	15.72
Avg. Depth	19.62	13.97

Sample 10 - TSP 3H Crack 1

Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
No Exclusion Criterion Applied					
-0.320	0%				end of crack estimated
-0.280	42%				saw cut into end
-0.260	49%	L1	0.155	2.4E-04	
-0.240	63%				
-0.220	73%				
-0.200	75%				
-0.180	83%				
-0.170	82%	L2	0.137	2.1E-04	overlapping cracks
-0.160	85%				
-0.140	82%				
-0.120	84%	L3	0.072	1.1E-04	
-0.110	84%				
-0.100	85%				
-0.080	85%				
-0.060	85%				
-0.040	82%				
-0.020	82%				
0.000	86%				
0.020	87%				
0.040	88%				
0.060	94%				
0.080	94%				
0.100	94%				
0.120	95%	L4	0.055	8.5E-05	
0.140	97%				
0.160	97%				
0.180	97%				
0.200	99%				
0.220	99%				
0.240	98%				
0.260	92%				
0.280	76%	L5	0.084	1.3E-04	
0.300	68%				
0.320	58%				
0.340	53%				
0.360	49%				
0.380	45%				
0.400	37%	L6	0.118	1.8E-04	
0.420	47%				
0.440	0%				end of crack
Length	0.76				
Max Depth	99.42				
Avg. Depth	74.29				

Length	0.16" Average	Lig. Corrected
-0.320	35.47	33.73
-0.310	38.73	36.98
-0.300	41.80	40.06
-0.290	44.48	42.73
-0.28	46.83	45.09
-0.27	49.14	47.40
-0.26	51.41	49.67
-0.25	53.33	50.04
-0.24	55.18	51.90
-0.23	60.09	56.80
-0.22	64.28	61.00
-0.21	67.93	64.65
-0.2	71.04	66.95
-0.19	73.50	69.41
-0.18	75.80	71.71
-0.17	77.90	75.55
-0.16	79.58	77.24
-0.15	80.85	78.50
-0.14	81.85	79.51
-0.13	82.50	80.16
-0.12	82.99	80.65
-0.11	83.41	81.06
-0.1	83.59	81.24
-0.09	83.63	81.29
-0.08	83.86	83.05
-0.07	83.93	83.13
-0.06	84.12	83.31
-0.05	84.44	83.63
-0.04	84.71	83.91
-0.03	85.10	85.10
-0.02	85.69	85.69
-0.01	86.25	86.25
0	86.78	86.78
0.01	87.31	87.31
0.02	87.83	87.83
0.03	88.38	88.38
0.04	89.05	88.43
0.05	89.86	89.24
0.06	90.71	90.09
0.07	91.58	90.96
0.08	92.36	91.74
0.09	93.01	92.39
0.1	93.62	93.00
0.11	94.29	93.67
0.12	95.01	94.39
0.13	95.70	95.08
0.14	96.20	95.58
0.15	96.48	95.86
0.16	96.73	96.12
0.17	96.80	96.18
0.18	96.67	96.05
0.19	96.08	95.46
0.2	94.98	93.41
0.21	93.61	92.66
0.22	91.94	91.00
0.23	89.95	89.00
0.24	87.65	86.70
0.25	85.18	84.23
0.26	82.57	81.62
0.27	79.87	78.92
0.28	76.96	76.01
0.29	73.86	72.91
0.3	70.64	69.70
0.31	67.21	66.26
0.32	63.60	61.32
0.33	60.30	58.03
0.34	57.50	55.22
0.35	53.49	51.21
0.36	48.57	46.29
0.37	46.87	45.54
0.38	45.21	43.88
0.39	43.61	42.28
0.4	42.14	40.81
0.41	40.82	39.49
0.42	39.52	38.19
0.43	38.22	36.89
0.44	36.84	35.51
Length	0.76	0.76
Max Depth	96.80	96.18
Avg. Depth	74.64	73.22

Sample 10 - TSP 3H - Crack 2

Destructive Exam

Final Data

Destructive Exam						Final Data		
Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes	Length	0.16" Average	Ljg. Corrected
No Exclusion Criterion Applied								
-0.330	0%				End of SCC	-0.330	32.71	31.77
-0.324	26%					-0.320	34.00	33.06
-0.320	30%					-0.310	33.93	32.87
-0.300	37%					-0.300	34.32	33.26
-0.280	37%					-0.29	34.42	33.36
-0.268	34%	L9	0.084	1.3E-04	Overlapping cracks	-0.28	34.29	33.24
-0.260	42%					-0.27	33.96	27.89
-0.240	46%					-0.26	33.65	27.44
-0.232	32%	L8	0.010	1.5E-05		-0.25	33.41	27.19
-0.220	39%					-0.24	33.41	27.19
-0.200	33%					-0.23	32.38	26.17
-0.184	27%	L10	0.446	6.9E-04		-0.22	32.43	26.21
-0.180	29%					-0.21	32.15	25.94
-0.176	29%	L7	0.013	2.0E-05		-0.2	31.73	25.49
-0.176	0%					-0.19	31.29	25.06
-0.160	34%					-0.18	31.05	25.76
-0.140	30%	L6	0.002	3.1E-06		-0.176	30.49	25.20
-0.120	30%					-0.174	29.93	24.58
-0.100	34%	L5	0.005	7.3E-06		-0.17	29.19	23.85
-0.080	32%					-0.16	29.14	23.90
-0.060	34%					-0.15	28.82	23.59
-0.048	44%	L4	0.021	3.3E-05	Overlapping cracks	-0.14	28.75	23.51
-0.040	43%					-0.13	29.32	23.85
-0.020	41%					-0.12	30.12	29.66
0.000	40%					-0.11	30.87	30.56
0.020	31%					-0.1	31.56	31.25
0.024	0%					-0.09	33.95	33.64
0.028	0%					-0.08	35.56	35.25
0.032	38%	L3	0.119	1.8E-04	Overlapping cracks	-0.07	35.65	35.34
0.040	35%					-0.06	35.62	35.30
0.052	48%	L2	0.018	2.9E-05		-0.05	34.99	33.37
0.060	43%					-0.04	35.31	33.68
0.080	44%	L11	0.008	1.2E-05		-0.03	36.21	34.38
0.100	43%					-0.02	36.85	35.02
0.120	39%					-0.01	37.42	35.64
0.128	21%	L1	0.005	8.1E-06		0	38.09	36.22
0.140	36%				separate crack	0.01	38.78	36.91
0.156	26%					0.02	39.38	37.51
0.160	0%				end of SCC	0.03	39.79	37.92
						0.04	39.60	37.97
						0.05	38.48	36.79
						0.06	38.11	36.43
						0.07	37.45	35.76
						0.08	35.05	33.37
						0.09	34.74	33.05
						0.1	34.67	32.98
						0.11	34.90	33.21
						0.12	36.11	35.75
						0.13	36.17	35.82
						0.14	35.32	35.17
						0.15	34.54	34.39
						0.16	33.52	33.37
Length	0.49					Length	0.49	0.49
Max Depth	47.64					Max Depth	39.79	37.97
Avg. Depth	34.77					Avg. Depth	34.29	31.71

Sample 10 - TSP 4H - Crack 1

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
No Exclusion Cntenon Applied					
-0.320	0%				end of scc
-0.300	20%				
-0.292	16%				
-0.288	34%				
-0.284	36%				
-0.280	44%	L11	0.11	1.65E-04	step
-0.276	61%				
-0.260	69%				
-0.248	72%				
-0.244	77%	L1	0.04	5.58E-05	step front
-0.240	75%	L10	0.04	5.91E-05	step back
-0.220	75%				
-0.216	78%	L2	0.16	2.48E-04	step back
-0.200	86%				
-0.192	88%	L9	0.04	5.63E-05	step back
-0.180	89%				
-0.160	83%				
-0.140	78%				
-0.120	78%				
-0.114	80%	L8	0.02	3.78E-05	step back
-0.100	81%				
-0.080	83%				
-0.060	83%				
-0.040	78%				
-0.020	78%				
0.000	79%				
0.020	80%				
0.040	89%				
0.048	71%	L3	0.34	5.34E-04	step
0.060	73%				
0.080	73%	L7	0.34	5.33E-04	step
0.100	71%				
0.120	77%				
0.140	78%				
0.160	77%				
0.180	76%				
0.200	79%				
0.220	82%				
0.240	66%				
0.260	53% L4		0.06	8.93E-05	step back
0.280	44%				
0.296	41% L5		0.11	1.63E-04	step
0.300	37%				
0.320	38%				
0.328	37% L6		0.04	5.69E-05	step
0.340	35%				
0.360	18%				
0.378	0%				end of scc
Length	0.698				
Max Depth	89.38				
Avg. Depth	66.56				

Length	0.16" Average	Lig. Corrected
-0.32	42.07	40.03
-0.31	45.35	43.32
-0.30	48.02	44.20
-0.29	50.80	46.97
-0.28	53.51	49.69
-0.27	56.02	51.78
-0.26	58.24	54.01
-0.25	60.00	55.77
-0.24	61.37	57.14
-0.23	66.13	61.89
-0.22	70.14	65.91
-0.21	73.57	69.34
-0.20	76.71	72.48
-0.19	78.88	75.57
-0.18	79.87	76.56
-0.17	80.60	77.29
-0.16	81.25	78.34
-0.15	81.69	79.22
-0.14	82.16	79.68
-0.13	82.49	81.81
-0.12	82.30	81.61
-0.11	81.82	81.14
-0.10	81.20	80.93
-0.09	80.57	80.30
-0.08	80.17	79.89
-0.07	79.96	79.69
-0.06	79.93	79.66
-0.05	80.30	80.03
-0.04	80.93	80.65
-0.03	80.51	76.36
-0.02	80.08	76.21
-0.01	79.61	75.74
0.00	79.07	71.34
0.01	78.45	70.71
0.02	77.77	70.03
0.03	77.24	69.50
0.04	77.02	69.28
0.05	76.97	69.23
0.06	76.95	69.22
0.07	76.92	69.19
0.08	76.84	69.10
0.09	76.67	68.93
0.10	76.43	68.69
0.11	76.24	68.50
0.12	75.89	68.15
0.13	75.39	67.65
0.14	76.06	72.19
0.15	76.10	72.24
0.16	75.67	71.80
0.17	74.87	74.87
0.18	73.73	73.09
0.19	72.38	71.73
0.20	70.60	69.96
0.21	68.57	67.92
0.22	66.18	64.35
0.23	63.81	61.98
0.24	61.51	59.68
0.25	59.14	56.90
0.26	56.72	54.48
0.27	53.83	51.59
0.28	50.34	48.10
0.29	46.19	43.95
0.30	41.46	39.22
0.31	38.90	36.66
0.32	36.56	34.32
0.33	34.49	32.25
0.34	32.60	30.36
0.35	30.93	29.34
0.36	29.36	27.77
0.37	27.94	26.34
0.38	26.37	24.78
Length	0.698	0.698
Max Depth	82.49	81.81
Avg. Depth	67.03	63.63

Sample 11 - TSP 2H - Crack 1

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
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Length	0.16" Average	Lig. Corrected
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No Exclusion Criterion Applied								
-0.44	0.00				End of SCC	-0.44	29.91	29.91
-0.42	0.17					-0.43	32.18	32.18
-0.4	0.34					-0.42	34.20	34.20
-0.38	0.45					-0.41	36.58	36.58
-0.36	0.51					-0.4	39.21	39.21
-0.34	0.54					-0.39	42.21	42.21
-0.32	0.71					-0.38	45.50	45.50
-0.3	0.92					-0.37	48.51	48.51
-0.28	0.96					-0.36	51.29	51.29
-0.26	0.97 L1		0.0188	0.06	DUCTILE	-0.35	56.97	56.97
-0.24	0.98					-0.34	62.19	61.98
-0.22	0.98				SCC?	-0.33	66.92	66.71
-0.2	0.97					-0.32	71.17	70.95
-0.18	0.99					-0.31	74.90	74.68
-0.16	0.98					-0.3	78.32	78.11
-0.14	0.96					-0.29	81.42	81.21
-0.12	0.90					-0.28	84.34	84.13
-0.1	0.90					-0.27	87.14	86.93
-0.08	0.90					-0.26	89.88	89.67
-0.06	0.89					-0.25	92.49	92.28
-0.04	0.88					-0.24	94.59	94.38
-0.02	0.89					-0.23	96.13	95.92
0	0.88					-0.22	96.98	96.77
0.02	0.89 L31				SCC?	-0.21	97.05	96.83
0.04	0.85					-0.2	96.81	96.60
0.06	0.85					-0.19	96.46	96.25
0.08	0.96 L32				SCC?	-0.18	96.07	95.86
0.1	0.96					-0.17	95.63	95.63
0.12	0.95					-0.16	95.17	95.17
0.14	0.92					-0.15	94.67	94.67
0.16	0.93					-0.14	94.15	94.15
0.18	0.95					-0.13	93.61	93.61
0.2	0.97					-0.12	93.06	93.06
0.22	0.99					-0.11	92.55	92.55
0.24	0.96					-0.1	92.01	92.01
0.26	0.93					-0.09	91.40	91.40
0.28	0.97					-0.08	90.78	90.78
0.3	0.94					-0.07	90.20	90.20
0.32	0.89					-0.06	89.73	89.73
0.397	0.00				End of SCC ended in sa	-0.05	89.21	89.21
						-0.04	88.73	88.73
						-0.03	88.44	88.44
						-0.02	88.18	88.18
						-0.01	88.24	88.24
						0	88.62	88.62
						0.01	88.99	88.99
						0.02	89.39	89.39
						0.03	89.78	89.78
						0.04	90.15	90.15
						0.05	90.46	90.46
						0.06	90.65	90.65
						0.07	90.83	90.83
						0.08	91.08	91.08
						0.09	91.41	91.41
						0.1	91.77	91.77
						0.11	92.19	92.19
						0.12	92.82	92.82
						0.13	93.61	93.61
						0.14	94.41	94.41
						0.15	95.13	95.13
						0.16	95.45	95.45
						0.17	95.35	95.35
						0.18	95.13	95.13
						0.19	95.03	95.03
						0.2	95.08	95.08
						0.21	95.08	95.08
						0.22	95.09	95.09
						0.23	95.07	95.07
						0.24	94.90	94.90
						0.25	94.01	94.01
						0.26	92.39	92.39
						0.27	90.02	90.02
						0.28	86.89	86.89
						0.29	83.01	83.01
						0.3	78.40	78.40
						0.31	73.09	73.09
						0.32	67.35	67.35
						0.33	65.54	65.54
						0.34	63.61	63.61
						0.35	61.53	61.53
						0.36	58.99	58.99

Length 0.837
Max Depth 99.20
Avg. Depth 80.91

Sample 11 - TSP 2H - Crack 1

Destructive Exam

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
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No Exclusion Criterion Applied

Final Data

Length	0.16" Average	Lig. Corrected
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0.37 55.87 55.87

Sample 11 - TSP 2H - Crack 1

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
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No Exclusion Criterion Applied

Length	0.16" Average	Lig. Corrected
0.38	52.31	52.31
0.39	48.18	48.18
0.397	43.37	43.37
Length	0.837	0.837
Max Depth	97.05	96.83
Avg. Depth	81.44	81.40

Sample 11 - TSP 2H - Crack 2

Destructive Exam		Final Data		
Length	Depth	Length	0.16" Average	Lig. Corrected
No Exclusion Criterion Applied Also No Avg. Over Length of Crack, Avg. Max. Depth = Avg. Depth = 33%				
0.22	0			
0.24	43			
0.26	42			
0.28	40			
0.30	36			
0.32	36			
0.34	35			
0.36	30			
0.38	0			
Length	0.16			
Max Depth	43.00			
Avg. Depth	32.75			

Sample 11 - TSP 3H - Crack 1

Destructive Exam

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
-0.544	0.00				end of scc
-0.540	8.58				
-0.520	5.67				
-0.500	10.40				
-0.480	12.95				
-0.470	32.29				
-0.460	39.91				
-0.440	44.29				
-0.420	49.60				
-0.400	73.53				
-0.380	68.44				
-0.360	80.73				
-0.354	85.16	L8	0.019	3.0E-05	
-0.340	83.49				
-0.320	79.49				
-0.312	69.09	L7	0.663	1.0E-03	Overlapping cracks
-0.300	61.75				
-0.280	64.65				
-0.268	64.07	L6	0.489	7.6E-04	Overlapping cracks
-0.260	55.27				
-0.230	96.70				
-0.210	99.20				
-0.190	98.00				
-0.170	95.20				
-0.150	96.80				
-0.130	96.90				
-0.110	96.60				
-0.100	82.69				
-0.092	82.25	L9	0.209	3.2E-04	
-0.080	80.95				
-0.060	84.07	L5	SCC		
-0.040	84.07				
-0.020	81.16				
0.000	80.22				
0.020	84.29				
0.040	86.04				
0.060	82.55				
0.080	84.44	L4	SCC		
0.100	84.73				
0.120	84.07				
0.140	83.93				
0.160	84.58				
0.170	84.51	L10	0.037	5.8E-05	Overlapping cracks
0.180	80.65				
0.200	90.11				
0.220	89.16	L11	SCC		
0.240	87.05				
0.250	86.91	L3	SCC		
0.260	89.96				
0.280	88.22				
0.300	88.73	L2	SCC		
0.320	88.95	L1	SCC		
0.340	99.50				
0.360	93.20				
0.370	95.90	L12	2.580	4.0E-03	
0.380	96.60				
0.400	87.05				
0.420	78.40				
0.440	65.96				
0.460	60.29				
0.480	53.67				
0.500	46.25				
0.520	39.27				
0.540	28.73				
0.560	19.71				
0.564	17.53				end of scc
0.572	0.00				
Length	1.116				
Max Depth	99.5				
Avg. Depth	72.58				

Adjusted Destructive Exam

Ligament Number		Ligament Number	
Length	Depth	Length	Depth
Tails Excluded By 4C Cntenon			
-0.500	0.00	-0.544	0.00
-0.480	12.95	-0.540	8.58
-0.470	32.29	-0.520	5.67
-0.460	39.91		
-0.440	44.29		
-0.420	49.60		
-0.400	73.53		
-0.380	68.44		
-0.360	80.73		
-0.354	85.16	L8	
-0.340	83.49		
-0.320	79.49		
-0.312	69.09	L7	
-0.300	61.75		
-0.280	64.65		
-0.268	64.07	L6	
-0.260	55.27		
-0.230	96.70		
-0.210	99.20		
-0.190	98.00		
-0.170	95.20		
-0.150	96.80		
-0.130	96.90		
-0.110	96.60		
-0.100	82.69		
-0.092	82.25	L9	
-0.080	80.95		
-0.060	84.07	L5	
-0.040	84.07		
-0.020	81.16		
0.000	80.22		
0.020	84.29		
0.040	86.04		
0.060	82.55		
0.080	84.44	L4	
0.100	84.73		
0.120	84.07		
0.140	83.93		
0.160	84.58		
0.170	84.51	L10	
0.180	80.65		
0.200	90.11		
0.220	89.16	L11	
0.240	87.05		
0.250	86.91	L3	
0.260	89.96		
0.280	88.22		
0.300	88.73	L2	
0.320	88.95	L1	
0.340	99.50		
0.360	93.20		
0.370	95.90	L12	
0.380	96.60		
0.400	87.05		
0.420	78.40		
0.440	65.96		
0.460	60.29		
0.480	53.67		
0.500	46.25		
0.520	39.27		
0.540	28.73		
0.560	19.71		
0.564	17.53		
0.572	0.00		
Length	1.072		
Max Depth	99.50		
Avg. Depth	75.17		

Final Data

Length	0.16" Average	Lig. Corrected
-0.500	30.34	30.34
-0.490	33.46	33.46
-0.480	37.10	37.10
-0.470	39.93	39.93
-0.460	42.12	42.12
-0.450	44.44	44.44
-0.440	46.86	46.86
-0.430	49.22	49.00
-0.420	51.24	51.02
-0.410	56.03	55.81
-0.400	60.33	60.11
-0.390	63.56	63.34
-0.380	65.29	65.07
-0.370	66.72	66.49
-0.360	68.08	67.85
-0.350	69.24	69.01
-0.340	69.73	69.50
-0.330	70.88	70.65
-0.320	72.13	71.90
-0.310	73.50	73.27
-0.300	75.08	74.85
-0.290	76.89	76.66
-0.280	78.31	78.08
-0.270	79.32	79.09
-0.260	80.02	80.00
-0.250	80.71	80.69
-0.240	81.57	82.55
-0.230	82.58	83.46
-0.220	84.29	85.16
-0.210	86.36	87.80
-0.200	88.33	90.44
-0.190	90.21	93.08
-0.180	91.30	95.72
-0.170	92.87	98.36
-0.160	93.57	101.00
-0.150	93.55	103.64
-0.140	92.81	106.28
-0.130	91.99	108.92
-0.120	91.10	111.56
-0.110	90.16	114.20
-0.100	89.17	116.84
-0.090	88.23	119.48
-0.080	87.35	122.12
-0.070	86.54	124.76
-0.060	85.81	127.40
-0.050	85.12	130.04
-0.040	84.48	132.68
-0.030	83.75	135.32
-0.020	82.92	137.96
-0.010	82.97	140.60
0.000	83.11	143.24
0.010	83.32	145.88
0.020	83.45	148.52
0.030	83.47	151.16
0.040	83.47	153.80
0.050	83.47	156.44
0.060	83.55	159.08
0.070	83.73	161.72
0.080	83.96	164.36
0.090	84.21	167.00
0.100	84.12	169.64
0.110	84.18	172.28
0.120	84.47	174.92
0.130	84.68	177.56
0.140	84.97	180.20
0.150	85.30	182.84
0.160	85.51	185.48
0.170	85.65	188.12
0.180	85.97	190.76
0.190	86.22	193.40
0.200	86.45	196.04
0.210	86.71	198.68
0.220	86.99	201.32
0.230	87.27	203.96
0.240	87.55	206.60
0.250	88.12	209.24
0.260	89.00	211.88
0.270	89.92	214.52
0.280	90.38	217.16
0.290	90.72	219.80
0.300	91.13	222.44
0.310	91.29	225.08
0.320	91.23	227.72
0.330	90.97	230.36
0.340	90.47	233.00

Sample 11 - TSP 3H - Crack 1

Destructive Exam

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
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Adjusted Destructive Exam

		Ligament Number	
Length	Depth	Length	Depth

Tails Excluded By 4C Criterion

Final Data

Length	0.16" Average	Lig. Corrected
0.350	89.43	60.43
0.360	88.07	59.07
0.370	86.59	57.59
0.380	84.93	55.93
0.390	83.07	54.07
0.400	81.00	52.00
0.410	78.70	49.71
0.420	75.88	46.88
0.430	72.54	43.55
0.440	69.19	40.19
0.450	65.70	36.71
0.460	61.75	32.76
0.470	57.50	28.50
0.480	53.25	24.25
0.490	48.39	19.39
0.500	46.24	17.24
0.510	44.10	15.10
0.520	42.09	13.09
0.530	40.26	11.26
0.540	38.35	9.35
0.550	36.36	7.36
0.560	34.30	5.30
0.570	32.14	3.14
0.572	28.93	-0.07
Length	1.072	1.072
Max Depth	93.57	91.3
Avg. Depth	75.53	68.41

Sample 11 - TSP 4H - Crack 1

Destructive Exam

Adjusted Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
-0.524	0%				End of SCC
-0.520	18%				
-0.500	23%				
-0.485	10%				
-0.408	64%				
-0.380	51%				
-0.360	62%	L31			SCC?
-0.340	70%				
-0.320	78%				
-0.300	89%				
-0.280	98%	L32			SCC?
-0.260	98%				
-0.240	98%				
-0.220	98%				
-0.200	96%				
-0.180	95%	L33			SCC?
-0.160	94%				
-0.140	89%				
-0.120	83%	L4	0.085	0.067	Ductile
-0.100	81%				
-0.080	77%	L3	0.284	0.229	Ductile
-0.060	85%				
-0.040	81%				
-0.020	82%				
0.000	78%				
0.020	75%				
0.040	80%				
0.060	82%				
0.080	81%				
0.100	80%	L34			SCC?
0.120	79%				
0.140	83%				
0.160	79%				
0.180	86%				
0.200	82%				
0.220	90%	L1	0.038	0.080	Ductile
0.240	91%				
0.260	86%				
0.280	75%	L2	0.112	0.133	Ductile
0.300	78%				
0.320	70%				
0.340	42%				
0.360	48%				
0.388	52%				
0.445	32%				
0.460	39%				
0.480	41%				
0.500	31%				
0.520	28%				
0.524	0%				End of SCC
Length	1.048				
Max Depth	98.11				
Avg. Depth	68.58				

Length		Depth		Ligament Number	
Tails Excluded By 4C Criterion					
-0.485	0	-0.524	0.00		
-0.408	63.56364	-0.520	17.96		
-0.38	50.54545	-0.500	22.98		
-0.36	61.67273			L31	
-0.34	70.25455				
-0.32	78.25455				
-0.3	89.30909				
-0.28	98.10909			L32	
-0.26	98.10909				
-0.24	98.10909				
-0.22	98.10909				
-0.2	96.14545				
-0.18	94.54545			L33	
-0.16	93.74545				
-0.14	88.8				
-0.12	83.41818			L4	
-0.1	80.87273				
-0.08	76.50909			L3	
-0.06	85.38182				
-0.04	81.45455				
-0.02	82.32727				
0	77.81818				
0.02	75.34545				
0.04	79.85455				
0.06	81.67273				
0.08	80.72727				
0.1	80			L34	
0.12	78.76364				
0.14	82.76364				
0.16	79.34545				
0.18	86.4				
0.2	81.67273				
0.22	89.6			L1	
0.24	90.54545				
0.26	85.67273				
0.28	74.61818			L2	
0.3	78.03636				
0.32	70.25455				
0.34	42.4				
0.36	47.56364				
0.368	51.78182				
0.445	32.21818				
0.46	38.90909				
0.48	40.87273				
0.5	31.41818				
0.52	27.70909				
0.524	0				
Length	1.009				
Max Depth	98.11				
Avg. Depth	70.14				

Length	0.16" Average	Lig. Corrected
-0.485	32.59	32.59
-0.475	35.08	35.08
-0.465	36.70	36.70
-0.455	38.09	38.09
-0.445	39.69	39.69
-0.435	41.41	41.41
-0.425	43.19	43.19
-0.415	45.01	45.01
-0.405	46.84	46.84
-0.395	51.61	51.61
-0.385	56.22	56.22
-0.375	60.63	60.63
-0.365	64.81	64.81
-0.355	68.64	68.64
-0.345	71.98	71.98
-0.335	74.84	74.84
-0.325	77.21	77.21
-0.315	79.33	79.33
-0.305	81.72	81.72
-0.295	84.35	84.35
-0.285	86.90	86.90
-0.275	89.06	89.06
-0.265	90.89	90.89
-0.255	92.44	92.44
-0.245	93.71	93.71
-0.235	94.67	94.67
-0.225	95.20	95.20
-0.215	95.25	95.25
-0.205	94.86	94.86
-0.195	94.08	93.14
-0.185	93.11	92.17
-0.175	92.03	91.09
-0.165	90.82	89.88
-0.155	89.68	85.84
-0.145	88.80	84.96
-0.135	88.00	84.16
-0.125	87.10	83.26
-0.115	86.22	82.38
-0.105	85.42	81.58
-0.095	84.61	80.77
-0.085	83.71	79.87
-0.075	82.72	78.88
-0.065	81.75	77.91
-0.055	80.95	73.05
-0.045	80.44	72.54
-0.035	80.18	72.27
-0.025	80.08	73.12
-0.015	80.08	73.12
-0.005	80.15	73.19
0.005	80.32	73.36
0.015	80.41	76.35
0.025	80.20	76.14
0.035	79.89	75.83
0.045	79.73	75.67
0.055	79.74	75.68
0.065	79.73	75.67
0.075	79.67	75.61
0.085	79.80	75.74
0.095	80.23	76.17
0.105	80.78	76.72
0.115	81.15	81.15
0.125	81.44	81.44
0.135	81.87	81.87
0.145	82.38	82.38
0.155	82.90	82.90
0.165	83.39	83.39
0.175	83.77	83.77
0.185	83.93	83.93
0.195	83.79	82.56
0.205	83.58	82.35
0.215	83.43	82.20
0.225	83.09	81.86
0.235	82.52	81.29
0.245	81.53	80.30
0.255	79.66	78.43
0.265	77.25	76.02
0.275	74.96	73.73
0.285	73.04	71.81
0.295	71.06	69.83
0.305	68.70	67.47
0.315	66.06	64.82

Sample 11 - TSP 4H - Crack 1

Destructive Exam

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes

Adjusted Destructive Exam

		Ligament Number	
Length	Depth	Length	Depth
Tails Excluded By 4C Criterion			

Final Data

Length	0.16" Average	Lig. Corrected
0.325	63.24	62.01
0.335	60.33	59.09
0.345	57.41	56.18
0.355	54.58	53.34
0.365	51.92	51.92
0.375	49.64	49.64
0.385	47.42	47.42
0.395	45.32	45.32
0.405	43.33	43.33
0.415	41.60	41.60
0.425	40.49	40.49
0.435	39.60	39.60
0.445	38.51	38.51
0.455	35.56	35.56
0.465	34.65	34.65
0.475	33.80	33.80
0.485	33.01	33.01
0.495	32.28	32.28
0.505	31.66	31.66
0.515	31.14	31.14
0.52	30.78	30.78
0.524	30.62	30.62
Length	1.009	1.009
Max Depth	95.25	95.25
Avg. Depth	70.21	68.67

Sample 11 - TSP 4H - Crack 2

Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
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Length	0.16" Average	Lig. Corrected
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No Exclusion Criterion Applied					
-0.380	0%				End of SCC
-0.360	35%				
-0.340	38%				
-0.320	41%				
-0.300	42%				
-0.280	44%				
-0.260	45%				
-0.240	42%				
-0.220	42%				
-0.200	46%				
-0.180	46%				
-0.160	44%				
-0.140	44%				
-0.120	41%				
-0.100	43%	L3	0.213	0.267	DUCTILE
-0.080	41%				
-0.060	43%				
-0.040	44%				
-0.020	39%				
0.000	39%	L31			SCC?
0.020	36%				
0.040	35%				
0.060	35%				
0.080	30%	L32			SCC?
0.100	38%				
0.120	42%				
0.140	38%	L1	0.116	0.173	DUCTILE
0.160	32%				
0.180	37%				
0.200	37%				
0.220	35%				
0.240	34%				
0.260	37%	L2	0.036	0.080	DUCTILE
0.280	37%				
0.300	37%	L33			SCC?
0.320	37%				
0.340	37%				
0.360	35%				
0.410	0%				End of SCC
Length	0.790				
Max Depth	46.33				
Avg. Depth	37.30				

-0.380	32.22	32.22
-0.370	33.28	33.28
-0.360	34.23	34.23
-0.350	35.08	35.08
-0.340	35.85	35.85
-0.330	36.41	36.41
-0.320	36.80	36.80
-0.310	37.13	37.13
-0.300	37.43	37.43
-0.290	40.03	40.03
-0.280	41.72	41.72
-0.270	42.38	42.38
-0.260	42.97	42.97
-0.250	43.40	43.40
-0.240	43.66	43.66
-0.230	43.84	43.84
-0.220	43.99	43.99
-0.210	44.03	44.03
-0.200	43.95	43.95
-0.190	43.85	43.85
-0.180	43.74	41.35
-0.170	43.54	41.14
-0.160	43.36	40.96
-0.150	43.33	40.93
-0.140	43.38	40.98
-0.130	43.46	41.06
-0.120	43.44	41.04
-0.110	43.15	40.75
-0.100	42.72	40.32
-0.090	42.29	39.89
-0.080	41.94	39.54
-0.070	41.57	39.17
-0.060	41.10	38.70
-0.050	40.60	38.20
-0.040	40.18	37.78
-0.030	39.81	37.42
-0.020	39.41	37.01
-0.010	38.82	36.82
0.000	38.14	36.14
0.010	37.77	37.77
0.020	37.56	37.56
0.030	37.38	37.38
0.040	37.27	37.27
0.050	37.02	37.02
0.060	36.81	35.51
0.070	36.56	35.26
0.080	36.13	34.83
0.090	35.85	34.55
0.100	35.80	34.50
0.110	35.87	34.57
0.120	35.96	34.66
0.130	36.00	34.70
0.140	35.97	34.67
0.150	35.94	34.64
0.160	36.03	34.73
0.170	36.36	35.06
0.180	36.52	34.82
0.190	36.45	34.75
0.200	36.29	34.59
0.210	36.02	34.32
0.220	35.84	34.13
0.230	35.79	35.39
0.240	35.95	35.54
0.250	36.28	35.88
0.260	36.47	36.07
0.270	36.44	36.04
0.280	36.31	35.90
0.290	35.74	35.34
0.300	34.84	34.44
0.310	33.60	33.20
0.320	31.97	31.57
0.330	29.96	29.56
0.340	29.61	29.20
0.350	29.11	29.11
0.360	28.54	28.54
0.370	27.87	27.87
0.380	27.12	27.12
0.390	26.26	26.26
0.400	25.19	25.19
0.410	23.82	23.82

Sample 11 - TSP 4H - Crack 2

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
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No Exclusion Criterion Applied

Length	0.16" Average	Ug. Corrected
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Length	0.79	0.79
Max Depth	44.03	44.03
Avg. Depth	37.47	36.59

Sample 12 - TSP 2H - Crack 1

Destructive Exam

Final Data

Axial Position Inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
------------------------	------------------------	--------------------	---	---	-------

No Exclusion Criteron Applied Also No Avg. Over Length of Crack

0.000	0
0.019	10
0.033	20
0.060	30
0.084	34
0.088	34
0.091	34
0.095	34
0.120	34
0.133	30
0.136	25
0.139	20
0.177	20
0.181	20
0.184	20
0.201	30
0.217	34
0.220	30
0.232	34
0.242	0

Length	0.242
Max Depth	34.00
Avg. Depth	24.90

Length	0.16" Average	Lig. Corrected
--------	------------------	-------------------

0.00	23.40	23.40
0.01	23.41	21.96
0.02	23.69	22.24
0.03	24.08	22.63
0.04	24.34	22.89
0.05	24.72	23.27
0.06	24.00	21.10
0.07	23.08	20.18
0.08	23.08	20.18
0.09	23.08	20.18
0.10	23.08	18.00
0.11	24.00	18.92
0.12	24.78	19.70
0.13	25.39	20.32
0.14	25.73	20.66
0.15	25.88	20.81
0.16	25.86	20.79
0.17	25.64	20.57
0.18	25.31	21.69
0.19	24.84	21.21
0.20	24.27	20.64
0.21	23.62	19.99
0.22	22.87	19.25
0.23	22.02	19.84
0.24	21.28	19.10
0.242	21.28	19.10

Length	0.242	0.242
Max Depth	25.88	23.40
Avg. Depth	24.11	20.75

Sample 12 - TSP 3H - Crack 1

Destructive Exam

Final Data

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Type/Area (in ²)	Notes
No Exclusion Criterenon Applied Also No Avg. Over Length of Crack					
-0.085	0%				end of scc
-0.078	16%				
-0.068	16%				
-0.060	17%				
-0.055	17%	L2	0.018	2.8E-05	
-0.052	21%				
-0.044	23%				
-0.036	20%				
-0.030	18%	L3	0.013	2.0E-05	
-0.028	20%				
-0.020	20%				
-0.012	19%				
-0.004	16%				
0.004	14%				
0.008	14%	L1	0.119	1.8E-04	
0.012	16%				
0.020	17%				
0.028	15%				
0.036	11%				
0.044	0%				end of scc
Length	0.129				
Max Depth	22.69				
Avg. Depth	16.07				

Length	0.16" Average	Lig. Corrected
-0.085		0.00
-0.076		16.15
-0.068		16.29
-0.06		17.45
-0.0552		17.31
-0.052		21.16
-0.044		22.69
-0.036		19.71
-0.03		18.25
-0.028		20.00
-0.02		20.22
-0.012		19.27
-0.004		15.56
0.004		14.47
0.008		13.82
0.012		15.78
0.02		16.65
0.028		14.55
0.036		10.91
0.044		0.00
Length		0.129
Max Depth		22.69
Avg. Depth		16.04

Sample 12 - TSP 4H - Crack 1

Destructive Exam

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
-0.300	0%				
-0.295	5%				
-0.225	5%				Very shallow SCC visible intermittent estimated to be ~5% needs re-exam
-0.220	0%				End of SCC
-0.200	14%	L31			SCC?
-0.180	13%	L32			SCC?
-0.160	13%				
-0.140	20%				
-0.120	27%	L01	0.083	0.300	DUCTILE
-0.100	33%				
-0.080	28%				
-0.060	27%	L33			SCC?
-0.040	29%	L34			SCC?
-0.020	28%	L35			SCC?
0.000	22%				
0.020	19%				
0.040	22%	L36			SCC?
0.060	20%				
0.080	19%	L37			SCC?
0.100	16%				
0.120	16%				
0.140	0%				End of SCC
0.145	5%				Very shallow SCC visible intermittent estimated to be ~5% needs re-exam
0.225	5%				
0.230	0%				
Length	0.530				
Max Depth	33.09				
Avg. Depth	15.32				

Adjusted Destructive Exam

Length		Depth		Ligament Number	Length		Depth	
-0.22	0	-0.300	0.00					
-0.2	14	L31	-0.295	5.45				
-0.18	13	L32	-0.225	5.45				
-0.16	13							
-0.14	20							
-0.12	27	L01						
-0.1	33							
-0.08	28							
-0.06	27	L33						
-0.04	29	L34						
-0.02	28	L35						
0	22							
0.02	19							
0.04	22	L36						
0.06	20							
0.08	19	L37						
0.1	16		0.145	5				
0.12	16		0.225	5				
0.14	0		0.230	0				
Length	0.36							
Max Depth	33.09							
Avg. Depth	20.33							

Final Data

Length	0.16" Average	Lig. Corrected
-0.22	12.22	11.30
-0.21	13.35	12.42
-0.2	14.59	13.66
-0.19	15.88	14.95
-0.18	17.19	16.27
-0.17	18.14	17.22
-0.16	18.80	17.87
-0.15	19.34	18.42
-0.14	19.79	18.87
-0.13	21.44	20.51
-0.12	22.74	21.81
-0.11	23.59	22.66
-0.1	24.44	23.51
-0.09	25.15	25.15
-0.08	25.68	25.68
-0.07	26.12	26.12
-0.06	26.26	26.26
-0.05	26.29	26.29
-0.04	26.21	26.21
-0.03	25.85	25.85
-0.02	25.26	25.26
-0.01	24.47	24.47
0	23.79	23.79
0.01	23.18	23.18
0.02	22.50	22.50
0.03	21.85	21.85
0.04	21.15	21.15
0.05	19.91	19.91
0.06	18.24	18.24
0.07	17.63	17.63
0.08	17.13	17.13
0.09	16.79	16.79
0.1	16.50	16.50
0.11	16.29	16.29
0.12	15.91	15.91
0.13	15.30	15.30
0.14	14.67	14.67
Length	0.36	0.36
Max Depth	26.29	26.29
Avg. Depth	20.56	20.24

Sample 13 - TSP 3H - Crack 1

Destructive Exam

Axial Position inch	SCC Depth % wall	Ligament Number	Ligament Type/Area (mm ²)	Ligament Height (mm)	Notes
No Exclusion Criterion Applied					
-0.192	0%				End of SCC
-0.180	16%				
-0.160	21%	L1	0.091	0.264	DUCTILE
-0.140	21%				
-0.120	31%				
-0.100	27%	L2	0.017	0.093	DUCTILE
-0.080	34%				
-0.060	36%				
-0.040	41%				
-0.020	39%				
0.000	46%				
0.020	37%				
0.040	33%	L5	0.057	0.136	DUCTILE
0.060	29%				
0.080	27%	L4	0.038	0.100	DUCTILE
0.100	25%				
0.120	18%	L3	0.062	0.150	DUCTILE
0.140	3%				
0.144	0%				End of SCC
Length	0.336				
Max Depth	45.60				
Avg. Depth	28.64				

Final Data

Length	0.16" Average	Lig. Corrected
-0.192	18.61	17.59
-0.190	19.37	18.35
-0.180	20.29	19.08
-0.170	21.34	20.12
-0.160	22.32	21.10
-0.150	23.24	22.02
-0.140	24.20	22.99
-0.130	25.20	23.98
-0.120	26.04	24.82
-0.110	26.74	25.53
-0.100	29.24	28.03
-0.090	30.80	29.58
-0.080	32.14	30.92
-0.070	33.70	33.50
-0.060	35.47	35.27
-0.050	36.57	36.37
-0.040	37.00	36.17
-0.030	37.44	36.61
-0.020	37.90	37.07
-0.010	37.95	37.31
0.000	37.58	36.52
0.010	37.09	36.03
0.020	36.46	35.40
0.030	35.57	34.51
0.040	34.43	32.68
0.050	33.11	31.35
0.060	31.60	29.85
0.070	29.33	27.57
0.080	26.29	24.53
0.090	23.33	21.57
0.100	18.95	17.19
0.110	17.85	16.10
0.120	16.57	14.82
0.130	15.03	13.92
0.140	13.16	12.05
0.144	10.76	9.65
Length	0.336	0.336
Max Depth	37.95	37.31
Avg. Depth	28.44	27.25

Appendix C

NDE Analyses for +Point Coil Depth Profiles

Footnotes:

1. Length adjustment procedure applied.
2. No length adjustment required
3. Depth adjustment procedure applied.
4. No depth adjustment required
5. Zero depth added
6. Destructive exam average depths in figures are adjusted so that running average depth equals average depth directly from DE as given in Table C-62. This correction is not used in other parts of this report.



Table C-1
Pulled Tube R10C22
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.19	32	N/A	N/A			
-0.16	32				-0.14	0
-0.12	23				-0.12	23
-0.09	25				-0.09	25
-0.06	32				-0.06	32
-0.03	41				-0.03	41
0.01	32				0.01	32
0.04	25				0.04	25
0.07	30				0.07	30
0.11	39				0.11	39
0.14	18				0.14	18
0.17	34				0.17	0
0.20	34					
0.24	16					
0.27	34					
				Max. Volts	0.63	
				Max. Depth (%)	41.00	
				Length (in.)	0.31	
				Avg. Depth (%)	27.56	

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽³⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
				0.47	0	0.00	0.47	0
0.44	49	0.15	N/A	0.44	49	0.15	0.44	29
0.41	49	0.24		0.41	49	0.24	0.41	29
0.37	37	0.52		0.37	37	0.52	0.37	22
0.34	29	0.55		0.34	29	0.55	0.34	17
				0.31	0	0.00	0.31	0
Max. Volts					0.55	0.55		
Max. Depth (%)					49.00	29.00		
Length (in.)					0.16	0.16		
Avg. Depth (%)					33.44	19.79		

Table C-2
Pulled Tube R21C43
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.42	32	N/A	N/A			
-0.39	57			-0.39	0	
-0.36	44			-0.36	44	
-0.33	49			-0.33	49	
-0.30	57			-0.3	57	
-0.27	57			-0.27	57	
-0.24	59			-0.24	59	
-0.21	51			-0.21	51	
-0.18	44			-0.18	44	
-0.15	46			-0.15	46	
-0.12	44			-0.12	44	
-0.09	46			-0.09	46	
-0.06	41			-0.06	41	
-0.03	41			-0.03	41	
0.00	44			0	44	
0.03	39			0.03	39	
0.06	39			0.06	39	
0.09	46			0.09	46	
0.12	49			0.12	49	
0.15	51			0.15	51	
0.18	49			0.18	49	
0.21	54			0.21	54	
0.24	57			0.24	57	
0.27	54			0.27	54	
0.30	62			0.3	62	
0.33	59			0.33	59	
0.36	59			0.36	59	
0.39	57			0.39	57	
0.43	57			0.43	57	
0.45	49			0.45	49	
0.48	51			0.48	51	
0.52	70			0.52	0	
0.55	49					
0.58	70					
Max. Volts				3.09		
Max. Depth (%)				62.00		
Length (in.)				0.91		
Avg. Depth (%)				48.29		

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.59	99	0.16	37			
-0.56	87	0.24	31			
-0.52	84	0.35	30			
-0.49	60	0.67	22		-0.52	0
-0.46	55	1.27	20		-0.49	60
-0.43	58	1.97	21		-0.46	55
-0.39	58	2.77	21		-0.43	58
-0.36	60	3.19	22		-0.39	58
-0.33	63	2.82	23		-0.36	60
-0.29	63	2.10	23		-0.33	63
-0.26	58	2.67	21		-0.29	63
-0.23	58	2.63	21		-0.26	58
-0.19	58	2.23	21		-0.23	58
-0.16	55	1.88	20		-0.19	58
-0.13	55	1.65	20		-0.16	55
-0.09	49	1.51	18		-0.13	55
-0.06	49	1.28	18		-0.09	49
-0.03	44	1.31	16		-0.06	49
0.01	45	1.40	16		-0.03	44
0.04	52	1.19	52		0.01	45
0.07	47	1.26	17		0.04	52
0.11	44	1.51	16		0.07	47
0.14	47	1.53	17		0.11	44
0.17	47	1.58	17		0.14	47
0.21	47	1.62	17		0.17	47
0.24	47	1.92	17		0.21	47
0.27	55	1.91	17		0.24	47
0.30	55	1.88	20		0.27	55
0.34	52	1.85	19		0.30	55
0.37	55	1.53	20		0.34	52
0.40	47	1.04	17		0.37	55
0.44	49	0.53	18		0.40	47
0.47	84	0.24	30		0.44	49
0.50	81	0.24	29		0.47	0
0.54	94	0.12	50			
Max. Volts				2.82		
Max. Depth (%)				63.00		
Length (in.)				0.97		
Avg. Depth (%)				50.66		

**Table C-3
Pulled Tube R21C43
Laboratory Specimen NDE Analysis**

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.04	62		N/A			
-0.01	49			-0.01		0
0.02	39			0.02		39
0.05	37			0.05		37
0.08	41			0.08		41
0.11	44			0.11		44
0.14	41			0.14		41
0.17	41			0.17		41
0.20	39			0.2		39
0.23	37			0.23		37
0.26	41			0.26		41
0.29	37			0.29		37
				0.3		0
				Max. Volts		1.13
				Max. Depth (%)		44.00
				Length (in.)		0.31
				Avg. Depth (%)		37.23

Crack 2 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.29	0					
-0.28	60	0.11	22			
-0.24	63	0.16	23	0.16	-0.24	0
-0.21	42	0.28	15	0.28	-0.21	42
-0.18	39	0.50	14	0.50	-0.18	39
-0.14	39	0.92	14	0.92	-0.14	39
-0.11	39	1.26	14	1.26	-0.11	39
-0.08	42	1.16	15	1.16	-0.08	42
-0.04	36	1.01	13	1.01	-0.04	36
-0.01	34	0.82	12	0.82	-0.01	34
0.02	36	0.42	13	0.42	0.02	36
0.05	49	0.18	18	0.18	0.05	0
0.09	55	0.12	20			
0.12	69	0.10	25			
0.15	92	0.04	55			
0.16	0					
				Max. Volts		1.26
				Max. Depth (%)		43.00
				Length (in.)		0.29
				Avg. Depth (%)		35.14

Table C-4
Pulled Tube R12C32
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.34	0	0.35	29	0.35	-0.34	0
-0.31	67	0.64	25	0.64	-0.31	67
-0.28	61	1.29	23	1.29	-0.28	61
-0.24	73	2.41	27	2.41	-0.24	73
-0.21	67	3.50	25	3.50	-0.21	67
-0.18	67	3.44	25	3.44	-0.18	67
-0.15	67	2.69	25	2.69	-0.15	67
-0.11	61	3.01	23	3.01	-0.11	61
-0.08	55	3.27	21	3.27	-0.08	55
-0.05	64	2.51	24	2.51	-0.05	64
-0.02	55	2.66	21	2.66	-0.02	55
0.02	52	2.88	20	2.88	0.02	52
0.05	52	2.86	20	2.86	0.05	52
0.08	55	2.46	21	2.46	0.08	55
0.11	52	2.32	20	2.32	0.11	52
0.15	55	2.32	21	2.32	0.15	55
0.18	55	2.31	21	2.31	0.18	55
0.21	55	1.56	21	1.56	0.21	55
0.25	50	0.67	19	0.67	0.25	50
0.28	36	0.16	14	0.16	0.28	36
0.31	0	0.00	0	0.00	0.31	0
				Max. Volts		3.50
				Max. Depth (%)		73.0
				Length (In.)		0.65
				Avg. Depth (%)		55.19

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.36	0				-0.36	0
-0.32	70	0.67	25	0.67	-0.32	70
-0.29	65	1.34	23	1.34	-0.29	65
-0.25	76	2.51	27	2.51	-0.25	76
-0.22	70	3.62	25	3.62	-0.22	70
-0.18	68	3.55	24	3.55	-0.18	68
-0.15	70	2.80	25	2.80	-0.15	70
-0.11	65	3.14	23	3.14	-0.11	65
-0.08	59	3.41	21	3.41	-0.08	59
-0.04	68	2.62	24	2.62	-0.04	68
-0.01	59	2.77	21	2.77	-0.01	59
0.03	57	3.00	20	3.00	0.03	57
0.06	57	2.98	20	2.98	0.06	57
0.10	59	2.57	21	2.57	0.10	59
0.13	57	2.41	20	2.41	0.13	57
0.17	57	2.42	20	2.42	0.17	57
0.20	57	2.41	20	2.41	0.20	57
0.24	57	1.63	20	1.63	0.24	57
0.27	57	0.70	20	0.70	0.27	57
0.31	9	0.17	3	0.17	0.31	9
0.34	0				0.34	0
				Max. Volts		3.62
				Max. Depth (%)		76.00
				Length (In.)		0.70
				Avg. Depth (%)		56.85

Table C-4 (continued)
Pulled Tube R12C32
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.37	93	0.07	53			
-0.34	99	0.10	37			
-0.31	72	0.22	26	0.22	-0.31	0
-0.28	55	0.32	20	0.32	-0.28	0.55
-0.24	52	0.70	19	0.70	-0.24	0.52
-0.21	58	1.59	21	1.59	-0.21	0.58
-0.18	58	2.32	21	2.32	-0.18	0.58
-0.14	55	2.38	20	2.38	-0.14	0.55
-0.11	52	2.33	19	2.33	-0.11	0.52
-0.07	58	2.44	21	2.44	-0.07	0.58
-0.04	55	2.84	20	2.84	-0.04	0.55
-0.01	55	2.86	20	2.86	-0.01	0.55
0.03	58	2.65	21	2.65	0.03	0.58
0.06	63	2.50	23	2.50	0.06	0.63
0.09	55	3.25	20	3.25	0.09	0.55
0.13	63	2.99	23	2.99	0.13	0.63
0.16	69	2.68	25	2.68	0.16	0.69
0.19	69	3.46	25	3.46	0.19	0.69
0.23	72	3.43	26	3.43	0.23	0.72
0.26	75	2.40	27	2.40	0.26	0.75
0.29	63	1.28	23	1.28	0.29	0.63
0.33	69	0.64	25	0.64	0.33	0.69
0.36	100	0.36	36	0.36	0.36	0
0.39	97	0.22	44			
0.43	87	0.09	64			
				Max. Volts	3.46	
				Max. Depth (%)	75.00	
				Length (in.)	0.67	
				Avg. Depth (%)	57.90	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
No Data Available						

**Table C-5
Sample P7
Laboratory Specimen NDE Analysis**

Crack 1 - MR + Point - Analyst 1P

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.70	0	0.03	85					
-0.64	71	0.06	79					
-0.62	62	0.08	88					
-0.60	78	0.10	72					
-0.58	79	0.15	71					
-0.56	91	0.21	55					
-0.52	97	0.36	45	-0.52	0	0.36	-0.52	0
-0.50	97	0.39	39	-0.50	97	0.39	-0.50	97
-0.48	90	0.49	37	-0.48	90	0.49	-0.48	90
-0.46	99	0.64	42	-0.46	99	0.64	-0.46	99
-0.44	99	1.12	42	-0.44	99	1.12	-0.44	99
-0.42	87	1.93	36	-0.42	87	1.93	-0.42	87
-0.40	81	2.78	34	-0.40	81	2.78	-0.40	81
-0.38	90	3.14	37	-0.38	90	3.14	-0.38	90
-0.37	97	3.55	39	-0.37	97	3.55	-0.37	97
-0.35	97	3.90	39	-0.35	97	3.90	-0.35	97
-0.33	97	3.73	39	-0.33	97	3.73	-0.33	97
-0.31	98	3.31	43	-0.31	98	3.31	-0.31	98
-0.29	95	2.83	48	-0.29	95	2.83	-0.29	95
-0.31	98	3.31	43	-0.31	98	3.31	-0.31	98
-0.29	95	2.83	48	-0.29	95	2.83	-0.29	95
-0.27	95	2.94	49	-0.27	95	2.94	-0.27	95
-0.25	97	3.34	45	-0.25	97	3.34	-0.25	97
-0.23	98	4.14	44	-0.23	98	4.14	-0.23	98
-0.21	98	4.62	43	-0.21	98	4.62	-0.21	98
-0.19	98	4.86	43	-0.19	98	4.86	-0.19	98
-0.17	99	5.21	42	-0.17	99	5.21	-0.17	99
-0.15	98	5.15	43	-0.15	98	5.15	-0.15	98
-0.13	98	4.91	44	-0.13	98	4.91	-0.13	98
-0.11	97	4.91	45	-0.11	97	4.91	-0.11	97
-0.09	98	4.91	43	-0.09	98	4.91	-0.09	98
-0.07	99	5.00	41	-0.07	99	5.00	-0.07	99
-0.05	97	5.05	39	-0.05	97	5.05	-0.05	97
-0.03	100	5.22	40	-0.03	100	5.22	-0.03	100
-0.01	99	5.10	42	-0.01	99	5.10	-0.01	99
0.01	98	5.24	43	0.01	98	5.24	0.01	98
0.02	98	5.63	43	0.02	98	5.63	0.02	98
0.04	99	5.96	42	0.04	99	5.96	0.04	99
0.06	100	6.44	40	0.06	100	6.44	0.06	100
0.08	100	6.54	40	0.08	100	6.54	0.08	100
0.10	99	6.15	42	0.10	99	6.15	0.10	99
0.12	100	6.03	40	0.12	100	6.03	0.12	100
0.14	100	5.79	40	0.14	100	5.79	0.14	100
0.16	100	5.55	40	0.16	100	5.55	0.16	100
0.18	99	5.42	41	0.18	99	5.42	0.18	99
0.20	97	5.45	39	0.20	97	5.45	0.20	97
0.22	93	5.52	38	0.22	93	5.52	0.22	93
0.24	93	5.23	38	0.24	93	5.23	0.24	93
0.26	93	4.69	38	0.26	93	4.69	0.26	93
0.28	97	4.60	39	0.28	97	4.60	0.28	97
0.30	93	4.63	38	0.30	93	4.63	0.30	93
0.32	90	4.68	37	0.32	90	4.68	0.32	90
0.34	84	4.56	35	0.34	84	4.56	0.34	84
0.36	84	4.41	35	0.36	84	4.41	0.36	84
0.38	81	3.83	34	0.38	81	3.83	0.38	81
0.39	78	3.03	33	0.39	78	3.03	0.39	78
0.41	75	2.26	32	0.41	75	2.26	0.41	75
0.43	87	1.49	36	0.43	75	1.49	0.43	75
0.45	99	0.97	41	0.45	75	0.97	0.45	75
0.47	100	0.69	40	0.47	75	0.69	0.47	75
0.49	97	0.63	39	0.49	0	0.63	0.49	0
0.51	97	0.50	46					
0.53	95	0.38	48					
0.55	89	0.29	57					
0.57	84	0.21	64					
0.59	86	0.15	62					
0.61	68	0.13	82					
0.63	92	0.08	53					
0.65	86	0.06	62					
0.67	0	0.06	260					
		Max. Volts			6.54			6.54
		Max. Depth (%)			100.00			100.00
		Length (in.)			1.01			1.01
		Avg. Depth (%)			91.85			91.85

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.59	0	0.00	0					
-0.57	69	0.07	83					
-0.55	73	0.09	79					
-0.53	82	0.14	70					
-0.52	90	0.20	59					
-0.50	94	0.27	52					
-0.48	98	0.36	44					
-0.46	100	0.41	40					
-0.44	86	0.51	36					
-0.43	96	0.64	39					
-0.41	100	1.09	40	-0.41	0	1.09	-0.41	0
-0.39	80	1.99	34	-0.39	80	1.99	-0.39	80
-0.37	80	2.76	34	-0.37	80	2.76	-0.37	80
-0.36	86	3.24	36	-0.36	86	3.24	-0.36	86
-0.34	96	3.61	39	-0.34	96	3.61	-0.34	96
-0.32	93	3.94	38	-0.32	93	3.94	-0.32	93
-0.30	93	3.94	38	-0.30	93	3.94	-0.30	93
-0.28	99	3.44	42	-0.28	99	3.44	-0.28	99
-0.27	98	2.91	45	-0.27	98	2.91	-0.27	98
-0.25	97	2.81	47	-0.25	97	2.81	-0.25	97
-0.23	97	3.38	46	-0.23	97	3.38	-0.23	97
-0.21	98	4.05	44	-0.21	98	4.05	-0.21	98
-0.19	99	4.58	43	-0.19	99	4.58	-0.19	99
-0.18	99	4.91	42	-0.18	99	4.91	-0.18	99
-0.16	99	5.22	42	-0.16	99	5.22	-0.16	99
-0.14	99	5.30	42	-0.14	99	5.30	-0.14	99
-0.12	98	5.03	44	-0.12	98	5.03	-0.12	98
-0.11	98	4.93	44	-0.11	98	4.93	-0.11	98
-0.09	99	4.96	43	-0.09	99	4.96	-0.09	99
-0.07	99	4.92	42	-0.07	99	4.92	-0.07	99
-0.05	96	5.24	39	-0.05	96	5.24	-0.05	96
-0.03	96	5.33	39	-0.03	96	5.33	-0.03	96
-0.02	100	5.17	40	-0.02	100	5.17	-0.02	100
0.00	99	5.26	42	0.00	99	5.26	0.00	99
0.02	99	5.52	43	0.02	99	5.52	0.02	99
0.04	99	5.99	42	0.04	99	5.99	0.04	99
0.06	100	6.40	40	0.06	100	6.40	0.06	100
0.07	100	6.42	41	0.07	100	6.42	0.07	100
0.09	100	6.47	40	0.09	100	6.47	0.09	100
0.11	100	6.21	40	0.11	100	6.21	0.11	100
0.13	96	5.88	39	0.13	96	5.88	0.13	96
0.15	96	5.72	39	0.15	96	5.72	0.15	96
0.16	96	5.69	39	0.16	96	5.69	0.16	96
0.18	96	5.61	39	0.18	96	5.61	0.18	96
0.20	96	5.65	39	0.20	96	5.65	0.20	96
0.22	93	5.50	38	0.22	93	5.50	0.22	93
0.23	93	5.14	38	0.23	93	5.14	0.23	93
0.25	90	4.64	37	0.25	90	4.64	0.25	90
0.27	96	4.47	39	0.27	96	4.47	0.27	96
0.29	90	4.65	37	0.29	90	4.65	0.29	90
0.31	86	4.81	36	0.31	86	4.81	0.31	86
0.32	83	4.71	35	0.32	83	4.71	0.32	83
0.34	80	4.33	34	0.34	80	4.33	0.34	80
0.36	76	3.68	33	0.36	76	3.68	0.36	76
0.38	73	2.94	32	0.38	73	2.94	0.38	73
0.40	73	2.07	32	0.40	73	2.07	0.40	73
0.41	86	1.27	36	0.41	73	1.27	0.41	73
0.43	96	0.87	39	0.43	0	0.87	0.43	0
0.45	96	0.70	39					
0.47	99	0.61	42					
0.48	97	0.48	46					
0.50	94	0.37	51					
0.52	90	0.26	58					
0.54	89	0.19	60					
0.56	91	0.13	57					
0.57	92	0.09	56					
0.59	93	0.07	54					
0.61	0	0.00	0					
		Max. Volts			6.47			6.47
		Max. Depth (%)			100.00			100.00
		Length (in.)			0.84			0.84
		Avg. Depth (%)			90.96			90.96

**Table C-5 (continued)
Sample P7
Laboratory Specimen NDE Analysis**

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position*	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.63	0	0.00						
-0.61	75	0.07	63					
-0.59	79	0.11	58					
-0.57	82	0.15	55					
-0.55	89	0.23	45					
-0.53	93	0.29	40					
-0.52	99	0.37	32					
-0.50	98	0.42	29	-0.50	0	0.42	-0.50	0
-0.48	90	0.52	26	-0.48	90	0.52	-0.48	90
-0.44	98	1.12	29	-0.44	98	1.12	-0.44	98
-0.42	87	2.03	25	-0.42	87	2.03	-0.42	87
-0.40	82	2.83	23	-0.40	82	2.83	-0.40	82
-0.38	90	3.30	26	-0.38	90	3.30	-0.38	90
-0.36	98	3.65	29	-0.36	98	3.65	-0.36	98
-0.35	95	3.99	28	-0.35	95	3.99	-0.35	95
-0.33	98	3.98	29	-0.33	98	3.98	-0.33	98
-0.31	99	3.48	32	-0.31	99	3.48	-0.31	99
-0.29	97	2.95	35	-0.29	97	2.95	-0.29	97
-0.27	95	2.84	37	-0.27	95	2.84	-0.27	95
-0.25	97	3.44	34	-0.25	97	3.44	-0.25	97
-0.23	98	4.12	33	-0.23	98	4.12	-0.23	98
-0.21	98	4.65	33	-0.21	98	4.65	-0.21	98
-0.21	98	4.65	33	-0.21	98	4.65	-0.21	98
-0.20	98	4.97	33	-0.20	98	4.97	-0.20	98
-0.18	99	5.29	32	-0.18	99	5.29	-0.18	99
-0.16	99	5.36	32	-0.16	99	5.36	-0.16	99
-0.14	97	5.09	34	-0.14	97	5.09	-0.14	97
-0.12	97	4.99	35	-0.12	97	4.99	-0.12	97
-0.10	97	5.01	34	-0.10	97	5.01	-0.10	97
-0.08	99	4.98	31	-0.08	99	4.98	-0.08	99
-0.06	98	5.30	29	-0.06	98	5.30	-0.06	98
-0.05	95	5.36	28	-0.05	95	5.36	-0.05	95
-0.03	100	5.23	30	-0.03	100	5.23	-0.03	100
-0.01	99	5.28	32	-0.01	99	5.28	-0.01	99
0.01	98	5.56	33	0.01	98	5.56	0.01	98
0.03	99	6.06	31	0.03	99	6.06	0.03	99
0.05	100	6.49	30	0.05	100	6.49	0.05	100
0.07	98	6.52	29	0.07	98	6.52	0.07	98
0.09	100	6.57	30	0.09	100	6.57	0.09	100
0.10	100	6.32	30	0.10	100	6.32	0.10	100
0.12	98	5.96	29	0.12	98	5.96	0.12	98
0.14	100	5.79	30	0.14	100	5.79	0.14	100
0.16	98	5.72	29	0.16	98	5.72	0.16	98
0.18	98	5.63	29	0.18	98	5.63	0.18	98
0.20	98	5.69	29	0.20	98	5.69	0.20	98
0.22	95	5.54	28	0.22	95	5.54	0.22	95
0.24	93	5.19	27	0.24	93	5.19	0.24	93
0.25	95	4.71	28	0.25	95	4.71	0.25	95
0.27	98	4.54	29	0.27	98	4.54	0.27	98
0.29	95	4.72	28	0.29	95	4.72	0.29	95
0.31	90	4.86	26	0.31	90	4.86	0.31	90
0.33	87	4.74	25	0.33	87	4.74	0.33	87
0.35	85	4.35	24	0.35	85	4.35	0.35	85
0.37	82	3.69	23	0.37	82	3.69	0.37	82
0.39	76	2.96	21	0.39	76	2.96	0.39	76
0.40	79	2.10	22	0.40	79	2.10	0.40	79
0.42	90	1.28	26	0.42	90	1.28	0.42	90
0.44	98	0.88	29	0.44	98	0.88	0.44	98
0.46	100	0.64	30	0.47	0	0.64	0.47	0
0.48	99	0.58	31					
0.50	97	0.47	35					
0.52	92	0.35	41					
0.53	87	0.24	48					
0.55	84	0.19	52					
0.57	82	0.13	54					
0.59	83	0.08	53					
0.61	83	0.05	53					
0.61	83	0.05	53					
0.63	98	0.04	33					
0.65	0	0.00						

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length	Depth	Volts	Length	Depth
No Data Available								

*Reversed Sign	Max. Volts	6.57	6.57
	Max. Depth (%)	100.00	100.00
	Length (in.)	0.97	0.97
	Avg. Depth (%)	92.31	92.31

**Table C-6
Sample P7
Laboratory Specimen NDE Analysis**

Crack 2 - MR + Point - Analyst 1P

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.55	0	0.09	25					
-0.51	30	0.07	15					
-0.47	69	0.06	30	-0.47	0	0.06	-0.47	0
-0.45	15	0.09	8	-0.45	15	0.09	-0.45	15
-0.43	47	0.09	22	-0.43	47	0.09	-0.43	47
-0.41	63	0.09	28	-0.41	63	0.09	-0.41	63
-0.39	84	0.09	35	-0.39	84	0.09	-0.39	84
-0.37	99	0.10	42	-0.36	78	0.10	-0.36	78
-0.36	78	0.13	33	-0.34	94	0.13	-0.34	94
-0.34	94	0.17	50	-0.32	95	0.17	-0.32	95
-0.32	95	0.22	49	-0.3	95	0.22	-0.30	95
-0.30	95	0.28	49	-0.28	99	0.28	-0.28	99
-0.28	99	0.38	42	-0.26	99	0.38	-0.26	99
-0.26	99	0.51	41	-0.24	97	0.51	-0.24	97
-0.24	97	0.60	39	-0.22	99	0.60	-0.22	99
-0.22	99	0.71	41	-0.2	100	0.71	-0.20	100
-0.20	100	0.96	40	-0.18	87	0.96	-0.18	87
-0.18	87	1.79	36	-0.16	78	1.79	-0.16	78
-0.16	78	2.70	33	-0.14	78	2.70	-0.14	78
-0.14	78	3.53	33	-0.12	87	3.53	-0.12	87
-0.12	87	3.69	36	-0.1	90	3.69	-0.10	90
-0.10	90	3.52	37	-0.08	90	3.52	-0.08	90
-0.08	90	3.45	37	-0.06	87	3.45	-0.06	87
-0.06	87	3.57	36	-0.04	87	3.57	-0.04	87
-0.04	87	3.97	36	-0.02	84	3.97	-0.02	84
-0.02	84	4.37	35	0	87	4.37	0.00	87
0.00	87	4.84	36	0.01	87	4.84	0.01	87
0.01	87	4.73	36	0.03	93	4.73	0.03	93
0.03	93	4.38	38	0.05	90	4.38	0.05	90
0.05	90	3.99	37	0.07	87	3.99	0.07	87
0.07	87	3.91	36	0.09	87	3.91	0.09	87
0.09	87	3.84	36	0.11	81	3.84	0.11	81
0.11	81	3.76	34	0.13	87	3.76	0.13	87
0.13	87	3.77	36	0.15	90	3.77	0.15	90
0.15	90	3.75	37	0.17	87	3.75	0.17	87
0.17	87	3.85	36	0.19	84	3.85	0.19	84
0.19	84	4.13	35	0.21	84	4.13	0.21	84
0.21	84	4.38	35	0.23	87	4.38	0.23	87
0.23	87	4.45	36	0.25	87	4.45	0.25	87
0.25	87	4.25	36	0.27	87	4.25	0.27	87
0.27	87	4.22	36	0.29	84	4.22	0.29	84
0.29	84	3.95	35	0.31	84	3.95	0.31	84
0.31	84	3.61	35	0.33	84	3.61	0.33	84
0.33	84	3.27	35	0.35	78	3.27	0.35	78
0.35	78	3.24	33	0.37	72	3.24	0.37	72
0.37	72	3.15	31	0.39	66	3.15	0.39	66
0.39	66	2.73	29	0.4	75	2.73	0.40	75
0.40	75	1.79	32	0.42	90	1.79	0.42	90
0.42	90	0.99	37	0.44	84	0.99	0.44	84
0.44	84	0.59	35	0.46	0	0.59	0.46	0
0.46	93	0.50	38					
0.48	87	0.47	36					
0.50	98	0.43	43					
0.52	94	0.34	50					
0.54	95	0.26	49					
0.56	88	0.19	59					
0.58	91	0.13	54					
0.60	99	0.11	41					
0.62	35	0.09	17					
0.64	0	0.09	192					
Max. Volts				4.84		4.84		
Max. Depth (%)				100.00		100.00		
Length (in.)				0.93		0.93		
Avg. Depth (%)				82.08		82.08		

Unadjusted NDE						Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾	
-0.33	0	0.00	0						
-0.31	96	0.16	48						
-0.29	95	0.22	50						
-0.28	97	0.28	46						
-0.26	97	0.40	47						
-0.24	100	0.49	40						
-0.22	93	0.58	38						
-0.20	86	0.71	36						
-0.19	100	0.88	40	-0.19	0			-0.19 0	
-0.17	86	1.47	36	-0.17	86			-0.17 96	
-0.15	80	2.46	34	-0.15	80			-0.15 89	
-0.13	76	3.39	33	-0.13	76			-0.13 84	
-0.11	83	3.76	35	-0.11	83			-0.11 92	
-0.10	86	3.71	36	-0.10	86			-0.10 96	
-0.08	90	3.54	37	-0.08	90			-0.08 100	
-0.06	90	3.54	37	-0.06	90			-0.06 100	
-0.04	83	3.76	35	-0.04	83			-0.04 92	
-0.02	83	4.38	35	-0.02	83			-0.02 92	
-0.01	83	4.73	35	-0.01	83			-0.01 92	
0.01	86	4.80	36	0.01	86			0.01 96	
0.03	90	4.63	37	0.03	90			0.03 100	
0.05	90	4.24	37	0.05	90			0.05 100	
0.06	90	3.94	37	0.06	90			0.06 100	
0.08	86	3.95	36	0.08	86			0.08 96	
0.10	80	3.93	34	0.10	80			0.10 89	
0.12	80	3.81	34	0.12	80			0.12 89	
0.14	86	3.80	36	0.14	86			0.14 96	
0.15	86	3.93	36	0.15	86			0.15 96	
0.17	86	4.14	36	0.17	86			0.17 96	
0.19	86	4.26	36	0.19	86			0.19 96	
0.21	86	4.45	36	0.21	86			0.21 96	
0.23	86	4.49	36	0.23	86			0.23 96	
0.24	86	4.36	36	0.24	86			0.24 96	
0.26	83	4.10	35	0.26	83			0.26 92	
0.28	83	3.79	35	0.28	83			0.28 92	
0.30	80	3.56	34	0.30	80			0.30 89	
0.32	80	3.38	34	0.32	80			0.32 89	
0.33	73	3.29	32	0.33	73			0.33 81	
0.35	67	3.03	30	0.35	67			0.35 74	
0.37	67	2.36	30	0.37	67			0.37 74	
0.39	83	1.40	35	0.39	83			0.39 92	
0.40	96	0.67	39	0.42	86			0.42 96	
0.42	86	0.51	36	0.44	0			0.44 0	
0.44	83	0.52	35						
0.46	83	0.49	35						
0.48	99	0.43	42						
0.49	96	0.34	49						
0.51	94	0.25	51						
0.53	93	0.17	53						
0.55	94	0.13	51						
0.56	95	0.10	50						
0.58	47	0.08	23						
0.60	53	0.08	25						
0.62	0	0.00	0						
Max. Volts						4.80		4.80	
Max. Depth (%)						90.00		100.00	
Length (in.)						0.63		0.63	
Avg. Depth (%)						80.48		89.43	

**Table C-6 (continued)
Sample P7
Laboratory Specimen NDE Analysis**

Crack 2 - MR + Point - Analyst 3

Crack 2 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.41	0							
-0.39	60	0.11	16					
-0.36	90	0.10	44					
-0.37	87	0.07	48					
-0.34	93	0.14	40					
-0.32	92	0.20	41					
-0.30	93	0.29	40					
-0.28	96	0.39	36					
-0.26	100	0.47	30					
-0.24	90	0.52	26					
-0.22	85	0.59	24	-0.24	0		-0.24	0
-0.21	95	0.88	28	-0.21	93	0.88	-0.21	100
-0.19	93	1.41	27	-0.19	93	1.41	-0.19	100
-0.17	82	2.48	23	-0.17	82	2.48	-0.17	88
-0.15	82	3.45	23	-0.15	82	3.45	-0.15	88
-0.13	87	3.82	25	-0.13	87	3.82	-0.13	94
-0.11	90	3.76	26	-0.11	90	3.76	-0.11	97
-0.09	93	3.58	27	-0.09	93	3.58	-0.09	100
-0.07	93	3.58	27	-0.07	93	3.58	-0.07	100
-0.06	87	3.80	25	-0.06	87	3.80	-0.06	94
-0.04	87	4.45	25	-0.04	87	4.45	-0.04	94
-0.02	87	4.81	25	-0.02	87	4.81	-0.02	94
0.00	90	4.89	26	0.00	90	4.89	0.00	97
0.02	93	4.73	27	0.02	93	4.73	0.02	100
0.04	93	4.32	27	0.04	93	4.32	0.04	100
0.06	93	3.99	27	0.06	93	3.99	0.06	100
0.08	90	4.00	26	0.08	90	4.00	0.08	97
0.09	85	3.98	24	0.09	85	3.98	0.09	91
0.11	85	3.85	24	0.11	85	3.85	0.11	91
0.13	90	3.84	26	0.13	90	3.84	0.13	97
0.15	90	3.98	26	0.15	90	3.98	0.15	97
0.17	90	4.19	26	0.17	90	4.19	0.17	97
0.19	90	4.33	26	0.19	90	4.33	0.19	97
0.21	87	4.54	25	0.21	87	4.54	0.21	94
0.23	87	4.56	25	0.23	87	4.56	0.23	94
0.24	87	4.42	25	0.24	87	4.42	0.24	94
0.26	87	4.15	25	0.26	87	4.15	0.26	94
0.28	87	3.83	25	0.28	87	3.83	0.28	94
0.30	85	3.60	24	0.30	85	3.60	0.30	91
0.32	85	3.42	24	0.32	85	3.42	0.32	91
0.34	79	3.35	22	0.34	79	3.35	0.34	85
0.36	73	3.13	20	0.36	73	3.13	0.36	78
0.38	73	2.50	20	0.38	73	2.50	0.38	78
0.39	85	1.55	24	0.39	85	1.55	0.39	91
0.41	90	0.83	26	0.41	90	0.83	0.41	97
0.43	82	0.59	23	0.43	82	0.59	0.43	88
0.45	87	0.53	25	0.45	87	0.53	0.45	94
0.47	87	0.50	25	0.47	87	0.50	0.47	94
0.49	98	0.44	33	0.50	0		0.50	0
0.51	94	0.34	39					
0.52	92	0.25	41					
0.54	88	0.13	47					
0.56	87	0.09	48					
0.58	96	0.10	36					
0.60	49	0.09	13					
0.62	42	0.08	11					
0.64	14	0.08	4					
0.66	30	0.08	8					
0.67	18	0.08	5					
0.69	0							
Max. Volts				4.89		4.89		
Max. Depth (%)				93.00		100.00		
Length (in.)				0.74		0.74		
Avg. Depth (%)				83.71		90.01		

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length	Depth	Volts	Length	Depth
No Data Available								

**Table C-7
Sample P7
Laboratory Specimen NDE Analysis**

Crack 3 - MR + Point - Analyst 1P

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-1.00	0	0.06	8			
-0.98	78	0.07	33			
-0.96	92	0.06	53			
-0.94	90	0.07	37			
-0.92	93	0.09	38			
-0.90	90	0.11	37			
-0.88	78	0.13	33	0.13	-0.86	0
-0.84	47	0.14	22	0.14	-0.84	47
-0.82	52	0.17	24	0.17	-0.82	52
-0.80	60	0.20	27	0.20	-0.80	60
-0.78	63	0.38	28	0.38	-0.78	63
-0.76	60	0.68	27	0.88	-0.76	60
-0.74	57	1.38	26	1.38	-0.74	57
-0.72	55	1.61	25	1.61	-0.72	55
-0.70	55	1.32	25	1.32	-0.70	55
-0.68	63	0.70	28	0.70	-0.68	63
-0.67	72	0.25	31	0.25	-0.67	72
-0.65	50	0.18	23	0.18	-0.65	50
-0.63	47	0.17	22	0.17	-0.63	47
-0.61	37	0.20	18	0.20	-0.61	37
-0.59	60	0.18	27	0.18	-0.59	0
-0.57	81	0.14	34			
-0.55	72	0.11	31			
-0.53	90	0.11	37			
-0.51	98	0.08	43			
-0.49	47	0.10	22			
-0.47	57	0.08	26			
-0.45	0	0.07	15			
Max. Volts				1.61		
Max. Depth (%)				72.00		
Length (in.)				0.27		
Avg. Depth (%)				50.69		

Crack 3 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.80	0	0.00	0	0.00	-0.80	0
-0.78	42	0.47	21	0.47	-0.78	42
-0.76	58	1.02	27	1.02	-0.76	58
-0.74	55	1.49	26	1.49	-0.74	55
-0.72	53	1.68	25	1.68	-0.72	53
-0.70	55	1.29	26	1.29	-0.70	55
-0.69	58	0.68	27	0.68	-0.69	58
-0.67	55	0.25	26	0.25	-0.67	55
-0.65	0	0.00	0	0.00	-0.65	0
Max. Volts				1.68		
Max. Depth (%)				58.00		
Length (in.)				0.15		
Avg. Depth (%)				46.37		

**Table C-7 (continued)
Sample P7
Laboratory Specimen NDE Analysis**

Crack 3 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.98	0	0.00				
-0.95	95	0.05	28			
-0.93	97	0.06	34			
-0.91	100	0.08	30			
-0.89	95	0.12	28			
-0.87	63	0.15	17	0.15	-0.88	0
-0.85	38	0.15	10	0.15	-0.85	38
-0.83	42	0.19	11	0.19	-0.83	42
-0.81	53	0.21	14	0.21	-0.81	53
-0.80	60	0.44	16	0.44	-0.80	60
-0.78	60	0.99	16	0.99	-0.78	60
-0.76	57	1.46	15	1.46	-0.76	57
-0.74	53	1.65	14	1.65	-0.74	53
-0.72	57	1.31	15	1.31	-0.72	57
-0.70	70	0.68	19	0.68	-0.70	70
-0.68	49	0.23	13	0.23	-0.68	49
-0.66	34	0.18	9	0.18	-0.66	34
-0.63	63	0.19	17	0.19	-0.63	0
-0.63	49	0.19	13			
-0.61	90	0.13	26			
-0.59	99	0.12	32			
-0.57	97	0.10	35			
-0.55	87	0.06	48			
-0.53	0	0.00				
		Max. Volts				1.65
		Max. Depth (%)				70.00
		Length (in.)				0.25
		Avg. Depth (%)				45.02

Crack 3 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
No Data Available						

**Table C-8
Sample P8
Laboratory Specimen NDE Analysis**

Crack 1 - MR + Point - Analyst 1P

Unadjusted NDE				Unadjusted NDE				Length ⁽¹⁾	Depth	Final with Adjustments				Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Axial Position	Depth	Volts	Phase Angle			Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-1.46	0	0.06	228	-0.06	99	5.28	42			-0.06	99			5.28	-0.06	99	
-1.46	95	0.06	48	-0.02	99	5.92	41			-0.02	99			5.92	-0.02	99	
-1.44	70	0.08	80	0.00	99	6.17	41			0.00	99			6.17	0.00	99	
-1.42	65	0.11	85	0.02	99	6.06	42			0.02	99			6.06	0.02	99	
-1.40	79	0.15	71	0.04	99	6.02	42			0.04	99			6.02	0.04	99	
-1.38	91	0.18	55	0.06	98	5.77	43			0.06	98			5.77	0.06	98	
-1.36	87	0.21	61	0.08	98	5.58	43			0.08	98			5.58	0.08	98	
-1.34	97	0.27	45	0.10	98	5.81	43			0.10	98			5.81	0.10	98	
-1.32	95	0.33	49	0.12	98	5.85	43			0.12	98			5.85	0.12	98	
-1.30	99	0.47	41	0.14	98	6.20	43	-1.30	0	0.14	98	0.47	-1.30	0	6.20	0.14	98
-1.28	93	0.81	38	0.16	98	6.18	43	-1.28	63	0.16	98	0.81	-1.28	63	6.18	0.16	98
-1.26	63	1.34	28	0.18	98	6.31	43	-1.26	63	0.18	98	1.34	-1.26	63	6.31	0.18	98
-1.24	72	1.96	31	0.20	99	6.63	42	-1.24	72	0.20	99	1.96	-1.24	72	6.63	0.20	99
-1.22	81	2.36	34	0.22	100	6.73	40	-1.22	81	0.22	100	2.36	-1.22	81	6.73	0.22	100
-1.20	81	2.78	34	0.24	100	7.04	40	-1.20	81	0.24	100	2.78	-1.20	81	7.04	0.24	100
-1.18	84	3.11	35	0.26	99	6.84	42	-1.18	84	0.26	99	3.11	-1.18	84	6.84	0.26	99
-1.16	87	3.23	36	0.28	98	6.85	44	-1.16	87	0.28	98	3.23	-1.16	87	6.85	0.28	98
-1.14	84	3.52	35	0.30	97	6.81	45	-1.14	84	0.30	97	3.52	-1.14	84	6.81	0.30	97
-1.12	87	3.52	36	0.32	97	6.99	45	-1.12	87	0.32	97	3.52	-1.12	87	6.99	0.32	97
-1.10	87	3.70	36	0.34	98	7.25	43	-1.10	87	0.34	98	3.70	-1.10	87	7.25	0.34	98
-1.08	90	3.57	37	0.36	99	7.56	41	-1.08	90	0.36	99	3.57	-1.08	90	7.56	0.36	99
-1.06	84	3.38	35	0.37	100	7.58	40	-1.06	84	0.37	100	3.38	-1.06	84	7.58	0.37	100
-1.04	90	3.31	37	0.39	99	7.08	41	-1.04	90	0.39	99	3.31	-1.04	90	7.08	0.39	99
-1.02	93	3.36	38	0.41	99	7.08	41	-1.02	93	0.41	99	3.36	-1.02	93	7.08	0.41	99
-1.00	90	3.69	37	0.43	100	7.05	40	-1.00	90	0.43	100	3.69	-1.00	90	7.05	0.43	100
-0.98	87	4.17	36	0.45	93	7.34	38	-0.98	87	0.45	93	4.17	-0.98	87	7.34	0.45	93
-0.96	84	4.47	35	0.47	93	7.57	38	-0.96	84	0.47	93	4.47	-0.96	84	7.57	0.47	93
-0.94	87	4.65	36	0.49	93	7.39	38	-0.94	87	0.49	93	4.65	-0.94	87	7.39	0.49	93
-0.92	90	4.77	37	0.51	90	7.62	37	-0.92	90	0.51	90	4.77	-0.92	90	7.62	0.51	90
-0.90	87	4.97	36	0.53	84	7.66	35	-0.90	87	0.53	84	4.97	-0.90	87	7.66	0.53	84
-0.90	87	4.97	36	0.55	81	7.50	34	-0.90	87	0.55	81	4.97	-0.90	87	7.50	0.55	81
-0.89	81	5.25	34	0.57	78	7.28	33	-0.89	81	0.57	78	5.25	-0.89	81	7.28	0.57	78
-0.87	81	5.28	34	0.59	81	7.13	34	-0.87	81	0.59	81	5.28	-0.87	81	7.13	0.59	81
-0.87	81	5.28	34	0.61	84	6.95	35	-0.87	81	0.61	84	5.28	-0.87	81	6.95	0.61	84
-0.85	90	4.94	37	0.63	87	6.95	36	-0.85	90	0.63	87	4.94	-0.85	90	6.95	0.63	87
-0.83	93	4.80	38	0.65	90	7.08	37	-0.83	93	0.65	90	4.80	-0.83	93	7.08	0.65	90
-0.81	90	5.03	37	0.67	93	7.28	38	-0.81	90	0.67	93	5.03	-0.81	90	7.28	0.67	93
-0.79	84	5.38	35	0.69	97	7.29	39	-0.79	84	0.69	97	5.38	-0.79	84	7.29	0.69	97
-0.77	81	5.70	34	0.71	97	6.96	39	-0.77	81	0.71	97	5.70	-0.77	81	6.96	0.71	97
-0.75	81	5.87	34	0.73	90	6.41	37	-0.75	81	0.73	90	5.87	-0.75	81	6.41	0.73	90
-0.73	81	5.78	34	0.75	93	5.76	38	-0.73	81	0.75	93	5.78	-0.73	81	5.76	0.75	93
-0.73	81	5.78	34	0.77	87	5.16	36	-0.73	81	0.77	87	5.78	-0.73	81	5.16	0.77	87
-0.71	78	5.84	33	0.79	81	4.66	34	-0.71	78	0.79	81	5.84	-0.71	78	4.66	0.79	81
-0.69	78	5.67	33	0.81	81	4.37	34	-0.69	78	0.81	81	5.67	-0.69	78	4.37	0.81	81
-0.67	81	5.32	34	0.83	84	4.28	35	-0.67	81	0.83	84	5.32	-0.67	81	4.28	0.83	84
-0.65	84	5.22	35	0.85	87	4.20	36	-0.65	84	0.85	87	5.22	-0.65	84	4.20	0.85	87
-0.63	84	5.24	35	0.87	84	4.17	35	-0.63	84	0.87	84	5.24	-0.63	84	4.17	0.87	84
-0.61	81	5.31	34	0.89	84	4.14	35	-0.61	81	0.89	84	5.31	-0.61	81	4.14	0.89	84
-0.59	81	5.38	34	0.91	84	4.02	35	-0.59	81	0.91	84	5.38	-0.59	81	4.02	0.91	84
-0.57	81	5.22	34	0.93	81	4.03	34	-0.57	81	0.93	81	5.22	-0.57	81	4.03	0.93	81
-0.55	75	5.28	32	0.95	87	3.91	36	-0.55	75	0.95	87	5.28	-0.55	75	3.91	0.95	87
-0.53	75	5.01	32	0.97	90	3.75	37	-0.53	75	0.97	90	5.01	-0.53	75	3.75	0.97	90
-0.51	75	4.94	32	0.99	97	3.54	39	-0.51	75	0.99	97	4.94	-0.51	75	3.54	0.99	97
-0.49	75	4.72	32	1.01	87	3.57	36	-0.49	75	1.01	87	4.72	-0.49	75	3.57	1.01	87
-0.47	75	4.78	32	1.03	87	3.71	36	-0.47	75	1.03	87	4.78	-0.47	75	3.71	1.03	87
-0.45	75	4.64	32	1.05	90	3.70	37	-0.45	75	1.05	90	4.64	-0.45	75	3.70	1.05	90
-0.43	75	4.67	32	1.07	90	3.62	37	-0.43	75	1.07	90	4.67	-0.43	75	3.62	1.07	90
-0.41	75	4.47	32	1.08	87	3.53	36	-0.41	75	1.08	87	4.47	-0.41	75	3.53	1.08	87
-0.39	72	4.55	31	1.10	78	3.45	33	-0.39	72	1.10	78	4.55	-0.39	72	3.45	1.10	78
-0.37	75	4.39	32	1.12	75	2.91	32	-0.37	75	1.12	75	4.39	-0.37	75	2.91	1.12	75
-0.35	72	4.47	31	1.14	75	2.14	32	-0.35	72	1.14	75	4.47	-0.35	72	2.14	1.14	75
-0.33	75	4.45	32	1.16	72	1.47	31	-0.33	75	1.16	72	4.45	-0.33	75	1.47	1.16	72
-0.31	81	4.34	34	1.18	66	1.28	29	-0.31	81	1.18	66	4.34	-0.31	81	1.28	1.18	66
-0.29	84	4.39	35	1.22	63	1.15	28	-0.29	84	1.22	63	4.39	-0.29	84	1.15	1.22	63
-0.28	90	4.73	37	1.24	72	0.83	31	-0.28	90	1.24	72	4.73	-0.28	90	0.83	1.24	72
-0.26	93	4.92	38	1.26	100	0.43	40	-0.26	93	1.26	72	4.92	-0.26	93	0.43	1.26	72
-0.24	97	4.84	39	1.28	95	0.19	48	-0.24	97	1.28	0	4.84	-0.24	97	0.19	1.28	0
-0.22	97	4.85	39	1.30	97	0.13	46	-0.22	97			4.85	-0.22	97			
-0.20	100	4.64	41	1.32	100	0.13	40	-0.20	100			4.64	-0.20	100			
-0.18	99	4.56	41	1.34	95	0.12	48	-0.18	99			4.56	-0.18	99			
-0.16	97	4.81	39	1.36	98	0.10	44	-0.16	97			4.81	-0.16	97			
-0.14	93	4.85	38	1.38	90	0.09	56	-0.14	93			4.85	-0.14	93			
-0.12	93	5.01	38	1.40	83	0.07	65	-0.12	93			5.01	-0.12	93			
-0.10	100	4.90	40	1.42	73	0.00	77	-0.10	100			4.90	-0.10	100			
-0.08	99	4.88	42	1.44	0	0.00	3	-0.08	99			4.88	-0.08	99			

(Continued on Next Column)

(Con't on Next Col.)

(Con't on Next Col.)

Max. Volts	7.66	Max. Depth (%)	100.00	Avg. Depth (%)	86.15
Max. Length (in.)	2.58				

Table C-8 (continued)
Sample P8
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Unadjusted NDE						Final with Adjustments				Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-1.37	0	0.00	0	-0.05	99	5.12	42			-0.05	99				5.12	-0.05	99
-1.36	61	0.07	28	-0.03	99	5.50	42			-0.03	99				5.50	-0.03	99
-1.34	67	0.08	30	-0.01	100	5.88	41			-0.01	100				5.88	-0.01	100
-1.32	100	0.09	41	0.01	99	5.98	42			0.01	99				5.98	0.01	99
-1.30	86	0.12	64	0.02	100	6.13	41			0.02	100				6.13	0.02	100
-1.28	94	0.15	52	0.04	99	6.14	42			0.04	99				6.14	0.04	99
-1.27	94	0.19	51	0.06	99	5.90	42			0.06	99				5.90	0.06	99
-1.25	94	0.23	51	0.08	99	5.62	43			0.08	99				5.62	0.08	99
-1.23	97	0.29	46	0.10	99	5.78	43			0.10	99				5.78	0.10	99
-1.21	99	0.37	42	0.11	99	5.97	43			0.11	99				5.97	0.11	99
-1.19	99	0.55	42	0.13	99	6.01	43	-1.19	0	0.13	99	0.55	-1.19	0	6.01	0.13	99
-1.17	83	0.93	35	0.15	99	6.34	43	-1.17	70	0.15	99	0.93	-1.17	70	6.34	0.15	99
-1.16	70	1.48	31	0.17	99	6.27	43	-1.16	70	0.17	99	1.48	-1.16	70	6.27	0.17	99
-1.14	70	2.06	31	0.19	99	6.52	42	-1.14	70	0.19	99	2.06	-1.14	70	6.52	0.19	99
-1.12	76	2.53	33	0.20	100	6.84	40	-1.12	76	0.20	100	2.53	-1.12	76	6.84	0.20	100
-1.10	80	2.89	34	0.22	96	7.00	39	-1.10	80	0.22	96	2.89	-1.10	80	7.00	0.22	96
-1.08	80	3.12	34	0.24	100	7.13	40	-1.08	80	0.24	100	3.12	-1.08	80	7.13	0.24	100
-1.07	83	3.37	35	0.26	99	6.80	43	-1.07	83	0.26	99	3.37	-1.07	83	6.80	0.26	99
-1.05	83	3.60	35	0.28	98	6.92	44	-1.05	83	0.28	98	3.60	-1.05	83	6.92	0.28	98
-1.03	83	3.70	35	0.30	98	6.88	45	-1.03	83	0.30	98	3.70	-1.03	83	6.88	0.30	98
-1.01	86	3.62	36	0.31	98	7.12	44	-1.01	86	0.31	98	3.62	-1.01	86	7.12	0.31	98
-0.99	83	3.66	35	0.33	100	7.52	41	-0.99	83	0.33	100	3.66	-0.99	83	7.52	0.33	100
-0.97	86	3.47	36	0.35	100	7.57	40	-0.97	86	0.35	100	3.47	-0.97	86	7.57	0.35	100
-0.96	86	3.33	36	0.37	100	7.43	40	-0.96	86	0.37	100	3.33	-0.96	86	7.43	0.37	100
-0.94	90	3.42	37	0.39	100	7.13	41	-0.94	90	0.39	100	3.42	-0.94	90	7.13	0.39	100
-0.92	90	3.76	37	0.40	100	6.93	41	-0.92	90	0.40	100	3.76	-0.92	90	6.93	0.40	100
-0.90	86	4.25	36	0.42	96	7.33	39	-0.90	86	0.42	96	4.25	-0.90	86	7.33	0.42	96
-0.88	83	4.59	35	0.44	93	7.56	38	-0.88	83	0.44	93	4.59	-0.88	83	7.56	0.44	93
-0.87	86	4.71	36	0.46	93	7.52	38	-0.87	86	0.46	93	4.71	-0.87	86	7.52	0.46	93
-0.85	86	4.83	36	0.48	90	7.36	37	-0.85	86	0.48	90	4.83	-0.85	86	7.36	0.48	90
-0.83	83	5.10	35	0.49	86	7.55	36	-0.83	83	0.49	86	5.10	-0.83	83	7.55	0.49	86
-0.81	80	5.35	34	0.51	83	7.68	35	-0.81	80	0.51	83	5.35	-0.81	80	7.68	0.51	83
-0.79	80	5.29	34	0.53	80	7.62	34	-0.79	80	0.53	80	5.29	-0.79	80	7.62	0.53	80
-0.78	90	4.98	37	0.55	76	7.38	33	-0.78	90	0.55	76	4.98	-0.78	90	7.38	0.55	76
-0.76	90	4.87	37	0.57	83	7.10	35	-0.76	90	0.57	83	4.87	-0.76	90	7.10	0.57	83
-0.74	86	5.08	36	0.59	86	6.99	36	-0.74	86	0.59	86	5.08	-0.74	86	6.99	0.59	86
-0.72	80	5.45	34	0.60	86	7.10	36	-0.72	80	0.60	86	5.45	-0.72	80	7.10	0.60	86
-0.70	76	5.69	33	0.62	90	7.32	37	-0.70	76	0.62	90	5.69	-0.70	76	7.32	0.62	90
-0.68	80	5.82	34	0.64	93	7.39	38	-0.68	80	0.64	93	5.82	-0.68	80	7.39	0.64	93
-0.67	80	5.96	34	0.66	96	7.25	39	-0.67	80	0.66	96	5.96	-0.67	80	7.25	0.66	96
-0.65	76	5.93	33	0.68	90	6.98	37	-0.65	76	0.68	90	5.93	-0.65	76	6.98	0.68	90
-0.63	73	5.78	32	0.69	90	6.36	37	-0.63	73	0.69	90	5.78	-0.63	73	6.36	0.69	90
-0.61	76	5.49	33	0.71	96	5.49	39	-0.61	76	0.71	96	5.49	-0.61	76	5.49	0.71	96
-0.59	83	5.26	35	0.73	83	5.07	35	-0.59	83	0.73	83	5.26	-0.59	83	5.07	0.73	83
-0.58	83	5.28	35	0.75	86	4.62	36	-0.58	83	0.75	86	5.28	-0.58	83	4.62	0.75	86
-0.56	80	5.38	34	0.77	83	4.42	35	-0.56	80	0.77	83	5.38	-0.56	80	4.42	0.77	83
-0.54	80	5.44	34	0.79	83	4.32	35	-0.54	80	0.79	83	5.44	-0.54	80	4.32	0.79	83
-0.52	76	5.38	33	0.80	83	4.26	35	-0.52	76	0.80	83	5.38	-0.52	76	4.26	0.80	83
-0.50	73	5.29	32	0.82	83	4.23	35	-0.50	73	0.82	83	5.29	-0.50	73	4.23	0.82	83
-0.48	70	5.07	31	0.84	86	4.15	36	-0.48	70	0.84	86	5.07	-0.48	70	4.15	0.84	86
-0.47	70	4.96	31	0.86	90	4.02	37	-0.47	70	0.86	90	4.96	-0.47	70	4.02	0.86	90
-0.45	70	4.86	31	0.88	86	4.00	36	-0.45	70	0.88	86	4.86	-0.45	70	4.00	0.88	86
-0.43	73	4.74	32	0.90	86	3.94	36	-0.43	73	0.90	86	4.74	-0.43	73	3.94	0.90	86
-0.41	73	4.72	32	0.91	90	3.78	37	-0.41	73	0.91	90	4.72	-0.41	73	3.78	0.91	90
-0.39	73	4.74	32	0.93	90	3.65	37	-0.39	73	0.93	90	4.74	-0.39	73	3.65	0.93	90
-0.38	73	4.63	32	0.95	83	3.69	35	-0.38	73	0.95	83	4.63	-0.38	73	3.69	0.95	83
-0.36	70	4.57	31	0.97	80	3.73	34	-0.36	70	0.97	80	4.57	-0.36	70	3.73	0.97	80
-0.34	70	4.61	31	0.99	83	3.59	35	-0.34	70	0.99	83	4.61	-0.34	70	3.59	0.99	83
-0.32	70	4.55	31	1.00	86	3.51	36	-0.32	70	1.00	86	4.55	-0.32	70	3.51	1.00	86
-0.30	73	4.42	32	1.02	83	3.53	35	-0.30	73	1.02	83	4.42	-0.30	73	3.53	1.02	83
-0.29	70	4.36	31	1.04	73	3.39	32	-0.29	70	1.04	73	4.36	-0.29	70	3.39	1.04	73
-0.27	80	4.46	34	1.06	70	2.83	31	-0.27	80	1.06	70	4.46	-0.27	80	2.83	1.06	70
-0.25	86	4.65	36	1.08	70	2.10	31	-0.25	86	1.08	70	4.65	-0.25	86	2.10	1.08	70
-0.23	93	4.66	38	1.10	67	1.50	30	-0.23	93	1.10	67	4.66	-0.23	93	1.50	1.10	67
-0.21	96	4.94	39	1.11	64	1.31	29	-0.21	96	1.11	64	4.94	-0.21	96	1.31	1.11	64
-0.19	96	4.94	39	1.13	61	1.32	28	-0.19	96	1.13	61	4.94	-0.19	96	1.32	1.13	61
-0.18	100	4.76	41	1.15	61	1.23	28	-0.18	100	1.15	61	4.76	-0.18	100	1.23	1.15	61
-0.16	100	4.59	41	1.17	70	0.87	31	-0.16	100	1.17	70	4.59	-0.16	100	0.87	1.17	70
-0.14	100	4.82	40	1.19	100	0.44	40	-0.14	100	1.19	70	4.82	-0.14	100	0.44	1.19	70
-0.12	93	4.96	38	1.20	82	0.20	55	-0.12	93	1.21	0	4.96	-0.12	93	0.20	1.21	0
-0.10	90	5.01	37	1.22	99	0.13	43	-0.10	90			5.01	-0.10	90			
-0.09	96	5.02	39	1.24	0	0.00	0	-0.09	96			5.02	-0.09	96			
-0.07	100	5.01	41					-0.07	100			5.01	-0.07	100			

(Continued on Next Column)

(Con't on Next Col.)

(Con't on Next Col.)

Max. Volts	7.68		7.68
Max. Depth (%)	100.00		100.00
Length (In.)	2.40		2.40
Avg. Depth (%)	84.77		84.77

Table C-9
Sample P8
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1P

Unadjusted NDE				Unadjusted NDE				Length ⁽¹⁾	Depth	Final with Adjustments				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Axial Position	Depth	Volts	Phase Angle			Volts	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾			
-1.29	0	0.06	210	0.21	75	4.16	32											
-1.27	81	0.08	34	0.23	75	4.21	32											
-1.25	72	0.09	31	0.25	81	4.06	34											
-1.23	84	0.12	35	0.27	78	3.95	33											
-1.21	69	0.14	30	0.29	81	3.84	34											
-1.19	87	0.18	36	0.31	84	3.61	35											
-1.17	66	0.22	29	0.33	78	3.71	33											
-1.15	50	0.20	23	0.35	75	3.58	32											
-1.13	98	0.35	43	0.36	75	3.59	32											
-1.11	97	0.57	39	0.38	81	3.44	34	-1.11	0									
-1.09	75	0.90	32	0.40	78	3.62	33	-1.09	75	0.40	78	0.90	-1.09	77				
-1.07	75	1.33	32	0.42	78	3.84	33	-1.07	75	0.42	78	1.33	-1.07	77				
-1.05	78	1.52	33	0.44	75	4.13	32	-1.05	78	0.44	75	1.52	-1.05	80				
-1.01	75	1.53	32	0.46	78	4.16	33	-1.01	75	0.46	78	1.53	-1.01	77				
-0.99	84	1.90	35	0.48	75	4.13	32	-0.99	84	0.48	75	1.90	-0.99	87				
-0.97	87	2.30	36	0.50	78	4.02	33	-0.97	87	0.50	78	2.30	-0.97	90				
-0.95	93	2.65	38	0.52	78	4.01	33	-0.95	93	0.52	78	2.65	-0.95	96				
-0.93	97	2.89	39	0.54	81	4.02	34	-0.93	97	0.54	81	2.89	-0.93	100				
-0.91	93	3.18	38	0.56	81	4.29	34	-0.91	93	0.56	81	3.18	-0.91	96				
-0.90	90	3.35	37	0.58	81	4.55	34	-0.90	90	0.58	81	3.35	-0.90	93				
-0.88	90	3.59	37	0.60	81	4.83	34	-0.88	90	0.60	81	3.59	-0.88	93				
-0.86	87	3.74	36	0.62	84	5.10	35	-0.86	87	0.62	84	3.74	-0.86	90				
-0.84	87	3.83	36	0.64	84	5.11	35	-0.84	87	0.64	84	3.83	-0.84	90				
-0.82	87	4.00	36	0.66	87	5.03	36	-0.82	87	0.66	87	4.00	-0.82	90				
-0.80	90	4.21	37	0.68	87	4.97	36	-0.80	90	0.68	87	4.21	-0.80	93				
-0.78	90	4.49	37	0.70	90	4.76	37	-0.78	90	0.70	90	4.49	-0.78	93				
-0.76	84	4.85	35	0.72	87	4.70	36	-0.76	84	0.72	87	4.85	-0.76	87				
-0.74	84	4.95	35	0.74	84	4.68	35	-0.74	84	0.74	84	4.95	-0.74	87				
-0.72	84	4.86	35	0.76	84	4.77	35	-0.72	84	0.76	84	4.86	-0.72	87				
-0.70	84	4.84	35	0.78	84	4.76	35	-0.70	84	0.78	84	4.84	-0.70	87				
-0.68	81	4.80	34	0.80	84	4.80	35	-0.68	81	0.80	84	4.80	-0.68	84				
-0.66	84	4.90	35	0.82	84	4.83	35	-0.66	84	0.82	84	4.90	-0.66	87				
-0.64	81	5.05	34	0.84	84	4.88	35	-0.64	81	0.84	84	5.05	-0.64	84				
-0.62	81	5.06	34	0.86	87	4.92	36	-0.62	81	0.86	87	5.06	-0.62	84				
-0.60	78	5.23	33	0.88	87	5.01	36	-0.60	78	0.88	87	5.23	-0.60	80				
-0.58	75	5.21	32	0.90	87	5.15	36	-0.58	75	0.90	87	5.21	-0.58	77				
-0.56	75	5.18	32	0.92	87	5.13	36	-0.56	75	0.92	87	5.18	-0.56	77				
-0.54	75	5.23	33	0.94	87	4.86	36	-0.54	75	0.94	87	5.23	-0.54	77				
-0.52	78	5.09	32	0.96	90	4.35	37	-0.52	78	0.96	90	5.09	-0.52	80				
-0.50	78	5.26	33	0.98	87	3.84	36	-0.50	78	0.98	87	5.26	-0.50	80				
-0.48	81	5.29	34	1.00	90	3.51	37	-0.48	81	1.00	90	5.29	-0.48	84				
-0.46	78	5.70	33	1.02	90	3.32	37	-0.46	78	1.02	90	5.70	-0.46	80				
-0.44	84	5.74	35	1.03	87	3.42	36	-0.44	84	1.03	87	5.74	-0.44	87				
-0.42	78	6.08	33	1.05	84	3.57	35	-0.42	78	1.05	84	6.08	-0.42	80				
-0.40	78	6.01	33	1.07	78	3.50	33	-0.40	78	1.07	78	6.01	-0.40	80				
-0.38	78	5.81	33	1.09	78	3.29	33	-0.38	78	1.09	78	5.81	-0.38	80				
-0.36	78	5.57	33	1.11	81	2.81	34	-0.36	78	1.11	81	5.57	-0.36	80				
-0.34	78	5.39	33	1.13	81	2.26	34	-0.34	78	1.13	81	5.39	-0.34	80				
-0.32	75	5.47	32	1.15	72	1.91	31	-0.32	75	1.15	72	5.47	-0.32	77				
-0.30	75	5.42	32	1.17	66	1.54	29	-0.30	75	1.17	66	5.42	-0.30	77				
-0.28	81	5.06	34	1.19	72	1.27	31	-0.28	81	1.19	72	5.06	-0.28	84				
-0.27	84	4.81	35	1.21	72	1.01	31	-0.27	84	1.21	72	4.81	-0.27	87				
-0.25	87	4.71	36	1.23	87	0.61	36	-0.25	87	1.23	87	4.71	-0.25	90				
-0.23	90	4.81	37	1.25	95	0.28	49	-0.23	90	1.25	95	4.81	-0.23	93				
-0.21	87	4.99	36	1.27	81	0.14	68	-0.21	87	1.27	81	4.99	-0.21	90				
-0.19	87	5.25	36	1.29	84	0.13	35	-0.19	87	1.29	84	5.25	-0.19	90				
-0.17	87	5.28	36	1.31	84	0.15	35	-0.17	87	1.31	0	5.28	-0.17	90				
-0.15	81	5.32	34	1.33	99	0.13	42	-0.15	81			5.32	-0.15	84				
-0.13	81	5.29	34	1.35	100	0.13	40	-0.13	81			5.29	-0.13	84				
-0.11	78	4.99	33	1.37	91	0.11	54	-0.11	78			4.99	-0.11	80				
-0.09	81	4.94	34	1.39	100	0.08	40	-0.09	81			4.94	-0.09	84				
-0.07	84	4.66	35	1.41	75	0.08	32	-0.07	84			4.66	-0.07	87				
-0.05	87	4.34	36	1.43	35	0.07	17	-0.05	87			4.34	-0.05	90				
-0.03	81	4.42	34	1.45	0	0.07	179	-0.03	81			4.42	-0.03	84				
-0.01	78	4.42	33					-0.01	78			4.42	-0.01	80				
0.01	72	4.38	31					0.01	72			4.38	0.01	74				
0.03	75	4.44	32					0.03	75			4.44	0.03	77				
0.05	84	4.32	35					0.05	84			4.32	0.05	87				
0.07	78	4.45	33					0.07	78			4.45	0.07	80				
0.09	81	4.45	34					0.09	81			4.45	0.09	84				
0.11	75	4.21	32					0.11	75			4.21	0.11	77				
0.13	75	4.12	32					0.13	75			4.12	0.13	77				
0.15	81	3.87	34					0.15	81			3.87	0.15	84				
0.17	78	3.99	33					0.17	78			3.99	0.17	80				
0.19	78	4.13	33					0.19	78			4.13	0.19	80				
(Continued on Next Column)				(Con't on Next Col.)				(Con't on Next Col.)										
												6.08						
												97.00						
												2.42						
												81.01						
												100.00						
												2.42						
												83.51						

Table C-9 (continued)
 Sample P8
 Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE				Unadjusted NDE				Final with Adjustments				Final with Adjustments					
Axial Position	Depth	Volts	Phase Angle	Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-1.16	0	0.00	0	0.18	76	4.10	33			0.18	76				4.10	0.18	79
-1.14	95	0.08	50	0.20	73	4.20	32			0.20	73				4.20	0.20	76
-1.12	100	0.10	41	0.22	73	4.28	32			0.22	73				4.28	0.22	76
-1.11	100	0.13	40	0.24	76	4.13	33			0.24	76				4.13	0.24	79
-1.09	93	0.15	38	0.26	76	4.07	33			0.26	76				4.07	0.26	79
-1.07	80	0.18	34	0.27	80	3.92	34			0.27	80				3.92	0.27	83
-1.05	61	0.19	28	0.29	83	3.79	35			0.29	83				3.79	0.29	86
-1.03	90	0.25	37	0.31	83	3.70	35			0.31	83				3.70	0.31	86
-1.02	90	0.63	37	0.33	76	3.74	33	-1.02	0	0.33	76	-1.02	0		3.74	0.33	79
-1.00	73	0.99	32	0.35	73	3.70	32	-1.00	73	0.35	73	0.99	-1.00	76	3.70	0.35	76
-0.98	76	1.36	33	0.36	76	3.60	33	-0.98	76	0.36	76	1.36	-0.98	79	3.60	0.36	79
-0.96	80	1.51	34	0.38	80	3.53	34	-0.96	80	0.38	80	1.51	-0.96	83	3.53	0.38	83
-0.94	73	1.55	32	0.40	76	3.69	33	-0.94	73	0.40	76	1.55	-0.94	76	3.69	0.40	79
-0.92	73	1.52	32	0.42	73	3.98	32	-0.92	73	0.42	73	1.52	-0.92	76	3.98	0.42	76
-0.91	83	1.94	35	0.44	73	4.15	32	-0.91	83	0.44	73	1.94	-0.91	86	4.15	0.44	76
-0.89	86	2.35	36	0.46	76	4.22	33	-0.89	86	0.46	76	2.35	-0.89	90	4.22	0.46	79
-0.87	93	2.63	38	0.47	76	4.11	33	-0.87	93	0.47	76	2.63	-0.87	97	4.11	0.47	79
-0.85	96	2.93	39	0.49	76	4.09	33	-0.85	96	0.49	76	2.93	-0.85	100	4.09	0.49	79
-0.83	96	3.20	39	0.51	76	4.10	33	-0.83	96	0.51	76	3.20	-0.83	100	4.10	0.51	79
-0.82	90	3.39	37	0.53	80	4.15	34	-0.82	90	0.53	80	3.39	-0.82	94	4.15	0.53	83
-0.80	93	3.61	38	0.55	80	4.39	34	-0.80	93	0.55	80	3.61	-0.80	97	4.39	0.55	83
-0.78	90	3.79	37	0.56	80	4.72	34	-0.78	90	0.56	80	3.79	-0.78	94	4.72	0.56	83
-0.76	86	3.90	36	0.58	80	5.00	34	-0.76	86	0.58	80	3.90	-0.76	90	5.00	0.58	83
-0.74	86	4.00	36	0.60	83	5.15	35	-0.74	86	0.60	83	4.00	-0.74	90	5.15	0.60	86
-0.72	90	4.20	37	0.62	86	5.18	36	-0.72	90	0.62	86	4.20	-0.72	94	5.18	0.62	90
-0.71	90	4.57	37	0.64	86	5.04	36	-0.71	90	0.64	86	4.57	-0.71	94	5.04	0.64	90
-0.69	83	4.87	35	0.65	86	4.89	36	-0.69	83	0.65	86	4.87	-0.69	86	4.89	0.65	90
-0.67	83	5.01	35	0.67	90	4.69	37	-0.67	83	0.67	90	5.01	-0.67	86	4.69	0.67	94
-0.65	83	4.95	35	0.69	86	4.71	36	-0.65	83	0.69	86	4.95	-0.65	86	4.71	0.69	90
-0.63	83	4.84	35	0.71	86	4.71	36	-0.63	83	0.71	86	4.84	-0.63	86	4.71	0.71	90
-0.62	80	4.80	34	0.73	83	4.76	35	-0.62	80	0.73	83	4.80	-0.62	83	4.76	0.73	86
-0.60	80	4.89	34	0.75	83	4.77	35	-0.60	80	0.75	83	4.89	-0.60	83	4.77	0.75	86
-0.58	80	5.02	34	0.76	83	4.84	35	-0.58	80	0.76	83	5.02	-0.58	83	4.84	0.76	86
-0.56	76	5.18	33	0.78	83	4.89	35	-0.56	76	0.78	83	5.18	-0.56	79	4.89	0.78	86
-0.54	73	5.17	32	0.80	86	4.86	36	-0.54	73	0.80	86	5.17	-0.54	76	4.86	0.80	90
-0.52	73	5.27	32	0.82	86	4.98	36	-0.52	73	0.82	86	5.27	-0.52	76	4.98	0.82	90
-0.51	73	5.26	32	0.84	86	5.09	36	-0.51	73	0.84	86	5.26	-0.51	76	5.09	0.84	90
-0.49	70	5.15	31	0.86	83	5.18	35	-0.49	70	0.86	83	5.15	-0.49	73	5.18	0.86	86
-0.47	73	5.19	32	0.87	83	5.14	35	-0.47	73	0.87	83	5.19	-0.47	76	5.14	0.87	86
-0.45	73	5.27	32	0.89	83	4.87	35	-0.45	73	0.89	83	5.27	-0.45	76	4.87	0.89	86
-0.43	80	5.40	34	0.91	86	4.32	36	-0.43	80	0.91	86	5.40	-0.43	83	4.32	0.91	90
-0.42	76	5.57	33	0.93	86	3.77	36	-0.42	76	0.93	86	5.57	-0.42	79	3.77	0.93	90
-0.40	80	5.93	34	0.95	90	3.44	37	-0.40	80	0.95	90	5.93	-0.40	83	3.44	0.95	94
-0.38	80	6.05	34	0.96	90	3.37	37	-0.38	80	0.96	90	6.05	-0.38	83	3.37	0.96	94
-0.36	80	5.98	34	0.98	86	3.49	36	-0.36	80	0.98	86	5.98	-0.36	83	3.49	0.98	90
-0.34	76	5.85	33	1.00	80	3.65	34	-0.34	76	1.00	80	5.85	-0.34	79	3.65	1.00	83
-0.32	76	5.62	33	1.02	76	3.57	33	-0.32	76	1.02	76	5.62	-0.32	79	3.57	1.02	79
-0.31	76	5.50	33	1.04	80	3.19	34	-0.31	76	1.04	80	5.50	-0.31	79	3.19	1.04	83
-0.29	76	5.39	33	1.06	80	2.67	34	-0.29	76	1.06	80	5.39	-0.29	79	2.67	1.06	83
-0.27	73	5.48	32	1.07	76	2.24	33	-0.27	73	1.07	76	5.48	-0.27	76	2.24	1.07	79
-0.25	76	5.27	33	1.09	70	1.86	31	-0.25	76	1.09	70	5.27	-0.25	79	1.86	1.09	73
-0.23	83	4.93	35	1.11	70	1.54	31	-0.23	83	1.11	70	4.93	-0.23	86	1.54	1.11	73
-0.22	86	4.66	36	1.13	67	1.28	30	-0.22	86	1.13	67	4.66	-0.22	90	1.28	1.13	70
-0.20	86	4.80	36	1.15	70	1.00	31	-0.20	86	1.15	70	4.80	-0.20	90	1.00	1.15	73
-0.18	86	5.03	36	1.17	86	0.59	36	-0.18	86	1.17	0	5.03	-0.18	90	0.59	1.17	0
-0.16	86	5.15	36	1.18	97	0.27	46	-0.16	86			5.15	-0.16	90			
-0.14	83	5.37	35	1.20	88	0.13	61	-0.14	83			5.37	-0.14	86			
-0.12	83	5.44	35	1.22	88	0.09	61	-0.12	83			5.44	-0.12	86			
-0.11	83	5.30	35	1.24	100	0.11	41	-0.11	83			5.30	-0.11	86			
-0.09	76	5.23	33	1.26	99	0.12	43	-0.09	76			5.23	-0.09	79			
-0.07	80	5.11	34	1.27	0	0.00	0	-0.07	80			5.11	-0.07	83			
-0.05	83	4.77	35					-0.05	83			4.77	-0.05	86			
-0.03	86	4.48	36					-0.03	86			4.48	-0.03	90			
-0.02	80	4.44	34					-0.02	80			4.44	-0.02	83			
0.00	76	4.52	33					0.00	76			4.52	0.00	79			
0.02	73	4.49	32					0.02	73			4.49	0.02	76			
0.04	73	4.45	32					0.04	73			4.45	0.04	76			
0.06	76	4.50	33					0.06	76			4.50	0.06	79			
0.07	80	4.51	34					0.07	80			4.51	0.07	83			
0.09	80	4.45	34					0.09	80			4.45	0.09	83			
0.11	73	4.43	32					0.11	73			4.43	0.11	76			
0.13	73	4.25	32					0.13	73			4.25	0.13	76			
0.15	76	3.96	33					0.15	76			3.96	0.15	79			
0.17	76	4.03	33					0.17	76			4.03	0.17	79			

(Continued on Next Column)

(Con't on Next Col.)

(Con't on Next Col.)

Max. Volts	6.05		6.05
Max. Depth (%)	96.00		96.00
Length (in.)	2.19		2.19
Avg. Depth (%)	79.38		82.68

Table C-10 (continued)
Sample P9
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Unadjusted NDE				Length ⁽¹⁾	Depth	Final with Adjustments			Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Axial Position	Depth	Volts	Phase Angle			Volts	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾		
-1.04	0	0.00	0	0.3	100	5.33	41			0.30	100			5.33	0.30	100	
-1.02	76	0.05	76	0.31	100	5.38	40			0.31	100			5.38	0.31	100	
-1.00	90	0.07	58	0.33	96	5.35	39			0.33	96			5.35	0.33	96	
-0.98	100	0.11	41	0.35	96	5.23	39			0.35	96			5.23	0.35	96	
-0.97	100	0.14	41	0.37	96	5.29	39			0.37	96			5.29	0.37	96	
-0.95	93	0.16	53	0.39	90	5.27	37			0.39	90			5.27	0.39	90	
-0.93	98	0.21	45	0.4	93	5.23	38	-0.93	0	0.40	93	-0.93	0	5.23	0.40	93	
-0.91	73	0.31	32	0.42	90	4.94	37	-0.91	58	0.42	90	0.31	-0.91	58	4.94	0.42	90
-0.89	58	0.41	27	0.44	86	4.85	36	-0.89	58	0.44	86	0.41	-0.89	58	4.85	0.44	86
-0.88	58	0.46	27	0.46	86	4.75	36	-0.88	58	0.46	86	0.46	-0.88	58	4.75	0.46	86
-0.86	86	0.51	36	0.48	80	4.67	34	-0.86	86	0.48	80	0.51	-0.86	86	4.67	0.48	80
-0.84	83	0.80	35	0.49	83	4.58	35	-0.84	83	0.49	83	0.80	-0.84	83	4.58	0.49	83
-0.82	67	1.43	30	0.51	83	4.34	35	-0.82	67	0.51	83	1.43	-0.82	67	4.34	0.51	83
-0.80	61	1.96	28	0.53	80	4.14	34	-0.8	61	0.53	80	1.96	-0.80	61	4.14	0.53	80
-0.79	70	2.17	31	0.55	80	4	34	-0.79	70	0.55	80	2.17	-0.79	70	4.00	0.55	80
-0.77	70	2.28	31	0.57	76	3.68	33	-0.77	70	0.57	76	2.28	-0.77	70	3.68	0.57	76
-0.75	70	2.38	31	0.59	83	3.46	35	-0.75	70	0.59	83	2.38	-0.75	70	3.46	0.59	83
-0.73	70	2.48	31	0.6	83	3.27	35	-0.73	70	0.60	83	2.48	-0.73	70	3.27	0.60	83
-0.71	73	2.53	32	0.62	76	3.25	33	-0.71	73	0.62	76	2.53	-0.71	73	3.25	0.62	76
-0.70	70	2.78	31	0.64	73	3	32	-0.7	70	0.64	73	2.78	-0.70	70	3.00	0.64	73
-0.68	67	3.05	30	0.66	70	2.55	31	-0.68	67	0.66	70	3.05	-0.68	67	2.55	0.66	70
-0.66	64	3.25	29	0.68	76	1.86	33	-0.66	64	0.68	76	3.25	-0.66	64	1.86	0.68	76
-0.64	67	3.38	30	0.69	76	1.37	33	-0.64	67	0.69	76	3.38	-0.64	67	1.37	0.69	76
-0.62	70	3.48	31	0.71	64	1.15	29	-0.62	70	0.71	64	3.48	-0.62	70	1.15	0.71	64
-0.61	73	3.63	32	0.73	64	0.97	29	-0.61	73	0.73	64	3.63	-0.61	73	0.97	0.73	64
-0.59	73	3.73	32	0.75	96	0.6	39	-0.59	73	0.75	64	3.73	-0.59	73	0.60	0.75	64
-0.57	73	3.74	32	0.77	93	0.33	54	-0.57	73	0.77	0	3.74	-0.57	73		0.77	0
-0.55	76	3.64	33	0.79	88	0.23	62	-0.55	76			3.64	-0.55	76			
-0.53	80	3.57	34	0.8	91	0.17	57	-0.53	80			3.57	-0.53	80			
-0.52	76	3.66	33	0.82	90	0.14	58	-0.52	76			3.66	-0.52	76			
-0.50	76	3.82	33	0.84	85	0.11	65	-0.5	76			3.82	-0.50	76			
-0.48	73	3.92	32	0.86	77	0.09	75	-0.48	73			3.92	-0.48	73			
-0.46	73	3.85	32	0.88	69	0.06	83	-0.46	73			3.85	-0.46	73			
-0.44	76	3.62	33	0.89	69	0.04	83	-0.44	76			3.62	-0.44	76			
-0.43	83	3.43	35	0.91	0	0	0	-0.43	83			3.43	-0.43	83			
-0.41	86	3.36	36					-0.41	86			3.36	-0.41	86			
-0.39	90	3.37	37					-0.39	90			3.37	-0.39	90			
-0.37	100	3.39	40					-0.37	100			3.39	-0.37	100			
-0.35	100	3.48	41					-0.35	100			3.48	-0.35	100			
-0.34	100	3.74	41					-0.34	100			3.74	-0.34	100			
-0.32	100	3.99	41					-0.32	100			3.99	-0.32	100			
-0.30	100	4.31	41					-0.3	100			4.31	-0.30	100			
-0.28	100	4.67	40					-0.28	100			4.67	-0.28	100			
-0.26	96	5.04	39					-0.26	96			5.04	-0.26	96			
-0.25	96	5.15	39					-0.25	96			5.15	-0.25	96			
-0.23	99	5.22	42					-0.23	99			5.22	-0.23	99			
-0.21	99	5.40	42					-0.21	99			5.40	-0.21	99			
-0.19	99	5.80	42					-0.19	99			5.80	-0.19	99			
-0.17	99	6.29	42					-0.17	99			6.29	-0.17	99			
-0.16	98	6.58	44					-0.16	98			6.58	-0.16	98			
-0.14	98	6.83	45					-0.14	98			6.83	-0.14	98			
-0.12	97	7.13	46					-0.12	97			7.13	-0.12	97			
-0.10	96	7.56	48					-0.1	96			7.56	-0.10	96			
-0.08	96	8.20	48					-0.08	96			8.20	-0.08	96			
-0.07	96	9.12	48					-0.07	96			9.12	-0.07	96			
-0.05	96	9.84	48					-0.05	96			9.84	-0.05	96			
-0.03	96	0.32	48					-0.03	96			0.32	-0.03	96			
-0.01	97	0.51	47					-0.01	97			0.51	-0.01	97			
0.01	96	0.19	48					0.01	96			0.19	0.01	96			
0.03	95	9.52	50					0.03	95			9.52	0.03	95			
0.04	94	8.75	52					0.04	94			8.75	0.04	94			
0.06	94	8.59	51					0.06	94			8.59	0.06	94			
0.08	94	8.85	51					0.08	94			8.85	0.08	94			
0.10	96	9.52	48					0.1	96			9.52	0.10	96			
0.12	97	9.83	47					0.12	97			9.83	0.12	97			
0.13	97	9.60	47					0.13	97			9.60	0.13	97			
0.15	97	9.10	47					0.15	97			9.10	0.15	97			
0.17	97	8.35	47					0.17	97			8.35	0.17	97			
0.19	97	7.54	47					0.19	97			7.54	0.19	97			
0.21	97	6.72	47					0.21	97			6.72	0.21	97			
0.22	97	5.99	47					0.22	97			5.99	0.22	97			
0.24	97	5.47	46					0.24	97			5.47	0.24	97			
0.26	97	5.38	46					0.26	97			5.38	0.26	97			
0.28	98	5.39	44					0.28	98			5.39	0.28	98			

(Continued on Next Column)

(Con't on Next Col.)

(Con't on Next Col.)

Max. Volts	9.84																	9.84
Max. Depth (%)	100.00																	100
Length (in.)	1.70																	1.70
Avg. Depth (%)	84.05																	84.05

Table C-11
Sample P9
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1P

Unadjusted NDE				Unadjusted NDE				Length ⁽¹⁾	Depth	Final with Adjustments			Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Axial Position	Depth	Volts	Phase Angle			Volts	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-1.26	0	0.06	189	0.24	75	2.19	32			0.24	75	2.19	0.24	75	
-1.24	96	0.05	47	0.26	87	2.37	36			0.26	87	2.37	0.26	87	
-1.22	91	0.08	54	0.28	87	2.53	36			0.28	87	2.53	0.28	87	
-1.20	82	0.10	67	0.3	81	2.62	34			0.30	81	2.62	0.30	81	
-1.18	93	0.11	51	0.32	75	2.68	32			0.32	75	2.68	0.32	75	
-1.16	98	0.16	43	0.34	75	2.66	32			0.34	75	2.66	0.34	75	
-1.14	97	0.19	39	0.36	72	2.7	31	-1.14	0	0.36	72	2.70	0.36	72	
-1.12	69	0.24	30	0.38	72	2.79	31	-1.12	69	0.38	72	2.79	0.38	72	
-1.10	81	0.24	34	0.4	72	2.81	31	-1.1	81	0.40	72	2.81	0.40	72	
-1.08	84	0.40	35	0.42	75	2.75	32	-1.08	84	0.42	75	2.75	0.42	75	
-1.06	75	0.76	32	0.44	72	2.66	31	-1.06	75	0.44	72	2.66	0.44	72	
-1.04	63	1.22	28	0.46	66	2.6	29	-1.04	63	0.46	66	2.60	0.46	66	
-1.02	69	1.54	30	0.48	66	2.48	29	-1.02	69	0.48	66	2.48	0.48	66	
-1.00	69	1.71	30	0.5	66	2.36	29	-1	69	0.50	66	2.36	0.50	66	
-0.98	63	1.96	28	0.52	63	2.11	28	-0.98	63	0.52	63	2.11	0.52	63	
-0.96	69	2.31	30	0.54	63	1.55	28	-0.96	69	0.54	63	1.55	0.54	63	
-0.94	69	2.78	30	0.56	81	1.17	34	-0.94	69	0.56	81	1.17	0.56	81	
-0.92	72	3.40	31	0.58	75	1.5	32	-0.92	72	0.58	75	1.50	0.58	75	
-0.90	81	3.66	34	0.6	78	1.73	33	-0.9	81	0.60	78	1.73	0.60	78	
-0.88	78	3.92	33	0.61	81	1.54	34	-0.88	78	0.61	81	1.54	0.61	81	
-0.86	81	4.22	34	0.63	81	1.17	34	-0.86	81	0.63	81	1.17	0.63	81	
-0.84	90	4.25	37	0.65	90	0.92	37	-0.84	90	0.65	90	0.92	0.65	90	
-0.82	87	4.52	36	0.68	69	1.22	30	-0.82	87	0.68	69	1.22	0.68	69	
-0.81	93	4.79	38	0.7	66	1.16	29	-0.81	93	0.70	66	1.16	0.70	66	
-0.79	97	4.99	39	0.71	72	0.73	31	-0.79	97	0.71	72	0.73	0.71	72	
-0.77	90	5.36	37	0.73	81	0.28	34	-0.77	90	0.73	81	0.28	0.73	81	
-0.75	87	5.36	36	0.75	57	0.25	26	-0.75	87	0.75	57	0.25	0.75	57	
-0.73	90	4.93	37	0.77	97	0.13	46	-0.73	90	0.77	97	0.13	0.77	57	
-0.71	84	4.67	35	0.77	30	0.25	15	-0.71	84	0.77	30	0.25	0.71	84	
-0.69	81	4.42	34	0.79	42	0.56	20	-0.69	81	0.79	0	4.42	-0.69	81	
-0.67	84	4.38	35	0.81	42	0.73	20	-0.67	84			4.38	-0.67	84	
-0.65	81	4.44	34	0.83	55	0.57	25	-0.65	81			4.44	-0.65	81	
-0.63	81	4.69	34	0.85	81	0.28	34	-0.63	81			4.69	-0.63	81	
-0.61	87	4.75	36	0.87	63	0.07	28	-0.61	87			4.75	-0.61	87	
-0.59	97	4.66	39	0.89	40	0.08	19	-0.59	97			4.66	-0.59	97	
-0.57	100	4.55	40	0.91	40	0.08	19	-0.57	100			4.55	-0.57	100	
-0.55	100	4.35	40	0.93	55	0.09	25	-0.55	100			4.35	-0.55	100	
-0.53	97	4.31	39	0.95	60	0.07	27	-0.53	97			4.31	-0.53	97	
-0.51	93	4.15	38	0.97	0	0.07	212	-0.51	93			4.15	-0.51	93	
-0.49	93	3.88	38					-0.49	93			3.88	-0.49	93	
-0.47	90	3.83	37					-0.47	90			3.83	-0.47	90	
-0.45	93	3.90	38					-0.45	93			3.90	-0.45	93	
-0.43	90	3.88	37					-0.43	90			3.88	-0.43	90	
-0.41	87	3.96	36					-0.41	87			3.96	-0.41	87	
-0.39	90	3.79	37					-0.39	90			3.79	-0.39	90	
-0.37	97	3.73	39					-0.37	97			3.73	-0.37	97	
-0.35	100	3.76	40					-0.35	100			3.76	-0.35	100	
-0.33	97	3.97	39					-0.33	97			3.97	-0.33	97	
-0.31	99	4.30	41					-0.31	99			4.30	-0.31	99	
-0.29	99	4.35	41					-0.29	99			4.35	-0.29	99	
-0.27	99	4.52	41					-0.27	99			4.52	-0.27	99	
-0.25	99	4.43	42					-0.25	99			4.43	-0.25	99	
-0.21	99	4.11	42					-0.21	99			4.11	-0.21	99	
-0.19	99	4.05	42					-0.19	99			4.05	-0.19	99	
-0.17	100	4.11	40					-0.17	100			4.11	-0.17	100	
-0.16	97	4.27	39					-0.16	97			4.27	-0.16	97	
-0.14	100	4.51	40					-0.14	100			4.51	-0.14	100	
-0.12	100	4.63	40					-0.12	100			4.63	-0.12	100	
-0.10	99	4.53	41					-0.1	99			4.53	-0.10	99	
-0.08	99	4.36	41					-0.08	99			4.36	-0.08	99	
-0.06	97	4.31	39					-0.06	97			4.31	-0.06	97	
-0.04	84	4.21	35					-0.04	84			4.21	-0.04	84	
-0.02	87	3.79	36					-0.02	87			3.79	-0.02	87	
0.02	100	2.67	40					0.02	100			2.67	0.02	100	
0.04	99	2.31	41					0.04	99			2.31	0.04	99	
0.06	99	2.12	42					0.06	99			2.12	0.06	99	
0.08	90	2.17	37					0.08	90			2.17	0.08	90	
0.10	87	2.17	36					0.1	87			2.17	0.10	87	
0.12	93	1.95	38					0.12	93			1.95	0.12	93	
0.14	93	1.66	38					0.14	93			1.66	0.14	93	
0.16	78	1.52	33					0.16	78			1.52	0.16	78	
0.18	63	1.56	28					0.18	63			1.56	0.18	63	
0.20	57	1.69	26					0.2	57			1.69	0.20	57	
0.22	69	1.92	30					0.22	69			1.92	0.22	69	

(Continued on Next Column)

(Con't on Next Col.)

(Con't on Next Col.)

Max. Volts	5.36		
Max. Depth (%)	100.00		
Length (in.)	1.93		
Avg. Depth (%)	82.72		

Table C-11 (continued)
Sample P9
Laboratory Specimen NDE Analysis
 Crack 2 - MR + Point - Analyst 2

Unadjusted NDE				Unadjusted NDE				Length ⁽¹⁾	Depth	Length ⁽¹⁾	Depth	Final with Adjustments		Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Axial Position	Depth	Volts	Phase Angle					Volts	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾
-1.14	0	0.00	0	0.20	58	1.77	27			0.20	58			1.77	0.20	58
-1.12	96	0.07	39	0.21	61	1.99	28			0.21	61			1.99	0.21	61
-1.10	99	0.09	42	0.23	70	2.25	31			0.23	70			2.25	0.23	70
-1.08	93	0.12	38	0.25	80	2.44	34			0.25	80			2.44	0.25	80
-1.07	76	0.16	33	0.27	83	2.63	35			0.27	83			2.63	0.27	83
-1.05	70	0.20	31	0.29	76	2.76	33			0.29	76			2.76	0.29	76
-1.03	50	0.23	24	0.30	70	2.77	31			0.30	70			2.77	0.30	70
-1.01	80	0.27	34	0.32	67	2.64	30			0.32	67			2.64	0.32	67
-0.99	100	0.43	40	0.34	64	2.60	29	-1.00	0	0.34	64	-1.00	0	2.60	0.34	64
-0.98	67	0.85	30	0.36	67	2.72	30	-0.98	67	0.36	67	0.85	-0.98	2.72	0.36	67
-0.96	61	1.28	28	0.38	67	2.80	30	-0.96	61	0.38	67	1.28	-0.96	2.80	0.38	67
-0.94	64	1.55	29	0.40	70	2.74	31	-0.94	64	0.40	70	1.55	-0.94	2.74	0.40	70
-0.92	67	1.80	30	0.41	70	2.71	31	-0.92	67	0.41	70	1.80	-0.92	2.71	0.41	70
-0.90	64	2.02	29	0.43	64	2.63	29	-0.90	64	0.43	64	2.02	-0.90	2.63	0.43	64
-0.88	67	2.32	30	0.45	64	2.58	29	-0.88	67	0.45	64	2.32	-0.88	2.58	0.45	64
-0.87	64	2.88	29	0.47	64	2.37	29	-0.87	64	0.47	64	2.88	-0.87	2.37	0.47	64
-0.85	67	3.43	30	0.49	61	2.19	28	-0.85	67	0.49	61	3.43	-0.85	2.19	0.49	61
-0.83	73	3.79	32	0.50	55	1.69	26	-0.83	73	0.50	55	3.79	-0.83	1.69	0.50	55
-0.81	76	4.02	33	0.52	64	1.22	29	-0.81	76	0.52	64	4.02	-0.81	1.22	0.52	64
-0.80	80	4.25	34	0.54	67	1.41	30	-0.80	80	0.54	67	4.25	-0.80	1.41	0.54	67
-0.78	83	4.41	35	0.56	70	1.67	31	-0.78	83	0.56	70	4.41	-0.78	1.67	0.56	70
-0.76	86	4.55	36	0.58	73	1.59	32	-0.76	86	0.58	73	4.55	-0.76	1.59	0.58	73
-0.74	90	4.80	37	0.59	80	1.28	34	-0.74	90	0.59	80	4.80	-0.74	1.28	0.59	80
-0.72	90	5.12	37	0.61	67	0.98	30	-0.72	90	0.61	67	5.12	-0.72	0.98	0.61	67
-0.70	86	5.33	36	0.63	67	1.18	30	-0.70	86	0.63	67	5.33	-0.70	1.18	0.63	67
-0.69	83	5.36	35	0.65	61	1.28	28	-0.69	83	0.65	61	5.36	-0.69	1.28	0.65	61
-0.67	86	5.06	36	0.67	64	0.93	29	-0.67	86	0.67	64	5.06	-0.67	0.93	0.67	64
-0.65	83	4.75	35	0.69	73	0.45	32	-0.65	83	0.69	73	4.75	-0.65	0.45	0.69	73
-0.63	80	4.48	34	0.70	67	0.22	30	-0.63	80	0.70	67	4.48	-0.63	0.22	0.70	67
-0.61	80	4.41	34	0.72	90	0.18	37	-0.61	80	0.72	90	4.41	-0.61	0.18	0.72	90
-0.60	83	4.54	35	0.74	30	0.37	16	-0.60	83	0.74	30	4.54	-0.60	0.37	0.74	30
-0.58	83	4.77	35	0.76	39	0.72	20	-0.58	83	0.76	39	4.77	-0.58	0.72	0.76	39
-0.56	86	4.82	36	0.78	45	0.70	22	-0.56	86	0.78	45	4.82	-0.56	0.70	0.78	45
-0.54	93	4.70	38	0.79	50	0.42	24	-0.54	93	0.79	50	4.70	-0.54	0.42	0.79	50
-0.52	100	4.55	40	0.81	58	0.16	27	-0.52	100	0.81	58	4.55	-0.52	0.16	0.81	58
-0.51	100	4.51	40	0.83	0	0.00	0	-0.51	100	0.83	0	4.51	-0.51	0.00	0.83	0
-0.49	96	4.39	39					-0.49	96			4.39	-0.49			96
-0.47	93	4.24	38					-0.47	93			4.24	-0.47			93
-0.45	90	4.04	37					-0.45	90			4.04	-0.45			90
-0.43	90	3.92	37					-0.43	90			3.92	-0.43			90
-0.42	90	3.91	37					-0.42	90			3.91	-0.42			90
-0.40	90	3.99	37					-0.40	90			3.99	-0.40			90
-0.38	93	3.96	38					-0.38	93			3.96	-0.38			93
-0.36	86	3.95	36					-0.36	86			3.95	-0.36			86
-0.34	93	3.81	38					-0.34	93			3.81	-0.34			93
-0.33	96	3.76	39					-0.33	96			3.76	-0.33			96
-0.31	96	3.95	39					-0.31	96			3.95	-0.31			96
-0.29	96	4.20	39					-0.29	96			4.20	-0.29			96
-0.27	100	4.41	40					-0.27	100			4.41	-0.27			100
-0.25	100	4.53	41					-0.25	100			4.53	-0.25			100
-0.24	100	4.51	41					-0.24	100			4.51	-0.24			100
-0.22	99	4.38	42					-0.22	99			4.38	-0.22			99
-0.20	99	4.14	42					-0.20	99			4.14	-0.20			99
-0.18	99	4.03	43					-0.18	99			4.03	-0.18			99
-0.16	100	4.11	41					-0.16	100			4.11	-0.16			100
-0.15	100	4.30	40					-0.15	100			4.30	-0.15			100
-0.13	96	4.51	39					-0.13	96			4.51	-0.13			96
-0.11	96	4.66	39					-0.11	96			4.66	-0.11			96
-0.09	100	4.65	40					-0.09	100			4.65	-0.09			100
-0.07	100	4.45	40					-0.07	100			4.45	-0.07			100
-0.06	100	4.37	40					-0.06	100			4.37	-0.06			100
-0.04	90	4.44	37					-0.04	90			4.44	-0.04			90
-0.02	83	4.28	35					-0.02	83			4.28	-0.02			83
0.00	90	3.76	37					0.00	90			3.76	0.00			90
0.02	96	3.10	39					0.02	96			3.10	0.02			96
0.03	99	2.55	42					0.03	99			2.55	0.03			99
0.05	100	2.24	40					0.05	100			2.24	0.05			100
0.07	100	2.13	41					0.07	100			2.13	0.07			100
0.09	93	2.17	38					0.09	93			2.17	0.09			93
0.11	80	2.15	37					0.11	80			2.15	0.11			80
0.12	93	1.94	38					0.12	93			1.94	0.12			93
0.14	86	1.71	36					0.14	86			1.71	0.14			86
0.16	70	1.59	31					0.16	70			1.59	0.16			70
0.18	58	1.64	27					0.18	58			1.64	0.18			58

(Continued on Next Column)

(Con't on Next Col.)

(Con't on Next Col.)

Max. Volts	5.36		5.36
Max. Depth (%)	100.00		100
Length (in.)	1.78		1.78
Avg. Depth (%)	79.14		79.14

Table C-12
Sample P10
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1P

Unadjusted NDE				Unadjusted NDE				Length ⁽¹⁾	Depth	Final with Adjustments			Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Axial Position	Depth	Volts	Phase Angle			Volts	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾
1.52	0	0.05	14	0.04	96	5.4	47								
1.50	40	0.06	19	0.02	94	4.89	50								
1.49	35	0.05	17	0.00	94	4.8	50								
1.46	75	0.05	32	-0.02	94	5.07	50								
1.44	15	0.06	2	-0.04	95	5.47	49								
1.42	99	0.08	42	-0.06	93	5.73	51								
1.41	78	0.07	33	-0.08	92	5.65	53								
1.39	98	0.07	44	-0.10	92	5.48	53								
1.37	93	0.09	52	-0.12	94	5.39	50	1.37	0						
1.35	93	0.11	38	-0.14	95	5.35	49	1.35	69						
1.33	69	0.17	30	-0.16	94	5.37	50	1.33	69						
1.31	69	0.23	30	-0.18	93	5.44	51	1.31	69						
1.29	93	0.37	38	-0.20	93	5.79	52	1.29	93						
1.27	72	0.72	31	-0.22	94	6.13	50	1.27	72						
1.25	63	1.02	28	-0.24	95	6.25	48	1.25	63						
1.23	66	1.15	29	-0.24	95	6.25	48	1.23	66						
1.21	63	1.22	28	-0.26	97	5.99	46	1.21	63						
1.19	57	1.31	26	-0.28	97	5.36	46	1.19	57						
1.17	63	1.54	28	-0.30	97	4.94	46	1.17	63						
1.15	66	1.99	29	-0.32	98	5.03	43	1.15	66						
1.13	69	2.52	30	-0.34	100	5.61	40	1.13	69						
1.11	69	3.00	30	-0.36	100	6.23	40	1.11	69						
1.09	69	3.33	30	-0.38	99	6.68	41	1.09	69						
1.07	69	3.55	30	-0.40	100	6.66	40	1.07	69						
1.05	69	3.59	30	-0.42	97	6.66	39	1.05	69						
1.03	72	3.44	31	-0.44	93	6.14	38	1.03	72						
1.01	75	3.39	32	-0.46	90	5.76	37	1.01	75						
0.99	75	3.55	32	-0.48	84	5.58	35	0.99	75						
0.97	72	3.99	31	-0.50	81	5.78	34	0.97	72						
0.95	72	4.57	31	-0.51	75	6.09	32	0.95	72						
0.93	72	5.03	31	-0.53	75	6.34	32	0.93	72						
0.91	78	5.21	33	-0.55	78	6.4	33	0.91	78						
0.89	78	5.24	33	-0.57	84	6.39	35	0.89	78						
0.87	75	5.21	32	-0.59	81	6.55	34	0.87	75						
0.85	75	5.28	32	-0.61	81	6.52	34	0.85	75						
0.83	72	5.38	31	-0.63	81	6.48	34	0.83	72						
0.81	69	5.32	30	-0.65	78	6.54	33	0.81	69						
0.79	72	5.22	31	-0.67	78	6.52	33	0.79	72						
0.77	72	5.08	31	-0.69	81	6.60	34	0.77	72						
0.75	72	5.06	31	-0.71	78	6.78	33	0.75	72						
0.73	72	5.12	31	-0.73	75	6.68	32	0.73	72						
0.71	72	5.28	31	-0.75	75	6.29	32	0.71	72						
0.69	75	5.44	32	-0.77	78	5.73	33	0.69	75						
0.67	78	5.49	33	-0.79	78	5.41	33	0.67	78						
0.65	84	5.50	35	-0.81	72	5.15	31	0.65	84						
0.63	81	5.58	34	-0.83	69	4.84	30	0.63	81						
0.61	78	5.54	33	-0.85	69	4.55	30	0.61	78						
0.59	78	5.33	33	-0.87	75	4.41	32	0.59	78						
0.57	78	5.03	33	-0.89	78	4.34	33	0.57	78						
0.55	78	4.78	33	-0.91	81	4.31	34	0.55	78						
0.53	75	4.68	32	-0.93	84	4.22	35	0.53	75						
0.51	75	4.54	32	-0.95	84	4.05	35	0.51	75						
0.49	78	4.47	33	-0.97	81	3.85	34	0.49	78						
0.47	81	4.38	34	-0.99	75	3.76	32	0.47	81						
0.45	81	4.42	34	-1.01	72	3.55	31	0.45	81						
0.44	81	4.59	34	-1.03	66	3.44	29	0.44	81						
0.42	81	4.70	34	-1.05	63	3.32	28	0.42	81						
0.40	81	4.71	34	-1.07	63	3.07	28	0.40	81						
0.38	84	4.61	35	-1.09	63	2.73	28	0.38	84						
0.36	90	4.33	37	-1.11	63	2.40	28	0.36	90						
0.34	99	4.07	42	-1.13	63	2.12	28	0.34	99						
0.32	97	4.17	46	-1.15	66	1.90	29	0.32	97						
0.30	96	4.51	47	-1.17	63	1.85	28	0.30	96						
0.28	97	4.92	46	-1.19	63	1.67	28	0.28	97						
0.26	96	5.05	47	-1.21	60	1.48	27	0.26	96						
0.24	96	5.12	47	-1.23	60	1.16	27	0.24	96						
0.22	96	5.34	47	-1.25	57	0.86	26	0.22	96						
0.20	96	5.73	47	-1.27	55	0.59	25	0.20	96						
0.18	95	6.07	48	-1.29	75	0.31	32	0.18	95						
0.16	95	6.17	49	-1.31	81	0.20	34	0.16	95						
0.14	94	6.13	50	-1.33	97	0.16	39	0.14	94						
0.12	94	6.19	50	-1.35	81	0.13	34	0.12	94						
0.10	95	6.37	49	-1.37	98	0.10	43	0.10	95						
0.08	97	6.47	46	-1.39	96	0.09	47	0.08	97						
0.08	97	6.47	46	-1.41	87	0.07	61	0.08	97						
0.06	97	6.11	46	-1.43	0	0.06	49	0.06	97						

(Con't on Next Col.)

(Con't on Next Col.)

Max. Volts	6.66			6.86
Max. Depth (%)	100.00			100
Length (in.)	2.74			2.74
Avg. Depth (%)	79.69			79.69

Table C-12 (continued)
 Sample P10
 Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Unadjusted NDE				Length ⁽²⁾		Length ⁽²⁾		Final with Adjustments		Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
-1.26	0	0.00	0	0.11	94	5.46	52	-1.26	0	0.11	94	0.00	-1.26	0	5.46	0.11	94
-1.24	37	0.12	19	0.13	95	5.4	50	-1.24	37	0.13	95	0.12	-1.24	37	5.40	0.13	95
-1.22	55	0.15	26	0.15	96	5.33	48	-1.22	55	0.15	96	0.15	-1.22	55	5.33	0.15	96
-1.20	53	0.21	25	0.16	95	5.38	50	-1.20	53	0.16	95	0.21	-1.20	53	5.38	0.16	95
-1.19	80	0.36	34	0.18	94	5.55	52	-1.19	70	0.18	94	0.36	-1.19	70	5.55	0.18	94
-1.17	70	0.70	31	0.2	94	5.89	51	-1.17	70	0.20	94	0.70	-1.17	70	5.89	0.20	94
-1.15	61	1.03	28	0.22	96	6.23	49	-1.15	61	0.22	96	1.03	-1.15	61	6.23	0.22	96
-1.13	61	1.17	28	0.24	97	6.32	47	-1.13	61	0.24	97	1.17	-1.13	61	6.32	0.24	97
-1.11	61	1.25	28	0.25	97	5.83	46	-1.11	61	0.25	97	1.25	-1.11	61	5.83	0.25	97
-1.09	58	1.35	27	0.27	97	5.28	46	-1.09	58	0.27	97	1.35	-1.09	58	5.28	0.27	97
-1.08	58	1.53	27	0.29	98	4.9	45	-1.08	58	0.29	98	1.53	-1.08	58	4.90	0.29	98
-1.06	61	1.89	28	0.31	99	5.08	42	-1.06	61	0.31	99	1.89	-1.06	61	5.08	0.31	99
-1.04	67	2.34	30	0.33	100	5.58	40	-1.04	67	0.33	100	2.34	-1.04	67	5.58	0.33	100
-1.02	67	2.96	30	0.35	100	6.12	40	-1.02	67	0.35	100	2.96	-1.02	67	6.12	0.35	100
-1.00	67	3.34	30	0.36	100	6.52	41	-1.00	67	0.36	100	3.34	-1.00	67	6.52	0.36	100
-0.99	67	3.61	30	0.38	100	6.87	40	-0.99	67	0.38	100	3.61	-0.99	67	6.87	0.38	100
-0.97	67	3.65	30	0.4	93	6.77	38	-0.97	67	0.40	93	3.65	-0.97	67	6.77	0.40	93
-0.95	70	3.46	31	0.42	90	6.21	37	-0.95	70	0.42	90	3.46	-0.95	70	6.21	0.42	90
-0.93	76	3.30	33	0.44	86	5.84	36	-0.93	76	0.44	86	3.30	-0.93	76	5.84	0.44	86
-0.91	76	3.47	33	0.46	83	5.67	35	-0.91	76	0.46	83	3.47	-0.91	76	5.67	0.46	83
-0.89	73	3.86	32	0.47	80	5.75	34	-0.89	73	0.47	80	3.86	-0.89	73	5.75	0.47	80
-0.88	73	4.48	32	0.49	76	5.98	33	-0.88	73	0.49	76	4.48	-0.88	73	5.98	0.49	76
-0.86	70	5.07	31	0.51	73	6.24	32	-0.86	70	0.51	73	5.07	-0.86	70	6.24	0.51	73
-0.84	70	5.39	31	0.53	76	6.46	33	-0.84	70	0.53	76	5.39	-0.84	70	6.46	0.53	76
-0.82	73	5.35	32	0.55	80	6.55	34	-0.82	73	0.55	80	5.35	-0.82	73	6.55	0.55	80
-0.80	73	5.20	32	0.56	80	6.61	34	-0.80	73	0.56	80	5.20	-0.80	73	6.61	0.56	80
-0.78	76	5.30	33	0.58	80	6.51	34	-0.78	76	0.58	80	5.30	-0.78	76	6.51	0.58	80
-0.77	73	5.46	32	0.6	80	6.56	34	-0.77	73	0.60	80	5.46	-0.77	73	6.56	0.60	80
-0.75	70	5.52	31	0.62	76	6.6	33	-0.75	70	0.62	76	5.52	-0.75	70	6.60	0.62	76
-0.73	67	5.45	30	0.64	76	6.55	33	-0.73	67	0.64	76	5.45	-0.73	67	6.55	0.64	76
-0.71	67	5.23	30	0.66	80	6.61	34	-0.71	67	0.66	80	5.23	-0.71	67	6.61	0.66	80
-0.69	70	5.11	31	0.67	76	6.8	33	-0.69	70	0.67	76	5.11	-0.69	70	6.80	0.67	76
-0.68	70	5.04	31	0.69	73	6.8	32	-0.68	70	0.69	73	5.04	-0.68	70	6.80	0.69	73
-0.66	73	5.18	32	0.71	73	6.42	32	-0.66	73	0.71	73	5.18	-0.66	73	6.42	0.71	73
-0.64	73	5.49	32	0.73	80	5.88	34	-0.64	73	0.73	80	5.49	-0.64	73	5.88	0.73	80
-0.62	73	5.59	32	0.75	73	5.51	32	-0.62	73	0.75	73	5.59	-0.62	73	5.51	0.75	73
-0.60	76	5.55	33	0.77	73	5.13	32	-0.60	76	0.77	73	5.55	-0.60	76	5.13	0.77	73
-0.58	80	5.50	34	0.78	67	4.91	30	-0.58	80	0.78	67	5.50	-0.58	80	4.91	0.78	67
-0.57	76	5.63	33	0.80	64	4.57	29	-0.57	76	0.80	64	5.63	-0.57	76	4.57	0.80	64
-0.55	76	5.52	33	0.82	70	4.46	31	-0.55	76	0.82	70	5.52	-0.55	76	4.46	0.82	70
-0.53	76	5.18	33	0.84	76	4.35	33	-0.53	76	0.84	76	5.18	-0.53	76	4.35	0.84	76
-0.51	76	4.77	33	0.86	80	4.34	34	-0.51	76	0.86	80	4.77	-0.51	76	4.34	0.86	80
-0.49	76	4.73	33	0.88	83	4.29	35	-0.49	76	0.88	83	4.73	-0.49	76	4.29	0.88	83
-0.47	73	4.73	32	0.89	83	4.11	35	-0.47	73	0.89	83	4.73	-0.47	73	4.11	0.89	83
-0.46	73	4.55	32	0.91	80	3.98	34	-0.46	73	0.91	80	4.55	-0.46	73	3.98	0.91	80
-0.44	76	4.46	33	0.93	76	3.88	33	-0.44	76	0.93	76	4.46	-0.44	76	3.88	0.93	76
-0.42	76	4.42	33	0.95	70	3.68	31	-0.42	76	0.95	70	4.42	-0.42	76	3.68	0.95	70
-0.40	76	4.51	33	0.97	67	3.54	30	-0.40	76	0.97	67	4.51	-0.40	76	3.54	0.97	67
-0.38	76	4.63	33	0.98	61	3.35	28	-0.38	76	0.98	61	4.63	-0.38	76	3.35	0.98	61
-0.37	80	4.69	34	1.00	61	3.19	28	-0.37	80	1.00	61	4.69	-0.37	80	3.19	1.00	61
-0.35	83	4.70	35	1.02	58	2.88	27	-0.35	83	1.02	58	4.70	-0.35	83	2.88	1.02	58
-0.33	86	4.52	36	1.04	55	2.56	26	-0.33	86	1.04	55	4.52	-0.33	86	2.56	1.04	55
-0.31	93	4.25	38	1.06	58	2.22	27	-0.31	93	1.06	58	4.25	-0.31	93	2.22	1.06	58
-0.29	99	4.06	43	1.08	61	2.00	28	-0.29	99	1.08	61	4.06	-0.29	99	2.00	1.08	61
-0.27	97	4.36	46	1.09	61	1.90	28	-0.27	97	1.09	61	4.36	-0.27	97	1.90	1.09	61
-0.26	97	4.75	46	1.11	61	1.79	28	-0.26	97	1.11	61	4.75	-0.26	97	1.79	1.11	61
-0.24	98	5.02	45	1.13	58	1.61	27	-0.24	98	1.13	58	5.02	-0.24	98	1.61	1.13	58
-0.22	97	5.08	46	1.15	55	1.29	26	-0.22	97	1.15	55	5.08	-0.22	97	1.29	1.15	55
-0.20	97	5.09	46	1.17	50	1.01	24	-0.20	97	1.17	50	5.09	-0.20	97	1.01	1.17	50
-0.18	96	5.40	48	1.19	45	0.68	22	-0.18	96	1.19	45	5.40	-0.18	96	0.68	1.19	45
-0.16	97	5.83	47	1.20	50	0.37	24	-0.16	97	1.20	50	5.83	-0.16	97	0.37	1.20	50
-0.15	96	6.11	48	1.22	58	0.19	27	-0.15	96	1.22	58	6.11	-0.15	96	0.19	1.22	58
-0.13	96	6.15	49	1.24	47	0.15	23	-0.13	96	1.24	47	6.15	-0.13	96	0.15	1.24	47
-0.11	95	6.08	50	1.26	61	0.14	28	-0.11	95	1.26	47	6.08	-0.11	95	0.14	1.26	47
-0.09	95	6.21	50	1.28	73	0.13	32	-0.09	95	1.28	47	6.21	-0.09	95	0.13	1.28	47
-0.07	96	6.32	48	1.30	89	0.08	60	-0.07	96	1.30	0	6.32	-0.07	96	0.08	1.30	0
-0.06	97	6.34	47	1.31	0	0.00	0	-0.06	97			6.34	-0.06	97			
-0.04	97	5.93	47					-0.04	97			5.93	-0.04	97			
-0.02	96	5.38	48					-0.02	96			5.38	-0.02	96			
0.00	96	4.91	49					0.00	96			4.91	0.00	96			
0.02	96	4.84	49					0.02	96			4.84	0.02	96			
0.04	96	5.13	49					0.04	96			5.13	0.04	96			
0.05	95	5.56	50					0.05	95			5.56	0.05	95			
0.07	94	5.70	51					0.07	94			5.70	0.07	94			
0.09	94	5.64	52					0.09	94			5.64	0.09	94			

(Continued on Next Column)

(Con't on Next Col.)

(Con't on Next Col.)

Max. Volts	6.87				6.87
Max. Depth (%)	100.00				100
Length (in.)	2.56				2.56
Avg. Depth (%)	76.65				76.65

Table C-13
Sample P10
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1P

Unadjusted NDE				Unadjusted NDE				Final with Adjustments				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾	
-0.94	0	0.10	20	0.54	69	4.40	30							4.40	0.54	88
-0.92	19	0.09	10	0.56	66	4.20	29							4.20	0.56	85
-0.90	35	0.06	17	0.58	69	4.13	30							4.13	0.58	88
-0.88	40	0.08	19	0.60	66	4.33	29							4.33	0.60	85
-0.86	50	0.07	23	0.62	66	4.60	29	-0.86	0					4.60	0.62	85
-0.84	32	0.22	16	0.64	69	4.70	30	-0.84	32	0.07	-0.84	41		4.70	0.64	88
-0.82	37	0.43	18	0.66	72	4.49	31	-0.82	37	0.66	0.22	-0.82	47	4.49	0.66	92
-0.80	40	0.64	19	0.68	72	4.65	31	-0.80	40	0.68	0.43	-0.80	51	4.65	0.68	92
-0.78	42	0.72	20	0.70	72	4.76	31	-0.78	42	0.70	0.64	-0.78	54	4.76	0.70	92
-0.76	44	0.75	21	0.72	66	5.08	29	-0.76	44	0.72	0.66	0.72	-0.76	5.08	0.72	85
-0.74	50	0.74	23	0.74	66	5.13	29	-0.74	50	0.74	0.66	0.75	-0.74	5.13	0.74	85
-0.72	47	0.78	22	0.76	63	5.01	28	-0.72	47	0.76	0.63	0.74	-0.72	5.01	0.76	81
-0.70	47	0.86	22	0.78	63	4.83	28	-0.70	47	0.78	0.63	0.78	-0.70	4.83	0.78	81
-0.68	47	1.01	22	0.80	66	4.71	29	-0.68	47	0.80	0.66	0.86	-0.68	4.71	0.80	85
-0.66	47	1.01	22	0.82	66	4.83	29	-0.66	47	0.82	0.66	1.01	-0.66	4.83	0.82	85
-0.64	55	0.84	25	0.84	69	4.97	30	-0.64	55	0.84	0.69	1.01	-0.64	4.97	0.84	88
-0.62	55	0.74	25	0.86	69	5.09	30	-0.62	55	0.86	0.69	0.84	-0.62	5.09	0.86	88
-0.60	52	0.79	24	0.88	69	4.97	30	-0.60	52	0.88	0.69	0.74	-0.60	4.97	0.88	88
-0.58	52	0.95	24	0.90	72	4.78	31	-0.58	52	0.90	0.72	0.79	-0.58	4.78	0.90	92
-0.56	50	1.07	23	0.92	69	4.69	30	-0.56	50	0.92	0.69	0.95	-0.56	4.69	0.92	88
-0.54	52	1.13	24	0.94	66	4.57	29	-0.54	52	0.94	0.66	1.07	-0.54	4.57	0.94	85
-0.52	57	1.20	26	0.96	66	4.32	29	-0.52	57	0.96	0.66	1.13	-0.52	4.32	0.96	85
-0.50	60	1.31	27	0.98	69	4.06	30	-0.50	60	0.98	0.69	1.20	-0.50	4.06	0.98	88
-0.48	57	1.49	26	1.00	66	4.03	29	-0.48	57	1.00	0.66	1.31	-0.48	4.03	1.00	85
-0.46	57	1.67	26	1.02	63	4.03	28	-0.46	57	1.02	0.63	1.49	-0.46	4.03	1.02	81
-0.45	57	1.70	26	1.04	60	3.96	27	-0.45	57	1.04	0.60	1.67	-0.45	3.96	1.04	77
-0.43	55	1.65	25	1.06	60	3.79	27	-0.43	55	1.06	0.60	1.70	-0.43	3.79	1.06	77
-0.41	55	1.55	25	1.08	63	3.47	28	-0.41	55	1.08	0.63	1.65	-0.41	3.47	1.08	81
-0.39	52	1.51	24	1.10	63	3.11	28	-0.39	52	1.10	0.63	1.55	-0.39	3.11	1.10	81
-0.37	50	1.56	23	1.12	66	3.01	29	-0.37	50	1.12	0.66	1.51	-0.37	3.01	1.12	85
-0.35	50	1.63	23	1.14	63	3.03	28	-0.35	50	1.14	0.63	1.56	-0.35	3.03	1.14	81
-0.33	55	1.72	25	1.16	63	2.87	28	-0.33	55	1.16	0.63	1.63	-0.33	2.87	1.16	81
-0.31	57	1.88	26	1.18	63	2.53	28	-0.31	57	1.18	0.63	1.72	-0.31	2.53	1.18	81
-0.29	60	2.12	27	1.20	60	2.21	27	-0.29	60	1.20	0.60	1.88	-0.29	2.21	1.20	77
-0.27	63	2.35	28	1.22	57	1.99	26	-0.27	63	1.22	57	2.12	-0.27	1.99	1.22	73
-0.25	69	2.43	30	1.24	52	1.82	24	-0.25	69	1.24	52	2.35	-0.25	1.82	1.24	67
-0.23	69	2.44	30	1.26	57	1.72	26	-0.23	69	1.26	57	2.43	-0.23	1.72	1.26	73
-0.21	72	2.48	31	1.28	52	1.50	24	-0.21	72	1.28	52	2.44	-0.21	1.50	1.28	67
-0.19	72	2.54	31	1.30	55	1.15	25	-0.19	72	1.30	55	2.48	-0.19	1.15	1.30	71
-0.17	69	2.64	30	1.32	52	0.82	24	-0.17	69	1.32	52	2.54	-0.17	0.82	1.32	67
-0.15	66	2.82	29	1.34	57	0.51	26	-0.15	66	1.34	57	2.64	-0.15	0.51	1.34	73
-0.13	66	3.05	29	1.36	55	0.32	25	-0.13	66	1.36	55	2.82	-0.13	0.32	1.36	71
-0.11	66	3.27	29	1.38	55	0.22	25	-0.11	66	1.38	55	3.05	-0.11	0.22	1.38	71
-0.09	69	3.33	30	1.40	78	0.14	33	-0.09	69	1.40	0	3.27	-0.09	0.14	1.40	0
-0.07	72	3.34	31	1.42	90	0.11	37	-0.07	72			3.33	-0.07			
-0.05	72	3.29	31	1.44	60	0.12	27	-0.05	72			3.34	-0.05			
-0.03	69	3.21	30	1.46	57	0.13	26	-0.03	69			3.29	-0.03			
-0.01	72	3.11	31	1.48	93	0.13	38	-0.01	72			3.21	-0.01			
0.01	72	3.04	31	1.50	52	0.13	24	0.01	72			3.11	0.01			
0.01	72	3.04	31	1.52	0	0.10	16	0.01	72			3.04	0.01			
0.03	78	3.12	33					0.03	78			3.04	0.03			100
0.05	75	3.27	32					0.05	75			3.12	0.05			96
0.07	72	3.42	31					0.07	72			3.27	0.07			92
0.09	72	3.43	31					0.09	72			3.42	0.09			92
0.11	72	3.37	31					0.11	72			3.43	0.11			92
0.13	72	3.30	31					0.13	72			3.37	0.13			92
0.15	72	3.23	31					0.15	72			3.30	0.15			92
0.17	75	3.15	32					0.17	75			3.23	0.17			96
0.19	75	3.06	32					0.19	75			3.15	0.19			96
0.21	75	2.98	32					0.21	75			3.06	0.21			96
0.23	66	2.86	29					0.23	66			2.98	0.23			85
0.25	72	2.81	31					0.25	72			2.86	0.25			92
0.27	69	2.87	30					0.27	69			2.81	0.27			88
0.29	69	3.03	30					0.29	69			2.87	0.29			88
0.31	69	3.18	30					0.31	69			3.03	0.31			88
0.35	66	3.32	29					0.35	66			3.18	0.35			85
0.37	60	3.34	27					0.37	60			3.32	0.37			77
0.39	60	3.23	27					0.39	60			3.34	0.39			77
0.41	60	3.13	27					0.41	60			3.23	0.41			77
0.43	63	3.10	28					0.43	63			3.13	0.43			81
0.45	66	3.38	29					0.45	66			3.10	0.45			85
0.47	66	3.61	29					0.47	66			3.38	0.47			85
0.49	69	3.91	30					0.49	69			3.61	0.49			88
0.51	69	4.22	30					0.51	69			3.91	0.51			88
0.52	69	4.35	30					0.52	69			4.22	0.52			88

(Continued on Next Column)

(Con't on Next Col.)

(Con't on Next Col.)

Max. Volts	5.13		5.13
Max. Depth (%)	78.00		100.00
Length (in.)	2.26		2.26
Avg. Depth (%)	61.83		79.27

Table C-13 (continued)
Sample P10
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 3

Unadjusted NDE				Unadjusted NDE				Length ⁽¹⁾	Depth	Final with Adjustments		Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Axial Position	Depth	Volts	Phase Angle			Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾	
-0.90	0			0.54	73	4.42	20	-0.90	0			4.42	0.54	89	
-0.87	15	0.09	3	0.56	70	4.35	19	-0.87	15	0.09	-0.87	18	4.35	0.56	85
-0.85	15	0.09	2	0.58	70	4.23	19	-0.85	15	0.09	-0.85	18	4.23	0.58	85
-0.83	15	0.12	2	0.60	73	4.36	20	-0.83	15	0.12	-0.83	18	4.36	0.60	89
-0.82	30	0.18	8	0.62	70	4.67	19	-0.82	30	0.18	-0.82	37	4.67	0.62	85
-0.80	38	0.31	10	0.64	73	4.69	20	-0.80	38	0.31	-0.80	46	4.69	0.64	89
-0.78	30	0.60	8	0.66	76	4.71	21	-0.78	30	0.60	-0.78	37	4.71	0.66	93
-0.76	34	0.74	9	0.68	76	4.64	21	-0.76	34	0.74	-0.76	41	4.64	0.68	93
-0.74	38	0.78	10	0.7	76	4.82	21	-0.74	38	0.78	-0.74	46	4.82	0.70	93
-0.72	42	0.77	11	0.72	73	5.18	20	-0.72	42	0.77	-0.72	51	5.18	0.72	89
-0.70	46	0.75	12	0.73	70	5.16	19	-0.70	46	0.75	-0.70	56	5.16	0.73	85
-0.68	46	0.85	12	0.75	67	5.01	18	-0.68	46	0.85	-0.68	56	5.01	0.75	82
-0.66	38	0.98	10	0.77	67	4.99	18	-0.66	38	0.98	-0.66	46	4.99	0.77	82
-0.64	38	1.03	10	0.79	67	4.86	18	-0.64	38	1.03	-0.64	46	4.86	0.79	82
-0.62	46	0.89	12	0.81	67	5.02	18	-0.62	46	0.89	-0.62	56	5.02	0.81	82
-0.60	57	0.74	15	0.83	70	5.2	19	-0.60	57	0.74	-0.60	70	5.20	0.83	85
-0.59	53	0.74	14	0.85	70	5.11	19	-0.59	53	0.74	-0.59	65	5.11	0.85	85
-0.57	49	0.89	13	0.87	73	5.01	20	-0.57	49	0.89	-0.57	60	5.01	0.87	89
-0.55	49	1.02	13	0.89	73	4.91	20	-0.55	49	1.02	-0.55	60	4.91	0.89	89
-0.53	46	1.08	12	0.91	70	4.77	19	-0.53	46	1.08	-0.53	56	4.77	0.91	85
-0.51	53	1.11	14	0.93	73	4.54	20	-0.51	53	1.11	-0.51	65	4.54	0.93	89
-0.49	60	1.20	16	0.95	70	4.45	19	-0.49	60	1.20	-0.49	73	4.45	0.95	85
-0.47	63	1.38	17	0.96	70	4.06	19	-0.47	63	1.38	-0.47	77	4.06	0.96	85
-0.45	60	1.58	16	0.98	73	4.08	20	-0.45	60	1.58	-0.45	73	4.08	0.98	89
-0.43	57	1.74	15	1	67	4.16	18	-0.43	57	1.74	-0.43	70	4.16	1.00	82
-0.41	57	1.72	15	1.02	63	4.11	17	-0.41	57	1.72	-0.41	70	4.11	1.02	77
-0.39	57	1.62	15	1.04	60	4.02	16	-0.39	57	1.62	-0.39	70	4.02	1.04	73
-0.38	53	1.54	14	1.08	67	3.25	18	-0.38	53	1.54	-0.38	65	3.25	1.08	82
-0.36	49	1.56	13	1.1	63	3.15	17	-0.36	49	1.56	-0.36	60	3.15	1.10	77
-0.34	46	1.63	12	1.12	63	3.11	17	-0.34	46	1.63	-0.34	56	3.11	1.12	77
-0.32	49	1.71	13	1.14	67	3	18	-0.32	49	1.71	-0.32	60	3.00	1.14	82
-0.30	60	1.86	16	1.16	67	2.72	18	-0.30	60	1.86	-0.30	73	2.72	1.16	82
-0.28	63	2.07	17	1.18	63	2.38	17	-0.28	63	2.07	-0.28	77	2.38	1.18	77
-0.26	63	2.30	17	1.19	63	2.06	17	-0.26	63	2.30	-0.26	77	2.06	1.19	77
-0.24	70	2.42	19	1.21	60	1.9	16	-0.24	70	2.42	-0.24	85	1.90	1.21	73
-0.22	73	2.48	20	1.23	57	1.81	15	-0.22	73	2.48	-0.22	89	1.81	1.23	70
-0.20	73	2.53	20	1.25	53	1.62	14	-0.20	73	2.53	-0.20	89	1.62	1.25	65
-0.18	70	2.60	19	1.27	53	1.35	14	-0.18	70	2.60	-0.18	85	1.35	1.27	65
-0.16	70	2.66	19	1.29	53	0.96	14	-0.16	70	2.66	-0.16	85	0.96	1.29	65
-0.15	67	2.80	18	1.31	60	0.59	16	-0.15	67	2.80	-0.15	82	0.59	1.31	73
-0.13	67	2.96	18	1.33	63	0.37	17	-0.13	67	2.96	-0.13	82	0.37	1.33	77
-0.11	67	3.18	18	1.35	67	0.23	18	-0.11	67	3.18	-0.11	82	0.23	1.35	82
-0.09	73	3.30	20	1.37	70	0.16	19	-0.09	73	3.30	-0.09	89	0.16	1.37	85
-0.07	73	3.38	20	1.39	90	0.12	26	-0.07	73	3.38	-0.07	89		1.40	0
-0.05	76	3.36	21	1.41	94	0.08	38	-0.05	76	3.36	-0.05	93			
-0.03	73	3.36	20	1.42	90	0.1	26	-0.03	73	3.36	-0.03	89			
-0.01	73	3.26	20	1.44	97	0.06	34	-0.01	73	3.26	-0.01	89			
-0.01	70	3.23	19	1.46	49	0.08	13	-0.01	70	3.23	-0.01	85			
0.01	79	3.17	22	1.49	0			0.01	79	3.17	0.01	96			
0.03	79	3.19	22					0.03	79	3.19	0.03	96			
0.04	76	3.28	21					0.04	76	3.28	0.04	93			
0.06	76	3.41	21					0.06	76	3.41	0.06	93			
0.08	76	3.47	21					0.08	76	3.47	0.08	93			
0.10	73	3.40	20					0.10	73	3.40	0.10	89			
0.12	73	3.32	20					0.12	73	3.32	0.12	89			
0.14	76	3.30	21					0.14	76	3.30	0.14	93			
0.16	76	3.29	21					0.16	76	3.29	0.16	93			
0.18	82	3.23	23					0.18	82	3.23	0.18	100			
0.20	79	3.17	22					0.20	79	3.17	0.20	96			
0.22	76	3.07	21					0.22	76	3.07	0.22	93			
0.24	73	2.95	20					0.24	73	2.95	0.24	89			
0.26	76	2.90	21					0.26	76	2.90	0.26	93			
0.27	73	3.00	20					0.27	73	3.00	0.27	89			
0.29	73	3.15	20					0.29	73	3.15	0.29	89			
0.31	70	3.30	19					0.31	70	3.30	0.31	85			
0.33	70	3.32	19					0.33	70	3.32	0.33	85			
0.35	67	3.34	18					0.35	67	3.34	0.35	82			
0.37	63	3.33	17					0.37	63	3.33	0.37	77			
0.39	63	3.30	17					0.39	63	3.30	0.39	77			
0.41	63	3.17	17					0.41	63	3.17	0.41	77			
0.43	67	3.27	18					0.43	67	3.27	0.43	82			
0.45	67	3.49	18					0.45	67	3.49	0.45	82			
0.49	73	3.98	20					0.49	73	3.98	0.49	89			
0.50	73	4.36	20					0.50	73	4.36	0.50	89			
0.52	70	4.49	19					0.52	70	4.49	0.52	85			

(Continued on Next Column)

(Don't on Next Col.)

(Don't on Next Col.)

Max. Volts	5.20			5.20
Max. Depth (%)	82.00			100.00
Length (in.)	2.30			2.30
Avg. Depth (%)	61.99			75.60

Table C-14
Sample P11
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1P

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽⁹⁾	Depth	Volts	Length ⁽⁹⁾	Depth ⁽⁹⁾
-0.77	0	0.04	186					
-0.75	53	0.05	96					
-0.73	66	0.05	84					
-0.71	52	0.06	97					
-0.69	44	0.08	103					
-0.67	39	0.09	107					
-0.65	45	0.09	102					
-0.63	44	0.17	103					
-0.61	57	0.24	93					
-0.59	70	0.33	80	-0.59	0	0.33	-0.59	0
-0.57	83	0.45	66	-0.57	81	0.45	-0.57	84
-0.55	87	0.61	60	-0.55	87	0.61	-0.55	90
-0.53	88	0.83	59	-0.53	88	0.83	-0.53	91
-0.51	91	1.02	55	-0.51	91	1.02	-0.51	94
-0.49	90	1.23	56	-0.49	90	1.23	-0.49	93
-0.47	90	1.63	56	-0.47	90	1.63	-0.47	93
-0.45	93	2.42	52	-0.45	93	2.42	-0.45	96
-0.43	93	3.42	51	-0.43	93	3.42	-0.43	96
-0.41	91	4.21	54	-0.41	91	4.21	-0.41	94
-0.39	89	4.85	58	-0.39	89	4.85	-0.39	92
-0.37	89	5.52	57	-0.37	89	5.52	-0.37	92
-0.35	91	6.19	55	-0.35	91	6.19	-0.35	94
-0.33	92	6.74	53	-0.33	92	6.74	-0.33	95
-0.31	92	6.95	53	-0.31	92	6.95	-0.31	95
-0.29	93	7.18	52	-0.29	93	7.18	-0.29	96
-0.27	95	7.19	49	-0.27	95	7.19	-0.27	98
-0.25	97	7.02	45	-0.25	97	7.02	-0.25	100
-0.23	97	6.49	46	-0.23	97	6.49	-0.23	100
-0.21	95	6.21	49	-0.21	95	6.21	-0.21	98
-0.19	93	6.14	52	-0.19	93	6.14	-0.19	96
-0.17	92	6.44	53	-0.17	92	6.44	-0.17	95
-0.15	93	7.05	51	-0.15	93	7.05	-0.15	96
-0.13	95	7.47	49	-0.13	95	7.47	-0.13	98
-0.11	94	7.26	50	-0.11	94	7.26	-0.11	97
-0.09	93	6.68	52	-0.09	93	6.68	-0.09	96
-0.07	90	6.21	56	-0.07	90	6.21	-0.07	93
-0.05	89	6.01	57	-0.05	89	6.01	-0.05	92
-0.03	89	5.96	57	-0.03	89	5.96	-0.03	92
-0.01	90	5.90	56	-0.01	90	5.90	-0.01	93
0.01	91	5.72	54	0.01	91	5.72	0.01	94
0.03	91	5.34	55	0.03	91	5.34	0.03	94
0.05	90	4.81	56	0.05	90	4.81	0.05	93
0.07	89	4.29	58	0.07	89	4.29	0.07	92
0.09	88	3.82	59	0.09	88	3.82	0.09	91
0.11	89	3.45	58	0.11	89	3.45	0.11	92
0.13	88	2.99	59	0.13	88	2.99	0.13	91
0.15	86	2.52	62	0.15	86	2.52	0.15	89
0.17	85	2.11	63	0.17	85	2.11	0.17	88
0.19	87	1.84	61	0.19	87	1.84	0.19	90
0.21	88	1.57	59	0.21	88	1.57	0.21	91
0.23	88	1.15	59	0.23	88	1.15	0.23	91
0.25	88	0.75	59	0.25	0	0.75	0.25	0
0.29	92	0.43	53					
0.31	90	0.39	56					
0.33	99	0.32	41					
0.35	0	0.06	133					
Max. Volts				7.47		7.47		
Max. Depth (%)				97.00		100.00		
Length (in.)				0.84		0.84		
Avg. Depth (%)				88.38		91.11		

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽⁹⁾	Depth	Volts	Length ⁽⁹⁾	Depth ⁽⁹⁾
-0.62	0	0.00	0					
-0.61	31	0.10	106					
-0.59	42	0.16	101					
-0.57	59	0.23	91					
-0.55	71	0.32	81					
-0.53	80	0.46	72					
-0.51	87	0.64	63					
-0.50	89	0.79	60	-0.50	0		-0.50	0
-0.48	92	1.01	55	-0.48	92	1.01	-0.48	94
-0.48	92	1.25	55	-0.46	92	1.25	-0.46	94
-0.44	93	1.63	54	-0.44	93	1.63	-0.44	95
-0.42	95	2.29	50	-0.42	95	2.29	-0.42	97
-0.40	96	3.34	49	-0.40	96	3.34	-0.40	98
-0.39	93	4.11	53	-0.39	93	4.11	-0.39	95
-0.37	91	4.64	57	-0.37	91	4.64	-0.37	93
-0.35	91	5.44	57	-0.35	91	5.44	-0.35	93
-0.33	92	6.19	55	-0.33	92	6.19	-0.33	94
-0.31	93	6.65	53	-0.31	93	6.65	-0.31	95
-0.29	93	7.01	53	-0.29	93	7.01	-0.29	95
-0.28	93	7.04	53	-0.28	93	7.04	-0.28	95
-0.26	96	6.94	49	-0.26	96	6.94	-0.26	98
-0.24	97	7.05	46	-0.24	97	7.05	-0.24	99
-0.22	98	6.81	45	-0.22	98	6.81	-0.22	100
-0.20	96	6.27	48	-0.20	96	6.27	-0.20	98
-0.18	94	5.87	52	-0.18	94	5.87	-0.18	96
-0.17	93	6.26	53	-0.17	93	6.26	-0.17	95
-0.15	94	6.85	52	-0.15	94	6.85	-0.15	96
-0.13	95	7.30	50	-0.13	95	7.30	-0.13	97
-0.11	96	7.34	49	-0.11	96	7.34	-0.11	98
-0.09	94	7.05	51	-0.09	94	7.05	-0.09	96
-0.07	93	6.49	54	-0.07	93	6.49	-0.07	95
-0.06	92	6.04	56	-0.06	92	6.04	-0.06	94
-0.04	91	5.82	57	-0.04	91	5.82	-0.04	93
-0.02	92	5.90	55	-0.02	92	5.90	-0.02	94
0.00	92	5.77	55	0.00	92	5.77	0.00	94
0.02	92	5.37	55	0.02	92	5.37	0.02	94
0.04	91	4.86	57	0.04	91	4.86	0.04	93
0.05	90	4.44	58	0.05	90	4.44	0.05	92
0.07	90	4.07	58	0.07	90	4.07	0.07	92
0.09	90	3.61	58	0.09	90	3.61	0.09	92
0.11	90	3.07	59	0.11	90	3.07	0.11	92
0.13	89	2.55	60	0.13	89	2.55	0.13	91
0.15	88	2.17	62	0.15	88	2.17	0.15	90
0.16	88	1.92	61	0.16	88	1.92	0.16	90
0.18	91	1.65	57	0.18	91	1.65	0.18	93
0.20	92	1.25	56	0.20	92	1.25	0.20	94
0.22	90	0.85	58	0.22	0		0.22	0
0.24	92	0.58	56					
0.26	94	0.45	52					
0.27	96	0.36	48					
0.29	96	0.28	39					
0.31	67	0.20	30					
0.33	13	0.15	8					
0.35	0	0.00	0					
Max. Volts				7.34		7.34		
Max. Depth (%)				98.00		100		
Length (in.)				0.72		0.72		
Avg. Depth (%)				90.06		91.89		

Table C-15
Sample P11
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1P

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽⁹⁾	Depth	Volts	Length ⁽⁹⁾	Depth ⁽⁹⁾
-0.58	0	0.10	14					
-0.56	57	0.05	26					
-0.54	97	0.05	39					
-0.52	98	0.06	44					
-0.50	96	0.09	47					
-0.48	99	0.16	41					
-0.46	97	0.19	39					
-0.44	96	0.25	47					
-0.42	98	0.31	44					
-0.40	96	0.40	47	-0.40	0		-0.40	0
-0.38	98	0.45	43	-0.38	98	0.45	-0.38	99
-0.36	98	0.54	43	-0.36	98	0.54	-0.36	99
-0.34	98	0.77	43	-0.34	98	0.77	-0.34	99
-0.32	98	1.14	43	-0.32	98	1.14	-0.32	99
-0.30	97	1.56	45	-0.30	97	1.56	-0.30	98
-0.28	97	1.96	45	-0.28	97	1.96	-0.28	98
-0.26	97	2.31	45	-0.26	97	2.31	-0.26	98
-0.24	97	2.63	45	-0.24	97	2.63	-0.24	98
-0.22	97	2.86	46	-0.22	97	2.86	-0.22	98
-0.20	95	3.03	48	-0.20	95	3.03	-0.20	96
-0.18	95	3.17	49	-0.18	95	3.17	-0.18	96
-0.16	96	3.45	47	-0.16	96	3.45	-0.16	97
-0.14	97	3.89	46	-0.14	97	3.89	-0.14	98
-0.12	99	4.50	42	-0.12	99	4.50	-0.12	100
-0.10	99	4.91	41	-0.10	99	4.91	-0.10	100
-0.08	98	5.05	44	-0.08	98	5.05	-0.08	99
-0.06	97	5.10	46	-0.06	97	5.10	-0.06	98
-0.04	97	5.10	45	-0.04	97	5.10	-0.04	98
-0.02	98	5.06	44	-0.02	98	5.06	-0.02	99
0.00	98	4.75	44	0.00	98	4.75	0.00	99
0.02	97	4.40	45	0.02	97	4.40	0.02	98
0.04	98	3.97	44	0.04	98	3.97	0.04	99
0.06	98	3.22	43	0.06	98	3.22	0.06	99
0.08	96	2.31	47	0.08	96	2.31	0.08	97
0.10	94	1.60	50	0.10	94	1.60	0.10	95
0.12	95	1.38	49	0.12	95	1.38	0.12	96
0.14	95	1.15	49	0.14	95	1.15	0.14	96
0.16	93	0.90	51	0.16	0		0.16	0
0.18	90	0.67	56					
0.20	93	0.50	51					
0.22	89	0.37	58					
0.24	89	0.24	58					
0.26	82	0.18	67					
0.28	59	0.12	91					
0.30	27	0.11	115					
0.32	0	0.18	8					
Max. Volts				5.10		5.10		
Max. Depth (%)				99.00		100		
Length (in.)				0.56		0.56		
Avg. Depth (%)				93.54		94.48		

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽⁹⁾	Depth	Volts	Length ⁽⁹⁾	Depth ⁽⁹⁾
-0.54	0	0.00	0					
-0.52	42	0.06	21					
-0.50	53	0.07	25					
-0.49	53	0.10	25					
-0.47	67	0.11	30					
-0.45	80	0.14	34					
-0.43	93	0.18	38					
-0.41	100	0.24	41					
-0.39	100	0.31	41					
-0.38	80	0.39	34					
-0.36	86	0.47	36	-0.36	0		-0.36	0
-0.34	99	0.55	42	-0.34	99	0.55	-0.34	100
-0.32	98	0.74	44	-0.32	98	0.74	-0.32	99
-0.30	98	1.11	44	-0.30	98	1.11	-0.30	99
-0.28	98	1.50	44	-0.28	98	1.50	-0.28	99
-0.27	99	1.91	43	-0.27	99	1.91	-0.27	100
-0.25	98	2.27	44	-0.25	98	2.27	-0.25	99
-0.23	98	2.62	44	-0.23	98	2.62	-0.23	99
-0.21	97	2.86	46	-0.21	97	2.86	-0.21	98
-0.19	97	3.10	47	-0.19	97	3.10	-0.19	98
-0.17	97	3.30	47	-0.17	97	3.30	-0.17	98
-0.16	97	3.45	47	-0.16	97	3.45	-0.16	98
-0.14	98	3.96	45	-0.14	98	3.96	-0.14	99
-0.12	99	4.51	42	-0.12	99	4.51	-0.12	100
-0.10	96	4.98	39	-0.10	96	4.98	-0.10	97
-0.08	99	5.22	42	-0.08	99	5.22	-0.08	100
-0.06	98	5.22	45	-0.06	98	5.22	-0.06	99
-0.05	97	5.16	46	-0.05	97	5.16	-0.05	98
-0.03	98	5.02	45	-0.03	98	5.02	-0.03	99
-0.01	98	4.88	44	-0.01	98	4.88	-0.01	99
0.01	98	4.60	44	0.01	98	4.60	0.01	99
0.03	99	4.16	43	0.03	99	4.16	0.03	100
0.05	99	3.43	42	0.05	99	3.43	0.05	100
0.06	98	2.53	45	0.06	98	2.53	0.06	99
0.08	96	1.81	48	0.08	96	1.81	0.08	97
0.10	96	1.43	49	0.10	96	1.43	0.10	97
0.12	97	1.22	46	0.12	97	1.22	0.12	98
0.14	96	0.98	48	0.14	0		0.14	0
0.16	94	0.74	51					
0.17	93	0.56	54					
0.19	92	0.42	55					
0.21	94	0.31	51					
0.23	92	0.21	55					
0.25	90	0.13	58					
0.27	90	0.09	58					
0.28	0	0.00	0					
Max. Volts				5.22		5.22		
Max. Depth (%)				99.00		100.00		
Length (in.)				0.50		0.50		
Avg. Depth (%)				93.85		94.80		

Table C-16
Sample P12
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1P

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽⁹⁾	Depth	Volts	Length ⁽⁹⁾	Depth ⁽⁹⁾
-0.42	0	0.77	58	-0.42	0			
-0.40	93	1.31	51	-0.40	93	1.31	-0.40	93
-0.38	98	2.00	44	-0.38	98	2.00	-0.38	98
-0.36	97	2.60	45	-0.36	97	2.60	-0.36	97
-0.34	95	2.77	49	-0.34	95	2.77	-0.34	95
-0.32	94	3.06	50	-0.32	94	3.06	-0.32	94
-0.30	95	3.53	49	-0.30	95	3.53	-0.30	95
-0.28	97	4.33	45	-0.28	97	4.33	-0.28	97
-0.26	98	5.00	43	-0.26	98	5.00	-0.26	98
-0.24	98	5.42	44	-0.24	98	5.42	-0.24	98
-0.22	98	5.49	44	-0.22	98	5.49	-0.22	98
-0.20	97	5.25	45	-0.20	97	5.25	-0.20	97
-0.18	96	5.34	47	-0.18	96	5.34	-0.18	96
-0.16	97	5.74	46	-0.16	97	5.74	-0.16	97
-0.14	96	6.21	47	-0.14	96	6.21	-0.14	96
-0.12	95	6.46	48	-0.12	95	6.46	-0.12	95
-0.10	93	6.83	51	-0.10	93	6.83	-0.10	93
-0.08	93	7.02	51	-0.08	93	7.02	-0.08	93
-0.06	94	7.07	50	-0.06	94	7.07	-0.06	94
-0.04	95	6.99	49	-0.04	95	6.99	-0.04	95
-0.02	97	6.87	46	-0.02	97	6.87	-0.02	97
0.00	98	6.80	44	0.00	98	6.80	0.00	98
0.02	98	5.99	43	0.02	98	5.99	0.02	98
0.03	98	5.32	44	0.03	98	5.32	0.03	98
0.05	99	4.94	41	0.05	99	4.94	0.05	99
0.07	93	4.79	38	0.07	93	4.79	0.07	93
0.09	87	4.65	36	0.09	87	4.65	0.09	87
0.11	100	4.21	40	0.11	100	4.21	0.11	100
0.13	100	4.04	40	0.13	100	4.04	0.13	100
0.15	99	3.62	42	0.15	99	3.62	0.15	99
0.17	99	3.26	41	0.17	99	3.26	0.17	99
0.19	99	2.54	41	0.19	99	2.54	0.19	99
0.21	99	2.09	42	0.21	99	2.09	0.21	99
0.23	93	1.74	38	0.23	93	1.74	0.23	93
0.25	93	1.45	38	0.25	93	1.45	0.25	93
0.27	87	1.05	36	0.27	87	1.05	0.27	87
0.29	99	0.71	42	0.29	99	0.71	0.29	99
0.31	96	0.55	47	0.31	96	0.55	0.31	96
0.33	92	0.49	53	0.33	92	0.49	0.33	92
0.35	93	0.53	51	0.35	93	0.53	0.35	93
0.37	96	0.54	47	0.37	96	0.54	0.37	96
0.39	97	0.54	46	0.39	97	0.54	0.39	97
0.41	99	0.54	41	0.41	99	0.54	0.41	99
0.43	99	0.56	42	0.43	99	0.56	0.43	99
0.45	97	0.91	45	0.45	97	0.91	0.45	97
0.47	87	1.62	36	0.47	87	1.62	0.47	87
0.49	75	2.38	32	0.49	75	2.38	0.49	75
0.51	75	2.88	32	0.51	75	2.88	0.51	75
0.53	90	2.83	37	0.53	90	2.83	0.53	90
0.55	100	2.86	40	0.55	100	2.86	0.55	100
0.57	90	3.52	37	0.57	90	3.52	0.57	90
0.59	87	4.00	36	0.59	87	4.00	0.59	87
0.61	87	3.90	36	0.61	87	3.90	0.61	87
0.63	90	3.66	37	0.63	90	3.66	0.63	90
0.65	84	3.24	35	0.65	84	3.24	0.65	84
0.67	78	2.87	33	0.67	78	2.87	0.67	78
0.69	84	2.51	35	0.69	84	2.51	0.69	84
0.71	84	2.53	35	0.71	84	2.53	0.71	84
0.73	84	2.76	35	0.73	84	2.76	0.73	84
0.75	87	2.96	36	0.75	87	2.96	0.75	87
0.77	97	3.09	39	0.77	97	3.09	0.77	97
0.79	78	3.02	33	0.79	78	3.02	0.79	78
0.81	78	2.50	33	0.81	78	2.50	0.81	78
0.83	78	1.51	33	0.83	78	1.51	0.83	78
0.85	97	0.87	39	0.85	97	0.87	0.85	97
0.87	78	0.68	33	0.87	78	0.68	0.87	78
0.89	84	0.49	35	0.89	84	0.49	0.89	84
0.91	90	0.48	37	0.91	0	0.91	0	
0.93	99	0.39	42					
0.95	96	0.28	47					
0.97	93	0.22	52					
0.99	92	0.14	53					
1.01	83	0.12	66					
1.05	0	0.06	257					
Max. Volts		7.07						7.07
Max. Depth (%)			100.00					100.00
Length (in.)			1.33					1.33
Avg. Depth (%)			90.96					90.96

Table C-16
Sample P12
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Unadjusted NDE				Length ⁽¹⁾	Depth	Final with Adjustments			Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Axial Position	Depth	Volts	Phase Angle			Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾	Volts
-0.45	0	0.00	0	0.92	80	0.52	34			0.92	80			0.52	80
-0.43	86	0.12	64	0.94	100	0.45	40			0.94	0			0.94	0
-0.41	92	0.15	55	0.96	97	0.36	46								
-0.39	88	0.18	62	0.98	93	0.25	54								
-0.38	86	0.22	64	1.00	88	0.17	62								
-0.36	88	0.29	62	1.02	85	0.11	66								
-0.34	91	0.37	57	1.03	70	0.07	82								
-0.32	92	0.45	56	1.05	0	0.00	0								
-0.30	90	0.59	58												
-0.28	92	0.84	55					-0.29	0				-0.29	0	
-0.27	96	1.42	49					-0.27	96	1.42			-0.27	96	
-0.25	99	2.14	42					-0.25	99	2.14			-0.25	99	
-0.23	98	2.63	45					-0.23	98	2.63			-0.23	98	
-0.21	97	2.75	47					-0.21	97	2.75			-0.21	97	
-0.19	96	3.09	49					-0.19	96	3.09			-0.19	96	
-0.17	97	3.56	47					-0.17	97	3.56			-0.17	97	
-0.16	98	4.46	45					-0.16	98	4.46			-0.16	98	
-0.14	99	5.15	42					-0.14	99	5.15			-0.14	99	
-0.12	99	5.50	43					-0.12	99	5.50			-0.12	99	
-0.10	98	5.40	44					-0.10	98	5.40			-0.10	98	
-0.08	97	5.32	46					-0.08	97	5.32			-0.08	97	
-0.06	98	5.44	45					-0.06	98	5.44			-0.06	98	
-0.05	97	5.69	47					-0.05	97	5.69			-0.05	97	
-0.03	97	6.35	47					-0.03	97	6.35			-0.03	97	
-0.01	96	6.69	49					-0.01	96	6.69			-0.01	96	
0.01	94	6.90	51					0.01	94	6.90			0.01	94	
0.03	95	7.02	50					0.03	95	7.02			0.03	95	
0.05	94	6.94	51					0.05	94	6.94			0.05	94	
0.06	97	7.13	47					0.06	97	7.13			0.06	97	
0.08	97	6.90	46					0.08	97	6.90			0.08	97	
0.10	99	6.66	43					0.10	99	6.66			0.10	99	
0.12	98	5.92	44					0.12	98	5.92			0.12	98	
0.14	99	5.22	42					0.14	99	5.22			0.14	99	
0.15	100	4.94	40					0.15	100	4.94			0.15	100	
0.17	93	4.71	38					0.17	93	4.71			0.17	93	
0.19	90	4.61	37					0.19	90	4.61			0.19	90	
0.21	100	4.27	40					0.21	100	4.27			0.21	100	
0.23	100	3.94	40					0.23	100	3.94			0.23	100	
0.25	100	3.67	41					0.25	100	3.67			0.25	100	
0.26	100	3.08	40					0.26	100	3.08			0.26	100	
0.28	99	2.53	42					0.28	99	2.53			0.28	99	
0.30	99	1.97	43					0.30	99	1.97			0.30	99	
0.32	93	1.71	38					0.32	93	1.71			0.32	93	
0.34	86	1.38	36					0.34	86	1.38			0.34	86	
0.36	90	0.96	37					0.36	90	0.96			0.36	90	
0.37	99	0.66	43					0.37	99	0.66			0.37	99	
0.39	95	0.52	50					0.39	95	0.52			0.39	95	
0.41	93	0.48	53					0.41	93	0.48			0.41	93	
0.43	94	0.50	51					0.43	94	0.50			0.43	94	
0.45	96	0.51	49					0.45	96	0.51			0.45	96	
0.47	97	0.50	46					0.47	97	0.50			0.47	97	
0.48	99	0.54	43					0.48	99	0.54			0.48	99	
0.50	98	0.67	45					0.50	98	0.67			0.50	98	
0.52	99	1.07	43					0.52	99	1.07			0.52	99	
0.54	80	1.93	34					0.54	80	1.93			0.54	80	
0.56	70	2.65	31					0.56	70	2.65			0.56	70	
0.58	73	2.92	32					0.58	73	2.92			0.58	73	
0.59	93	2.84	38					0.59	93	2.84			0.59	93	
0.61	100	3.04	40					0.61	100	3.04			0.61	100	
0.63	90	3.71	37					0.63	90	3.71			0.63	90	
0.65	86	4.06	36					0.65	86	4.06			0.65	86	
0.67	90	3.87	37					0.67	90	3.87			0.67	90	
0.69	86	3.57	36					0.69	86	3.57			0.69	86	
0.70	80	3.25	34					0.70	80	3.25			0.70	80	
0.72	76	2.76	33					0.72	76	2.76			0.72	76	
0.74	80	2.47	34					0.74	80	2.47			0.74	80	
0.76	76	2.48	33					0.76	76	2.48			0.76	76	
0.78	83	2.71	35					0.78	83	2.71			0.78	83	
0.80	83	2.93	35					0.80	83	2.93			0.80	83	
0.81	80	3.05	34					0.81	80	3.05			0.81	80	
0.83	70	2.91	31					0.83	70	2.91			0.83	70	
0.85	76	2.14	33					0.85	76	2.14			0.85	76	
0.87	86	1.25	36					0.87	86	1.25			0.87	86	
0.89	83	0.79	35					0.89	83	0.79			0.89	83	
0.91	83	0.62	35					0.91	83	0.62			0.91	83	

(Cont on Next Col.)

(Cont on Next Col.)

(Cont on Next Col.)

Max. Volts
Max. Depth (%)
Length (in.)
Avg. Depth (%)

7.13
100.00
1.23
90.30

7.13
100.00
1.23
90.30

Table C-16
Sample P12
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Unadjusted NDE				Length ⁽¹⁾	Depth	Length ⁽¹⁾	Depth	Final with Adjustments		Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Axial Position	Depth	Volts	Phase Angle					Volts	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾
-0.60	0	0.36	13	0.84	85	3.14	24			0.84	85			3.14	0.84	85
-0.59	60	0.32	16	0.87	82	2.20	23			0.87	82			2.20	0.87	82
-0.57	82	0.27	23	0.89	90	1.27	26			0.89	90			1.27	0.89	90
-0.55	87	0.19	25	0.91	87	0.80	25			0.91	87			0.80	0.91	87
-0.53	92	0.14	41	0.93	85	0.63	24			0.93	85			0.63	0.93	85
-0.51	85	0.09	51	0.95	82	0.53	23			0.95	82			0.53	0.95	82
-0.49	85	0.08	50	0.97	100	0.46	30			0.97	100			0.46	0.97	100
-0.47	89	0.09	46	0.99	96	0.36	36			0.99	96			0.36	0.99	96
-0.45	86	0.12	49	1.01	90	0.26	44			1.01	90			0.26	1.01	90
-0.43	79	0.18	58	1.03	86	0.18	49			1.03	86			0.18	1.03	86
-0.41	84	0.24	52	1.05	77	0.10	61	-0.42	0			-0.42	0			
-0.39	83	0.30	53	1.07	75	0.08	63	-0.39	83	0.30	-0.39	83				
-0.37	90	0.36	44	1.09	0	0.08	0	-0.37	90	0.36	-0.37	90				
-0.35	89	0.40	46					-0.35	89	0.40	-0.35	89				
-0.34	90	0.52	44					-0.34	90	0.52	-0.34	90				
-0.32	91	0.79	42					-0.32	91	0.79	-0.32	91				
-0.30	94	1.43	39					-0.30	94	1.43	-0.30	94				
-0.26	97	2.67	35					-0.26	97	2.67	-0.26	97				
-0.26	97	2.67	35					-0.26	97	2.67	-0.26	97				
-0.24	94	2.80	38					-0.24	94	2.80	-0.24	94				
-0.22	93	3.14	40					-0.22	93	3.14	-0.22	93				
-0.20	95	3.61	37					-0.20	95	3.61	-0.20	95				
-0.18	97	4.51	35					-0.18	97	4.51	-0.18	97				
-0.16	99	5.18	32					-0.16	99	5.18	-0.16	99				
-0.14	98	5.54	33					-0.14	98	5.54	-0.14	98				
-0.12	97	5.47	34					-0.12	97	5.47	-0.12	97				
-0.10	96	5.39	36					-0.10	96	5.39	-0.10	96				
-0.09	97	5.51	35					-0.09	97	5.51	-0.09	97				
-0.07	95	5.76	37					-0.07	95	5.76	-0.07	95				
-0.05	95	6.44	37					-0.05	95	6.44	-0.05	95				
-0.03	94	6.78	38					-0.03	94	6.78	-0.03	94				
-0.01	93	6.98	40					-0.01	93	6.98	-0.01	93				
0.01	92	7.10	41					0.01	92	7.10	0.01	92				
0.03	92	7.02	41					0.03	92	7.02	0.03	92				
0.05	95	7.22	37					0.05	95	7.22	0.05	95				
0.07	96	6.99	36					0.07	96	6.99	0.07	96				
0.09	98	6.74	33					0.09	98	6.74	0.09	98				
0.11	98	5.99	33					0.11	98	5.99	0.11	98				
0.13	99	5.28	32					0.13	99	5.28	0.13	99				
0.14	100	5.00	30					0.14	100	5.00	0.14	100				
0.16	95	4.77	28					0.16	95	4.77	0.16	95				
0.18	93	4.67	27					0.18	93	4.67	0.18	93				
0.20	100	4.32	30					0.20	100	4.32	0.20	100				
0.22	100	3.98	30					0.22	100	3.98	0.22	100				
0.24	99	3.72	31					0.24	99	3.72	0.24	99				
0.26	100	3.11	30					0.26	100	3.11	0.26	100				
0.28	99	2.56	32					0.28	99	2.56	0.28	99				
0.30	98	1.99	33					0.30	98	1.99	0.30	98				
0.32	95	1.73	28					0.32	95	1.73	0.32	95				
0.34	90	1.40	26					0.34	90	1.40	0.34	90				
0.36	93	0.97	27					0.36	93	0.97	0.36	93				
0.37	98	0.67	33					0.37	98	0.67	0.37	98				
0.39	93	0.54	40					0.39	93	0.54	0.39	93				
0.41	92	0.51	41					0.41	92	0.51	0.41	92				
0.43	93	0.55	40					0.43	93	0.55	0.43	93				
0.45	94	0.55	38					0.45	94	0.55	0.45	94				
0.47	97	0.53	34					0.47	97	0.53	0.47	97				
0.49	100	0.55	30					0.49	100	0.55	0.49	100				
0.51	97	0.67	34					0.51	97	0.67	0.51	97				
0.53	98	1.08	33					0.53	98	1.08	0.53	98				
0.55	85	1.95	24					0.55	85	1.95	0.55	85				
0.57	76	2.68	21					0.57	76	2.68	0.57	76				
0.59	79	2.96	22					0.59	79	2.96	0.59	79				
0.61	95	2.87	28					0.61	95	2.87	0.61	95				
0.62	100	3.08	30					0.62	100	3.08	0.62	100				
0.64	93	3.76	27					0.64	93	3.76	0.64	93				
0.66	87	4.11	25					0.66	87	4.11	0.66	87				
0.68	93	3.91	27					0.68	93	3.91	0.68	93				
0.70	90	3.61	26					0.70	90	3.61	0.70	90				
0.72	85	3.29	24					0.72	85	3.29	0.72	85				
0.74	82	2.80	23					0.74	82	2.80	0.74	82				
0.76	87	2.54	25					0.76	87	2.54	0.76	87				
0.78	85	2.63	24					0.78	85	2.63	0.78	85				
0.80	90	2.84	26					0.80	90	2.84	0.80	90				
0.82	90	3.05	26					0.82	90	3.05	0.82	90				
(Continued on Next Column)				(Con't on Next Col.)				(Con't on Next Col.)		(Con't on Next Col.)		(Con't on Next Col.)				
								Max. Volts		7.22		7.22				
								Max. Depth (%)		100.00		100.00				
								Length (in.)		1.40		1.40				
								Avg. Depth (%)		90.55		90.55				

Table C-17 (continued)
Sample P12
Laboratory Specimen NDE Analysis

Crack 2 (3&4) - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.19	0	0.27		-0.19	0	0
-0.17	26	0.40		0.40	-0.17	26
-0.15	42	0.75		0.75	-0.15	42
-0.13	38	1.01		1.01	-0.13	38
-0.11	42	0.91		0.91	-0.11	42
-0.09	60	0.53		0.53	-0.09	60
-0.08	76	0.24		0.24	-0.08	76
-0.06	22	0.23		0.23	-0.06	22
-0.04	26	0.26		0.26	-0.04	26
-0.02	34	0.26		0.26	-0.02	34
0.00	60	0.25		0.25	0.00	60
0.02	67	0.23		0.23	0.02	67
0.04	57	0.24		0.24	0.04	57
0.06	53	0.24		0.24	0.06	53
0.08	28	0.27		0.27	0.08	26
0.10	14	0.28		0.28	0.10	14
0.12	34	0.27		0.27	0.12	34
0.14	73	0.43		0.43	0.14	73
0.15	57	0.89		0.89	0.15	57
0.17	46	1.27		1.27	0.17	46
0.19	46	1.15		1.15	0.19	46
0.21	63	0.64		0.64	0.21	63
0.23	30	0.25		0.25	0.23	30
0.25	0	0.21		0.21	0.25	0
0.27	0	0.24		0.24	0.27	0
0.29	22	0.24		0.24	0.29	22
0.31	18	0.20		0.20	0.31	18
0.33	38	0.18			0.34	0
0.38	0	0.00				
				Max. Volts	1.27	
				Max. Depth (%)	76.00	
				Length (in.)	0.53	
				Avg. Depth (%)	36.60	

Crack 2 (3&4) - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
No Data Available						

Table C-18
Sample P12
Laboratory Specimen NDE Analysis

Crack 5 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-1.06	0	0.06	207			
-0.96	97	0.15	46			
-0.94	87	0.20	36		-0.94	0
-0.92	52	0.31	24	0.31	-0.92	52
-0.90	44	0.41	21	0.41	-0.9	44
-0.88	69	0.51	30	0.51	-0.88	69
-0.86	81	0.87	34	0.87	-0.86	81
-0.84	81	1.51	34	1.51	-0.84	81
-0.82	72	2.07	31	2.07	-0.82	72
-0.80	69	2.17	30	2.17	-0.8	69
-0.78	75	1.61	32	1.61	-0.78	75
-0.76	84	0.85	35	0.85	-0.76	84
-0.74	52	0.33	24	0.33	-0.74	52
-0.72	50	0.33	23	0.33	-0.72	50
-0.70	72	0.33	31	0.33	-0.7	72
-0.68	72	0.28	31	0.28	-0.68	72
-0.66	0	0.20	39		-0.66	0
Max. Volts						2.17
Max. Depth (%)						84.00
Length (in.)						0.24
Avg. Depth (%)						60.75

Crack 5 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.92	0	0.00	0			
-0.90	76	0.08	33		-0.90	0
-0.88	47	0.12	23		-0.88	47
-0.86	47	0.13	23		-0.86	47
-0.85	90	0.13	37		-0.85	90
-0.83	96	0.15	39		-0.83	96
-0.81	64	0.23	29		-0.81	64
-0.79	47	0.34	23		-0.79	47
-0.77	42	0.45	21		-0.77	42
-0.75	55	0.56	26		-0.75	55
-0.74	80	1.00	34		-0.74	80
-0.72	73	1.67	32		-0.72	73
-0.70	70	2.15	31		-0.70	70
-0.68	67	2.09	30		-0.68	67
-0.66	70	1.47	31		-0.66	70
-0.65	76	0.70	33		-0.65	76
-0.63	45	0.35	22		-0.63	45
-0.61	47	0.35	23		-0.61	47
-0.59	55	0.31	26		-0.59	55
-0.57	76	0.26	33		-0.57	76
-0.55	67	0.20	30		-0.55	67
-0.54	97	0.15	46		-0.53	0
-0.52	93	0.13	54			
-0.50	0	0.00	0			
Max. Volts						2.15
Max. Depth (%)						80.00
Length (in.)						0.24
Avg. Depth (%)						54.73

Table C-18 (continued)
 Sample P12
 Laboratory Specimen NDE Analysis

Crack 5 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ^(%)	Depth ^(%)
-0.91	0	0.08				
-0.89	53	0.12	14			
-0.87	85	0.13	24			
-0.85	98	0.13	33			
-0.83	98	0.15	29		-0.83	0
-0.82	70	0.23	19	0.23	-0.80	49
-0.80	49	0.35	13	0.35	-0.78	42
-0.78	42	0.46	11	0.46	-0.76	60
-0.76	60	0.56	16	0.56	-0.74	82
-0.74	82	1.00	23	1.00	-0.72	76
-0.72	76	1.64	21	1.64	-0.70	73
-0.70	73	2.15	20	2.15	-0.68	73
-0.68	73	2.11	20	2.11	-0.66	79
-0.66	79	1.49	22		-0.63	0
-0.64	87	0.72	25			
-0.62	0	0.35	13			
				Max. Volts	2.15	
				Max. Depth (%)	82.00	
				Length (in.)	0.20	
				Avg. Depth (%)	56.60	

Crack 5 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
No Data Available						

Table C-20
Sample 1 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.48	87	0.04	52			
-0.46	91	0.05	47			
-0.44	90	0.07	30	0.07	-0.44	0
-0.42	40	0.10	14	0.10	-0.42	40
-0.39	40	0.16	14	0.16	-0.39	40
-0.37	40	0.38	14	0.38	-0.37	40
-0.35	46	0.62	16	0.62	-0.35	46
-0.33	49	1.04	17	1.04	-0.33	49
-0.31	56	1.33	19	1.33	-0.31	56
-0.29	56	1.42	19	1.42	-0.29	56
-0.27	52	1.49	18	1.49	-0.27	52
-0.25	49	1.52	17	1.52	-0.25	49
-0.22	49	1.74	17	1.74	-0.22	49
-0.20	49	1.90	17	1.90	-0.20	49
-0.18	49	2.13	17	2.13	-0.18	49
-0.16	49	2.05	17	2.05	-0.16	49
-0.14	56	1.66	19	1.66	-0.14	56
-0.12	62	1.32	21	1.32	-0.12	62
-0.10	62	1.16	21	1.16	-0.10	62
-0.07	68	1.18	23	1.18	-0.07	68
-0.05	68	1.25	23	1.25	-0.05	68
-0.03	81	1.31	27	1.31	-0.03	81
-0.01	77	1.33	26	1.33	-0.01	77
0.01	81	1.38	27	1.38	0.01	81
0.03	74	1.39	25	1.39	0.03	74
0.05	62	1.50	21	1.50	0.05	62
0.08	56	1.65	19	1.65	0.08	56
0.10	49	1.87	17	1.87	0.10	49
0.12	52	1.94	18	1.94	0.12	52
0.14	52	2.00	18	2.00	0.14	52
0.16	59	2.05	20	2.05	0.16	59
0.18	59	2.26	20	2.26	0.18	59
0.20	59	2.35	20	2.35	0.20	59
0.23	62	2.50	21	2.50	0.23	62
0.25	62	2.44	21	2.44	0.25	62
0.27	59	2.26	20	2.26	0.27	59
0.29	59	1.83	20	1.83	0.29	59
0.31	56	1.53	19	1.53	0.31	56
0.33	49	1.30	17	1.30	0.33	49
0.35	46	1.13	16	1.13	0.35	46
0.37	46	0.88	16	0.88	0.37	46
0.40	62	0.44	21	0.44	0.40	0
0.42	77	0.2	26			
0.44	71	0.11	24			
0.46	71	0.1	24			
0.48	74	0.09	25			
0.50	100	0.07	33			

Max. Volts	2.50
Max. Depth (%)	81.00
Length (in.)	0.84
Avg. Depth (%)	54.48

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.39	0	0.00	0	0.00	-0.39	0
-0.36	41	0.37	14	0.37	-0.36	41
-0.34	47	0.61	16	0.61	-0.34	47
-0.32	49	1.01	17	1.01	-0.32	49
-0.30	55	1.30	19	1.30	-0.30	55
-0.28	55	1.38	19	1.38	-0.28	55
-0.25	52	1.45	18	1.45	-0.25	52
-0.23	49	1.48	17	1.48	-0.23	49
-0.21	49	1.69	17	1.69	-0.21	49
-0.19	49	1.85	17	1.85	-0.19	49
-0.17	49	2.07	17	2.07	-0.17	49
-0.15	49	1.99	17	1.99	-0.15	49
-0.12	55	1.61	19	1.61	-0.12	55
-0.10	61	1.29	21	1.29	-0.10	61
-0.08	61	1.13	21	1.13	-0.08	61
-0.06	67	1.15	23	1.15	-0.06	67
-0.04	67	1.21	23	1.21	-0.04	67
-0.01	79	1.28	27	1.28	-0.01	79
0.01	76	1.30	26	1.30	0.01	76
0.03	79	1.34	27	1.34	0.03	79
0.05	73	1.36	25	1.36	0.05	73
0.07	61	1.46	21	1.46	0.07	61
0.09	55	1.61	19	1.61	0.09	55
0.12	49	1.82	17	1.82	0.12	49
0.14	52	1.88	18	1.88	0.14	52
0.16	52	1.94	18	1.94	0.16	52
0.18	58	1.99	20	1.99	0.18	58
0.20	58	2.20	20	2.20	0.20	58
0.23	58	2.30	20	2.30	0.23	58
0.25	61	2.41	21	2.41	0.25	61
0.27	61	2.36	21	2.36	0.27	61
0.29	58	2.16	20	2.16	0.29	58
0.31	58	1.79	20	1.79	0.31	58
0.33	55	1.49	19	1.49	0.33	55
0.36	49	1.27	17	1.27	0.36	49
0.38	47	1.10	16	1.10	0.38	47
0.40	47	0.85	16	0.85	0.40	47
0.42	61	0.43	21	0.43	0.42	0
0.44	0	0.00	0			

Max. Volts	2.41
Max. Depth (%)	79.00
Length (in.)	0.81
Avg. Depth (%)	54.85

**Table C-20 (continued)
Sample 1 - 3H
Laboratory Specimen NDE Analysis**

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.44	96	0.06	37			
-0.42	98	0.08	34			
-0.40	94	0.13	28			
-0.38	57	0.17	16	0.17	-0.38	0
-0.36	38	0.38	11	0.38	-0.36	38
-0.33	46	0.61	13	0.61	-0.33	46
-0.31	49	1.02	14	1.02	-0.31	49
-0.29	57	1.31	16	1.31	-0.29	57
-0.27	57	1.39	16	1.39	-0.27	57
-0.25	53	1.47	15	1.47	-0.25	53
-0.22	49	1.47	14	1.47	-0.22	49
-0.20	49	1.70	14	1.70	-0.20	49
-0.18	49	1.86	14	1.86	-0.18	49
-0.16	49	2.08	14	2.08	-0.16	49
-0.14	46	2.01	13	2.01	-0.14	46
-0.11	57	1.63	16	1.63	-0.11	57
-0.09	57	1.32	16	1.32	-0.09	57
-0.07	57	1.21	16	1.21	-0.07	57
-0.05	63	1.23	18	1.23	-0.05	63
-0.03	60	1.29	17	1.29	-0.03	60
-0.01	73	1.33	21	1.33	-0.01	73
0.02	77	1.33	22	1.33	0.02	77
0.04	73	1.36	21	1.36	0.04	73
0.06	77	1.37	22	1.37	0.06	77
0.08	60	1.50	17	1.50	0.08	60
0.10	53	1.65	15	1.65	0.10	53
0.13	49	1.89	14	1.89	0.13	49
0.15	49	1.95	14	1.95	0.15	49
0.17	53	2.02	15	2.02	0.17	53
0.19	60	2.07	17	2.07	0.19	60
0.21	60	2.27	17	2.27	0.21	60
0.23	60	2.35	17	2.35	0.23	60
0.26	63	2.46	18	2.46	0.26	63
0.28	63	2.41	18	2.41	0.28	63
0.30	63	2.25	18	2.25	0.30	63
0.32	60	1.90	17	1.90	0.32	60
0.34	53	1.57	15	1.57	0.34	53
0.37	46	1.30	13	1.30	0.37	46
0.39	42	1.13	12	1.13	0.39	42
0.41	42	0.88	12	0.88	0.41	42
0.43	57	0.45	16	0.45	0.43	0
0.45	77	0.2	22			
				Max. Volts	2.46	
				Max. Depth (%)	77.00	
				Length (in.)	0.81	
				Avg. Depth (%)	54.39	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
0.40	0	0.00	19	0.00	0.40	0
0.38	45	0.91	16	0.91	0.38	45
0.36	45	1.14	16	1.14	0.36	45
0.34	48	1.34	17	1.34	0.34	48
0.32	55	1.59	19	1.59	0.32	55
0.29	58	1.91	20	1.91	0.29	58
0.27	61	2.25	21	2.25	0.27	61
0.25	61	2.42	21	2.42	0.25	61
0.23	61	2.43	21	2.43	0.23	61
0.21	58	2.32	20	2.32	0.21	58
0.19	58	2.18	20	2.18	0.19	58
0.17	58	1.99	20	1.99	0.17	58
0.14	51	1.96	18	1.96	0.14	51
0.12	51	1.87	18	1.87	0.12	51
0.10	51	1.81	18	1.81	0.10	51
0.08	58	1.61	20	1.61	0.08	58
0.06	64	1.46	22	1.46	0.06	64
0.04	74	1.37	25	1.37	0.04	74
0.02	83	1.36	28	1.36	0.02	83
0.00	83	1.32	28	1.32	0.00	83
-0.03	80	1.29	27	1.29	-0.03	80
-0.05	74	1.22	25	1.22	-0.05	74
-0.07	67	1.16	23	1.16	-0.07	67
-0.09	61	1.15	21	1.15	-0.09	61
-0.11	58	1.38	20	1.38	-0.11	58
-0.13	51	1.73	18	1.73	-0.13	51
-0.15	48	2.05	17	2.05	-0.15	48
-0.17	48	2.06	17	2.06	-0.17	48
-0.20	48	1.84	17	1.84	-0.20	48
-0.22	48	1.66	17	1.66	-0.22	48
-0.24	51	1.48	18	1.48	-0.24	51
-0.26	51	1.47	18	1.47	-0.26	51
-0.28	55	1.39	19	1.39	-0.28	55
-0.30	55	1.26	19	1.26	-0.30	55
-0.32	48	0.93	17	0.93	-0.32	48
-0.34	45	0.56	16	0.56	-0.34	45
-0.37	39	0.33	14	0.33	-0.37	39
-0.39	0	0.00	6	0.00	-0.39	0
*Reversed Sign				Max. Volts	2.43	
				Max. Depth (%)	83.00	
				Length (in.)	0.79	
				Avg. Depth (%)	55.47	

Table C-21
Sample 1 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.43	81	0.04	27			
-0.41	84	0.06	28			
-0.39	52	0.06	18			
-0.37	62	0.06	21			
-0.35	100	0.11	33			
-0.33	65	0.36	22	0.36	-0.33	0
-0.31	46	0.76	16	0.76	-0.31	46
-0.28	49	0.93	17	0.93	-0.28	49
-0.26	56	0.98	19	0.98	-0.26	56
-0.24	52	1.13	18	1.13	-0.24	52
-0.22	46	1.36	16	1.36	-0.22	46
-0.20	43	1.47	15	1.47	-0.20	43
-0.18	43	1.46	15	1.46	-0.18	43
-0.16	43	1.55	15	1.55	-0.16	43
-0.14	40	1.76	14	1.76	-0.14	40
-0.11	43	1.71	15	1.71	-0.11	43
-0.09	56	1.38	19	1.38	-0.09	56
-0.07	59	1.15	20	1.15	-0.07	59
-0.05	59	1.06	20	1.06	-0.05	59
-0.03	77	1.02	26	1.02	-0.03	77
-0.01	87	1.05	29	1.05	-0.01	87
0.01	74	1.15	25	1.15	0.01	74
0.03	68	1.21	23	1.21	0.03	68
0.06	68	1.15	23	1.15	0.06	68
0.08	62	1.18	21	1.18	0.08	62
0.10	49	1.40	17	1.40	0.10	49
0.12	43	1.74	15	1.74	0.12	43
0.14	46	1.95	16	1.95	0.14	46
0.16	52	2.03	18	2.03	0.16	52
0.18	56	2.08	19	2.08	0.18	56
0.20	52	2.16	18	2.16	0.20	52
0.23	52	2.18	18	2.18	0.23	52
0.25	52	2.03	18	2.03	0.25	52
0.27	56	1.84	19	1.84	0.27	56
0.29	56	1.73	19	1.73	0.29	56
0.31	52	1.72	18	1.72	0.31	52
0.33	49	1.73	17	1.73	0.33	49
0.35	52	1.55	18	1.55	0.35	52
0.37	52	1.25	18	1.25	0.37	52
0.39	43	1.04	15	1.04	0.39	43
0.42	37	0.87	13	0.87	0.42	37
0.44	34	0.60	12	0.60	0.44	34
0.46	43	0.29	15	0.29	0.46	43
0.48	87	0.07	52			

Max. Volts	2.18
Max. Depth (%)	87.00
Length (in.)	0.79
Avg. Depth (%)	51.35

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.35	64	0.35	22	0.35	-0.35	0
-0.32	47	0.74	16	0.74	-0.32	47
-0.30	49	0.90	17	0.90	-0.30	49
-0.28	55	0.95	19	0.95	-0.28	55
-0.26	52	1.10	18	1.10	-0.26	52
-0.24	47	1.33	16	1.33	-0.24	47
-0.22	44	1.43	15	1.43	-0.22	44
-0.19	44	1.42	15	1.42	-0.19	44
-0.17	44	1.51	15	1.51	-0.17	44
-0.15	41	1.71	14	1.71	-0.15	41
-0.13	44	1.67	15	1.67	-0.13	44
-0.11	55	1.34	19	1.34	-0.11	55
-0.09	58	1.12	20	1.12	-0.09	58
-0.06	58	1.03	20	1.03	-0.06	58
-0.04	76	1.00	26	1.00	-0.04	76
-0.02	85	1.03	29	1.03	-0.02	85
0.00	73	1.12	25	1.12	0.00	73
0.02	67	1.18	23	1.18	0.02	67
0.04	67	1.12	23	1.12	0.04	67
0.07	61	1.15	21	1.15	0.07	61
0.09	49	1.37	17	1.37	0.09	49
0.11	44	1.69	15	1.69	0.11	44
0.13	47	1.89	16	1.89	0.13	47
0.15	52	1.97	18	1.97	0.15	52
0.17	55	2.02	19	2.02	0.17	55
0.20	52	2.10	18	2.10	0.20	52
0.22	52	2.12	18	2.12	0.22	52
0.24	52	1.98	18	1.98	0.24	52
0.26	55	1.79	19	1.79	0.26	55
0.28	55	1.68	19	1.68	0.28	55
0.30	52	1.68	18	1.68	0.30	52
0.33	49	1.68	17	1.68	0.33	49
0.35	52	1.50	18	1.50	0.35	52
0.37	52	1.21	18	1.21	0.37	52
0.39	44	1.01	15	1.01	0.39	44
0.41	38	0.84	13	0.84	0.41	38
0.43	35	0.58	12	0.58	0.43	35
0.46	0	0.00	0	0.00	0.46	0

Max. Volts	2.12
Max. Depth (%)	85.00
Length (in.)	0.81
Avg. Depth (%)	50.80

Table C-21 (continued)
Sample 1 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.33	67	0.35	19	0.35	-0.33	0
-0.31	46	0.75	13	0.75	-0.31	46
-0.29	49	0.91	14	0.91	-0.29	49
-0.27	57	0.93	16	0.93	-0.27	57
-0.25	53	1.11	15	1.11	-0.25	53
-0.23	46	1.33	13	1.33	-0.23	46
-0.20	42	1.44	12	1.44	-0.20	42
-0.18	42	1.44	12	1.44	-0.18	42
-0.16	42	1.53	12	1.53	-0.16	42
-0.14	38	1.73	11	1.73	-0.14	38
-0.12	42	1.70	12	1.70	-0.12	42
-0.10	53	1.40	15	1.40	-0.10	53
-0.07	55	1.18	17	1.18	-0.07	55
-0.05	53	1.10	14	1.10	-0.05	53
-0.03	74	1.04	19	1.04	-0.03	74
-0.01	85	1.07	26	1.07	-0.01	85
0.01	75	1.16	22	1.16	0.01	75
0.04	67	1.23	18	1.23	0.04	67
0.06	69	1.17	20	1.17	0.06	69
0.08	60	1.20	18	1.20	0.08	60
0.10	48	1.41	13	1.41	0.10	48
0.12	42	1.71	12	1.71	0.12	42
0.14	42	1.91	12	1.91	0.14	42
0.17	53	1.99	15	1.99	0.17	53
0.19	57	2.05	16	2.05	0.19	57
0.21	53	2.16	15	2.16	0.21	53
0.23	49	2.17	14	2.17	0.23	49
0.25	53	2.01	15	2.01	0.25	53
0.27	57	1.82	16	1.82	0.27	57
0.30	57	1.73	16	1.73	0.30	57
0.32	53	1.70	15	1.70	0.32	53
0.34	49	1.71	14	1.71	0.34	49
0.36	48	1.51	14	1.51	0.36	48
0.38	49	1.23	14	1.23	0.38	49
0.40	46	1.03	13	1.03	0.40	46
0.43	34	0.85	10	0.85	0.43	34
0.45	27	0.61	8	0.61	0.45	27
0.47	34	0.33	10	0.33	0.47	0
				Max. Volts	2.17	
				Max. Depth (%)	85.00	
				Length (in.)	0.80	
				Avg. Depth (%)	50.54	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.43	0	0.00	17	0.00	-0.43	0
-0.41	36	0.35	13	0.35	-0.41	36
-0.39	33	0.65	12	0.65	-0.39	33
-0.37	39	0.87	14	0.87	-0.37	39
-0.35	45	1.07	16	1.07	-0.35	45
-0.33	51	1.27	18	1.27	-0.33	51
-0.31	51	1.58	18	1.58	-0.31	51
-0.29	51	1.72	18	1.72	-0.29	51
-0.27	51	1.72	18	1.72	-0.27	51
-0.24	55	1.74	19	1.74	-0.24	55
-0.22	55	1.87	19	1.87	-0.22	55
-0.20	51	2.05	18	2.05	-0.20	51
-0.18	51	2.16	18	2.16	-0.18	51
-0.16	55	2.12	19	2.12	-0.16	55
-0.14	51	2.05	18	2.05	-0.14	51
-0.12	51	1.99	18	1.99	-0.12	51
-0.10	45	1.88	16	1.88	-0.10	45
-0.07	42	1.64	15	1.64	-0.07	42
-0.05	51	1.34	18	1.34	-0.05	51
-0.03	61	1.17	21	1.17	-0.03	61
-0.01	67	1.16	23	1.16	-0.01	67
0.01	70	1.19	24	1.19	0.01	70
0.03	83	1.12	28	1.12	0.03	83
0.05	87	1.04	29	1.04	0.05	87
0.07	77	1.01	26	1.01	0.07	77
0.09	67	1.03	23	1.03	0.09	67
0.12	58	1.16	20	1.16	0.12	58
0.14	51	1.43	18	1.43	0.14	51
0.16	42	1.71	15	1.71	0.16	42
0.18	42	1.70	15	1.70	0.18	42
0.20	42	1.52	15	1.52	0.20	42
0.22	42	1.45	15	1.45	0.22	42
0.24	42	1.44	15	1.44	0.24	42
0.26	45	1.30	16	1.30	0.26	45
0.28	51	1.09	18	1.09	0.28	51
0.31	55	0.95	19	0.95	0.31	55
0.33	48	0.88	17	0.88	0.33	48
0.35	48	0.68	17	0.68	0.35	48
0.37	0	0.00	21	0.00	0.37	0
				Max. Volts	2.16	
				Max. Depth (%)	87.00	
				Length (in.)	0.80	
				Avg. Depth (%)	51.20	

Table C-22
Sample 2 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE					Final with Adjustments					
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾		
-0.48	34	0.30	12	-0.48	0	0.30	-0.48	0		
-0.46	28	0.40	10	-0.46	28	0.40	-0.46	21		
-0.44	23	0.45	8	-0.44	23	0.45	-0.44	17		
-0.42	20	0.44	7	-0.42	20	0.44	-0.42	15		
-0.39	34	0.34	12	-0.39	34	0.34	-0.39	25		
-0.37	31	0.52	11	-0.37	31	0.52	-0.37	23		
-0.35	40	0.50	14	-0.35	40	0.50	-0.35	30		
-0.33	40	0.56	14	-0.33	40	0.56	-0.33	30		
-0.31	37	0.62	13	-0.31	37	0.62	-0.31	27		
-0.29	34	0.65	12	-0.29	34	0.65	-0.29	25		
-0.27	31	0.62	11	-0.27	31	0.62	-0.27	23		
-0.25	28	0.61	10	-0.25	28	0.61	-0.25	21		
-0.22	25	0.58	9	-0.22	25	0.58	-0.22	18		
-0.20	28	0.52	10	-0.20	28	0.52	-0.20	21		
-0.18	31	0.59	11	-0.18	31	0.59	-0.18	23		
-0.16	31	0.70	11	-0.16	31	0.70	-0.16	23		
-0.14	34	0.75	12	-0.14	34	0.75	-0.14	25		
-0.12	34	0.74	12	-0.12	34	0.74	-0.12	25		
-0.10	31	0.71	11	-0.10	31	0.71	-0.10	23		
-0.07	28	0.71	10	-0.07	28	0.71	-0.07	21		
-0.05	28	0.70	10	-0.05	28	0.70	-0.05	21		
-0.03	31	0.64	11	-0.03	31	0.64	-0.03	23		
-0.01	28	0.58	10	-0.01	28	0.58	-0.01	21		
0.01	34	0.64	12	0.01	34	0.64	0.01	25		
0.03	20	0.55	7	0.03	20	0.55	0.03	15		
0.05	17	0.46	6	0.05	17	0.46	0.05	13		
0.07	14	0.47	5	0.07	14	0.47	0.07	10		
0.10	20	0.48	7	0.10	20	0.48	0.10	15		
0.12	40	0.50	14	0.12	40	0.50	0.12	30		
0.14	37	0.58	13	0.14	37	0.58	0.14	27		
0.16	25	0.61	9	0.16	25	0.61	0.16	18		
0.18	20	0.64	7	0.18	20	0.64	0.18	15		
0.20	23	0.59	8	0.20	23	0.59	0.20	17		
0.22	25	0.60	9	0.22	25	0.60	0.22	18		
0.25	34	0.57	12	0.25	34	0.57	0.25	25		
0.27	46	0.46	16	0.27	46	0.46	0.27	34		
0.29	43	0.45	15	0.29	43	0.45	0.29	32		
0.31	37	0.42	13	0.31	37	0.42	0.31	27		
0.33	28	0.38	10	0.33	28	0.38	0.33	21		
0.35	25	0.36	9	0.35	25	0.36	0.35	18		
0.37	25	0.32	9	0.37	25	0.32	0.37	18		
0.40	23	0.29	8	0.40	23	0.29	0.40	17		
0.42	28	0.27	10	0.42	28	0.27	0.42	21		
0.44	17	0.27	6	0.44	17	0.27	0.44	13		
0.46	25	0.21	9	0.46	25	0.21	0.46	18		
0.48	14	0.21	5	0.48	14	0.21	0.48	10		
0.50	8	0.18	3	0.50	8	0.18	0.50	6		
0.52	20	0.14	7	0.52	0	0.14	0.52	0		
Max. Volts					0.75	0.75				
Max. Depth (%)					46.00	34.00				
Length (in.)					1.00	1.00				
Avg. Depth (%)					27.60	20.40				

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE					Final with Adjustments					
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾		
-0.43	0	0	0	-0.43	0	0	-0.43	0		
-0.41	23	0.44	8	-0.41	23	0.44	-0.41	20		
-0.39	20	0.43	7	-0.39	20	0.43	-0.39	17		
-0.37	29	0.44	10	-0.37	29	0.44	-0.37	25		
-0.35	32	0.55	11	-0.35	32	0.55	-0.35	27		
-0.32	35	0.65	12	-0.32	35	0.65	-0.32	30		
-0.30	38	0.65	13	-0.30	38	0.65	-0.30	32		
-0.28	35	0.64	12	-0.28	35	0.64	-0.28	30		
-0.26	35	0.63	12	-0.26	35	0.63	-0.26	30		
-0.24	32	0.6	11	-0.24	32	0.6	-0.24	27		
-0.22	29	0.6	10	-0.22	29	0.6	-0.22	25		
-0.19	28	0.56	9	-0.19	26	0.56	-0.19	22		
-0.17	29	0.51	10	-0.17	29	0.51	-0.17	25		
-0.15	32	0.57	11	-0.15	32	0.57	-0.15	27		
-0.13	32	0.68	11	-0.13	32	0.68	-0.13	27		
-0.11	35	0.73	12	-0.11	35	0.73	-0.11	30		
-0.08	35	0.72	12	-0.08	35	0.72	-0.08	30		
-0.06	32	0.69	11	-0.06	32	0.69	-0.06	27		
-0.04	29	0.71	10	-0.04	29	0.71	-0.04	25		
-0.02	29	0.69	10	-0.02	29	0.69	-0.02	25		
0.00	32	0.62	11	0.00	32	0.62	0.00	27		
0.02	32	0.58	11	0.02	32	0.58	0.02	27		
0.05	35	0.62	12	0.05	35	0.62	0.05	30		
0.07	20	0.53	7	0.07	20	0.53	0.07	17		
0.09	17	0.45	6	0.09	17	0.45	0.09	15		
0.11	14	0.46	5	0.11	14	0.46	0.11	12		
0.13	20	0.47	7	0.13	20	0.47	0.13	17		
0.15	41	0.49	14	0.15	41	0.49	0.15	35		
0.18	38	0.57	13	0.18	38	0.57	0.18	32		
0.20	23	0.63	8	0.20	23	0.63	0.20	20		
0.22	20	0.62	7	0.22	20	0.62	0.22	17		
0.24	20	0.58	7	0.24	20	0.58	0.24	17		
0.26	26	0.58	9	0.26	26	0.58	0.26	22		
0.29	32	0.56	11	0.29	32	0.56	0.29	27		
0.31	41	0.51	14	0.31	41	0.51	0.31	35		
0.33	38	0.45	13	0.33	38	0.45	0.33	32		
0.35	38	0.41	13	0.35	38	0.41	0.35	32		
0.37	29	0.37	10	0.37	29	0.37	0.37	25		
0.39	26	0.35	9	0.39	26	0.35	0.39	22		
0.42	26	0.31	9	0.42	26	0.31	0.42	22		
0.44	0	0	0	0.44	0	0	0.44	0		
Max. Volts					0.73	0.73				
Max. Depth (%)					41.00	35.00				
Length (in.)					0.87	0.87				
Avg. Depth (%)					29.13	24.86				

Table C-22 (continued)
Sample 2 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.42	6	0.40	3	-0.42	0	0.40	-0.42	0
-0.40	14	0.44	5	-0.40	14	0.44	-0.40	11
-0.38	10	0.43	4	-0.38	10	0.43	-0.38	8
-0.36	29	0.41	8.5	-0.36	29	0.41	-0.36	23
-0.33	18	0.57	6	-0.33	18	0.57	-0.33	15
-0.31	38	0.49	11	-0.31	38	0.49	-0.31	31
-0.31	31	0.65	9	-0.31	31	0.65	-0.31	25
-0.29	27	0.43	8	-0.29	27	0.43	-0.29	22
-0.27	34	0.62	10	-0.27	34	0.62	-0.27	28
-0.25	31	0.64	9	-0.25	31	0.64	-0.25	25
-0.23	27	0.60	8	-0.23	27	0.60	-0.23	22
-0.20	23	0.59	7	-0.20	23	0.59	-0.20	19
-0.18	18	0.56	6	-0.18	18	0.56	-0.18	15
-0.16	23	0.51	7	-0.16	23	0.51	-0.16	19
-0.14	23	0.60	7	-0.14	23	0.60	-0.14	19
-0.12	22	0.73	7	-0.12	22	0.73	-0.12	18
-0.10	31	0.74	9	-0.10	31	0.74	-0.10	25
-0.07	31	0.73	9	-0.07	31	0.73	-0.07	25
-0.05	27	0.70	8	-0.05	27	0.70	-0.05	22
-0.03	23	0.72	7	-0.03	23	0.72	-0.03	19
-0.01	23	0.69	7	-0.01	23	0.69	-0.01	19
0.01	31	0.63	9	0.01	31	0.63	0.01	25
0.04	25	0.64	8	0.04	25	0.64	0.04	20
0.06	17	0.67	6	0.06	17	0.67	0.06	14
0.08	8	0.58	4	0.08	8	0.58	0.08	7
0.10	10	0.46	4	0.10	10	0.46	0.10	8
0.12	2	0.47	2	0.12	2	0.47	0.12	2
0.17	21	0.50	8	0.17	21	0.50	0.17	17
0.19	24	0.55	8	0.19	24	0.55	0.19	20
0.21	14	0.64	5	0.21	14	0.64	0.21	11
0.23	10	0.43	4	0.23	10	0.43	0.23	8
0.25	10	0.59	4	0.25	10	0.59	0.25	8
0.28	14	0.59	5	0.28	14	0.59	0.28	11
0.30	27	0.57	8	0.30	27	0.57	0.30	22
0.32	23	0.57	7	0.32	23	0.57	0.32	19
0.34	27	0.51	8	0.34	27	0.51	0.34	22
0.36	23	0.47	7	0.36	23	0.47	0.36	19
0.39	23	0.37	7	0.39	23	0.37	0.39	19
0.41	18	0.35	6	0.41	18	0.35	0.41	15
0.43	2	0.32	2.00	0.43	0	0.32	0.43	0
				Max. Volts	0.74			0.74
				Max. Depth (%)	38.00			31.00
				Length (in.)	0.85			0.85
				Avg. Depth (%)	20.79			16.96

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.43	0	0.00	10	-0.43	0	0.00	-0.43	0
-0.41	27	0.29	10	-0.41	27	0.29	-0.41	20
-0.39	27	0.32	10	-0.39	27	0.32	-0.39	20
-0.37	33	0.32	12	-0.37	33	0.32	-0.37	24
-0.35	42	0.35	15	-0.35	42	0.35	-0.35	31
-0.33	45	0.41	16	-0.33	45	0.41	-0.33	33
-0.31	45	0.47	16	-0.31	45	0.47	-0.31	33
-0.28	39	0.51	14	-0.28	39	0.51	-0.28	29
-0.26	33	0.50	12	-0.26	33	0.50	-0.26	24
-0.24	27	0.52	10	-0.24	27	0.52	-0.24	20
-0.22	16	0.53	6	-0.22	16	0.53	-0.22	12
-0.20	22	0.54	8	-0.20	22	0.54	-0.20	16
-0.18	30	0.51	11	-0.18	30	0.51	-0.18	22
-0.16	27	0.45	10	-0.16	27	0.45	-0.16	20
-0.14	13	0.45	5	-0.14	13	0.45	-0.14	10
-0.11	2	0.47	1	-0.11	2	0.47	-0.11	1
-0.09	22	0.48	8	-0.09	22	0.48	-0.09	16
-0.07	30	0.56	11	-0.07	30	0.56	-0.07	22
-0.05	36	0.62	13	-0.05	36	0.62	-0.05	26
-0.03	33	0.60	12	-0.03	33	0.60	-0.03	24
-0.01	30	0.65	11	-0.01	30	0.65	-0.01	22
0.01	25	0.69	9	0.01	25	0.69	0.01	18
0.03	27	0.72	10	0.03	27	0.72	0.03	20
0.06	30	0.71	11	0.06	30	0.71	0.06	22
0.08	33	0.73	12	0.08	33	0.73	0.08	24
0.10	30	0.73	11	0.10	30	0.73	0.10	22
0.12	30	0.67	11	0.12	30	0.67	0.12	22
0.14	33	0.56	12	0.14	33	0.56	0.14	24
0.16	33	0.49	12	0.16	33	0.49	0.16	24
0.18	30	0.53	11	0.18	30	0.53	0.18	22
0.20	33	0.54	12	0.20	33	0.54	0.20	24
0.23	36	0.56	13	0.23	36	0.56	0.23	26
0.25	33	0.58	12	0.25	33	0.58	0.25	24
0.27	33	0.48	12	0.27	33	0.48	0.27	24
0.29	39	0.48	14	0.29	39	0.48	0.29	29
0.31	39	0.48	14	0.31	39	0.48	0.31	29
0.33	39	0.44	14	0.33	39	0.44	0.33	29
0.35	36	0.37	13	0.35	36	0.37	0.35	26
0.37	30	0.35	11	0.37	30	0.35	0.37	22
0.40	27	0.33	10	0.40	27	0.33	0.40	20
0.42	30	0.31	11	0.42	30	0.31	0.42	22
0.44	0	0.00	9	0.44	0	0.00	0.44	0
				Max. Volts	0.73			0.73
				Max. Depth (%)	45.00			33.00
				Length (in.)	0.87			0.87
				Avg. Depth (%)	29.78			21.84

Table C-23
Sample 2 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
				-0.25	0	0.00	-0.25	0
-0.23	20	0.35	7	-0.23	20	0.35	-0.23	11
-0.21	20	0.38	7	-0.21	20	0.38	-0.21	11
-0.19	23	0.37	8	-0.19	23	0.37	-0.19	13
-0.17	28	0.41	10	-0.17	28	0.41	-0.17	16
-0.15	31	0.44	11	-0.15	31	0.44	-0.15	17
-0.12	34	0.35	12	-0.12	34	0.35	-0.12	19
-0.10	5	0.24	2	-0.10	5	0.24	-0.10	3
-0.08	14	0.23	5	-0.08	14	0.23	-0.08	8
-0.06	43	0.14	15	-0.06	43	0.14	-0.06	24
-0.04	56	0.38	19	-0.04	56	0.38	-0.04	31
-0.02	46	0.43	16	-0.02	46	0.43	-0.02	25
0.00	34	0.45	12	0.00	34	0.45	0.00	19
0.02	28	0.49	10	x	28	0.49	0.02	16
0.05	31	0.49	11	0.05	31	0.49	0.05	17
0.07	34	0.47	12	0.07	34	0.47	0.07	19
0.09	43	0.46	15	0.09	43	0.46	0.09	24
0.11	40	0.40	14	0.11	40	0.40	0.11	22
0.13	40	0.41	14	0.13	40	0.41	0.13	22
0.15	34	0.31	12	0.15	34	0.31	0.15	19
0.17	28	0.24	10	0.17	28	0.24	0.17	16
0.19	20	0.20	7	0.19	20	0.20	0.19	11
0.22	14	0.18	5	0.22	14	0.18	0.22	8
0.24	31	0.11	11	0.24	0	0.11	0.24	0
0.26	17	0.15	6					
Max. Volts				0.49	0.49			
Max. Depth (%)				56.00	31.00			
Length (in.)				0.49	0.49			
Avg. Depth (%)				28.80	15.94			

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.29	0	0	0	-0.29	0	0	-0.29	0
-0.27	23	0.35	8	-0.27	23	0.35	-0.27	13
-0.25	23	0.34	8	-0.25	23	0.34	-0.25	13
-0.23	20	0.34	7	-0.23	20	0.34	-0.23	12
-0.21	20	0.37	7	-0.21	20	0.37	-0.21	12
-0.18	23	0.36	8	-0.18	23	0.36	-0.18	13
-0.16	29	0.4	10	-0.16	29	0.4	-0.16	17
-0.14	32	0.43	11	-0.14	32	0.43	-0.14	19
-0.12	35	0.34	12	-0.12	35	0.34	-0.12	20
-0.1	6	0.23	2	-0.1	6	0.23	-0.1	3
-0.08	14	0.22	5	-0.08	14	0.22	-0.08	8
-0.05	32	0.23	11	-0.05	32	0.23	-0.05	19
-0.03	55	0.37	19	-0.03	55	0.37	-0.03	32
-0.01	47	0.42	16	-0.01	47	0.42	-0.01	27
0.01	35	0.44	12	0.01	35	0.44	0.01	20
0.03	32	0.51	11	0.03	32	0.51	0.03	19
0.05	32	0.49	11	0.05	32	0.49	0.05	19
0.08	35	0.46	12	0.08	35	0.46	0.08	20
0.1	44	0.45	15	0.1	44	0.45	0.1	26
0.12	44	0.45	15	0.12	44	0.45	0.12	26
0.14	41	0.39	14	0.14	41	0.39	0.14	24
0.16	35	0.3	12	0.16	35	0.3	0.16	20
0.19	29	0.24	10	0.19	29	0.24	0.19	17
0.21	20	0.19	7	0.21	20	0.19	0.21	12
0.23	0	0	0	0.23	0	0	0.23	0
Max. Volts				0.51	0.51			
Max. Depth (%)				55.00	32.00			
Length (in.)				0.52	0.52			
Avg. Depth (%)				29.27	17.03			

Table C-23 (continued)
Sample 2 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.30	0	0.35	1					
-0.28	46	0.19	23					
-0.25	0	0.34	4	-0.25	0	0.34	-0.25	0
-0.23	6	0.32	3	-0.23	6	0.32	-0.23	3
-0.21	2	0.34	2	-0.21	2	0.34	-0.21	1
-0.19	2	0.43	2	-0.19	2	0.43	-0.19	1
-0.17	6	0.47	3	-0.17	6	0.47	-0.17	3
-0.15	10	0.50	4	-0.15	10	0.50	-0.15	5
-0.12	0	0.45	1	-0.12	0	0.45	-0.12	0
-0.10	0	0.38	176	-0.10	0	0.38	-0.10	0
-0.08	0	0.35	178	-0.08	0	0.35	-0.08	0
-0.06	0	0.39	180	-0.06	0	0.39	-0.06	0
-0.04	57	0.38	16	-0.04	57	0.38	-0.04	27
-0.01	42	0.43	12	-0.01	42	0.43	-0.01	20
0.01	31	0.44	9	0.01	31	0.44	0.01	15
0.03	27	0.51	8	0.03	27	0.51	0.03	13
0.05	27	0.50	8	0.05	27	0.50	0.05	13
0.07	31	0.47	9	0.07	31	0.47	0.07	15
0.09	34	0.45	10	0.09	34	0.45	0.09	16
0.12	34	0.46	10	0.12	34	0.46	0.12	16
0.14	31	0.42	9	0.14	31	0.42	0.14	15
0.16	14	0.33	5	0.16	14	0.33	0.16	7
0.18	23	0.24	7	0.18	23	0.24	0.18	11
0.20	10	0.20	4	0.20	10	0.20	0.20	5
0.22	6	0.18	3	0.22	6	0.18	0.22	3
0.25	18	0.17	6	0.25	0	0.17	0.25	0
Max. Volts				0.51		0.51		
Max. Depth (%)				57.00		27.00		
Length (in.)				0.50		0.50		
Avg. Depth (%)				17.55		8.31		

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
0.20	0	0.00	8	0.20	0	0.00	0.20	0
0.18	27	0.25	10	0.18	27	0.25	0.18	14
0.16	33	0.31	12	0.16	33	0.31	0.16	17
0.14	36	0.40	13	0.14	36	0.40	0.14	19
0.12	39	0.45	14	0.12	39	0.45	0.12	20
0.09	39	0.45	14	0.09	39	0.45	0.09	20
0.07	33	0.48	12	0.07	33	0.48	0.07	17
0.05	30	0.51	11	0.05	30	0.51	0.05	16
0.03	30	0.50	11	0.03	30	0.50	0.03	16
0.01	36	0.45	13	0.01	36	0.45	0.01	19
-0.01	45	0.43	16	-0.01	45	0.43	-0.01	23
-0.03	58	0.36	20	-0.03	58	0.36	-0.03	30
-0.05	27	0.24	10	-0.05	27	0.24	-0.05	14
-0.08	13	0.22	5	-0.08	13	0.22	-0.08	7
-0.10	16	0.24	6	-0.10	16	0.24	-0.10	8
-0.12	30	0.35	11	-0.12	30	0.35	-0.12	16
-0.14	30	0.43	11	-0.14	30	0.43	-0.14	16
-0.16	27	0.40	10	-0.16	27	0.40	-0.16	14
-0.18	19	0.36	7	-0.18	19	0.36	-0.18	10
-0.20	19	0.36	7	-0.20	19	0.36	-0.20	10
-0.22	0	0.00	7	-0.22	0	0.00	-0.22	0
Reversed Sign				Max. Volts		0.51		0.51
				Max. Depth (%)		58.00		30.00
				Length (in.)		0.42		0.42
				Avg. Depth (%)		29.36		15.18

Table C-24
Sample 2 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.41	40	0.13	14	0.00	-0.41	0
-0.39	14	0.18	5	0.18	-0.39	14
-0.37	34	0.16	12	0.16	-0.37	34
-0.34	34	0.22	12	0.22	-0.34	34
-0.32	40	0.22	14	0.22	-0.32	40
-0.30	37	0.27	13	0.27	-0.30	37
-0.28	40	0.34	14	0.34	-0.28	40
-0.26	40	0.49	14	0.49	-0.26	40
-0.24	37	0.60	13	0.60	-0.24	37
-0.22	37	0.67	13	0.67	-0.22	37
-0.20	40	0.73	14	0.73	-0.20	40
-0.17	40	0.81	14	0.81	-0.17	40
-0.15	40	0.91	14	0.91	-0.15	40
-0.13	43	1.02	15	1.02	-0.13	43
-0.11	43	1.19	15	1.19	-0.11	43
-0.09	43	1.27	15	1.27	-0.09	43
-0.07	46	1.28	16	1.28	-0.07	46
-0.05	46	1.14	16	1.14	-0.05	46
-0.03	46	1.02	16	1.02	-0.03	46
0.00	52	0.94	18	0.94	0.00	52
0.02	56	0.84	19	0.84	0.02	56
0.04	59	0.73	20	0.73	0.04	59
0.06	49	0.64	17	0.64	0.06	49
0.08	43	0.64	15	0.64	0.08	43
0.10	40	0.71	14	0.71	0.10	40
0.12	40	0.72	14	0.72	0.12	40
0.14	43	0.61	15	0.61	0.14	43
0.17	37	0.49	13	0.49	0.17	37
0.19	34	0.44	12	0.44	0.19	34
0.21	34	0.44	12	0.44	0.21	34
0.23	25	0.45	9	0.45	0.23	25
0.25	25	0.39	9	0.39	0.25	25
0.27	14	0.27	5	0.27	0.27	14
0.29	3	0.19	1	0.00	0.29	0
Max. Volts				1.28		
Max. Depth (%)				59.00		
Length (in.)				0.70		
Avg. Depth (%)				38.07		

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.38	0	0.00	0	0.00	-0.38	0
-0.35	26	0.21	9	0.21	-0.35	26
-0.33	35	0.21	12	0.21	-0.33	35
-0.31	41	0.22	14	0.22	-0.31	41
-0.29	38	0.27	13	0.27	-0.29	38
-0.27	41	0.34	14	0.34	-0.27	41
-0.25	41	0.47	14	0.47	-0.25	41
-0.22	38	0.58	13	0.58	-0.22	38
-0.20	38	0.65	13	0.65	-0.20	38
-0.18	41	0.71	14	0.71	-0.18	41
-0.16	41	0.79	14	0.79	-0.16	41
-0.14	41	0.89	14	0.89	-0.14	41
-0.12	44	0.99	15	0.99	-0.12	44
-0.09	44	1.16	15	1.16	-0.09	44
-0.07	44	1.24	15	1.24	-0.07	44
-0.05	47	1.24	16	1.24	-0.05	47
-0.03	47	1.11	16	1.11	-0.03	47
-0.01	47	0.99	16	0.99	-0.01	47
0.01	52	0.91	18	0.91	0.01	52
0.04	55	0.82	19	0.82	0.04	55
0.06	58	0.71	20	0.71	0.06	58
0.08	49	0.62	17	0.62	0.08	49
0.10	44	0.63	15	0.63	0.10	44
0.12	41	0.69	14	0.69	0.12	41
0.14	41	0.70	14	0.70	0.14	41
0.17	44	0.59	15	0.59	0.17	44
0.19	38	0.50	13	0.50	0.19	38
0.21	35	0.43	12	0.43	0.21	35
0.23	35	0.42	12	0.42	0.23	35
0.25	26	0.44	9	0.44	0.25	26
0.27	26	0.38	9	0.38	0.27	26
0.30	14	0.26	5	0.26	0.30	14
0.32	3	0.18	1	0.18	0.32	3
0.34	0	0.00	0	0.00	0.34	0
Max. Volts				1.24		
Max. Depth (%)				58.00		
Length (in.)				0.72		
Avg. Depth (%)				37.81		

Table C-24 (continued)
Sample 2 - 4H
Laboratory Specimen DE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.37	0	0.18	3	0.18	-0.37	0
-0.35	14	0.22	5	0.22	-0.35	14
-0.33	31	0.21	9	0.21	-0.33	31
-0.31	38	0.22	11	0.22	-0.31	38
-0.28	38	0.27	11	0.27	-0.28	38
-0.26	46	0.28	13	0.28	-0.26	46
-0.24	46	0.32	13	0.32	-0.24	46
-0.22	42	0.45	12	0.45	-0.22	42
-0.20	38	0.60	11	0.60	-0.20	38
-0.18	46	0.56	13	0.56	-0.18	46
-0.15	38	0.80	11	0.80	-0.15	38
-0.13	38	0.90	11	0.90	-0.13	38
-0.11	42	1.00	12	1.00	-0.11	42
-0.09	42	1.19	12	1.19	-0.09	42
-0.07	42	1.27	12	1.27	-0.07	42
-0.05	42	1.26	12	1.26	-0.05	42
-0.03	46	1.13	13	1.13	-0.03	46
0.00	46	1.00	13	1.00	0.00	46
0.02	53	0.92	15	0.92	0.02	53
0.04	60	0.83	17	0.83	0.04	60
0.06	60	0.71	17	0.71	0.06	60
0.08	38	0.65	11	0.65	0.08	38
0.11	34	0.64	10	0.64	0.11	34
0.13	31	0.71	9	0.71	0.13	31
0.15	42	0.71	12	0.71	0.15	42
0.17	38	0.60	11	0.60	0.17	38
0.19	31	0.52	9	0.52	0.19	31
0.21	34	0.43	10	0.43	0.21	34
0.24	27	0.43	8	0.43	0.24	27
0.26	23	0.36	7	0.36	0.26	23
0.28	18	0.39	6	0.39	0.28	18
0.30	14	0.31	5	0.31	0.30	14
				0.00	0.32	0
				Max. Volts	1.27	
				Max. Depth (%)	60.00	
				Length (in.)	0.69	
				Avg. Depth (%)	38.93	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
0.30	0	0.00	3	0.00	0.30	0
0.28	22	0.14	8	0.14	0.28	22
0.26	25	0.22	9	0.22	0.26	25
0.24	30	0.36	11	0.36	0.24	30
0.22	42	0.35	15	0.35	0.22	42
0.20	36	0.39	13	0.39	0.20	36
0.18	42	0.51	15	0.51	0.18	42
0.15	42	0.62	15	0.62	0.15	42
0.13	39	0.72	14	0.72	0.13	39
0.11	39	0.70	14	0.70	0.11	39
0.09	45	0.64	16	0.64	0.09	45
0.07	48	0.65	17	0.65	0.07	48
0.05	55	0.74	19	0.74	0.05	55
0.03	55	0.85	19	0.85	0.03	55
0.01	51	0.94	18	0.94	0.01	51
-0.01	45	1.02	16	1.02	-0.01	45
-0.04	45	1.15	16	1.15	-0.04	45
-0.06	45	1.27	16	1.27	-0.06	45
-0.08	42	1.25	15	1.25	-0.08	42
-0.10	42	1.16	15	1.16	-0.10	42
-0.12	42	1.00	15	1.00	-0.12	42
-0.14	39	0.89	14	0.89	-0.14	39
-0.16	39	0.80	14	0.80	-0.16	39
-0.18	39	0.71	14	0.71	-0.18	39
-0.21	36	0.65	13	0.65	-0.21	36
-0.23	36	0.57	13	0.57	-0.23	36
-0.25	42	0.40	15	0.40	-0.25	42
-0.27	42	0.28	15	0.28	-0.27	42
-0.29	48	0.18	17	0.18	-0.29	0
-0.31	42	0.16	15			
-0.33	0	0.00	11			
*Reversed Sign				Max. Volts	1.27	
				Max. Depth (%)	55.00	
				Length (in.)	0.59	
				Avg. Depth (%)	39.57	

Table C-25
Sample 2 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.54	46	0.07	16					
-0.52	77	0.06	26					
-0.50	62	0.04	21					
-0.47	25	0.11	9					
-0.45	45	0.07	15	-0.45	0	0.07	-0.45	0
-0.43	25	0.20	9	-0.43	25	0.20	-0.43	16
-0.41	25	0.24	9	-0.41	25	0.24	-0.41	16
-0.39	25	0.26	9	-0.39	25	0.26	-0.39	16
-0.37	25	0.28	9	-0.37	25	0.28	-0.37	16
-0.35	23	0.37	8	-0.35	23	0.37	-0.35	15
-0.33	34	0.44	12	-0.33	34	0.44	-0.33	22
-0.30	37	0.53	13	-0.30	37	0.53	-0.30	24
-0.28	37	0.55	13	-0.28	37	0.55	-0.28	24
-0.26	34	0.56	12	-0.26	34	0.56	-0.26	22
-0.24	31	0.55	11	-0.24	31	0.55	-0.24	20
-0.22	28	0.53	10	-0.22	28	0.53	-0.22	18
-0.20	31	0.52	11	-0.20	31	0.52	-0.20	20
-0.18	31	0.54	11	-0.18	31	0.54	-0.18	20
-0.15	31	0.59	11	-0.15	31	0.59	-0.15	20
-0.13	28	0.58	10	-0.13	28	0.58	-0.13	18
-0.11	25	0.51	9	-0.11	25	0.51	-0.11	16
-0.09	25	0.46	9.00	-0.09	25	0.46	-0.09	16
-0.07	25	0.52	9.00	-0.07	25	0.52	-0.07	16
-0.05	40	0.63	14.00	-0.05	40	0.63	-0.05	26
-0.03	43	0.72	15.00	-0.03	43	0.72	-0.03	28
0.00	46	0.73	16.00	0.00	46	0.73	0.00	30
0.02	46	0.63	16.00	0.02	46	0.63	0.02	30
0.04	71	0.53	24.00	0.04	71	0.53	0.04	46
0.06	62	0.49	21.00	0.06	62	0.49	0.06	40
0.08	43	0.49	15.00	0.08	43	0.49	0.08	28
0.10	31	0.49	11.00	0.10	31	0.49	0.10	20
0.12	31	0.53	11.00	0.12	31	0.53	0.12	20
0.14	34	0.54	12.00	0.14	34	0.54	0.14	22
0.17	34	0.56	12.00	0.17	34	0.56	0.17	22
0.19	34	0.59	12.00	0.19	34	0.59	0.19	22
0.21	37	0.57	13.00	0.21	37	0.57	0.21	24
0.23	37	0.53	13.00	0.23	37	0.53	0.23	24
0.25	43	0.51	15.00	0.25	43	0.51	0.25	28
0.27	43	0.58	15.00	0.27	43	0.58	0.27	28
0.29	40	0.60	14.00	0.29	40	0.60	0.29	26
0.31	31	0.57	11.00	0.31	31	0.57	0.31	20
0.34	31	0.52	11.00	0.34	31	0.52	0.34	20
0.36	28	0.48	10.00	0.36	28	0.48	0.36	18
0.38	37	0.41	13.00	0.38	37	0.41	0.38	24
0.40	34	0.31	12.00	0.40	34	0.31	0.40	22
0.42	37	0.31	13.00	0.42	37	0.31	0.42	24
0.44	40	0.29	14.00	0.44	40	0.29	0.44	26
0.46	46	0.23	16.00	0.46	0	0.23	0.46	0
0.48	56	0.18	19.00					
0.51	62	0.13	21					
0.53	90	0.09	30					
0.55	52	0.11	18					
0.57	43	0.11	15					
0.59	49	0.11	17					
0.61	49	0.11	17					
		Max. Volts		0.73		0.73		
		Max. Depth (%)		71.00		46.00		
		Length (in.)		0.91		0.91		
		Avg. Depth (%)		34.31		22.23		

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.47	0	0.00	0	-0.47	0	0.00	-0.47	0
-0.45	20	0.22	7	-0.45	20	0.22	-0.45	13
-0.43	26	0.24	9	-0.43	26	0.24	-0.43	17
-0.40	26	0.25	9	-0.40	26	0.25	-0.40	17
-0.38	26	0.27	9	-0.38	26	0.27	-0.38	17
-0.36	29	0.34	10	-0.36	29	0.34	-0.36	19
-0.34	32	0.44	11	-0.34	32	0.44	-0.34	21
-0.32	35	0.53	12	-0.32	35	0.53	-0.32	24
-0.30	38	0.54	13	-0.30	38	0.54	-0.30	26
-0.27	35	0.55	12	-0.27	35	0.55	-0.27	24
-0.25	29	0.55	10	-0.25	29	0.55	-0.25	19
-0.23	29	0.51	10	-0.23	29	0.51	-0.23	19
-0.21	32	0.50	11	-0.21	32	0.50	-0.21	21
-0.19	32	0.53	11	-0.19	32	0.53	-0.19	21
-0.16	32	0.58	11	-0.16	32	0.58	-0.16	21
-0.14	29	0.57	10	-0.14	29	0.57	-0.14	19
-0.12	26	0.50	9	-0.12	26	0.50	-0.12	17
-0.10	26	0.45	9	-0.10	26	0.45	-0.10	17
-0.08	26	0.50	9	-0.08	26	0.50	-0.08	17
-0.06	41	0.61	14	-0.06	41	0.61	-0.06	28
-0.03	44	0.70	15	-0.03	44	0.70	-0.03	30
-0.01	47	0.71	16.00	-0.01	47	0.71	-0.01	32
0.01	47	0.61	16.00	0.01	47	0.61	0.01	32
0.03	70	0.52	24.00	0.03	70	0.52	0.03	47
0.05	61	0.48	21.00	0.05	61	0.48	0.05	41
0.07	44	0.47	15.00	0.07	44	0.47	0.07	30
0.10	32	0.48	11.00	0.10	32	0.48	0.10	21
0.12	32	0.52	11.00	0.12	32	0.52	0.12	21
0.14	35	0.52	12.00	0.14	35	0.52	0.14	24
0.16	35	0.54	12.00	0.16	35	0.54	0.16	24
0.18	35	0.57	12.00	0.18	35	0.57	0.18	24
0.21	38	0.55	13.00	0.21	38	0.55	0.21	26
0.23	38	0.52	13.00	0.23	38	0.52	0.23	26
0.25	41	0.53	14.00	0.25	41	0.53	0.25	28
0.27	38	0.59	13.00	0.27	38	0.59	0.27	26
0.29	32	0.61	11.00	0.29	32	0.61	0.29	21
0.31	23	0.57	8.00	0.31	23	0.57	0.31	15
0.34	23	0.53	8.00	0.34	23	0.53	0.34	15
0.36	23	0.47	8.00	0.36	23	0.47	0.36	15
0.38	29	0.41	10.00	0.38	29	0.41	0.38	19
0.40	32	0.36	11.00	0.40	32	0.36	0.40	21
0.42	38	0.33	13.00	0.42	38	0.33	0.42	26
0.44	41	0.28	14.00	0.44	41	0.28	0.44	28
0.47	0	0.00	0.00	0.47	0	0.00	0.47	0
		Max. Volts		0.71		0.74		
		Max. Depth (%)		70.00		47.00		
		Length (in.)		0.94		0.91		
		Avg. Depth (%)		33.50		22.49		

Table C-25 (continued)
Sample 2 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.50	42	0.06	12					
-0.48	63	0.04	18					
-0.46	42	0.07	12					
-0.43	18	0.12	6	-0.43	0	0.07	-0.43	0.00
-0.41	23	0.15	7	-0.41	23	0.15	-0.41	9.45
-0.39	23	0.13	7	-0.39	23	0.13	-0.39	x
-0.37	18	0.23	6	-0.37	18	0.23	-0.37	7.40
-0.35	18	0.26	6	-0.35	18	0.26	-0.35	7.40
-0.33	14	0.18	5	-0.33	14	0.18	-0.33	5.75
-0.3	14	0.25	5	-0.3	14	0.25	-0.3	5.75
-0.28	18	0.31	6	-0.28	18	0.31	-0.28	7.40
-0.26	23	0.47	7	-0.26	23	0.47	-0.26	9.45
-0.24	14	0.39	5	-0.24	14	0.39	-0.24	5.75
-0.22	14	0.54	5	-0.22	14	0.54	-0.22	5.75
-0.19	27	0.51	8	-0.19	27	0.51	-0.19	11.10
-0.17	27	0.53	8	-0.17	27	0.53	-0.17	11.10
-0.15	27	0.58	8	-0.15	27	0.58	-0.15	11.10
-0.13	23	0.57	7	-0.13	23	0.57	-0.13	9.45
-0.11	18	0.5	6	-0.11	18	0.5	-0.11	7.40
-0.09	18	0.46	6	-0.09	18	0.46	-0.09	7.40
-0.06	12	0.53	3	-0.06	12	0.53	-0.06	4.93
-0.04	31	0.64	7	-0.04	31	0.64	-0.04	12.74
-0.02	35	0.73	8	-0.02	35	0.73	-0.02	14.38
0	30	0.74	12	0	30	0.74	0	12.33
0.02	37	0.65	13	0.02	37	0.65	0.02	15.21
0.04	38	0.58	11	0.04	38	0.58	0.04	15.62
0.05	73	0.53	21	0.05	73	0.53	0.05	30.00
0.07	63	0.48	18	0.07	63	0.48	0.07	25.89
0.09	32	0.53	6	0.09	32	0.53	0.09	13.15
0.11	19	0.55	4	0.11	19	0.55	0.11	7.81
0.11	27	0.48	8	0.11	27	0.48	0.11	11.10
0.13	17	0.6	3	0.13	17	0.6	0.13	6.99
0.15	21	0.61	4	0.15	21	0.61	0.15	8.63
0.18	23	0.62	5	0.18	23	0.62	0.18	9.45
0.2	31	0.58	9	0.2	31	0.58	0.2	12.74
0.22	34	0.56	10	0.22	34	0.56	0.22	13.97
0.24	27	0.32	8	0.24	27	0.32	0.24	11.10
0.26	38	0.45	11	0.26	38	0.45	0.26	15.62
0.28	34	0.53	10	0.28	34	0.53	0.28	13.97
0.31	34	0.55	10	0.31	34	0.55	0.31	13.97
0.33	23	0.5	7	0.33	23	0.5	0.33	9.45
0.35	23	0.46	7	0.35	23	0.46	0.35	9.45
0.37	23	0.2	7	0.37	23	0.2	0.37	9.45
0.39	49	0.16	14	0.39	0	0.16	0.39	0.00
0.42	57	0.14	16					
0.44	57	0.13	16					
0.46	63	0.12	18					
0.48	53	0.11	15					
	89	0.07	26					
Max. Volts				0.74		0.74		
Max. Depth (%)				73.00		30.00		
Length (in.)				0.82		0.82		
Avg. Depth (%)				25.51		10.48		

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.13	0	0.00	12	-0.13	0	0.00	-0.13	0.00
-0.11	30	0.52	11	-0.11	30	0.52	-0.11	18.81
-0.09	33	0.49	12	-0.09	33	0.49	-0.09	20.69
-0.07	45	0.48	16	-0.07	45	0.48	-0.07	28.21
-0.04	64	0.49	22	-0.04	64	0.49	-0.04	40.12
-0.02	67	0.54	23	-0.02	67	0.54	-0.02	42.00
0.00	45	0.64	16	0.00	45	0.64	0.00	28.21
0.02	42	0.72	15	0.02	42	0.72	0.02	26.33
0.04	42	0.70	15	0.04	42	0.70	0.04	26.33
0.06	39	0.60	14	0.06	39	0.60	0.06	24.45
0.08	33	0.50	12	0.08	33	0.50	0.08	20.69
0.10	0	0.00	9	0.10	0	0.00	0.10	0.00
Max. Volts				0.72		0.72		
Max. Depth (%)				67.00		42.00		
Length (in.)				0.23		0.23		
Avg. Depth (%)				40.63		25.47		

Table C-26
Sample 3-3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NDD						

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NDD						

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NDD						

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NO DATA						

Table C-27
Sample 3-4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NDD						

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NDD						

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NDD						

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NDD						

Table C-28
Sample 4 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NDD						

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NO DATA						

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NDD						

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NO DATA						

Table C-29
Sample 5 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NDD						

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.21	0	0.00	0	-0.21	0	0.00	-0.21	0
-0.19	9	0.08	3	-0.19	9	0.08	-0.19	6
-0.17	38	0.10	12	-0.17	38	0.10	-0.17	27
-0.15	31	0.13	10	-0.15	31	0.13	-0.15	22
-0.13	38	0.14	12	-0.13	38	0.14	-0.13	27
-0.12	47	0.19	15	-0.12	47	0.19	-0.12	33
-0.10	44	0.27	14	-0.10	44	0.27	-0.10	31
-0.08	44	0.39	14	-0.08	44	0.39	-0.08	31
-0.06	44	0.42	14	-0.06	44	0.42	-0.06	31
-0.04	50	0.45	16	-0.04	50	0.45	-0.04	35
-0.02	41	0.46	13	-0.02	41	0.46	-0.02	29
0.00	50	0.44	16	0.00	50	0.44	0.00	35
0.02	38	0.49	12	0.02	38	0.49	0.02	27
0.03	35	0.55	11	0.03	35	0.55	0.03	25
0.05	38	0.52	12	0.05	38	0.52	0.05	27
0.07	38	0.51	12	0.07	38	0.51	0.07	27
0.09	38	0.47	12	0.09	38	0.47	0.09	27
0.11	38	0.40	12	0.11	38	0.40	0.11	27
0.13	31	0.33	10	0.13	31	0.33	0.13	22
0.15	35	0.26	11	0.15	35	0.26	0.15	25
0.17	28	0.17	9	0.17	28	0.17	0.17	20
0.18	0	0.00	0	0.18	0	0.00	0.18	0
				Max. Volts	0.55		0.55	
				Max. Depth (%)	50.00		35.00	
				Length (In.)	0.39		0.39	
				Avg. Depth (%)	36.33		25.43	

Table C-29 (continued)
Sample 5 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.22	17	0.07	14.00	-0.22	0	0.07	-0.22	0
-0.20	22	0.10	15.00	-0.20	22	0.10	-0.20	12
-0.18	19	0.15	14.50	-0.18	19	0.15	-0.18	11
-0.16	19	0.17	14.50	-0.16	19	0.17	-0.16	11
-0.13	23	0.21	15.50	-0.13	23	0.21	-0.13	13
-0.11	25	0.30	16.00	-0.11	25	0.30	-0.11	14
-0.09	21	0.41	15.00	-0.09	21	0.41	-0.09	12
-0.07	25	0.46	16.00	-0.07	25	0.46	-0.07	14
-0.05	27	0.48	16.50	-0.05	27	0.48	-0.05	15
-0.03	19	0.49	13.00	-0.03	19	0.49	-0.03	11
-0.01	25	0.47	16.00	-0.01	25	0.47	-0.01	14
0.01	17	0.53	13.00	0.01	17	0.53	0.01	9
0.03	15	0.58	12.00	0.03	15	0.58	0.03	8
0.05	17	0.55	13.50	0.05	17	0.55	0.05	9
0.07	17	0.54	13.50	0.07	17	0.54	0.07	9
0.10	19	0.49	18.50	0.10	19	0.49	0.10	11
0.12	17	0.44	13.50	0.12	17	0.44	0.12	9
0.14	15	0.37	13.00	0.14	15	0.37	0.14	8
0.16	15	0.30	12.50	0.16	15	0.30	0.16	8
0.18	13	0.21	12.50	0.18	0	0.21	0.18	0
Max. Volts					0.58			0.58
Max. Depth (%)					27.00			15.00
Length (in.)					0.40			0.40
Avg. Depth (%)					18.83			10.46

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NDD						

Table C-30
Sample 6 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.47	74	0.07	25			
-0.45	98	0.08	36			
-0.42	100	0.14	33			
-0.40	56	0.30	19	0.30	-0.40	0
-0.38	46	0.42	16	0.42	-0.38	46
-0.36	56	0.36	19	0.36	-0.36	56
-0.34	68	0.32	23	0.32	-0.34	68
-0.32	59	0.58	20	0.58	-0.32	59
-0.30	62	1.11	21	1.11	-0.30	62
-0.27	59	1.69	20	1.69	-0.27	59
-0.25	62	1.93	21	1.93	-0.25	62
-0.23	68	1.77	23	1.77	-0.23	68
-0.21	71	1.73	24	1.73	-0.21	71
-0.19	65	2.02	22	2.02	-0.19	65
-0.17	65	2.30	22	2.30	-0.17	65
-0.15	68	2.31	23	2.31	-0.15	68
-0.13	71	2.24	24	2.24	-0.13	71
-0.10	68	2.21	23	2.21	-0.10	68
-0.08	65	2.20	22	2.20	-0.08	65
-0.06	65	2.16	22	2.16	-0.06	65
-0.04	65	2.09	22	2.09	-0.04	65
-0.02	65	2.02	22	2.02	-0.02	65
0.00	68	2.07	23	2.07	0.00	68
0.02	74	2.19	25	2.19	0.02	74
0.04	71	2.34	24	2.34	0.04	71
0.06	68	2.35	23	2.35	0.06	68
0.09	71	2.17	24	2.17	0.09	71
0.11	68	2.03	23	2.03	0.11	68
0.13	65	1.95	22	1.95	0.13	65
0.15	65	1.91	22	1.91	0.15	65
0.17	65	1.81	22	1.81	0.17	65
0.19	68	1.63	23	1.63	0.19	68
0.21	65	1.45	22	1.45	0.21	65
0.23	62	1.26	21	1.26	0.23	62
0.26	62	1.06	21	1.06	0.26	62
0.28	62	0.91	21	0.91	0.28	62
0.30	56	0.79	19	0.79	0.30	56
0.32	56	0.55	19	0.55	0.32	56
0.34	71	0.23	24	0.23	0.34	0
0.36	62	0.11	21			
0.38	56	0.10	19			
0.40	71	0.08	24			
				Max. Volts	2.35	
				Max. Depth (%)	74.00	
				Length (in.)	0.74	
				Avg. Depth (%)	62.83	

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.41	0	0.00	0			
-0.39	55	0.29	19	0.29	-0.39	0
-0.37	47	0.40	16	0.40	-0.37	47
-0.35	55	0.35	19	0.35	-0.35	55
-0.33	67	0.32	23	0.32	-0.33	67
-0.31	58	0.57	20	0.57	-0.31	58
-0.28	61	1.08	21	1.08	-0.28	61
-0.26	58	1.65	20	1.65	-0.26	58
-0.24	61	1.88	21	1.88	-0.24	61
-0.22	67	1.73	23	1.73	-0.22	67
-0.20	70	1.69	24	1.69	-0.20	70
-0.17	64	1.96	22	1.96	-0.17	64
-0.15	64	2.24	22	2.24	-0.15	64
-0.13	67	2.25	23	2.25	-0.13	67
-0.11	70	2.18	24	2.18	-0.11	70
-0.09	67	2.15	23	2.15	-0.09	67
-0.07	64	2.14	22	2.14	-0.07	64
-0.04	64	2.10	22	2.10	-0.04	64
-0.02	64	2.03	22	2.03	-0.02	64
0.00	64	1.97	22	1.97	0.00	64
0.02	67	2.01	23	2.01	0.02	67
0.04	73	2.13	25	2.13	0.04	73
0.06	70	2.28	24	2.28	0.06	70
0.09	67	2.29	23	2.29	0.09	67
0.11	70	2.11	24	2.11	0.11	70
0.13	67	1.98	23	1.98	0.13	67
0.15	64	1.90	22	1.90	0.15	64
0.17	61	1.96	21	1.96	0.17	61
0.19	61	1.77	21	1.77	0.19	61
0.22	64	1.60	22	1.60	0.22	64
0.24	64	1.42	22	1.42	0.24	64
0.26	55	1.24	19	1.24	0.26	55
0.28	52	1.05	18	1.05	0.28	52
0.30	52	0.90	18	0.90	0.30	52
0.32	44	0.77	15	0.77	0.32	44
0.35	55	0.54	19	0.54	0.35	0
0.37	70	0.22	24			
0.39	0	0.00	0			
				Max. Volts	2.29	
				Max. Depth (%)	73.00	
				Length (in.)	0.74	
				Avg. Depth (%)	60.40	

Table C-30(continued)
Sample 6 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.45	77	0.07	22			
-0.43	99	0.08	32			
-0.41	100	0.14	30			
-0.39	0	0.31	21	0.31	-0.39	0
-0.37	46	0.41	13	0.41	-0.37	46
-0.34	60	0.37	17	0.37	-0.34	60
-0.32	67	0.34	19	0.34	-0.32	67
-0.31	67	1.31	16	1.31	-0.31	67
-0.30	57	0.59	16	0.59	-0.30	57
-0.28	65	1.52	17	1.52	-0.28	65
-0.26	63.5	1.92	16.5	1.92	-0.26	64
-0.24	66.5	2.00	17.5	2.00	-0.24	67
-0.22	70	1.92	17	1.92	-0.22	70
-0.21	67	1.79	19	1.79	-0.21	67
-0.20	64	2.33	15	2.33	-0.20	64
-0.19	70	1.74	20	1.74	-0.19	70
-0.17	65.5	2.33	17	2.33	-0.17	66
-0.15	67	2.58	16	2.58	-0.15	67
-0.13	70	2.50	17	2.50	-0.13	70
-0.11	64	2.50	15	2.50	-0.11	64
-0.09	60	2.57	14	2.57	-0.09	60
-0.07	56	2.58	13	2.58	-0.07	56
-0.04	56	2.48	13	2.48	-0.04	56
-0.02	56	2.42	13	2.42	-0.02	56
0.00	60	2.52	14	2.52	0.00	60
0.02	57	2.08	16	2.08	0.02	57
0.05	67	2.22	19	2.22	0.05	67
0.07	67	2.37	19	2.37	0.07	67
0.09	67	2.38	19	2.38	0.09	67
0.11	67	2.21	19	2.21	0.11	67
0.13	67	2.08	19	2.08	0.13	67
0.16	63	2.01	18	2.01	0.16	63
0.18	60	1.97	17	1.97	0.18	60
0.20	60	1.87	17	1.87	0.20	60
0.22	63	1.68	18	1.68	0.22	63
0.24	63	1.49	18	1.49	0.24	63
0.26	57	1.29	16	1.29	0.26	57
0.29	57	1.10	16	1.10	0.29	57
0.31	57	0.96	16	0.96	0.31	57
0.33	53	0.86	15	0.86	0.33	53
0.35	42	0.62	12	0.62	0.35	42
0.37	73	0.22	21	0.22	0.37	0
0.39	57	0.13	16			
0.42	38	0.13	11			
0.44	73	0.10	21			
0.46	92	0.08	27			
0.48	99	0.06	31			
0.50	94	0.03	39			
Max. Volts				2.58		
Max. Depth (%)				70.00		
Length (In.)				0.76		
Avg. Depth (%)				59.63		

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.35	0	0.00	21	0.00	-0.35	0
-0.33	64	0.27	22	0.27	-0.33	64
-0.31	58	0.58	20	0.58	-0.31	58
-0.29	61	0.80	21	0.80	-0.29	61
-0.26	61	0.92	21	0.92	-0.26	61
-0.24	61	1.08	21	1.08	-0.24	61
-0.22	61	1.28	21	1.28	-0.22	61
-0.20	67	1.47	23	1.47	-0.20	67
-0.18	67	1.65	23	1.65	-0.18	67
-0.16	64	1.81	22	1.81	-0.16	64
-0.14	64	1.90	22	1.90	-0.14	64
-0.12	67	1.95	23	1.95	-0.12	67
-0.10	67	2.04	23	2.04	-0.10	67
-0.07	70	2.18	24	2.18	-0.07	70
-0.05	67	2.33	23	2.33	-0.05	67
-0.03	70	2.30	24	2.30	-0.03	70
-0.01	74	2.15	25	2.15	-0.01	74
0.01	67	2.05	23	2.05	0.01	67
0.03	67	1.97	23	1.97	0.03	67
0.05	64	2.05	22	2.05	0.05	64
0.07	64	2.08	22	2.08	0.07	64
0.10	64	2.18	22	2.18	0.10	64
0.12	67	2.20	23	2.20	0.12	67
0.14	67	2.23	23	2.23	0.14	67
0.16	67	2.30	23	2.30	0.16	67
0.18	64	2.24	22	2.24	0.18	64
0.20	67	1.96	23	1.96	0.20	67
0.22	70	1.73	24	1.73	0.22	70
0.24	64	1.79	22	1.79	0.24	64
0.26	61	1.88	21	1.88	0.26	61
0.29	58	1.59	20	1.59	0.29	58
0.31	64	1.01	22	1.01	0.31	64
0.33	64	0.53	22	0.53	0.33	64
0.35	70	0.33	24	0.33	0.35	70
0.37	58	0.36	20	0.36	0.37	58
0.39	48	0.40	17	0.40	0.39	48
0.41	67	0.27	23	0.27	0.41	0
0.43	87	0.13	29			
0.45	87	0.08	29			
0.48	83	0.06	28			
0.50	0	0.00	39			
Max. Volts				2.33		
Max. Depth (%)				74.00		
Length (In.)				0.76		
Avg. Depth (%)				62.75		

Table C-31
Sample 6 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.45	98	0.05	37			
-0.43	98	0.08	36			
-0.41	81	0.08	27			
-0.39	77	0.09	26	0.09	-0.39	0
-0.37	37	0.21	13	0.21	-0.37	37
-0.34	52	0.52	18	0.52	-0.34	52
-0.32	56	0.85	19	0.85	-0.32	56
-0.30	62	1.04	21	1.04	-0.30	62
-0.28	68	1.18	23	1.18	-0.28	68
-0.26	62	1.47	21	1.47	-0.26	62
-0.24	62	1.70	21	1.70	-0.24	62
-0.22	65	1.90	22	1.90	-0.22	65
-0.20	62	2.11	21	2.11	-0.20	62
-0.17	62	2.25	21	2.25	-0.17	62
-0.15	68	2.31	23	2.31	-0.15	68
-0.13	71	2.40	24	2.40	-0.13	71
-0.11	65	2.51	22	2.51	-0.11	65
-0.09	62	2.49	21	2.49	-0.09	62
-0.07	68	2.26	23	2.26	-0.07	68
-0.05	71	2.01	24	2.01	-0.05	71
-0.03	68	1.81	23	1.81	-0.03	68
0.00	68	1.68	23	1.68	0.00	68
0.02	68	1.68	23	1.66	0.02	68
0.04	71	1.64	24	1.64	0.04	71
0.06	74	1.70	25	1.70	0.06	74
0.08	68	1.95	23	1.95	0.08	68
0.10	65	2.17	22	2.17	0.10	65
0.12	68	2.01	23	2.01	0.12	68
0.15	68	1.87	23	1.87	0.15	68
0.17	65	1.81	22	1.81	0.17	65
0.19	62	1.63	21	1.63	0.19	62
0.21	65	1.46	22	1.46	0.21	65
0.23	62	1.25	21	1.25	0.23	62
0.25	59	1.04	20	1.04	0.25	59
0.27	56	0.86	19	0.86	0.27	56
0.30	56	0.61	19	0.61	0.30	56
0.32	68	0.52	23	0.52	0.32	0
0.34	65	0.46	22			
0.36	74	0.32	25			
				Max. Volts	2.51	
				Max. Depth (%)	74.00	
				Length (in.)	0.71	
				Avg. Depth (%)	61.56	

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.36	0	0.00	0	0.00	-0.36	0
-0.34	38	0.21	13	0.21	-0.34	38
-0.31	52	0.51	18	0.51	-0.31	52
-0.29	55	0.83	19	0.83	-0.29	55
-0.27	61	1.01	21	1.01	-0.27	61
-0.25	67	1.14	23	1.14	-0.25	67
-0.23	61	1.44	21	1.44	-0.23	61
-0.20	61	1.65	21	1.65	-0.20	61
-0.18	64	1.85	22	1.85	-0.18	64
-0.16	61	2.06	21	2.06	-0.16	61
-0.14	61	2.19	21	2.19	-0.14	61
-0.12	67	2.25	23	2.25	-0.12	67
-0.10	70	2.33	24	2.33	-0.10	70
-0.07	64	2.45	22	2.45	-0.07	64
-0.05	61	2.43	21	2.43	-0.05	61
-0.03	67	2.20	23	2.20	-0.03	67
-0.01	70	1.95	24	1.95	-0.01	70
0.01	67	1.76	23	1.76	0.01	67
0.03	67	1.63	23	1.63	0.03	67
0.06	67	1.62	23	1.62	0.06	67
0.08	70	1.60	24	1.60	0.08	70
0.10	73	1.65	25	1.65	0.10	73
0.12	67	1.90	23	1.90	0.12	67
0.14	64	2.11	22	2.11	0.14	64
0.17	67	1.96	23	1.96	0.17	67
0.19	67	1.82	23	1.82	0.19	67
0.21	64	1.76	22	1.76	0.21	64
0.23	61	1.59	21	1.59	0.23	61
0.25	64	1.42	22	1.42	0.25	64
0.27	61	1.21	21	1.21	0.27	61
0.30	58	1.01	20	1.01	0.30	58
0.32	55	0.84	19	0.84	0.32	55
0.34	55	0.65	19	0.65	0.34	55
0.36	67	0.50	23	0.50	0.36	0
0.38	64	0.45	22			
0.40	0	0.00	0			
				Max. Volts	2.45	
				Max. Depth (%)	73.00	
				Length (in.)	0.72	
				Avg. Depth (%)	60.82	

Table C-31(continued)
Sample 6 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.43	94	0.07	39			
-0.40	92	0.07	27			
-0.38	77	0.09	22			
-0.36	99	0.11	32	0.11	-0.36	0
-0.34	34	0.24	10	0.24	-0.34	34
-0.32	53	0.52	15	0.52	-0.32	53
-0.30	57	0.84	16	0.84	-0.30	57
-0.27	63	1.03	18	1.03	-0.27	63
-0.25	60	1.18	17	1.18	-0.25	60
-0.23	60	1.50	17	1.50	-0.23	60
-0.21	60	1.73	17	1.73	-0.21	60
-0.19	63	1.92	18	1.92	-0.19	63
-0.16	63	2.12	18	2.12	-0.16	63
-0.14	63	2.26	18	2.26	-0.14	63
-0.12	67	2.32	19	2.32	-0.12	67
-0.10	70	2.42	20	2.42	-0.10	70
-0.08	63	2.52	18	2.52	-0.08	63
-0.06	57	2.51	16	2.51	-0.06	57
-0.03	63	2.27	18	2.27	-0.03	63
-0.01	67	2.00	19	2.00	-0.01	67
0.01	60	1.82	17	1.82	0.01	60
0.03	57	1.70	16	1.70	0.03	57
0.05	60	1.69	17	1.69	0.05	60
0.08	63	1.69	18	1.69	0.08	63
0.10	67	1.77	19	1.77	0.10	67
0.12	60	2.02	17	2.02	0.12	60
0.14	57	2.22	16	2.22	0.14	57
0.16	60	2.08	17	2.08	0.16	60
0.18	63	1.93	18	1.93	0.18	63
0.21	60	1.85	17	1.85	0.21	60
0.23	60	1.65	17	1.65	0.23	60
0.25	63	1.48	18	1.48	0.25	63
0.27	60	1.29	17	1.29	0.27	60
0.29	57	1.07	16	1.07	0.29	57
0.31	53	0.91	15	0.91	0.31	53
0.34	49	0.71	14	0.71	0.34	49
0.36	49	0.53	14	0.53	0.36	49
0.38	0	0.55	0	0.55	0.38	0
0.40	53.5	0.29	15.5			
Max. Volts				2.52		
Max. Depth (%)				70.00		
Length (in.)				0.74		
Avg. Depth (%)				57.82		

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.39	0	0.00	16			
-0.37	77	0.17	26	0.17	-0.37	0
-0.35	64	0.29	22	0.29	-0.35	64
-0.33	61	0.46	21	0.46	-0.33	61
-0.30	58	0.64	20	0.64	-0.30	58
-0.28	55	0.88	19	0.88	-0.28	55
-0.26	58	1.06	20	1.06	-0.26	58
-0.24	64	1.27	22	1.27	-0.24	64
-0.22	64	1.47	22	1.47	-0.22	64
-0.20	64	1.62	22	1.62	-0.20	64
-0.18	64	1.80	22	1.80	-0.18	64
-0.16	67	1.87	23	1.87	-0.16	67
-0.13	67	2.00	23	2.00	-0.13	67
-0.11	64	2.12	22	2.12	-0.11	64
-0.09	64	1.90	22	1.90	-0.09	64
-0.07	77	1.65	26	1.65	-0.07	77
-0.05	70	1.64	24	1.64	-0.05	70
-0.03	67	1.65	23	1.65	-0.03	67
-0.01	67	1.67	23	1.67	-0.01	67
0.01	67	1.82	23	1.82	0.01	67
0.04	70	2.02	24	2.02	0.04	70
0.06	64	2.27	22	2.27	0.06	64
0.08	64	2.45	22	2.45	0.08	64
0.10	64	2.48	22	2.48	0.10	64
0.12	70	2.37	24	2.37	0.12	70
0.14	64	2.28	22	2.28	0.14	64
0.16	64	2.21	22	2.21	0.16	64
0.18	61	2.05	21	2.05	0.18	61
0.21	64	1.85	22	1.85	0.21	64
0.23	61	1.66	21	1.66	0.23	61
0.25	64	1.42	22	1.42	0.25	64
0.27	67	1.14	23	1.14	0.27	67
0.29	61	0.99	21	0.99	0.29	61
0.31	51	0.78	18	0.78	0.31	51
0.33	51	0.47	18	0.47	0.33	51
0.35	42	0.20	15	0.20	0.35	42
0.38	83	0.09	28	0.09	0.38	0
0.40	90	0.08	30			
0.42	97	0.08	37			
0.44	0	0.00	41			
Max. Volts				2.48		
Max. Depth (%)				77.00		
Length (in.)				0.75		
Avg. Depth (%)				60.89		

Table C-32
Sample 6 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.46	98	0.04	36			
-0.44	87	0.06	29			
-0.42	97	0.07	32			
-0.40	74	0.14	25			
-0.37	62	0.17	21			
-0.35	62	0.31	21	0.31	-0.35	0
-0.33	43	0.66	15	0.66	-0.33	43
-0.31	56	0.89	19	0.89	-0.31	56
-0.29	65	1.02	22	1.02	-0.29	65
-0.27	68	1.18	23	1.18	-0.27	68
-0.25	65	1.38	22	1.38	-0.25	65
-0.22	65	1.52	22	1.52	-0.22	65
-0.20	65	1.62	22	1.62	-0.20	65
-0.18	65	1.65	22	1.65	-0.18	65
-0.16	62	1.70	21	1.70	-0.16	62
-0.14	59	1.74	20	1.74	-0.14	59
-0.12	59	1.80	20	1.80	-0.12	59
-0.10	65	1.84	22	1.84	-0.10	65
-0.08	65	1.95	22	1.95	-0.08	65
-0.05	65	1.99	22	1.99	-0.05	65
-0.03	68	1.89	23	1.89	-0.03	68
-0.01	65	1.81	22	1.81	-0.01	65
0.01	62	1.81	21	1.81	0.01	62
0.03	62	1.85	21	1.85	0.03	62
0.05	65	1.83	22	1.83	0.05	65
0.07	68	1.64	23	1.64	0.07	68
0.09	65	1.44	22	1.44	0.09	65
0.12	62	1.30	21	1.30	0.12	62
0.14	59	1.23	20	1.23	0.14	59
0.16	56	1.25	19	1.25	0.16	56
0.18	59	1.29	20	1.29	0.18	59
0.20	56	1.32	19	1.32	0.20	56
0.22	56	1.24	19	1.24	0.22	56
0.24	62	1.03	21	1.03	0.24	62
0.26	59	0.89	20	0.89	0.26	59
0.29	46	0.81	16	0.81	0.29	46
0.31	43	0.64	15	0.64	0.31	43
0.33	43	0.44	15	0.44	0.33	43
0.35	37	0.25	13	0.25	0.35	37
0.37	62	0.13	21	0.13	0.37	0
0.39	46	0.12	16			
0.41	43	0.10	15			
				Max. Volts		1.99
				Max. Depth (%)		68.00
				Length (in.)		0.72
				Avg. Depth (%)		57.86

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.37	0	0.00	0			
-0.34	55	0.31	19	0.31	-0.34	0
-0.32	47	0.64	16	0.64	-0.32	47
-0.30	55	0.87	19	0.87	-0.30	55
-0.28	64	0.99	22	0.99	-0.28	64
-0.26	67	1.15	23	1.15	-0.26	67
-0.23	64	1.34	22	1.34	-0.23	64
-0.21	64	1.48	22	1.48	-0.21	64
-0.19	64	1.58	22	1.58	-0.19	64
-0.17	64	1.61	22	1.61	-0.17	64
-0.15	61	1.65	21	1.65	-0.15	61
-0.13	58	1.70	20	1.70	-0.13	58
-0.10	58	1.75	20	1.75	-0.10	58
-0.08	64	1.79	22	1.79	-0.08	64
-0.06	64	1.90	22	1.90	-0.06	64
-0.04	64	1.94	22	1.94	-0.04	64
-0.02	67	1.84	23	1.84	-0.02	67
0.00	64	1.76	22	1.76	0.00	64
0.03	61	1.76	21	1.76	0.03	61
0.05	61	1.80	21	1.80	0.05	61
0.07	64	1.78	22	1.78	0.07	64
0.09	67	1.59	23	1.59	0.09	67
0.11	64	1.40	22	1.40	0.11	64
0.13	61	1.27	21	1.27	0.13	61
0.16	58	1.20	20	1.20	0.16	58
0.18	55	1.21	19	1.21	0.18	55
0.20	58	1.26	20	1.26	0.20	58
0.22	55	1.28	19	1.28	0.22	55
0.24	55	1.21	19	1.21	0.24	55
0.26	61	1.00	21	1.00	0.26	61
0.29	58	0.86	20	0.86	0.29	58
0.31	47	0.79	16	0.79	0.31	47
0.33	44	0.62	15	0.62	0.33	44
0.35	44	0.42	15	0.42	0.35	44
0.37	0	0.00	0	0.00	0.37	0
				Max. Volts		1.94
				Max. Depth (%)		67.00
				Length (in.)		0.71
				Avg. Depth (%)		57.87

Table C-32 (continued)
Sample 6 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾	
-0.42	92	0.06	27				
-0.40	80	0.08	23				
-0.38	63	0.16	18	0.16	-0.38	0	
-0.36	53	0.18	15	0.18	-0.36	53	
-0.33	53	0.32	15	0.32	-0.33	53	
-0.31	49	0.64	14	0.64	-0.31	49	
-0.29	49	0.90	14	0.90	-0.29	49	
-0.27	67	1.00	19	1.00	-0.27	67	
-0.25	70	1.16	20	1.16	-0.25	70	
-0.23	67	1.36	19	1.36	-0.23	67	
-0.20	67	1.50	19	1.50	-0.20	67	
-0.18	63	1.61	18	1.61	-0.18	63	
-0.16	63	1.64	18	1.64	-0.16	63	
-0.14	60	1.69	17	1.69	-0.14	60	
-0.12	60	1.74	17	1.74	-0.12	60	
-0.10	60	1.79	17	1.79	-0.10	60	
-0.07	63	1.82	18	1.82	-0.07	63	
-0.05	63	1.93	18	1.93	-0.05	63	
-0.03	53	1.96	15	1.96	-0.03	53	
-0.01	53	1.86	15	1.86	-0.01	53	
0.01	67	1.78	19	1.78	0.01	67	
0.03	63	1.78	18	1.78	0.03	63	
0.06	57	1.84	16	1.84	0.06	57	
0.08	63	1.80	18	1.80	0.08	63	
0.10	67	1.64	19	1.64	0.10	67	
0.12	63	1.44	18	1.44	0.12	63	
0.14	60	1.31	17	1.31	0.14	60	
0.17	57	1.23	16	1.23	0.17	57	
0.19	53	1.24	15	1.24	0.19	53	
0.21	53	1.28	15	1.28	0.21	53	
0.23	57	1.30	16	1.30	0.23	57	
0.25	57	1.22	16	1.22	0.25	57	
0.27	63	1.02	18	1.02	0.27	63	
0.30	60	0.87	17	0.87	0.30	60	
0.32	53	0.81	15	0.81	0.32	53	
0.34	46	0.65	13	0.65	0.34	46	
0.36	42	0.44	12	0.44	0.36	42	
0.38	31	0.26	9	0.26	0.38	31	
0.40	34	0.16	10	0.16	0.40	0	
				Max. Volts	1.96		
				Max. Depth (%)	70.00		
				Length (in.)	0.78		
				Avg. Depth (%)	56.56		

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾	
-0.43	0	0.00	174				
-0.41	91	0.06	47				
-0.39	94	0.09	31				
-0.37	87	0.10	29				
-0.35	80	0.14	27				
-0.33	51	0.36	18	0.36	-0.33	0	
-0.31	42	0.66	15	0.66	-0.31	42	
-0.28	48	0.82	17	0.82	-0.28	48	
-0.26	58	0.90	20	0.90	-0.26	58	
-0.24	61	1.05	21	1.05	-0.24	61	
-0.22	55	1.24	19	1.24	-0.22	55	
-0.20	55	1.31	19	1.31	-0.20	55	
-0.18	58	1.28	20	1.28	-0.18	58	
-0.16	58	1.24	20	1.24	-0.16	58	
-0.14	58	1.23	20	1.23	-0.14	58	
-0.12	61	1.31	21	1.31	-0.12	61	
-0.09	64	1.46	22	1.46	-0.09	64	
-0.07	67	1.65	23	1.65	-0.07	67	
-0.05	64	1.82	22	1.82	-0.05	64	
-0.03	61	1.80	21	1.80	-0.03	61	
-0.01	64	1.80	22	1.80	-0.01	64	
0.01	64	1.81	22	1.81	0.01	64	
0.03	67	1.89	23	1.89	0.03	67	
0.05	64	1.97	22	1.97	0.05	64	
0.07	64	1.92	22	1.92	0.07	64	
0.10	64	1.81	22	1.81	0.10	64	
0.12	58	1.77	20	1.77	0.12	58	
0.14	61	1.73	21	1.73	0.14	61	
0.16	61	1.68	21	1.68	0.16	61	
0.18	64	1.64	22	1.64	0.18	64	
0.20	64	1.60	22	1.60	0.20	64	
0.22	64	1.48	22	1.48	0.22	64	
0.24	64	1.34	22	1.34	0.24	64	
0.27	67	1.15	23	1.15	0.27	67	
0.29	61	0.99	21	0.99	0.29	61	
0.31	51	0.85	18	0.85	0.31	51	
0.33	48	0.60	17	0.60	0.33	48	
0.35	58	0.29	20	0.29	0.35	0	
0.37	61	0.16	21				
0.39	77	0.13	26				
0.41	83	0.08	28				
0.43	97	0.06	32				
0.46	0	0.00	28				
				Max. Volts	1.97		
				Max. Depth (%)	67.00		
				Length (in.)	0.69		
				Avg. Depth (%)	58.19		

Table C-33
Sample 6 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.26	56	0.13	19			
-0.24	43	0.15	15	0.15	-0.24	0
-0.21	34	0.25	12	0.25	-0.21	34
-0.19	34	0.55	12	0.55	-0.19	34
-0.17	43	0.86	15	0.86	-0.17	43
-0.15	52	1.02	18	1.02	-0.15	52
-0.13	59	1.15	20	1.15	-0.13	59
-0.11	59	1.26	20	1.26	-0.11	59
-0.09	59	1.28	20	1.28	-0.09	59
-0.07	59	1.17	20	1.17	-0.07	59
-0.04	62	0.97	21	0.97	-0.04	62
-0.02	68	0.86	23	0.86	-0.02	68
0.00	65	0.81	22	0.81	0.00	65
0.02	74	0.91	25	0.91	0.02	74
0.04	65	1.13	22	1.13	0.04	65
0.06	59	1.35	20	1.35	0.06	59
0.08	56	1.46	19	1.46	0.08	56
0.10	56	1.49	19	1.49	0.10	56
0.13	52	1.46	18	1.46	0.13	52
0.15	52	1.32	18	1.32	0.15	52
0.17	56	1.11	19	1.11	0.17	56
0.19	52	0.87	18	0.87	0.19	52
0.21	52	0.64	18	0.64	0.21	52
0.23	49	0.55	17	0.55	0.23	49
0.25	43	0.58	15	0.58	0.25	43
0.27	43	0.52	15	0.52	0.27	43
0.30	65	0.30	22	0.30	0.30	0
0.32	74	0.14				
0.34	52	0.08				
				Max. Volts	1.49	
				Max. Depth (%)	74.00	
				Length (in.)	0.54	
				Avg. Depth (%)	51.09	

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.22	0	0.00	0	0.00	-0.22	0
-0.20	32	0.52	11	0.52	-0.20	32
-0.18	44	0.84	15	0.84	-0.18	44
-0.15	52	0.99	18	0.99	-0.15	52
-0.13	58	1.12	20	1.12	-0.13	58
-0.11	58	1.23	20	1.23	-0.11	58
-0.09	58	1.25	20	1.25	-0.09	58
-0.07	58	1.13	20	1.13	-0.07	58
-0.05	61	0.95	21	0.95	-0.05	61
-0.02	67	0.84	23	0.84	-0.02	67
0.00	64	0.79	22	0.79	0.00	64
0.02	73	0.88	25	0.88	0.02	73
0.04	64	1.10	22	1.10	0.04	64
0.06	58	1.31	20	1.31	0.06	58
0.08	55	1.43	19	1.43	0.08	55
0.11	55	1.45	19	1.45	0.11	55
0.13	52	1.43	18	1.43	0.13	52
0.15	52	1.29	18	1.29	0.15	52
0.17	55	1.08	19	1.08	0.17	55
0.19	52	0.85	18	0.85	0.19	52
0.21	52	0.62	18	0.62	0.21	52
0.24	49	0.53	17	0.53	0.24	49
0.26	44	0.57	15	0.57	0.26	44
0.28	44	0.51	15	0.51	0.28	44
0.30	64	0.29	22	0.29	0.30	0
0.32	0	0.00	0			
				Max. Volts	1.45	
				Max. Depth (%)	73.00	
				Length (in.)	0.52	
				Avg. Depth (%)	52.53	

**Table C-33(continued)
Sample 6 - 4H
Laboratory Specimen NDE Analysis**

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.25	38	0.14	11	0.14	-0.25	0
-0.23	31	0.25	9	0.25	-0.23	31
-0.21	38	0.55	11	0.55	-0.21	38
-0.19	42	0.86	12	0.86	-0.19	42
-0.17	53	1.01	15	1.01	-0.17	53
-0.14	59	1.13	16	1.13	-0.14	59
-0.12	60	1.24	17	1.24	-0.12	60
-0.10	57	1.25	15	1.25	-0.10	57
-0.08	57	1.15	15	1.15	-0.08	57
-0.06	58	0.98	15	0.98	-0.06	58
-0.03	64	0.87	16	0.87	-0.03	64
-0.01	65	0.84	16	0.84	-0.01	65
0.01	65	0.94	17	0.94	0.01	65
0.03	60	1.16	19	1.16	0.03	60
0.05	53	1.37	17	1.37	0.05	53
0.07	52	1.48	16	1.48	0.07	52
0.10	53	1.51	14	1.51	0.10	53
0.12	51	1.48	15	1.48	0.12	51
0.14	51	1.33	14	1.33	0.14	51
0.16	53	1.15	15	1.15	0.16	53
0.18	49	0.89	14	0.89	0.18	49
0.20	53	0.63	15	0.63	0.20	53
0.23	49	0.57	14	0.57	0.23	49
0.25	46	0.59	13	0.59	0.25	46
0.27	49	0.44	14	0.44	0.27	49
0.29	77	0.21	22	0.21	0.29	0
0.31	83	0.12	24			
0.33	49	0.08	14			
				Max. Volts	1.51	
				Max. Depth (%)	65.00	
				Length (in.)	0.54	
				Avg. Depth (%)	51.05	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.33	0	0.00	8			
-0.31	45	0.09	16			
-0.29	67	0.15	23			
-0.27	61	0.33	21	0.33	-0.27	0
-0.25	45	0.51	16	0.51	-0.25	45
-0.23	45	0.57	16	0.57	-0.23	45
-0.21	51	0.55	18	0.55	-0.21	51
-0.18	51	0.67	18	0.67	-0.18	51
-0.16	51	0.90	18	0.90	-0.16	51
-0.14	55	1.14	19	1.14	-0.14	55
-0.12	51	1.34	18	1.34	-0.12	51
-0.10	51	1.46	18	1.46	-0.10	51
-0.08	55	1.48	19	1.48	-0.08	55
-0.06	58	1.44	20	1.44	-0.06	58
-0.04	61	1.29	21	1.29	-0.04	61
-0.02	67	1.09	23	1.09	-0.02	67
0.01	74	0.89	25	0.89	0.01	74
0.03	70	0.81	24	0.81	0.03	70
0.05	64	0.87	22	0.87	0.05	64
0.07	61	0.99	21	0.99	0.07	61
0.09	58	1.17	20	1.17	0.09	58
0.11	58	1.27	20	1.27	0.11	58
0.13	58	1.24	20	1.24	0.13	58
0.15	58	1.13	20	1.13	0.15	58
0.18	48	0.99	17	0.99	0.18	48
0.20	42	0.81	15	0.81	0.20	42
0.22	36	0.50	13	0.50	0.22	36
0.24	33	0.23	12	0.23	0.24	33
0.26	0	0.15	15	0.00	0.26	0
				Max. Volts	1.48	
				Max. Depth (%)	74.00	
				Length (in.)	0.53	
				Avg. Depth (%)	52.39	

Table C-34
Sample 6 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
					-0.28	0
-0.26	14	0.14	5	0.14	-0.26	14
-0.24	31	0.27	11	0.27	-0.24	31
-0.22	40	0.5	14	0.50	-0.22	40
-0.2	43	0.77	15	0.77	-0.20	43
-0.18	52	0.92	18	0.92	-0.18	52
-0.16	56	0.99	19	0.99	-0.16	56
-0.13	56	1.04	19	1.04	-0.13	56
-0.11	52	1.03	18	1.03	-0.11	52
-0.09	56	1.04	19	1.04	-0.09	56
-0.07	56	1.01	19	1.01	-0.07	56
-0.05	49	1	17	1.00	-0.05	49
-0.03	65	0.89	22	0.89	-0.03	65
-0.01	71	0.78	24	0.78	-0.01	71
0.01	62	0.83	21	0.83	0.01	62
0.03	59	1.01	20	1.01	0.03	59
0.05	56	1.2	19	1.20	0.05	56
0.07	59	1.27	20	1.27	0.07	59
0.1	62	1.3	21	1.30	0.10	62
0.12	62	1.26	21	1.26	0.12	62
0.14	62	1.22	21	1.22	0.14	62
0.16	62	1.08	21	1.08	0.16	62
0.18	62	1	21	1.00	0.18	62
0.2	62	0.82	21	0.82	0.20	62
0.22	59	0.63	20	0.63	0.22	59
0.24	59	0.38	20	0.38	0.24	59
0.26	49	0.2	17	0.20	0.26	49
0.3	46	0.24	16	0.24	0.30	46
0.33	43	0.26	15	0.26	0.33	43
0.35	49	0.16	17	0.16	0.35	0
				Max. Volts	1.30	
				Max. Depth (%)	71.00	
				Length (in.)	0.63	
				Avg. Depth (%)	51.84	

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.24	0	0.00	0			
-0.22	32	0.26	11	0.26	-0.22	0
-0.20	41	0.49	14	0.49	-0.20	41
-0.18	44	0.75	15	0.75	-0.18	44
-0.15	52	0.90	18	0.90	-0.15	52
-0.13	58	0.97	20	0.97	-0.13	58
-0.11	58	1.02	20	1.02	-0.11	58
-0.09	58	1.00	20	1.00	-0.09	58
-0.07	55	1.02	19	1.02	-0.07	55
-0.05	55	0.98	19	0.98	-0.05	55
-0.03	49	0.97	17	0.97	-0.03	49
0.00	64	0.86	22	0.86	0.00	64
0.02	70	0.76	24	0.76	0.02	70
0.04	61	0.81	21	0.81	0.04	61
0.06	58	0.98	20	0.98	0.06	58
0.08	55	1.17	19	1.17	0.08	55
0.10	58	1.24	20	1.24	0.10	58
0.12	61	1.26	21	1.26	0.12	61
0.15	61	1.23	21	1.23	0.15	61
0.17	61	1.19	21	1.19	0.17	61
0.19	61	1.05	21	1.05	0.19	61
0.21	61	0.98	21	0.98	0.21	61
0.23	61	0.80	21	0.80	0.23	61
0.25	58	0.62	20	0.62	0.25	58
0.27	58	0.37	20	0.37	0.27	58
0.29	49	0.20	17	0.20	0.29	49
0.32	61	0.17	21	0.17	0.32	0
0.34	47	0.24	16			
0.36	0	0.00	0			
				Max. Volts	1.26	
				Max. Depth (%)	70.00	
				Length (in.)	0.54	
				Avg. Depth (%)	54.15	

Table C-34(continued)
Sample 6 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.22	34	0.24	10	0.24	-0.24	0.00
-0.20	38	0.50	11	0.50	-0.20	34.00
-0.18	46	0.76	13	0.76	-0.18	46.00
-0.16	53	0.91	15	0.91	-0.16	53.00
-0.14	63	0.98	18	0.98	-0.14	63.00
-0.12	60	1.03	17	1.03	-0.12	60.00
-0.09	63	1.03	18	1.03	-0.09	63.00
-0.07	60	1.05	17	1.05	-0.07	60.00
-0.05	57	1.05	16	1.05	-0.05	57.00
-0.03	49	1.05	14	1.05	-0.03	49.00
-0.01	49	0.95	14	0.95	-0.01	49.00
0.01	67	0.83	19	0.83	0.01	67.00
0.03	57	0.87	16	0.87	0.03	57.00
0.06	53	1.04	15	1.04	0.06	53.00
0.08	53	1.23	15	1.23	0.08	53.00
0.10	53	1.31	15	1.31	0.10	53.00
0.12	60	1.35	17	1.35	0.12	60.00
0.14	60	1.31	17	1.31	0.14	60.00
0.16	60	1.28	17	1.28	0.16	60.00
0.18	60	1.14	17	1.14	0.18	60.00
0.21	60	1.02	17	1.02	0.21	60.00
0.23	53	0.84	15	0.84	0.23	53.00
0.25	60	0.62	17	0.62	0.25	60.00
0.27	63	0.37	18	0.37	0.27	63.00
0.29	49	0.24	14	0.24	0.29	49.00
0.31	63	0.17	18	0.17	0.31	63.00
0.33	42	0.23	12	0.23	0.33	42.00
0.36	34	0.24	10	0.24	0.36	34.00
0.38	49	0.14	14	0.14	0.38	0.00
				Max. Volts	1.35	
				Max. Depth (%)	67.00	
				Length (in.)	0.62	
				Avg. Depth (%)	52.46	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.40	0	0.00	28			
-0.38	64	0.08	22			
-0.35	45	0.17	16	0.17	-0.35	0
-0.33	39	0.25	14	0.25	-0.33	39
-0.31	48	0.23	17	0.23	-0.31	48
-0.29	61	0.18	21	0.18	-0.29	61
-0.27	51	0.23	18	0.23	-0.27	51
-0.25	58	0.42	20	0.42	-0.25	58
-0.23	58	0.65	20	0.65	-0.23	58
-0.21	64	0.83	22	0.83	-0.21	64
-0.19	61	1.01	21	1.01	-0.19	61
-0.17	64	1.10	22	1.10	-0.17	64
-0.15	61	1.22	21	1.22	-0.15	61
-0.12	61	1.26	21	1.26	-0.12	61
-0.10	61	1.28	21	1.28	-0.10	61
-0.08	58	1.25	20	1.25	-0.08	58
-0.06	55	1.15	19	1.15	-0.06	55
-0.04	58	0.98	20	0.98	-0.04	58
-0.02	64	0.81	22	0.81	-0.02	64
0.00	67	0.79	23	0.79	0.00	67
0.02	61	0.90	21	0.90	0.02	61
0.04	55	0.99	19	0.99	0.04	55
0.06	58	1.00	20	1.00	0.06	58
0.08	55	1.03	19	1.03	0.08	55
0.10	55	1.02	19	1.02	0.10	55
0.12	55	1.03	19	1.03	0.12	55
0.15	55	0.97	19	0.97	0.15	55
0.17	51	0.88	18	0.88	0.17	51
0.19	42	0.73	15	0.73	0.19	42
0.21	39	0.47	14	0.47	0.21	39
0.23	30	0.25	11	0.25	0.23	30
0.25	11	0.14	4	0.00	0.25	0
0.27	0	0.00	353			
				Max. Volts	1.28	
				Max. Depth (%)	67.00	
				Length (in.)	0.60	
				Avg. Depth (%)	53.43	

Table C-35
Sample 7 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.20	14	0.37	5	0	-0.22	0
-0.17	11	0.39	4	0	-0.17	11
-0.15	5	0.46	2	0	-0.15	5
-0.13	3	0.58	1	1	-0.13	3
-0.11	11	0.67	4	1	-0.11	11
-0.09	23	0.76	8	1	-0.09	23
-0.07	23	0.81	8	1	-0.07	23
-0.05	20	0.95	7	1	-0.05	20
-0.02	14	1.08	5	1	-0.02	14
0.00	14	1.24	5	1	0.00	14
0.02	20	1.21	7	1	0.02	20
0.04	20	1.14	7	1	0.04	20
0.06	23	1.08	8	1	0.06	23
0.08	25	0.96	9	1	0.08	25
0.10	28	0.83	10	1	0.10	28
0.12	28	0.72	10	1	0.12	28
0.15	25	0.57	9	1	0.15	25
0.17	20	0.46	7	0	0.17	20
0.19	14	0.41	5	0	0.19	14
0.21	14	0.32	5	0	0.21	14
0.23	14	0.27	5	0	0.23	14
0.25	0	0.24	358	0	0.25	0
				Max. Volts	1.24	
				Max. Depth (%)	28.00	
				Length (in.)	0.47	
				Avg. Depth (%)	16.89	

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.14	0	0.00	0			
-0.12	3	0.57	1	0.57	-0.12	0
-0.10	11	0.66	4	0.66	-0.10	11
-0.08	23	0.74	8	0.74	-0.08	23
-0.05	23	0.79	8	0.79	-0.05	23
-0.03	20	0.92	7	0.92	-0.03	20
-0.01	14	1.05	5	1.05	-0.01	14
0.01	14	1.20	5	1.20	0.01	14
0.03	20	1.18	7	1.18	0.03	20
0.05	20	1.11	7	1.11	0.05	20
0.08	23	1.05	8	1.05	0.08	23
0.10	26	0.93	9	0.93	0.10	26
0.12	29	0.81	10	0.81	0.12	29
0.14	29	0.70	10	0.70	0.14	29
0.16	26	0.58	9	0.58	0.16	26
0.18	0	0.00	0	0.00	0.18	0
				Max. Volts	1.20	
				Max. Depth (%)	29.00	
				Length (in.)	0.30	
				Avg. Depth (%)	20.02	

Table C-35(continued)
Sample 7 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.12	8	0.57	4	-0.12	8	0.57	-0.12	4
-0.10	44	0.49	13	-0.10	44	0.49	-0.10	24
-0.08	24	0.64	8	-0.08	24	0.64	-0.08	13
-0.06	44	0.53	13	-0.06	44	0.53	-0.06	24
-0.04	42	0.42	12	-0.04	42	0.42	-0.04	23
-0.01	26	0.68	8	-0.01	26	0.68	-0.01	14
0.01	45	0.46	13	0.01	45	0.46	0.01	25
0.03	24	0.64	8	0.03	24	0.64	0.03	13
0.05	38	0.61	11	0.05	38	0.61	0.05	20
0.08	25	0.75	8	0.08	25	0.75	0.08	13
0.10	39	0.53	11	0.10	39	0.53	0.10	21
0.12	38	0.47	11	0.12	38	0.47	0.12	20
0.14	23	0.39	7	0.14	23	0.39	0.14	12
0.16	8	0.26	4	0.16	8	0.26	0.16	4
				0.18	0	0.00	0.18	0
Max. Volts				0.75		0.75		
Max. Depth (%)				45		45.00		
Length (in.)				0.32		0.32		
Avg. Depth (%)				28.77		28.66		

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽¹⁾	
-0.19	0	0.00	0	0.00	-0.19	0	
-0.17	19	0.47	7	0.47	-0.17	19	
-0.14	25	0.58	9	0.58	-0.14	25	
-0.12	27	0.73	10	0.73	-0.12	27	
-0.10	27	0.85	10	0.85	-0.10	27	
-0.08	22	0.97	8	0.97	-0.08	22	
-0.06	22	1.09	8	1.09	-0.06	22	
-0.04	19	1.15	7	1.15	-0.04	19	
-0.02	19	1.21	7	1.21	-0.02	19	
0.00	16	1.19	6	1.19	0.00	16	
0.03	13	1.04	5	1.04	0.03	13	
0.05	22	0.90	8	0.90	0.05	22	
0.07	19	0.78	7	0.78	0.07	19	
0.09	22	0.73	8	0.73	0.09	22	
0.11	8	0.64	3	0.64	0.11	8	
0.13	2	0.55	1	0.55	0.13	2	
0.15	0	0.00	3	0.00	0.15	0	
0.30	0	0.00	183	0.00	0.30	0	
0.32	19	0.45	7	0.45	0.32	19	
0.35	22	0.56	8	0.56	0.35	22	
0.37	30	0.69	11	0.69	0.37	30	
0.39	33	0.79	12	0.79	0.39	33	
0.41	33	0.81	12	0.81	0.41	33	
0.43	27	0.67	10	0.67	0.43	27	
0.45	22	0.49	8	0.49	0.45	22	
0.47	22	0.28	8	0.28	0.47	22	
0.49	0	0.00	0	0.00	0.49	0	
Max. Volts				1.21			
Max. Depth (%)				33.00			
Length (in.)				0.68			
Avg. Depth (%)				15.25			

Table C-36
Sample 7 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.21	23	0.22	8					
-0.19	14	0.21	5	-0.19	0	0.21	-0.19	0
-0.17	5	0.22	2	-0.17	5	0.22	-0.17	3
-0.15	5	0.23	2	-0.15	5	0.23	-0.15	3
-0.13	8	0.27	3	-0.13	8	0.27	-0.13	5
-0.11	11	0.38	4	-0.11	11	0.38	-0.11	7
-0.09	20	0.52	7	-0.09	20	0.52	-0.09	13
-0.06	25	0.60	9	-0.06	25	0.60	-0.06	16
-0.04	25	0.65	9	-0.04	25	0.65	-0.04	16
-0.02	25	0.71	9	-0.02	25	0.71	-0.02	16
0.00	20	0.79	7	0.00	20	0.79	0.00	13
0.02	20	0.85	7	0.02	20	0.85	0.02	13
0.04	20	0.89	7	0.04	20	0.89	0.04	13
0.06	31	0.88	11	0.06	31	0.88	0.06	20
0.08	28	0.86	10	0.08	28	0.86	0.08	18
0.11	28	0.73	10	0.11	28	0.73	0.11	18
0.13	28	0.58	10	0.13	28	0.58	0.13	18
0.15	23	0.49	8	0.15	23	0.49	0.15	15
0.17	20	0.47	7	0.17	20	0.47	0.17	13
0.19	23	0.39	8	0.19	23	0.39	0.19	15
0.21	20	0.35	7	0.21	20	0.35	0.21	13
0.23	17	0.38	6	0.23	17	0.38	0.23	11
0.25	20	0.41	7	0.25	20	0.41	0.25	13
0.28	23	0.42	8	0.28	23	0.42	0.28	15
0.30	20	0.49	7	0.30	20	0.49	0.30	13
0.32	17	0.52	6	0.32	17	0.52	0.32	11
0.34	17	0.49	6	0.34	17	0.49	0.34	11
0.36	14	0.37	5	0.36	14	0.37	0.36	9
0.38	17	0.31	6	0.38	17	0.31	0.38	11
0.40	5	0.27	2	0.40	5	0.27	0.40	3
0.43	11	0.20	4	0.43	0	0.20	0.43	0
0.45	5	0.17	2					
Max. Volts				0.89		0.89		
Max. Depth (%)				31.00		20.00		
Length (in.)				0.62		0.62		
Avg. Depth (%)				18.46		11.91		

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.13	0	0.00	0	-0.13	0	0.00	-0.13	0
-0.11	11	0.37	4	-0.11	11	0.37	-0.11	11
-0.08	20	0.50	7	-0.08	20	0.50	-0.08	20
-0.06	26	0.59	9	-0.06	26	0.59	-0.06	26
-0.04	26	0.63	9	-0.04	26	0.63	-0.04	26
-0.02	26	0.69	9	-0.02	26	0.69	-0.02	26
0.00	20	0.77	7	0.00	20	0.77	0.00	20
0.02	20	0.83	7	0.02	20	0.83	0.02	20
0.05	20	0.86	7	0.05	20	0.86	0.05	20
0.07	32	0.86	11	0.07	32	0.86	0.07	32
0.09	29	0.84	10	0.09	29	0.84	0.09	29
0.11	29	0.72	10	0.11	29	0.72	0.11	29
0.13	29	0.57	10	0.13	29	0.57	0.13	29
0.15	23	0.48	8	0.15	23	0.48	0.15	23
0.17	0	0.00	0	0.17	0	0.00	0.17	0
Max. Volts				0.86		0.86		
Max. Depth (%)				32.00		32.00		
Length (in.)				0.30		0.30		
Avg. Depth (%)				21.92		21.92		

Table C-36(continued)
Sample 7 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE						Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾	
-0.10	0	0.43	1	-0.10	0	0.43	-0.10	0	
-0.08	7	0.55	2	-0.08	7	0.55	-0.08	7	
-0.06	10	0.65	4	-0.06	10	0.65	-0.06	10	
-0.04	12	0.68	4	-0.04	12	0.68	-0.04	12	
-0.02	10	0.72	4	-0.02	10	0.72	-0.02	10	
0.01	5	0.84	2	0.01	5	0.84	0.01	5	
0.03	5	0.87	2	0.03	5	0.87	0.03	5	
0.05	5	0.90	2	0.05	5	0.90	0.05	5	
0.07	17	0.91	8	0.07	17	0.91	0.07	17	
0.09	17	0.88	6	0.09	17	0.88	0.09	17	
0.12	17	0.76	6	0.12	17	0.76	0.12	17	
0.14	17	0.62	7	0.14	17	0.62	0.14	17	
0.16	8	0.53	5	0.16	8	0.53	0.16	8	
0.18	5	0.52	4	0.18	5	0.52	0.18	5	
0.20	8	0.45	5	0.20	8	0.45	0.20	8	
0.22	10	0.39	6	0.22	10	0.39	0.22	10	
0.24	0	0.46	1	0.24	0	0.46	0.24	0	
Max. Volts					0.91	0.91			
Max. Depth (%)					17.00	17.00			
Length (in.)					0.34	0.34			
Avg. Depth (%)					9.72	9.72			

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE						Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾	
-0.23	0	0.00	7	-0.23	0	0.00	-0.23	0	
-0.21	25	0.34	9	-0.21	25	0.34	-0.21	20	
-0.19	22	0.40	8	-0.19	22	0.40	-0.19	18	
-0.17	19	0.47	7	-0.17	19	0.47	-0.17	15	
-0.15	22	0.50	8	-0.15	22	0.50	-0.15	18	
-0.13	27	0.60	10	-0.13	27	0.60	-0.13	22	
-0.10	27	0.75	10	-0.10	27	0.75	-0.10	22	
-0.08	27	0.85	10	-0.08	27	0.85	-0.08	22	
-0.06	22	0.87	8	-0.06	22	0.87	-0.06	18	
-0.04	19	0.87	7	-0.04	19	0.87	-0.04	15	
-0.02	19	0.83	7	-0.02	19	0.83	-0.02	15	
0.00	19	0.77	7	0.00	19	0.77	0.00	15	
0.02	25	0.68	9	0.02	25	0.68	0.02	20	
0.04	25	0.63	9	0.04	25	0.63	0.04	20	
0.06	25	0.58	9	0.06	25	0.58	0.06	20	
0.09	19	0.49	7	0.09	19	0.49	0.09	15	
0.11	11	0.36	4	0.11	11	0.36	0.11	9	
0.13	8	0.26	3	0.13	8	0.26	0.13	7	
0.15	0	0.00	2	0.15	0	0.00	0.15	0	
Max. Volts					0.87	0.87			
Max. Depth (%)					27.00	22.00			
Length (in.)					0.38	0.38			
Avg. Depth (%)					20.29	16.53			

Table C-37
Sample 8 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.36	92	0.02	45			
-0.34	99	0.03	35			
-0.32	99	0.05	34			
-0.29	98	0.06	37			
-0.27	84	0.08	28			
-0.25	77	0.14	26			
-0.23	43	0.26	15	0	-0.23	43
-0.21	31	0.45	11	0	-0.21	31
-0.19	37	0.60	13	1	-0.19	37
-0.17	37	0.77	13	1	-0.17	37
-0.15	43	0.99	15	1	-0.15	43
-0.13	49	1.10	17	1	-0.13	49
-0.11	49	1.02	17	1	-0.11	49
-0.08	56	0.81	19	1	-0.08	56
-0.06	71	0.71	24	1	-0.06	71
-0.04	68	0.79	23	1	-0.04	68
-0.02	68	0.93	23	1	-0.02	68
0.00	59	1.04	20	1	0.00	59
0.02	49	1.16	17	1	0.02	49
0.04	43	1.25	15	1	0.04	43
0.06	40	1.24	14	1	0.06	40
0.08	40	1.14	14	1	0.08	40
0.10	40	0.96	14	1	0.10	40
0.13	37	0.76	13	1	0.13	37
0.15	37	0.63	13	1	0.15	37
0.17	31	0.59	11	1	0.17	31
0.19	34	0.52	12	1	0.19	34
0.21	40	0.35	14	0	0.21	40
0.23	49	0.20	17	0	0.23	49
0.25	59	0.10	20			
0.27	37	0.07	13			
0.29	46	0.06	16			
*Reversed Sign	Max. Volts				1.25	
	Max. Depth (%)				71.00	
	Length (in.)				0.46	
	Avg. Depth (%)				43.67	

*Reversed Sign

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.23	0	0.00	0	0	-0.23	0
-0.21	23	0.44	8	0	-0.21	23
-0.19	32	0.59	11	1	-0.19	32
-0.17	38	0.75	13	1	-0.17	38
-0.15	44	0.96	15	1	-0.15	44
-0.13	49	1.07	17	1	-0.13	49
-0.10	49	0.99	17	1	-0.10	49
-0.08	55	0.78	19	1	-0.08	55
-0.06	70	0.69	24	1	-0.06	70
-0.04	67	0.77	23	1	-0.04	67
-0.02	67	0.90	23	1	-0.02	67
0.00	58	1.01	20	1	0.00	58
0.02	49	1.13	17	1	0.02	49
0.05	44	1.22	15	1	0.05	44
0.07	41	1.21	14	1	0.07	41
0.09	41	1.11	14	1	0.09	41
0.11	38	0.94	13	1	0.11	38
0.13	38	0.74	13	1	0.13	38
0.15	32	0.63	11	1	0.15	32
0.17	29	0.58	10	1	0.17	29
0.20	35	0.51	12	1	0.20	35
0.22	35	0.34	12	0	0.22	35
0.24	32	0.19	11	0	0.24	32
0.26	0	0.00	0	0	0.26	0
*Reversed Sign	Max. Volts				1.22	
	Max. Depth (%)				70.00	
	Length (in.)				0.49	
	Avg. Depth (%)				42.03	

Table C-37(continued)
Sample 8 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.30	92	0.06	27			
-0.28	99	0.07	32			
-0.26	57	0.11	16			
-0.24	49	0.16	14			
-0.22	31	0.27	9	0.27	-0.22	0
-0.20	14	0.44	5	0.44	-0.20	14
-0.17	27	0.60	8	0.60	-0.17	27
-0.15	34	0.80	10	0.80	-0.15	34
-0.13	48	1.00	14	1.00	-0.13	48
-0.11	48	1.12	13	1.12	-0.11	48
-0.09	46	1.05	13	1.05	-0.09	46
-0.07	57	0.81	16	0.81	-0.07	57
-0.04	73	0.70	21	0.70	-0.04	73
-0.02	70	0.78	20	0.78	-0.02	70
0.00	57	0.93	16	0.93	0.00	57
0.02	60	1.06	17	1.06	0.02	60
0.04	49	1.19	14	1.19	0.04	49
0.06	42	1.29	12	1.29	0.06	42
0.09	38	1.27	11	1.27	0.09	38
0.11	38	1.17	11	1.17	0.11	38
0.13	34	0.99	10	0.99	0.13	34
0.15	34	0.79	10	0.79	0.15	34
0.17	31	0.67	9	0.67	0.17	31
0.19	27	0.62	8	0.62	0.19	27
0.21	27	0.56	8	0.56	0.21	27
0.24	34	0.39	10	0.39	0.24	34
0.26	38	0.23	11	0.23	0.26	0
0.28	49	0.14	14			
0.30	23	0.13	7			
				Max. Volts		1.29
				Max. Depth (%)		73.00
				Length (in.)		0.48
				Avg. Depth (%)		40.25

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.32	0	0	26			
-0.3	83	0.05	28			
-0.28	94	0.06	31			
-0.26	90	0.08	30			
-0.24	61	0.1	21			
-0.22	45	0.16	16			
-0.20	30	0.31	11	0.31	-0.20	0
-0.18	22	0.48	8	0.48	-0.18	22
-0.16	38	0.63	13	0.63	-0.16	36
-0.13	42	0.81	15	0.81	-0.13	42
-0.11	48	0.99	17	0.99	-0.11	48
-0.09	48	1.07	17	1.07	-0.09	48
-0.07	48	0.97	17	0.97	-0.07	48
-0.05	58	0.78	20	0.78	-0.05	58
-0.03	70	0.72	24	0.72	-0.03	70
-0.01	64	0.81	22	0.81	-0.01	64
0.01	64	0.94	22	0.94	0.01	64
0.03	58	1.03	20	1.03	0.03	58
0.05	45	1.17	16	1.17	0.05	45
0.07	42	1.24	15	1.24	0.07	42
0.10	39	1.19	14	1.19	0.10	39
0.12	39	1.09	14	1.09	0.12	39
0.14	36	0.91	13	0.91	0.14	36
0.16	36	0.72	13	0.72	0.16	36
0.18	36	0.61	13	0.61	0.18	36
0.20	33	0.58	12	0.58	0.20	33
0.22	33	0.48	12	0.48	0.22	33
0.24	42	0.31	15	0.00	0.24	0
0.26	48	0.17	17			
0.28	33	0.09	12			
0.30	0	0.00	7			
				Max. Volts		1.24
				Max. Depth (%)		70.00
				Length (in.)		0.44
				Avg. Depth (%)		42.58

Table C-38
Sample 8 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.35	90	0.05	49			
-0.33	92	0.06	46			
-0.31	99	0.07	35			
-0.29	98	0.09	36			
-0.27	65	0.17	22	0.17	-0.27	0
-0.25	37	0.32	13	0.32	-0.25	37
-0.23	40	0.39	14	0.39	-0.23	40
-0.20	37	0.53	13	0.53	-0.20	37
-0.18	43	0.79	15	0.79	-0.18	43
-0.16	52	1.02	18	1.02	-0.16	52
-0.14	56	1.24	19	1.24	-0.14	56
-0.12	52	1.31	18	1.31	-0.12	52
-0.10	49	1.36	17	1.36	-0.10	49
-0.08	43	1.35	15	1.35	-0.08	43
-0.06	52	1.23	18	1.23	-0.06	52
-0.03	52	1.11	18	1.11	-0.03	52
-0.01	52	1.13	18	1.13	-0.01	52
0.01	56	1.14	19	1.14	0.01	56
0.03	56	1.08	19	1.08	0.03	56
0.05	56	1.05	19	1.05	0.05	56
0.07	49	1.10	17	1.10	0.07	49
0.09	49	1.06	17	1.06	0.09	49
0.11	43	0.79	15	0.79	0.11	43
0.14	49	0.44	17	0.44	0.14	49
0.16	43	0.19	15	0.19	0.16	43
0.18	31	0.13	11	0.13	0.18	31
0.20	46	0.11	16	0.11	0.20	0
0.22	74	0.08	25			
0.24	95	0.06	41			
0.26	94	0.04	43			
0.28	84	0.03	56			
				Max. Volts		1.36
				Max. Depth (%)		56.00
				Length (in.)		0.47
				Avg. Depth (%)		45.33

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽¹⁾
-0.25	0	0.00	0	0.00	-0.25	0
-0.22	23	0.40	8	0.40	-0.22	23
-0.20	32	0.53	11	0.53	-0.20	32
-0.18	41	0.78	14	0.78	-0.18	41
-0.16	52	1.01	18	1.01	-0.16	52
-0.14	55	1.21	19	1.21	-0.14	55
-0.12	52	1.28	18	1.28	-0.12	52
-0.09	49	1.32	17	1.32	-0.09	49
-0.07	44	1.31	15	1.31	-0.07	44
-0.05	52	1.20	18	1.20	-0.05	52
-0.03	52	1.08	18	1.08	-0.03	52
-0.01	52	1.10	18	1.10	-0.01	52
0.01	55	1.11	19	1.11	0.01	55
0.04	55	1.05	19	1.05	0.04	55
0.06	55	1.02	19	1.02	0.06	55
0.08	49	1.07	17	1.07	0.08	49
0.10	44	1.04	15	1.04	0.10	44
0.12	44	0.77	15	0.77	0.12	44
0.14	41	0.43	14	0.43	0.14	41
0.16	0	0.00	0	0.00	0.16	0
				Max. Volts		1.32
				Max. Depth (%)		55.00
				Length (in.)		0.41
				Avg. Depth (%)		44.17

Table C-38(continued)
Sample 8 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.37	88	0.05	47			
-0.35	80	0.06	23			
-0.33	89	0.08	26			
-0.31	98	0.10	33			
-0.28	67	0.17	19	0.17	-0.28	0
-0.26	31	0.32	9	0.32	-0.26	31
-0.24	34	0.39	10	0.39	-0.24	34
-0.22	34	0.53	10	0.53	-0.22	34
-0.20	42	0.77	12	0.77	-0.20	42
-0.18	53	1.01	15	1.01	-0.18	53
-0.15	57	1.22	16	1.22	-0.15	57
-0.13	49	1.30	14	1.30	-0.13	49
-0.11	49	1.34	14	1.34	-0.11	49
-0.09	42	1.33	12	1.33	-0.09	42
-0.07	49	1.23	14	1.23	-0.07	49
-0.05	57	1.13	16	1.13	-0.05	57
-0.03	53	1.15	15	1.15	-0.03	53
0.00	53	1.14	15	1.14	0.00	53
0.02	49	1.09	14	1.09	0.02	49
0.04	52	1.06	16	1.06	0.04	52
0.06	46	1.12	14	1.12	0.06	46
0.08	42	1.08	13	1.08	0.08	42
0.10	34	0.85	10	0.85	0.10	34
0.11	42	0.79	12	0.79	0.11	42
0.13	42	0.47	13	0.47	0.13	42
0.15	27	0.22	9	0.22	0.15	27
0.17	23	0.15	5	0.15	0.17	23
0.19	28	0.13	13	0.13	0.19	28
0.21	0	0.08	21	0.08	0.21	0
-0.24	69	0.07	20			
-0.26	92	0.04	27			

*Reversed Sign

Max. Volts	1.34
Max. Depth (%)	57.00
Length (in.)	0.49
Avg. Depth (%)	41.76

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.21	0	0.00	24	0.00	-0.21	0
-0.19	25	0.09	9	0.09	-0.19	25
-0.17	42	0.11	15	0.11	-0.17	42
-0.15	30	0.13	11	0.13	-0.15	30
-0.13	39	0.23	14	0.23	-0.13	39
-0.11	45	0.51	16	0.51	-0.11	45
-0.09	45	0.84	16	0.84	-0.09	45
-0.07	48	1.04	17	1.04	-0.07	48
-0.05	51	1.09	18	1.09	-0.05	51
-0.02	55	1.04	19	1.04	-0.02	55
0.00	55	1.09	19	1.09	0.00	55
0.02	55	1.13	19	1.13	0.02	55
0.04	55	1.10	19	1.10	0.04	55
0.06	58	1.12	20	1.12	0.06	58
0.08	48	1.24	17	1.24	0.08	48
0.10	42	1.33	15	1.33	0.10	42
0.12	48	1.33	17	1.33	0.12	48
0.14	55	1.26	19	1.26	0.14	55
0.17	55	1.19	19	1.19	0.17	55
0.19	48	0.97	17	0.97	0.19	48
0.21	39	0.72	14	0.72	0.21	39
0.23	36	0.50	13	0.50	0.23	36
0.25	36	0.38	13	0.38	0.25	36
0.27	39	0.28	14	0.28	0.27	39
0.29	70	0.15	24	0.15	0.29	0
0.31	99	0.09	35			
0.33	94	0.07	31			
0.36	89	0.06	49			
0.38	0	0.00	50			

Max. Volts	1.33
Max. Depth (%)	58.00
Length (in.)	0.50
Avg. Depth (%)	44.12

Table C-39
Sample 8 - 3H (continued)
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.30	92	0.06	27			
-0.28	70	0.15	20			
-0.26	31	0.28	9	0.28	-0.26	0
-0.24	23	0.33	7	0.33	-0.24	23
-0.22	23	0.39	7	0.39	-0.22	23
-0.20	31	0.52	9	0.52	-0.20	31
-0.17	27	0.6	8	0.60	-0.17	27
-0.15	31	0.74	9	0.74	-0.15	31
-0.13	46	0.97	13	0.97	-0.13	46
-0.11	49	1.18	14	1.18	-0.11	49
-0.09	50	1.37	14	1.37	-0.09	50
-0.07	55	1.38	16	1.38	-0.07	55
-0.04	51	1.33	14	1.33	-0.04	51
-0.02	50	1.29	14	1.29	-0.02	50
0.00	50	1.21	14	1.21	0.00	50
0.02	46	1.13	12	1.13	0.02	46
0.04	55	1.06	16	1.06	0.04	55
0.06	58	1.03	17	1.03	0.06	58
0.09	53	1.13	15	1.13	0.09	53
0.11	52	1.12	15	1.12	0.11	52
0.13	52	0.98	15	0.98	0.13	52
0.15	50	0.87	14	0.87	0.15	50
0.17	44	0.79	13	0.79	0.17	44
0.19	35	0.55	10	0.55	0.19	35
0.21	18	0.27	6	0.27	0.21	18
0.24	27	0.11	8	0.11	0.24	27
0.26	84	0.04	25	0.04	0.26	0
0.28	86	0.06	25			
				Max. Volts		1.38
				Max. Depth (%)		58.00
				Length (in.)		0.52
				Avg. Depth (%)		40.62

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
				0.07	-0.24	0
				0.14	-0.22	30
-0.20	0	0.00	16	0.34	-0.20	45
-0.18	42	0.59	15	0.59	-0.18	42
-0.16	48	0.80	17	0.80	-0.16	48
-0.14	55	0.90	19	0.90	-0.14	55
-0.12	55	1.03	19	1.03	-0.12	55
-0.09	55	1.13	19	1.13	-0.09	55
-0.07	61	1.12	21	1.12	-0.07	61
-0.05	61	1.04	21	1.04	-0.05	61
-0.03	61	1.07	21	1.07	-0.03	61
-0.01	55	1.13	19	1.13	-0.01	55
0.01	51	1.24	18	1.24	0.01	51
0.03	55	1.30	19	1.30	0.03	55
0.05	51	1.33	18	1.33	0.05	51
0.07	55	1.36	19	1.36	0.07	55
0.09	51	1.31	18	1.31	0.09	51
0.12	48	1.13	17	1.13	0.12	48
0.14	42	0.92	15	0.92	0.14	42
0.16	36	0.70	13	0.70	0.16	36
0.18	33	0.57	12	0.57	0.18	33
0.20	33	0.49	12	0.49	0.20	33
0.22	30	0.38	11	0.38	0.22	30
0.24	30	0.32	11	0.32	0.24	30
0.26	33	0.25	12	0.25	0.26	33
0.28	0	0.00	21	0.00	0.28	0
				Max. Volts		1.36
				Max. Depth (%)		61.00
				Length (in.)		0.52
				Avg. Depth (%)		44.93

Table C-39
Sample 8 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.29	97	0.07	32			
-0.27	68	0.10	23	0.10	-0.27	0
-0.25	37	0.28	13	0.28	-0.25	37
-0.23	34	0.33	12	0.33	-0.23	34
-0.21	34	0.40	12	0.40	-0.21	34
-0.19	34	0.52	12	0.52	-0.19	34
-0.17	34	0.60	12	0.60	-0.17	34
-0.14	37	0.74	13	0.74	-0.14	37
-0.12	43	0.99	15	0.99	-0.12	43
-0.10	49	1.19	17	1.19	-0.10	49
-0.08	52	1.36	18	1.36	-0.08	52
-0.06	59	1.38	20	1.38	-0.06	59
-0.04	52	1.34	18	1.34	-0.04	52
-0.02	52	1.32	18	1.32	-0.02	52
0.00	52	1.23	18	1.23	0.00	52
0.02	52	1.13	18	1.13	0.02	52
0.05	62	1.06	21	1.06	0.05	62
0.07	65	1.04	22	1.04	0.07	65
0.09	59	1.15	20	1.15	0.09	59
0.11	59	1.13	20	1.13	0.11	59
0.13	56	1.00	19	1.00	0.13	56
0.15	56	0.87	19	0.87	0.15	56
0.17	49	0.79	17	0.79	0.17	49
0.19	43	0.54	15	0.54	0.19	43
0.21	49	0.28	17	0.28	0.21	49
0.24	56	0.09	19	0.09	0.24	0
0.26	84	0.05	28			
0.26	71	0.03	24			
Max. Volts				1.38		
Max. Depth (%)				65.00		
Length (in.)				0.51		
Avg. Depth (%)				46.18		

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.24	0	0.00	0	0.00	-0.24	0
-0.22	35	0.39	12	0.39	-0.22	35
-0.20	35	0.51	12	0.51	-0.20	35
-0.17	35	0.59	12	0.59	-0.17	35
-0.15	38	0.73	13	0.73	-0.15	38
-0.13	47	0.95	16	0.95	-0.13	47
-0.11	49	1.16	17	1.16	-0.11	49
-0.09	52	1.32	18	1.32	-0.09	52
-0.07	58	1.34	20	1.34	-0.07	58
-0.04	52	1.30	18	1.30	-0.04	52
-0.02	52	1.28	18	1.28	-0.02	52
0.00	52	1.20	18	1.20	0.00	52
0.02	52	1.10	18	1.10	0.02	52
0.04	61	1.03	21	1.03	0.04	61
0.06	64	1.02	22	1.02	0.06	64
0.08	58	1.12	20	1.12	0.08	58
0.11	58	1.10	20	1.10	0.11	58
0.13	55	0.97	19	0.97	0.13	55
0.15	55	0.85	19	0.85	0.15	55
0.17	49	0.77	17	0.77	0.17	49
0.19	44	0.53	15	0.53	0.19	44
0.21	49	0.27	17	0.27	0.21	49
0.23	0	0.00	0	0.00	0.23	0
Max. Volts				1.34		
Max. Depth (%)				64.00		
Length (in.)				0.47		
Avg. Depth (%)				47.83		

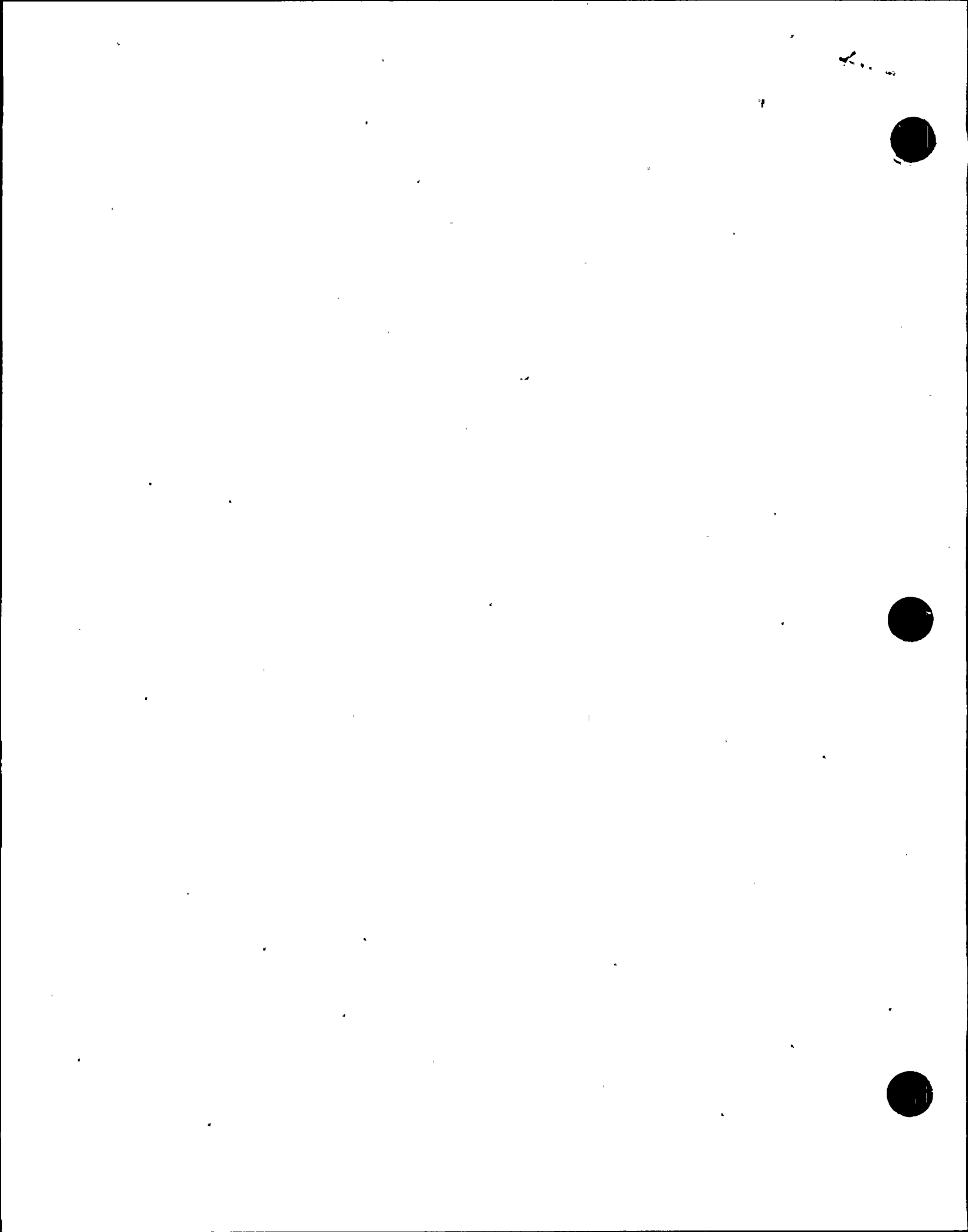


Table C-39
Sample 8 - 3H (continued)
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.30	92	0.06	27			
-0.28	70	0.15	20			
-0.26	31	0.28	9	0.28	-0.26	0
-0.24	23	0.33	7	0.33	-0.24	23
-0.22	23	0.39	7	0.39	-0.22	23
-0.20	31	0.52	9	0.52	-0.20	31
-0.17	27	0.6	8	0.60	-0.17	27
-0.15	31	0.74	9	0.74	-0.15	31
-0.13	46	0.97	13	0.97	-0.13	46
-0.11	49	1.18	14	1.18	-0.11	49
-0.09	50	1.37	14	1.37	-0.09	50
-0.07	55	1.38	16	1.38	-0.07	55
-0.04	51	1.33	14	1.33	-0.04	51
-0.02	50	1.29	14	1.29	-0.02	50
0.00	50	1.21	14	1.21	0.00	50
0.02	46	1.13	12	1.13	0.02	46
0.04	55	1.06	16	1.06	0.04	55
0.06	58	1.03	17	1.03	0.06	58
0.09	53	1.13	15	1.13	0.09	53
0.11	52	1.12	15	1.12	0.11	52
0.13	52	0.98	15	0.98	0.13	52
0.15	50	0.87	14	0.87	0.15	50
0.17	44	0.79	13	0.79	0.17	44
0.19	35	0.55	10	0.55	0.19	35
0.21	18	0.27	6	0.27	0.21	18
0.24	27	0.11	8	0.11	0.24	27
0.26	84	0.04	25	0.04	0.26	0
0.28	86	0.06	25			
Max. Volts				1.38		
Max. Depth (%)				58.00		
Length (in.)				0.52		
Avg. Depth (%)				40.62		

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
				0.07	-0.24	0
				0.14	-0.22	30
-0.20	0	0.00	16	0.34	-0.20	45
-0.18	42	0.59	15	0.59	-0.18	42
-0.16	48	0.80	17	0.80	-0.16	48
-0.14	55	0.90	19	0.90	-0.14	55
-0.12	55	1.03	19	1.03	-0.12	55
-0.09	55	1.13	19	1.13	-0.09	55
-0.07	61	1.12	21	1.12	-0.07	61
-0.05	61	1.04	21	1.04	-0.05	61
-0.03	61	1.07	21	1.07	-0.03	61
-0.01	55	1.13	19	1.13	-0.01	55
0.01	51	1.24	18	1.24	0.01	51
0.03	55	1.30	19	1.30	0.03	55
0.05	51	1.33	18	1.33	0.05	51
0.07	55	1.36	19	1.36	0.07	55
0.09	51	1.31	18	1.31	0.09	51
0.12	48	1.13	17	1.13	0.12	48
0.14	42	0.92	15	0.92	0.14	42
0.16	36	0.70	13	0.70	0.16	36
0.18	33	0.57	12	0.57	0.18	33
0.20	33	0.49	12	0.49	0.20	33
0.22	30	0.38	11	0.38	0.22	30
0.24	30	0.32	11	0.32	0.24	30
0.26	33	0.25	12	0.25	0.26	33
0.28	0	0.00	21	0.00	0.28	0
Max. Volts				1.36		
Max. Depth (%)				61.00		
Length (in.)				0.52		
Avg. Depth (%)				44.93		

Table C-38(continued)
Sample 8 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.37	88	0.05	47			
-0.35	80	0.06	23			
-0.33	89	0.08	26			
-0.31	98	0.10	33			
-0.28	67	0.17	19	0.17	-0.28	0
-0.26	31	0.32	9	0.32	-0.26	31
-0.24	34	0.39	10	0.39	-0.24	34
-0.22	34	0.53	10	0.53	-0.22	34
-0.20	42	0.77	12	0.77	-0.20	42
-0.18	53	1.01	15	1.01	-0.18	53
-0.15	57	1.22	16	1.22	-0.15	57
-0.13	49	1.30	14	1.30	-0.13	49
-0.11	49	1.34	14	1.34	-0.11	49
-0.09	42	1.33	12	1.33	-0.09	42
-0.07	49	1.23	14	1.23	-0.07	49
-0.05	57	1.13	16	1.13	-0.05	57
-0.03	53	1.15	15	1.15	-0.03	53
0.00	53	1.14	15	1.14	0.00	53
0.02	49	1.09	14	1.09	0.02	49
0.04	52	1.06	16	1.06	0.04	52
0.06	46	1.12	14	1.12	0.06	46
0.08	42	1.08	13	1.08	0.08	42
0.10	34	0.85	10	0.85	0.10	34
0.11	42	0.79	12	0.79	0.11	42
0.13	42	0.47	13	0.47	0.13	42
0.15	27	0.22	9	0.22	0.15	27
0.17	23	0.15	5	0.15	0.17	23
0.19	28	0.13	13	0.13	0.19	28
0.21	0	0.08	21	0.08	0.21	0
-0.24	69	0.07	20			
-0.26	92	0.04	27			
*Reversed Sign				Max. Volts	1.34	
				Max. Depth (%)	57.00	
				Length (in.)	0.49	
				Avg. Depth (%)	41.76	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.21	0	0.00	24	0.00	-0.21	0
-0.19	25	0.09	9	0.09	-0.19	25
-0.17	42	0.11	15	0.11	-0.17	42
-0.15	30	0.13	11	0.13	-0.15	30
-0.13	39	0.23	14	0.23	-0.13	39
-0.11	45	0.51	16	0.51	-0.11	45
-0.09	45	0.84	16	0.84	-0.09	45
-0.07	48	1.04	17	1.04	-0.07	48
-0.05	51	1.09	18	1.09	-0.05	51
-0.02	55	1.04	19	1.04	-0.02	55
0.00	55	1.09	19	1.09	0.00	55
0.02	55	1.13	19	1.13	0.02	55
0.04	55	1.10	19	1.10	0.04	55
0.06	58	1.12	20	1.12	0.06	58
0.08	48	1.24	17	1.24	0.08	48
0.10	42	1.33	15	1.33	0.10	42
0.12	48	1.33	17	1.33	0.12	48
0.14	55	1.26	19	1.26	0.14	55
0.17	55	1.19	19	1.19	0.17	55
0.19	48	0.97	17	0.97	0.19	48
0.21	39	0.72	14	0.72	0.21	39
0.23	36	0.50	13	0.50	0.23	36
0.25	36	0.38	13	0.38	0.25	36
0.27	39	0.28	14	0.28	0.27	39
0.29	70	0.15	24	0.15	0.29	0
0.31	99	0.09	35			
0.33	94	0.07	31			
0.36	89	0.06	49			
0.38	0	0.00	50			
				Max. Volts	1.33	
				Max. Depth (%)	58.00	
				Length (in.)	0.50	
				Avg. Depth (%)	44.12	

Table C-40
Sample 9 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
				0.35		0
0.33	37	0.23	13	0.23	0.33	37
0.31	46	0.38	16	0.38	0.31	46
0.29	49	0.47	17	0.47	0.29	49
0.26	49	0.48	17	0.48	0.26	49
0.24	46	0.42	16	0.42	0.24	46
0.22	49	0.38	17	0.38	0.22	49
0.20	46	0.42	16	0.42	0.20	46
0.18	31	0.48	11	0.48	0.18	31
0.16	43	0.48	15	0.48	0.16	43
0.14	40	0.41	14	0.41	0.14	40
0.12	43	0.41	15	0.41	0.12	43
0.09	40	0.44	14	0.44	0.09	40
0.07	43	0.47	15	0.47	0.07	43
0.05	43	0.56	15	0.56	0.05	43
0.03	34	0.69	12	0.69	0.03	34
0.01	40	0.72	14	0.72	0.01	40
-0.01	49	0.86	17	0.86	-0.01	49
-0.03	49	0.99	17	0.99	-0.03	49
-0.06	52	1.04	18	1.04	-0.06	52
-0.08	52	0.96	18	0.96	-0.08	52
-0.10	52	0.76	18	0.76	-0.10	52
-0.12	74	0.33	25	0.33	-0.12	0
-0.14	90	0.20	30			
-0.16	71	0.18	24			
-0.18	68	0.17	23			
-0.21	84	0.11	28			
-0.23	59	0.08	20			
*Reversed Sign				Max. Volts	1.04	
				Max. Depth (%)	52.00	
				Length (in.)	0.47	
				Avg. Depth (%)	42.70	

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
0.32	0	0.00	0	0.00	0.32	0
0.29	49	0.38	17	0.38	0.29	49
0.27	52	0.48	18	0.48	0.27	52
0.25	49	0.49	17	0.49	0.25	49
0.23	41	0.44	14	0.44	0.23	41
0.21	44	0.40	15	0.40	0.21	44
0.18	35	0.43	19	0.43	0.18	35
0.16	49	0.50	17	0.50	0.16	49
0.14	52	0.50	18	0.50	0.14	52
0.12	55	0.45	19	0.45	0.12	55
0.10	55	0.44	19	0.44	0.10	55
0.08	47	0.48	16	0.48	0.08	47
0.05	47	0.48	16	0.48	0.05	47
0.03	44	0.54	15	0.54	0.03	44
0.01	35	0.67	12	0.67	0.01	35
-0.01	47	0.70	16	0.70	-0.01	47
-0.03	49	0.63	17	0.63	-0.03	49
-0.06	49	0.97	17	0.97	-0.06	49
-0.08	52	1.01	18	1.01	-0.08	52
-0.10	55	0.94	19	0.94	-0.10	55
-0.12	55	0.74	19	0.74	-0.12	55
-0.14	61	0.40	21	0.40	-0.14	0
-0.16	58	0.21	20			
-0.18	0	0.00	0			
*Reversed Sign				Max. Volts	1.01	
				Max. Depth (%)	55.00	
				Length (in.)	0.46	
				Avg. Depth (%)	45.26	

Table C-40 (continued)
Sample 9 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
0.34	87				0.34	0
0.32	34	0.22	10	0.22	0.32	34
0.30	34	0.34	10	0.34	0.30	34
0.28	38	0.42	11	0.42	0.28	38
0.25	31	0.43	9	0.43	0.25	31
0.23	34	0.40	10	0.40	0.23	34
0.21	31	0.35	9	0.35	0.21	31
0.19	31	0.40	9	0.40	0.19	31
0.17	27	0.48	8	0.48	0.17	27
0.14	42	0.47	12	0.47	0.14	42
0.12	46	0.44	13	0.44	0.12	46
0.10	53	0.44	15	0.44	0.10	53
0.08	46	0.52	13	0.52	0.08	46
0.06	46	0.56	13	0.56	0.06	46
0.03	42	0.62	12	0.62	0.03	42
0.01	39	0.71	11	0.71	0.01	39
-0.01	53	0.72	15	0.72	-0.01	53
-0.03	55	0.82	16	0.82	-0.03	55
-0.05	49	0.98	14	0.98	-0.05	49
-0.07	53	1.02	15	1.02	-0.07	53
-0.10	53	0.94	15	0.94	-0.10	53
-0.10	49	0.91	14	0.91	-0.10	49
-0.12	49	0.79	14	0.79	-0.12	49
-0.14	60	0.41	17	0.41	-0.14	0
-0.16	63	0.24	18			
-0.18	52	0.20	15			
-0.21	61	0.16	18			
-0.23	83	0.11	24			
-0.25	83	0.07	24			
-0.27	87	0.05	49			
-0.29	84	0.03	53			
*Reversed Sign				Max. Volts	1.02	
				Max. Depth (%)	55.00	
				Length (in.)	0.48	
				Avg. Depth (%)	40.29	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.15	0	0.00	28	0.00	-0.15	0
-0.13	58	0.49	20	0.49	-0.13	58
-0.11	51	0.81	18	0.81	-0.11	51
-0.09	55	0.98	19	0.98	-0.09	55
-0.07	51	1.02	18	1.02	-0.07	51
-0.04	48	0.96	17	0.96	-0.04	48
-0.02	45	0.81	16	0.81	-0.02	45
0.00	39	0.70	14	0.70	0.00	39
0.02	36	0.64	13	0.64	0.02	36
0.04	42	0.54	15	0.54	0.04	42
0.06	45	0.48	16	0.48	0.06	45
0.08	42	0.45	15	0.45	0.08	42
0.11	42	0.41	15	0.41	0.11	42
0.13	42	0.43	15	0.43	0.13	42
0.15	36	0.47	13	0.47	0.15	36
0.17	33	0.44	12	0.44	0.17	33
0.19	33	0.39	12	0.39	0.19	33
0.21	33	0.36	12	0.36	0.21	33
0.23	36	0.41	13	0.41	0.23	36
0.25	39	0.45	14	0.45	0.25	39
0.28	45	0.43	16	0.43	0.28	45
0.30	39	0.33	14	0.33	0.30	39
0.32	27	0.19	10	0.19	0.32	27
0.36	0	0.00	174	0.00	0.36	0
				Max. Volts	1.02	
				Max. Depth (%)	58.00	
				Length (in.)	0.51	
				Avg. Depth (%)	39.11	

Table C-41
Sample 9-1H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments				
Axial Position*	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾
0.04	3	0.09	1	0.04	0.00	0.09	0.04	0
0.02	20	0.18	7	0.02	20.00	0.18	0.02	17
0.00	34	0.27	12	0.00	34.00	0.27	0.00	28
-0.02	40	0.36	14	-0.02	40.00	0.36	-0.02	33
-0.05	43	0.42	15	-0.05	43.00	0.42	-0.05	36
-0.07	49	0.42	17	-0.07	49.00	0.42	-0.07	41
-0.09	46	0.35	16	-0.09	46.00	0.35	-0.09	38
-0.11	25	0.29	9	-0.11	25.00	0.29	-0.11	21
-0.13	20	0.20	7	-0.13	20.00	0.20	-0.13	17
-0.15	59	0.13	20	-0.15	59.00	0.13	-0.15	49
-0.17	34	0.25	12	-0.17	34.00	0.25	-0.17	28
-0.19	25	0.31	9	-0.19	25.00	0.31	-0.19	21
-0.22	46	0.23	16	-0.22	46.00	0.23	-0.22	38
-0.24	52	0.15	18	-0.24	52.00	0.15	-0.24	43
-0.26	28	0.16	10	-0.26	28.00	0.16	-0.26	23
-0.28	34	0.18	12	-0.28	34.00	0.18	-0.28	28
-0.30	40	0.18	14	-0.30	40.00	0.18	-0.30	33
-0.32	40	0.15	14	-0.32	40.00	0.15	-0.32	33
-0.35	28	0.11	10	-0.35	28.00	0.11	-0.35	23
				-0.37	0.00		-0.37	0
*Reversed Sign	Max. Volts			0.42				0.42
	Max. Depth (%)			59.00				49.00
	Length (in.)			0.41				0.41
	Avg. Depth (%)			35.05				29.11

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position*	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾
0.00	0	0.00	0	0.00	0	0.00	0.00	0
-0.02	20	0.31	7	-0.02	20	0.31	-0.02	18
-0.04	41	0.35	14	-0.04	41	0.35	-0.04	37
-0.07	44	0.43	15	-0.07	44	0.43	-0.07	40
-0.09	49	0.41	17	-0.09	49	0.41	-0.09	44
-0.11	44	0.35	15	-0.11	44	0.35	-0.11	40
-0.13	26	0.28	9	-0.13	26	0.28	-0.13	23
-0.15	0	0.00	0	-0.15	0	0.00	-0.15	0
*Reversed Sign	Max. Volts			0.43				0.43
	Max. Depth (%)			49.00				44.00
	Length (in.)			0.15				0.15
	Avg. Depth (%)			32.70				29.36

Table C-41 (continued)
Sample 9-1H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 3

Unadjusted NDE								
Axial Position*	Depth	Volts	Phase Angle	Length ^{(1),5}	Depth	Final with Adjustments		
						Volts	Length ⁽¹⁾	Depth ⁽²⁾
				0.03	0		0.03	0
0.01	26	0.17	8	0.01	26	0.17	0.01	17
-0.01	38	0.28	11	-0.01	38	0.28	-0.01	25
-0.04	49	0.37	14	-0.04	49	0.37	-0.04	32
-0.06	49	0.42	14	-0.06	49	0.42	-0.06	32
-0.08	53	0.42	15	-0.08	53	0.42	-0.08	35
-0.10	42	0.36	12	-0.10	42	0.36	-0.10	28
-0.12	42	0.33	12	-0.12	42	0.33	-0.12	28
-0.15	34	0.23	10	-0.15	34	0.23	-0.15	23
-0.17	80	0.18	23	-0.17	80	0.18	-0.17	53
-0.19	46	0.29	13	-0.19	46	0.29	-0.19	30
-0.21	31	0.35	9	-0.21	31	0.35	-0.21	21
-0.23	57	0.30	16	-0.23	57	0.30	-0.23	38
-0.26	63	0.24	18	-0.26	63	0.24	-0.26	42
-0.28	49	0.25	14	-0.28	49	0.25	-0.28	32
-0.30	38	0.23	11	-0.30	38	0.23	-0.30	25
-0.32	38	0.21	11	-0.32	38	0.21	-0.32	25
-0.34	34	0.16	10	-0.34	34	0.16	-0.34	23
-0.37	31	0.11	9	-0.37	31	0.11	-0.37	21
				-0.39	0		-0.39	0
*Reversed Sign	Max. Volts				0.42			0.42
	Max. Depth (%)				80.00			53.00
	Length (in.)				0.42			0.42
	Avg. Depth (%)				42.24			27.98

Crack 2 - MR + Point - Analyst 4

Unadjusted NDE								
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Final with Adjustments		
						Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.33	39	0.19	14	-0.33	0	0.00	-0.33	0
-0.31	27	0.19	10	-0.31	27	0.19	-0.31	22
-0.29	30	0.16	11	-0.29	30	0.16	-0.29	25
-0.27	39	0.15	14	-0.27	39	0.15	-0.27	32
-0.25	39	0.22	14	-0.25	39	0.22	-0.25	32
-0.23	27	0.29	10	-0.23	27	0.29	-0.23	22
-0.20	30	0.26	11	-0.20	30	0.26	-0.20	25
-0.18	51	0.15	18	-0.18	51	0.15	-0.18	42
-0.16	30	0.18	11	-0.16	30	0.18	-0.16	25
-0.14	25	0.22	9	-0.14	25	0.22	-0.14	21
-0.12	42	0.33	15	-0.12	42	0.33	-0.12	35
-0.10	45	0.40	16	-0.10	45	0.40	-0.10	37
-0.08	42	0.42	15	-0.08	42	0.42	-0.08	35
-0.05	42	0.37	15	-0.05	42	0.37	-0.05	35
-0.03	33	0.30	12	-0.03	33	0.30	-0.03	27
-0.01	22	0.20	8	-0.01	22	0.20	-0.01	18
0.01	0	0.00	15	0.01	0	0.00	0.01	0
	Max. Volts				0.42			0.42
	Max. Depth (%)				51.00			42.00
	Length (in.)				0.34			0.34
	Avg. Depth (%)				32.90			27.09

Table C-42
Sample 9 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.66	65	0.05	22			
-0.64	68	0.05	23			
-0.62	56	0.05	19			
-0.59	92	0.05	45			
-0.57	82	0.05	59			
-0.55	89	0.09	49			
-0.53	77	0.19	26			
-0.51	81	0.33	27	0.33	-0.51	0
-0.49	74	0.5	25	0.50	-0.49	74
-0.47	71	0.75	24	0.75	-0.47	71
-0.45	68	0.98	23	0.98	-0.45	68
-0.42	65	1.22	22	1.22	-0.42	65
-0.40	77	1.47	26	1.47	-0.40	77
-0.38	74	1.75	25	1.75	-0.38	74
-0.36	71	1.97	24	1.97	-0.36	71
-0.34	74	2.08	25	2.08	-0.34	74
-0.32	77	2.18	26	2.18	-0.32	77
-0.30	77	2.35	26	2.35	-0.30	77
-0.28	81	2.65	27	2.65	-0.28	81
-0.25	77	3.03	26	3.03	-0.25	77
-0.23	74	3.34	25	3.34	-0.23	74
-0.21	74	3.36	25	3.36	-0.21	74
-0.19	77	3.34	26	3.34	-0.19	77
-0.17	77	3.50	26	3.50	-0.17	77
-0.15	74	3.73	25	3.73	-0.15	74
-0.13	77	3.83	26	3.83	-0.13	77
-0.10	81	3.94	27	3.94	-0.10	81
-0.08	81	3.88	27	3.88	-0.08	81
-0.06	77	3.99	26	3.99	-0.06	77
-0.04	74	4.16	25	4.16	-0.04	74
-0.02	71	4.00	24	4.00	-0.02	71
0.00	71	3.89	24	3.89	0.00	71
0.02	74	3.51	25	3.51	0.02	74
0.05	77	3.31	26	3.31	0.05	77
0.07	71	3.64	24	3.64	0.07	71
0.09	65	3.70	22	3.70	0.09	65
0.11	65	3.39	22	3.39	0.11	65
0.13	68	3.01	23	3.01	0.13	68
0.15	74	2.63	25	2.63	0.15	74
0.17	71	2.80	24	2.80	0.17	71
0.19	65	2.91	22	2.91	0.19	65
0.22	68	2.65	23	2.65	0.22	68
0.24	74	2.20	25	2.20	0.24	74
0.26	77	1.69	26	1.69	0.26	77
0.28	68	1.54	23	1.54	0.28	68
0.30	65	1.48	22	1.48	0.30	65
0.32	65	1.41	22	1.41	0.32	65
0.34	65	1.21	22	1.21	0.34	65
0.36	71	1.00	24	1.00	0.36	71
0.39	71	0.79	24	0.79	0.39	71
0.41	68	0.69	23	0.69	0.41	68
0.43	68	0.61	23	0.61	0.43	68
0.45	68	0.47	23	0.47	0.45	68
0.47	77	0.26	26	0.26	0.47	0
0.49	84	0.11	28			
0.51	74	0.09	25			
0.54	77	0.08	26			
0.56	68	0.07	23			
0.58	84	0.06	28			
0.60	17	0.06	6			
0.62	28	0.05	10			
*Reversed Sign				Max. Volts	4.16	
				Max. Depth (%)	81.00	
				Length (In.)	0.98	
				Avg. Depth (%)	70.83	

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.59	0	0	0			
-0.57	92	0.08	49			
-0.55	76	0.18	26			
-0.52	79	0.32	27	0.32	-0.52	0
-0.50	73	0.49	25	0.49	-0.50	73
-0.48	70	0.73	24	0.73	-0.48	70
-0.46	67	0.96	23	0.96	-0.46	67
-0.44	70	1.18	24	1.18	-0.44	70
-0.41	76	1.43	26	1.43	-0.41	76
-0.39	73	1.70	25	1.70	-0.39	73
-0.37	70	1.91	24	1.91	-0.37	70
-0.35	73	2.03	25	2.03	-0.35	73
-0.33	76	2.12	26	2.12	-0.33	76
-0.31	76	2.29	26	2.29	-0.31	76
-0.28	79	2.58	27	2.58	-0.28	79
-0.26	76	2.95	26	2.95	-0.26	76
-0.24	73	3.25	25	3.25	-0.24	73
-0.22	73	3.27	25	3.27	-0.22	73
-0.20	76	3.25	26	3.25	-0.20	76
-0.18	76	3.41	26	3.41	-0.18	76
-0.15	73	3.63	25	3.63	-0.15	73
-0.13	76	3.73	26	3.73	-0.13	76
-0.11	79	3.84	27	3.84	-0.11	79
-0.09	79	3.77	27	3.77	-0.09	79
-0.07	76	3.89	26	3.89	-0.07	76
-0.04	73	4.05	25	4.05	-0.04	73
-0.02	70	3.89	24	3.89	-0.02	70
0.00	70	3.79	24	3.79	0.00	70
0.02	73	3.42	25	3.42	0.02	73
0.04	76	3.22	26	3.22	0.04	76
0.06	70	3.54	24	3.54	0.06	70
0.09	64	3.60	22	3.60	0.09	64
0.11	64	3.30	22	3.30	0.11	64
0.13	67	2.93	23	2.93	0.13	67
0.15	73	2.55	25	2.55	0.15	73
0.17	70	2.73	24	2.73	0.17	70
0.20	64	2.84	22	2.84	0.20	64
0.22	67	2.58	23	2.58	0.22	67
0.24	73	2.14	25	2.14	0.24	73
0.26	76	1.64	26	1.64	0.26	76
0.28	67	1.50	23	1.50	0.28	67
0.30	64	1.44	22	1.44	0.30	64
0.33	64	1.37	22	1.37	0.33	64
0.35	64	1.18	22	1.18	0.35	64
0.37	70	0.97	24	0.97	0.37	70
0.39	70	0.77	24	0.77	0.39	70
0.41	67	0.67	23	0.67	0.41	67
0.43	67	0.60	23	0.60	0.43	67
0.44	67	0.47	23	0.47	0.44	67
0.48	76	0.25	26	0.25	0.48	0
0.50	0	0.00	0			
*Reversed Sign				Max. Volts	4.05	
				Max. Depth (%)	79.00	
				Length (In.)	1.00	
				Avg. Depth (%)	69.18	

Table C-42 (continued)
Sample 9 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.61	95	0.06	37			
-0.59	94	0.05	39			
-0.57	90	0.08	45			
-0.55	80	0.19	23			
-0.53	83	0.32	24	0.32	-0.53	0
-0.50	70	0.50	20	0.50	-0.50	70
-0.48	65	0.76	18	0.76	-0.48	65
-0.46	63	1.00	18	1.00	-0.46	63
-0.44	67	1.21	19	1.21	-0.44	67
-0.42	79	1.46	22	1.46	-0.42	79
-0.40	77	1.74	22	1.74	-0.40	77
-0.37	73	1.97	21	1.97	-0.37	73
-0.35	77	2.10	22	2.10	-0.35	77
-0.33	77	2.17	22	2.17	-0.33	77
-0.31	79	2.32	22	2.32	-0.31	79
-0.29	83	2.61	24	2.61	-0.29	83
-0.26	80	2.99	23	2.99	-0.26	80
-0.24	77	3.29	22	3.29	-0.24	77
-0.22	77	3.30	22	3.30	-0.22	77
-0.20	80	3.30	23	3.30	-0.20	80
-0.18	80	3.46	23	3.46	-0.18	80
-0.16	77	3.68	22	3.68	-0.16	77
-0.13	77	3.78	22	3.78	-0.13	77
-0.11	80	3.89	23	3.89	-0.11	80
-0.09	80	3.82	23	3.82	-0.09	80
-0.07	80	3.93	23	3.93	-0.07	80
-0.05	77	4.10	22	4.10	-0.05	77
-0.02	73	3.93	21	3.93	-0.02	73
0.00	73	3.83	21	3.83	0.00	73
0.02	77	3.45	22	3.45	0.02	77
0.04	73	3.28	21	3.28	0.04	73
0.06	70	3.64	20	3.64	0.06	70
0.08	63	3.68	18	3.68	0.08	63
0.11	67	3.38	19	3.38	0.11	67
0.13	67	2.98	19	2.98	0.13	67
0.15	77	2.58	22	2.58	0.15	77
0.17	73	2.76	21	2.76	0.17	73
0.19	67	2.87	19	2.87	0.19	67
0.22	70	2.61	20	2.61	0.22	70
0.24	77	2.17	22	2.17	0.24	77
0.26	73	1.67	21	1.67	0.26	73
0.28	67	1.53	19	1.53	0.28	67
0.30	67	1.46	19	1.46	0.30	67
0.32	67	1.42	19	1.42	0.32	67
0.35	67	1.21	19	1.21	0.35	67
0.37	70	0.98	20	0.98	0.37	70
0.39	73	0.78	21	0.78	0.39	73
0.41	77	0.68	22	0.68	0.41	77
0.43	70	0.60	20	0.60	0.43	70
0.46	60	0.46	17	0.46	0.46	60
0.48	73	0.25	21	0.25	0.48	0
0.50	89	0.11	26			
0.52	83	0.08	24			
0.54	80	0.07	23			
0.57	97	0.06	35			
0.59	67	0.05	33			
*Reversed Sign				Max. Volts	4.10	
				Max. Depth (%)	83.00	
				Length (in.)	1.01	
				Avg. Depth (%)	71.24	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.52	0	0	0			
-0.50	77	0.37	26	0.37	-0.50	0
-0.48	70	0.55	24	0.55	-0.48	70
-0.46	67	0.81	23	0.81	-0.46	67
-0.44	67	1.03	23	1.03	-0.44	67
-0.41	74	1.22	25	1.22	-0.41	74
-0.39	74	1.53	25	1.53	-0.39	74
-0.37	74	1.79	25	1.79	-0.37	74
-0.35	74	1.95	25	1.95	-0.35	74
-0.33	74	2.09	25	2.09	-0.33	74
-0.31	77	2.18	26	2.18	-0.31	77
-0.29	77	2.40	26	2.40	-0.29	77
-0.27	77	2.73	26	2.73	-0.27	77
-0.24	74	3.09	25	3.09	-0.24	74
-0.22	74	3.29	25	3.29	-0.22	74
-0.20	77	3.27	26	3.27	-0.20	77
-0.18	77	3.36	26	3.36	-0.18	77
-0.16	77	3.53	26	3.53	-0.16	77
-0.14	74	3.72	25	3.72	-0.14	74
-0.12	77	3.83	26	3.83	-0.12	77
-0.10	80	3.90	27	3.90	-0.10	80
-0.07	80	3.88	27	3.88	-0.07	80
-0.05	77	4.01	26	4.01	-0.05	77
-0.03	74	4.09	25	4.09	-0.03	74
-0.01	70	3.94	24	3.94	-0.01	70
0.01	70	3.76	24	3.76	0.01	70
0.03	74	3.40	25	3.40	0.03	74
0.05	74	3.28	25	3.28	0.05	74
0.07	67	3.62	23	3.62	0.07	67
0.10	64	3.54	22	3.54	0.10	64
0.12	67	3.18	23	3.18	0.12	67
0.14	70	2.89	24	2.89	0.14	70
0.16	74	2.65	25	2.65	0.16	74
0.18	67	2.77	23	2.77	0.18	67
0.20	64	2.80	22	2.80	0.20	64
0.22	67	2.52	23	2.52	0.22	67
0.24	74	2.05	25	2.05	0.24	74
0.27	74	1.62	25	1.62	0.27	74
0.29	67	1.51	23	1.51	0.29	67
0.31	64	1.43	22	1.43	0.31	64
0.33	64	1.35	22	1.35	0.33	64
0.35	67	1.15	23	1.15	0.35	67
0.37	70	0.93	24	0.93	0.37	70
0.39	70	0.77	24	0.77	0.39	70
0.41	70	0.67	24	0.67	0.41	70
0.44	70	0.57	24	0.57	0.44	70
0.46	67	0.42	23	0.42	0.46	67
0.48	0	0.00	27	0.00	0.48	0
				Max. Volts	4.09	
				Max. Depth (%)	80.00	
				Length (in.)	0.98	
				Avg. Depth (%)	69.70	

Table C-43
Sample 9 - 2H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE					Final with Adjustments				
Axial Position*	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾	Length ⁽³⁾
				0.44	0.00	0.00	0.44	0	
0.42	40	0.08	14	0.42	40.00	0.08	0.42	29	
0.40	56	0.23	19	0.40	56.00	0.23	0.40	40	
0.38	49	0.39	17	0.38	49.00	0.39	0.38	35	
0.35	56	0.54	19	0.35	56.00	0.54	0.35	40	
0.33	62	0.58	21	0.33	62.00	0.58	0.33	45	
0.31	62	0.54	21	0.31	62.00	0.54	0.31	45	
0.29	68	0.50	23	0.29	68.00	0.50	0.29	49	
0.27	68	0.47	23	0.27	68.00	0.47	0.27	49	
0.25	56	0.48	19	0.25	56.00	0.48	0.25	40	
0.23	56	0.57	19	0.23	56.00	0.57	0.23	40	
0.20	56	0.60	19	0.20	56.00	0.60	0.20	40	
0.18	52	0.57	18	0.18	52.00	0.57	0.18	37	
0.16	59	0.53	20	0.16	59.00	0.53	0.16	43	
0.14	62	0.52	21	0.14	62.00	0.52	0.14	45	
0.12	49	0.59	17	0.12	49.00	0.59	0.12	35	
0.10	56	0.60	19	0.10	56.00	0.60	0.10	40	
0.08	56	0.57	19	0.08	56.00	0.57	0.08	40	
0.06	59	0.58	20	0.06	59.00	0.58	0.06	43	
0.03	56	0.63	19	0.03	56.00	0.63	0.03	40	
0.01	52	0.68	18	0.01	52.00	0.68	0.01	37	
-0.01	52	0.70	18	-0.01	52.00	0.70	-0.01	37	
-0.03	59	0.68	20	-0.03	59.00	0.68	-0.03	43	
-0.05	56	0.70	19	-0.05	56.00	0.70	-0.05	40	
-0.07	59	0.68	20	-0.07	59.00	0.68	-0.07	43	
-0.09	59	0.71	20	-0.09	59.00	0.71	-0.09	43	
-0.12	56	0.71	19	-0.12	56.00	0.71	-0.12	40	
-0.14	52	0.70	18	-0.14	52.00	0.70	-0.14	37	
-0.16	49	0.74	17	-0.16	49.00	0.74	-0.16	35	
-0.18	46	0.65	16	-0.18	46.00	0.65	-0.18	33	
-0.20	46	0.66	16	-0.20	46.00	0.66	-0.20	33	
-0.22	52	0.55	18	-0.22	52.00	0.55	-0.22	37	
-0.24	49	0.52	17	-0.24	49.00	0.52	-0.24	35	
-0.26	40	0.47	14	-0.26	40.00	0.47	-0.26	29	
-0.29	43	0.36	15	-0.29	43.00	0.36	-0.29	31	
-0.31	49	0.26	17	-0.31	49.00	0.26	-0.31	35	
-0.33	52	0.27	18	-0.33	52.00	0.27	-0.33	37	
-0.35	37	0.33	13	-0.35	37.00	0.33	-0.35	27	
-0.37	34	0.33	12	-0.37	34.00	0.33	-0.37	25	
-0.39	43	0.21	15	-0.39	0.00	0.21	-0.39	0	
-0.41	56	0.08	19						
*Reversed Sign				Max. Volts	0.74		0.74		
				Max. Depth (%)	68.00		49.00		
				Length (in.)	0.83		0.83		
				Avg. Depth (%)	51.87		37.38		

Unadjusted NDE					Final with Adjustments				
Axial Position*	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾	Length ⁽³⁾
0.42	0	0.00	0	0.42	0.00	0.00	0.42	0	
0.40	44	0.23	15	0.40	44.00	0.23	0.40	32	
0.38	52	0.40	18	0.38	52.00	0.40	0.38	38	
0.36	52	0.55	18	0.36	52.00	0.55	0.36	38	
0.34	58	0.58	20	0.34	58.00	0.58	0.34	42	
0.32	61	0.53	21	0.32	61.00	0.53	0.32	45	
0.29	67	0.48	23	0.29	67.00	0.48	0.29	49	
0.27	67	0.45	23	0.27	67.00	0.45	0.27	49	
0.25	55	0.47	19	0.25	55.00	0.47	0.25	40	
0.23	55	0.56	19	0.23	55.00	0.56	0.23	40	
0.21	55	0.59	19	0.21	55.00	0.59	0.21	40	
0.18	52	0.58	18	0.18	52.00	0.58	0.18	38	
0.16	58	0.51	20	0.16	58.00	0.51	0.16	42	
0.14	61	0.51	21	0.14	61.00	0.51	0.14	45	
0.12	49	0.57	17	0.12	49.00	0.57	0.12	36	
0.10	55	0.58	19	0.10	55.00	0.58	0.10	40	
0.08	55	0.56	19	0.08	55.00	0.56	0.08	40	
0.05	58	0.56	20	0.05	58.00	0.56	0.05	42	
0.03	55	0.61	19	0.03	55.00	0.61	0.03	40	
0.01	49	0.67	17	0.01	49.00	0.67	0.01	36	
-0.01	52	0.68	18	-0.01	52.00	0.68	-0.01	38	
-0.03	58	0.66	20	-0.03	58.00	0.66	-0.03	42	
-0.06	52	0.68	18	-0.06	52.00	0.68	-0.06	38	
-0.08	58	0.67	20	-0.08	58.00	0.67	-0.08	42	
-0.10	58	0.69	20	-0.10	58.00	0.69	-0.10	42	
-0.12	55	0.69	19	-0.12	55.00	0.69	-0.12	40	
-0.14	52	0.69	18	-0.14	52.00	0.69	-0.14	38	
-0.16	49	0.72	17	-0.16	49.00	0.72	-0.16	36	
-0.19	47	0.70	16	-0.19	47.00	0.70	-0.19	34	
-0.21	47	0.65	16	-0.21	47.00	0.65	-0.21	34	
-0.23	47	0.59	16	-0.23	47.00	0.59	-0.23	34	
-0.25	47	0.56	16	-0.25	47.00	0.56	-0.25	34	
-0.27	41	0.50	14	-0.27	41.00	0.50	-0.27	30	
-0.29	41	0.38	14	-0.29	41.00	0.38	-0.29	30	
-0.32	44	0.26	15	-0.32	44.00	0.26	-0.32	32	
-0.34	49	0.27	17	-0.34	49.00	0.27	-0.34	36	
-0.36	44	0.34	13	-0.36	44.00	0.34	-0.36	32	
-0.38	38	0.38	13	-0.38	38.00	0.38	-0.38	28	
-0.40	0	0.00	0	-0.40	0.00	0.00	-0.40	0	
*Reversed Sign				Max. Volts	0.72		0.72		
				Max. Depth (%)	67.00		49.00		
				Length (in.)	0.82		0.82		
				Avg. Depth (%)	51.14		37.40		

Table C-43 (continued)
Sample 9 - 2H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 3

Crack 2 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position*	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
0.46	97	0.05	34					
0.44	94	0.05	28					
0.42	60	0.12	17					
0.39	55	0.26	15	0.39	0	0.26	0.39	0
0.37	46	0.43	13	0.37	46	0.43	0.37	42
0.35	49	0.55	14	0.35	49	0.55	0.35	44
0.33	49	0.55	14	0.33	49	0.55	0.33	44
0.31	57	0.51	16	0.31	57	0.51	0.31	52
0.28	63	0.46	18	0.28	63	0.46	0.28	57
0.26	60	0.41	17	0.26	60	0.41	0.26	54
0.24	60	0.48	17	0.24	60	0.48	0.24	54
0.22	53	0.57	15	0.22	53	0.57	0.22	48
0.20	57	0.60	16	0.20	57	0.60	0.20	52
0.17	53	0.56	15	0.17	53	0.56	0.17	48
0.15	60	0.52	17	0.15	60	0.52	0.15	54
0.13	63	0.51	18	0.13	63	0.51	0.13	57
0.11	49	0.58	14	0.11	49	0.58	0.11	44
0.09	53	0.59	15	0.09	53	0.59	0.09	48
0.07	57	0.56	16	0.07	57	0.56	0.07	52
0.04	57	0.57	16	0.04	57	0.57	0.04	52
0.02	57	0.62	16	0.02	57	0.62	0.02	52
0.00	42	0.64	12	0.00	42	0.64	0.00	38
-0.02	53	0.69	15	-0.02	53	0.69	-0.02	48
-0.04	55	0.65	16	-0.04	55	0.65	-0.04	50
-0.04	60	0.67	17	-0.04	60	0.67	-0.04	54
-0.06	46	0.66	13	-0.06	46	0.66	-0.06	42
-0.07	57	0.69	16	-0.07	57	0.69	-0.07	52
-0.09	60	0.68	17	-0.09	60	0.68	-0.09	54
-0.11	55	0.69	16	-0.11	55	0.69	-0.11	50
-0.13	49	0.68	14	-0.13	49	0.68	-0.13	44
-0.15	49	0.67	14	-0.15	49	0.67	-0.15	44
-0.17	46	0.69	13	-0.17	46	0.69	-0.17	42
-0.20	46	0.67	13	-0.20	46	0.67	-0.20	42
-0.22	42	0.62	12	-0.22	42	0.62	-0.22	38
-0.24	42	0.54	12	-0.24	42	0.54	-0.24	38
-0.26	42	0.53	12	-0.26	42	0.53	-0.26	38
-0.28	31	0.46	9	-0.28	31	0.46	-0.28	28
-0.31	42	0.36	12	-0.31	42	0.36	-0.31	38
-0.33	49	0.25	14	-0.33	49	0.25	-0.33	44
-0.35	46	0.26	13	-0.35	46	0.26	-0.35	42
-0.37	31	0.34	9	-0.37	31	0.34	-0.37	28
-0.39	27	0.35	8	-0.39	27	0.35	-0.39	24
-0.41	49	0.14	14	-0.41	0	0.14	-0.41	0
-0.44	86	0.04	25					
*Reversed Sign	Max. Volts			0.69				0.69
	Max. Depth (%)			63.00				57.00
	Length (in.)			0.80				0.80
	Avg. Depth (%)			48.93				44.27

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.37	0	0.00	14	-0.37	0	0.00	-0.37	0
-0.35	30	0.29	11	-0.35	30	0.29	-0.35	26
-0.33	36	0.33	13	-0.33	36	0.33	-0.33	31
-0.31	51	0.28	18	-0.31	51	0.28	-0.31	44
-0.29	55	0.26	19	-0.29	55	0.26	-0.29	47
-0.26	45	0.33	16	-0.26	45	0.33	-0.26	39
-0.24	42	0.44	15	-0.24	42	0.44	-0.24	36
-0.22	48	0.48	17	-0.22	48	0.48	-0.22	41
-0.20	48	0.53	17	-0.20	48	0.53	-0.20	41
-0.18	48	0.59	17	-0.18	48	0.59	-0.18	41
-0.16	48	0.68	17	-0.16	48	0.68	-0.16	41
-0.14	48	0.68	17	-0.14	48	0.68	-0.14	41
-0.12	51	0.68	18	-0.12	51	0.68	-0.12	44
-0.09	55	0.70	19	-0.09	55	0.70	-0.09	47
-0.07	61	0.65	21	-0.07	61	0.65	-0.07	52
-0.05	58	0.66	20	-0.05	58	0.66	-0.05	50
-0.03	55	0.69	19	-0.03	55	0.69	-0.03	47
-0.01	61	0.65	21	-0.01	61	0.65	-0.01	52
0.01	51	0.68	18	0.01	51	0.68	0.01	44
0.03	51	0.68	18	0.03	51	0.68	0.03	44
0.05	51	0.64	18	0.05	51	0.64	0.05	44
0.08	55	0.59	19	0.08	55	0.59	0.08	47
0.10	55	0.56	19	0.10	55	0.56	0.10	47
0.12	55	0.58	19	0.12	55	0.58	0.12	47
0.14	48	0.59	17	0.14	48	0.59	0.14	41
0.16	55	0.53	19	0.16	55	0.53	0.16	47
0.18	58	0.52	20	0.18	58	0.52	0.18	50
0.20	55	0.55	19	0.20	55	0.55	0.20	47
0.22	55	0.59	19	0.22	55	0.59	0.22	47
0.25	55	0.57	19	0.25	55	0.57	0.25	47
0.27	58	0.49	20	0.27	58	0.49	0.27	50
0.29	64	0.47	22	0.29	64	0.47	0.29	55
0.31	64	0.47	22	0.31	64	0.47	0.31	55
0.33	61	0.52	21	0.33	61	0.52	0.33	52
0.35	58	0.55	20	0.35	58	0.55	0.35	50
0.37	55	0.53	19	0.37	55	0.53	0.37	47
0.39	51	0.42	18	0.39	51	0.42	0.39	44
0.42	48	0.26	17	0.42	48	0.26	0.42	41
0.44	48	0.12	17	0.44	48	0.12	0.44	41
0.46	45	0.06	16	0.46	45	0.06	0.46	39
0.48	0	0.00	1	0.48	0	0.00	0.48	0
	Max. Volts			0.70				0.70
	Max. Depth (%)			64.00				55.00
	Length (in.)			0.85				0.85
	Avg. Depth (%)			50.97				43.80

Table C-44
Sample 9 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.52	40	0.10	14			
-0.50	34	0.18	12			
-0.48	74	0.28	25	0.28	-0.48	0
-0.46	59	0.45	20	0.45	-0.46	59
-0.44	56	0.64	19	0.64	-0.44	56
-0.41	62	0.78	21	0.78	-0.41	62
-0.39	68	0.99	23	0.99	-0.39	68
-0.37	71	1.23	24	1.23	-0.37	71
-0.35	71	1.45	24	1.45	-0.35	71
-0.33	74	1.57	25	1.57	-0.33	74
-0.31	74	1.57	25	1.57	-0.31	74
-0.29	77	1.58	26	1.58	-0.29	77
-0.26	81	1.60	27	1.60	-0.26	81
-0.24	77	1.68	26	1.68	-0.24	77
-0.22	81	1.76	27	1.76	-0.22	81
-0.20	77	1.80	26	1.80	-0.20	77
-0.18	74	1.83	25	1.83	-0.18	74
-0.16	74	1.83	25	1.83	-0.16	74
-0.14	74	1.90	25	1.90	-0.14	74
-0.12	65	2.04	22	2.04	-0.12	65
-0.10	65	2.02	22	2.02	-0.10	65
-0.07	71	1.84	24	1.84	-0.07	71
-0.05	74	1.70	25	1.70	-0.05	74
-0.03	68	1.70	23	1.70	-0.03	68
-0.01	68	1.74	23	1.74	-0.01	68
0.01	68	1.77	23	1.77	0.01	68
0.03	71	1.78	24	1.78	0.03	71
0.05	68	1.82	23	1.82	0.05	68
0.07	65	1.94	22	1.94	0.07	65
0.10	68	2.04	23	2.04	0.10	68
0.12	71	2.26	24	2.26	0.12	71
0.14	74	2.52	25	2.52	0.14	74
0.16	71	2.69	24	2.69	0.16	71
0.18	74	2.56	25	2.56	0.18	74
0.20	77	2.26	26	2.26	0.20	77
0.22	77	1.93	26	1.93	0.22	77
0.24	74	1.79	25	1.79	0.24	74
0.27	68	1.65	23	1.65	0.27	68
0.29	71	1.43	24	1.43	0.29	71
0.31	71	1.23	24	1.23	0.31	71
0.33	68	1.08	23	1.08	0.33	68
0.35	62	0.80	21	0.80	0.35	62
0.37	65	0.47	22	0.47	0.37	65
0.39	99	0.21	35	0.21	0.39	0
0.41	98	0.13	36			
0.44	95	0.10	41			
0.46	94	0.10	42			
0.48	83	0.08	58			
Max. Volts				2.69		
Max. Depth (%)				81.00		
Length (in.)				0.87		
Avg. Depth (%)				68.87		

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.50	0	0.00	0	0.00	-0.50	0
-0.48	35	0.17	12	0.17	-0.48	35
-0.46	44	0.23	15	0.23	-0.46	44
-0.43	58	0.43	20	0.43	-0.43	58
-0.41	55	0.62	19	0.62	-0.41	55
-0.39	61	0.76	21	0.76	-0.39	61
-0.37	67	0.97	23	0.97	-0.37	67
-0.35	70	1.19	24	1.19	-0.35	70
-0.33	70	1.41	24	1.41	-0.33	70
-0.30	73	1.53	25	1.53	-0.30	73
-0.28	73	1.53	25	1.53	-0.28	73
-0.26	76	1.54	26	1.54	-0.26	76
-0.24	79	1.55	27	1.55	-0.24	79
-0.22	76	1.63	26	1.63	-0.22	76
-0.20	79	1.71	27	1.71	-0.20	79
-0.17	76	1.75	26	1.75	-0.17	76
-0.15	73	1.78	25	1.78	-0.15	73
-0.13	73	1.78	25	1.78	-0.13	73
-0.11	73	1.85	25	1.85	-0.11	73
-0.09	64	1.98	22	1.98	-0.09	64
-0.07	64	1.96	22	1.96	-0.07	64
-0.04	70	1.79	24	1.79	-0.04	70
-0.02	73	1.65	25	1.65	-0.02	73
0.00	67	1.65	23	1.65	0.00	67
0.02	67	1.70	23	1.70	0.02	67
0.04	67	1.72	23	1.72	0.04	67
0.06	70	1.73	24	1.73	0.06	70
0.09	67	1.77	23	1.77	0.09	67
0.11	64	1.89	22	1.89	0.11	64
0.13	67	1.99	23	1.99	0.13	67
0.15	70	2.20	24	2.20	0.15	70
0.17	73	2.45	25	2.45	0.17	73
0.19	70	2.62	24	2.62	0.19	70
0.22	73	2.49	25	2.49	0.22	73
0.24	76	2.20	26	2.20	0.24	76
0.26	76	1.88	26	1.88	0.26	76
0.28	73	1.74	25	1.74	0.28	73
0.30	67	1.61	23	1.61	0.30	67
0.32	70	1.39	24	1.39	0.32	70
0.35	70	1.19	24	1.19	0.35	70
0.37	67	1.05	23	1.05	0.37	67
0.39	61	0.78	21	0.78	0.39	61
0.41	64	0.45	22	0.45	0.41	64
0.43	100	0.20	35	0.20	0.43	0
0.45	0	0.00	0			
Max. Volts				2.62		
Max. Depth (%)				79.00		
Length (in.)				0.93		
Avg. Depth (%)				66.66		

Table C-44 (continued)
Sample 9 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE						
Axial Position	Depth	Volts	Phase Angle	Final with Adjustments		
				Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.49	14	0.22	5			
-0.46	60	0.30	17	0.30	-0.46	0
-0.44	46	0.46	13	0.46	-0.44	46
-0.42	49	0.64	14	0.64	-0.42	49
-0.40	63	0.78	18	0.78	-0.40	63
-0.38	67	0.98	19	0.98	-0.38	67
-0.36	67	1.21	19	1.21	-0.36	67
-0.33	73	1.43	21	1.43	-0.33	73
-0.31	77	1.55	22	1.55	-0.31	77
-0.29	77	1.55	22	1.55	-0.29	77
-0.27	80	1.55	23	1.55	-0.27	80
-0.25	83	1.57	24	1.57	-0.25	83
-0.22	83	1.65	24	1.65	-0.22	83
-0.20	80	1.71	23	1.71	-0.20	80
-0.18	80	1.77	23	1.77	-0.18	80
-0.16	70	1.79	20	1.79	-0.16	70
-0.14	77	1.80	22	1.80	-0.14	77
-0.12	70	1.88	20	1.88	-0.12	70
-0.09	67	2.05	19	2.05	-0.09	67
-0.07	63	2.05	18	2.05	-0.07	63
-0.05	63	1.91	18	1.91	-0.05	63
-0.03	67	1.80	19	1.80	-0.03	67
-0.01	63	1.80	18	1.80	-0.01	63
0.01	60	1.83	17	1.83	0.01	60
0.04	67	1.83	19	1.83	0.04	67
0.06	67	1.83	19	1.83	0.06	67
0.08	63	1.86	18	1.86	0.08	63
0.10	63	1.97	18	1.97	0.10	63
0.12	67	2.09	19	2.09	0.12	67
0.14	70	2.31	20	2.31	0.14	70
0.17	70	2.56	20	2.56	0.17	70
0.19	73	2.71	21	2.71	0.19	73
0.21	73	2.56	21	2.56	0.21	73
0.23	77	2.26	22	2.26	0.23	77
0.25	80	1.93	23	1.93	0.25	80
0.27	73	1.79	21	1.79	0.27	73
0.30	70	1.65	20	1.65	0.30	70
0.32	70	1.45	20	1.45	0.32	70
0.34	73	1.21	21	1.21	0.34	73
0.36	70	1.06	20	1.06	0.36	70
0.38	63	0.81	18	0.81	0.38	63
0.41	67	0.48	19	0.48	0.41	67
0.43	80	0.23	23	0.23	0.43	0
-0.45	94	0.14	28			
-0.47	86	0.09	25			
-0.49	99	0.09	32			
-0.51	95	0.08	38			
-0.54	84	0.07	53			
-0.56	70	0.05	70			
0.58	51	0.04	90			
				Max. Volts	2.71	
				Max. Depth (%)	83.00	
				Length (in.)	0.89	
				Avg. Depth (%)	68.02	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE						
Axial Position	Depth	Volts	Phase Angle	Final with Adjustments		
				Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.36	0	0.00	25	0.00	-0.36	0
-0.34	67	0.84	23	0.84	-0.34	67
-0.32	70	1.09	24	1.09	-0.32	70
-0.30	70	1.25	24	1.25	-0.30	70
-0.28	74	1.46	25	1.46	-0.28	74
-0.26	70	1.67	24	1.67	-0.26	70
-0.24	74	1.81	25	1.81	-0.24	74
-0.21	77	2.00	26	2.00	-0.21	77
-0.19	74	2.32	25	2.32	-0.19	74
-0.17	74	2.57	25	2.57	-0.17	74
-0.15	70	2.63	24	2.63	-0.15	70
-0.13	74	2.44	25	2.44	-0.13	74
-0.11	70	2.19	24	2.19	-0.11	70
-0.09	67	2.00	23	2.00	-0.09	67
-0.07	67	1.83	23	1.83	-0.07	67
-0.05	67	1.80	23	1.80	-0.05	67
-0.02	70	1.76	24	1.76	-0.02	70
0.00	67	1.75	23	1.75	0.00	67
0.02	67	1.72	23	1.72	0.02	67
0.04	67	1.68	23	1.68	0.04	67
0.06	70	1.71	24	1.71	0.06	70
0.08	70	1.86	24	1.86	0.08	70
0.10	67	1.99	23	1.99	0.10	67
0.12	67	1.97	23	1.97	0.12	67
0.15	74	1.87	25	1.87	0.15	74
0.17	74	1.77	25	1.77	0.17	74
0.19	74	1.81	25	1.81	0.19	74
0.21	77	1.78	26	1.78	0.21	77
0.23	80	1.72	27	1.72	0.23	80
0.25	80	1.65	27	1.65	0.25	80
0.27	80	1.58	27	1.58	0.27	80
0.29	77	1.54	26	1.54	0.29	77
0.31	77	1.52	26	1.52	0.31	77
0.34	74	1.49	25	1.49	0.34	74
0.36	70	1.34	24	1.34	0.36	70
0.38	70	1.16	24	1.16	0.38	70
0.40	67	0.94	23	0.94	0.40	67
0.42	61	0.75	21	0.75	0.42	61
0.44	55	0.59	19	0.59	0.44	55
0.46	61	0.40	21	0.40	0.46	61
0.48	80	0.24	27	0.24	0.48	0
0.51	0	0.00	0			
				Max. Volts	2.63	
				Max. Depth (%)	80.00	
				Length (in.)	0.84	
				Avg. Depth (%)	69.19	

Table C-45
Sample 9 - 3H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.51	34	0.07	12			
-0.49	46	0.09	16	0.09	-0.49	0
-0.47	40	0.14	14	0.14	-0.47	40
-0.45	56	0.19	19	0.19	-0.45	56
-0.42	65	0.28	22	0.28	-0.42	65
-0.40	59	0.39	20	0.39	-0.40	59
-0.38	59	0.51	20	0.51	-0.38	59
-0.36	59	0.59	20	0.59	-0.36	59
-0.34	56	0.61	19	0.61	-0.34	56
-0.32	65	0.62	22	0.62	-0.32	65
-0.30	59	0.67	20	0.67	-0.30	59
-0.28	59	0.73	20	0.73	-0.28	59
-0.25	65	0.75	22	0.75	-0.25	65
-0.23	74	0.79	25	0.79	-0.23	74
-0.21	71	0.80	24	0.80	-0.21	71
-0.19	68	0.91	23	0.91	-0.19	68
-0.17	68	0.91	23	0.91	-0.17	68
-0.15	71	0.88	24	0.88	-0.15	71
-0.13	74	0.82	25	0.82	-0.13	74
-0.11	71	0.84	24	0.84	-0.11	71
-0.08	65	0.92	22	0.92	-0.08	65
-0.06	59	1.00	20	1.00	-0.06	59
-0.04	62	0.99	21	0.99	-0.04	62
-0.02	65	0.90	22	0.90	-0.02	65
0.00	62	0.84	21	0.84	0.00	62
0.02	71	0.73	24	0.73	0.02	71
0.04	65	0.71	22	0.71	0.04	65
0.06	56	0.74	19	0.74	0.06	56
0.09	59	0.70	20	0.70	0.09	59
0.11	56	0.69	19	0.69	0.11	56
0.13	52	0.67	18	0.67	0.13	52
0.15	56	0.64	19	0.64	0.15	56
0.17	52	0.61	18	0.61	0.17	52
0.19	62	0.54	21	0.54	0.19	62
0.21	62	0.53	21	0.53	0.21	62
0.23	56	0.55	19	0.55	0.23	56
0.26	56	0.52	19	0.52	0.26	56
0.28	56	0.46	19	0.46	0.28	56
0.30	59	0.41	20	0.41	0.30	59
0.32	43	0.41	15	0.41	0.32	43
0.34	40	0.40	14	0.40	0.34	40
0.36	40	0.29	14	0.29	0.36	40
0.38	34	0.24	12	0.24	0.38	34
0.40	25	0.17	9	0.17	0.40	25
0.42	52	0.08	18	0.08	0.42	0.00
0.45	25	0.05	9			
Max. Volts				1.00		
Max. Depth (%)				74.00		
Length (in.)				0.91		
Avg. Depth (%)				57.23		

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE							Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾	
-0.47	0	0.00	0	-0.47	0.00	0.00	-0.47	0	
-0.45	38	0.12	13	-0.45	38.00	0.12	-0.45	32	
-0.42	44	0.22	15	-0.42	44.00	0.22	-0.42	37	
-0.40	52	0.31	18	-0.40	52.00	0.31	-0.40	43	
-0.38	55	0.41	19	-0.38	55.00	0.41	-0.38	46	
-0.36	55	0.51	19	-0.36	55.00	0.51	-0.36	46	
-0.34	55	0.58	19	-0.34	55.00	0.58	-0.34	46	
-0.31	52	0.61	18	-0.31	52.00	0.61	-0.31	43	
-0.29	58	0.65	20	-0.29	58.00	0.65	-0.29	48	
-0.27	58	0.68	20	-0.27	58.00	0.68	-0.27	48	
-0.25	58	0.73	20	-0.25	58.00	0.73	-0.25	48	
-0.23	61	0.77	21	-0.23	61.00	0.77	-0.23	51	
-0.21	73	0.78	25	-0.21	73.00	0.78	-0.21	61	
-0.18	70	0.83	24	-0.18	70.00	0.83	-0.18	58	
-0.16	67	0.90	23	-0.16	67.00	0.90	-0.16	56	
-0.14	67	0.91	23	-0.14	67.00	0.91	-0.14	56	
-0.12	70	0.86	24	-0.12	70.00	0.86	-0.12	58	
-0.10	70	0.81	24	-0.10	70.00	0.81	-0.10	58	
-0.08	70	0.82	24	-0.08	70.00	0.82	-0.08	58	
-0.05	64	0.90	22	-0.05	64.00	0.90	-0.05	53	
-0.03	58	0.97	20	-0.03	58.00	0.97	-0.03	48	
-0.01	61	0.97	21	-0.01	61.00	0.97	-0.01	51	
0.01	61	0.91	21	0.01	61.00	0.91	0.01	51	
0.03	61	0.83	21	0.03	61.00	0.83	0.03	51	
0.05	64	0.73	22	0.05	64.00	0.73	0.05	53	
0.07	61	0.71	21	0.07	61.00	0.71	0.07	51	
0.10	55	0.73	19	0.10	55.00	0.73	0.10	46	
0.12	55	0.72	19	0.12	55.00	0.72	0.12	46	
0.14	55	0.67	19	0.14	55.00	0.67	0.14	46	
0.16	52	0.65	18	0.16	52.00	0.65	0.16	43	
0.18	52	0.64	18	0.18	52.00	0.64	0.18	43	
0.21	52	0.59	18	0.21	52.00	0.59	0.21	43	
0.23	58	0.54	20	0.23	58.00	0.54	0.23	48	
0.25	61	0.52	21	0.25	61.00	0.52	0.25	51	
0.27	55	0.53	19	0.27	55.00	0.53	0.27	46	
0.29	55	0.51	19	0.29	55.00	0.51	0.29	46	
0.31	55	0.45	19	0.31	55.00	0.45	0.31	46	
0.34	58	0.40	20	0.34	58.00	0.40	0.34	48	
0.36	44	0.40	15	0.36	44.00	0.40	0.36	37	
0.38	41	0.40	14	0.38	41.00	0.40	0.38	34	
0.40	38	0.31	13	0.40	38.00	0.31	0.40	32	
0.42	35	0.23	12	0.42	35.00	0.23	0.42	29	
0.44	0	0.00	0	0.44	0.00	0.00	0.44	0	
Max. Volts					0.97				
Max. Depth (%)					73.00				
Length (in.)					0.91				
Avg. Depth (%)					55.47				

Table C-45 (continued)
Sample 9 - 3H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 3

Crack 2 - MR + Point - Analyst 4

Unadjusted NDE								
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Final with Adjustments		
						Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.48	73	0.08	22.5					
-0.46	57	0.10	22	-0.46	0.00	0.12	-0.46	0
-0.44	57	0.19	16	-0.44	57.00	0.19	-0.44	47
-0.42	53	0.28	15	-0.42	53.00	0.28	-0.42	44
-0.39	63	0.35	18	-0.39	63.00	0.35	-0.39	52
-0.37	63	0.44	18	-0.37	63.00	0.44	-0.37	52
-0.35	53	0.46	15	-0.35	53.00	0.46	-0.35	44
-0.33	49	0.51	14	-0.33	49.00	0.51	-0.33	40
-0.31	57	0.56	16	-0.31	57.00	0.56	-0.31	47
-0.29	57	0.63	16	-0.29	57.00	0.63	-0.29	47
-0.26	57	0.64	16	-0.26	57.00	0.64	-0.26	47
-0.24	57	0.71	16	-0.24	57.00	0.71	-0.24	47
-0.22	73	0.81	21	-0.22	73.00	0.81	-0.22	60
-0.20	70	0.86	20	-0.20	70.00	0.86	-0.20	58
-0.18	70	0.94	20	-0.18	70.00	0.94	-0.18	58
-0.16	70	0.97	20	-0.16	70.00	0.97	-0.16	58
-0.13	67	0.92	19	-0.13	67.00	0.92	-0.13	55
-0.11	70	0.87	20	-0.11	70.00	0.87	-0.11	58
-0.09	70	0.86	20	-0.09	70.00	0.86	-0.09	58
-0.07	67	0.92	19	-0.07	67.00	0.92	-0.07	55
-0.05	60	0.99	17	-0.05	60.00	0.99	-0.05	49
-0.03	63	0.98	18	-0.03	63.00	0.98	-0.03	52
0.00	63	0.93	18	0.00	63.00	0.93	0.00	52
0.02	60	0.86	17	0.02	60.00	0.86	0.02	49
0.04	63	0.77	18	0.04	63.00	0.77	0.04	52
0.06	60	0.74	17	0.06	60.00	0.74	0.06	49
0.08	53	0.75	15	0.08	53.00	0.75	0.08	44
0.11	53	0.77	15	0.11	53.00	0.77	0.11	44
0.13	57	0.72	16	0.13	57.00	0.72	0.13	47
0.15	57	0.70	16	0.15	57.00	0.70	0.15	47
0.17	57	0.66	16	0.17	57.00	0.66	0.17	47
0.19	53	0.61	15	0.19	53.00	0.61	0.19	44
0.21	57	0.57	16	0.21	57.00	0.57	0.21	47
0.24	57	0.55	16	0.24	57.00	0.55	0.24	47
0.26	53	0.56	15	0.26	53.00	0.56	0.26	44
0.28	53	0.55	15	0.28	53.00	0.55	0.28	44
0.30	57	0.47	16	0.30	57.00	0.47	0.30	47
0.32	60	0.44	17	0.32	60.00	0.44	0.32	49
0.34	49	0.42	14	0.34	49.00	0.42	0.34	40
0.37	38	0.39	11	0.37	38.00	0.39	0.37	31
0.39	42	0.31	12	0.39	42.00	0.31	0.39	35
0.41	34	0.22	10	0.41	34.00	0.22	0.41	28
0.43	38	0.15	11	0.43	38.00	0.15	0.43	31
0.45	57	0.08	16	0.45	0.00	0.08	0.45	0
0.47	96	0.04	36					
		Max. Volts			0.99			0.99
		Max. Depth (%)			73.00			60.00
		Length (in.)			0.91			0.91
		Avg. Depth (%)			56.26			46.24

Unadjusted NDE								
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Final with Adjustments		
						Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.39	0	0.00	14	-0.39	0	0.00	-0.39	0
-0.37	36	0.26	13	-0.37	36	0.26	-0.37	31
-0.35	39	0.34	14	-0.35	39	0.34	-0.35	34
-0.33	46	0.39	17	-0.33	46	0.39	-0.33	40
-0.31	61	0.40	21	-0.31	61	0.40	-0.31	53
-0.29	61	0.44	21	-0.29	61	0.44	-0.29	53
-0.27	58	0.50	20	-0.27	58	0.50	-0.27	50
-0.25	58	0.54	20	-0.25	58	0.54	-0.25	50
-0.23	61	0.53	21	-0.23	61	0.53	-0.23	53
-0.20	61	0.54	21	-0.20	61	0.54	-0.20	53
-0.18	58	0.58	20	-0.18	58	0.58	-0.18	50
-0.16	55	0.62	19	-0.16	55	0.62	-0.16	48
-0.14	55	0.65	19	-0.14	55	0.65	-0.14	48
-0.12	58	0.66	20	-0.12	58	0.66	-0.12	50
-0.10	58	0.69	20	-0.10	58	0.69	-0.10	50
-0.08	61	0.70	21	-0.08	61	0.70	-0.08	53
-0.06	64	0.69	22	-0.06	64	0.69	-0.06	55
-0.03	67	0.72	23	-0.03	67	0.72	-0.03	58
-0.01	57	0.79	23	-0.01	57	0.79	-0.01	49
0.01	64	0.87	22	0.01	64	0.87	0.01	55
0.03	54	0.94	22	0.03	54	0.94	0.03	47
0.05	64	0.97	22	0.05	64	0.97	0.05	55
0.07	64	0.92	22	0.07	64	0.92	0.07	55
0.09	70	0.84	24	0.09	70	0.84	0.09	61
0.11	74	0.82	25	0.11	74	0.82	0.11	64
0.13	74	0.85	25	0.13	74	0.85	0.13	64
0.16	70	0.89	24	0.16	70	0.89	0.16	61
0.18	70	0.87	24	0.18	70	0.87	0.18	61
0.20	70	0.85	24	0.20	70	0.85	0.20	61
0.22	70	0.80	24	0.22	70	0.80	0.22	61
0.24	64	0.77	22	0.24	64	0.77	0.24	55
0.26	61	0.72	21	0.26	61	0.72	0.26	53
0.28	58	0.69	20	0.28	58	0.69	0.28	50
0.30	64	0.62	22	0.30	64	0.62	0.30	55
0.33	58	0.59	20	0.33	58	0.59	0.33	50
0.35	58	0.54	20	0.35	58	0.54	0.35	50
0.37	61	0.50	21	0.37	61	0.50	0.37	53
0.39	61	0.41	21	0.39	61	0.41	0.39	53
0.41	61	0.32	21	0.41	61	0.32	0.41	53
0.43	0	0.00	22	0.43	0	0.00	0.43	0
		Max. Volts			0.97			0.97
		Max. Depth (%)			74.00			64.00
		Length (in.)			0.82			0.82
		Avg. Depth (%)			59.36			51.34

Table C-46
Sample 9 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.55	90	0.07	30			
-0.53	71	0.08	24			
-0.51	87	0.10	29			
-0.49	74	0.17	25			
-0.46	52	0.34	18	0.34	-0.46	0
-0.44	40	0.51	14	0.51	-0.44	40
-0.42	59	0.52	20	0.52	-0.42	59
-0.40	68	0.58	23	0.58	-0.40	68
-0.38	65	0.79	22	0.79	-0.38	65
-0.36	68	1.01	23	1.01	-0.36	68
-0.34	71	1.30	24	1.30	-0.34	71
-0.32	74	1.50	25	1.50	-0.32	74
-0.30	74	1.51	25	1.51	-0.30	74
-0.27	74	1.47	25	1.47	-0.27	74
-0.25	77	1.41	26	1.41	-0.25	77
-0.23	71	1.55	24	1.55	-0.23	71
-0.21	71	1.63	24	1.63	-0.21	71
-0.19	74	1.70	25	1.70	-0.19	74
-0.17	74	1.74	25	1.74	-0.17	74
-0.15	71	1.81	24	1.81	-0.15	71
-0.13	68	1.70	23	1.70	-0.13	68
-0.10	74	1.50	25	1.50	-0.10	74
-0.08	71	1.42	24	1.42	-0.08	71
-0.06	68	1.45	23	1.45	-0.06	68
-0.04	71	1.47	24	1.47	-0.04	71
-0.02	71	1.39	24	1.39	-0.02	71
0.00	74	1.44	25	1.44	0.00	74
0.02	71	1.53	24	1.53	0.02	71
0.04	71	1.57	24	1.57	0.04	71
0.06	68	1.67	23	1.67	0.06	68
0.09	65	1.73	22	1.73	0.09	65
0.11	71	1.71	24	1.71	0.11	71
0.13	74	1.72	25	1.72	0.13	74
0.15	71	1.82	24	1.82	0.15	71
0.17	71	1.78	24	1.78	0.17	71
0.19	71	1.56	24	1.56	0.19	71
0.21	74	1.32	25	1.32	0.21	74
0.23	68	1.20	23	1.20	0.23	68
0.26	59	1.11	20	1.11	0.26	59
0.28	56	0.88	19	0.88	0.28	56
0.30	65	0.59	22	0.59	0.30	65
0.32	56	0.37	19	0.37	0.32	56
0.34	87	0.18	29	0.18	0.34	0
0.36	91	0.09	47			
0.38	94	0.10	43			
0.40	91	0.11	47			
0.42	90	0.09	48			
				Max. Volts		1.82
				Max. Depth (%)		77.00
				Length (In.)		0.80
				Avg. Depth (%)		66.91

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.46	0	0.00	0	0.00	-0.46	0
-0.44	41	0.34	14	0.34	-0.44	41
-0.42	41	0.49	14	0.49	-0.42	41
-0.39	58	0.51	20	0.51	-0.39	58
-0.37	67	0.56	23	0.56	-0.37	67
-0.35	64	0.77	22	0.77	-0.35	64
-0.33	61	1.02	21	1.02	-0.33	61
-0.31	70	1.26	24	1.26	-0.31	70
-0.29	73	1.45	25	1.45	-0.29	73
-0.26	73	1.46	25	1.46	-0.26	73
-0.24	73	1.41	25	1.41	-0.24	73
-0.22	76	1.37	26	1.37	-0.22	76
-0.20	70	1.51	24	1.51	-0.20	70
-0.18	70	1.58	24	1.58	-0.18	70
-0.16	73	1.65	25	1.65	-0.16	73
-0.13	73	1.69	25	1.69	-0.13	73
-0.11	70	1.76	24	1.76	-0.11	70
-0.09	67	1.65	23	1.65	-0.09	67
-0.07	73	1.46	25	1.46	-0.07	73
-0.05	70	1.38	24	1.38	-0.05	70
-0.03	67	1.41	23	1.41	-0.03	67
-0.01	70	1.44	24	1.44	-0.01	70
0.02	70	1.36	24	1.36	0.02	70
0.04	73	1.40	25	1.40	0.04	73
0.06	70	1.49	24	1.49	0.06	70
0.08	70	1.53	24	1.53	0.08	70
0.10	67	1.63	23	1.63	0.10	67
0.12	64	1.68	22	1.68	0.12	64
0.15	70	1.66	24	1.66	0.15	70
0.17	73	1.67	25	1.67	0.17	73
0.19	70	1.77	24	1.77	0.19	70
0.21	70	1.72	24	1.72	0.21	70
0.23	73	1.52	25	1.52	0.23	73
0.25	73	1.29	25	1.29	0.25	73
0.28	87	1.17	23	1.17	0.28	67
0.30	58	1.08	20	1.08	0.30	58
0.32	55	0.85	19	0.85	0.32	55
0.34	64	0.57	22	0.57	0.34	64
0.36	55	0.36	19	0.36	0.36	55
0.38	85	0.18	29	0.18	0.38	0
0.41	0	0.00	0			
				Max. Volts		1.77
				Max. Depth (%)		76.00
				Length (In.)		0.84
				Avg. Depth (%)		65.32

Table C-46 (continued)
Sample 9 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.50	92	0.09	27			
-0.47	77	0.16	22	0.16	-0.47	0
-0.45	53	0.34	15	0.34	-0.45	53
-0.43	49	0.49	14	0.49	-0.43	49
-0.41	60	0.52	17	0.52	-0.41	60
-0.39	70	0.57	20	0.57	-0.39	70
-0.36	63	0.78	18	0.78	-0.36	63
-0.34	67	0.99	19	0.99	-0.34	67
-0.32	73	1.22	21	1.22	-0.32	73
-0.30	77	1.41	22	1.41	-0.30	77
-0.28	77	1.44	22	1.44	-0.28	77
-0.26	77	1.43	22	1.43	-0.26	77
-0.24	73	1.38	21	1.38	-0.24	73
-0.21	73	1.52	21	1.52	-0.21	73
-0.19	73	1.60	21	1.60	-0.19	73
-0.17	73	1.67	21	1.67	-0.17	73
-0.15	73	1.69	21	1.69	-0.15	73
-0.13	70	1.76	20	1.76	-0.13	70
-0.11	67	1.68	19	1.68	-0.11	67
-0.08	73	1.49	21	1.49	-0.08	73
-0.06	73	1.40	21	1.40	-0.06	73
-0.04	67	1.44	19	1.44	-0.04	67
-0.02	67	1.47	19	1.47	-0.02	67
0.00	70	1.40	20	1.40	0.00	70
0.02	77	1.42	22	1.42	0.02	77
0.05	70	1.51	20	1.51	0.05	70
0.07	73	1.54	21	1.54	0.07	73
0.09	63	1.66	18	1.66	0.09	63
0.11	60	1.71	17	1.71	0.11	60
0.13	67	1.72	19	1.72	0.13	67
0.15	70	1.73	20	1.73	0.15	70
0.18	67	1.82	19	1.82	0.18	67
0.20	67	1.78	19	1.78	0.20	67
0.22	70	1.58	20	1.58	0.22	70
0.24	67	1.35	19	1.35	0.24	67
0.26	63	1.23	18	1.23	0.26	63
0.28	57	1.12	16	1.12	0.28	57
0.31	60	0.91	17	0.91	0.31	60
0.33	63	0.64	18	0.64	0.33	63
0.35	46	0.45	13	0.45	0.35	46
0.37	60	0.22	17	0.22	0.37	0
Max. Volts				1.82		
Max. Depth (%)				77.00		
Length (in.)				0.84		
Avg. Depth (%)				65.79		

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽¹⁾
-0.35	0	0.00	26	0.00	-0.35	0
-0.33	58	0.42	20	0.42	-0.33	58
-0.31	64	0.63	22	0.63	-0.31	64
-0.29	61	0.92	21	0.92	-0.29	61
-0.27	61	1.12	21	1.12	-0.27	61
-0.24	67	1.22	23	1.22	-0.24	67
-0.22	70	1.37	24	1.37	-0.22	70
-0.20	74	1.54	25	1.54	-0.20	74
-0.18	70	1.77	24	1.77	-0.18	70
-0.16	70	1.78	24	1.78	-0.16	70
-0.14	70	1.68	24	1.68	-0.14	70
-0.12	67	1.64	23	1.64	-0.12	67
-0.10	67	1.71	23	1.71	-0.10	67
-0.07	70	1.63	24	1.63	-0.07	70
-0.05	74	1.52	25	1.52	-0.05	74
-0.03	74	1.50	25	1.50	-0.03	74
-0.01	74	1.42	25	1.42	-0.01	74
0.01	74	1.40	25	1.40	0.01	74
0.03	70	1.44	24	1.44	0.03	70
0.05	70	1.40	24	1.40	0.05	70
0.07	70	1.43	24	1.43	0.07	70
0.09	70	1.54	24	1.54	0.09	70
0.11	67	1.70	23	1.70	0.11	67
0.14	70	1.77	24	1.77	0.14	70
0.16	74	1.69	25	1.69	0.16	74
0.18	74	1.66	25	1.66	0.18	74
0.20	74	1.56	25	1.56	0.20	74
0.22	70	1.50	24	1.50	0.22	70
0.24	77	1.41	26	1.41	0.24	77
0.26	70	1.43	24	1.43	0.26	70
0.28	77	1.45	26	1.45	0.28	77
0.30	77	1.39	26	1.39	0.30	77
0.33	74	1.17	25	1.17	0.33	74
0.35	64	0.93	22	0.93	0.35	64
0.37	64	0.74	22	0.74	0.37	64
0.39	67	0.56	23	0.56	0.39	67
0.41	51	0.50	18	0.50	0.41	51
0.43	48	0.46	17	0.46	0.43	48
0.45	0	0.00	20	0.00	0.45	0
Max. Volts				1.78		
Max. Depth (%)				77.00		
Length (in.)				0.80		
Avg. Depth (%)				67.03		

Table C-47
Sample 9 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.51	65	0.11	22			
-0.48	31	0.13	11	0.13	-0.48	0
-0.46	31	0.18	11	0.18	-0.46	31
-0.44	28	0.22	10	0.22	-0.44	28
-0.42	20	0.28	7	0.28	-0.42	20
-0.40	34	0.50	12	0.50	-0.40	34
-0.38	43	0.66	15	0.66	-0.38	43
-0.36	59	0.77	20	0.77	-0.36	59
-0.34	65	0.99	22	0.99	-0.34	65
-0.32	65	1.24	22	1.24	-0.32	65
-0.30	68	1.41	23	1.41	-0.30	68
-0.28	74	1.50	25	1.50	-0.28	74
-0.25	81	1.56	27	1.56	-0.25	81
-0.23	71	1.76	24	1.76	-0.23	71
-0.21	65	1.97	22	1.97	-0.21	65
-0.19	65	2.09	22	2.09	-0.19	65
-0.17	68	2.10	23	2.10	-0.17	68
-0.15	71	2.17	24	2.17	-0.15	71
-0.13	65	2.27	22	2.27	-0.13	65
-0.11	68	2.15	23	2.15	-0.11	68
-0.09	68	1.98	23	1.98	-0.09	68
-0.07	68	1.80	23	1.80	-0.07	68
-0.05	65	1.78	22	1.78	-0.05	65
-0.03	62	1.89	21	1.89	-0.03	62
0.00	62	2.03	21	2.03	0.00	62
0.02	59	2.12	20	2.12	0.02	59
0.04	62	2.08	21	2.08	0.04	62
0.06	62	2.10	21	2.10	0.06	62
0.08	68	2.00	23	2.00	0.08	68
0.10	65	2.06	22	2.06	0.10	65
0.12	68	1.78	23	1.78	0.12	68
0.14	74	1.42	25	1.42	0.14	74
0.16	68	1.21	23	1.21	0.16	68
0.18	62	1.10	21	1.10	0.18	62
0.20	62	0.99	21	0.99	0.20	62
0.23	62	0.75	21	0.75	0.23	62
0.25	59	0.55	20	0.55	0.25	59
0.27	49	0.48	17	0.48	0.27	49
0.29	56	0.44	19	0.44	0.29	56
0.31	46	0.28	16	0.28	0.31	46
0.33	43	0.18	15	0.18	0.33	0
				Max. Volts	2.27	
				Max. Depth (%)	81.00	
				Length (in.)	0.81	
				Avg. Depth (%)	58.98	

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.42	0	0.00	0	0.00	-0.42	0
-0.40	17	0.28	6	0.28	-0.40	17
-0.37	29	0.50	10	0.50	-0.37	29
-0.35	38	0.66	13	0.66	-0.35	38
-0.33	55	0.77	19	0.77	-0.33	55
-0.31	61	0.97	21	0.97	-0.31	61
-0.29	61	1.23	21	1.23	-0.29	61
-0.27	70	1.38	24	1.38	-0.27	70
-0.25	73	1.46	25	1.46	-0.25	73
-0.23	79	1.52	27	1.52	-0.23	79
-0.20	70	1.72	24	1.72	-0.20	70
-0.18	64	1.91	22	1.91	-0.18	64
-0.16	64	2.03	22	2.03	-0.16	64
-0.14	67	2.05	23	2.05	-0.14	67
-0.12	70	2.11	24	2.11	-0.12	70
-0.10	64	2.21	22	2.21	-0.10	64
-0.08	67	2.09	23	2.09	-0.08	67
-0.06	67	1.92	23	1.92	-0.06	67
-0.03	67	1.75	23	1.75	-0.03	67
-0.01	64	1.74	22	1.74	-0.01	64
0.01	61	1.84	21	1.84	0.01	61
0.03	61	1.97	21	1.97	0.03	61
0.05	58	2.07	20	2.07	0.05	58
0.07	61	2.02	21	2.02	0.07	61
0.09	61	2.05	21	2.05	0.09	61
0.12	67	1.95	23	1.95	0.12	67
0.14	64	2.00	22	2.00	0.14	64
0.16	67	1.73	23	1.73	0.16	67
0.18	73	1.39	25	1.39	0.18	73
0.20	67	1.18	23	1.18	0.20	67
0.22	61	1.07	21	1.07	0.22	61
0.24	61	0.96	21	0.96	0.24	61
0.26	61	0.73	21	0.73	0.26	61
0.29	58	0.53	20	0.53	0.29	58
0.31	49	0.47	17	0.47	0.31	49
0.33	55	0.43	19	0.43	0.33	55
0.35	47	0.28	16	0.28	0.35	47
0.37	70	0.18	24	0.18	0.37	0
0.39	0	0.00	0			
				Max. Volts	2.21	
				Max. Depth (%)	79.00	
				Length (in.)	0.79	
				Avg. Depth (%)	58.81	

Table C-48
Sample 9 - 5H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.06	59	0.16	20	-0.06	0	0.16	-0.06	0
-0.04	43	0.41	15	-0.04	43	0.41	-0.04	40
-0.02	40	0.50	14	-0.02	40	0.50	-0.02	37
0.01	40	0.38	14	0.01	40	0.38	0.01	37
0.03	56	0.17	19	0.03	0	0.17	0.03	0
Max. Volts					0.50	0.50		
Max. Depth (%)					43.00	40.00		
Length (in.)					0.09	0.09		
Avg. Depth (%)					31.78	29.56		

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.05	0	0.00	0	-0.03	0	0.16	-0.03	0
0.00	44	0.39	15	0.00	44	0.39	0.00	41
0.02	41	0.49	14	0.02	41	0.49	0.02	38
0.04	41	0.37	14	0.04	41	0.37	0.04	38
0.06	55	0.17	19	0.06	0	0.17	0.06	0
0.08	0	0.00	0					
Max. Volts					0.49	0.49		
Max. Depth (%)					44.00	41.00		
Length (in.)					0.09	0.09		
Avg. Depth (%)					30.44	28.37		

**Table C-48 (continued)
Sample 9 - 5H
Laboratory Specimen NDE Analysis**

Crack 2 - MR + Point - Analyst 3

Crack 2 - MR + Point - Analyst 4

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
				-0.07	0	0.00	-0.07	0
-0.05	34	0.07	10	-0.05	34	0.07	-0.05	21
-0.03	54	0.18	14	-0.03	54	0.16	-0.03	34
-0.01	41	0.44	11	-0.01	41	0.40	-0.01	25
0.02	34	0.55	9	0.02	34	0.46	0.02	21
0.04	43	0.45	11	0.04	43	0.37	0.04	27
0.06	53	0.17	15	0.06	0	0.17	0.06	0
		Max. Volts			0.55			0.55
		Max. Depth (%)			54.00			33.50
		Length (in.)			0.13			0.13
		Avg. Depth (%)			34.53			21.42

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.07	0	0.00	19	-0.07	0	0.00	-0.07	0
-0.05	42	0.31	15	-0.05	42	0.31	-0.05	34
-0.03	39	0.46	14	-0.03	39	0.46	-0.03	32
-0.01	42	0.43	15	-0.01	42	0.43	-0.01	34
0.01	48	0.24	17	0.01	48	0.24	0.01	39
0.03	0	0.00	20	0.03	0	0.00	0.03	0
		Max. Volts			0.46			0.46
		Max. Depth (%)			48.00			39.00
		Length (in.)			0.10			0.10
		Avg. Depth (%)			34.20			27.79

Table C-49
Sample 10 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.55	95	0.10	41			
-0.53	96	0.11	40			
-0.51	90	0.16	31			
-0.49	77	0.34	26	0.34	-0.49	0
-0.47	67	0.52	22	0.52	-0.47	67
-0.45	80	0.73	27	0.73	-0.45	80
-0.43	80	0.85	27	0.85	-0.43	80
-0.41	75	1.02	25	1.02	-0.41	75
-0.39	72	1.20	24	1.20	-0.39	72
-0.37	77	1.33	26	1.33	-0.37	77
-0.35	80	1.32	27	1.32	-0.35	80
-0.32	85	1.37	29	1.37	-0.32	85
-0.30	93	1.38	32	1.38	-0.30	93
-0.28	88	1.57	30	1.57	-0.28	88
-0.26	90	1.70	31	1.70	-0.26	90
-0.24	90	1.75	31	1.75	-0.24	90
-0.22	85	1.80	29	1.80	-0.22	85
-0.20	90	1.65	31	1.65	-0.20	90
-0.18	85	1.68	29	1.68	-0.18	85
-0.16	88	1.60	30	1.60	-0.16	88
-0.14	83	1.61	28	1.61	-0.14	83
-0.12	85	1.37	29	1.37	-0.12	85
-0.10	75	1.22	25	1.22	-0.10	75
-0.08	80	1.02	27	1.02	-0.08	80
-0.06	77	1.04	26	1.04	-0.06	77
-0.04	75	1.26	25	1.26	-0.04	75
-0.02	75	1.50	25	1.50	-0.02	75
0.00	77	1.67	26	1.67	0.00	77
0.02	77	1.70	26	1.70	0.02	77
0.05	83	1.56	28	1.56	0.05	83
0.07	85	1.37	29	1.37	0.07	85
0.09	85	1.32	29	1.32	0.09	85
0.11	88	1.25	30	1.25	0.11	88
0.13	85	1.22	29	1.22	0.13	85
0.15	83	1.11	28	1.11	0.15	83
0.17	75	0.93	25	0.93	0.17	75
0.19	69	0.72	23	0.72	0.19	69
0.21	67	0.51	22	0.51	0.21	67
0.23	67	0.29	22	0.29	0.23	67
0.25	95	0.14	33	0.14	0.25	0
0.27	92	0.09	44			
				Max. Volts		1.80
				Max. Depth (%)		93.00
				Length (in.)		0.74
				Avg. Depth (%)		78.30

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.49	0	0.00	0	0.00	-0.49	0
-0.46	67	0.15	23	0.15	-0.46	67
-0.44	64	0.31	22	0.31	-0.44	64
-0.42	64	0.46	22	0.46	-0.42	64
-0.40	64	0.58	22	0.58	-0.40	64
-0.38	70	0.71	24	0.71	-0.38	70
-0.36	64	0.84	22	0.84	-0.36	64
-0.33	61	1.05	21	1.05	-0.33	61
-0.31	64	1.14	22	1.14	-0.31	64
-0.29	70	1.21	24	1.21	-0.29	70
-0.27	79	1.20	27	1.20	-0.27	79
-0.25	85	1.25	29	1.25	-0.25	85
-0.23	82	1.32	28	1.32	-0.23	82
-0.21	82	1.49	28	1.49	-0.21	82
-0.18	82	1.54	28	1.54	-0.18	82
-0.16	76	1.61	26	1.61	-0.16	76
-0.14	76	1.56	26	1.56	-0.14	76
-0.12	76	1.52	26	1.52	-0.12	76
-0.10	73	1.48	25	1.48	-0.10	73
-0.08	73	1.46	25	1.46	-0.08	73
-0.05	73	1.36	25	1.36	-0.05	73
-0.03	76	1.19	26	1.19	-0.03	76
-0.01	79	1.06	27	1.06	-0.01	79
0.01	85	1.02	29	1.02	0.01	85
0.03	79	1.08	27	1.08	0.03	79
0.05	70	1.27	24	1.27	0.05	70
0.08	67	1.43	23	1.43	0.08	67
0.10	64	1.52	22	1.52	0.10	64
0.12	67	1.52	23	1.52	0.12	67
0.14	73	1.38	25	1.38	0.14	73
0.16	73	1.24	25	1.24	0.16	73
0.18	76	1.18	26	1.18	0.18	76
0.21	76	1.12	26	1.12	0.21	76
0.23	73	1.04	25	1.04	0.23	73
0.25	67	0.89	23	0.89	0.25	67
0.27	55	0.69	19	0.69	0.27	55
0.29	52	0.46	18	0.46	0.29	52
0.31	61	0.23	21	0.23	0.31	0
0.33	91	0.09	31			
0.36	0	0.00	0			
				Max. Volts		1.61
				Max. Depth (%)		85.00
				Length (in.)		0.80
				Avg. Depth (%)		69.37

Table C-49 (continued)
Sample 10 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.51	0	0.07	177			
-0.49	67	0.08	19			
-0.47	57	0.11	16	0.11	-0.47	0
-0.45	53	0.33	15	0.33	-0.45	53
-0.43	57	0.48	16	0.48	-0.43	57
-0.40	60	0.60	17	0.60	-0.40	60
-0.38	73	0.71	21	0.71	-0.38	73
-0.36	67	0.85	19	0.85	-0.36	67
-0.34	67	1.05	19	1.05	-0.34	67
-0.32	67	1.13	19	1.13	-0.32	67
-0.30	73	1.23	21	1.23	-0.30	73
-0.28	80	1.21	23	1.21	-0.28	80
-0.25	89	1.27	26	1.27	-0.25	89
-0.23	86	1.34	25	1.34	-0.23	86
-0.21	83	1.52	24	1.52	-0.21	83
-0.19	83	1.58	24	1.58	-0.19	83
-0.17	77	1.66	22	1.66	-0.17	77
-0.15	77	1.61	22	1.61	-0.15	77
-0.12	80	1.56	23	1.56	-0.12	80
-0.10	77	1.50	22	1.50	-0.10	77
-0.08	77	1.49	22	1.49	-0.08	77
-0.06	73	1.40	21	1.40	-0.06	73
-0.04	73	1.25	21	1.25	-0.04	73
-0.02	80	1.14	23	1.14	-0.02	80
0.01	83	1.10	24	1.10	0.01	83
0.03	73	1.17	21	1.17	0.03	73
0.05	67	1.35	19	1.35	0.05	67
0.07	63	1.50	18	1.50	0.07	63
0.09	63	1.57	18	1.57	0.09	63
0.11	67	1.56	19	1.56	0.11	67
0.14	73	1.41	21	1.41	0.14	73
0.16	77	1.28	22	1.28	0.16	77
0.18	77	1.22	22	1.22	0.18	77
0.20	77	1.17	22	1.17	0.20	77
0.22	70	1.09	20	1.09	0.22	70
0.24	67	0.94	19	0.94	0.24	67
0.27	57	0.74	16	0.74	0.27	57
0.29	53	0.52	15	0.52	0.29	53
0.31	67	0.30	19	0.30	0.31	0
0.33	86	0.15	25			
0.35	94	0.09	28			
0.37	77	0.08	22			
0.40	63	0.06	18			
0.42	67	0.04	19			
0.44	70	0.04	71			
0.46	51	0.02	90			
				Max. Volts		1.66
				Max. Depth (%)		89.00
				Length (in.)		0.78
				Avg. Depth (%)		70.17

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.43	0	0	46			
-0.41	95	0.06	40			
-0.39	95	0.07	40			
-0.37	83	0.07	28			
-0.35	91	0.06	46			
-0.33	77	0.12	26			
-0.31	58	0.29	20	0.30	-0.31	0
-0.29	51	0.52	18	0.52	-0.29	51
-0.26	58	0.75	20	0.75	-0.26	58
-0.24	67	0.93	23	0.93	-0.24	67
-0.22	74	1.06	25	1.06	-0.22	74
-0.20	77	1.16	26	1.16	-0.20	77
-0.18	77	1.22	26	1.22	-0.18	77
-0.16	74	1.29	25	1.29	-0.16	74
-0.14	70	1.44	24	1.44	-0.14	70
-0.12	67	1.54	23	1.54	-0.12	67
-0.10	64	1.53	22	1.53	-0.10	64
-0.07	67	1.39	23	1.39	-0.07	67
-0.05	74	1.25	25	1.25	-0.05	74
-0.03	83	1.08	28	1.08	-0.03	83
0.01	80	1.10	27	1.1	0.01	80
0.03	77	1.26	26	1.26	0.03	77
0.05	74	1.40	25	1.4	0.05	74
0.07	77	1.49	26	1.49	0.07	77
0.09	74	1.52	25	1.52	0.09	74
0.12	77	1.55	26	1.55	0.12	77
0.14	77	1.57	26	1.57	0.14	77
0.16	80	1.62	27	1.62	0.16	80
0.18	83	1.56	28	1.56	0.18	83
0.20	83	1.48	28	1.48	0.20	83
0.22	87	1.32	29	1.32	0.22	87
0.24	83	1.26	28	1.26	0.24	83
0.26	80	1.20	27	1.2	0.26	80
0.28	70	1.21	24	1.21	0.28	70
0.30	64	1.13	22	1.13	0.30	64
0.33	61	1.01	21	1.01	0.33	61
0.35	67	0.82	23	0.82	0.35	67
0.37	70	0.69	24	0.69	0.37	70
0.39	64	0.56	22	0.56	0.39	64
0.41	64	0.43	22	0.43	0.41	64
0.43	64	0.27	22	0.27	0.43	64
0.45	77	0.13	26	0.13	0.45	0
0.47	92	0.07	45			
0.49	0	0.00	172			
				Max. Volts		1.62
				Max. Depth (%)		87.00
				Length (in.)		0.76
				Avg. Depth (%)		70.25

Table C-50
Sample 10 - 3H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE					Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽²⁾	Depth ^(2A)	
-0.17	41	0.16	13	-0.17	41	0.16	-0.17	27	
-0.15	44	0.17	14	-0.15	44	0.17	-0.15	29	
-0.13	47	0.23	15	-0.13	47	0.23	-0.13	31	
-0.11	64	0.26	21	-0.11	64	0.26	-0.11	42	
-0.09	53	0.27	17	-0.09	53	0.27	-0.09	35	
-0.07	44	0.29	14	-0.07	44	0.29	-0.07	29	
-0.05	53	0.32	17	-0.05	53	0.32	-0.05	35	
-0.03	80	0.28	27	-0.03	80	0.28	-0.03	53	
-0.01	61	0.30	20	-0.01	61	0.30	-0.01	40	
0.01	72	0.31	24	0.01	72	0.31	0.01	48	
0.03	67	0.30	22	0.03	67	0.30	0.03	44	
0.06	69	0.29	23	0.06	69	0.29	0.06	46	
0.08	64	0.28	21	0.08	64	0.28	0.08	42	
0.10	53	0.23	17	0.10	53	0.23	0.10	35	
0.12	72	0.25	24	0.12	72	0.25	0.12	48	
0.14	67	0.27	22	0.14	67	0.27	0.14	44	
0.16	53	0.38	17	0.16	53	0.38	0.16	35	
0.18	55	0.35	18	0.18	55	0.35	0.18	36	
0.20	64	0.24	21	0.20	64	0.24	0.20	42	
0.22	69	0.24	23	0.22	69	0.24	0.22	46	
0.24	53	0.26	17	0.24	53	0.26	0.24	35	
0.26	58	0.28	19	0.26	58	0.28	0.26	38	
0.28	58	0.32	19	0.28	58	0.32	0.28	38	
0.30	55	0.27	18	0.30	55	0.27	0.30	36	
0.32	44	0.17	14	0.32	44	0.17	0.32	29	
				0.34	0		0.34	0	
Max. Volts				0.38		0.38			
Max. Depth (%)				80.00		53.00			
Length (in.)				0.53		0.53			
Avg. Depth (%)				56.38		56.38			

Unadjusted NDE					Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾	
-0.13	0	0.00	0	-0.13	0	0.00	-0.13	0	
-0.11	52	0.19	18	-0.11	52	0.19	-0.11	41	
-0.09	67	0.17	23	-0.09	67	0.17	-0.09	53	
-0.07	73	0.21	25	-0.07	73	0.21	-0.07	58	
-0.04	70	0.31	24	-0.04	70	0.31	-0.04	56	
-0.02	64	0.30	22	-0.02	64	0.30	-0.02	51	
0.00	61	0.35	21	0.00	61	0.35	0.00	48	
0.02	61	0.36	21	0.02	61	0.36	0.02	48	
0.04	58	0.36	20	0.04	58	0.36	0.04	46	
0.06	61	0.36	21	0.06	61	0.36	0.06	48	
0.09	64	0.37	22	0.09	64	0.37	0.09	51	
0.11	61	0.40	21	0.11	61	0.40	0.11	48	
0.13	58	0.41	20	0.13	58	0.41	0.13	46	
0.15	61	0.39	21	0.15	61	0.39	0.15	48	
0.17	58	0.38	20	0.17	58	0.38	0.17	46	
0.19	61	0.35	21	0.19	61	0.35	0.19	48	
0.22	64	0.36	22	0.22	64	0.36	0.22	51	
0.24	47	0.41	16	0.24	47	0.41	0.24	37	
0.26	49	0.36	17	0.26	49	0.36	0.26	39	
0.28	61	0.27	21	0.28	61	0.27	0.28	48	
0.30	61	0.25	21	0.30	61	0.25	0.30	48	
0.32	55	0.29	19	0.32	55	0.29	0.32	44	
0.35	49	0.34	17	0.35	49	0.34	0.35	39	
0.37	52	0.30	18	0.37	52	0.30	0.37	41	
0.39	47	0.22	16	0.39	47	0.22	0.39	37	
0.41	52	0.13	18	0.41	52	0.13	0.41	41	
0.43	0	0.00	0	0.43	0	0.00	0.43	0	
Max. Volts				0.41		0.41			
Max. Depth (%)				73.00		58.00			
Length (in.)				0.56		0.56			
Avg. Depth (%)				56.83		45.15			

Table C-50 (continued)
Sample 10 - 3H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 3

Crack 2 - MR + Point - Analyst 4

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.18	0	0.00	0	-0.18	0	0.00	-0.18	0
-0.16	23	0.09	7	-0.16	23	0.09	-0.16	15
-0.14	31	0.12	9	-0.14	31	0.12	-0.14	20
-0.12	53	0.19	15	-0.12	53	0.19	-0.12	35
-0.09	57	0.24	16	-0.09	57	0.24	-0.09	37
-0.07	63	0.27	18	-0.07	63	0.27	-0.07	41
-0.05	63	0.30	18	-0.05	63	0.30	-0.05	41
-0.03	67	0.33	19	-0.03	67	0.33	-0.03	44
0.00	60	0.35	17	0.00	60	0.35	0.00	39
0.02	63	0.35	18	0.02	63	0.35	0.02	41
0.04	60	0.35	17	0.04	60	0.35	0.04	39
0.06	63	0.35	18	0.06	63	0.35	0.06	41
0.08	67	0.37	19	0.08	67	0.37	0.08	44
0.10	57	0.40	16	0.10	57	0.40	0.10	37
0.12	60	0.41	17	0.12	60	0.41	0.12	39
0.14	60	0.40	17	0.14	60	0.40	0.14	39
0.17	49	0.39	14	0.17	49	0.39	0.17	32
0.19	63	0.36	18	0.19	63	0.36	0.19	41
0.21	63	0.37	18	0.21	63	0.37	0.21	41
0.23	46	0.45	13	0.23	46	0.45	0.23	30
0.25	57	0.39	16	0.25	57	0.39	0.25	37
0.28	70	0.34	20	0.28	70	0.34	0.28	46
0.30	63	0.34	18	0.30	63	0.34	0.30	41
0.32	60	0.36	17	0.32	60	0.36	0.32	39
0.34	60	0.37	17	0.34	60	0.37	0.34	39
0.36	53	0.33	15	0.36	53	0.33	0.36	35
0.38	57	0.25	16	0.38	57	0.25	0.38	37
0.41	57	0.15	16	0.41	57	0.15	0.41	37
0.43	73	0.10	21	0.43	0	0.10	0.43	0
0.45	49	0.08	14					
		Max. Volts		0.45		0.45		0.45
		Max. Depth (%)		70.00		46.00		42.00
		Length (in.)		0.61		0.61		0.55
		Avg. Depth (%)		55.47		36.45		33.55

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.49	0	0.00	0	-0.49	0	0.00	-0.49	0
-0.47	48	0.08	17	-0.47	48	0.08	-0.47	30
-0.44	58	0.09	20	-0.44	58	0.09	-0.44	35
-0.42	51	0.13	18	-0.42	0	0.13	-0.42	0
-0.40	45	0.20	16	-0.40	45	0.20	-0.40	27
-0.38	45	0.28	16	-0.38	45	0.28	-0.38	27
-0.36	45	0.30	16	-0.36	45	0.30	-0.36	27
-0.34	48	0.31	17	-0.34	48	0.31	-0.34	29
-0.32	55	0.27	19	-0.32	55	0.27	-0.32	33
-0.30	64	0.27	22	-0.30	64	0.27	-0.30	38
-0.28	51	0.34	18	-0.28	51	0.34	-0.28	31
-0.25	42	0.41	15	-0.25	42	0.41	-0.25	25
-0.23	58	0.38	20	-0.23	58	0.38	-0.23	35
-0.21	64	0.34	22	-0.21	64	0.34	-0.21	38
-0.19	64	0.33	22	-0.19	64	0.33	-0.19	38
-0.17	67	0.32	23	-0.17	67	0.32	-0.17	40
-0.15	61	0.36	21	-0.15	61	0.36	-0.15	37
-0.13	58	0.37	20	-0.13	58	0.37	-0.13	35
-0.11	64	0.34	22	-0.11	64	0.34	-0.11	38
-0.09	67	0.32	23	-0.09	67	0.32	-0.09	40
-0.06	64	0.34	22	-0.06	64	0.34	-0.06	38
-0.04	64	0.33	22	-0.04	64	0.33	-0.04	38
-0.02	64	0.31	22	-0.02	64	0.31	-0.02	38
0.00	67	0.31	23	0.00	67	0.31	0.00	40
0.02	70	0.29	24	0.02	70	0.29	0.02	42
0.04	70	0.25	24	0.04	70	0.25	0.04	42
0.06	61	0.22	21	0.06	61	0.22	0.06	37
0.08	55	0.20	19	0.08	55	0.20	0.08	33
0.10	55	0.14	19	0.10	55	0.14	0.10	33
0.13	0	0.00	21	0.13	0	0.00	0.13	0
		Max. Volts		0.41		0.41		0.41
		Max. Depth (%)		70.00		42.00		42.00
		Length (in.)		0.55		0.55		0.55
		Avg. Depth (%)		55.92		33.55		33.55

Table C-51
Sample 10 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.42	93	0.13	32	0.13	-0.42	0
-0.40	50	0.18	16	0.18	-0.40	50
-0.37	47	0.27	15	0.27	-0.37	47
-0.35	47	0.38	15	0.38	-0.35	47
-0.33	50	0.58	16	0.58	-0.33	50
-0.31	58	0.79	19	0.79	-0.31	58
-0.29	67	1.01	22	1.01	-0.29	67
-0.27	75	1.14	25	1.14	-0.27	75
-0.25	80	1.18	27	1.18	-0.25	80
-0.23	83	1.26	28	1.26	-0.23	83
-0.21	85	1.31	29	1.31	-0.21	85
-0.19	85	1.35	29	1.35	-0.19	85
-0.17	83	1.47	28	1.47	-0.17	83
-0.15	83	1.53	28	1.53	-0.15	83
-0.13	83	1.48	28	1.48	-0.13	83
-0.11	77	1.54	26	1.54	-0.11	77
-0.09	75	1.51	25	1.51	-0.09	75
-0.07	75	1.38	25	1.38	-0.07	75
-0.05	83	1.13	28	1.13	-0.05	83
-0.03	85	0.97	29	0.97	-0.03	85
-0.01	88	0.90	30	0.90	-0.01	88
0.02	75	1.05	25	1.05	0.02	75
0.04	83	1.14	28	1.14	0.04	83
0.06	72	1.33	24	1.33	0.06	72
0.08	75	1.43	25	1.43	0.08	75
0.10	75	1.39	25	1.39	0.10	75
0.12	75	1.26	25	1.26	0.12	75
0.14	77	1.24	26	1.24	0.14	77
0.16	80	1.16	27	1.16	0.16	80
0.18	88	1.08	30	1.08	0.18	88
0.20	85	1.01	29	1.01	0.20	85
0.22	85	0.90	29	0.90	0.22	85
0.24	83	0.72	28	0.72	0.24	83
0.26	69	0.62	23	0.62	0.26	69
0.28	64	0.41	21	0.41	0.28	64
0.30	75	0.20	25	0.20	0.30	0
0.32	95	0.12	41			
0.34	91	0.12	46			

Max. Volts	1.54
Max. Depth (%)	88.00
Length (in.)	0.72
Avg. Depth (%)	72.50

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.41	0	0	0			
-0.39	55	0.13	19	0.13	-0.39	0
-0.36	41	0.29	14	0.29	-0.36	41
-0.34	49	0.46	17	0.46	-0.34	49
-0.32	61	0.56	21	0.56	-0.32	61
-0.30	64	0.69	22	0.69	-0.30	64
-0.28	61	0.86	21	0.86	-0.28	61
-0.26	61	1.00	21	1.00	-0.26	61
-0.24	70	1.07	24	1.07	-0.24	70
-0.21	70	1.11	24	1.11	-0.21	70
-0.19	73	1.13	25	1.13	-0.19	73
-0.17	76	1.18	26	1.18	-0.17	76
-0.15	73	1.28	25	1.28	-0.15	73
-0.13	70	1.36	24	1.36	-0.13	70
-0.11	67	1.42	23	1.42	-0.11	67
-0.08	67	1.44	23	1.44	-0.08	67
-0.06	64	1.41	22	1.41	-0.06	64
-0.04	64	1.35	22	1.35	-0.04	64
-0.02	67	1.19	23	1.19	-0.02	67
0.00	76	0.99	26	0.99	0.00	76
0.02	82	0.91	28	0.91	0.02	82
0.05	82	0.96	28	0.96	0.05	82
0.07	79	1.07	27	1.07	0.07	79
0.09	70	1.19	24	1.19	0.09	70
0.11	67	1.25	23	1.25	0.11	67
0.13	67	1.22	23	1.22	0.13	67
0.15	67	1.18	23	1.18	0.15	67
0.18	70	1.13	24	1.13	0.18	70
0.20	73	1.07	25	1.07	0.20	73
0.22	76	0.97	26	0.97	0.22	76
0.24	79	0.90	27	0.90	0.24	79
0.26	76	0.78	26	0.78	0.26	76
0.28	73	0.66	25	0.66	0.28	73
0.31	58	0.53	20	0.53	0.31	58
0.33	47	0.38	16	0.38	0.33	47
0.35	44	0.14	15	0.14	0.35	44
0.37	61	0.08	21	0.08	0.37	0
0.39	61	0.09	21			
0.41	0	0.00	0			

Max. Volts	1.44
Max. Depth (%)	82.00
Length (in.)	0.76
Avg. Depth (%)	65.02

**Table C-51 (continued)
Sample 10 - 4H
Laboratory Specimen NDE Analysis**

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.46	100	0.05	30			
-0.43	73	0.05	21			
-0.41	63	0.08	18			
-0.39	67	0.14	19	0.14	-0.39	0
-0.37	53	0.31	15	0.31	-0.37	53
-0.35	49	0.47	14	0.47	-0.35	49
-0.33	57	0.57	16	0.57	-0.33	57
-0.31	67	0.69	19	0.69	-0.31	67
-0.28	67	0.87	19	0.87	-0.28	67
-0.26	63	1.01	18	1.01	-0.26	63
-0.24	73	1.09	21	1.09	-0.24	73
-0.22	77	1.13	22	1.13	-0.22	77
-0.20	77	1.14	22	1.14	-0.20	77
-0.18	80	1.20	23	1.20	-0.18	80
-0.15	73	1.29	21	1.29	-0.15	73
-0.13	73	1.37	21	1.37	-0.13	73
-0.11	70	1.44	20	1.44	-0.11	70
-0.09	70	1.45	20	1.45	-0.09	70
-0.07	70	1.42	20	1.42	-0.07	70
-0.05	63	1.37	18	1.37	-0.05	63
-0.02	63	1.21	18	1.21	-0.02	63
0.00	73	1.01	21	1.01	0.00	73
0.02	77	0.94	22	0.94	0.02	77
0.04	77	1.00	22	1.00	0.04	77
0.06	73	1.12	21	1.12	0.06	73
0.08	70	1.25	20	1.25	0.08	70
0.11	67	1.32	19	1.32	0.11	67
0.13	67	1.28	19	1.28	0.13	67
0.15	67	1.25	19	1.25	0.15	67
0.17	67	1.18	19	1.18	0.17	67
0.19	70	1.12	20	1.12	0.19	70
0.21	73	1.02	21	1.02	0.21	73
0.24	77	0.92	22	0.92	0.24	77
0.26	77	0.80	22	0.80	0.26	77
0.28	77	0.66	22	0.66	0.28	77
0.30	60	0.54	17	0.54	0.30	60
0.32	49	0.41	14	0.41	0.32	49
0.34	60	0.20	17	0.20	0.34	0
0.37	89	0.12	26			
0.39	86	0.10	25			
0.41	63	0.09	18			
0.43	89	0.07	26			
0.45	27	0.03	8			
				Max. Volts	1.45	
				Max. Depth (%)	80.00	
				Length (In.)	0.73	
				Avg. Depth (%)	66.88	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽²⁾
NDD						

Table C-52
Sample 11 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.55	43	0.06	15			
-0.53	49	0.07	17			
-0.50	65	0.09	22			
-0.48	77	0.11	26			
-0.46	81	0.13	27			
-0.44	81	0.17	27			
-0.42	74	0.23	25	0.23	-0.42	0
-0.40	65	0.33	22	0.33	-0.40	65
-0.38	59	0.54	20	0.54	-0.38	59
-0.36	65	0.88	22	0.88	-0.36	65
-0.33	62	1.30	21	1.30	-0.33	62
-0.31	65	1.59	22	1.59	-0.31	65
-0.29	71	1.76	24	1.76	-0.29	71
-0.27	74	1.78	25	1.78	-0.27	74
-0.25	77	1.80	26	1.80	-0.25	77
-0.23	77	1.88	26	1.88	-0.23	77
-0.21	81	1.94	27	1.94	-0.21	81
-0.19	84	2.01	28	2.01	-0.19	84
-0.16	81	2.21	27	2.21	-0.16	81
-0.14	74	2.44	25	2.44	-0.14	74
-0.12	74	2.54	25	2.54	-0.12	74
-0.10	74	2.59	25	2.59	-0.10	74
-0.08	71	2.64	24	2.64	-0.08	71
-0.06	68	2.63	23	2.63	-0.06	68
-0.04	71	2.51	24	2.51	-0.04	71
-0.01	71	2.47	24	2.47	-0.01	71
0.01	71	2.55	24	2.55	0.01	71
0.03	71	2.62	24	2.62	0.03	71
0.05	71	2.66	24	2.66	0.05	71
0.07	74	2.71	25	2.71	0.07	74
0.09	74	2.79	25	2.79	0.09	74
0.11	77	2.83	26	2.83	0.11	77
0.13	77	3.04	26	3.04	0.13	77
0.16	74	3.25	25	3.25	0.16	74
0.18	77	3.05	26	3.05	0.18	77
0.20	81	2.71	27	2.71	0.20	81
0.22	81	2.41	27	2.41	0.22	81
0.24	81	2.23	27	2.23	0.24	81
0.26	81	2.18	27	2.18	0.26	81
0.28	77	2.17	26	2.17	0.28	77
0.30	77	2.06	26	2.06	0.30	77
0.33	74	1.89	25	1.89	0.33	74
0.35	71	1.67	24	1.67	0.35	71
0.37	71	1.44	24	1.44	0.37	71
0.39	68	1.20	23	1.20	0.39	68
0.41	71	0.92	24	0.92	0.41	71
0.43	71	0.52	24	0.52	0.43	71
0.45	77	0.26	26	0.26	0.45	0
0.47	94	0.15	31			
0.50	99	0.11	35			
0.52	98	0.10	36			
0.54	81	0.09	27			
				Max. Volts	3.25	
				Max. Depth (%)	84.00	
				Length (in.)	0.87	
				Avg. Depth (%)	71.68	

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.46	0	0	0			
-0.43	73	0.23	25			
-0.41	64	0.32	22	0.32	-0.41	0
-0.39	58	0.53	20	0.53	-0.39	58
-0.37	58	0.90	20	0.90	-0.37	58
-0.35	61	1.26	21	1.26	-0.35	61
-0.32	64	1.54	22	1.54	-0.32	64
-0.30	70	1.73	24	1.73	-0.30	70
-0.28	76	1.77	26	1.77	-0.28	76
-0.26	79	1.77	27	1.77	-0.26	79
-0.24	76	1.83	26	1.83	-0.24	76
-0.22	79	1.89	27	1.89	-0.22	79
-0.19	82	1.96	28	1.96	-0.19	82
-0.17	79	2.15	27	2.15	-0.17	79
-0.15	73	2.38	25	2.38	-0.15	73
-0.13	73	2.47	25	2.47	-0.13	73
-0.11	73	2.52	25	2.52	-0.11	73
-0.09	70	2.57	24	2.57	-0.09	70
-0.06	67	2.56	23	2.56	-0.06	67
-0.04	70	2.44	24	2.44	-0.04	70
-0.02	70	2.40	24	2.40	-0.02	70
0.00	70	2.48	24	2.48	0.00	70
0.02	70	2.55	24	2.55	0.02	70
0.05	70	2.59	24	2.59	0.05	70
0.07	73	2.63	25	2.63	0.07	73
0.09	73	2.72	25	2.72	0.09	73
0.11	76	2.76	26	2.76	0.11	76
0.13	76	2.96	26	2.96	0.13	76
0.15	73	3.16	25	3.16	0.15	73
0.18	76	2.97	26	2.97	0.18	76
0.20	79	2.64	27	2.64	0.20	79
0.22	79	2.35	27	2.35	0.22	79
0.24	79	2.17	27	2.17	0.24	79
0.26	79	2.14	27	2.14	0.26	79
0.28	76	2.13	26	2.13	0.28	76
0.31	73	2.06	25	2.06	0.31	73
0.33	70	1.87	24	1.87	0.33	70
0.35	70	1.66	24	1.66	0.35	70
0.37	67	1.44	23	1.44	0.37	67
0.39	64	1.19	22	1.19	0.39	64
0.41	64	0.90	22	0.90	0.41	64
0.44	70	0.50	24	0.50	0.44	70
0.46	76	0.25	26	0.25	0.46	0
0.48	91	0.14	31			
0.50	100	0.11	35			
0.52	0	0.00	0			
				Max. Volts	3.16	
				Max. Depth (%)	82.00	
				Length (in.)	0.87	
				Avg. Depth (%)	70.20	

Table C-52 (continued)
Sample 11 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.53	97	0.09	35			
-0.51	94	0.09	39			
-0.48	83	0.13	24			
-0.46	83	0.17	24			
-0.44	77	0.23	22			
-0.42	67	0.32	19	0.32	-0.42	0
-0.40	57	0.55	16	0.55	-0.40	57
-0.38	57	0.91	16	0.91	-0.38	57
-0.35	63	1.28	18	1.28	-0.35	63
-0.33	67	1.56	19	1.56	-0.33	67
-0.31	73	1.73	21	1.73	-0.31	73
-0.29	77	1.79	22	1.79	-0.29	77
-0.27	80	1.79	23	1.79	-0.27	80
-0.25	83	1.85	24	1.85	-0.25	83
-0.22	83	1.91	24	1.91	-0.22	83
-0.2	86	1.98	25	1.98	-0.20	86
-0.18	80	2.2	23	2.20	-0.18	80
-0.16	77	2.41	22	2.41	-0.16	77
-0.14	77	2.52	22	2.52	-0.14	77
-0.11	77	2.57	22	2.57	-0.11	77
-0.09	70	2.61	20	2.61	-0.09	70
-0.07	70	2.61	20	2.61	-0.07	70
-0.05	73	2.51	21	2.51	-0.05	73
-0.03	70	2.47	20	2.47	-0.03	70
-0.01	70	2.56	20	2.56	-0.01	70
0.02	70	2.64	20	2.64	0.02	70
0.04	70	2.7	20	2.70	0.04	70
0.06	70	2.76	20	2.76	0.06	70
0.08	73	2.82	21	2.82	0.08	73
0.1	77	2.85	22	2.85	0.10	77
0.12	77	3.03	22	3.03	0.12	77
0.15	73	3.21	21	3.21	0.15	73
0.17	80	3.01	23	3.01	0.17	80
0.19	83	2.68	24	2.68	0.19	83
0.21	83	2.39	24	2.39	0.21	83
0.23	80	2.21	23	2.21	0.23	80
0.26	83	2.17	24	2.17	0.26	83
0.28	80	2.16	23	2.16	0.28	80
0.3	80	2.09	23	2.09	0.30	80
0.32	77	1.92	22	1.92	0.32	77
0.34	73	1.7	21	1.70	0.34	73
0.36	70	1.45	20	1.45	0.36	70
0.39	70	1.18	20	1.18	0.39	70
0.41	73	0.9	21	0.90	0.41	73
0.43	80	0.43	23	0.43	0.43	0
0.45	80	0.16	23			
0.47	94	0.15	28			
0.50	99	0.11	32			
				Max. Volts		3.21
				Max. Depth (%)		86.00
				Length (in.)		0.85
				Avg. Depth (%)		72.71

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.44	0	0	31	0.00	-0.44	0
-0.41	77	0.3	26	0.30	-0.41	77
-0.39	74	0.57	25	0.57	-0.39	74
-0.37	70	0.97	24	0.97	-0.37	70
-0.35	70	1.25	24	1.25	-0.35	70
-0.33	70	1.49	24	1.49	-0.33	70
-0.31	70	1.71	24	1.71	-0.31	70
-0.29	74	1.91	25	1.91	-0.29	74
-0.27	77	2.07	26	2.07	-0.27	77
-0.25	80	2.13	27	2.13	-0.25	80
-0.22	80	2.17	27	2.17	-0.22	80
-0.2	80	2.23	27	2.23	-0.20	80
-0.18	83	2.45	28	2.45	-0.18	83
-0.16	80	2.77	27	2.77	-0.16	80
-0.14	77	3.07	26	3.07	-0.14	77
-0.12	74	3.18	25	3.18	-0.12	74
-0.1	77	2.97	26	2.97	-0.10	77
-0.08	74	2.8	25	2.80	-0.08	74
-0.05	74	2.75	25	2.75	-0.05	74
-0.03	70	2.67	24	2.67	-0.03	70
-0.01	70	2.63	24	2.63	-0.01	70
0.01	70	2.59	24	2.59	0.01	70
0.03	70	2.51	24	2.51	0.03	70
0.05	70	2.46	24	2.46	0.05	70
0.07	70	2.51	24	2.51	0.07	70
0.09	70	2.61	24	2.61	0.09	70
0.12	70	2.61	24	2.61	0.12	70
0.14	74	2.56	25	2.56	0.14	74
0.16	74	2.5	25	2.50	0.16	74
0.18	77	2.37	26	2.37	0.18	77
0.2	80	2.14	27	2.14	0.20	80
0.22	83	1.98	28	1.98	0.22	83
0.24	80	1.91	27	1.91	0.24	80
0.26	77	1.85	26	1.85	0.26	77
0.28	77	1.78	26	1.78	0.28	77
0.31	74	1.77	25	1.77	0.31	74
0.33	70	1.7	24	1.70	0.33	70
0.35	64	1.51	22	1.51	0.35	64
0.37	58	1.21	20	1.21	0.37	58
0.39	55	0.84	19	0.84	0.39	55
0.41	67	0.47	23	0.47	0.41	67
0.43	64	0.31	22	0.31	0.43	64
0.45	64	0.21	22	0.21	0.45	64
0.48	0	0	27	0.00	0.48	0
				Max. Volts		3.18
				Max. Depth (%)		83.00
				Length (in.)		0.92
				Avg. Depth (%)		70.52

**Table C-53
Sample 11 - 2H
Laboratory Specimen NDE Analysis**

Crack 2 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
0.21	96	0.04	40	0.21	0	0.04	0.21	0
0.23	31	0.15	11	0.23	31	0.15	0.23	27
0.25	43	0.22	15	0.25	43	0.22	0.25	38
0.27	49	0.24	17	0.27	49	0.24	0.27	43
0.29	43	0.25	15	0.29	43	0.25	0.29	38
0.32	34	0.22	12	0.32	34	0.22	0.32	30
0.34	34	0.18	12	0.34	34	0.18	0.34	30
0.36	43	0.11	15	0.36	43	0.11	0.36	38
0.38	62	0.07	21	0.38	0	0.07	0.38	0
Max. Volts				0.25		0.25		
Max. Depth (%)				49.00		43.00		
Length (in.)				0.17		0.17		
Avg. Depth (%)				34.85		30.59		

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length	Depth	Volts	Length	Depth
NDD								

**Table C-53 (continued)
Sample 11 - 2H
Laboratory Specimen NDE Analysis**

Crack 2 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ^(2,3)
0.21	0	0.07	188	0.21	0	0.07	0.21	0
0.24	27	0.15	8	0.24	27	0.15	0.24	27
0.26	42	0.21	12	0.26	42	0.21	0.26	42
0.28	46	0.24	13	0.28	46	0.24	0.28	46
0.30	42	0.24	12	0.30	42	0.24	0.30	42
0.32	46	0.25	13	0.32	46	0.25	0.32	46
0.35	42	0.18	12	0.35	42	0.18	0.35	42
0.37	46	0.12	13	0.37	46	0.12	0.37	46
0.39	14	0.09	5	0.39	14	0.09	0.39	14
				0.41	0	0.00	0.41	0
Max. Volts				0.25		0.25		
Max. Depth (%)				46.00		46.00		
Length (in.)				0.20		0.20		
Avg. Depth (%)				33.38		33.38		

Crack 2 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length	Depth	Volts	Length	Depth
NDD								

Table C-54
Sample 11 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.71	65	0.06	22			
-0.69	100	0.09	33			
-0.67	81	0.12	27			
-0.65	100	0.15	33			
-0.63	74	0.18	25			
-0.61	97	0.18	32	0.18	-0.61	0
-0.59	68	0.28	23	0.28	-0.59	68
-0.57	68	0.49	23	0.49	-0.57	68
-0.55	65	0.77	22	0.77	-0.55	65
-0.52	71	1.07	24	1.07	-0.52	71
-0.50	71	1.37	24	1.37	-0.50	71
-0.48	68	1.65	23	1.65	-0.48	68
-0.46	71	1.96	24	1.96	-0.46	71
-0.44	71	2.23	24	2.23	-0.44	71
-0.42	77	2.24	26	2.24	-0.42	77
-0.40	84	2.41	28	2.41	-0.40	84
-0.38	90	2.52	30	2.52	-0.38	90
-0.36	87	2.92	29	2.92	-0.36	87
-0.33	90	3.13	30	3.13	-0.33	90
-0.31	87	3.38	29	3.38	-0.31	87
-0.29	87	3.37	29	3.37	-0.29	87
-0.27	87	3.19	29	3.19	-0.27	87
-0.25	90	2.98	30	2.98	-0.25	90
-0.23	87	2.95	29	2.95	-0.23	87
-0.21	84	3.17	28	3.17	-0.21	84
-0.19	74	3.30	25	3.30	-0.19	74
-0.16	74	3.50	25	3.50	-0.16	74
-0.14	74	3.33	25	3.33	-0.14	74
-0.12	77	3.10	26	3.10	-0.12	77
-0.10	74	3.03	25	3.03	-0.10	74
-0.08	71	3.00	24	3.00	-0.08	71
-0.06	71	2.88	24	2.88	-0.06	71
-0.04	74	2.68	25	2.68	-0.04	74
-0.02	74	2.66	25	2.66	-0.02	74
0.00	74	3.00	25	3.00	0.00	74
0.02	74	3.13	25	3.13	0.02	74
0.05	74	2.94	25	2.94	0.05	74
0.07	74	2.88	25	2.88	0.07	74
0.09	74	2.79	25	2.79	0.09	74
0.11	74	2.68	25	2.68	0.11	74
0.13	77	2.71	26	2.71	0.13	77
0.15	77	2.86	26	2.86	0.15	77
0.17	74	3.24	25	3.24	0.17	74
0.19	77	3.25	26	3.25	0.19	77
0.22	81	3.06	27	3.06	0.22	81
0.24	90	2.60	30	2.60	0.24	90
0.26	90	2.39	30	2.39	0.26	90
0.28	87	2.22	29	2.22	0.28	87
0.30	84	2.12	28	2.12	0.30	84
0.32	81	1.94	27	1.94	0.32	81
0.34	71	1.66	24	1.66	0.34	71
0.36	87	1.35	29	1.35	0.36	87
0.38	90	1.24	30	1.24	0.38	90
0.40	84	1.29	28	1.29	0.40	84
0.43	77	1.37	26	1.37	0.43	77
0.45	71	1.12	24	1.12	0.45	71
0.47	65	0.86	22	0.86	0.47	65
0.49	65	0.54	22	0.54	0.49	65
0.51	77	0.29	26	0.29	0.51	0
0.53	49	0.20	17			
0.55	94	0.12	43			
0.57	83	0.08	58			
Max. Volts				3.50		
Max. Depth (%)				90.00		
Length (in.)				1.12		
Avg. Depth (%)				76.25		

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.59	0	0	0			
-0.57	70	0.24	24			
-0.54	70	0.33	24	0.33	-0.54	0
-0.52	64	0.76	22	0.76	-0.52	64
-0.50	67	1.08	23	1.08	-0.50	67
-0.48	67	1.38	23	1.38	-0.48	67
-0.46	67	1.62	23	1.62	-0.46	67
-0.44	70	1.96	24	1.96	-0.44	70
-0.41	70	2.25	24	2.25	-0.41	70
-0.39	79	2.32	27	2.32	-0.39	79
-0.37	85	2.38	29	2.38	-0.37	85
-0.35	82	2.67	28	2.67	-0.35	82
-0.33	82	3.07	28	3.07	-0.33	82
-0.31	85	3.27	29	3.27	-0.31	85
-0.28	88	3.29	30	3.29	-0.28	88
-0.26	85	3.16	29	3.16	-0.26	85
-0.24	88	3.00	30	3.00	-0.24	88
-0.22	88	2.88	30	2.88	-0.22	88
-0.20	79	2.99	27	2.99	-0.20	79
-0.18	73	3.34	25	3.34	-0.18	73
-0.15	70	3.31	24	3.31	-0.15	70
-0.13	73	3.17	25	3.17	-0.13	73
-0.11	73	2.99	25	2.99	-0.11	73
-0.09	73	2.92	25	2.92	-0.09	73
-0.07	73	2.93	25	2.93	-0.07	73
-0.05	67	2.85	23	2.85	-0.05	67
-0.03	70	2.71	24	2.71	-0.03	70
0.00	73	2.57	25	2.57	0.00	73
0.02	76	2.77	26	2.77	0.02	76
0.04	73	2.96	25	2.96	0.04	73
0.06	70	3.04	24	3.04	0.06	70
0.08	76	2.82	26	2.82	0.08	76
0.10	70	2.78	24	2.78	0.10	70
0.13	73	2.67	25	2.67	0.13	73
0.15	73	2.62	25	2.62	0.15	73
0.17	70	2.79	24	2.79	0.17	70
0.19	76	2.97	26	2.97	0.19	76
0.21	76	3.20	26	3.20	0.21	76
0.23	79	3.05	27	3.05	0.23	79
0.26	88	2.66	30	2.66	0.26	88
0.28	88	2.38	30	2.38	0.28	88
0.30	85	2.22	29	2.22	0.30	85
0.32	85	2.06	29	2.06	0.32	85
0.34	79	1.91	27	1.91	0.34	79
0.36	76	1.70	26	1.70	0.36	76
0.38	79	1.46	27	1.46	0.38	79
0.41	79	1.33	27	1.33	0.41	79
0.43	76	1.39	26	1.39	0.43	76
0.45	73	1.41	25	1.41	0.45	73
0.47	73	1.21	25	1.21	0.47	73
0.49	67	0.93	23	0.93	0.49	67
0.51	61	0.46	21	0.46	0.51	61
0.53	85	0.28	29	0.28	0.53	0
0.56	100	0.15	35			
0.58	0	0.00	0			
Max. Volts				3.34		
Max. Depth (%)				88.00		
Length (in.)				1.07		
Avg. Depth (%)				74.37		

Table C-54 (continued)
 Sample 11 - 3H
 Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.71	70	0.06	20			
-0.68	100	0.09	30			
-0.66	83	0.12	24			
-0.64	97	0.15	29			
-0.62	77	0.17	22			
-0.60	80	0.18	23	0.18	-0.60	0
-0.58	67	0.27	19	0.27	-0.58	67
-0.55	70	0.49	20	0.49	-0.55	70
-0.53	63	0.78	18	0.78	-0.53	63
-0.51	70	1.09	20	1.09	-0.51	70
-0.49	67	1.35	19	1.35	-0.49	67
-0.47	63	1.69	18	1.69	-0.47	63
-0.45	63	1.98	18	1.98	-0.45	63
-0.43	70	2.23	20	2.23	-0.43	70
-0.40	80	2.31	23	2.31	-0.40	80
-0.38	86	2.41	25	2.41	-0.38	86
-0.36	89	2.60	26	2.60	-0.36	89
-0.34	86	2.98	25	2.98	-0.34	86
-0.32	92	3.14	27	3.14	-0.32	92
-0.30	89	3.33	26	3.33	-0.30	89
-0.27	89	3.31	26	3.31	-0.27	89
-0.25	89	3.15	26	3.15	-0.25	89
-0.23	92	2.94	27	2.94	-0.23	92
-0.21	86	2.91	25	2.91	-0.21	86
-0.19	83	3.12	24	3.12	-0.19	83
-0.17	77	3.25	22	3.25	-0.17	77
-0.14	73	3.45	21	3.45	-0.14	73
-0.12	77	3.30	22	3.30	-0.12	77
-0.10	73	3.11	21	3.11	-0.10	73
-0.08	73	3.06	21	3.06	-0.08	73
-0.06	67	3.03	19	3.03	-0.06	67
-0.04	67	2.91	19	2.91	-0.04	67
-0.01	73	2.69	21	2.69	-0.01	73
0.01	77	2.68	22	2.68	0.01	77
0.03	70	3.00	20	3.00	0.03	70
0.03	70	3.00	20	3.00	0.03	70
0.05	70	3.15	20	3.15	0.05	70
0.07	73	2.97	21	2.97	0.07	73
0.09	73	2.92	21	2.92	0.09	73
0.12	70	2.82	20	2.82	0.12	70
0.14	73	2.69	21	2.69	0.14	73
0.16	77	2.70	22	2.70	0.16	77
0.18	77	2.86	22	2.86	0.18	77
0.20	77	3.23	22	3.23	0.20	77
0.22	80	3.23	23	3.23	0.22	80
0.24	83	3.04	24	3.04	0.24	83
0.27	92	2.57	27	2.57	0.27	92
0.29	92	2.36	27	2.36	0.29	92
0.31	86	2.21	25	2.21	0.31	86
0.33	83	2.10	24	2.10	0.33	83
0.35	80	1.94	23	1.94	0.35	80
0.37	73	1.67	21	1.67	0.37	73
0.40	77	1.45	22	1.45	0.40	77
0.42	80	1.39	23	1.39	0.42	80
0.44	73	1.41	21	1.41	0.44	73
0.46	73	1.44	21	1.44	0.46	73
0.48	67	1.19	19	1.19	0.48	67
0.50	67	0.90	19	0.90	0.50	67
0.53	67	0.60	19	0.60	0.53	67
0.55	70	0.38	20	0.38	0.55	70
0.57	46	0.19	13	0.19	0.57	46
0.59	92	0.13	27	0.13	0.59	0
0.61	83	0.07	55			
0.63	666	0.06	75			
				Max. Volts	3.45	
				Max. Depth (%)	92.00	
				Length (in.)	1.19	
				Avg. Depth (%)	74.61	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NDD						

Table C-55
Sample 11 - 3H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1P

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
				-0.43	0		-0.43	0
-0.41	43	0.35	15	-0.41	43	0.35	-0.41	32
-0.39	49	0.43	17	-0.39	49	0.43	-0.39	37
-0.37	56	0.48	19	-0.37	56	0.48	-0.37	42
-0.35	65	0.49	22	-0.35	65	0.49	-0.35	49
-0.32	59	0.53	20	-0.32	59	0.53	-0.32	44
-0.30	56	0.56	19	-0.3	56	0.56	-0.30	42
-0.28	49	0.58	17	-0.28	49	0.58	-0.28	37
-0.26	52	0.58	18	-0.26	52	0.58	-0.26	39
-0.24	59	0.56	20	-0.24	59	0.56	-0.24	44
-0.22	56	0.61	19	-0.22	56	0.61	-0.22	42
-0.20	56	0.61	19	-0.2	56	0.61	-0.20	42
-0.18	49	0.63	17	-0.18	49	0.63	-0.18	37
-0.16	49	0.59	17	-0.16	49	0.59	-0.16	37
-0.13	52	0.58	18	-0.13	52	0.58	-0.13	39
-0.11	52	0.56	18	-0.11	52	0.56	-0.11	39
-0.09	59	0.55	20	-0.09	59	0.55	-0.09	44
-0.07	65	0.53	22	-0.07	65	0.53	-0.07	49
-0.05	59	0.55	20	-0.05	59	0.55	-0.05	44
-0.03	52	0.52	18	-0.03	52	0.52	-0.03	39
-0.01	52	0.44	18	-0.01	52	0.44	-0.01	39
0.01	46	0.41	16	0.01	46	0.41	0.01	35
0.03	46	0.42	16	0.03	46	0.42	0.03	35
0.06	49	0.43	17	0.06	49	0.43	0.06	37
0.08	46	0.47	16	0.08	46	0.47	0.08	35
0.10	46	0.45	16	0.1	46	0.45	0.10	35
0.12	49	0.41	17	0.12	49	0.41	0.12	37
0.14	52	0.33	18	0.14	52	0.33	0.14	39
0.16	40	0.18	14	0.16	40	0.18	0.16	30
				0.18	0		0.18	0
Max. Volts				0.63	0.63			
Max. Depth (%)				65.00	49.00			
Length (in.)				0.61	0.61			
Avg. Depth (%)				50.59	38.14			

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.40	0	0.00	0	-0.40	0	0.00	-0.40	0
-0.38	47	0.38	16	-0.38	47	0.38	-0.38	38
-0.36	52	0.44	18	-0.36	52	0.44	-0.36	42
-0.34	55	0.48	19	-0.34	55	0.48	-0.34	44
-0.32	58	0.50	20	-0.32	58	0.50	-0.32	47
-0.30	52	0.53	18	-0.30	52	0.53	-0.30	42
-0.27	52	0.56	18	-0.27	52	0.56	-0.27	42
-0.25	52	0.57	18	-0.25	52	0.57	-0.25	42
-0.23	55	0.55	19	-0.23	55	0.55	-0.23	44
-0.21	55	0.59	19	-0.21	55	0.59	-0.21	44
-0.19	49	0.61	17	-0.19	49	0.61	-0.19	39
-0.17	55	0.59	19	-0.17	55	0.59	-0.17	44
-0.14	52	0.58	18	-0.14	52	0.58	-0.14	42
-0.12	49	0.56	17	-0.12	49	0.56	-0.12	39
-0.10	55	0.56	19	-0.10	55	0.56	-0.10	44
-0.08	55	0.55	19	-0.08	55	0.55	-0.08	44
-0.06	61	0.54	21	-0.06	61	0.54	-0.06	49
-0.04	58	0.53	20	-0.04	58	0.53	-0.04	47
-0.01	55	0.53	19	-0.01	55	0.53	-0.01	44
0.01	49	0.47	17	0.01	49	0.47	0.01	39
0.03	47	0.42	16	0.03	47	0.42	0.03	38
0.05	47	0.40	16	0.05	47	0.40	0.05	38
0.07	47	0.42	16	0.07	47	0.42	0.07	38
0.09	49	0.43	17	0.09	49	0.43	0.09	39
0.11	47	0.46	16	0.11	47	0.46	0.11	38
0.14	49	0.42	17	0.14	49	0.42	0.14	39
0.16	49	0.37	17	0.16	49	0.37	0.16	39
0.18	35	0.26	12	0.18	35	0.26	0.18	28
0.20	0	0.00	0	0.20	0	0.00	0.20	0
Max. Volts				0.61	0.61			
Max. Depth (%)				61.00	49.00			
Length (in.)				0.60	0.60			
Avg. Depth (%)				49.70	39.92			

Table C-55 (continued)
 Sample 11 - 3H
 Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.42	49	0.26	14					
-0.40	38	0.17	11					
-0.38	57	0.29	16					
-0.36	49	0.37	14					
-0.33	60	0.42	17					
-0.31	57	0.44	16	-0.31	0	0.44	-0.31	0
-0.29	46	0.50	13	-0.29	46	0.50	-0.29	38
-0.27	38	0.57	11	-0.27	38	0.57	-0.27	31
-0.25	46	0.56	13	-0.25	46	0.56	-0.25	38
-0.23	60	0.55	17	-0.23	60	0.55	-0.23	49
-0.20	57	0.60	16	-0.20	57	0.60	-0.20	47
-0.18	57	0.60	16	-0.18	57	0.60	-0.18	47
-0.16	49	0.62	14	-0.16	49	0.62	-0.16	40
-0.14	49	0.58	14	-0.14	49	0.58	-0.14	40
-0.12	53	0.57	15	-0.12	53	0.57	-0.12	43
-0.10	46	0.56	13	-0.10	46	0.56	-0.10	38
-0.07	49	0.56	14	-0.07	49	0.56	-0.07	40
-0.05	49	0.54	14	-0.05	49	0.54	-0.05	40
-0.03	49	0.55	14	-0.03	49	0.55	-0.03	40
-0.01	38	0.53	11	-0.01	38	0.53	-0.01	31
-0.01	53	0.51	15	-0.01	53	0.51	-0.01	43
0.01	46	0.46	13	0.01	46	0.46	0.01	38
0.03	34	0.42	10	0.03	34	0.42	0.03	28
0.06	38	0.43	11	0.06	38	0.43	0.06	31
0.08	46	0.42	13	0.08	46	0.42	0.08	38
0.10	46	0.46	13	0.10	46	0.46	0.10	38
0.12	46	0.44	13	0.12	46	0.44	0.12	38
0.14	44	0.40	13	0.14	44	0.40	0.14	36
0.16	44	0.32	13	0.16	44	0.32	0.16	36
0.18	0	0.21	0	0.18	0	0.21	0.18	0
Max. Volts					0.62			0.62
Max. Depth (%)					60.00			49.00
Length (in.)					0.49			0.49
Avg. Depth (%)					45.24			36.95

Crack 2 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾
NO DATA								

Table C-56
Sample 11 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
0.54	52	0.07	18			
0.52	0	0.07	142			
0.50	94	0.08	42			
0.48	92	0.11	46			
0.46	99	0.18	35			
0.44	74	0.32	25	0.32	0.44	0
0.41	49	0.52	17	0.52	0.41	49
0.39	49	0.74	17	0.74	0.39	49
0.37	49	1.00	17	1.00	0.37	49
0.35	59	1.21	20	1.21	0.35	59
0.33	71	1.59	24	1.59	0.33	71
0.31	71	1.85	24	1.85	0.31	71
0.29	77	1.97	26	1.97	0.29	77
0.27	84	2.00	28	2.00	0.27	84
0.25	81	2.18	27	2.18	0.25	81
0.22	77	2.32	26	2.32	0.22	77
0.20	77	2.38	26	2.38	0.20	77
0.18	77	2.40	26	2.40	0.18	77
0.16	74	2.58	25	2.58	0.16	74
0.14	71	2.71	24	2.71	0.14	71
0.12	71	2.70	24	2.70	0.12	71
0.10	74	2.59	25	2.59	0.10	74
0.08	71	2.55	24	2.55	0.08	71
0.06	77	2.41	26	2.41	0.06	77
0.03	77	2.34	26	2.34	0.03	77
0.01	74	2.37	25	2.37	0.01	74
-0.01	71	2.44	24	2.44	-0.01	71
-0.03	71	2.55	24	2.55	-0.03	71
-0.05	71	2.65	24	2.65	-0.05	71
-0.07	71	2.83	24	2.83	-0.07	71
-0.09	68	3.07	23	3.07	-0.09	68
-0.13	74	3.01	25	3.01	-0.13	74
-0.16	77	3.15	26	3.15	-0.16	77
-0.18	77	3.21	26	3.21	-0.18	77
-0.20	84	3.23	28	3.23	-0.20	84
-0.22	90	3.25	30	3.25	-0.22	90
-0.24	90	3.34	30	3.34	-0.24	90
-0.26	87	3.28	29	3.28	-0.26	87
-0.28	90	2.95	30	2.95	-0.28	90
-0.30	90	2.60	30	2.60	-0.30	90
-0.33	90	2.29	30	2.29	-0.33	90
-0.35	84	2.26	28	2.26	-0.35	84
-0.37	84	2.10	28	2.10	-0.37	84
-0.39	81	1.96	27	1.96	-0.39	81
-0.41	81	1.81	27	1.81	-0.41	81
-0.43	77	1.63	26	1.63	-0.43	77
-0.45	74	1.40	25	1.40	-0.45	74
-0.47	71	1.13	24	1.13	-0.47	71
-0.49	65	0.84	22	0.84	-0.49	65
-0.52	62	0.53	21	0.53	-0.52	62
-0.54	65	0.28	22	0.28	-0.54	65
-0.56	90	0.11	30	0.11	-0.56	0
-0.58	77	0.07	26			
-0.60	99	0.06	34			
-0.62	97	0.06	32			
-0.64	71	0.04	72			
-0.66	54	0.03	90			

*Reversed Sign

Max. Volts	3.34
Max. Depth (%)	90.00
Length (in.)	1.00
Avg. Depth (%)	72.62

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
0.48	0	0	0			
0.46	67	0.32	23	0.32	0.46	0
0.44	52	0.46	18	0.46	0.44	52
0.42	47	0.63	16	0.63	0.42	47
0.40	52	0.89	18	0.89	0.40	52
0.38	55	1.20	19	1.20	0.38	55
0.35	67	1.45	23	1.45	0.35	67
0.33	70	1.71	24	1.71	0.33	70
0.31	73	1.87	25	1.87	0.31	73
0.29	79	1.90	27	1.90	0.29	79
0.27	82	1.97	28	1.97	0.27	82
0.25	79	2.14	27	2.14	0.25	79
0.22	76	2.30	26	2.30	0.22	76
0.20	79	2.32	27	2.32	0.20	79
0.18	73	2.46	25	2.46	0.18	73
0.16	70	2.63	24	2.63	0.16	70
0.14	70	2.61	24	2.61	0.14	70
0.12	70	2.53	24	2.53	0.12	70
0.10	70	2.51	24	2.51	0.10	70
0.07	70	2.44	24	2.44	0.07	70
0.05	73	2.32	25	2.32	0.05	73
0.03	73	2.25	25	2.25	0.03	73
0.01	73	2.32	25	2.32	0.01	73
-0.01	70	2.45	24	2.45	-0.01	70
-0.03	70	2.53	24	2.53	-0.03	70
-0.05	73	2.62	25	2.62	-0.05	73
-0.08	67	2.84	23	2.84	-0.08	67
-0.10	67	3.01	23	3.01	-0.10	67
-0.12	70	2.99	24	2.99	-0.12	70
-0.14	76	2.93	26	2.93	-0.14	76
-0.16	76	3.08	26	3.08	-0.16	76
-0.18	79	3.18	27	3.18	-0.18	79
-0.21	88	3.11	30	3.11	-0.21	88
-0.23	91	3.15	31	3.15	-0.23	91
-0.25	88	3.26	30	3.26	-0.25	88
-0.27	88	3.16	30	3.16	-0.27	88
-0.29	88	2.77	30	2.77	-0.29	88
-0.31	88	2.40	30	2.40	-0.31	88
-0.33	85	2.18	29	2.18	-0.33	85
-0.36	82	2.14	28	2.14	-0.36	82
-0.38	82	2.02	28	2.02	-0.38	82
-0.40	79	1.88	27	1.88	-0.40	79
-0.42	76	1.72	26	1.72	-0.42	76
-0.44	73	1.53	25	1.53	-0.44	73
-0.46	70	1.33	24	1.33	-0.46	70
-0.49	70	1.10	24	1.10	-0.49	70
-0.51	61	0.84	21	0.84	-0.51	61
-0.53	55	0.37	19	0.37	-0.53	55
-0.55	58	0.31	20	0.31	-0.55	58
-0.57	79	0.12	27	0.12	-0.57	0
-0.59	0	0.00	0			

Max. Volts	3.26
Max. Depth (%)	91.00
Length (in.)	1.03
Avg. Depth (%)	71.47

Table C-56 (continued)
Sample 11 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
0.58	0	0.05	143			
0.56	38	0.04	103			
0.54	56	0.05	85			
0.52	81	0.10	57			
0.49	99	0.21	32			
0.47	71	0.34	22	0.34	0.47	0
0.45	49	0.51	14	0.51	0.45	49
0.43	46	0.71	13	0.71	0.43	46
0.41	46	0.89	13	0.89	0.41	46
0.39	60	1.28	17	1.28	0.39	60
0.36	70	1.57	20	1.57	0.36	70
0.34	73	1.80	21	1.80	0.34	73
0.32	80	1.93	23	1.93	0.32	80
0.30	86	1.96	25	1.96	0.30	86
0.28	83	2.14	24	2.14	0.28	83
0.26	73	2.31	21	2.31	0.26	73
0.23	77	2.35	22	2.35	0.23	77
0.21	73	2.36	21	2.36	0.21	73
0.19	77	2.54	22	2.54	0.19	77
0.17	73	2.66	21	2.66	0.17	73
0.15	73	2.66	21	2.66	0.15	73
0.13	67	2.57	19	2.57	0.13	67
0.10	67	2.56	19	2.56	0.10	67
0.08	73	2.45	21	2.45	0.08	73
0.06	70	2.41	20	2.41	0.06	70
0.04	73	2.41	21	2.41	0.04	73
0.02	63	2.47	18	2.47	0.02	63
0.00	70	2.55	20	2.55	0.00	70
-0.03	67	2.63	19	2.63	-0.03	67
-0.05	67	2.81	19	2.81	-0.05	67
-0.07	63	3.08	418	3.06	-0.07	63
-0.09	70	3.05	20	3.05	-0.09	70
-0.11	73	3.00	21	3.00	-0.11	73
-0.13	77	3.14	22	3.14	-0.13	77
-0.16	77	3.20	22	3.20	-0.16	77
-0.18	83	3.22	24	3.22	-0.18	83
-0.20	89	3.24	26	3.24	-0.20	89
-0.22	92	3.33	27	3.33	-0.22	92
-0.24	92	3.32	27	3.32	-0.24	92
-0.26	92	3.00	27	3.00	-0.26	92
-0.29	89	2.66	26	2.66	-0.29	89
-0.31	86	2.30	25	2.30	-0.31	86
-0.33	86	2.22	25	2.22	-0.33	86
-0.35	86	2.07	25	2.07	-0.35	86
-0.37	83	1.93	24	1.93	-0.37	83
-0.39	80	1.78	23	1.78	-0.39	80
-0.41	73	1.62	21	1.62	-0.41	73
-0.44	73	1.42	21	1.42	-0.44	73
-0.46	70	1.20	20	1.20	-0.46	70
-0.48	67	0.90	19	0.90	-0.48	67
-0.50	57	0.64	16	0.64	-0.50	57
-0.52	60	0.35	17	0.35	-0.52	60
-0.54	83	0.14	24	0.14	-0.54	0
-0.57	100	0.09	30			
-0.59	100	0.08	30			

*Reversed Sign

Max. Volts	3.33
Max. Depth (%)	92.00
Length (in.)	1.01
Avg. Depth (%)	71.92

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.53	0	0.00	26	0.00	-0.53	0
-0.51	58	0.34	20	0.34	-0.51	58
-0.49	61	0.61	21	0.61	-0.49	61
-0.47	74	0.84	25	0.84	-0.47	74
-0.45	74	1.16	25	1.16	-0.45	74
-0.42	77	1.42	26	1.42	-0.42	77
-0.40	77	1.63	26	1.63	-0.40	77
-0.38	77	1.83	26	1.83	-0.38	77
-0.36	83	1.96	28	1.96	-0.36	83
-0.34	83	2.12	28	2.12	-0.34	83
-0.32	87	2.24	29	2.24	-0.32	87
-0.30	90	2.34	30	2.34	-0.30	90
-0.28	90	2.66	30	2.66	-0.28	90
-0.26	90	3.01	30	3.01	-0.26	90
-0.24	90	3.29	30	3.29	-0.24	90
-0.21	94	3.26	31	3.26	-0.21	94
-0.19	90	3.17	30	3.17	-0.19	90
-0.17	83	3.17	28	3.17	-0.17	83
-0.15	80	3.07	27	3.07	-0.15	80
-0.13	77	3.09	26	3.09	-0.13	77
-0.11	74	3.00	25	3.00	-0.11	74
-0.09	70	3.04	24	3.04	-0.09	70
-0.07	67	3.00	23	3.00	-0.07	67
-0.05	70	2.76	24	2.76	-0.05	70
-0.02	70	2.61	24	2.61	-0.02	70
0.00	70	2.50	24	2.50	0.00	70
0.02	74	2.41	25	2.41	0.02	74
0.04	74	2.34	25	2.34	0.04	74
0.06	77	2.33	26	2.33	0.06	77
0.08	77	2.42	26	2.42	0.08	77
0.10	70	2.54	24	2.54	0.10	70
0.12	70	2.60	24	2.60	0.12	70
0.14	70	2.68	24	2.68	0.14	70
0.17	70	2.62	24	2.62	0.17	70
0.19	74	2.48	25	2.48	0.19	74
0.21	80	2.34	27	2.34	0.21	80
0.23	77	2.32	26	2.32	0.23	77
0.25	77	2.23	26	2.23	0.25	77
0.27	80	2.10	27	2.10	0.27	80
0.29	83	1.93	28	1.93	0.29	83
0.31	77	1.91	26	1.91	0.31	77
0.33	74	1.75	25	1.75	0.33	74
0.35	70	1.51	24	1.51	0.35	70
0.38	58.00	1.24	20	1.24	0.38	58
0.40	51.00	0.93	18	0.93	0.40	51
0.42	42.00	0.73	15	0.73	0.42	42
0.44	48.00	0.48	17	0.48	0.44	48
0.46	0	0.00	25	0.00	0.46	0

Max. Volts	3.29
Max. Depth (%)	94.00
Length (in.)	0.99
Avg. Depth (%)	73.03

Table C-57
Sample 11 - 4H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE						Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾	
-0.51	34	0.11	12	-0.51	34	0.11	-0.51	0	
-0.49	23	0.15	8	-0.49	23	0.15	-0.49	18	
-0.47	31	0.23	11	-0.47	31	0.23	-0.47	25	
-0.45	46	0.27	16	-0.45	46	0.27	-0.45	37	
-0.43	59	0.35	20	-0.43	59	0.35	-0.43	47	
-0.40	49	0.41	17	-0.40	49	0.41	-0.40	39	
-0.38	56	0.48	19	-0.38	56	0.48	-0.38	45	
-0.36	62	0.50	21	-0.36	62	0.50	-0.36	50	
-0.34	56	0.52	19	-0.34	56	0.52	-0.34	45	
-0.32	59	0.52	20	-0.32	59	0.52	-0.32	47	
-0.30	65	0.48	22	-0.30	65	0.48	-0.30	52	
-0.28	65	0.48	22	-0.28	65	0.48	-0.28	52	
-0.26	71	0.46	24	-0.26	71	0.46	-0.26	57	
-0.24	68	0.49	23	-0.24	68	0.49	-0.24	55	
-0.21	71	0.48	24	-0.21	71	0.48	-0.21	57	
-0.19	81	0.48	27	-0.19	81	0.48	-0.19	65	
-0.17	81	0.46	27	-0.17	81	0.46	-0.17	65	
-0.15	81	0.46	27	-0.15	81	0.46	-0.15	65	
-0.13	77	0.50	26	-0.13	77	0.50	-0.13	62	
-0.11	71	0.53	24	-0.11	71	0.53	-0.11	57	
-0.09	74	0.56	25	-0.09	74	0.56	-0.09	59	
-0.07	71	0.64	24	-0.07	71	0.64	-0.07	57	
-0.05	65	0.70	22	-0.05	65	0.70	-0.05	52	
-0.02	62	0.68	21	-0.02	62	0.68	-0.02	50	
0.00	71	0.62	24	0.00	71	0.62	0.00	57	
0.02	65	0.61	22	0.02	65	0.61	0.02	52	
0.04	59	0.60	20	0.04	59	0.60	0.04	47	
0.06	62	0.57	21	0.06	62	0.57	0.06	50	
0.08	59	0.55	20	0.08	59	0.55	0.08	47	
0.10	62	0.58	21	0.10	62	0.58	0.10	50	
0.12	59	0.61	20	0.12	59	0.61	0.12	47	
0.15	59	0.64	20	0.15	59	0.64	0.15	47	
0.17	62	0.61	21	0.17	62	0.61	0.17	50	
0.19	62	0.57	21	0.19	62	0.57	0.19	50	
0.21	62	0.52	21	0.21	62	0.52	0.21	50	
0.23	68	0.51	23	0.23	68	0.51	0.23	55	
0.25	65	0.51	22	0.25	65	0.51	0.25	52	
0.27	68	0.49	23	0.27	68	0.49	0.27	55	
0.29	62	0.45	21	0.29	62	0.45	0.29	50	
0.31	65	0.41	22	0.31	65	0.41	0.31	52	
0.34	65	0.41	22	0.34	65	0.41	0.34	52	
0.36	65	0.41	22	0.36	65	0.41	0.36	52	
0.38	59	0.38	20	0.38	59	0.38	0.38	47	
0.40	46	0.32	16	0.40	46	0.32	0.40	37	
0.42	49	0.19	17	0.42	49	0.19	0.42	39	
0.44	68	0.10	23	0.44	68	0.10	0.44	0	
					Max. Volts	0.70			0.70
					Max. Depth (%)	81.00			65.00
					Length (in.)	0.95			0.95
					Avg. Depth (%)	60.92			48.88

Unadjusted NDE						Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾	
-0.52	0	0.00	0	-0.52	0	0.00	-0.52	0	
-0.49	32	0.23	11	-0.49	32	0.23	-0.49	26	
-0.47	47	0.26	16	-0.47	47	0.26	-0.47	38	
-0.45	61	0.31	21	-0.45	61	0.31	-0.45	49	
-0.43	58	0.41	20	-0.43	58	0.41	-0.43	47	
-0.41	58	0.47	20	-0.41	58	0.47	-0.41	47	
-0.39	64	0.49	22	-0.39	64	0.49	-0.39	52	
-0.36	61	0.50	21	-0.36	61	0.50	-0.36	49	
-0.34	55	0.51	19	-0.34	55	0.51	-0.34	45	
-0.32	64	0.48	22	-0.32	64	0.48	-0.32	52	
-0.30	64	0.46	22	-0.30	64	0.46	-0.30	52	
-0.28	64	0.46	22	-0.28	64	0.46	-0.28	52	
-0.26	64	0.46	22	-0.26	64	0.46	-0.26	52	
-0.24	70	0.48	24	-0.24	70	0.48	-0.24	57	
-0.21	73	0.47	25	-0.21	73	0.47	-0.21	59	
-0.19	79	0.45	27	-0.19	79	0.45	-0.19	64	
-0.17	79	0.45	27	-0.17	79	0.45	-0.17	64	
-0.15	79	0.45	27	-0.15	79	0.45	-0.15	64	
-0.13	73	0.51	25	-0.13	73	0.51	-0.13	59	
-0.11	73	0.54	25	-0.11	73	0.54	-0.11	59	
-0.08	73	0.57	25	-0.08	73	0.57	-0.08	59	
-0.06	64	0.65	22	-0.06	64	0.65	-0.06	52	
-0.04	64	0.66	22	-0.04	64	0.66	-0.04	52	
-0.02	67	0.64	23	-0.02	67	0.64	-0.02	54	
0.00	70	0.59	24	0.00	70	0.59	0.00	57	
0.02	61	0.60	21	0.02	61	0.60	0.02	49	
0.04	58	0.60	20	0.04	58	0.60	0.04	47	
0.07	58	0.54	20	0.07	58	0.54	0.07	47	
0.09	58	0.56	20	0.09	58	0.56	0.09	47	
0.11	58	0.60	20	0.11	58	0.60	0.11	47	
0.13	58	0.63	20	0.13	58	0.63	0.13	47	
0.15	55	0.64	19	0.15	55	0.64	0.15	45	
0.17	52	0.60	18	0.17	52	0.60	0.17	42	
0.20	61	0.53	21	0.20	61	0.53	0.20	49	
0.22	67	0.49	23	0.22	67	0.49	0.22	54	
0.24	61	0.49	21	0.24	61	0.49	0.24	49	
0.26	61	0.50	21	0.26	61	0.50	0.26	49	
0.28	64	0.46	22	0.28	64	0.46	0.28	52	
0.30	61	0.43	21	0.30	61	0.43	0.30	49	
0.32	58	0.42	20	0.32	58	0.42	0.32	47	
0.35	58	0.41	20	0.35	58	0.41	0.35	47	
0.37	41	0.40	21	0.37	41	0.40	0.37	33	
0.39	58	0.38	20	0.39	58	0.38	0.39	47	
0.41	58	0.29	20	0.41	58	0.29	0.41	47	
0.43	58	0.16	20	0.43	58	0.16	0.43	47	
0.45	82	0.09	20	0.45	0	0.09	0.45	0	
0.47	0	0.00	0						
					Max. Volts	0.66			0.66
					Max. Depth (%)	79.00			64.00
					Length (in.)	0.97			0.97
					Avg. Depth (%)	60.16			48.74

Table C-57 (continued)
Sample 11 - 4H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 3

Crack 2 - MR + Point - Analyst 4

Unadjusted NDE						Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.53	14	0.19	5	-0.53	0	0.19	-0.53	0
-0.50	27	0.27	8	-0.50	27	0.27	-0.50	20
-0.48	53	0.31	15	-0.48	53	0.31	-0.48	38
-0.46	60	0.36	17	-0.46	60	0.36	-0.46	43
-0.44	57	0.44	16	-0.44	57	0.44	-0.44	41
-0.42	63	0.49	18	-0.42	63	0.49	-0.42	46
-0.40	63	0.49	18	-0.40	63	0.49	-0.40	46
-0.38	57	0.52	16	-0.38	57	0.52	-0.38	41
-0.35	63	0.52	18	-0.35	63	0.52	-0.35	46
-0.33	67	0.51	19	-0.33	67	0.51	-0.33	48
-0.31	70	0.51	20	-0.31	70	0.51	-0.31	51
-0.29	70	0.52	20	-0.29	70	0.52	-0.29	51
-0.27	67	0.55	19	-0.27	67	0.55	-0.27	48
-0.25	67	0.55	19	-0.25	67	0.55	-0.25	48
-0.22	75	0.51	22	-0.22	75	0.51	-0.22	54
-0.20	80	0.52	22	-0.20	80	0.52	-0.20	58
-0.18	83	0.44	24	-0.18	83	0.44	-0.18	60
-0.16	73	0.55	21	-0.16	73	0.55	-0.16	53
-0.14	70	0.57	20	-0.14	70	0.57	-0.14	51
-0.12	65	0.44	19	-0.12	65	0.44	-0.12	47
-0.09	73	0.62	21	-0.09	73	0.62	-0.09	53
-0.07	57	0.66	16	-0.07	57	0.66	-0.07	41
-0.05	63	0.67	18	-0.05	63	0.67	-0.05	46
-0.03	73	0.62	21	-0.03	73	0.62	-0.03	53
-0.01	67	0.60	19	-0.01	67	0.60	-0.01	48
0.01	60	0.61	17	0.01	60	0.61	0.01	43
0.06	63	0.62	18	0.06	63	0.62	0.06	46
0.08	63	0.66	18	0.08	63	0.66	0.08	46
0.10	67	0.68	19	0.10	67	0.68	0.10	48
0.12	60	0.70	17	0.12	60	0.70	0.12	43
0.14	63	0.64	18	0.14	63	0.64	0.14	46
0.17	63	0.58	18	0.17	63	0.58	0.17	46
0.19	63	0.52	18	0.19	63	0.52	0.19	46
0.21	63	0.52	18	0.21	63	0.52	0.21	46
0.23	60	0.54	17	0.23	60	0.54	0.23	43
0.25	60	0.52	17	0.25	60	0.52	0.25	43
0.27	63	0.51	18	0.27	63	0.51	0.27	46
0.30	60	0.47	17	0.30	60	0.47	0.30	43
0.32	63	0.44	18	0.32	63	0.44	0.32	46
0.34	60	0.43	17	0.34	60	0.43	0.34	43
0.36	57	0.42	16	0.36	57	0.42	0.36	41
0.38	49	0.31	14	0.38	49	0.31	0.38	35
0.40	31	0.19	9	0.40	31	0.19	0.40	22
0.43	70	0.10	20	0.43	0	0.10	0.43	0
*Reversed Sign	Max. Volts				0.70			0.70
	Max. Depth (%)				83.00			60.00
	Length (in.)				0.96			0.96
	Avg. Depth (%)				60.42			43.67

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾
0.44	0	0.00	21	0.44	0	0.00	0.44	0
0.41	39	0.17	14	0.41	39	0.17	0.41	31
0.39	45	0.27	16	0.39	45	0.27	0.39	36
0.37	51	0.34	18	0.37	51	0.34	0.37	41
0.35	61	0.39	21	0.35	61	0.39	0.35	49
0.33	58	0.40	20	0.33	58	0.40	0.33	46
0.31	61	0.41	21	0.31	61	0.41	0.31	49
0.29	64	0.44	22	0.29	64	0.44	0.29	51
0.27	67	0.47	23	0.27	67	0.47	0.27	54
0.25	64	0.50	22	0.25	64	0.50	0.25	51
0.22	67	0.51	23	0.22	67	0.51	0.22	54
0.20	61	0.50	21	0.20	61	0.50	0.20	49
0.18	61	0.54	21	0.18	61	0.54	0.18	49
0.16	61	0.58	21	0.16	61	0.58	0.16	49
0.14	61	0.63	21	0.14	61	0.63	0.14	49
0.12	61	0.61	21	0.12	61	0.61	0.12	49
0.10	61	0.58	21	0.10	61	0.58	0.10	49
0.08	64	0.55	22	0.08	64	0.55	0.08	51
0.06	61	0.56	21	0.06	61	0.56	0.06	49
0.03	61	0.59	21	0.03	61	0.59	0.03	49
0.01	61	0.60	21	0.01	61	0.60	0.01	49
-0.01	70	0.60	24	-0.01	70	0.60	-0.01	56
-0.03	64	0.65	22	-0.03	64	0.65	-0.03	51
-0.05	64	0.68	22	-0.05	64	0.68	-0.05	51
-0.07	67	0.65	23	-0.07	67	0.65	-0.07	54
-0.09	70	0.58	24	-0.09	70	0.58	-0.09	56
-0.11	74	0.53	25	-0.11	74	0.53	-0.11	59
-0.13	77	0.49	26	-0.13	77	0.49	-0.13	62
-0.15	80	0.47	27	-0.15	80	0.47	-0.15	64
-0.18	80	0.45	27	-0.18	80	0.45	-0.18	64
-0.20	80	0.46	27	-0.20	80	0.46	-0.20	64
-0.22	74	0.48	25	-0.22	74	0.48	-0.22	59
-0.24	70	0.48	24	-0.24	70	0.48	-0.24	56
-0.26	58	0.47	20	-0.26	58	0.47	-0.26	46
-0.28	64	0.47	22	-0.28	64	0.47	-0.28	51
-0.30	61	0.47	21	-0.30	61	0.47	-0.30	49
-0.32	58	0.50	20	-0.32	58	0.50	-0.32	46
-0.34	58	0.50	20	-0.34	58	0.50	-0.34	46
-0.37	58	0.50	20	-0.37	58	0.50	-0.37	46
-0.39	64	0.50	22	-0.39	64	0.50	-0.39	51
-0.41	64	0.47	22	-0.41	64	0.47	-0.41	51
-0.43	61	0.38	21	-0.43	61	0.38	-0.43	49
-0.45	51	0.28	18	-0.45	51	0.28	-0.45	41
-0.47	36	0.24	13	-0.47	36	0.24	-0.47	29
-0.49	0	0.00	9	-0.49	0	0.00	-0.49	0
	Max. Volts				0.68			0.68
	Max. Depth (%)				80.00			64.00
	Length (in.)				0.93			0.93
	Avg. Depth (%)				60.97			48.77

Table C-58
Sample 12 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.20	25	0.10	9					
-0.18	49	0.12	17	-0.18	0	0.12	-0.18	0
-0.16	37	0.18	13	-0.16	37	0.18	-0.16	23
-0.14	43	0.20	15	-0.14	43	0.20	-0.14	26
-0.12	37	0.29	13	-0.12	37	0.29	-0.12	23
-0.10	37	0.30	13	-0.10	37	0.30	-0.10	23
-0.08	46	0.30	16	-0.08	46	0.30	-0.08	28
-0.06	43	0.34	15	-0.06	43	0.34	-0.06	26
-0.03	37	0.36	13	-0.03	37	0.36	-0.03	23
-0.01	37	0.37	13	-0.01	37	0.37	-0.01	23
0.01	31	0.40	11	0.01	31	0.40	0.01	19
0.03	28	0.41	10	0.03	28	0.41	0.03	17
0.05	37	0.40	13	0.05	37	0.40	0.05	23
0.07	46	0.29	16	0.07	46	0.29	0.07	28
0.09	34	0.20	12	0.09	34	0.20	0.09	21
0.11	65	0.14	22	0.11	0	0.14	0.11	0
0.13	43	0.11	15					
0.15	62	0.09	21					
		Max. Volts			0.41			0.41
		Max. Depth (%)			46.00			28.00
		Length (in.)			0.29			0.29
		Avg. Depth (%)			35.38			21.54

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.20	0	0.00	0					
-0.18	47	0.12	16	-0.18	0	0.12	-0.18	0
-0.15	35	0.19	12	-0.15	35	0.19	-0.15	28
-0.13	41	0.22	14	-0.13	41	0.22	-0.13	32
-0.11	38	0.28	13	-0.11	38	0.28	-0.11	30
-0.09	35	0.31	12	-0.09	35	0.31	-0.09	28
-0.07	47	0.30	16	-0.07	47	0.30	-0.07	37
-0.05	44	0.33	15	-0.05	44	0.33	-0.05	35
-0.03	38	0.35	13	-0.03	38	0.35	-0.03	30
-0.01	35	0.37	12	-0.01	35	0.37	-0.01	28
0.02	32	0.39	11	0.02	32	0.39	0.02	25
0.04	41	0.40	14	0.04	41	0.40	0.04	32
0.06	38	0.39	13	0.06	38	0.39	0.06	30
0.08	41	0.30	14	0.08	41	0.30	0.08	32
0.10	44	0.21	15	0.10	44	0.21	0.10	35
0.12	52	0.17	18	0.12	52	0.17	0.12	41
0.14	41	0.14	14	0.14	41	0.14	0.14	32
0.16	0	0.00	0	0.16	0	0.00	0.16	0
		Max. Volts			0.40			0.40
		Max. Depth (%)			52.00			41.00
		Length (in.)			0.34			0.34
		Avg. Depth (%)			36.91			29.10

Table C-58 (continued)
Sample 12 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.24	0	0.00	0					
-0.22	13	0.08	5					
-0.19	31	0.09	9					
-0.17	38	0.12	11					
-0.15	42	0.15	12	-0.15	0	0.15	-0.15	0
-0.13	31	0.20	9	-0.13	31	0.20	-0.13	18
-0.11	31	0.26	9	-0.11	31	0.26	-0.11	18
-0.09	31	0.32	9	-0.09	31	0.32	-0.09	18
-0.06	31	0.37	9	-0.06	31	0.37	-0.06	18
-0.04	31	0.38	9	-0.04	31	0.38	-0.04	18
-0.02	23	0.40	7	-0.02	23	0.40	-0.02	13
0.00	27	0.43	8	0.00	27	0.43	0.00	16
0.02	23	0.46	7	0.02	23	0.46	0.02	13
0.04	18	0.48	6	0.04	18	0.48	0.04	10
0.07	14	0.44	5	0.07	14	0.44	0.07	8
0.09	18	0.34	6	0.09	18	0.34	0.09	10
0.11	18	0.22	6	0.11	18	0.22	0.11	10
0.13	6	0.16	3	0.13	6	0.16	0.13	3
0.15	10	0.14	4	0.15	10	0.14	0.15	6
0.17	0	0.12	176	0.17	0	0.12	0.17	0
		Max. Volts			0.48			0.48
		Max. Depth (%)			31.00			18.00
		Length (in.)			0.32			0.32
		Avg. Depth (%)			20.97			12.18

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length	Depth	Volts	Length	Depth
NDD								

Table C-59
Sample 12 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ^(3,4)
				-0.16	0	0.00	-0.16	0
-0.14	14	0.10	5	-0.14	14	0.10	-0.14	9
-0.11	23	0.13	8	-0.11	23	0.13	-0.11	16
-0.09	31	0.15	11	-0.09	31	0.15	-0.09	21
-0.07	31	0.20	11	-0.07	31	0.20	-0.07	21
-0.05	23	0.22	8	-0.05	23	0.22	-0.05	16
-0.03	20	0.22	7	-0.03	20	0.22	-0.03	13
-0.01	28	0.26	10	-0.01	28	0.26	-0.01	19
0.01	28	0.28	10	0.01	28	0.28	0.01	19
0.03	31	0.28	11	0.03	31	0.28	0.03	21
0.05	40	0.22	14	0.05	40	0.22	0.05	27
0.07	46	0.15	16	0.07	46	0.15	0.07	31
0.09	34	0.11	12	0.09	34	0.11	0.09	23
0.11	43	0.08	15	0.11	43	0.08	0.11	29
0.13	23	0.08	8	0.13	23	0.08	0.13	16
0.15	14	0.07	5	0.15	0	0.07	0.15	0
Max. Volts				0.28		0.28		
Max. Depth (%)				46.00		31.00		
Length (in.)				0.31		0.31		
Avg. Depth (%)				27.37		18.45		

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length	Depth	Volts	Length	Depth
NDD								

**Table C-59 (continued)
Sample 12 - 3H
Laboratory Specimen NDE Analysis**

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.19	46	0.08	13	-0.19	0	0.08	-0.19	0
-0.15	32	0.13	12	-0.15	32	0.13	-0.15	29
-0.13	32	0.21	10	-0.13	32	0.21	-0.13	29
-0.11	28	0.31	9	-0.11	28	0.31	-0.11	26
-0.09	32	0.41	10	-0.09	32	0.41	-0.09	29
-0.06	34	0.40	10	-0.06	34	0.40	-0.06	31
-0.04	29	0.39	9	-0.04	29	0.39	-0.04	26
-0.02	26	0.44	8	-0.02	26	0.44	-0.02	24
0.00	32	0.47	9	0.00	32	0.47	0.00	29
0.02	40	0.46	12	0.02	40	0.46	0.02	37
0.04	46	0.45	13	0.04	46	0.45	0.04	42
0.06	42	0.49	12	0.06	42	0.49	0.06	38
0.09	33	0.48	10	0.09	33	0.48	0.09	30
0.11	40	0.44	12	0.11	40	0.44	0.11	37
0.13	40	0.36	12	0.13	40	0.36	0.13	37
0.15	40	0.28	12	0.15	40	0.28	0.15	37
0.17	53	0.22	15	0.17	0.00	0.22	0.17	0
Max. Volts					0.49	0.49		
Max. Depth (%)					46.00	42.00		
Length (in.)					0.36	0.36		
Avg. Depth (%)					32.07	29.28		

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length	Depth	Volts	Length	Depth
NDD								

Table C-50
Sample 12 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE						Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth ⁽²⁾	Volts	Length ⁽¹⁾	Depth ⁽²⁾
				0.19	0	0.00	0.19	0
0.17	49	0.07	17	0.17	49	0.07	0.17	41
0.15	52	0.13	18	0.15	52	0.13	0.15	43
0.13	52	0.18	18	0.13	52	0.18	0.13	43
0.11	46	0.27	16	0.11	46	0.27	0.11	38
0.09	49	0.31	17	0.09	49	0.31	0.09	41
0.07	46	0.39	16	0.07	46	0.39	0.07	38
0.05	40	0.38	14	0.05	40	0.38	0.05	33
0.03	40	0.36	14	0.03	40	0.36	0.03	33
0.01	43	0.38	15	0.01	43	0.38	0.01	36
-0.01	43	0.44	15	-0.01	43	0.44	-0.01	36
-0.03	46	0.44	16	-0.03	46	0.44	-0.03	38
-0.05	59	0.44	20	-0.05	59	0.44	-0.05	49
-0.07	49	0.47	17	-0.07	49	0.47	-0.07	41
-0.10	49	0.45	17	-0.10	49	0.45	-0.10	41
-0.12	49	0.41	17	-0.12	49	0.41	-0.12	41
-0.14	46	0.34	16	-0.14	46	0.34	-0.14	38
-0.16	46	0.26	16	-0.16	46	0.26	-0.16	38
-0.18	49	0.20	17	-0.18	49	0.20	-0.18	41
-0.20	49	0.14	17	-0.20	49	0.14	-0.20	41
				-0.22	0	0.00	-0.22	0
*Reversed Sign		Max. Volts		0.47				0.47
		Max. Depth (%)		59.00				49.00
		Length (in.)		0.41				0.41
		Avg. Depth (%)		45.20				37.53

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE						Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾
0.20	0	0.00	0	0.20	0	0.00	0.20	0
0.17	52	0.13	18	0.17	52	0.13	0.17	44
0.15	47	0.18	16	0.15	47	0.18	0.15	40
0.13	44	0.27	15	0.13	44	0.27	0.13	37
0.11	44	0.38	15	0.11	44	0.38	0.11	37
0.09	41	0.40	14	0.09	41	0.40	0.09	35
0.07	41	0.37	14	0.07	41	0.37	0.07	35
0.05	41	0.35	14	0.05	41	0.35	0.05	35
0.03	41	0.41	14	0.03	41	0.41	0.03	35
0.00	41	0.44	14	0.00	41	0.44	0.00	35
-0.02	47	0.42	16	-0.02	47	0.42	-0.02	40
-0.04	58	0.43	20	-0.04	58	0.43	-0.04	49
-0.06	49	0.46	17	-0.06	49	0.46	-0.06	41
-0.08	41	0.44	14	-0.08	41	0.44	-0.08	35
-0.10	49	0.39	17	-0.10	49	0.39	-0.10	41
-0.12	47	0.33	16	-0.12	47	0.33	-0.12	40
-0.14	47	0.25	16	-0.14	47	0.25	-0.14	40
-0.17	49	0.19	17	-0.17	49	0.19	-0.17	41
-0.19	0	0.00	0	-0.19	0	0.00	-0.19	0
*Reversed Sign		Max. Volts		0.46				0.46
		Max. Depth (%)		58.00				49.00
		Length (in.)		0.39				0.39
		Avg. Depth (%)		42.90				36.24

Table C-60 (continued)
Sample 12 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments				
Axial Position*	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
0.22	53	0.08	15					
0.19	63	0.08	18					
0.17	55	0.11	16					
0.15	55	0.17	14	0.15	0	0.00	0.15	0
0.13	33	0.24	10	0.13	33	0.24	0.13	19
0.11	33	0.37	10	0.11	33	0.37	0.11	19
0.09	35	0.42	10	0.09	35	0.42	0.09	20
0.06	38	0.39	11	0.06	38	0.39	0.06	22
0.04	25	0.41	8	0.04	25	0.41	0.04	14
0.02	28	0.46	9	0.02	28	0.46	0.02	16
0.00	28	0.48	9	0.00	28	0.48	0.00	16
-0.02	57	0.43	16	-0.02	57	0.43	-0.02	33
-0.04	57	0.44	16	-0.04	57	0.44	-0.04	33
-0.07	37	0.49	11	-0.07	37	0.49	-0.07	21
-0.09	33	0.50	10	-0.09	33	0.50	-0.09	19
-0.11	38	0.42	11	-0.11	38	0.42	-0.11	22
-0.13	35	0.33	12	-0.13	35	0.33	-0.13	20
-0.15	40	0.22	12	-0.15	40	0.22	-0.15	23
-0.17	35	0.19	10	-0.17	35	0.19	-0.17	20
-0.19	6	0.17	3	-0.19	0	0.00	-0.19	0
-0.20	46	0.15	13					
*Reversed Sign		Max. Volts		0.50				0.50
		Max. Depth (%)		57.00				33.00
		Length (in.)		0.34				0.34
		Avg. Depth (%)		34.93				20.22

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position*	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
0.22	0	0.00	16	0.22	0	0.00	0.22	0
0.20	48	0.13	17	0.20	48	0.13	0.20	42
0.18	48	0.20	17	0.18	48	0.20	0.18	42
0.16	42	0.26	15	0.16	42	0.26	0.16	37
0.14	42	0.34	15	0.14	42	0.34	0.14	37
0.12	48	0.40	17	0.12	48	0.40	0.12	42
0.10	48	0.44	17	0.10	48	0.44	0.10	42
0.08	48	0.47	17	0.08	48	0.47	0.08	42
0.06	55	0.44	19	0.06	55	0.44	0.06	48
0.04	45	0.43	16	0.04	45	0.43	0.04	39
0.01	39	0.45	14	0.01	39	0.45	0.01	34
-0.01	36	0.42	13	-0.01	36	0.42	-0.01	31
-0.03	39	0.35	14	-0.03	39	0.35	-0.03	34
-0.05	36	0.38	13	-0.05	36	0.38	-0.05	31
-0.07	39	0.40	14	-0.07	39	0.40	-0.07	34
-0.09	39	0.39	14	-0.09	39	0.39	-0.09	34
-0.11	39	0.29	14	-0.11	39	0.29	-0.11	34
-0.13	45	0.19	16	-0.13	45	0.19	-0.13	39
-0.15	51	0.13	18	-0.15	51	0.13	-0.15	45
-0.17	42	0.10	15	-0.17	42	0.10	-0.17	37
-0.19	30	0.08	11	-0.19	30	0.08	-0.19	26
-0.21	0	0.00	10	-0.21	0	0.00	-0.21	0
*Reversed Sign		Max. Volts		0.47				0.47
		Max. Depth (%)		55.00				48.00
		Length (in.)		0.43				0.43
		Avg. Depth (%)		40.93				35.72

Table C-61
Sample 13 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position*	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
0.24	68	0.06	23					
0.22	25	0.08	9					
0.20	43	0.11	15					
0.17	52	0.15	18	0.17	0	0.15	0.17	0
0.15	37	0.23	13	0.15	37	0.23	0.15	28
0.13	37	0.35	13	0.13	37	0.35	0.13	28
0.11	28	0.46	10	0.11	28	0.46	0.11	22
0.09	34	0.57	12	0.09	34	0.57	0.09	26
0.07	43	0.67	15	0.07	43	0.67	0.07	33
0.05	40	0.70	14	0.05	40	0.70	0.05	31
0.03	40	0.71	14	0.03	40	0.71	0.03	31
0.01	43	0.70	15	0.01	43	0.70	0.01	33
-0.01	37	0.68	13	-0.01	37	0.68	-0.01	28
-0.03	43	0.63	15	-0.03	43	0.63	-0.03	33
-0.05	49	0.60	17	-0.05	49	0.60	-0.05	38
-0.07	52	0.57	18	-0.07	52	0.57	-0.07	40
-0.10	52	0.51	18	-0.10	52	0.51	-0.10	40
-0.12	49	0.47	17	-0.12	49	0.47	-0.12	38
-0.14	46	0.44	16	-0.14	46	0.44	-0.14	35
-0.16	34	0.42	12	-0.16	34	0.42	-0.16	26
-0.18	28	0.33	10	-0.18	28	0.33	-0.18	22
-0.20	37	0.17	13	-0.20	0	0.17	-0.20	0
-0.22	28	0.10	10					
-0.24	0	0.08	0					
*Reversed Sign	Max. Volts				0.71			0.71
	Max. Depth (%)				52.00			40.00
	Length (in.)				0.37			0.37
	Avg. Depth (%)				38.81			29.85

Unadjusted NDE				Final with Adjustments				
Axial Position*	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
0.21	0	0.00	0					
0.19	52	0.15	18					
0.17	38	0.23	13	0.17	0	0.00	0.17	0
0.15	32	0.35	11	0.15	32	0.35	0.15	25
0.13	29	0.45	10	0.13	29	0.45	0.13	23
0.11	35	0.56	12	0.11	35	0.56	0.11	28
0.09	38	0.65	13	0.09	38	0.65	0.09	30
0.07	41	0.68	14	0.07	41	0.68	0.07	32
0.04	41	0.69	14	0.04	41	0.69	0.04	32
0.02	44	0.68	15	0.02	44	0.68	0.02	35
0.00	38	0.66	13	0.00	38	0.66	0.00	30
-0.02	44	0.61	15	-0.02	44	0.61	-0.02	35
-0.04	49	0.58	17	-0.04	49	0.58	-0.04	39
-0.06	52	0.55	18	-0.06	52	0.55	-0.06	41
-0.08	52	0.50	18	-0.08	52	0.50	-0.08	41
-0.10	49	0.46	17	-0.10	49	0.46	-0.10	39
-0.12	47	0.43	16	-0.12	47	0.43	-0.12	37
-0.15	35	0.41	12	-0.15	35	0.41	-0.15	28
-0.17	29	0.32	10	-0.17	29	0.32	-0.17	23
-0.19	26	0.19	9	-0.19	26	0.19	-0.19	21
-0.21	17	0.12	6	-0.21	17	0.12	-0.21	13
-0.23	0	0.00	0	-0.23	0	0.00	-0.23	0
*Reversed Sign	Max. Volts				0.69			0.69
	Max. Depth (%)				52.00			41.00
	Length (in.)				0.40			0.40
	Avg. Depth (%)				36.95			29.13

Table C-61 (continued)
Sample 13 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE						Final with Adjustments		
Axial Position*	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
0.22	53	0.07	15					
0.20	42	0.10	12					
0.18	49	0.17	14	0.18	0	0.17	0.18	0
0.16	27	0.26	8	0.16	27	0.26	0.16	19
0.14	27	0.35	8	0.14	27	0.35	0.14	19
0.12	31	0.47	9	0.12	31	0.47	0.12	22
0.10	31	0.60	9	0.10	31	0.60	0.10	22
0.07	40	0.68	12	0.07	40	0.68	0.07	29
0.05	38	0.74	11	0.05	38	0.74	0.05	27
0.03	38	0.78	11	0.03	38	0.78	0.03	27
0.01	39	0.73	11	0.01	39	0.73	0.01	28
-0.01	38	0.70	11	-0.01	38	0.70	-0.01	27
-0.03	44	0.66	13	-0.03	44	0.66	-0.03	32
-0.05	48	0.63	14	-0.05	48	0.63	-0.05	34
-0.07	53	0.56	15	-0.07	53	0.56	-0.07	38
-0.09	38	0.59	11	-0.09	38	0.59	-0.09	27
-0.10	53	0.51	15	-0.10	53	0.51	-0.10	38
-0.12	42	0.50	12	-0.12	42	0.50	-0.12	30
-0.14	39	0.47	11	-0.14	39	0.47	-0.14	28
-0.16	33	0.42	10	-0.16	33	0.42	-0.16	23
-0.18	23	0.28	7	-0.18	23	0.28	-0.18	16
-0.20	27	0.20	8	-0.20	27	0.20	-0.20	19
-0.22	23	0.10	7	-0.22	23	0.10	-0.22	16
				-0.24	0	0.00	-0.24	0
*Reversed Sign	Max. Volts			0.78				0.78
	Max. Depth (%)			53.00				38.00
	Length (in.)			0.42				0.42
	Avg. Depth (%)			34.52				24.75

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.23	0	0.00	13	-0.23	0	0.00	-0.23	0
-0.20	33	0.12	12	-0.20	33	0.12	-0.20	25
-0.18	30	0.21	11	-0.18	30	0.21	-0.18	23
-0.16	33	0.34	12	-0.16	33	0.34	-0.16	25
-0.14	42	0.41	15	-0.14	42	0.41	-0.14	32
-0.12	51	0.43	18	-0.12	51	0.43	-0.12	39
-0.10	55	0.48	19	-0.10	55	0.48	-0.10	42
-0.08	51	0.53	18	-0.08	51	0.53	-0.08	39
-0.06	51	0.57	18	-0.06	51	0.57	-0.06	39
-0.04	45	0.61	16	-0.04	45	0.61	-0.04	34
-0.02	48	0.61	17	-0.02	48	0.61	-0.02	37
0.00	36	0.68	13	0.00	36	0.68	0.00	27
0.02	42	0.70	15	0.02	42	0.70	0.02	32
0.04	39	0.70	14	0.04	39	0.70	0.04	30
0.06	39	0.68	14	0.06	39	0.68	0.06	30
0.09	39	0.63	14	0.09	39	0.63	0.09	30
0.11	33	0.52	12	0.11	33	0.52	0.11	25
0.13	30	0.42	11	0.13	30	0.42	0.13	23
0.15	0	0.00	12	0.15	33	0.31	0.15	25
				0.17	0	0.00	0.17	0
	Max. Volts			0.70				0.70
	Max. Depth (%)			55.00				42.00
	Length (in.)			0.40				0.40
	Avg. Depth (%)			37.89				28.93

Table C-62

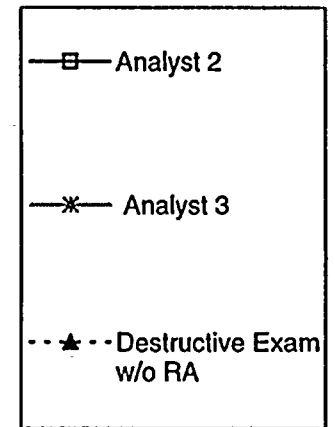
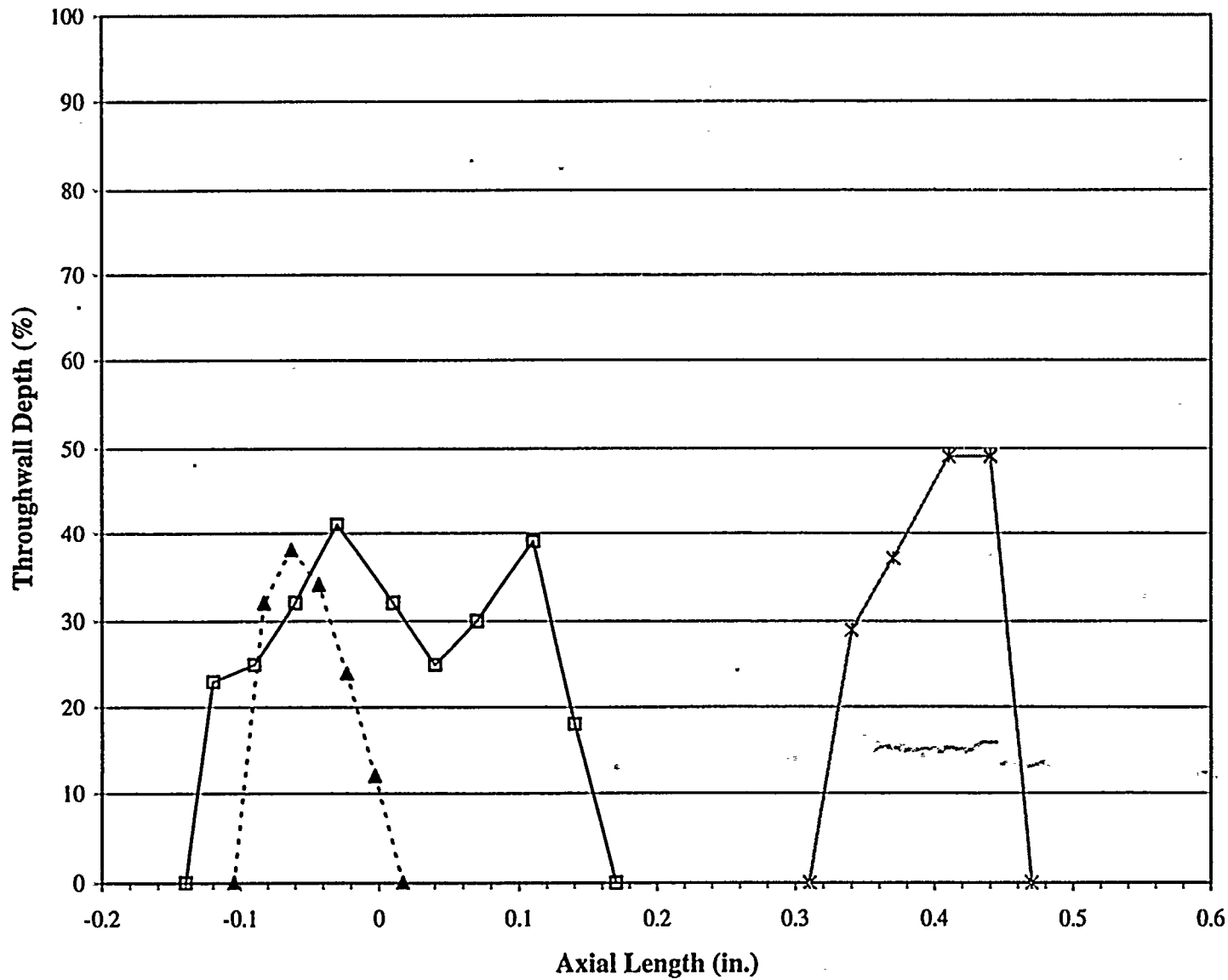
Destructive Exam Average Depth Corrections for Running Average Error

Dent Samples			DE. Avg.	DE	DE Running	DE Corrected
Sample No.	TSP Location	Crack No.				
P7		1	96.31	96.15	94.32	94.48
P7		2	84.67	84.49	82.48	82.66
P7		3	46.23			46.23
P8		1	86.15	86.18	84.77	84.74
P8		2	83.99	83.75	79.41	79.65
P9		1	79.76	79.55	75.26	75.47
P9		2	89.64	89.83	86.59	86.40
P10		1	90.12	90.07	88.70	88.75
P10		2	72.76	72.65	69.03	69.14
P11		1	97.56	96.92	95.61	96.25
P11		2	75.08	76.27	74.58	73.39
P12		1	80.60	80.50	77.27	77.37
P12		2(3+4)	29.90	29.90		29.90
P12		5	64.80	69.44		64.80
10/22		1	23.21			23.21
21/43		1	50.27	49.25		50.27
21/43		2	39.37	39.35		39.37
21/64		1	58.56	60.40		58.56
12/32		1	59.42	59.93	57.54	57.03
1	1H	1				0.00
1	2H	1				0.00
1	3H	1	39.18	39.40		39.18
1	4H	1	38.95	38.88	36.72	36.79
1	5H	1				0.00
2	1H	1	22.71	22.43	21.76	22.04
2	2H	1				0.00
2	3H	1	16.28	16.23	15.22	15.27
2	4H	1	29.77	30.04	29.03	28.76
2	5H	1	18.63	18.70	18.34	18.27
3	1H	1				0.00
3	2H	1				0.00
3	3H	1	25.73	25.88	23.40	23.25
3	4H	1	7.28	7.30	6.41	6.39
3	5H	1				0.00
4	1H	1				0.00
4	2H	1				0.00
4	3H	1				0.00
4	4H	1	10.16	10.22	9.57	9.51
4	5H	1				0.00
5	1H	1				0.00
5	2H	1				0.00
5	3H	1				0.00
5	4H	1				0.00
5	5H	1				0.00
6	1H	1	62.94	62.99	60.54	60.49
6	2H	1	62.10	62.11	59.09	59.08
6	2H	2				0.00
6	3H	1	58.33	59.26	56.14	55.21
6	4H	1	51.25	51.53	49.41	49.13
6	5H	1	56.63	56.58	54.09	54.14
7	1H	1	21.53	21.50	20.12	20.15
7	1H	2				0.00
7	1H	3				0.00
7	2H	1				0.00
7	3H	1	25.18	25.36	24.95	24.77
7	4H	1				0.00
7	5H	1				0.00
8	1H	1	40.24	40.79	40.73	40.18
8	2H	1	39.04	39.60	37.13	36.57
8	3H	1	33.26	33.55	31.81	31.52
8	4H	1				0.00
8	5H	1				0.00
9	1H	1	36.61	35.83	30.88	31.66
9	1H	2	25.48			
9	1H	3				0.00
9	2H	1	69.51	69.57	67.37	67.31
9	2H	2	38.59	39.02	35.62	35.19
9	2H	3				0.00
9	3H	1	64.49	64.77	60.89	60.61
9	3H	2	43.34	44.03	40.75	40.06
9	4H	1	57.48	57.79	56.38	56.07
9	4H	2				
9	5H	1	60.62	60.85	57.46	57.23
9	5H	2	26.75			26.69
9	5H	3	19.68	19.82	13.97	13.83
10	1H	1				0.00
10	1H	2				0.00
10	2H	1				0.00
10	2H	2				0.00
10	3H	1	74.29	74.64	73.22	72.87
10	3H	2	34.77	34.29	31.71	32.19
10	4H	1	66.56	67.03	63.63	63.16
10	5H	1				0.00

Dent Samples			DE. Avg.	DE	DE Running	DE Corrected
Sample No.	TSP Location	Crack No.				
11	1H	1				0.00
11	1H	2				0.00
11	2H	1	80.91	81.44	81.40	80.87
11	2H	2	32.75			32.75
11	3H	1	75.17	75.53	68.41	68.05
11	3H	2	38.56	38.25	38.23	38.54
11	4H	1	70.14	70.21	68.67	68.60
11	4H	2	37.30	37.47	36.59	36.42
11	5H	1				0.00
11	5H	2				0.00
12	1H	1				0.00
12	2H	1	24.90	24.11	20.75	21.54
12	3H	1	16.07			16.04
12	4H	1	20.33	20.56	20.24	20.01
12	5H	1				0.00
13	1H	1				0.00
13	2H	1				0.00
13	3H	1	28.64	28.44	27.25	27.45
13	4H	1				0.00
13	5H	1				0.00
14	1H	1				0.00
14	2H	1				0.00
14	3H	1				0.00
14	4H	1				0.00
14	5H	1				0.00

* Corrected average = Running avg. with lg. correction + (DE avg. - Running Avg.)

Figure C-1
Sample R10C22
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam



	<u>A1</u>	<u>A2</u>	<u>A3</u>	<u>A4</u>	<u>DE</u>
Max. Volts		0.63	0.55		
Max. Depth (%)		41.0	49.0		23.21
Max Depth w/o RA (%)					38.00
Length (in.)		0.310	0.160		0.122
Avg. Depth (%)		27.56	33.44		23.21

Figure C-2
Sample R21C43 Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

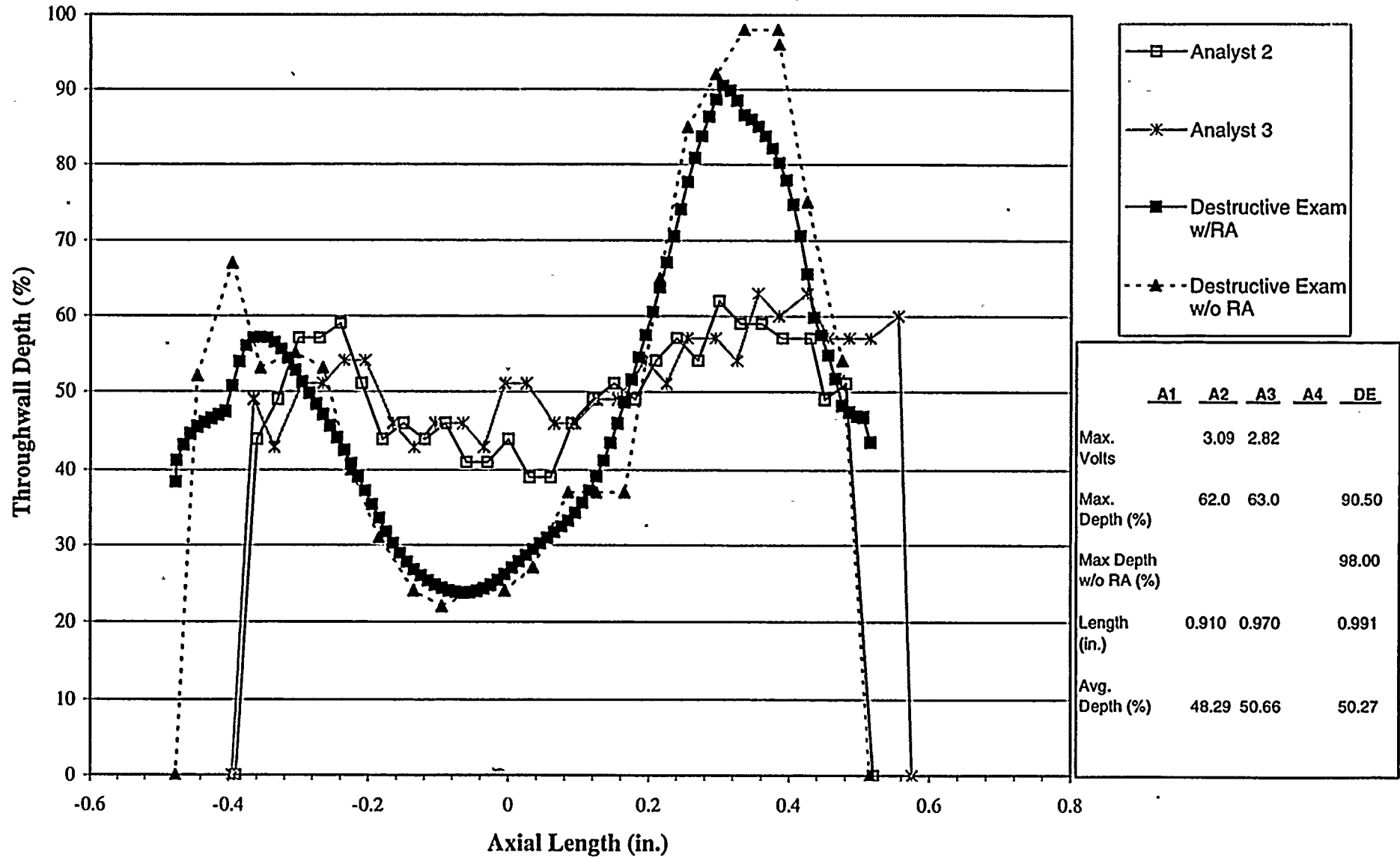


Figure C-3
Sample R21C43 Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

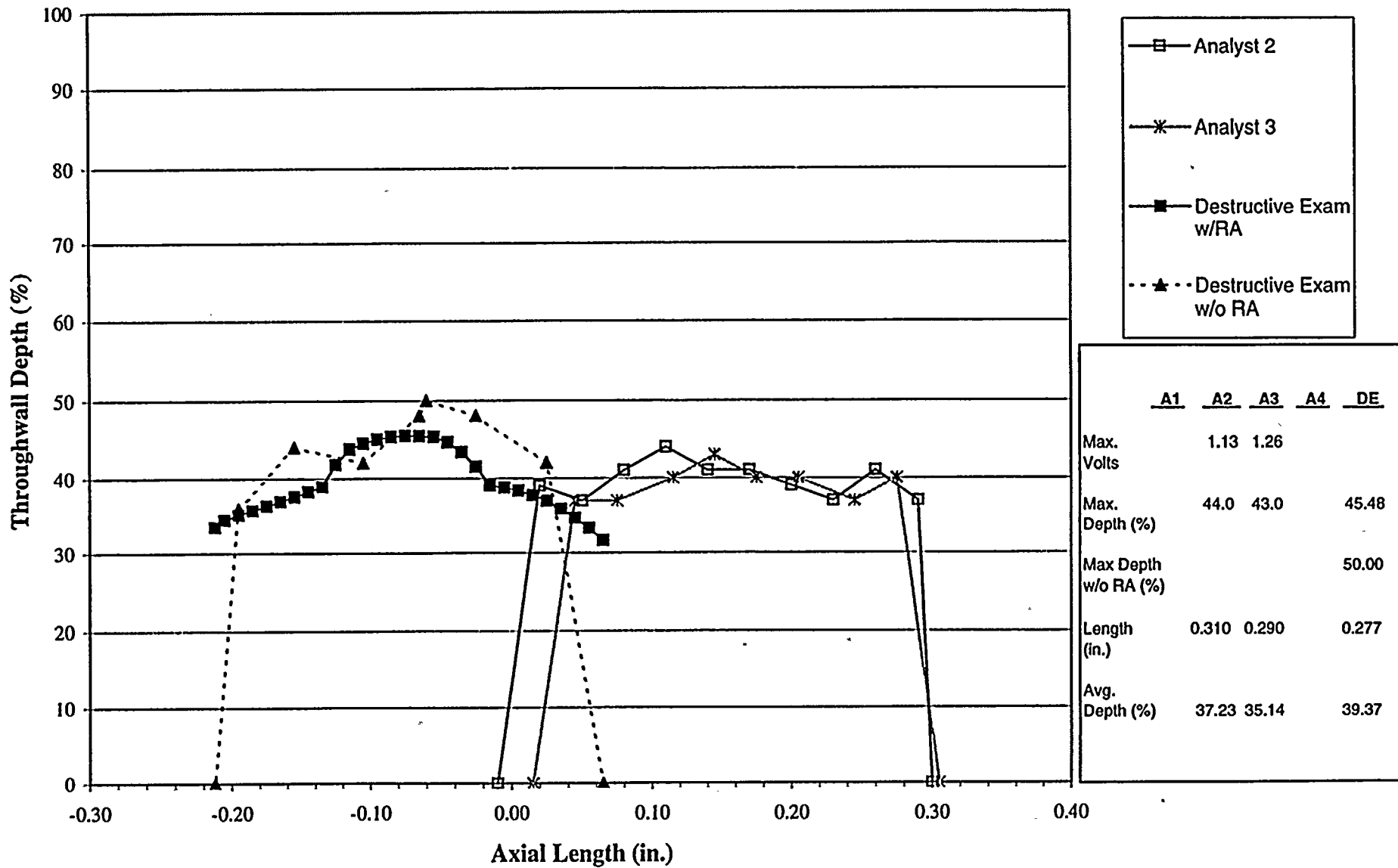


Figure C-4
Sample R21C64 Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

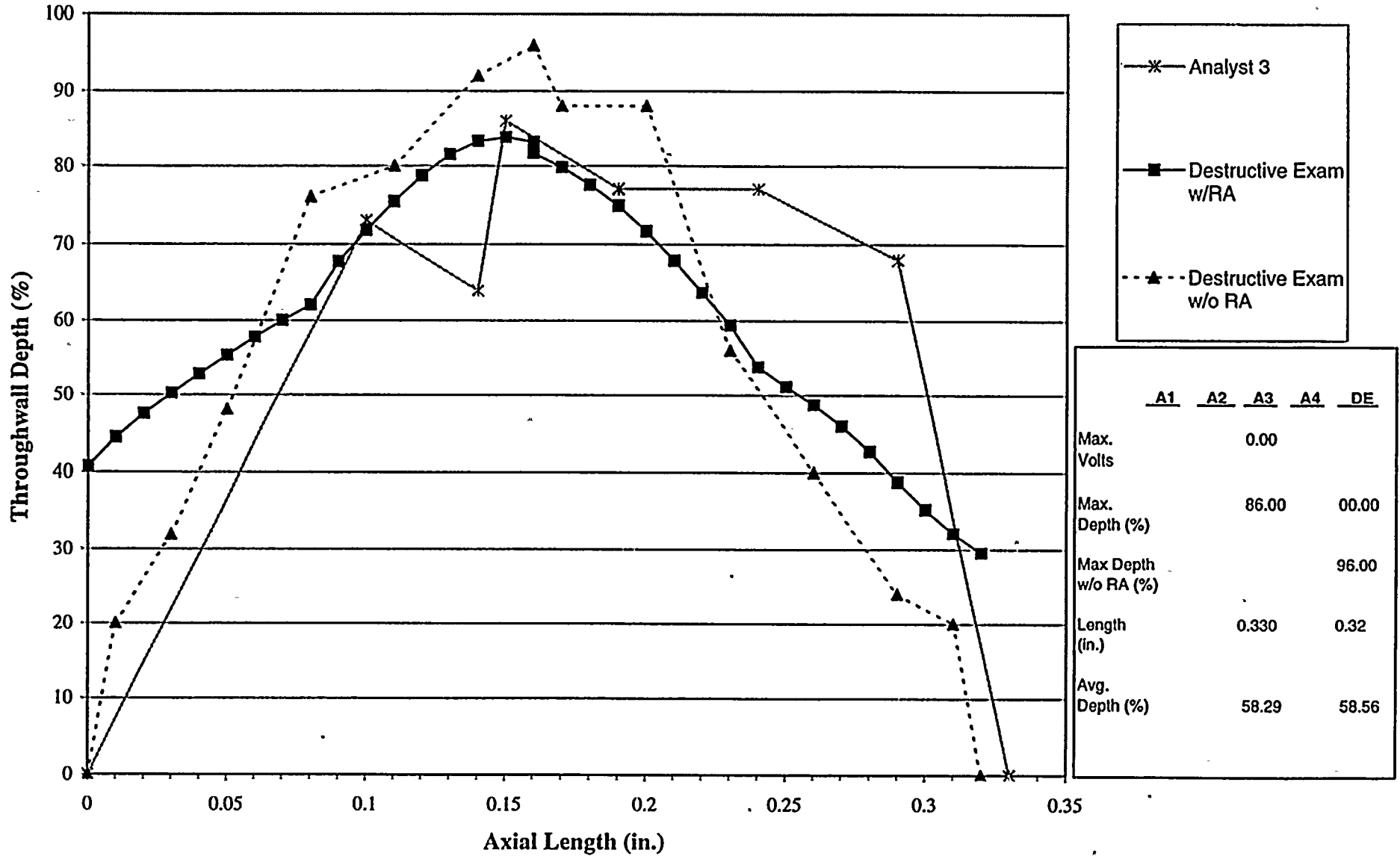


Figure C-5
Sample R12C32 Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

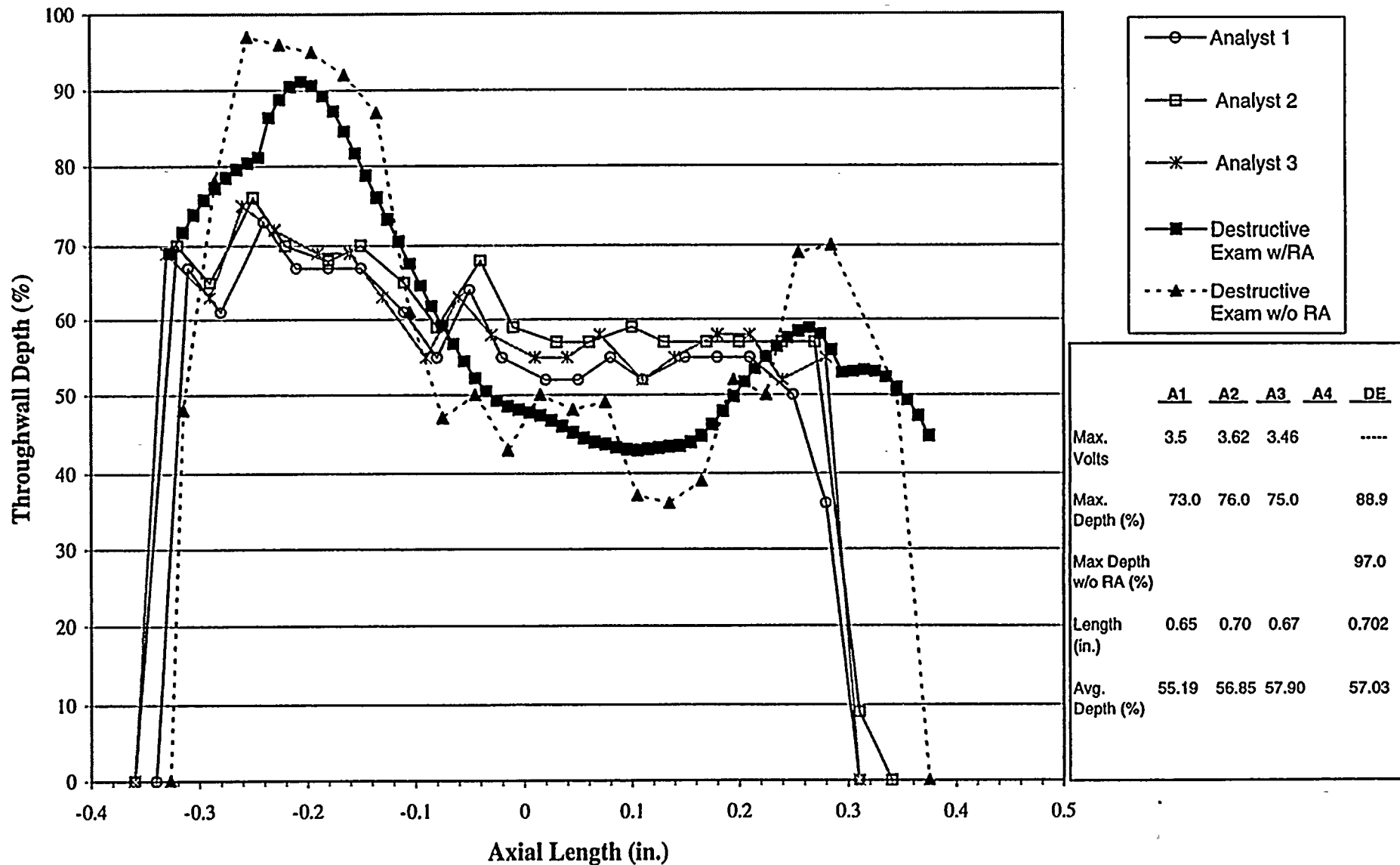


Figure C-6
Sample P7 Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

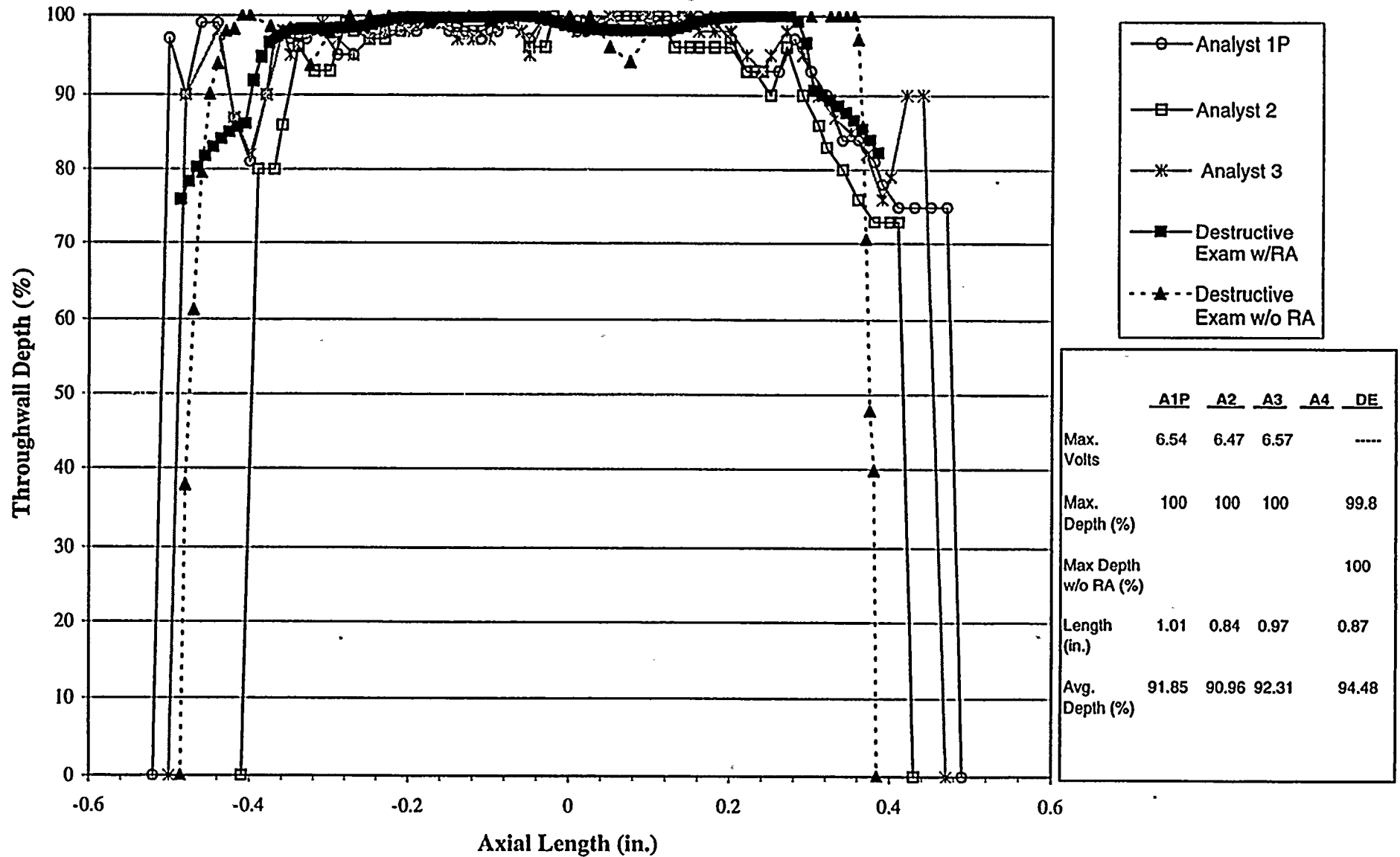


Figure C-7
Sample P7 Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

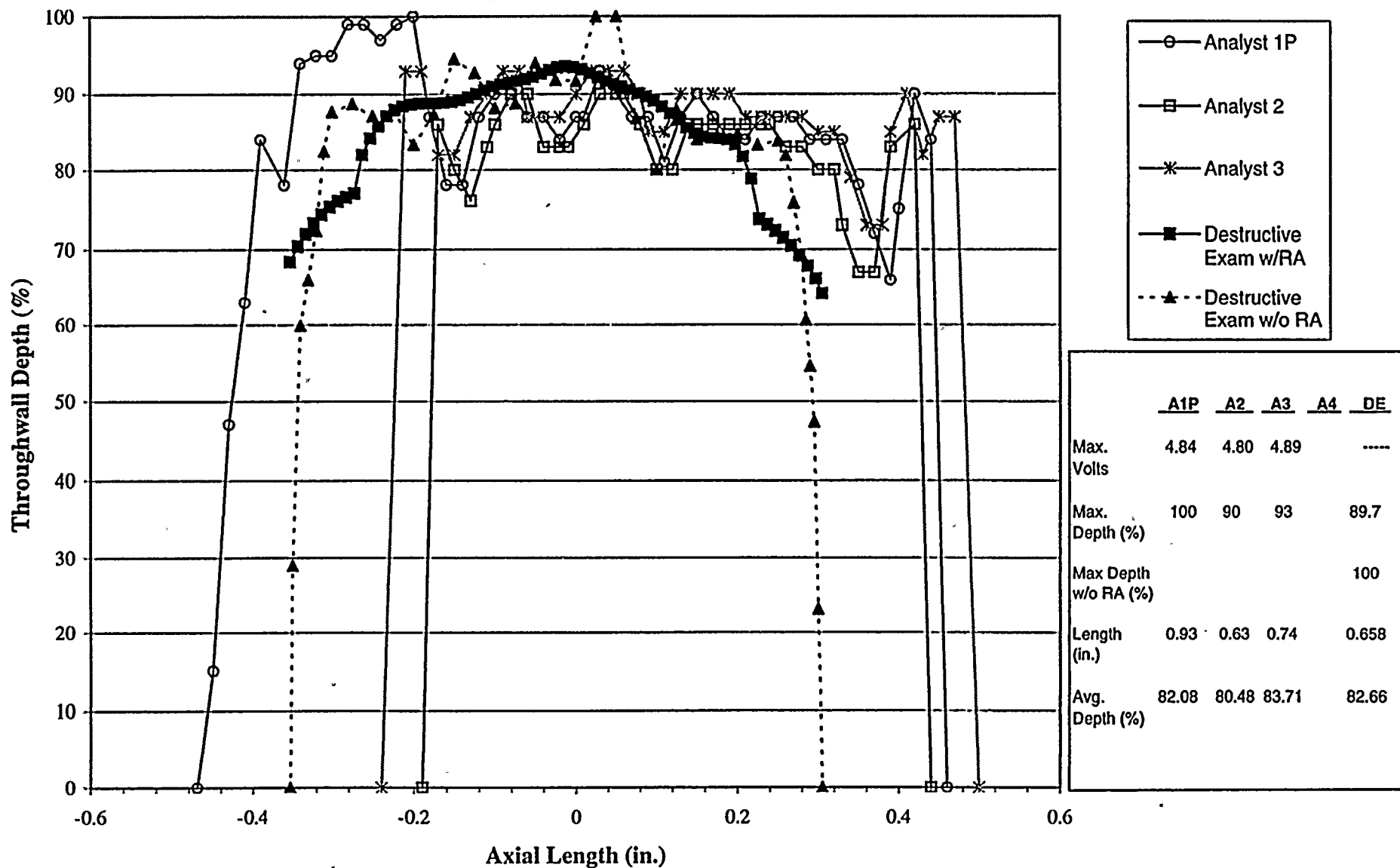


Figure C-8
Sample P7 Crack 3
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

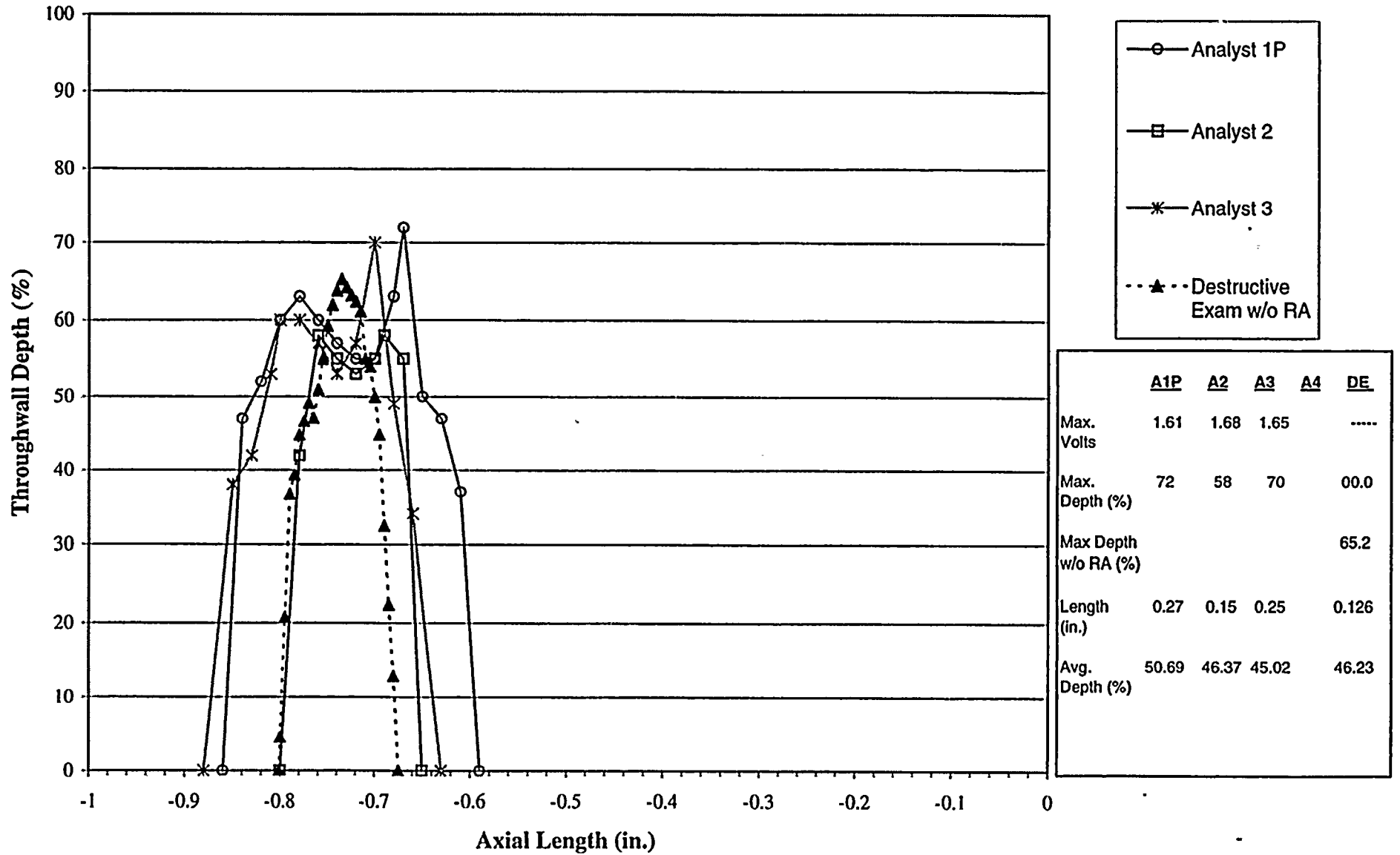


Figure C-9
Sample P8 Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

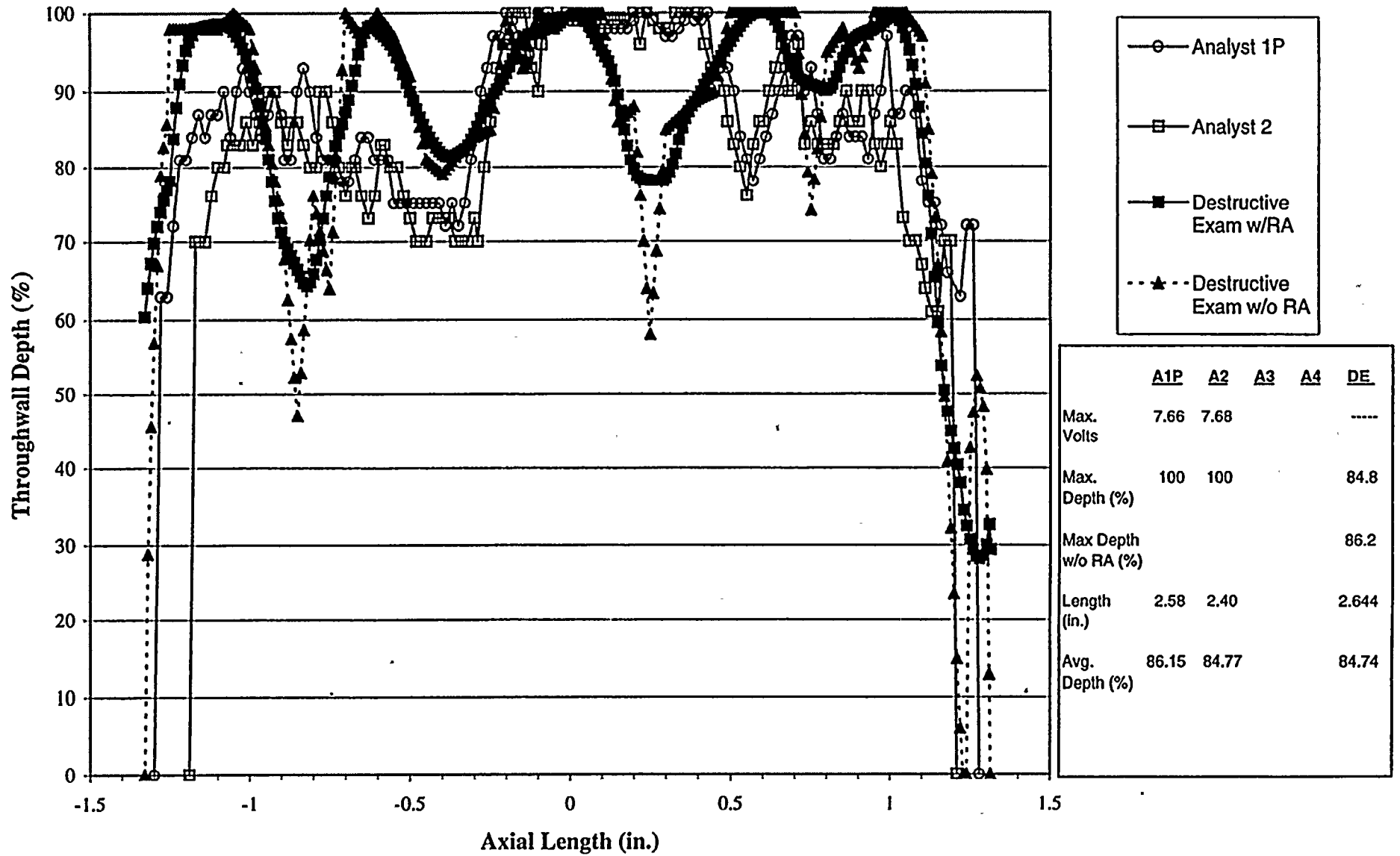


Figure C-10
Sample P8 Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

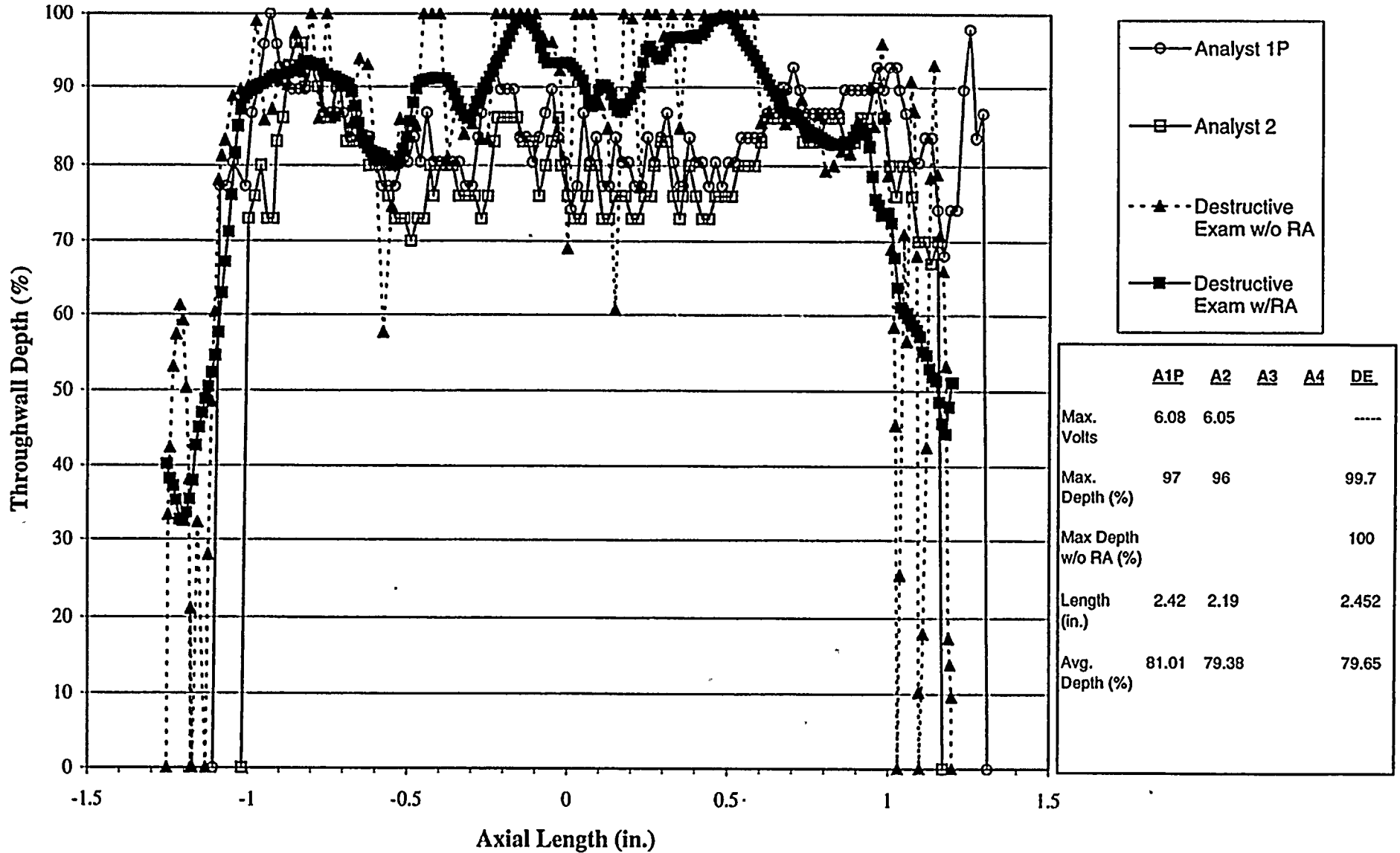


Figure C-11
Sample P9 Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

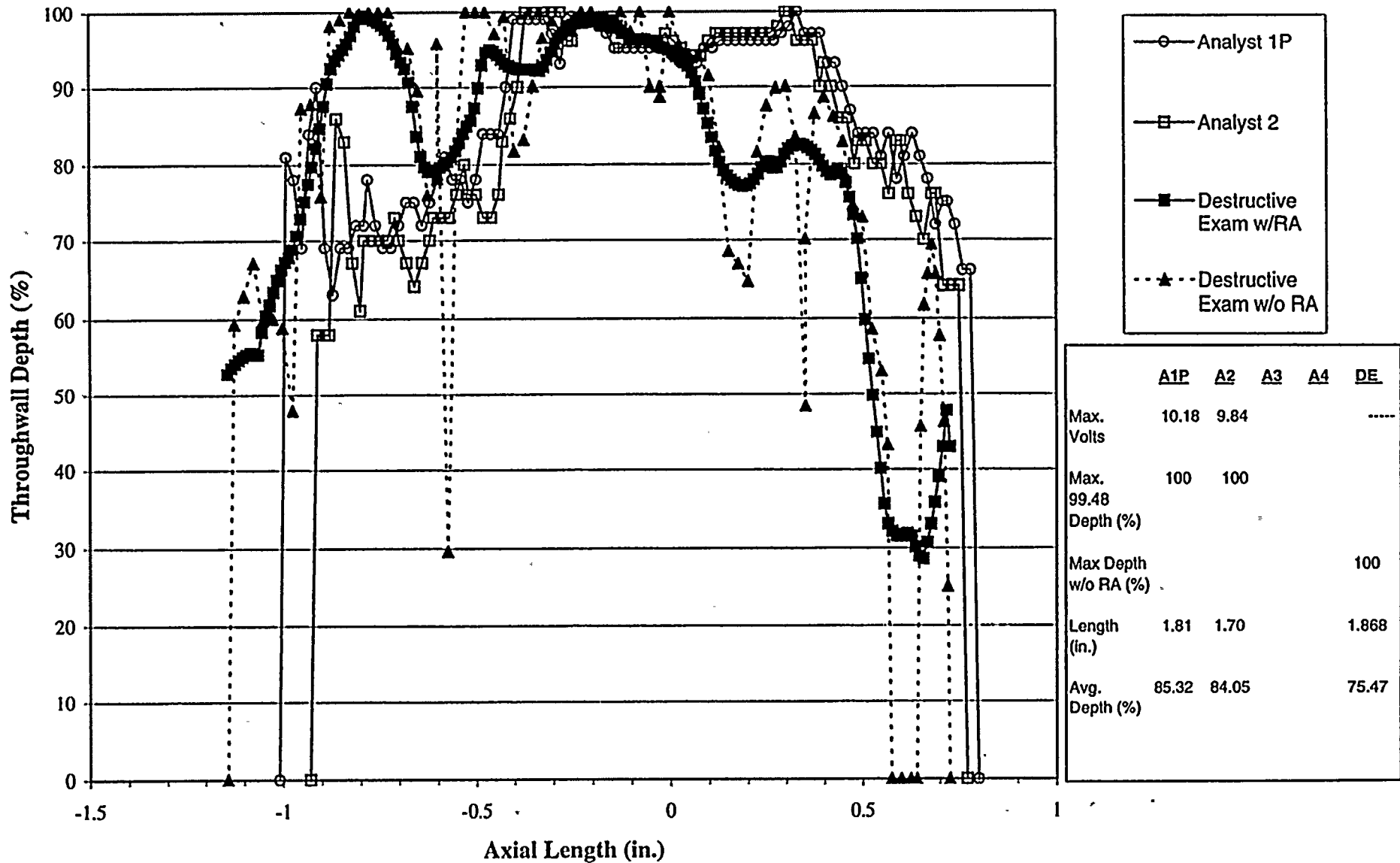


Figure C-12
Sample P9 Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

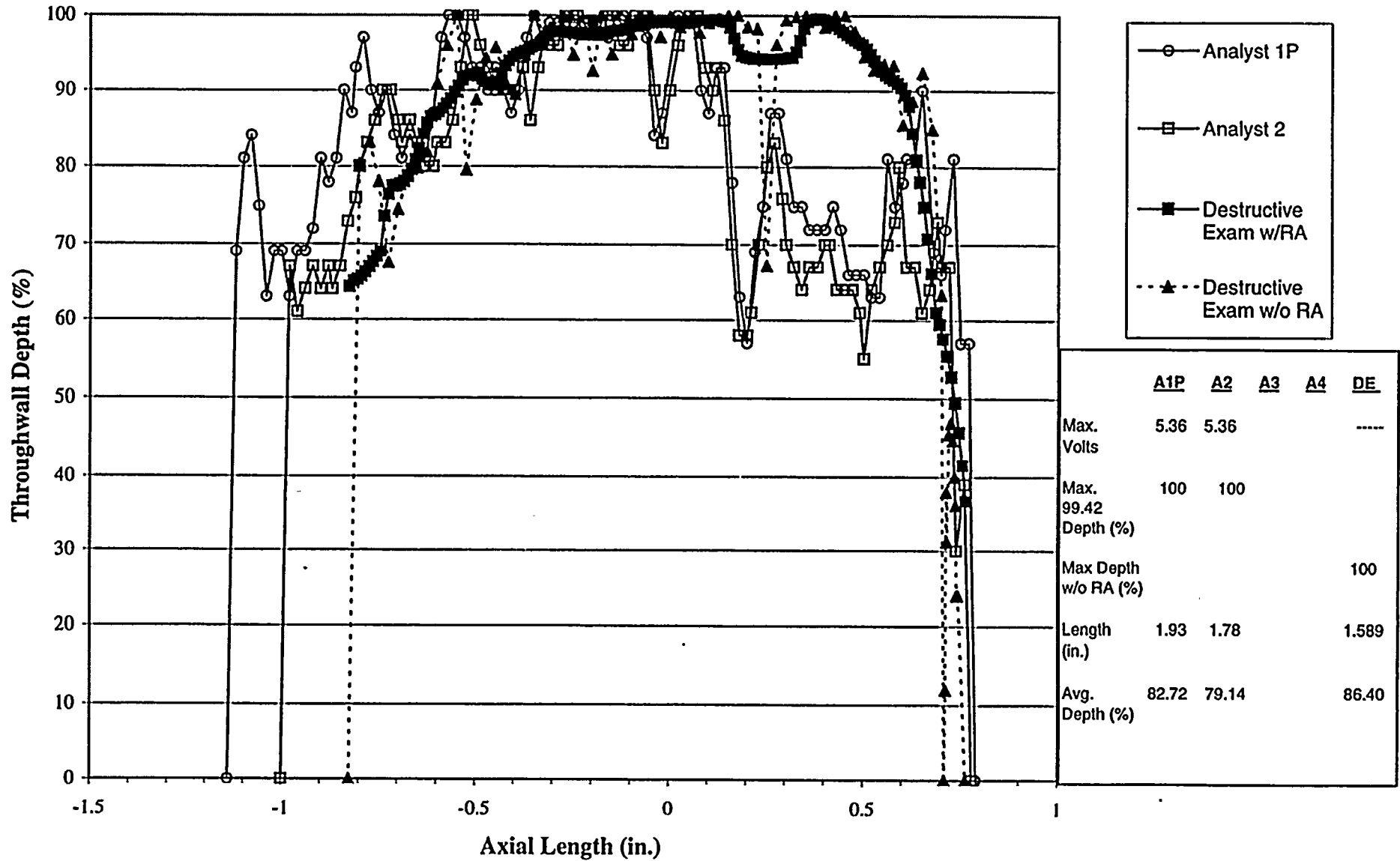


Figure C-13
Sample P10 Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

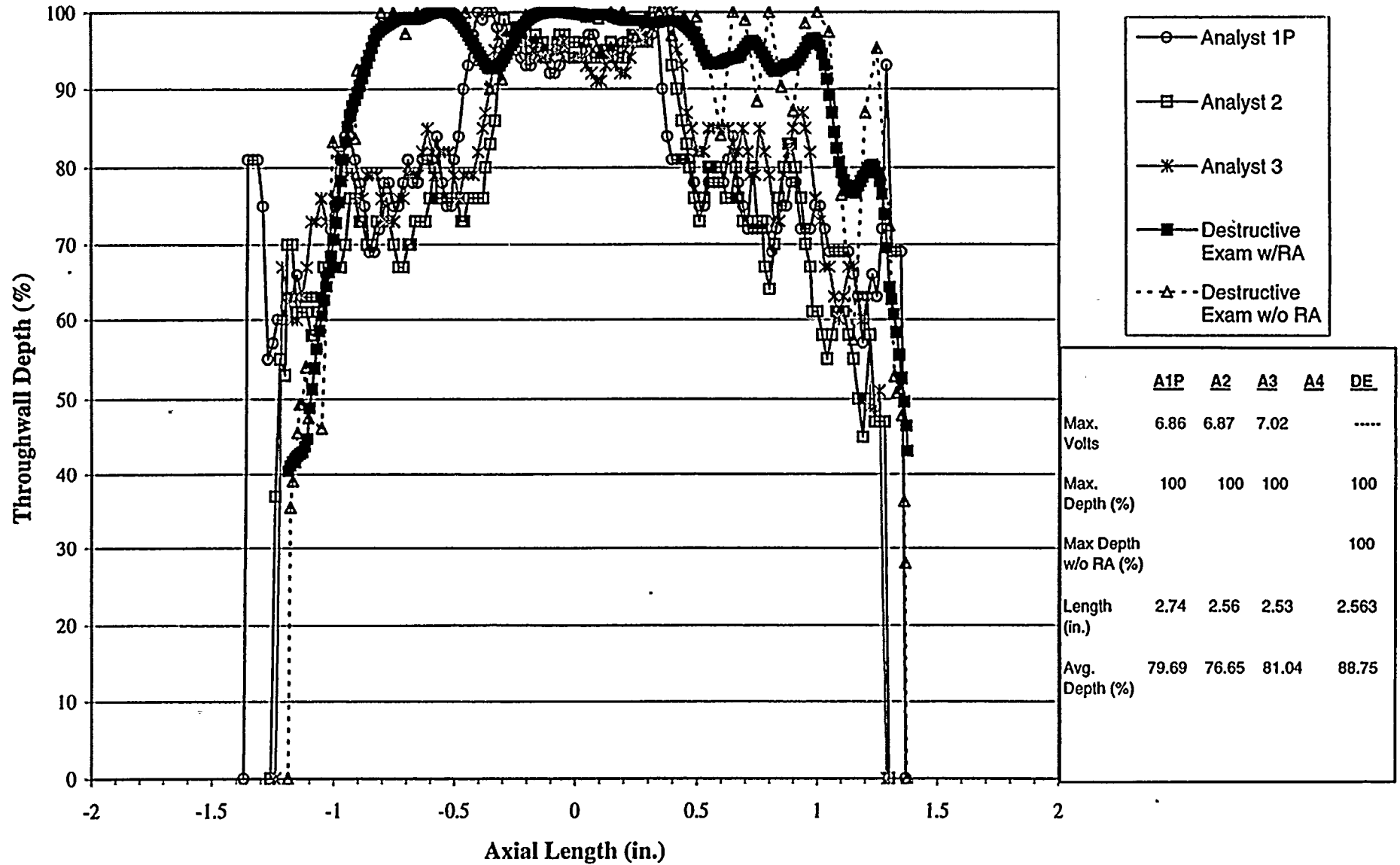


Figure C-14
Sample P10 Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

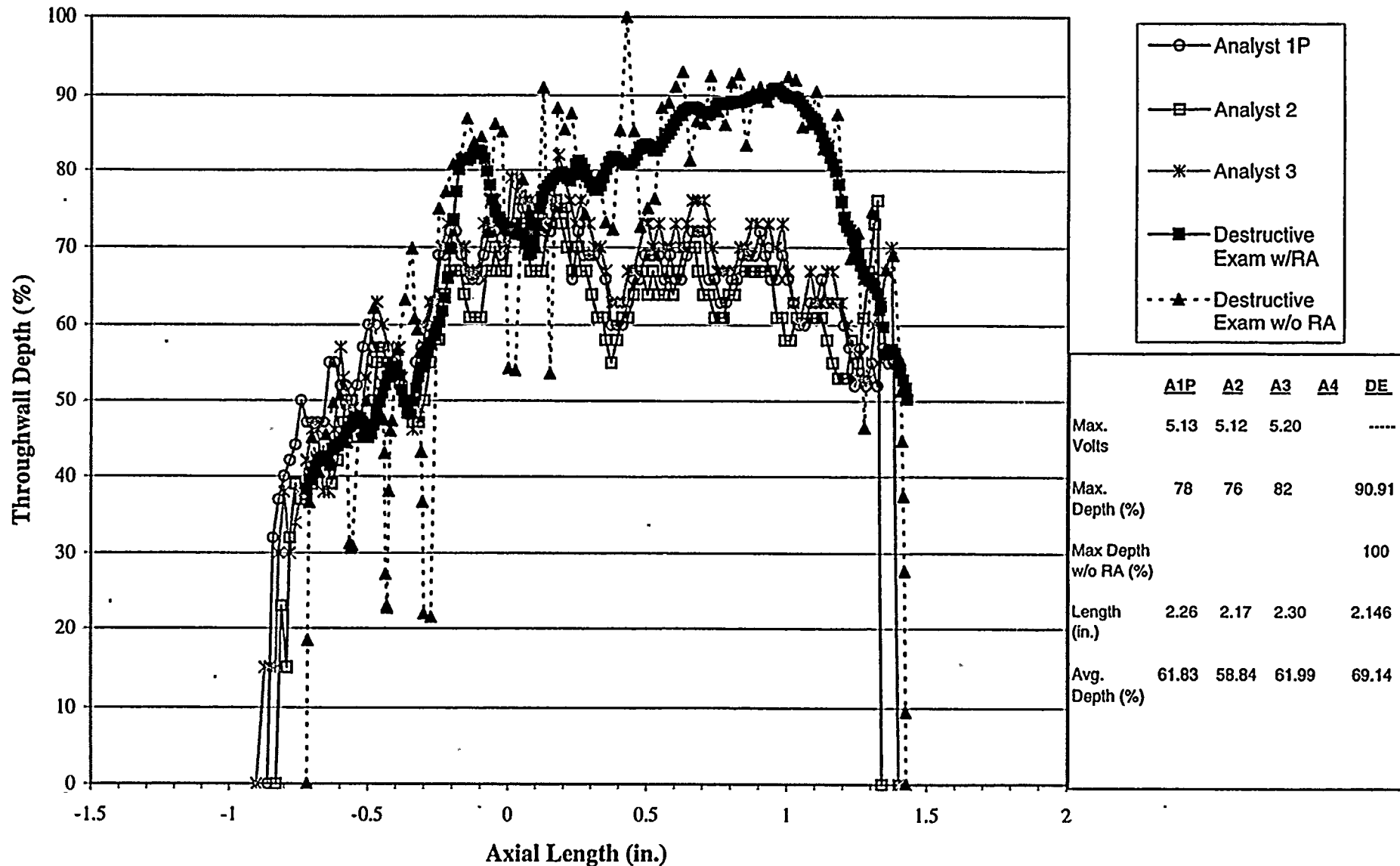


Figure C-15
Sample P11 Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

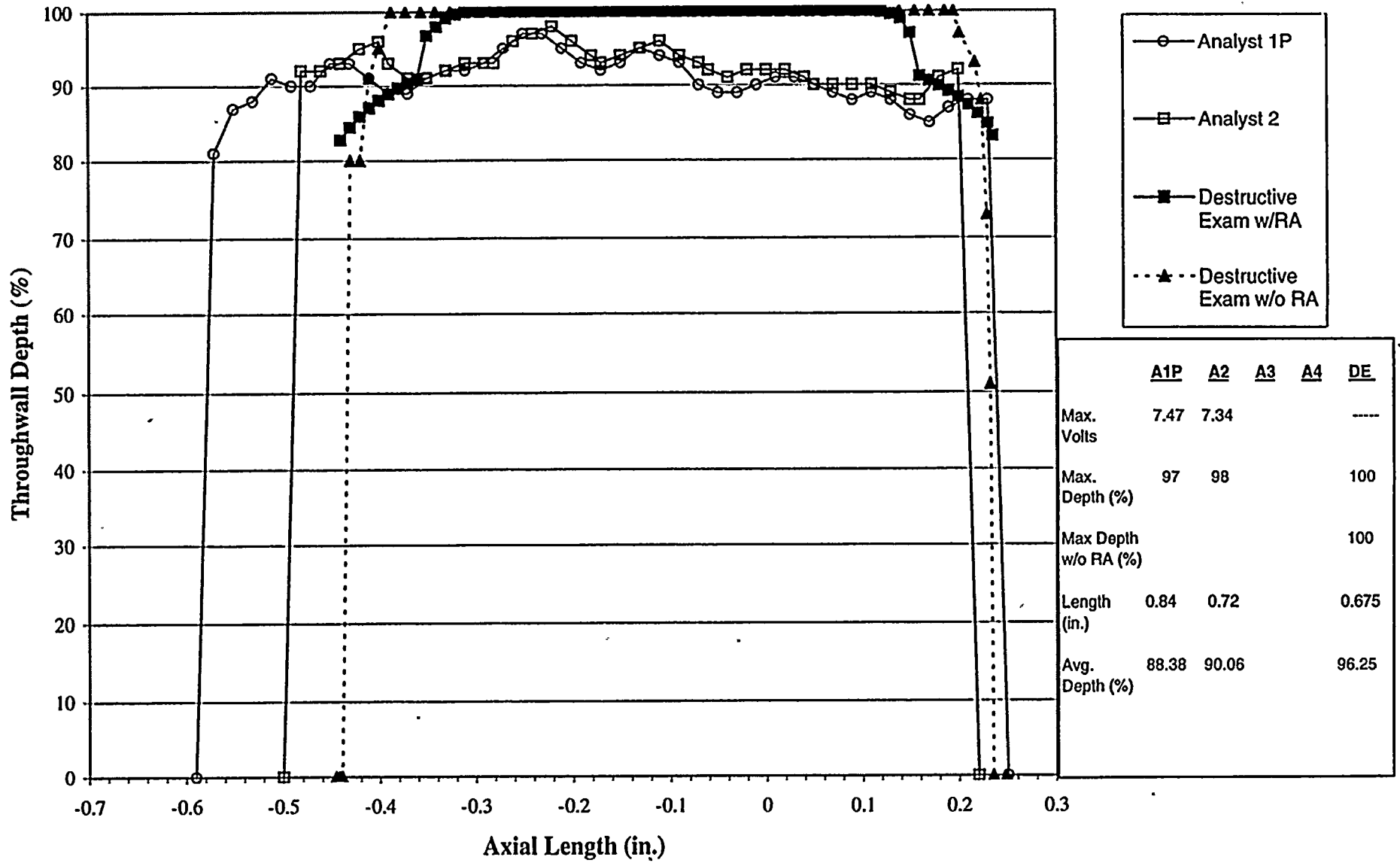


Figure C-16
Sample P11 Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

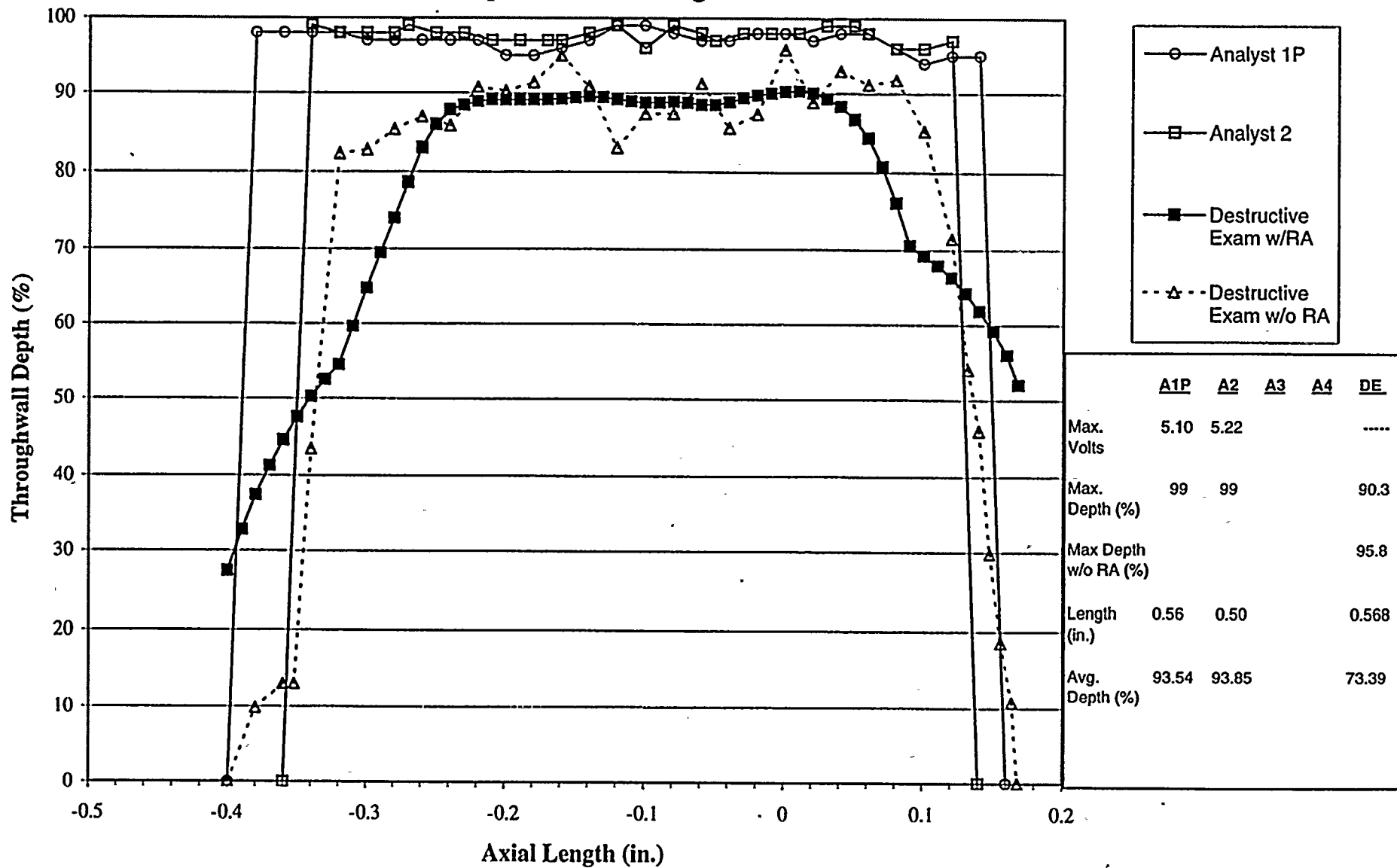


Figure C-17
Sample P12 Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

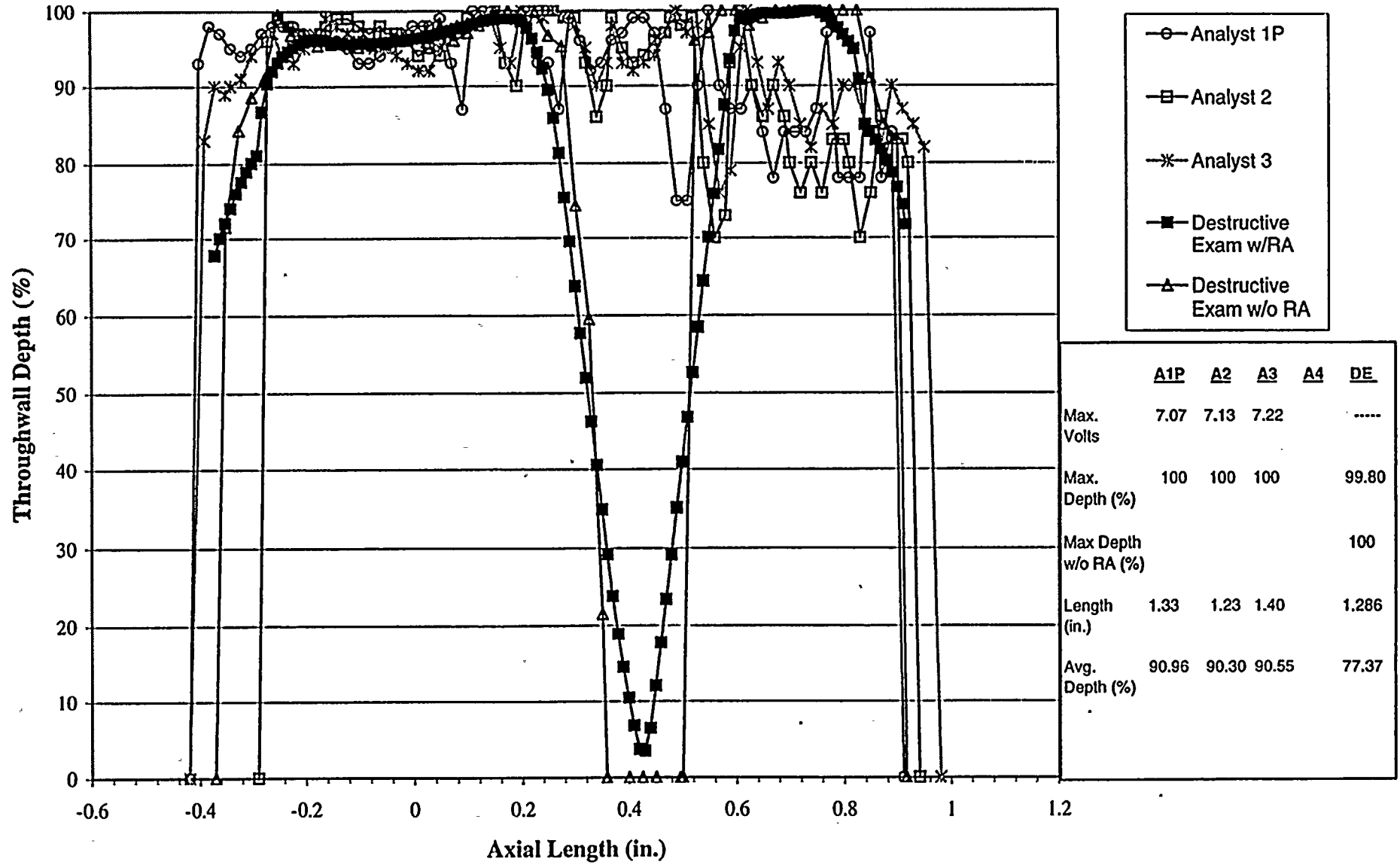


Figure C-18
Sample P12 Crack 2(3+4)
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

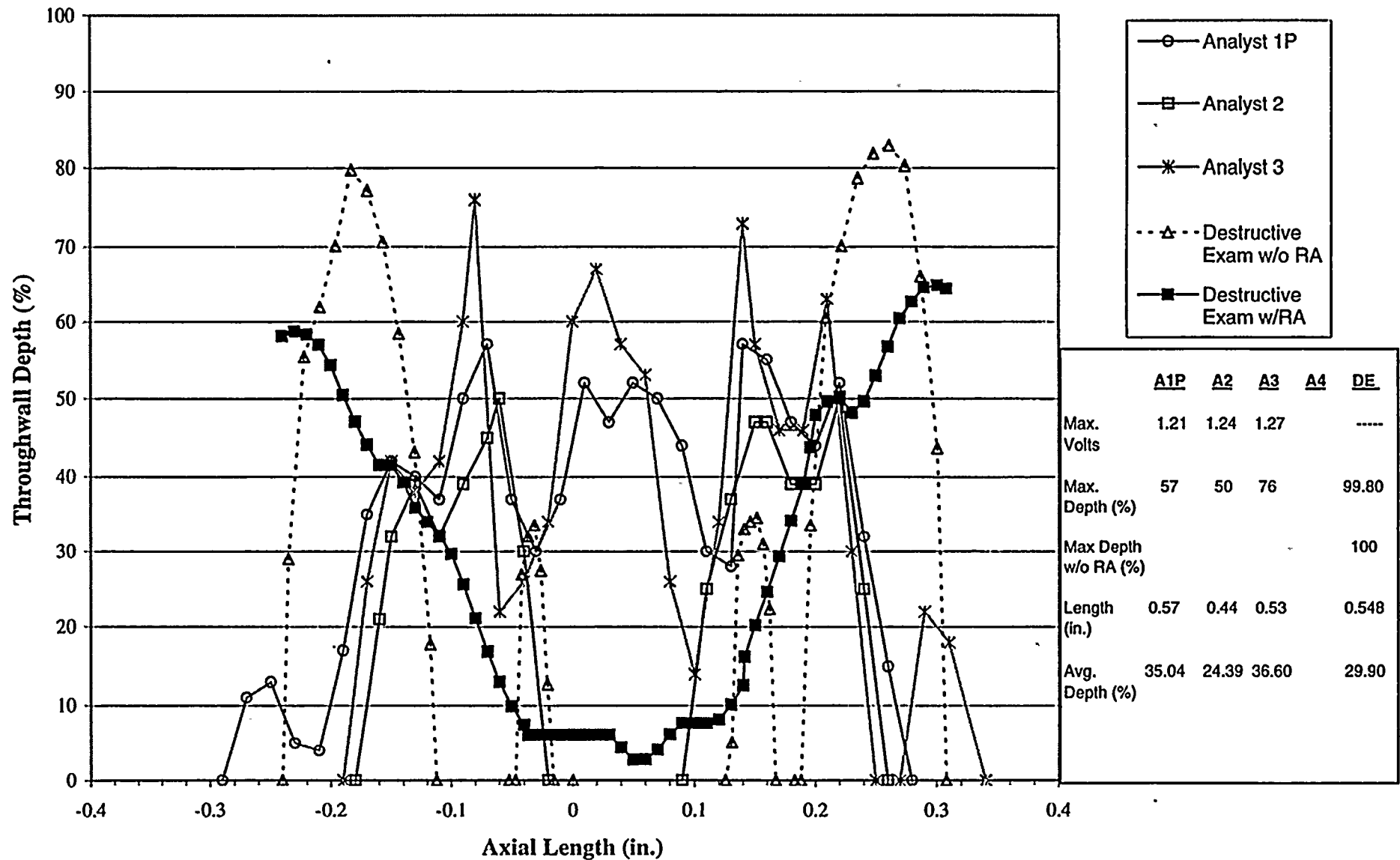


Figure C-19
Sample P12 Crack 5
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

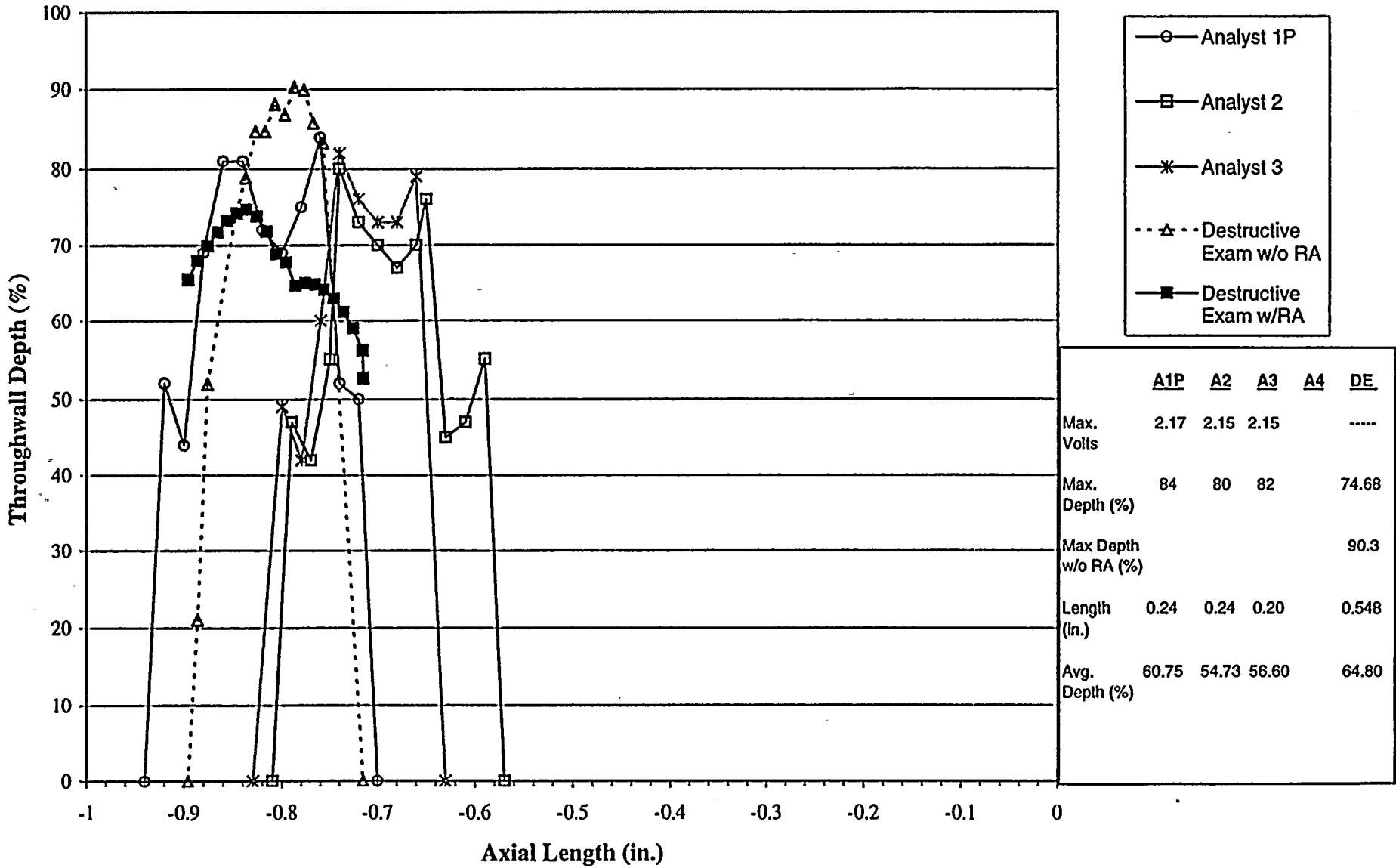


Figure C-20
Sample 1, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

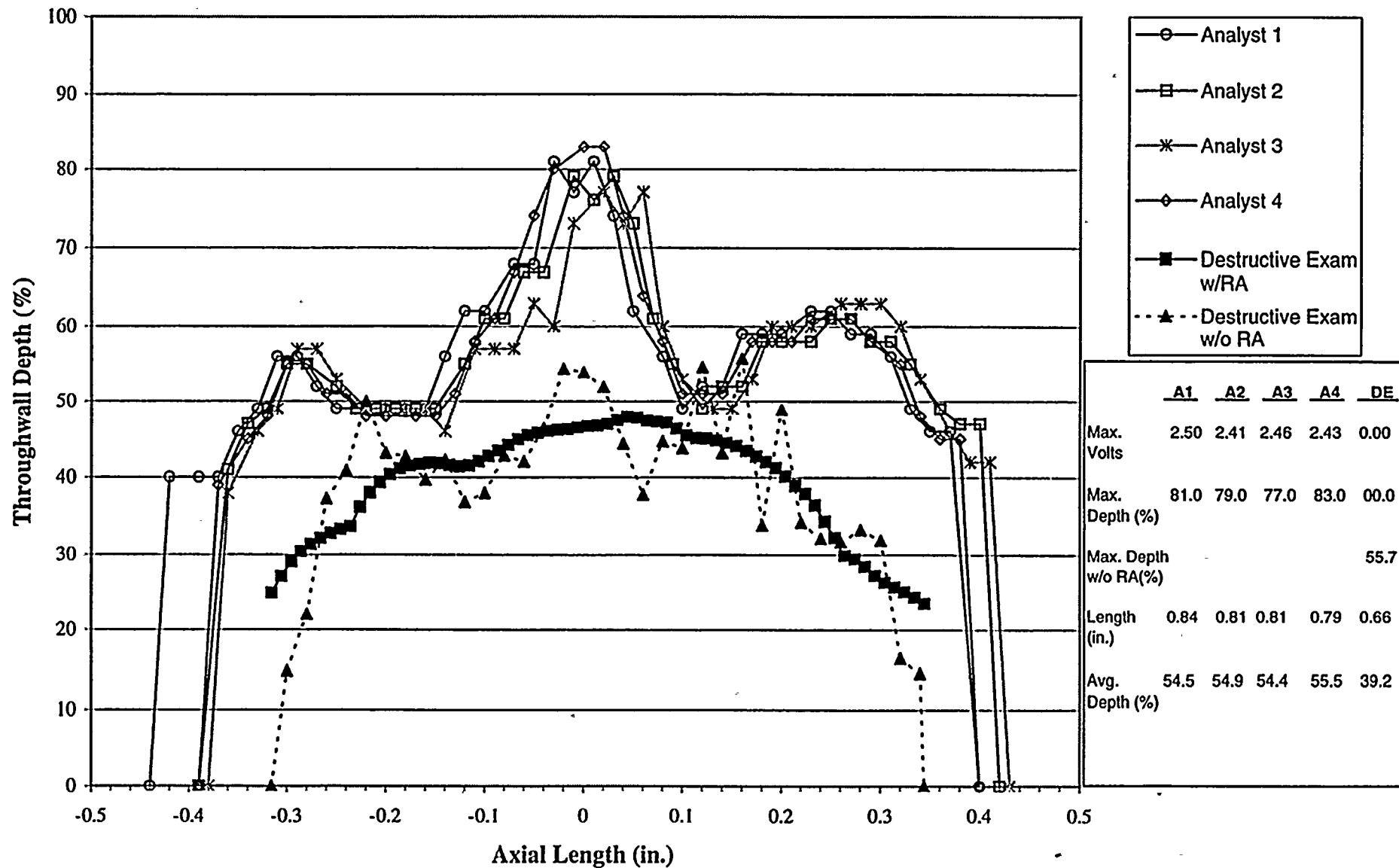


Figure C-21
Sample 1, TSP 4H
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

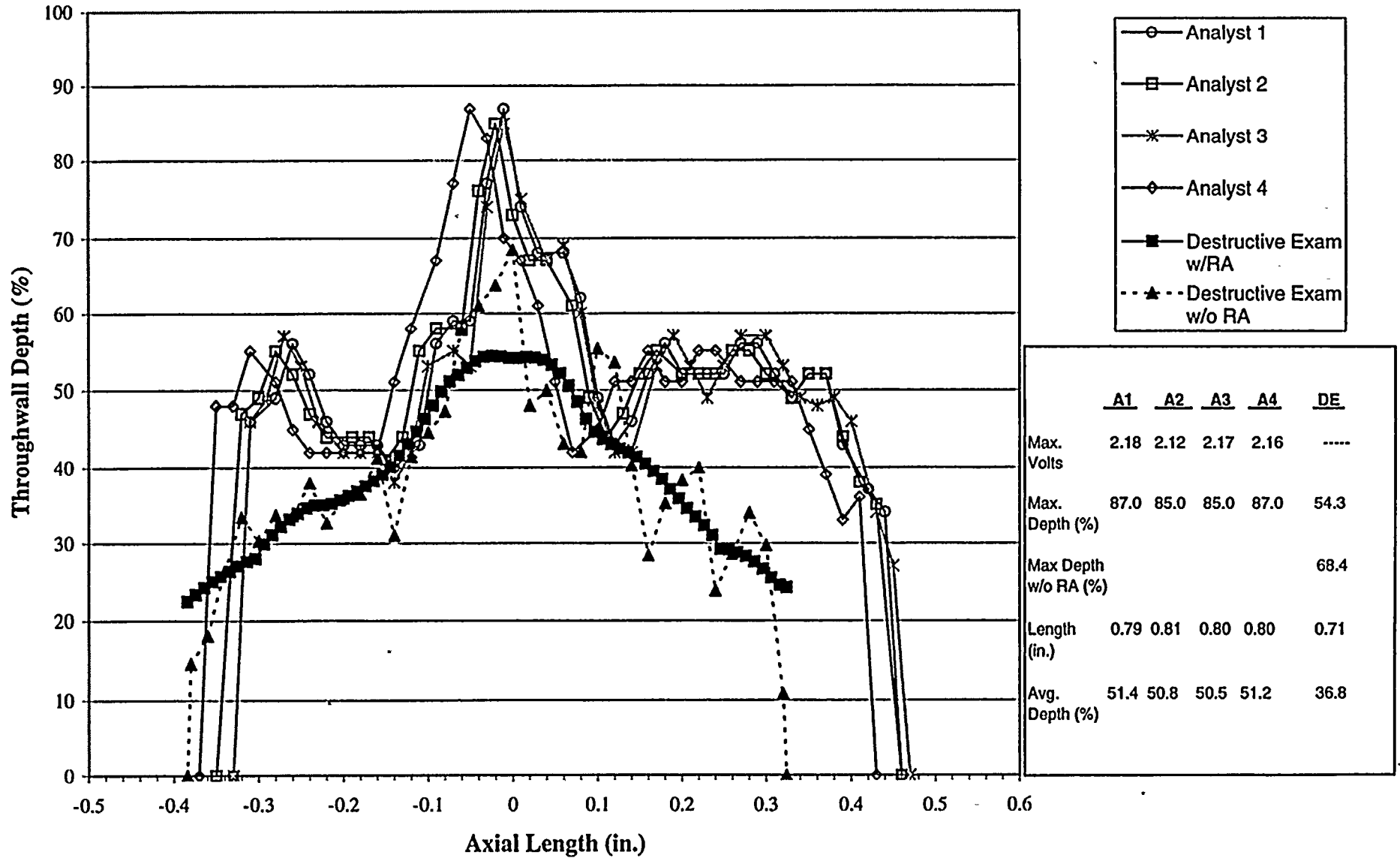


Figure C-22
Sample 2, TSP 1H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

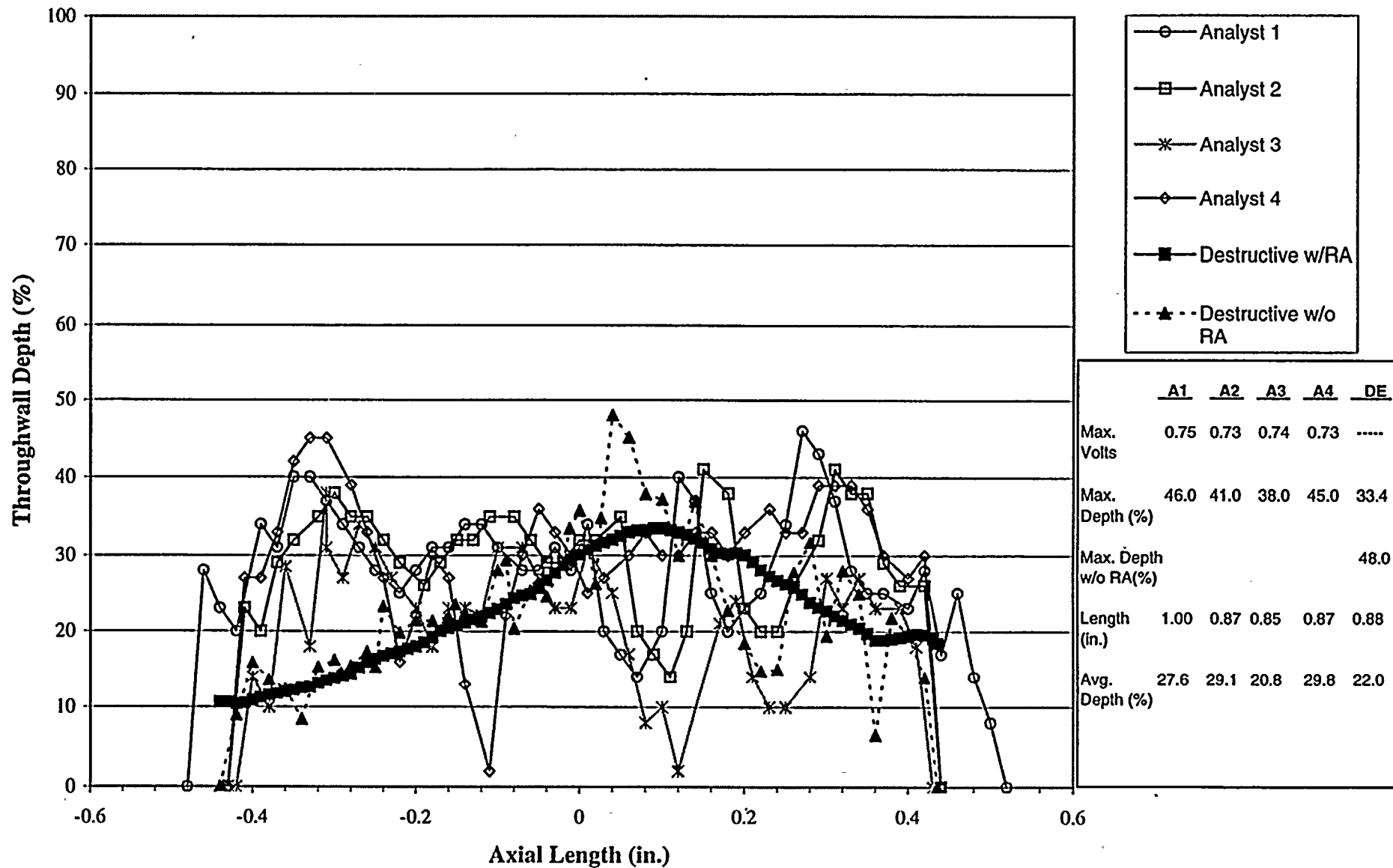


Figure C-23
Sample 2, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

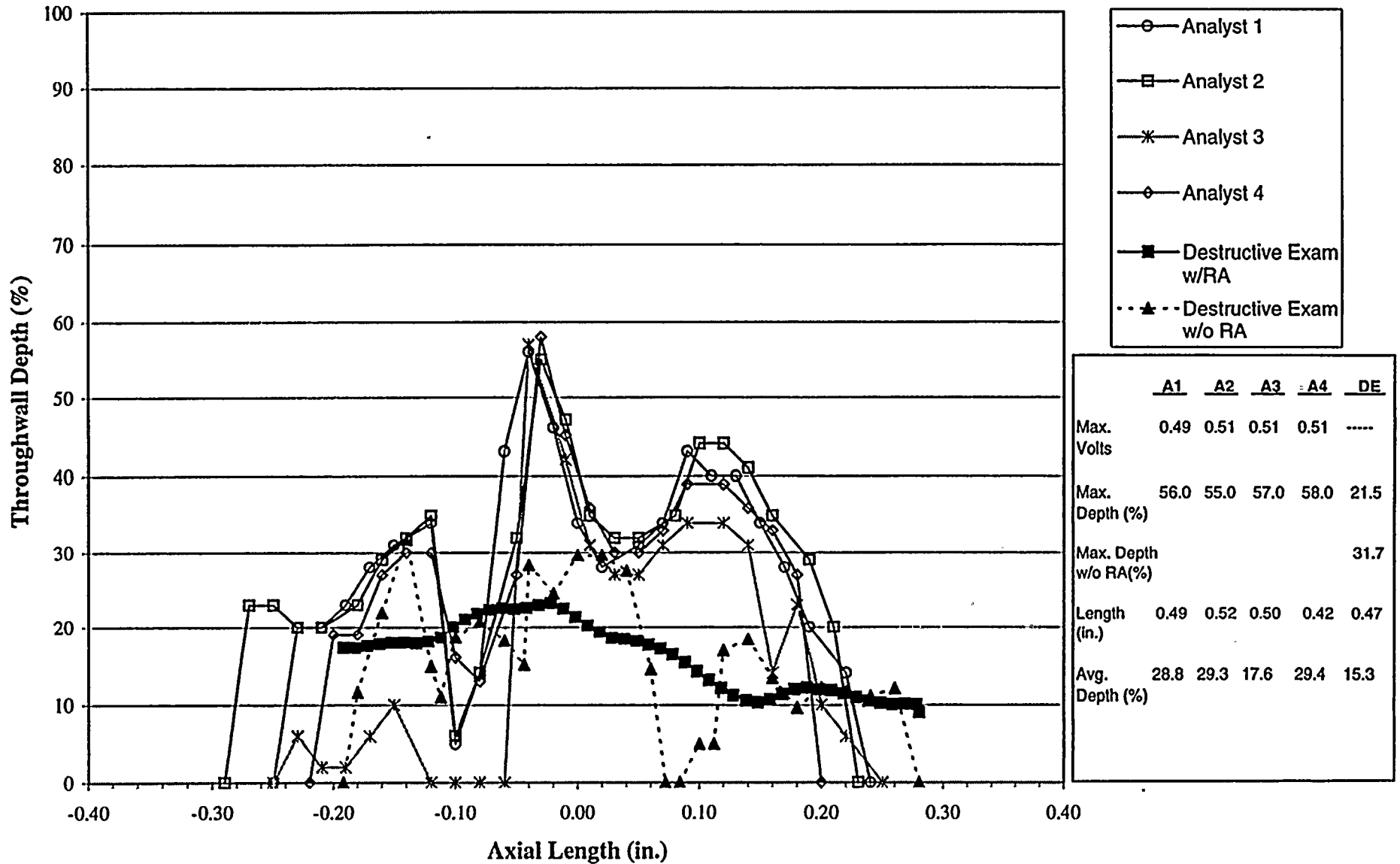


Figure C-24
Sample 2, TSP 4H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

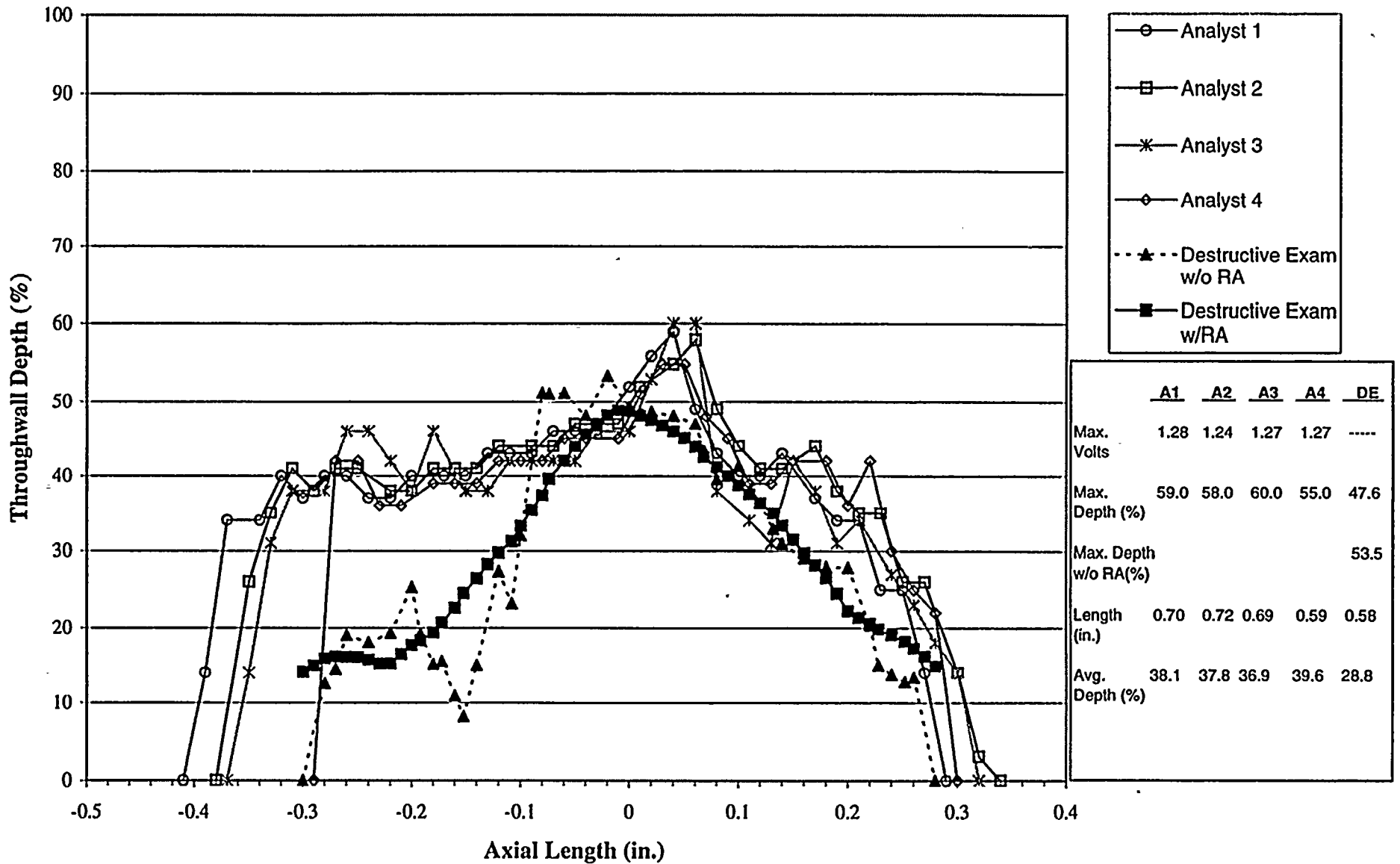


Figure C-25
Sample 2, TSP 5H
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

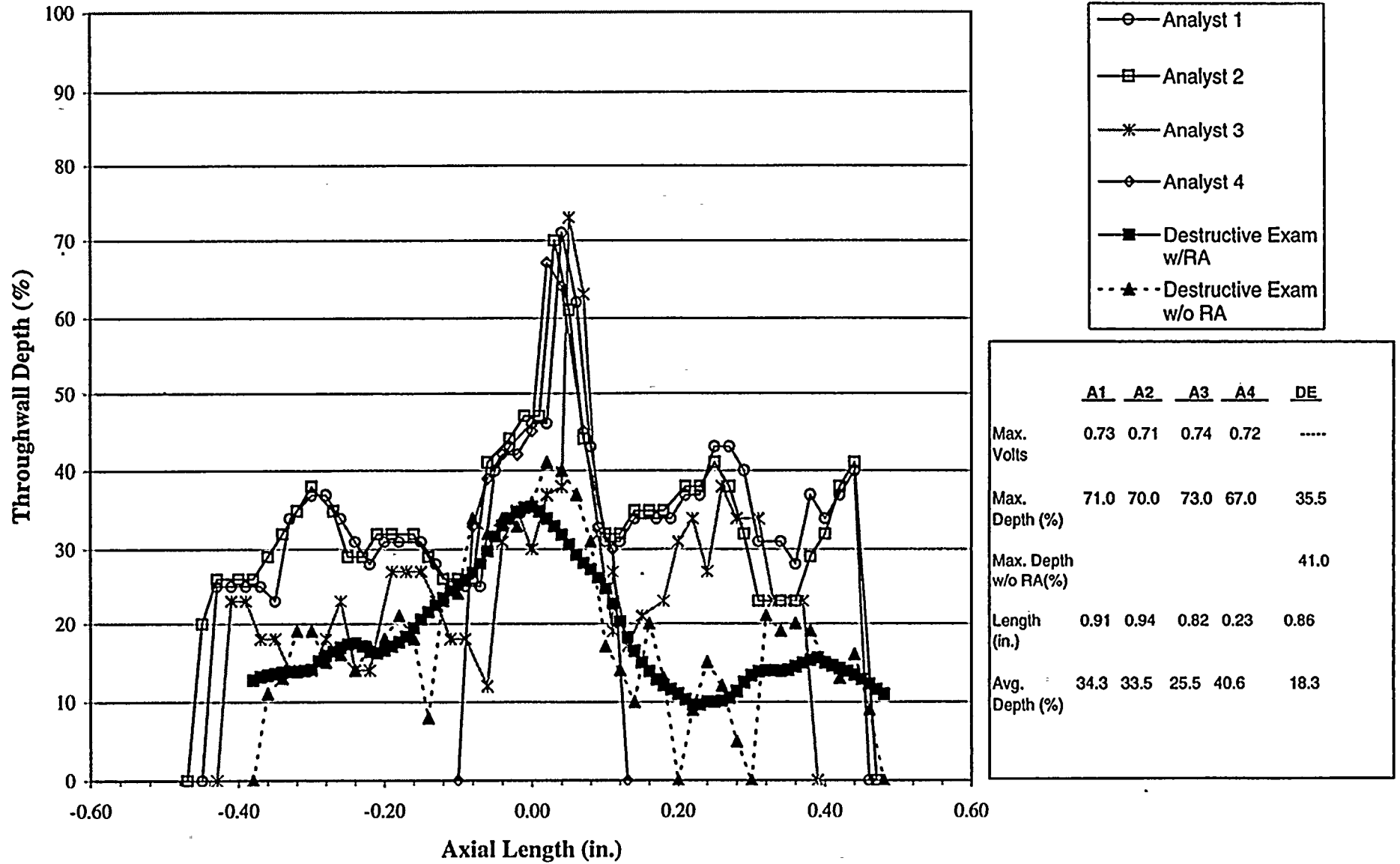
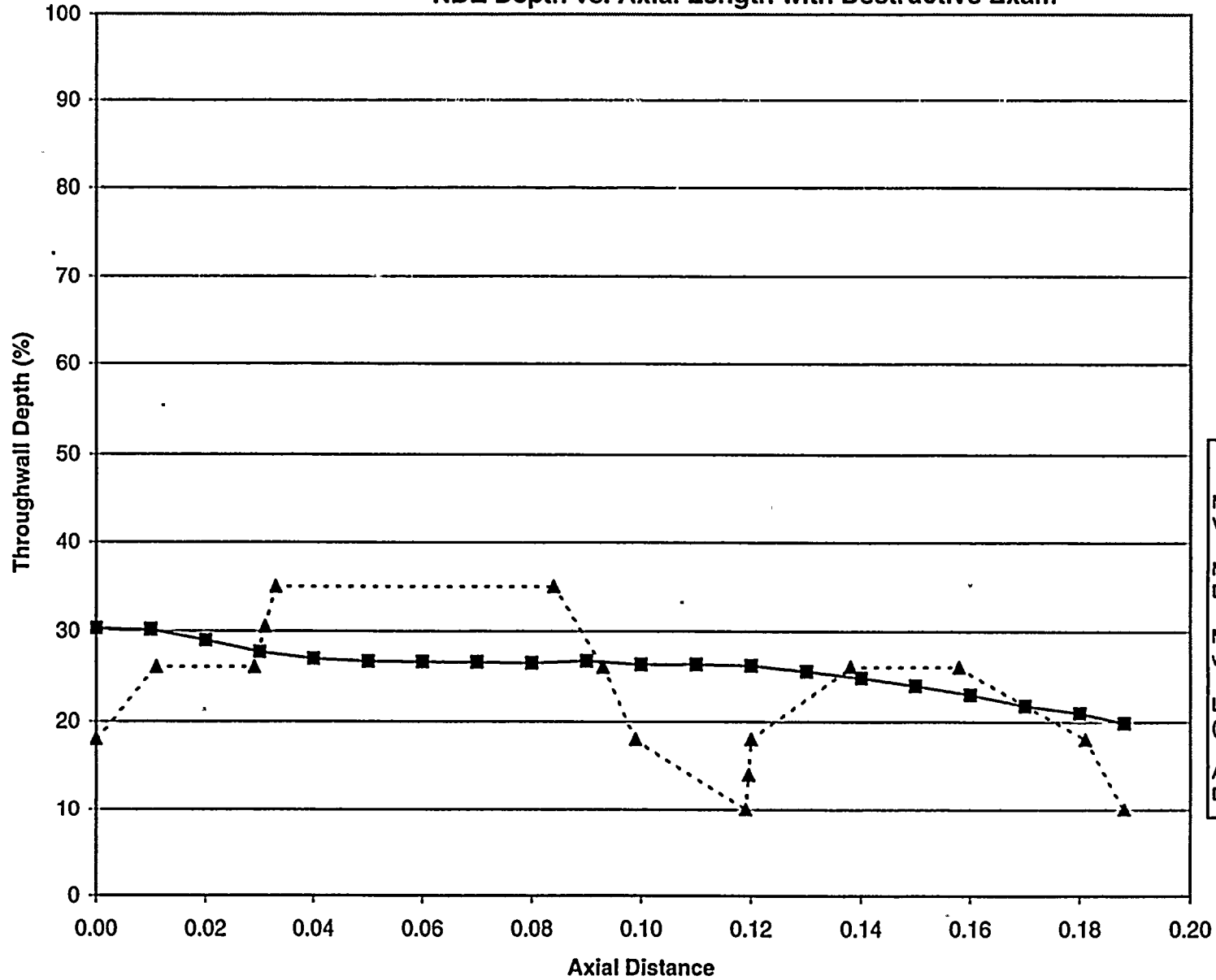


Figure C-26
 Sample 3, TSP 3H Crack 1
 Depth vs. Axial Length

NDE Depth vs. Axial Length with Destructive Exam

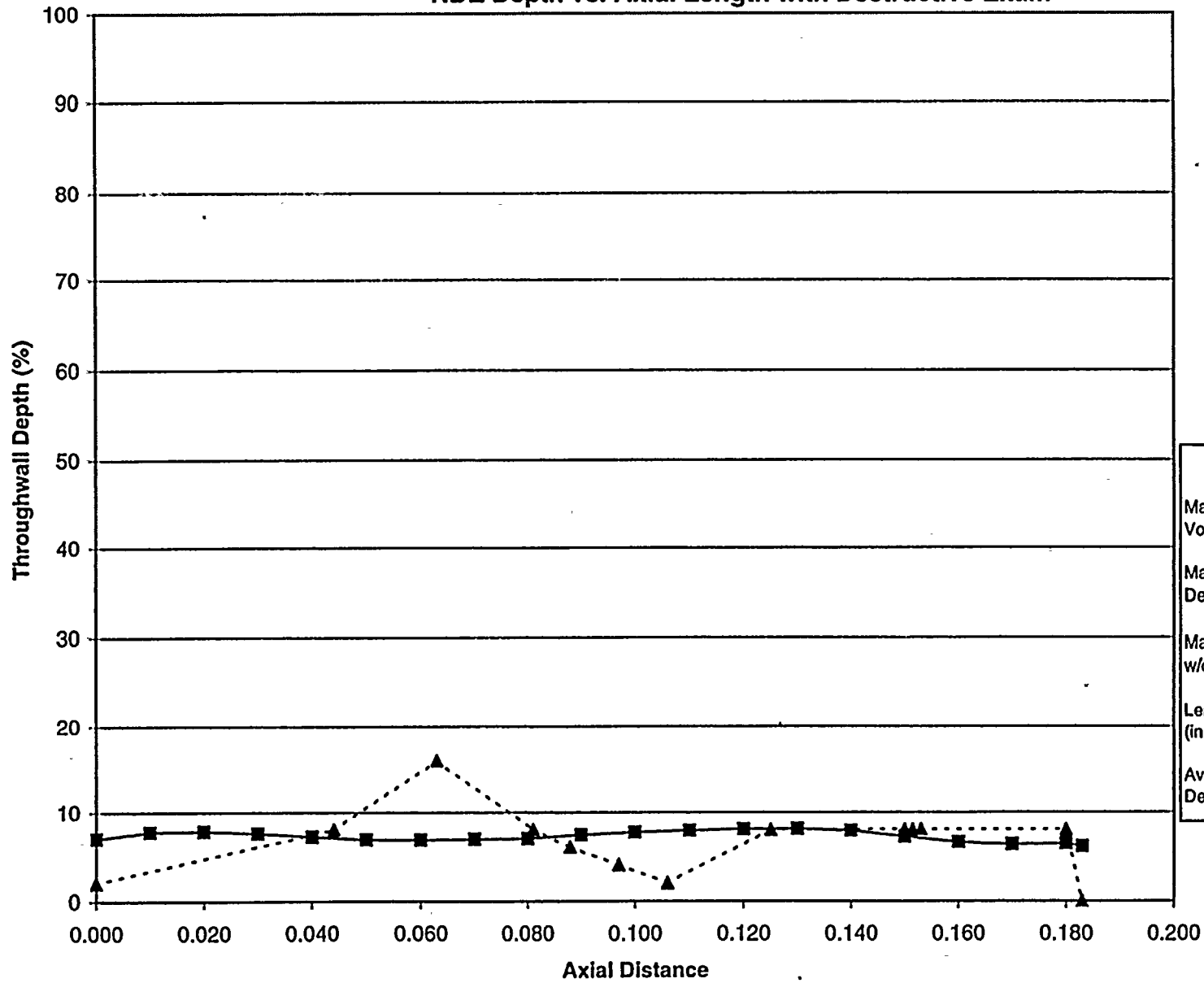


—■— Destructive Exam w/RA
 - -▲- - Destructive Exam w/o RA

	A1	A2	A3	A4	DE
Max. Volts	NDD	NDD	NDD	No Data	---
Max. Depth (%)					29.1
Max Depth w/o RA (%)					35.0
Length (in.)					.188
Avg. Depth(%)					23.25

Figure C-27
 Sample 3, TSP 4H Crack 1
 Depth vs. Axial Length

NDE Depth vs. Axial Length with Destructive Exam



■ Destructive Exam w/RA
 ▲ Destructive Exam w/o RA

	A1	A2	A3	A4	DE
Max. Volts	NDD	NDD	NDD	No Data	---
Max. Depth (%)					7.72
Max Depth w/o RA (%)					16.0
Length (in.)					0.183
Avg. Depth(%)					6.39

Figure C-28
Sample 4, TSP 4H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

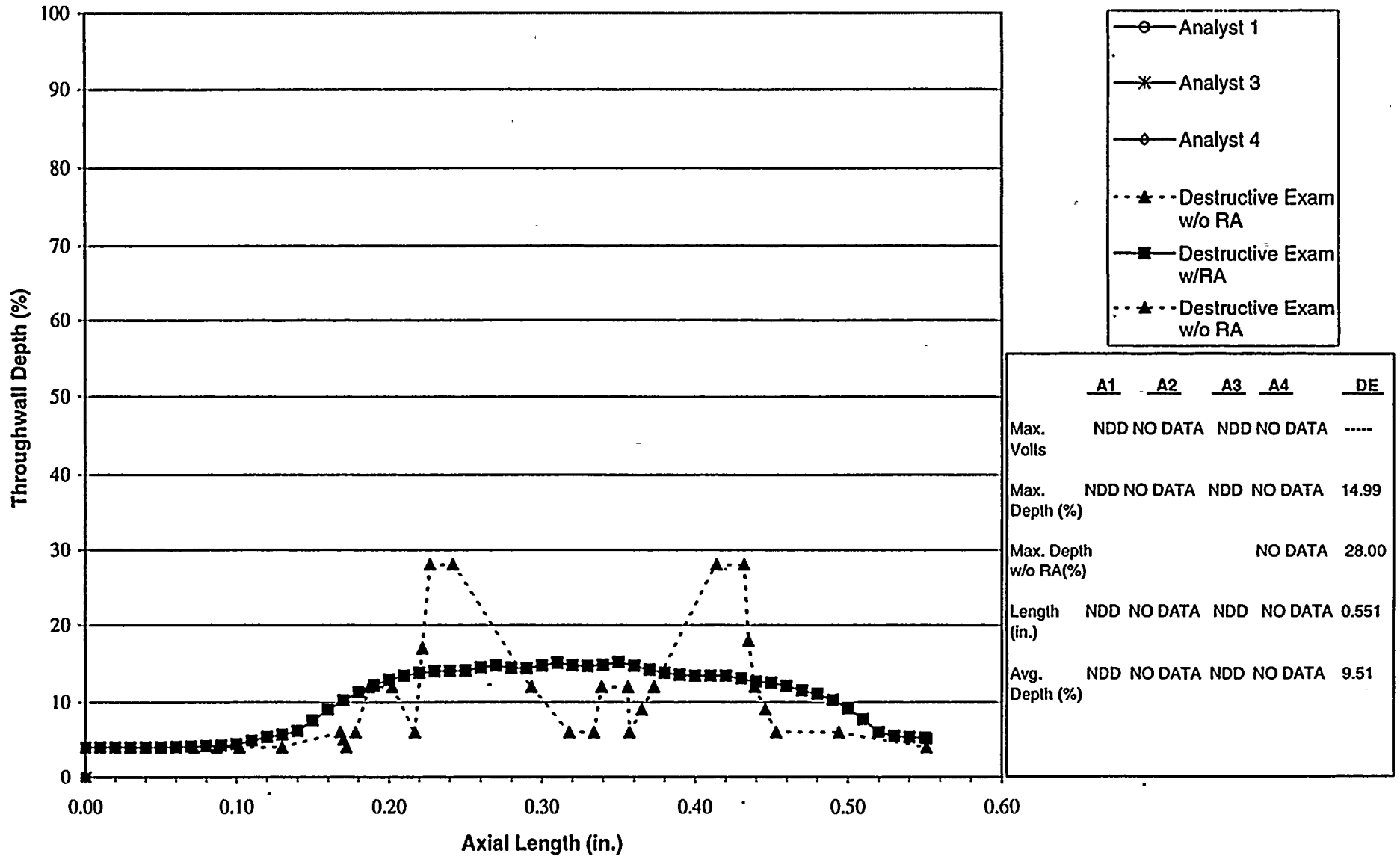
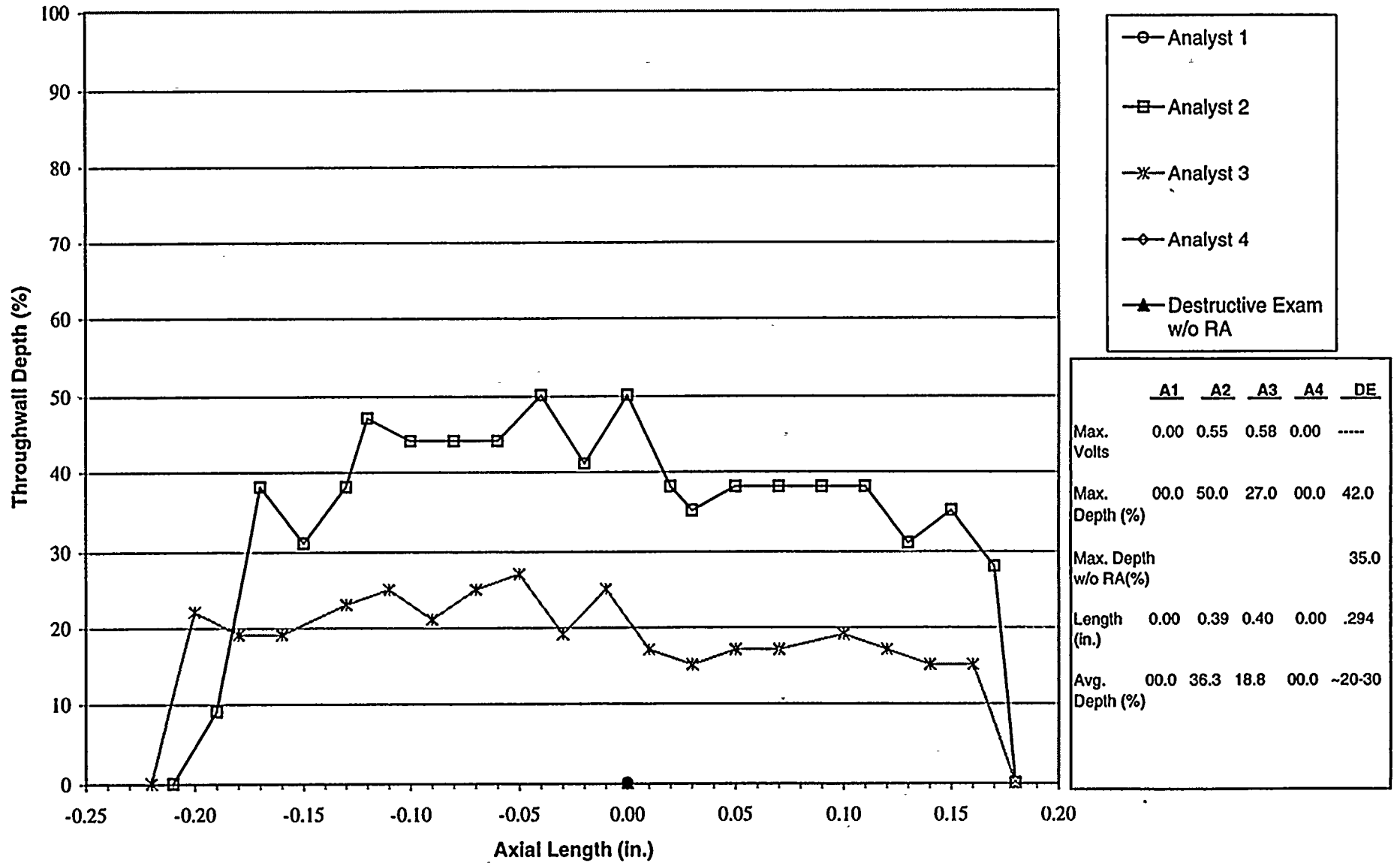


Figure C-29
Sample 5, TSP 1H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam



	A1	A2	A3	A4	DE
Max. Volts	0.00	0.55	0.58	0.00	----
Max. Depth (%)	00.0	50.0	27.0	00.0	42.0
Max. Depth w/o RA(%)					35.0
Length (in.)	0.00	0.39	0.40	0.00	.294
Avg. Depth (%)	00.0	36.3	18.8	00.0	~20-30

Figure C-30
Sample 6, TSP 1H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

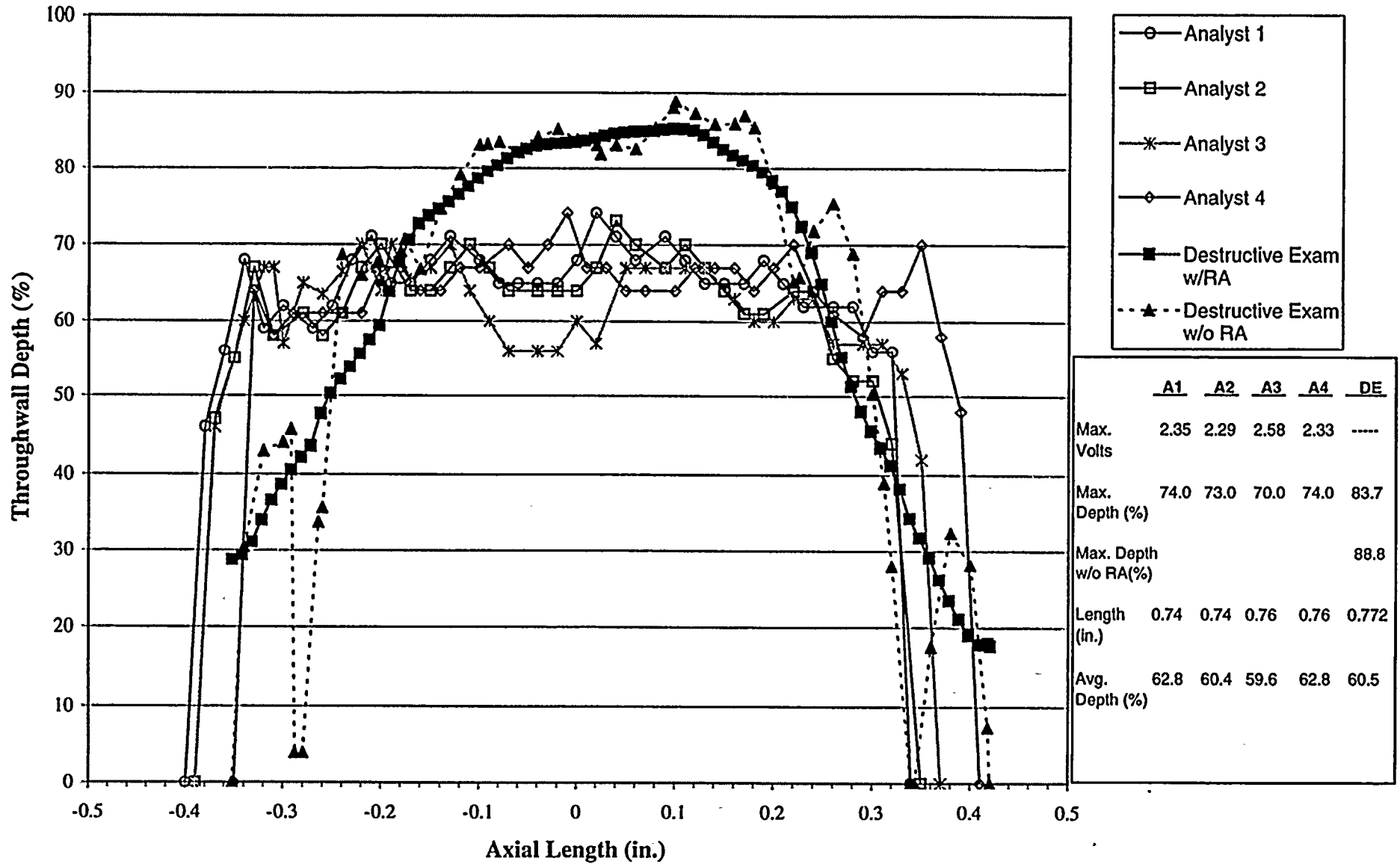


Figure C-31
Sample 6, TSP 2H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

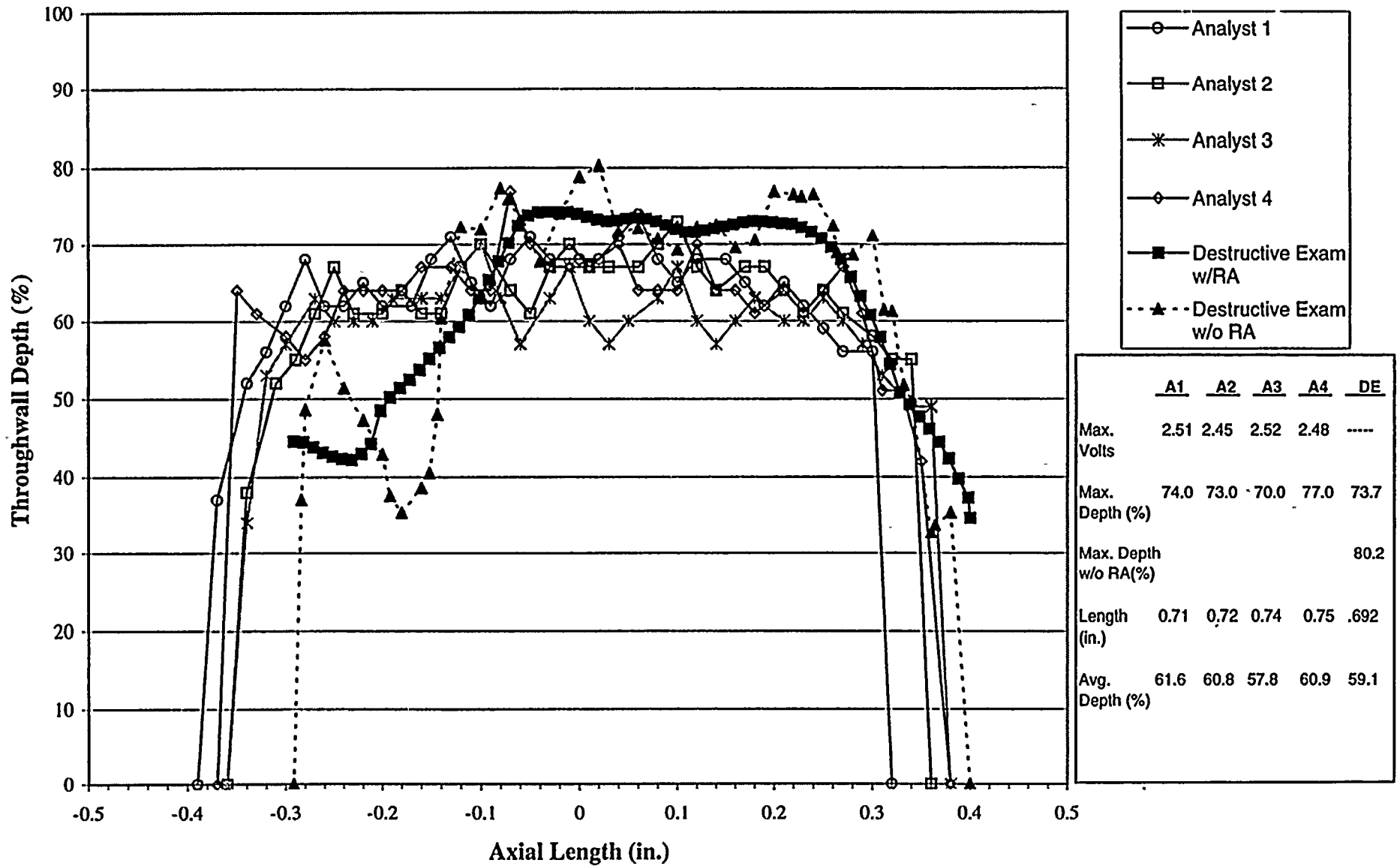


Figure C-32
Sample 6, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

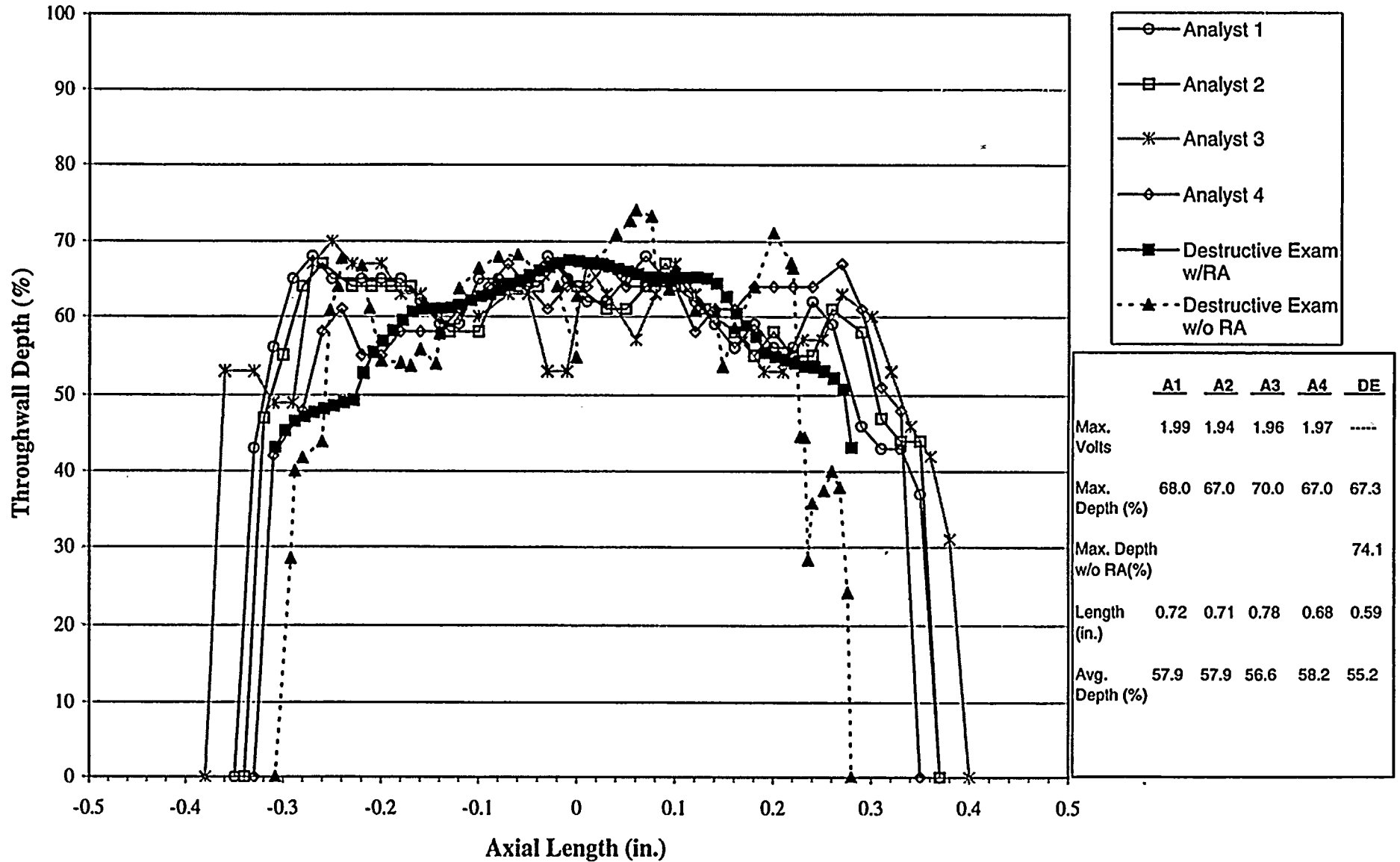


Figure C-33
Sample 6, TSP 4H - Crack 1
Mid-Range +Point, 300 kHz
Length NDE Depth vs. Axial Length with Destructive Exam

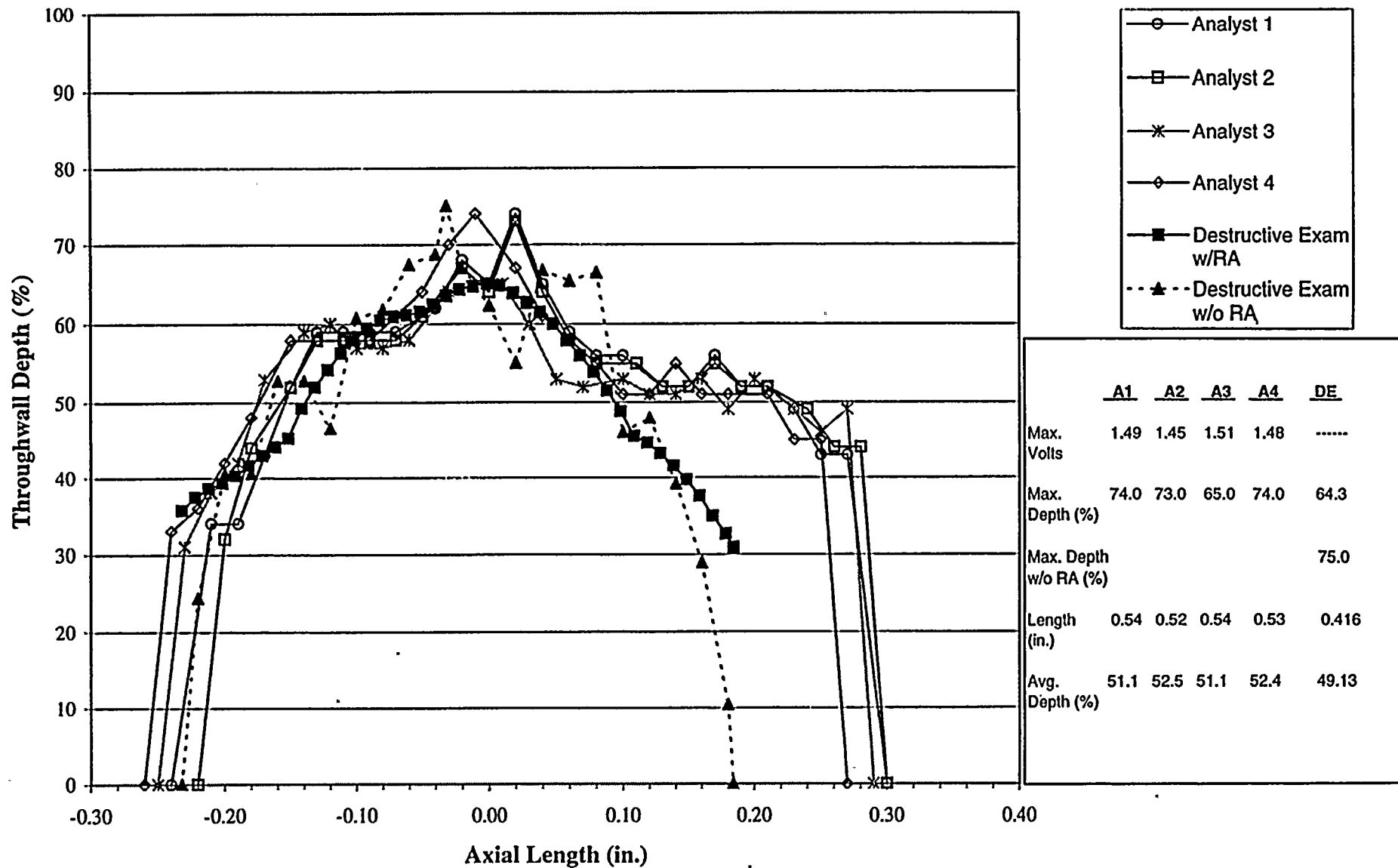


Figure C-34
Sample 6, TSP 5H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

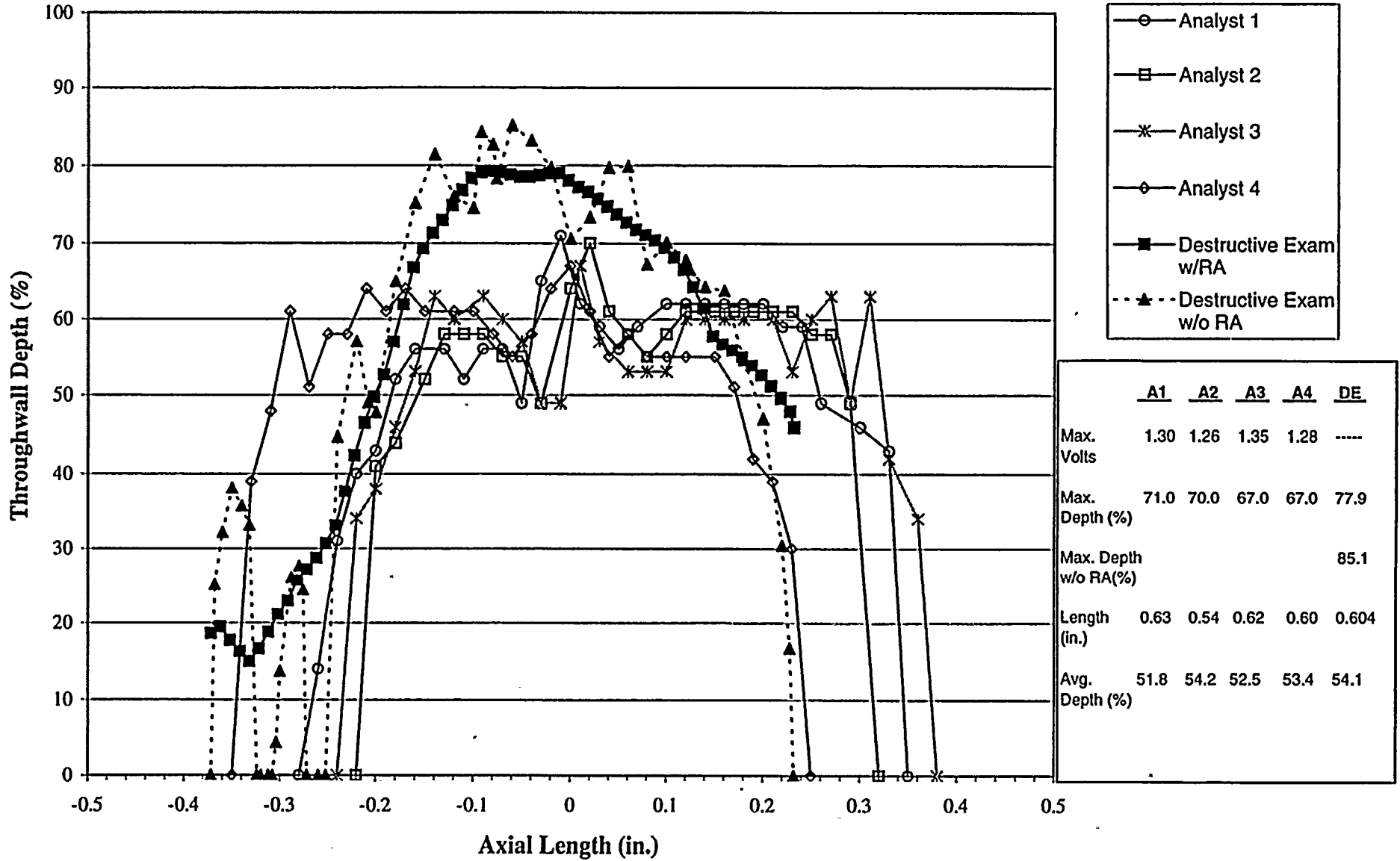
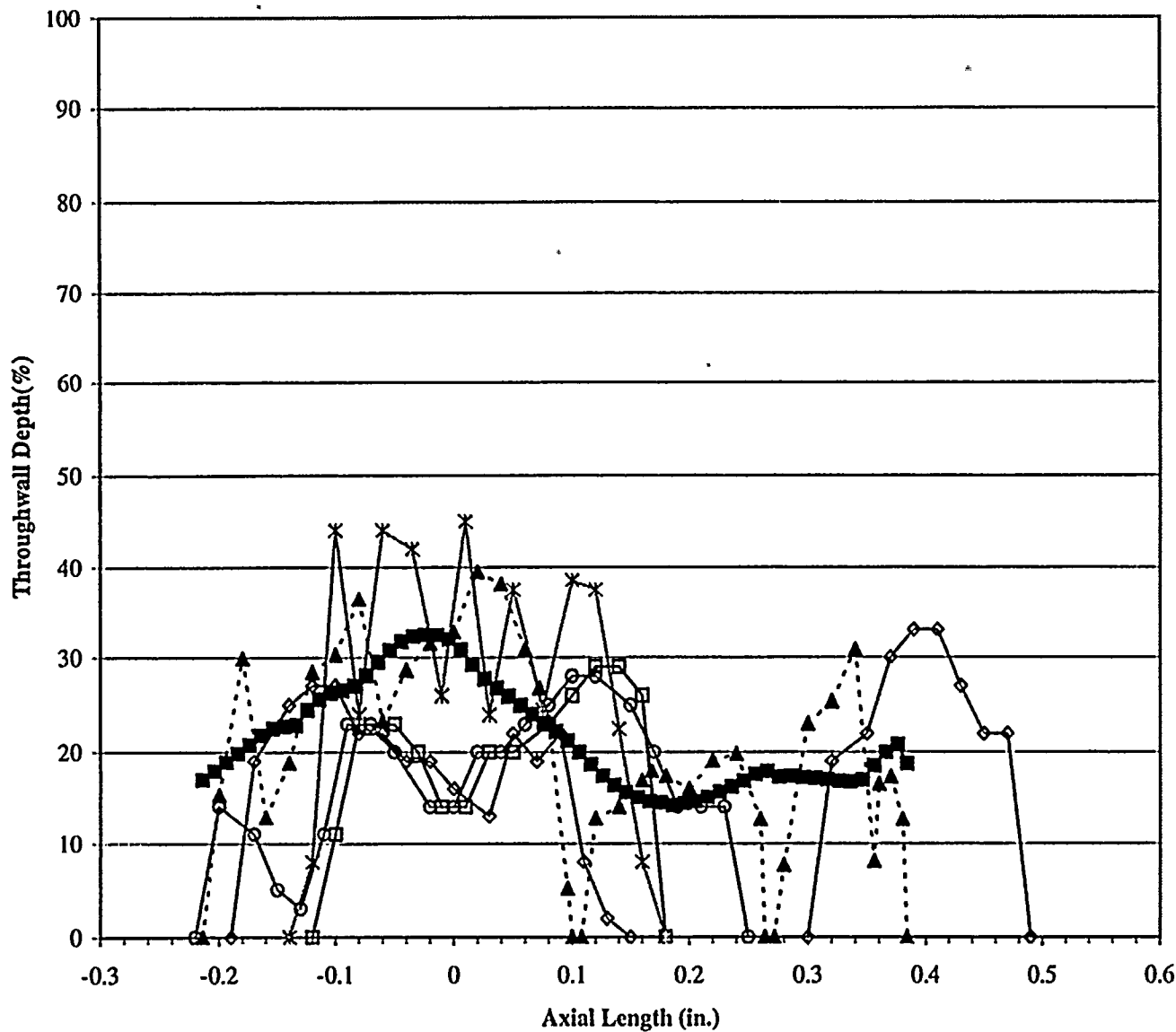


Figure C-35
Sample 7, TSP 1H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam



○	Analyst 1
□	Analyst 2
*	Analyst 3
◇	Analyst 4
■	Destructive Exam w/RA
---▲---	Destructive Exam w/o RA

	<u>A1</u>	<u>A2</u>	<u>A3</u>	<u>A4</u>	<u>DE</u>
Max. Volts	1.24	1.20	0.75	1.21	-----
Max. Depth (%)	28.0	29.0	45.0	33.0	30.1
Max. Depth w/o RA(%)					39.49
Length (in.)	0.47	0.30	0.32	0.68	0.598
Avg. Depth (%)	16.9	20.0	28.7	15.25	20.15

Figure C-36
Sample 7, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

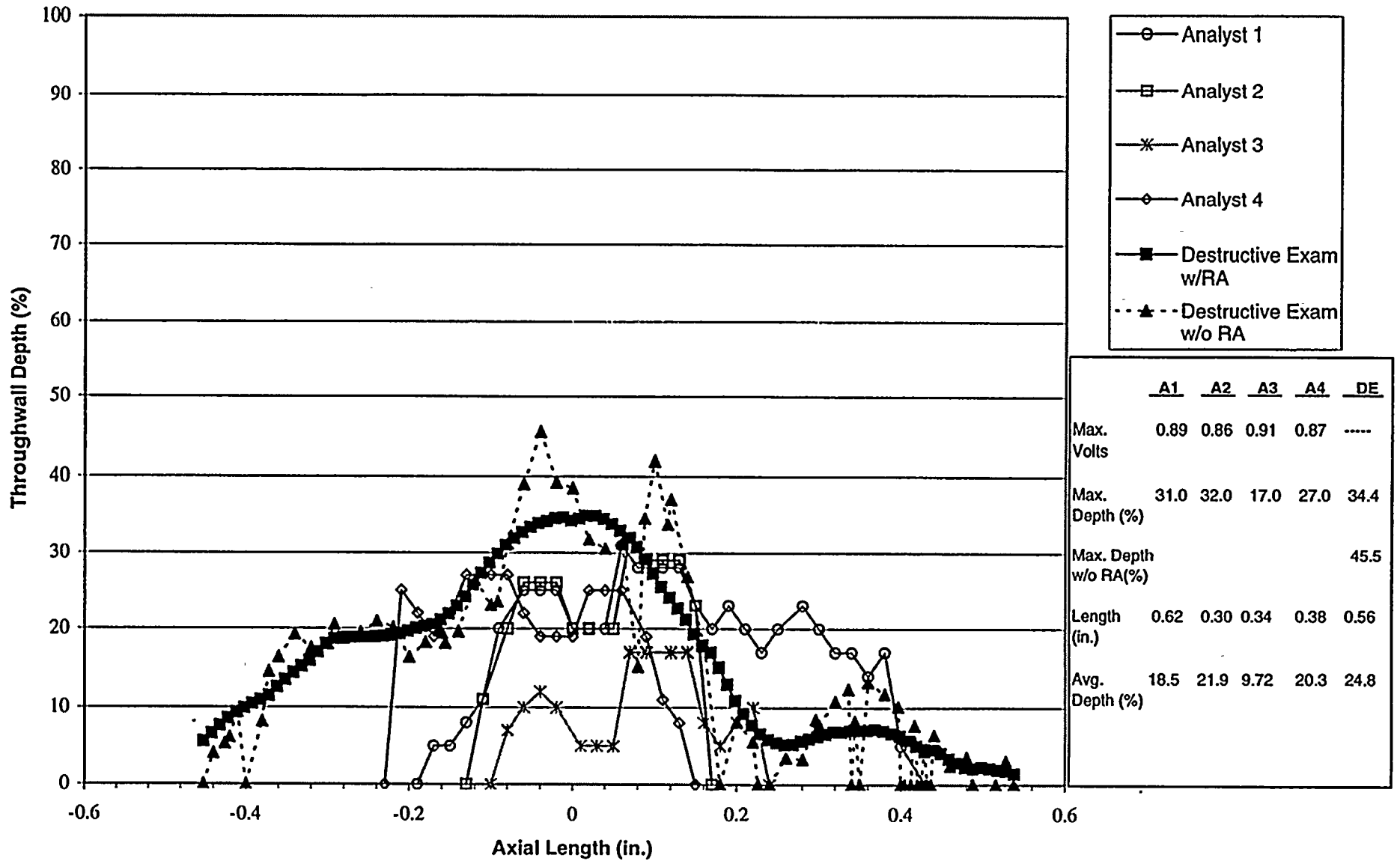
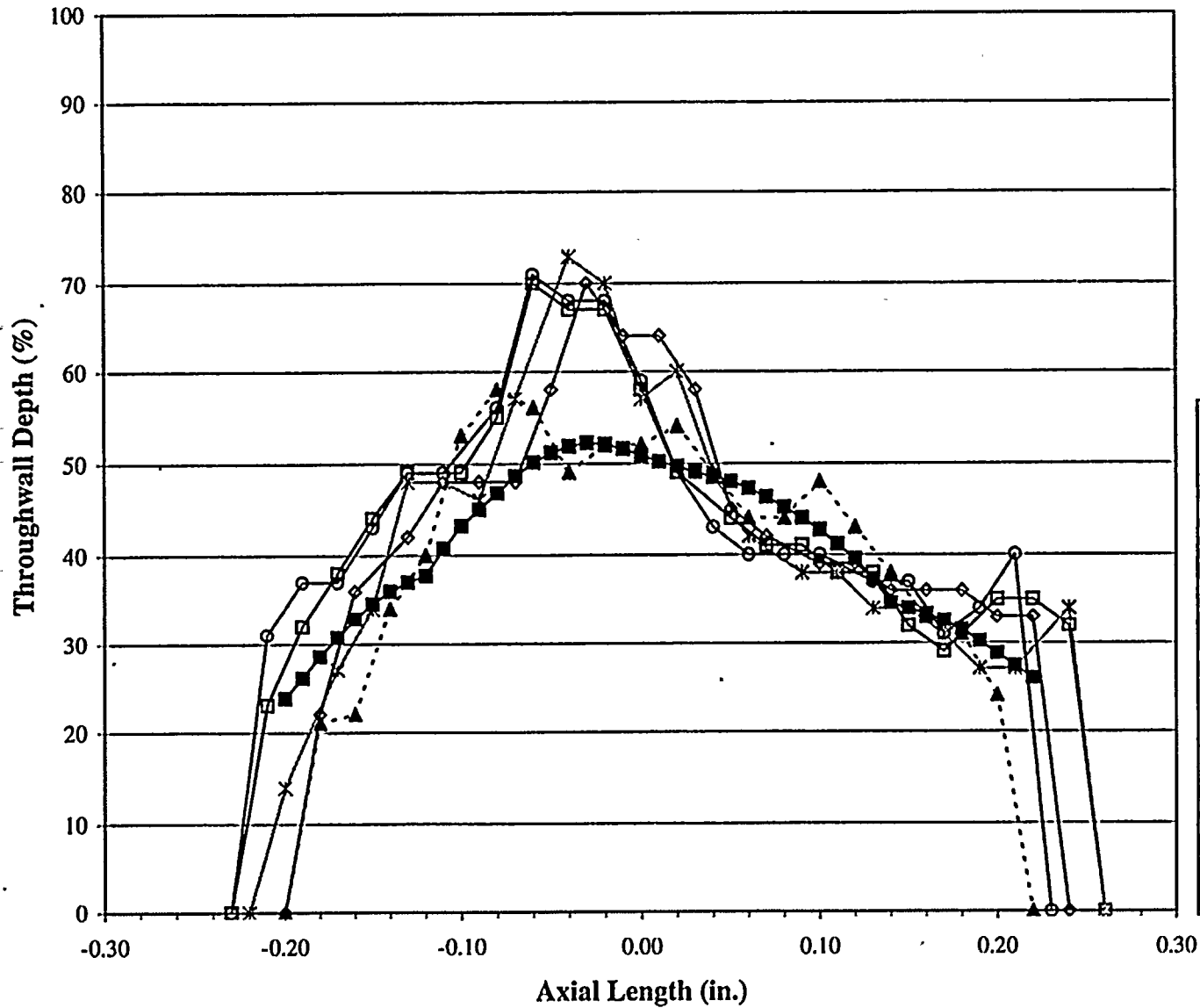


Figure C-37
Sample 8, TSP 1H
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam



- Analyst 1
- Analyst 2
- * Analyst 3
- ◇ Analyst 4
- Destructive Exam w/RA
- ▲--- Destructive Exam w/o RA

	<u>A1</u>	<u>A2</u>	<u>A3</u>	<u>A4</u>	<u>DE</u>
Max. Volts	1.25	1.22	1.29	1.24
Max. Depth (%)	71.0	70.0	73.0	70.0	52.2
Max Depth w/o RA(%)					58.0
Length (in.)	0.46	0.49	0.48	0.44	0.42
Avg. Depth (%)	43.7	42.0	40.3	42.6	40.2

Figure C-38
Sample 8, TSP 2H
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

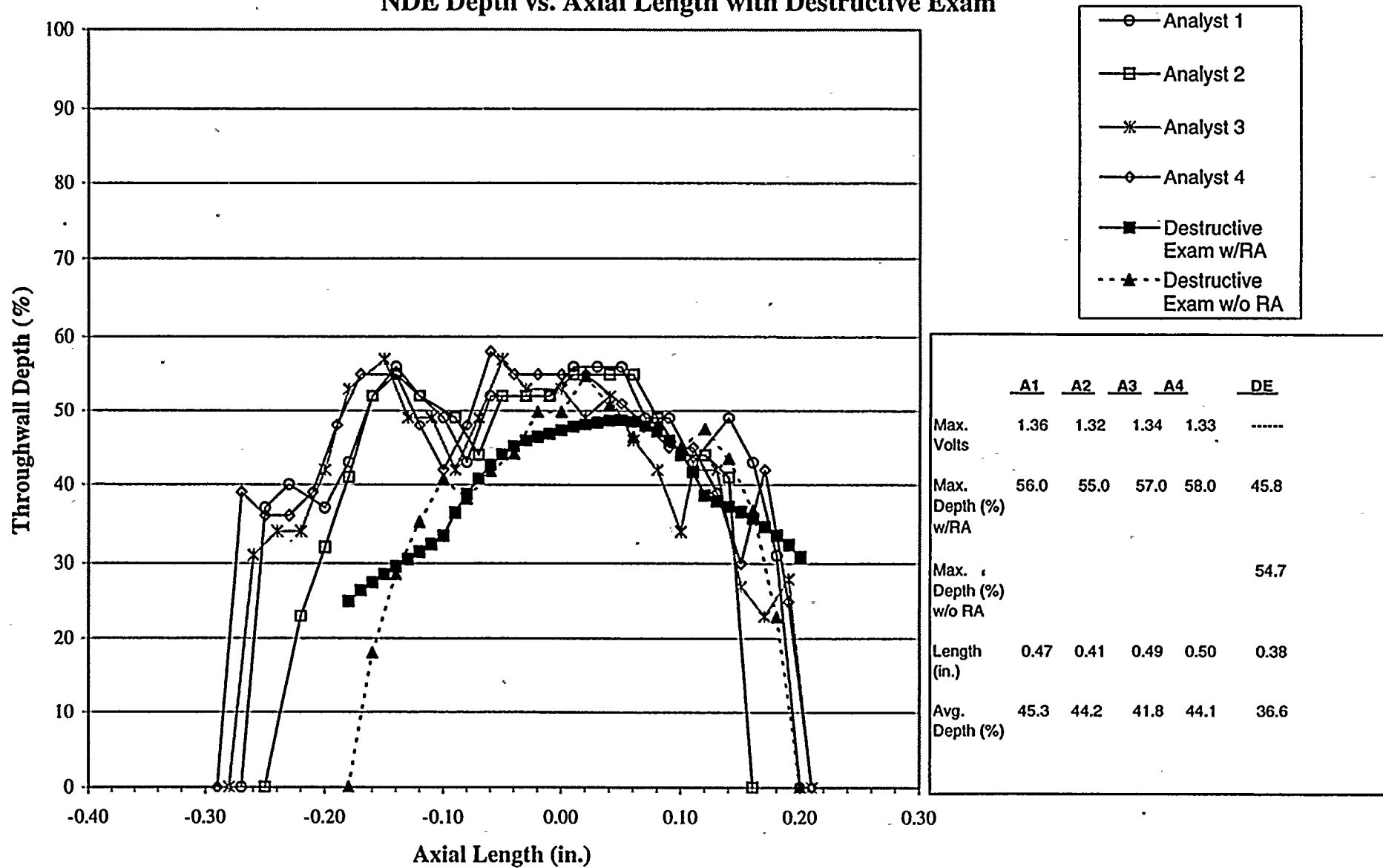


Figure C-39
Sample 8, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

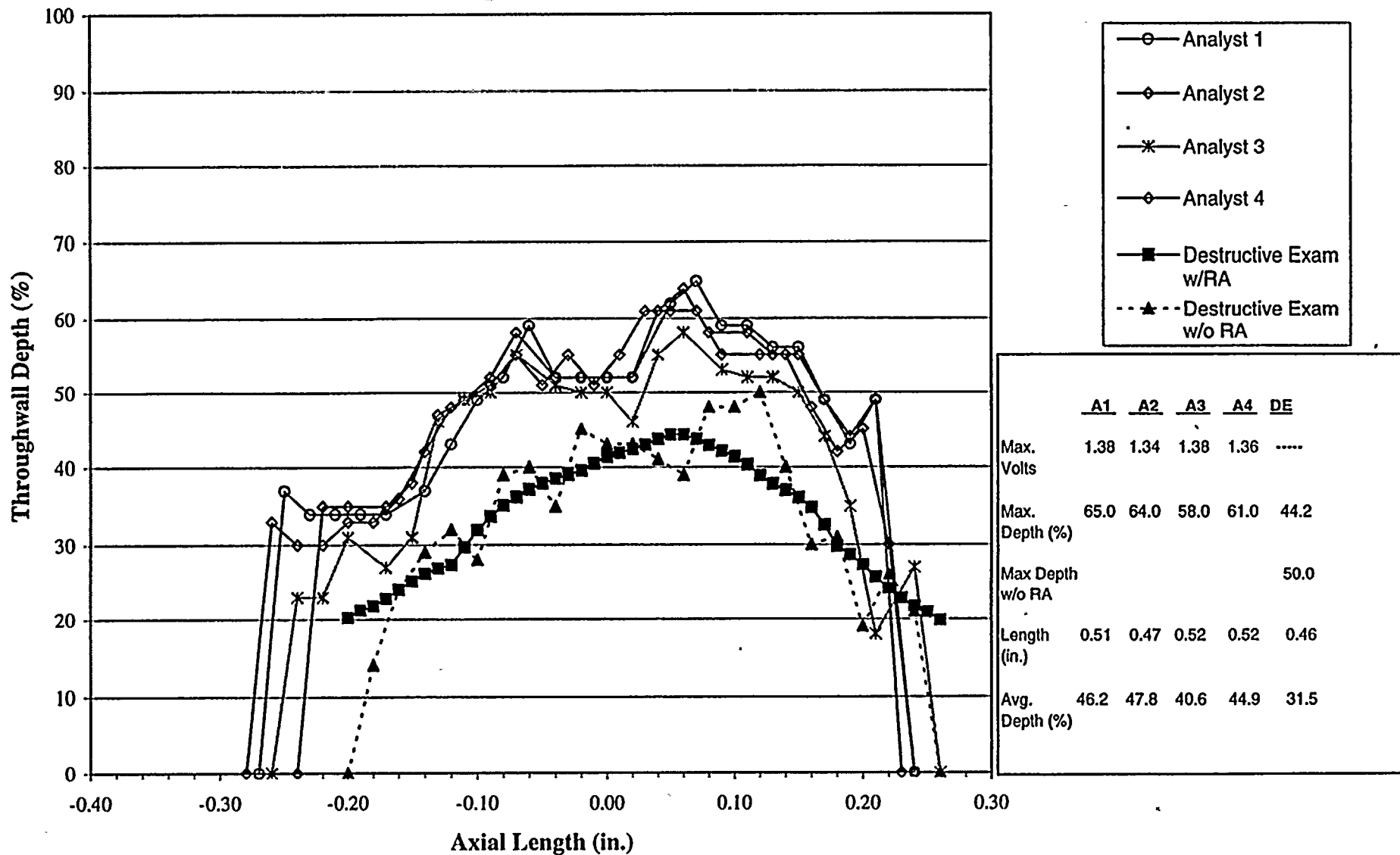


Figure C-40
Sample 9, TSP 1H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

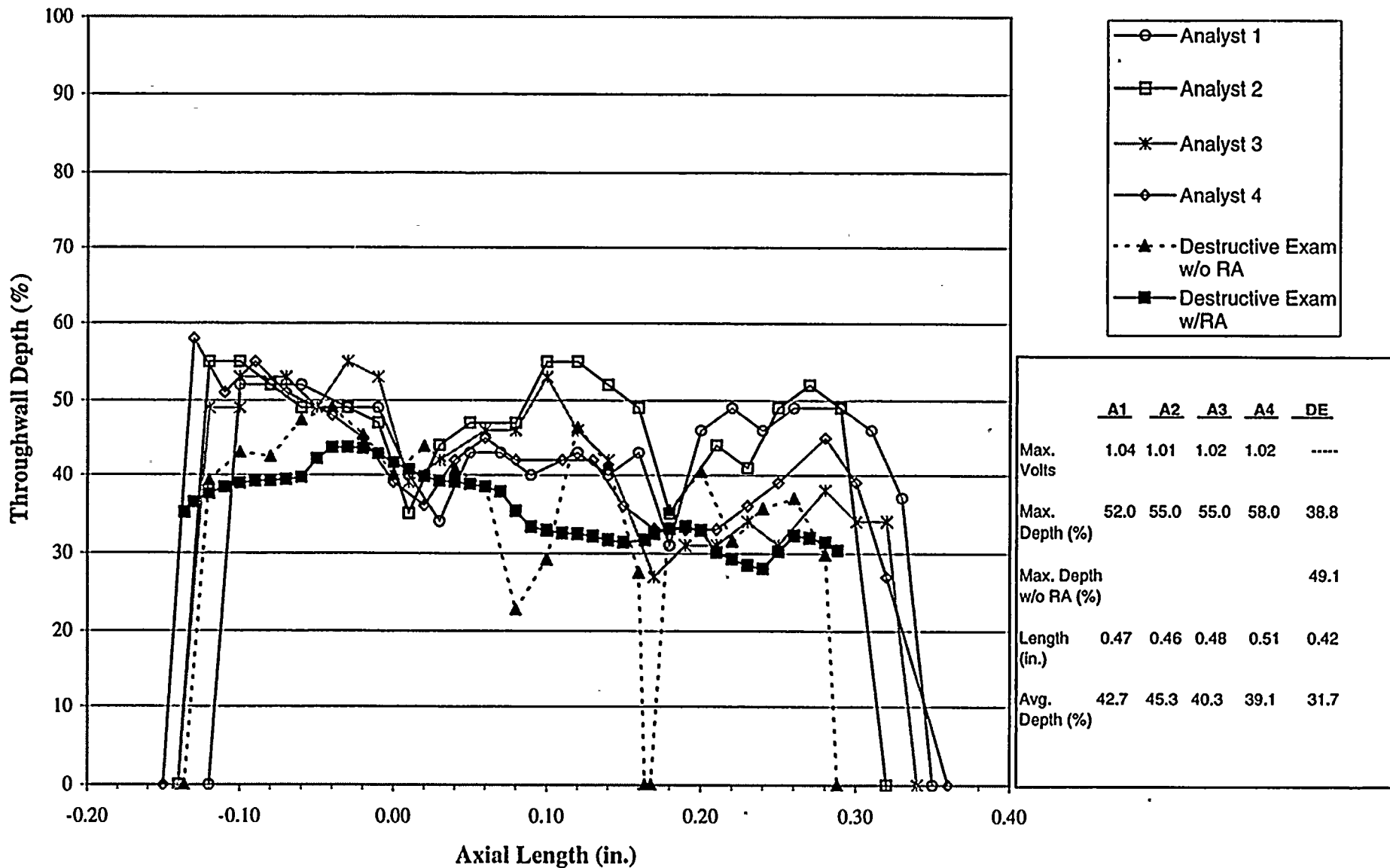


Figure C-41
Sample 9, TSP 1H - Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

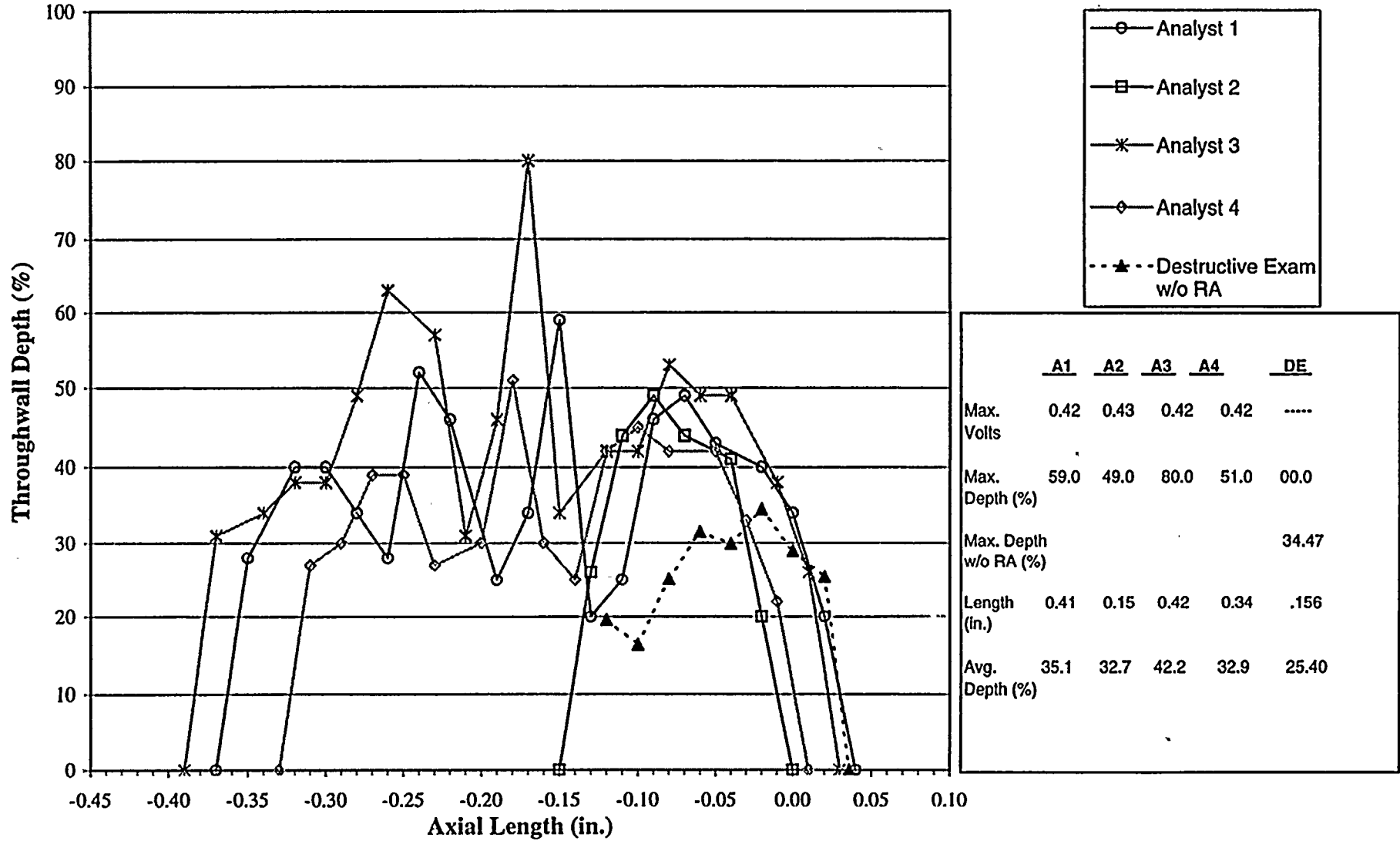
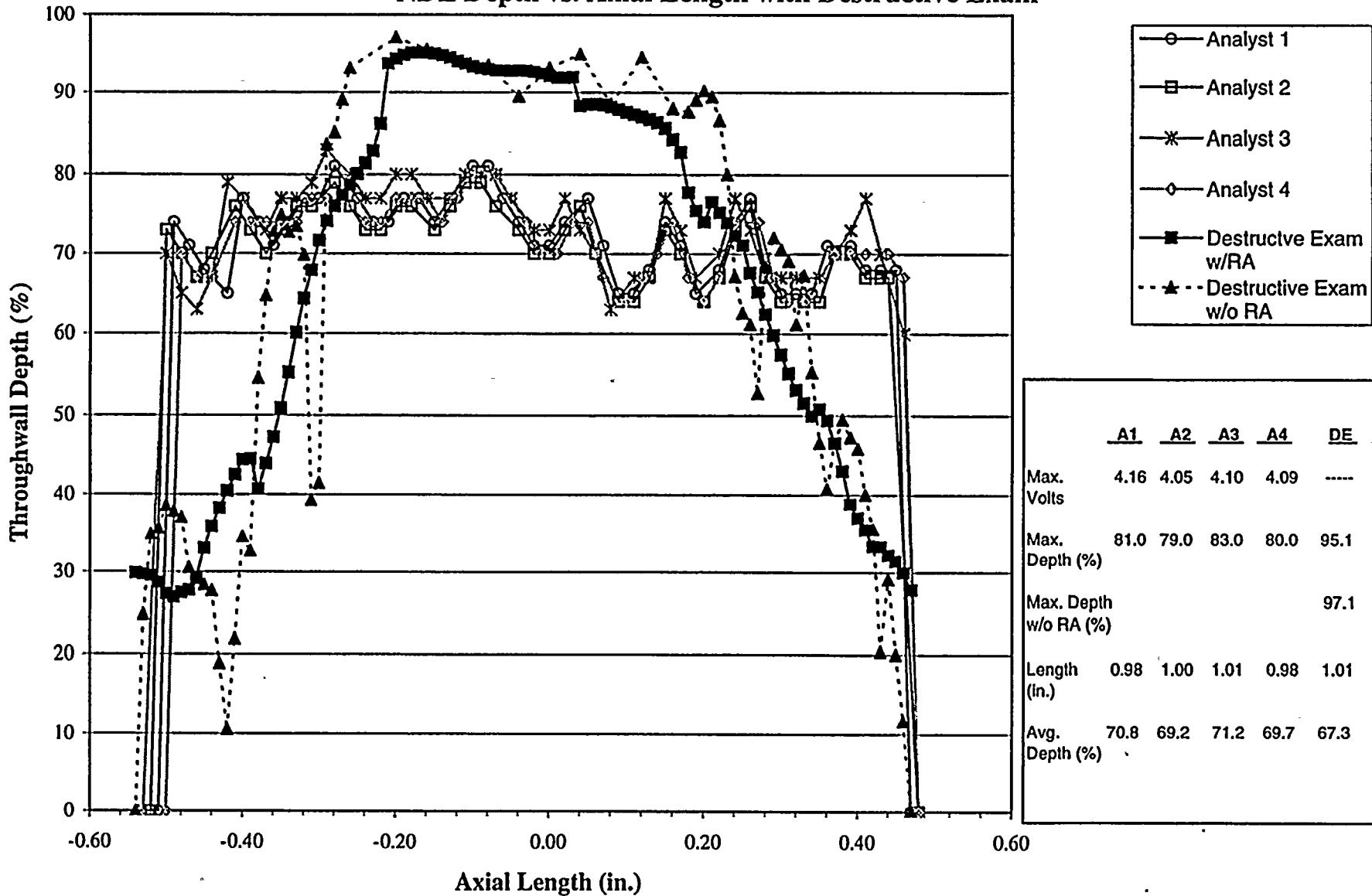


Figure C-42
 Sample 9, TSP 2H - Crack 1
 Mid-Range +Point, 300 kHz

NDE Depth vs. Axial Length with Destructive Exam



	<u>A1</u>	<u>A2</u>	<u>A3</u>	<u>A4</u>	<u>DE</u>
Max. Volts	4.16	4.05	4.10	4.09	-----
Max. Depth (%)	81.0	79.0	83.0	80.0	95.1
Max. Depth w/o RA (%)					97.1
Length (in.)	0.98	1.00	1.01	0.98	1.01
Avg. Depth (%)	70.8	69.2	71.2	69.7	67.3

Figure C-43
Sample 9, TSP 2H - Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

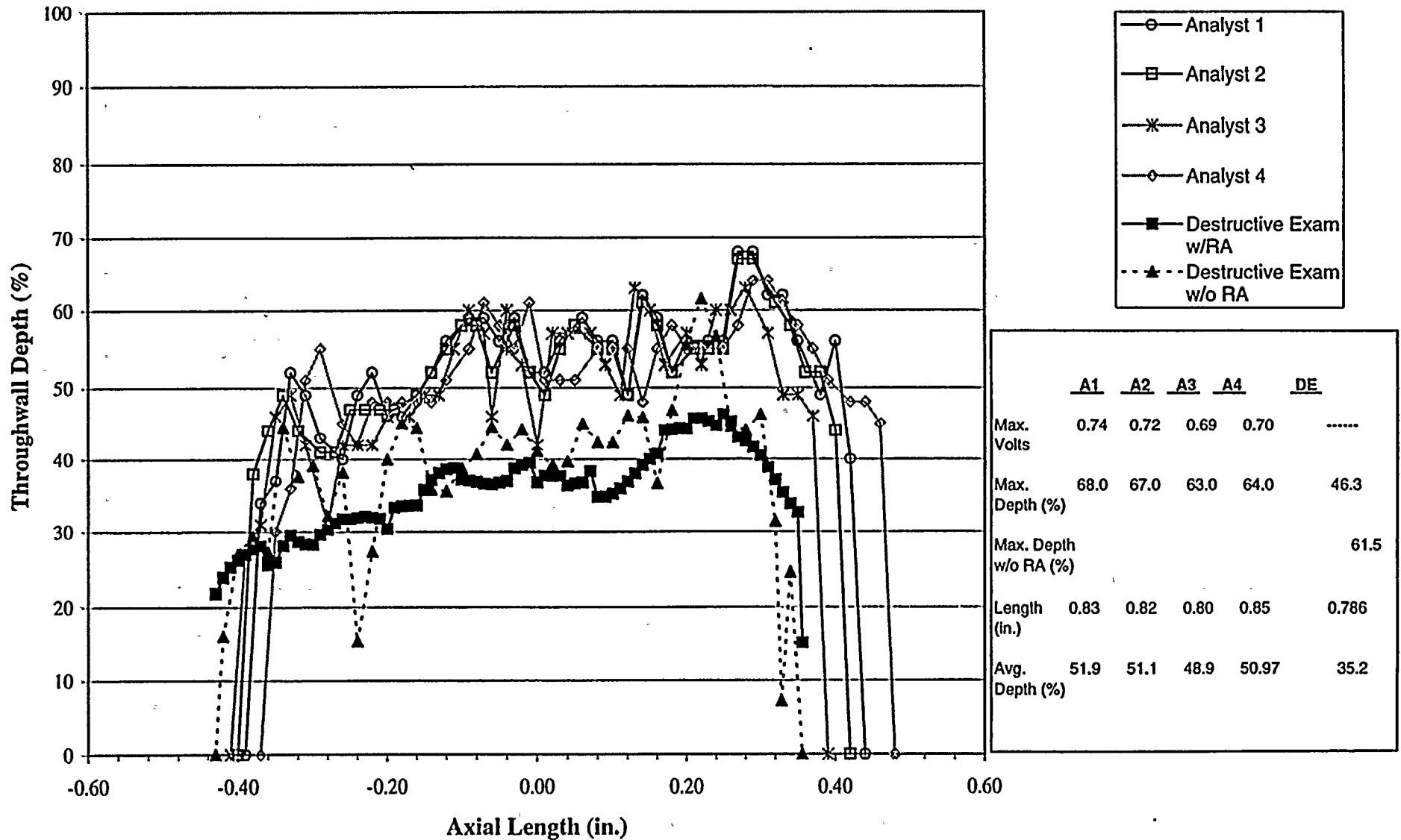


Figure C-44
Sample 9, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

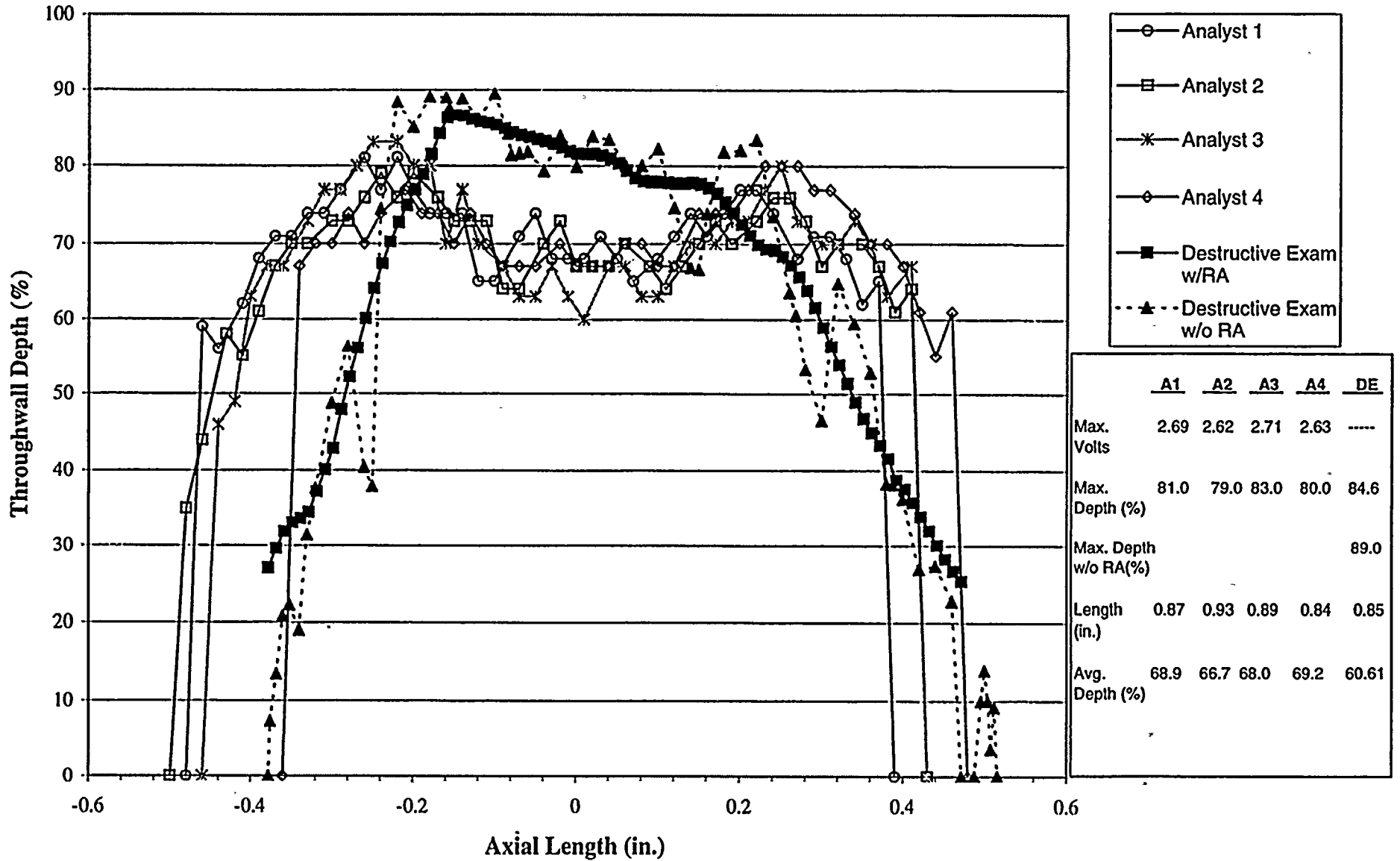


Figure C-45
Sample 9, TSP 3H - Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

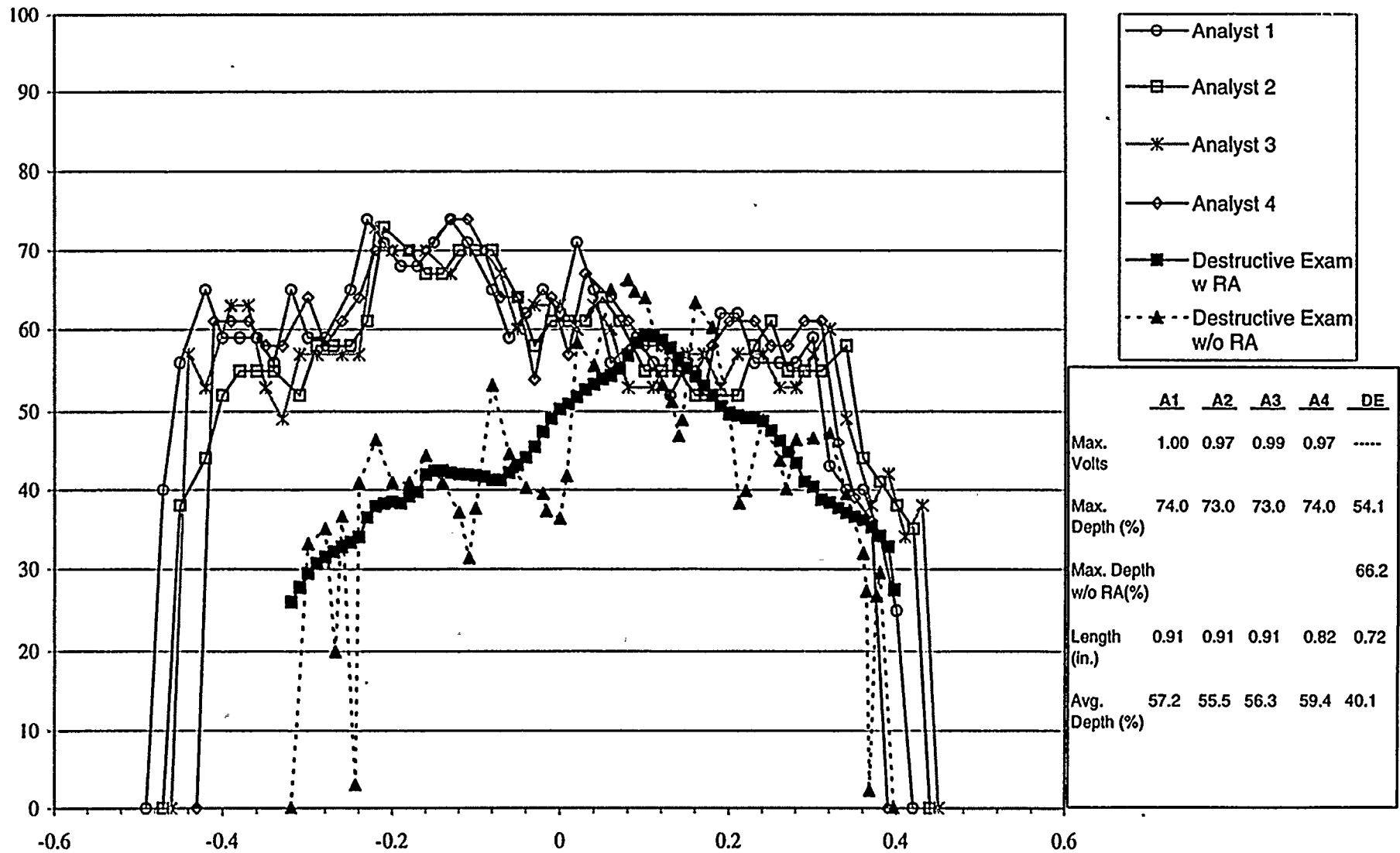


Figure C-46
Sample 9, TSP 4H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

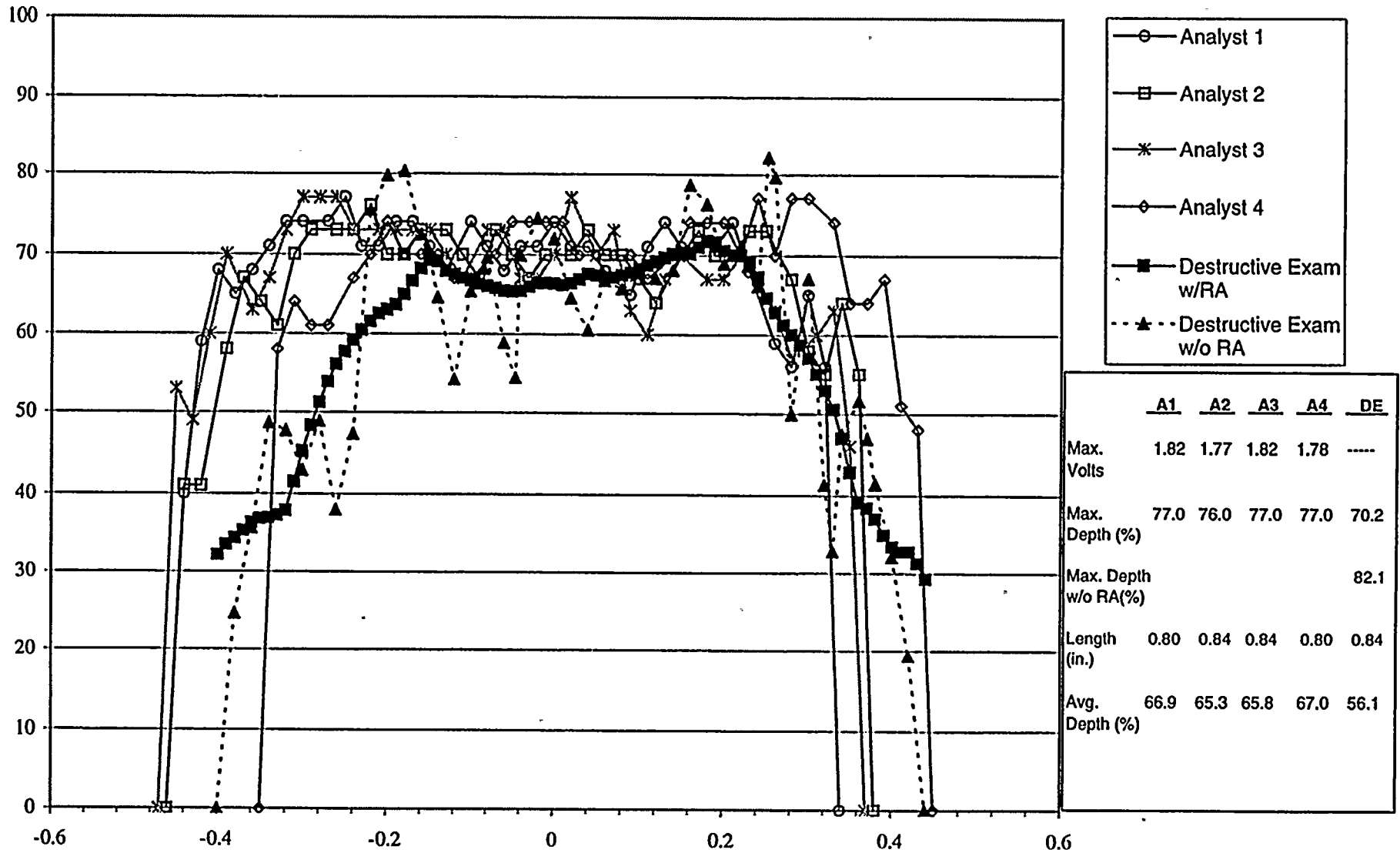


Figure C-47
Sample 9, TSP 4H - Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

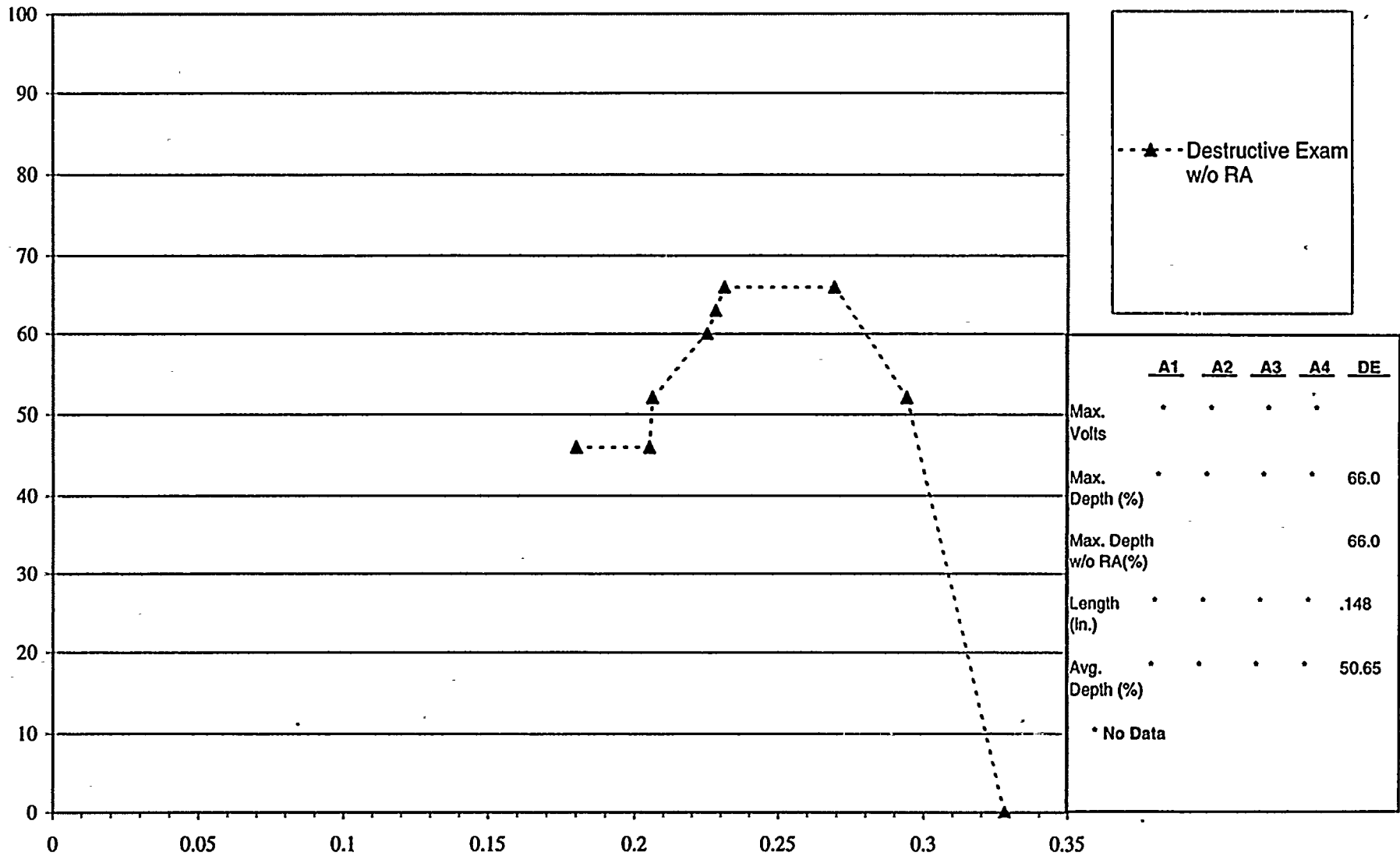
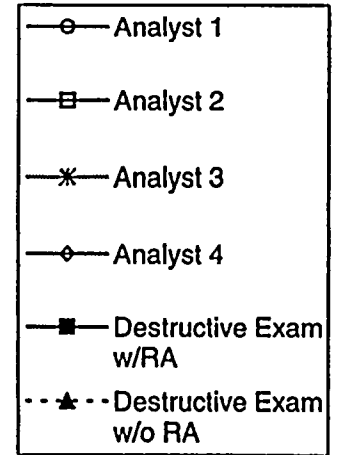
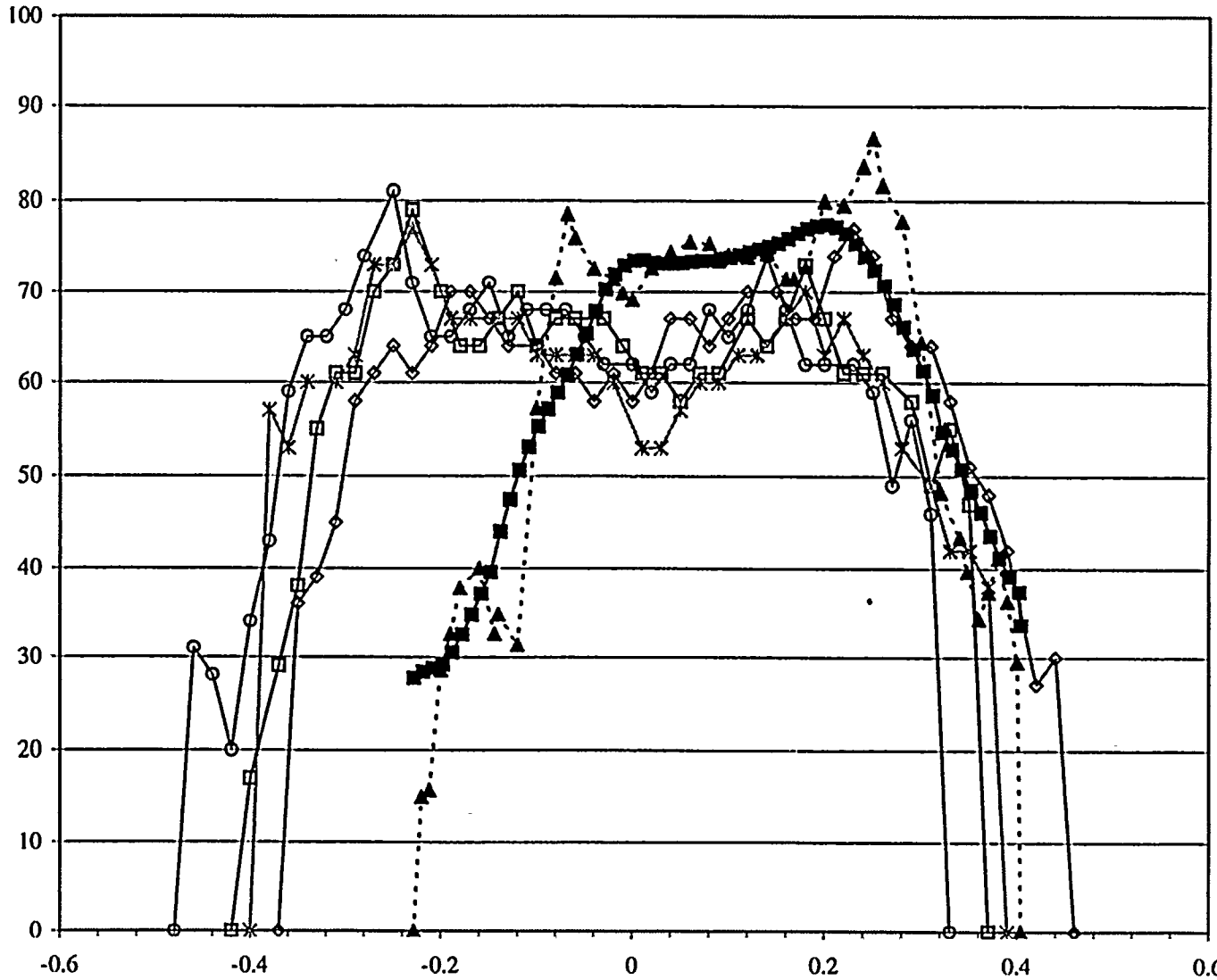


Figure C-48
Sample 9, TSP 5H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam



	A1	A2	A3	A4	DE
Max. Volts	2.27	2.21	2.30	2.23	----
Max. Depth (%)	81.0	79.0	77.0	77.0	74.6
Max. Depth w/o RA(%)					86.5
Length (in.)	0.81	0.79	0.79	0.83	0.632
Avg. Depth (%)	59.0	58.8	59.3	58.4	57.2

Figure C-49
Sample 9, TSP 5H - Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

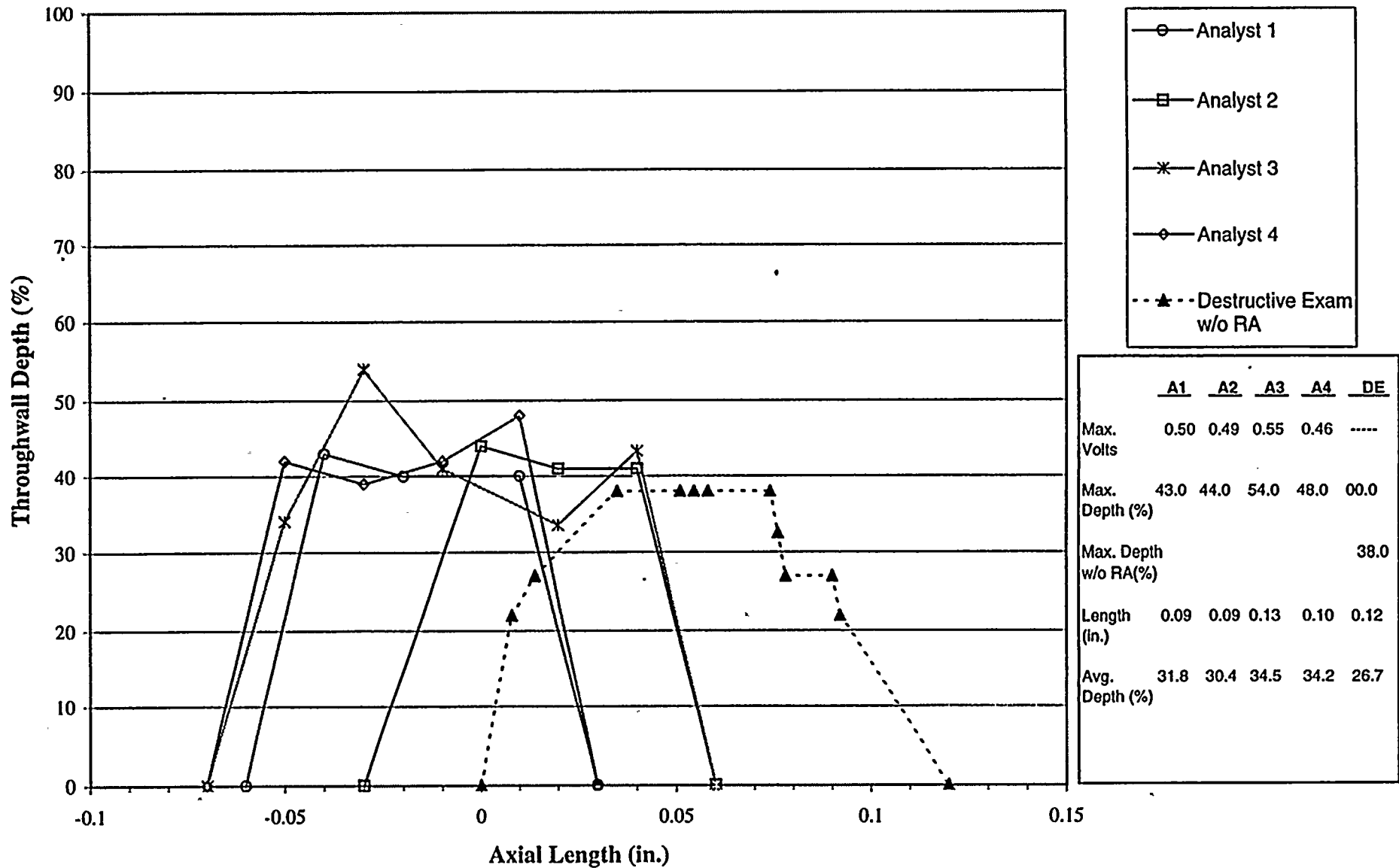
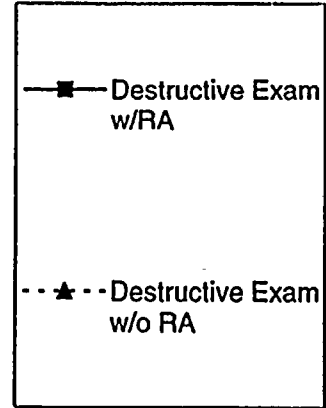
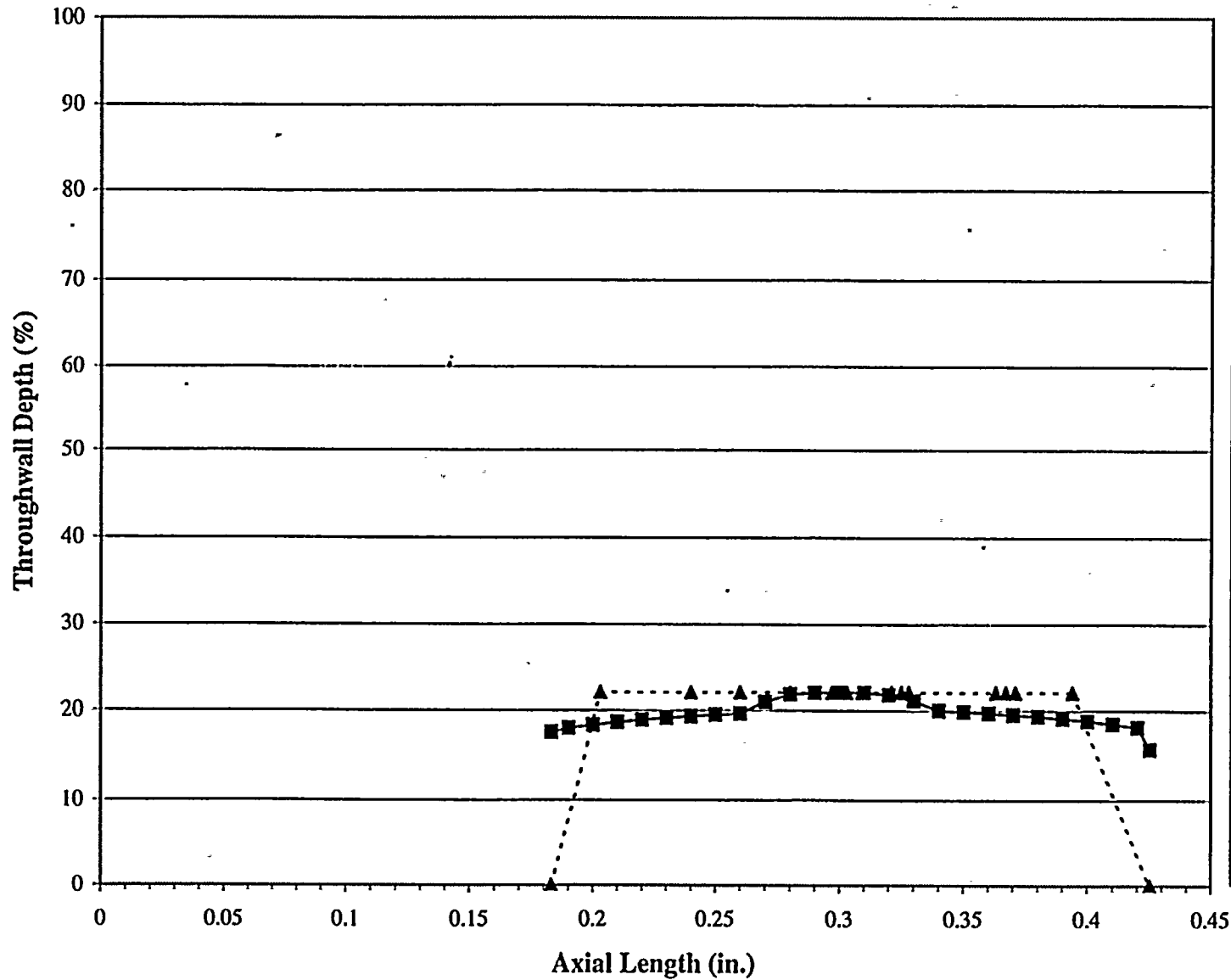


Figure C-50
Sample 9, TSP 5H - Crack 3
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam



	A1	A2	A3	A4	DE
Max. Volts	*	*	*	*	
Max. 15.72 Depth (%)	*	*	*	*	
Max. Depth w/o RA(%)					22.0
Length (in.)	*	*	*	*	.242
Avg. Depth (%)	*	*	*	*	13.83
* No Data					

Figure C-51
Sample 10, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

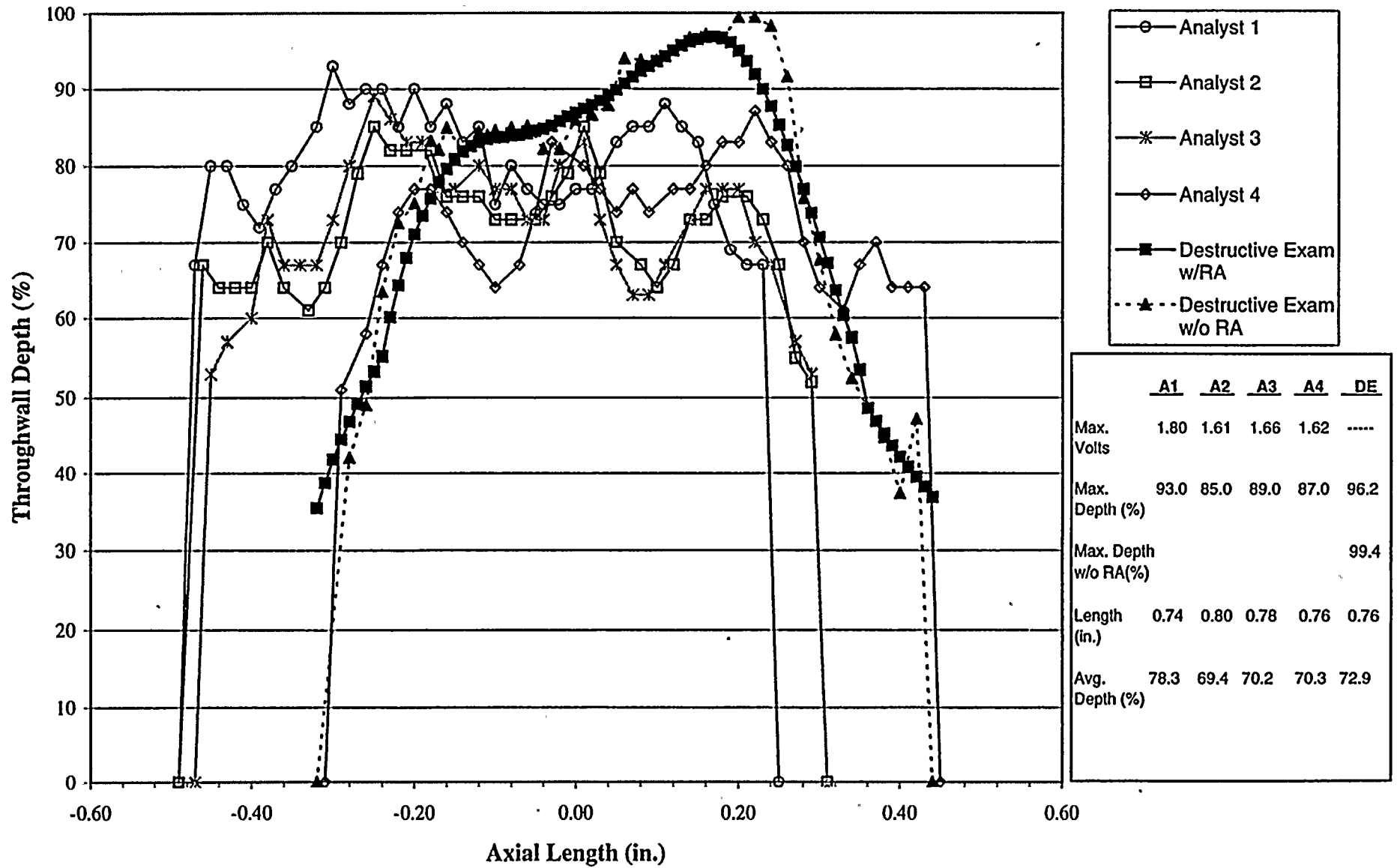
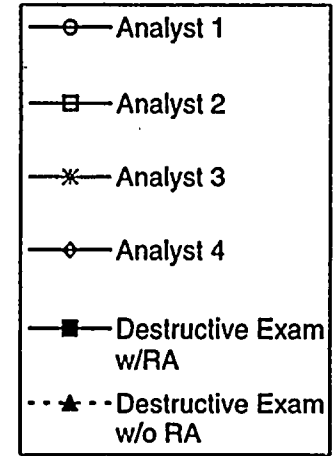
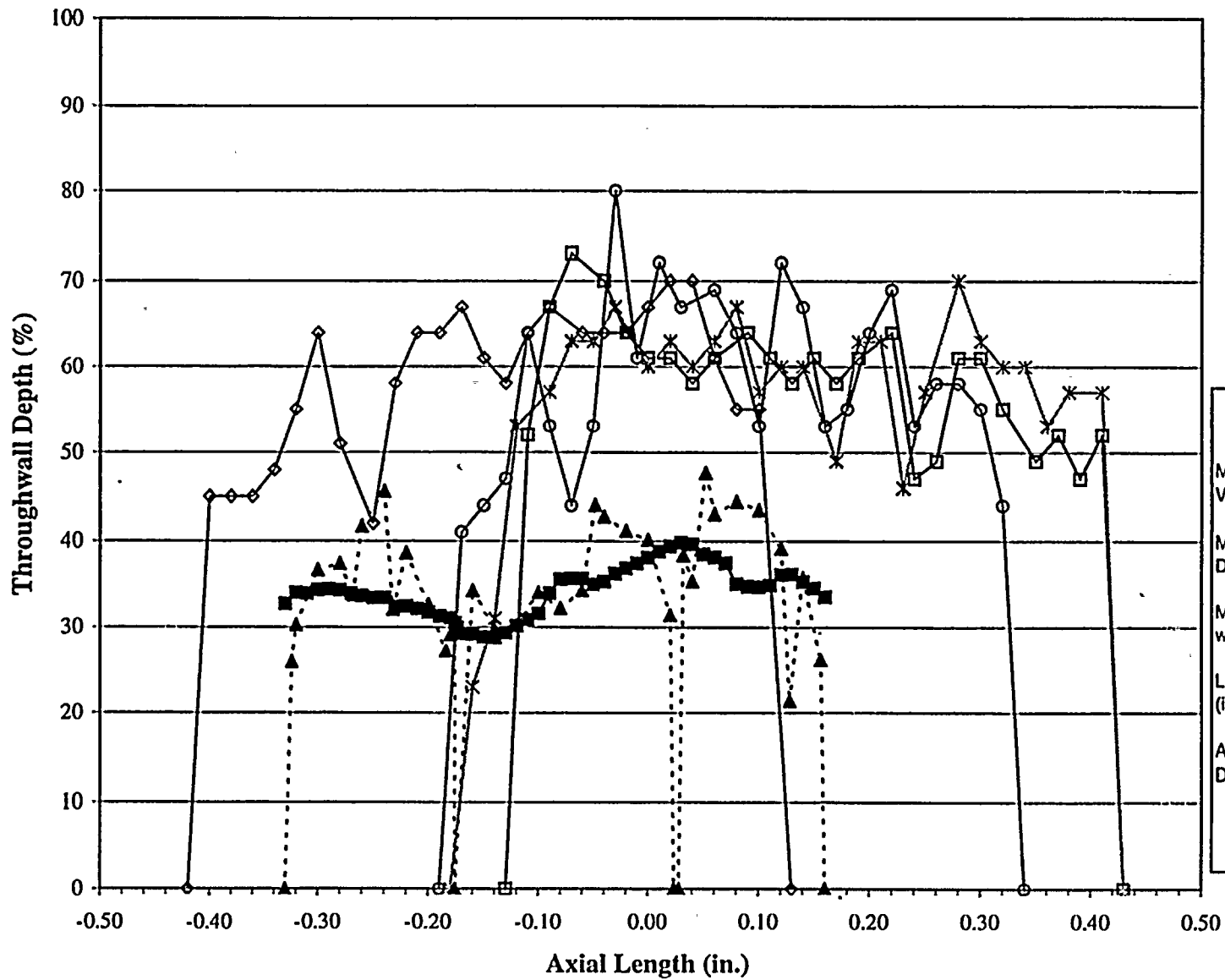


Figure C-52
Sample 10, TSP 3H - Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam



	<u>A1</u>	<u>A2</u>	<u>A3</u>	<u>A4</u>	<u>DE</u>
Max. Volts	0.38	0.41	0.45	0.41	-----
Max. Depth (%)	80.0	73.0	70.0	70.0	38.0
Max. Depth w/o RA (%)					47.6
Length (in.)	0.53	0.56	0.61	0.55	0.49
Avg. Depth (%)	56.4	56.8	55.5	55.9	32.2

Figure C-53
Sample 10, TSP 4H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

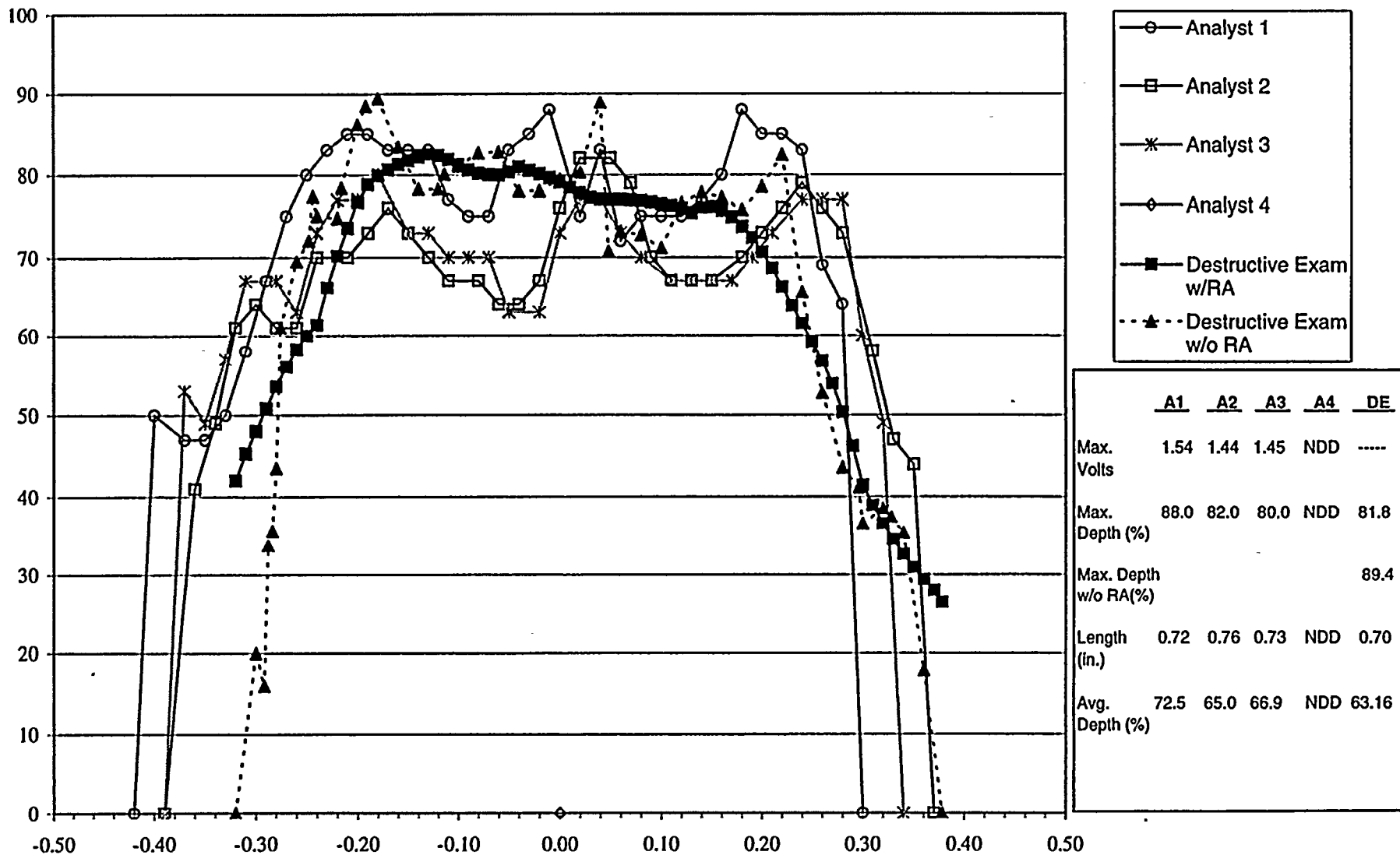
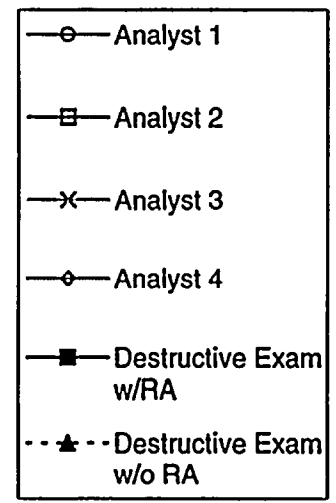
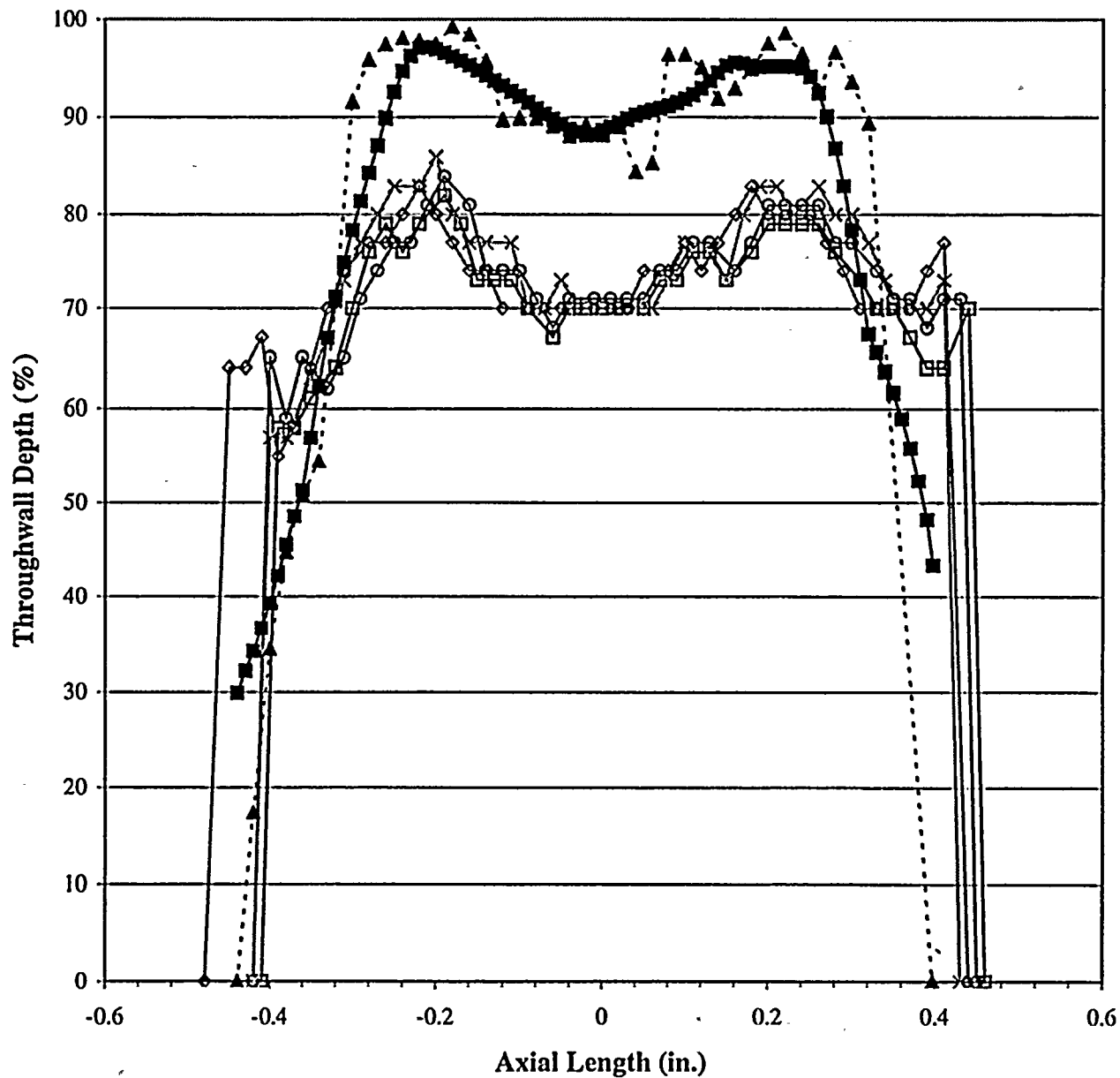


Figure C-54
Sample 11, TSP 2H- Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam



	<u>A1</u>	<u>A2</u>	<u>A3</u>	<u>A4</u>	<u>DE</u>
Max. Volts	3.25	3.16	3.21	3.18	-----
Max. Depth (%)	84.0	82.0	86.0	83.0	96.8
Max Depth w/o RA (%)					99.2
Length (in.)	0.87	0.87	0.85	0.92	0.84
Avg. Depth (%)	71.7	70.2	72.7	70.5	80.9

Figure C-55
Sample 11, TSP 2H- Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

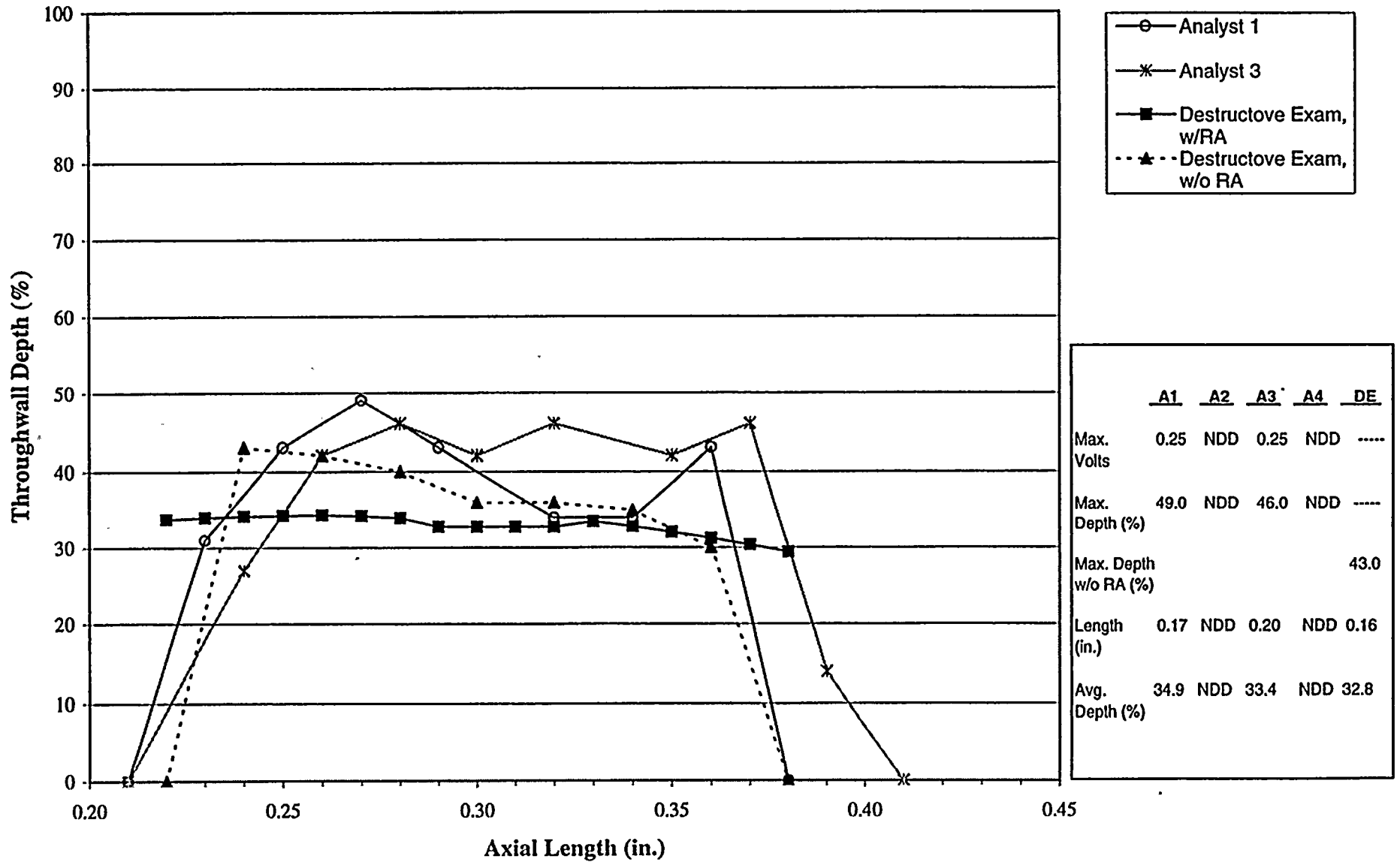


Figure C-56
Sample 11, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

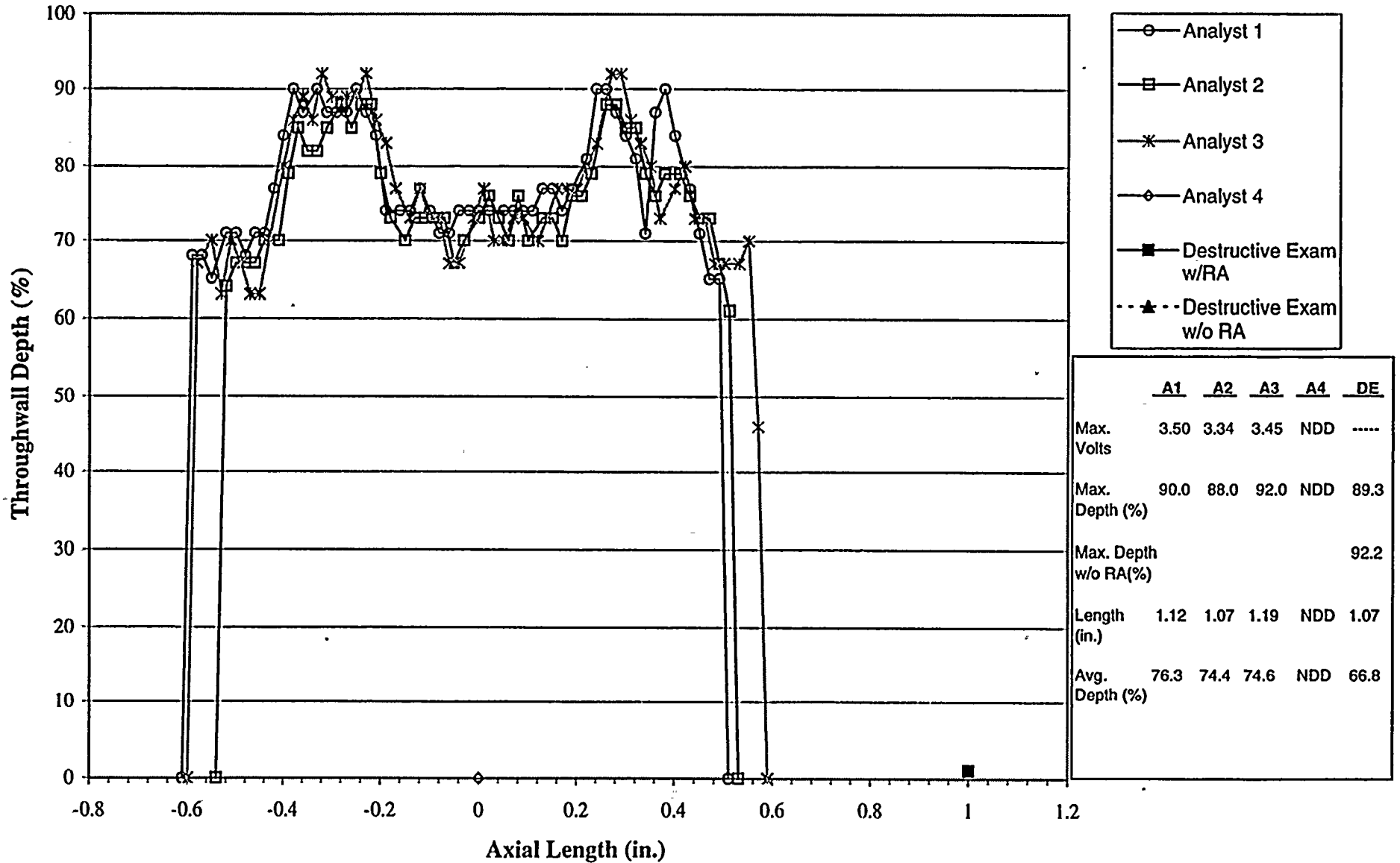


Figure C-56
Sample 11, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

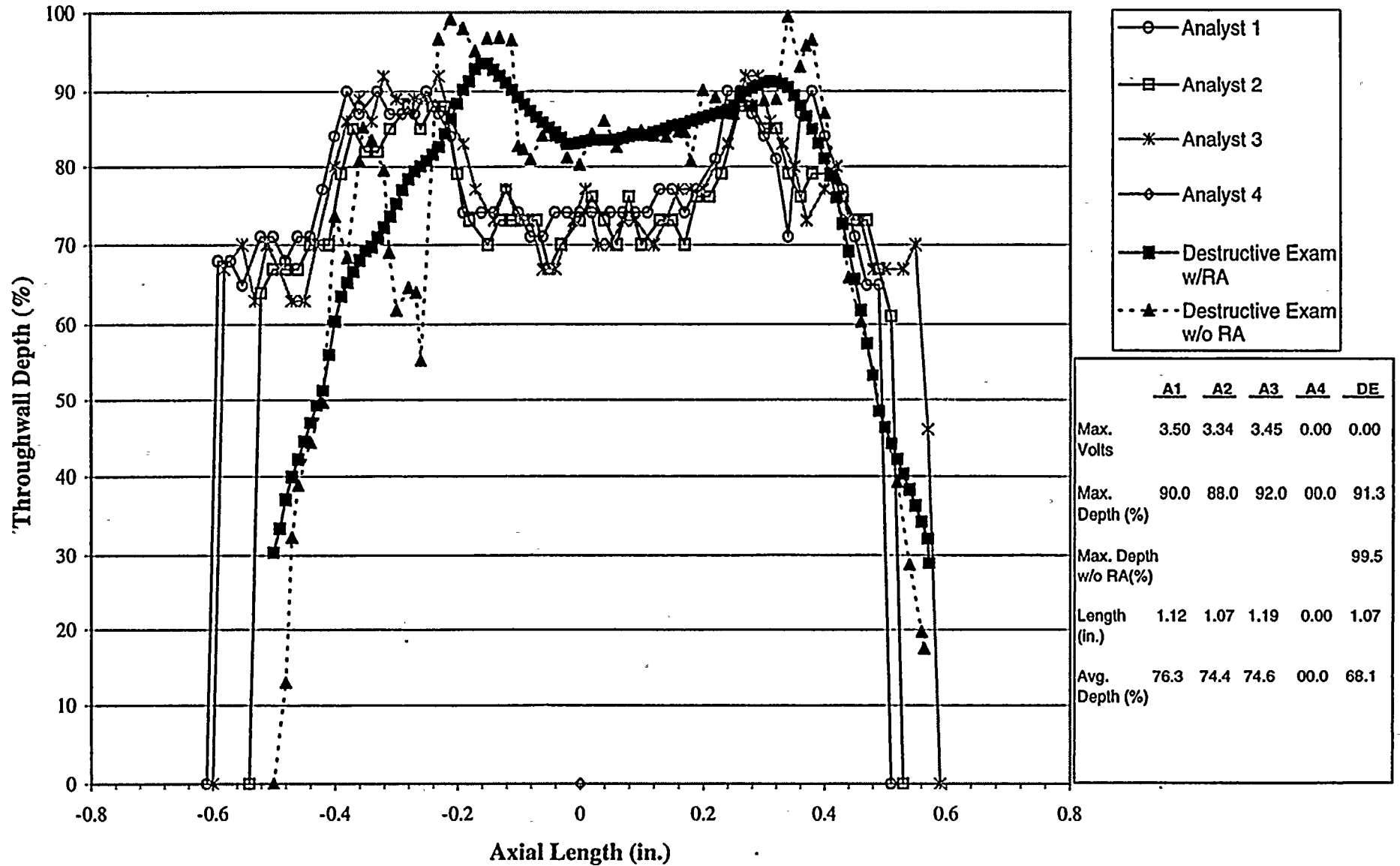


Figure C-58

Sample 11, TSP 4H- Crack 1

Mid-Range +Point, 300 kHz

NDE Depth vs. Axial Length with Destructive Exam

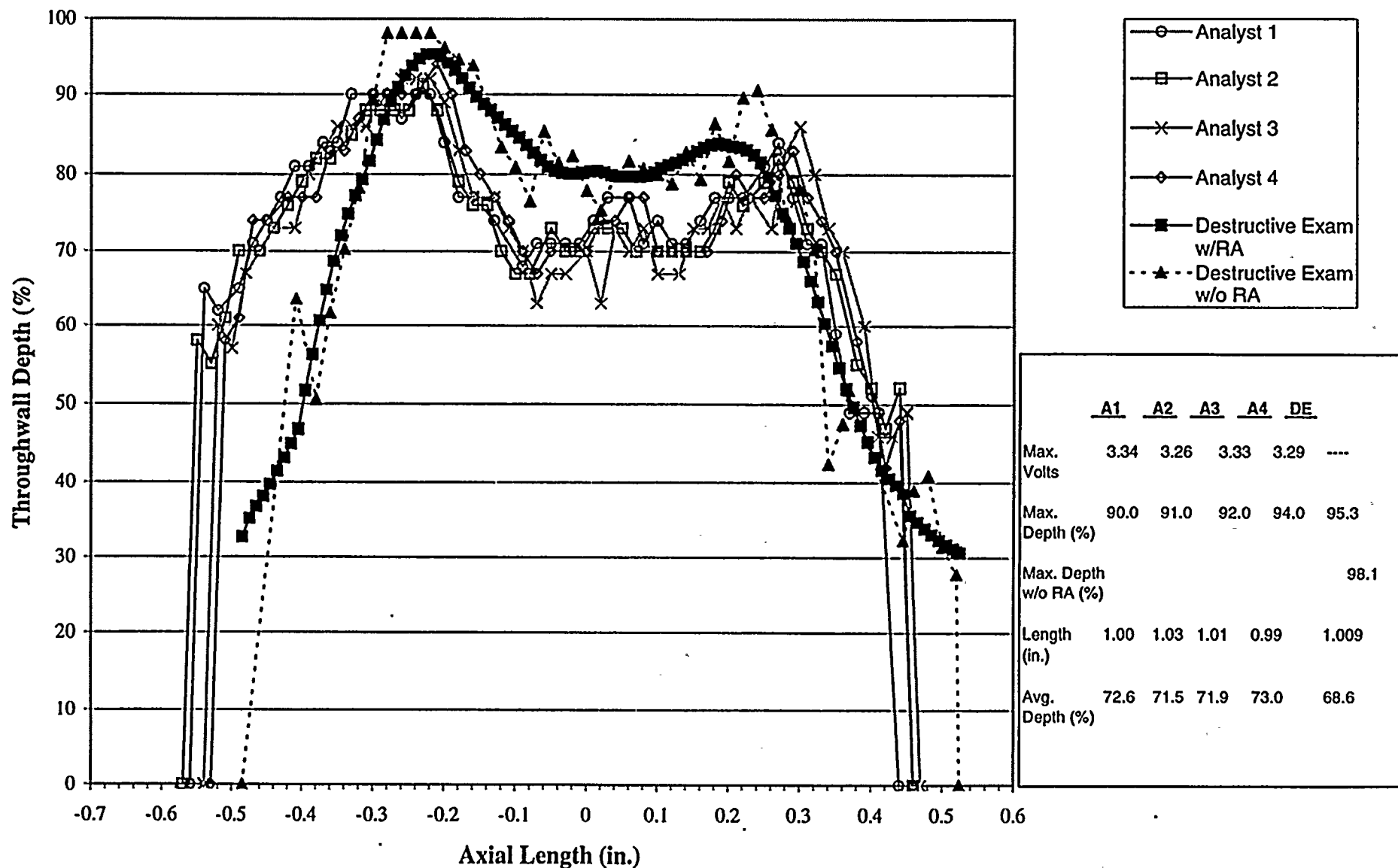


Figure C-59
Sample 11, TSP 4H- Crack 2
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

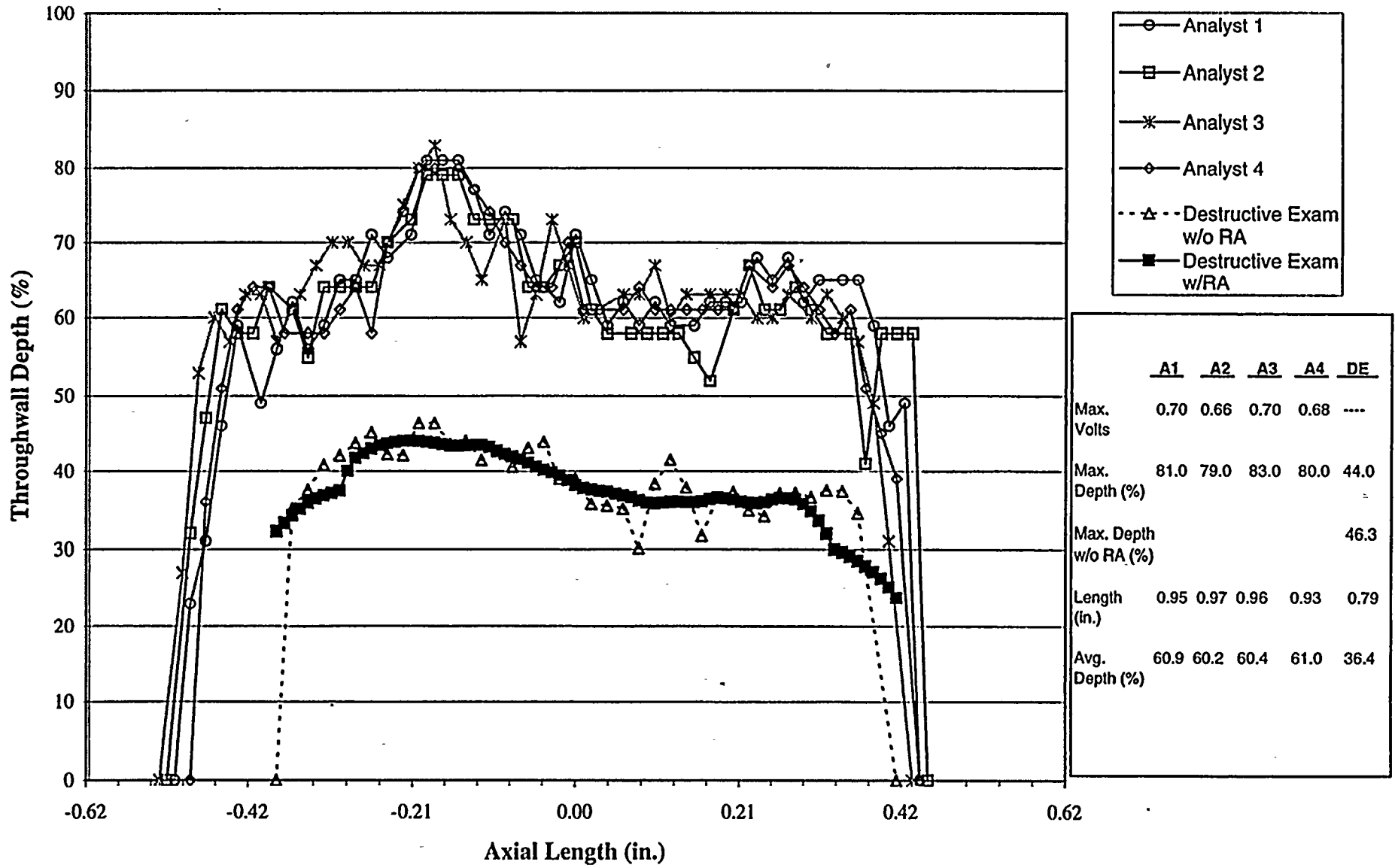


Figure C-60
Sample 12, TSP 2H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

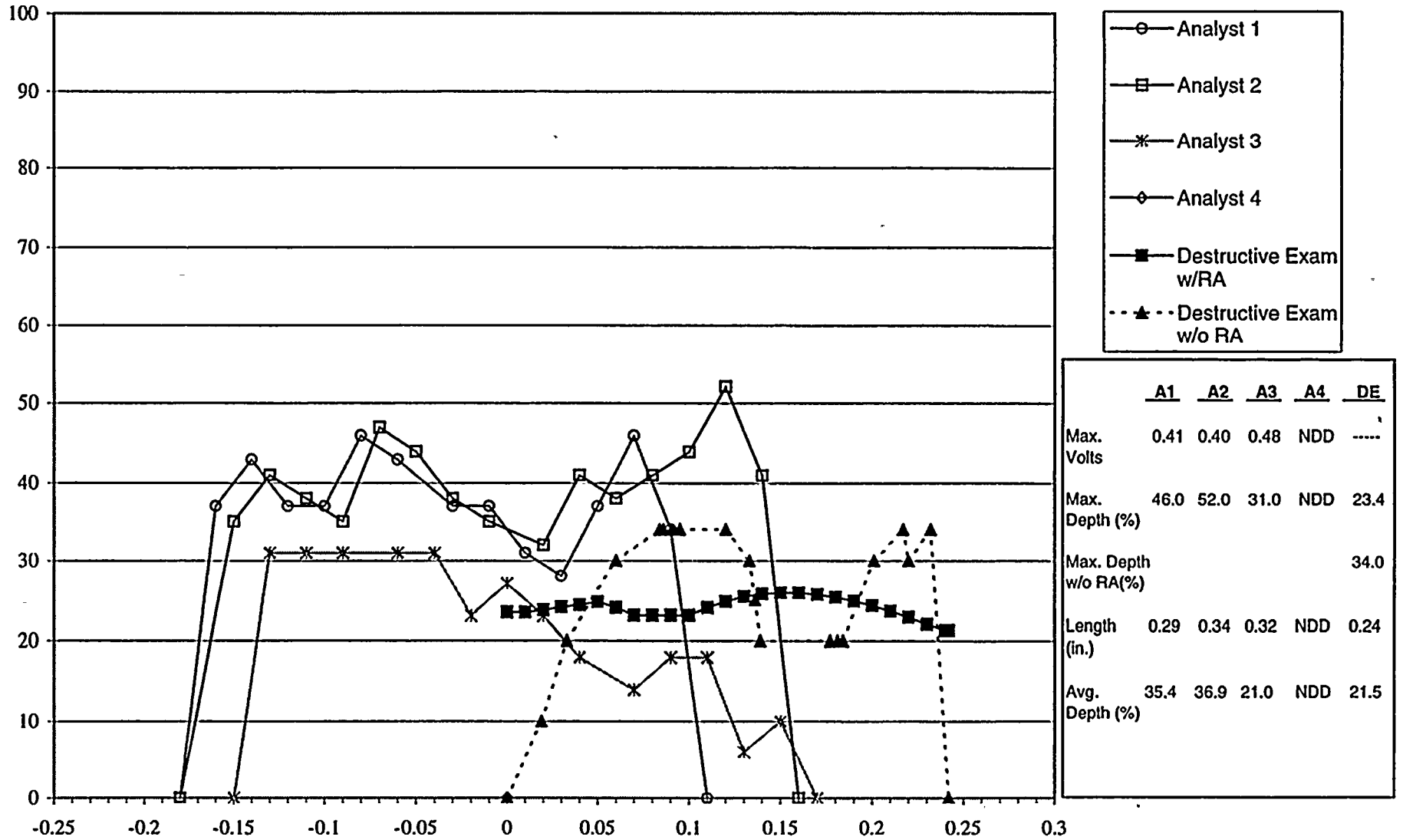


Figure C-61
Sample 12, TSP 3H - Crack 1
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

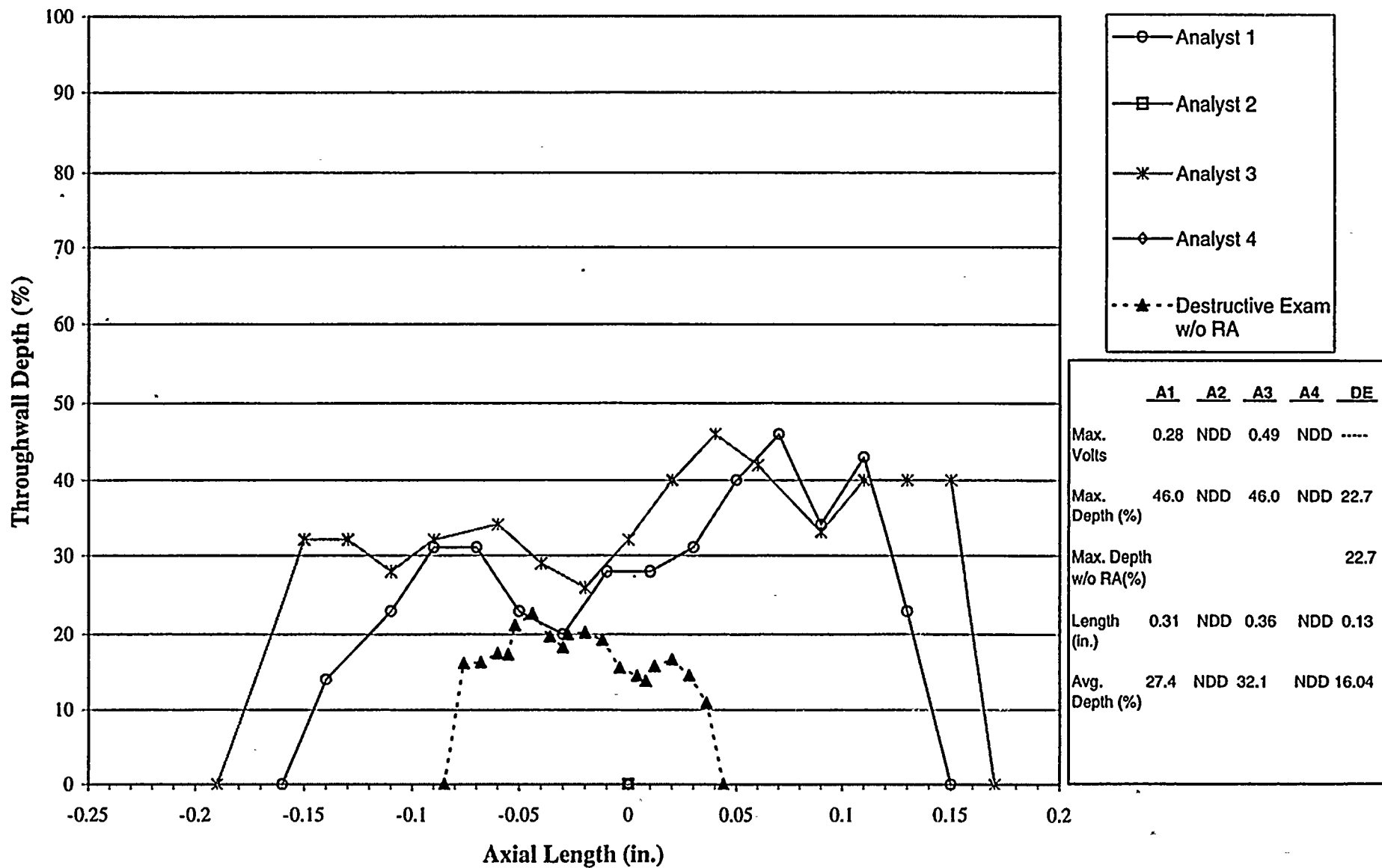


Figure C-62
Sample 12, TSP 4H
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam

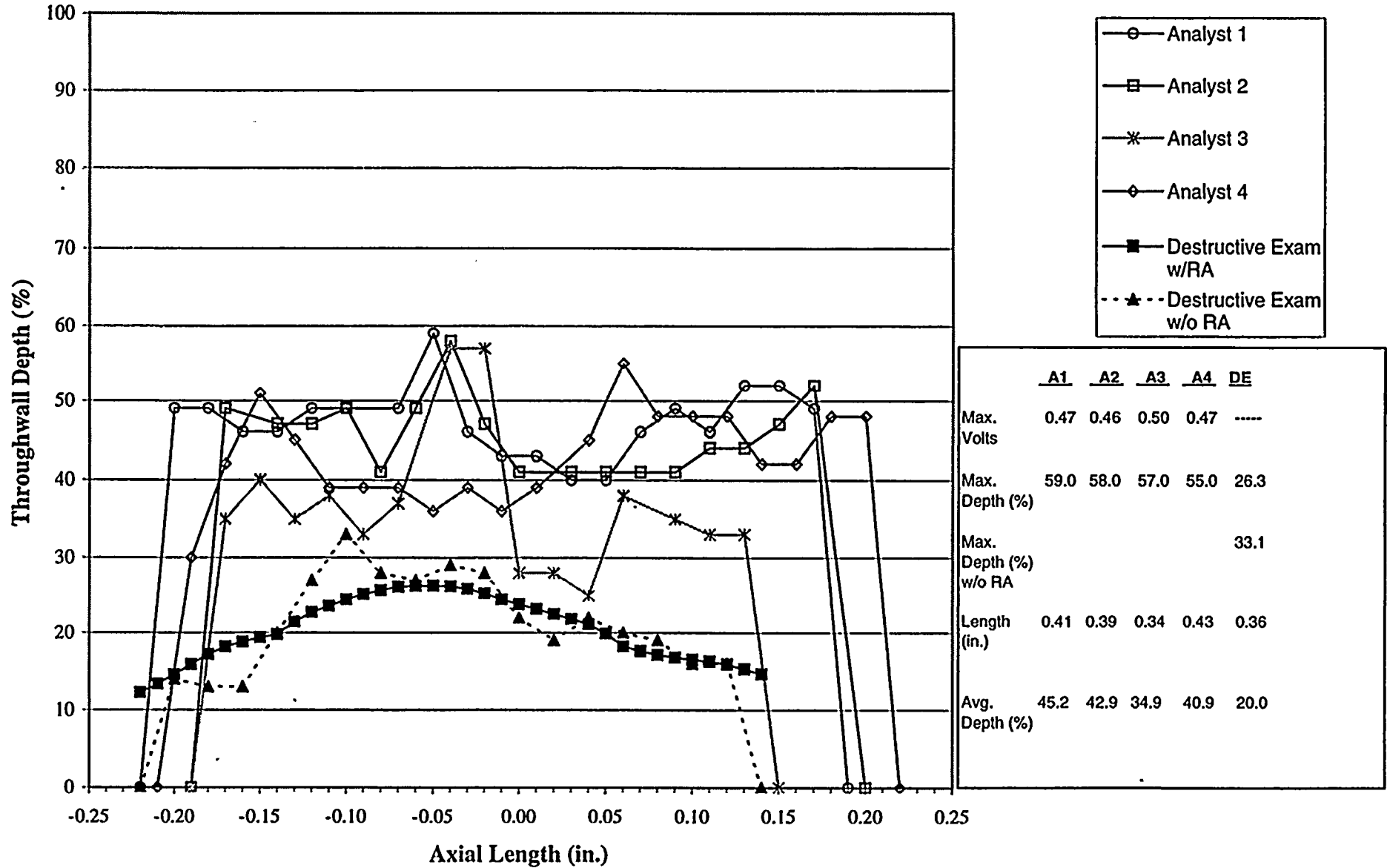
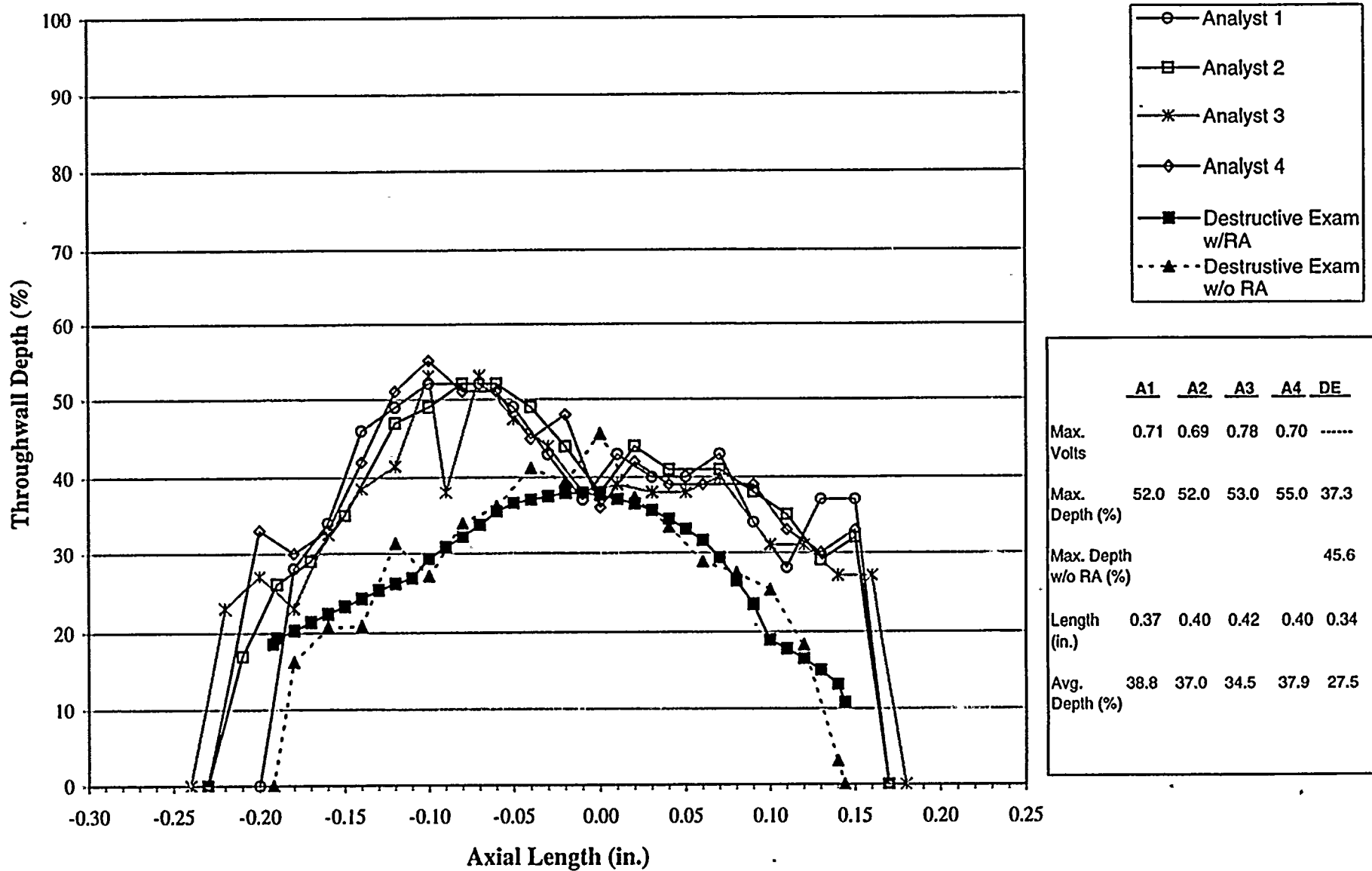


Figure C-63
Sample 13, TSP 3H
Mid-Range +Point, 300 kHz
NDE Depth vs. Axial Length with Destructive Exam



Appendix D

NDE Bobbin Detection Analyses



Table D-1 Summary of Bobbin Detection for Axial PWSCC at Dented TSPs

Specimen No.	TSP	Crack	Bobbin Dent Voltage (1)	Analyst Reporting a Flaw Call				Detection All Calls Bobbin	POD Total % Detected Bobbin	Destructive Exam				
				Bobbin Analysis						Length (inches)	Local Max. Depth (%)	Avg. Max. Depth (%)	Avg. Depth Lig. Corr. (%)	
				Analyst 1	Analyst 2	Analyst 3	Analyst 4							
10/22	2H	1	2.39	X	X	X	NA	3/3	100	0.122	38.0	23.21	23.21	
21/43	1H	1	3.89	X	X	X	NA	3/3	100	0.991	98.0	90.50	49.29	
21/43	1H	2								0.277	50.0	45.48	39.59	
12/32	1H	1	1.21	NA	X	X	NA	2/2	100	0.702	97.0	88.90	57.54	
P7	1H	1		NA	X	NA	NA	1/1	100	0.870	100.0	99.78	94.32	
P7	1H	2								0.658	100.0	89.68	82.48	
P7	1H	3								0.126	65.2	46.23	46.23	
P8	1H	1		NA	X	NA	NA	1/1	100	2.644	100.0	99.55	84.77	
P8	1H	2								2.452	100.0	99.73	79.41	
P9	1H	1		NA	X	NA	NA	1/1	100	1.868	100.0	99.48	75.26	
P9	1H	2								1.589	100.0	99.42	86.59	
P10	1H	1		NA	X	NA	NA	1/1	100	2.563	100.0	100.00	88.70	
P10	1H	2								2.146	100.0	90.91	69.03	
P11	1H	1		NA	X	NA	NA	1/1	100	0.675	100.0	100.00	95.61	
P11	1H	2								0.568	95.8	90.30	74.58	
P12	1H	1		NA	X	NA	NA	1/1	100	1.286	100.0	99.80	77.27	
P12	1H	2								0.548	82.8	64.86	29.90	
P12	1H	5								0.181	90.3	74.68	69.44	
1	3H	1	2.63	X	X	X	O	3/4	75	0.660	55.7	47.88	39.40	
1	4H	1	2.32	X	X	X	X	4/4	100	0.708	68.4	54.32	36.72	
2	1H	1	3.87	O	X	O	O	1/4	25	0.876	48.0	33.42	21.76	
2	3H	1	2.21	X	X	X	X	4/4	100	0.472	31.7	21.53	15.22	
2	4H	1	1.84	X	X	X	X	4/4	100	0.580	53.5	47.62	29.03	
2	5H	1	2.32	X	X	O	X	3/4	75	0.860	41.0	35.50	18.34	
3	3H	1	5.68	O	O	O	NA	0/3: >5v dent	0	0.188	35.0	29.12	23.40	
3	4H	1	4.62	O	O	O	NA	0/3	0	0.183	16.0	7.72	6.41	
4	4H	1	5.14	NA	NA	O	NA	0/1: >5v dent	0	0.551	28.0	14.99	9.57	
5	1H	1	2.42	X	X	O	NA	2/3	67	0.294	42.0	35.00	0.00	
6	1H	1	2.03	X	X	X	X	4/4	100	0.772	88.8	83.72	60.54	
6	2H	1	1.89	X	X	X	X	4/4	100	0.692	80.2	73.72	59.09	
6	3H	1	2.24	X	X	X	X	4/4	100	0.588	74.1	67.26	56.14	
6	4H	1	2.18	X	X	X	X	4/4	100	0.416	75.0	64.29	49.41	
6	5H	1	1.98	X	X	X	X	4/4	100	0.604	85.1	77.89	54.09	
7	1H	1	5.03	X	X	X	X	4/4	100	0.598	39.5	30.14	20.12	
7	3H	1	4.28	X	X	X	X	4/4	100	0.560	45.5	34.43	24.95	
8	1H	1	1.42	X	X	X	X	4/4	100	0.420	58.0	52.24	40.73	
8	2H	1	1.52	X	X	X	X	4/4	100	0.380	54.7	45.77	37.13	
8	3H	1	1.61	X	X	X	X	4/4	100	0.460	50.0	44.21	31.81	
9	1H	1	1.34	X	X	X	X	4/4	100	0.424	49.1	38.82	30.88	
9	1H	2								Not	34.5	25.40	25.48	
9	2H	1	1.24	X	X	X	X	4/4	100	1.010	97.1	95.09	67.37	
9	2H	2								0.786	61.5	46.26	35.62	
9	3H	1	1.23	X	X	X	X	4/4	100	0.850	89.0	84.64	60.89	
9	3H	2								0.717	66.2	54.10	40.75	
9	4H	1	1.21	X	X	X	O	3/4	75	0.840	82.1	70.18	56.38	
9	4H	2								0.328	36.0	23.14	0.00	
9	5H	1	1.31	X	X	X	X	4/4	100	0.632	86.5	74.63	57.46	
9	5H	2								0.120	38.0	26.69	26.75	
10	3H	1	1.28	X	X	X	O	3/4	75	0.760	99.4	96.18	73.22	
10	3H	2								0.490	47.6	37.97	31.71	
10	4H	1	1.7	X	X	X	O	3/4	75	0.698	89.4	81.81	63.63	
11	2H	1	1.49	X	X	X	X	4/4	100	0.837	99.2	96.83	81.40	
11	2H	2								0.160	43.0	32.75	32.75	
11	3H	1	1.34	X	X	X	O	3/4	75	1.072	99.5	91.30	68.41	
11	4H	1	1.95	X	X	X	X	4/4	100	1.009	98.1	95.25	68.67	
11	4H	2								0.790	46.3	44.03	36.59	
12	2H	1	1.38	O	O	O	O	0/4	0	0.242	34.0	23.40	20.75	
12	3H	1	1.22	X	O	X	O	2/4	50	0.129	22.7	16.04	16.04	
12	4H	1	1.39	O	O	X	O	1/4	25	0.360	33.1	26.29	20.24	
13	3H	1	1.19	X	X	X	X	4/4	100	0.336	45.6	37.31	27.25	
Overall Detection Rate				30/35	37/42	30/37	21/30	118/144	0.82	0.77	POD at 90% Confidence:			
Detection > 34% TW				24/24	31/31	24/25	18/23	97/103	0.94	0.90	POD at 90% Confidence:			
Detection > 30% TW				27/28	35/35	26/29	20/26	108/118	0.92	0.87	POD at 90% Confidence:			
Detection > 20% TW				29/33	37/40	29/34	21/29	116/136	0.85	0.80	POD at 90% Confidence:			

Notes: 1. Dent voltages based on Westinghouse analyses for lab specimen prior to cracking and PG&E for field indications

Table D-2: Final Bobbin Data Analyses

Lookup ID	Specimen	Specimen	TSP	Crack No.	Dent Voltage (1)	Analyst 1			Analyst 2			Analyst 3			Analyst 4		
						Dent V	Call	Volts	Dent V	Call	Volts	Dent V	Call	Volts	Dent V	Call	Volts
10/221		10/22	2H	1	2.39												
21/431		21/43	1H	1	3.89												
21/432		21/43	1H	2													
12/321		12/32	1H	1	1.21												
P71	P1-7	P7	1H	1						DSI	10.8						
P72		P7	1H	2													
P73		P7	1H	3													
P81	P1-8	P8	1H	1						DSI	7.83						
P82		P9	1H	2													
P91	P1-9	P9	1H	1						DSI	12.2						
P92		P9	1H	2													
P101	P1-10	P10	1H	1						DSI	7.72						
P102		P10	1H	2													
P111	P1-11	P11	1H	1						DSI	10.2						
P112		P12	1H	2													
P121	P1-12	P12	1H	1						DSI	3.73						
P122 (3+4)		P12	1H	2 (3+4)													
P125		P12	1H	5													
13H1	1-3	1	3H	1	2.63	2.47	RRC-MRS/RRC	1.22-3.03	2.5	DSI	2.96	2.39	PI/PI	2.79		NDD	
14H1	1-4	1	4H	1	2.32	1.75	RRC-MRS/RRC	0.76-2.66	1.79	DSI	2.66	1.58	PI/PI	2.19		PI	2.13
21H1	2-1	2	1H	1	3.87	3.73	NDD/NDD		3.4	DSI	2.04	3.29	NDD/NDD			NDD	
23H1	2-3	2	3H	1	2.21	2.08	RRC/RRC	0.14	1.9	DSI	1.12	1.85	PI/PI	0.21		PI	0.17
24H1	2-4	2	4H	1	1.84	1.28	RRC/RRC	0.42	1.15	DSI	0.65	1.12	PI/PI	1.12		PI	0.19
25H1	2-5	2	5H	1	2.32	2.02	RRC/RRC	1.73	2.03	DSI	1.71	2.47	NDD/DDT			PI	1.73
33H1		3	3H	1	5.68												
34H1		3	4H	1	4.62												
44H1	4-4	4	4H	1	5.14							8.04	NDD				
51H1	5-1	5	1H	1	2.42	1.42	RRC-MRS/NDD	0.42-1.42	2.38	DSI	0.73	1.6	NDD				
61H1	6-1	6	1H	1	2.03		RRC-MRS/RRC	0.56-2.01	1.01	DSI	1.65	0.9	PI/PI	1.48		PI	1.89
62H1	6-2	6	2H	1	1.89		RRC-MRS/RRC	0.98-2.11	1.98	DSI	2.11	1.58	PI/PI	1.46		PI	0.98
63H1	6-3	6	3H	1	2.24		RRC-MRS/RRC	0.91-1.41	0.96	DSI	0.99		PI/PI	0.86		PI	0.79
64H1	6-4	6	4H	1	2.18	1.14	RRC-MRS/RRC	0.71-1.14	1.15	DSI	0.71	0.96	PI/PI	0.47		PI	0.64
65H1	6-5	6	5H	1	1.98	0.97	RRC-MRS/RRC	0.79-1.16	0.97	DSI	0.8	0.88	PI/PI	0.68		PI	1.03
71H1	7-1	7	1H	1	5.03	4.08	RRC-MRS/RRC	0.55-4.08	4.1	DSI	2.49	4.02	PI/DDT	0.6		PI	0.45
73H1	7-3	7	3H	1	4.28	3.24	RRC/RRC	0.71	3.26	DSI	1.1	3.3	PI/PI	0.83		PI	0.7

D-2

Table D-2: Final Bobbin Data Analyses

Lookup ID	Specimen	Specimen	TSP	Crack No.	Dent Voltage (1)	Analyst 1			Analyst 2			Analyst 3			Analyst 4		
						Dent V	Call	Volts	Dent V	Call	Volts	Dent V	Call	Volts	Dent V	Call	Volts
81H1	8-1	8	1H	1	1.42	0.67	RRC-MRS/RRC	0.88-0.88	0.41	DSI	0.89		PI/PI	0.52		PI	0.89
82H1	8-2	8	2H	1	1.52	0.79	RRC-MRS/RRC	0.86-1.00	0.8	DSI	0.86	0.52	PI/PI	0.82		PI	0.85
83H1	8-3	8	3H	1	1.61	0.87	RRC-MRS/RRC	0.69-1.55	0.46	DSI	0.7	1.02	PI/PI	0.91		PI	0.68
85H1	8-5	8	5H	1	1.67	1.83	RRC/RRC	0.57	1.84	DSI	0.57	1.92	NDD/NDD			NDD	
91H1	9-1	9	1H	1	1.34		RRC-MRS/RRC	1.33-2.76	0.94	DSI	0.5	3.1	PI/PI	1.47		PI	0.52
91H2		9	1H	2													
92H1	9-2	9	2H	1	1.24		RRC-MRS/RRC	1.89-3.76	None	DSI	3.77		PI/PI	3.76		PI	3.76
92H2	9-3	9	2H	2													
93H1	9-3	9	3H	1	1.23		RRC-MRS/RRC	1.51-2.72	1.29	DSI	2.09		PI/PI	1.96		PI	1.95
93H2	9-4	9	3H	2													
94H1	9-4	9	4H	1	1.21	1.25	RRC-MRS/RRC	0.79-1.83	1.25	DSI	1.44	1.27	PI/PI	1.25		NDD	
94H2		9	4H	2													
95H1	9-5	9	5H	1	1.31		RRC-MRS/RRC	0.59-3.84	0.85	DSI	1.06		PI/PI	1.06		PI	0.63
95H2	9-6	9	5H	2													
103H1	10-3	10	3H	1	1.28	0.65	NDD-MRS/RRC	1.73	0.65	DSI	1.25		PI/PI	1.08		NDD	
103H2	10-4	10	3H	2													
104H1	10-4	10	4H	1	1.70	0.82	NDD-MRS/RRC	1.28	0.82	DSI	1.27	0.63	PI/PI	0.96		NDD	
112H1	11-2	11	2H	1	1.49	0.74	RRC-MRS/RRC	0.75-2.75	0.73	DSI	2.07	0.66	PI/PI	1.89		PI	0.55
112H2	11-3	11	2H	2													
113H1	11-3	11	3H	1	1.34		RRC-MRS/RRC	2.08-3.45	1.1	DSI	3.25		PI/PI	2.88		NDD	
114H1	11-4	11	4H	1	1.95		RRC-MRS/RRC	1.96-3.45	1.17	DSI	2.47	2.31	PI/PI	2.00		PI	2.46
114H2	11-5	11	4H	2													
122H1	12-2	12	2H	1	1.38	1.28	NDD/NDD		1.29	NDD		1.38	NDD/NDD			NDD	
123H1	12-3	12	3H	1	1.22	1.18	RRC/NDD	0.16	1.15	NDD		1.27	PI/NDD	0.23		NDD	
124H1	12-4	12	4H	1	1.39	1.2	NDD/NDD		1.19	NDD		0.9	PI/NDD	0.11		NDD	
133H1	13-3	13	3H	1	1.19	1.06	RRC-MRS/RRC	0.28-1.06	0.75	DSI	0.27	0.84	PI/PI	0.31		PI	0.29

1. Dent voltages based on Westinghouse analyses for lab and PG&E for field

PI = Possible Indication (flaw)	RRC = Possible Flaw (Re-test with Rotating Coil)
DDT = Distorted Dent	MRS = Mix Residual Signal
DSI = Distorted Support Indication (fl)	NDD = No Detectable Degradation



Appendix E
NDE Cecco Detection Analyses.



Table E-1 Summary of Cecco Detection for Axial PWSCC at Dented TSPs

Specimen No.	TSP	Crack	Bobbin Dent Voltage	Analyst Reporting a Flaw Call					All Calls Cecco	Total % Detected	Length (inches)	Destructive Exam		
				Analyst 3	Analyst 5	Analyst A	Analyst B	Analyst C				Local Max.	Avg. Max. Depth	Avg. Depth
				Updated Guidelines*								Depth (%)	(%)	(%)
			(1)											
10/22	2H	1	2.39							0.122	38.0	23.21	23.21	
21/43	1H	1	3.89							0.991	98.0	90.50	49.29	
21/43	1H	2								0.277	50.0	45.48	39.59	
12/32	1H	1	1.21							0.702	97.0	88.90	57.54	
P7	1H	1								0.870	100.0	99.78	94.32	
P7	1H	2								0.658	100.0	89.68	82.48	
P7	1H	3								0.126	65.2	46.23	46.23	
P8	1H	1								2.644	100.0	99.55	84.77	
P8	1H	2								2.452	100.0	99.73	79.41	
P9	1H	1								1.868	100.0	99.48	75.26	
P9	1H	2								1.589	100.0	99.42	86.59	
P10	1H	1								2.563	100.0	100.00	88.70	
P10	1H	2								2.146	100.0	90.91	69.03	
P11	1H	1								0.675	100.0	100.00	95.61	
P11	1H	2								0.568	95.8	90.30	74.58	
P12	1H	1								1.286	100.0	99.80	77.27	
P12	1H	2								0.548	82.8	64.86	29.90	
P12	1H	5								0.181	90.3	74.68	69.44	
1	3H	1	2.63	PI	PI	PI	PI	PI	5/5	100	0.660	55.7	47.88	39.40
1	4H	1	2.32	PI	PI	PI	PI	PI	5/5	100	0.708	68.4	54.32	36.72
2	1H	1	3.87	PI	PI	PI	PI	PI	5/5	100	0.876	48.0	33.42	21.76
2	3H	1	2.21	PI	PI	PI	PI	PI	5/5	100	0.472	31.7	21.53	15.22
2	4H	1	1.84	PI	PI	PI	PI	PI	5/5	100	0.580	53.5	47.62	29.03
2	5H	1	2.32	PI	PI	PI	PI	PI	5/5	100	0.860	41.0	35.50	18.34
3	3H	1	5.68	NDD	NDD	NDD	NDD	PI	1/5	20	0.188	35.0	29.12	23.40
3	4H	1	4.62	NDD	NDD	NDD	NDD	NDD	0/5	0	0.183	16.0	7.72	6.41
4	4H	1	5.14	NDD?	NDD	PI	NDD	NDD	1/5	20	0.551	28.0	14.99	9.57
5	1H	1	2.42	PI	NDD	NDD	NDD	NDD	1/5	20	0.294	42.0	35.00	20-30%
6	1H	1	2.03	PI	PI	PI	PI	PI	5/5	100	0.772	88.8	83.72	60.54
6	2H	1	1.89	PI	PI	PI	PI	PI	5/5	100	0.692	80.2	73.72	59.09
6	3H	1	2.24	PI	PI	PI	PI	PI	5/5	100	0.588	74.1	67.26	56.14
6	4H	1	2.18	PI	PI	PI	PI	PI	5/5	100	0.416	75.0	64.29	49.41
6	5H	1	1.98	PI	PI	PI	PI	PI	5/5	100	0.604	85.1	77.89	54.09
7	1H	1	5.03	PI	NDD	PI	PI	PI	4/5	80	0.598	39.5	30.14	20.12
7	3H	1	4.28	PI	PI	PI	PI	PI	5/5	100	0.560	45.5	34.43	24.95
8	1H	1	1.42	PI	PI	PI	PI	PI	5/5	100	0.420	58.0	52.24	40.73
8	2H	1	1.52	PI	PI	PI	PI	PI	5/5	100	0.380	54.7	45.77	37.13
8	3H	1	1.61	PI	PI	PI	PI	PI	5/5	100	0.460	50.0	44.21	31.81
9	1H	1	1.34	PI	PI	PI	PI	PI	5/5	100	0.424	49.1	38.82	30.88
9	1H	2								Not Determined	34.5	25.40	25.48	
9	2H	1	1.24	PI	PI	PI	PI	PI	5/5	100	1.010	97.1	95.09	67.37
9	2H	2								0.786	61.5	46.26	35.62	
9	3H	1	1.23	PI	PI	PI	PI	PI	5/5	100	0.850	89.0	84.64	60.89
9	3H	2								0.717	66.2	54.10	40.75	
9	4H	1	1.21	PI	PI	PI	PI	PI	5/5	100	0.840	82.1	70.18	56.38
9	4H	2								0.328	36.0	23.14		
9	5H	1	1.31	PI	PI	PI	PI	PI	5/5	100	0.632	86.5	74.63	57.46
9	5H	2								0.120	38.0	26.69	26.75	
10	3H	1	1.28	PI	PI	PI	PI	PI	5/5	100	0.760	99.4	96.18	73.22
10	3H	2								0.490	47.6	37.97	31.71	
10	4H	1	1.7	PI	PI	PI	PI	PI	5/5	100	0.698	89.4	81.81	63.63
11	2H	1	1.49	PI	PI	PI	PI	PI	5/5	100	0.837	99.2	96.83	81.40
11	2H	2								0.160	43.0	32.75	32.75	
11	3H	1	1.34	PI	PI	PI	PI	PI	5/5	100	1.072	99.5	91.30	68.41
11	4H	1	1.95	PI	PI	PI	PI	PI	5/5	100	1.009	98.1	95.25	68.67
11	4H	2								0.790	46.3	44.03	36.59	
12	2H	1	1.38	PI	NDD	PI	NDD	PI	3/5	60	0.242	34.0	23.40	20.75
12	3H	1	1.22	PI	NDD	PI	NDD	PI	3/5	60	0.129	22.7	16.04	16.04
12	4H	1	1.39	PI	NDD	NDD	NDD	PI	2/5	40	0.360	33.1	26.29	20.24
13	3H	1	1.19	PI	NDD	PI	PI	PI	4/5	80	0.336	45.6	37.31	27.25
Overall Detection Rate				31/34	25/34	30/34	27/34	31/34	144/170	0.91	0.80	POD at 90% Confidence:		
Detection > 30% TW				27/27	24/27	26/27	26/27	26/27	129/135	0.96	0.92	POD at 90% Confidence:		
Detection > 20% TW				30/31	25/31	28/31	27/31	30/31	129/155	0.83	0.78	POD at 90% Confidence:		

Notes: 1. Dent voltages based on Westinghouse analyses for lab specimen prior to cracking and PG&E for field indications

Table E-2: Final Cecco-5 Results

Lookup ID	Specimen	Specimen	TSP	Crack No.	Dent Voltage (1)	Cecco Analysis		Cecco-Updated Guidelines			ALL Cecco Calls Ratio
						Analyst 3	Analyst 5	Analyst A	Analyst B	Analyst C	
						Call	Call	Call Amplitude	Call Amplitude	Call Amplitude	
10/221		10/22	2H	1	2.39						
21/431		21/43	1H	1	3.89						
21/432		21/43	1H	2							
12/321		12/32	1H	1	1.21						
P71	P1-7	P7	1H	1							
P72		P7	1H	2							
P73		P7	1H	3							
P81	P1-8	P8	1H	1							
P82		P9	1H	2							
P91	P1-9	P9	1H	1							
P92		P9	1H	2							
P101	P1-10	P10	1H	1							
P102		P10	1H	2							
P111	P1-11	P11	1H	1							
P112		P12	1H	2							
P121	P1-12	P12	1H	1							
P122 (3+4)		P12	1H	2 (3+4)							
P125		P12	1H	5							
13H1	1-3	1	3H	1	2.63	PI	PI	PI 72.9V	PI 83.4V	PI 20.6V	5/5
14H1	1-4	1	4H	1	2.32	PI	PI	PI 55.8V	PI 71.8V	PI 24.8V	5/5
21H1	2-1	2	1H	1	3.87	PI	PI	PI 28.5V	PI 39.4V	PI 20.3V	5/5
23H1	2-3	2	3H	1	2.21	PI	PI	PI 20.9V	PI 20.9V	PI 16.8V	5/5
24H1	2-4	2	4H	1	1.84	PI	PI	PI 19.9V	PI 19.4V	PI 19.4V	5/5
25H1	2-5	2	5H	1	2.32	PI	PI	PI 24.3V	PI 26.6V	PI 24.2V	5/5
33H1	3-3	3	3H	1	5.68	NDD	NDD	NDD	NDD	PI 13.7V	1/5
34H1	3-4	3	4H	1	4.62	NDD	NDD	NDD	NDD	NDD	0/5
44H1	4-4	4	4H	1	5.14	NDD?	NDD	PI 29.7V	NDD	NDD	1/5
51H1	5-1	5	1H	1	2.42	PI	NDD	NDD	NDD	NDD	1/5
61H1	6-1	6	1H	1	2.03	PI	PI	PI 70.9V	PI 105V	PI 90.0V	5/5
62H1	6-2	6	2H	1	1.89	PI	PI	PI 88.7V	PI 134V	PI 31.1V	5/5
63H1	6-3	6	3H	1	2.24	PI	PI	PI 80.7V	PI 86.2V	PI 57.6V	5/5
64H1	6-4	6	4H	1	2.18	PI	PI	PI 18.1V	PI 61.3V	PI 25.3V	5/5
65H1	6-5	6	5H	1	1.98	PI	PI	PI 39.0V	PI 57.2V	PI 17.0V	5/5
71H1	7-1	7	1H	1	5.03	PI	NDD	PI 25.1V	PI 24.0V	PI 6.2V	4/5
73H1	7-3	7	3H	1	4.28	PI	PI	PI 25.3V	PI 18.6V	PI 21.2V	5/5
81H1	8-1	8	1H	1	1.42	PI	PI	PI 67.3V	PI 42.2V	PI 36.5V	5/5
82H1	8-2	8	2H	1	1.52	PI	PI	PI 74.6V	PI 58.4V	PI 39.4V	5/5
83H1	8-3	8	3H	1	1.61	PI	PI	PI 53.7V	PI 90.3V	PI 36.1V	5/5
91H1	9-1	9	1H	1	1.34	PI	PI	PI 48.3V	PI 29.8V	PI 36.4V	5/5
91H2	9-1	9	1H	2							
92H1	9-2	9	2H	1	1.24	PI	PI	PI 67.8V	PI 68.8V	PI 48.2V	5/5
92H2	9-2	9	2H	2							
93H1	9-3	9	3H	1	1.23	PI	PI	PI 90.2V	PI 104V	PI 56.7V	5/5
93H2	9-3	9	3H	2							
94H1	9-4	9	4H	1	1.21	PI	PI	PI 75.9V	PI 75.5V	PI 30.3V	5/5
94H2	9-4	9	4H	2							
95H1	9-5	9	5H	1	1.31	PI	PI	PI 97.6V	PI 54.0V	PI 47.9V	5/5
95H2	9-5	9	5H	2							
103H1	10-3	10	3H	1	1.28	PI	PI	PI 67.3V	PI 67.3V	PI 13.6V	5/5
103H2	10-3	10	3H	2							
104H1	10-4	10	4H	1	1.70	PI	PI	PI 52.6V	PI 52.3V	PI 9.8V	5/5
112H1	11-2	11	2H	1	1.49	PI	PI	PI 85.0V	PI 74.5V	PI 16.5V	5/5
112H2	11-2	11	2H	2							
113H1	11-3	11	3H	1	1.34	PI	PI	PI 86.0V	PI 86.0V	PI 19.3V	5/5
114H1	11-4	11	4H	1	1.95	PI	PI	PI 100V	PI 100V	PI 19.0V	5/5
114H2	11-4	11	4H	2							
122H1	12-2	12	2H	1	1.38	PI	NDD	PI 15.0V	NDD	PI 9.0V	3/5
123H1	12-3	12	3H	1	1.22	PI	NDD	PI 17.1V	NDD	PI 8.5V	3/5
124H1	12-4	12	4H	1	1.39	PI	NDD	NDD	NDD	PI 8.4V	2/5
133H1	13-3	13	3H	1	1.19	PI	NDD	PI 37.7V	PI 36.7V	PI 36.7V	4/5

1. Dent voltages based on Westinghouse analyses for lab and PG&E for field

- PI = Possible Indication (flaw)
- NDD = No Detectable Degradation

Appendix F
Test Sample Material Data

F-1

Heat #3330 1996 "P" Samples

REVISION

WESTINGHOUSE ELECTRIC CORPORATION

DIVISION ELXK
DATE 7.27.93

CUSTOMER ORDER <u>N/A</u>		GENERAL ORDER NO. <u>N/A</u>		PURCHASE ORDER <u>MM-99809-M</u>		PAR <u>N/A</u>	CAN <u>COI</u>	PROJECT <u>TEST</u>
Q.D. NO. <u>GLTD-1000</u>	VENDOR S.D. <u>N/A</u>	P.O. ITEM NO. <u>005</u>	SPIN NO. <u>N/A</u>	BASIC COMPONENT CHECK <input type="checkbox"/> YES or <input checked="" type="checkbox"/> NO				
EQUIPMENT SPEC. NO. & REV. <u>STD-MS-1988-3354, Rev. d</u>			DRAWING NO. <u>N/A</u>		REVISION <u>N/A</u>		GROUP/ITER. <u>N/A</u>	
ASME CODE SECTION & CLASS <u>N/A</u>			ASME CODE EDITION & ADDENDA <u>N/A</u>			ASME CODE CASES <u>N/A</u>		
ITEM NAME <u>I-600 Reinforced Tubing</u>							QUANTITY RELEASED <u>1 pc. (~10'l)</u>	
SERIAL OR IDENTIFICATION NUMBER(S) <u>Ht. # NX 3330 (Alloy # 9TT-678)</u>								
<u>Tube 9D-19B</u>								
<u>Matl. Size: 895X.050X~10'l</u>								
<u>38 K Yield</u>								

The attributes listed below have been reviewed and approved by QC/QA as noted by an A in the status column. Non-applicable items are lined out. Records are available for review. Contingent items are identified by "C" on the status column and explained in the remarks section.

	STATUS	STATUS	STATUS
AUDIT CHECKLIST	<input checked="" type="checkbox"/> Material Certifications	<input checked="" type="checkbox"/> Operating Electrical Test Records	<input checked="" type="checkbox"/> ASME Data Report Form(s)
	<input checked="" type="checkbox"/> Heat Treat Records	<input checked="" type="checkbox"/> Non-Operating Elec. Test Records	<input checked="" type="checkbox"/> Certified Stress Report
	<input checked="" type="checkbox"/> RT Film and Records	<input checked="" type="checkbox"/> Pressure Test Records	<input checked="" type="checkbox"/> Special Handling, Storage & Inst.
	<input checked="" type="checkbox"/> PT Records	<input checked="" type="checkbox"/> Seat Tightness Test Records	<input checked="" type="checkbox"/> Instruction Books
	<input checked="" type="checkbox"/> MT Records	<input checked="" type="checkbox"/> Performance Test Records	<input checked="" type="checkbox"/> <u>CQC</u>
	<input checked="" type="checkbox"/> IIT Records	<input checked="" type="checkbox"/> Welding Personnel Qual. Cert.	<input checked="" type="checkbox"/> <u>Flare Test</u>
	<input checked="" type="checkbox"/> Visual Inspection Records	<input checked="" type="checkbox"/> NDE Personnel Qual. Cert.	
	<input checked="" type="checkbox"/> Dimensional Inspection	<input checked="" type="checkbox"/> Painting	
	<input checked="" type="checkbox"/> Cleanliness	<input checked="" type="checkbox"/> Packaging	

CUSTOMER QA DATA PACKAGE REQUIRED BY PURCHASE ORDER: YES NO DEVIATION NOTICE(S) NONE APPLICABLE ONE(S) LISTED BY DN NAME (COPY ATTACHED TO SHIPPING PAPER)

REMARKS

Released from WMSO - QA Store to L. Kozak for test.

THE SUPPLIER CERTIFIES that for the equipment and material released, all contractual requirements have been met. Approved deviations, if any, are listed above.

DATE 7/27/93 SUPPLIER SIGNATURE [Signature] P.O. # 411

The equipment shown hereon is released by Quality Assurance. Shipment may be made subject to authorization by Purchasing.

The equipment supplier has certified that the equipment above meets all requirements of the purchase order, drawings and specifications. Westinghouse has reviewed evidence supporting this release and except as specified above has detected no deviations from such requirements. This release does not waive any rights Westinghouse may have under the purchase order including Westinghouse's right to reject the equipment upon discovery of any such deviations after arrival at destination.

[Signature] WESTINGHOUSE QUALITY ASSURANCE REPRESENTATIVE

(W) IL & D MATERIALS TESTING AND EVALUATION LAB REPORT

Customer R ASPDEN Mtl. Ident. INCORPORATED Report No. 95960
 Date 3/9/88 Type Test FLARE Gage Length _____
 Tested By J.J. IRMA Test Temp RT Test Speed _____

FLARE TESTS PERFORMED USING A 40° ANGLE CENTER	
W.P.A. NUMBER	TEST RESULT
3530-13A	PASSED
3530-14A	"
3530-18A	"
3530-19A	"
3530-21A	"
3530-25A	"
3530-26A	"
3530-27A	"
3530-28A	"
3530-29A	"
3530-30A	"

~~95960~~
 95960
 3/23/88

RI-7

WESTINGHOUSE R & D CENTER---MATERIALS TESTING AND EVALUATION LABS

CUSTOMER: R. G. Aspden

REQ. NO: 95960

MATERIAL IDENT: Inconel 600 tubing

BUDGET NO: 5M21-DFRAN-40

TEST TYPE: Tensile

GAGE LENGTH: 2.00"

TEST TEMP: Room temp.

TEST SPEED: 0.05"/min

DATE: 29-FEB-88

TESTED BY: R. P. Sadusk

TEST MACHINE: 30,000 lbf SATEC, Mod# 30WBN
S/N 1016, Last calib: 1-SEP-87

EXTENSOMETER: BDRE-2
Last calib: 6-JAN-88

SPEC. IDENT.	O.D. (in)	WALL THKS (in)	I.D. (in)	0.2% OFFSET YIELD STRENGTH (lbf)	0.2% OFFSET YIELD STRENGTH (KSI)	ULTIMATE STRENGTH (lbf)	ULTIMATE STRENGTH (KSI)	ELONGAT IN 2. (in)
Tube #B641-3 STT 678	0.6710	0.0480	0.775	4620	37.23			
Tube #B641-4	0.6710	0.0480	0.775	4730	38.11	12160	97.98	0.90

2/29/88
WSP
accept for 40KSI + 2

F-1 (con't)

Heat #8161 1996 "P" Samples

REVISION

DIVISION NSD

WESTINGHOUSE ELECTRIC CORPORATION

DATE 11.20

CUSTOMER ORDER NO. <u>N/A</u>	GENERAL ORDER NO. <u>N/A</u>	PURCHASE ORDER NO. <u>MB-09438-11</u>	PAR. NO. <u>N/A</u>
ASME SPEC NO. <u>XFRD-95063</u>	VENDOR S.O. NO. <u>N/A</u>	PO ITEM NO. <u>001</u>	SPIN NO. <u>N/A</u>
EQUIPMENT SPEC NO & REV. <u>SB-163</u>	DRAWING NO. <u>N/A</u>	REVISION <u>N/A</u>	GROUP ITEM <u>N/A</u>
ASME CODE SECTION & CLASS <u>II</u>	ASME CODE EDITION & ADDENDUM <u>1959 Ed.</u>	ASME CODE CASE NO. <u>N/A</u>	
ITEM NAME <u>L-60ci M/A tubing</u>			QUANTITY RELEASED <u>170-23</u>
SERIAL OR IDENTIFICATION NUMBER(S) <u>HT # NX81E1</u>			

Mat'l Size .875" x .050" x 23

The attributes listed below have been reviewed and approved by QC/QA as noted by an A in the status column. Non-applicable items are lined out. Records are available for review. Contingent items are identified by "C" on the status column and explained in the remarks section.

AUDIT CHECKLIST	STATUS	STATUS
<u>A</u> Material Certifications	Operating Electrical Test Records	ASME Data Report Form(s)
Heat Treat Records	Non-Operating Elec. Test Records	Certified Stress Report
RT Film and Records	<u>A</u> Pressure Test Records	Special Handling, Storage & Instr.
PT Records	Seal Tightness Test Records	Instruction Books
MT Records	Performance Test Records	<u>A</u> Welding Personnel Qual. Cert.
<u>A</u> UT Records	<u>A</u> Welding Personnel Qual. Cert.	<u>A</u> Flare tes
<u>A</u> Visual Inspection Records	<u>A</u> NDE Personnel Qual. Cert.	
<u>A</u> Dimensional Inspection	Painting	
<u>A</u> Cleanliness	<u>A</u> Packaging	

CUSTOMER QA DATA PACKAGE REQUIRED BY PURCHASE ORDER. YES NO DEVIATION NOTICE(S) NONE ONE MORE APPLICABLE DMS(S) LISTED BY DN NUM (COPY ATTACHED TO SHIPPING PAPER)

REMARKS

Released to MPC For Work Order (From 4 QA stores).

THE SUPPLIER CERTIFIES that for the equipment and material released, all contractual requirements have been met. Approved deviations, if any, are listed above.

SUPPLIER Castle Metals PO NO. N/A
 SUPPLIER SIGNATURE N/A DATE 11.20

The equipment shown hereon is released by Quality Assurance. Shipment may be made subject to authorization by Purchasing.

The equipment supplier has certified that the equipment above meets all requirements of the purchase order, drawings and specifications. Westinghouse has reviewed evidence supporting this release and except as specified above has detected no deviations from such requirements. This release does not waive any rights Westinghouse may have under the purchase order including Westinghouse's right to reject the equipment upon discovery of any such deviations after arrival at destination.

PC
 WESTINGHOUSE QUALITY ASSURANCE REPRESENTATIVE

PRODUCT ASSURANCE

SUPPLIER TO SHIPPING PAPERS)



Castle Metals®

Since 1890

3-1-9

26800 MILES ROAD
BEDFORD HEIGHTS, OH 44146-1482

ATTN. PURCHASING AGENT

Gentlemen:

This is to certify that the material on your order number MB09438M
covered by our number 346196 meets the following specifications.
ORD. # 469LBS 7/8" X .050" AW ALLOY 600 SMLS, .040%MIN C 1725 ANNL

This Certification is given subject to A. M. Castle & Co.'s terms and
conditions of sales.

Yours truly,

A. M. CASTLE & CO.

Kimberly Bryant

KIMBERLY BRYANT - MET REPORT GEN.

Authorized Agent

SCOTTDALE

P.O. BOX 302 • SCOTTDALE, PA 15683

ULTRASONIC INSPECTION

CUSTOMER: CASTLE METALS		CUSTOMER P.O.: 346196-10BEJ		TCSS ORDER #: 38850-1	
DATE RECEIVED: N/A		QTY RECEIVED: 48		ACC: 45 COMPLETE REJ: 3 PARTIAL	
APPROVED TEST PROCEDURE: OCP-2A, REV. 8 ADD. 1B			APPLICABLE SPECIFICATIONS: ASME-SB-163-89 ASME SEC. II & III, '89 ED.		
DESCRIPTION OF MATERIAL / STAGE OF MATERIAL AT TIME OF TEST: GRADE 600 HT# NX8161 SEAMLESS ANNEALED					
SIZE: .875" O.D. X .050 AW					
TEST DIR:	AXIAL	AXIAL	CIRC.	CIRC.	
EQUIP. MFG:	Sonic	Sonic	Sonic	Sonic	
MODEL NO:	Mark II	Mark II	Mark II	Mark II	
SERIAL NO:	772011	771367	11363E	11207E	
TRANS. MFG:	TECHNISONIC	TECHNISONIC	TECHNISONIC	TECHNISONIC	
MODEL NO:	ILD-0506-GP	ILD-0506-GP	ILD-0506-GP	ILD-0506-GP	
SERIAL NO:	E 6841	E 6842	E 6843	E 6840	
SIZE:	.615 X .750	.615 X .750	.615 X .750	.615 X .750	
FREQUENCY:	5 MHZ	5 MHZ	5 MHZ	5 MHZ	
CABLE LENGTH: 6'	CALIBRATION STD #: DESCRIPTION: K-597				
CALIBRATION STD FINISH: <63 RMS	PRODUCTION FINISH: <63 RMS		METHOD: Pulse-Echo / Shear Wave / Immersion (TAC-TC7E)		
SCANNING SPEED: 160 SF/MIN.	COUPLANT: Water		REFERENCE LEVEL: 75%		
AREA GATED: I.D. to O.D.	DEFECT ALARM LEVEL: 60%		RECORDING EQUIPMENT (if used): GOULD TA 2000		
ADDITIONAL INFORMATION (if necessary):					
ULTRASONIC INSPECTOR: QA/QC\CHARTS				DATE OF INSPECTION: FEB. 16, 19	
<i>David G. Ward</i> DAVID G. WARD, LEVEL II				PAGE 1 OF 1	

Stainless Division
 BOX 302
 SCOTSDALE, PENNSYLVANIA 15083

CERTIFICATE OF

Customer GASTLE METALS Cust. Order No. 346196-10 BEJ Date FEB 19.
 TC-S Order No. 38850-1 Qty. Shipped 985 Feet C Qty. Ordered 1,000 FEET
 Size .875 OD X .050 AW Specification ASME SB-163 Grade Alloy 60
 Comments: ASME Section II, 1989 Edition Seamless.

HEAT NO.	C	Mn	P	S	Si	Cr	Ni	Mo	Cu	Ca	C+Ti	Ti	Al	T2

HEAT NO.	ULTIMATE STRENGTH (PSI)	YIELD STRENGTH (PSI)	% ELONGATION IN 2 IN.	HARDNESS	GRAIN SIZE	NUM OF P.
	NX8161	108400	55400	45.0		

Flare	Flattening	Alloy Ident.	Bond	Hydrostatic	Eddy Current	Microscopic	Lotus Doc
OK		OK		ACCEPTABLE 100% 100G 10-25 10-25-91 BY 3-21-91	OK		

HEAT TREATMENT: ALL MATERIAL SUPPLIED ON THIS ORDER WAS SUBJECT TO A FINAL SOLUTION BRIGHT ANNEALING HEAT TREATMENT IN A CONTINUOUS FURNACE. THE MATERIAL WAS HELD AT A TEMPERATURE OF 17000F /17500F FOR A TIME SUFFICIENT TO INSURE COMPLETE SOLUTION OF THE CARBIDES IN THE MATRIX, FOLLOWED IMMEDIATELY BY QUENCHING TO BELOW 800F IN THREE TO FIVE MINUTES. 'QUENCHING' WAS ACCOMPLISHED VIA THE CONTACT H₂ ATM AND NON-CONTACT CIRCULATING COOLING WATER. (PER TDS PROCEDURE APZ, REV: 11, dated 7-22-91.)

Ultrasonic	Dye Pen.	SI
		100
		00
		10

WE CERTIFY THAT THIS MATERIAL HAS PROCESSED AND TESTED IN ACCORDANCE WITH THE REFERENCED SPECIFICATION AND PERFORMANCE WITH ALL REQUIREMENTS

METALLURGICAL DEPARTMENT
Glenn P. Johnson, Jr.
 Glenn P. Johnson, Jr. / Senior

"ALL ITEMS FURNISHED WITH THIS SHIP IN FULL COMPLIANCE WITH ALL PURCHASE AND SPECIFICATION REQUIREMENTS."

"THE TEST REPORTS REPRESENT THE ACTUAL ATTRIBUTES OF THE ITEMS FURNISHED. THE TEST RESULTS ARE IN FULL COMPLIANCE WITH ALL APPLICABLE SPECIFICATION REQUIREMENTS."

CASTLE METALS, CLV
 DATE RECD 3/9/91
 RD. _____
 APPROVED BY [Signature]
 MISC. _____

JOB #MB09438M

DURING MANUFACTURING PROCESSES, TESTS, AND INSPECTIONS, THIS MATERIAL DID NOT COME IN DIRECT CONTACT WITH MERCURY OR ANY OF ITS COMPOUNDS NOR WITH ANY MERCURY CONTAINING DEVICE EMPLOYING A SINGLE BOUNDARY CONTAINMENT.

No Welding was performed on this product.

THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL LAW, TITLE 18, CHAPTER 47 CLEVELAND, OH



INCO ALLOYS INTERNATIONAL, INC.
HUNTINGTON, WEST VIRGINIA 25726

8

TELEDYNE COLUMBIA-SUMMERILL TELEDYNE INC FRANKLIN ST & SCOTDDALE AVE SCOTDDALE PA 15883	CERTIFIED MATERIAL TEST REPORT No. 52148		THIS IS TO CERTIFY THAT ALL REQUIRED INSPECTIONS HAVE BEEN PERFORMED IN ACCORDANCE WITH THE SPECIFICATION REQUIREMENTS. THE TEST REPORT REFLECTS ACTUAL ATTRIBUTES OF THE MATERIAL FURNISHED AND TESTS SHOWN ARE CORRECT AND TRUE. THE MATERIAL SUPPLIED CERTIFICATE IS IN FULL COMPLIANCE WITH ALL INSPECTION REQUIREMENTS. WE HEREBY CERTIFY THAT THESE ARE IN ACCORDANCE WITH THE SPECIFIED REQUIREMENTS. <i>W.E. Bolen</i> QUALITY CERTIFICATION REPRESENTATIVE
	UN ORDER NO./ITEM J19641 2	DATE 09/08/92	
TELEDYNE COLUMBIA-SUMMERILL TELEDYNE INC BOX 302 SCOTDDALE PA 15883	QUANTITY 3823 LBS	INSPECTED BY IAII	
	CHARGE ORDER NO. 001873-00	MARK ORDER NO. 001873-00	
INCONEL ALLOY 600		CD REDRAW QUAL PIPE PKL ANN	
1.2500 .5CH 40		RDM	

SPECIFICATIONS: ASME SB-167 1988 EDITION 1990 ADDENDA CHEM ONLY/
ASTM B-167-90 CHEM ONLY/ ASME SECTION 3 1988 EDITION.1990
ADDENDA NCA 3800 QUALITY SYSTEMS ONLY

UNS: N06600

CHEMICAL ANALYSIS (WT. %)

FI-15

HEAT#	C	MN	FE	S	SI	CU	NI	CR
NXB161	0.04	0.21	7.62	0.001	0.26	0.11	76.17	15.59

THE % OF NICKEL INCLUDES A SMALL AMOUNT OF COBALT
MELT METHOD: AIR MELT

HEAT/LOT - NXB161151 39 PCS.
ASME QUALITY SYSTEMS CERTIFICATE QSC-328-1 EXPIRES 3/31/93

VISUAL AND DIMENSIONAL EXAMINATION SATISFACTORY.
MATERIAL, WHEN SHIPPED, IS FREE FROM CONTAMINATION BY MERCURY, RADIUM, ALPHA SOURCE,
AND LOW MELTING ELEMENTS.
AUTHORIZED QUALITY CERTIFICATION REP. - D.B. WATSON, G.W. ADAMS, W.E. BOLEN, R.A. CRAZE, G.B. SIMPSON

Q.C. APPROVED

Interstate / U, MISSOURI STATE
 Madison, PA 17063

FROM Mary Reid	IN CORRESPONDING SHOW OUR ORDER NO. & DATE MB-41387 H 12/05/95
AT Waltz Mill (412) 722-5541	CUSTOMER'S OR SUPPLIER'S REFERENCE AND DATE
TERMS	COPIES OF INV. TO
COPIES OF INV. TO <i>Mary Reid/Kozak</i>	COPIES OF INV. TO

CREDIT FOR SAME	SHIPPED TO Westinghouse Electric Corp. Science & Technology Center 1310 Beulah Rd. Pittsburgh, PA 15235
-----------------------	---

MARK EACH PACKAGE
 Attn: R.J. Jacko

F.O.B. Madison, PA	CHARGE TRANSP. TO XARD-95063	TAX CODE	HOW TO SHIP AND ROUTE Hand Carry	PREPAID CO.
MATERIAL LOCATED IN See L. Kozak	DATE MATERIAL TO BE SHIPPED 12/05/95		EST. VAL 100.	

PKG. NO. & WEIGHT	ITEM	QUANTITY	IDENTIFICATION AND DESCRIPTION	UNIT PRICE	MULTIPLIER	AMOUNT
	1	2 ea.	7/8 split clamps (TSP)			
	2	33 ea.	8" long MA Alloy 600 HT 8161 Serial Numbers TSPD-1 thru TSP-33			
	3	9 ea.	8" long MA Alloy 600 HT 3330			

5 DEC 95

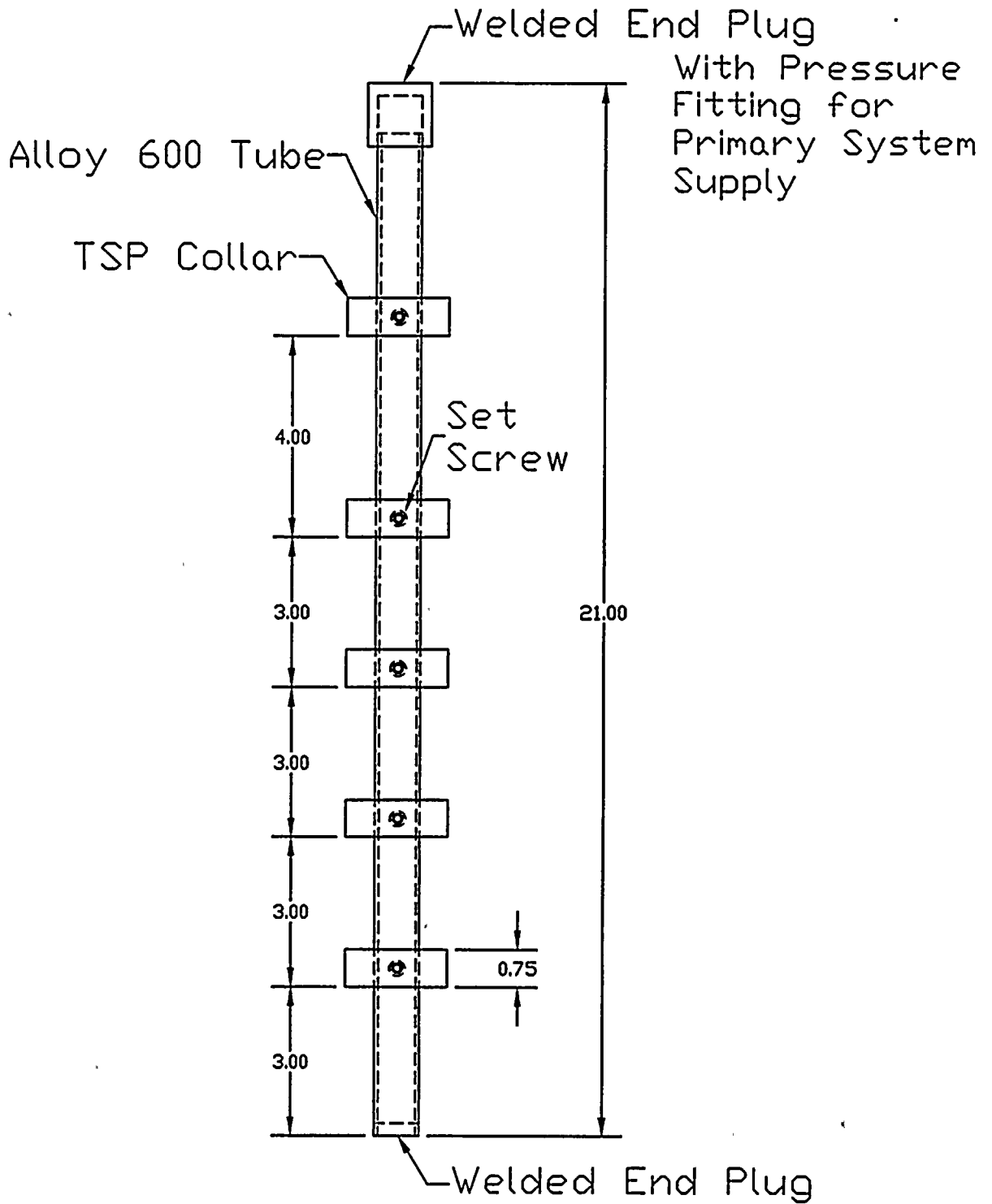
Rec'd L. Kozak

REASON FOR SHIPPING for use in testing
 When material is returned - deliver to L.M. Kozak

GROSS WEIGHT	CHG. INCOMING TRANSP. YES NO	INCOMING CARRIER	FINV	CREDIT ACCOUNT	COMM. C
ZONE	AMT. PPD.	REQUESTED BY L. Kozak 12/05/95	DEPT.	APPROVED	CORRESPONDENT
EXP. W/B. NO.	CAR INFORMATION	ROUTE	SHIPMENT NO. AND DATE	PART.	FINAL PF

F-2
1997 Set Screw Samples
Heat 2650 (All)

Set Screw Sample Specimen Schematic



F-2 (con't)

1997 Set Screw Sample Tubing Material Certifications



Industrial
Services
Integration
Division

QUALITY RELEASE

TUBE# 307
390

BOP-100R

QR-11401 REV. 2

ORDER NO 734220	PART NAME I-600 TUBING	DRAWING & REV N/A
SER NO —	CHG NOTICE NO —	PO ITEM NO 001
SUPPLIER W. SMP	PROJ. SO NO BHUP-0589	QTY. ON ORDER 2
	E. SPEC & REV 265694, Rev. 3	QTY. RELEASED 2
		ORDER COMPLETE <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO

SERIAL OR IDENTIFICATION NOS
~~XXXXXXXXXXXXXXXXXXXX~~

MATL. SIZE: .875X.050X40"

The equipment shown hereon is released by W Quality Assurance. Shipment may be made subject to authorization by W Purchasing. In the Audit Checklist below, an A indicates acceptability, a C indicates a contingency and a W indicates that W QA has waived the auditing or witnessing of the attribute. All non-applicable items are lined out.

AUDIT CHECKLIST

<input checked="" type="checkbox"/> Material Certifications	<input type="checkbox"/> Non-Operating Electrical Tests
<input type="checkbox"/> Test Final Records	<input type="checkbox"/> Operating Electrical Test
<input type="checkbox"/> QI Plan and Records	<input type="checkbox"/> Pressure Test
<input type="checkbox"/> Test Records	<input type="checkbox"/> Seat Tightness Test
<input type="checkbox"/> Visual	<input type="checkbox"/> Performance Test
<input checked="" type="checkbox"/> Dimensional W. SMP	<input checked="" type="checkbox"/> Cleanliness
<input type="checkbox"/> Material Records	<input checked="" type="checkbox"/> Packaging
<input type="checkbox"/> Welding Qualification	<input type="checkbox"/> Code Form
<input checked="" type="checkbox"/> CofC	<input type="checkbox"/> Painting
<input type="checkbox"/>	<input type="checkbox"/>

NO REMAINS OR DEVIATIONS HAVE BEEN APPROVED BY THE RESPONSIBLE WESTINGHOUSE ENGINEER UNLESS A SPECIFIC EXCEPTION IS STATED.
Released from WNSID Sec 2 for use on BHUP-0589

<p>THE SUPPLIER CERTIFIES that for the equipment and material released, all contractual requirements have been met. Approved deviations, if any, are listed above.</p>	SUPPLIER SIGNATURE	DATE
	TITLE	
<p>Equipment shown hereon is released by <u>W</u> Quality Assurance. Shipment may be made subject to authorization by <u>W</u> Purchasing. Equipment supplier has certified that the equipment above meets all requirements of the purchase order drawings and specifications. Westinghouse has reviewed evidence supporting this release and as specified above has detected no deviations from such requirements. This release does not waive any rights Westinghouse may have under the purchase order including Westinghouse's right to reject the equipment upon discovery of any such deviations after arrival at destination.</p>	<p><i>[Signature]</i> 7/9/86 Westinghouse Quality Assurance Representative</p>	

CUSTOMER (W) NES CUSTOMER ORDER NO. 546-MZY-434220-PN

(W) ORDER NUMBER T10-00797 SPECIFICATION NUMBER 2656A84 Rev. 3

TYPE OF MATERIAL: WESTRO ALLOY 600T SEAMLESS TUBE, NON-THERMALLY TREATED

0.875" Ncm. O.D. x .050" Avg. Wall x 40" Long

MATERIAL SPECIFICATION ASME-SB-163, Alloy UNS N06600, W '79 Addenda and Code Case N-20 (1484)

Box No. 100 - Ht. No. NX-1019-110 pcs. Box No. 102 -
Box No. 101 - Ht. No. NX-1019 - 78 pcs. Ht. NX-1019 -47 -
Box No. 101 - Ht. No. NX-1015 - 32 pcs.
Box No. 102 - Ht. No. NX-1015 - 63 pcs.

MATERIAL IDENTIFICATION MARKING: On shipping container, maintained by lot, material marking not permitted (NCA 3866.6[a][2] and NCA 3866.6 [a][4]).

MATERIAL TESTS:

FLARE TEST - On each end of each tube - Satisfactory.

TENSILE & HARDNESS - Shown at least once by heat and item on attached sheet.

CHEMISTRY - Copy of vendor report of chemistry attached.

THIS IS TO CERTIFY THAT TO THE BEST OF OUR KNOWLEDGE AND BELIEF, BASED ON ACTUAL INSPECTION AND/OR TESTS, THE ABOVE DESCRIBED PARTS ARE IN ACCORDANCE WITH DRAWING AND/OR SPECIFICATIONS, AND WERE MANUFACTURED IN ACCORDANCE WITH A DOCUMENTED QUALITY PROGRAM MEETING THE REQUIREMENTS OF NCA-3800.

QRS-1778

R. D. Petrosky
R. D. Petrosky Date /
Mgr. of Insp. & Quality Serv.
6/1/87

WESTRO ALLOY 600T MATERIAL CERTIFICATION

(H) Order Number T10-00797

Customer Order No. 546-MZY-434220-P..

Heat Number	C	Mn	Fe	S	Si	Cu	Ni	Cr	Al	Ti	Co	P	B	Ultimate Strength PSI	Yield Strength PSI	% Elong.	R ₁ la. n.
21019	.034	.33	8.93	.003	.12	.42	74.86	15.31	.23	.19	.04	.009	.003	108,000	57,000	38	8t
21819	.047	.26	9.00	.001	.18	.28	74.49	15.74	.24	.23	.04	.008	.005	110,000	58,000	37	8c

F2-9

In Situ Heat Treatment of U-Bends.

NP-5496
Research Project S303-11
Final Report, November 1987

Prepared by
WESTINGHOUSE ELECTRIC CORPORATION
Post Office Box 855
Pittsburgh, Pennsylvania 15230

Principal Investigators
F. W. Pement
G. Economy
R. G. Aspden

Prepared for
Steam Generator Owners Group
and
Electric Power Research Institute
3412 Hillview Avenue
Palo Alto, California 94304

EPRI Project Manager
A. R. McIlree
Nuclear Power Division

TABLE 2-1
 CHARACTERISTICS OF ALLOY 600 U-BEND TEST HEATS
 (MILL ANNEALED STRAIGHT LENGTHS)

HEAT NUMBER	2616	2650
NOMINAL OUTSIDE DIAMETER (in.)	3/4	7/8
NOMINAL WALL THICKNESS (in.)	0.043	0.050
% C	0.030 [*] /0.031 ^{**}	0.035 [*] /0.039 ^{**}
% Ni	73.81	74.83
% Cr	16.15	15.06
% Fe	9.28	9.27
% Mn	0.24	0.30
% Si	0.22	0.21
% Cu	0.27	0.29
% Ti	0.22	0.22
% Al	0.27	0.24
% Co	0.05	0.05
% S	0.001	0.001
% P	0.010	0.008
% B	0.000 [*] /0.003 ^{**}	0.000 [*] /0.003 ^{**}
ULTIMATE TENSILE STRENGTH (ksi) [*]	107.0	104.0
YIELD STRENGTH (ksi) [*]	64.0	61.0
ELONGATION IN 2 IN. (%) [*]	37.0	40.5
HARDNESS (R _B) [*]	88	87
ASTM GRAIN SIZE ^{**}	9.5	9.0
INTERGRANULAR PRECIPITATES ^{**}	LIGHT	VERY LIGHT
INTRAGRANULAR PRECIPITATES ^{**}	MEDIUM	MEDIUM

^{*}From Ref. (3).

^{**}From Ref. (5). Others are as reported in Refs. (3) and (5).

09/16/83 2,28 PM.

QUALITY CONTROL HEAT MASTER FILE LISTING FOR THERMALLY TREATED TUBES

HEAT NO	HUNTINGTON ALLOY LADLE ANALYSIS						TESTING BY SPECIALTY METALS DIVISION							
							YIELD	TENSILE	EL. RB	* HUEY	MA	TT	MARF	
2646 F2-12	C	.029	MN .26	FE 9.20	S .002	** 11/16	55,000	109,000	37.0	86	*	11/16	.00	.24
	SI	.27	CU .06	NI 74.33	CR 15.85	** 11/16	57,000	111,000	36.0	86	*	11/16	.00	.14
	AL	.24	TI .27	CO .02	P .006	** 11/16	49,000	106,000	40.0	83	*	11/16	.00	.22
	B	.003				** 7/8	49,000	106,000	42.0	84	*	7/8	.00	.10
2650	C	.038	MN .30	FE 9.27	S .001	** 11/16	52,000	107,000	38.0	85	*	11/16	.00	.59
	SI	.21	CU .29	NI 74.83	CR 15.06	** 11/16	49,000	105,000	38.0	83	*	11/16	.00	.22
	AL	.24	TI .22	CO .05	P .008	** 11/16	53,000	109,000	36.5	85	*	11/16	.00	.23
	B	.003				** 11/16	53,000	108,000	34.0	86	*	7/8	.00	.29
						** 7/8	49,200	104,500	40.5	85	*	7/8	.00	.19
2653	C	.037	MN .29	FE 9.24	S .001	** 11/16	57,000	109,000	37.0	87	*	11/16	.00	.20
	SI	.12	CU .30	NI 74.96	CR 15.05	** 11/16	57,000	111,000	36.5	88	*	11/16	.00	.12
	AL	.37	TI .23	CO .04	P .008	** 11/16	51,000	107,000	36.5	85	*	11/16	.00	.22
	B	.002				** 11/16	52,000	108,000	35.5	85	*	11/16	.00	.20
2654	C	.030	MN .31	FE 9.07	S .002	** 11/16	53,000	108,000	37.0	86	*	11/16	.00	.14
	SI	.16	CU .30	NI 74.40	CR 15.73	** 11/16	55,000	110,000	36.5	87	*	11/16	.00	.10
	AL	.19	TI .19	CO .05	P .008	** 11/16	51,000	107,000	36.5	84	*	11/16	.00	.12
	B	.003				** 11/16	53,000	110,000	37.5	85	*			
					** 11/16	41,000	93,000	32.5	85	*				
2655	C	.033	MN .31	FE 8.92	S .001	** 11/16	57,000	113,000	37.5	87	*	11/16	.00	.19
	SI	.25	CU .32	NI 74.44	CR 15.73	** 11/16	54,000	110,000	36.5	86	*	11/16	.00	.03

T. Properties

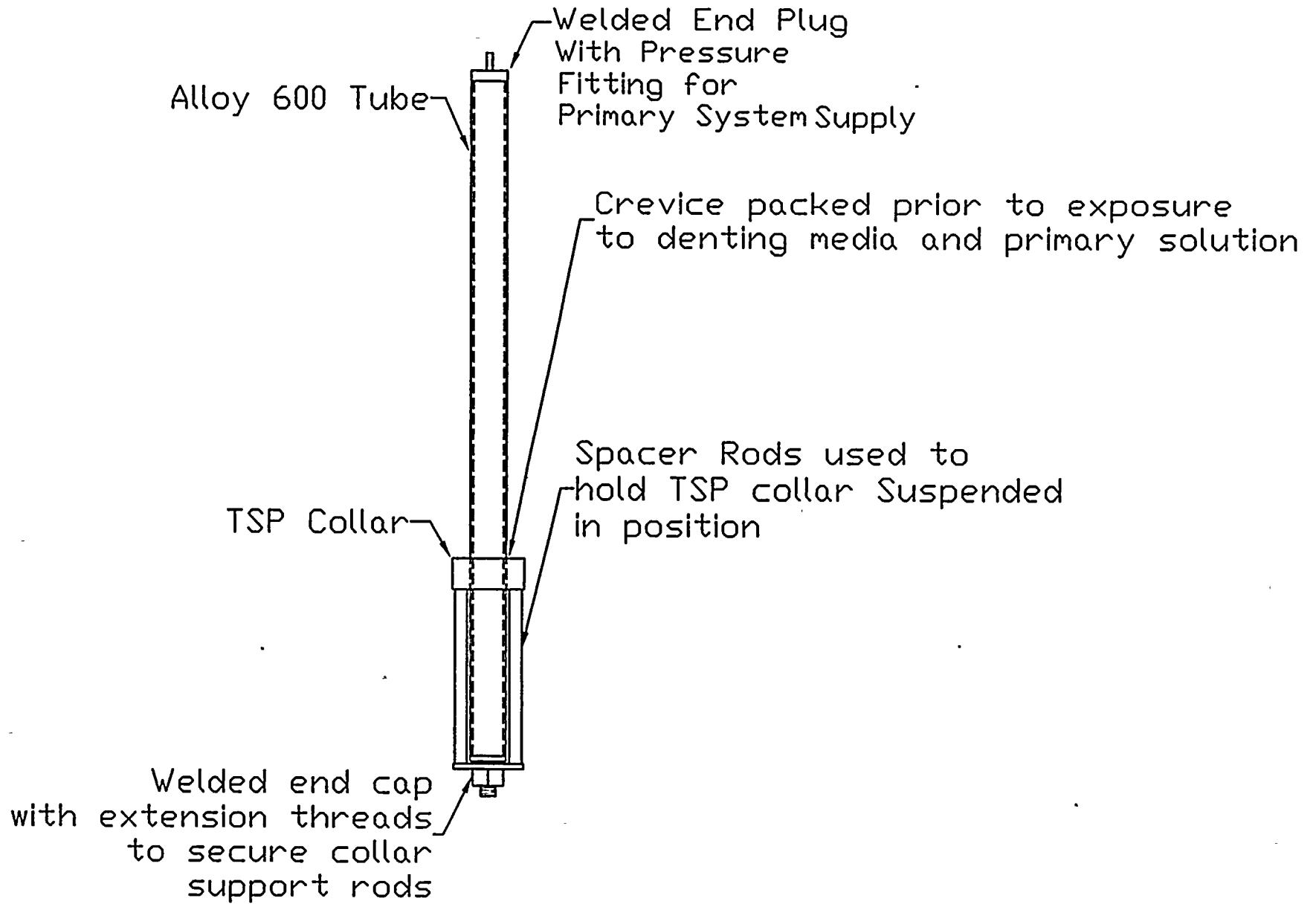
F-3

1997 Corrosion Dented Samples

**Samples TSP-21 thru TSP-30
Heat 1019 (See F-2)**

**Samples TSP-31, TSP-32
Heat 2650 (See F-2)**

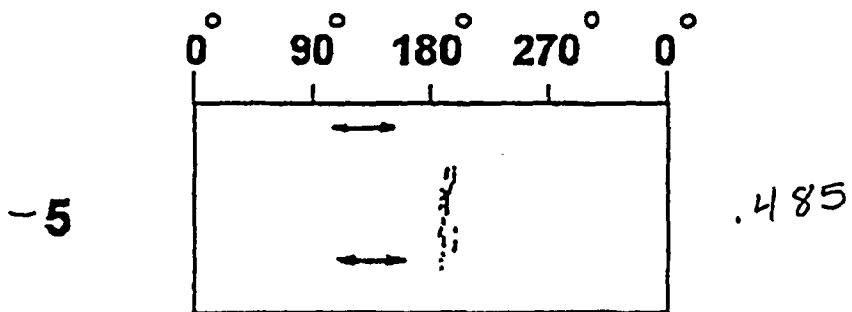
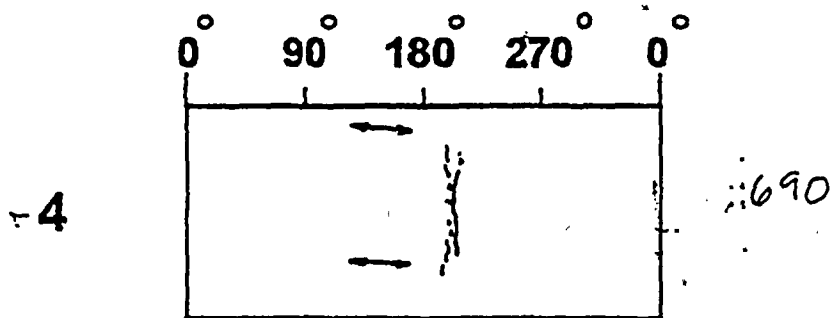
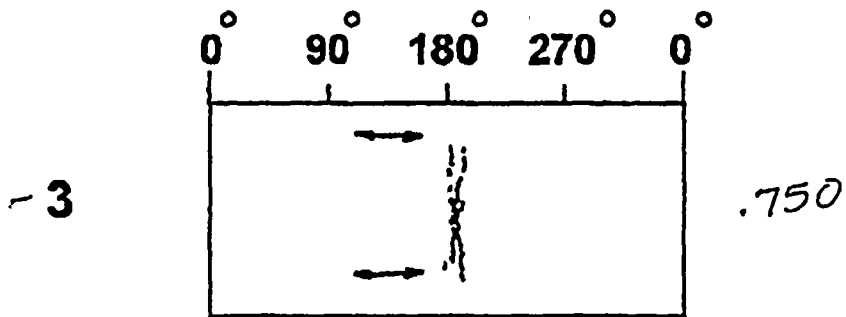
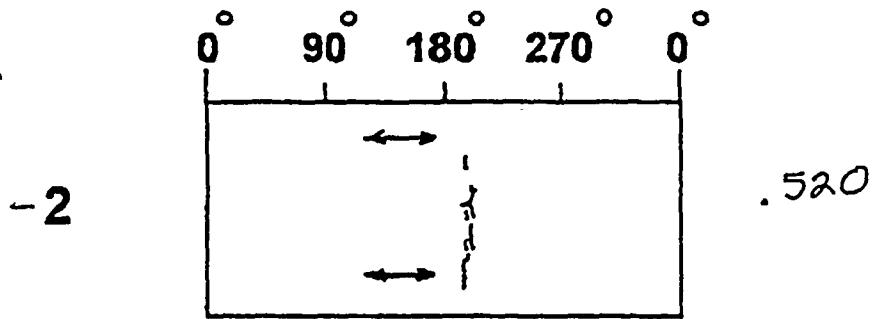
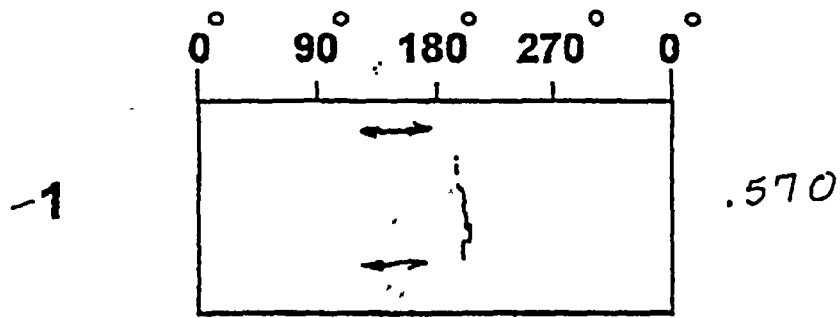
Corrosion Dented Specimen Schematic



Appendix G
Silastic Mold Crack Tracings

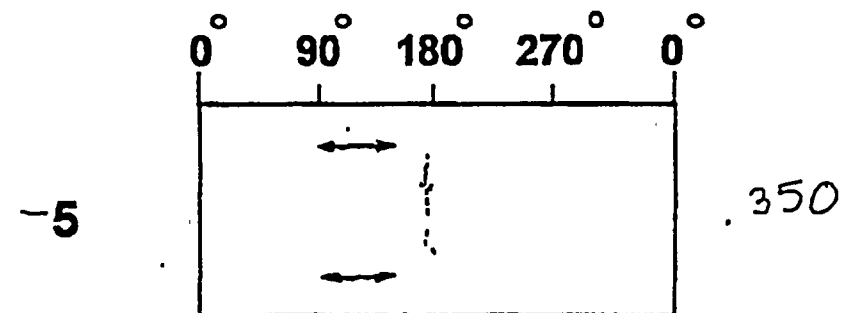
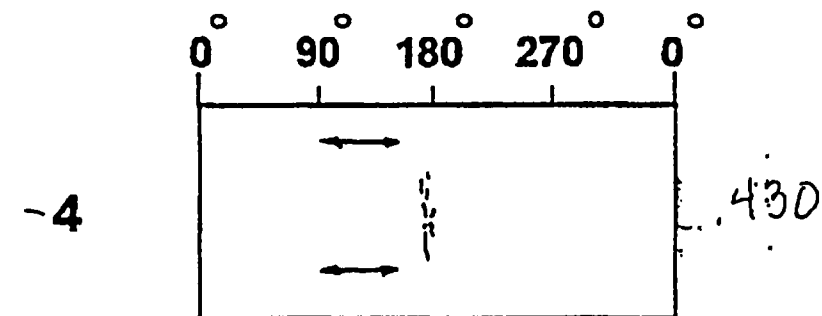
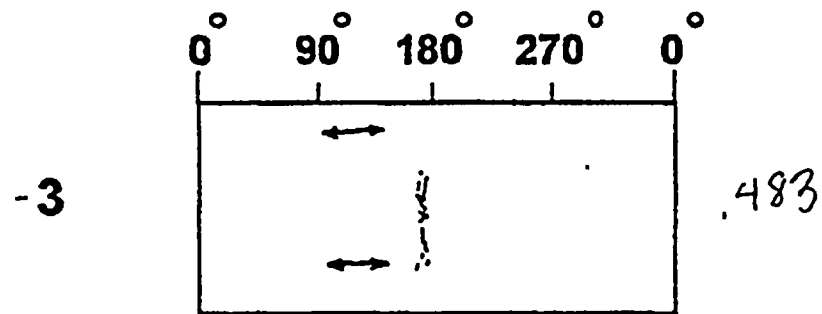
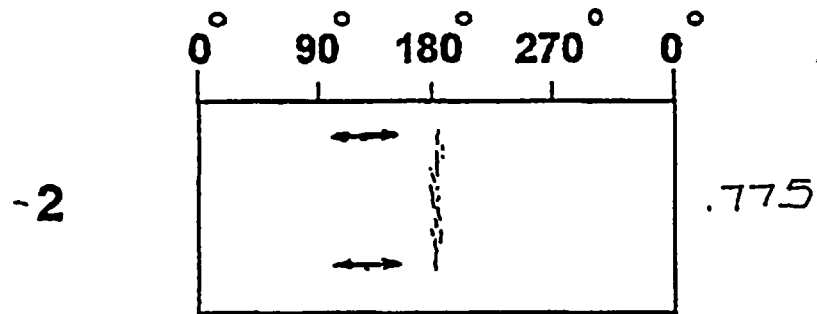
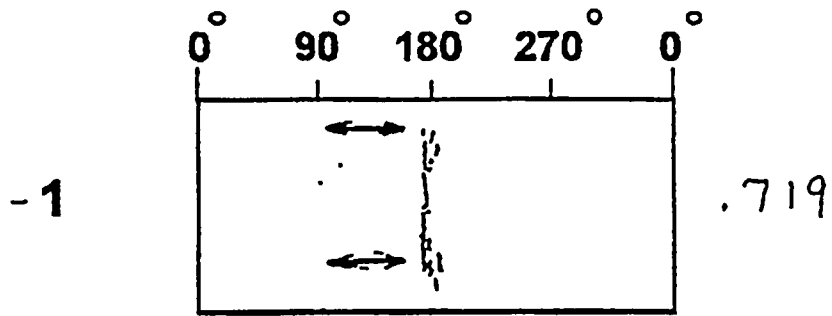
Sample # 1

Top



Sample # 2

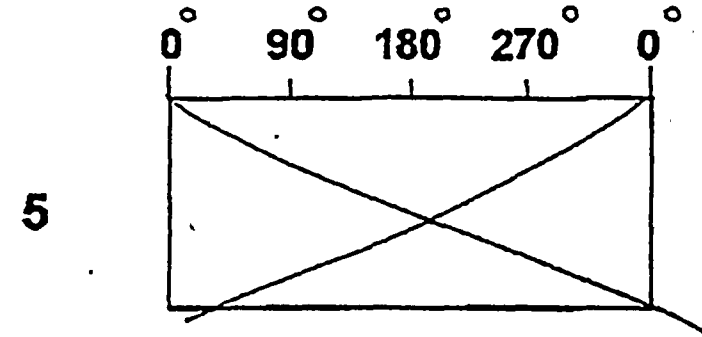
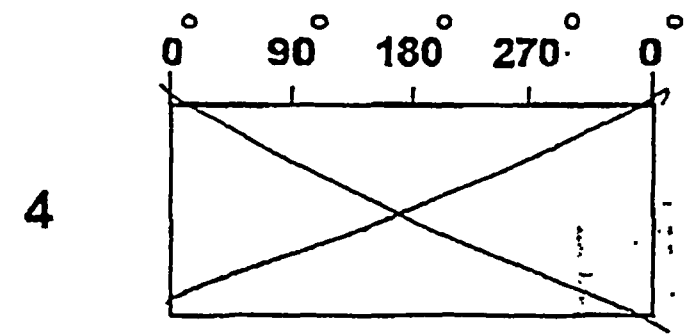
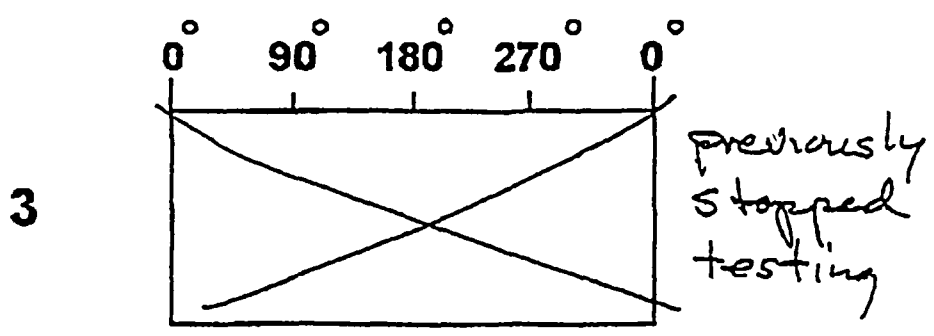
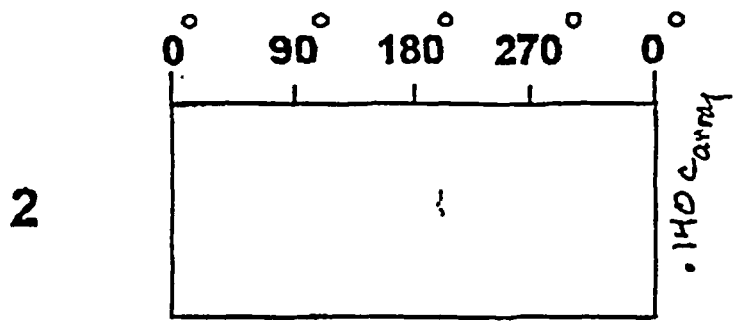
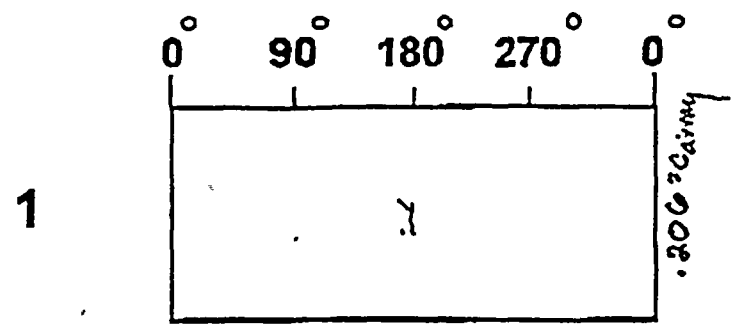
Top



G-4

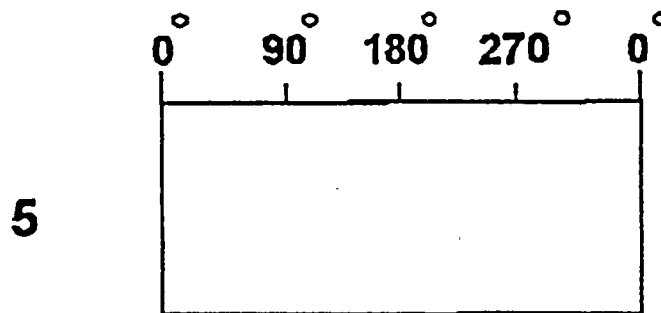
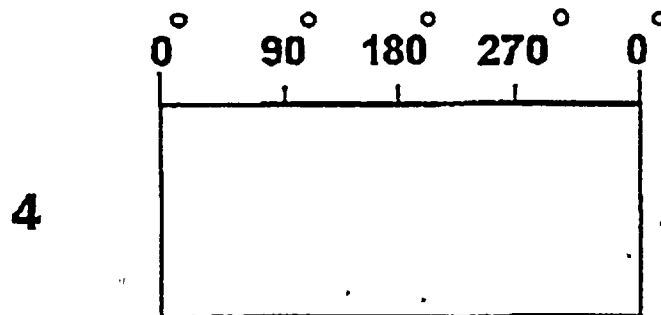
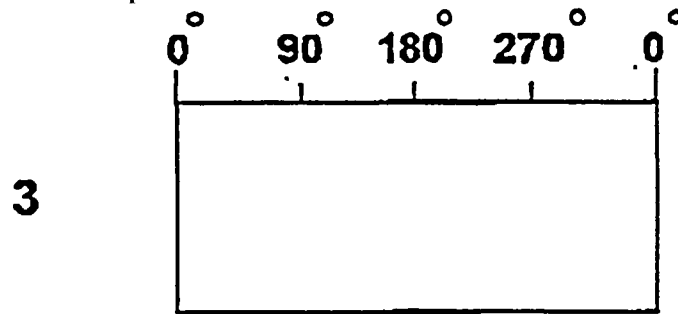
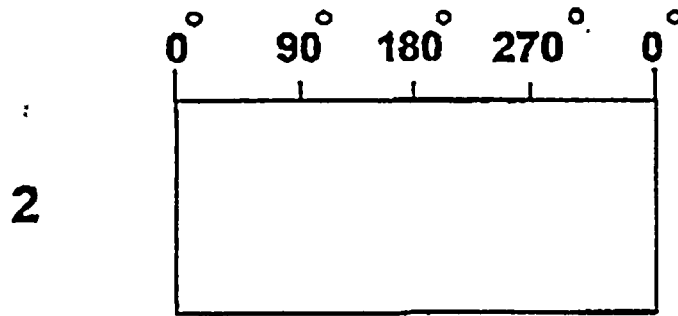
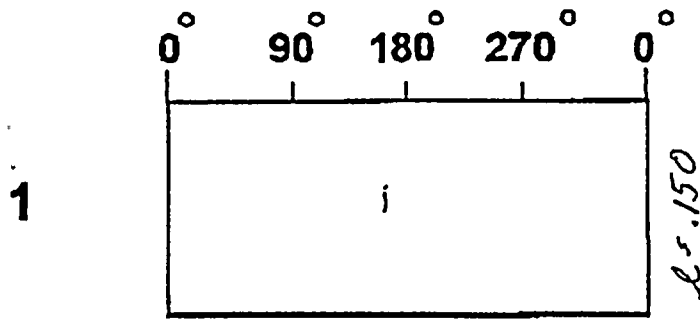
Sample # 3 9/5/97

Top



Sample # 3 (2nd Exposure) (3-1, 3-2)

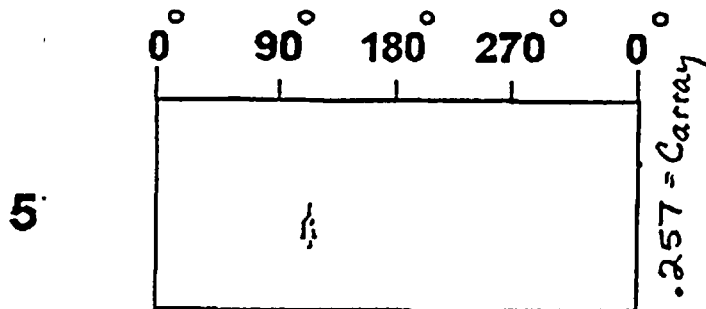
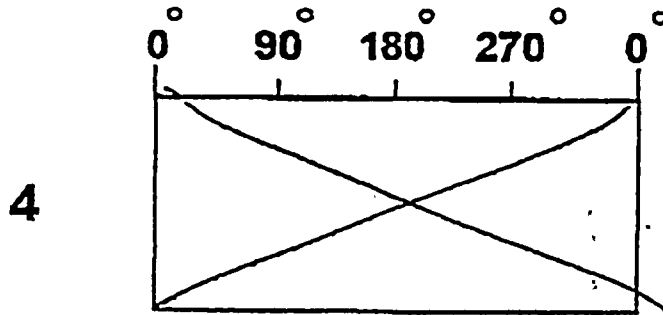
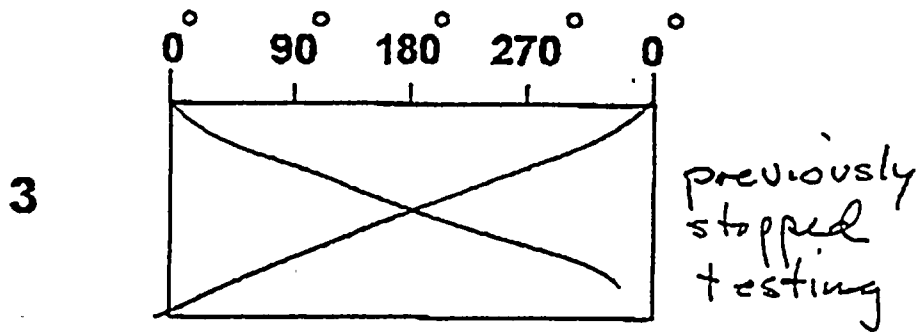
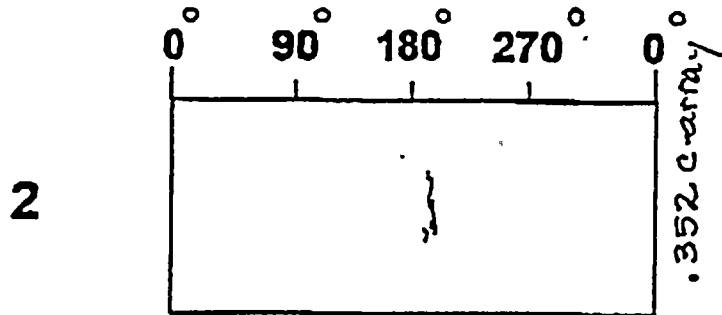
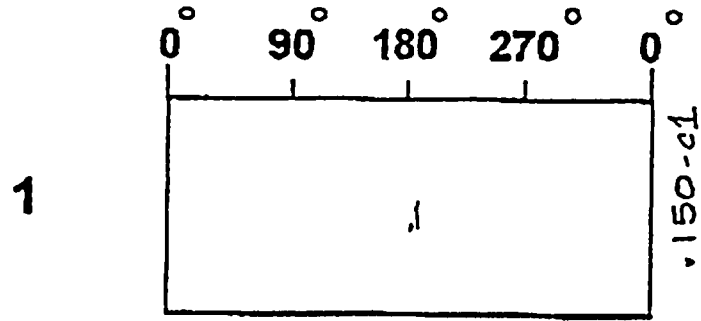
Top



Sample # 4

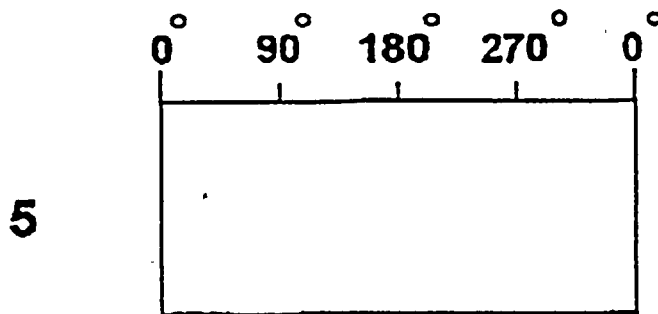
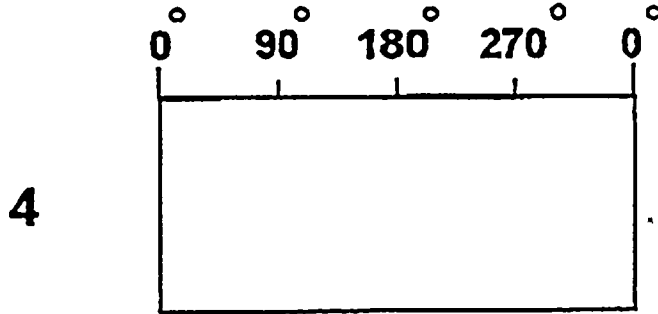
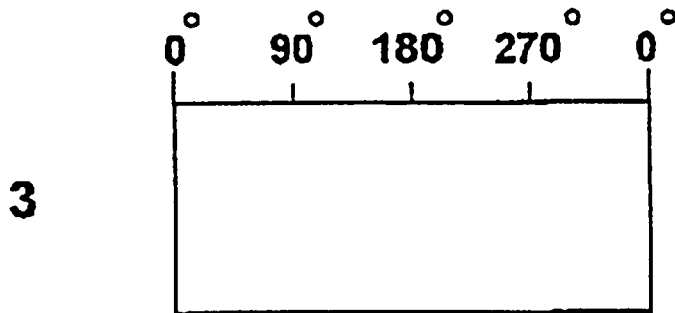
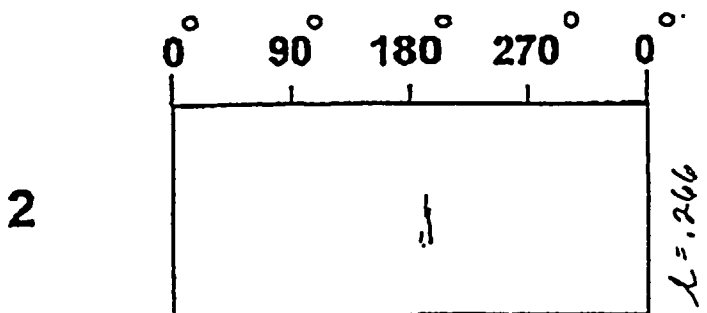
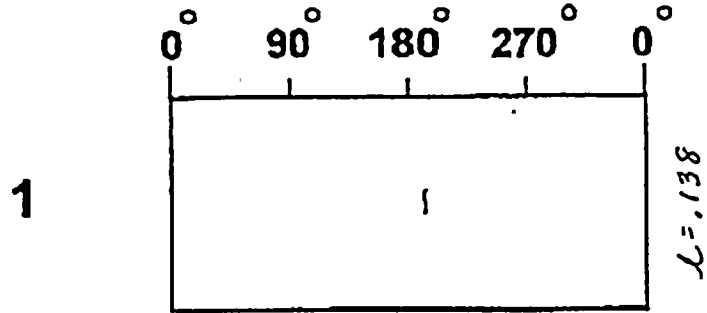
9/5/97

Top



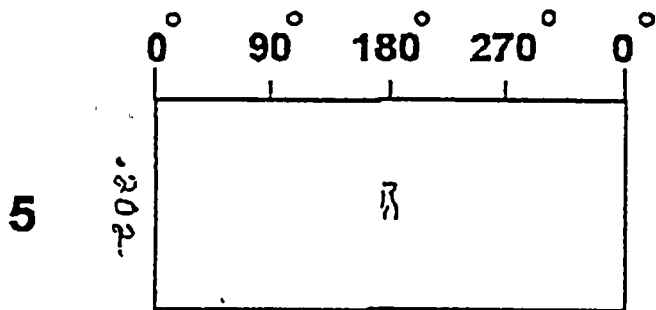
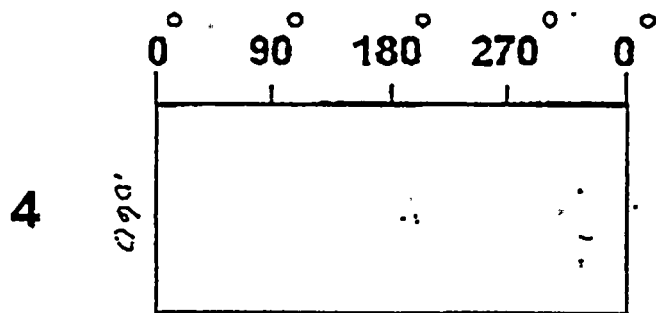
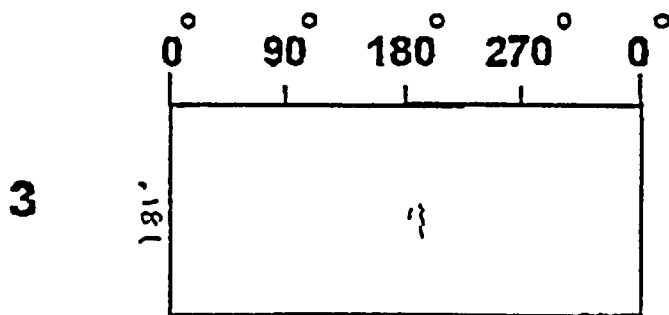
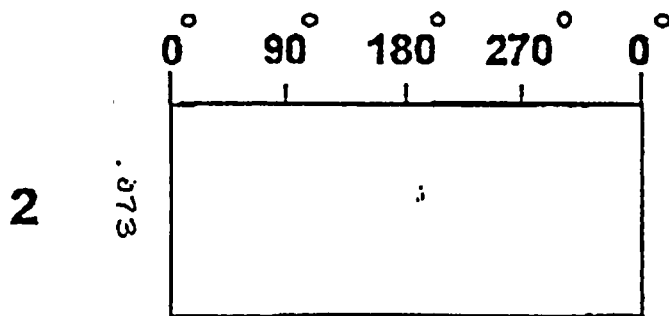
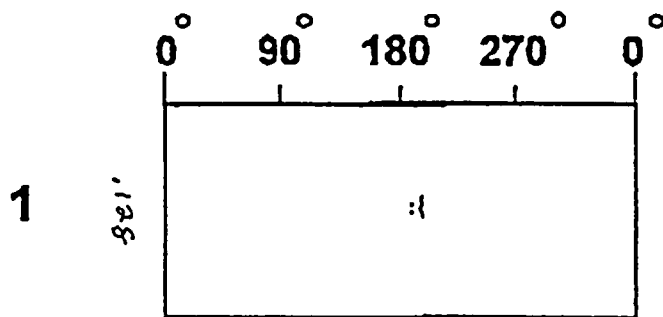
Sample # 4 (2nd exposure) (4-1, 4-2, 4-5)

Top



Sample # 3

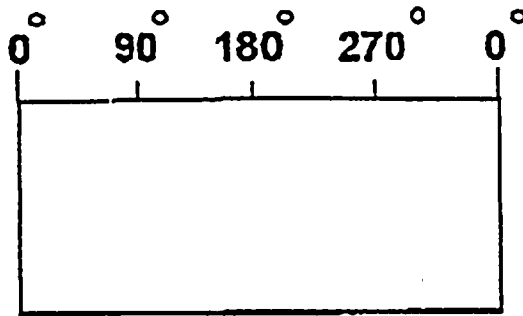
Top



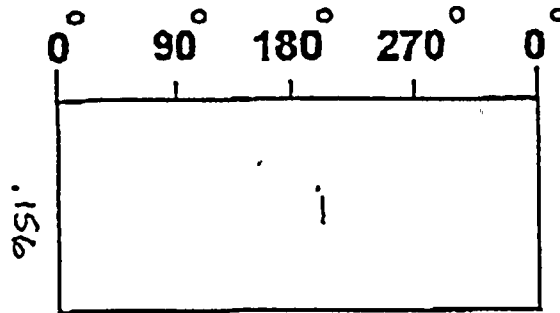
Sample # 4

Top

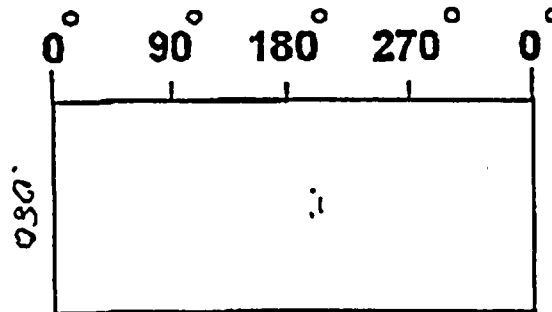
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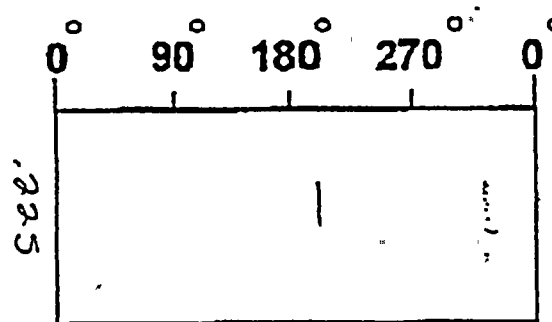
2



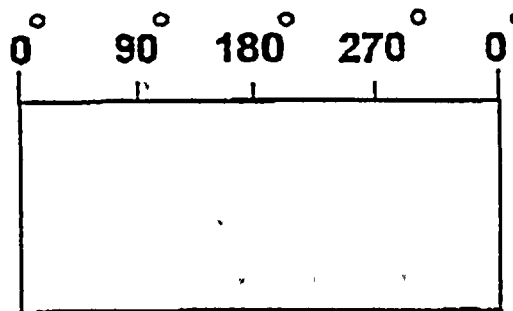
3



4

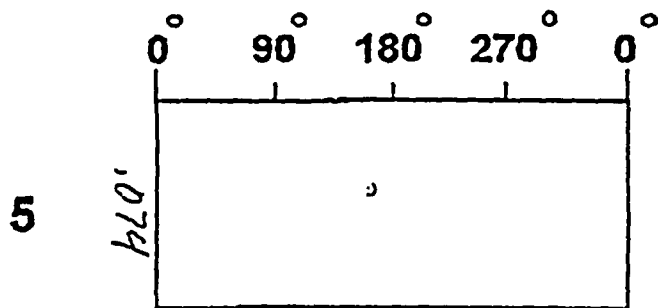
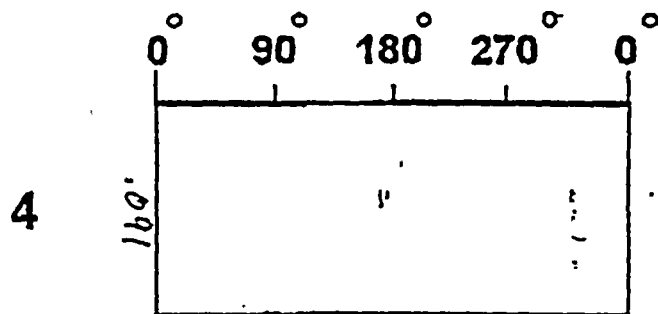
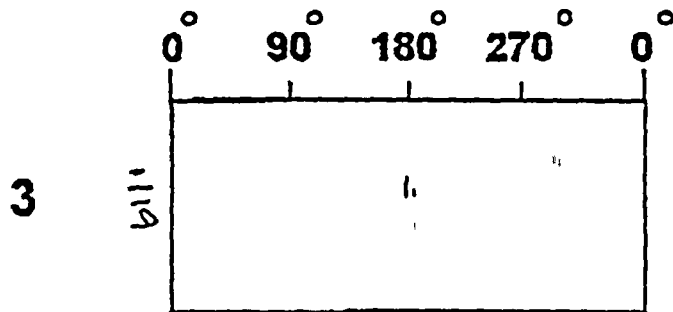
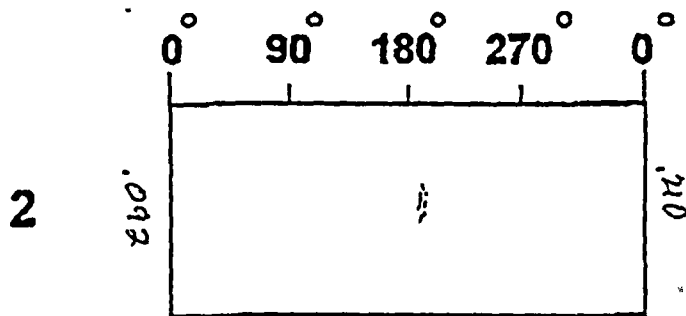
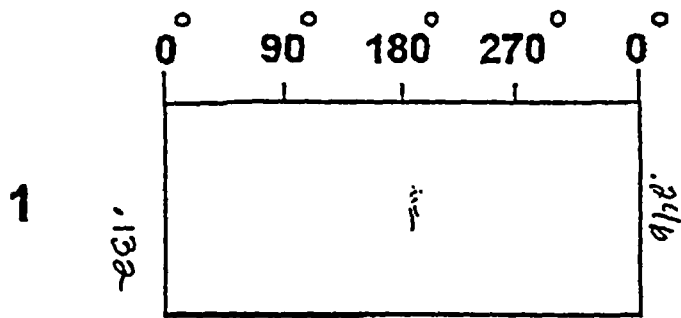


5



Sample # 5

Top



8.0"
9.0"
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11.0"
12.0"
13.0"
14.0"
15.0"
16.0"
17.0"
18.0"

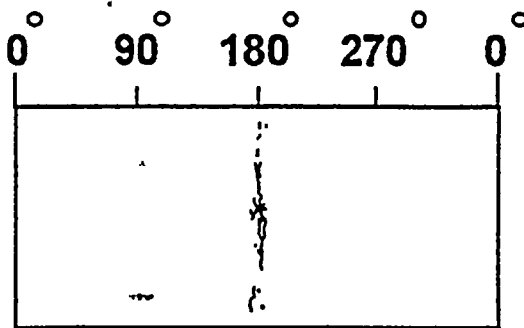
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880
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905
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980
985
990
995
1000



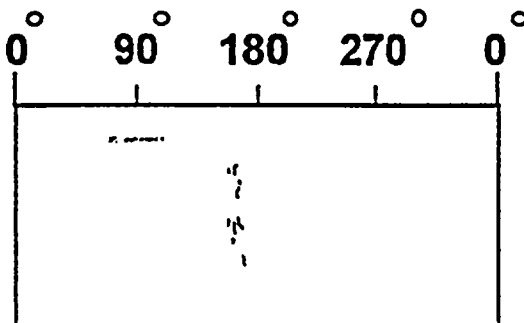
Sample # 7

Top

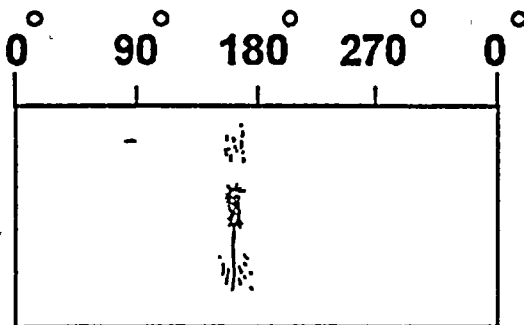
1



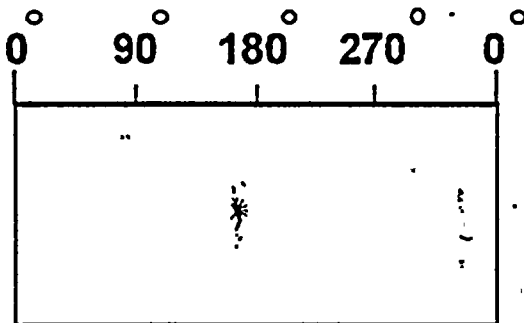
2



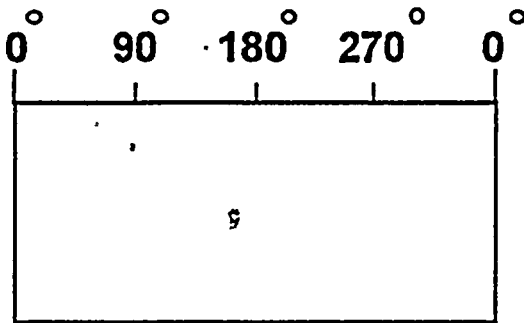
3



4

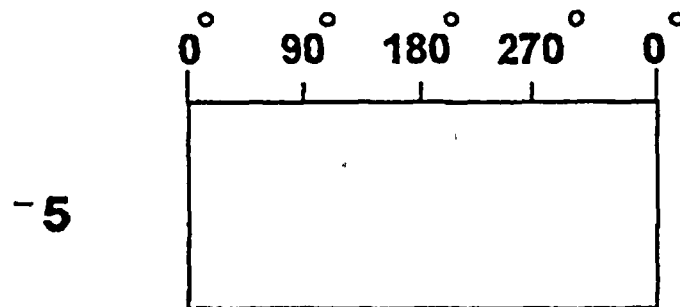
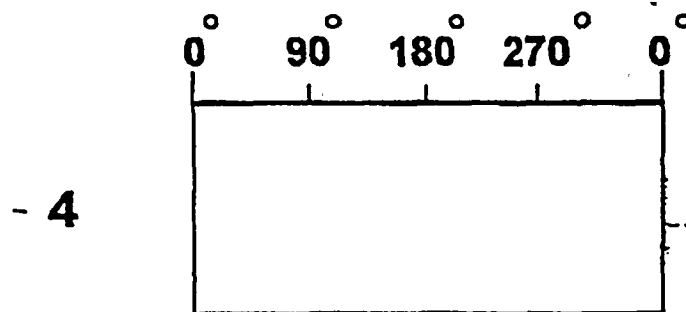
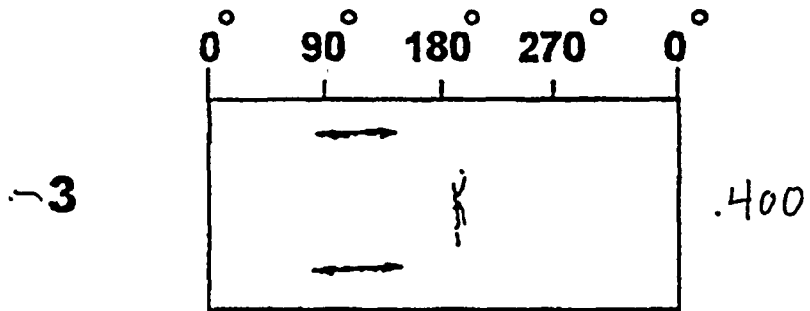
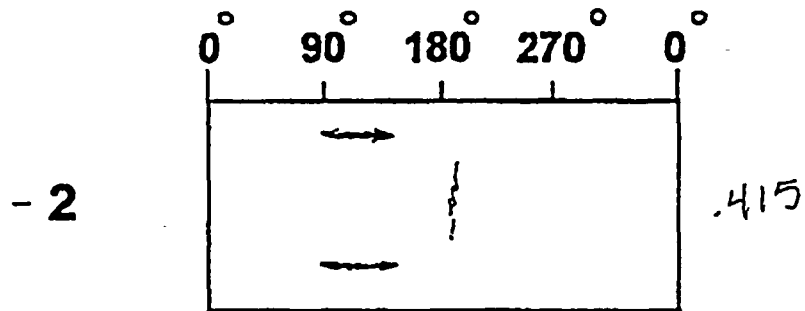
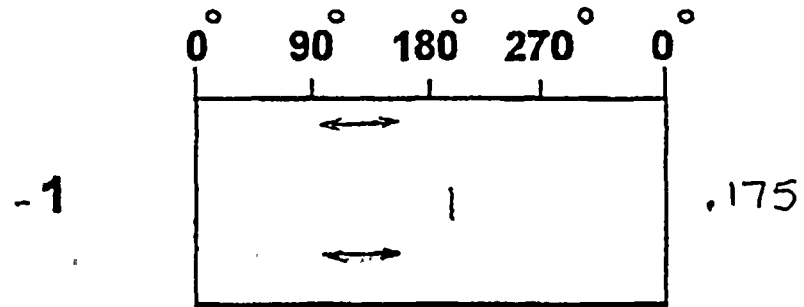


5



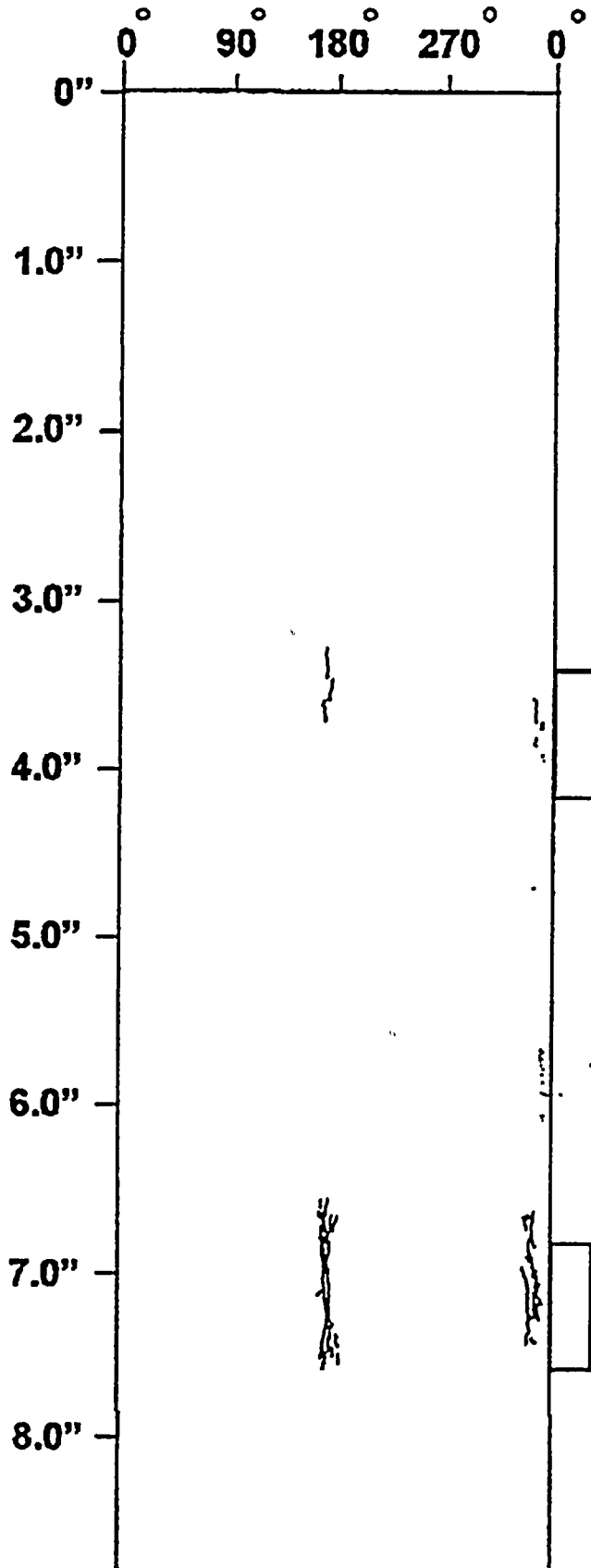
Sample # 8

Top

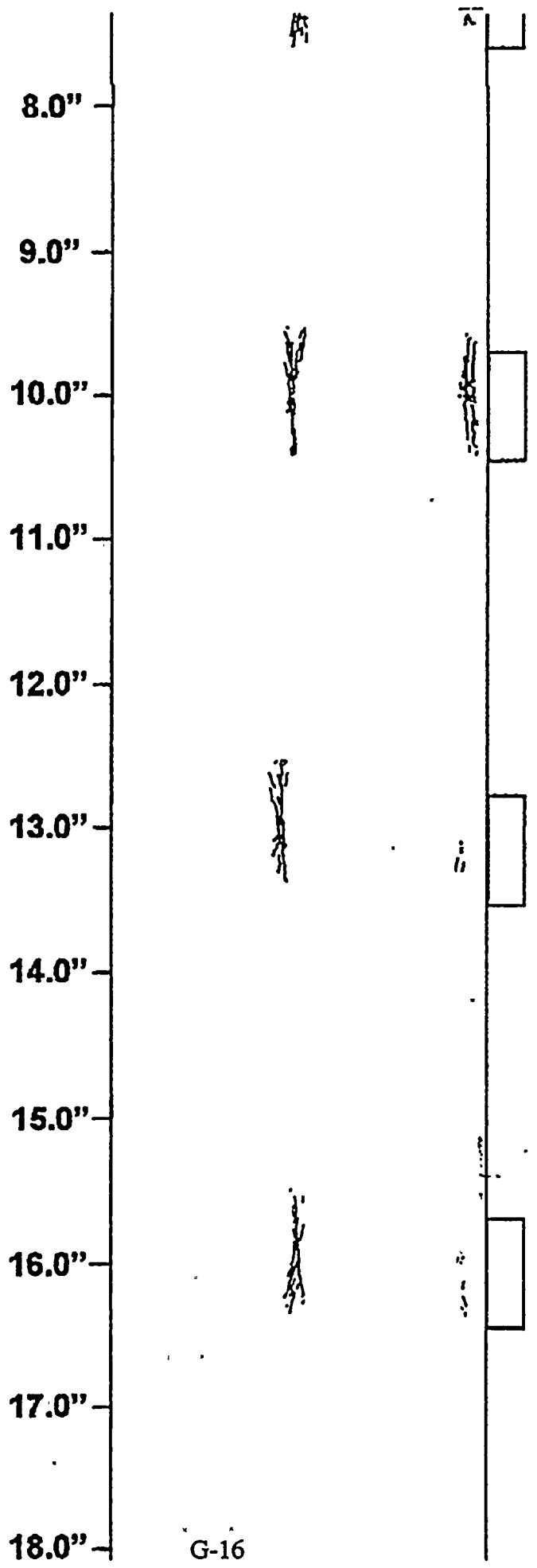


Tube # 9

9a



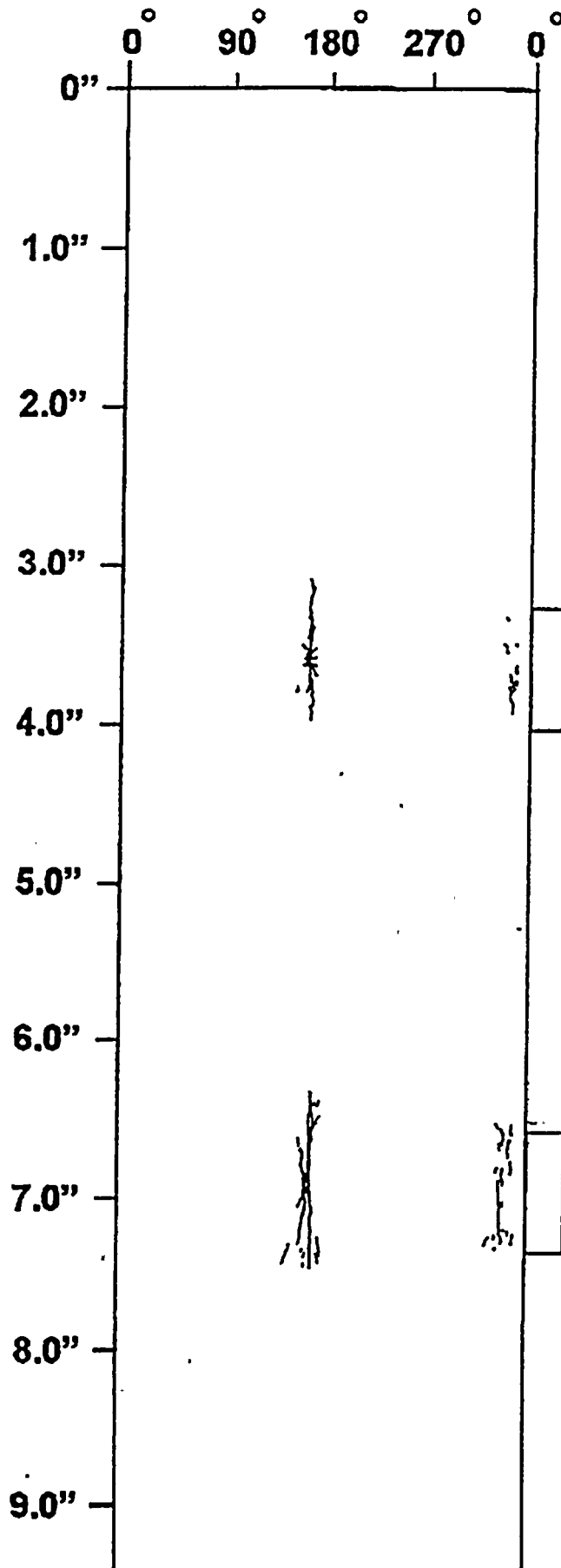
9b



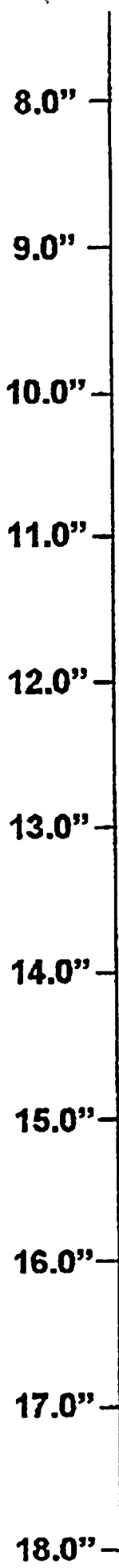
G-16

Tube # 10

10a

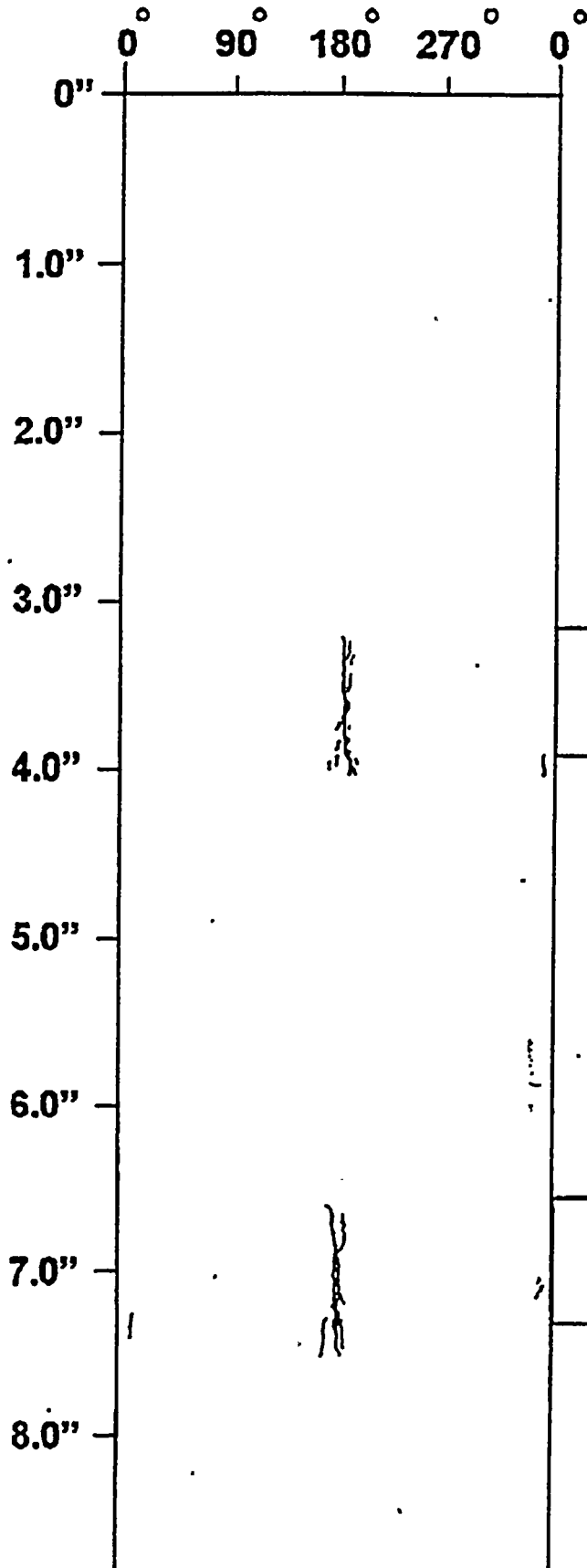


icb

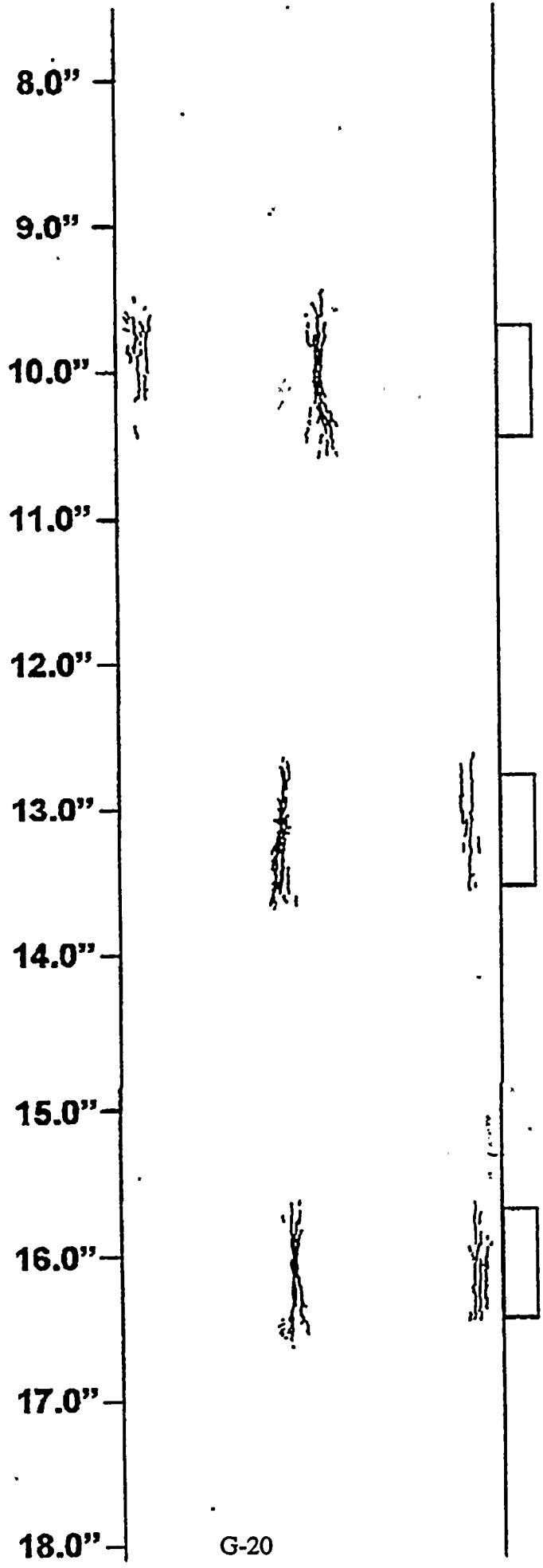


11a

Tube # 11



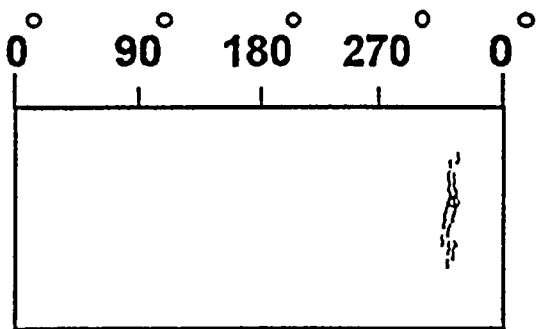
116



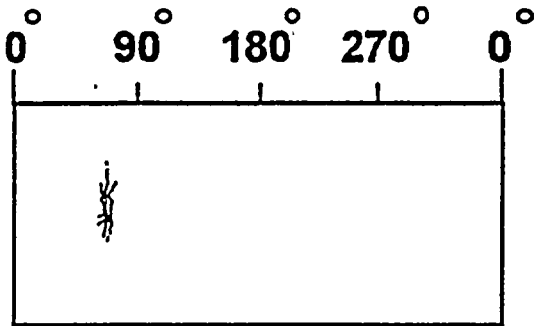
Sample # 13

Top

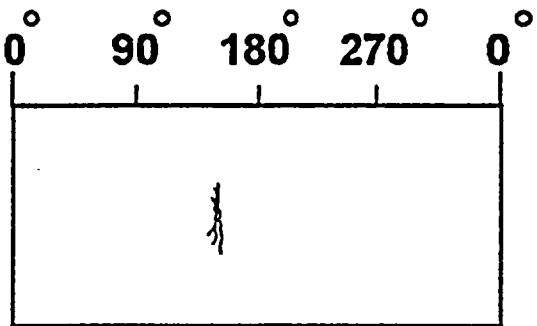
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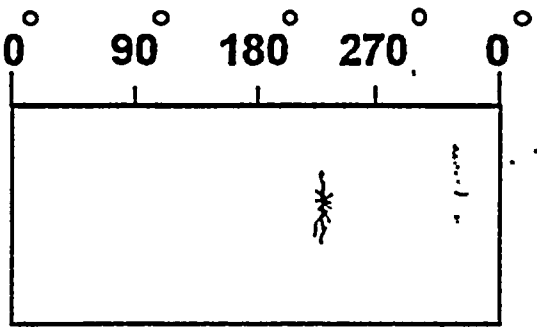
2



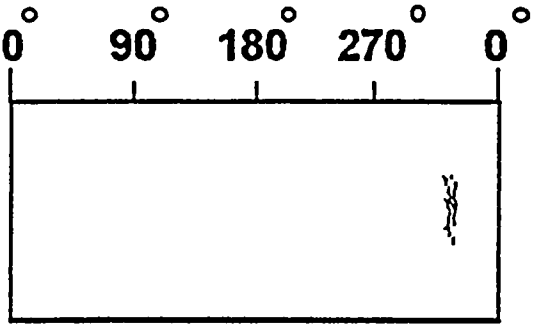
3



4



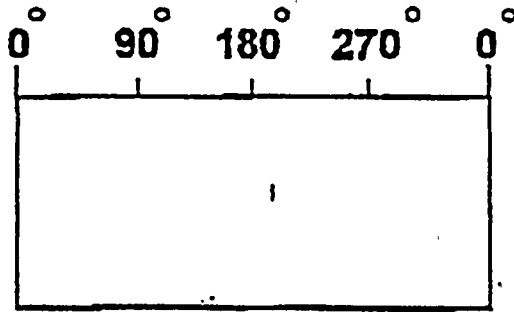
5



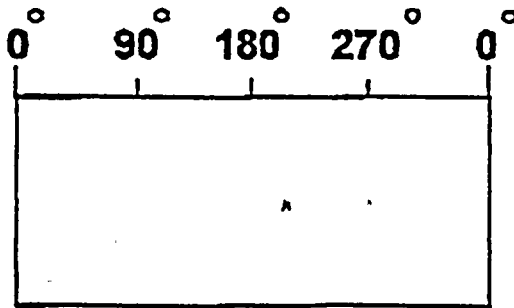
Sample # 14

Top

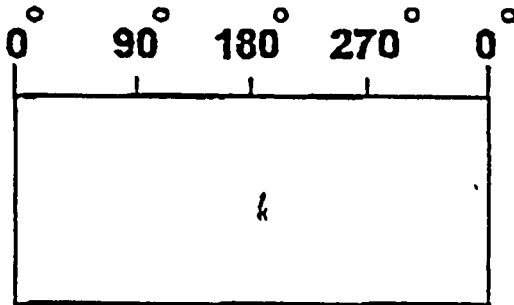
1



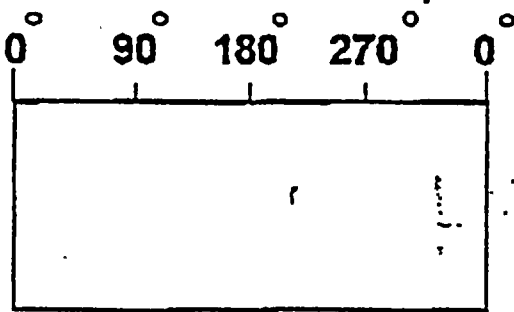
2



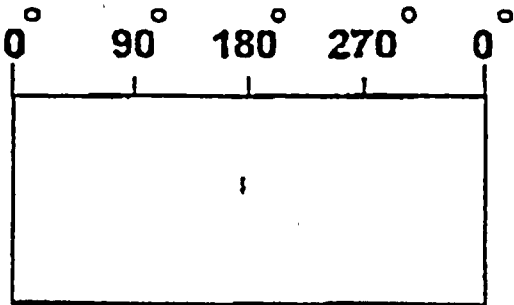
3



4



5



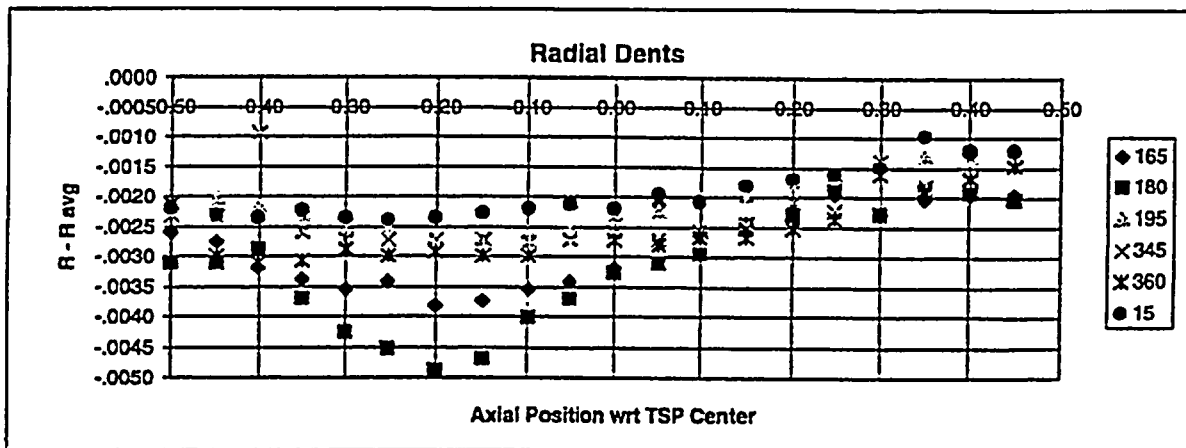
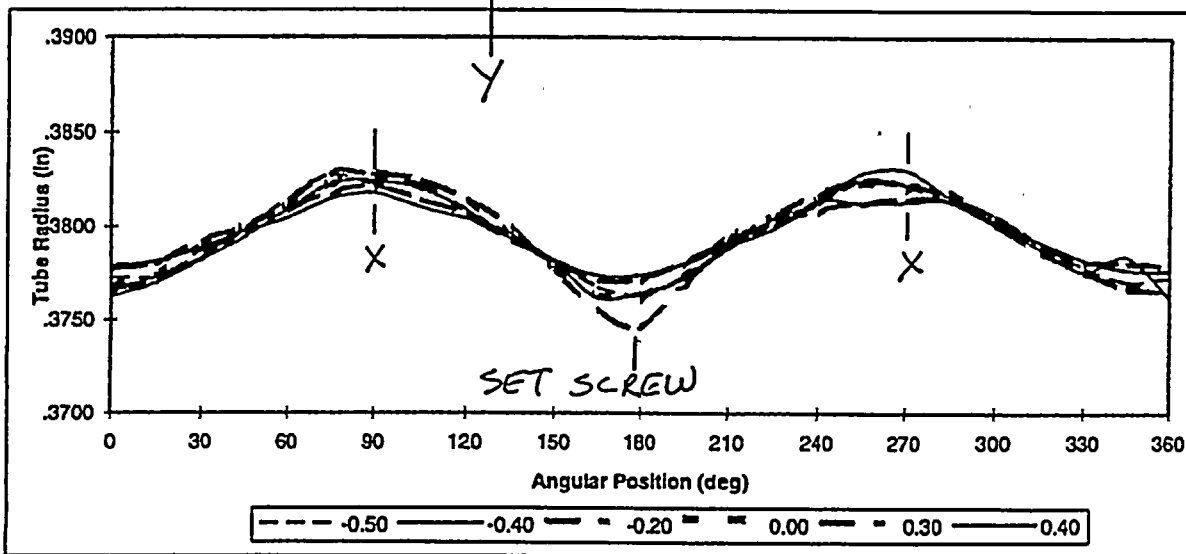
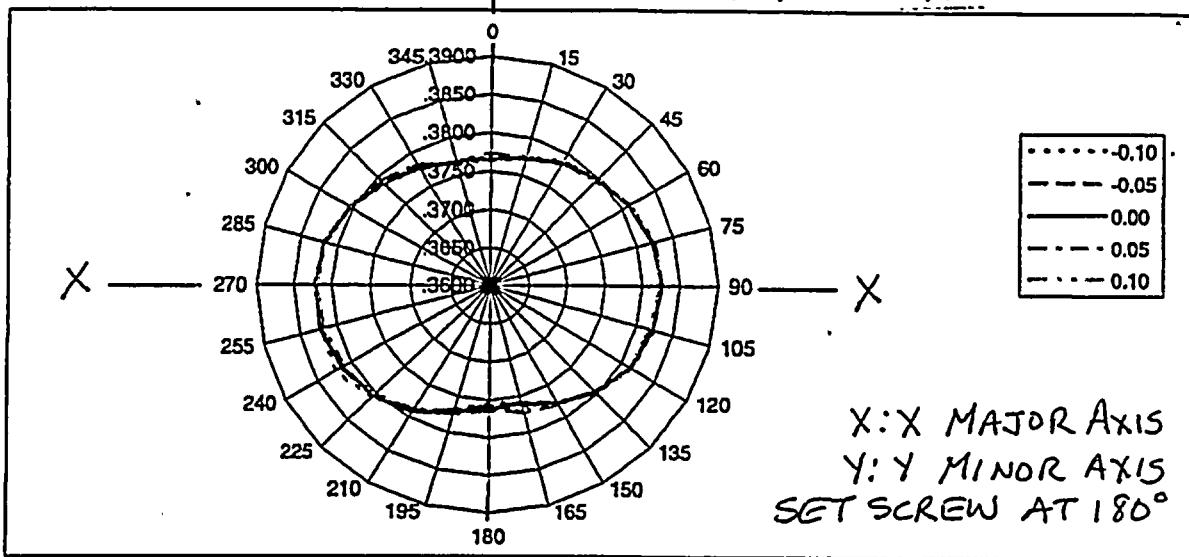
Appendix H

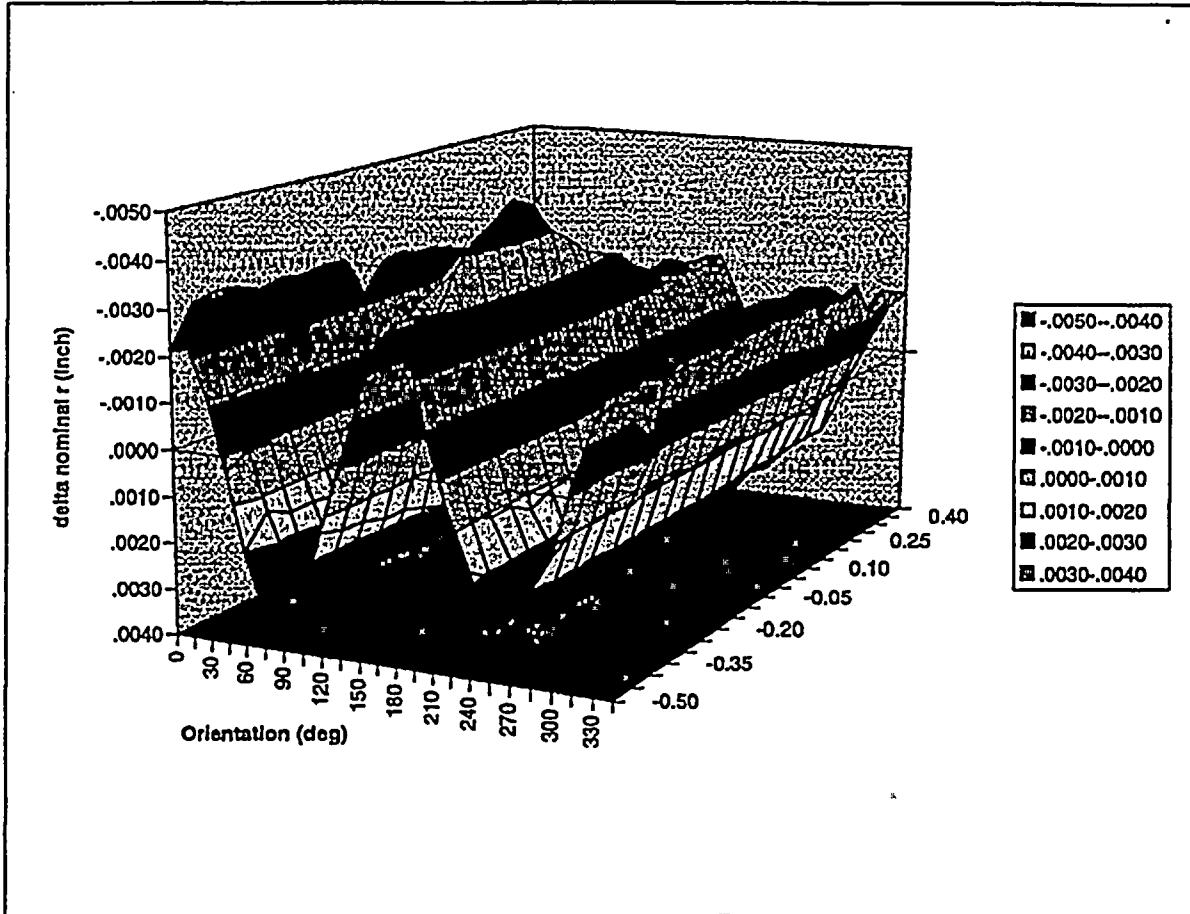
Dent Sample Laser Profilometry Data

Laser profilometry is provided for the following samples:

3-1	12-1
3-2	12-2
3-3	12-3
3-4	12-4
3-5	12-5
6-1	13-1
6-2	13-2
6-3	13-3
6-4	13-4
6-5	13-5
7-1	
7-2	
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7-4	
7-5	
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10-5	
11-1	
11-2	
11-3	
11-4	
11-5	

SPECIMEN
TSP
SMD03-1 = 3-1H

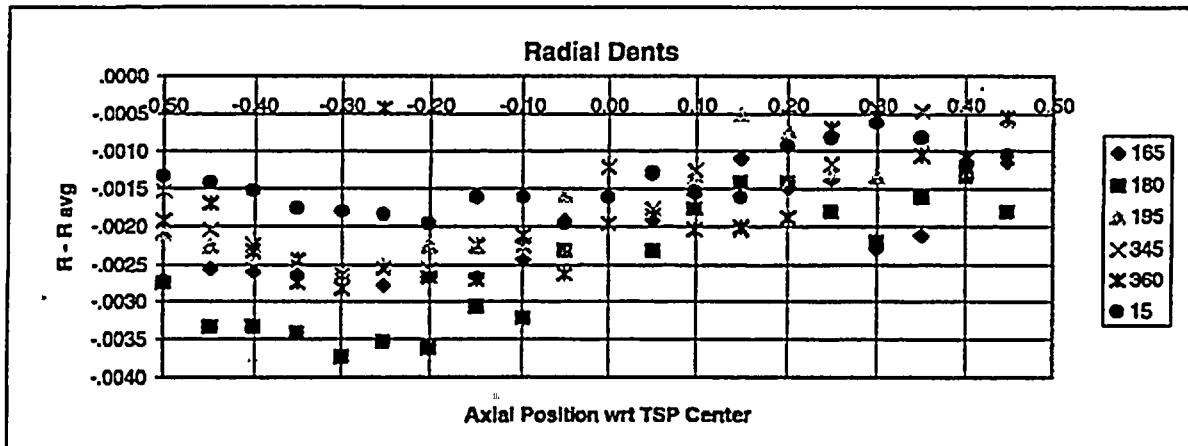
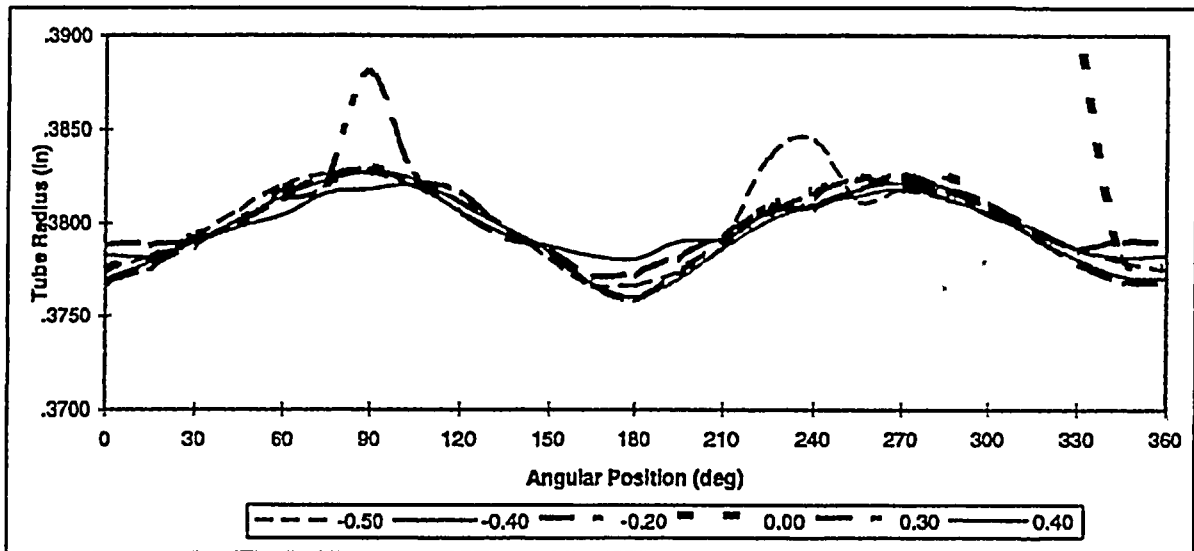
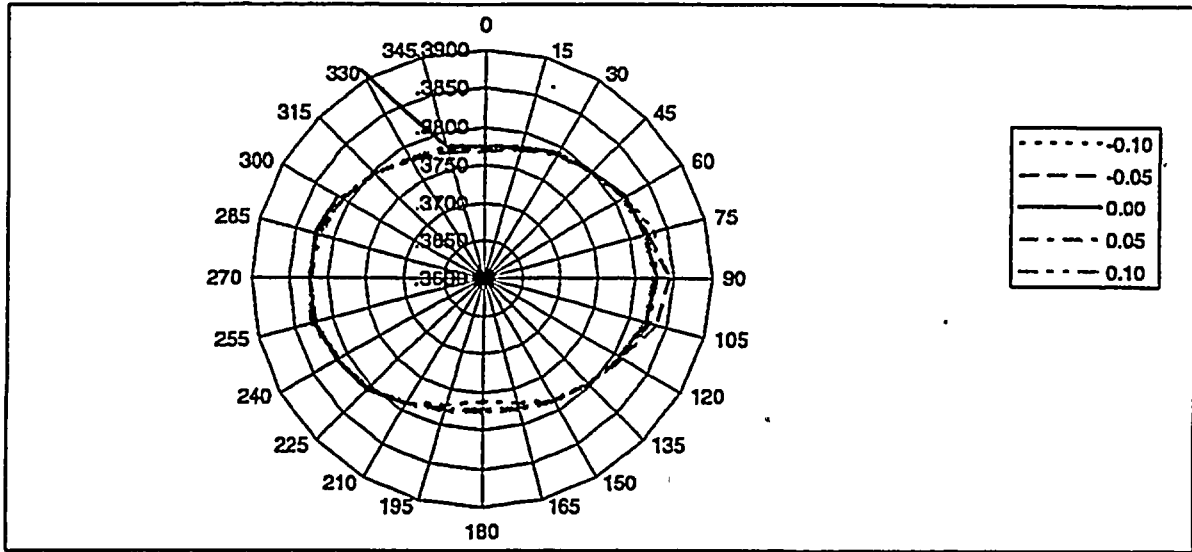


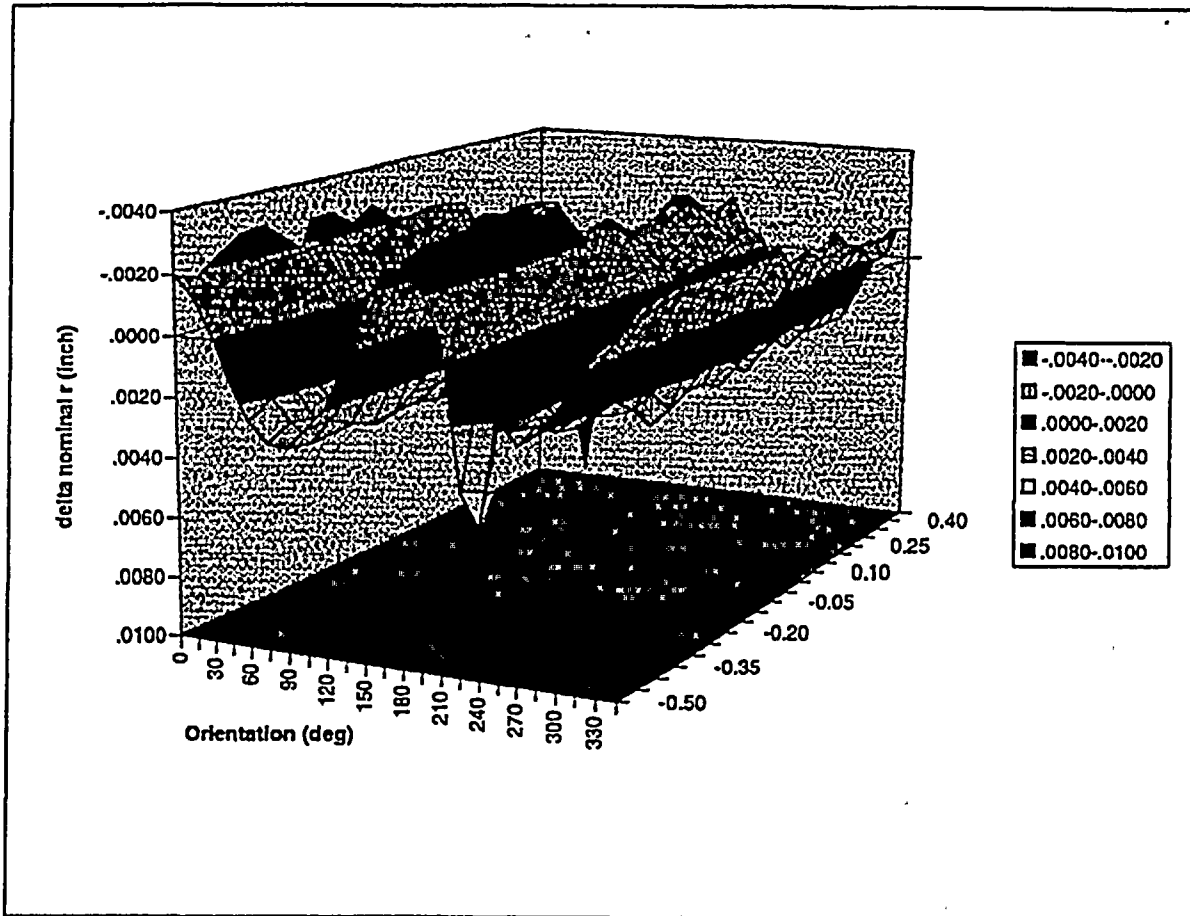


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3795	.3794

At screw location:
 Average radial dent -.0027
 Maximum radial dent -.0049

At position by tsp:
 Average radial dent -.0023
 Maximum radial dent -.0031





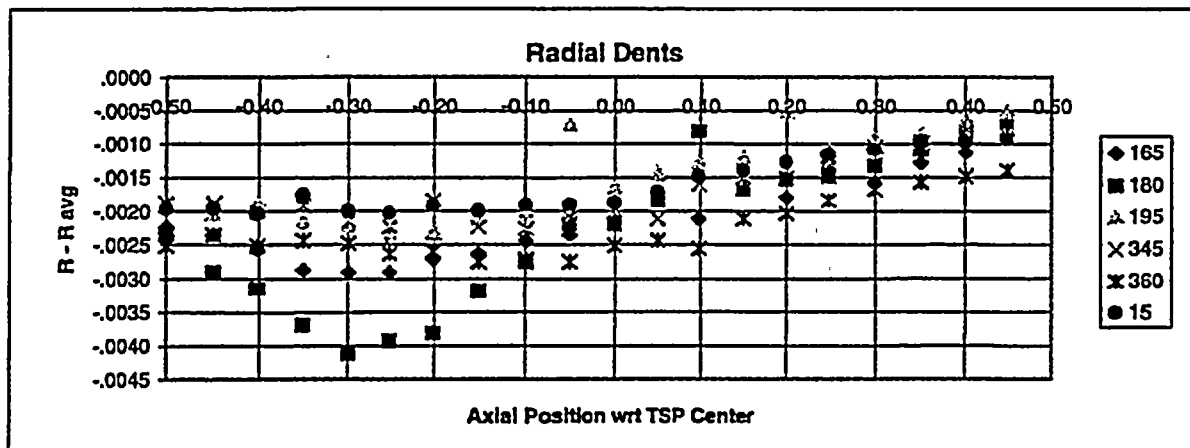
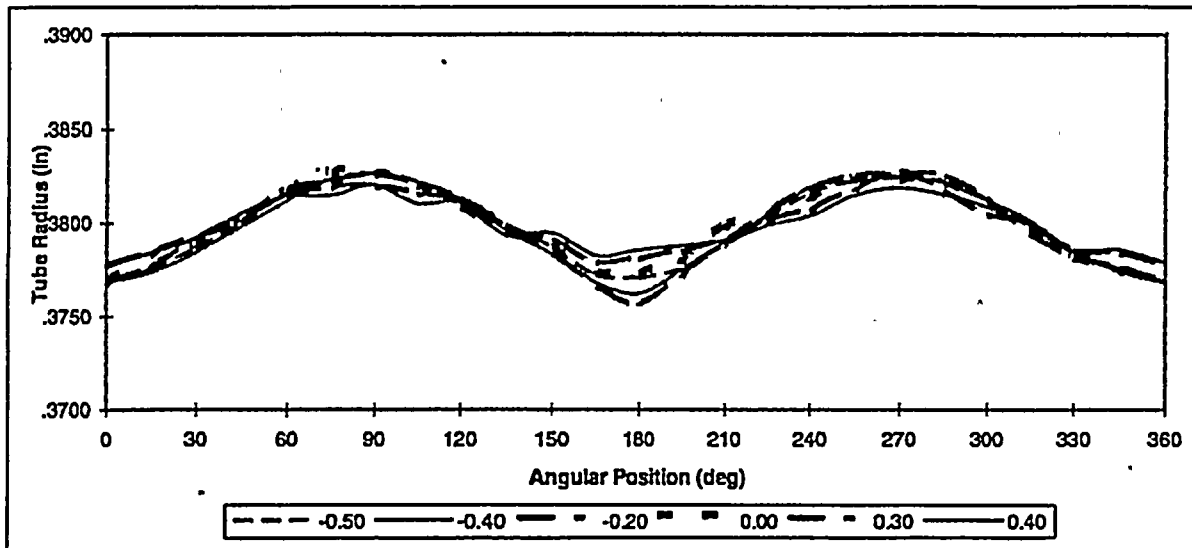
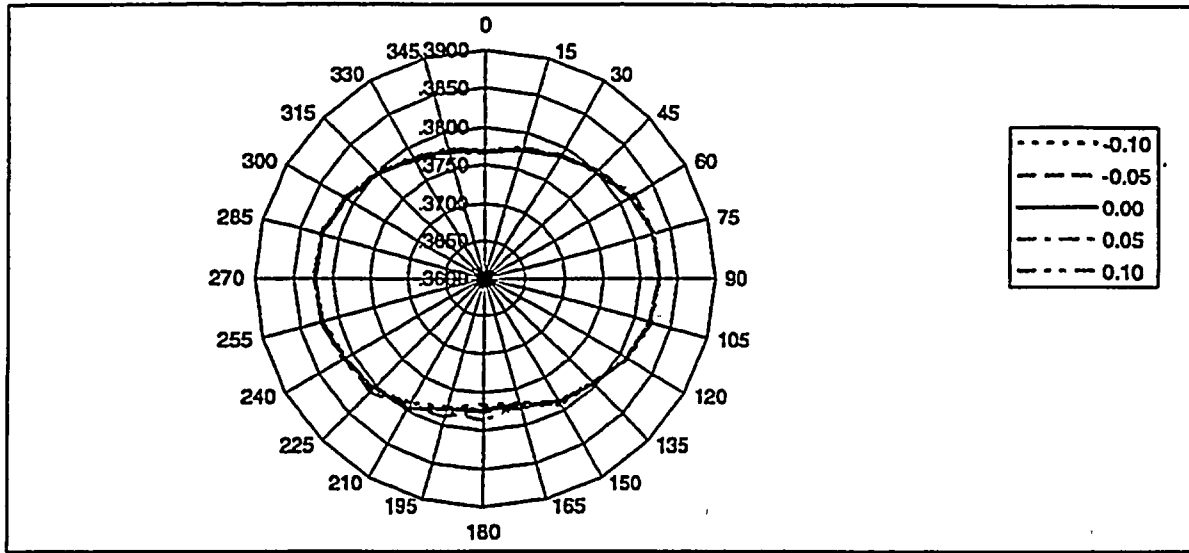
Specimen	over tsp	straight tube
Avg. Tube ID radius	.3799	.3794

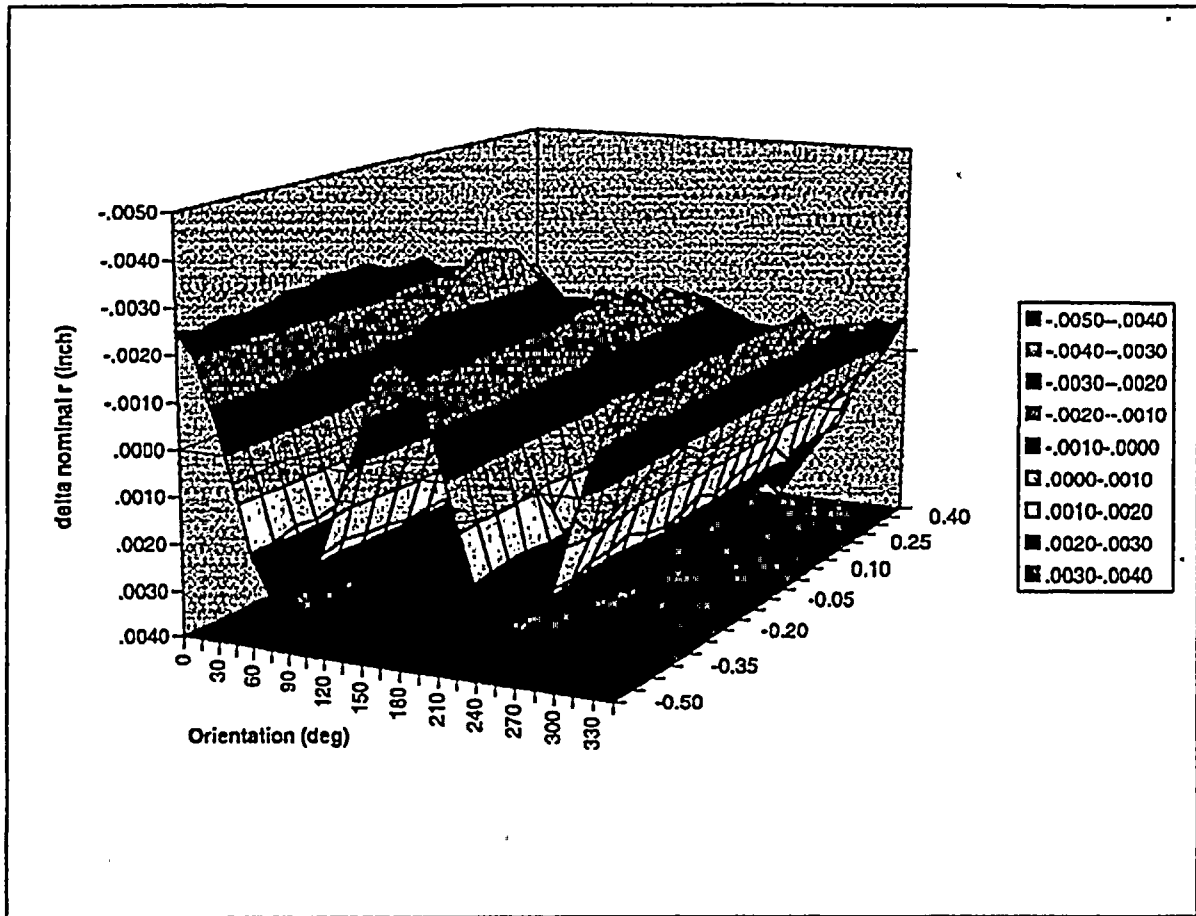
At screw location:

Average radial dent	-.0021
Maximum radial dent	-.0037

At position by tsp:

Average radial dent	-.0017
Maximum radial dent	-.0028

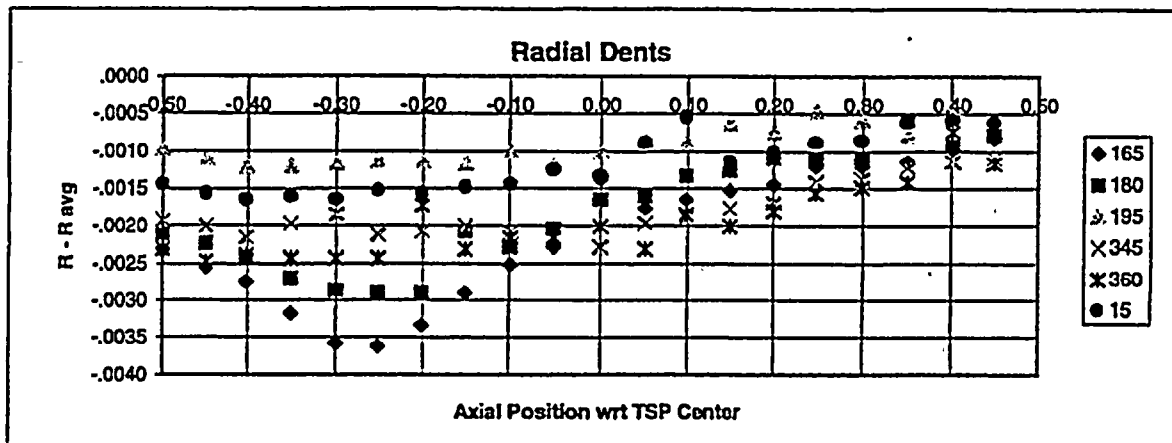
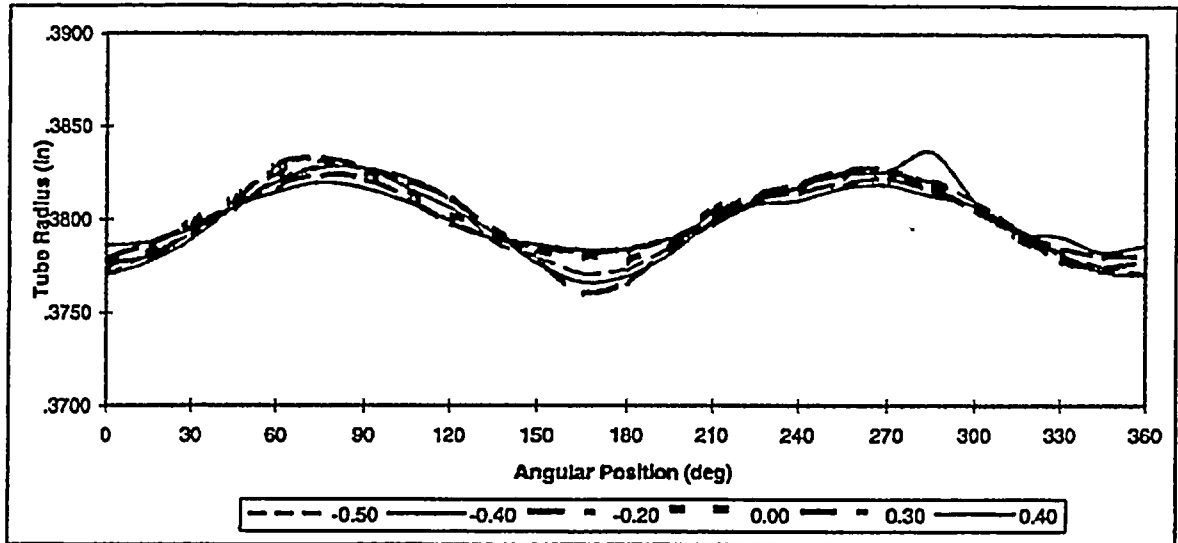
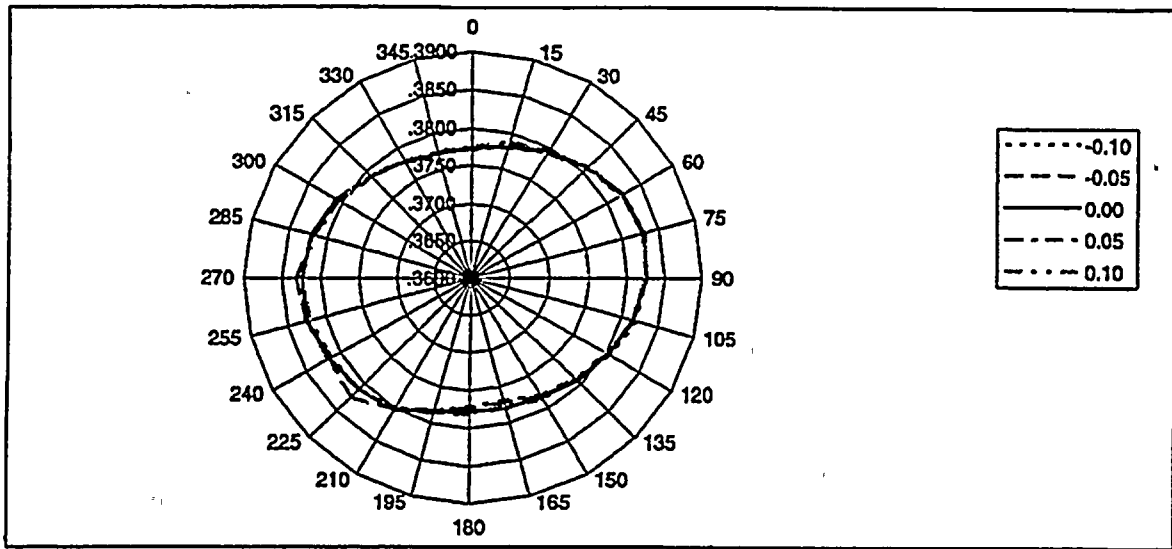


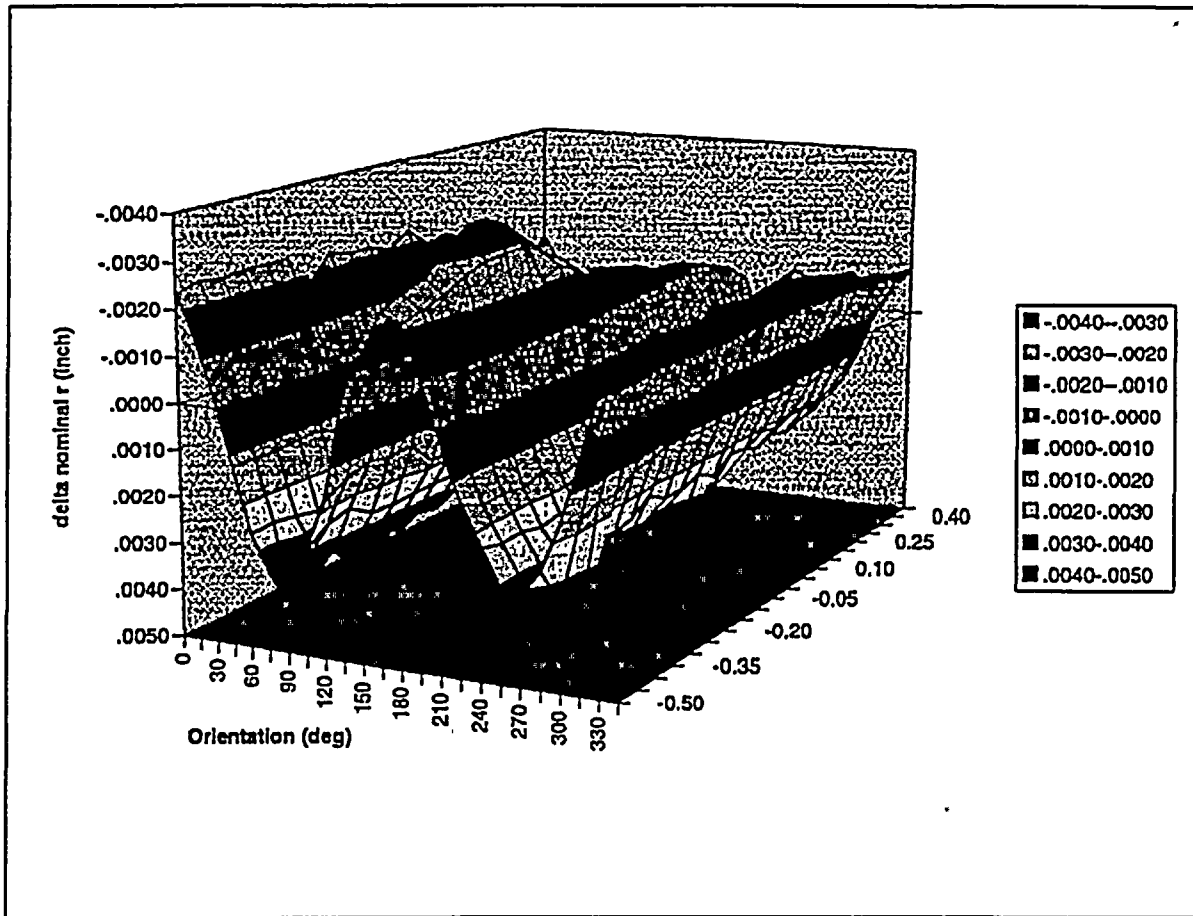


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3799	.3794

At screw location:
 Average radial dent -.0020
 Maximum radial dent -.0041

At position by tsp:
 Average radial dent -.0019
 Maximum radial dent -.0028





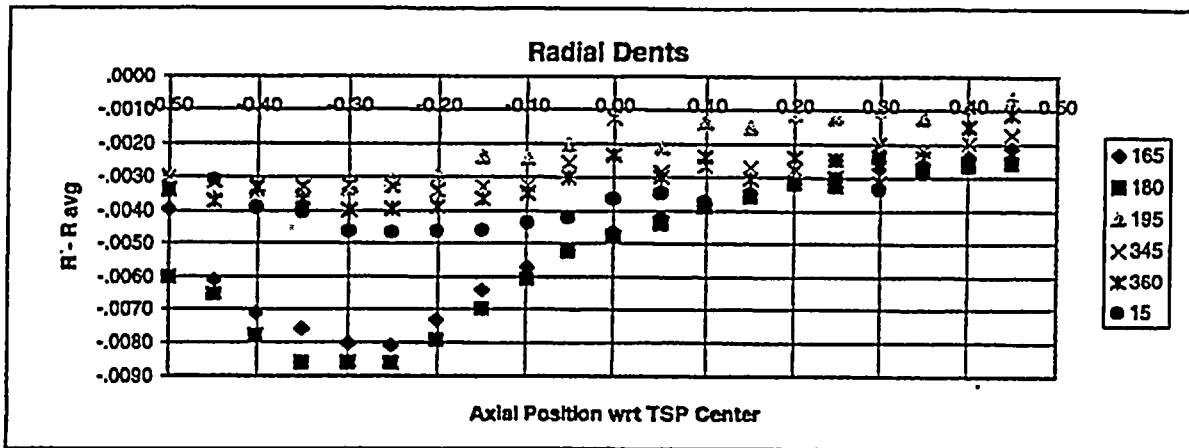
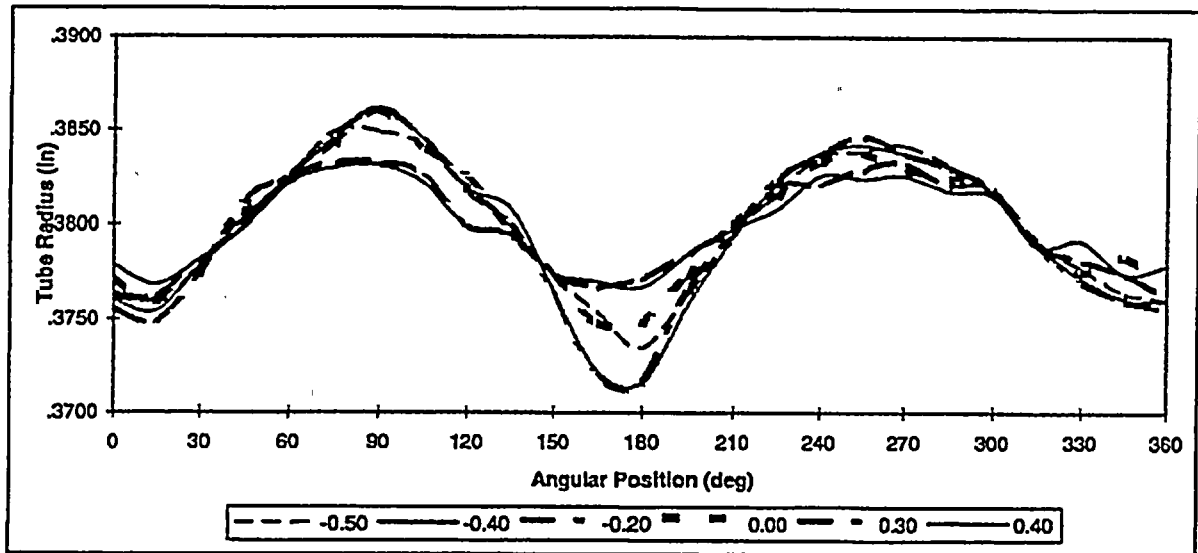
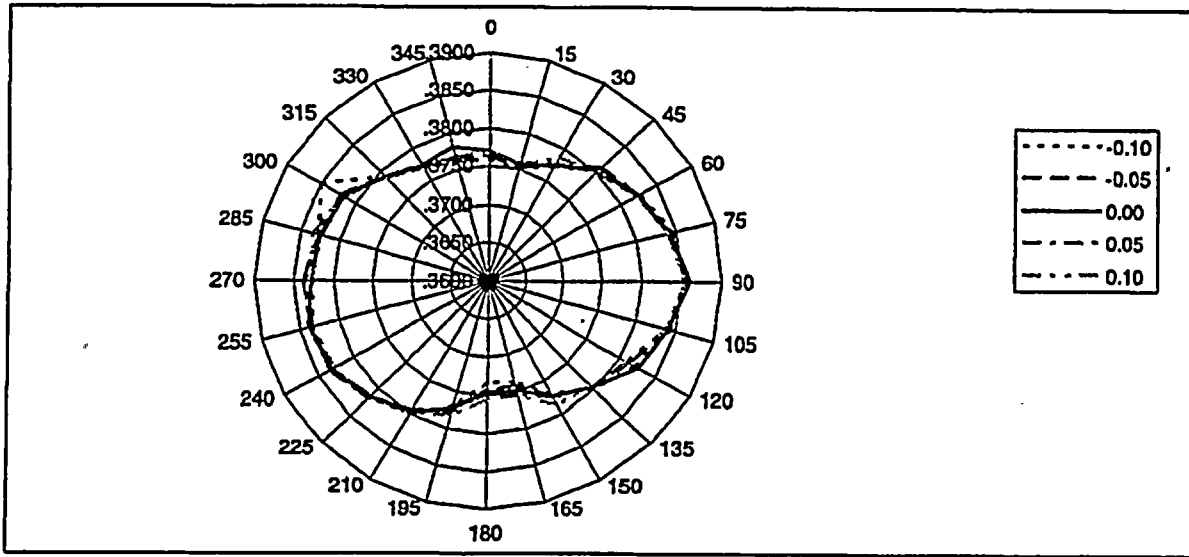
Specimen	over tsp	straight tube
Avg. Tube ID radius	.3800	.3794

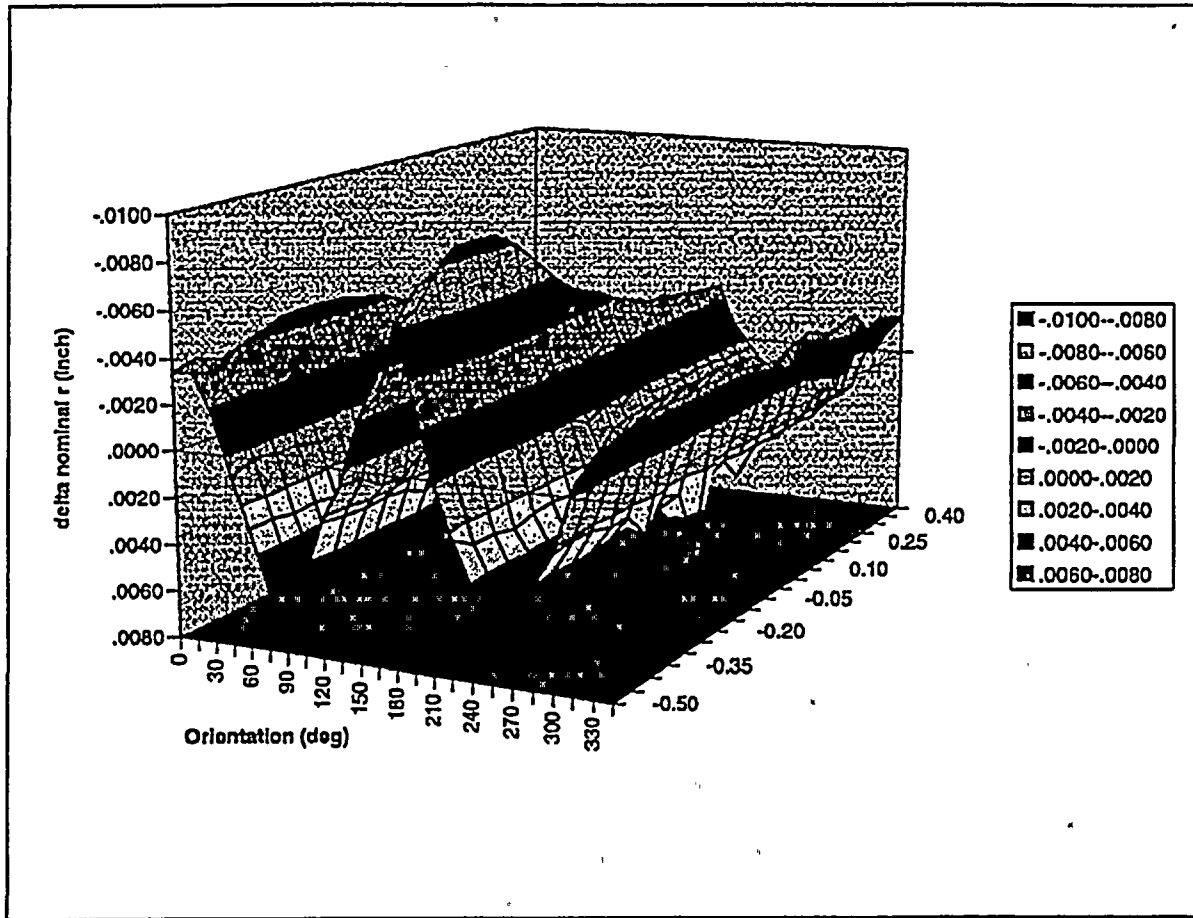
At screw location:

Average radial dent	-.0016
Maximum radial dent	-.0036

At position by tsp:

Average radial dent	-.0017
Maximum radial dent	-.0025





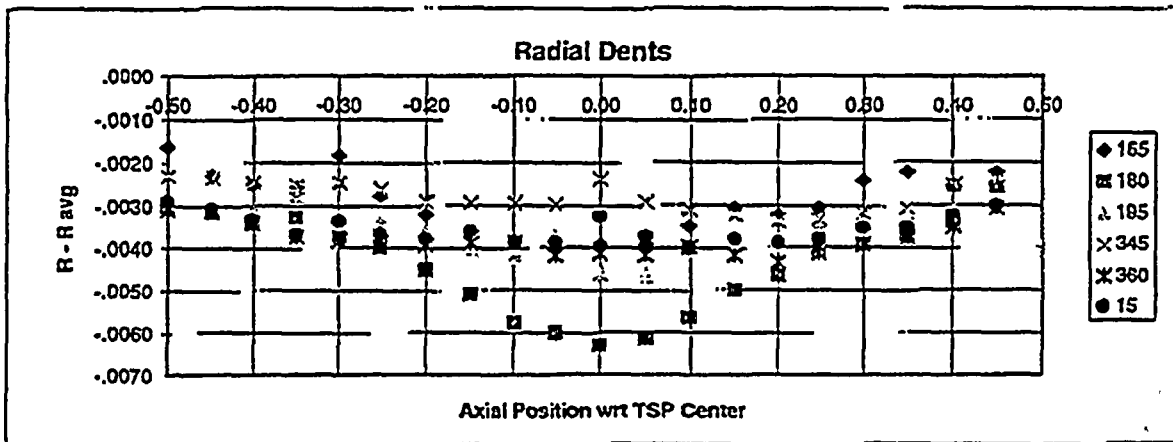
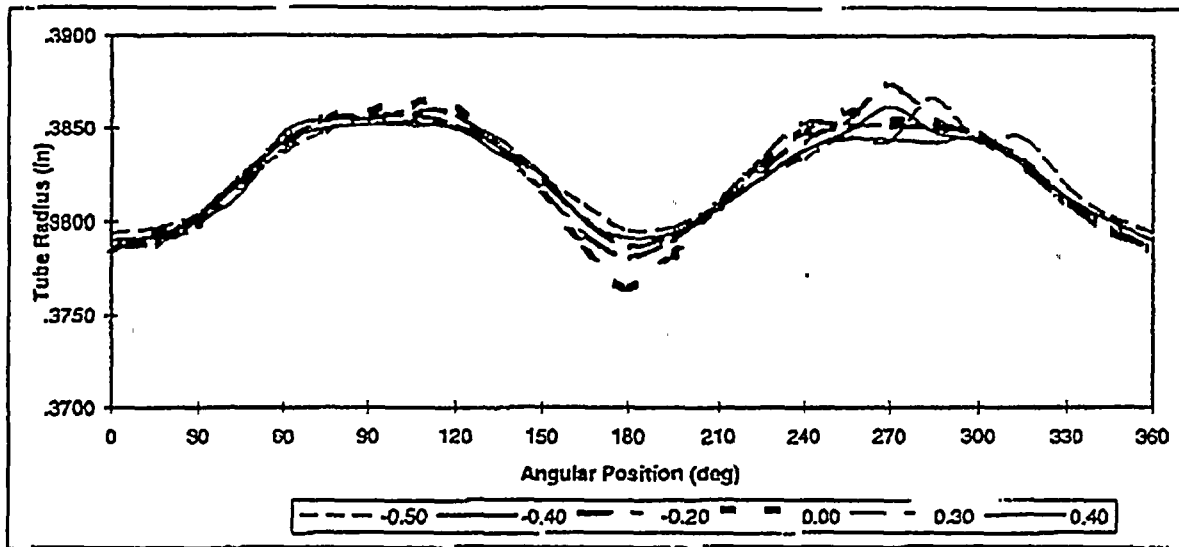
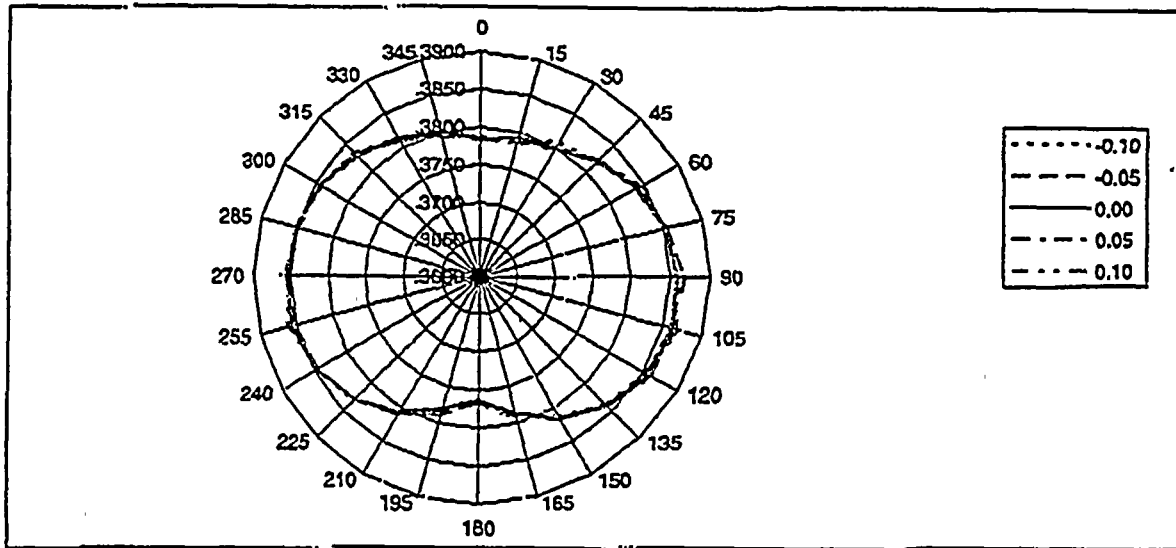
Specimen	over tsp	straight tube
Avg. Tube ID radius	.3799	.3794

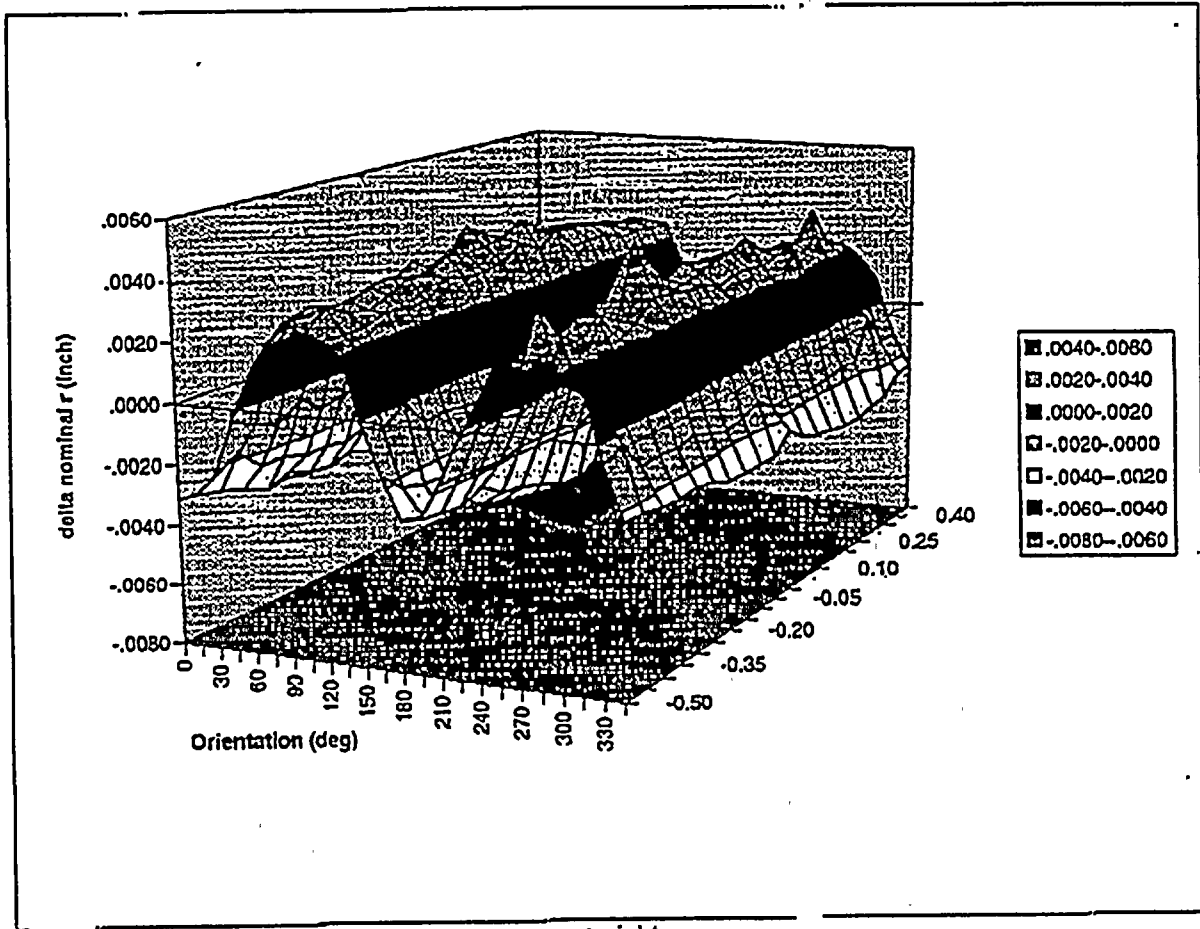
At screw location:

Average radial dent	-0.0041
Maximum radial dent	-0.0086

At position by tsp:

Average radial dent	-0.0031
Maximum radial dent	-0.0047





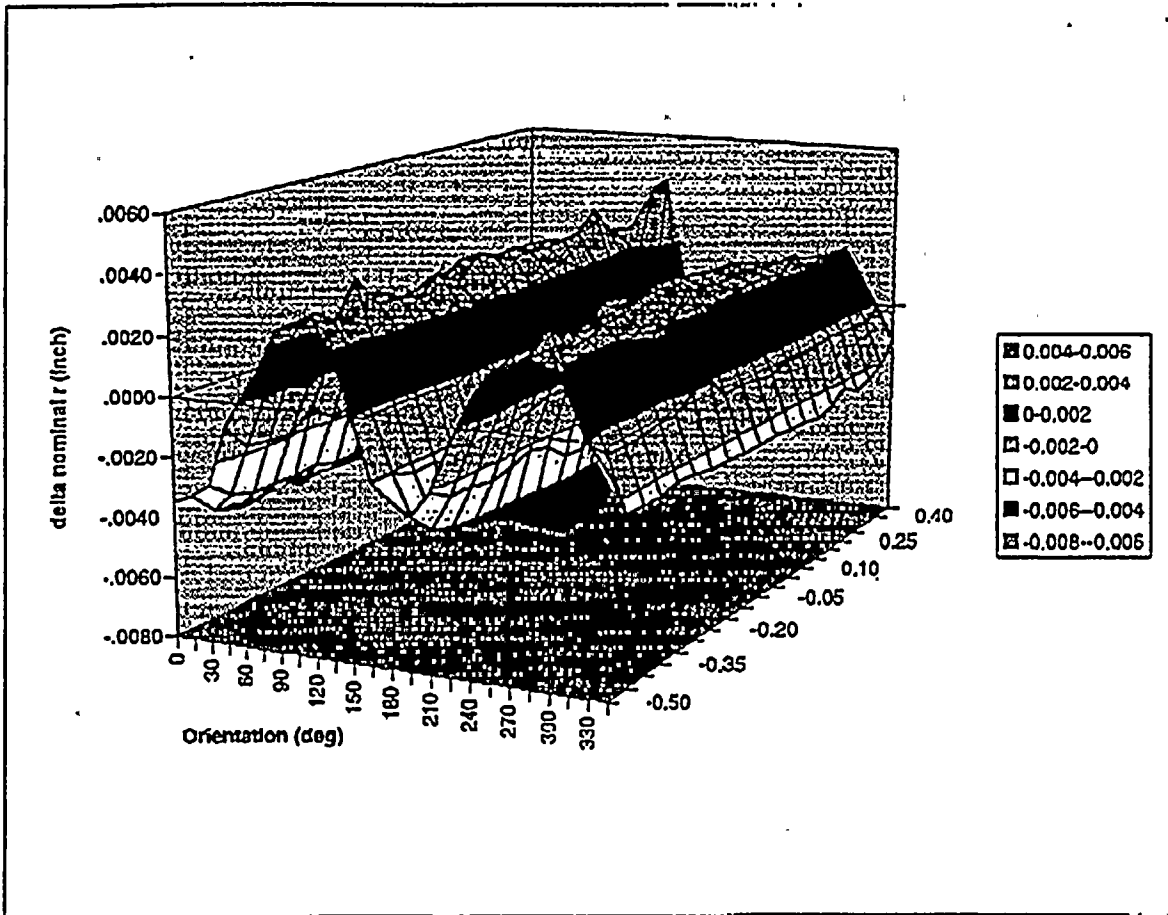
Specimen	over tsp	straight tube
Avg. Tube ID radius	.3825	.3825

At screw location:

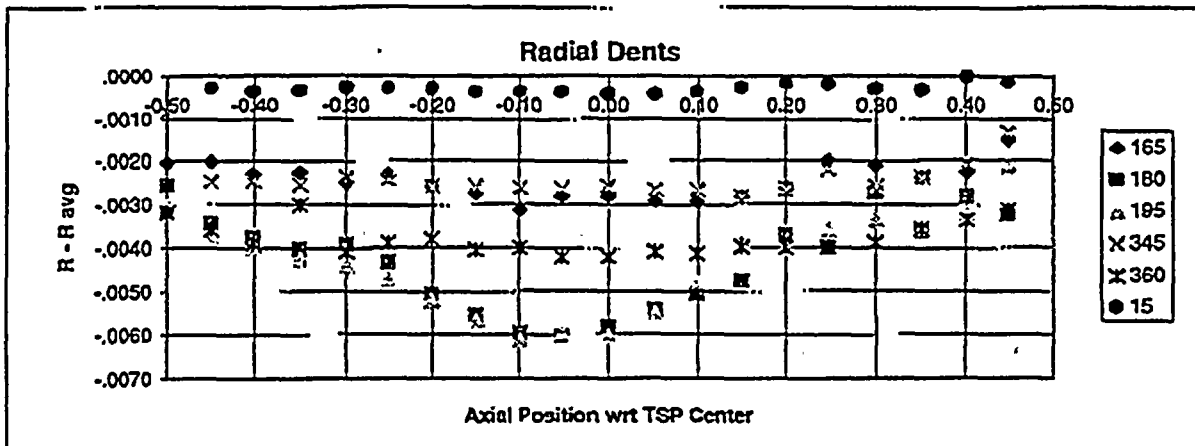
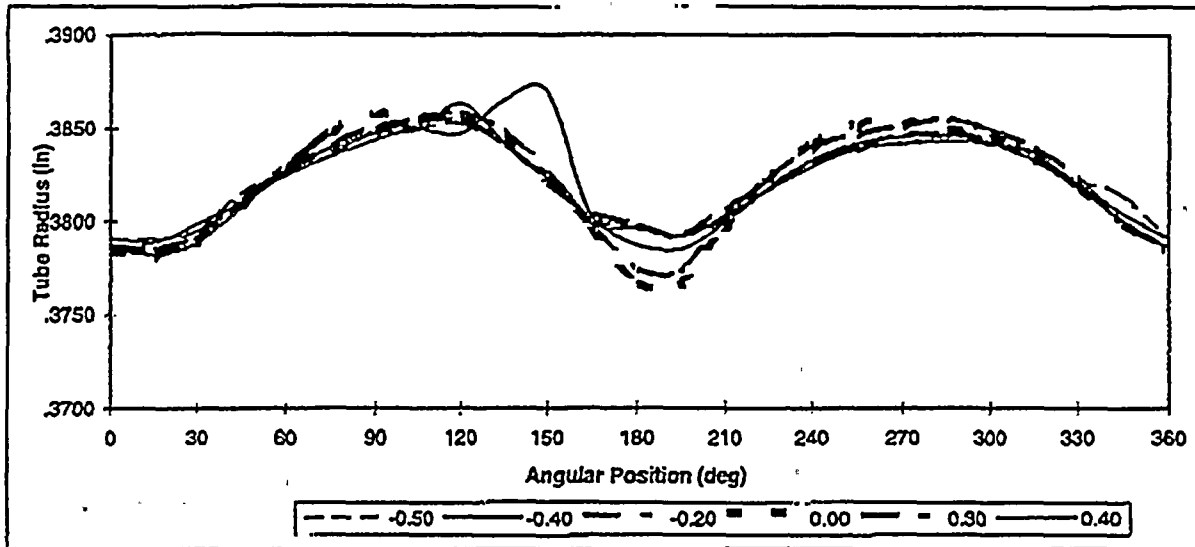
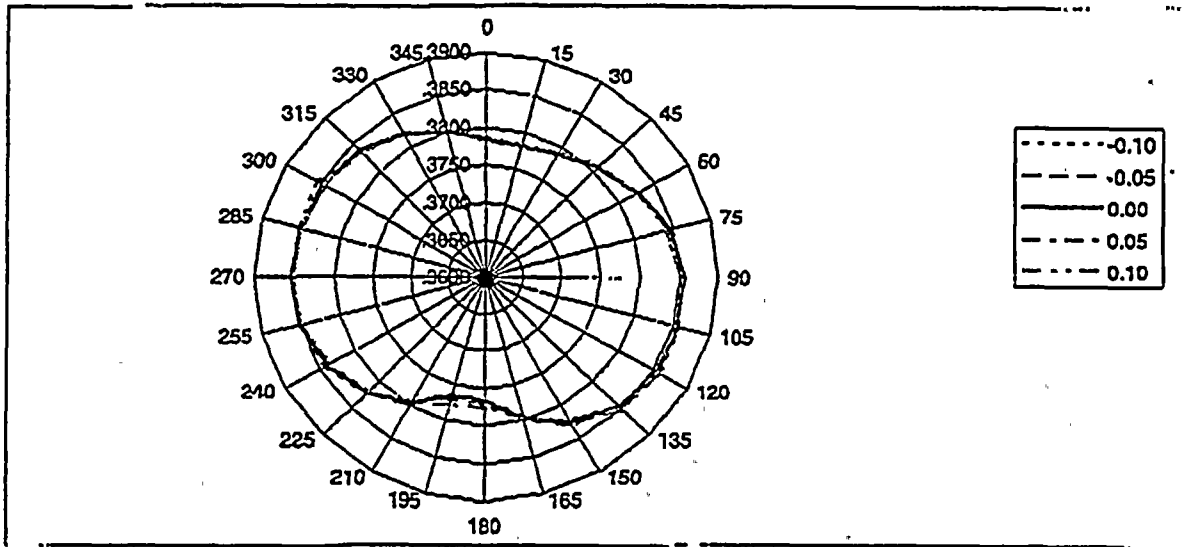
Average radial dent	-.0036
Maximum radial dent	-.0063

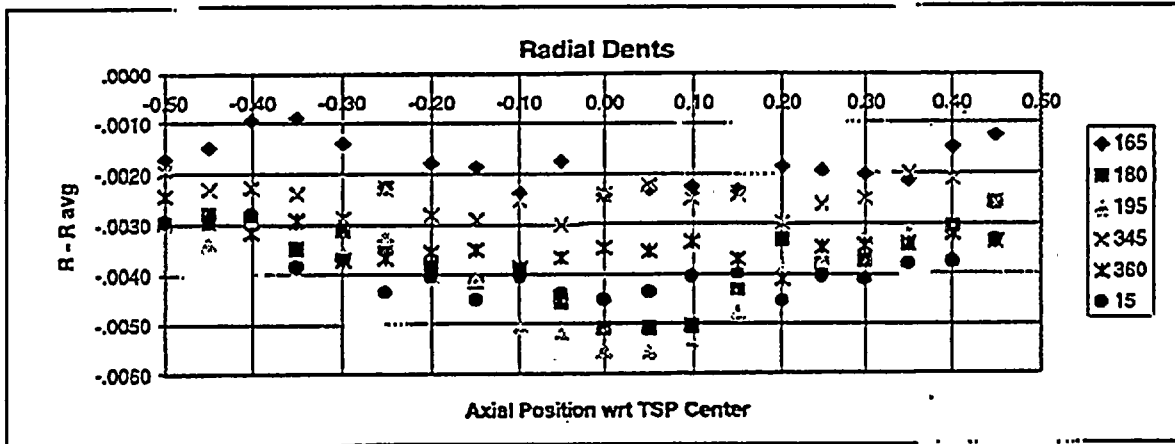
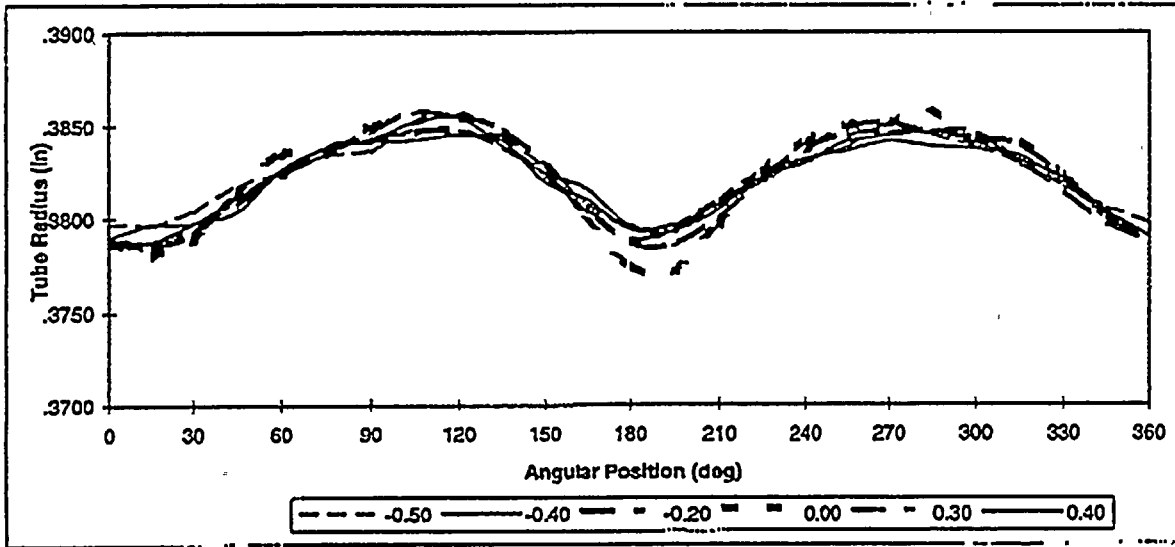
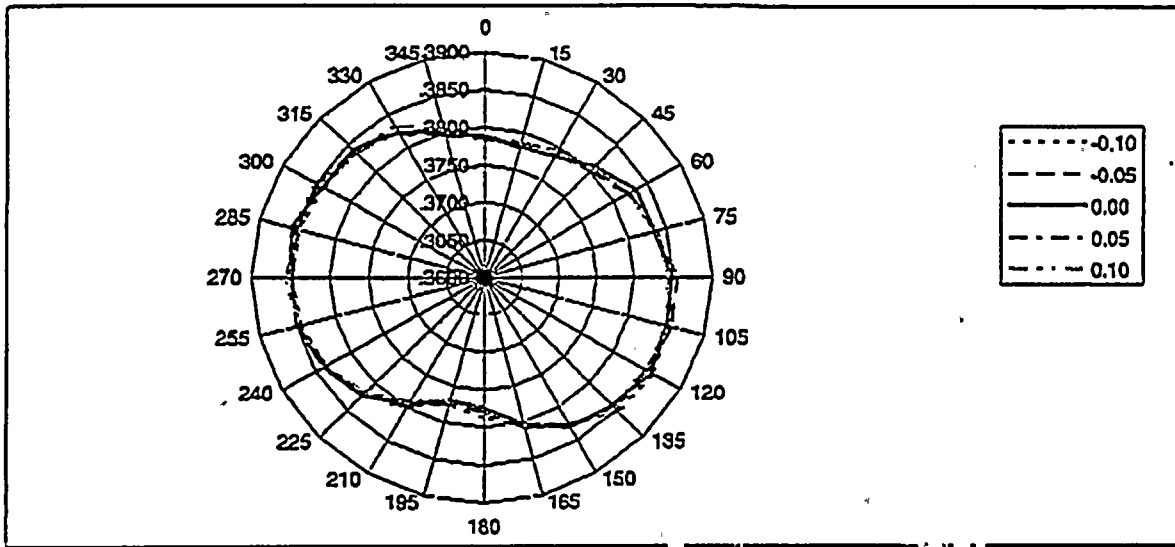
At position by tsp:

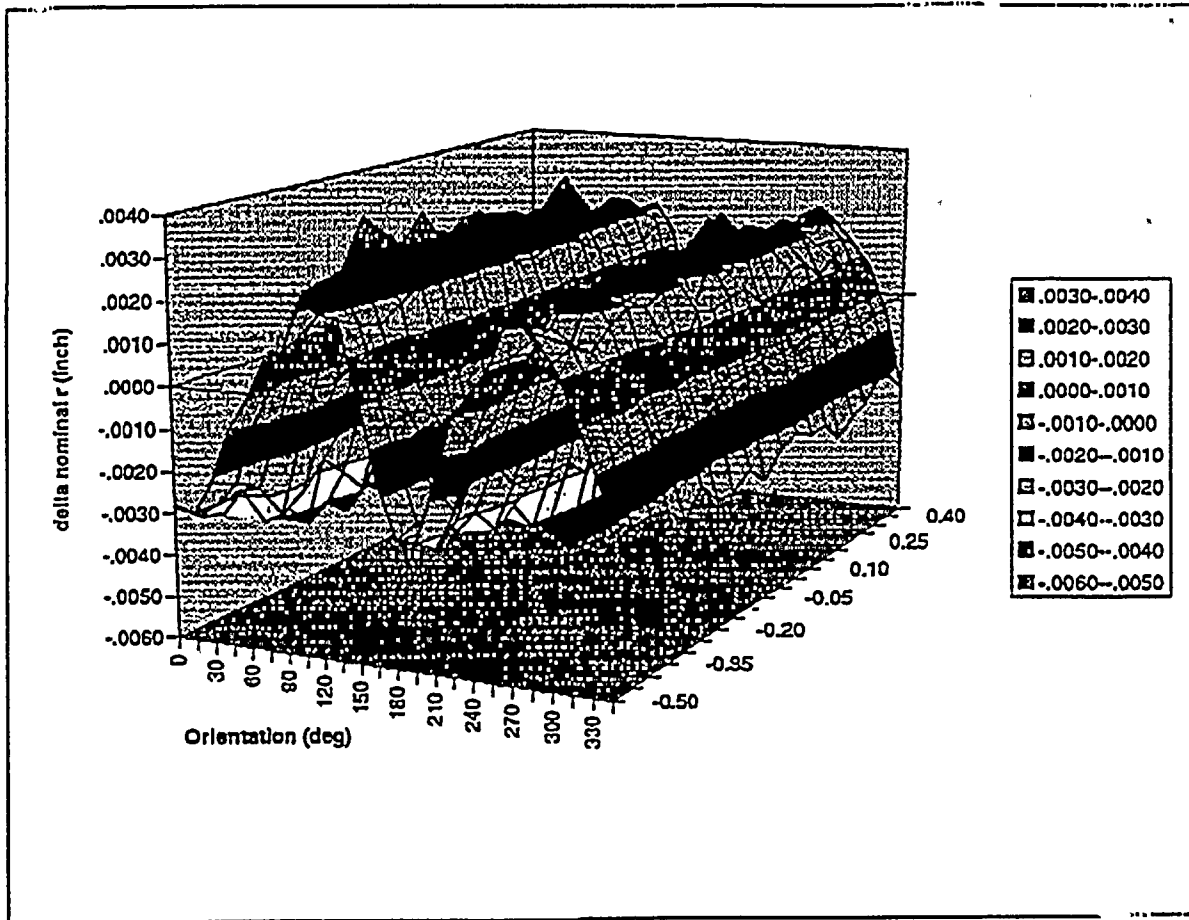
Average radial dent	-.0034
Maximum radial dent	-.0043



	over	straight
Specimen	tsp	tube
Avg. Tube ID radius	.3822	.3825
At screw location:		
Average radial dent	-.0037	
Maximum radial dent	-.0061	
At position by tsp:		
Average radial dent	-.0022	
Maximum radial dent	-.0042	







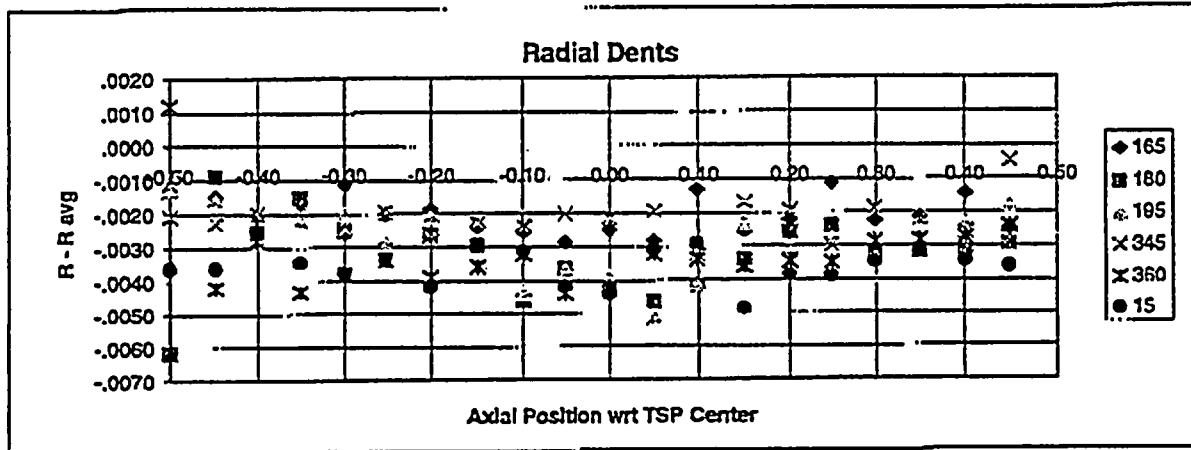
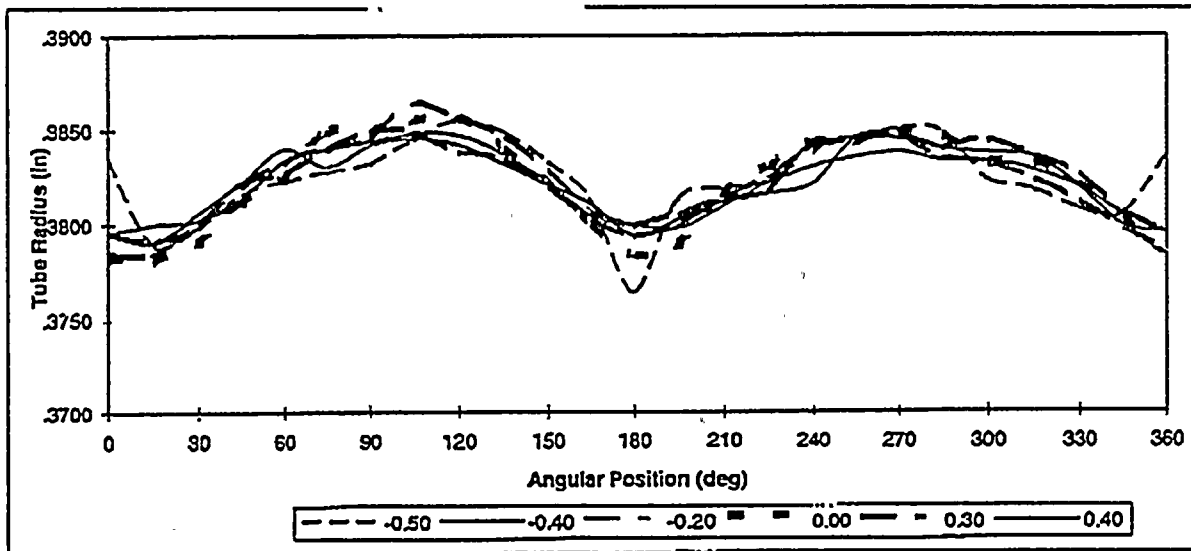
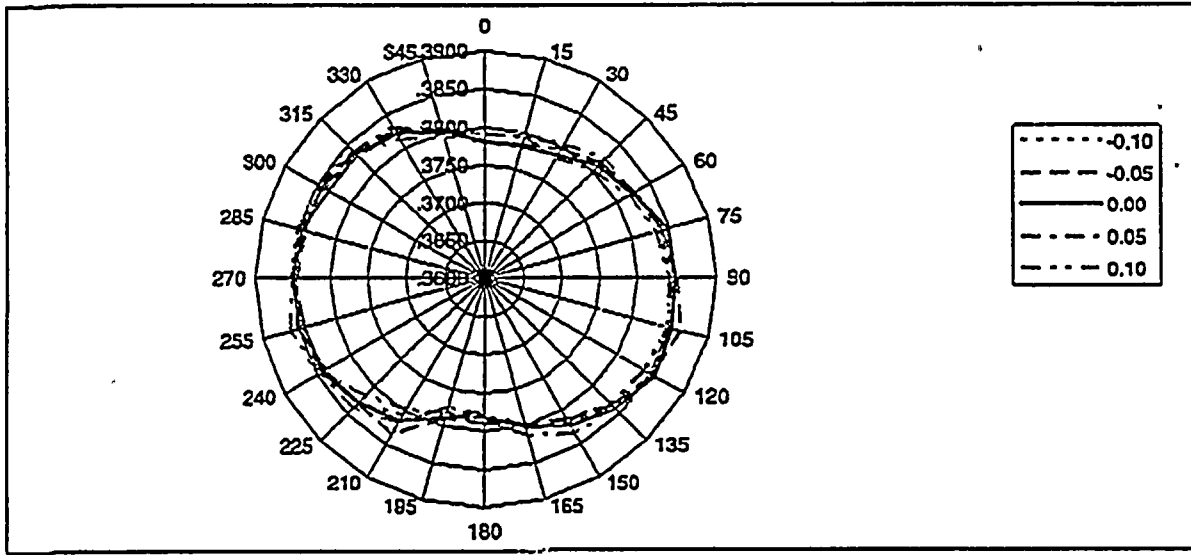
Specimen	over tsp	straight tube
Avg. Tube ID radius	.3822	.3825

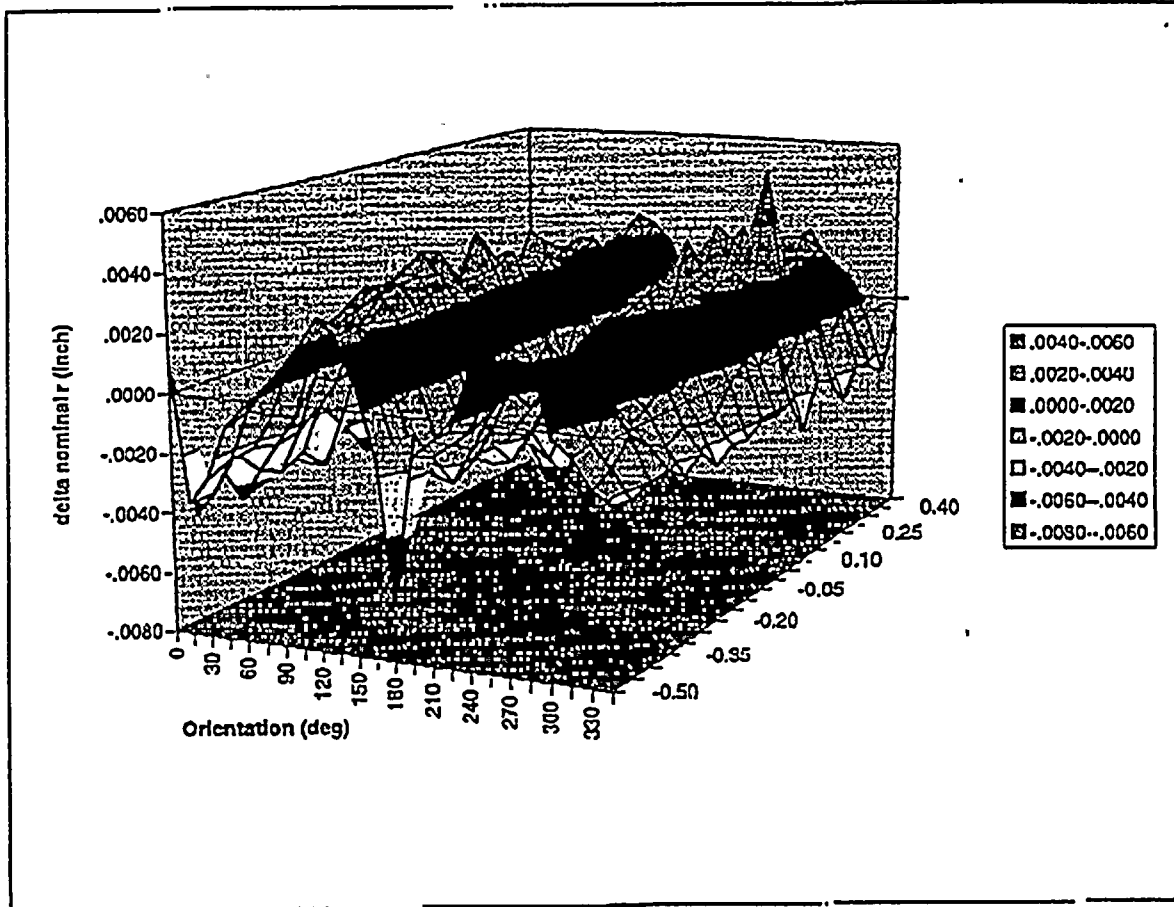
At screw location:

Average radial dent	-.0032
Maximum radial dent	-.0056

At position by tsp:

Average radial dent	-.0033
Maximum radial dent	-.0046

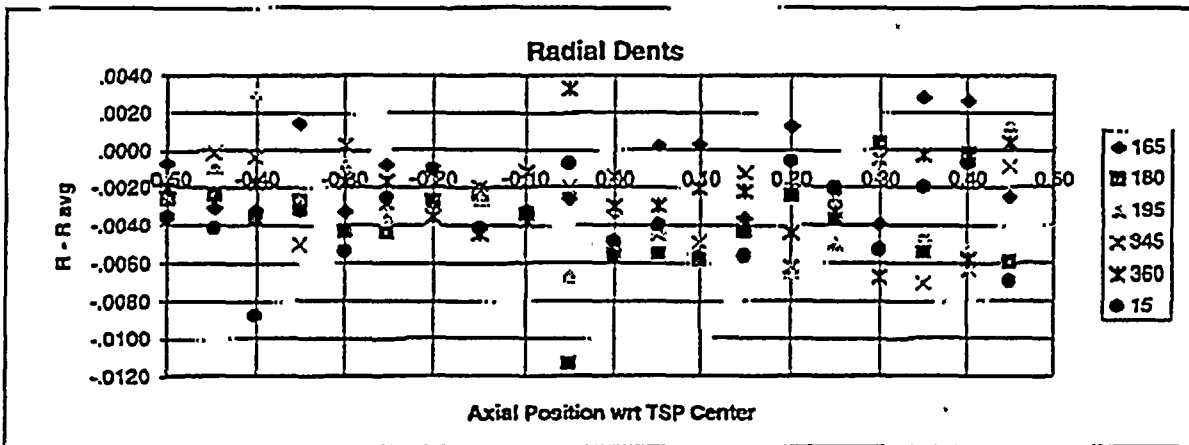
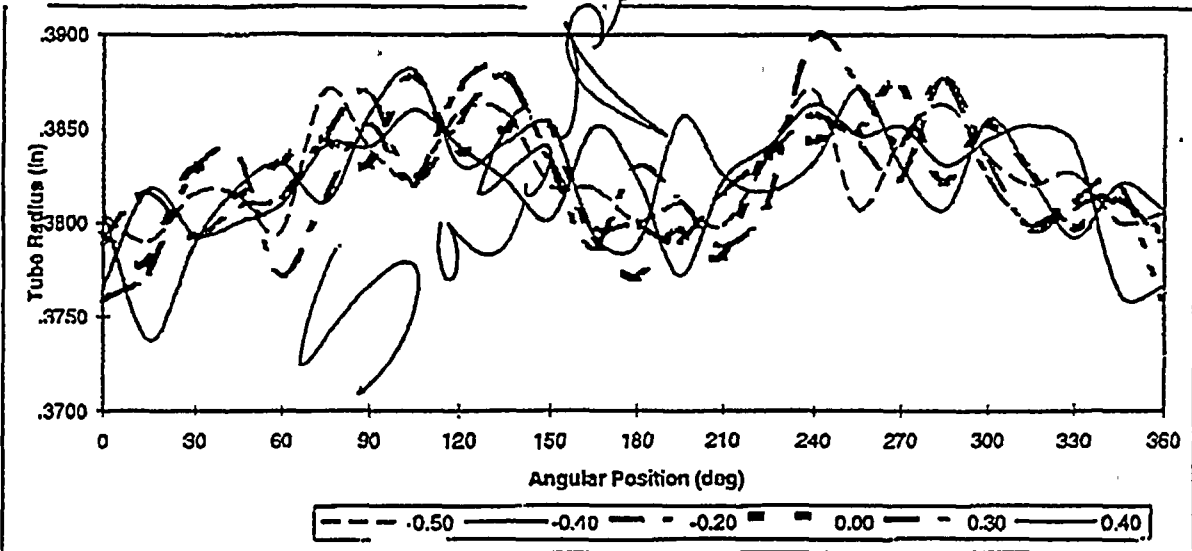
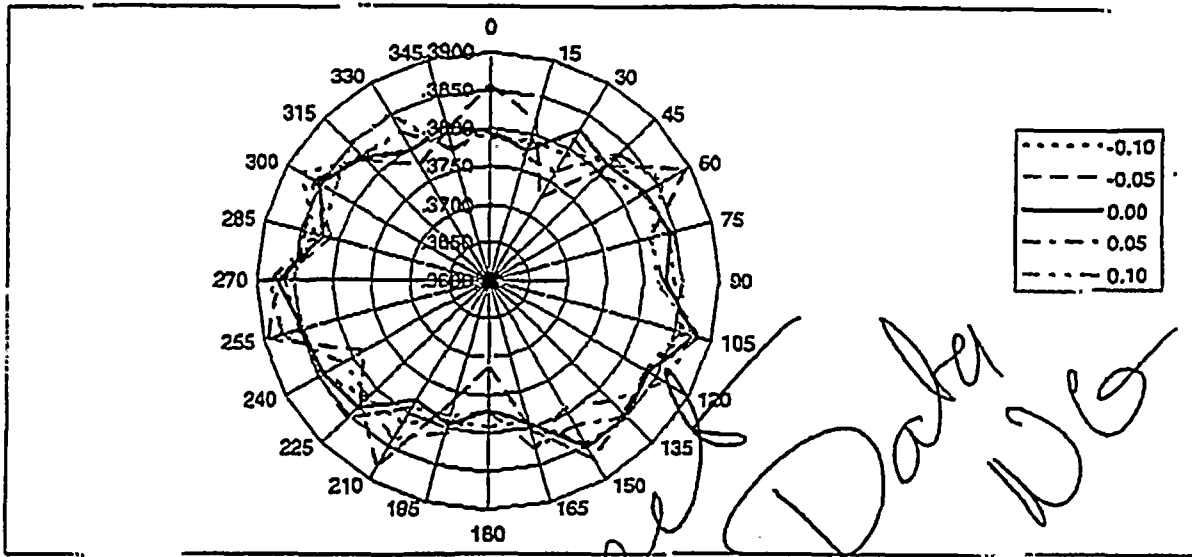


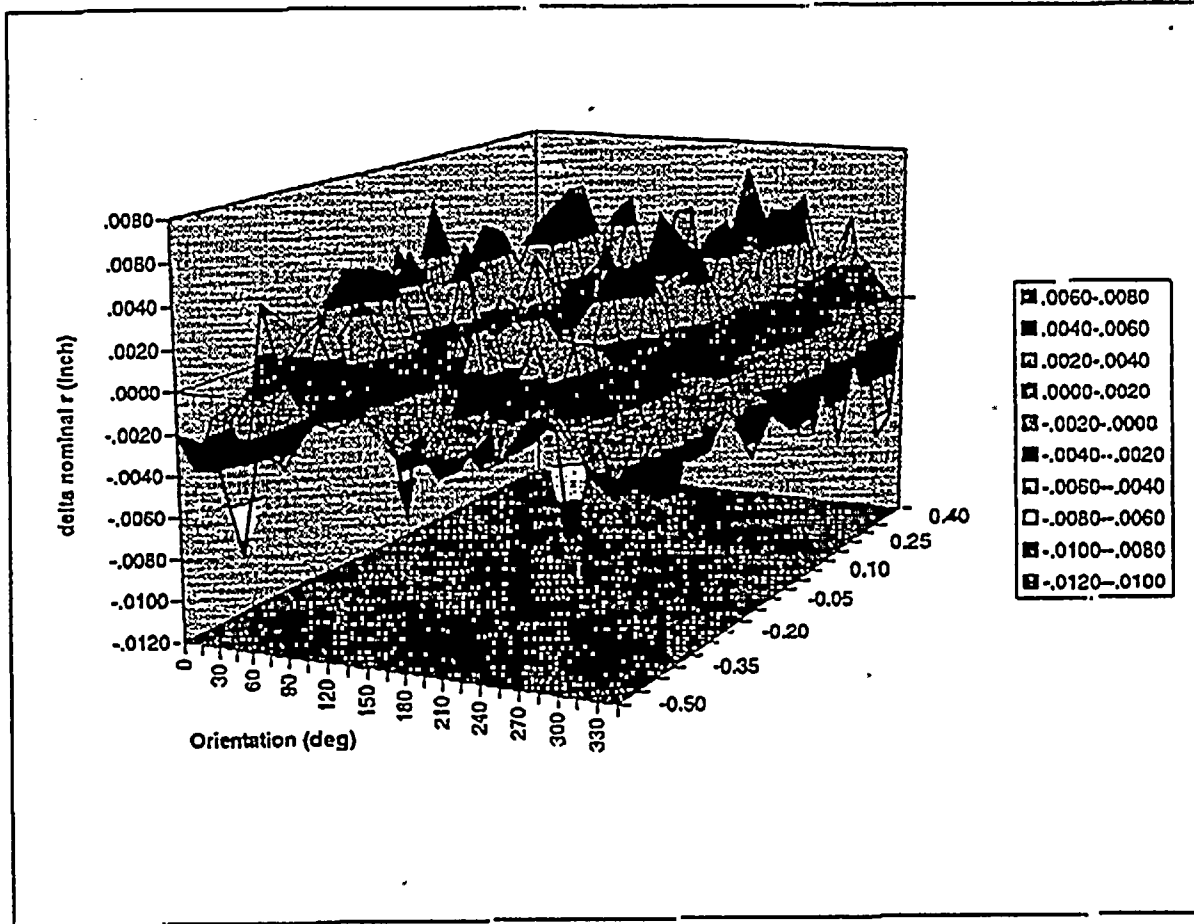


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3823	.3825

At screw location:
 Average radial dent -.0027
 Maximum radial dent -.0062

At position by tsp:
 Average radial dent -.0030
 Maximum radial dent -.0049



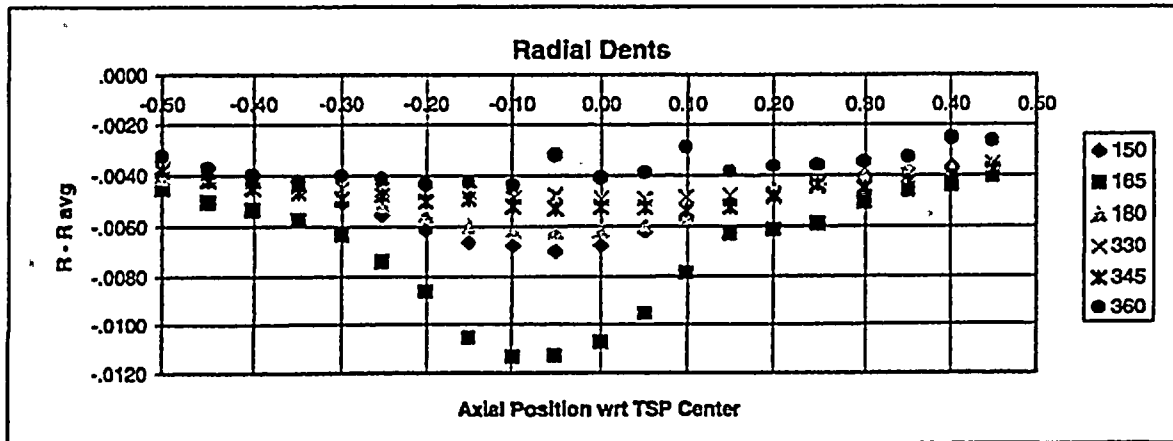
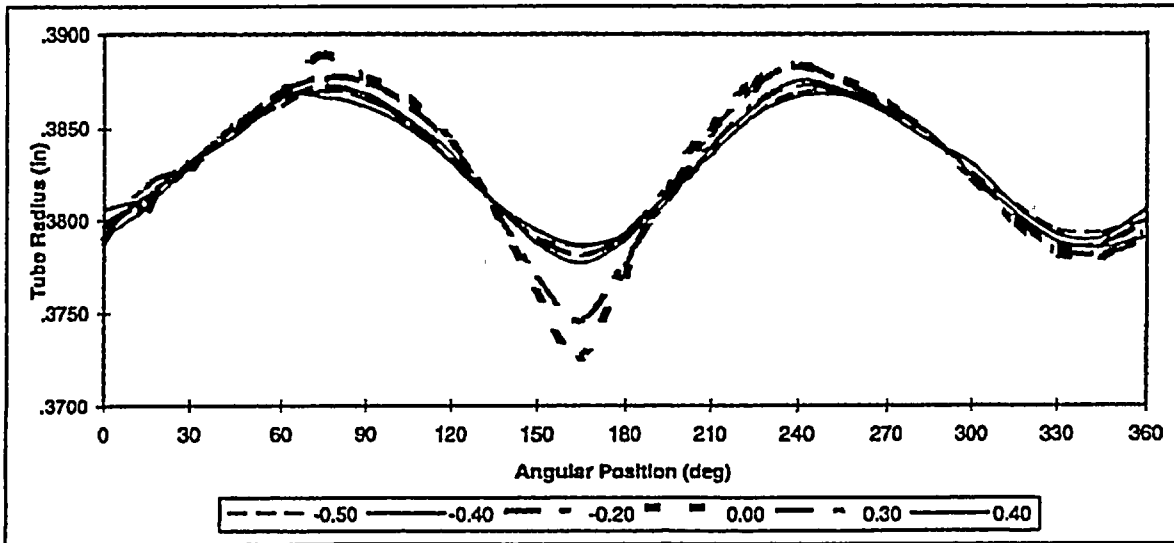
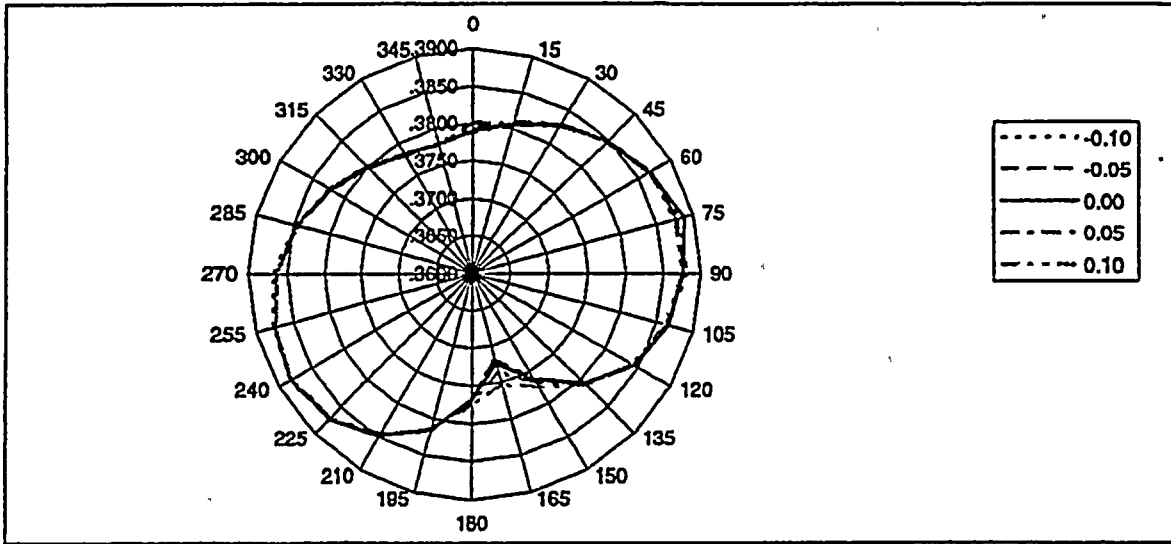


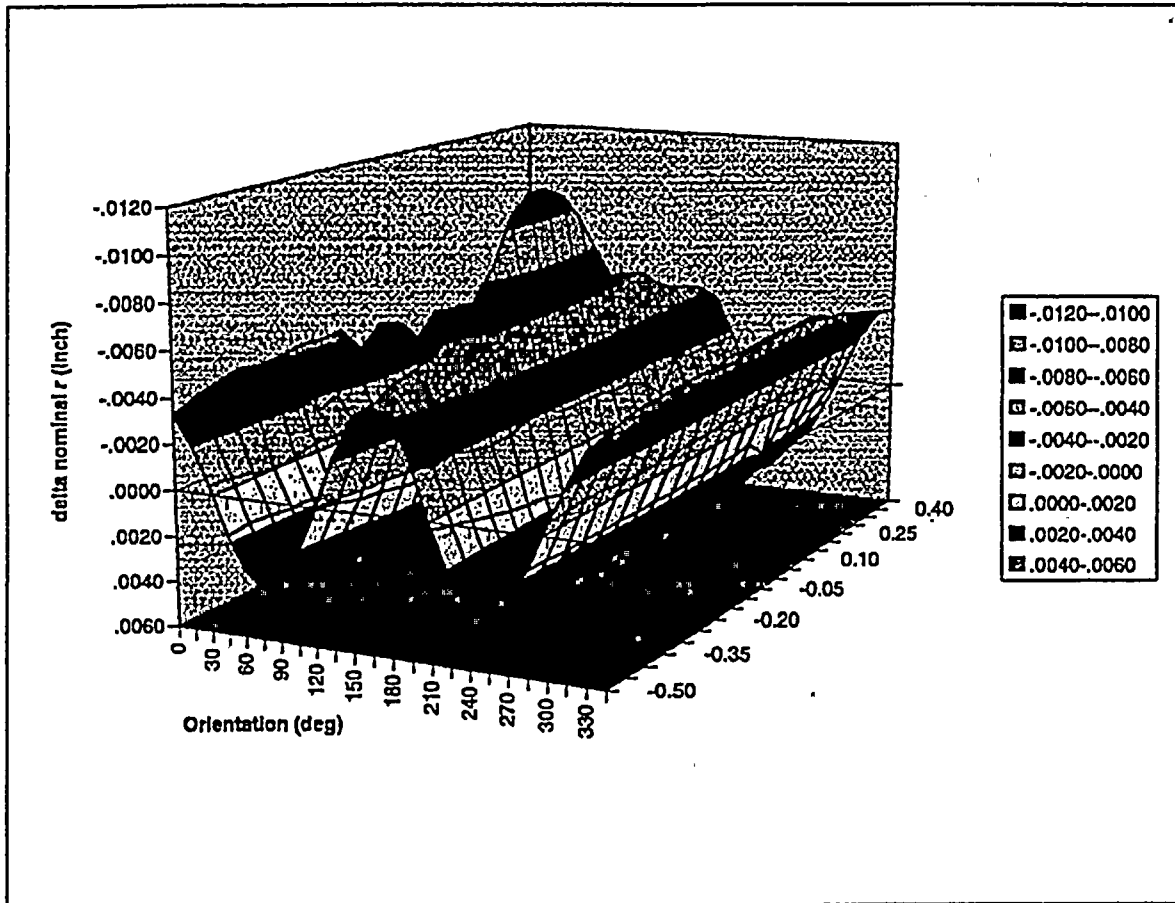
Specimen	over tsp	straight tube
Avg. Tube ID radius	.3824	.3825

At screw location:
 Average radial dent -.0027
 Maximum radial dent -.0113

At position by tsp:
 Average radial dent -.0030
 Maximum radial dent -.0088

Suspect Data

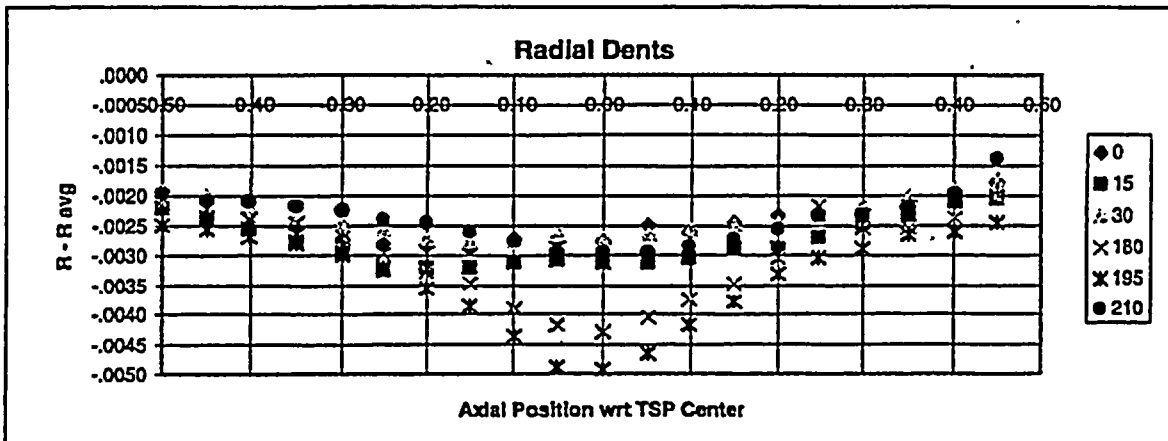
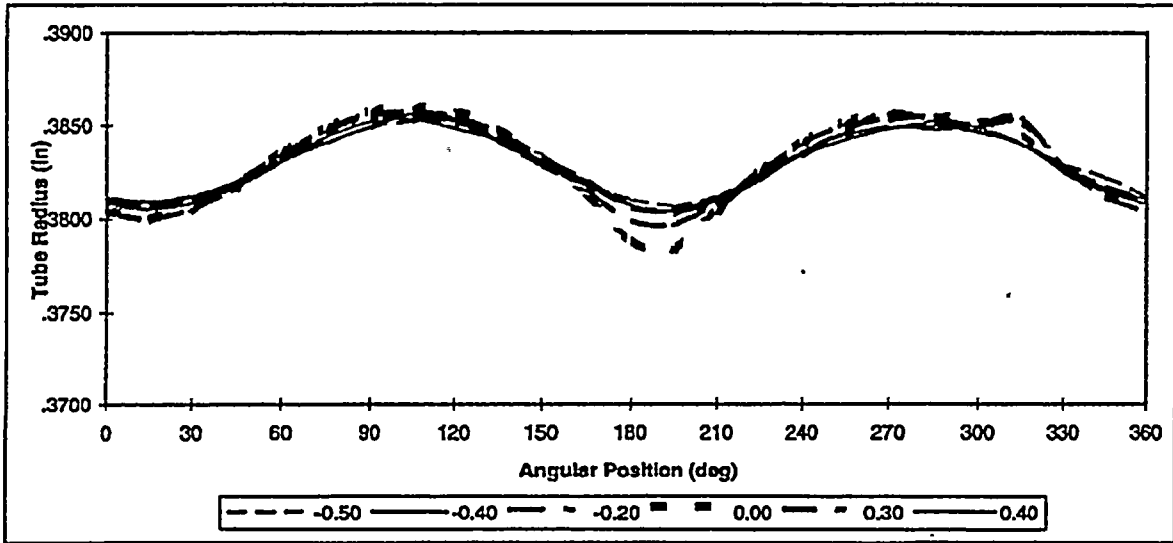
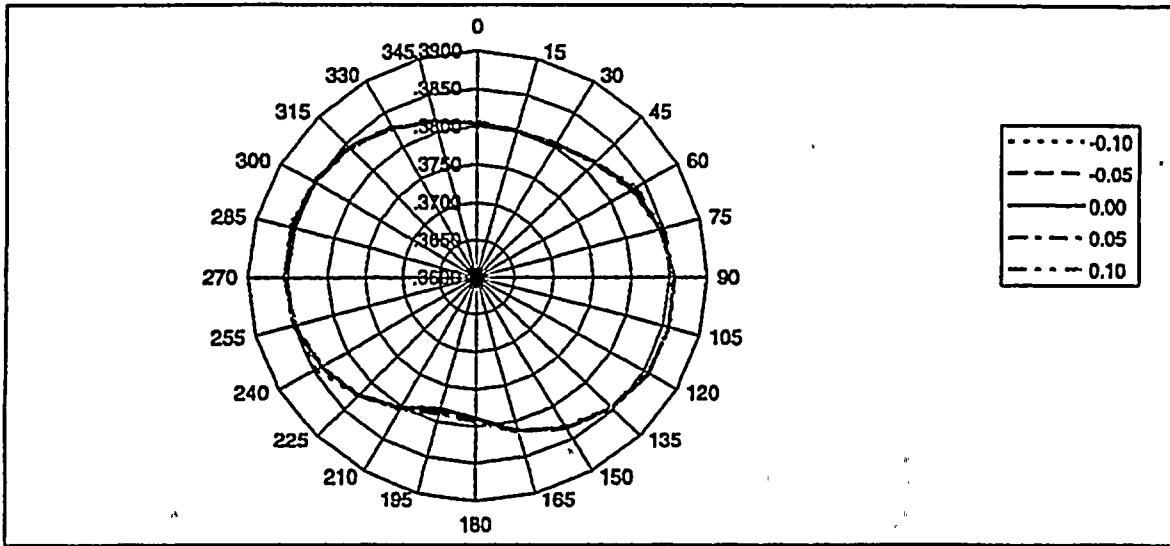


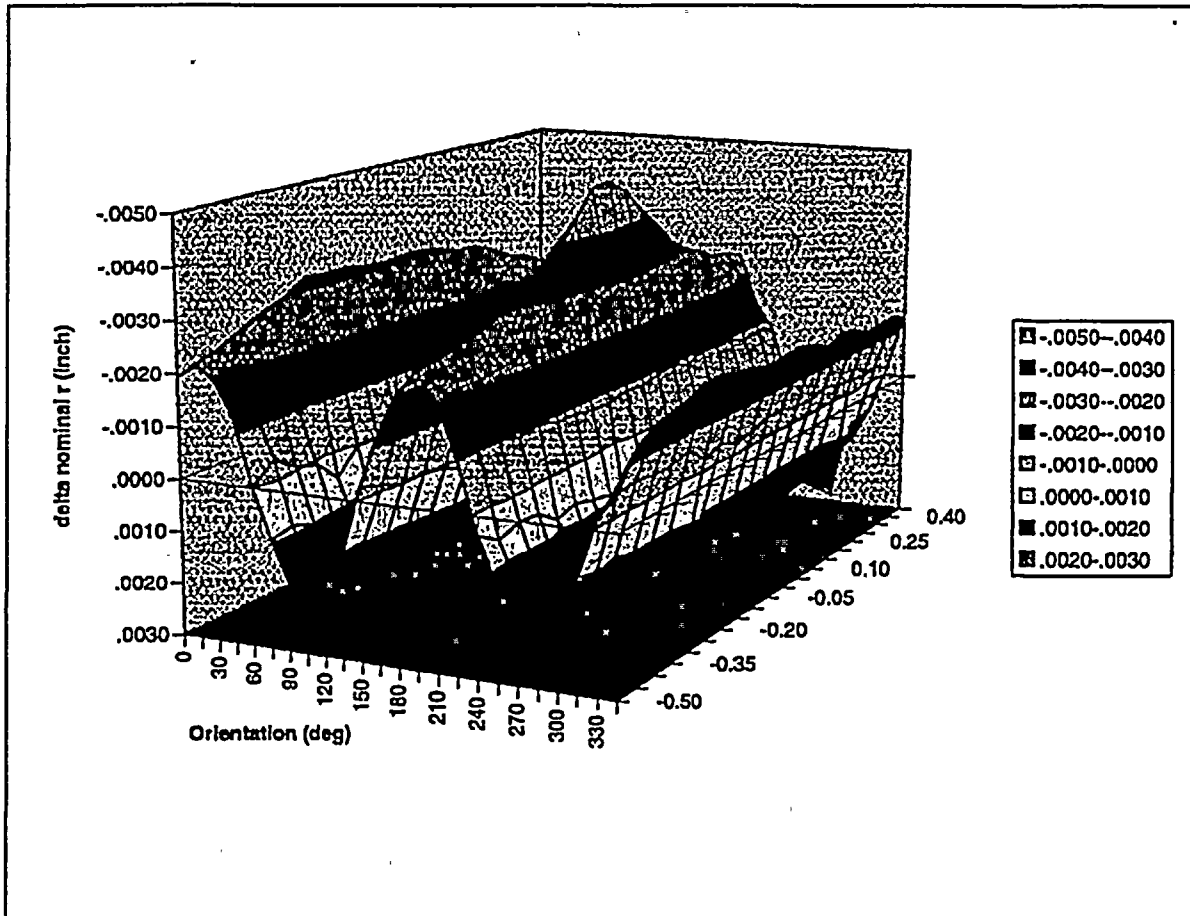


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3828	.3831

At screw location:
 Average radial dent -0.0057
 Maximum radial dent -0.0113

At position by tsp:
 Average radial dent -0.0043
 Maximum radial dent -0.0054





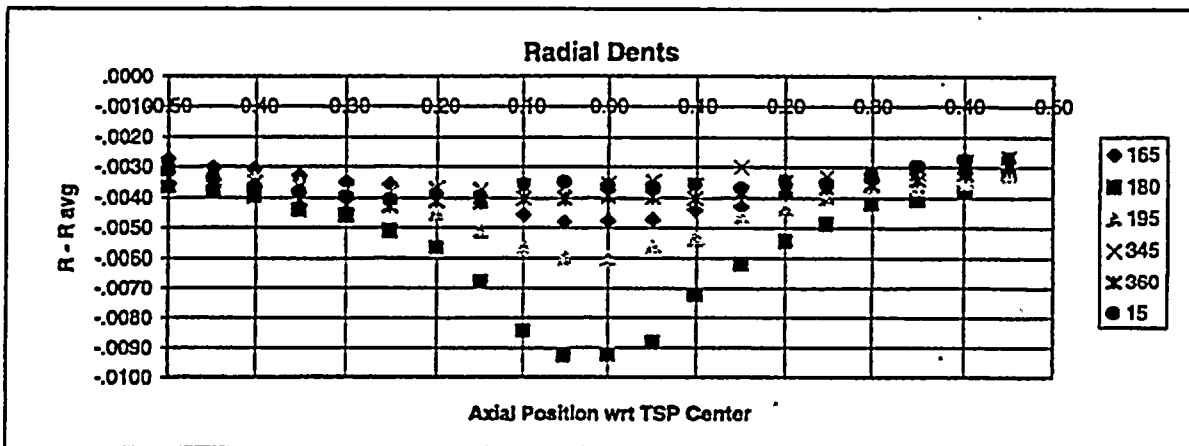
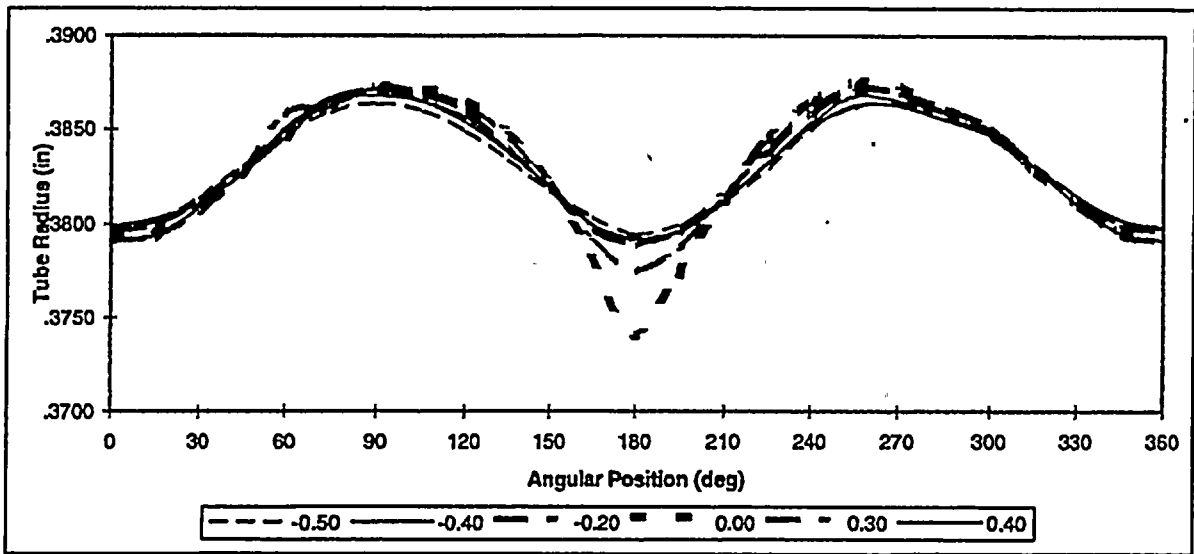
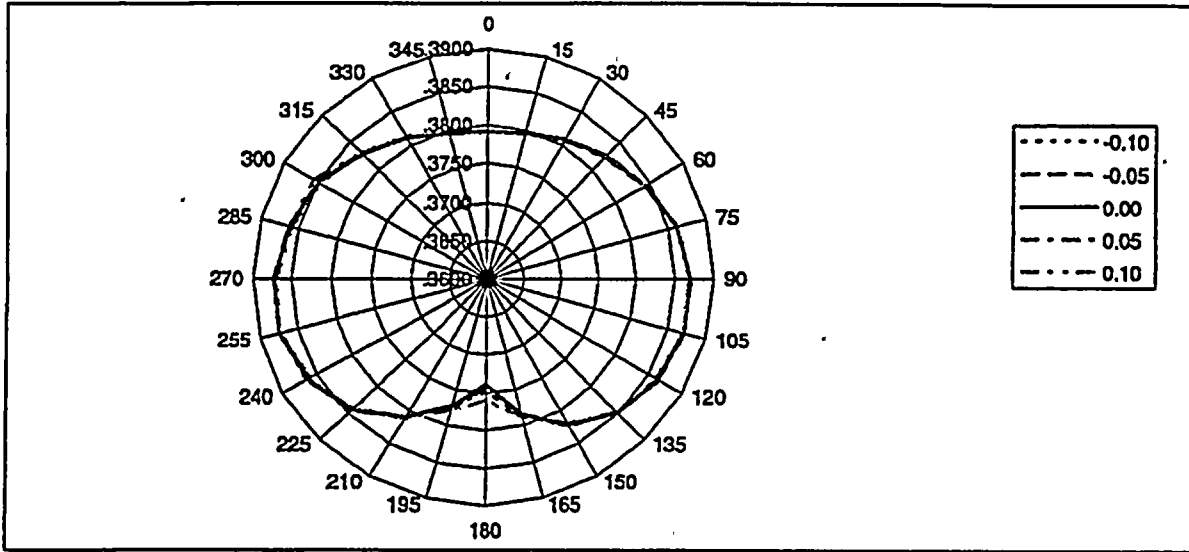
Specimen	over tsp	straight tube
Avg. Tube ID radius	.3829	.3831

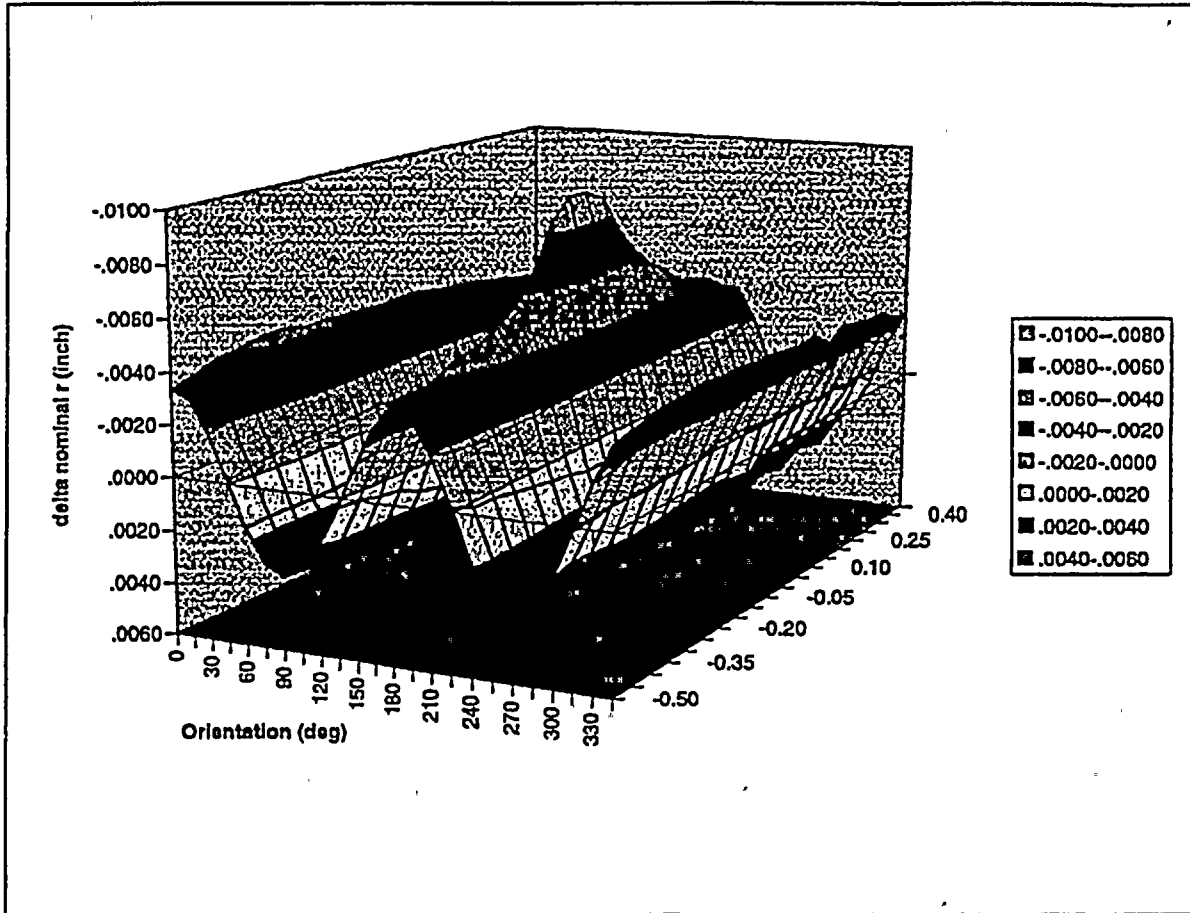
At screw location:

Average radial dent	-.0015
Maximum radial dent	-.0043

At position by tsp:

Average radial dent	-.0015
Maximum radial dent	-.0029

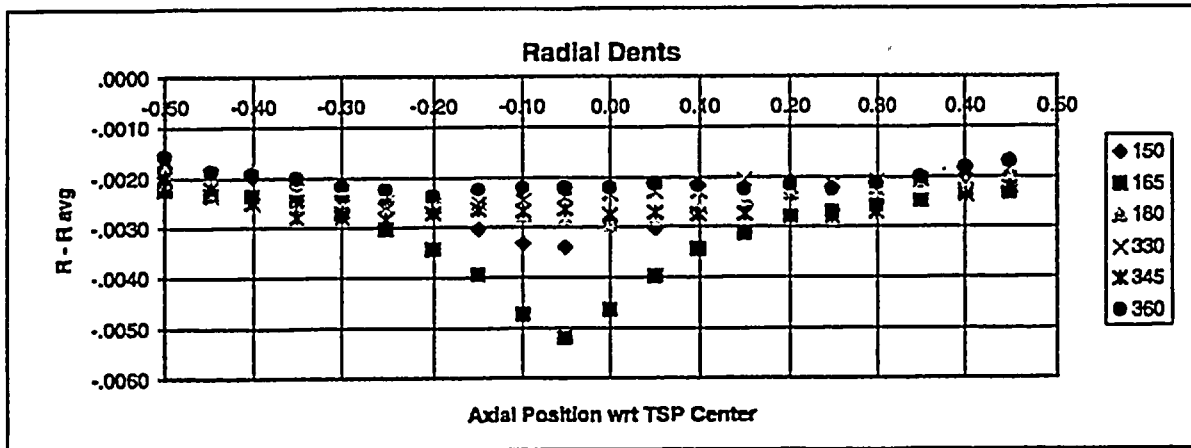
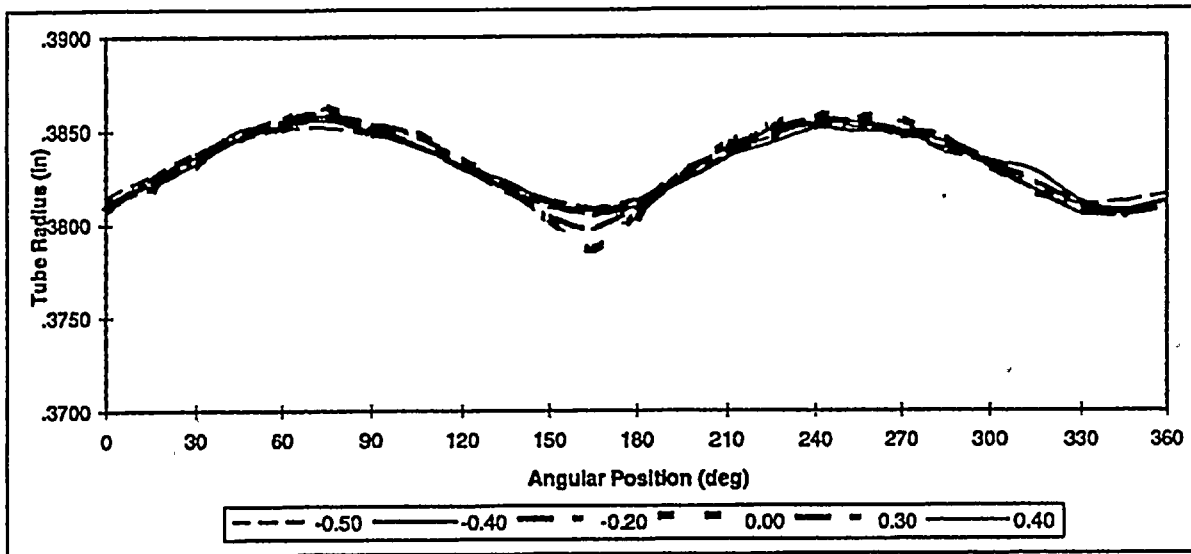
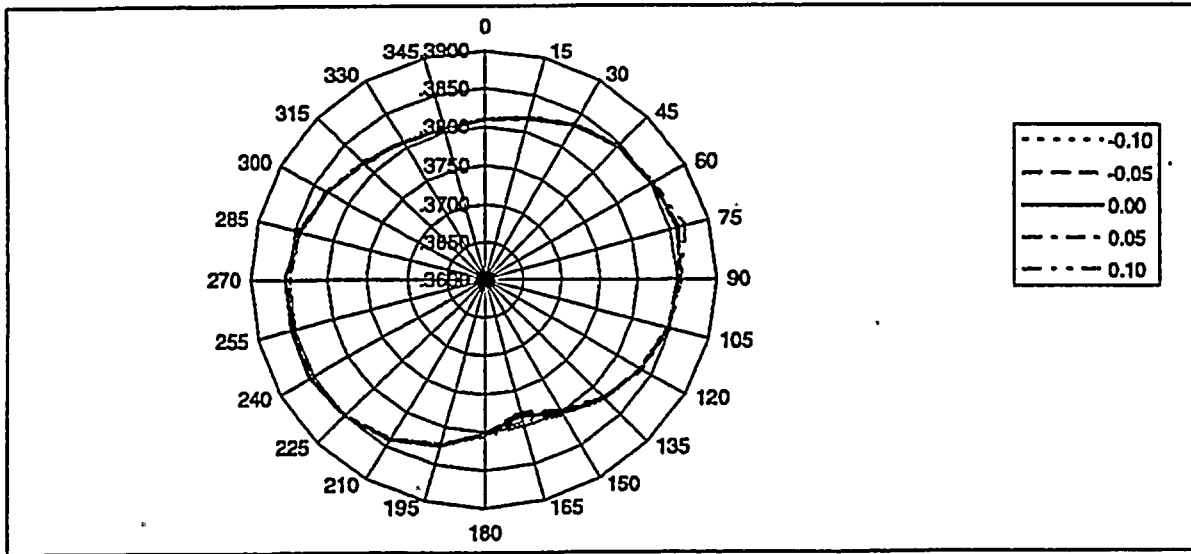


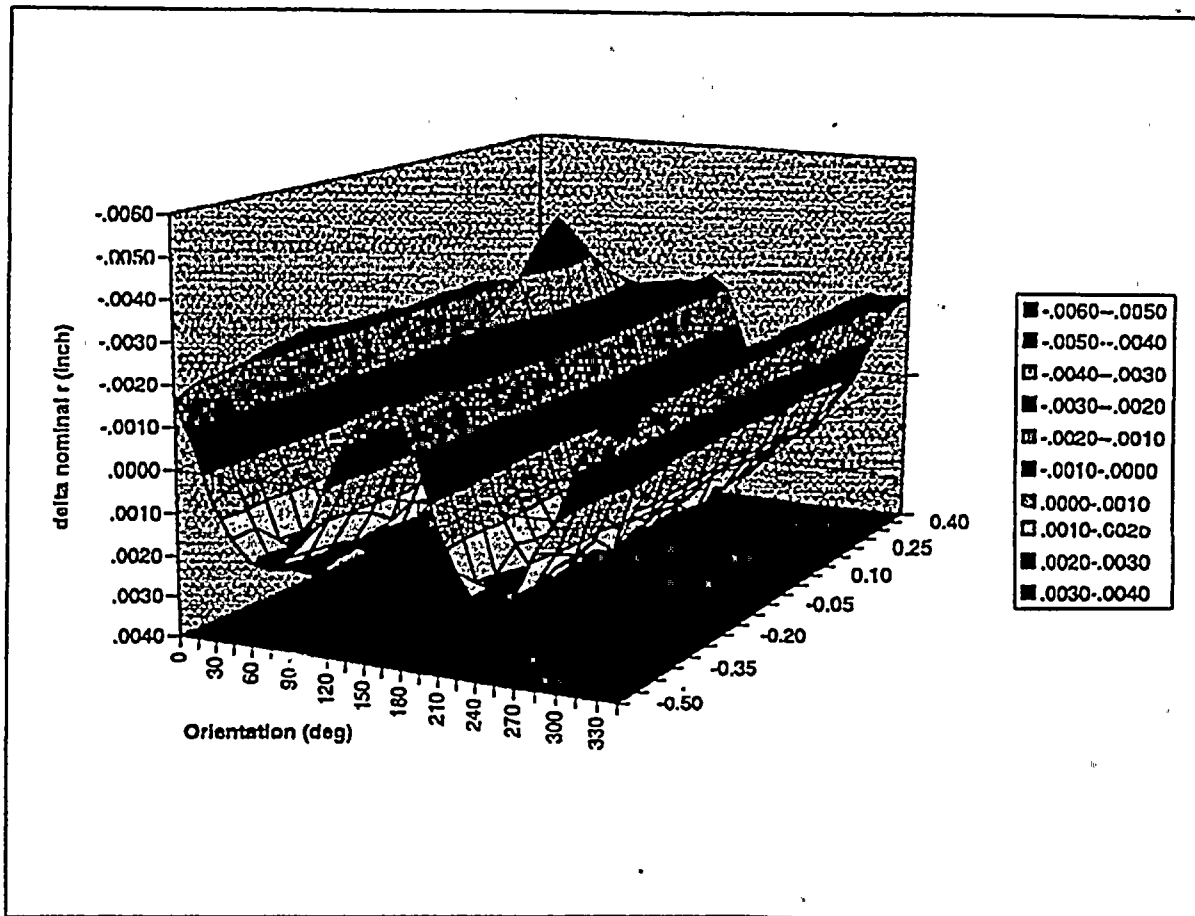


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3831	.3831

At screw location:
 Average radial dent -0.0035
 Maximum radial dent -0.0093

At position by tsp:
 Average radial dent -0.0030
 Maximum radial dent -0.0043





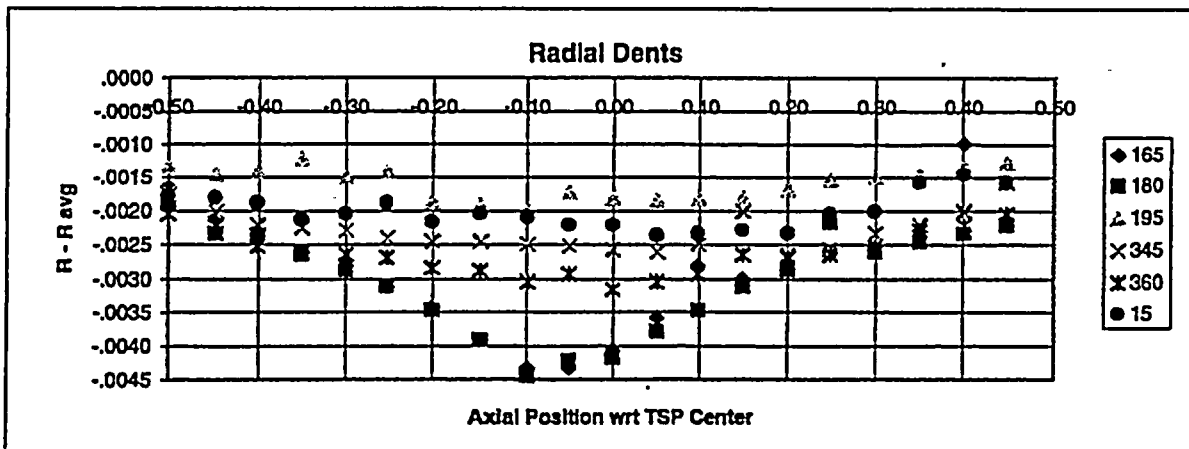
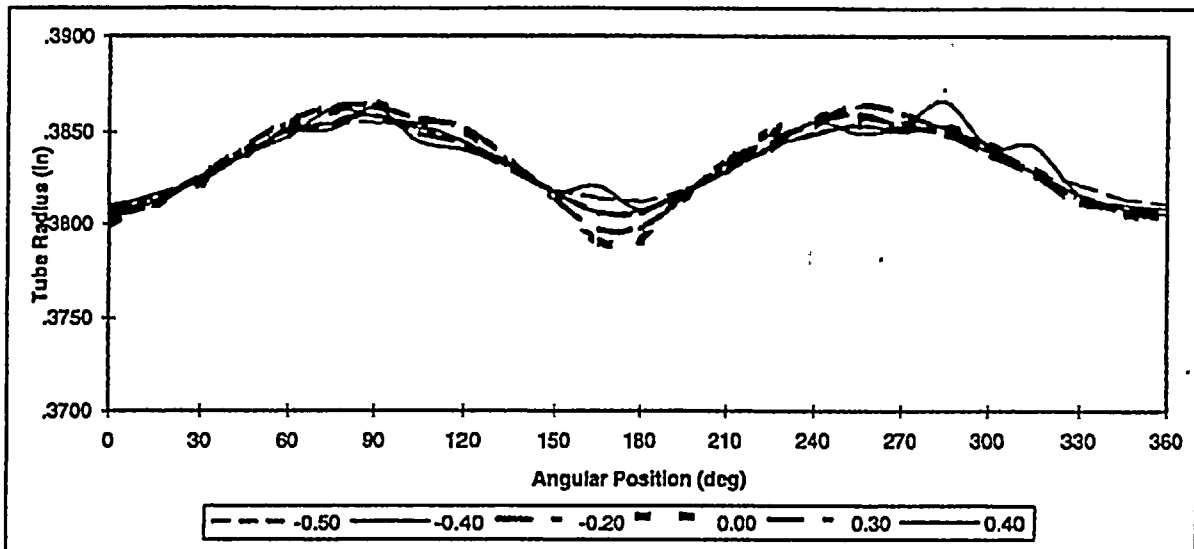
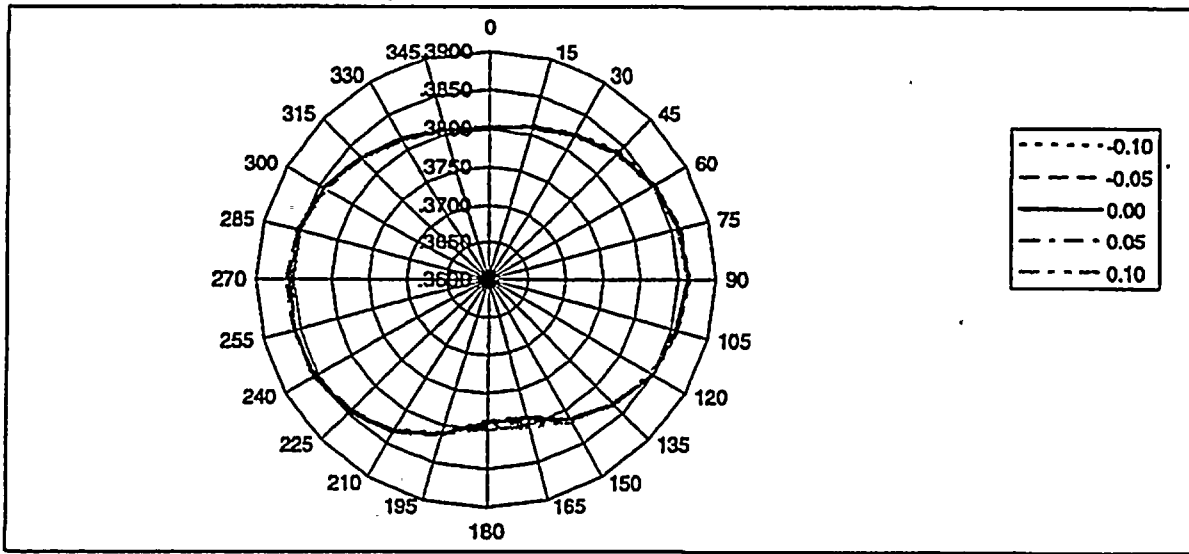
Specimen	over tsp	straight tube
Avg. Tube ID radius	.3831	.3831

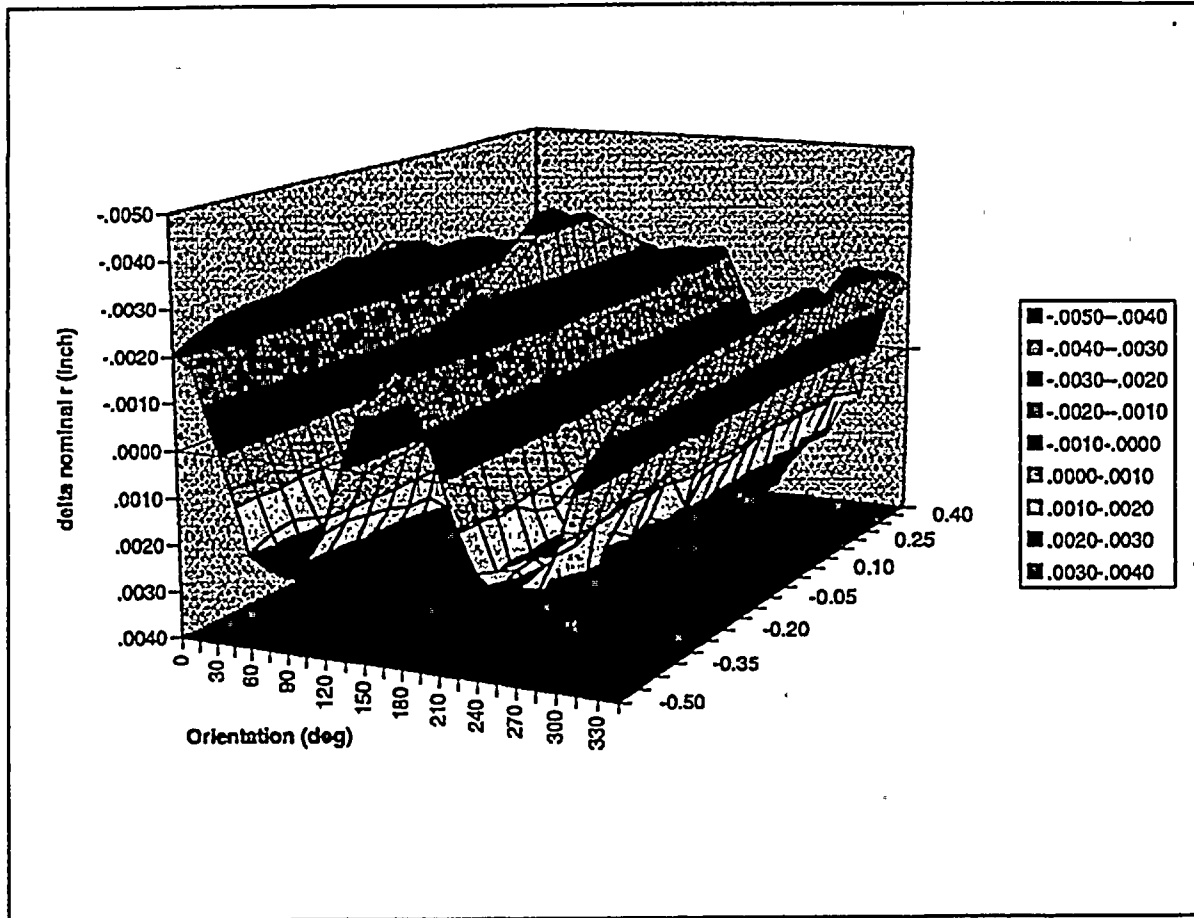
At screw location:

Average radial dent	-0.0026
Maximum radial dent	-0.0052

At position by tsp:

Average radial dent	-0.0023
Maximum radial dent	-0.0028





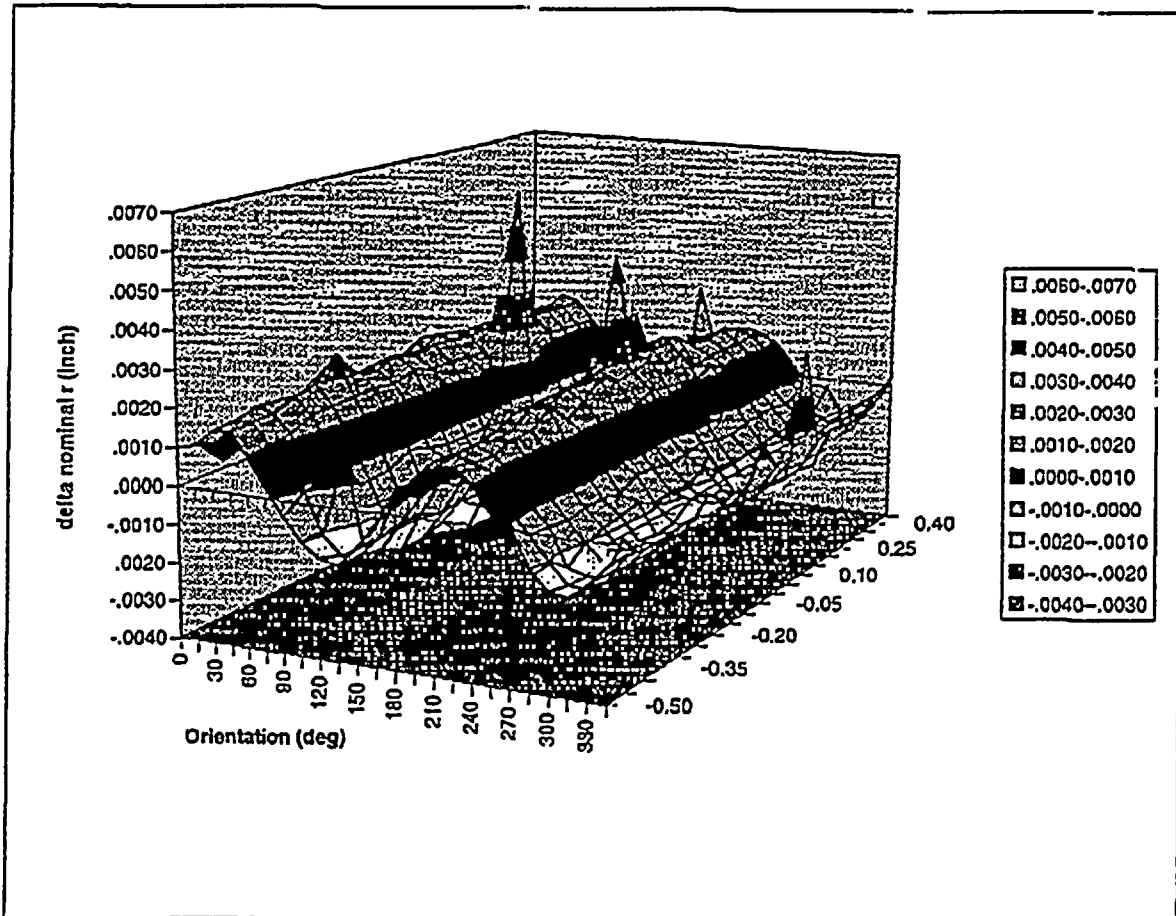
Specimen	over tsp	straight tube
Avg. Tube ID radius	.3833	.3831

At screw location:

Average radial dent	-.0025
Maximum radial dent	-.0045

At position by tsp:

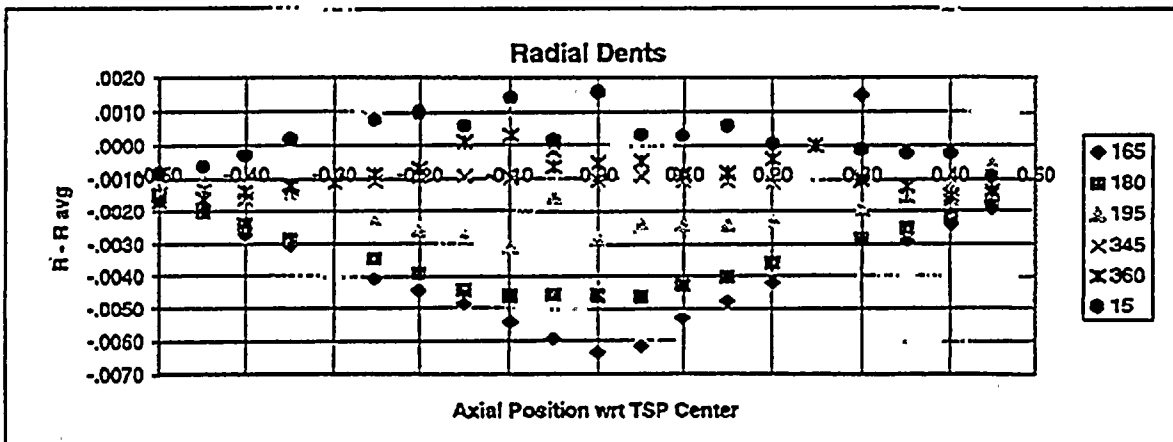
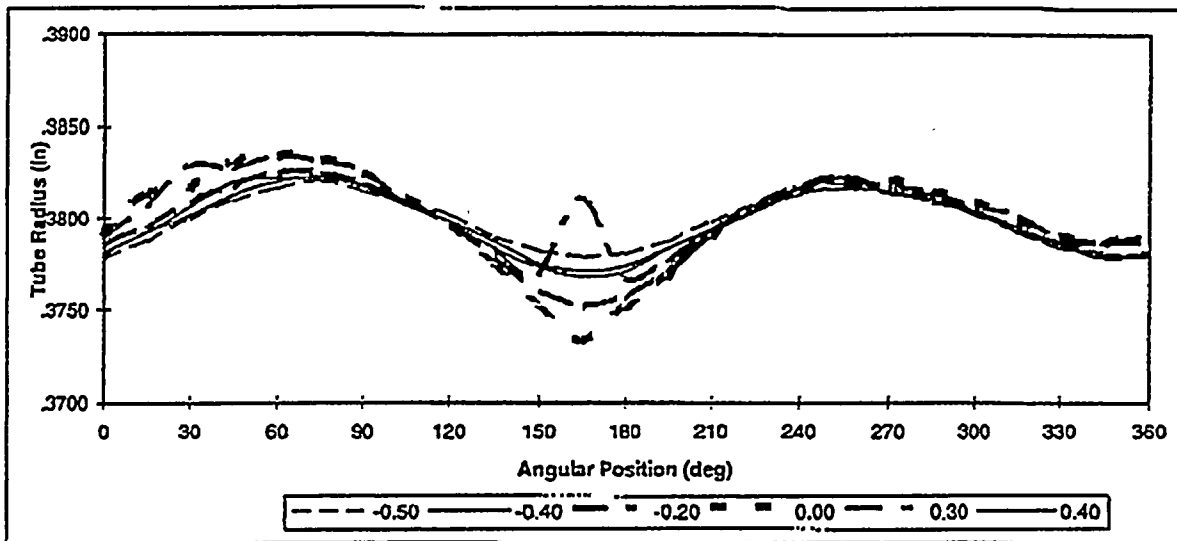
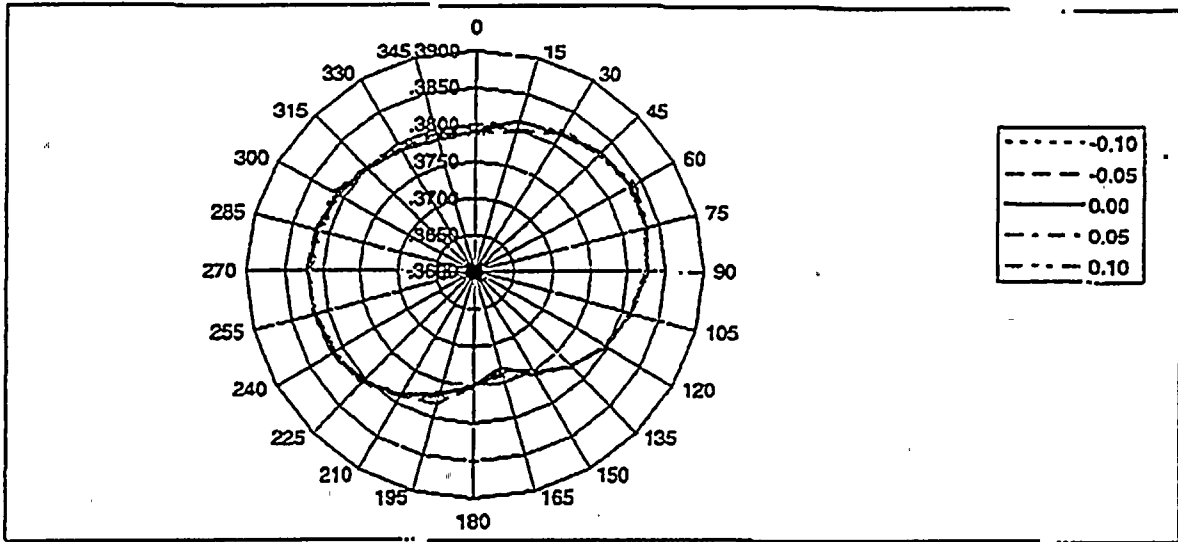
Average radial dent	-.0023
Maximum radial dent	-.0032

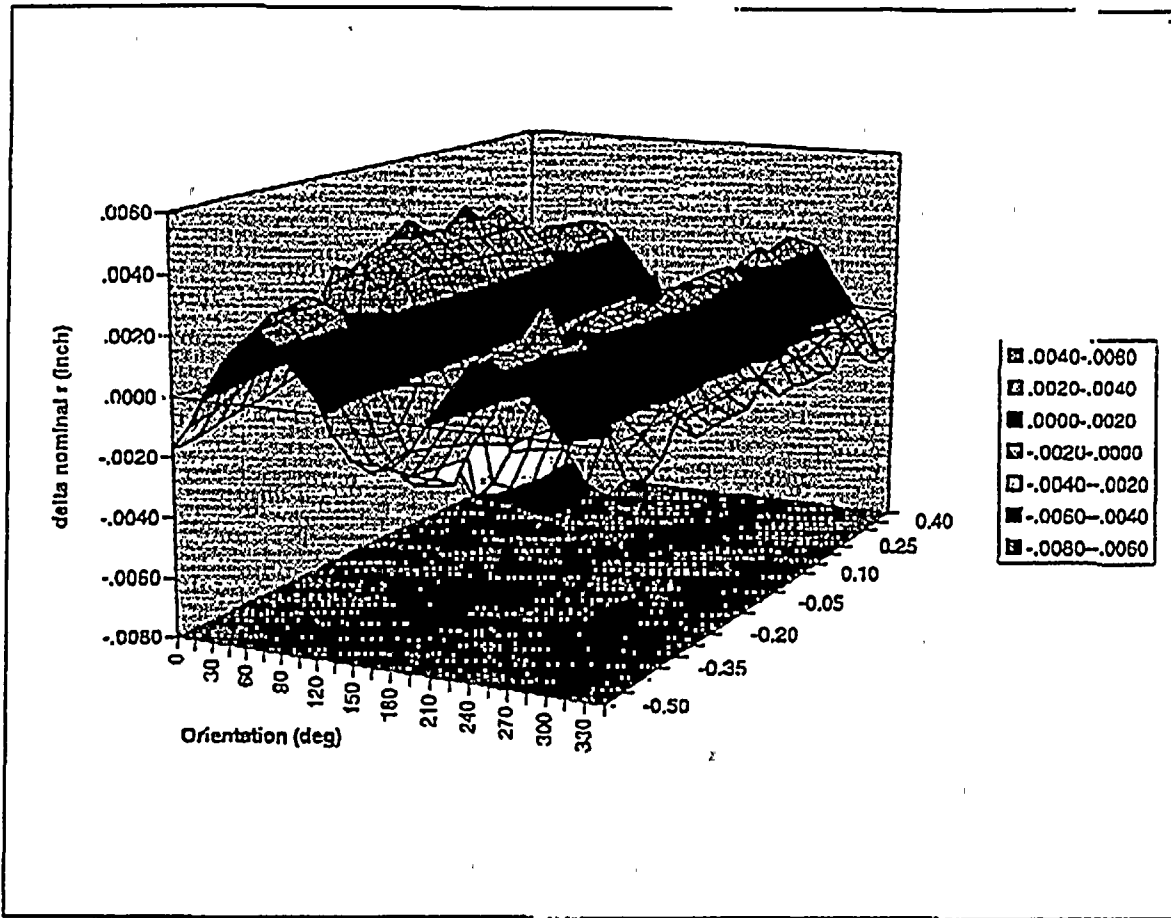


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3796	.3795

At screw location:
 Average radial dent -.0017
 Maximum radial dent -.0031

At position by tsp:
 Average radial dent .0004
 Maximum radial dent -.0032





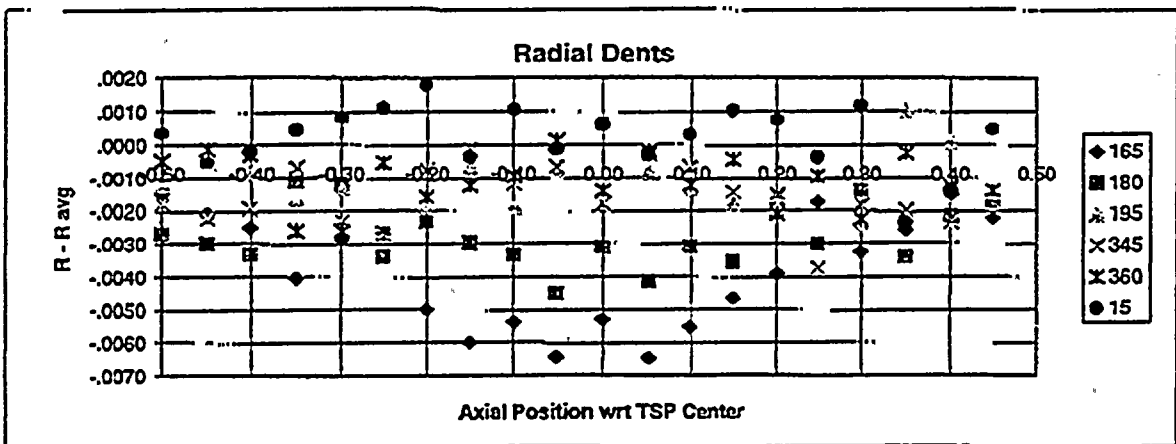
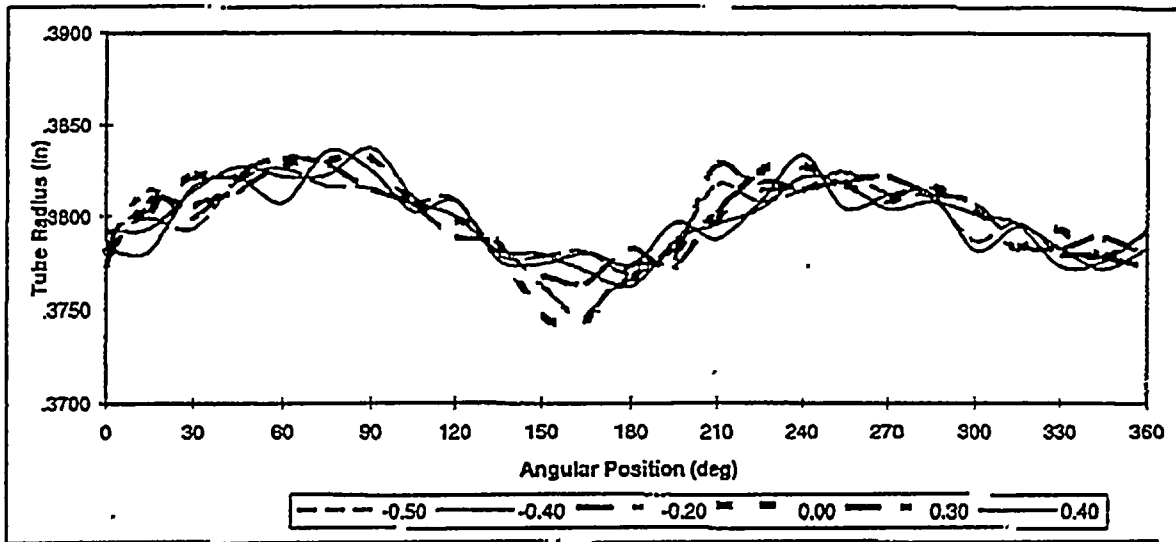
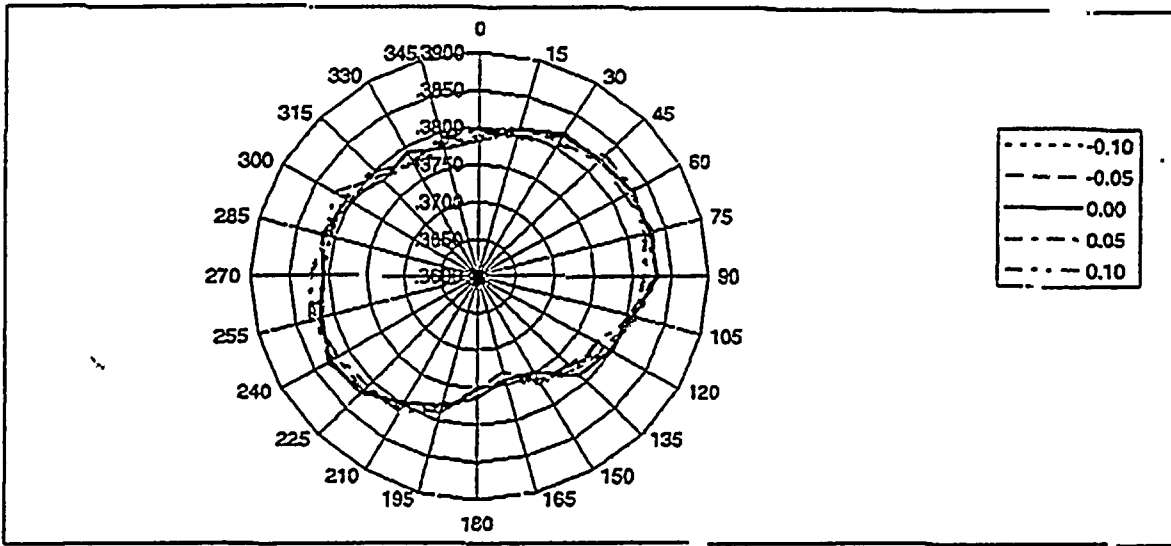
	over	straight
Specimen	tsp	tube
Avg. Tube ID radius	.3799	.3795

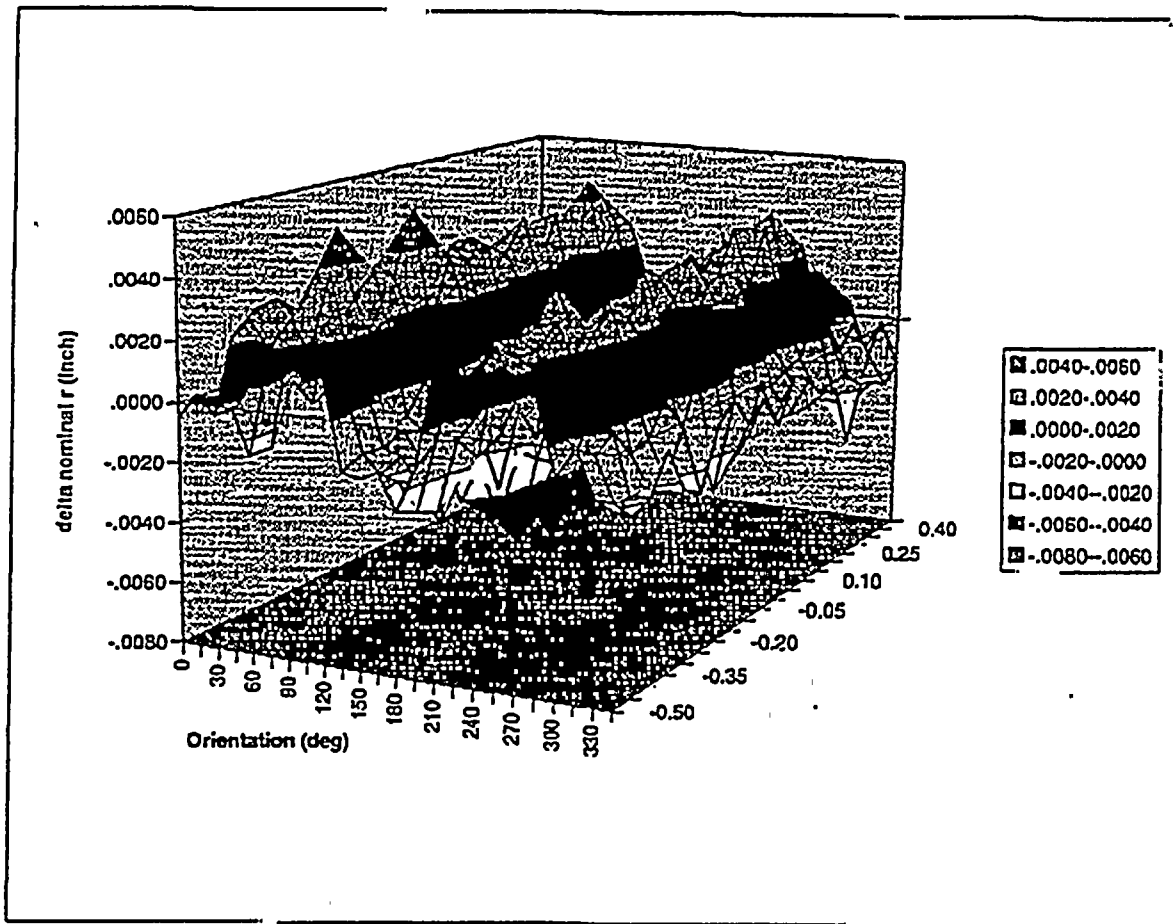
At screw location:

Average radial dent	-.0030
Maximum radial dent	-.0064

At position by tsp:

Average radial dent	-.0006
Maximum radial dent	-.0017





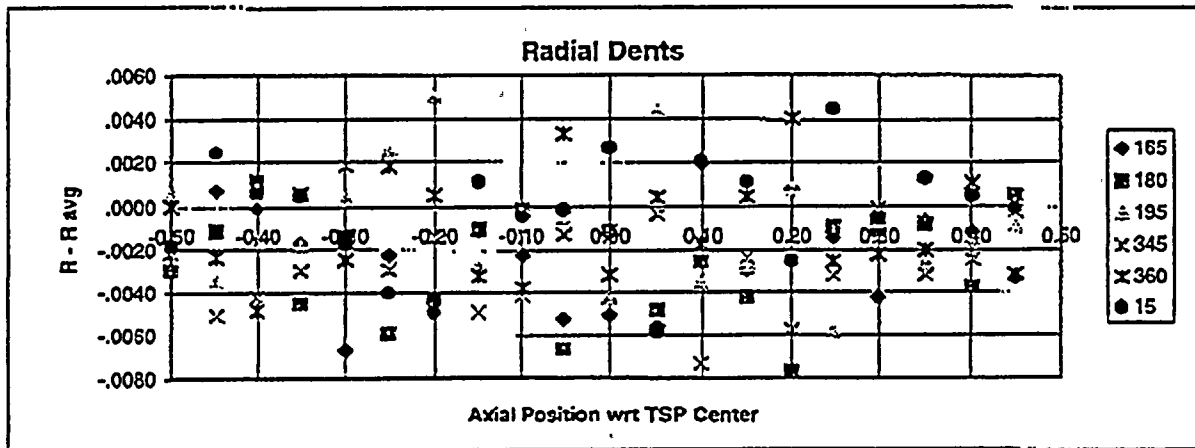
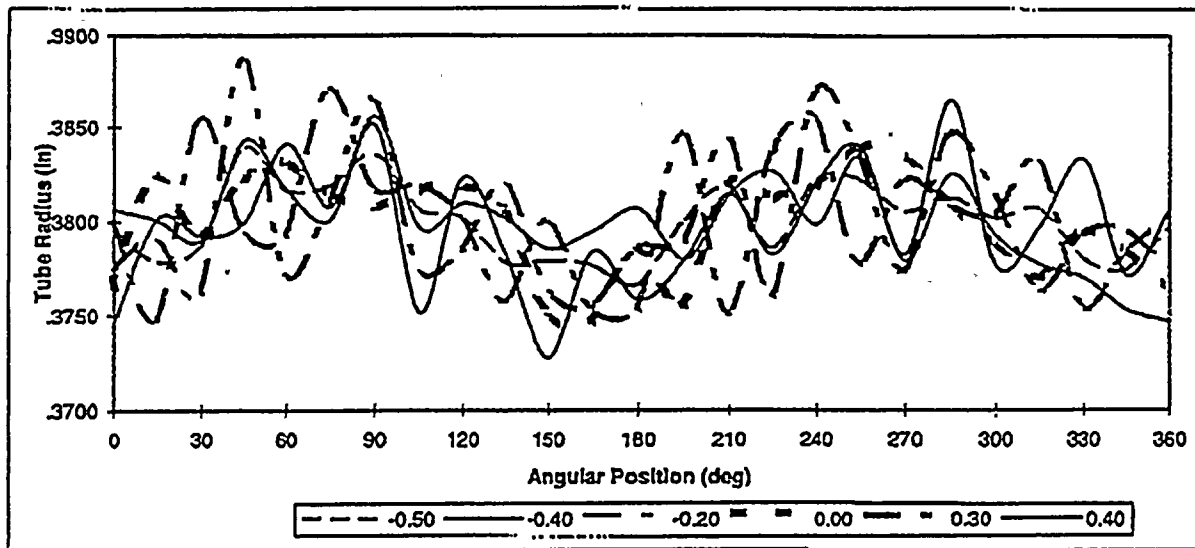
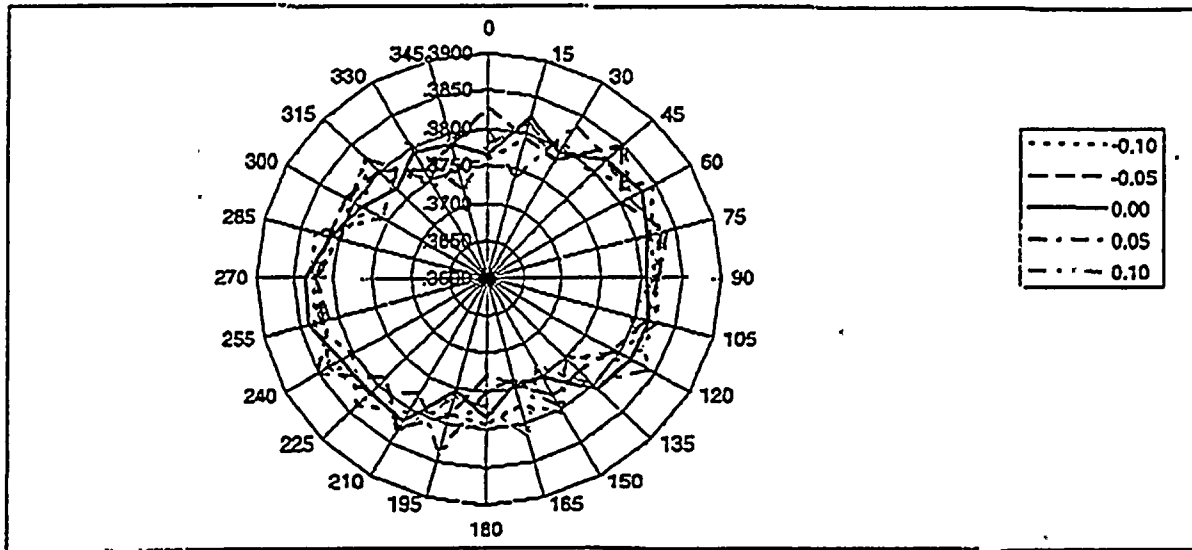
	over	straight
Specimen	tsp	tube
Avg. Tube ID radius	.3798	.3795

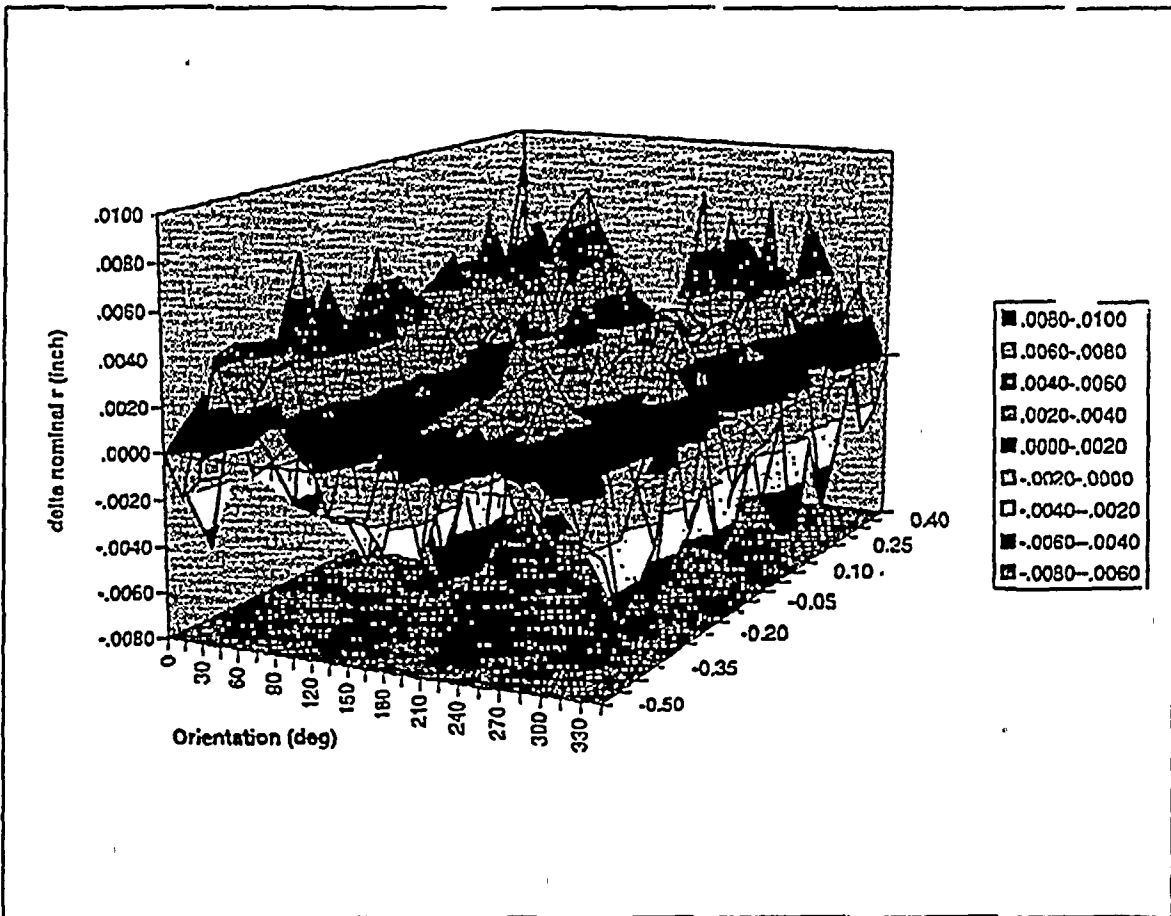
At screw location:

Average radial dent	-.0026
Maximum radial dent	-.0065

At position by tsp:

Average radial dent	-.0008
Maximum radial dent	-.0037

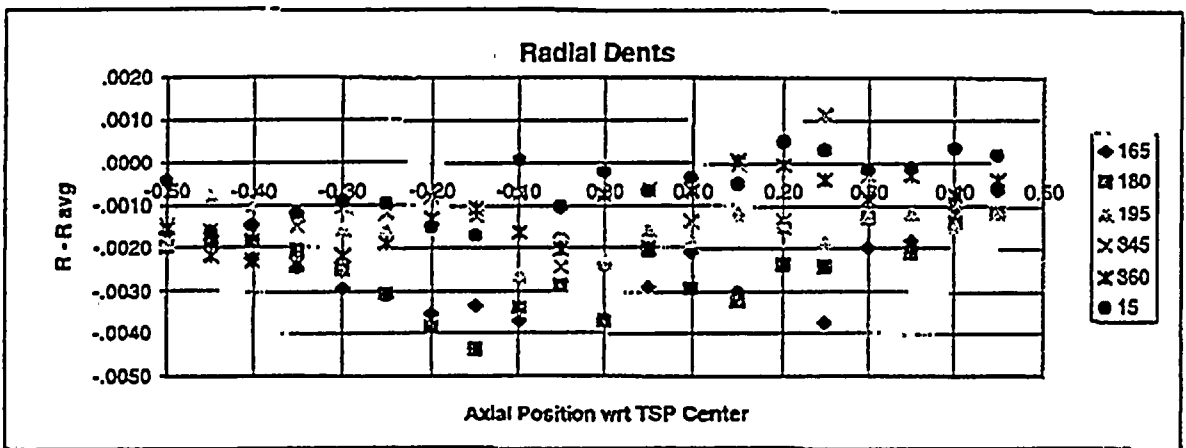
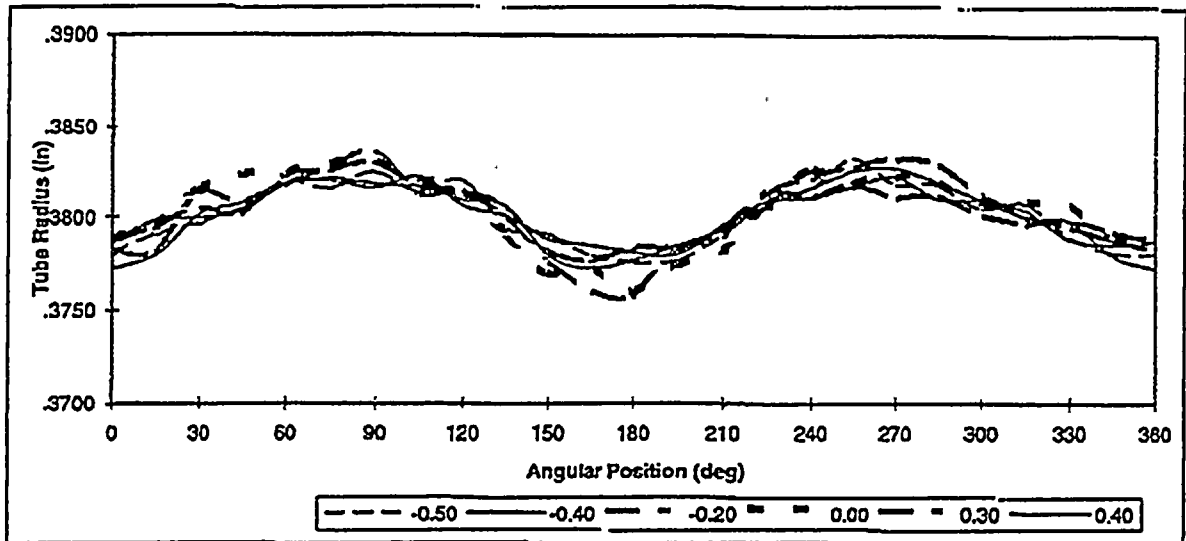
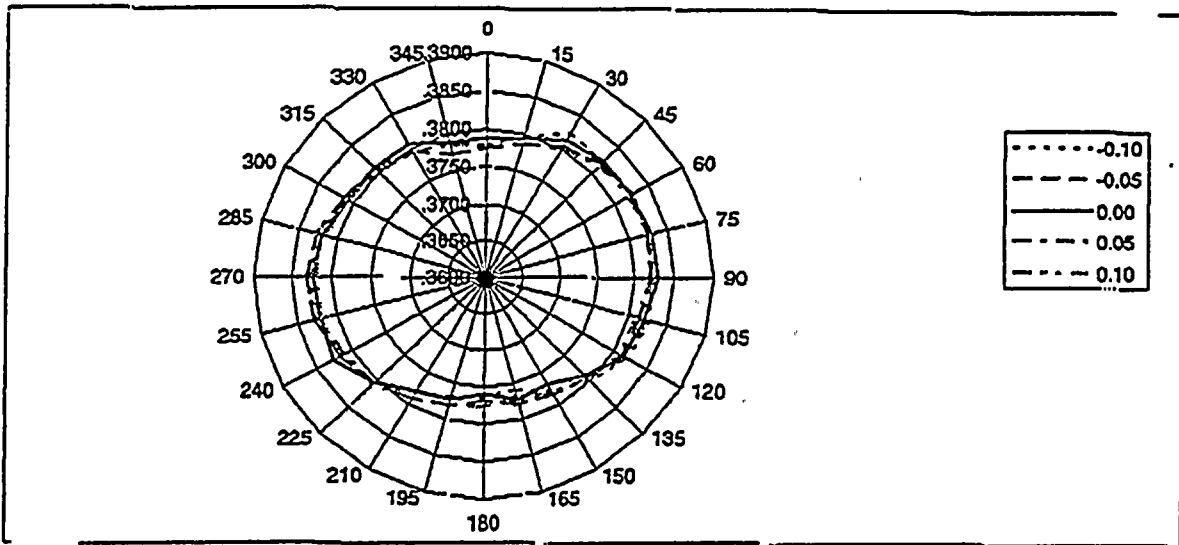


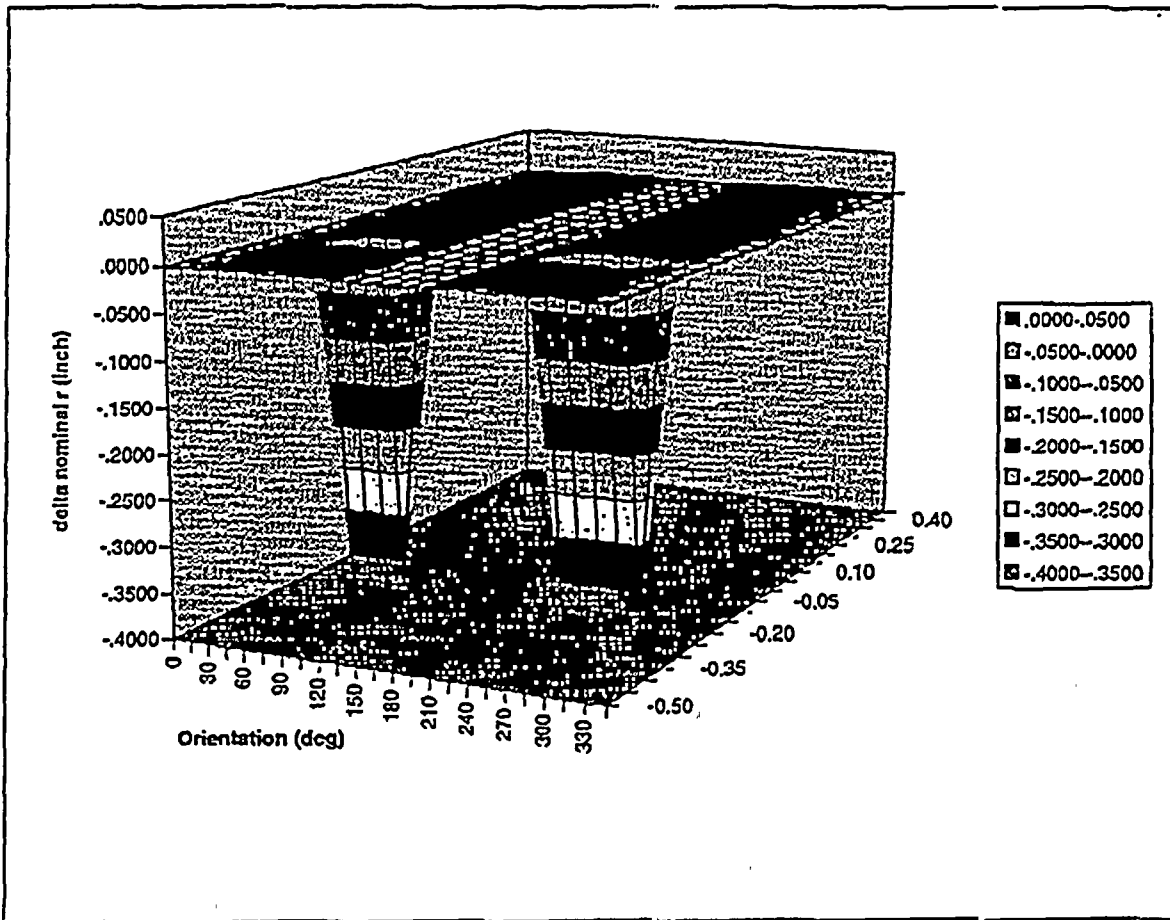


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3800	.3795

At screw location:
 Average radial dent -.0020
 Maximum radial dent -.0077

At position by tsp:
 Average radial dent -.0013
 Maximum radial dent -.0073

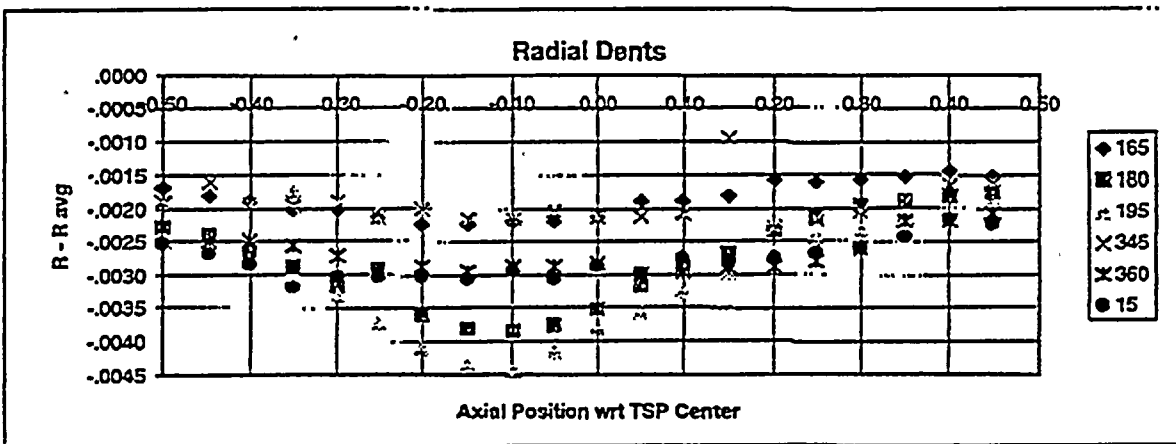
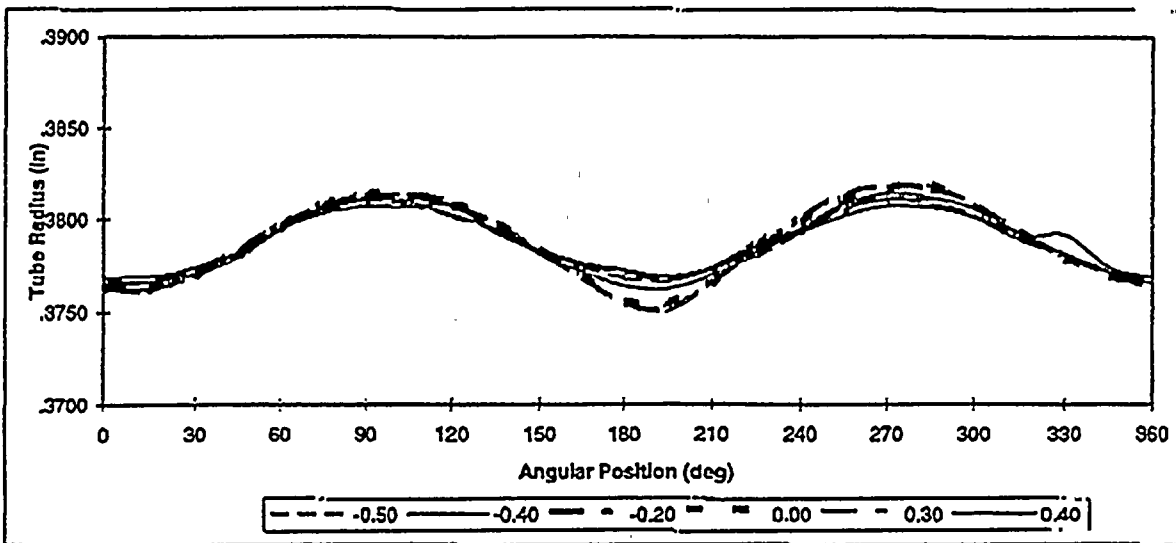
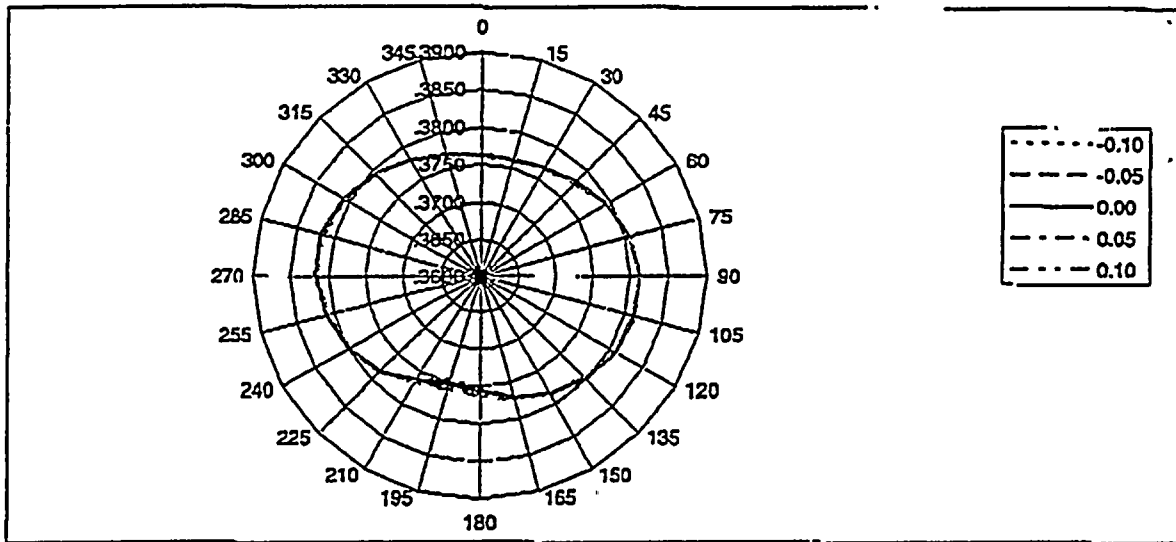


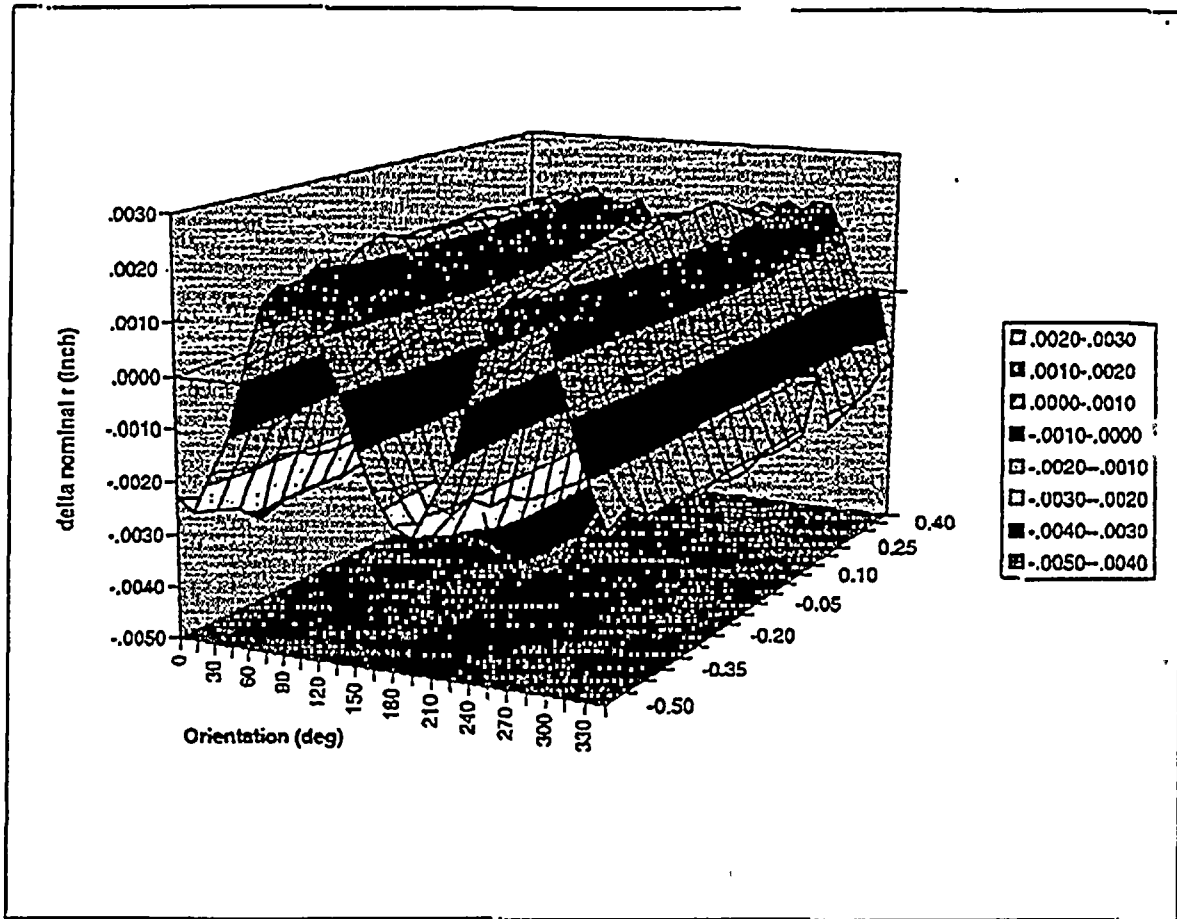


	over	straight
Specimen	tsp	tube
Avg. Tube ID radius	.3802	.3795

At screw location:
 Average radial dent -.0021
 Maximum radial dent -.0044

At position by tsp:
 Average radial dent -.0009
 Maximum radial dent -.0024

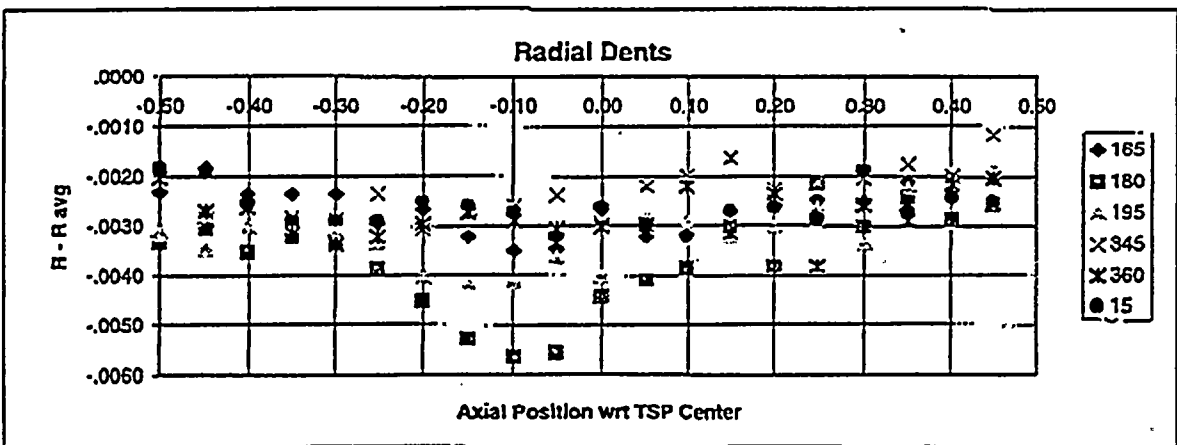
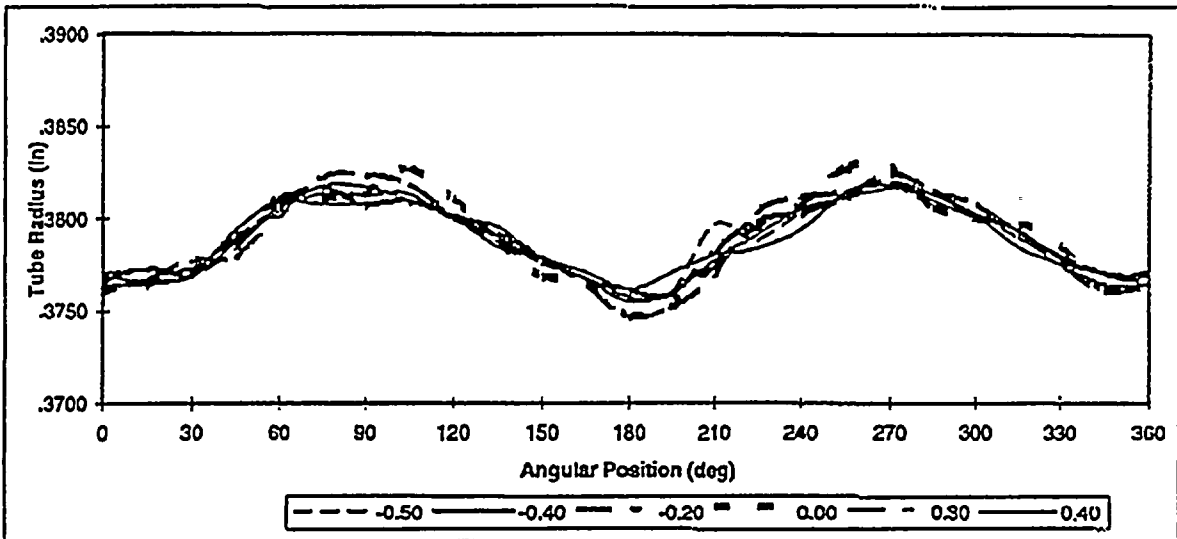
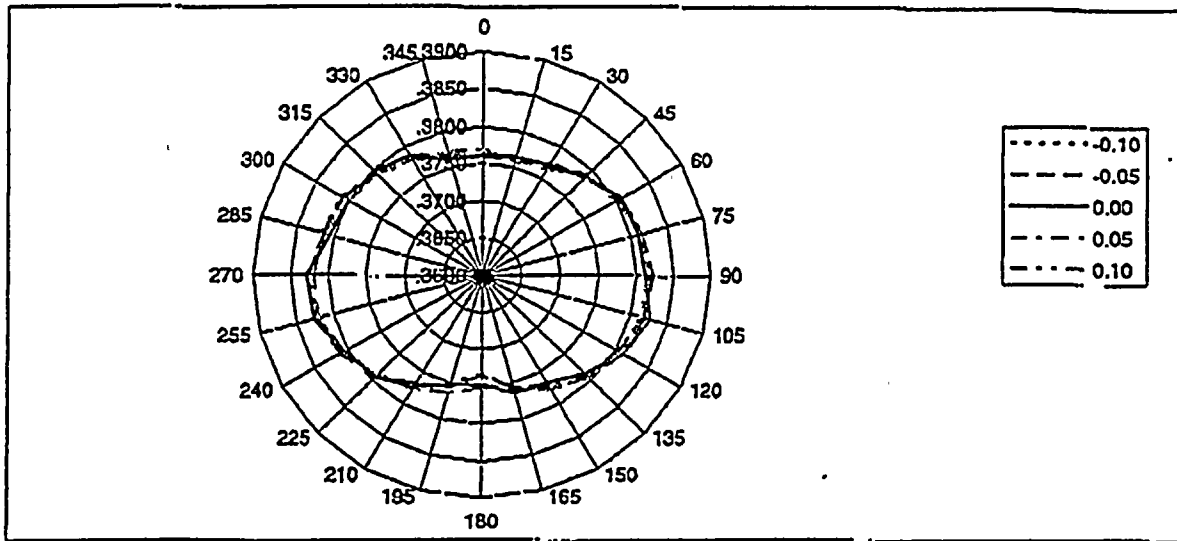


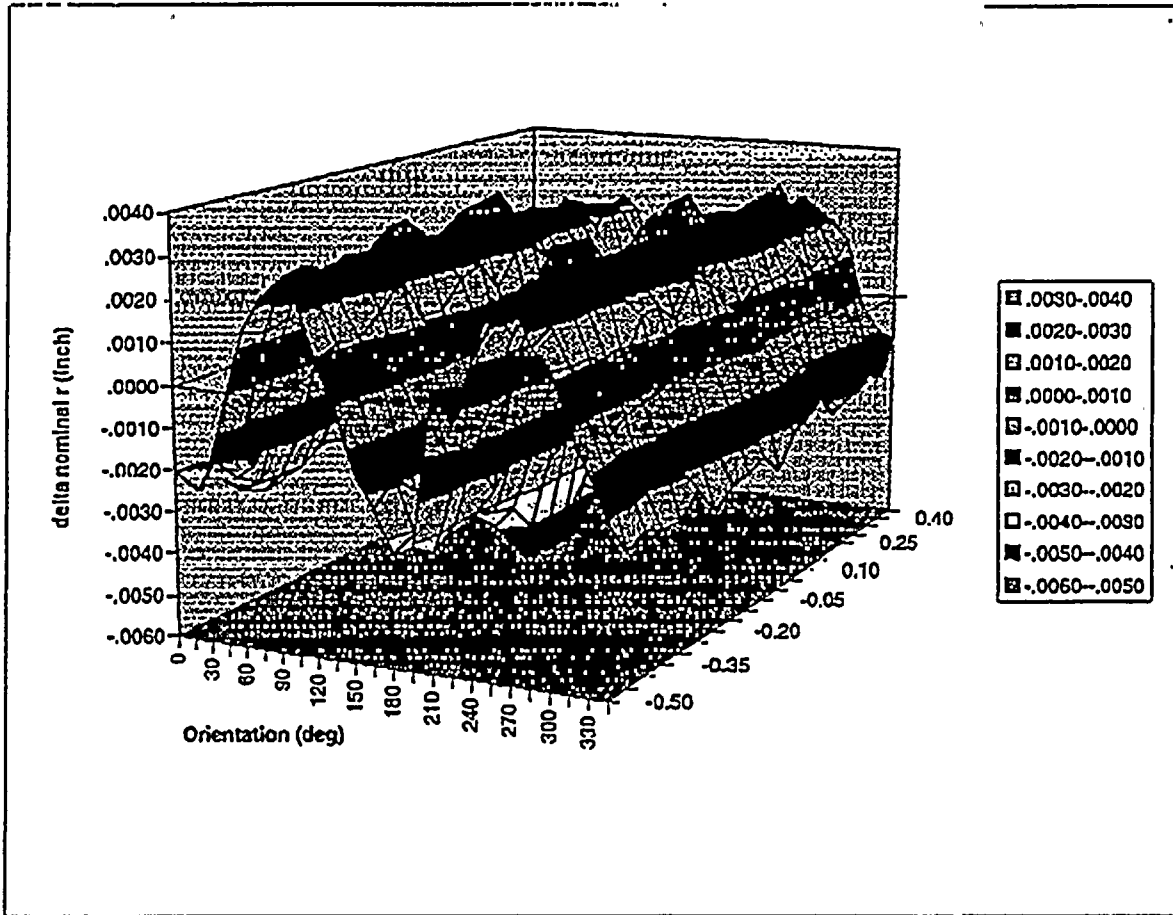


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3788	.3790

At screw location:
 Average radial dent -.0026
 Maximum radial dent -.0044

At position by tsp:
 Average radial dent -.0025
 Maximum radial dent -.0032

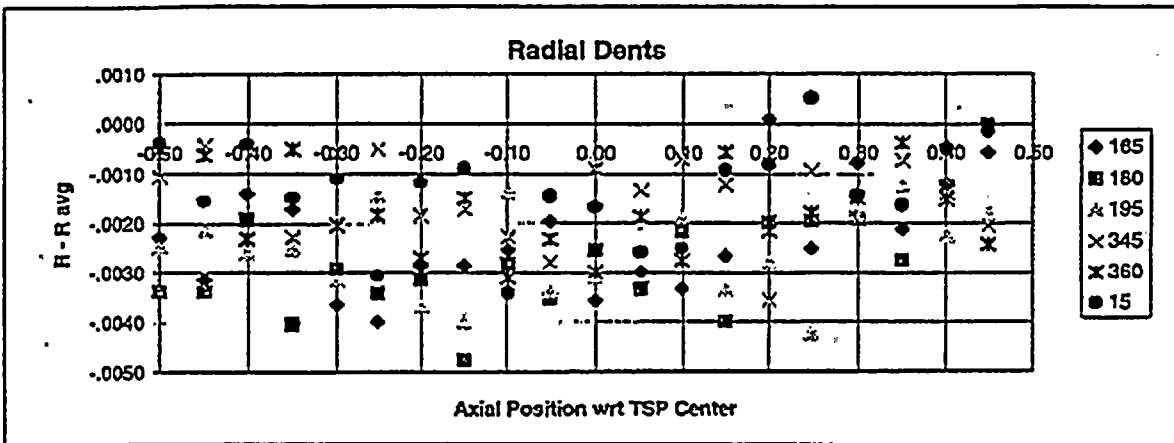
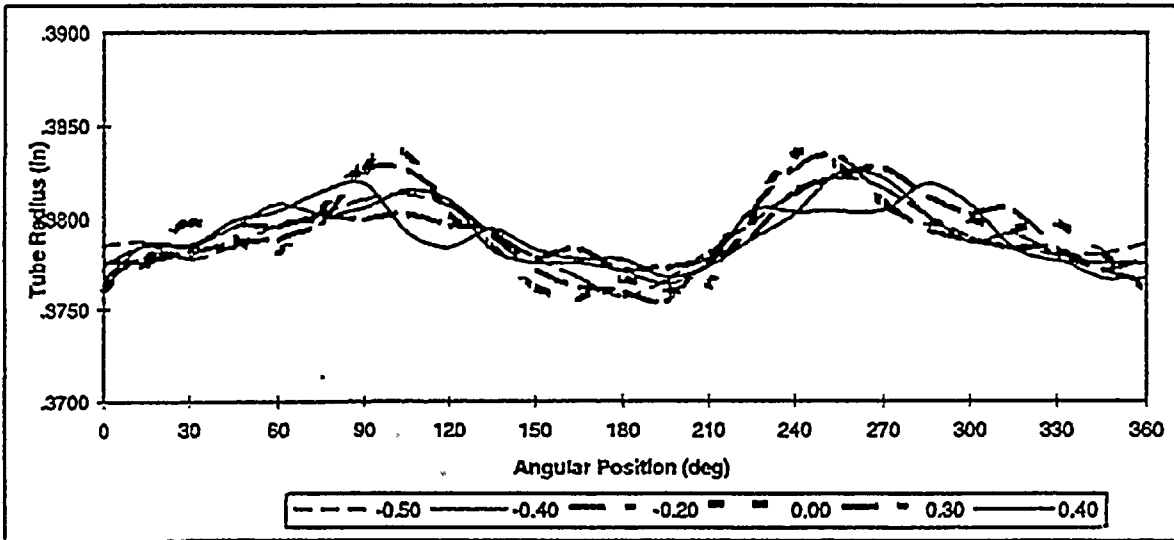
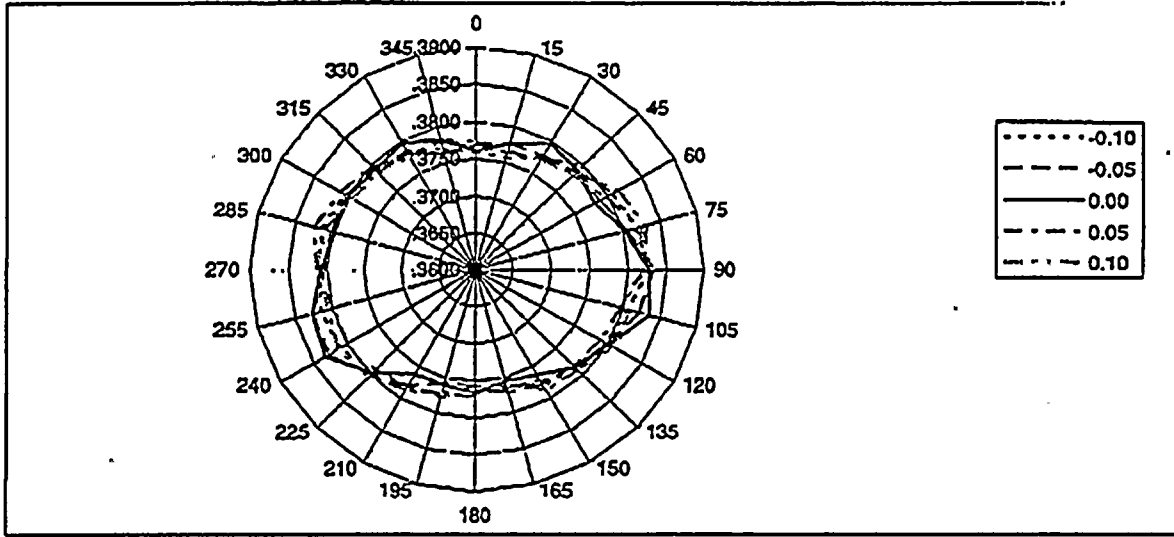


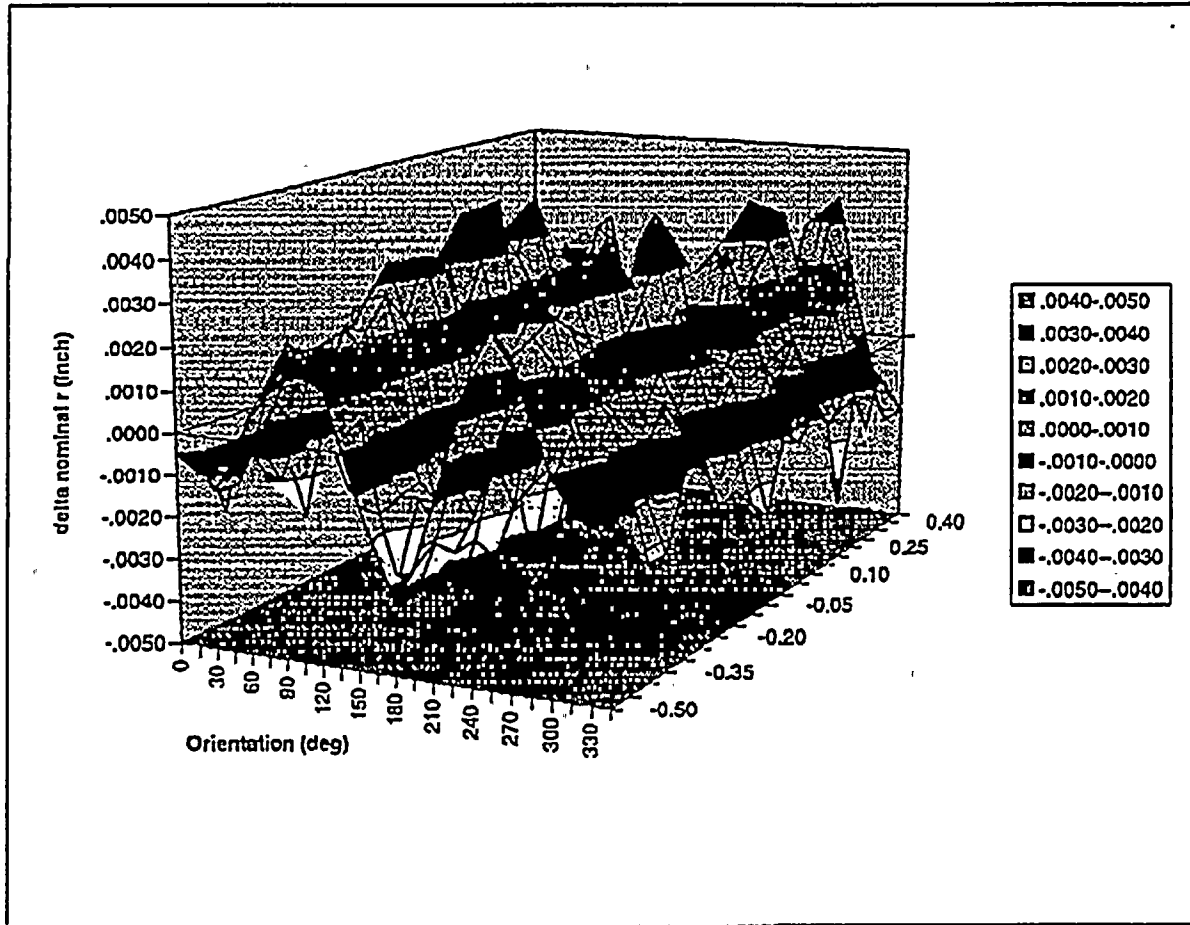


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3789	.3790

At screw location:
 Average radial dent -.0032
 Maximum radial dent -.0057

At position by tsp:
 Average radial dent -.0026
 Maximum radial dent -.0038

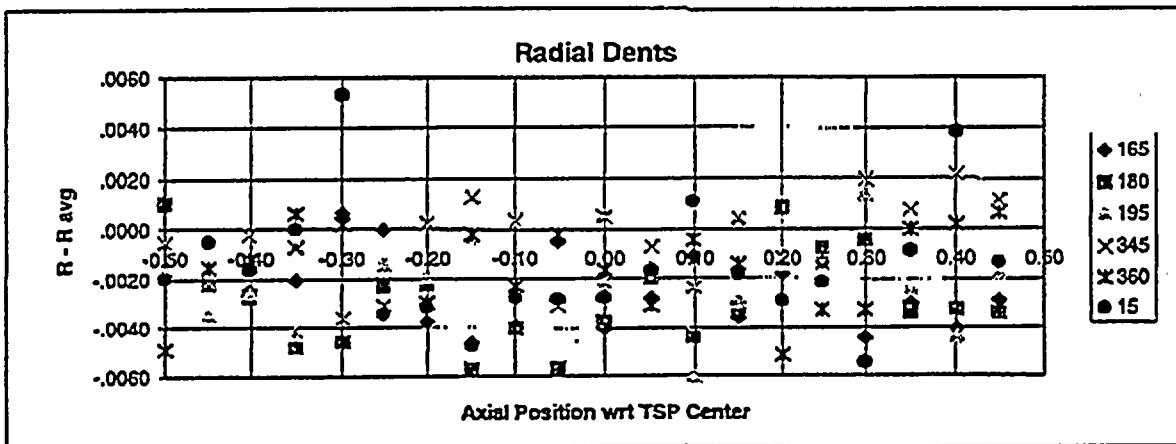
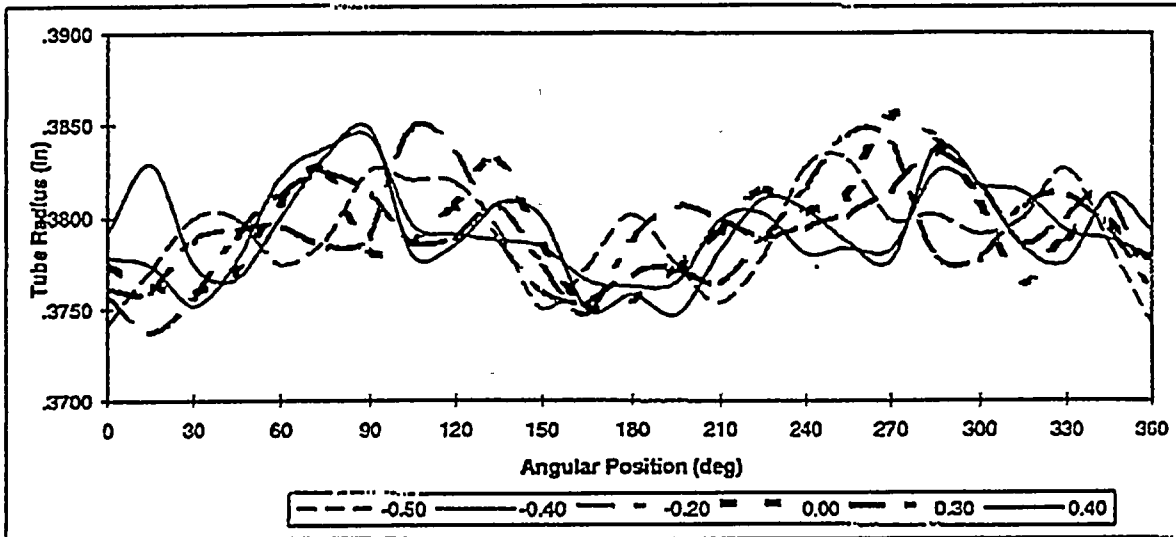
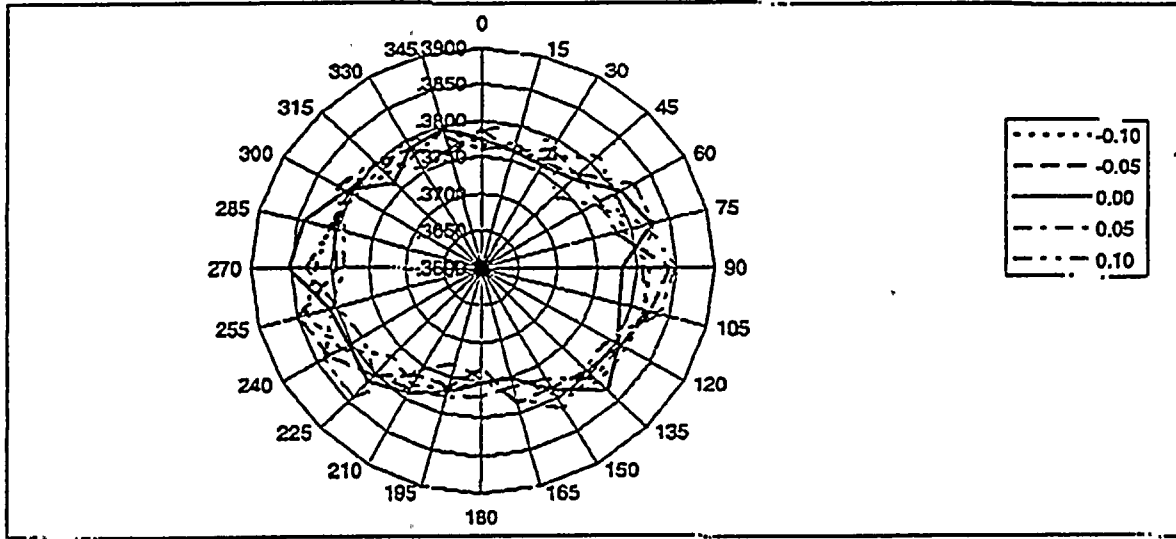


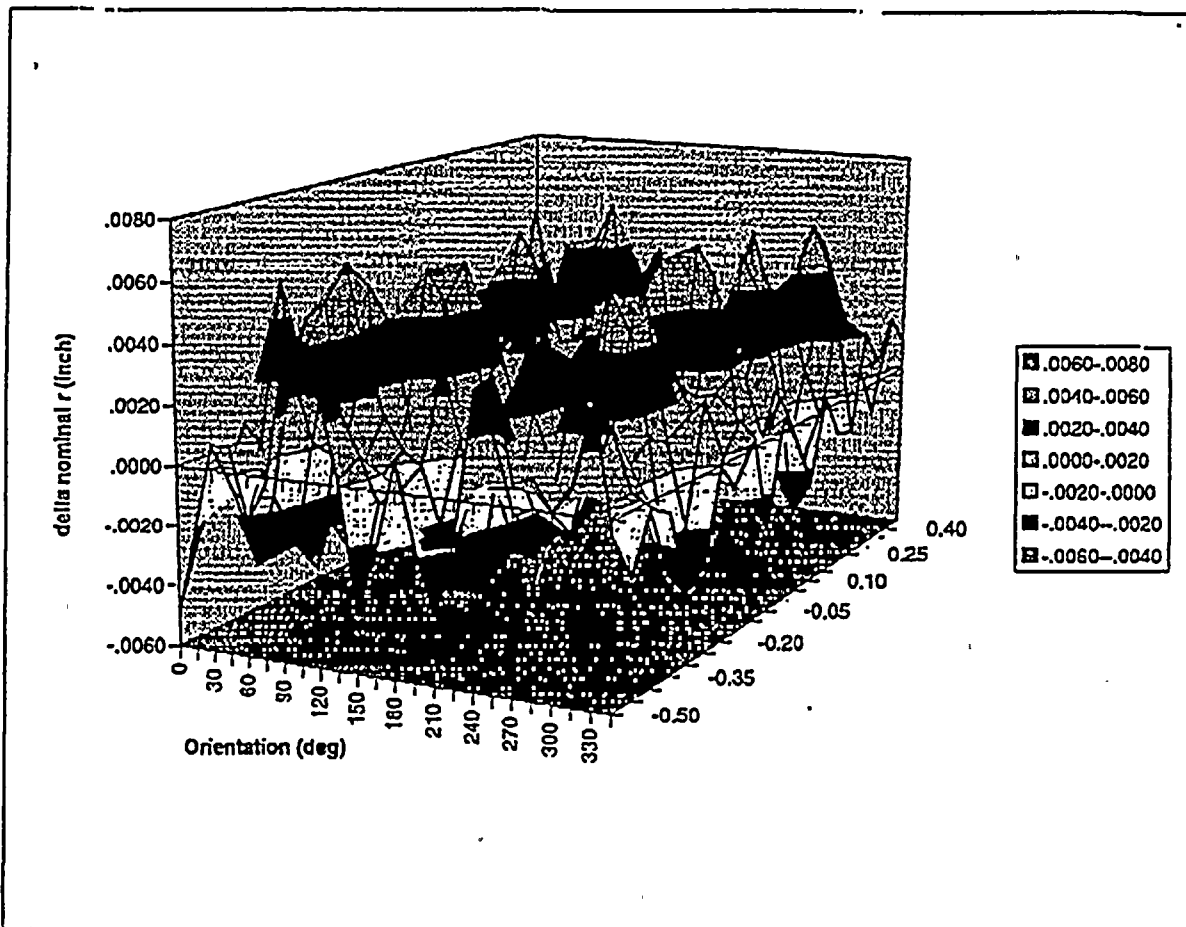


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3791	.3790

At screw location:
 Average radial dent -.0025
 Maximum radial dent -.0048

At position by tsp:
 Average radial dent -.0015
 Maximum radial dent -.0036

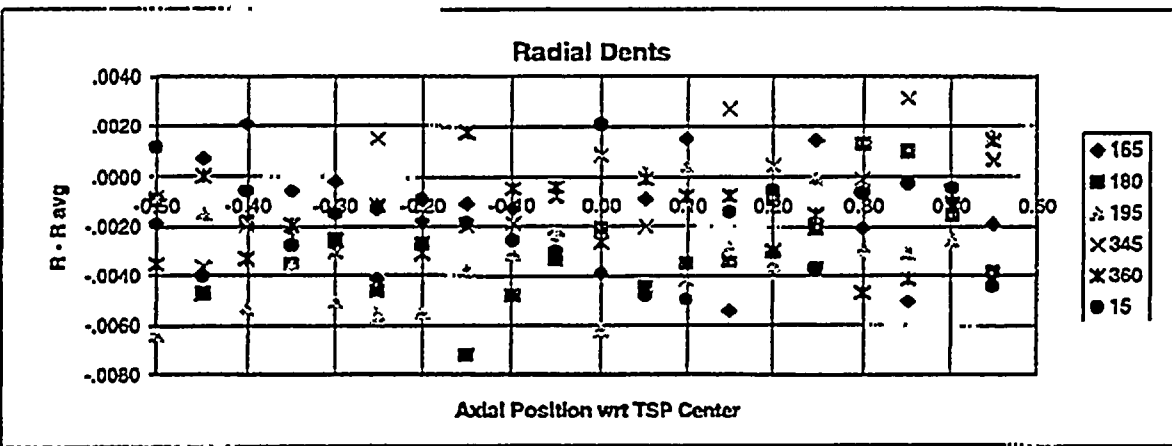
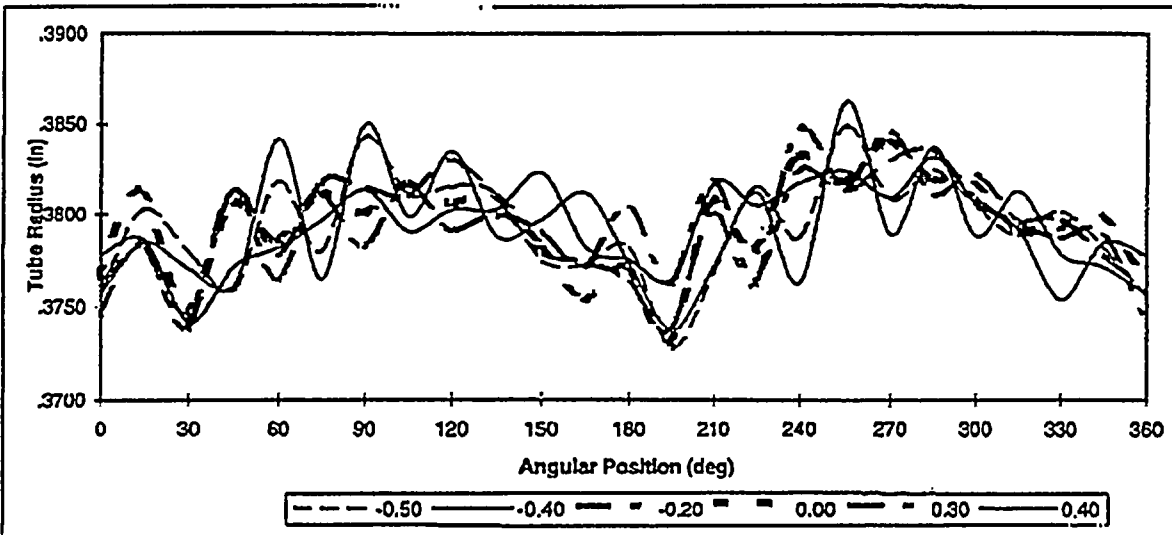
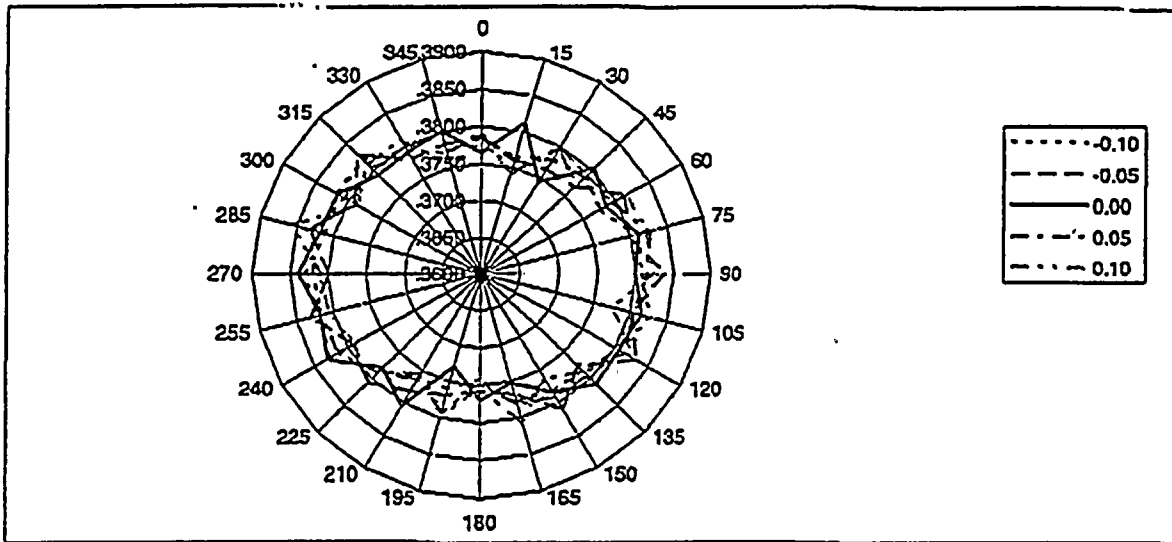


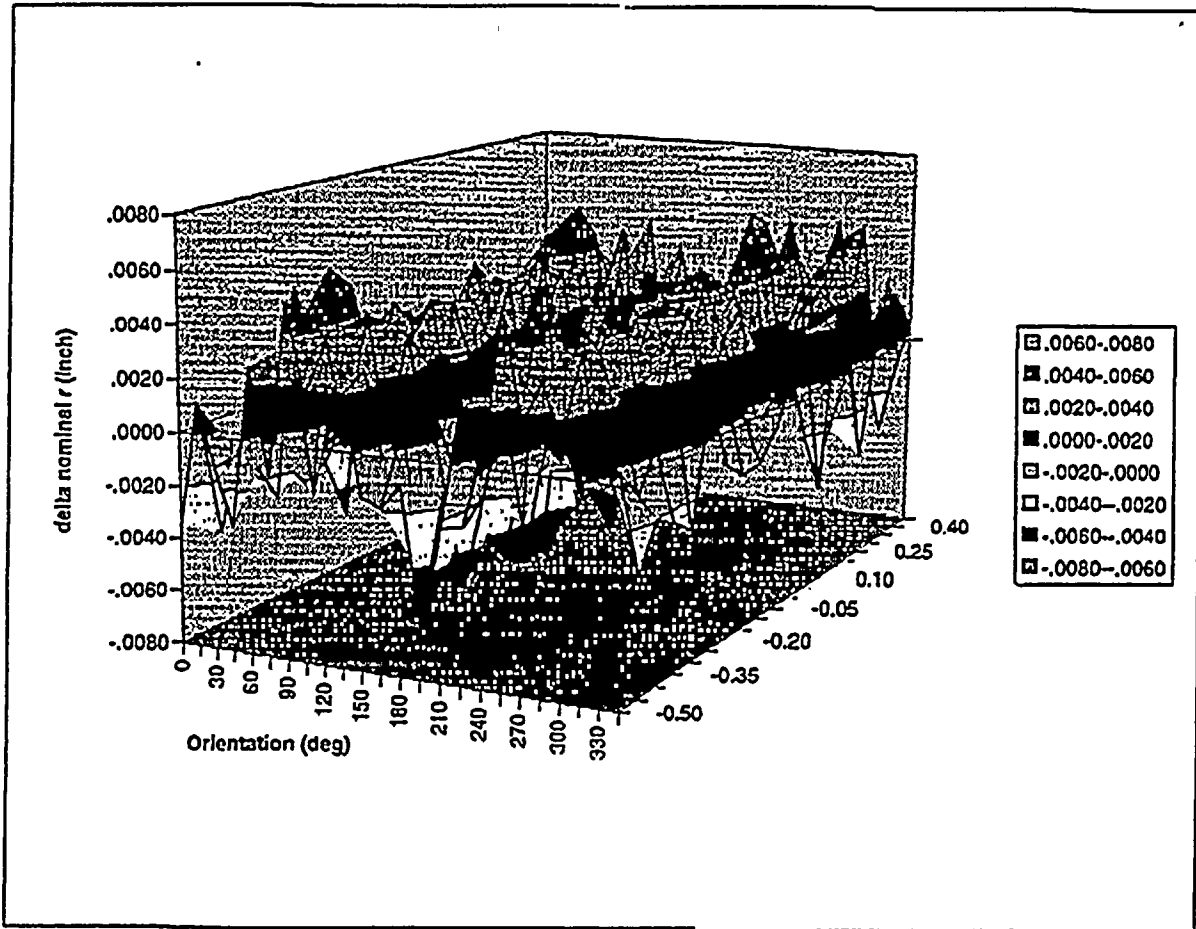


Specimen	over	straight
Avg. Tube ID radius	tsp .3792	tube .3790

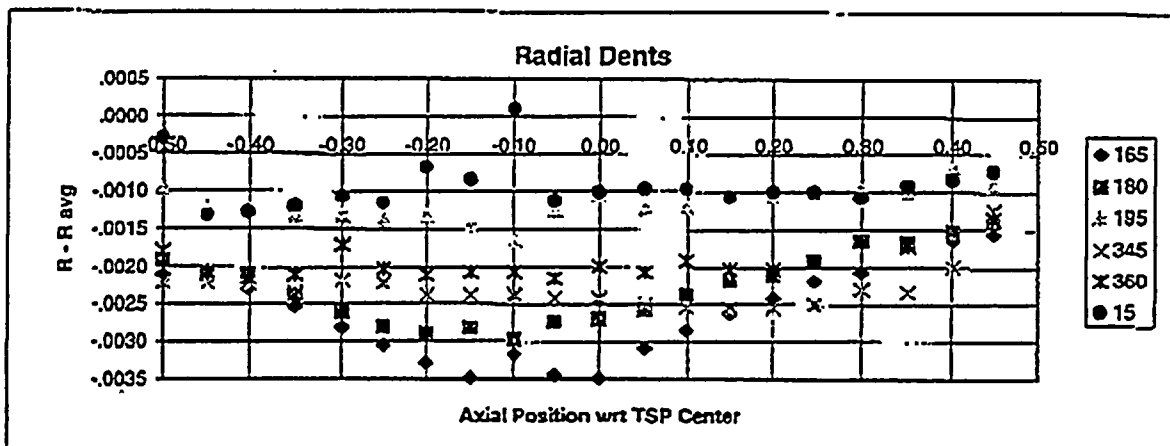
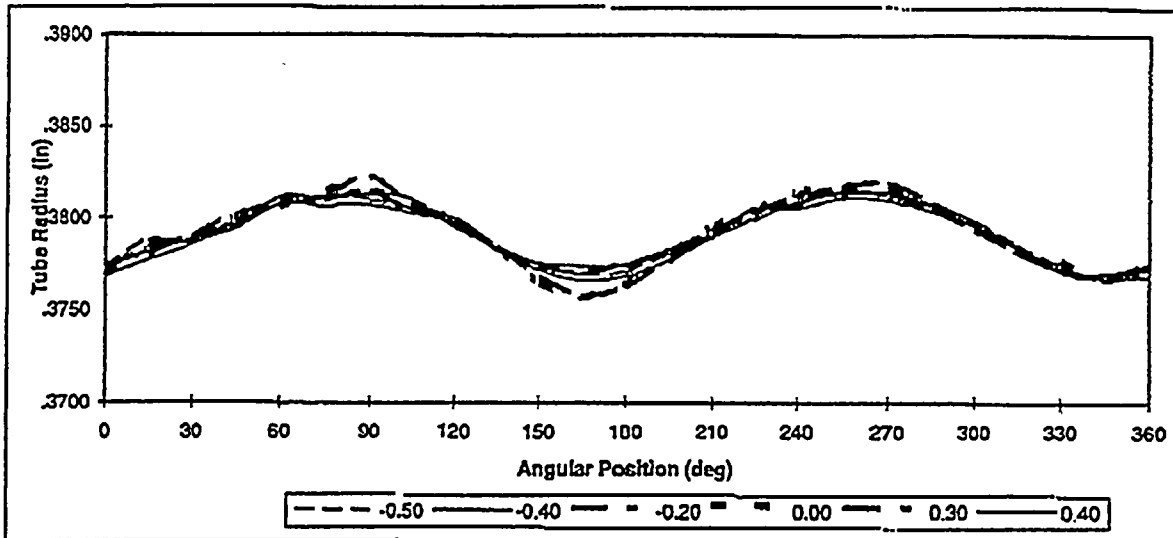
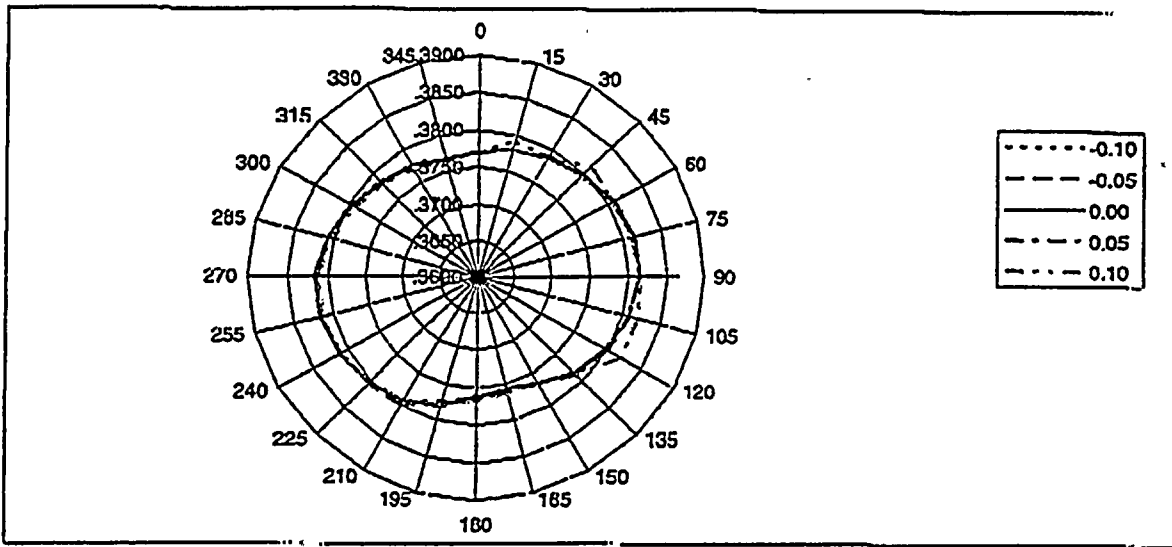
At screw location:
 Average radial dent -.0025
 Maximum radial dent -.0060

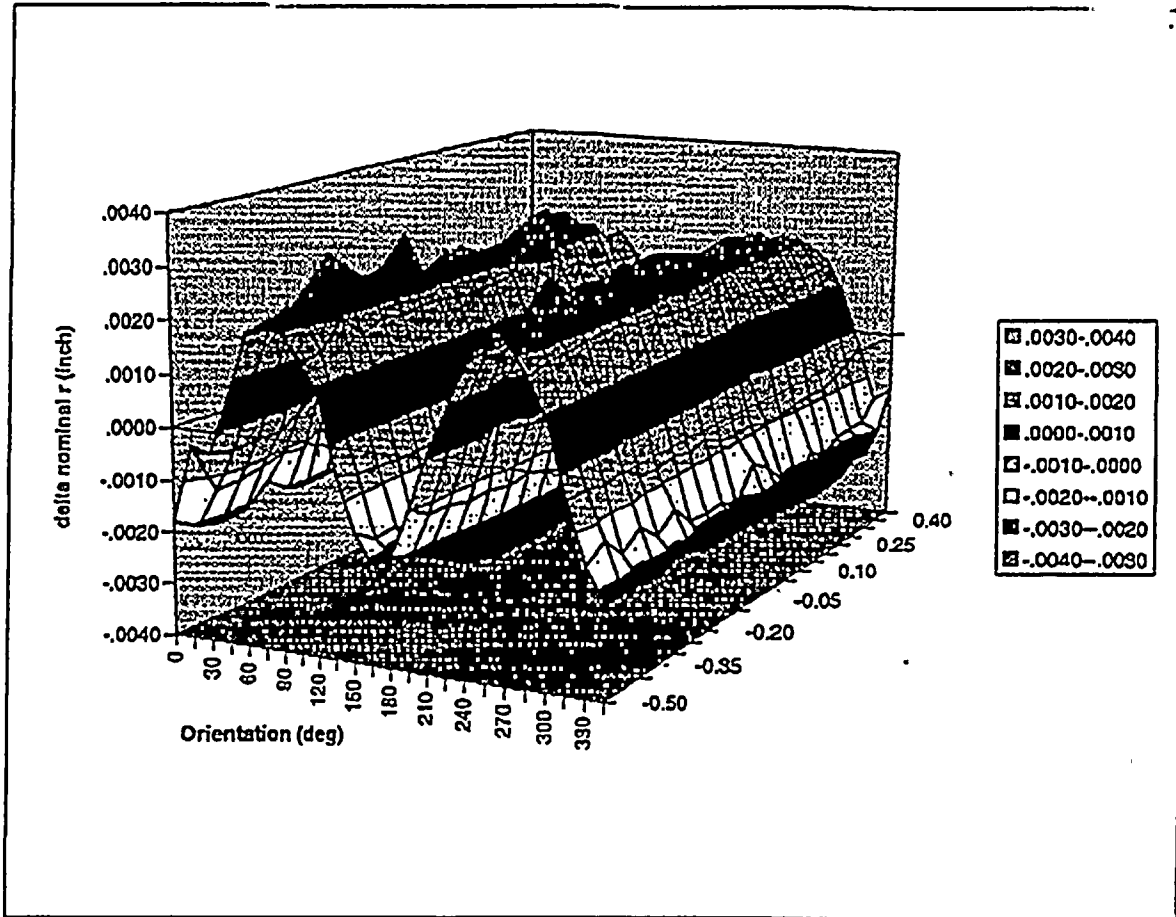
At position by tsp:
 Average radial dent -.0012
 Maximum radial dent -.0055





Specimen	over tsp	straight tube
Avg. Tube ID radius	.3793	.3790
At screw location:		
Average radial dent	-.0025	
Maximum radial dent	-.0072	
At position by tsp:		
Average radial dent	-.0015	
Maximum radial dent	-.0050	

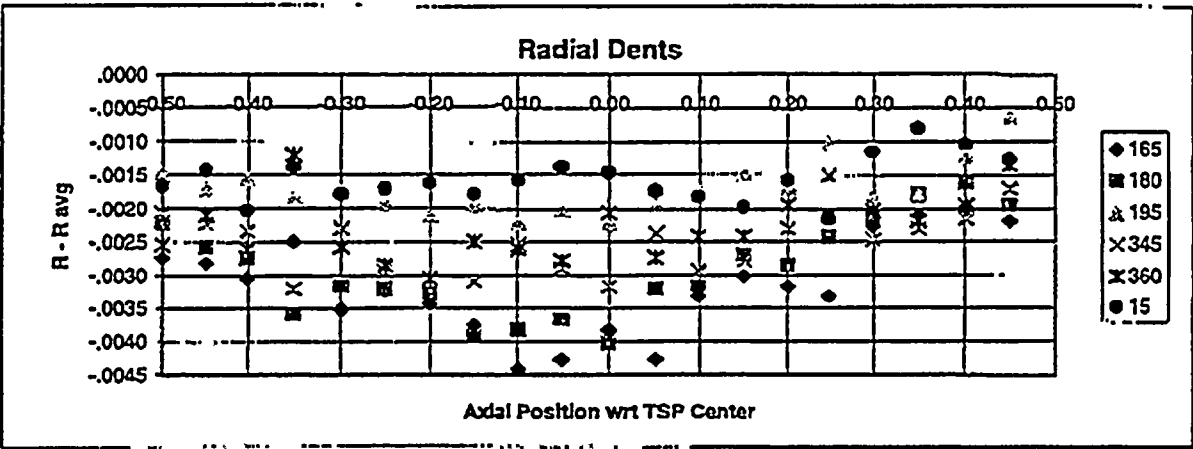
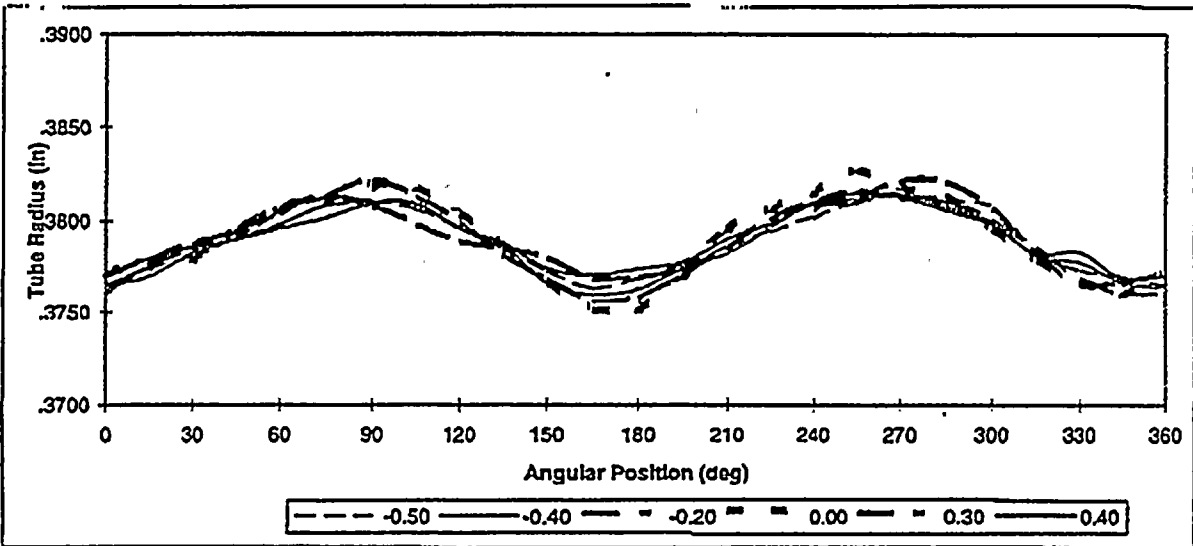
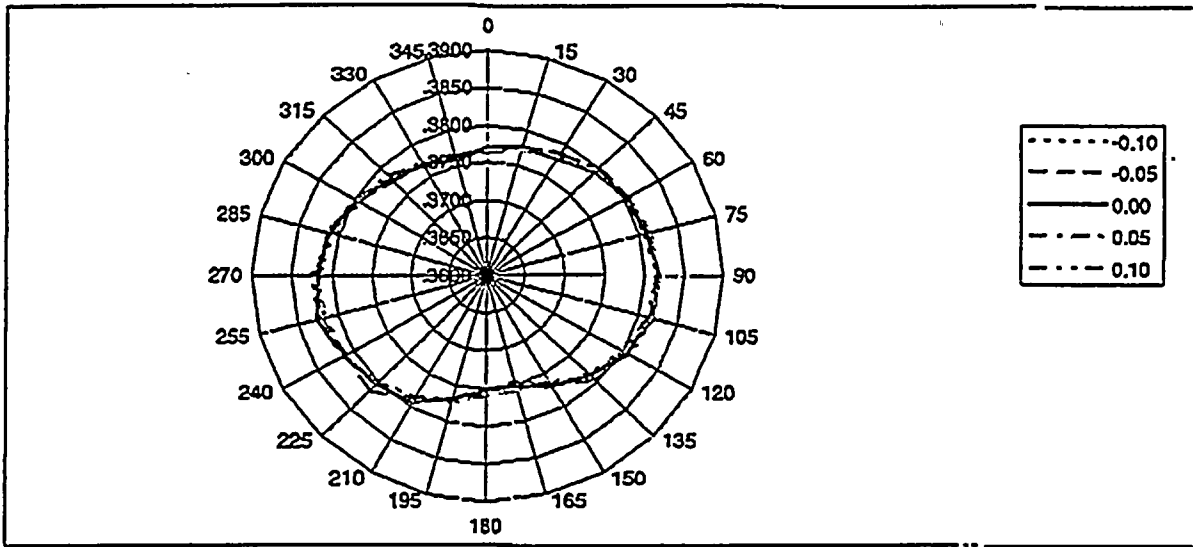


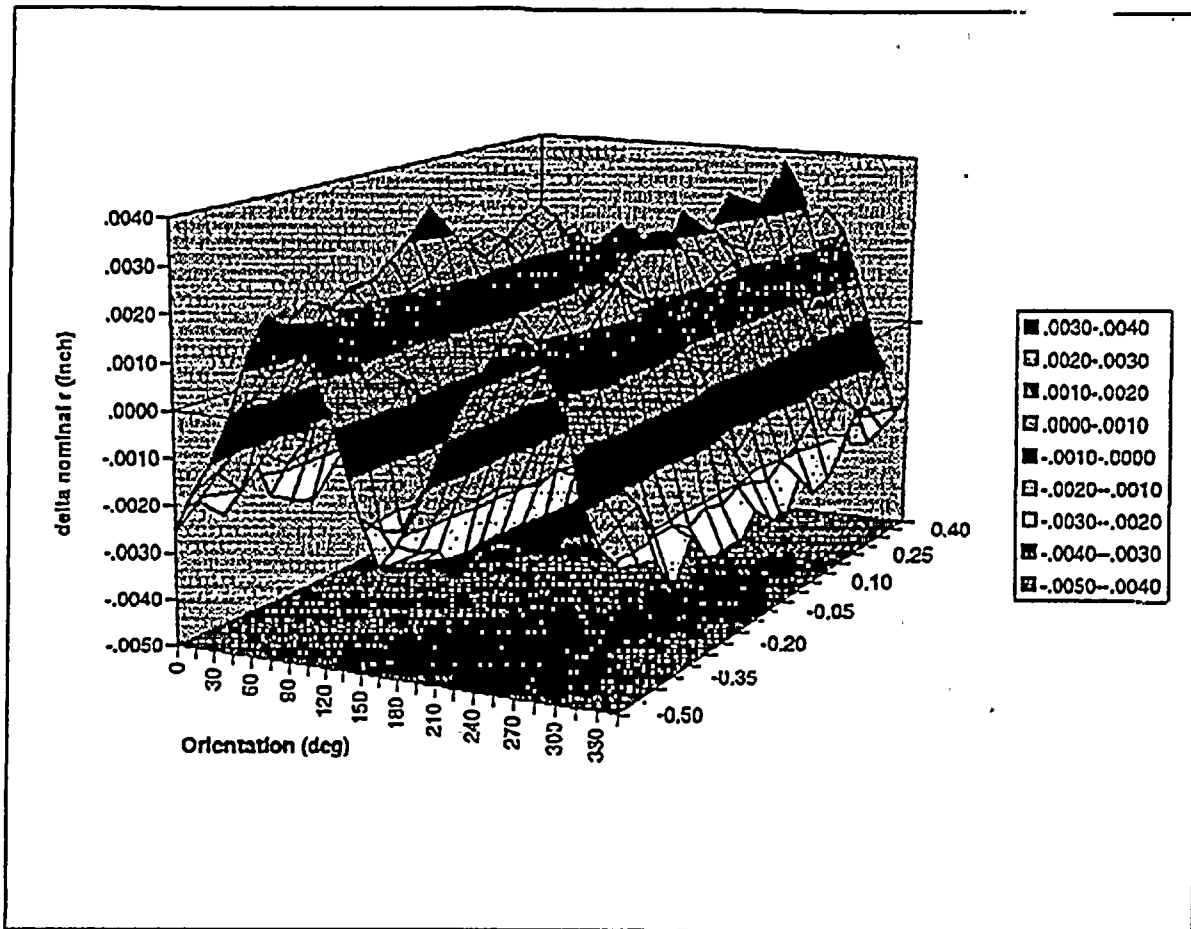


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3791	.3790

At screw location:
 Average radial dent -.0020
 Maximum radial dent -.0035

At position by tsp:
 Average radial dent -.0017
 Maximum radial dent -.0026





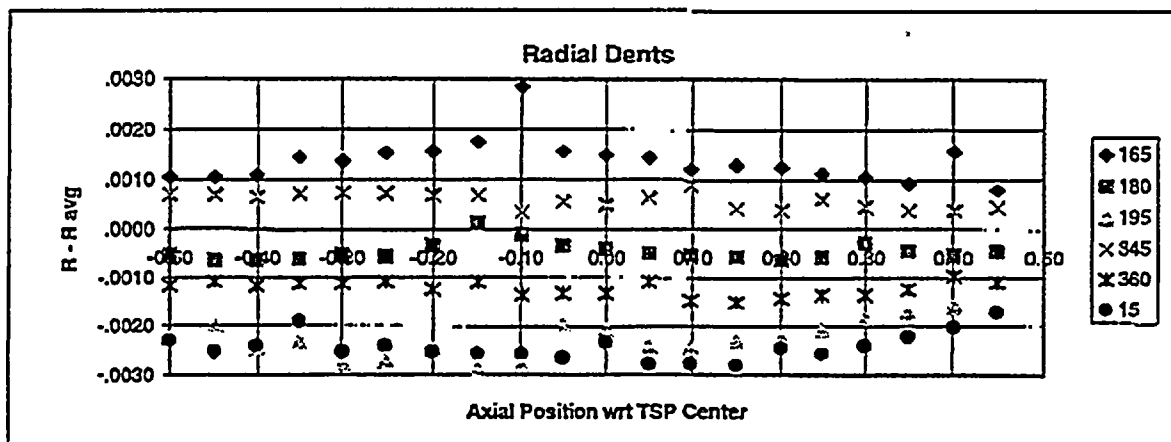
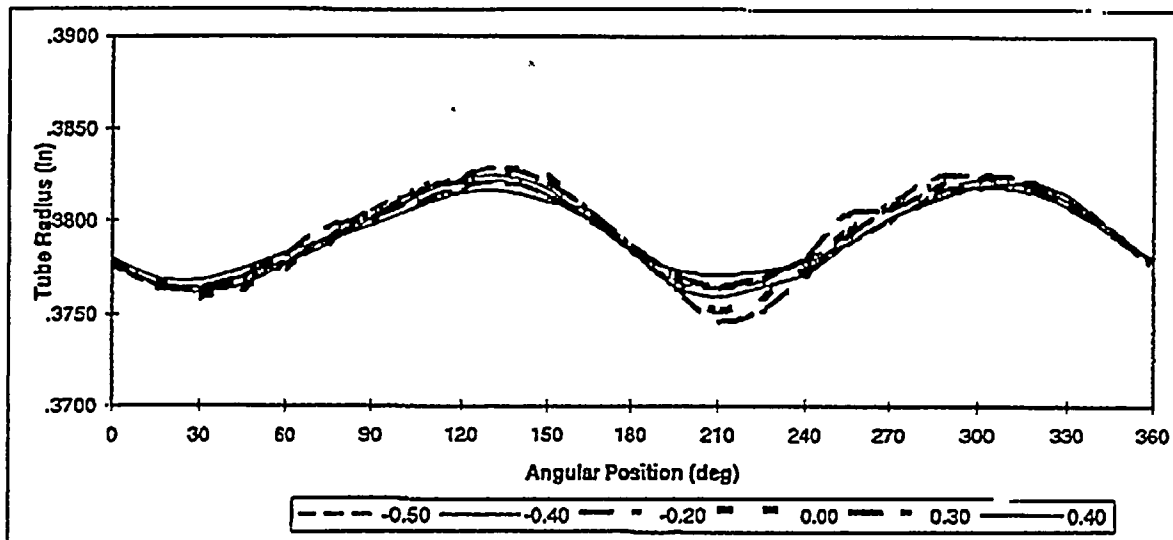
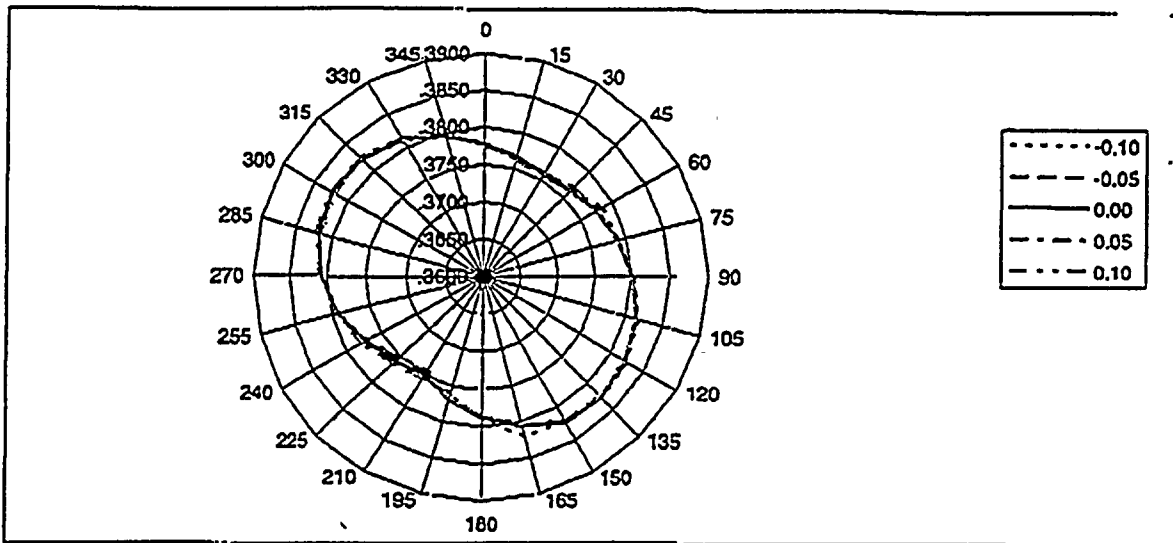
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Avg. Tube ID radius	.3790	.3790

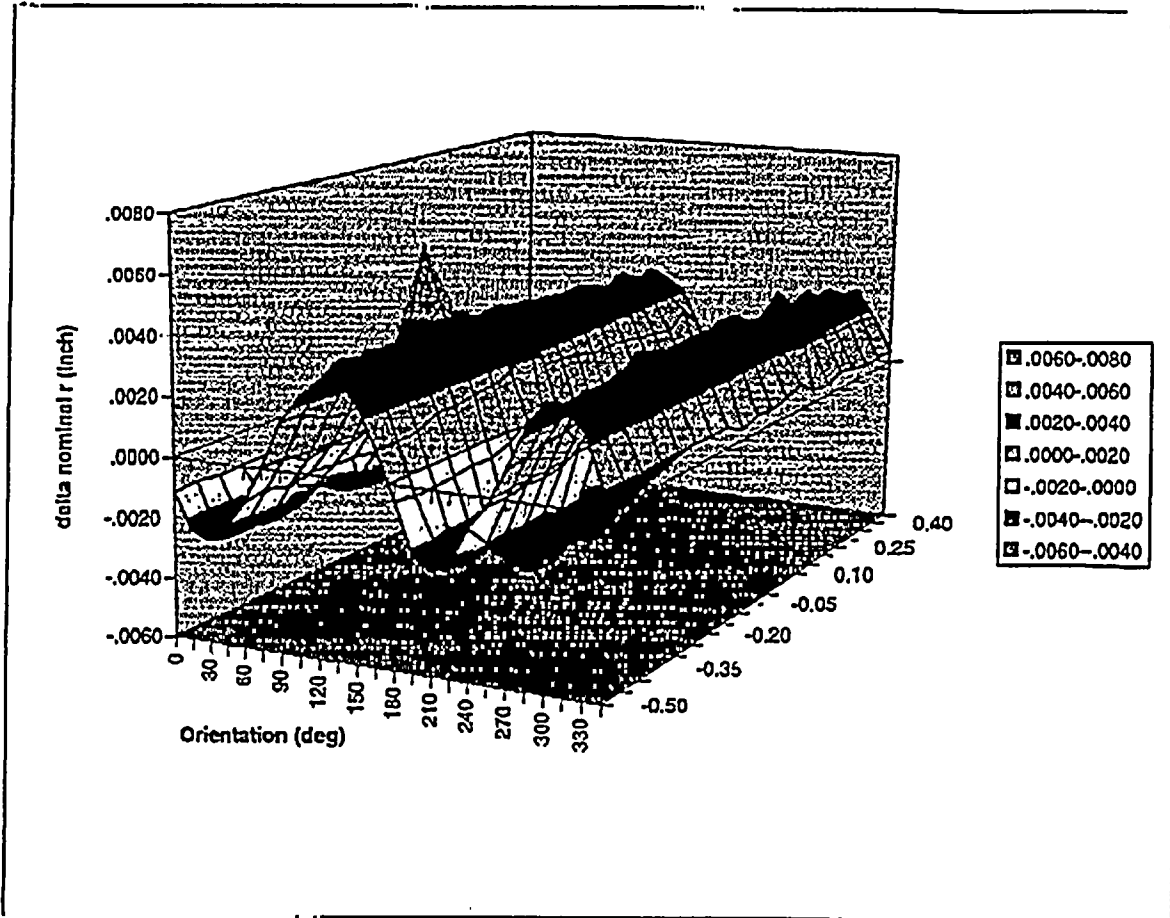
At screw location:

Average radial dent	-.0026
Maximum radial dent	-.0044

At position by tsp:

Average radial dent	-.0021
Maximum radial dent	-.0032

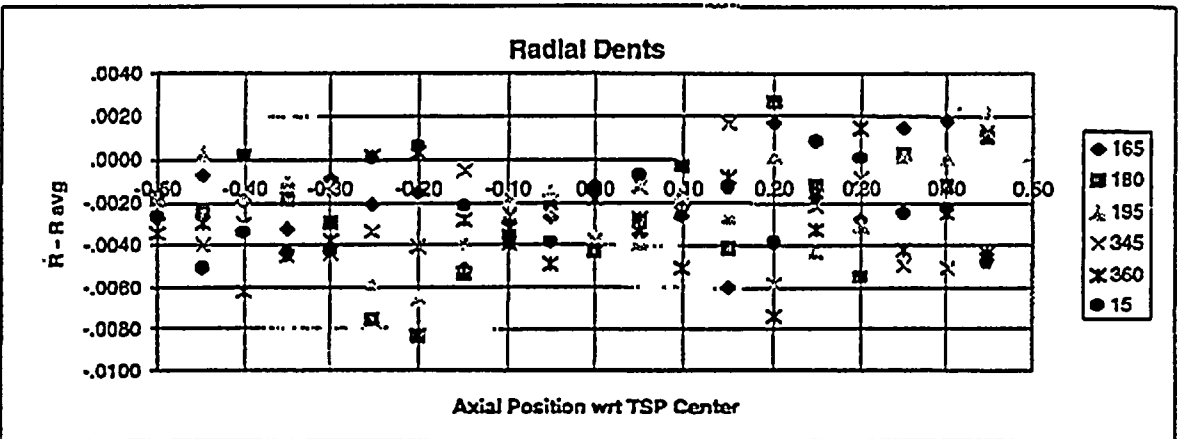
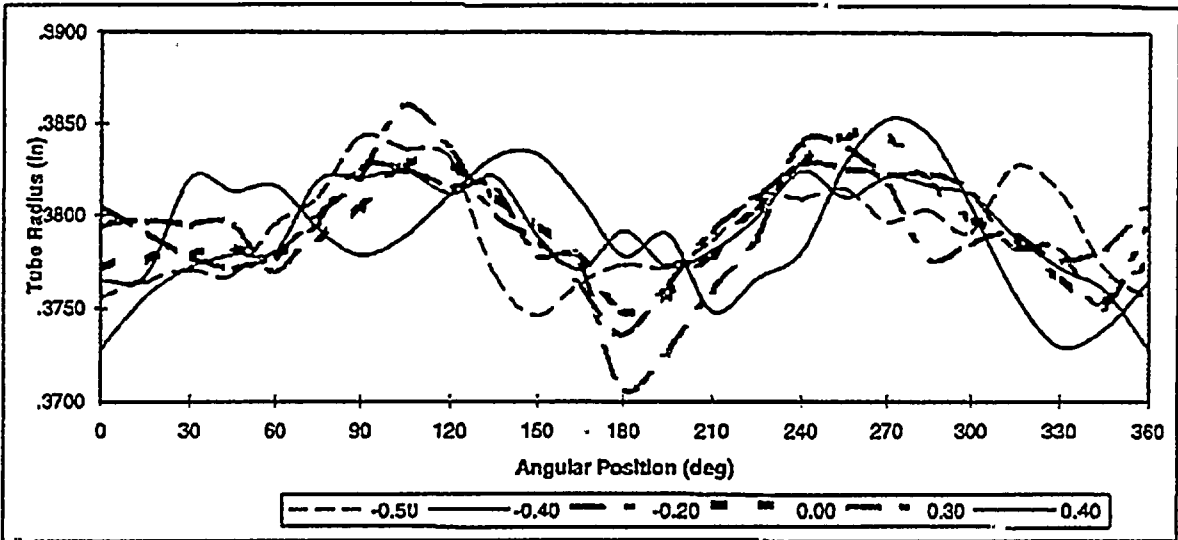
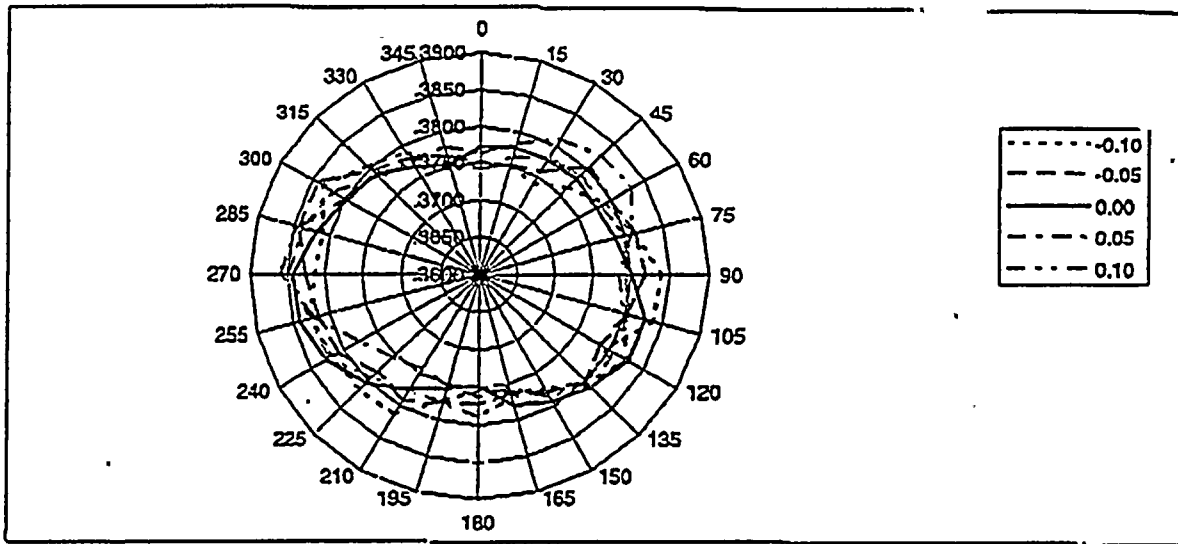


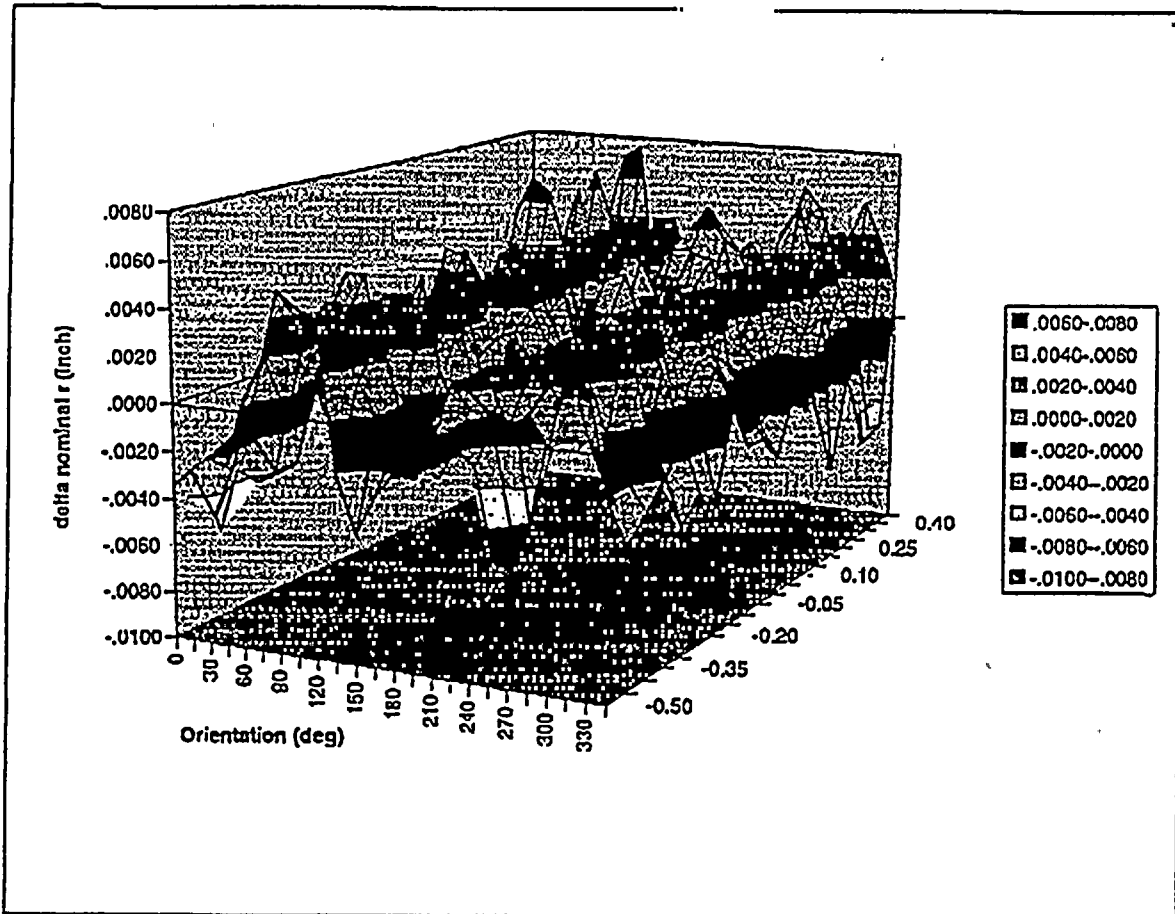


	over	straight
Specimen	tsp	tube
Avg. Tube ID radius	.3793	.3790

At screw location:
 Average radial dent -.0028
 Maximum radial dent -.0047

At position by tsp:
 Average radial dent -.0024
 Maximum radial dent -.0032





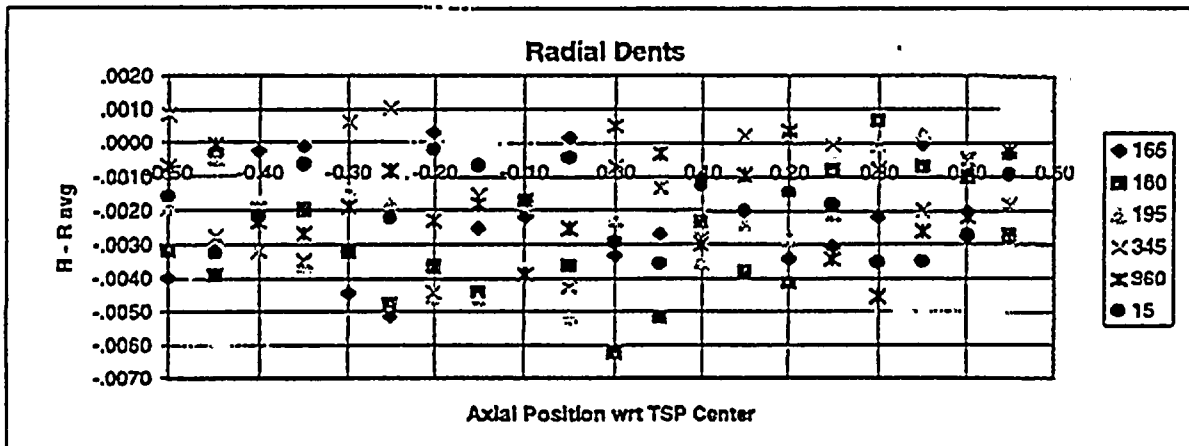
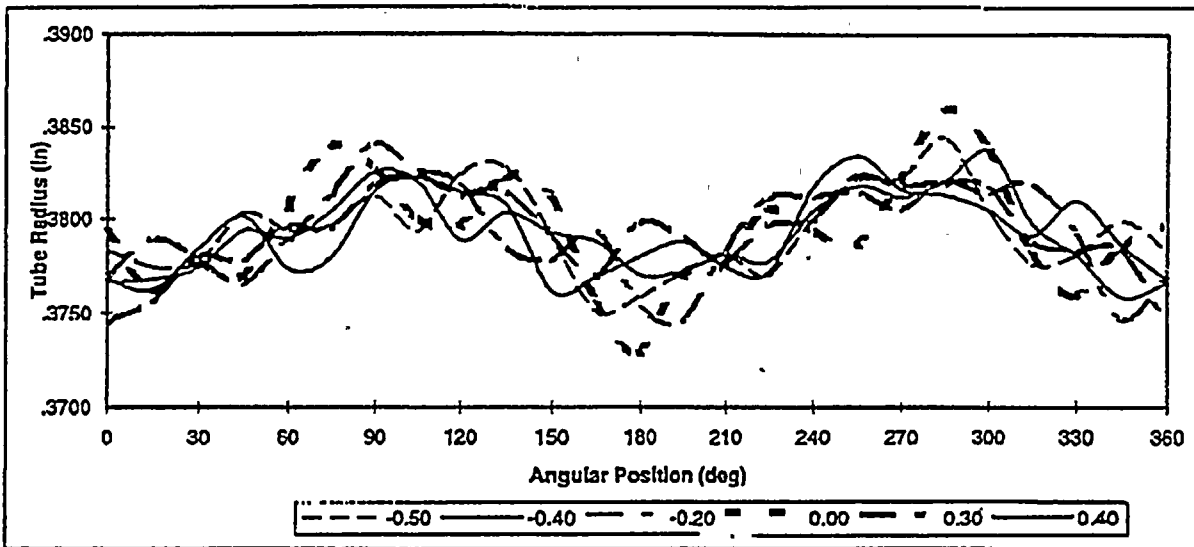
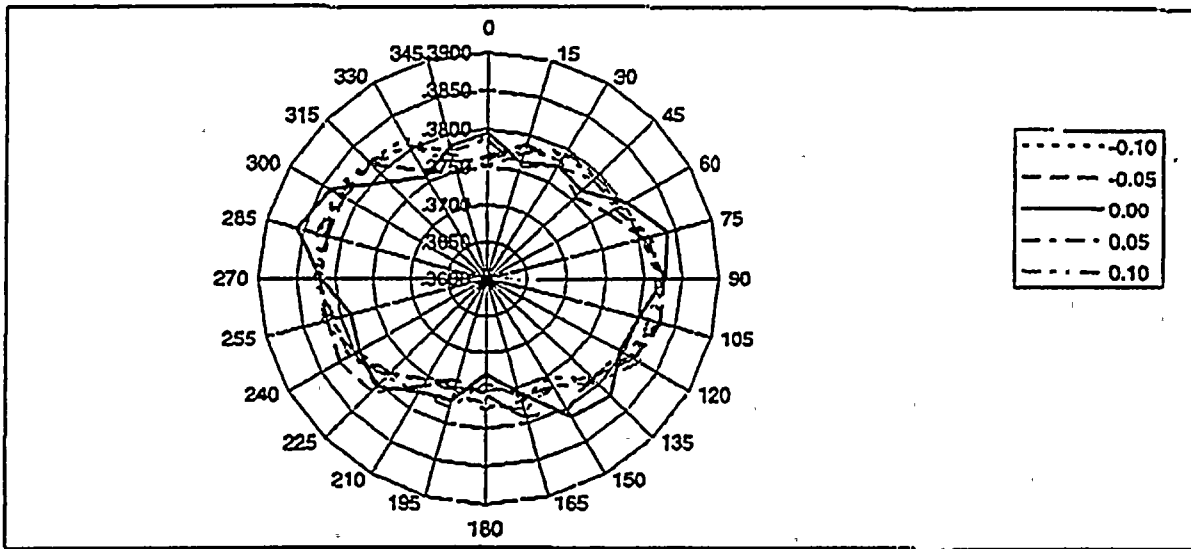
Specimen	over tsp	straight tube
Avg. Tube ID radius	.3792	.3790

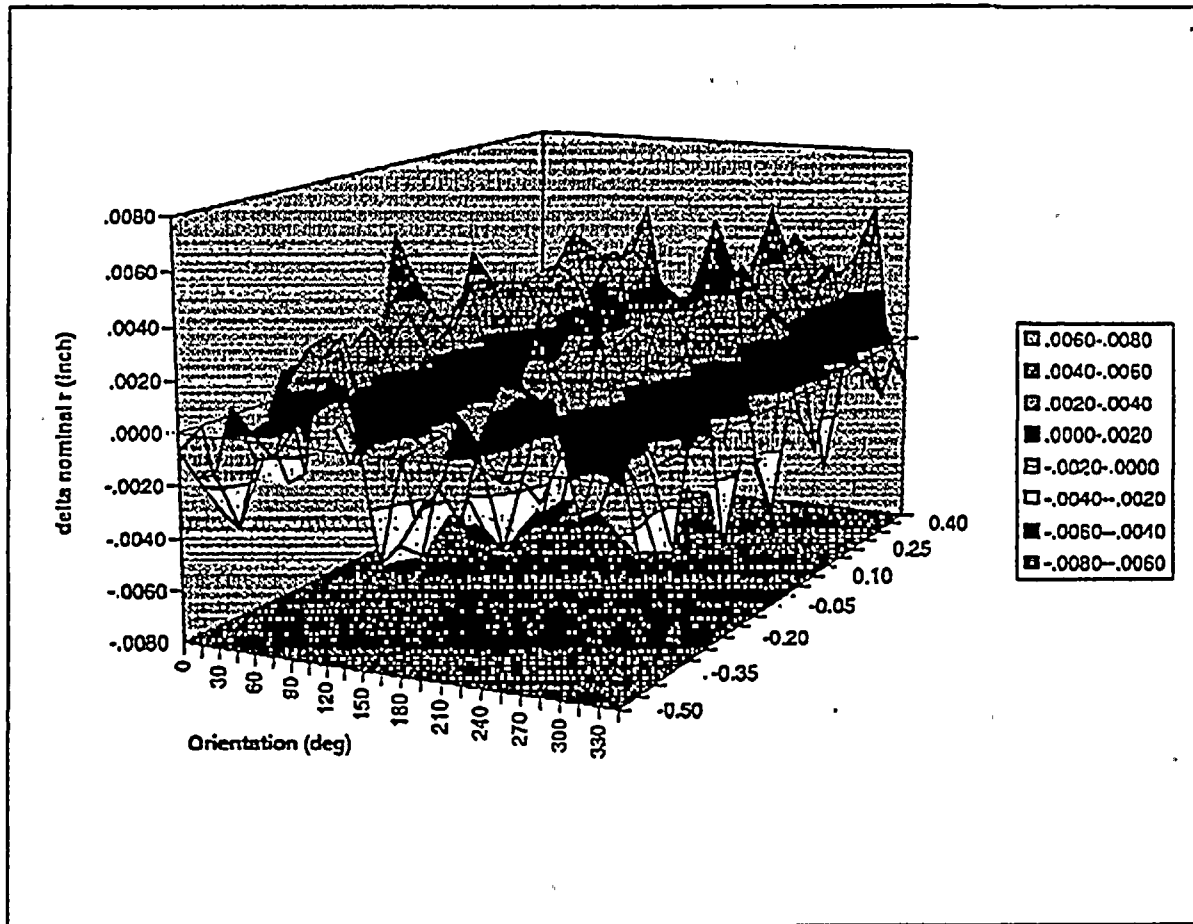
At screw location:

Average radial dent	-.0022
Maximum radial dent	-.0084

At position by tsp:

Average radial dent	-.0027
Maximum radial dent	-.0074





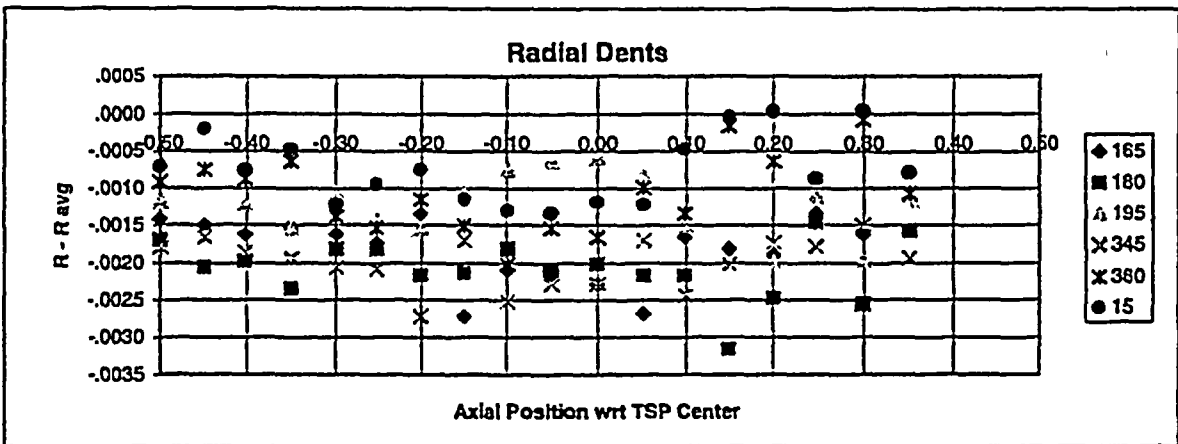
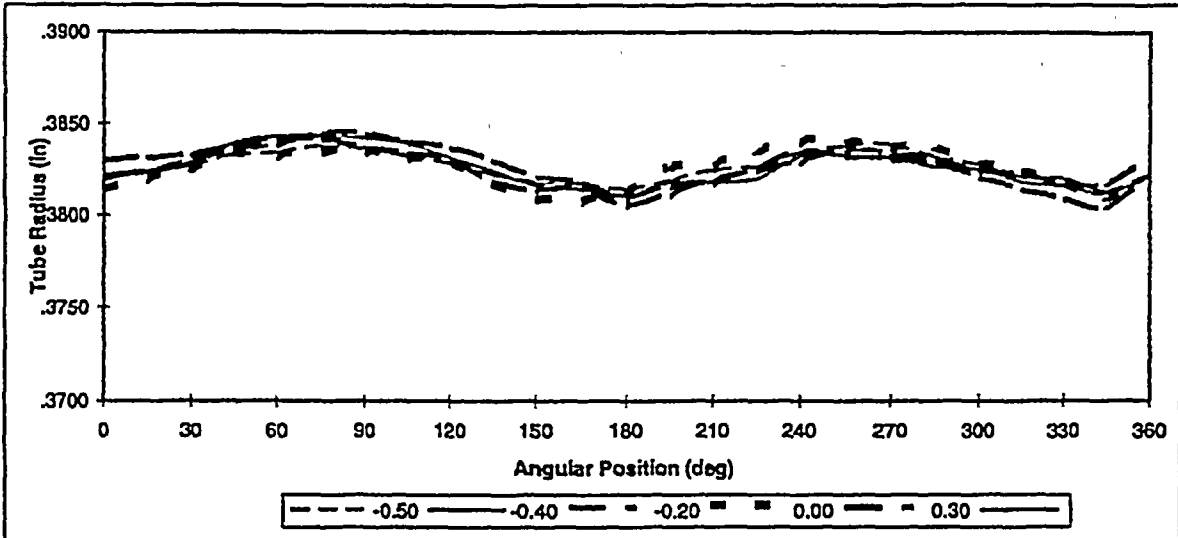
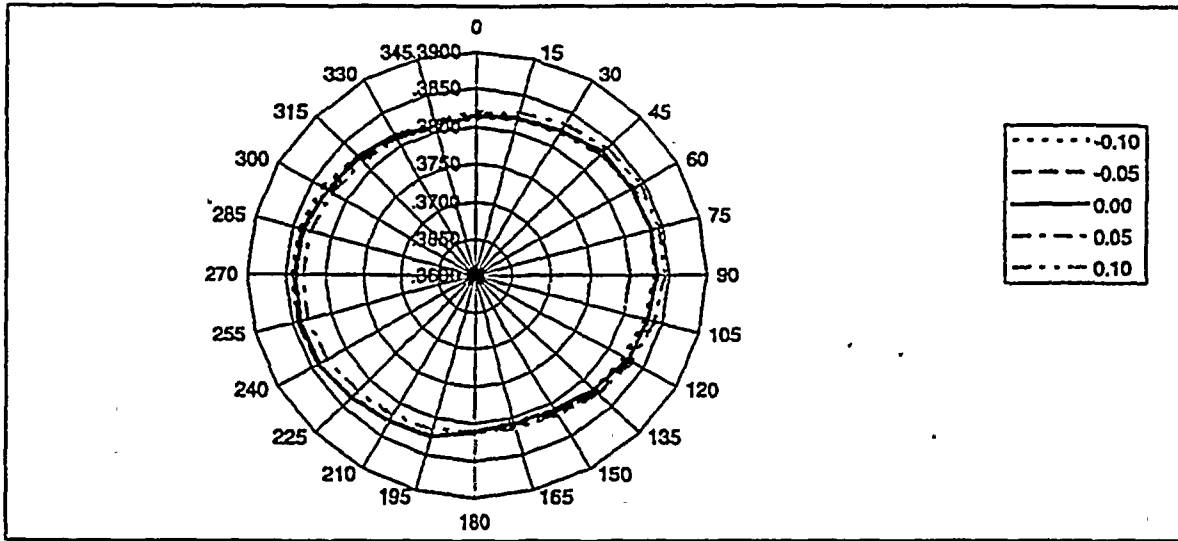
Specimen	over	straight
	tsp	tube
Avg. Tube ID radius	.3793	.3790

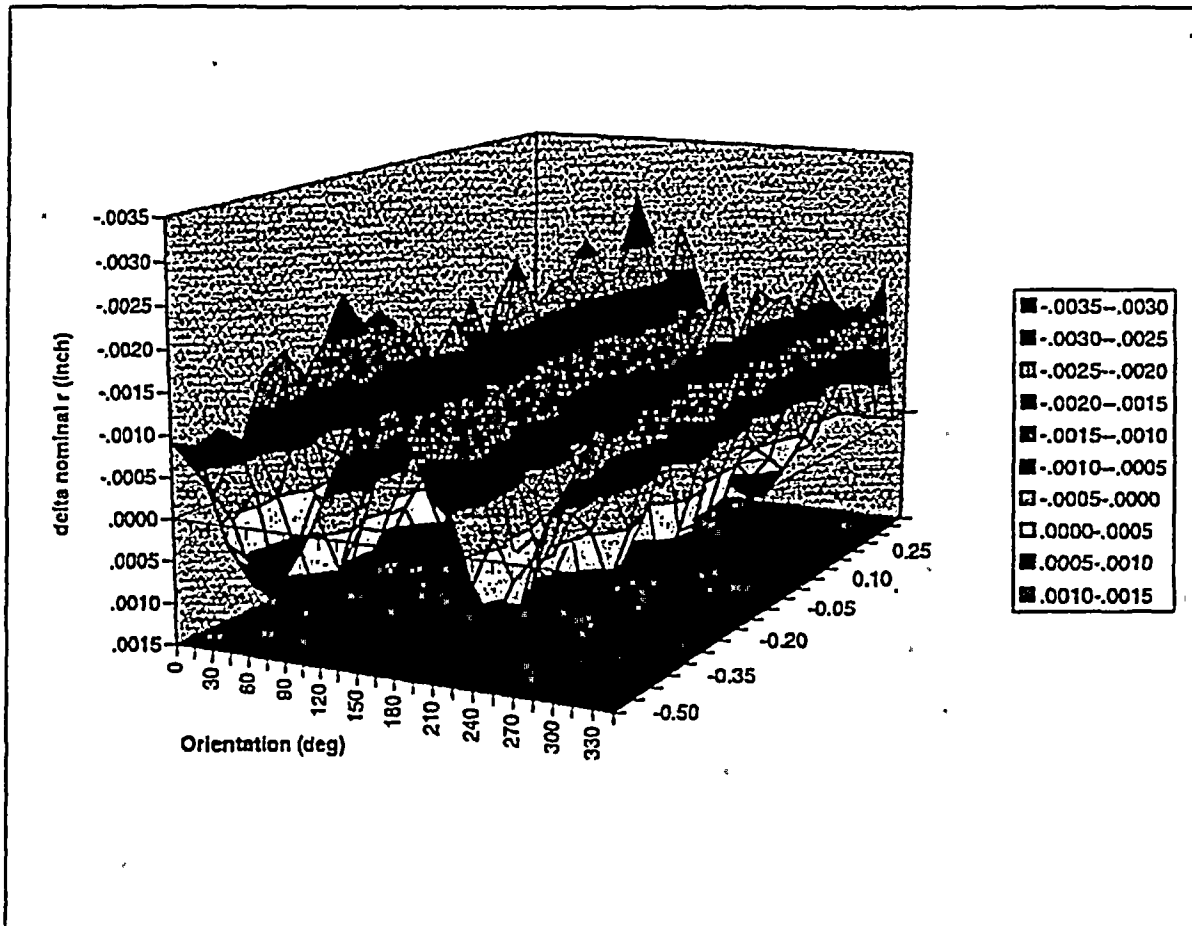
At screw location:

Average radial dent	-.0024
Maximum radial dent	-.0063

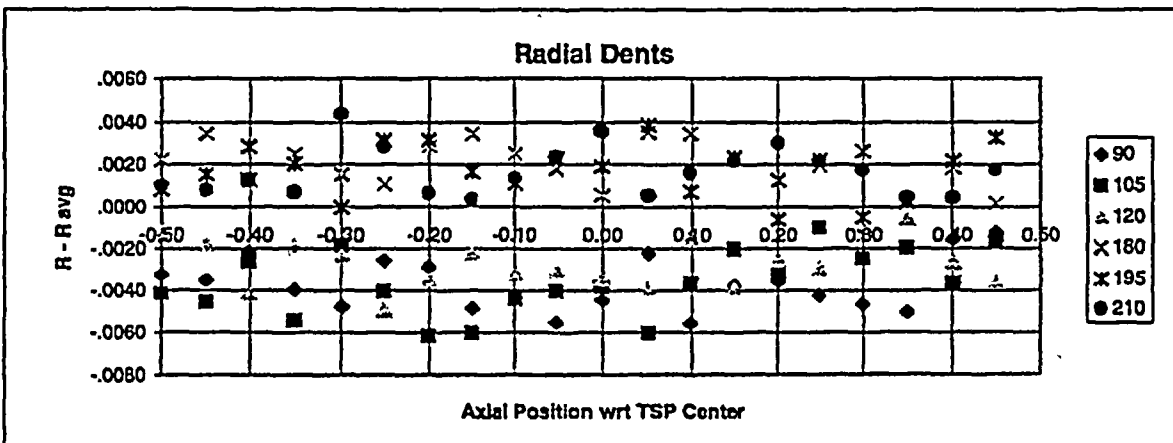
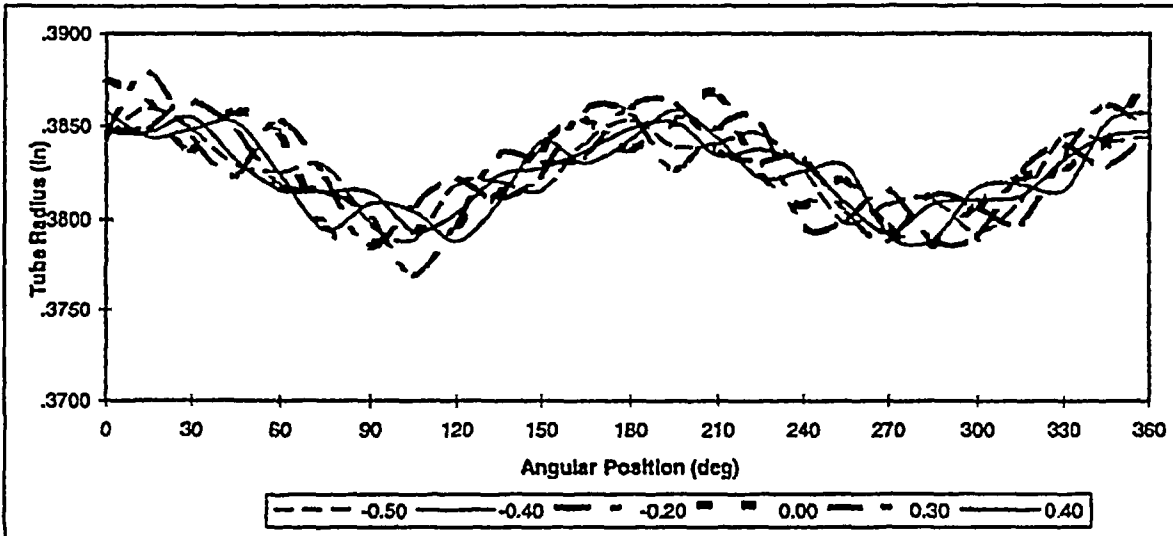
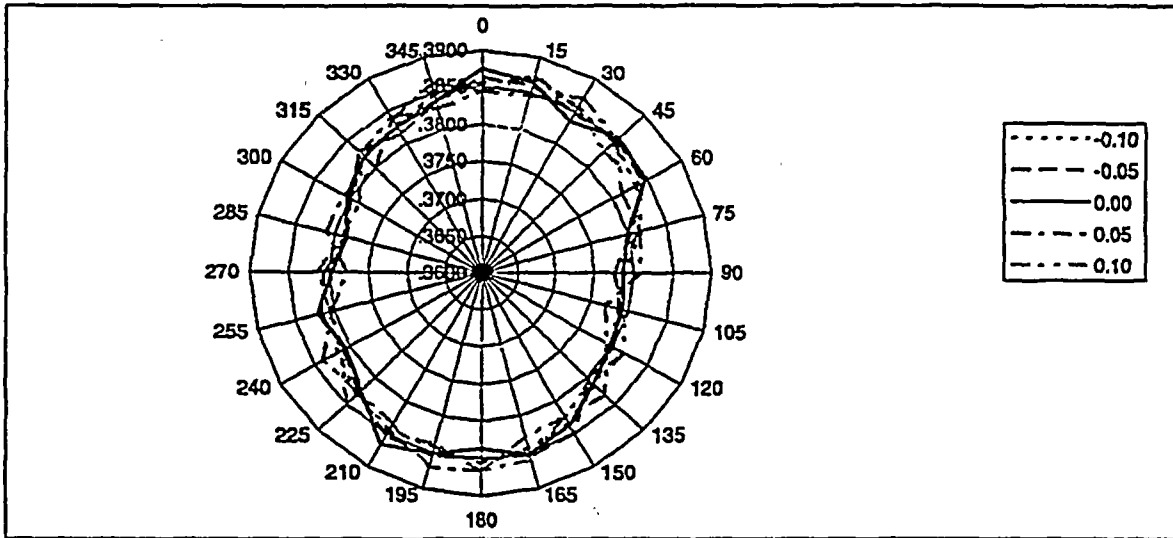
At position by tsp:

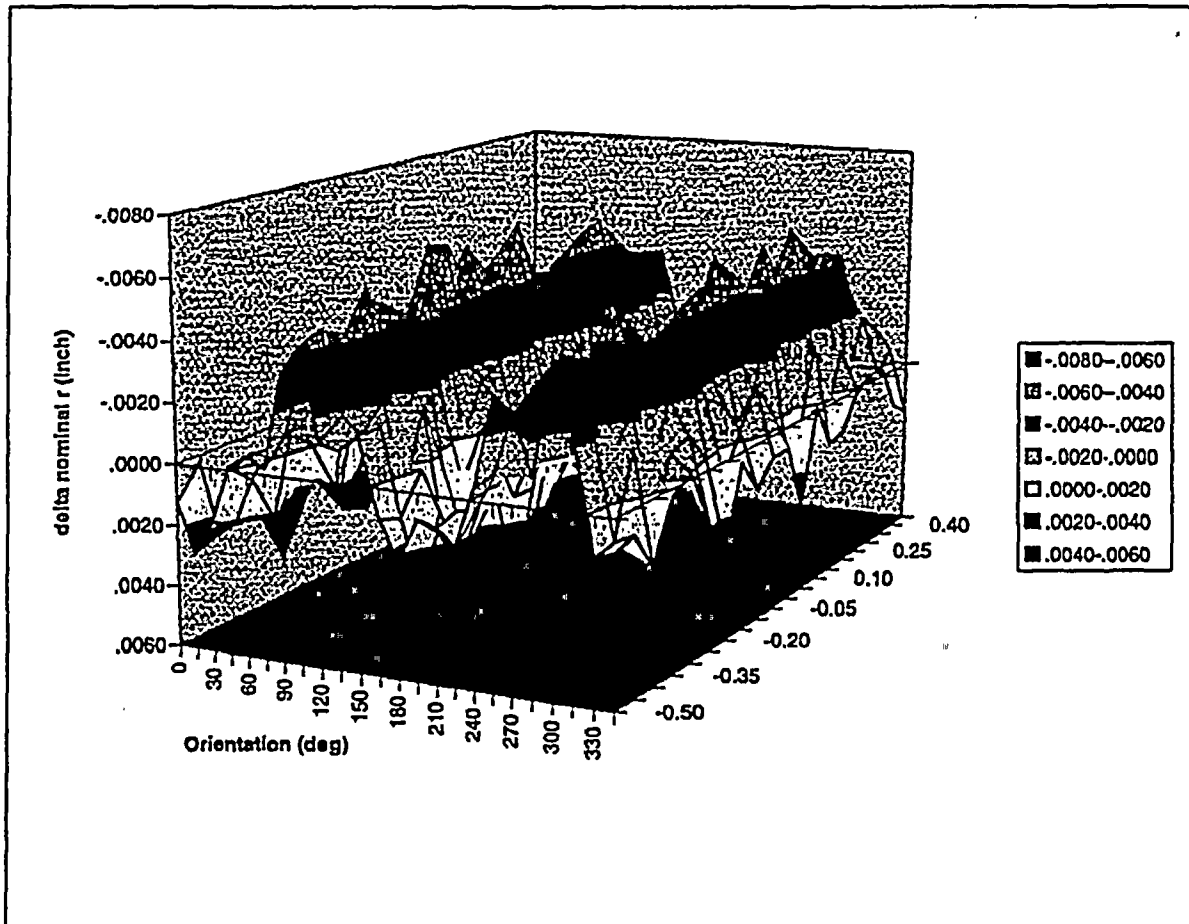
Average radial dent	-.0017
Maximum radial dent	-.0045





Specimen	over tsp	straight tube
Avg. Tube ID radius	.3826	.3830
At screw location:		
Average radial dent	-.0014	
Maximum radial dent	-.0032	
At position by tsp:		
Average radial dent	-.0013	
Maximum radial dent	-.0027	

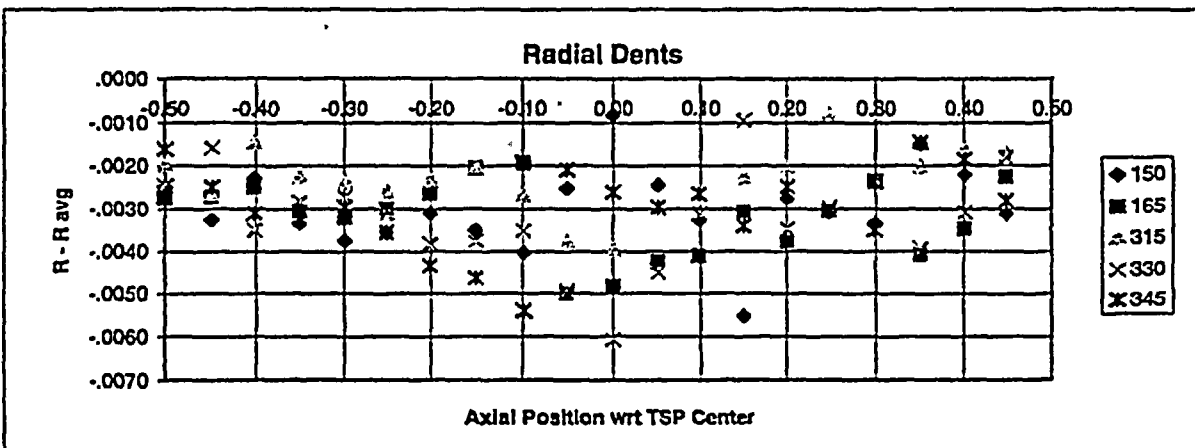
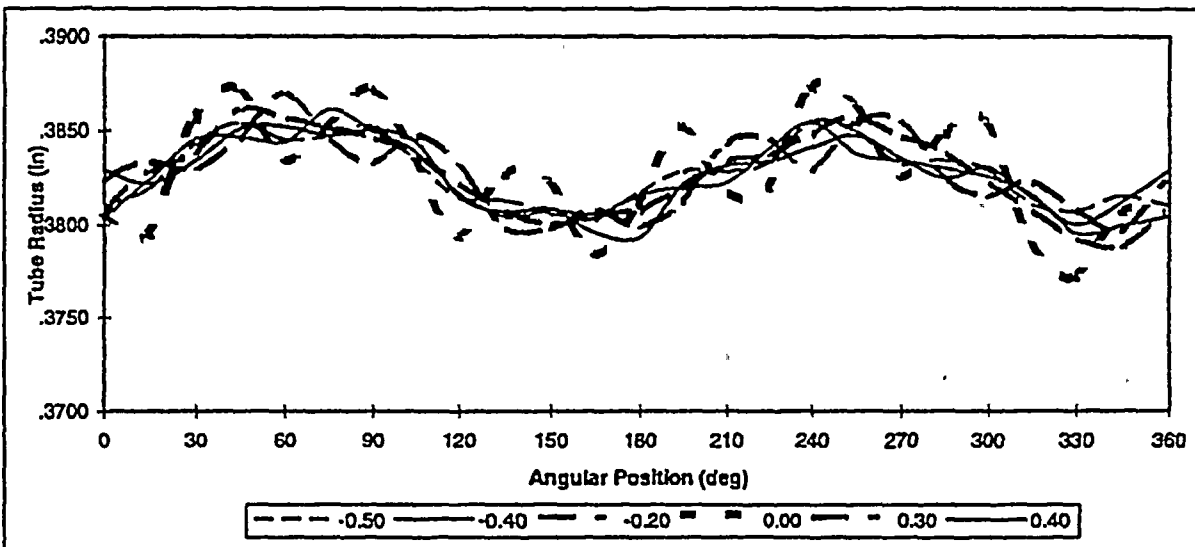
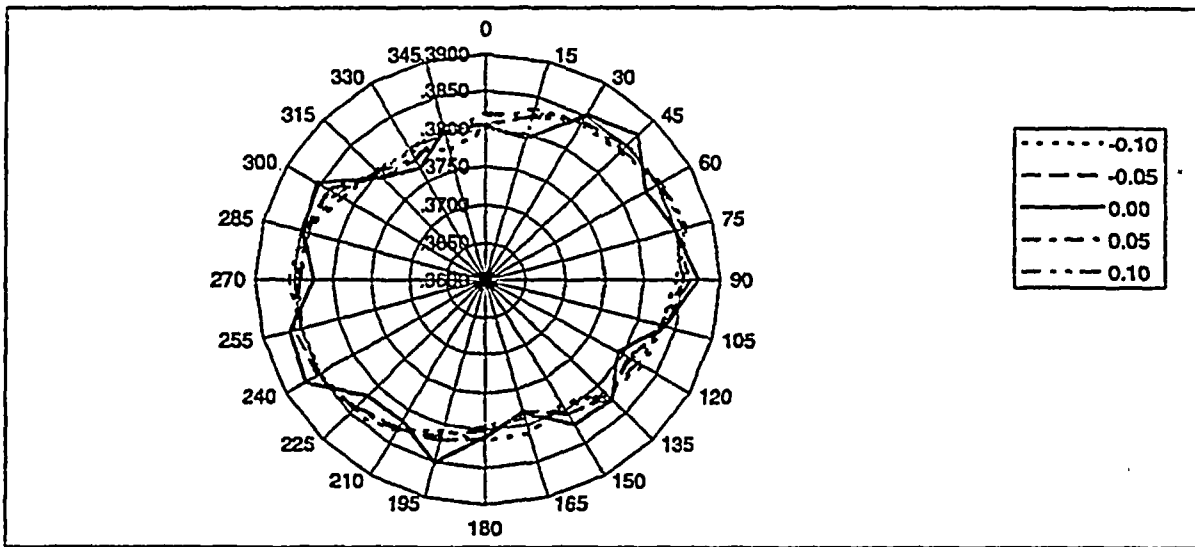


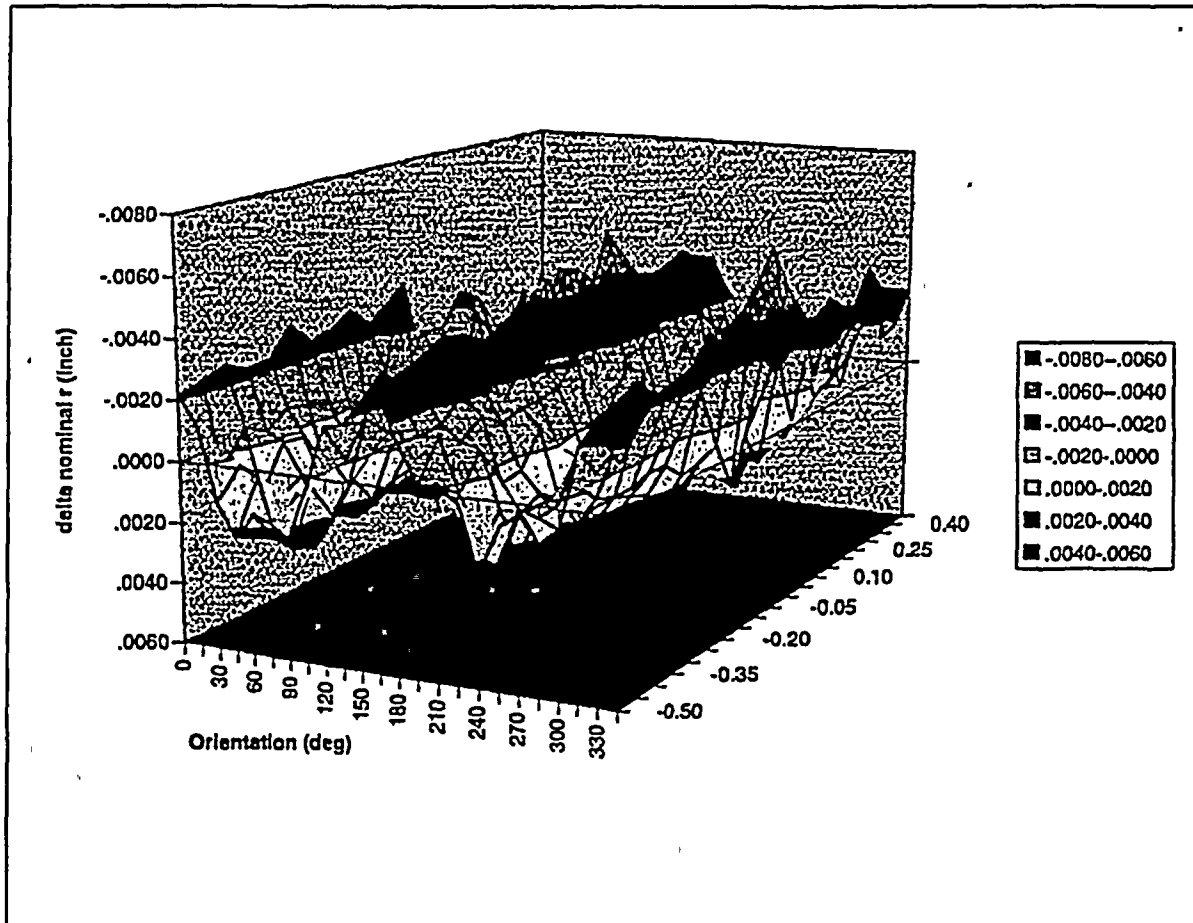


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3826	.3830

At screw location:
 Average radial dent -.0031
 Maximum radial dent -.0062

At position by tsp:
 Average radial dent -.0029
 Maximum radial dent -.0057

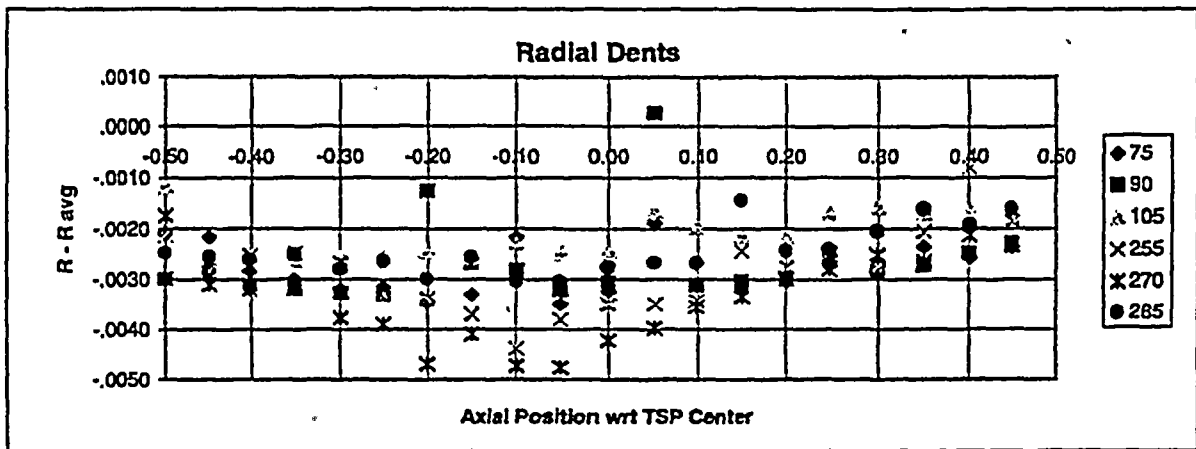
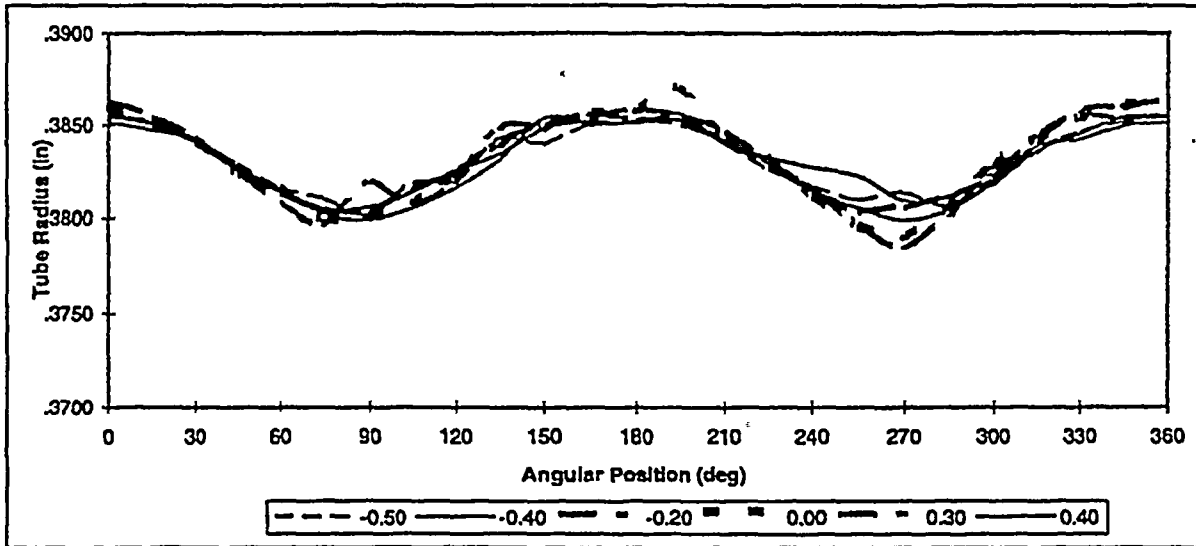
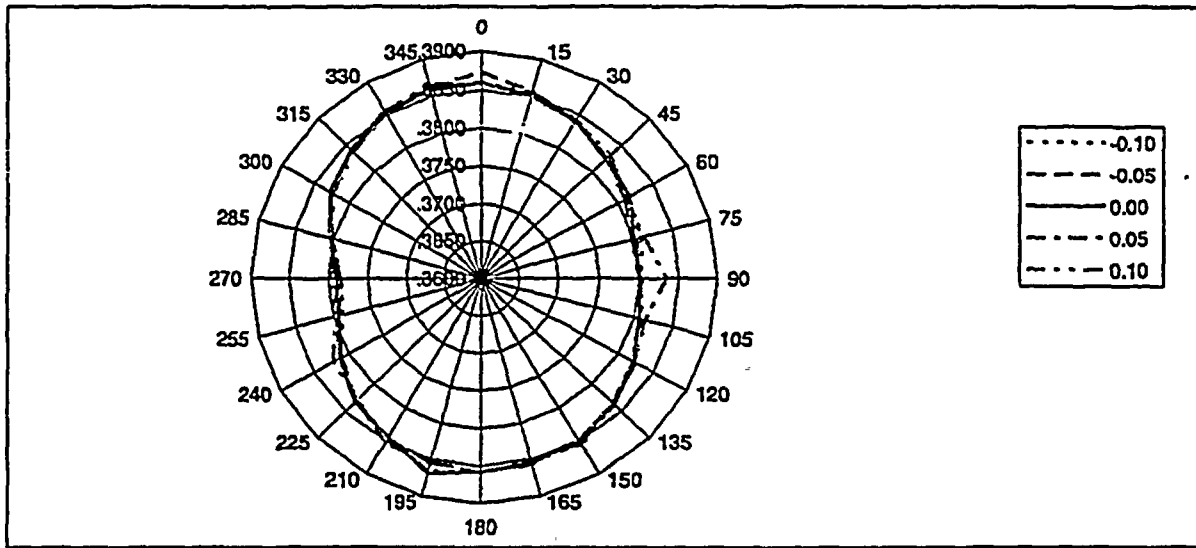


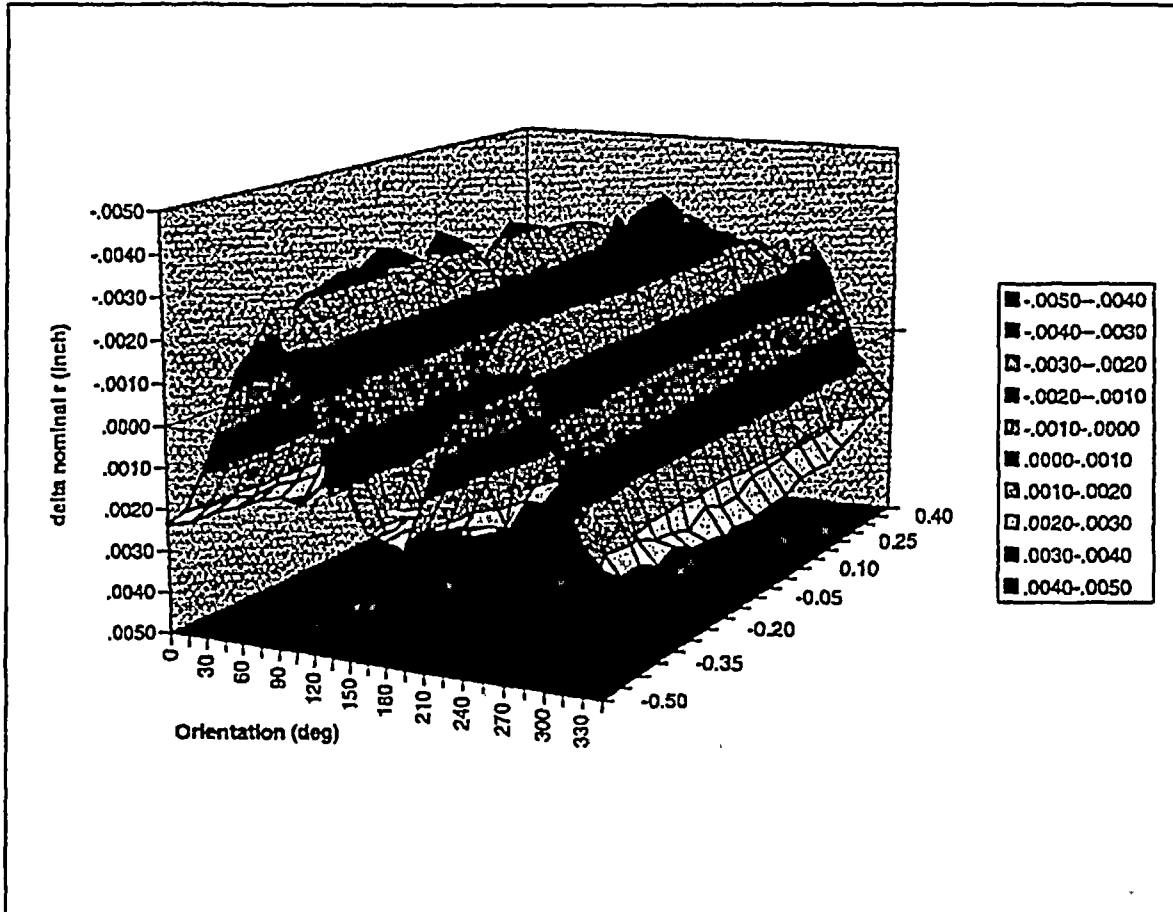


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3827	.3830

At screw location:
 Average radial dent -.0028
 Maximum radial dent -.0061

At position by tsp:
 Average radial dent -.0028
 Maximum radial dent -.0055

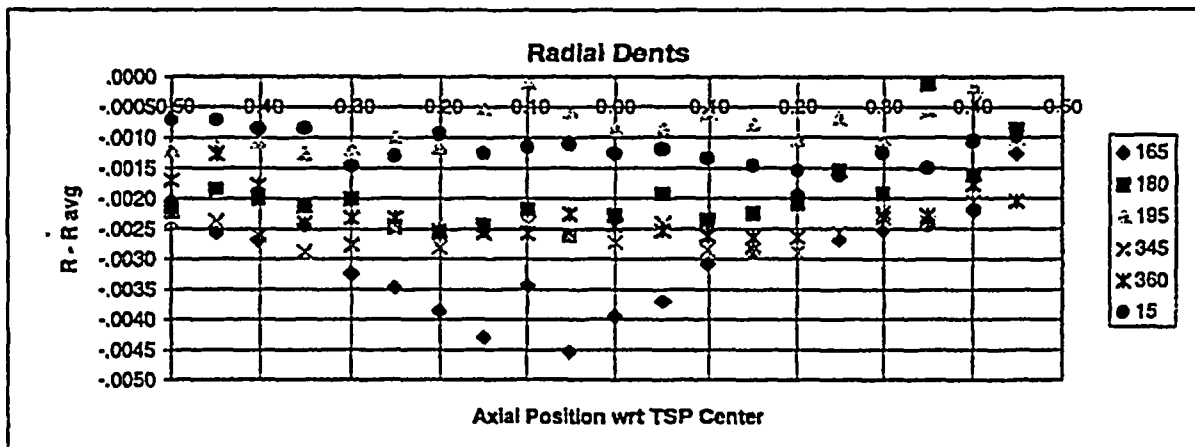
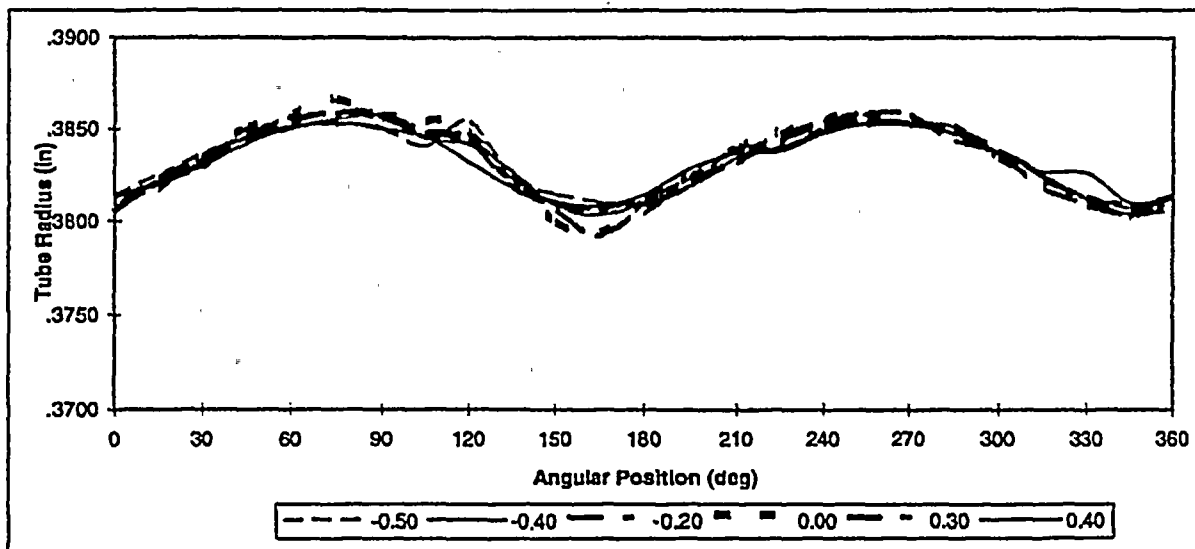
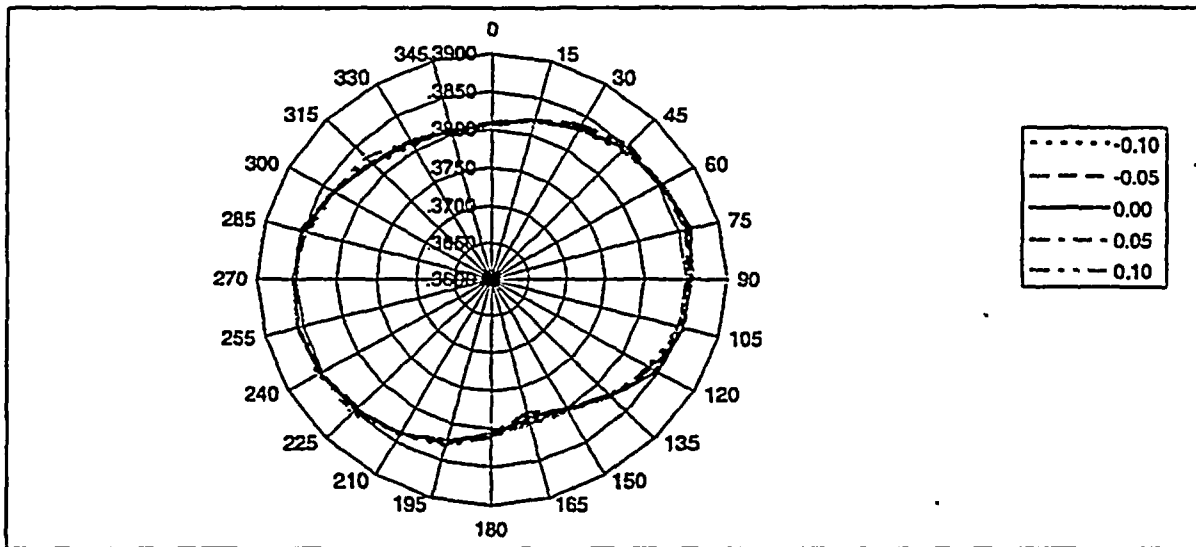


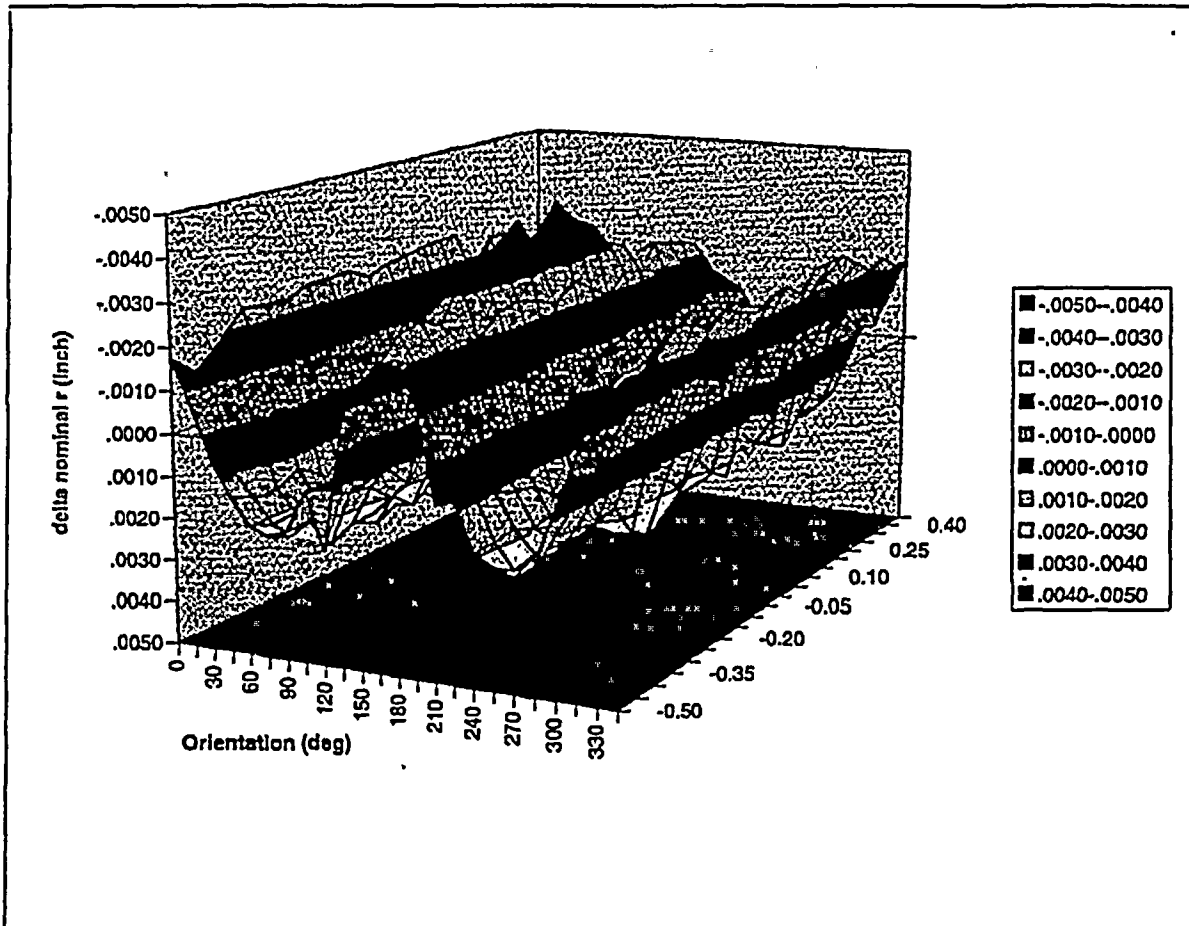


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3831	.3830

At screw location:
 Average radial dent -.0029
 Maximum radial dent -.0048

At position by tsp:
 Average radial dent -.0025
 Maximum radial dent -.0035

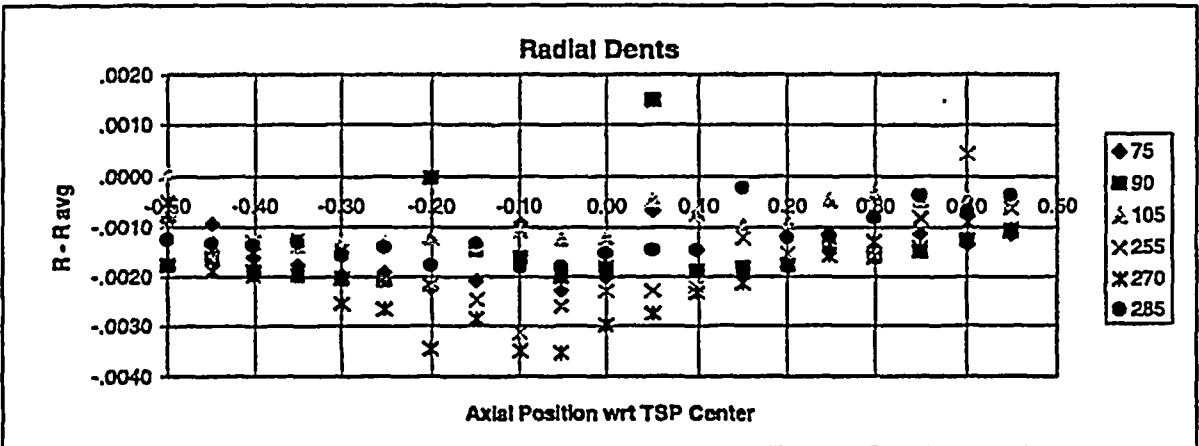
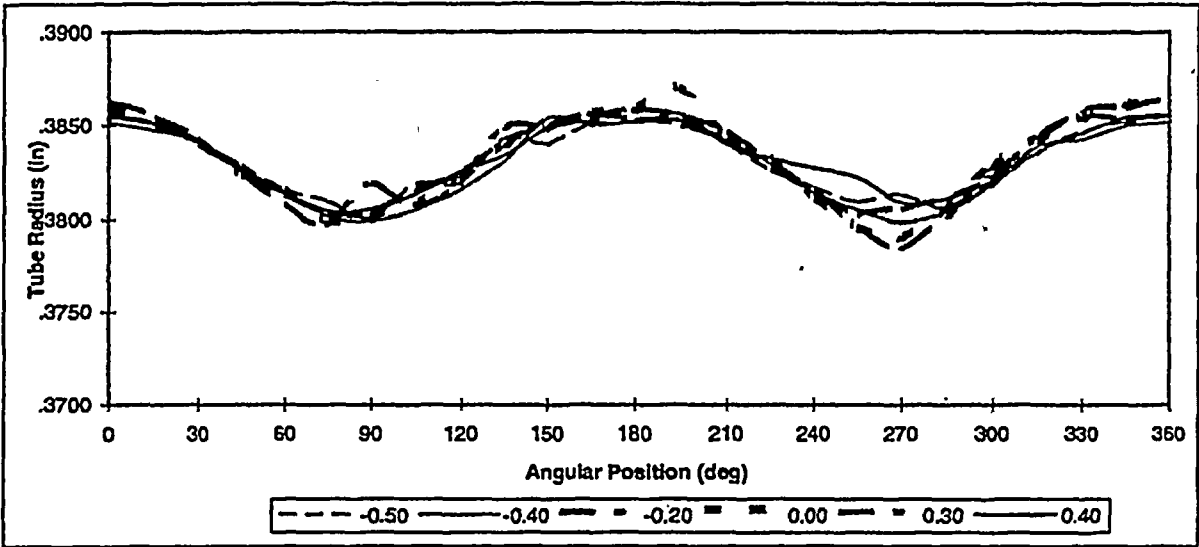
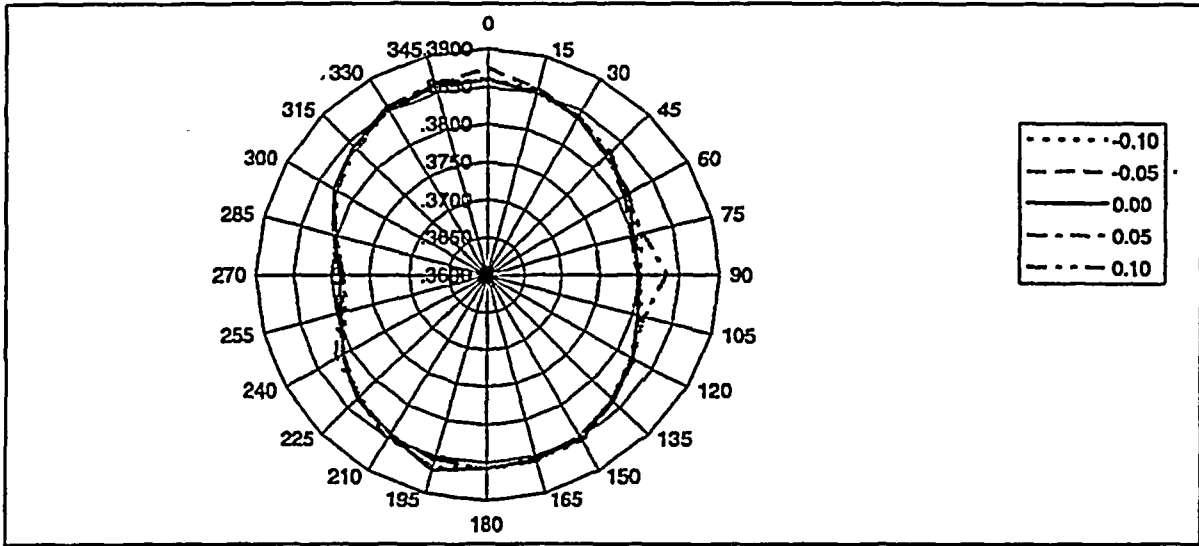


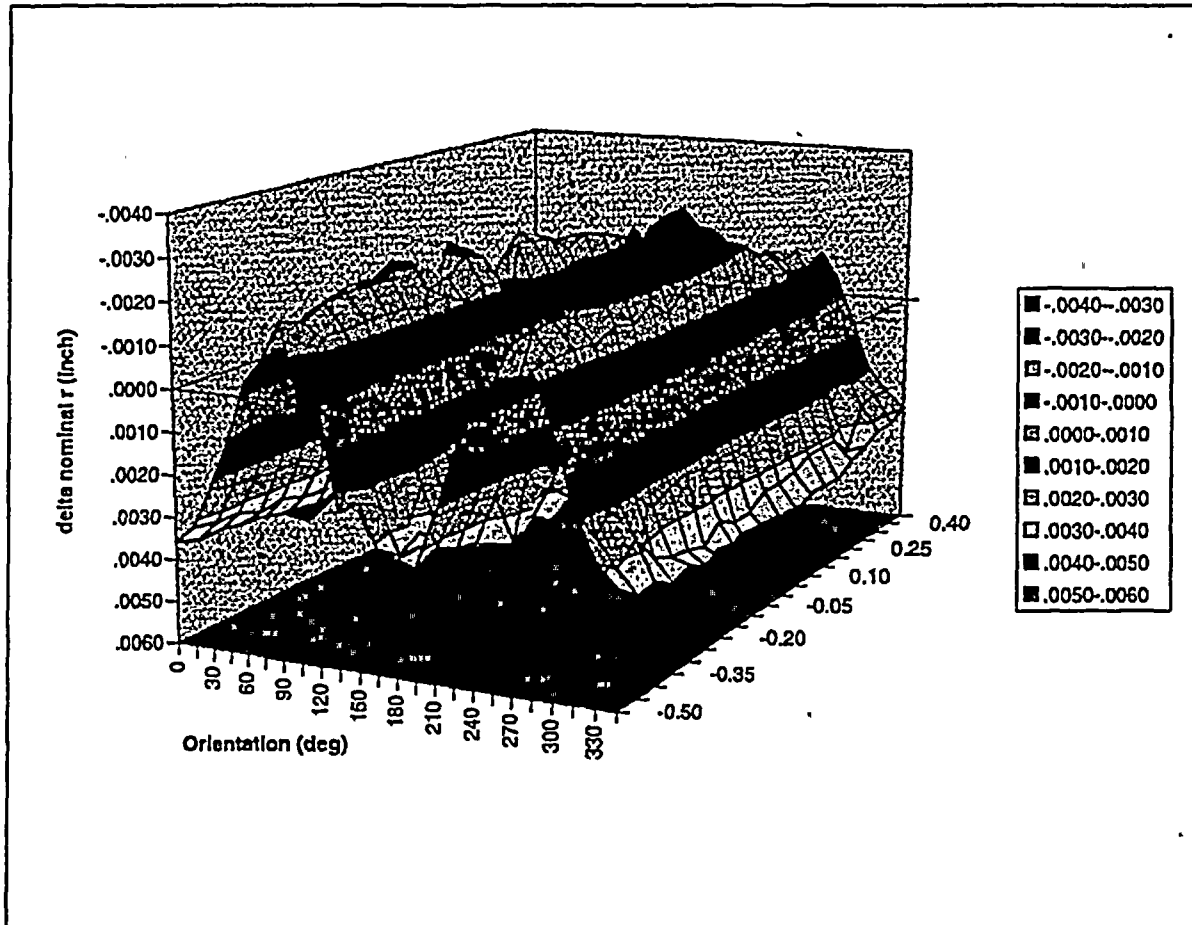


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3833	.3830

At screw location:
 Average radial dent -.0019
 Maximum radial dent -.0045

At position by tsp:
 Average radial dent -.0020
 Maximum radial dent -.0029





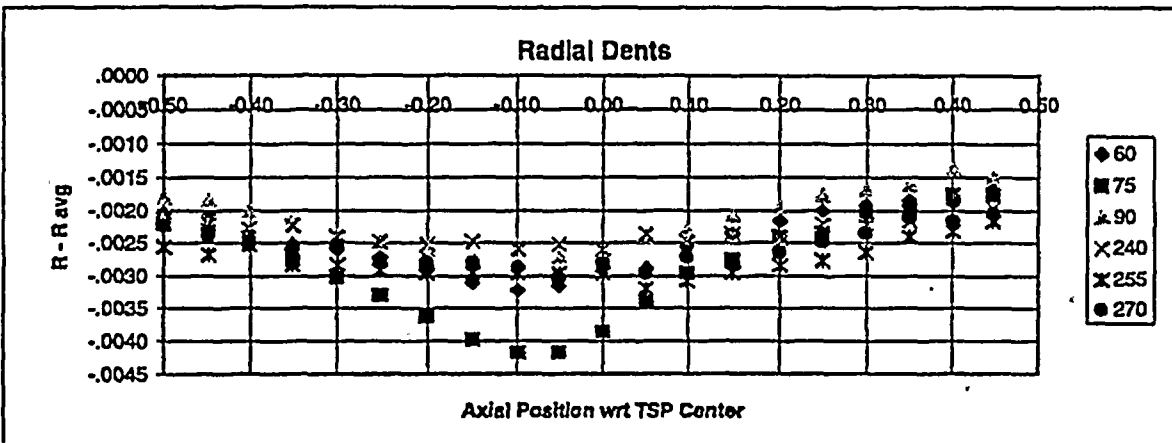
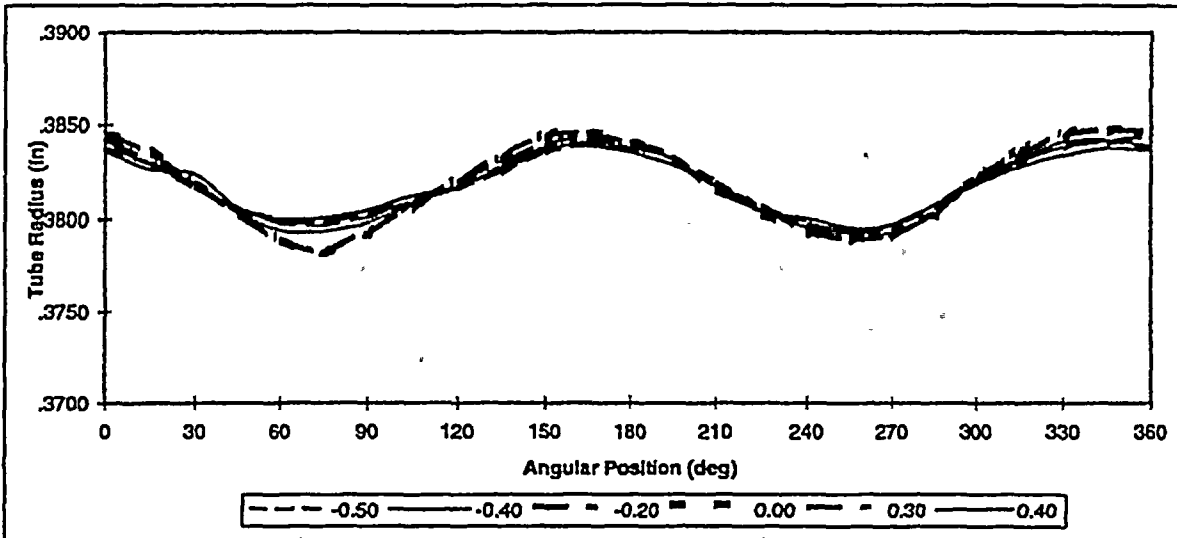
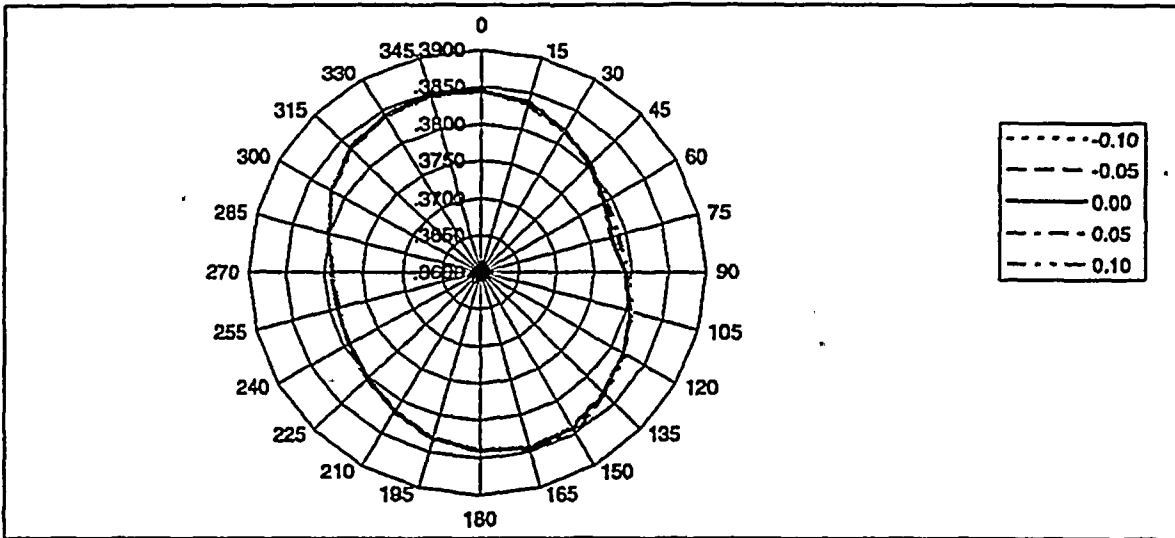
Specimen	over tsp	straight tube
Avg. Tube ID radius	.3831	.3818

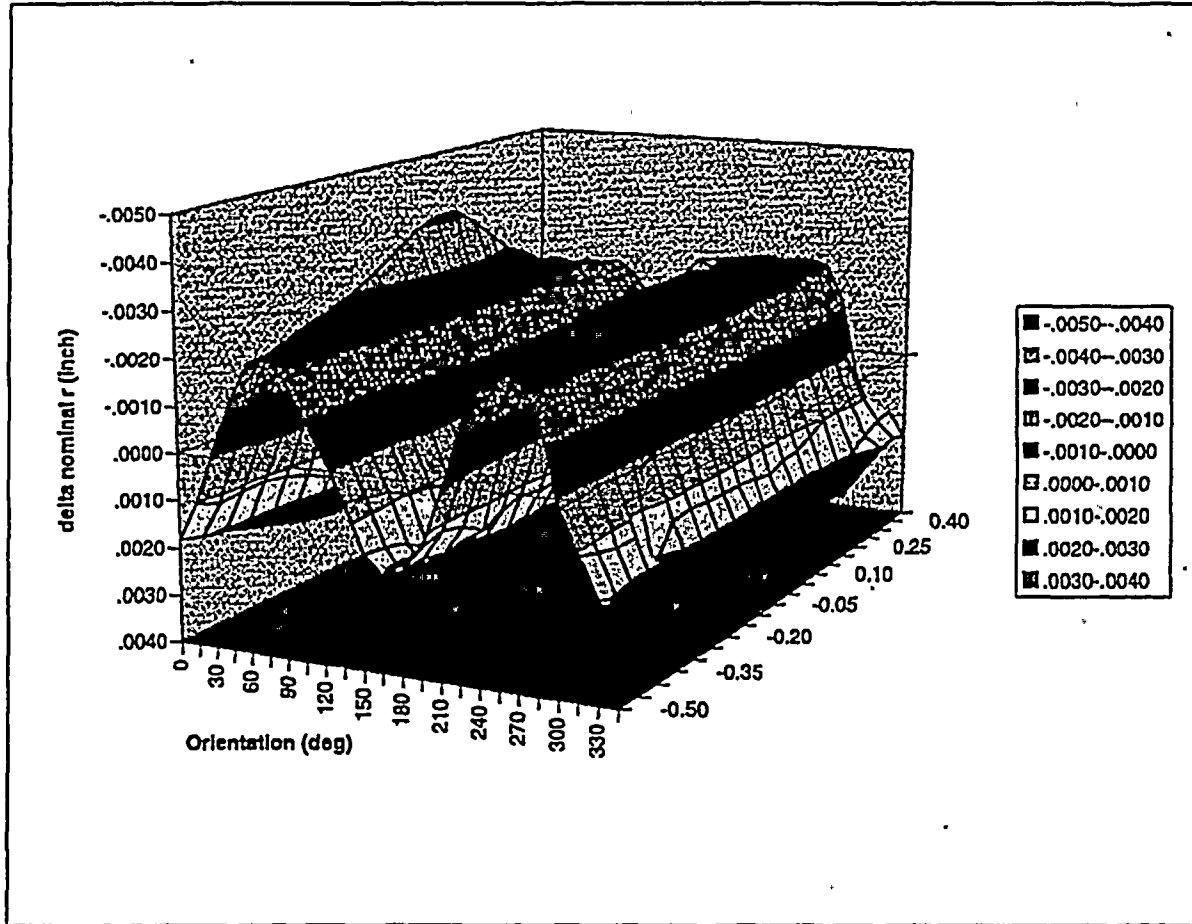
At screw location:

Average radial dent	-.0017
Maximum radial dent	-.0035

At position by tsp:

Average radial dent	-.0013
Maximum radial dent	-.0023

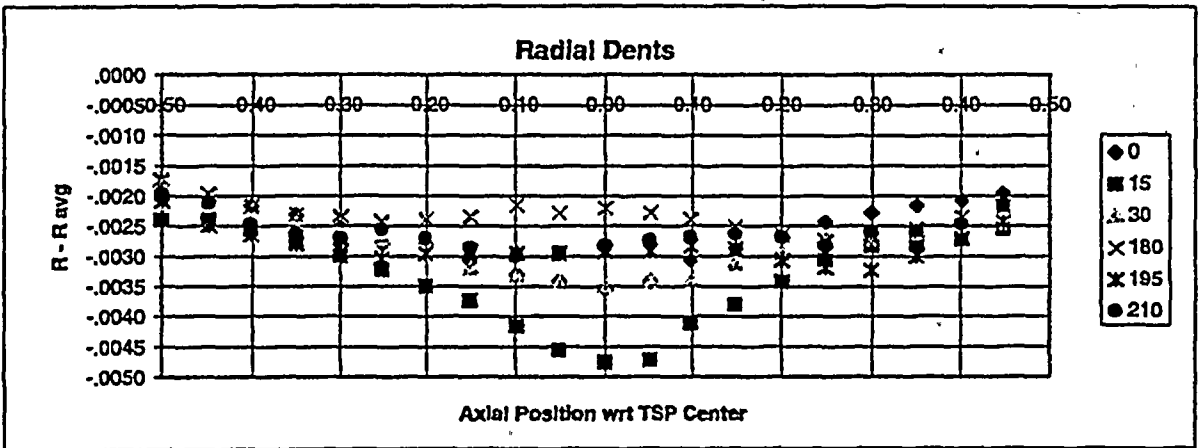
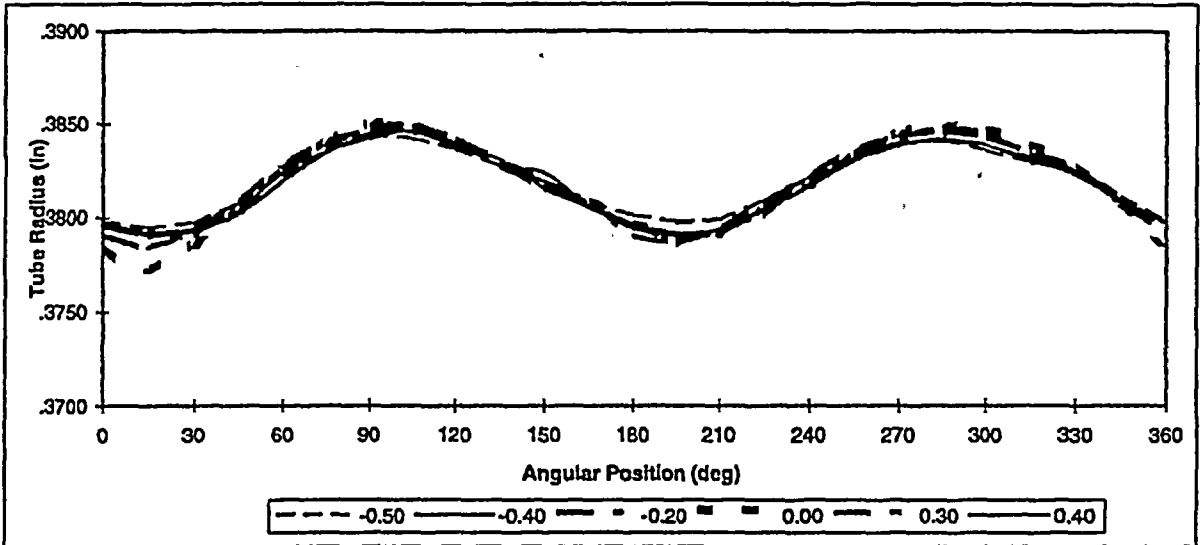
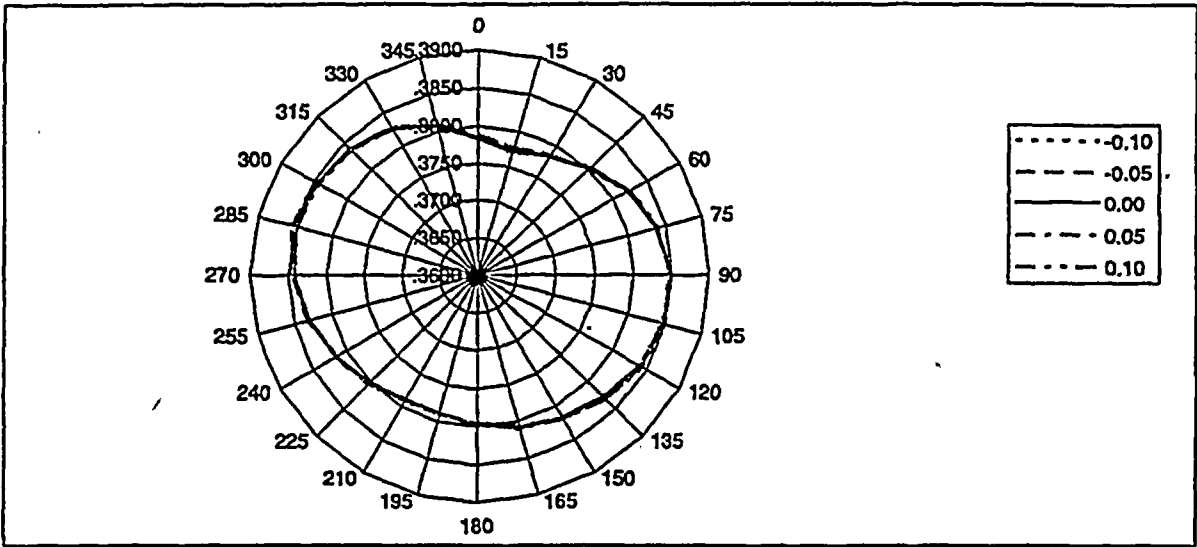


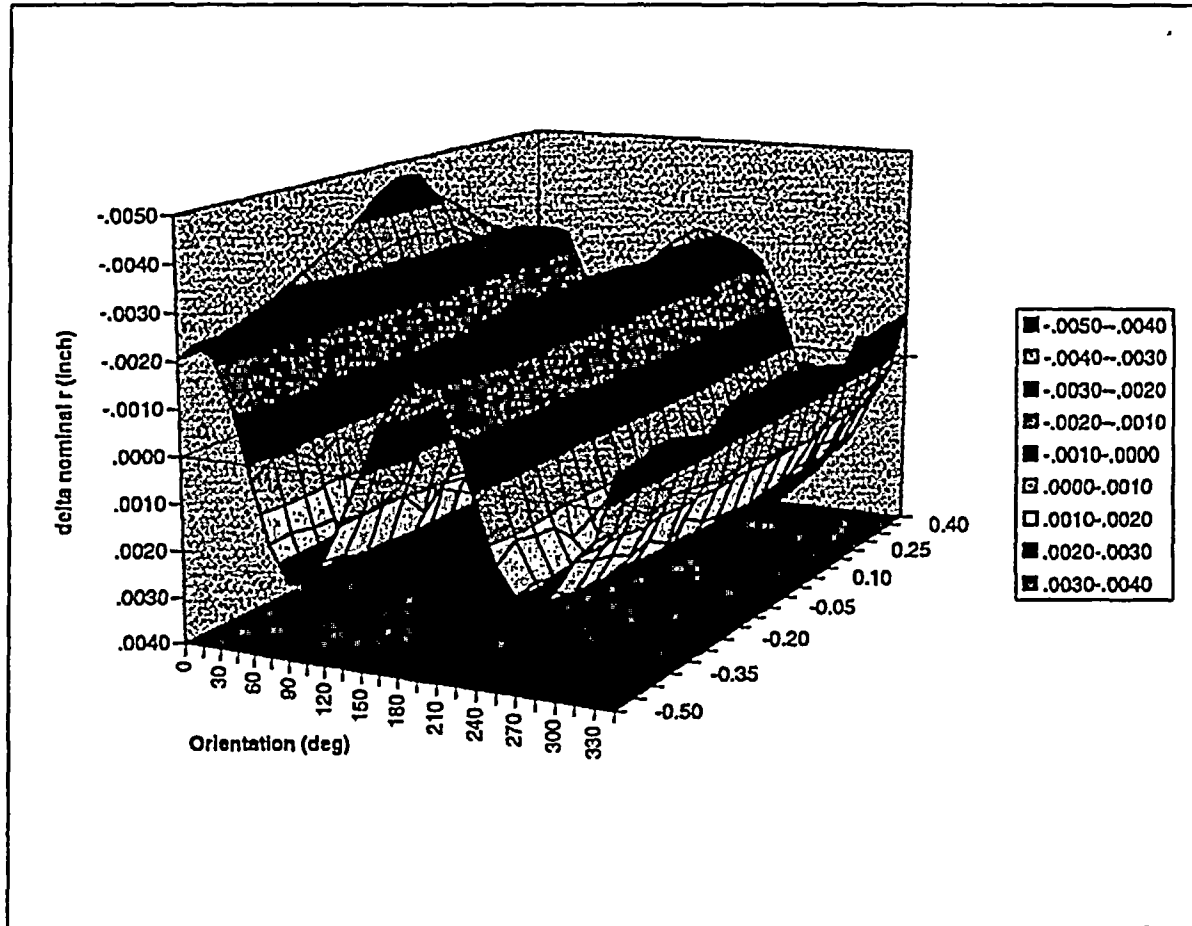


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3817	.3818

At screw location:
 Average radial dent -0.0025
 Maximum radial dent -0.0042

At position by tsp:
 Average radial dent -0.0026
 Maximum radial dent -0.0032

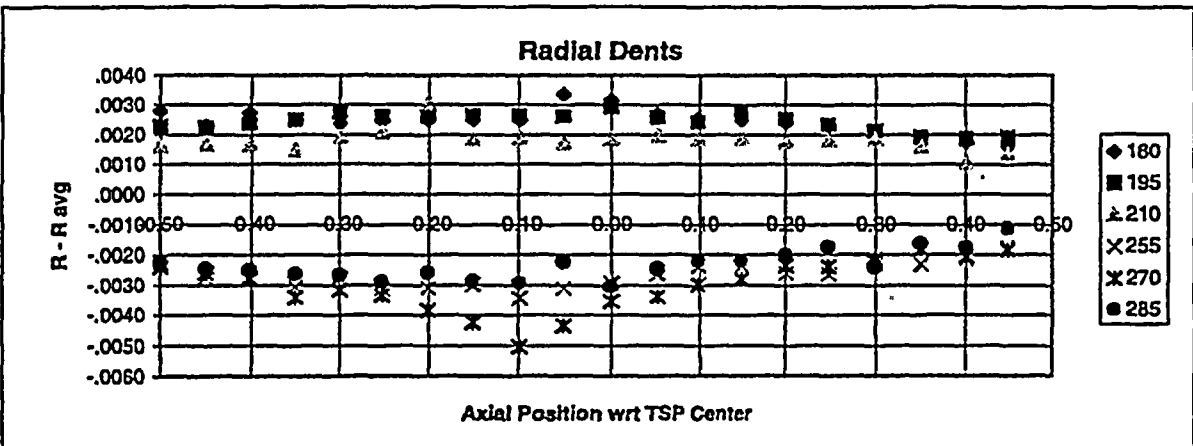
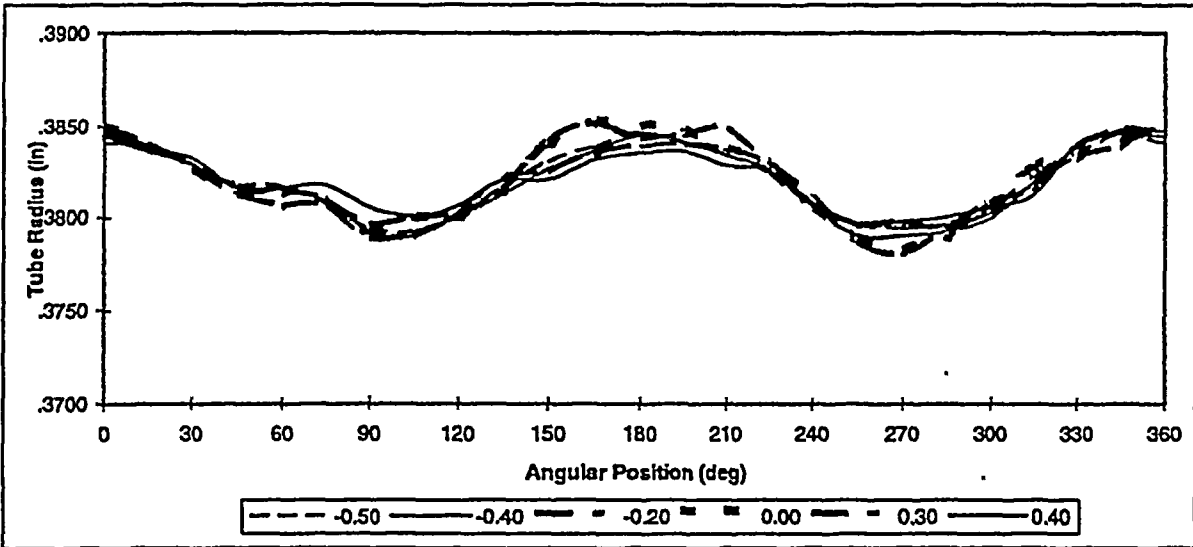
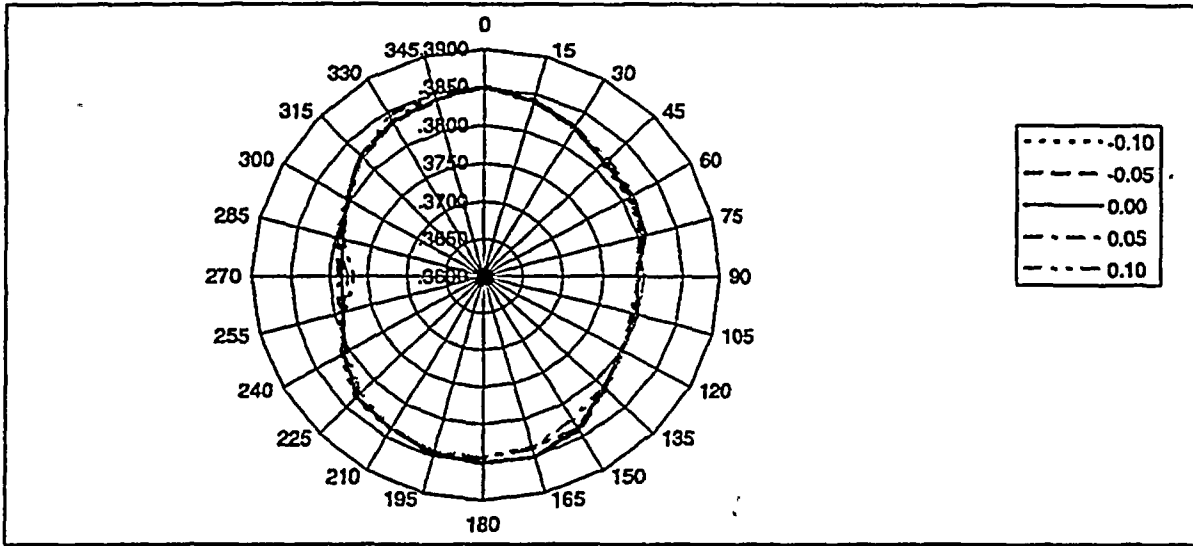


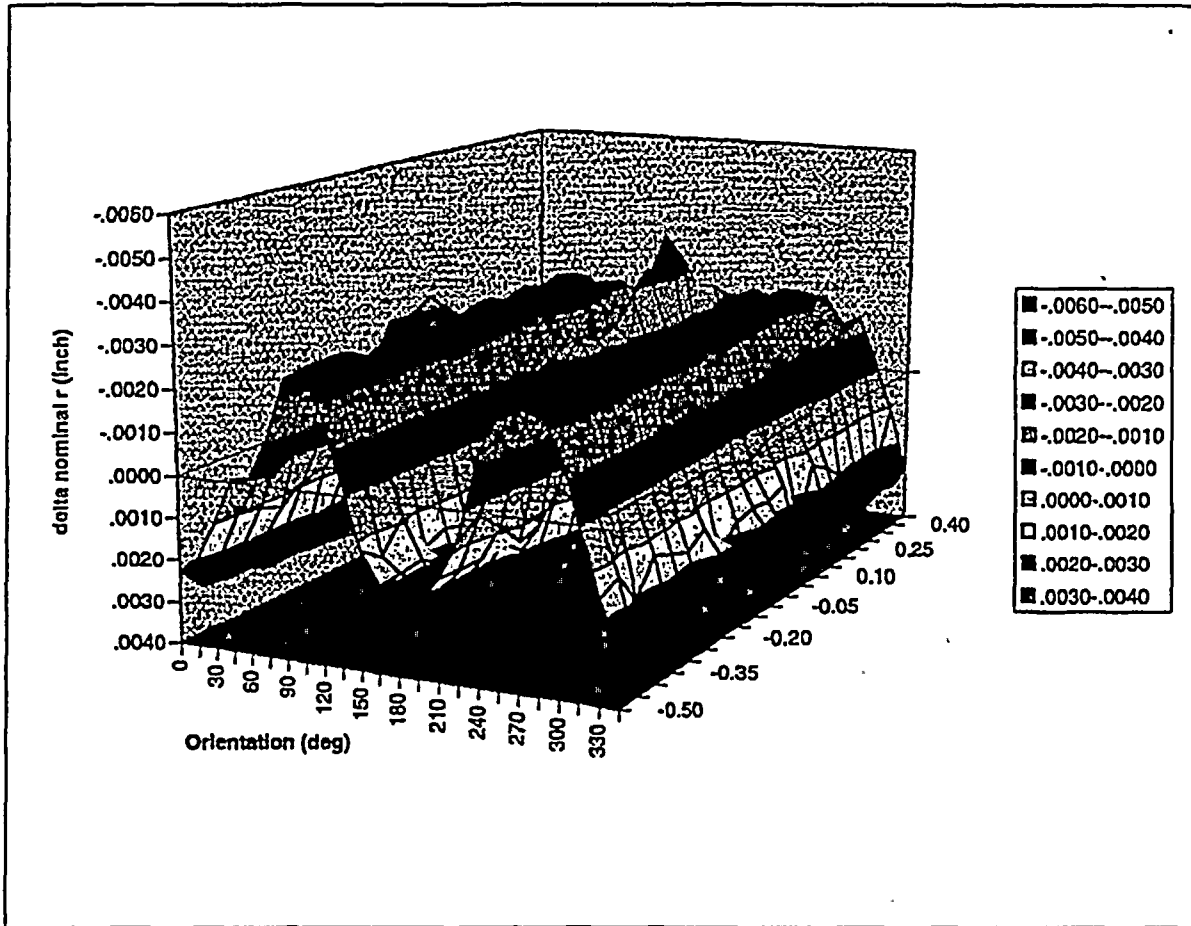


Specimen	over tsp	straight tube
Avg. Tube ID radius	.3818	.3818

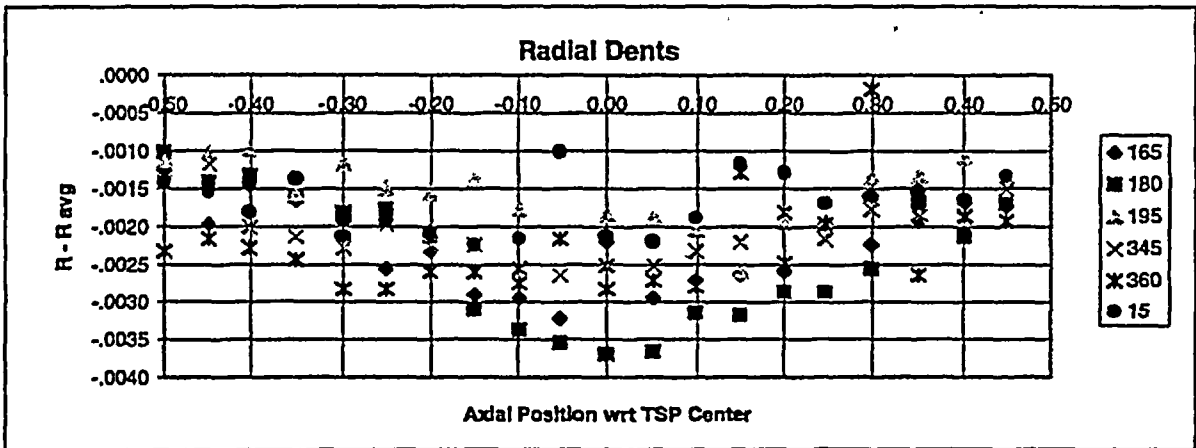
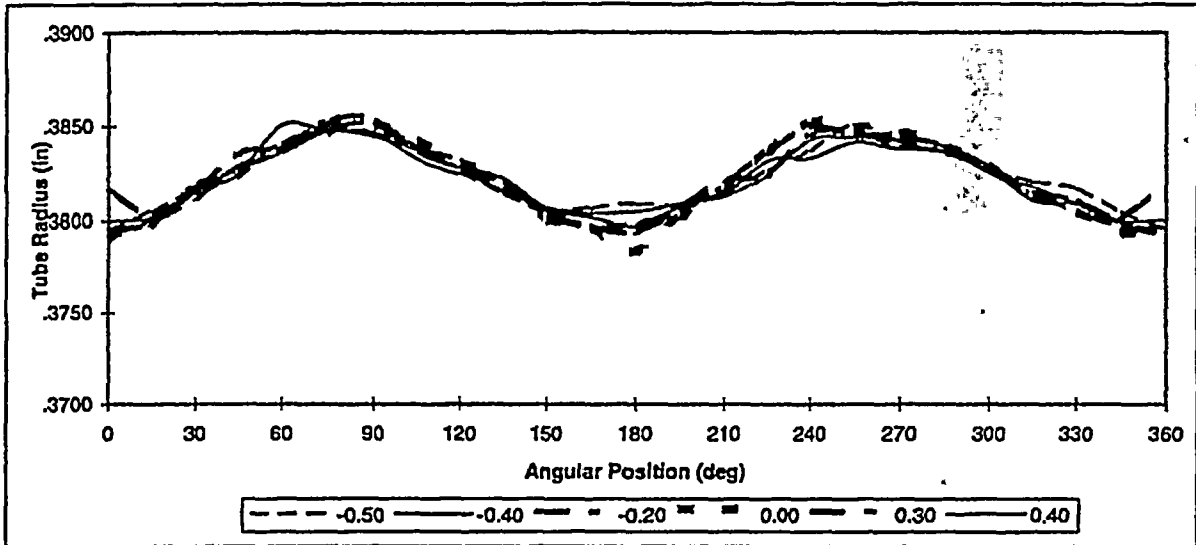
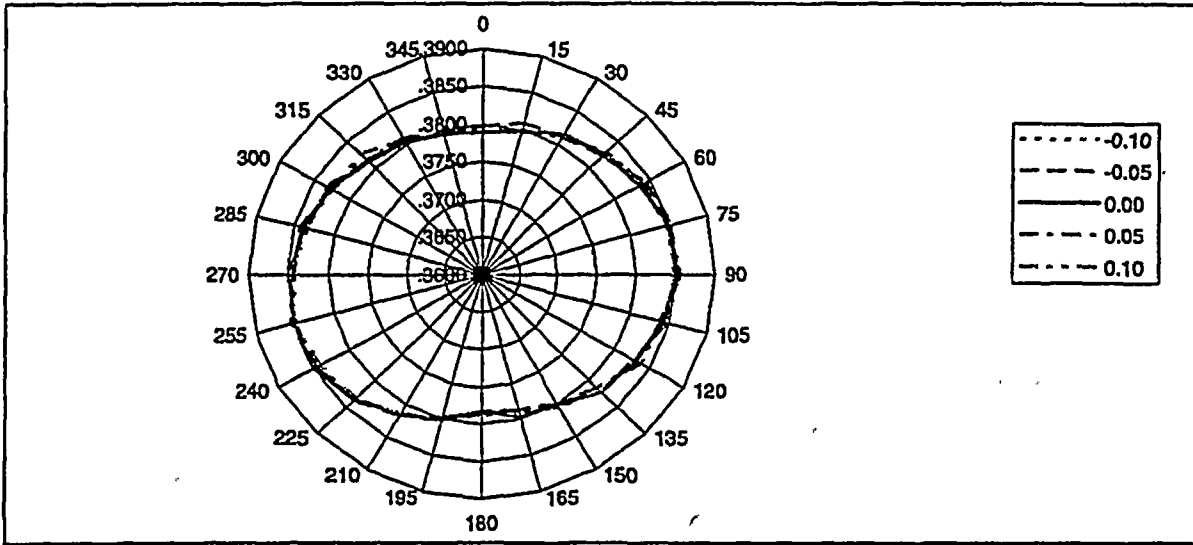
At screw location:
 Average radial dent -0.0029
 Maximum radial dent -0.0048

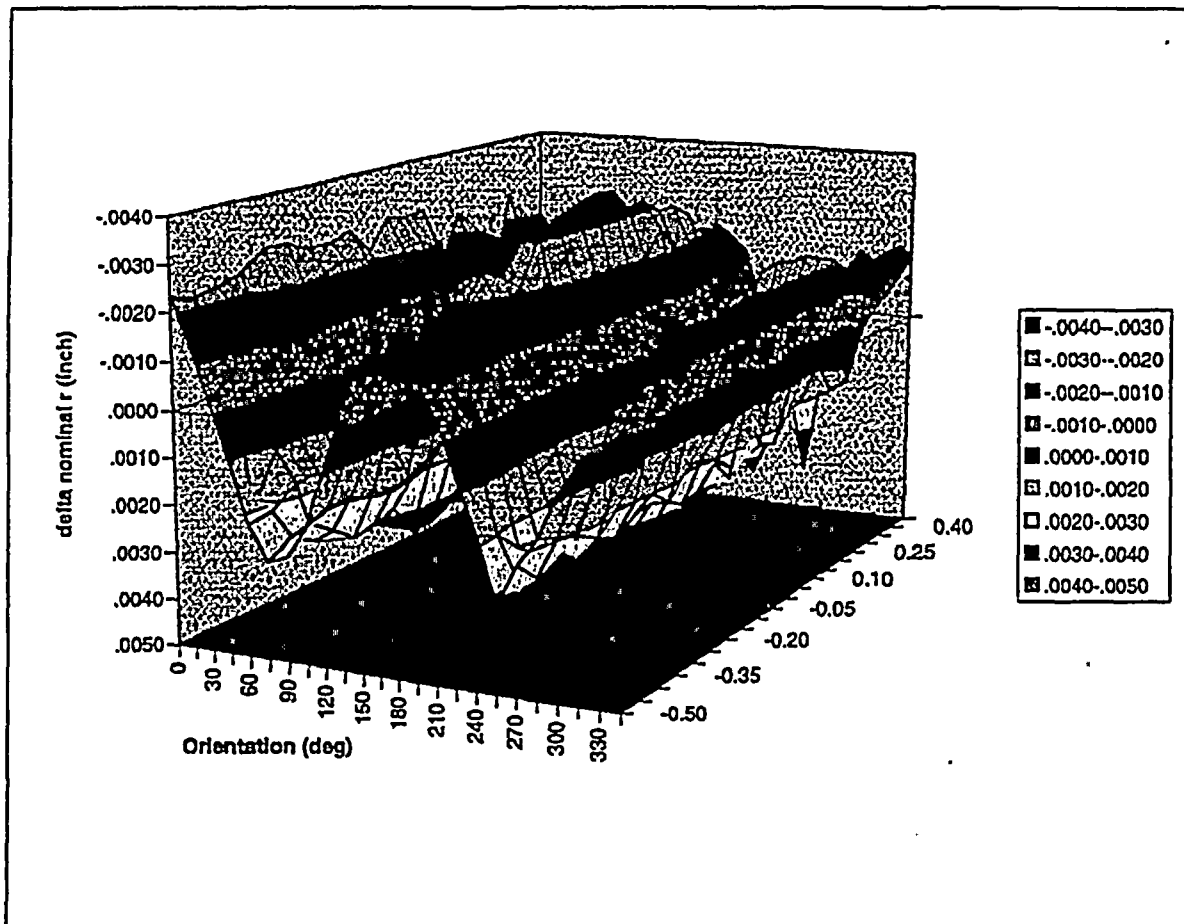
At position by tsp:
 Average radial dent -0.0026
 Maximum radial dent -0.0032





Specimen	over tsp	straight tube
Avg. Tube ID radius	.3819	.3818
At screw location:		
Average radial dent	-0.0027	
Maximum radial dent	-0.0050	
At position by tsp:		
Average radial dent	-0.0020	
Maximum radial dent	-0.0033	





Specimen	over tsp	straight tube
Avg. Tube ID radius	.3822	.3818

At screw location:

Average radial dent	-.0021
Maximum radial dent	-.0037

At position by tsp:

Average radial dent	-.0020
Maximum radial dent	-.0028



Appendix I

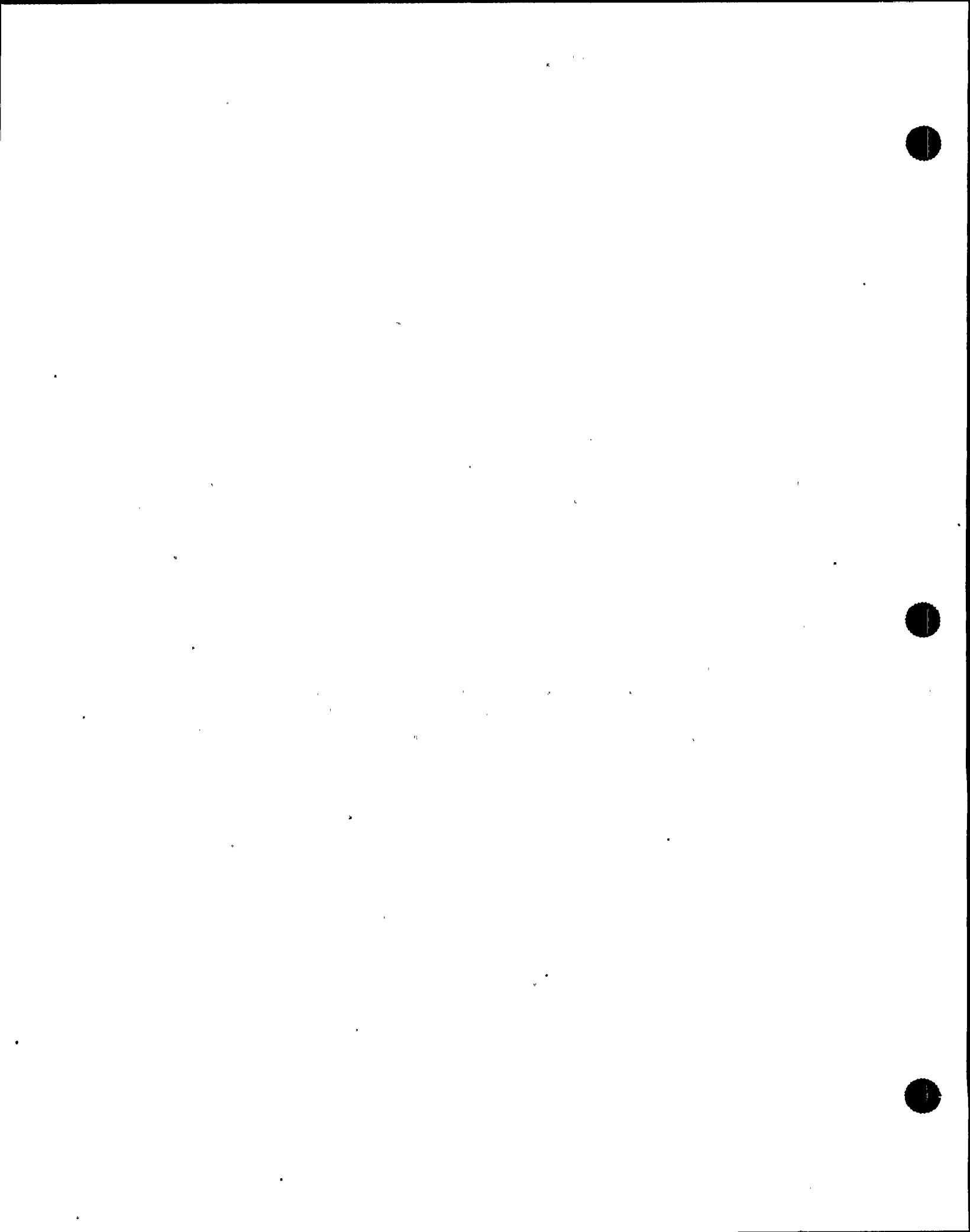
Evaluation of Adjustments to Phase Based Depth Sizing for Axial PWSCC at Dented TSP Intersections

*This analysis is based on the status of data for 1/19/98 and
may not be consistent with the final data.*



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Appendix I

Evaluation of Adjustments to Phase Based Depth Sizing

1. INTRODUCTION

Depth sizing based on phase angle analyses has been found to overestimate depths for shallow indications and underestimate depths that are near throughwall or throughwall. For shallow indications, the voltage response is small and the phase response tends to be pulled to larger angles or deeper depths for ID indications. Based on a review of the analysis results, this effect is dominant for indications that have a maximum voltage less than about one volt. Underestimates of depth for very deep indications tend to occur when the maximum voltage is about 4.5 volts or higher. In between about 1.0 and 4.5 maximum volts, depth sizing from phase angle response provides very accurate depth profiles. In this appendix, five alternate methods are evaluated to either adjust the depths found from phase analyses or to provide an alternate technique for depth sizing based on relating voltage to depth. The need for adjustment is based on the voltage level of the indications.

A method is recommended for inclusion in NDE qualification efforts for adjusting phase angle depths for both shallow and throughwall or near throughwall indications.

2. CONCLUSIONS

This section describes the general results from comparisons of NDE with destructive exam results, assessments of NDE uncertainties following adjustments to phase angle depth analyses and a recommended adjustment procedure for modifying phase angle results for very small and throughwall indications.

General Results on Comparisons of NDE and Destructive Exam Results

- Maximum depths from destructive examinations should be averaged over the effective coil field (about 0.16" for + Point coil) for comparison with NDE results. This practice provides the most meaningful comparison for tube integrity leakage considerations and is consistent with recommendations in Appendix H of the EPRI ISI guidelines. NDE uncertainties for this definition of maximum depth will differ significantly from that based on using the local maximum depth from destructive examinations.
- Depths from phase angle analyses show strong tendencies to overestimate maximum and average depths for indications with maximum voltages less than about 1 volt and to underestimate depths near 100% for indications with maximum voltages greater than about 4.5 volts.
- Depths from phase angle analyses show very good agreement with destructive exam maximum and average depths for indications having maximum voltages between about 1.0 and 4.5 volts.

Five options (see Section 3 for a detailed description of the options), including additional variation within three of the options, were evaluated for reducing the NDE uncertainties

for the shallow and very deep indications. The options and associated NDE uncertainties are given in Table I2-1. The options 3b, 4b and 5b extend the voltage based adjustments to all indications as compared to only indications with maximum voltages less than one volt for the 3a, 4a and 5a options. NDE analyses results from two of the four analysts evaluating the data were used for this assessment. This provides some analysis variability while reducing the scope of modifying existing analyses to reflect the modifications. The first data row of Table I2-1 provides the reference NDE uncertainties from the two analysts' results based on the current procedure of phase angle analyses for depth. The NDE uncertainty results for average depths are acceptable (standard deviation of $< 10\%$, mean error of -4%) but the results for maximum depth are too large, particularly based on the recommended coil average maximum depth. The desired NDE uncertainties would have a few percent ($< 3\%$) mean error that is preferably negative (NDE greater than destructive exam on the average) and a standard deviation that is about 10% or less. The NDE uncertainty at 95% confidence for average depth is typical of the value that would be used to reduce the structural limit, together with growth data, to obtain a plugging limit. The NDE uncertainty on maximum depth would likely be used to identify potential leakers for leakage analyses. Conclusions from this assessment are summarized below.

Assessments of NDE Uncertainties Including Adjustments to Phase Angle Analyses

- All of the options (1, 3a, 4a, 5a), which limit the modification to small (< 1.0 maximum volt) and very deep (> 4.5 maximum volts) indications, result in reductions in NDE uncertainties compared to the reference phase angle analyses. Phase angle analyses for depth yield very good agreement with destructive exam results for indications having maximum voltages between 1.0 and 4.5 volts and these results are not improved by the adjustment procedures evaluated.
- For shallow indications having < 1 volt maximum, Options 1 (phase based depths adjusted by ratio of depth at maximum voltage to maximum depth from phase analyses), 3a and 4a (similar voltage correlation with depth for < 1.0 maximum volt indications), and 5a (depth at max. volts adjusted by ratio of volts to maximum volts) result in comparable, improved agreement with destructive exam compared to the reference case.
- For deep indications having greater than about 4.5 maximum volts, the relatively simple Option 1 adjustment procedure (adjust depths by ratio of 100% to maximum depth from phase analyses – also used for Options 4 and 5) yields better agreement with destructive exam results than use of a voltage correlation (Options 2 and 3).
- For average depths, Options 1, 3a, 4a, 4b, 5a and 5b provide modest NDE uncertainty improvements over the reference case of applying only phase angle analyses.
- For coil averaged maximum depth, Options 1, 3a, 4a, 4b, 5a and 5b provide significant NDE uncertainty improvements over the reference case based on reductions in both the mean error and standard deviation.

Overall, it is concluded that multiple options can be applied to improve depth sizing for shallow and near throughwall indications. The recommended option is described below:

Recommended Option for Adjusting Phase Angle Analyses for Shallow and Near Throughwall Indications

The results summarized above show that the adjustment procedure should be limited to adjusting phase angle results at voltages less than about 1.0 volt and to near throughwall indications such as greater than about 4.5 volts. Options 1, 3a, 4a, 4b, 5a and 5b provide acceptable adjustment procedures. Option 1 is based entirely on use of phase angle analyses while Options 3 to 5 introduce either a voltage/depth correlation (Options 3 and 4) or a voltage based profile (Option 5). While the voltage/depth correlations work quite well for the data evaluated, it must be recognized that there is no theoretical basis for voltage to relate closely to depth since voltage responds to the volume of the flaw. Voltage/depth correlations have considerable scatter (Figure I3-4, for example) since voltage is particularly sensitive to crack morphology (uncorroded ligaments, multiple parallel cracks, oxide on crack face, etc.). The voltage correlations work reasonably well for axial PWSCC due to the relatively simple crack morphology as compared to ODSCC indications. Similarly, the simple PWSCC morphology is the primary basis for success in phase angle depth sizing. However, it is believed that the potential for a large error is greater with voltage correlations than with depth sizing.

Given that multiple options result in acceptable NDE uncertainties, it is recommended that Option 1 be applied for axial PWSCC at dented TSP intersections. This option is entirely based on phase angle analyses. For very small indications having maximum voltages < 1.0 volt, the premise for Option 1 is that the best estimate of depth occurs where the amplitude is the largest. For very small voltages, the phase angles are distorted toward increasing angles or larger depths. The best maximum depth estimate can reasonably be expected to occur at the point of maximum voltage. It can be noted, however, that this is reasonable only when the amplitude is very small and the phase distorted since maximum depth very often does not occur at maximum voltage for larger signals. Option 1 then applies maximum depth as that at maximum volts for < 1.0 volt indications and adjusts depths at other points in the profile by the ratio of the depth at maximum volts to the maximum depth from phase analyses. This process almost always results in a reduction in average and maximum depth.

Option 1 applies a similar adjustment procedure for very deep indications. The general trend of phase angle analyses is to underestimate depths for throughwall cracks. The adjustment for very deep indications is based on the premise that, above some voltage, there is a very high probability that the indication is throughwall. The available data would indicate this voltage range to be about 3.5 to 5 volts with the probability of throughwall penetration increasing with voltage. Option 1 applies a voltage of 4.5 volts to represent throughwall indications. For indications having > 4.5 maximum volts, Option 1 then adjusts the phase angle depth profile by the ratio of 100% to the maximum depth from phase angle analyses. This is always a conservative depth adjustment since depths can only be increased by this procedure.

It is recommended that Option 1 be incorporated into NDE procedures and applied to all NDE qualification efforts including EPRI Appendix H and the NDE Performance Test supporting a ARC.

3. DEPTH ADJUSTMENT METHODS EVALUATED

Depth sizing based on phase angle analyses has been found to overestimate depths for shallow indications and underestimate depths that are near throughwall or throughwall. For the shallow indications, the voltage response is small and the phase response tends to be pulled to larger angles or deeper depths for ID indications. These trends of NDE versus destructive examination results are shown in Table I3-1 and Figures I3-1 to I3-3 for average depth corrected for uncorroded ligaments, maximum depth averaged over the coil field and maximum local depth. The ligament corrected average depth represents the corrosion average depth reduced by the area of uncorroded ligaments over the crack length. The coil average maximum depth is based on a running average of the local crack depths over the coil field size for the + Point coil and includes corrections for uncorroded ligaments. Following the guidance of the EPRI ISI Guidelines, Appendix H, the coil field size obtained is 0.16 inch for the mid-range + Point coil.

Between the shallow indications having about 1.0 maximum volt and the deep indications having greater than about 4.5 maximum volts, depth sizing from phase angle response provides very accurate depth profiles. In this appendix, alternate methods are evaluated to either adjust the depths found from phase analyses or to provide an alternate technique for depth sizing. The length adjustment procedure for the tails of the NDE distribution has been applied to all data prior to evaluating the methods of this appendix. These methods are based on the voltage level of the indications as described below.

The five methods evaluated in this appendix are:

1. Option 1: Depth Adjustments for < 1.0 and > 4.5 Volts

For maximum volts < 1.0, define maximum depth as the depth at the maximum voltage point and adjust all depths based on the ratio of depth at maximum volts to maximum depth from phase angle analyses. This option is based on the premise that for small amplitudes, the best estimate of depth is obtained at the maximum volt location. It is recognized that the true maximum depth may not occur at the maximum volt location. The adjusted average depth can be obtained as follows:

$$(\text{average depth})'_{\text{adjusted}} = (\text{average depth})'_{\text{phase}} \cdot \frac{(\text{depth})'_{\text{at max volts}}}{(\text{maximum depth})'_{\text{phase}}}$$

If the maximum volts is > 4.5 volts, the maximum depth is defined to be 100% and all depths are adjusted based on the ratio of 100% depth to the maximum depth from phase angle analyses. The adjusted average depth can be obtained as follows:

$$(\text{average depth})'_{\text{adjusted}} = (\text{average depth})'_{\text{phase}} \cdot \frac{100\%}{(\text{maximum depth})'_{\text{phase}}}$$

This option is evaluated in Section 4.

2. *Option 2: Depth Adjustment Based on Correlation of Maximum Depth with Maximum Voltage*

For this option, a correlation is developed between maximum depth (from destructive exam data) and maximum volts using all or a subset of the available data. Only data with destructive exam depths < 100% are used for the correlation since maximum volts is strongly dependent on throughwall length and use of indications with 100% depth would distort the correlation below 100% depth. The regression curve is forced to go through the zero volt, zero depth point so that a continuous correlation is obtained that includes zero volts and depth. The resulting correlation is then used to obtain the maximum depth for the indication from the maximum volts. All depths are then adjusted by the ratio of maximum depth from the correlation to maximum depth from the phase angle analysis. All maximum voltages greater than the correlation value at 100% depth are assigned a depth of 100%. The adjusted average depth can then be obtained from:

$$(average\ depth)_{adjusted}^i = (average\ depth)_{phase}^i \cdot \frac{(maximum\ depth)_{volt\ depth}}{(maximum\ depth)_{phase}}$$

The resulting correlation for this analysis is given in Figure I3-4. This correlation uses all data points for specimens destructively examined through September, 1997. Results from this evaluation are given in Section 5.

3. *Option 3: All Depths Developed from Correlation of Depth with Voltage*

For this option, a correlation of maximum depth with maximum voltage is applied as a voltage to depth calibration curve. All depths are derived from applying the correlation to the NDE voltage profile to obtain the depth profile from the point by point voltage analysis. Phase analyses for depth are not used in this option.

For a final application of this methodology or Option 2 above, the specimens used to develop the depth to voltage correlation cannot be used to qualify the technique. Prior discussions with the NRC have identified that the NRC would follow this position if used to develop NDE uncertainties as part of the NRC draft Reg. Guide 1074 NDE Performance Test. To test the sensitivity of the depth/voltage correlation to the data used, a subset of 10 specimens that are widely scattered about an expected correlation were used for this analysis. Figure I3-5 shows the data used and the resulting correlation. Figure I3-6 compares the correlation obtained with this data set to the correlation obtained from the larger data set used for Option 2 above. It is seen that the correlations are not strongly dependent upon the data used to develop the correlation. Since this appendix is intended to assess the feasibility of the methodology rather than to provide a final qualification of the method, the resulting correlation of Figure I3-5 was applied to all available specimens destructively examined for this assessment. The results of this assessment are given in Section 6.

4. *Option 4: Depths Based on Linear Depth/Volt Correlation for Voltages < 1.0 and Adjustment to 100% for Voltages > 4.5 Volts*

This option combines a simplified depth to voltage correlation for voltages < 1.0 volt and the Option 1 depth adjustment to 100% for maximum voltages > 4.5 volts. Depth is assumed to vary linearly with voltage (% depth = 60×volts) for voltages up to 1 volt. This simplified correlation is used to eliminate a regression correlation with destructive exam data in order to use all the destructive exam data in the NDE uncertainty analyses. Two variations of this option are assessed. The first applies the depth/volt correlation only for indications having a maximum voltage < 1.0 volt. The second variation applies the depth/volt correlation to all indications at points < 1.0 volt and uses depth from phase analyses for points having voltages > 1.0 volt. The results of this assessment are given in Section 7.

5. *Option 5: Depths Adjusted by Voltage Ratio to Depth at Max. Volts for Voltages < 1.0 and Adjustment to 100% for Voltages > 4.5 Volts*

This option is similar to Option 1 in that it uses the depth at maximum volts to adjust the depth profile for indications with < 1.0 maximum volts. Option 1 applies the depth profile from phase angle analyses while this option applies the voltage profile to obtain the depth profile. All depths for Option 5 having < 1.0 volt are obtained by adjusting the depth at maximum volts by the ratio of the voltage at the point to the maximum volts. This option can be expressed as:

$$\left(\text{depth}\right)_{\text{adjusted}}^i = \left(\text{depth}\right)_{\text{max.volts}} \cdot \frac{V^i}{V_{\text{max}}}$$

This Option 5a yields the same maximum depth for indications < 1.0 maximum volts as Option 1 but average depths may differ from Option 1. For indications with maximum volts > 4.5, the same adjustment to 100% depth as applied for Option 1 is also applied for this option. A second variation of this options. Option 5b, applies the depth adjustment to all indications at points < 1.0 volt and uses depth from phase analyses for points having voltages > 1.0. In this case, the depth and volts at a point closest to, but greater than 1.0 volt, are used to adjust points having < 1.0 volt. The results of this assessment are given in Section 8.

4. OPTION 1 ASSESSMENT: DEPTH ADJUSTMENT FOR < 1.0 AND > 4.5 VOLTS

As described in Section 3, Option 1 is applied on the assumption that for small voltage indications, the depth determined from phase angle analysis at the maximum voltage is assumed to be the most accurate estimate of the maximum depth. The point by point depths from phase analyses are then adjusted by the ratio of depth at maximum voltage to maximum depth from phase analysis. Adjusted average depths can then be obtained by this same ratio. The results from these adjustments are given in Table I4-1. Figures I4-1 to I4-3 show the trends of adjusted average depth versus destructive exam average depth corrected for uncorroded ligaments, adjusted maximum depth versus the coil field averaged maximum depth from destructive exam and adjusted maximum depth versus local

maximum depth from destructive exam. NDE uncertainties are presented in Table I4-1 for both the local and coil field averaged maximum depth.

Table I4-1 shows, at the bottom of the table, the NDE uncertainty mean, standard deviation and upper 95% confidence value for length, average depth and each of the two definitions for maximum depth. Both the original phase angle analysis results and the adjusted NDE results are given in Table I4-1. Lengths have not been adjusted by the analyses of this appendix. This table includes the NDE uncertainty obtained before and after the adjustments of this method. It is seen that a significant reduction in the NDE uncertainty for maximum depth is obtained by this methodology. The NDE uncertainty for average depth is only slightly improved although Figure I4-1 shows a fairly consistent variation about the ideal 45° line with a modest trend to overestimate the average depth as also shown by the mean error in Table I4-1. Similar trends are found for maximum depth in Figures I4-2 and I4-3 although the adjusted NDE maximum depth continues to consistently overestimate the coil field averaged maximum depth from destructive examination.

Overall, this adjustment method, which is relatively simple to apply to the data with no additional NDE analysis, reduces the NDE uncertainty on maximum depth to acceptable levels although higher than that obtained for average depth.

5.0 OPTION 2 ASSESSMENT: DEPTH ADJUSTMENT BASED ON CORRELATION OF MAXIMUM DEPTH WITH MAXIMUM VOLTAGE

As described in Section 3, Option 2 is applied on the assumption that the best estimate of maximum depth can be obtained from a correlation of maximum depth from destructive examination with maximum voltage for all indications. The depths determined from the phase angle analysis are assumed to provide the best depth profile and are adjusted by the ratio of maximum depth from the correlation to the maximum depth obtained from phase analysis. Adjusted average depths can then be obtained by this same ratio. The results from these adjustments are given in Table I5-1. Figures I5-1 to I5-3 show the trends of adjusted average depth versus destructive exam average depth, adjusted maximum depth versus local maximum depth from destructive exam and adjusted maximum depth versus the coil field averaged maximum depth from destructive exam.

The bottom of the Table I5-1 shows the NDE uncertainty mean, standard deviation and upper 95% confidence value for length, average depth and each of the two definitions for maximum depth. Lengths have not been adjusted by the analyses of this appendix. This table includes the NDE uncertainty obtained before and after the adjustments of this method. It is seen that a significant reduction in the NDE uncertainty for maximum depth is obtained by this methodology. The NDE uncertainty for average depth is not improved although Figure I5-1 shows a fairly consistent variation about the ideal 45° line with a modest trend to overestimate the average depth as also shown by the mean error in Table I5-1. Similar trends are found for maximum depth in Figures I5-2 and I5-3 although the adjusted NDE maximum depth continues to consistently overestimate the coil averaged maximum depth from destructive examination.

Overall, this adjustment method, which is relatively simple to apply to the data with no additional NDE analysis, reduces the NDE uncertainty on maximum depth to acceptable levels comparable to that obtained for average depth. This option, which requires the use of a depth/voltage correlation, results in NDE uncertainties larger than obtained for Option 1.

6. OPTION 3 ASSESSMENT: ALL DEPTHS BASED ON CORRELATION OF DEPTH WITH VOLTAGE

As described in Section 3, Option 3 is applied on the assumption that the best estimate of all depths can be obtained from a correlation of maximum depth from destructive examination with maximum voltage. The point by point voltage profile values from the NDE analysis are converted to a depth profile using the depth/voltage correlation. Option 3a is evaluated by applying the depth/voltage correlation for tubes with maximum volts < 1.0 volt and > 4.5 volts. Option 3b applies the correlation to all indications. The Option 3b method completely eliminates all phase angle analyses for depth and uses only voltage analyses. The NDE uncertainties resulting from the Option 3a voltage based analyses are given in Table I6-1. Figures I6-1 to I6-3 show the trends of adjusted average depth versus destructive exam average depth, adjusted maximum depth versus local maximum depth from destructive exam and adjusted maximum depth versus the coil field averaged maximum depth from destructive exam.

The bottom of the Table I6-1 shows the NDE uncertainty mean, standard deviation and upper 95% confidence value for Option 3a. It is seen that a significant reduction in the NDE uncertainty for maximum depth is obtained by this methodology. The NDE uncertainty for average depth is not improved although Figure I6-1 shows a fairly consistent variation about the ideal 45° line with a modest trend to overestimate the average depth as also shown by the mean error in Table I6-1. Similar trends are found for maximum depth in Figures I6-2 and I6-3 although the adjusted NDE maximum depth continues to consistently overestimate the coil field averaged maximum depth from destructive examination. The resulting NDE uncertainties are very similar to that obtained for Option 1.

Based on the improvement obtained for small and large indications using the correlation of depth with voltage, the correlation was applied to all indications as Option 3b with the results given in Table I6-2. The trends of NDE versus destructive exam are shown in Figures I6-4 to I6-6. It is seen that Option 3b results in larger NDE uncertainties than obtained with Option 3a and offer no improvement over the complete use of phase angle analyses for depth. Comparing Figures I6-1 and I6-4, the mid-range data (DE depths of about 40% to 80%) have larger NDE uncertainties for Option 3b. It is concluded that phase angle analyses are better than voltage based analyses for indications having maximum voltages about above one volt.

7. OPTION 4 ASSESSMENT: DEPTHS BASED ON LINEAR DEPTH/VOLT CORRELATION FOR < 1.0 VOLT INDICATIONS AND ADJUSTMENTS TO 100% DEPTH FOR > 4.5 VOLT INDICATIONS

Option 3a, which applies a depth/volt correlation for < 1 volt indications resulted in significantly reduced NDE uncertainties compared to phase angle analyses for these small indications. To eliminate the need for a correlation that uses a significant part of the destructive exam database, a simplified correlation was defined. For modest depths, it is expected that depth would vary approximately linearly with voltage. The data of Figure I3-4 support a crack depth of about 55-60% at 1.0 volt. Depths at 1.0 volt in the range of 50% to 70% could be applied to be less or more conservative. Option 4 was evaluated using $\text{Depth \%} = 60 \times \text{volts}$ for voltages < 1.0. The depth adjustment to 100% of Option 1 was applied for indications with maximum voltages > 4.5 volts. Option 4a limited application of the depth/volt correlation to indications having maximum voltages < 1.0 volt. Option 4b applied the correlation to all indications at voltages < 1.0 volt.

The NDE uncertainties resulting from the Option 4a voltage based analyses are given in Table I7-1. Figures I7-1 to I7-3 show the trends of adjusted average depth versus destructive exam average depth, adjusted maximum depth versus the coil field averaged maximum depth from destructive exam and adjusted maximum depth versus local maximum depth from destructive exam.

The bottom of the Table I7-1 shows the NDE uncertainty mean, standard deviation and upper 95% confidence value for Option 4a as well as for the unmodified phase angle analyses. It is seen that a significant reduction in the NDE uncertainty for maximum depth is obtained by this methodology. The NDE uncertainty for average depth is also improved and Figure I7-1 shows a fairly consistent variation about the ideal 45° line which is supported by the small mean error in Table I7-1. Similar trends are found for maximum depth in Figures I7-2 and I7-3 although the adjusted NDE maximum depth continues to consistently overestimate the coil field averaged maximum depth from destructive examination. The resulting NDE uncertainties are very similar to that obtained for Option 1.

Based on the improvement obtained for small indications using the correlation of depth with voltage, the correlation was applied to all indications at < 1 volt response (as Option 4b) with the results given in Table I7-2. The assumption for applying this option is that the depths would be better estimated from the voltage correlation when voltages are less than one volt and by phase analysis when greater than one volt. The trends of NDE versus destructive exam are shown in Figures I7-4 to I7-6. It is seen that Option 4b results in comparable mean and standard deviations for the NDE uncertainties to that obtained with Option 4a. The mean values are more positive for Option 4b. This results in larger NDE uncertainties at +95% confidence. Comparing Figures I7-1 and I7-4, the mid-range data (DE depths of about 40% to 80%) have larger NDE uncertainties for Option 4b. This result is somewhat surprising based on the improvement in depth estimates obtained when the maximum voltage is < 1 volt.

8. OPTION 5 ASSESSMENT: DEPTHS ADJUSTED BASED BY VOLTAGE RATIO TO DEPTH AT MAXIMUM VOLTS FOR < 1.0 VOLT INDICATIONS AND ADJUSTMENTS TO 100% DEPTH FOR > 4.5 VOLT INDICATIONS

For voltages < 1.0, Option 5 was evaluated using depth at a point equal to depth at maximum volts times the ratio of the voltage at the point to maximum volts. That is, depths are scaled by voltage relative to the depth at maximum volts. The depth adjustment to 100% of Option 1 was applied for indications with maximum voltages > 4.5 volts. Option 5a limited application of the depth adjustment to indications having maximum voltages < 1.0 volt. Option 5b applied the depth adjustment to all indications at voltages < 1.0 volt where the depth and voltage values used for the adjustment are at the point having a voltage just above one volt. This option results in the same maximum voltage as Option 1 although average depths can differ from Option 1. Option 1 applies the depth profile from phase angle analyses while this option applies the voltage profile to obtain the depth profile.

The NDE uncertainties resulting from the Option 5a voltage based analyses are given in Table I8-1. Figures I8-1 to I8-3 show the trends of adjusted average depth versus destructive exam average depth, adjusted maximum depth versus the coil field averaged maximum depth from destructive exam and adjusted maximum depth versus local maximum depth from destructive exam.

The bottom of the Table I8-1 shows the NDE uncertainty mean, standard deviation and upper 95% confidence value for Option 5a as well as for the unmodified phase angle analyses. It is seen that the reduction in the NDE uncertainty for maximum depth obtained by this methodology is the same as Option 1 in Table I4-1. The NDE uncertainty for average depth is also improved and Figure I8-1 shows NDE depths to be slightly biased to the high side of the ideal 45° line which supports the small, negative mean error in Table I8-1. Similar trends are found for maximum depth in Figures I8-2 and I8-3 although the adjusted NDE maximum depth continues to consistently overestimate the coil field averaged maximum depth from destructive examination. The resulting NDE uncertainties are nearly identical to that obtained for Option 1.

Based on the improvement obtained for small indications using the voltage based depth adjustments, the correlation was applied to all indications at < 1 volt response (as Option 5b) with the results given in Table I8-2. The assumption for applying this option is that the depths would be better estimated from the voltage adjusted depths when voltages are less than one volt and by phase analysis when greater than one volt. The trends of NDE versus destructive exam are shown in Figures I8-4 to I8-6. It is seen that Option 5b results in comparable mean and standard deviations for the NDE uncertainties to that obtained with Option 5a. The mean values are more positive for Option 5b. This results in larger NDE uncertainties at +95% confidence. Comparing Figures I8-1 and I8-4, the mid-range data (DE depths of about 40% to 80%) have larger NDE uncertainties for Option 5b. This result is somewhat surprising based on the improvement in depth estimates obtained when the maximum voltage is < 1 volt.

Table I2-1
Summary of NDE Uncertainties for Alternate Depth Sizing Options

Depth Sizing Method	NDE Uncertainty (Destructive Exam-NDE) ⁽¹⁾			
	Uncertainty Parameter	Local Max. Depth (%)	Coil Avg. Max. Depth (%)	Lig. Corr. Avg. Depth (%)
Reference: Phase angle depth sizing	Mean	-0.9	-8.0	-4.0
	Std. Deviation	15.2	15.3	9.3
	+95% Confidence	24.2	17.3	11.3
Option 1: Depths adjusted based on depth at max. volts for < 1.0 ind. and adjusted to 100% for > 4.5 max. volts ind.	Mean	1.7	-5.4	-2.7
	Std. Deviation	11.1	11.7	7.6
	+95% Conf.	20.1	13.9	9.8
Option 2: All indication depths adjusted based on depth at max. volts from a depth/volt corr.	Mean	-1.4	-8.5	-5.3
	Std. Deviation	9.2	9.9	10.4
	+95% Conf.	13.7	7.8	11.9
Option 3a: Depth/volt corr. used to obtain depths from voltage profile for < 1.0 and > 4.5 max. volts indications	Mean	2.4	-4.7	-3.0
	Std. Deviation	11.3	11.8	7.6
	+95% Conf.	21.1	14.8	9.6
Option 3b: Depth/volt corr. used to obtain depths from voltage profile for all volts	Mean	-3.2	-10.3	-6.0
	Std. Deviation	8.9	10.2	10.7
	+95% Conf.	11.5	6.6	11.7
Option 4a: Linear depth/volt corr. used to obtain depths from voltage profile for indications with < 1.0 max. volt and depths adjusted for > 4.5 max. volts to 100% max. depth	Mean	3.0	-3.9	-1.5
	Std. Deviation	10.9	11.5	8.4
	+95% Conf.	20.9	15.1	12.3
Option 4b: Linear depth/volt corr. used to obtain depths for all indications at < 1.0 volt and depths adjusted for >4.5 max. volts to 100% max. depth	Mean	4.0	-3.1	1.9

	Std. Deviation	11.4	11.3	8.8
	+95% Conf.	22.8	15.4	16.4
Option 5a: Depths adjusted by voltage ratio times depth at max. volts for <1.0 max. volt ind. and adjusted to 100% depth for >4.5 max. volts	Mean	1.6	-5.5	-2.7
	Std. Deviation	11.2	11.7	7.8
	+95% Conf.	20.1	13.9	10.1
Option 5b: Depths adjusted by voltage ratio times depth for all indications at < 1.0 volt and depths adjusted for >4.5 max. volts to 100% max. depth	Mean	3.1	-4.0	1.5
	Std. Deviation	12.3	11.7	9.5
	+95% Conf.	23.4	15.4	17.2

Notes:

1. Evaluation limited to analyst 2 and 3 results for 33 specimen data points available 9/97

Table I3-1
Depths Obtained from Phase Angle Analyses
Dented TSP NDE Evaluations - +Point Mid-Range Coil

Sample Number	Crack Number	Elevation	Analyst	Adjusted NDE				Destructive Exam				Destructive Exam - NDE			
				Length (inches)	Max Depth (%)	Avg Depth (%)	Max. Volts	Length (inches)	Local Max. Depth (%)	Coil Avg. Max. Depth (%)	Lig. Corr. Avg. Depth (%)	Length (inches)	Local Max. Depth (%)	Coil Avg. Max. Depth (%)	Lig. Corr. Avg. Depth (%)
10/22	1		2	0.310	41.0	27.6	0.63	0.122	38.0	23.2	23.2	-0.188	-3.0	-17.8	-4.4
21/43	1		2	0.910	62.0	48.3	3.09	0.991	98.0	90.5	50.3	0.081	36.0	28.5	2.0
21/43	2		2	0.310	44.0	37.2	1.13	0.277	50.0	45.5	39.4	-0.033	6.0	1.5	2.1
P7	1		2	0.840	100.0	91.0	6.47	0.870	100.0	99.8	94.5	0.030	0.0	-0.2	3.5
P7	2		2	0.630	90.0	80.5	4.80	0.658	100.0	90.0	82.7	0.028	10.0	0.0	2.2
P7	3		2	0.150	58.0	46.4	1.68	0.126	65.2	46.2	46.2	-0.024	7.2	-11.8	-0.1
P8	1		2	2.400	100.0	84.8	7.68	2.643	100.0	99.6	84.8	0.243	0.0	-0.5	0.0
P8	2		2	2.190	96.0	79.4	6.08	2.452	100.0	99.7	79.7	0.262	4.0	3.7	0.3
P9	1		2	1.700	100.0	84.1	9.89	1.868	100.0	99.4	75.5	0.168	0.0	-0.6	-8.6
P9	2		2	1.780	100.0	79.1	5.36	1.589	100.0	99.4	86.4	-0.191	0.0	-0.6	7.3
P10	1		2	2.560	100.0	76.7	6.87	2.563	100.0	100.0	88.8	0.003	0.0	0.0	12.1
P10	2		2	2.170	76.0	58.8	5.12	2.146	100.0	90.9	69.1	-0.024	24.0	14.9	10.3
P11	1		2	0.720	98.0	90.1	7.34	0.675	100.0	100.0	96.3	-0.045	2.0	2.0	6.2
P11	2		2	0.500	99.0	93.9	5.22	0.568	95.8	90.3	73.4	0.068	-3.2	-8.7	-20.5
P12	1		2	1.230	100.0	90.3	7.13	1.290	100.0	99.8	77.4	0.060	0.0	-0.2	-12.9
P12	5		2	0.240	80.0	54.7	2.15	0.181	90.3	74.7	64.8	-0.059	10.3	-5.3	10.1
P12	2		2	0.440	50.0	24.4	1.24	0.550	82.8	64.9	30.0	0.110	32.8	14.9	5.6
1	1	4H	2	0.810	85.0	50.8	2.12	0.708	68.4	54.3	36.8	-0.102	-16.6	-30.7	-14.0
2	1	5H	2	0.940	70.0	33.5	0.71	0.860	41.0	35.5	18.3	-0.080	-29.0	-34.5	-15.2
6	1	4H	2	0.520	73.0	52.5	1.45	0.416	75.0	64.3	49.1	-0.104	2.0	-8.7	-3.4
8	1	1H	2	0.490	70.0	42.0	1.22	0.420	58.0	52.2	34.1	-0.070	-12.0	-17.8	-7.9
8	1	2H	2	0.410	55.0	44.2	1.32	0.380	55.0	45.8	36.6	-0.030	0.0	-9.2	-7.6
8	1	3H	2	0.470	64.0	47.8	1.34	0.460	50.0	44.2	31.5	-0.010	-14.0	-19.8	-16.3
9	1	1H	2	0.460	55.0	45.3	1.01	0.424	49.1	38.8	31.7	-0.036	-5.9	-16.2	-13.6
9	1	2H	2	1.000	79.0	69.2	4.05	1.010	90.0	84.1	58.5	0.010	11.0	5.1	-10.7
9	2	2H	2	0.820	67.0	51.1	0.72	0.786	61.5	48.9	38.6	-0.034	-5.5	-18.1	-12.6
9	1	2H	2	0.870	82.0	70.2	3.16	0.837	99.2	96.8	80.9	-0.033	17.2	14.8	10.7
11	2	2H	2	No Data Available				0.160	43.0	32.8	32.8				
11	1	4H	2	1.030	91.0	71.5	3.26	1.009	98.1	95.3	68.6	-0.021	7.1	4.3	-2.9
11	2	4H	2	0.970	79.0	60.2	0.66	0.790	46.3	44.0	36.4	-0.180	-32.7	-35.0	-23.7
12	1	4H	2	0.390	58.0	42.9	0.46	0.360	33.0	26.3	20.0	-0.030	-25.0	-31.7	-22.9
13	1	3H	2	0.400	52.0	37.0	0.69	0.336	38.0	37.3	27.3	-0.064	-14.1	-14.7	-9.7
10/22	1		3	0.160	49.0	33.4	0.55	0.122	38.0	23.2	23.2	-0.038	-11.0	-25.8	-10.2
21/43	1		3	0.970	63.0	50.7	2.82	0.991	98.0	90.5	50.3	0.021	35.0	27.5	-0.4
21/43	2		3	0.290	43.0	35.1	1.16	0.277	50.0	45.5	39.4	-0.013	7.0	2.5	4.2
P7	1		3	0.970	100.0	92.3	6.57	0.870	100.0	99.8	94.5	-0.100	0.0	-0.2	2.2
P7	2		3	0.740	93.0	83.7	4.89	0.658	100.0	90.0	82.7	-0.082	7.0	-3.0	-1.0
P7	3		3	0.250	70.0	45.0	1.65	0.126	65.2	46.2	46.2	-0.124	-4.8	-23.8	1.2
P10	1		3	2.530	100.0	81.0	7.02	2.563	100.0	100.0	88.8	0.033	0.0	0.0	7.7
P10	2		3	2.300	82.0	62.0	5.20	2.146	100.0	90.9	69.1	-0.154	18.0	8.9	7.1
P12	1		3	1.400	100.0	90.6	7.22	1.290	100.0	99.8	77.4	-0.110	0.0	-0.2	-13.2
P12	5		3	0.200	82.0	56.6	2.15	0.181	90.3	74.7	64.8	-0.019	8.3	-7.3	8.2
P12	2		3	0.530	76.0	36.6	1.27	0.550	82.8	64.9	30.0	0.020	6.8	-11.1	-6.6
1	1	4H	3	0.800	85.0	50.5	2.17	0.708	68.4	54.3	36.8	-0.092	-16.6	-30.7	-13.8
2	1	5H	3	0.820	73.0	25.5	0.74	0.860	41.0	35.5	18.3	0.040	-32.0	-37.5	-7.2
6	1	4H	3	0.540	65.0	51.1	1.51	0.416	75.0	64.3	49.1	-0.124	10.0	-0.7	-1.9
8	1	1H	3	0.480	73.0	40.3	1.29	0.420	58.0	52.2	34.1	-0.060	-15.0	-20.8	-6.1
8	1	2H	3	0.450	57.0	43.7	1.34	0.380	55.0	45.8	36.6	-0.070	-2.0	-11.2	-7.1
8	1	3H	3	0.520	58.0	40.1	1.38	0.460	50.0	44.2	31.5	-0.060	-8.0	-13.8	-8.6
9	1	1H	3	0.480	55.0	40.3	1.02	0.424	49.1	38.8	31.7	-0.056	-5.9	-16.2	-8.6
9	1	2H	3	1.010	83.0	71.2	4.10	1.010	90.0	84.1	58.5	0.000	7.0	1.1	-12.7
9	2	2H	3	0.800	63.0	48.9	0.69	0.786	61.5	48.9	38.6	-0.014	-1.5	-14.1	-10.3
11	1	2H	3	0.850	86.0	72.7	3.21	0.837	99.2	96.8	80.9	-0.013	13.2	10.8	8.2
11	2	2H	3	0.200	46.0	33.4	0.25	0.160	43.0	32.8	32.8	-0.040	-3.0	-13.3	-0.6
11	1	4H	3	1.010	92.0	71.9	3.33	1.009	98.1	95.3	68.6	-0.001	6.1	3.3	-3.3
11	2	4H	3	0.950	83.0	60.4	0.70	0.790	46.3	44.0	36.4	-0.160	-36.7	-39.0	-24.0
12	1	4H	3	0.340	57.0	34.9	0.50	0.360	33.0	26.3	20.0	0.020	-24.0	-30.7	-14.9
13	1	3H	3	0.420	53.0	34.5	0.78	0.336	38.0	37.3	27.3	-0.084	-15.1	-15.7	-7.3
Mean												-0.028	-0.9	-8.0	-4.5
Standard Deviation												0.088	15.2	15.3	9.2
NDE Uncertainty at + 95% Confidence												0.118	24.2	17.3	10.8

Table I4-1

Option 1. Depth Adjustments Based on Ratio of Depth at Maximum Volts to Maximum Depth from Phase Analyses for <1.0 Volt and 100% Depth Adjusted for >4.5 Volt

Sample Number	Crack Number	Elevation	Analyst	Adjusted NDE				Destructive Exam				Destructive Exam - NDE				Destructive Exam - Adj. NDE					
				Length (Inches)	Max Depth (%)	Avg Depth (%)	Max. Volts	Adjusted Max. Depth	Adjusted Avg. Depth	Length (Inches)	Local Max. Depth (%)	Coil Avg. Max. Depth (%)	Lig. Corr. Avg. Depth (%)	Length (Inches)	Local Max. Depth (%)	Coil Avg. Max. Depth (%)	Lig. Corr. Avg. Depth (%)	Length (Inches)	Local Max. Depth (%)	Coil Avg. Max. Depth (%)	Lig. Corr. Avg. Depth (%)
10/22	1		2	0.310	41.0	27.6	-0.63	41.0	27.6	0.122	38.0	23.2	23.2	-0.185	-3.0	-17.8	-4.4	-3.0	-17.8	-4.4	
21/43	1		2	0.910	62.0	48.3	-3.09	62.0	48.3	0.991	68.0	50.5	50.5	0.081	36.0	28.6	2.0	36.0	28.6	2.0	
21/43	2		2	0.310	44.0	37.2	-1.13	44.0	37.2	0.277	50.0	45.5	39.4	-0.033	6.0	1.6	2.1	6.0	1.6	2.1	
P7	1		2	0.840	100.0	91.0	-6.47	100.0	91.0	0.870	100.0	99.8	94.5	0.030	0.0	-0.2	3.5	0.0	-0.2	3.5	
P7	2		2	0.630	90.0	80.5	-4.80	100.0	89.4	0.658	100.0	90.0	82.7	0.028	10.0	0.0	2.2	0.0	-10.0	-6.7	
P7	3		2	0.150	58.0	48.4	-1.68	58.0	48.4	0.126	65.2	45.2	48.2	-0.024	7.2	-11.8	-0.1	7.2	-11.8	-0.1	
P8	1		2	2.400	100.0	84.8	-7.68	100.0	84.8	2.645	100.0	99.6	84.8	0.245	0.0	-0.4	0.0	0.0	-0.4	0.0	
P8	2		2	2.190	98.0	79.4	-8.08	100.0	82.7	2.452	100.0	99.7	79.7	0.262	-4.0	-3.7	0.3	0.0	-0.3	-3.0	
P9	1		2	1.700	100.0	84.1	-9.89	100.0	84.1	1.868	100.0	99.4	75.5	0.168	0.0	-0.6	-8.6	0.0	-0.6	-8.6	
P9	2		2	1.780	100.0	79.1	-5.36	100.0	79.1	1.586	100.0	99.4	86.4	-0.191	0.0	-0.6	7.5	0.0	-0.6	7.5	
P10	1		2	2.560	100.0	78.7	-8.87	100.0	78.7	2.563	100.0	100.0	88.8	0.033	0.0	0.0	12.1	0.0	0.0	12.1	
P10	2		2	2.170	76.0	58.8	-5.12	100.0	77.4	2.148	100.0	90.9	69.1	-0.024	24.0	14.9	10.5	0.0	-9.1	-8.3	
P11	1		2	0.720	98.0	90.1	-7.34	100.0	91.9	0.875	100.0	100.0	98.3	-0.045	2.0	2.0	8.2	0.0	0.0	4.4	
P11	2		2	0.600	99.0	93.9	-5.22	100.0	94.8	0.565	95.8	90.3	73.4	0.068	-3.2	-6.7	-20.5	-4.2	-9.7	-21.4	
P12	1		2	1.520	100.0	90.3	-7.13	100.0	90.3	1.290	100.0	99.8	77.4	0.060	0.0	-0.2	-12.9	0.0	-0.2	-12.9	
P12	5		2	0.240	80.0	54.7	-2.15	80.0	54.7	0.181	90.3	74.7	64.8	-0.059	10.3	-6.3	10.1	10.3	-5.3	10.1	
P12	2		2	0.440	50.0	24.4	-1.24	50.0	24.4	0.650	82.8	64.9	30.0	0.110	32.8	-14.9	5.8	32.8	-14.9	5.8	
1	1	4H	2	0.810	85.0	50.8	-2.12	85.0	50.8	0.708	68.4	54.3	36.8	-0.102	-18.6	-30.7	-14.0	-18.6	-30.7	-14.0	
2	1	5H	2	0.940	70.0	33.5	-0.71	47.0	22.6	0.880	41.0	35.5	18.3	-0.080	-29.0	-34.5	-15.2	-6.0	-11.5	-4.2	
6	1	4H	2	1.780	73.0	52.5	-1.45	73.0	52.5	0.416	75.0	64.3	49.1	-0.104	2.0	-8.7	-3.4	2.0	-8.7	-3.4	
8	1	1H	2	0.490	70.0	42.0	-1.22	70.0	42.0	0.425	58.0	52.2	34.1	-0.070	-12.0	-17.8	-7.5	-12.0	-17.8	-7.5	
8	1	2H	2	0.410	65.0	44.2	-1.32	65.0	44.2	0.380	55.0	45.8	36.6	-0.030	0.0	-9.2	-7.8	0.0	-9.2	-7.8	
8	1	3H	2	0.470	64.0	47.8	-1.34	64.0	47.8	0.460	60.0	44.2	31.5	-0.010	-14.0	-19.8	-16.3	-14.0	-19.8	-16.3	
9	1	1H	2	0.460	65.0	45.3	-1.01	62.0	42.8	0.424	49.1	38.8	31.7	-0.036	-5.9	-16.2	-13.6	-2.9	-13.2	-11.1	
9	1	2H	2	1.000	79.0	69.2	-4.05	79.0	69.2	1.010	90.0	84.1	58.5	0.010	11.0	6.1	-10.7	11.0	6.1	-10.7	
9	2	2H	2	0.820	67.0	61.1	-0.72	49.0	37.4	0.785	61.5	48.9	38.8	-0.034	-5.5	-18.1	-12.6	12.5	-0.1	1.2	
11	1	2H	2	0.870	82.0	70.2	-3.18	82.0	70.2	0.837	92.2	98.8	80.9	-0.033	17.2	14.8	10.7	17.2	14.8	10.7	
11	2	2H	2	No Data Available						0.160	43.0	32.8	32.8								
11	1	4H	2	1.030	91.0	71.5	-3.26	91.0	71.5	1.000	96.1	95.3	68.6	-0.021	7.1	4.3	-2.9	7.1	4.3	-2.9	
11	2	4H	2	0.970	79.0	60.2	-0.66	64.0	48.7	0.790	48.3	44.0	36.4	-0.180	-32.7	-35.0	-23.7	-17.7	-20.0	-12.9	
12	1	4H	2	0.590	58.0	42.9	-0.46	49.0	36.2	0.580	33.0	28.3	20.0	-0.030	-25.0	-31.7	-22.9	-18.0	-22.7	-16.2	
13	1	3H	2	0.400	52.0	37.0	-0.69	41.0	29.1	0.336	38.0	37.3	27.3	-0.064	-14.1	-14.7	-9.7	-3.1	-3.7	-1.9	
10/22	1		3	0.160	49.0	33.4	-0.55	29.0	19.8	0.122	38.0	23.2	23.2	-0.038	-11.0	-25.8	-10.2	9.0	-8.8	3.4	
21/43	1		3	0.970	63.0	50.7	-2.82	63.0	50.7	0.991	68.0	60.8	50.3	0.021	35.0	27.5	-0.4	35.0	27.5	-0.4	
21/43	2		3	0.290	43.0	35.1	-1.26	43.0	35.1	0.277	50.0	45.6	39.4	-0.013	7.0	2.5	4.2	7.0	2.5	4.2	
P7	1		3	0.970	100.0	92.3	-6.57	100.0	92.3	0.870	100.0	99.8	84.5	-0.100	0.0	-0.2	2.2	0.0	-0.2	2.2	
P7	2		3	0.740	93.0	83.7	-4.89	100.0	90.0	0.658	100.0	90.0	82.7	-0.062	7.0	-3.0	-1.0	0.0	-10.0	-7.5	
P7	3		3	0.250	70.0	45.0	-1.65	70.0	45.0	0.128	65.2	48.2	48.2	-0.124	-4.8	-23.8	1.2	-4.8	-23.8	1.2	
P10	1		3	2.530	100.0	81.0	-7.02	100.0	81.0	2.563	100.0	100.0	88.8	0.033	0.0	0.0	7.7	0.0	0.0	7.7	
P10	2		3	2.300	82.0	62.0	-5.20	100.0	78.8	2.148	100.0	90.9	69.1	-0.154	18.0	8.9	7.1	0.0	-9.1	-6.9	
P12	1		3	1.400	100.0	90.4	-7.22	100.0	90.4	1.290	100.0	99.8	77.4	-0.110	0.0	-0.2	-13.2	0.0	-0.2	-13.2	
P12	5		3	0.200	82.0	56.6	-2.15	82.0	56.6	0.181	90.3	74.7	64.8	-0.019	8.3	-7.3	8.2	8.3	-7.3	8.2	
P12	2		3	0.530	76.0	36.6	-1.27	76.0	36.6	0.650	82.8	64.9	30.0	0.020	6.8	-11.1	-6.6	6.8	-11.1	-6.6	
1	1	4H	3	0.800	85.0	50.5	-2.17	85.0	50.5	0.708	68.4	54.3	36.8	-0.092	-18.6	-30.7	-13.8	-18.6	-30.7	-13.8	
2	1	5H	3	0.820	73.0	25.5	-0.74	30.0	10.5	0.860	41.0	35.5	18.3	0.040	-32.0	-37.5	-7.2	11.0	5.9	7.8	
6	1	4H	3	0.540	65.0	51.1	-1.51	65.0	51.1	0.416	75.0	64.3	49.1	-0.124	10.0	-0.7	-1.9	10.0	-0.7	-1.9	
8	1	1H	3	0.480	73.0	40.3	-1.29	73.0	40.3	0.420	58.0	52.2	34.1	-0.060	-15.0	-20.8	-6.1	-15.0	-20.8	-6.1	
8	1	2H	3	0.450	67.0	43.7	-1.34	67.0	43.7	0.380	55.0	45.8	36.6	-0.070	-2.0	-11.2	-7.1	-2.0	-11.2	-7.1	
8	1	3H	3	0.520	58.0	40.1	-1.38	58.0	40.1	0.460	50.0	44.2	31.8	-0.060	-8.0	-13.8	-8.6	-8.0	-13.8	-8.6	
9	1	1H	3	0.480	55.0	40.3	-1.02	53.0	38.8	0.424	49.1	38.8	31.7	-0.056	-5.9	-16.2	-8.6	-3.9	-14.2	-7.2	
9	1	2H	3	1.010	83.0	71.2	-4.10	83.0	71.2	1.010	90.0	84.1	58.5	0.000	7.0	1.1	-12.7	7.0	1.1	-12.7	
9	2	2H	3	0.800	63.0	48.9	-0.69	57.0	44.3	0.788	61.8	48.9	38.8	-0.014	-1.5	-14.1	-10.3	4.5	-8.1	-6.7	
11	1	2H	3	0.850	86.0	72.7	-3.21	86.0	72.7	0.837	92.2	98.8	80.9	-0.013	13.2	10.8	8.2	13.2	10.8	8.2	
11	2	2H	3	0.200	46.0	33.4	-0.25	46.0	33.4	0.160	43.0	32.8	32.8	-0.040	-3.0	-13.3	-0.6	-3.0	-13.3	-0.6	
11	1	4H	3	1.010	92.0	71.9	-3.33	92.0	71.9	1.009	98.1	95.3	68.6	-0.001	6.1	3.3	-3.3	6.1	3.3	-3.3	
11	2	4H	3	0.950	83.0	60.4	-0.70	60.0	43.7	0.790	48.3	44.0	36.4	-0.160	-36.7	-39.0	-24.0	-13.7	-16.0	-7.5	
12	1	4H	3	0.340	57.0	34.9	-0.50	33.0	20.2	0.360	33.0	28.3	20.0	0.020	-24.0	-30.7	-14.9	0.0	-6.7	-0.2	
13	1	3H	3	0.420	63.0	34.5	-0.78	38.0	24.8	0.306	38.0	27.3	27.3	-0.064	-15.1	-15.7	-7.3	0.0	-0.7	2.6	
Mean													-0.028	-0.9	-8.0	-4.5	1.7	-4.4	-3.1		
Standard Deviation													0.088	15.2	15.3	9.2	11.1	11.7	7.6		
NDE Uncertainty at ± 85% Confidence													0.118	24.2	17.3	10.8	20.1	13.9	8.5		

Table I5-1
Option 2. Depth Adjustments for All Indications Based on Correlation of Maximum Depth with Maximum Voltage

Sample Number	Crack Number	Deviation	Analyst	Adjusted NDE					Destructive Exam			Destructive Exam - NDE			Destructive Exam - Adj. NDE							
				Length (inches)	Max Depth (%)	Avg Depth (%)	Max. Volts	Adjusted Max. Depth	Adjusted Avg. Depth	Length (inches)	Local Max. Depth (%)	Coll. Avg. Max. Depth (%)	Ug. Corr. Avg. Depth (%)	Length (inches)	Local Max. Depth (%)	Coll. Avg. Max. Depth (%)	Ug. Corr. Avg. Depth (%)	Length (inches)	Local Max. Depth (%)	Coll. Avg. Max. Depth (%)	Ug. Corr. Avg. Depth (%)	
10/22	1		2	0.310	41.0	27.8	0.63	40.0	28.9	0.122	38.0	23.2	23.2	-0.188	-3.0	-17.8	-4.4	-2.0	-16.8	-3.7		
21/43	1		2	0.910	62.0	48.3	3.09	99.0	77.1	-0.991	198.0	90.5	50.3	0.081	36.0	28.5	2.0	-1.0	-8.5	-26.8		
21/43	2		2	0.310	44.0	37.2	1.13	61.0	51.8	0.277	60.0	45.5	30.4	-0.033	6.0	1.5	2.1	-11.0	-15.5	-12.2		
P7	1		2	0.840	100.0	91.0	6.47	100.0	91.0	0.870	100.0	99.8	94.5	0.030	0.0	-0.2	3.5	0.0	-0.2	3.5		
P7	2		2	0.630	90.0	80.5	4.80	100.0	86.4	0.638	100.0	90.0	82.7	0.028	10.0	0.0	2.2	0.0	-10.0	-6.7		
P7	3		2	0.150	58.0	46.4	1.68	75.9	60.7	0.126	65.2	46.2	46.2	-0.024	7.2	-11.8	-0.1	-10.7	-29.7	-14.8		
P8	1		2	2.400	100.0	84.8	7.68	100.0	84.8	2.643	100.0	99.8	84.8	0.243	0.0	-0.5	0.0	0.0	-0.5	0.0		
P8	2		2	2.190	96.0	79.4	6.08	100.0	82.7	2.452	100.0	99.7	79.7	0.262	4.0	3.7	0.3	0.0	-0.3	-3.0		
P9	1		2	1.700	100.0	84.1	9.80	100.0	84.1	1.858	100.0	99.4	75.5	0.168	0.0	-0.8	-8.2	0.0	-0.8	-8.8		
P9	2		2	1.780	100.0	79.1	5.38	100.0	79.1	1.589	100.0	99.4	68.4	-0.181	0.0	-0.8	7.5	0.0	-0.8	7.5		
P10	1		2	2.500	100.0	78.7	6.87	100.0	78.7	2.563	100.0	100.0	88.8	0.003	0.0	0.0	12.1	0.0	0.0	12.1		
P10	2		2	2.170	78.0	58.8	5.12	100.0	77.4	-2.148	100.0	90.8	69.1	-0.024	24.0	14.9	10.3	0.0	-9.1	-8.3		
P11	1		2	0.720	98.0	90.1	7.34	100.0	91.9	0.873	100.0	100.0	96.3	-0.043	2.0	2.0	8.2	0.0	0.0	4.4		
P11	2		2	0.500	96.0	93.9	5.22	100.0	94.8	0.588	95.8	90.3	73.4	0.068	-3.2	-8.7	-20.5	-4.2	-9.7	-21.4		
P12	1		2	1.230	100.0	90.3	7.13	100.0	90.3	1.290	100.0	99.8	77.4	0.000	0.0	-0.2	-12.9	0.0	-0.2	-12.9		
P12	5		2	0.240	80.0	54.7	2.15	85.0	58.2	0.181	90.3	74.7	64.8	-0.059	10.3	-5.3	10.1	5.3	-10.3	6.6		
P12	2		2	0.440	50.0	24.4	1.24	64.5	31.5	0.550	82.8	64.8	30.0	0.110	32.8	14.9	5.6	18.3	0.4	-1.5		
1	1	4H	2	0.810	85.0	60.8	2.12	84.5	60.5	0.708	68.4	64.3	36.8	-0.102	-16.8	-30.7	-14.0	-16.1	-30.2	-13.7		
2	1	5H	2	0.940	70.0	33.5	0.71	43.3	20.7	0.890	41.0	35.5	18.3	-0.080	-29.0	-34.5	-15.2	-2.3	-7.8	-2.4		
6	1	4H	2	0.520	73.0	52.5	1.45	70.0	50.4	0.418	75.0	64.3	49.1	-0.104	2.0	-8.7	-3.4	5.0	-5.7	-1.2		
8	1	1H	2	0.480	70.0	42.0	1.22	64.0	38.4	0.420	58.0	52.2	34.1	-0.070	-12.0	-17.8	-7.9	-4.0	-11.8	-4.3		
8	1	2H	2	0.410	55.0	44.2	1.32	66.3	53.2	0.390	55.0	45.8	36.6	-0.030	0.0	-9.2	-7.6	-11.3	-20.5	-16.8		
8	1	3H	2	0.470	84.0	47.8	1.34	67.9	50.7	0.480	50.0	44.2	31.8	-0.010	-14.0	-19.8	-18.3	-17.9	-23.7	-19.2		
9	1	1H	2	0.460	85.0	45.3	1.01	56.3	46.5	0.424	49.1	38.8	31.7	-0.036	-5.9	-16.2	-13.6	-7.4	-17.7	-14.8		
9	1	2H	2	1.000	79.0	69.2	4.05	100.0	87.8	1.010	90.0	84.1	58.5	0.010	11.0	5.1	-10.7	-10.0	-15.9	-20.0		
9	2	2H	2	0.820	67.0	51.1	0.72	43.5	33.8	0.786	61.5	48.9	36.8	-0.034	-5.5	-18.1	-12.6	18.0	5.4	5.4		
11	1	2H	2	0.670	82.0	70.2	3.18	99.8	85.4	0.837	99.2	96.8	80.9	-0.033	17.2	14.8	10.7	-0.5	-2.9	-4.5		
11	2	2H	2	No Data Available								-0.190	-43.0	32.8	32.8							
11	1	4H	2	1.000	91.0	71.5	3.26	100.0	78.5	1.000	98.1	95.3	68.6	-0.021	7.1	4.3	-2.9	-1.9	-4.8	-8.9		
11	2	4H	2	0.970	79.0	60.2	0.66	42.0	32.0	0.790	46.3	44.0	36.4	-0.180	-32.7	-35.0	-23.7	4.3	2.0	4.4		
12	1	4H	2	0.300	58.0	42.9	0.46	28.5	21.1	0.380	33.0	28.5	20.0	-0.030	-25.0	-31.7	-22.9	4.5	-2.2	-1.1		
13	1	3H	2	0.400	52.0	37.0	0.69	42.5	30.2	0.336	38.0	37.3	27.3	-0.084	-14.1	-14.7	-8.7	-4.6	-5.2	-2.9		
10/22	1		3	0.160	49.0	33.4	0.55	34.0	23.2	0.122	38.0	23.2	23.2	-0.036	-11.0	-25.8	-10.2	4.0	-10.8	0.0		
21/43	1		3	0.970	63.0	50.7	2.82	95.0	78.4	0.981	98.0	90.5	80.3	0.021	35.0	27.5	-0.4	3.0	-4.5	-28.1		
21/43	2		3	0.290	43.0	35.1	1.26	64.8	52.9	0.277	50.0	45.8	39.4	-0.013	7.0	2.5	4.2	-14.8	-19.3	-13.5		
P7	1		3	0.970	100.0	92.3	6.57	100.0	92.3	0.870	100.0	99.8	94.5	-0.100	0.0	-0.2	2.2	0.0	-0.2	2.2		
P7	2		3	0.740	93.0	83.7	4.89	100.0	90.0	0.858	100.0	90.0	82.7	-0.062	7.0	-3.0	-1.0	0.0	-10.0	-7.3		
P7	3		3	0.250	70.0	45.0	1.65	75.0	48.2	0.126	65.2	46.2	46.2	-0.124	-4.8	-23.8	1.2	-9.8	-28.8	-2.0		
P10	1		3	2.530	100.0	81.0	7.02	100.0	81.0	2.583	100.0	100.0	88.8	0.033	0.0	0.0	7.7	0.0	0.0	7.7		
P10	2		3	2.300	82.0	62.0	5.20	100.0	75.6	2.148	100.0	90.9	69.1	-0.154	18.0	8.9	7.1	0.0	-0.1	-6.5		
P12	1		3	1.400	100.0	90.6	7.22	100.0	90.6	1.290	100.0	99.8	77.4	-0.110	0.0	-0.2	-13.2	0.0	-0.2	-13.2		
P12	5		3	0.200	82.0	56.6	2.15	85.0	58.7	0.181	90.3	74.7	64.8	-0.019	8.3	-7.3	8.2	5.3	-10.3	6.1		
P12	2		3	0.530	76.0	36.6	1.27	65.0	31.3	0.550	82.8	64.9	30.0	0.020	6.8	-11.1	-6.6	17.8	-0.1	-1.2		
1	1	4H	3	0.800	85.0	50.5	2.17	85.8	51.0	0.708	68.4	64.3	36.8	-0.062	-16.8	-30.7	-13.8	-17.4	-31.4	-14.2		
2	1	5H	3	0.820	73.0	25.9	0.74	45.0	15.7	0.890	41.0	35.5	18.3	0.040	-32.0	-37.5	-7.2	-4.0	-8.6	2.5		
6	1	4H	3	0.540	65.0	51.1	1.51	71.8	56.4	0.416	75.0	64.3	49.1	-0.124	10.0	-0.7	-1.9	3.3	-7.5	-7.2		
8	1	1H	3	0.480	73.0	40.3	1.29	65.9	36.3	0.420	58.0	52.2	34.1	-0.060	-15.0	-20.8	-6.1	-7.9	-13.7	-2.2		
8	1	2H	3	0.450	57.0	43.7	1.34	67.9	52.1	0.390	55.0	45.8	36.6	-0.070	-2.0	-11.2	-7.1	-12.9	-22.1	-15.5		
8	1	3H	3	0.520	58.0	40.1	1.38	68.3	47.2	0.480	50.0	44.2	31.5	-0.080	-8.0	-13.8	-8.6	-18.3	-24.0	-15.7		
9	1	1H	3	0.480	55.0	40.3	1.02	57.0	41.8	0.424	49.1	38.8	31.7	-0.058	-5.9	-16.2	-8.6	-7.9	-18.2	-10.1		
9	1	2H	3	1.010	83.0	71.2	4.10	100.0	85.8	1.010	90.0	84.1	58.5	0.000	7.0	1.1	-12.7	-10.0	-18.9	-27.3		
9	2	2H	3	0.800	63.0	48.9	0.69	42.5	33.0	0.786	61.5	48.9	36.8	-0.014	-1.3	-14.1	-10.3	18.0	6.4	5.6		
11	1	2H	3	0.850	86.0	72.7	3.21	100.0	84.5	0.837	99.2	96.8	80.9	-0.013	13.2	10.8	8.2	-0.8	-3.2	-3.7		
11	2	2H	3	0.200	46.0	33.4	0.25	15.5	11.2	0.180	43.0	32.8	32.8	-0.040	-3.0	-13.3	-0.6	27.5	17.3	21.8		
11	1	4H	3	1.010	92.0	71.9	3.33	100.0	78.2	1.009	98.1	95.3	68.6	-0.001	6.1	3.3	-3.3	-1.9	-4.8	-8.8		
11	2	4H	3	0.950	83.0	60.4	0.70	43.0	31.3	0.790	46.3	44.0	38.4	-0.160	-36.7	-39.0	-24.0	3.3	1.0	5.1		
12	1	4H	3	0.340	57.0	34.9	0.50	31.0	19.0	0.300	33.0	28.5	20.0	0.020	-24.0	-30.7	-14.9	2.0	-4.7	1.0		
13	1	3H	3	0.420	53.0	34.5	0.78	47.0	30.6	0.336	38.0	37.3	27.3	-0.084	-15.1	-15.7	-7.3	-0.1	-0.7	-3.4		
										Mean				-0.028	-0.3	-8.0	-4.5	-1.4	-8.8	-5.7		
										Standard Deviation				0.068	15.3	15.3	9.2	9.2	9.9	10.2		
										NDE Uncertainty at 95% Confidence				0.118	24.2	17.3	10.8	12.7	7.8	11.2		

Table I6-1

Option 3a. Depths Obtained from Voltage Profile and Correlation with Depth for <1.0 Volt and >4.5 Volt Indications

Sample Number	Crack Number	Elevation	Probe Type	Software	Analyst	Adjusted NDE				Adjusted Max. Depth	Adjusted Avg. Depth	Destructive Exam				Destructive Exam - NDE				Destructive Exam - Adj. NDE								
						Length (Inches)	Max. Depth (%)	Avg. Depth (%)	Max. Volts			Length (Inches)	Local Max. Depth (%)	Coll. Avg. Max. Depth (%)	Ug. Corr. Avg. Depth (%)	Length (Inches)	Local Max. Depth (%)	Coll. Avg. Max. Depth (%)	Ug. Corr. Avg. Depth (%)	Local Max. Depth (%)	Coll. Avg. Max. Depth (%)	Ug. Corr. Avg. Depth (%)						
10/22	1		+point	ANS	2	0.310	41.0	27.8	0.83	43.8	18.7	0.122	38.0	23.2	23.2	-0.188	-3.0	-17.8	-4.4	-5.3	-20.3	4.3						
2/43	1		+point	ANS	2	0.910	62.0	48.3	3.00	82.0	48.3	0.901	98.0	90.5	50.3	0.081	36.0	28.5	2.0	36.0	28.5	2.0						
2/43	2		+point	ANS	2	0.310	44.0	37.2	1.13	44.0	37.2	0.277	50.0	45.5	30.4	-0.033	6.0	1.5	2.1	6.0	1.5	2.1						
2/7	1		+point	EDO	2	0.840	100.0	91.0	6.47	100.0	86.3	0.870	100.0	99.8	84.5	0.030	0.0	-0.2	3.5	0.0	-0.2	-1.8						
2/7	2		+point	EDO	2	0.630	90.0	80.5	4.80	100.0	81.8	0.658	100.0	90.0	82.7	0.028	10.0	0.0	2.5	0.0	-10.0	-9.1						
2/7	3		+point	EDO	2	0.150	58.0	48.4	1.88	58.0	48.4	0.128	65.2	46.2	46.2	-0.024	7.2	-11.8	-0.1	7.2	-11.8	-0.1						
2/8	1		+point	EDO	2	2.400	100.0	84.8	7.88	100.0	86.7	2.643	100.0	99.8	84.8	0.243	0.0	-0.5	0.0	0.0	-0.5	-11.8						
2/8	2		+point	EDO	2	2.190	96.0	79.4	6.08	100.0	86.8	2.452	100.0	99.7	79.7	0.262	4.0	3.7	0.3	0.0	-0.3	-16.0						
2/9	1		+point	EDO	2	1.700	100.0	84.1	9.80	100.0	89.8	1.868	100.0	99.4	75.5	0.168	0.0	-0.6	-6.0	0.0	-0.6	-14.1						
2/9	2		+point	EDO	2	1.780	100.0	79.1	5.36	100.0	87.8	1.589	100.0	99.4	85.4	-0.181	0.0	-0.6	7.5	0.0	-0.6	-1.4						
2/10	1		+point	EDO	2	2.590	100.0	78.7	6.87	100.0	90.4	2.563	100.0	100.0	88.8	0.003	0.0	0.0	12.1	0.0	0.0	-1.7						
2/10	2		+point	EDO	2	2.170	78.0	58.8	5.12	100.0	83.3	2.146	100.0	90.9	69.1	-0.024	24.0	14.9	10.3	0.0	-9.1	-14.2						
2/11	1		+point	EDO	2	0.720	98.0	90.1	7.34	100.0	82.1	0.673	100.0	100.0	96.3	-0.045	2.0	2.0	8.2	0.0	0.0	4.2						
2/11	2		+point	EDO	2	0.500	99.0	93.9	5.22	100.0	84.8	0.568	95.8	90.3	73.4	0.068	-3.2	-8.7	-20.5	-4.2	-6.7	-11.4						
2/12	1		+point	EDO	2	1.230	100.0	90.3	7.13	100.0	84.2	1.290	100.0	99.8	77.4	0.060	0.0	-0.2	-12.0	0.0	-0.2	-6.8						
2/12	5		+point	EDO	2	0.240	80.0	54.7	2.15	80.0	64.7	0.181	90.3	74.7	64.8	-0.050	10.3	-5.3	10.1	10.3	-5.3	10.1						
2/12	2		+point	EDO	2	0.440	50.0	24.4	1.24	50.0	24.4	0.550	82.8	64.9	30.0	0.110	32.8	14.9	5.0	32.8	14.9	5.0						
2/12	1		4H	+point MR	EDO	2	0.810	83.0	50.8	2.12	83.0	50.8	0.708	68.4	54.3	36.8	-0.102	-18.8	-30.7	-14.0	-18.8	-30.7	-14.0					
2/12	1		5H	+point MR	EDO	2	0.940	70.0	33.5	0.71	47.0	33.1	0.860	41.0	35.5	18.3	-0.080	-29.0	-34.5	-18.2	-6.0	-11.5	-14.8					
2/12	1		4H	+point MR	EDO	2	0.520	73.0	32.5	1.43	73.0	32.5	0.418	75.0	64.3	49.1	-0.104	2.0	-8.7	-3.4	2.0	-8.7	-3.4					
2/12	1		1H	+point MR	EDO	2	0.460	70.0	42.0	1.22	70.0	42.0	0.420	58.0	52.2	34.1	-0.070	-12.0	-17.8	-7.0	-12.0	-17.8	-7.0					
2/12	1		2H	+point MR	EDO	2	0.410	55.0	44.2	1.32	55.0	44.2	0.380	55.0	45.8	36.6	-0.030	0.0	-0.2	-7.6	0.0	-0.2	-7.6					
2/12	1		3H	+point MR	EDO	2	0.470	64.0	47.8	1.34	64.0	47.8	0.460	50.0	44.2	31.5	-0.010	-14.0	-19.8	-16.3	-14.0	-19.8	-16.3					
2/12	1		1H	+point MR	EDO	2	0.460	55.0	45.3	1.01	58.0	36.8	0.424	49.1	38.8	31.7	-0.036	-5.9	-16.2	-13.0	-8.9	-19.2	-5.2					
2/12	1		2H	+point MR	EDO	2	1.000	79.0	69.2	4.06	79.0	69.2	1.010	90.0	84.1	58.5	0.010	11.0	5.1	-10.7	11.0	5.1	-10.7					
2/12	2		2H	+point MR	EDO	2	0.820	67.0	51.1	0.72	48.0	33.8	0.788	61.5	48.9	38.6	-0.034	-5.3	-18.1	-12.2	13.3	0.9	4.8					
2/12	1		2H	+point MR	EDO	2	0.870	82.0	70.2	3.16	82.0	70.2	0.837	99.2	96.8	80.9	-0.033	17.2	14.8	10.7	17.2	14.8	10.7					
11	2		2H	+point MR	EDO	2	Data Available						0.160	43.0	32.8	32.8												
11	1		4H	+point MR	EDO	2	1.030	91.0	71.5	3.26	91.0	71.5	1.009	98.1	95.3	68.8	-0.021	7.1	4.3	-2.9	7.1	4.3	-2.9					
11	2		4H	+point MR	EDO	2	0.970	79.0	60.2	0.66	45.0	32.8	0.790	48.3	44.0	36.4	-0.180	-32.7	-35.0	-23.7	1.3	-1.0	3.8					
12	1		4H	+point MR	EDO	2	0.390	58.0	42.9	0.46	37.8	22.7	0.390	33.0	28.3	20.0	-0.030	-25.0	-31.7	-22.9	1.5	-5.2	-2.2					
13	1		3H	+point MR	EDO	2	0.400	52.0	37.0	0.60	46.8	32.8	0.336	38.0	37.3	27.3	-0.064	-14.1	-14.7	-6.7	-8.8	-6.5	-5.3					
10/22	1		+point	ANS	3	0.160	49.0	33.4	0.53	34.3	20.8	0.122	38.0	23.2	23.2	-0.038	-11.0	-25.8	-10.2	-0.3	-15.1	2.4						
2/43	1		+point	ANS	3	0.970	63.0	50.7	2.82	63.0	50.7	0.991	98.0	90.5	50.3	0.021	35.0	27.5	-0.4	35.0	27.5	-0.4						
2/43	2		+point	ANS	3	0.290	43.0	35.1	1.16	43.0	35.1	0.277	50.0	45.5	30.4	-0.013	7.0	2.5	4.2	7.0	2.5	4.2						
2/7	1		+point	EDO	3	0.970	100.0	92.3	6.57	100.0	92.2	0.870	100.0	99.8	84.5	-0.100	0.0	-0.2	2.5	0.0	-0.2	2.5						
2/7	2		+point	EDO	3	0.740	83.0	83.7	4.89	100.0	86.8	0.658	100.0	90.0	82.7	-0.082	7.0	-3.0	-1.0	0.0	-10.0	-9.8						
2/7	3		+point	EDO	3	0.250	70.0	43.0	1.63	70.0	43.0	0.128	65.2	46.2	46.2	-0.124	-4.8	-23.8	1.2	-4.8	-23.8	1.2						
2/10	1		+point	EDO	3	2.530	100.0	81.0	7.02	100.0	86.1	2.563	100.0	100.0	86.8	0.033	0.0	0.0	7.7	0.0	0.0	-6.3						
2/10	2		+point	EDO	3	2.300	82.0	63.0	5.20	100.0	82.7	2.146	100.0	90.9	69.1	-0.154	18.0	8.9	7.1	0.0	-9.1	-13.6						
2/12	1		+point	EDO	3	1.400	100.0	90.6	7.22	100.0	79.9	1.290	100.0	99.8	77.4	-0.110	0.0	-0.2	-13.2	0.0	-0.2	-2.5						
2/12	5		+point	EDO	3	0.200	82.0	56.6	2.15	82.0	56.6	0.181	90.3	74.7	64.8	-0.019	8.3	-7.3	8.2	8.3	-7.3	8.2						
2/12	2		+point	EDO	3	0.530	78.0	36.6	1.27	78.0	36.6	0.550	82.8	64.9	30.0	0.020	6.8	-11.1	-6.0	6.8	-11.1	-6.0						
2/12	1		4H	+point MR	EDO	3	0.800	85.0	50.5	2.17	85.0	50.5	0.708	68.4	54.3	36.8	-0.092	-18.8	-30.7	-13.8	-18.8	-30.7	-13.8					
2/12	1		5H	+point MR	EDO	3	0.820	73.0	25.5	0.74	48.0	37.8	0.860	41.0	35.5	18.3	0.040	-32.0	-37.5	-7.2	-7.0	-12.5	-13.6					
2/12	1		4H	+point MR	EDO	3	0.540	65.0	51.1	1.51	65.0	51.1	0.418	75.0	64.3	49.1	-0.124	10.0	-0.7	-1.9	10.0	-0.7	-1.9					
2/12	1		1H	+point MR	EDO	3	0.480	73.0	40.3	1.29	73.0	40.3	0.420	58.0	52.2	34.1	-0.060	-15.0	-20.8	-6.1	-15.0	-20.8	-6.1					
2/12	1		2H	+point MR	EDO	3	0.450	57.0	43.7	1.34	57.0	43.7	0.380	55.0	45.8	36.6	-0.070	-2.0	-11.2	-7.1	-2.0	-11.2	-7.1					
2/12	1		3H	+point MR	EDO	3	0.520	58.0	40.1	1.38	58.0	40.1	0.460	50.0	44.2	31.5	-0.060	-8.0	-13.8	-8.6	-8.0	-13.8	-8.6					
2/12	1		1H	+point MR	EDO	3	0.480	55.0	40.3	1.02	60.0	36.2	0.424	49.1	38.8	31.7	-0.056	-5.9	-16.2	-8.0								
2/12	1		2H	+point MR	EDO	3	1.010	83.0	71.2	4.10	83.0	71.2	1.010	90.0	84.1	58.5	0.000	7.0	1.1	-12.7	7.0	1.1	-12.7					
2/12	2		2H	+point MR	EDO	3	0.800	63.0	48.9	0.69	46.8	37.0	0.788	61.5	48.9	38.6	-0.014	-1.3	-14.1	-10.3	14.7	2.1	1.6					
11	1		2H	+point MR	EDO	3	0.850	86.0	72.7	3.21	86.0	72.7	0.837	99.2	96.8	80.9	-0.013	13.2	10.8	8.2	13.2	10.8	8.2					
11	2		2H	+point MR	EDO	3	0.200	48.0	33.4	0.25	18.0	17.7	0.160	43.0	32.8	32.8	-0.040	-3.0	-13.3	-8.6	25.0	14.8	21.1					
11	1		4H	+point MR	EDO	3	1.010	92.0	71.9	3.33	92.0	71.9	1.009	98.1	95.3	68.8	-0.001	6.1	3.3	-3.3	6.1	3.3	-3.3					
11	2		4H	+point MR	EDO	3	0.950	83.0	60.4	0.70	47.0	34.8	0.790	46.3	44.0	36.4	-0.180	-36.7	-30.0	-24.0	-0.7	-3.0	1.9					
12	1		4H	+point MR	EDO	3	0.340	57.0	34.9	0.50	35.0	25.8	0.360	33.0	26.3	20.0	0.020	-24.0	-30.7	-14.9	-2.0	-6.7	-5.3					
13	1		3H	+point MR	EDO	3	0.420	53.0	34.5	0.78	51.0	33.4	0.336	38.0	37.3	27.3	-0.084	-15.1	-15.7	-7.3	-13.1	-13.7	-6.2					
																Mean						-0.028	-8.9	-8.9	-6.5	2.4	-4.7	-3.4
																Standard Deviation												

Table I6-2
Option 3b. Depths Obtained from Voltage Profile and Voltage Correlation with Depth for All Indications

Sample Number	Crack Number	Elevation	Probe Type	Software	Analyst	Adjusted NDE				Destructive Exam				Destructive Exam - NDE				Destructive Exam - Adj. NDE				
						Length (inches)	Max Depth (%)	Avg Depth (%)	Max. Volts	Adjusted Max. Depth	Adjusted Avg. Depth	Length (inches)	Local Max. Depth (%)	Coll. Avg. Max. Depth (%)	Lig. Corr. Avg. Depth (%)	Length (inches)	Local Max. Depth (%)	Coll. Avg. Max. Depth (%)	Lig. Corr. Avg. Depth (%)	Local Max. Depth (%)	Coll. Avg. Max. Depth (%)	Lig. Corr. Avg. Depth (%)
10/22	1		+point	ANS	2	0.310	41.0	27.8	0.63	43.8	18.7	0.122	38.0	23.2	23.2	-0.188	-3.0	-17.8	-4.4	-5.5	-20.3	4.5
21/43	1		+point	ANS	2	0.310	82.0	48.3	3.09	100.0	68.9	0.991	98.0	80.5	50.3	0.081	36.0	28.5	2.0	-2.0	-9.8	-19.6
21/43	2		+point	ANS	2	0.310	44.0	37.2	1.13	60.0	38.8	0.277	50.0	45.3	39.4	-0.033	6.0	1.5	2.1	-10.0	-14.8	0.6
P7	1		+point	EDD	2	0.840	100.0	91.0	6.47	100.0	94.3	0.870	100.0	99.8	94.5	0.030	0.0	-0.2	3.5	0.0	-0.2	-1.8
P7	2		+point	EDD	2	0.630	90.0	80.5	4.80	100.0	91.8	0.658	100.0	90.0	82.7	0.028	10.0	0.0	2.2	0.0	-10.0	-9.1
P7	3		+point	EDD	2	0.150	58.0	46.4	1.68	78.8	46.8	0.126	65.2	48.2	46.2	-0.024	7.2	-11.8	-0.1	-13.8	-32.6	-0.6
P8	1		+point	EDD	2	2.400	100.0	84.8	7.88	100.0	94.7	2.643	100.0	99.6	84.8	0.243	0.0	-0.5	0.0	0.0	-0.5	-11.9
P8	2		+point	EDD	2	2.190	96.0	79.4	6.08	100.0	98.3	2.452	100.0	99.7	79.7	0.262	4.0	3.7	0.5	0.0	-0.3	-16.9
P8	11		+point	EDD	2	1.700	100.0	84.1	9.89	100.0	98.6	1.868	100.0	99.4	75.3	0.168	0.0	-0.6	-8.6	0.0	-0.6	-14.1
P9	2		+point	EDD	2	1.780	100.0	79.1	5.36	100.0	87.8	1.589	100.0	92.4	86.4	-0.191	0.0	-0.6	7.3	0.0	-0.6	-1.4
P10	1		+point	EDD	2	2.560	100.0	76.7	6.87	100.0	90.4	2.563	100.0	100.0	88.8	0.030	0.0	0.0	12.1	0.0	0.0	-1.7
P10	2		+point	EDD	2	2.170	76.0	58.8	5.12	100.0	83.3	2.146	100.0	90.9	69.1	-0.024	24.0	14.9	10.3	0.0	-9.1	-14.2
P11	1		+point	EDD	2	0.720	98.0	90.1	7.24	100.0	92.1	0.874	100.0	100.0	96.3	-0.045	2.0	2.0	6.2	0.0	0.0	4.2
P11	2		+point	EDD	2	0.500	99.0	93.9	5.22	100.0	84.8	0.568	95.8	80.3	73.4	0.068	-3.2	-8.7	-20.4	-4.2	-9.7	-11.4
P12	1		+point	EDD	2	1.230	100.0	90.3	7.13	100.0	84.0	1.290	100.0	99.8	77.4	0.060	0.0	-0.2	-12.9	0.0	-0.2	-8.8
P12	5		+point	EDD	2	0.240	80.0	54.7	2.15	87.1	45.2	0.181	90.3	74.7	64.8	-0.069	10.3	-6.3	10.1	3.1	-12.5	19.6
P12	2		+point	EDD	2	0.440	50.0	24.4	1.24	67.7	25.4	0.550	82.8	64.9	30.0	0.110	32.8	14.9	8.6	15.1	-2.8	4.6
1	1		4H+point MR	EDD	2	0.810	85.0	50.8	2.12	87.3	67.4	0.708	68.4	54.3	36.8	-0.102	-18.8	-30.7	-14.0	-18.8	-33.0	-30.7
2	1		5H+point MR	EDD	2	0.940	70.0	33.5	1.71	47.0	33.1	0.860	41.0	35.5	18.9	-0.060	-29.0	-34.5	-15.2	-6.0	-11.5	-14.8
6	1		4H+point MR	EDD	2	0.520	73.0	52.5	1.45	73.8	56.0	0.415	75.0	64.3	49.1	-0.104	2.0	-8.7	-3.4	1.5	-9.2	-6.9
8	1		1H+point MR	EDD	2	0.490	70.0	42.0	1.22	67.1	47.7	0.420	58.0	52.2	34.1	-0.070	-12.0	-17.8	-7.9	-8.1	-14.9	-13.6
8	1		2H+point MR	EDD	2	0.410	65.0	44.2	1.32	70.0	53.5	0.380	55.0	45.8	34.6	-0.030	0.0	-0.2	-7.6	-15.0	-24.2	-17.0
8	1		3H+point MR	EDD	2	0.470	64.0	47.8	1.34	70.8	52.8	0.480	50.0	44.2	31.8	-0.010	-14.0	-19.8	-16.3	-20.8	-26.3	-21.3
9	1		1H+point MR	EDD	2	0.460	65.0	45.3	1.01	58.0	36.8	0.424	49.1	38.8	31.7	-0.034	-6.9	-16.2	-13.6	-8.9	-19.2	-5.2
9	1		2H+point MR	EDD	2	1.000	79.0	69.2	4.06	100.0	81.4	1.010	90.0	84.1	58.5	0.018	11.0	6.1	-10.7	-10.0	-15.9	-22.9
9	2		2H+point MR	EDD	2	0.820	67.0	51.1	0.72	48.0	33.8	0.786	61.8	48.9	38.6	-0.034	-6.5	-18.1	-12.6	13.1	0.9	4.8
9	1		2H+point MR	EDD	2	0.870	82.0	70.2	3.16	100.0	81.8	0.837	92.2	95.8	80.9	-0.033	17.2	14.8	10.7	-0.8	-3.2	-0.6
11	2		2H+point MR	EDD	2	No Data Available						0.180	43.0	32.8	32.8							
11	1		4H+point MR	EDD	2	1.030	91.0	71.5	3.26	100.0	81.9	1.009	98.1	95.3	68.6	-0.021	7.1	4.3	-2.9	-1.9	-4.8	-13.3
11	2		4H+point MR	EDD	2	0.970	79.0	60.2	0.86	48.0	32.8	0.790	48.3	44.0	36.4	-0.180	-32.7	-35.0	-23.7	1.3	-1.0	3.8
12	1		4H+point MR	EDD	2	0.390	58.0	42.9	0.46	31.5	22.3	0.360	33.0	26.3	20.0	-0.030	-25.0	-31.7	-22.9	1.5	-6.2	-2.2
13	1		3H+point MR	EDD	2	0.400	52.0	37.0	0.89	46.8	32.8	0.336	38.0	37.3	27.9	-0.064	-14.1	-14.7	-6.7	-8.8	-6.4	-6.3
10/22	1		+point	ANS	3	0.160	49.0	33.4	0.55	38.3	20.8	0.122	38.0	23.2	23.2	-0.038	-11.0	-25.8	-10.2	-0.3	-15.1	2.4
21/43	1		+point	ANS	3	0.970	63.0	50.7	2.82	87.3	64.4	0.991	98.0	90.5	50.3	0.021	35.0	27.5	-0.4	0.8	-6.8	-16.1
21/43	2		+point	ANS	3	0.290	43.0	35.1	1.18	60.0	41.0	0.277	60.0	45.3	39.4	-0.013	7.0	2.5	4.2	-10.0	-14.5	-1.7
P7	1		+point	EDD	3	0.970	100.0	92.3	6.57	100.0	92.2	0.870	100.0	99.8	94.5	-0.100	0.0	-0.2	2.2	0.0	-0.2	2.3
P7	2		+point	EDD	3	0.740	93.0	83.7	4.89	100.0	94.3	0.658	100.0	90.0	82.7	-0.082	7.0	-3.0	-1.0	0.0	-10.0	-3.8
P7	3		+point	EDD	3	0.250	70.0	45.0	1.65	78.1	33.7	0.126	65.2	48.2	48.2	-0.124	-4.8	-23.8	1.2	-13.0	-31.9	12.5
P10	1		+point	EDD	3	2.530	100.0	81.0	7.02	100.0	95.1	2.563	100.0	100.0	88.8	0.030	0.0	0.0	7.7	0.0	0.0	-4.3
P10	2		+point	EDD	3	2.300	82.0	62.0	5.20	100.0	82.7	2.146	100.0	90.9	69.1	-0.154	18.0	8.9	7.1	0.0	-9.1	-13.6
P12	1		+point	EDD	3	1.400	100.0	90.6	7.22	100.0	79.9	1.290	100.0	99.8	77.4	-0.110	0.0	-0.2	-13.2	0.0	-0.2	-2.3
P12	5		+point	EDD	3	0.200	82.0	56.6	2.15	67.2	50.7	0.181	90.3	74.7	64.8	-0.019	8.3	-7.3	8.2	3.1	-12.5	14.1
P12	2		+point	EDD	3	0.530	76.0	36.6	1.27	70.8	27.7	0.550	82.8	64.9	30.0	0.020	6.8	-11.1	-6.6	11.9	-6.0	2.3
1	1		4H+point MR	EDD	3	0.800	85.0	50.3	2.17	88.1	68.2	0.708	68.4	54.3	36.8	-0.092	-16.6	-30.7	-13.2	-19.7	-33.7	-32.4
2	1		5H+point MR	EDD	3	0.820	73.0	25.3	0.74	48.0	31.8	0.860	41.0	35.5	18.3	0.040	-37.5	-7.2	-7.0	-12.5	-13.6	
6	1		4H+point MR	EDD	3	0.540	65.0	51.1	1.51	75.0	54.2	0.418	75.0	64.3	49.1	-0.124	10.0	-0.7	-1.9	0.0	-10.7	-7.1
8	1		1H+point MR	EDD	3	0.480	73.0	40.3	1.29	69.2	50.1	0.420	58.0	52.2	34.1	-0.060	-15.0	-20.8	-6.1	-11.2	-17.0	-16.0
8	1		2H+point MR	EDD	3	0.450	57.0	43.7	1.34	70.5	52.4	0.380	55.0	45.8	36.6	-0.070	-2.0	-11.2	-7.1	-15.3	-24.7	-15.9
8	1		3H+point MR	EDD	3	0.520	58.0	40.1	1.38	71.8	48.7	0.480	50.0	44.2	31.5	-0.060	-8.0	-13.8	-8.6	-21.5	-27.3	-18.1
9	1		1H+point MR	EDD	3	0.480	55.0	40.3	1.02	60.0	36.2	0.424	49.1	38.8	31.7	-0.066	-5.9	-16.2	-8.6	-10.9	-21.2	-4.6
9	1		2H+point MR	EDD	3	1.010	83.0	71.2	4.10	100.0	81.8	1.010	90.0	84.1	58.5	0.000	7.0	1.1	-12.7	-10.0	-15.9	-23.1
9	2		2H+point MR	EDD	3	0.800	63.0	48.9	0.69	46.8	37.0	0.786	61.5	48.9	38.6	-0.014	-1.5	-14.1	-10.3	14.7	2.1	1.8
11	1		2H+point MR	EDD	3	0.850	86.0	72.7	3.21	100.0	83.4	0.837	92.2	98.8	80.9	-0.013	13.2	10.8	8.2	-0.8	-3.2	-2.5
11	2		2H+point MR	EDD	3	0.200	46.0	33.4	0.25	18.0	11.7	0.160	43.0	32.8	32.8	-0.040	-3.0	-13.3	-0.4	25.0	14.8	21.1
11	1		4H+point MR	EDD	3	1.010	92.0	71.9	3.23	100.0	83.5	1.009	98.1	95.3	68.6	-0.001	6.1	3.3	-3.3	-1.9	-4.8	-14.9
11	2		4H+point MR	EDD	3	0.950	83.0	60.4	0.70	47.0	34.8	0.790	46.3	44.0	36.4	-0.100	-36.7	-39.0	-24.0	-0.7	-3.0	1.9
12	1		4H+point MR	EDD	3	0.340	57.0	34.9	0.50	35.0	25.8	0.360	33.0	26.3	20.0	0.020	-24.0	-30.7	-14.9	-2.0	-8.7	-5.5
13	1		3H+point MR	EDD	3	0.420	53.0	34.5	0.78	51.0	33.4	0.336	38.0	37.3	27.3	-0.084	-15.1	-15.7	-7.3	-13.1	-13.7	-8.2
												Mean			-0.028	-0.9	-8.0	-4.4	-3.2	-10.3	-4.4	
												Standard Deviation			0.088	15.2	15.3	6.2	8.3	10.3	10.9	
												NDE Uncertainty at +95% Confidence			0.116	24.2	17.3	10.9</				

Table I7-1

Option 4a. Depths Based on Depth/Volt Correlation for ≤ 1.0 Volt Indications (Depth = 60V%) and Adjustment to 100% Depth for >4.5 Volt Indications

Sample Number	Crack Number	Elevation	Analyst	Adjusted NDE						Destructive Exam				Destructive Exam - NDE				Destructive Exam - Adj NDE			
				Length (inches)	Max Depth (%)	Avg Depth (%)	Max. Volts	Adj. Max. Depth	Adj. Avg. Depth	Length (inches)	Local Max. Depth (%)	Coil Avg. Max. Depth (%)	Lig. Corr. Avg. Depth (%)	Length (inches)	Local Max. Depth (%)	Coil Avg. Max. Depth (%)	Lig. Corr. Avg. Depth (%)	Length (inches)	Local Max. Depth (%)	Coil Avg. Max. Depth (%)	Lig. Corr. Avg. Depth (%)
10/22	1		2	0.310	41.0	27.6	0.63	37.8	16.0	0.122	38.0	23.2	23.2	-0.185	-3.0	-17.8	-4.4	0.2	-14.6	7.2	
21/43	1		2	0.910	62.0	48.3	3.09	62.0	48.3	0.991	98.0	90.5	50.3	0.081	36.0	28.8	2.0	36.0	28.5	2.0	
21/43	2		2	0.310	44.0	37.2	1.13	44.0	37.2	0.277	50.0	45.6	39.4	-0.033	6.0	1.5	2.1	6.0	1.5	2.1	
P7	1		2	0.840	100.0	91.0	6.47	100.0	91.0	0.870	100.0	99.8	94.5	0.030	0.0	-0.2	3.5	0.0	-0.2	3.5	
P7	2		2	0.630	90.0	80.6	4.80	100.0	89.4	0.658	100.0	90.0	82.7	0.028	10.0	-0.0	2.2	0.0	-10.0	-6.7	
P7	3		2	0.150	58.0	46.4	1.88	58.0	48.4	0.126	65.2	48.2	48.2	-0.024	7.2	-11.8	-0.1	7.2	-11.8	-0.1	
P8	1		2	2.400	100.0	84.8	7.68	100.0	84.8	2.643	100.0	99.8	84.8	0.243	0.0	-0.5	0.0	0.0	-0.6	0.0	
P8	2		2	2.190	96.0	79.4	6.08	100.0	82.7	2.452	100.0	99.7	79.7	0.262	4.0	3.7	0.3	0.0	-0.3	-0.0	
P9	1		2	1.700	100.0	84.1	9.89	100.0	84.1	1.868	100.0	99.4	75.5	0.168	0.0	-0.6	-6.6	0.0	-0.6	-6.6	
P9	2		2	1.780	100.0	79.1	5.36	100.0	79.1	1.582	100.0	99.4	85.4	-0.191	0.0	-0.6	7.3	0.0	-0.6	7.3	
P10	1		2	2.560	100.0	76.7	6.87	100.0	76.7	2.563	100.0	100.0	88.8	0.003	0.0	0.0	12.1	0.0	0.0	12.1	
P10	2		2	2.170	78.0	58.8	6.12	100.0	77.4	2.146	100.0	90.9	69.1	-0.024	24.0	14.9	10.3	0.0	-9.1	-8.3	
P11	1		2	0.720	96.0	90.1	7.34	100.0	91.9	0.765	100.0	100.0	96.3	-0.045	2.0	2.0	6.2	0.0	0.0	4.4	
P11	2		2	0.500	99.0	93.5	6.22	100.0	94.8	0.568	95.8	90.3	73.4	0.068	-3.2	-8.7	-20.5	-4.2	-9.7	-21.4	
P12	1		2	1.230	100.0	90.3	7.13	100.0	90.3	1.290	100.0	99.8	77.4	0.080	0.0	-0.2	-12.9	0.0	-0.2	-12.9	
P12	5		2	0.240	80.0	54.7	2.15	80.0	54.7	0.181	90.3	74.7	64.8	-0.050	10.3	-5.3	10.1	10.3	-5.3	10.1	
P12	2		2	0.440	60.0	24.4	1.24	50.0	24.4	0.650	82.6	64.9	30.0	0.110	32.8	14.9	5.6	32.8	14.9	5.6	
1	1	4H	2	0.810	80.0	50.8	2.42	85.0	50.8	0.708	68.4	54.3	36.8	-0.102	-16.6	-30.7	-14.0	-16.6	-30.7	-14.0	
2	1	6H	2	0.840	70.0	33.5	0.71	42.6	28.6	0.860	41.0	35.5	18.3	-0.060	-29.0	-34.5	-15.2	-1.6	-7.1	-10.3	
6	1	4H	2	0.520	73.0	62.4	1.43	73.0	62.4	0.416	75.0	64.3	49.1	-0.104	2.0	-6.7	-3.4	2.0	-6.7	-3.4	
8	1	1H	2	0.490	70.0	42.0	1.22	70.0	42.0	0.420	58.0	52.2	34.1	-0.070	-12.0	-17.8	-7.9	-12.0	-17.8	-7.9	
8	1	2H	2	0.410	55.0	44.2	1.32	55.0	44.2	0.390	65.0	45.8	36.6	-0.030	0.0	-9.2	-7.6	0.0	-9.2	-7.6	
8	1	3H	2	0.470	64.0	47.8	1.34	64.0	47.8	0.460	60.0	44.2	31.5	-0.010	-14.0	-19.8	-14.0	-19.8	-14.0	-16.3	
9	1	1H	2	0.480	65.0	45.3	1.01	55.0	45.3	0.424	49.1	38.8	31.7	-0.036	-5.9	-16.2	-13.6	-5.9	-16.2	-13.6	
9	2	1H	2	0.150	49.0	32.7	0.43	25.8	18.6	0.168	34.5	24.4	24.4	0.018	-14.6	-24.6	-8.3	8.7	-1.4	5.8	
9	1	2H	2	1.000	79.0	69.2	4.05	79.0	69.2	1.010	90.0	84.1	58.5	0.010	11.0	5.1	-10.7	11.0	5.1	-10.7	
11	1	2H	2	0.670	82.0	70.2	3.16	82.0	70.2	0.837	99.2	98.8	80.9	-0.033	17.2	14.8	10.7	17.2	14.8	10.7	
11	2	2H	2	No Data Available						0.160	43.0	32.8	32.8								
11	1	4H	2	1.030	91.0	71.5	3.26	91.0	71.5	1.099	98.1	95.3	68.6	-0.021	7.1	4.3	-2.9	7.1	4.3	-2.9	
11	2	4H	2	0.970	79.0	60.2	0.86	39.6	28.3	0.790	48.3	44.0	36.4	-0.180	-32.7	-35.0	-23.7	6.7	4.4	8.1	
12	1	4H	2	0.390	68.0	42.9	0.48	27.8	19.1	0.360	33.0	28.3	20.0	-0.030	-25.0	-31.7	-22.9	6.4	-1.3	0.9	
13	1	3H	2	0.400	52.0	37.0	0.69	41.4	28.3	0.336	38.0	37.3	27.3	-0.064	-14.1	-14.7	-8.7	-3.5	-4.1	-1.1	
10/22	1		3	0.160	49.0	33.4	0.55	33.0	17.9	0.122	38.0	23.2	23.2	-0.038	-11.0	-25.8	-10.2	5.0	-9.8	5.4	
21/43	1		3	0.970	63.0	50.7	2.82	63.0	50.7	0.991	98.0	90.5	50.3	0.021	35.0	27.5	-0.4	35.0	27.5	-0.4	
21/43	2		3	0.290	43.0	35.1	1.26	43.0	35.1	0.277	50.0	45.5	39.4	-0.013	7.0	2.5	4.2	7.0	2.5	4.2	
P7	1		3	0.970	100.0	92.3	6.57	100.0	92.3	0.870	100.0	99.8	94.5	-0.100	0.0	-0.2	2.2	0.0	-0.2	2.2	
P7	2		3	0.740	93.0	83.7	4.89	100.0	90.0	0.658	100.0	90.0	82.7	-0.082	7.0	-3.0	-1.0	0.0	-10.0	-7.3	
P7	3		3	0.250	70.0	45.0	1.65	70.0	45.0	0.126	65.2	48.2	46.2	-0.124	-4.8	-23.8	1.2	-4.8	-23.8	1.2	
P10	1		3	2.530	100.0	81.0	7.02	100.0	81.0	2.563	100.0	100.0	88.8	0.033	0.0	0.0	7.7	0.0	0.0	7.7	
P10	2		3	2.300	82.0	62.0	5.20	100.0	75.8	2.146	100.0	90.9	69.1	-0.154	18.0	8.9	7.1	0.0	-9.1	-6.5	
P12	1		3	1.400	100.0	90.6	7.22	100.0	90.6	1.290	100.0	99.8	77.4	-0.110	0.0	-0.2	-13.2	0.0	-0.2	-13.2	
P12	5		3	0.200	82.0	56.6	2.15	82.0	56.6	0.181	90.3	74.7	64.8	-0.019	8.3	-7.3	8.2	8.3	-7.3	8.2	
P12	2		3	0.530	76.0	36.6	1.27	76.0	36.6	0.550	82.8	64.9	30.0	0.020	6.8	-11.1	-6.6	6.8	-11.1	-6.6	
1	1	4H	3	0.900	85.0	50.5	2.17	85.0	50.5	0.708	68.4	54.3	36.8	-0.092	-16.6	-30.7	-13.8	-16.6	-30.7	-13.8	
2	1	5H	3	0.820	73.0	25.8	0.74	44.4	27.6	0.860	41.0	35.5	18.3	0.040	-32.0	-37.5	-7.2	-3.4	-8.9	-9.4	
6	1	4H	3	0.540	65.0	51.1	1.51	65.0	51.1	0.416	75.0	64.3	49.1	-0.124	10.0	-0.7	-1.9	10.0	-0.7	-1.9	
8	1	1H	3	0.480	73.0	40.3	1.29	73.0	40.3	0.420	58.0	52.2	34.1	-0.060	-15.0	-20.8	-6.1	-15.0	-20.8	-6.1	
8	1	2H	3	0.450	57.0	43.7	1.34	57.0	43.7	0.380	55.0	45.8	36.6	-0.070	-2.0	-11.2	-7.1	-2.0	-11.2	-7.1	
8	1	3H	3	0.520	58.0	40.1	1.38	58.0	40.1	0.460	50.0	44.2	31.5	-0.060	-8.0	-13.8	-8.6	-8.0	-13.8	-8.6	
9	1	1H	3	0.480	55.0	40.3	1.02	55.0	40.3	0.424	49.1	38.8	31.7	-0.056	-5.9	-16.2	-8.6	-5.9	-16.2	-8.6	
9	2	1H	3	0.420	80.0	42.2	0.42	25.2	15.4	0.168	34.5	24.4	24.4	-0.252	-45.5	-55.6	-17.9	9.3	-0.8	8.9	
9	1	2H	3	1.010	83.0	71.2	4.10	83.0	71.2	1.010	90.0	84.1	58.5	0.000	7.0	1.1	-12.7	7.0	1.1	-12.7	
11	1	2H	3	0.850	86.0	72.7	3.21	86.0	72.7	0.837	99.2	96.8	80.9	-0.013	13.2	10.8	8.2	13.2	10.8	8.2	
11	2	2H	3	0.200	46.0	33.4	0.25	15.0	9.8	0.160	43.0	32.8	32.8	-0.040	-3.0	-13.3	-0.6	28.0	17.8	23.0	
11	1	4H	3	1.010	92.0	71.9	3.33	92.0	71.9	1.009	98.1	95.3	68.6	-0.001	6.1	3.3	-3.3	6.1	3.3	-3.3	
11	2	4H	3	0.950	83.0	60.4	0.70	42.0	29.7	0.790	48.3	44.0	36.4	-0.160	-36.7	-39.0	-24.0	4.3	2.0	6.7	
12	1	4H	3	0.340	57.0	34.9	0.50	30.0	22.0	0.360	33.0	26.3	20.0	0.020	-24.0	-30.7	-14.9	3.0	-3.7	-2.0	
13	1	3H	3	0.420	53.0	34.5	0.78	46.8	29.3	0.336	38.0	37.3	27.3	-0.084	-15.1	-15.7	-7.3	-8.8	-9.5	-2.0	
Mean											-0.031				1.8	-8.8	-4.5	3.0	-4.0	-1.8	
Standard Deviation											0.093				16.4	16.4	9.2	10.9	11.5	8.6	
NDE Uncertainty at $\pm 95\%$ Confidence											0.123				25.2	18.6	10.8	20.9	15.0	12.3	

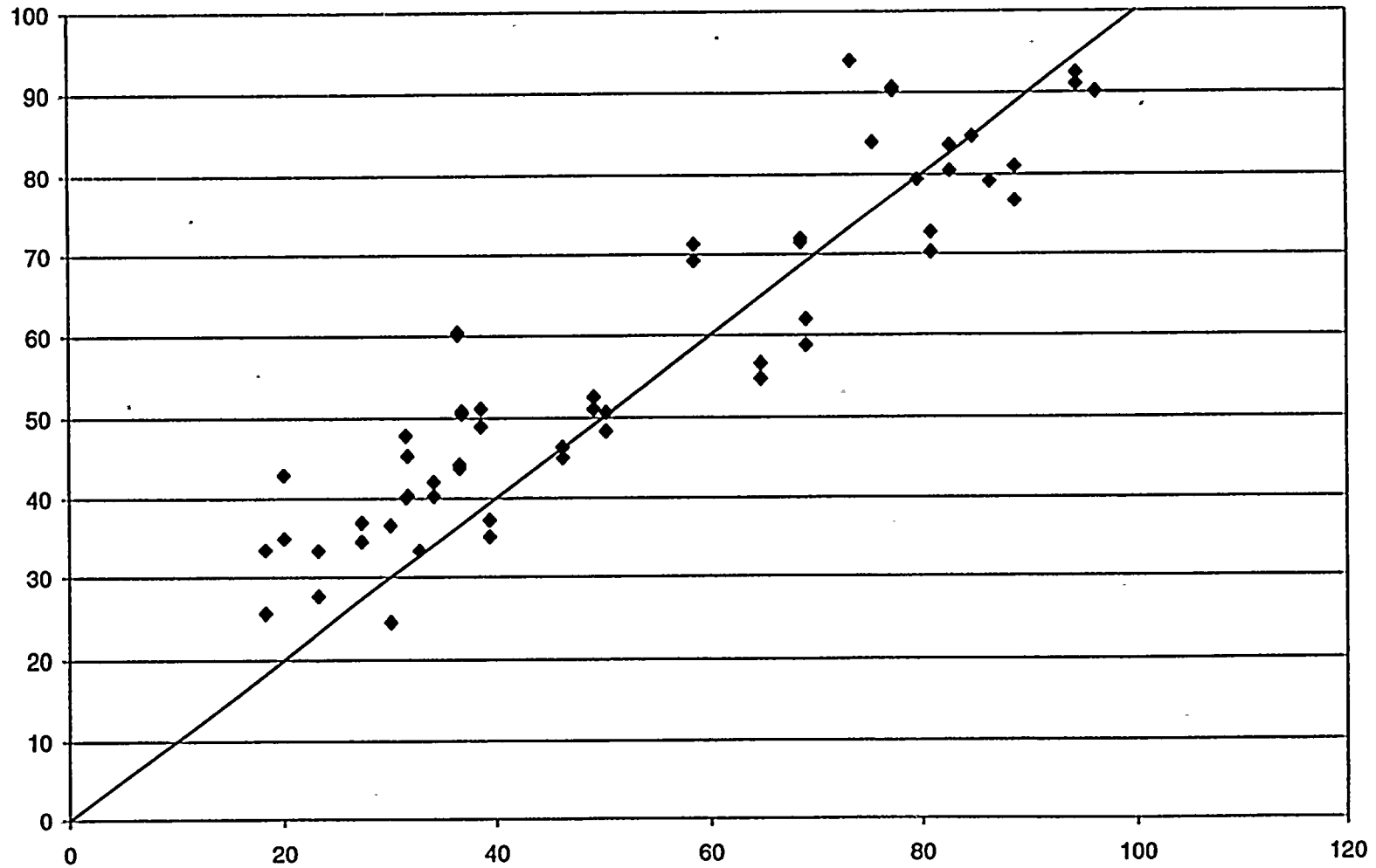
Table I8-1
Option 5a. Depths Adjusted by Voltage Ratio ($D_v = D_{max\ volts} \cdot V/V_{max}$) for ≤ 1 Volt Indications
and Adjustments to 100% Depth for >4.5 Volt Indications

Sample Number	Crack Number	Elevation	Analyst	Adjusted NDE					Destructive Exam				Destructive Exam - NDE			Destructive Exam - Adj NDE				
				Length (inches)	Max Depth (%)	Avg Depth (%)	Max. Volts	Adj. Max. Depth	Adj. Avg. Depth	Length (inches)	Local Max. Depth (%)	Coil Avg. Max. Depth (%)	Lig. Corr. Avg. Depth (%)	Length (inches)	Local Max. Depth (%)	Coil Avg. Max. Depth (%)	Lig. Corr. Avg. Depth (%)	Length (inches)	Local Max. Depth (%)	Coil Avg. Max. Depth (%)
10/22	1		2	0.310	41.0	27.6	0.63	41.0	17.3	0.122	38.0	23.2	23.2	-0.185	-3.0	-17.8	-4.4	-3.0	-17.8	5.9
21/43	1		2	0.910	62.0	48.3	3.09	62.0	48.3	0.991	98.0	90.5	60.3	0.081	36.0	28.5	2.0	36.0	28.5	2.0
21/43	2		2	0.310	44.0	37.2	1.13	44.0	37.2	0.277	60.0	45.5	39.4	-0.033	6.0	1.5	2.1	6.0	1.5	2.1
P7	1		2	0.840	100.0	91.0	6.47	100.0	91.0	0.870	100.0	99.8	84.5	0.030	0.0	-0.2	3.5	0.0	-0.2	3.5
P7	2		2	0.630	90.0	80.5	4.80	100.0	89.4	0.658	100.0	90.0	82.7	0.028	10.0	0.0	2.2	0.0	-10.0	-6.7
P7	3		2	0.150	58.0	44.4	1.68	58.0	44.4	0.128	65.2	48.2	48.2	-0.024	7.2	-11.8	-0.1	7.2	-11.8	-0.1
P8	1		2	2.400	100.0	84.8	7.68	100.0	84.8	2.843	100.0	99.8	84.8	0.243	0.0	-0.5	0.0	0.0	-0.8	0.0
P8	2		2	2.190	98.0	79.4	6.08	100.0	82.7	2.452	100.0	92.7	79.7	0.262	4.0	3.7	0.3	0.0	-0.3	-3.0
P9	1		2	1.700	100.0	84.1	9.89	100.0	84.1	1.868	100.0	99.4	75.5	0.168	0.0	-0.6	-8.6	0.0	-0.6	-8.6
P9	2		2	1.780	100.0	79.1	5.98	100.0	79.1	1.589	100.0	99.4	86.4	-0.181	0.0	-0.6	-7.3	0.0	-0.6	7.3
P10	1		2	2.560	100.0	76.7	6.87	100.0	76.7	2.563	100.0	100.0	89.8	0.003	0.0	0.0	12.1	0.0	0.0	12.1
P10	2		2	2.170	78.0	58.8	6.12	100.0	77.4	2.146	100.0	90.9	69.1	-0.024	24.0	14.9	10.3	0.0	-9.1	-8.3
P11	1		2	0.720	98.0	90.1	7.34	100.0	91.9	0.778	100.0	100.0	96.3	-0.043	2.0	2.0	-8.2	0.0	0.0	4.4
P11	2		2	0.500	99.0	93.9	5.22	100.0	94.8	0.568	95.8	90.3	73.4	0.068	-3.2	-8.7	-20.6	-4.2	-9.7	-21.4
P12	1		2	1.230	100.0	90.3	7.13	100.0	90.3	1.290	100.0	99.8	77.4	0.090	0.0	-0.2	-12.6	0.0	-0.2	-12.9
P12	5		2	0.240	80.0	54.7	2.15	80.0	54.7	0.181	90.3	74.7	64.8	-0.059	10.3	-5.3	10.1	10.3	-5.3	10.1
P12	2		2	0.440	50.0	24.4	1.24	50.0	24.4	0.550	82.8	64.9	30.0	0.110	32.8	14.9	5.6	32.8	14.9	5.6
1	1	4H	2	0.810	85.0	60.8	2.12	85.0	50.8	0.708	68.4	54.3	36.8	-0.102	-16.6	-30.7	-14.0	-16.6	-30.7	-14.0
2	1	5H	2	0.940	70.0	33.9	0.71	47.0	31.0	0.860	41.0	35.5	18.3	-0.090	-29.0	-34.5	-15.2	-6.0	-11.5	-13.3
6	1	4H	2	0.520	73.0	52.5	1.45	73.0	52.5	0.416	75.0	64.3	49.1	-0.104	2.0	-8.7	-3.4	2.0	-8.7	-3.4
8	1	1H	2	0.490	70.0	42.0	1.22	70.0	42.0	0.420	58.0	52.2	34.1	-0.070	-12.0	-17.8	-7.9	-12.0	-17.8	-7.9
8	1	2H	2	0.410	55.0	44.2	1.32	55.0	44.2	0.380	55.0	45.8	36.6	-0.030	0.0	-9.2	-7.6	0.0	-9.2	-7.6
8	1	3H	2	0.470	64.0	47.8	1.34	64.0	47.8	0.460	50.0	44.2	31.5	-0.010	-14.0	-19.8	-16.3	-14.0	-19.8	-16.3
9	1	1H	2	0.460	55.0	45.3	1.01	55.0	45.3	0.424	49.1	38.8	31.7	-0.036	-5.9	-16.2	-13.6	-5.9	-16.2	-13.6
9	1	2H	2	1.000	79.0	69.2	4.05	79.0	69.2	1.010	90.0	84.1	68.6	0.010	11.0	5.1	-10.7	11.0	5.1	-10.7
9	2	2H	2	0.820	67.0	51.1	0.72	49.0	36.1	0.786	61.5	48.9	38.6	-0.034	-5.5	-18.1	-12.6	12.5	-0.1	2.5
11	1	2H	2	0.870	82.0	70.2	3.16	82.0	70.2	0.837	89.2	98.8	80.9	-0.033	17.2	14.8	10.7	17.2	14.8	10.7
11	2	2H	2	No Data Available							0.160	43.0	32.8							
11	1	4H	2	1.030	91.0	71.5	3.26	91.0	71.5	1.009	98.1	95.3	68.6	-0.021	7.1	4.3	-2.9	7.1	4.3	-2.9
11	2	4H	2	0.970	79.0	60.2	0.66	64.0	45.7	0.790	48.0	44.0	36.4	-0.180	-32.7	-35.0	-23.7	-17.7	-20.0	-9.3
12	1	4H	2	0.390	58.0	42.9	0.48	49.0	33.8	0.360	33.0	28.3	20.0	-0.030	-25.0	-31.7	-22.9	-18.0	-22.7	-13.8
13	1	3H	2	0.400	52.0	37.0	0.69	41.0	28.1	0.336	38.0	37.3	27.3	-0.054	-14.1	-14.7	-9.7	-3.1	-3.7	-0.8
10/22	1		3	0.160	49.0	33.4	0.55	29.0	15.7	0.122	39.0	23.2	23.2	-0.038	-11.0	-25.8	-10.2	9.0	-5.8	7.5
21/43	1		3	0.970	63.0	50.7	2.82	63.0	50.7	0.991	98.0	90.5	50.3	0.021	35.0	27.5	-0.4	35.0	27.5	-0.4
21/43	2		3	0.290	43.0	35.1	1.26	43.0	35.1	0.277	50.0	45.5	39.4	-0.013	7.0	2.5	4.2	7.0	2.5	4.2
P7	1		3	0.970	100.0	92.3	6.57	100.0	92.3	0.870	100.0	99.8	94.5	-0.100	0.0	-0.2	2.2	0.0	-0.2	2.2
P7	2		3	0.740	93.0	83.7	4.89	100.0	90.0	0.658	100.0	90.0	82.7	-0.082	7.0	-3.0	-1.0	0.0	-10.0	-7.3
P7	3		3	0.250	70.0	45.0	1.65	70.0	45.0	0.128	65.2	48.2	48.2	-0.124	-4.8	-23.8	1.2	-4.8	-23.8	1.2
P10	1		3	2.530	100.0	81.0	7.02	100.0	81.0	2.563	100.0	100.0	89.8	0.033	0.0	0.0	7.7	0.0	0.0	7.7
P10	2		3	2.300	82.0	62.0	5.20	100.0	75.8	2.146	100.0	90.9	69.1	-0.154	18.0	8.9	7.1	0.0	-9.1	-8.5
P12	1		3	1.400	100.0	90.6	7.22	100.0	90.8	1.290	100.0	99.8	77.4	-0.110	0.0	-0.2	-13.2	0.0	-0.2	-13.2
P12	5		3	0.200	82.0	56.6	2.15	82.0	56.6	0.181	90.3	74.7	64.8	-0.019	8.3	-7.3	8.2	8.3	-7.3	8.2
P12	2		3	0.530	76.0	36.6	1.27	78.0	36.6	0.550	82.8	64.9	30.0	0.020	6.8	-11.1	-6.8	6.8	-11.1	-6.8
1	1	4H	3	0.800	85.0	50.5	2.17	85.0	50.5	0.708	68.4	54.3	36.8	-0.092	-16.6	-30.7	-13.8	-16.6	-30.7	-13.8
2	1	5H	3	0.820	73.0	25.5	0.74	30.0	18.7	0.860	41.0	35.5	18.3	0.040	-32.0	-37.5	-7.2	11.0	5.3	-0.4
6	1	4H	3	0.540	65.0	51.1	1.51	65.0	51.1	0.416	75.0	64.3	49.1	-0.124	10.0	-0.7	-1.9	10.0	-0.7	-1.9
8	1	1H	3	0.480	73.0	40.3	1.29	73.0	40.3	0.420	58.0	52.2	34.1	-0.060	-15.0	-20.8	-6.1	-15.0	-20.8	-6.1
8	1	2H	3	0.450	57.0	43.7	1.34	57.0	43.7	0.380	55.0	45.8	36.6	-0.070	-2.0	-11.2	-7.1	-2.0	-11.2	-7.1
8	1	3H	3	0.520	58.0	40.1	1.38	58.0	40.1	0.460	50.0	44.2	31.5	-0.060	-8.0	-13.8	-8.6	-8.0	-13.8	-8.6
9	1	1H	3	0.480	55.0	40.3	1.02	55.0	40.3	0.424	49.1	38.8	31.7	-0.056	-5.9	-16.2	-8.6	-5.9	-16.2	-8.6
9	1	2H	3	1.010	83.0	71.2	4.10	83.0	71.2	1.010	90.0	84.1	58.5	0.000	7.0	1.1	-12.7	7.0	1.1	-12.7
9	2	2H	3	0.800	63.0	48.9	0.69	57.0	43.8	0.786	61.5	48.9	38.6	-0.014	-1.5	-14.1	-10.3	4.5	-8.1	-5.2
11	1	2H	3	0.850	86.0	72.7	3.21	86.0	72.7	0.837	99.2	96.8	80.9	-0.013	13.2	10.8	8.2	13.2	10.8	8.2
11	2	2H	3	0.200	46.0	33.4	0.25	46.0	29.9	0.160	43.0	32.8	32.8	-0.040	-3.0	-13.3	-0.6	-3.0	-13.3	2.9
11	1	4H	3	1.010	92.0	71.9	3.33	92.0	71.9	1.009	98.1	95.3	68.6	-0.001	6.1	3.3	-3.3	6.1	3.3	-3.3
11	2	4H	3	0.950	83.0	60.4	0.70	60.0	43.2	0.790	48.3	44.0	36.4	-0.160	-36.7	-39.0	-24.0	-13.7	-16.0	-6.8
12	1	4H	3	0.340	57.0	34.9	0.50	33.0	24.2	0.360	33.0	28.3	20.0	0.020	-24.0	-30.7	-14.9	0.0	-6.7	-4.2
13	1	3H	3	0.420	53.0	34.5	0.78	39.0	23.8	0.336	38.0	37.3	27.3	-0.084	-15.1	-15.7	-7.3	0.0	-0.7	3.5
											Mean			-0.028	-0.9	-6.0	-4.5	1.6	-5.8	-3.1
											Standard Deviation			0.088	15.2	15.3	9.2	11.2	11.7	7.4
											NDE Uncertainty at $\pm 95\%$ Confidence			0.118	24.2	17.3	10.9	20.1	13.9	9.8

Table I8-2
Option 5b. Depths Adjusted by Voltage Ratio ($D_{\text{voltage}} = D_{\text{v-1.0}} * V/V_{-1.0}$) at < 1 Volt for All Indications
and Adjustments to 100% Depth for >4.5 Volt Indications

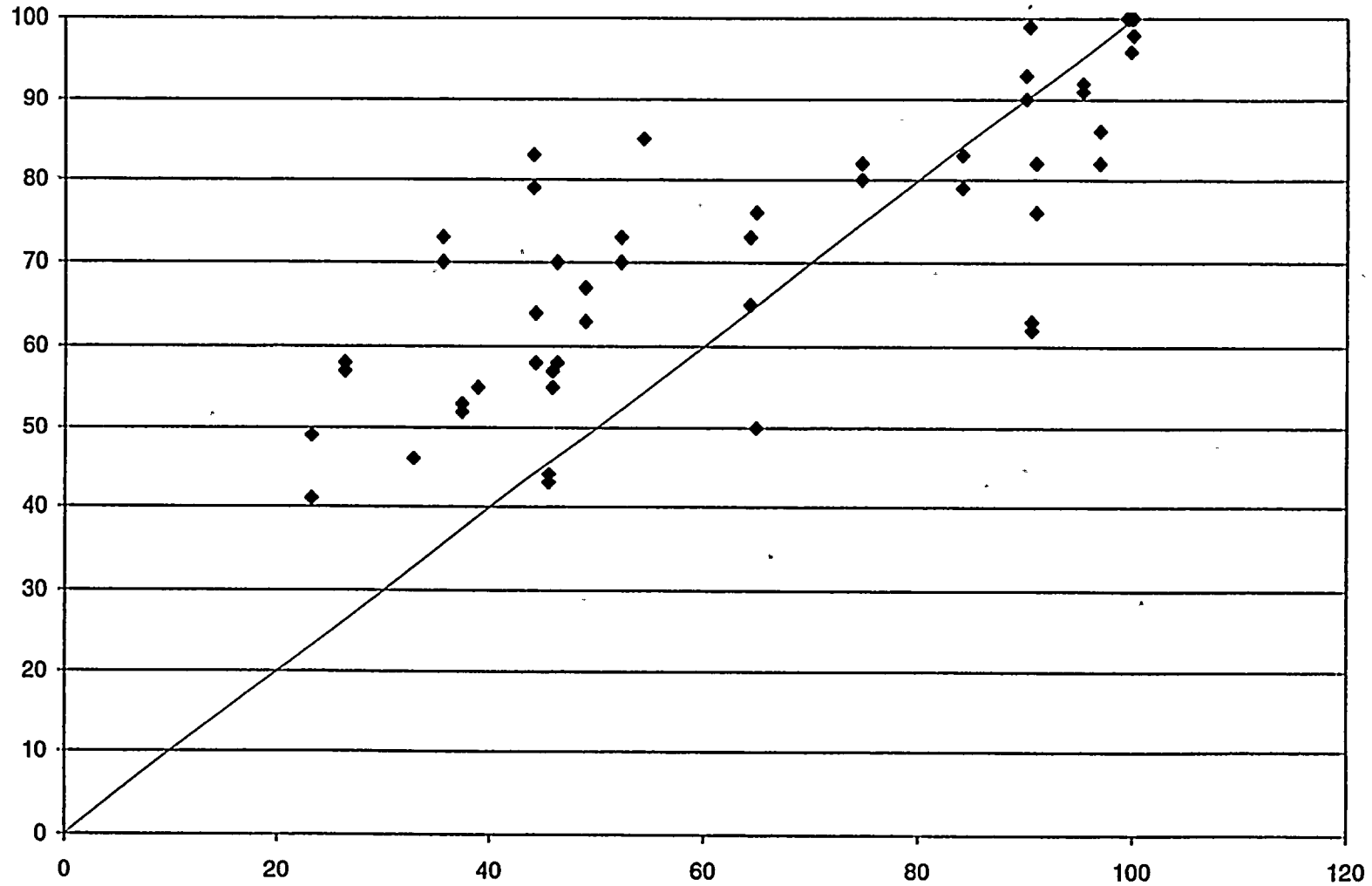
Sample Number	Crack Number	Elevation	Analyst	Adjusted NOE										Destructive Exam				Destructive Exam - NOE				Destructive Exam - Ag. NOE		
				Length (inches)	Max Depth (%)	Avg Depth (%)	Max. Volts	Adj. Max. Depth	Adj. Avg. Depth	Adj. Max. Depth	Adj. Avg. Depth	Adj. Max. Depth	Adj. Avg. Depth	Length (inches)	Local Max. Depth (%)	Col. Avg. Max. Depth (%)	Lq. Corr. Avg. Depth (%)	Length (inches)	Local Max. Depth (%)	Col. Avg. Max. Depth (%)	Lq. Corr. Avg. Depth (%)	Local Max. Depth (%)	Col. Avg. Max. Depth (%)	Lq. Corr. Avg. Depth (%)
10/22	1		2	0.310	41.0	27.6	0.63	41.0	41.0	17.3	17.3	0.122	38.0	33.2	23.2	-0.188	3.0	-17.8	-4.4	-3.0	-17.8	-4.4	5.9	
21/43	1		2	0.810	62.0	-48.3	3.06	70.7	70.7	44.4	44.4	0.991	98.0	90.5	50.3	0.081	36.0	28.8	2.0	27.3	18.8	3.0		
21/43	2		2	0.310	44.0	37.2	1.13	44.0	44.0	22.8	22.8	0.277	50.0	45.5	30.4	-0.033	6.0	1.5	2.1	6.0	1.5	18.5		
P7	1		2	0.840	100.0	91.0	6.47	100.0	100.0	91.0	91.0	0.876	100.0	99.8	94.5	-0.030	0.0	-0.2	3.5	0.0	-0.2	3.5		
P7	2		2	0.630	90.0	80.5	4.80	90.0	100.0	78.9	87.0	0.654	100.0	90.0	82.7	-0.028	10.0	0.0	2.2	0.0	-10.0	-4.3		
P7	3		2	0.150	58.0	48.4	1.68	58.0	58.0	37.0	37.0	0.126	65.2	46.2	48.2	-0.024	7.2	-11.8	-0.1	7.2	-11.8	9.3		
P8	1		2	2.400	100.0	84.8	7.88	100.0	100.0	84.0	84.0	2.643	100.0	99.8	84.8	0.243	0.0	-0.3	0.0	0.0	-0.3	0.8		
P8	2		2	2.190	96.0	79.4	6.08	96.0	100.0	79.0	82.3	2.452	100.0	99.7	79.7	0.262	4.0	3.7	0.3	0.0	-0.3	-2.7		
P9	1		2	1.700	100.0	84.1	8.89	100.0	100.0	78.8	78.8	1.888	100.0	99.4	75.5	0.168	0.0	-0.4	-8.6	0.0	-0.4	-3.7		
P9	2		2	1.780	100.0	79.1	6.56	100.0	100.0	78.8	78.8	1.589	100.0	99.4	86.4	-0.191	0.0	-0.8	7.9	0.0	-0.8	9.6		
P10	1		2	2.560	100.0	78.7	8.87	100.0	100.0	73.8	73.8	2.583	100.0	100.0	82.8	-0.003	0.0	-0.0	12.1	0.0	0.0	15.1		
P10	2		2	2.170	78.0	58.8	5.12	78.0	100.0	64.9	72.3	2.144	100.0	90.0	69.1	-0.021	24.0	14.9	10.3	0.0	-0.1	-3.1		
P11	1		2	0.720	98.0	90.1	7.34	98.0	100.0	90.1	91.9	0.875	100.0	100.0	96.9	-0.045	2.0	2.0	8.2	0.0	0.0	4.3		
P11	2		2	0.500	90.0	83.9	5.22	90.0	100.0	90.4	91.4	0.548	95.8	90.3	73.4	-0.068	-3.2	-8.7	-20.5	-4.3	-6.7	-18.1		
P12	1		2	1.230	100.0	90.3	7.13	100.0	100.0	84.1	84.1	1.290	100.0	99.8	77.4	-0.040	0.0	-0.2	-12.9	0.0	-0.2	-4.7		
P12	5		2	0.240	80.0	54.7	2.15	73.0	73.0	35.7	35.7	0.181	80.3	74.7	64.8	-0.059	10.3	-5.3	10.1	17.3	1.7	29.1		
P12	2		2	0.440	50.0	24.4	1.24	39.0	39.0	11.7	11.7	0.550	82.8	64.9	30.0	-0.110	32.8	14.9	5.6	43.8	25.9	18.3		
1	1	4H	2	0.810	85.0	50.8	2.12	85.0	85.0	48.9	48.9	0.708	68.4	64.3	36.8	-0.102	-16.8	-30.7	-14.0	-16.8	-30.7	-12.1		
2	1	8H	2	0.940	70.0	33.5	0.71	47.0	47.0	31.8	31.8	0.880	41.0	35.5	18.3	-0.080	-29.0	-34.5	-15.2	-6.0	-11.5	-13.5		
6	1	4H	2	0.520	73.0	62.5	1.45	64.0	64.0	47.9	47.9	0.416	75.0	64.3	49.1	-0.104	2.0	-8.7	-3.4	11.0	0.3	1.2		
8	1	1H	2	0.490	70.0	43.0	1.22	69.8	69.8	41.9	41.9	0.420	58.0	52.2	34.1	-0.070	-12.0	-17.8	-7.0	-11.8	-17.4	-7.8		
8	1	2H	2	0.410	55.0	44.2	1.32	55.0	55.0	42.8	42.8	0.380	55.0	45.8	38.9	-0.030	0.0	-0.2	7.6	0.0	-0.2	-6.1		
8	1	3H	2	0.470	64.0	47.8	1.34	64.0	64.0	46.8	46.8	0.480	50.0	44.2	31.5	-0.010	-14.0	-19.8	-16.3	-14.0	-19.8	-15.0		
9	1	1H	2	0.480	65.0	45.3	1.01	62.0	62.0	28.2	28.2	0.424	49.1	38.8	31.7	-0.036	-6.9	-18.2	-13.8	-2.8	-13.2	3.4		
9	1	2H	2	1.000	79.0	69.2	4.05	79.0	79.0	64.8	64.8	1.016	90.0	84.1	68.1	-0.010	11.0	5.1	-10.7	11.0	5.1	-6.3		
9	2	2H	2	0.820	67.0	51.1	0.72	49.0	49.0	36.1	36.1	0.784	61.5	48.9	38.8	-0.034	-5.5	-18.1	-12.8	12.5	-0.1	2.5		
11	1	2H	2	0.870	82.0	70.2	3.18	82.0	82.0	67.6	67.6	0.837	90.2	98.8	80.9	-0.033	17.2	14.8	10.7	17.2	14.8	13.3		
11	2	2H	2	No Data Available										0.180	43.0	32.8	32.8							
11	1	4H	2	1.030	91.0	71.5	3.29	91.0	91.0	69.5	69.5	1.009	98.1	95.3	68.4	-0.021	7.1	4.3	-2.9	7.1	4.3	-0.9		
11	2	4H	2	0.870	79.0	60.2	0.84	64.0	64.0	45.7	45.7	0.790	48.3	44.0	36.4	-0.180	-32.7	-35.0	-27.7	-17.7	-20.0	-9.3		
12	1	4H	2	0.390	58.0	42.9	0.44	49.0	49.0	33.8	33.8	0.380	32.0	28.3	20.0	-0.030	-25.0	-31.7	-22.9	-18.0	-22.7	-13.8		
13	1	3H	2	0.400	52.0	37.0	0.69	41.0	41.0	28.1	28.1	0.334	38.0	37.3	27.3	-0.064	-14.1	-14.7	-6.7	-3.1	-3.7	-0.8		
10/22	1		3	0.160	49.0	33.4	0.55	29.0	29.0	15.7	15.7	0.122	38.0	33.2	23.2	-0.036	-11.0	-25.8	-10.2	9.0	-5.8	7.5		
21/43	1		3	0.970	63.0	50.7	2.82	63.0	63.0	44.8	44.8	0.991	98.0	90.5	50.3	0.021	35.0	27.5	-0.4	35.0	27.5	5.5		
21/43	2		3	0.290	43.0	35.1	1.26	43.0	43.0	27.0	27.0	0.277	50.0	45.5	39.4	-0.013	7.0	2.5	4.2	7.0	2.5	12.4		
P7	1		3	0.970	100.0	92.3	6.57	100.0	100.0	90.8	90.8	0.870	100.0	99.8	94.5	-0.100	0.0	-0.2	2.2	0.0	-0.2	3.9		
P7	2		3	0.740	93.0	83.7	4.89	93.0	100.0	76.6	82.4	0.658	100.0	90.0	82.7	-0.082	7.0	-3.0	-1.0	0.0	-1.0	0.3		
P7	3		3	0.250	70.0	45.0	1.65	57.0	57.0	23.8	23.8	0.126	65.2	46.2	46.2	-0.124	-4.8	-23.8	1.2	8.2	-10.8	22.5		
P10	1		3	2.530	100.0	81.0	7.02	100.0	100.0	80.6	80.6	2.543	100.0	100.0	88.8	0.033	0.0	0.0	7.7	0.0	0.0	8.2		
P10	2		3	2.300	82.0	62.0	5.20	82.0	100.0	59.1	72.0	2.144	100.0	90.0	69.1	-0.164	18.0	8.9	7.1	0.0	-0.1	-2.9		
P12	1		3	1.400	100.0	90.6	7.22	100.0	100.0	84.6	84.6	1.290	100.0	99.8	77.4	-0.110	0.0	-0.2	-13.2	0.0	-0.2	-0.1		
P12	5		3	0.200	82.0	56.6	2.15	79.0	79.0	48.9	48.9	0.181	90.3	74.7	64.8	-0.019	8.3	-7.3	8.2	11.3	-4.3	15.9		
P12	2		3	0.530	76.0	36.6	1.27	48.0	48.0	18.3	18.3	0.550	82.8	64.9	30.0	0.020	6.8	-11.1	-6.6	36.8	18.9	13.8		
1	1	4H	3	0.800	85.0	50.5	2.17	85.0	85.0	50.1	50.1	0.708	68.4	64.3	36.8	-0.092	-16.6	-30.7	-13.8	-16.6	-30.7	-13.4		
2	1	5H	3	0.820	73.0	25.5	0.74	30.0	30.0	18.7	18.7	0.860	41.0	35.5	18.3	0.040	-32.0	-37.5	-7.2	11.0	5.5	-0.4		
6	1	4H	3	0.540	65.0	51.1	1.51	60.0	60.0	44.2	44.2	0.416	75.0	64.3	49.1	-0.124	10.0	-0.7	-1.9	15.0	4.3	4.9		
8	1	1H	3	0.480	73.0	40.3	1.29	60.0	60.0	34.2	34.2	0.420	58.0	52.2	34.1	-0.060	-15.0	-20.8	-6.1	-2.0	-7.8	-0.1		
8	1	2H	3	0.500	57.0	43.7	1.34	57.0	57.0	40.7	40.7	0.380	55.0	45.8	36.6	-0.070	-2.0	-11.2	-7.1	-2.0	-11.2	-4.1		
8	1	3H	3	0.520	58.0	40.1	1.38	58.8	58.8	40.1	40.1	0.460	50.0	44.2	31.5	-0.060	-8.0	-13.8	-8.6	-8.8	-14.6	-8.6		
9	1	1H	3	0.480	55.0	40.3	1.02	53.0	53.0	28.8	28.8	0.424	49.1	38.8	31.7	-0.054	-6.9	-16.2	-8.4	-3.9	-14.2	2.9		
9	1	2H	3	1.010	83.0	71.2	4.10	83.0	83.0	66.1	66.1	1.010	90.0	84.1	68.5	0.000	7.0	1.1	-12.7	7.0	1.1	-7.8		
9	2	2H	3	0.800	63.0	48.9	0.69	57.0	57.0	43.8	43.8	0.784	61.5	48.9	38.6	-0.014	-1.5	-14.1	-10.3	4.5	-8.1	-3.2		
11	1	2H	3	0.850	88.0	72.7	3.21	88.0	88.0	71.6	71.6	0.837	99.2	98.8	80.9	-0.013	13.2	10.8	8.2	13.2	10.8	9.3		
11	2	2H	3	0.200	46.0	33.4	0.25	48.0	48.0	29.9	29.9	0.160	43.0	32.8	32.8	-0.040	-3.0	-13.3	-0.6	-3.0	-13.3	2.9		
11	1	4H	3	1.010	92.0	71.9	3.32	92.0	92.0	70.1	70.1	1.009	98.1	95.3	68.4	-0.001	6.1	3.3	-3.3	6.1	3.3	-1.5		
11	2	4H	3	0.950	83.0	60.4	0.70	60.0	60.0	43.2	43.2	0.780	46.3	44.0	36.4	-0.160	-36.7	-39.0	-24.0	-13.7	-16.0	-6.8		
12	1	4H	3	0.340	57.0	34.9	0.50	33.0	33.0	24.2	24.2	0.360	33.0	26.3	20.0	0.020	-24.0	-30.7	-14.9	0.0	-6.7	-4.2		
13	1	3H	3	0.420	53.0	34.5	0.78	38.0	38.0	23.8	23.8	0.234	38.0	37.3	27.3	-0.084	-15.1	-15.7	-7.3	0.0	-0.7	3.5		
Mean															-0.028	-0.8	-8.0	-4.5	2.1	-4.0	1.1			
Standard																								

Figure I3-1
NDE Results Based on Phase Angle Analyses
NDE Average Depth vs. Destructive Exam Average Depth



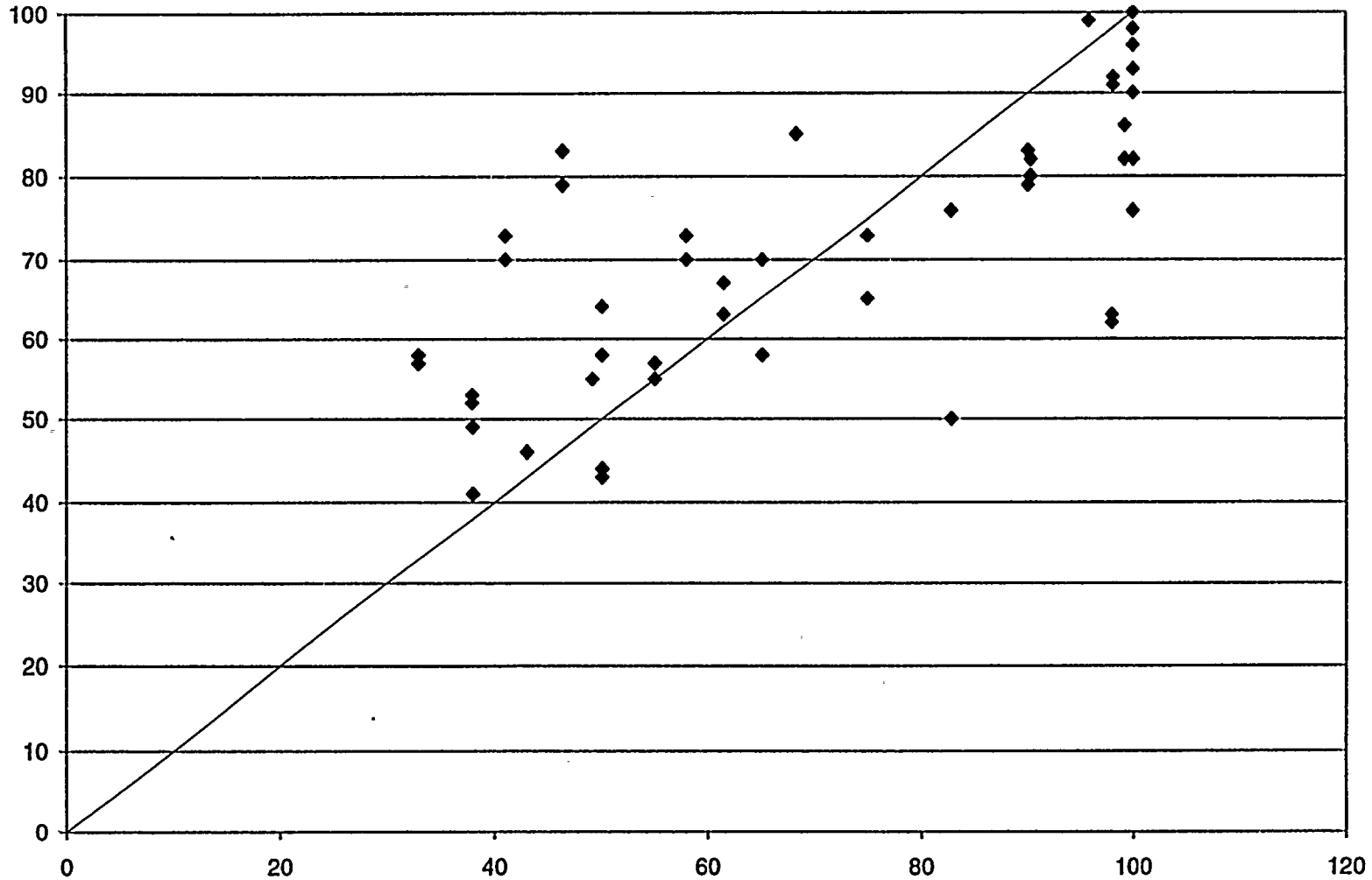
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Figure I3-2
NDE Results Based on Phase Angle Analyses
NDE Maximum Depth vs. Destructive Exam Maximum Depth Averaged Over Coil Field (0.16")



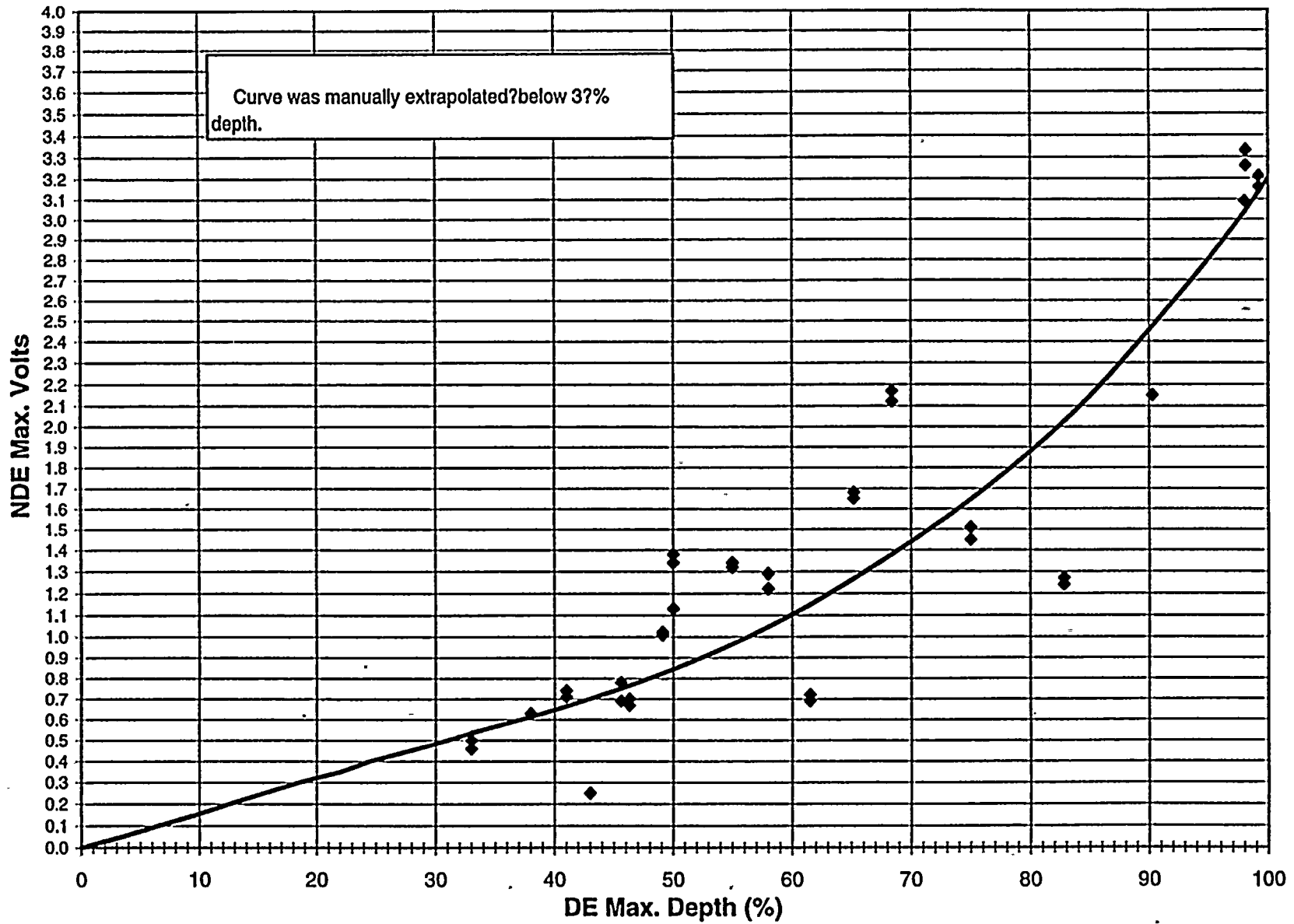
I-23

Figure I3-3
NDE Results Based on Phase Angle Analyses
NDE Maximum Depth vs. Destructive Exam Local Maximum Depth



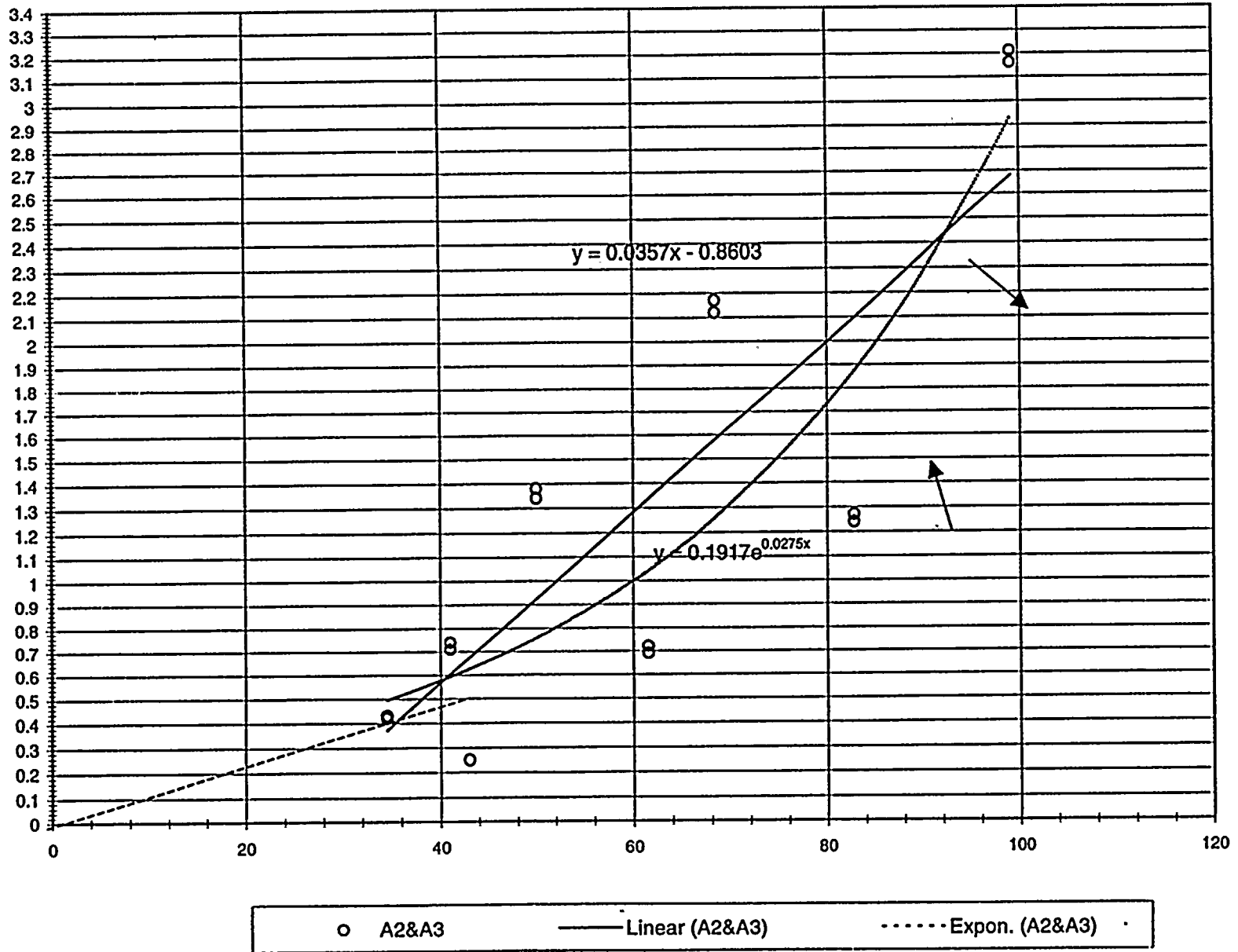
I-24

Figure I3-4
All Dented TSP Lab Specimens & Pulled Tubes
NDE Max. Volts vs. DE Max. Depth



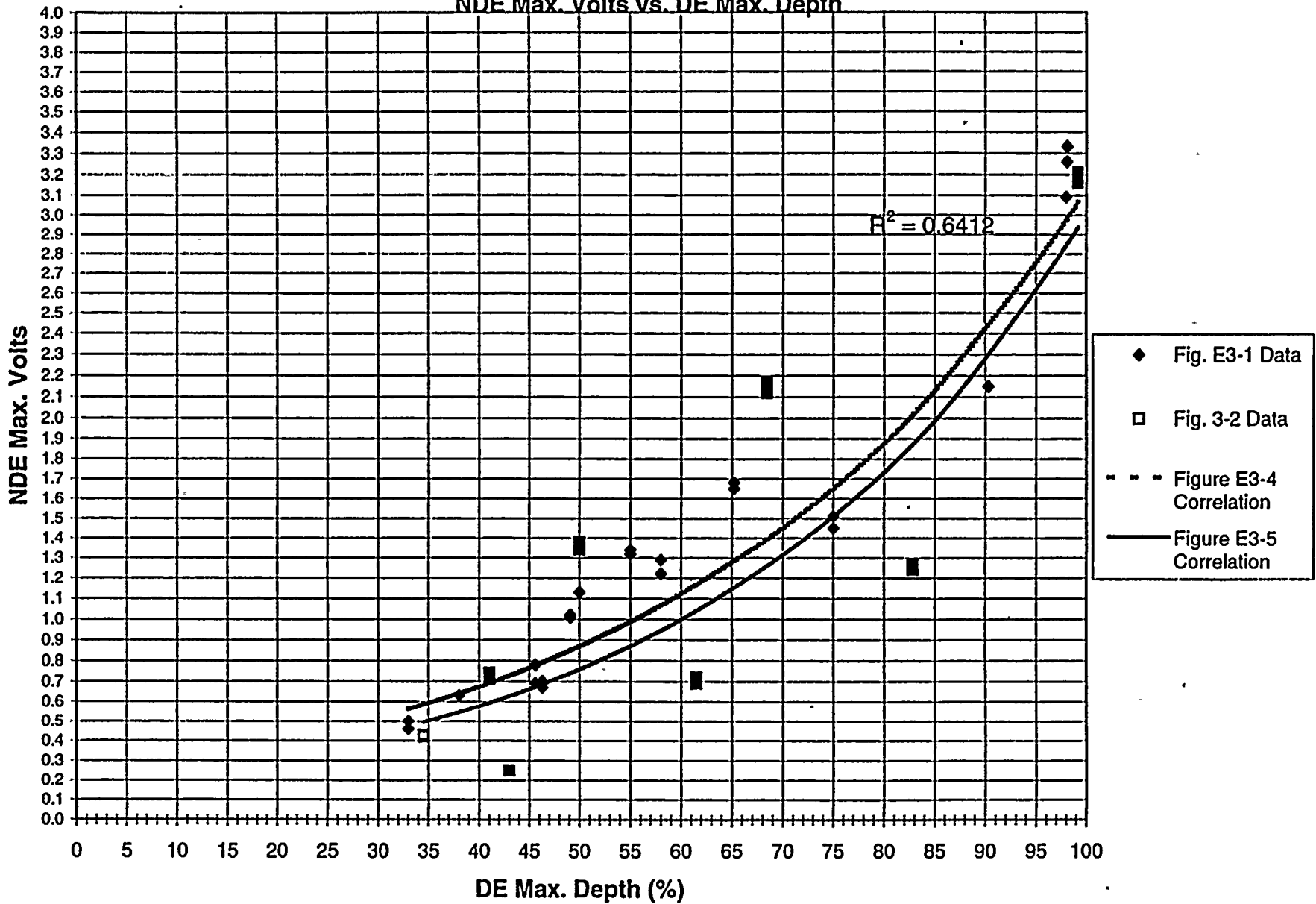
I-25

Figure I3-5
NDE Maximum Volts vs. Destructive Exam Maximum Depth
Dented TSP Lab Specimens
8 Specimens Selected for Variable Volt/Depth Trends



I-26

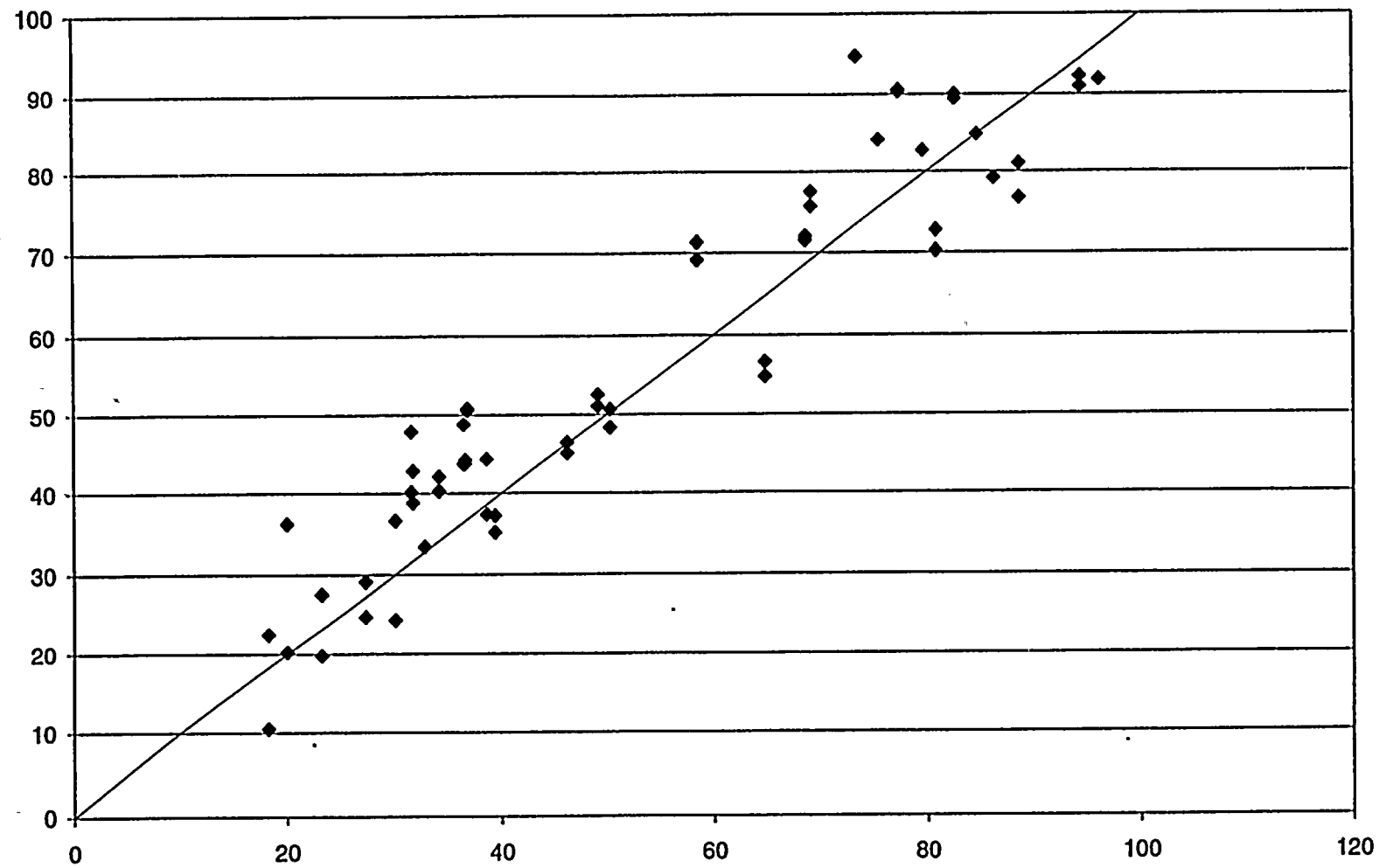
Figure I3-6
 Comparison of Volt vs. Depth Correlations
 Dented TSP Lab & Pulled Tubes
 NDE Max. Volts vs. DE Max. Depth



I-27

I-28

Figure I4-1
Option 1. NDE Results Based on Depth at Maximum Volts for <1.0 Volt and 100% Depth for >4.5 Volt
NDE Average Depth vs. Destructive Exam Average Depth



I-29

Figure I4-2
Option 1. NDE Results Based on Depth at Maximum Volts for <1.0 Volt and 100% Depth for >4.5 Volt
NDE Maximum Depth vs. Destructive Exam Depth Averaged Over Coil Field (0.16")

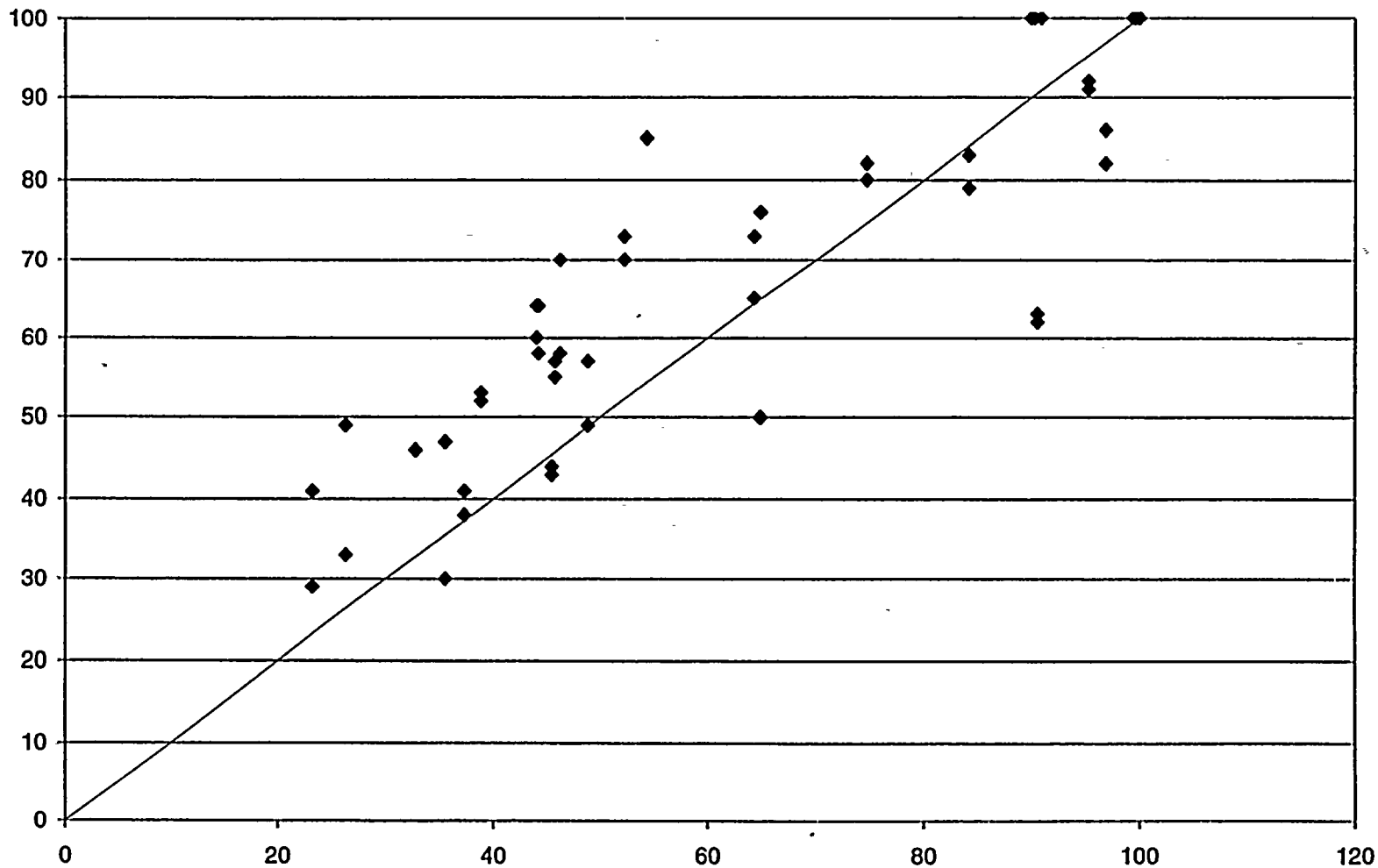
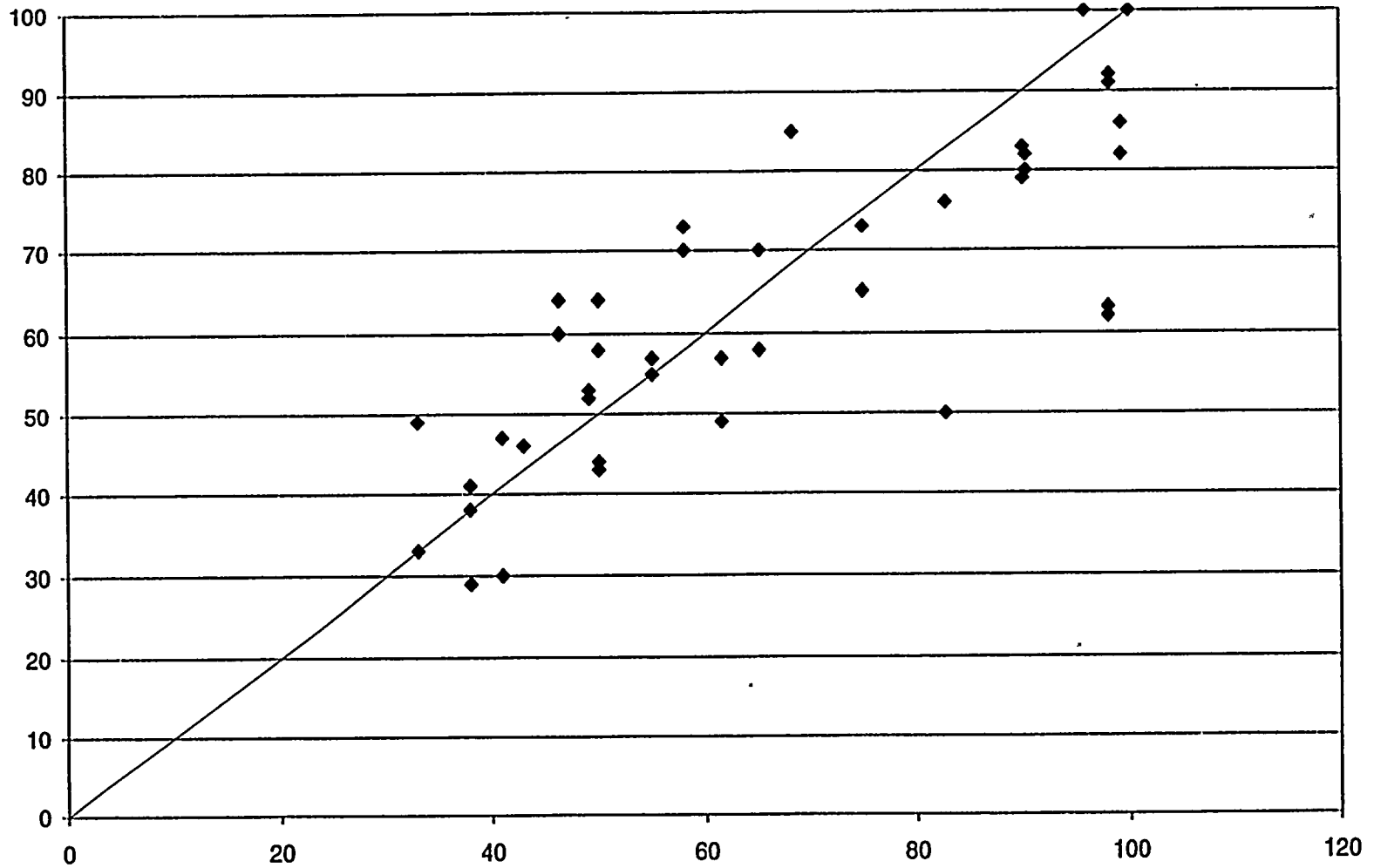


Figure I4-3

Option 1. NDE Results Based on Depth at Maximum Volts for <1.0 Volt and 100% Depth for >4.5 Volt
NDE Maximum Depth vs. Destructive Exam Local Maximum Depth



I-30

I-31

Figure I5-1
Option 2. NDE Results Based on Maximum Depth Adjustment from Depth vs. Voltage Correlation
NDE Average Depth vs. Destructive Exam Average Depth

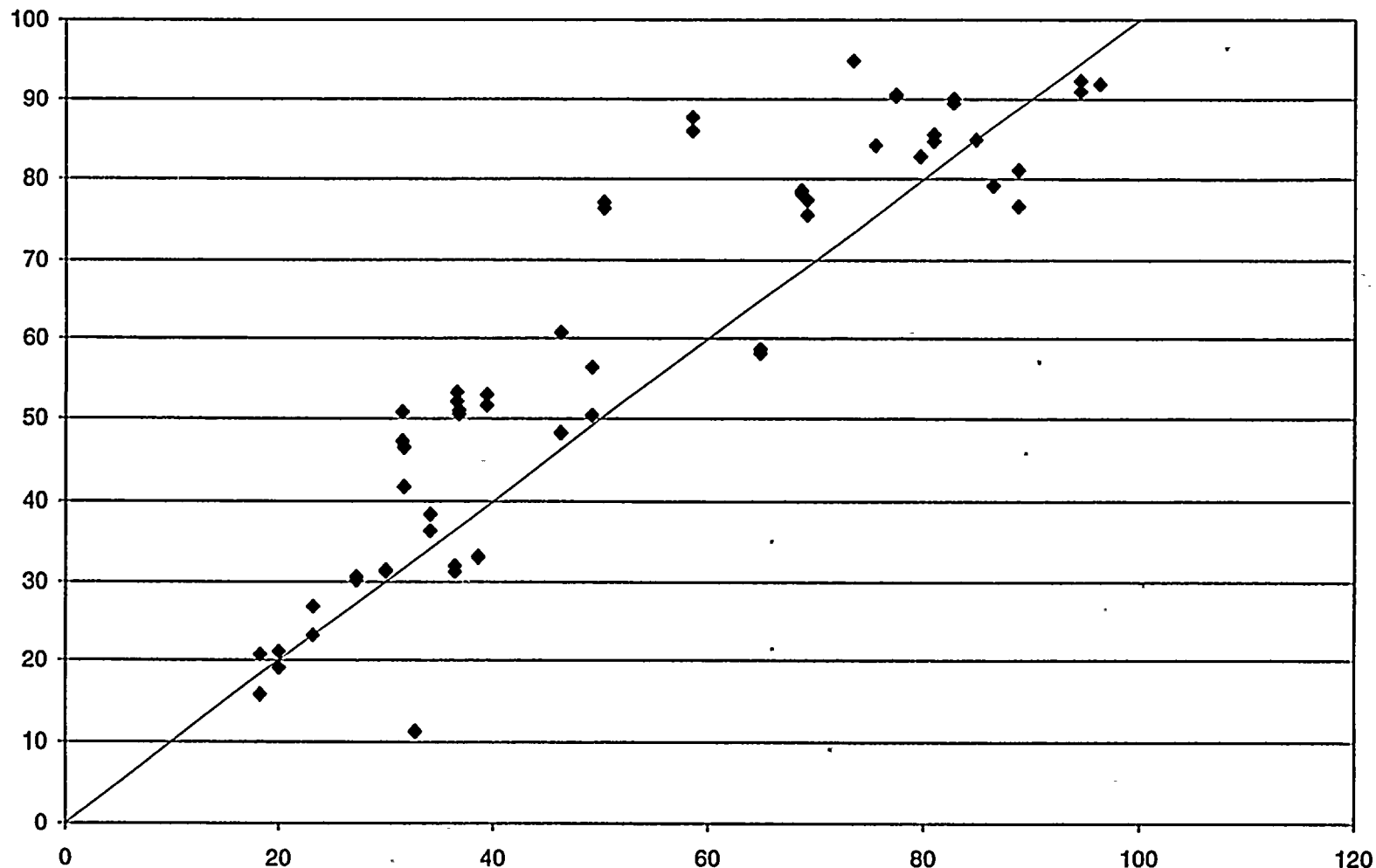
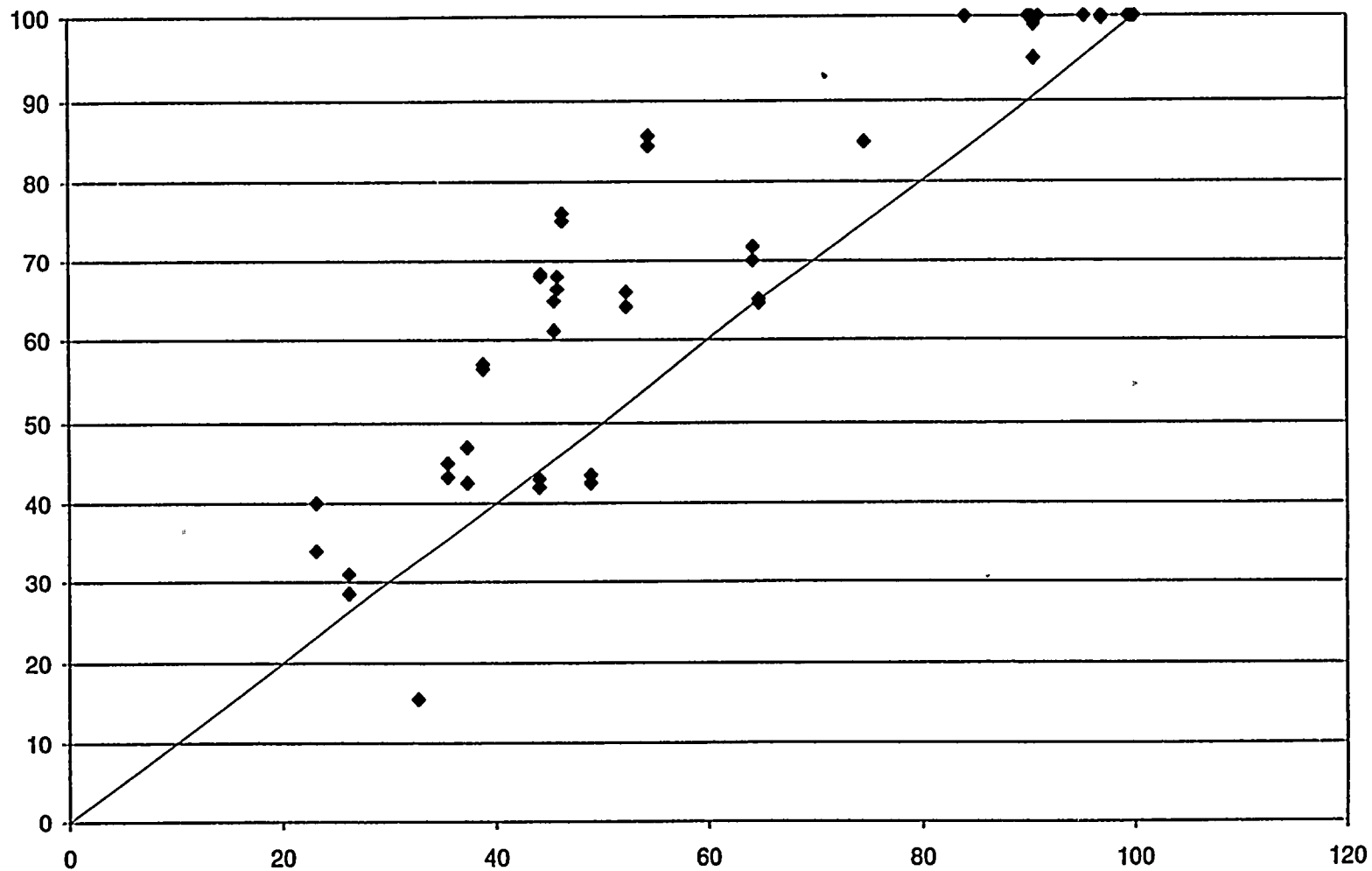


Figure I5-2

Option 2. NDE Results Based on Maximum Depth Adjustment from Depth vs. Voltage Correlation
NDE Maximum Depth vs. Destructive Exam Depth Averaged Over Coil Field (0.16")



I-32

Figure I5-3
Option 2. NDE Results Based on Maximum Depth Adjustment from Depth vs. Voltage Correlation
NDE Maximum Depth vs. Destructive Exam Local Maximum Depth

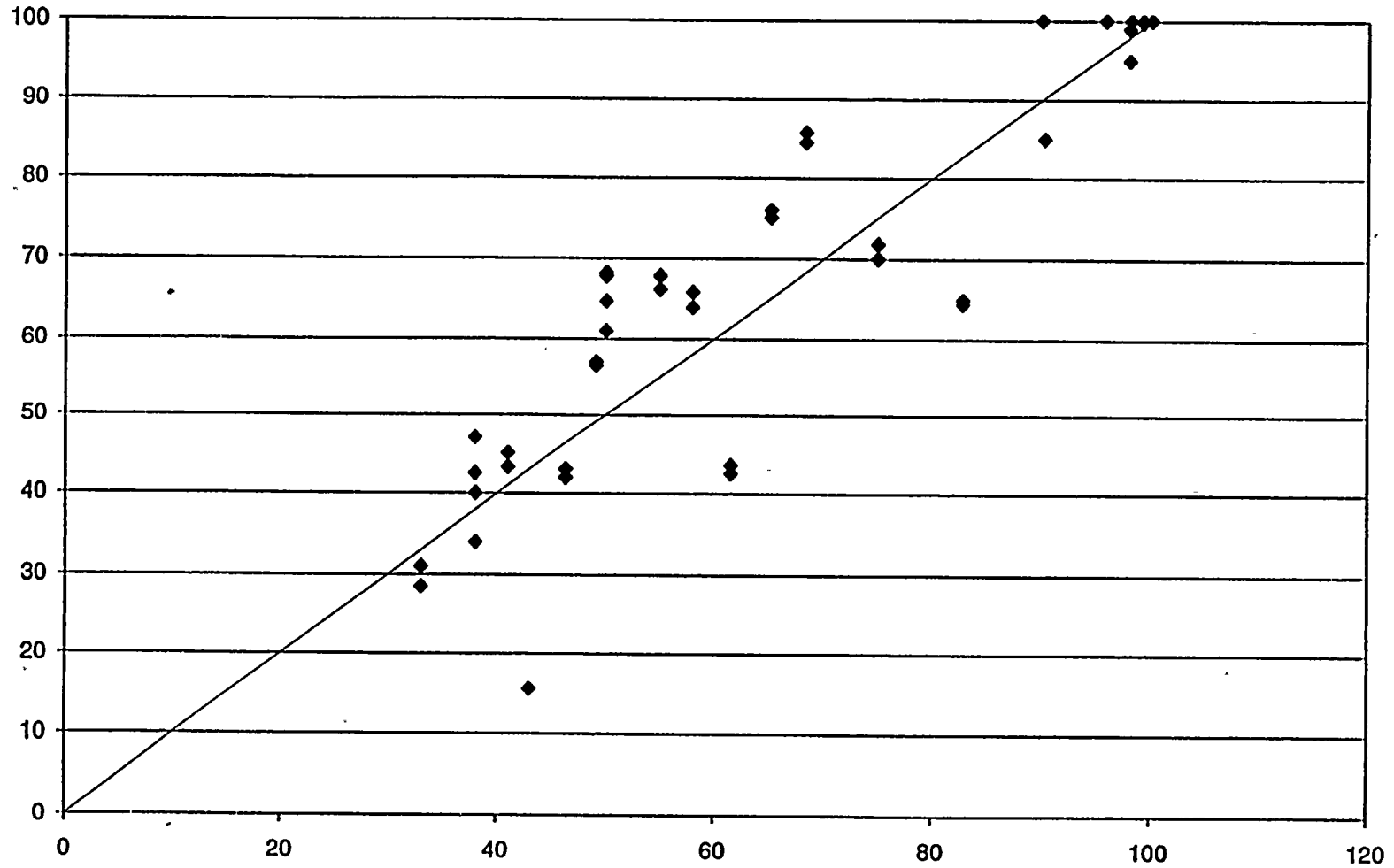
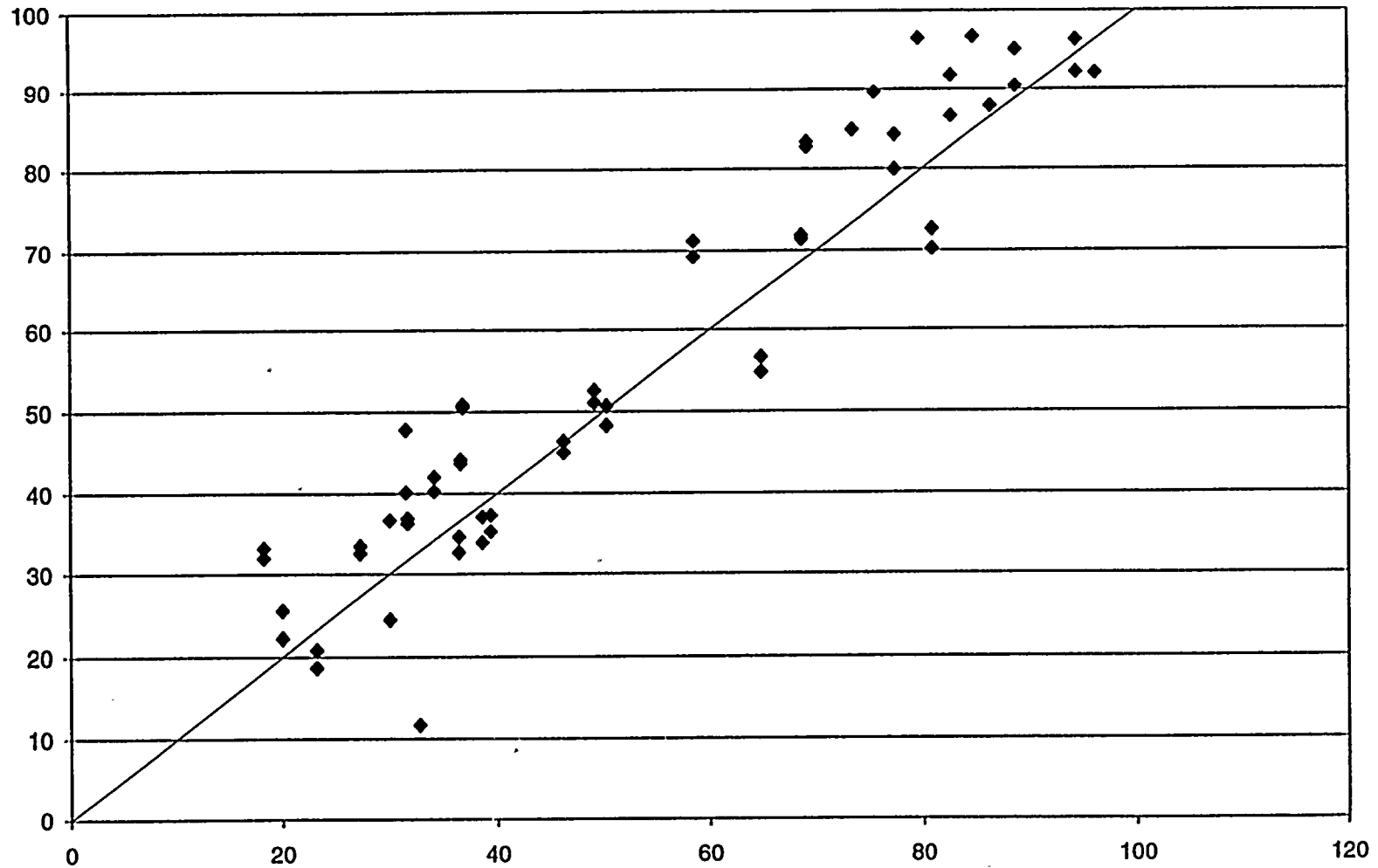


Figure I6-1
Option 3a. NDE Results Obtained from Voltage Profile and Correlation with Depth
for <1.0 Volt and >4.5 Volt Indications
NDE Average Depth vs. Destructive Exam Average Depth



I-34

Figure I6-2
Option 3a. NDE Results Obtained from Voltage Profile and Correlation with Depth
for <1.0 Volt and >4.5 Volt Indications

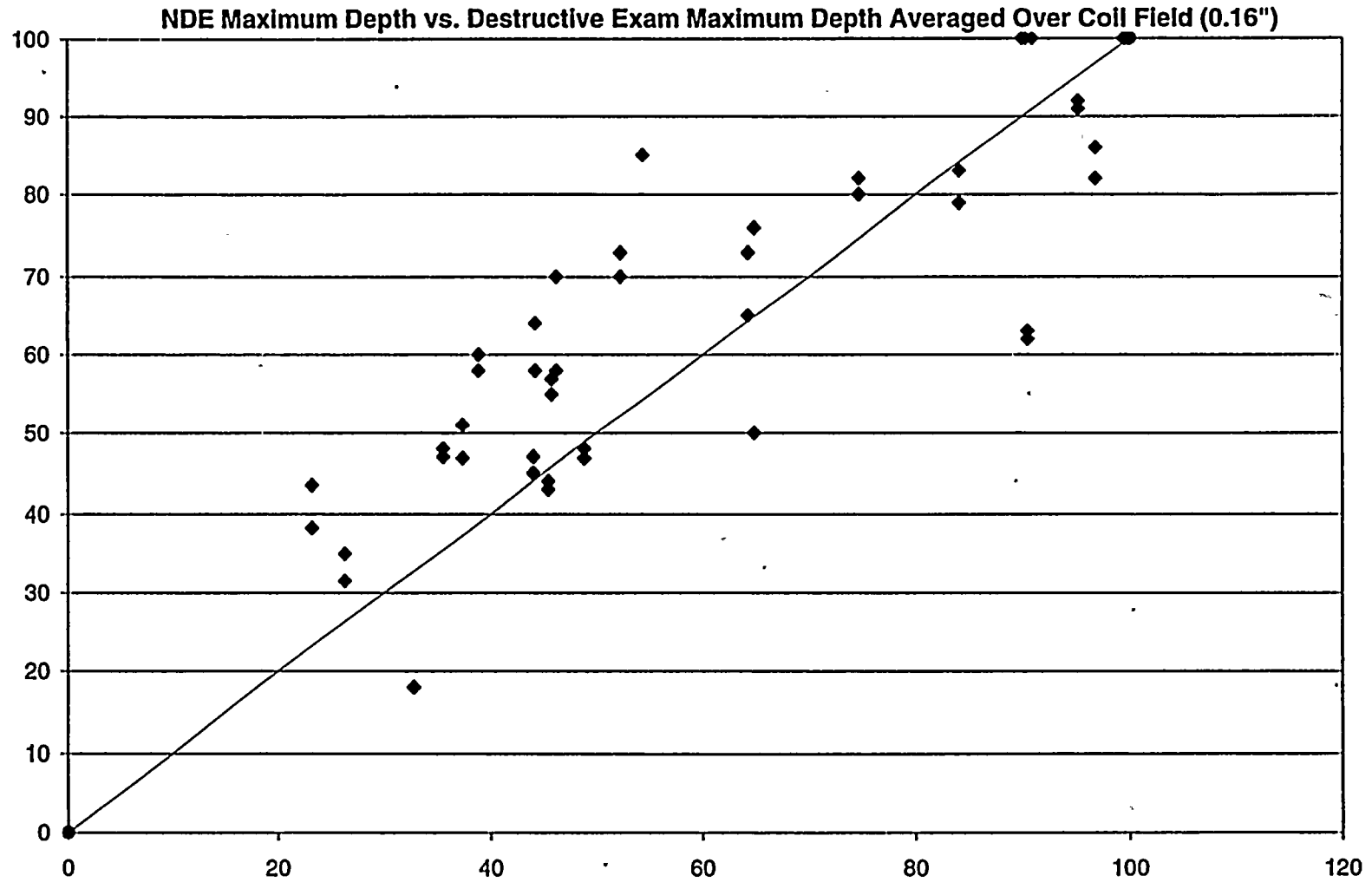
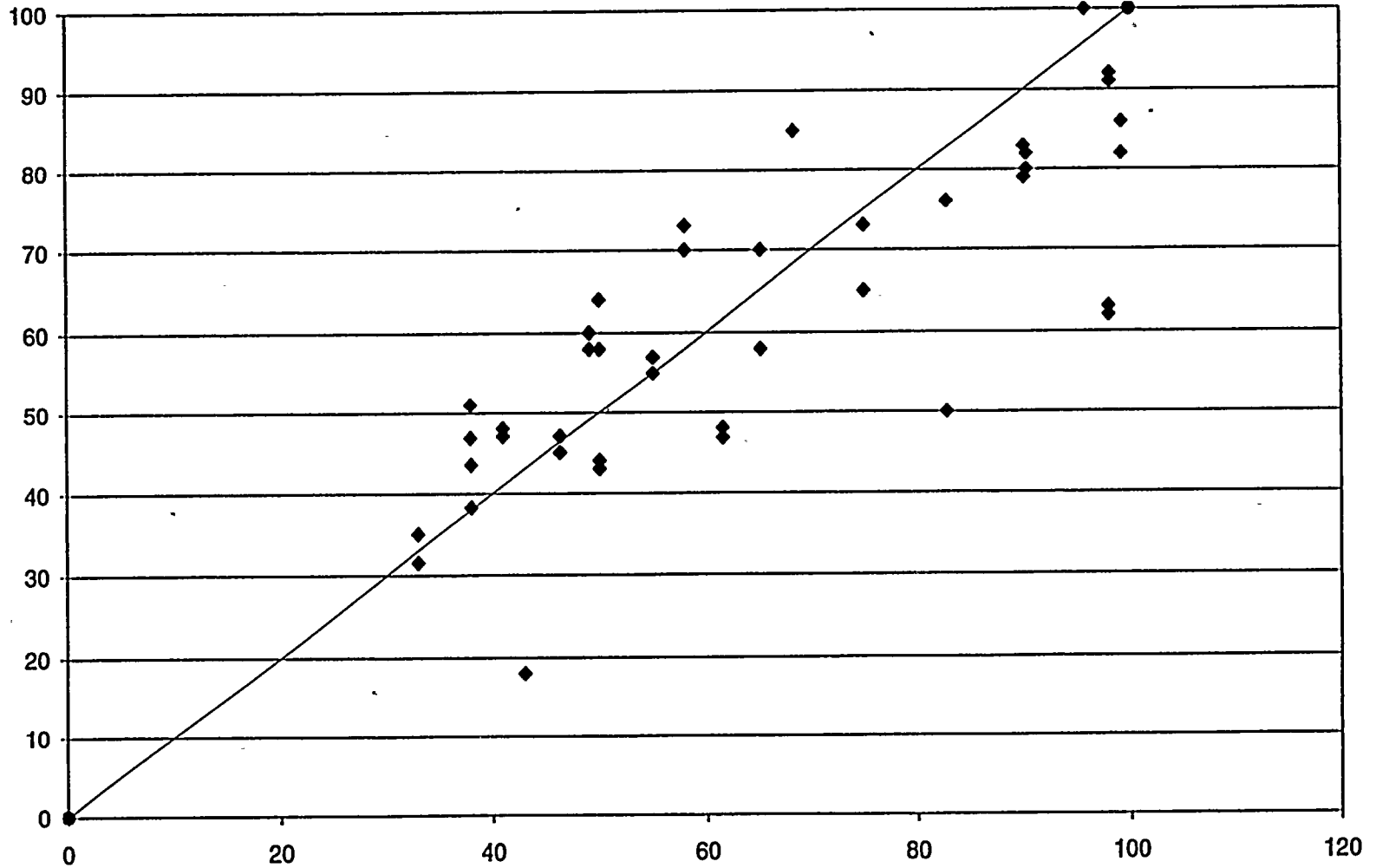


Figure I6-3
Option 3a. NDE Results Obtained from Voltage Profile and Correlation with Depth
for <1.0 Volt and >4.5 Volt Indicators
NDE Maximum Depth vs. Destructive Exam Local Maximum Depth



I-36

I-37

Figure I6-4
Option 3b. Depths Obtained from Voltage Profile and Voltage Correlation
with Depth for All Indications
NDE Average Depth vs. Destructive Exam Average Depth

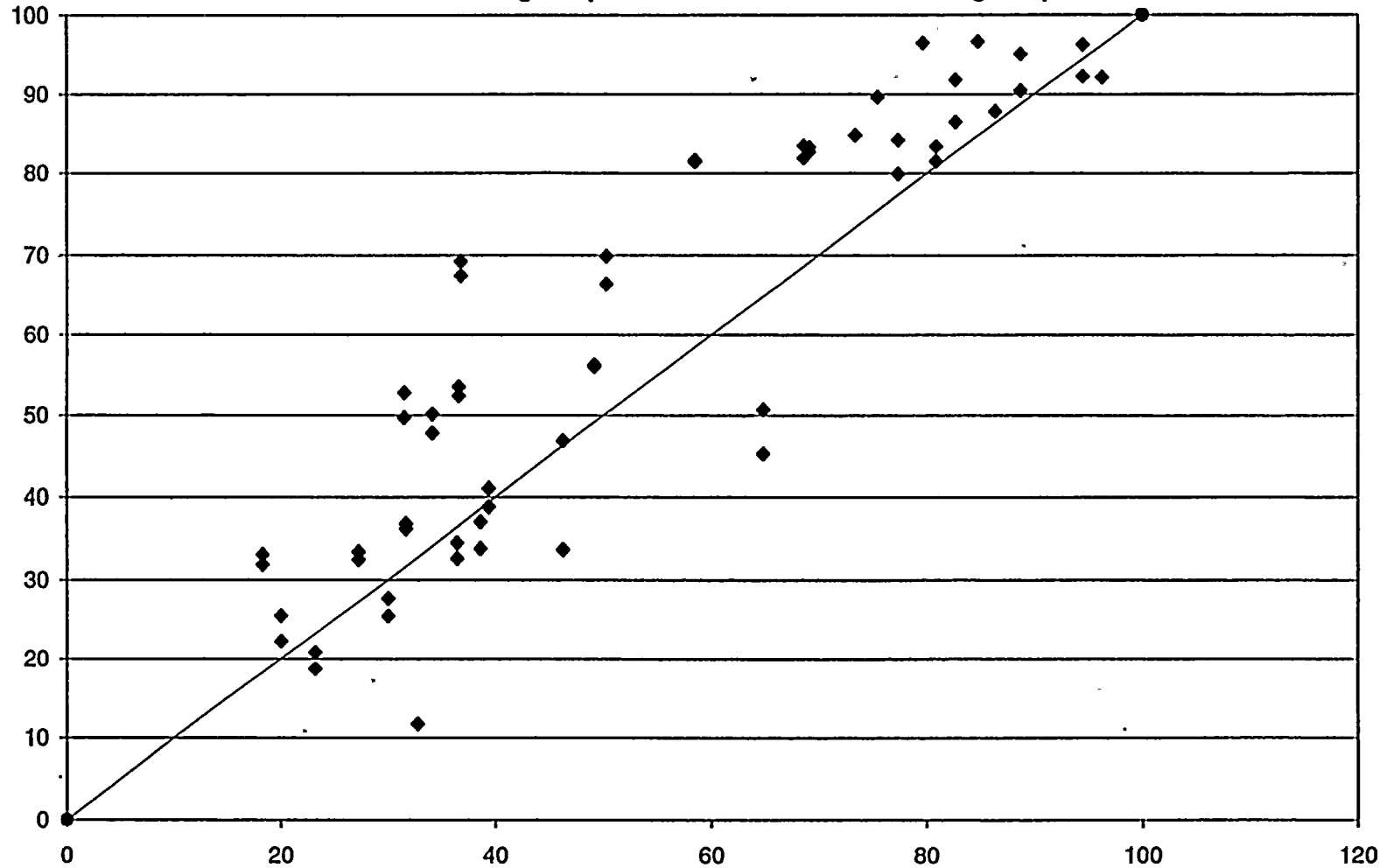
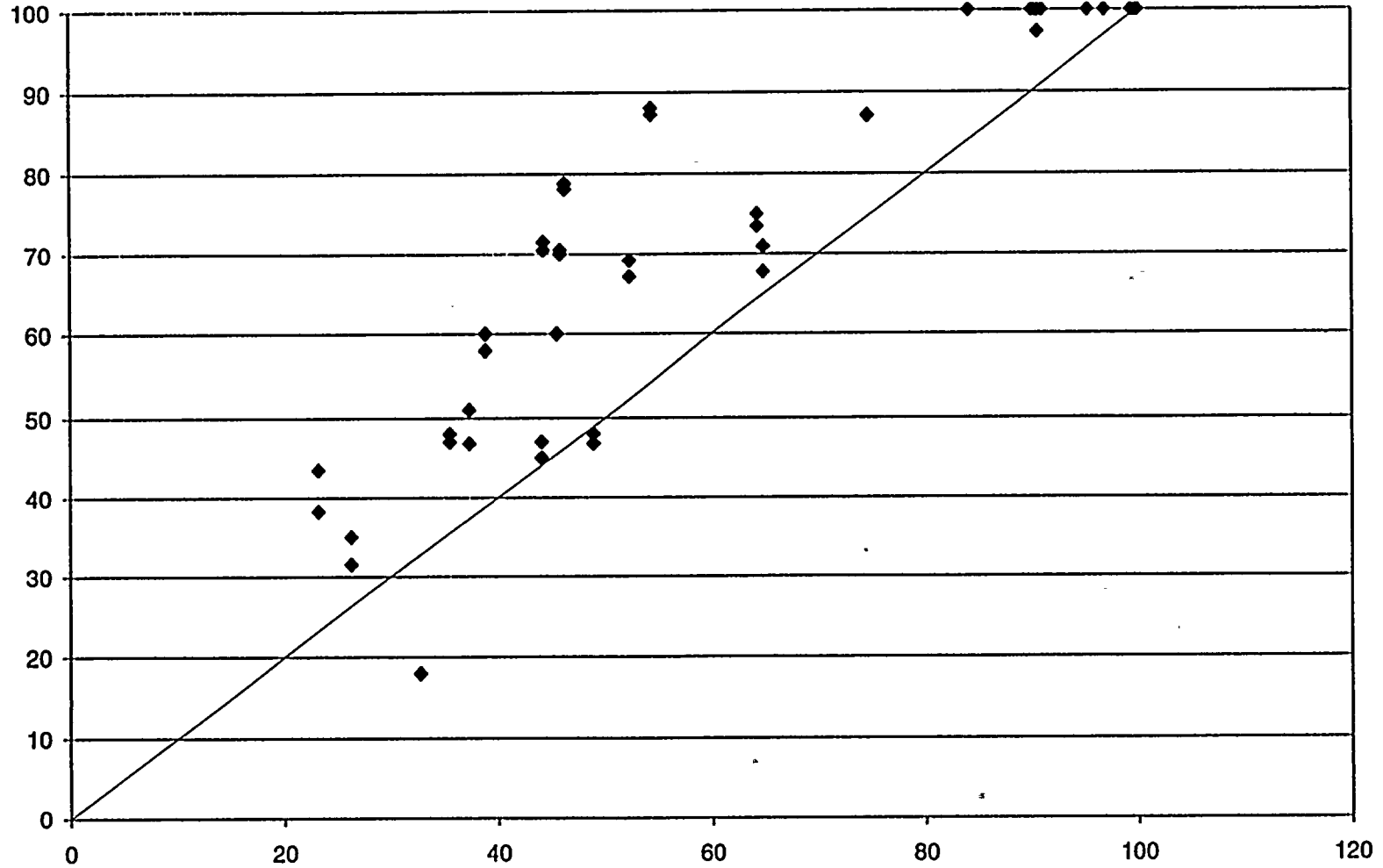
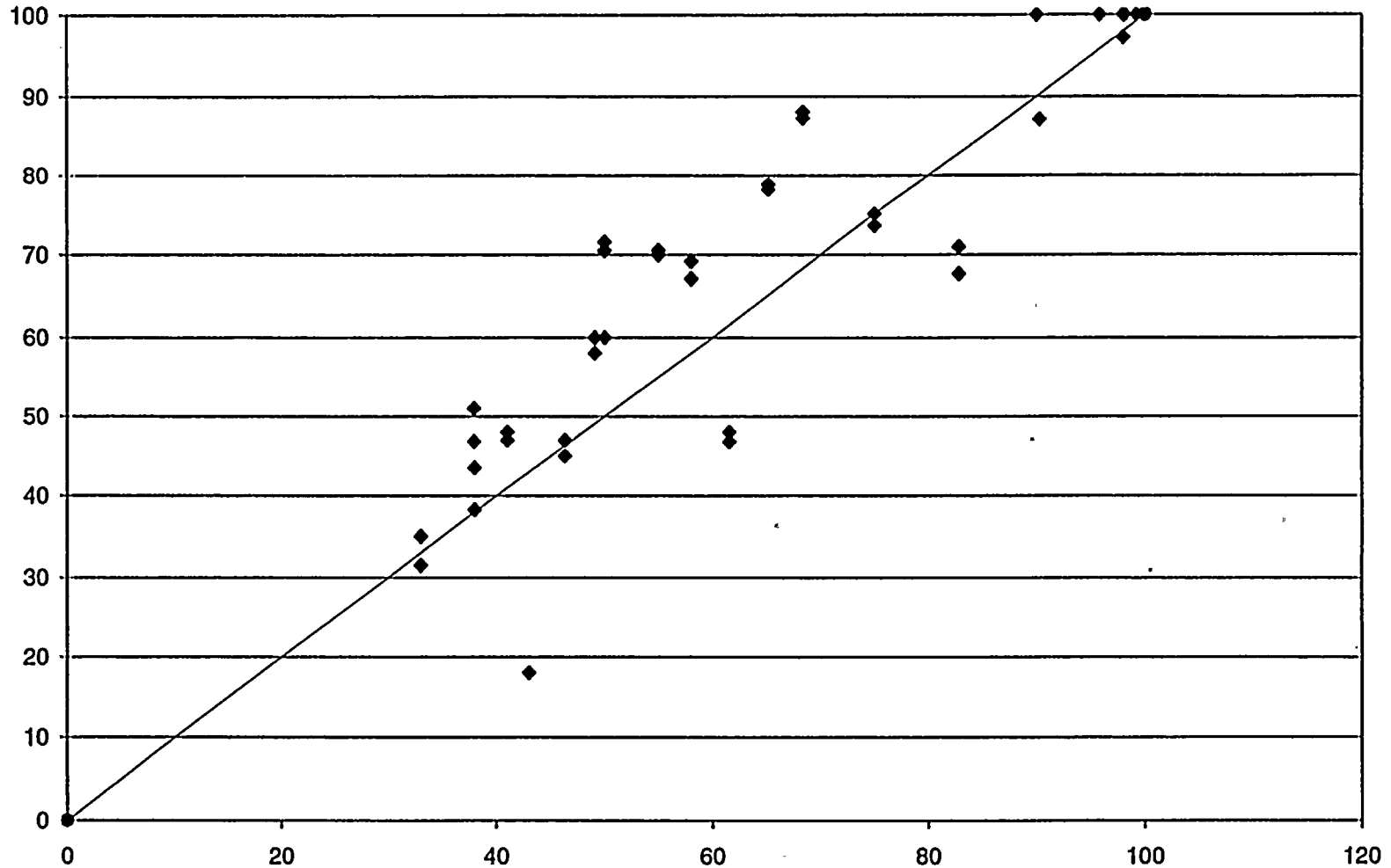


Figure I 6-5
Option 3b. Depths Obtained from Voltage Profile and Voltage Correlation
with Depth for All Indications
NDE Maximum Depth vs. Destructive Exam Maximum Depth Averaged Over Coil Field (0.16")



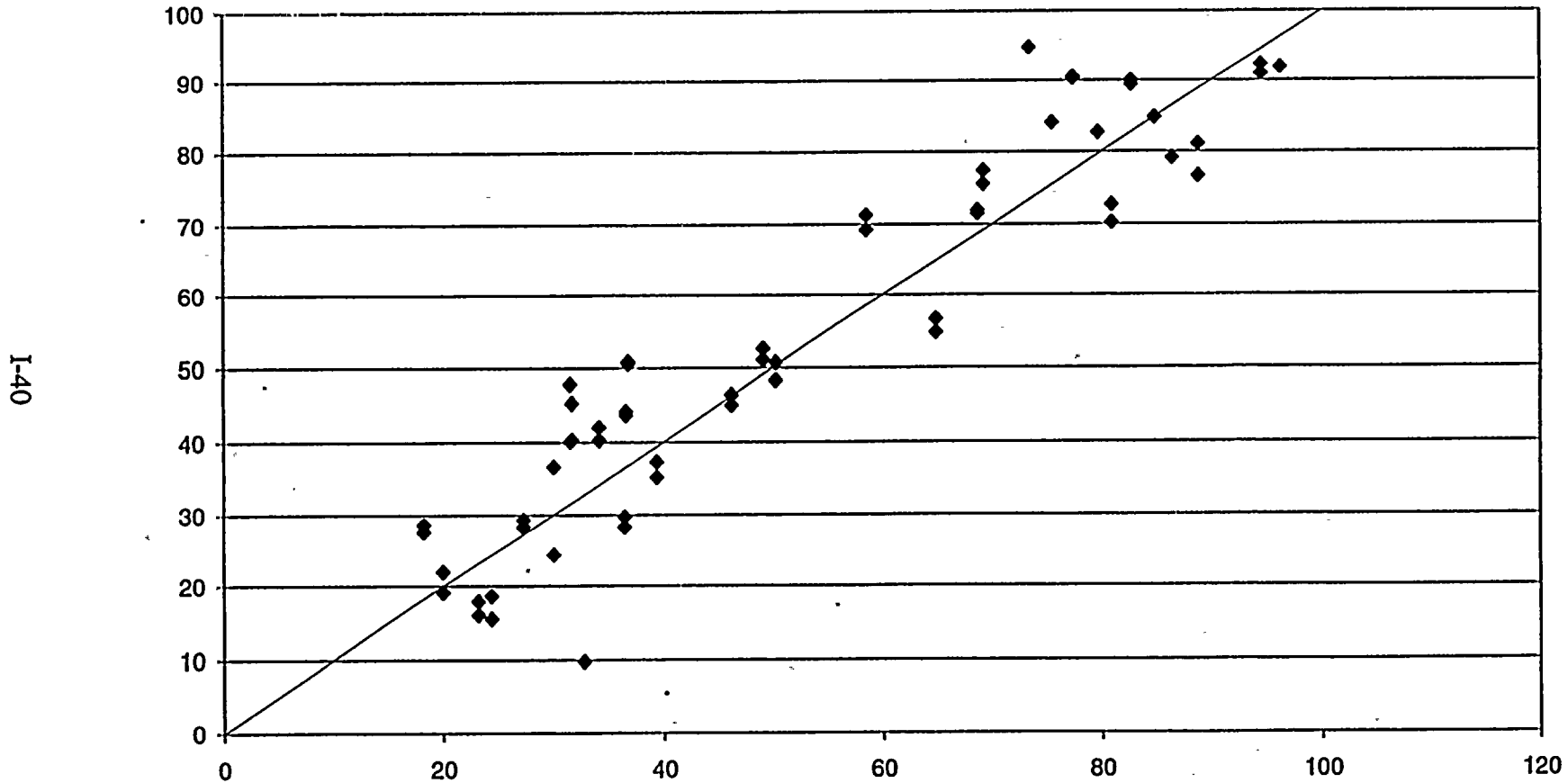
I-38

Figure I6-6
Option 3b. Depths Obtained from Voltage Profile and Voltage Correlation
with Depth for All Indications
NDE Maximum Depth vs. Destructive Exam Local Maximum Depth



I-39

Figure I7-1
Option 4a. Depths Based on Depth/Volt Correlation for <1.0 Volt Indications (Depth = 60V%)
and Adjustment to 100% Depth for >4.5 Volt Indications
NDE Average Depth vs. Destructive Exam Average Depth



I-41

Figure 17-2
Option 4a. Depths Based on Depth/Volt Correlation for <1.0 Volt Indications (Depth = 60V%)
and Adjustment to 100% Depth for >4.5 Volt Indications
NDE Max. Depth vs. Destructive Exam Max. Depth Averaged Over Coil Field (0.16")

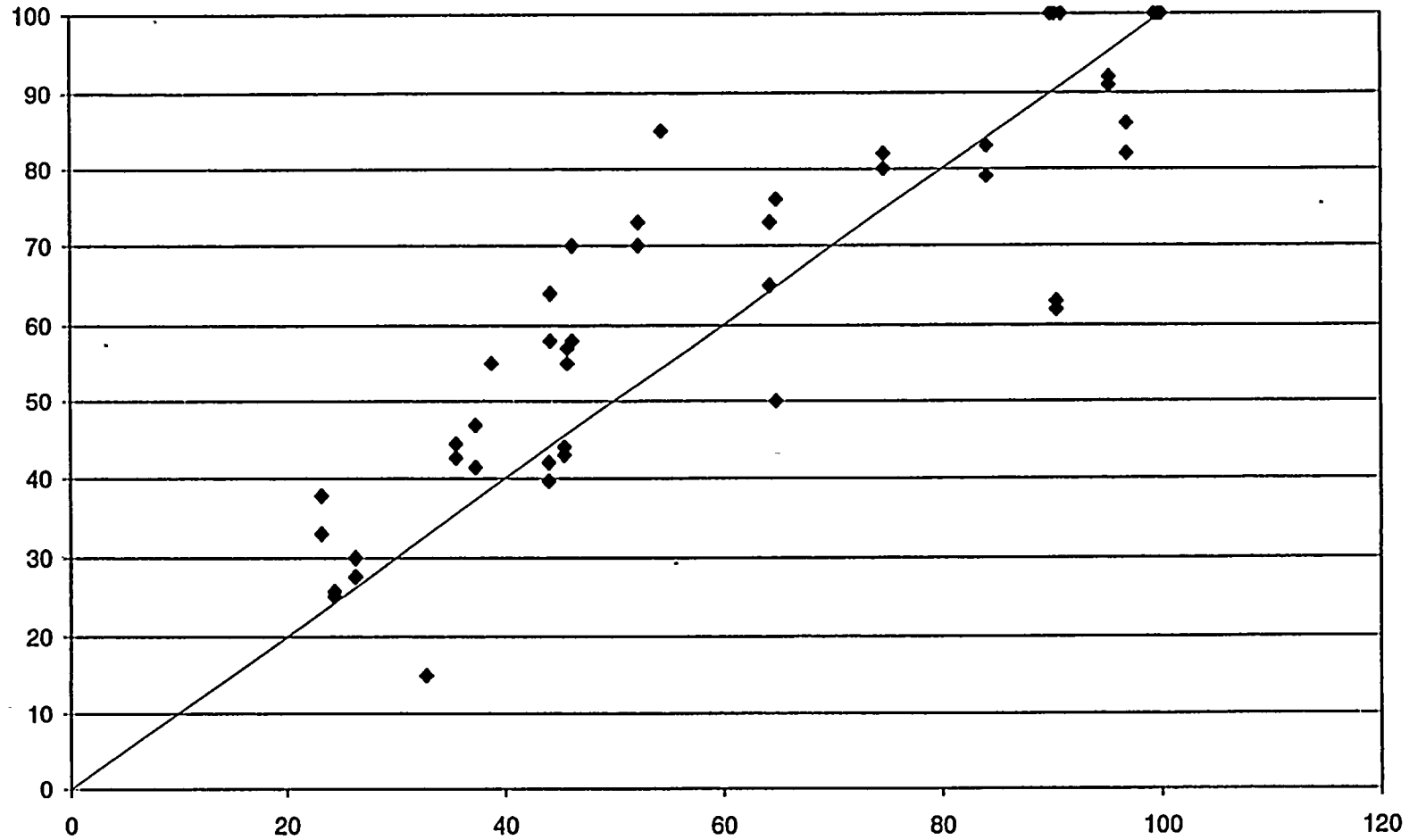
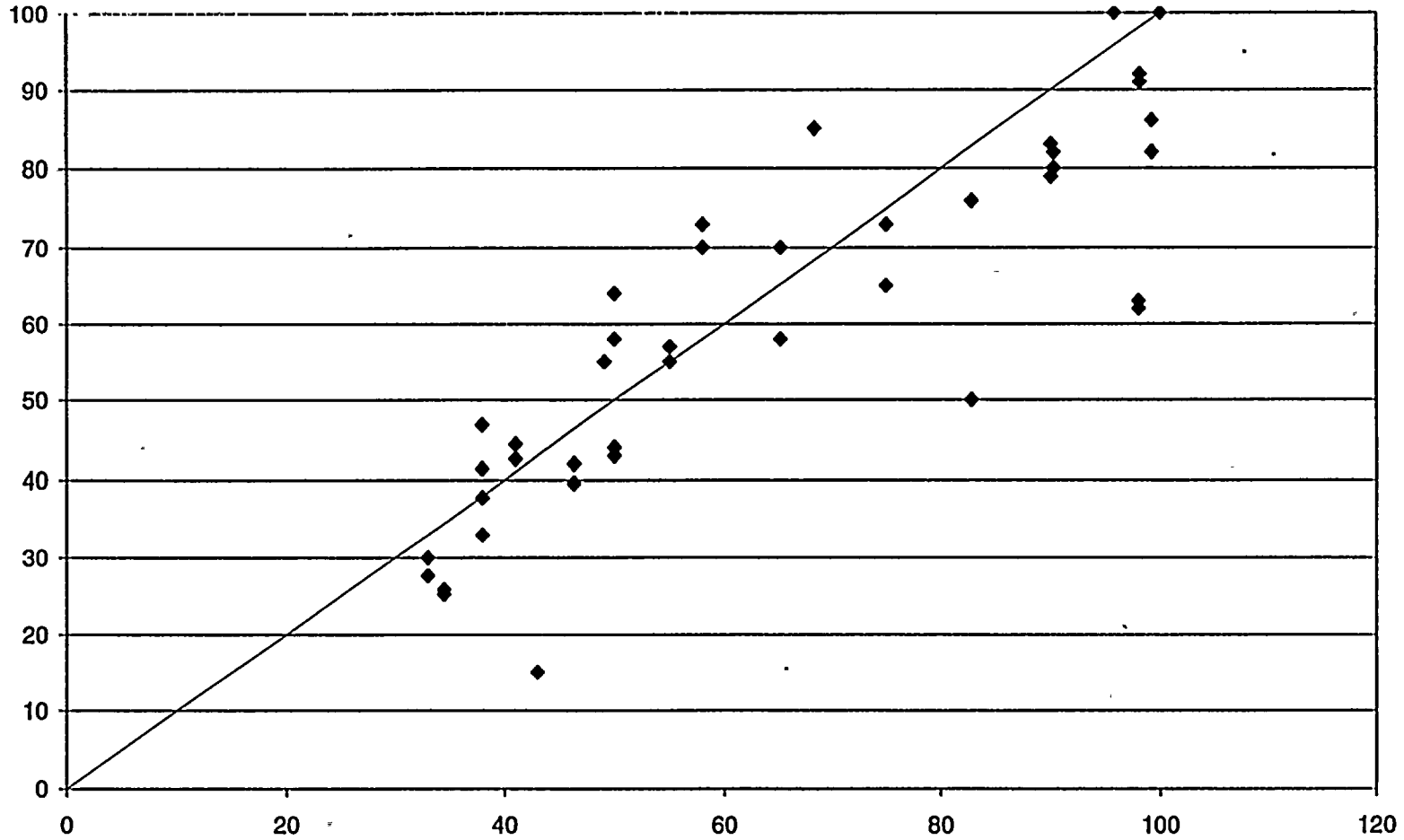
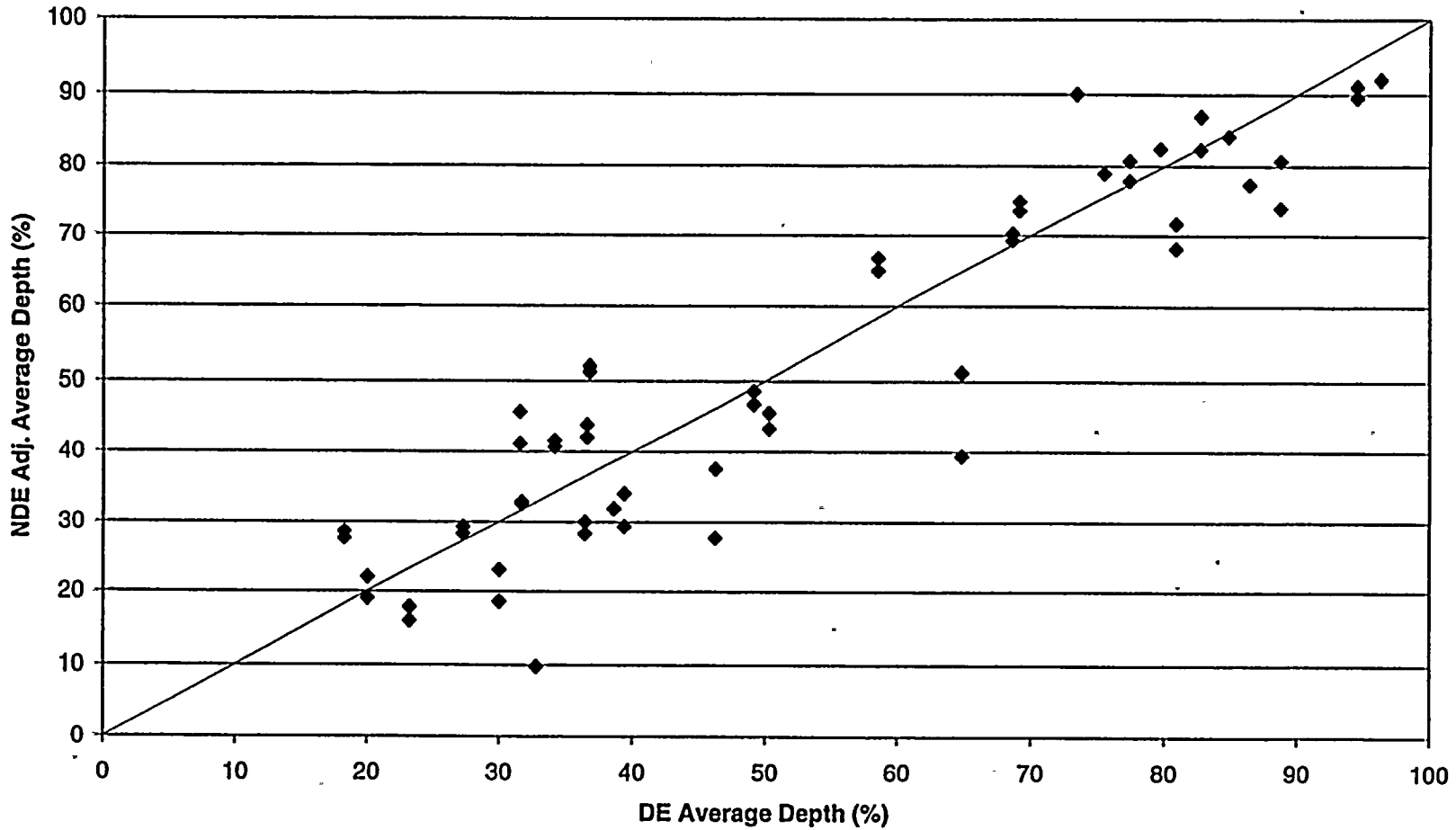


Figure I7-3
Option 4a. Depths Based on Depth/Volt Correlation for <1.0 Volt Indications (Depth = 60V%)
and Adjustment to 100% Depth for >4.5 Volt Indications
NDE Maximum Depth vs. Destructive Exam Local Maximum Depth



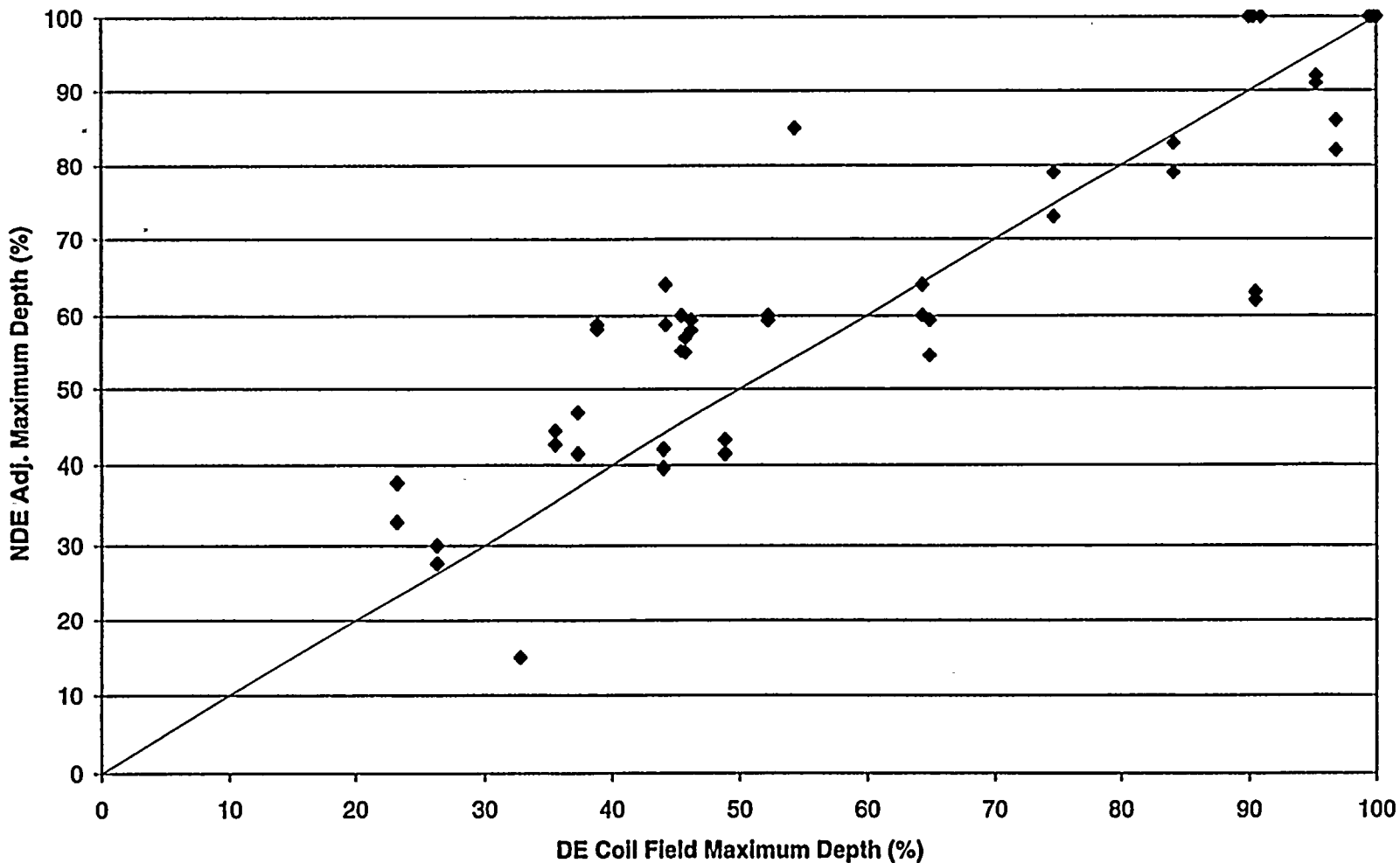
I-42

Figure I7-4
Option 4b. Depths Based on Depth/Volt Correlation (Depth=60V%)
at ≤ 1.0 Volt for All Indications and Adjustments to 100% Depth for >4.5 Volt Indications
NDE Average Depth vs. Destructive Exam Average Depth



I-43

Figure I7-5
Option 4b. Depths Based on Depth/Volt Correlation (Depth=60V%)
at ≤ 1.0 Volt for All Indications and Adjustments to 100% Depth for >4.5 Volt Indications
NDE Maximum Depth vs. Destructive Exam Maximum Depth Averaged Over Coil Field (0.16")



I-44

I-45

Figure I7-6
Option 4b. Depths Based on Depth/Volt Correlation (Depth=60V%)
at ≤ 1.0 Volt for All Indications and Adjustments to 100% Depth for >4.5 Volt Indications
NDE Maximum Depth vs. Destructive Exam Local Maximum Depth

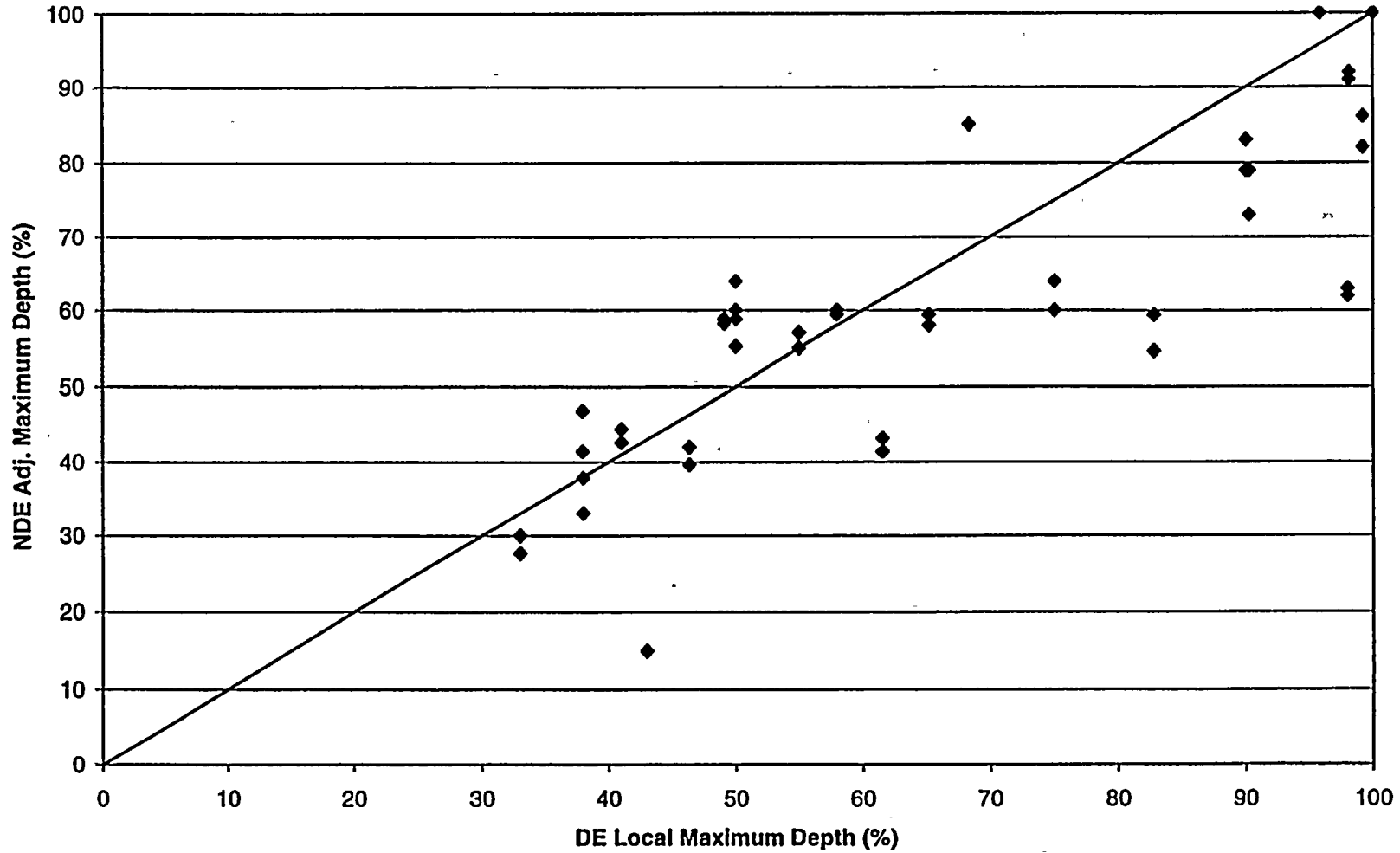


Figure I8-1
Option 5a. Depths Adjusted by Voltage Ratio ($D_v = D_{max\ volts} * V/V_{max}$) for ≤ 1 Volt Indications
and Adjustments to 100% Depth for >4.5 Volt Indications
NDE Average Depth vs. Destructive Exam Average Depth

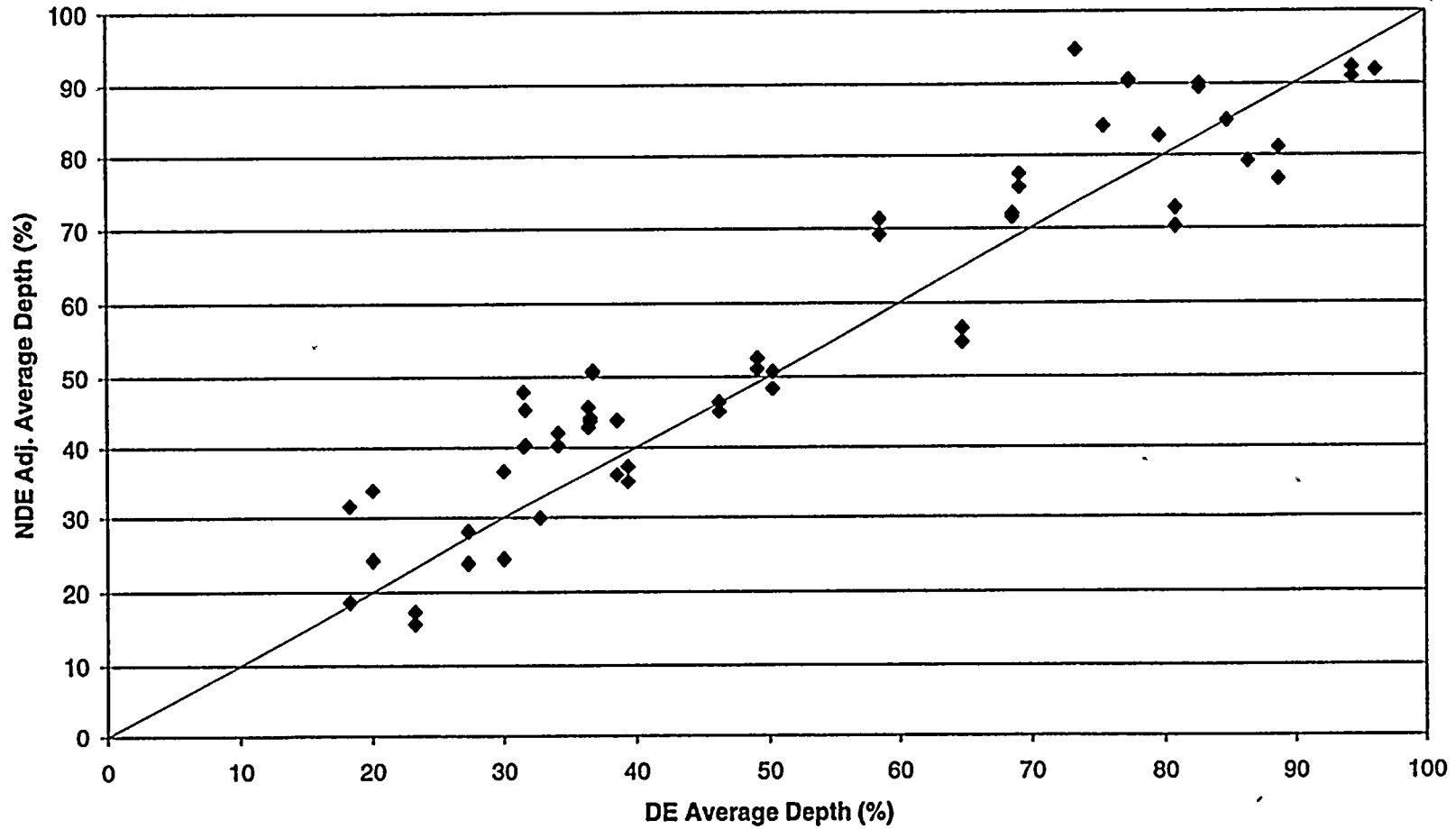
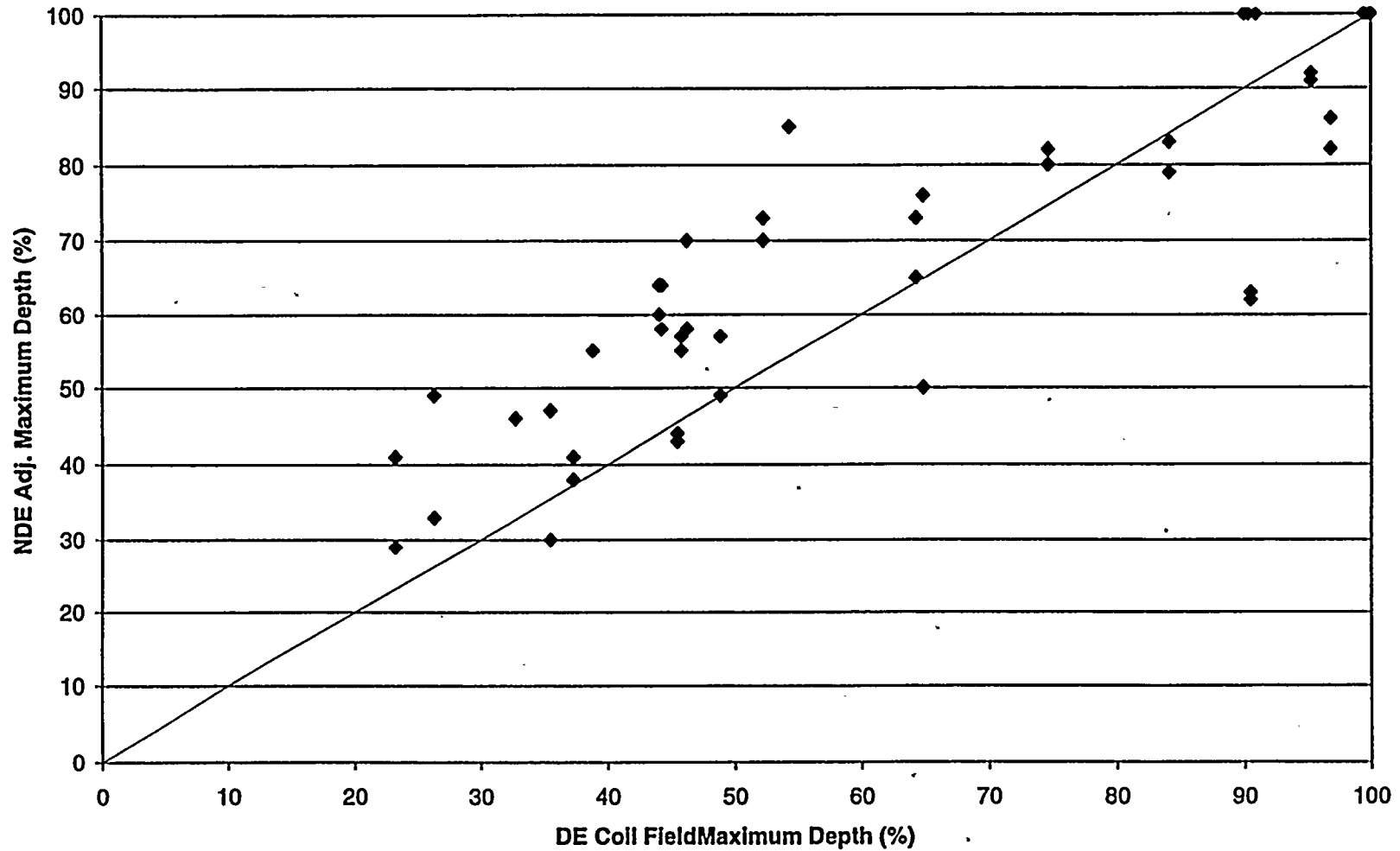


Figure I8-2

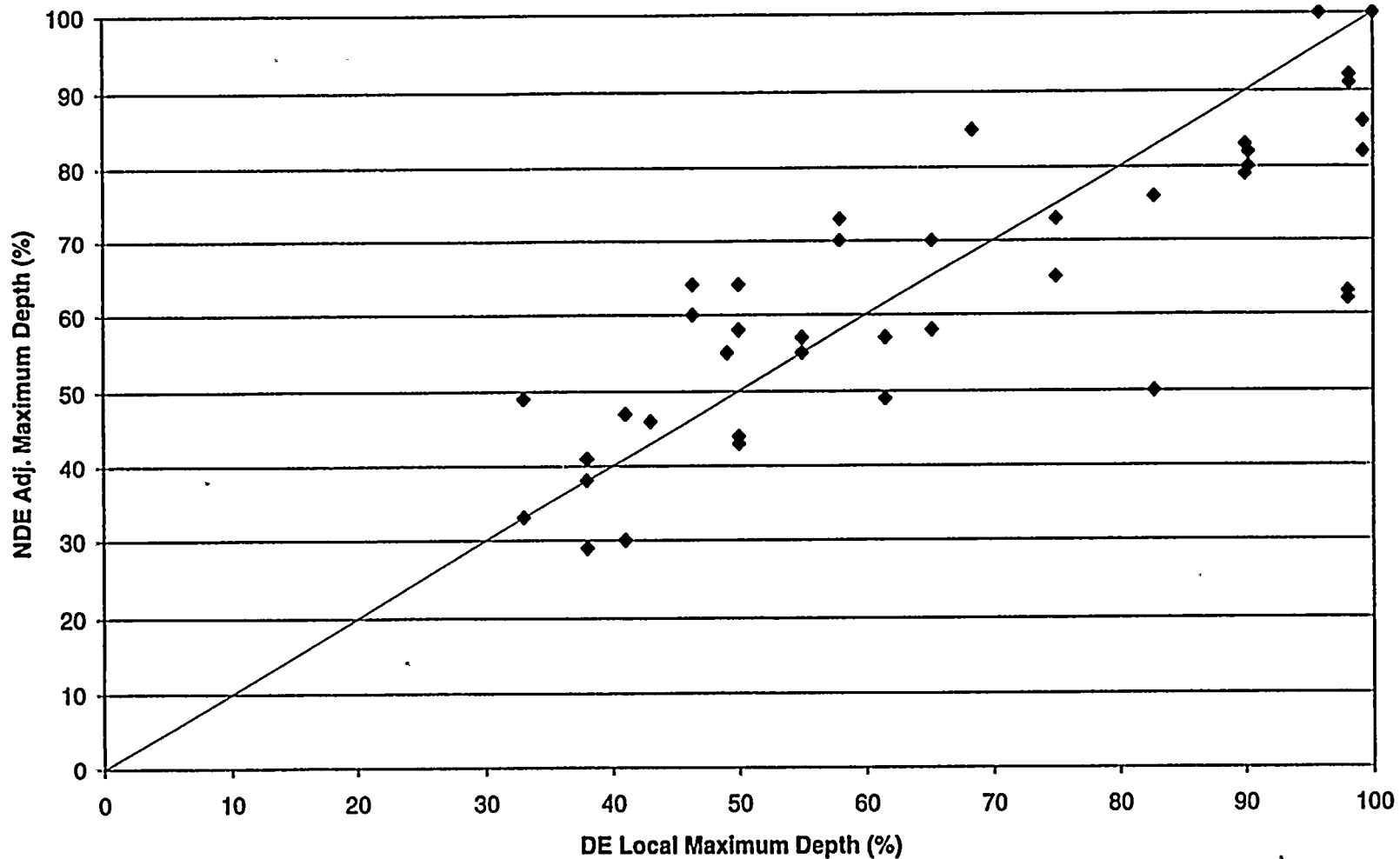
Option 5a. Depths Adjusted by Voltage Ratio ($D_v = D_{\text{max volts}} * V/V_{\text{max}}$) for ≤ 1 Volt Indications
and Adjustments to 100% Depth for >4.5 Volt Indications

NDE Max. Depth vs. Destructive Exam Max. Depth Averaged Over Coil Field (0.16")



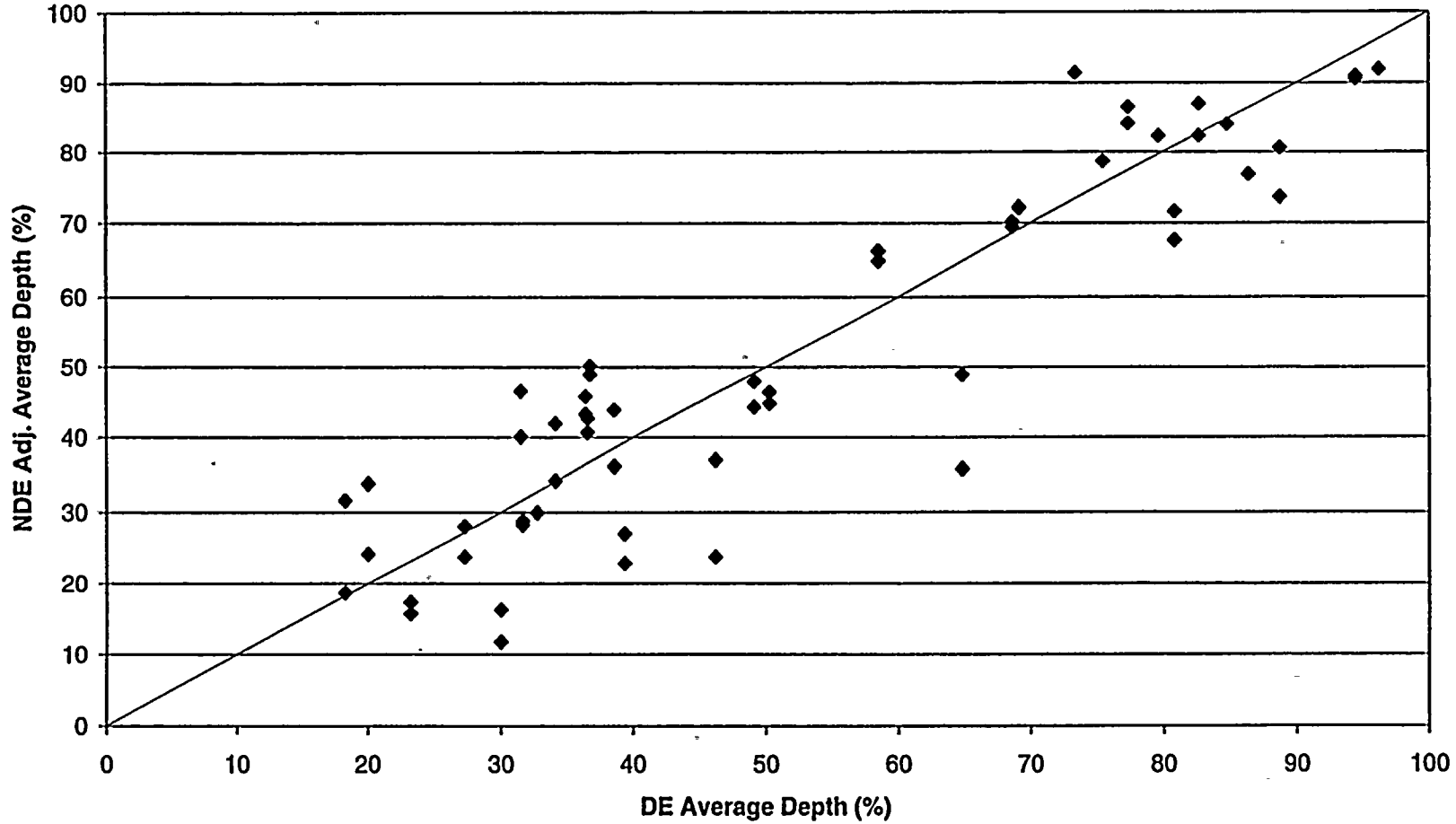
I-47

Figure I8-3
Option 5a. Depths Adjusted by Voltage Ratio ($D_v = D_{\text{max volts}} * V/V_{\text{max}}$) for ≤ 1 Volt Indications
and Adjustments to 100% Depth for >4.5 Volt Indications
NDE Maximum Depth vs. Destructive Exam Local Maximum Depth



I-48

Figure I8-4
Option 5b. Depths Adjusted by Voltage Ratio ($D_{volts}=D_{v-1.0} * V/V_{-1.0}$)
at ≤ 1 Volt for All Indications and Adjustments to 100% Depth for >4.5 Volt Indications
NDE Average Depth vs. Destructive Exam Average Depth



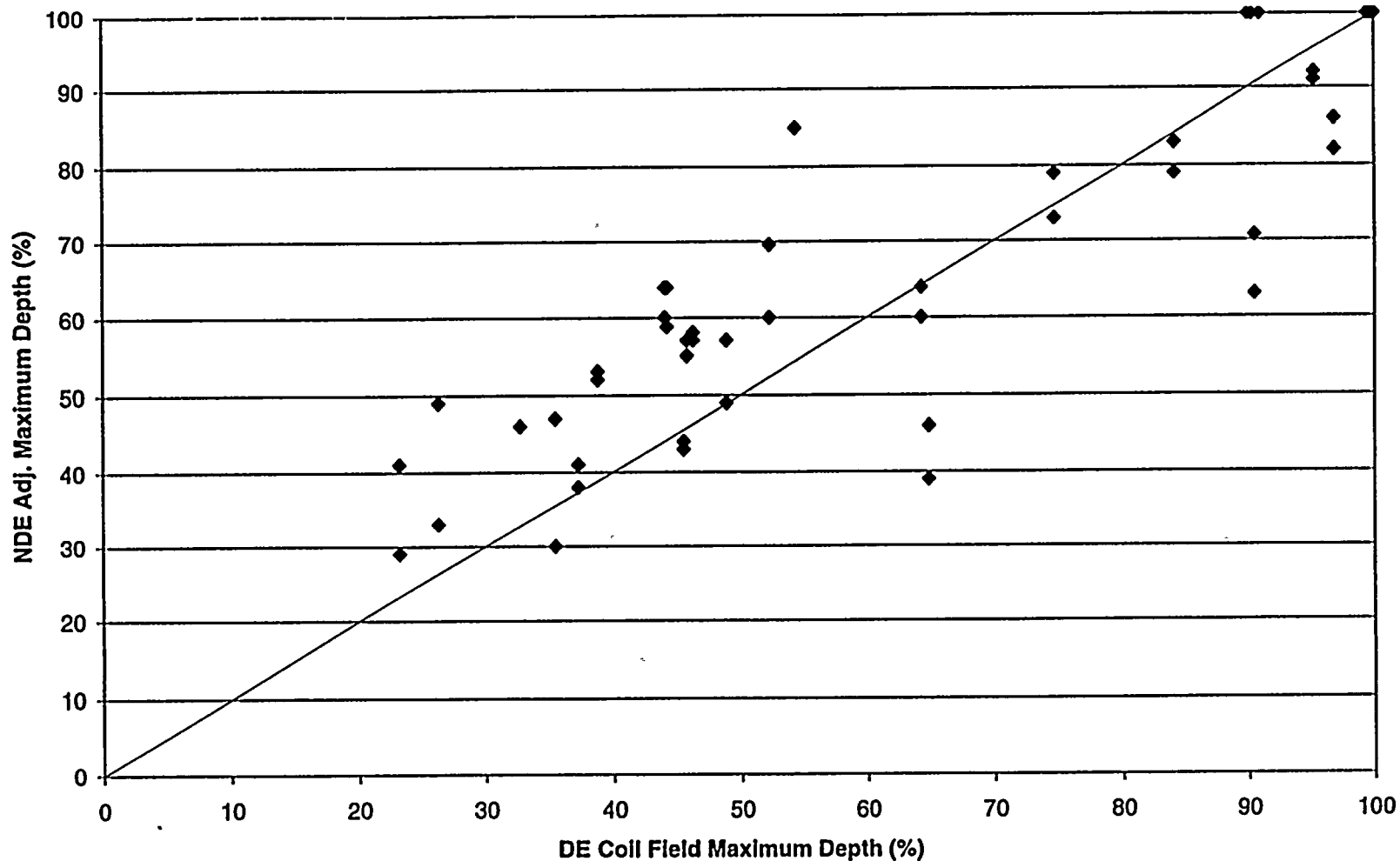
I-49

Figure I8-5

Option 5b. Depths Adjusted by Voltage Ratio ($D_{\text{volts}} = D_{V=1.0} * V/V_{-1.0}$)

at ≤ 1 Volt for All Indications and Adjustments to 100% Depth for >4.5 Volt Indications

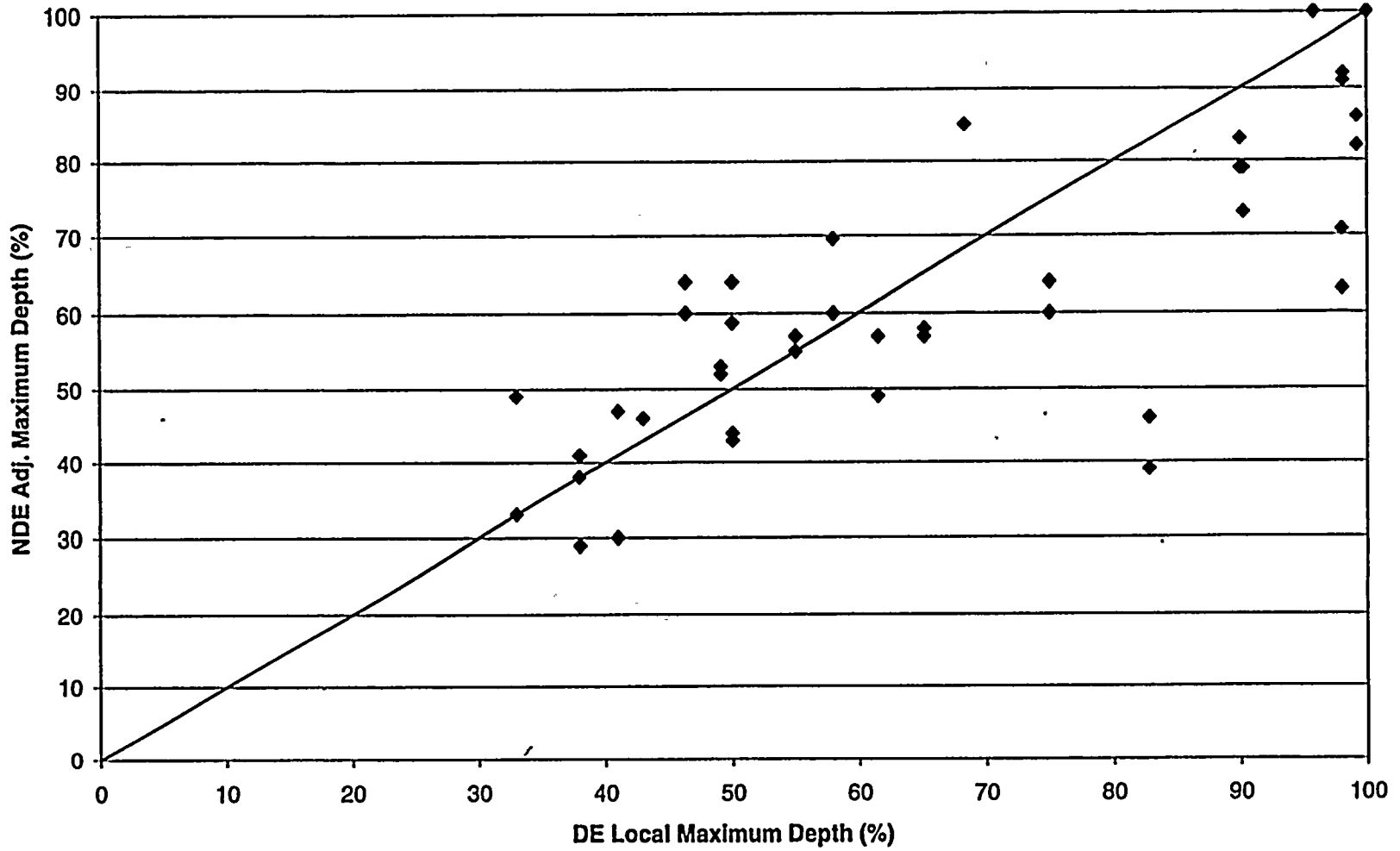
NDE Maximum Depth vs. Destructive Exam Maximum Depth Averaged Over Coil Field (0.16")



I-50

I-51

Figure I 8-6
Option 5b. Depths Adjusted by Voltage Ratio ($D_{volts} = D_{v-1.0} * V/V_{-1.0}$)
at ≤ 1 Volt for All Indications and Adjustments to 100% Depth for >4.5 Volt Indications
NDE Maximum Depth vs. Destructive Exam Local Maximum Depth





Appendix J

NDE Analyses for +Point Coil Depth Profiles without Destructive Exam Data

Footnotes:

1. Length adjustment procedure applied.
2. No length adjustment required
3. Depth adjustment procedure applied.
4. No depth adjustment required
5. Zero depth added



Table J-1
Laboratory Specimen
NDE Analysis Sample 1 - 1H

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
				0.00	-0.35	0
-0.33	23	0.14	8	0.14	-0.33	23
-0.31	34	0.39	12	0.39	-0.31	34
-0.29	34	0.73	12	0.73	-0.29	34
-0.27	40	1.00	14	1.00	-0.27	40
-0.25	46	1.10	16	1.10	-0.25	46
-0.23	49	1.04	17	1.04	-0.23	49
-0.21	49	0.93	17	0.93	-0.21	49
-0.18	46	0.91	16	0.91	-0.18	46
-0.16	49	1.02	17	1.02	-0.16	49
-0.14	52	1.21	18	1.21	-0.14	52
-0.12	49	1.33	17	1.33	-0.12	49
-0.1	46	1.04	16	1.04	-0.10	46
-0.08	59	0.60	20	0.60	-0.08	59
-0.06	71	0.45	24	0.45	-0.06	71
-0.04	87	0.64	29	0.64	-0.04	87
-0.01	100	0.87	33	0.87	-0.01	100
0.01	99	1.00	35	1.00	0.01	99
0.03	84	1.21	28	1.21	0.03	84
0.05	65	1.56	22	1.56	0.05	65
0.07	56	2.02	19	2.02	0.07	56
0.09	59	2.38	20	2.38	0.09	59
0.11	59	2.60	20	2.60	0.11	59
0.14	62	2.47	21	2.47	0.14	62
0.16	65	2.54	22	2.54	0.16	65
0.18	65	2.86	22	2.86	0.18	65
0.2	62	2.92	21	2.92	0.20	62
0.22	62	2.85	21	2.85	0.22	62
0.24	65	2.66	22	2.66	0.24	65
0.26	65	2.70	22	2.70	0.26	65
0.29	65	2.55	22	2.55	0.29	65
0.31	59	2.02	20	2.02	0.31	59
0.33	52	1.33	18	1.33	0.33	52
0.35	46	0.88	16	0.88	0.35	46
0.37	46	0.47	16	0.47	0.37	46
0.39	98	0.19	36	0.19	0.39	0
0.41	94	0.14	43			
0.43	96	0.11	39			
0.46	92	0.11	45			
0.48	92	0.08	46			
0.50	88	0.06	51			

Max. Volts 2.92
 Max. Depth (%) 100.00
 Length (in.) 0.74
 Avg. Depth (%) 56.84

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
				0.00	-0.33	0
-0.33	0	0.00	0	0.00	-0.33	0
-0.31	35	0.38	12	0.38	-0.31	35
-0.29	35	0.71	12	0.71	-0.29	35
-0.26	38	0.98	13	0.98	-0.26	38
-0.24	44	1.07	15	1.07	-0.24	44
-0.22	47	1.02	16	1.02	-0.22	47
-0.20	49	0.90	17	0.90	-0.20	49
-0.18	47	0.89	16	0.89	-0.18	47
-0.15	49	1.00	17	1.00	-0.15	49
-0.13	52	1.17	18	1.17	-0.13	52
-0.11	49	1.30	17	1.30	-0.11	49
-0.09	47	1.01	16	1.01	-0.09	47
-0.07	58	0.59	20	0.59	-0.07	58
-0.05	70	0.44	24	0.44	-0.05	70
-0.02	85	0.62	29	0.62	-0.02	85
0.00	97	0.84	33	0.84	0.00	97
0.02	100	0.98	35	0.98	0.02	100
0.04	82	1.18	28	1.18	0.04	82
0.06	64	1.52	22	1.52	0.06	64
0.09	55	1.97	19	1.97	0.09	55
0.11	58	2.32	20	2.32	0.11	58
0.13	58	2.53	20	2.53	0.13	58
0.15	61	2.41	21	2.41	0.15	61
0.17	64	2.47	22	2.47	0.17	64
0.19	61	2.79	21	2.79	0.19	61
0.22	61	2.86	21	2.86	0.22	61
0.24	61	2.80	21	2.80	0.24	61
0.26	64	2.63	22	2.63	0.26	64
0.28	64	2.65	22	2.65	0.28	64
0.30	61	2.51	21	2.51	0.30	61
0.33	55	1.98	19	1.98	0.33	55
0.35	52	1.30	18	1.30	0.35	52
0.37	47	0.85	16	0.85	0.37	47
0.39	47	0.46	16	0.46	0.39	47
0.41	0	0.00	0	0.00	0.41	0

Max. Volts 2.86
 Max. Depth (%) 100.00
 Length (in.) 0.74
 Avg. Depth (%) 56.41

Table J-1 (continued)
Laboratory Specimen
NDE Analysis Sample 1 - 1H

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
					-0.33	0
-0.31	31	0.39	9	0.39	-0.31	31
-0.29	31	0.72	9	0.72	-0.29	31
-0.27	38	0.99	11	0.99	-0.27	38
-0.25	46	1.09	13	1.09	-0.25	46
-0.23	49	1.02	14	1.02	-0.23	49
-0.20	49	0.91	14	0.91	-0.20	49
-0.18	42	0.90	12	0.90	-0.18	42
-0.16	46	1.01	13	1.01	-0.16	46
-0.14	53	1.19	15	1.19	-0.14	53
-0.12	46	1.34	13	1.34	-0.12	46
-0.09	42	1.03	12	1.03	-0.09	42
-0.07	60	0.60	17	0.60	-0.07	60
-0.05	73	0.45	21	0.45	-0.05	73
-0.03	89	0.63	26	0.63	-0.03	89
-0.01	80	0.81	23	0.81	-0.01	80
0.02	92	0.98	27	0.98	0.02	92
0.04	86	1.19	25	1.19	0.04	86
0.06	67	1.54	19	1.54	0.06	67
0.08	57	1.99	16	1.99	0.08	57
0.10	60	2.34	17	2.34	0.10	60
0.12	60	2.56	17	2.56	0.12	60
0.15	60	2.48	17	2.48	0.15	60
0.17	63	2.58	18	2.58	0.17	63
0.19	60	2.93	17	2.93	0.19	60
0.21	60	2.99	17	2.99	0.21	60
0.23	60	2.93	17	2.93	0.23	60
0.26	67	2.73	19	2.73	0.26	67
0.28	67	2.65	19	2.65	0.28	67
0.30	67	2.51	19	2.51	0.30	67
0.32	60	1.99	17	1.99	0.32	60
0.34	53	1.31	15	1.31	0.34	53
0.36	46	0.86	13	0.86	0.36	46
0.39	46	0.46	13	0.46	0.39	46
0.41	0	0.22	24	0.22	0.41	0
0.43	99	0.16	32			
0.45	95	0.13	38			
0.47	47	0.09	152			
0.49	42	0.09	97			
0.50	92	0.08	42			
0.52	30	0.10	104			
0.54	19.5	0.11	116			
0.56	70	0.07	70			
0.58	12	0.09	119			
0.60	0	0.07	156			
0.62	0	0.05	175			
				Max. Volts	2.99	
				Max. Depth (%)	92.00	
				Length (in.)	0.74	
				Avg. Depth (%)	56.22	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.41	0	0.00	26	0.00	-0.41	0
-0.39	42	0.53	15	0.53	-0.39	42
-0.37	48	0.96	17	0.96	-0.37	48
-0.34	55	1.41	19	1.41	-0.34	55
-0.32	61	2.11	21	2.11	-0.32	61
-0.30	64	2.53	22	2.53	-0.30	64
-0.28	64	2.66	22	2.66	-0.28	64
-0.26	64	2.64	22	2.64	-0.26	64
-0.24	61	2.64	21	2.64	-0.24	61
-0.22	61	2.87	21	2.87	-0.22	61
-0.20	64	2.75	22	2.75	-0.20	64
-0.17	64	2.50	22	2.50	-0.17	64
-0.15	61	2.48	21	2.48	-0.15	61
-0.13	58	2.53	20	2.53	-0.13	58
-0.11	58	2.25	20	2.25	-0.11	58
-0.09	61	1.91	21	1.91	-0.09	61
-0.07	67	1.48	23	1.48	-0.07	67
-0.05	83	1.18	28	1.18	-0.05	83
-0.03	94	0.93	31	0.93	-0.03	94
0.00	97	0.82	32	0.82	0.00	97
0.02	90	0.58	30	0.58	0.02	90
0.04	70	0.47	24	0.47	0.04	70
0.06	55	0.62	19	0.62	0.06	55
0.08	45	1.09	16	1.09	0.08	45
0.10	48	1.29	17	1.29	0.10	48
0.12	51	1.15	18	1.15	0.12	51
0.15	48	0.99	17	0.99	0.15	48
0.17	45	0.90	16	0.90	0.17	45
0.19	45	0.95	16	0.95	0.19	45
0.21	45	1.05	16	1.05	0.21	45
0.23	42	1.06	15	1.06	0.23	42
0.25	36	0.94	13	0.94	0.25	36
0.27	33	0.64	12	0.64	0.27	33
0.29	30	0.32	11	0.32	0.29	30
0.32	0	0.00	8	0.00	0.32	0
				Max. Volts	2.87	
				Max. Depth (%)	97.00	
				Length (in.)	0.73	
				Avg. Depth (%)	56.10	

Table J-2
Sample 1 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Axial Position	Depth	Volts	Phase Angle	Final with Adjustments		
				Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.51	27	0.01	112			
-0.49	87	0.04	52			
-0.47	97	0.07	32			
-0.45	81	0.08	27			
-0.42	90	0.08	30			
-0.40	87	0.11	29			
-0.38	43	0.22	15	0.22	-0.38	0
-0.36	37	0.43	13	0.43	-0.36	37
-0.34	43	0.54	15	0.54	-0.34	43
-0.32	46	0.86	16	0.86	-0.32	46
-0.30	52	1.35	18	1.35	-0.30	52
-0.27	56	1.57	19	1.57	-0.27	56
-0.25	52	1.56	18	1.56	-0.25	52
-0.23	52	1.46	18	1.46	-0.23	52
-0.21	49	1.60	17	1.6	-0.21	49
-0.19	46	1.81	16	1.81	-0.19	46
-0.17	49	1.83	17	1.83	-0.17	49
-0.15	56	1.64	19	1.64	-0.15	56
-0.12	62	1.55	21	1.55	-0.12	62
-0.10	68	1.64	23	1.64	-0.10	68
-0.08	71	1.67	24	1.67	-0.08	71
-0.06	62	1.62	21	1.62	-0.06	62
-0.04	71	1.40	24	1.4	-0.04	71
-0.02	81	1.09	27	1.09	-0.02	81
0.00	74	1.10	25	1.1	0.00	74
0.03	62	1.27	21	1.27	0.03	62
0.05	65	1.35	22	1.35	0.05	65
0.07	68	1.84	23	1.84	0.07	68
0.09	62	2.56	21	2.56	0.09	62
0.11	59	2.99	20	2.99	0.11	59
0.13	62	3.05	21	3.05	0.13	62
0.15	65	2.87	22	2.87	0.15	65
0.18	65	2.69	22	2.69	0.18	65
0.20	62	2.52	21	2.52	0.20	62
0.22	59	2.54	20	2.54	0.22	59
0.24	59	2.57	20	2.57	0.24	59
0.26	59	2.26	20	2.26	0.26	59
0.28	56	2.01	19	2.01	0.28	56
0.30	59	1.47	20	1.47	0.30	59
0.33	59	1.05	20	1.05	0.33	59
0.35	59	0.72	20	0.72	0.35	59
0.37	56	0.52	19	0.52	0.37	56
0.39	56	0.38	19	0.38	0.39	56
0.41	43	0.24	15	0.24	0.41	43
0.43	74	0.18	25	0.18	0.43	0
0.45	81	0.09	27			
0.48	90	0.06	30			

Max. Volts 3.05
 Max. Depth (%) 81.00
 Length (in.) 0.81
 Avg. Depth (%) 57.15

Crack 1 - MR + Point - Analyst 2

Axial Position	Depth	Volts	Phase Angle	Final with Adjustments		
				Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.40	0	0.00	0			
-0.37	44	0.21	15	0.21	-0.37	0
-0.35	38	0.42	13	0.42	-0.35	38
-0.33	44	0.52	15	0.52	-0.33	44
-0.31	47	0.84	16	0.84	-0.31	47
-0.29	52	1.33	18	1.33	-0.29	52
-0.26	55	1.53	19	1.53	-0.26	55
-0.24	52	1.54	18	1.54	-0.24	52
-0.22	49	1.43	17	1.43	-0.22	49
-0.20	49	1.56	17	1.56	-0.20	49
-0.18	47	1.77	16	1.77	-0.18	47
-0.15	49	1.78	17	1.78	-0.15	49
-0.13	55	1.60	19	1.60	-0.13	55
-0.11	61	1.51	21	1.51	-0.11	61
-0.09	67	1.60	23	1.60	-0.09	67
-0.07	70	1.62	24	1.62	-0.07	70
-0.04	61	1.57	21	1.57	-0.04	61
-0.02	70	1.36	24	1.36	-0.02	70
0.00	79	1.06	27	1.06	0.00	79
0.02	73	1.07	25	1.07	0.02	73
0.04	61	1.24	21	1.24	0.04	61
0.06	64	1.31	22	1.31	0.06	64
0.09	67	1.79	23	1.79	0.09	67
0.11	61	2.49	21	2.49	0.11	61
0.13	58	2.91	20	2.91	0.13	58
0.15	61	2.97	21	2.97	0.15	61
0.17	64	2.79	22	2.79	0.17	64
0.20	64	2.62	22	2.62	0.20	64
0.22	61	2.45	21	2.45	0.22	61
0.24	58	2.47	20	2.47	0.24	58
0.26	55	2.50	19	2.50	0.26	55
0.28	58	2.20	20	2.20	0.28	58
0.31	55	1.96	19	1.96	0.31	55
0.33	58	1.43	20	1.43	0.33	58
0.35	58	1.02	20	1.02	0.35	58
0.37	58	0.70	20	0.70	0.37	58
0.39	55	0.51	19	0.51	0.39	55
0.41	55	0.37	19	0.37	0.41	55
0.44	0	0.00	0	0.00	0.44	0

Max. Volts 2.97
 Max. Depth (%) 79.00
 Length (in.) 0.81
 Avg. Depth (%) 56.28

Table J-2 (continued)
Sample 1 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Axial Position	Depth	Volts	Phase Angle	Final with Adjustments		
				Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.48	89	0.04	47			
-0.46	94	0.06	39			
-0.44	83	0.08	24			
-0.42	83	0.10	24			
-0.4	67	0.11	19			
-0.37	53	0.22	15	0.22	-0.37	0
-0.35	34	0.42	10	0.42	-0.35	34
-0.33	42	0.53	12	0.53	-0.33	42
-0.31	46	0.85	13	0.85	-0.31	46
-0.29	53	1.36	15	1.36	-0.29	53
-0.26	53	1.57	15	1.57	-0.26	53
-0.24	53	1.57	15	1.57	-0.24	53
-0.22	53	1.47	15	1.47	-0.22	53
-0.2	49	1.57	14	1.57	-0.2	49
-0.18	46	1.79	13	1.79	-0.18	46
-0.16	49	1.8	14	1.8	-0.16	49
-0.13	53	1.63	15	1.63	-0.13	53
-0.11	63	1.56	18	1.56	-0.11	63
-0.09	63	1.72	18	1.72	-0.09	63
-0.07	53	1.79	15	1.79	-0.07	53
-0.05	53	1.77	15	1.77	-0.05	53
-0.02	73	1.38	21	1.38	-0.02	73
0	80	1.16	23	1.16	0.00	80
0.02	63	1.15	18	1.15	0.02	63
0.04	49	1.34	14	1.34	0.04	49
0.06	49	1.42	14	1.42	0.06	49
0.09	63	1.88	18	1.88	0.09	63
0.11	60	2.57	17	2.57	0.11	60
0.13	57	2.99	16	2.99	0.13	57
0.15	60	3.06	17	3.06	0.15	60
0.17	63	2.88	18	2.88	0.17	63
0.2	60	2.72	17	2.72	0.2	60
0.22	63	2.55	18	2.55	0.22	63
0.24	60	2.58	17	2.58	0.24	60
0.26	60	2.6	17	2.6	0.26	60
0.28	63	2.34	18	2.34	0.28	63
0.31	57	2.07	16	2.07	0.31	57
0.33	60	1.44	17	1.44	0.33	60
0.35	60	1.03	17	1.03	0.35	60
0.37	60	0.71	17	0.71	0.37	60
0.39	60	0.51	17	0.51	0.39	60
0.42	57	0.37	16	0.37	0.42	57
0.44	42	0.26	12	0.26	0.44	42
0.46	57	0.23	16	0.23	0.46	0
0.48	86	0.14	25			
0.50	94	0.10	28			
0.53	92	0.08	27			
				Max. Volts	3.06	
				Max. Depth (%)	80.00	
				Length (in.)	0.83	
				Avg. Depth (%)	55.02	

Crack 1 - MR + Point - Analyst 4

Axial Position	Depth	Volts	Phase Angle	Final with Adjustments		
				Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.46	0	0.00	23	0.00	-0.46	0
-0.44	51	0.27	18	0.27	-0.44	51
-0.42	58	0.40	20	0.40	-0.42	58
-0.39	55	0.56	19	0.56	-0.39	55
-0.37	58	0.78	20	0.78	-0.37	58
-0.35	58	1.11	20	1.11	-0.35	58
-0.33	55	1.58	19	1.58	-0.33	55
-0.31	55	2.06	19	2.06	-0.31	55
-0.29	58	2.32	20	2.32	-0.29	58
-0.27	58	2.54	20	2.54	-0.27	58
-0.24	61	2.51	21	2.51	-0.24	61
-0.22	61	2.54	21	2.54	-0.22	61
-0.20	64	2.71	22	2.71	-0.20	64
-0.18	64	2.89	22	2.89	-0.18	64
-0.16	61	3.01	21	3.01	-0.16	61
-0.14	61	2.81	21	2.81	-0.14	61
-0.12	61	2.37	21	2.37	-0.12	61
-0.10	67	1.71	23	1.71	-0.10	67
-0.07	67	1.27	23	1.27	-0.07	67
-0.05	64	1.22	22	1.22	-0.05	64
-0.03	77	1.09	26	1.09	-0.03	77
-0.01	74	1.15	25	1.15	-0.01	74
0.01	64	1.43	22	1.43	0.01	64
0.03	61	1.62	21	1.62	0.03	61
0.05	58	1.65	20	1.65	0.05	58
0.08	64	1.61	22	1.61	0.08	64
0.10	61	1.56	21	1.56	0.10	61
0.12	55	1.68	19	1.68	0.12	55
0.14	48	1.80	17	1.80	0.14	48
0.16	48	1.75	17	1.75	0.16	48
0.18	48	1.53	17	1.53	0.18	48
0.20	51	1.48	18	1.48	0.20	51
0.23	51	1.57	18	1.57	0.23	51
0.25	51	1.51	18	1.51	0.25	51
0.27	51	1.21	18	1.21	0.27	51
0.29	45	0.78	16	0.78	0.29	45
0.31	42	0.51	15	0.51	0.31	42
0.33	39	0.38	14	0.38	0.33	39
0.35	45	0.19	16	0.19	0.35	45
0.37	0	0.00	29	0.00	0.37	0
				Max. Volts	3.01	
				Max. Depth (%)	77.00	
				Length (in.)	0.83	
				Avg. Depth (%)	55.84	

Table J-3
Sample 1 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.27	100	0.07	33			
-0.25	59	0.09	20			
-0.23	23	0.12	8			
-0.21	20	0.19	7			
-0.19	59	0.26	20	0.26	-0.19	0
-0.17	43	0.49	15	0.49	-0.17	43
-0.15	37	0.55	13	0.55	-0.15	37
-0.13	25	0.64	9	0.64	-0.13	25
-0.11	40	0.43	14	0.43	-0.11	40
-0.08	84	0.27	28	0.27	-0.08	84
-0.06	65	0.48	22	0.48	-0.06	65
-0.04	65	0.68	22	0.68	-0.04	65
-0.02	77	0.70	26	0.70	-0.02	77
0.00	74	0.71	25	0.71	0.00	74
0.02	52	0.90	18	0.90	0.02	52
0.04	43	1.04	15	1.04	0.04	43
0.06	43	1.13	15	1.13	0.06	43
0.08	43	1.10	15	1.10	0.08	43
0.10	46	1.00	16	1.00	0.10	46
0.12	43	0.88	15	0.88	0.12	43
0.14	34	0.67	12	0.67	0.14	34
0.17	34	0.48	12	0.48	0.17	34
0.19	40	0.33	14	0.33	0.19	40
0.21	43	0.33	15	0.33	0.21	43
0.23	37	0.48	13	0.48	0.23	37
0.25	49	0.56	17	0.56	0.25	0
0.27	59	0.59	20			
0.29	46	0.60	16			
0.31	31	0.36	11			
0.33	34	0.10	12			

Max. Volts 1.13
 Max. Depth (%) 84.00
 Length (in.) 0.44
 Avg. Depth (%) 46.18

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.18	0	0.00	0			
-0.16	44	0.48	15			
-0.14	29	0.68	10			
-0.12	26	0.62	9			
-0.10	41	0.42	14			
-0.07	82	0.26	28	0.26	-0.07	0
-0.05	64	0.46	22	0.46	-0.05	64
-0.03	64	0.66	22	0.66	-0.03	64
-0.01	76	0.68	26	0.68	-0.01	76
0.01	73	0.69	25	0.69	0.01	73
0.03	52	0.87	18	0.87	0.03	52
0.05	44	1.02	15	1.02	0.05	44
0.08	44	1.10	15	1.10	0.08	44
0.10	44	1.07	15	1.07	0.10	44
0.12	47	0.97	16	0.97	0.12	47
0.14	44	0.86	15	0.86	0.14	44
0.16	35	0.65	12	0.65	0.16	35
0.18	35	0.47	12	0.47	0.18	35
0.20	41	0.30	14	0.30	0.20	41
0.22	38	0.33	13	0.33	0.22	38
0.25	38	0.47	13	0.47	0.25	38
0.27	49	0.57	17	0.57	0.27	0
0.29	55	0.59	19			
0.31	44	0.58	15			
0.33	32	0.35	11			
0.35	0	0.00	0			

Max. Volts 1.10
 Max. Depth (%) 76.00
 Length (in.) 0.34
 Avg. Depth (%) 45.88

Table J-3 (continued)
Sample 1 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.27	96.50	0.07	29			
-0.24	71	0.08	19			
-0.21	31	0.13	9			
-0.19	17	0.17	6			
-0.17	60	0.25	16			
-0.15	36	0.43	10	0.43	-0.15	0
-0.13	17	0.68	6	0.68	-0.13	17
-0.11	22	0.62	7	0.62	-0.11	22
-0.09	44	0.42	12	0.42	-0.09	44
-0.07	88.5	0.22	25	0.22	-0.07	88.5
-0.04	70.5	0.45	19	0.45	-0.04	70.5
-0.02	73.5	0.63	20	0.63	-0.02	73.5
0.00	82.5	0.67	23	0.67	0.00	82.5
0.02	80	0.69	22	0.69	0.02	80
0.04	54	0.86	15	0.86	0.04	54
0.06	46	0.97	13	0.97	0.06	46
0.09	33.5	1.10	10	1.10	0.09	33.5
0.11	38	1.06	11	1.06	0.11	38
0.13	39.5	1.01	11	1.01	0.13	39.5
0.15	35.5	0.89	10	0.89	0.15	35.5
0.17	24.5	0.68	8	0.68	0.17	24.5
0.19	29	0.49	9	0.49	0.19	29
0.22	42	0.35	12	0.35	0.22	42
0.26	40	0.49	11	0.49	0.26	40
0.28	44	0.59	12	0.59	0.28	44
0.30	61.7	0.41	17	0.41	0.30	0.0
0.33	37.5	0.47	11			
0.36	22	0.15	185			

Max. Volts	1.1
Max. Depth (%)	88.50
Length (in.)	0.45
Avg. Depth (%)	45.29

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽⁴⁾
-0.28	0	0.00	20	0.00	-0.28	0
-0.26	45	0.55	16	0.55	-0.26	45
-0.24	36	0.42	13	0.42	-0.24	36
-0.21	42	0.32	15	0.32	-0.21	42
-0.19	39	0.34	14	0.34	-0.19	39
-0.17	33	0.53	12	0.53	-0.17	33
-0.15	36	0.71	13	0.71	-0.15	36
-0.13	42	0.89	15	0.89	-0.13	42
-0.11	45	1.02	16	1.02	-0.11	45
-0.09	45	1.08	16	1.08	-0.09	45
-0.07	42	1.10	15	1.10	-0.07	42
-0.05	45	0.99	16	0.99	-0.05	45
-0.03	55	0.84	19	0.84	-0.03	55
-0.01	74	0.70	25	0.70	-0.01	74
0.01	74	0.66	25	0.66	0.01	74
0.04	64	0.62	22	0.62	0.04	64
0.06	70	0.41	24	0.41	0.06	70
0.08	58	0.28	20	0.28	0.08	58
0.10	33	0.48	12	0.48	0.10	33
0.12	25	0.65	9	0.65	0.12	25
0.14	30	0.63	11	0.63	0.14	30
0.16	45	0.43	16	0.43	0.16	0
0.18	48	0.24	17			
0.20	22	0.17	8			
0.22	0	0.00	8			

Max. Volts	1.10
Max. Depth (%)	74.00
Length (in.)	0.44
Avg. Depth (%)	44.86

Table J-4
Sample 2 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽¹⁾
-0.37	0	0.00	0	-0.37	0	0.00	-0.37	0
-0.35	17	0.31	6	-0.35	17	0.31	-0.35	14
-0.33	23	0.39	8	-0.33	23	0.39	-0.33	19
-0.31	31	0.40	11	-0.31	31	0.40	-0.31	26
-0.29	34	0.43	12	-0.29	34	0.43	-0.29	29
-0.27	40	0.41	14	-0.27	40	0.41	-0.27	34
-0.25	34	0.51	12	-0.25	34	0.51	-0.25	29
-0.23	37	0.48	13	-0.23	37	0.48	-0.23	31
-0.20	34	0.51	12	-0.20	34	0.51	-0.2	29
-0.18	31	0.54	11	-0.18	31	0.54	-0.18	26
-0.16	28	0.57	10	-0.16	28	0.57	-0.16	23
-0.14	28	0.53	10	-0.14	28	0.53	-0.14	23
-0.12	34	0.45	12	-0.12	34	0.45	-0.12	29
-0.10	40	0.51	14	-0.10	40	0.51	-0.1	34
-0.08	52	0.60	18	-0.08	52	0.60	-0.08	44
-0.06	52	0.64	18	-0.06	52	0.64	-0.06	44
-0.03	62	0.71	21	-0.03	62	0.71	-0.03	52
-0.01	59	0.77	20	-0.01	59	0.77	-0.01	49
0.01	52	0.80	18	0.01	52	0.80	0.01	44
0.03	43	0.70	15	0.03	43	0.70	0.03	36
0.05	46	0.52	16	0.05	46	0.52	0.05	39
0.07	25	0.42	9	0.07	25	0.42	0.07	21
0.09	25	0.45	9	0.09	25	0.45	0.09	21
0.12	31	0.44	11	0.12	31	0.44	0.12	26
0.14	34	0.42	12	0.14	34	0.42	0.14	29
0.16	31	0.41	11	0.16	31	0.41	0.16	26
0.18	31	0.39	11	0.18	31	0.39	0.18	26
0.20	31	0.40	11	0.20	31	0.40	0.2	26
0.22	28	0.39	10	0.22	28	0.39	0.22	23
0.24	25	0.33	9	0.24	25	0.33	0.24	21
0.27	20	0.27	7	0.27	20	0.27	0.27	17
0.29	0	0.00	0	0.29	0	0.00	0.29	0
Max. Volts				0.80		0.80		
Max. Depth (%)				62.00		52.00		
Length (in.)				0.66		0.66		
Avg. Depth (%)				34.23		28.71		

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽¹⁾
-0.36	0	0.00	0	-0.36	0	0.00	-0.36	0
-0.34	17	0.30	6	-0.34	17	0.30	-0.34	14
-0.32	20	0.40	7	-0.32	20	0.40	-0.32	17
-0.30	29	0.41	10	-0.30	29	0.41	-0.3	25
-0.28	38	0.40	13	-0.28	38	0.40	-0.28	32
-0.25	35	0.45	12	-0.25	35	0.45	-0.25	30
-0.23	35	0.50	12	-0.23	35	0.50	-0.23	30
-0.21	35	0.50	12	-0.21	35	0.50	-0.21	30
-0.19	35	0.49	12	-0.19	35	0.49	-0.19	30
-0.17	32	0.53	11	-0.17	32	0.53	-0.17	27
-0.14	29	0.56	10	-0.14	29	0.56	-0.14	25
-0.12	29	0.52	10	-0.12	29	0.52	-0.12	25
-0.10	35	0.44	12	-0.10	35	0.44	-0.1	30
-0.08	41	0.50	14	-0.08	41	0.50	-0.08	35
-0.06	52	0.58	18	-0.06	52	0.58	-0.06	44
-0.03	52	0.62	18	-0.03	52	0.62	-0.03	44
-0.01	61	0.69	21	-0.01	61	0.69	-0.01	52
0.01	58	0.75	20	0.01	58	0.75	0.01	49
0.03	52	0.78	18	0.03	52	0.78	0.03	44
0.05	44	0.69	15	0.05	44	0.69	0.05	38
0.07	47	0.51	16	0.07	47	0.51	0.07	40
0.10	35	0.42	12	0.10	35	0.42	0.1	30
0.12	26	0.44	9	0.12	26	0.44	0.12	22
0.14	32	0.43	11	0.14	32	0.43	0.14	27
0.16	35	0.41	12	0.16	35	0.41	0.16	30
0.18	32	0.40	11	0.18	32	0.40	0.18	27
0.20	32	0.38	11	0.20	32	0.38	0.2	27
0.23	32	0.39	11	0.23	32	0.39	0.23	27
0.25	29	0.38	10	0.25	29	0.38	0.25	25
0.27	26	0.32	9	0.27	26	0.32	0.27	22
0.29	20	0.26	7	0.29	20	0.26	0.29	17
0.31	0	0.00	0	0.31	0	0.00	0.31	0
Max. Volts				0.78		0.78		
Max. Depth (%)				61.00		52.00		
Length (in.)				0.67		0.67		
Avg. Depth (%)				34.96		29.60		

Table J-4 (continued)
Sample 2 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.40	0	0.00	0	-0.40	0	0.00	-0.40	0
-0.38	10	0.19	4	-0.38	10	0.19	-0.38	10
-0.36	10	0.22	4	-0.36	10	0.22	-0.36	10
-0.34	23	0.27	7	-0.34	23	0.27	-0.34	22
-0.32	6	0.36	3	-0.32	6	0.36	-0.32	6
-0.30	10	0.37	4	-0.30	10	0.37	-0.30	10
-0.27	27	0.35	8	-0.27	27	0.35	-0.27	26
-0.25	14	0.42	5	-0.25	14	0.42	-0.25	13
-0.23	18	0.36	6	-0.23	18	0.36	-0.23	17
-0.21	14	0.52	5	-0.21	14	0.52	-0.21	13
-0.19	21	0.49	9	-0.19	21	0.49	-0.19	20
-0.16	27	0.47	8	-0.16	27	0.47	-0.16	26
-0.14	6	0.59	3	-0.14	6	0.59	-0.14	6
-0.12	2	0.55	2	-0.12	2	0.55	-0.12	2
-0.10	10	0.46	4	-0.10	10	0.46	-0.10	10
-0.08	18	0.55	6	-0.08	18	0.55	-0.08	17
-0.05	31	0.66	9	-0.05	31	0.66	-0.05	30
-0.03	23	0.74	7	-0.03	23	0.74	-0.03	22
-0.01	42	0.82	12	-0.01	42	0.82	-0.01	40
0.01	46	0.82	13	0.01	46	0.82	0.01	44
0.03	44	0.84	13	0.03	44	0.84	0.03	42
0.05	35	0.72	10	0.05	35	0.72	0.05	33
0.08	35	0.56	10	0.08	35	0.56	0.08	33
0.10	6	0.52	3	0.10	6	0.52	0.10	6
0.12	23	0.42	7	0.12	23	0.42	0.12	22
0.14	27	0.37	8	0.14	27	0.37	0.14	26
0.16	26	0.40	8	0.16	26	0.40	0.16	25
0.19	27	0.38	8	0.19	27	0.38	0.19	26
0.21	22	0.36	7	0.21	22	0.36	0.21	21
0.23	10	0.45	4	0.23	10	0.45	0.23	10
0.25	10	0.43	4	0.25	10	0.43	0.25	10
0.27	14	0.34	5	0.27	14	0.34	0.27	13
0.30	0	0.00	0	0.30	0	0.00	0.30	0
Max. Volts				0.84		0.84		
Max. Depth (%)				48.00		44.00		
Length (in.)				0.70		0.70		
Avg. Depth (%)				20.14		19.26		

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.29	0	0.00	0	-0.29	0	0.00	-0.29	0
-0.27	22	0.28	8	-0.27	22	0.28	-0.27	18
-0.25	25	0.33	9	-0.25	25	0.33	-0.25	21
-0.23	27	0.37	10	-0.23	27	0.37	-0.23	23
-0.21	30	0.39	11	-0.21	30	0.39	-0.21	25
-0.18	27	0.38	10	-0.18	27	0.38	-0.18	23
-0.16	30	0.39	11	-0.16	30	0.39	-0.16	25
-0.14	33	0.41	12	-0.14	33	0.41	-0.14	28
-0.12	30	0.42	11	-0.12	30	0.42	-0.12	25
-0.10	27	0.44	10	-0.10	27	0.44	-0.1	23
-0.08	33	0.44	12	-0.08	33	0.44	-0.08	28
-0.06	42	0.55	15	-0.06	42	0.55	-0.06	35
-0.03	45	0.71	16	-0.03	45	0.71	-0.03	38
-0.01	51	0.78	18	-0.01	51	0.78	-0.01	43
0.01	55	0.74	19	0.01	55	0.74	0.01	46
0.03	61	0.69	21	0.03	61	0.69	0.03	51
0.05	55	0.62	19	0.05	55	0.62	0.05	46
0.07	48	0.58	17	0.07	48	0.58	0.07	40
0.09	42	0.49	15	0.09	42	0.49	0.09	35
0.11	33	0.44	12	0.11	33	0.44	0.11	28
0.14	27	0.53	10	0.14	27	0.53	0.14	23
0.16	27	0.56	10	0.16	27	0.56	0.16	23
0.18	30	0.53	11	0.18	30	0.53	0.18	25
0.20	33	0.49	12	0.20	33	0.49	0.2	28
0.21	36	0.48	13	0.21	36	0.48	0.21	30
0.22	36	0.49	13	0.22	36	0.49	0.22	30
0.26	36	0.44	13	0.26	36	0.44	0.26	30
0.28	33	0.40	12	0.28	33	0.40	0.28	28
0.31	27	0.39	10	0.31	27	0.39	0.31	23
0.33	25	0.37	9	0.33	25	0.37	0.33	21
0.35	25	0.29	9	0.35	25	0.29	0.35	21
0.37	0	0.00	0	0.37	0	0.00	0.37	0
Max. Volts				0.78		0.78		
Max. Depth (%)				61.00		51.00		
Length (in.)				0.66		0.66		
Avg. Depth (%)				33.87		28.32		

Table J-5
Sample 3 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽⁶⁾	Depth ⁽⁶⁾
NO DATA						

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.15	0	0.00	0	0.00	-0.15	0
-0.12	11	0.47	4	0.47	-0.12	11
-0.10	6	0.55	2	0.55	-0.1	6
-0.08	17	0.86	6	0.86	-0.08	17
-0.05	23	1.27	8	1.27	-0.05	23
-0.03	26	1.48	9	1.48	-0.03	26
-0.01	20	1.60	7	1.60	-0.01	20
0.02	26	1.57	9	1.57	0.02	26
0.04	23	1.33	8	1.33	0.04	23
0.06	26	1.07	9	1.07	0.06	26
0.08	17	0.76	6	0.76	0.08	17
0.11	20	0.54	7	0.54	0.11	20
0.13	26	0.41	9	0.41	0.13	26
0.16	0	0.00	0	0.00	0.16	0
Max. Volts						1.60
Max. Depth (%)						26.0
Length (in.)						0.31
Avg. Depth (%)						18.13

TableJ-5 (continued)
 Sample 3 - 1H
 Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ^(a)	Depth	Volts	Length ^(a)	Depth ^(a)
NO DATA								

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ^(a)	Depth	Volts	Length ^(a)	Depth ^(a)
NO DATA								

Table J-6
Sample 3 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
NO DATA						

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
0	0	0.00	0	0.00	-0.18	0
-0.16	26	0.35	9	0.35	-0.16	26
-0.14	23	0.45	8	0.45	-0.14	23
-0.11	17	0.50	6	0.50	-0.11	17
-0.09	20	0.70	7	0.70	-0.09	20
-0.07	17	1.00	6	1.00	-0.07	17
-0.04	17	1.21	6	1.21	-0.04	17
-0.02	23	1.32	8	1.32	-0.02	23
0.00	29	1.33	10	1.33	0	29
0.03	29	1.15	10	1.15	0.03	29
0.05	35	0.72	12	0.72	0.05	35
0.07	35	0.38	12	0.38	0.07	35
0.10	20	0.31	7	0.31	0.1	20
0.12	0	0.00	0	0.00	0.12	0
Max. Volts						1.33
Max. Depth (%)						35.00
Length (in.)						0.30
Avg. Depth (%)						22.52

Table J-6 (continued)
Sample 3 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽⁹⁾	Depth ⁽⁹⁾
NO DATA						

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽⁹⁾	Depth ⁽⁹⁾
NO DATA						

Table J-7
Sample 3 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽³⁾
NO DATA						

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽³⁾
NDD						

Table J-7 (continued)
Sample 3 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE						
Axial Position	Depth	Volts	Phase Angle	Final with Adjustments		
				Volts	Length ⁽⁶⁾	Depth ⁽⁶⁾
NDD						

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE						
Axial Position	Depth	Volts	Phase Angle	Final with Adjustments		
				Volts	Length ⁽⁶⁾	Depth ⁽⁶⁾
NO DATA						

**Table J-8
Sample 4 - 1H
Laboratory Specimen NDE Analysis**

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽³⁾	Depth ⁽⁴⁾
NO DATA						

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽³⁾	Depth ⁽⁴⁾
-0.13	0	0.00	0	0.00	-0.13	0
-0.11	47	0.54	16	0.54	-0.11	47
-0.08	47	0.84	16	0.84	-0.08	47
-0.06	58	0.97	20	0.97	-0.06	58
-0.04	58	1.03	20	1.03	-0.04	58
-0.01	55	1.10	19	1.10	-0.01	55
0.01	49	1.09	17	1.09	0.01	49
0.03	47	0.89	16	0.89	0.03	47
0.06	52	0.53	18	0.53	0.06	52
0.08	61	0.39	21	0.39	0.08	61
0.10	55	0.39	19	0.39	0.10	55
0.13	61	0.36	21	0.36	0.13	61
0.15	64	0.32	22	0.32	0.15	64
0.17	0	0.00	0	0.00	0.17	0
Max. Volts						1.10
Max. Depth (%)						64.00
Length (in.)						0.30
Avg. Depth (%)						50.63

Table J-8 (continued)
 Sample 4 - 1H
 Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽⁹⁾	Depth ⁽⁹⁾
NO DATA						

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽⁹⁾	Depth ⁽⁹⁾
NO DATA						

**Table J-9
Sample 4 - 2H
Laboratory Specimen NDE Analysis**

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽³⁾	Depth ⁽⁴⁾
NO DATA						

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽³⁾	Depth ⁽⁴⁾
-0.23	0	0.00	0	0.00	-0.23	0
-0.21	52	0.61	52	0.61	-0.21	52
-0.18	58	1.07	58	1.07	-0.18	58
-0.16	61	1.74	61	1.74	-0.16	61
-0.14	61	2.35	61	2.35	-0.14	61
-0.11	58	2.63	58	2.63	-0.11	58
-0.09	55	2.52	55	2.52	-0.09	55
-0.07	49	2.40	49	2.40	-0.07	49
-0.04	47	2.41	47	2.41	-0.04	47
-0.02	44	2.45	44	2.45	-0.02	44
0.00	47	2.31	47	2.31	0.00	47
0.03	49	2.14	49	2.14	0.03	49
0.05	47	2.10	47	2.10	0.05	47
0.07	47	1.84	47	1.84	0.07	47
0.10	49	1.42	49	1.42	0.1	49.00
0.12	41	1.00	41	1.00	0.12	41.00
0.14	38	0.62	38	0.62	0.14	38.00
0.17	38	0.43	38	0.43	0.17	38.00
0.19	41	0.38	41	0.38	0.19	41
0.21	0	0.00	0	0.00	0.21	0
Max. Volts						2.63
Max. Depth (%)						61.00
Length (in.)						0.44
Avg. Depth (%)						46.83

Table J-9 (continued)
Sample 4 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽⁹⁾	Depth ⁽⁹⁾
NO DATA						

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽⁹⁾	Depth ⁽⁹⁾
NO DATA						

Table J-10
 Sample 4 - 3H
 Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ^(a)	Depth ^(a)
NO DATA						

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ^(a)	Depth ^(a)
NO DATA						

Table J-10 (continued)
Sample 4 - 3H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ^(a)	Depth ^(a)
NDD						

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ^(a)	Depth ^(a)
NO DATA						

Table J-11 (continued)
Sample 4 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽²⁾
NO DATA						

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽²⁾
NO DATA						

TableJ-12
Sample 5 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE					Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾
NO DATA								

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE						Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽²⁾	
-0.16	0	0.00	0	-0.16	0	0.00	-0.16	0	
-0.14	41	0.12	13	-0.14	41	0.12	-0.14	37	
-0.12	44	0.13	14	-0.12	44	0.13	-0.12	40	
-0.10	47	0.20	15	-0.1	47	0.20	-0.1	43	
-0.08	47	0.29	15	-0.08	47	0.29	-0.08	43	
-0.06	50	0.34	16	-0.06	50	0.34	-0.06	45	
-0.04	55	0.40	18	-0.04	55	0.40	-0.04	50	
-0.03	50	0.43	16	-0.03	50	0.43	-0.03	45	
-0.01	53	0.42	18	-0.01	53	0.42	-0.01	48	
0.01	47	0.40	15	0.01	47	0.40	0.01	43	
0.03	50	0.40	16	0.03	50	0.40	0.03	45	
0.05	50	0.39	16	0.05	50	0.39	0.05	45	
0.07	50	0.37	16	0.07	50	0.37	0.07	45	
0.09	53	0.33	17	0.09	53	0.33	0.09	48	
0.11	0	0.00	0	0.11	0	0.00	0.11	0	
					Max. Volts	0.43			0.43
					Max. Depth (%)	55.00			50.00
					Length (In.)	0.27			0.27
					Avg. Depth (%)	45.24			41.13

Table J-12 (continued)
Sample 5 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE					Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽¹⁾
-0.16	0	0.00	0	-0.16	0	0.00	-0.16	0
-0.14	23	0.16	16	-0.14	23	0.16	-0.14	21
-0.12	28	0.23	17	-0.12	28	0.23	-0.12	26
-0.10	23	0.32	16	-0.10	23	0.32	-0.10	21
-0.08	19	0.38	15	-0.08	19	0.38	-0.08	18
-0.05	29	0.43	17	-0.05	29	0.43	-0.05	27
-0.03	27	0.47	17	-0.03	27	0.47	-0.03	25
-0.01	19	0.46	15	-0.01	19	0.46	-0.01	18
0.01	23	0.45	16	0.01	23	0.45	0.01	21
0.03	29	0.44	17	0.03	29	0.44	0.03	27
0.05	25	0.45	16	0.05	25	0.45	0.05	23
0.07	25	0.42	16	0.07	25	0.42	0.07	23
0.09	27	0.37	17	0.09	27	0.37	0.09	25
0.11	0	0.00	0	0.11	0	0.00	0.11	0
Max. Volts					0.47	0.47		
Max. Depth (%)					29.00	27.00		
Length (in.)					0.27	0.27		
Avg. Depth (%)					22.89	21.31		

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE					Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽¹⁾
NO DATA								

Table J-13 (continued)
 Sample 5 - 3H
 Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.03	0	0.00	0	-0.03	0	0.00	-0.03	0
-0.01	19	0.19	12	-0.01	19	0.19	-0.01	18
0.01	17	0.28	11	0.01	17	0.28	0.01	16
0.03	21	0.35	14	0.03	21	0.35	0.03	20
0.05	26.5	0.36	14	0.05	27	0.36	0.05	25
0.07	28.5	0.36	15	0.07	27	0.36	0.07	25
0.09	28.5	0.37	16	0.09	29	0.37	0.09	27
0.11	26.5	0.37	14	0.11	27	0.37	0.11	25
0.14	25	0.33	14	0.14	25	0.33	0.14	23
0.16	23	0.27	14	0.16	23	0.27	0.16	21
0.18	0	0.00	0	0.18	0	0.00	0.18	0
Max. Volts				0.37		0.37		
Max. Depth (%)				28.50		26.50		
Length (In.)				0.21		0.21		
Avg. Depth (%)				21.51		20.00		

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
NO DATA								

Table J-14
Sample 5 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
NO DATA								

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.08	0	0.00	0	-0.08	0	0.00	-0.08	0
-0.07	28	0.14	9	-0.07	28	0.14	-0.07	23
-0.05	41	0.16	13	-0.05	41	0.16	-0.05	34
-0.03	38	0.23	12	-0.03	38	0.23	-0.03	32
-0.01	50	0.29	16	-0.01	50	0.29	-0.01	42
0.01	50	0.33	16	0.01	50	0.33	0.01	42
0.03	35	0.39	11	0.03	35	0.39	0.03	29
0.05	44	0.40	14	0.05	44	0.40	0.05	37
0.06	47	0.35	15	0.06	47	0.35	0.06	39
0.08	38	0.25	12	0.08	38	0.25	0.08	32
0.10	38	0.19	12	0.1	38	0.19	0.1	32
0.12	53	0.14	17	0.12	53	0.14	0.12	44
0.14	53	0.12	17	0.14	53	0.12	0.14	44
0.16	44	0.10	14	0.16	44	0.10	0.16	37
0.18	0	0.00	0	0.18	0	0.00	0.18	0
		Max. Volts		0.40				0.40
		Max. Depth (%)		53.00				44.00
		Length (in.)		0.26				0.26
		Avg. Depth (%)		40.71				33.80

Table J-14 (continued)
Sample 5 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.18	0	0.00	0	-0.18	0	0.00	-0.18	0
-0.16	26	0.11	16	-0.16	26	0.11	-0.16	14
-0.14	34	0.16	18	-0.14	34	0.16	-0.14	19
-0.12	38	0.13	19	-0.12	38	0.13	-0.12	21
-0.1	8.5	0.18	10	-0.1	8.5	0.18	-0.10	5
-0.08	19	0.21	14	-0.08	19	0.21	-0.08	11
-0.06	0	0.32	7	-0.06	0	0.32	-0.06	0
-0.05	30	0.23	17	-0.05	30	0.23	-0.05	17
-0.03	19	0.33	15	-0.03	19	0.33	-0.03	11
-0.01	24.5	0.40	16	-0.01	24.5	0.40	-0.01	14
0.01	15	0.46	13	0.01	15	0.46	0.01	8
0.03	21	0.47	15	0.03	21	0.47	0.03	12
0.05	23	0.40	15	0.05	23	0.40	0.05	13
0.07	17	0.31	12.5	0.07	17	0.31	0.07	9
0.09	19	0.24	14	0.09	19	0.24	0.09	11
0.11	17	0.19	14	0.11	17	0.19	0.11	9
0.13	19	0.16	13	0.13	19	0.16	0.13	11
0.15	21	0.13	14	0.15	21	0.13	0.15	12
0.17	0	0.00	0	0.17	0	0.00	0.17	0
Max. Volts				0.47		0.47		
Max. Depth (%)				38.00		21.00		
Length (in.)				0.35		0.35		
Avg. Depth (%)				19.63		10.85		

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth	Volts	Length ⁽²⁾	Depth ⁽³⁾
NO DATA								

Table J-16
Sample 7 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.22	0	0.00	0	-0.22	0	0.00	-0.22	0
-0.19	23	0.16	8	-0.19	23	0.16	-0.19	18
-0.17	28	0.21	10	-0.17	28	0.21	-0.17	22
-0.15	37	0.33	13	-0.15	37	0.33	-0.15	28
-0.13	37	0.43	13	-0.13	37	0.43	-0.13	28
-0.11	37	0.56	13	-0.11	37	0.56	-0.11	28
-0.09	40	0.80	14	-0.09	40	0.80	-0.09	31
-0.06	43	0.96	15	-0.06	43	0.96	-0.06	33
-0.04	46	0.92	16	-0.04	46	0.92	-0.04	35
-0.02	49	0.89	17	-0.02	49	0.89	-0.02	38
0.00	46	0.89	16	0.00	46	0.89	0	35
0.02	49	0.88	17	0.02	49	0.88	0.02	38
0.04	46	0.82	16	0.04	46	0.82	0.04	35
0.06	49	0.70	17	0.06	49	0.70	0.06	38
0.09	56	0.56	19	0.09	56	0.56	0.09	43
0.11	43	0.41	15	0.11	43.00	0.41	0.11	33
0.13	40	0.33	14	0.13	40.00	0.33	0.13	31
0.15	34	0.24	12	0.15	34.00	0.24	0.15	26
0.17	25	0.19	9	0.17	25.00	0.19	0.17	19
0.19	23	0.15	8	0	23	0.15	0.19	18
0.21	17	0.10	6	0	17	0.10	0.21	13
0.24	0	0.00	0	0	0	0.00	0.24	0
Max. Volts				0.96		0.96		
Max. Depth (%)				56.00		43.00		
Length (in.)				0.46		0.46		
Avg. Depth (%)				35.87		27.54		

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.19	0	0.00	0	-0.19	0	0.00	-0.19	0
-0.16	38	0.33	13	-0.16	38	0.33	-0.16	30
-0.14	38	0.42	13	-0.14	38	0.42	-0.14	30
-0.12	38	0.54	13	-0.12	38	0.54	-0.12	30
-0.10	41	0.78	14	-0.1	41	0.78	-0.1	33
-0.08	44	0.93	15	-0.08	44	0.93	-0.08	35
-0.05	47	0.90	16	-0.05	47	0.90	-0.05	38
-0.03	49	0.87	17	-0.03	49	0.87	-0.03	39
-0.01	47	0.87	16	-0.01	47	0.87	-0.01	38
0.01	49	0.85	17	0.01	49	0.85	0.01	39
0.03	47	0.80	16	0.03	47	0.80	0.03	38
0.05	49	0.68	17	0.05	49	0.68	0.05	39
0.08	55	0.55	19	0.08	55	0.55	0.08	44
0.10	44	0.40	15	0.1	44	0.40	0.1	35
0.12	41	0.32	14	0.12	41	0.32	0.12	33
0.14	0	0.00	0	0.14	0	0.00	0.14	0
Max. Volts				0.93		0.93		
Max. Depth (%)				55.00		44.00		
Length (in.)				0.33		0.33		
Avg. Depth (%)				41.53		33.22		

Table J-16 (continued)
Sample 7 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.27	0	0.00	0	-0.27	0	0.00	-0.27	0
-0.24	18	0.11	6	-0.24	18	0.11	-0.24	16
-0.22	14	0.15	5	-0.22	14	0.15	-0.22	13
-0.2	23	0.20	7	-0.2	23	0.20	-0.20	21
-0.18	34	0.33	10	-0.18	34	0.33	-0.18	31
-0.16	31	0.42	9	-0.16	31	0.42	-0.16	28
-0.13	31	0.54	9	-0.13	31	0.54	-0.13	28
-0.11	34	0.77	10	-0.11	34	0.77	-0.11	31
-0.09	42	0.94	12	-0.09	42	0.94	-0.09	38
-0.07	46	0.91	13	-0.07	46	0.91	-0.07	42
-0.05	42	0.89	12	-0.05	42	0.89	-0.05	38
-0.02	38	0.90	11	-0.02	38	0.90	-0.02	35
0.00	46	0.89	13	0.00	46	0.89	0.00	42
0.02	42	0.84	12	0.02	42	0.84	0.02	38
0.04	38	0.71	11	0.04	38	0.71	0.04	35
0.06	42	0.59	12	0.06	42	0.59	0.06	38
0.09	27	0.46	8	0.09	27	0.46	0.09	25
0.11	14	0.39	5	0.11	14	0.39	0.11	13
0.13	6	0.30	3	0.13	6	0.30	0.13	5
0.15	10	0.20	4	0.15	10	0.20	0.15	9
0.17	0	0.00	0	0.17	0	0.00	0.17	0
Max. Volts				0.94		0.94		
Max. Depth (%)				46.00		42.00		
Length (in.)				0.44		0.44		
Avg. Depth (%)				28.88		26.36		

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.17	0	0.00	186	-0.17	0	0.00	-0.17	0
-0.15	27	0.19	10	-0.15	27	0.19	-0.15	25
-0.13	33	0.26	12	-0.13	33	0.26	-0.13	31
-0.11	39	0.34	14	-0.11	39	0.34	-0.11	37
-0.09	42	0.44	15	-0.09	42	0.44	-0.09	39
-0.07	48	0.58	17	-0.07	48	0.58	-0.07	45
-0.04	48	0.71	17	-0.04	48	0.71	-0.04	45
-0.02	45	0.83	16	-0.02	45	0.83	-0.02	42
0.00	48	0.88	17	0.00	48	0.88	0	45
0.02	48	0.88	17	0.02	48	0.88	0.02	45
0.04	48	0.89	17	0.04	48	0.89	0.04	45
0.06	45	0.92	16	0.06	45	0.92	0.06	42
0.08	42	0.93	15	0.08	42	0.93	0.08	39
0.11	39	0.75	14	0.11	39	0.75	0.11	37
0.13	36	0.53	13	0.13	36	0.53	0.13	34
0.15	33	0.41	12	0.15	33	0.41	0.15	31
0.17	36	0.31	13	0.17	36	0.31	0.17	34
0.19	27	0.19	10	0.19	27	0.19	0.19	25
0.21	27	0.15	10	0.21	27	0.15	0.21	25
0.23	0	0.00	7	0.23	0	0.00	0.23	0
Max. Volts				0.93		0.93		
Max. Depth (%)				48.00		45.00		
Length (in.)				0.40		0.40		
Avg. Depth (%)				37.76		35.40		

Table J-17
Sample 7 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽¹⁾	Volts	Length ⁽²⁾	Depth ⁽¹⁾
-0.11	0	0.00	0	-0.11	0	0.00	-0.11	0
-0.09	17	0.15	6	-0.09	17	0.15	-0.09	16
-0.07	40	0.22	14	-0.07	40	0.22	-0.07	38
-0.05	62	0.27	21	-0.05	62	0.27	-0.05	59
-0.03	71	0.28	24	-0.03	71	0.28	-0.03	68
-0.01	68	0.29	23	-0.01	68	0.29	-0.01	65
0.02	56	0.26	19	0.02	56	0.26	0.02	54
0.04	34	0.20	12	0.04	34	0.20	0.04	33
0.06	0	0.00	0	0.06	0	0.00	0.06	0
Max. Volts				0.29		0.29		
Max. Depth (%)				71.00		68.00		
Length (in.)				0.17		0.17		
Avg. Depth (%)				44.59		42.70		

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽¹⁾	Volts	Length ⁽²⁾	Depth ⁽¹⁾
-0.06	0	0.00	0			0.00	-0.06	0
-0.04	41	0.22	14			0.22	-0.04	39
-0.02	61	0.26	21			0.26	-0.02	58
0.01	70	0.27	24			0.27	0.01	67
0.03	67	0.29	23			0.29	0.03	64
0.05	55	0.26	19			0.26	0.05	53
0.07	35	0.20	12			0.20	0.07	34
0.09	0	0.00	0			0.00	0.09	0
Max. Volts				0.29		0.29		
Max. Depth (%)				70.00		67.00		
Length (in.)				0.15		0.15		
Avg. Depth (%)				48.23		46.17		

Table J-19
 Sample 8 - 4H
 Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽⁵⁾
-0.12	0	0.00	0	-0.12	0	0.00	-0.12	0
-0.10	46	0.24	16	-0.10	46	0.24	-0.1	43
-0.08	49	0.25	17	-0.08	49	0.25	-0.08	46
-0.06	40	0.26	14	-0.06	40	0.26	-0.06	38
-0.04	31	0.26	11	-0.04	31	0.26	-0.04	29
-0.02	46	0.26	16	-0.02	46	0.26	-0.02	43
0.01	34	0.26	12	0.01	34	0.26	0.01	32
0.03	23	0.25	8	0.03	23	0.25	0.03	22
0.05	25	0.23	9	0.05	25	0.23	0.05	23
0.07	43	0.20	15	0.07	43	0.20	0.07	40
0.09	43	0.18	15	0.09	43	0.18	0.09	40
0.11	0	0.00	0	0.11	0	0.00	0.11	0
Max. Volts				0.26		0.26		
Max. Depth (%)				49.00		46.00		
Length (in.)				0.23		0.23		
Avg. Depth (%)				34.78		32.65		

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽⁵⁾
NDD								

Table J-21
Sample 9 - 5H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽¹⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.06	0	0.00	0	-0.06	0	0.00	-0.06	0
-0.04	43	0.41	15	-0.04	43	0.41	-0.04	40
-0.02	40	0.50	14	-0.02	40	0.50	-0.02	37
0.01	40	0.38	14	0.01	40	0.38	0.01	37
0.03	0	0.00	0	0.03	0	0.00	0.03	0
Max. Volts					0.50	0.50		
Max. Depth (%)					43.00	40.00		
Length (in.)					0.09	0.09		
Avg. Depth (%)					31.78	29.56		

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽¹⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.03	0	0.00	0	-0.03	0	0.00	-0.03	0
0	44	0.39	15	0	44	0.39	0	41
0.02	41	0.49	14	0.02	41	0.49	0.02	38
0.04	41	0.37	14	0.04	41	0.37	0.04	38
0.06	0	0.00	0	0.06	0	0.00	0.06	0
Max. Volts					0.49	0.49		
Max. Depth (%)					44.00	41		
Length (in.)					0.09	0.09		
Avg. Depth (%)					30.44	28.37		

**Table J-21 (continued)
Sample 9 - 5H
Laboratory Specimen NDE Analysis**

Crack 2 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.07	0			-0.07	0	0.07	-0.07	0
-0.05	34	0.07	10	-0.05	34	0.07	-0.05	21
-0.03	54	0.18	14	-0.03	54	0.18	-0.03	34
-0.01	41	0.44	11	-0.01	41	0.44	-0.01	25
0.02	33.5	0.55	9	0.02	33.5	0.55	0.02	21
0.04	43.3333	0.45	11	0.04	43.333	0.45	0.04	27
0.06	0	0.17	15	0.06	0	0.17	0.06	0
		Max. Volts		0.55		0.55		0.55
		Max. Depth (%)		54.00		33.50		33.50
		Length (In.)		0.13		0.13		0.13
		Avg. Depth (%)		34.53		21.42		21.42

Crack 2 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.07	0	0.00	0	-0.07	0	0.00	-0.07	0
-0.05	42	0.31	15	-0.05	42	0.31	-0.05	34
-0.03	39	0.46	14	-0.03	39	0.46	-0.03	32
-0.01	42	0.43	15	-0.01	42	0.43	-0.01	34
0.01	48	0.24	17	0.01	48	0.24	0.01	39
0.03	0	0.00	0	0.03	0	0.00	0.03	0
		Max. Volts		0.46		0.46		0.46
		Max. Depth (%)		48.00		39.00		39.00
		Length (In.)		0.10		0.10		0.10
		Avg. Depth (%)		34.20		27.79		27.79

Table J-22
Sample 10 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth ⁽⁴⁾
-0.51	0	0.00	0	0.00	-0.51	0
-0.49	58	0.83	19	0.83	-0.49	58
-0.47	53	0.95	17	0.95	-0.47	53
-0.45	58	1.02	19	1.02	-0.45	58
-0.43	61	1.14	20	1.14	-0.43	61
-0.41	67	1.50	22	1.50	-0.41	67
-0.39	72	1.85	24	1.85	-0.39	72
-0.37	72	2.30	24	2.30	-0.37	72
-0.35	75	2.68	25	2.68	-0.35	75
-0.33	75	2.93	25	2.93	-0.33	75
-0.31	83	2.55	28	2.55	-0.31	83
-0.29	83	2.44	28	2.44	-0.29	83
-0.27	85	2.74	29	2.74	-0.27	85
-0.25	80	3.15	27	3.15	-0.25	80
-0.22	83	3.09	28	3.09	-0.22	83
-0.20	83	2.96	28	2.96	-0.20	83
-0.18	88	2.69	30	2.69	-0.18	88
-0.16	85	2.68	29	2.68	-0.16	85
-0.14	80	2.72	27	2.72	-0.14	80
-0.12	80	2.44	27	2.44	-0.12	80
-0.10	80	2.12	27	2.12	-0.10	80
-0.08	77	1.87	26	1.87	-0.08	77
-0.06	75	1.83	25	1.83	-0.06	75
-0.04	72	1.87	24	1.87	-0.04	72
-0.02	69	2.10	23	2.10	-0.02	69
0.00	77	2.21	26	2.21	0.00	77
0.02	77	2.39	26	2.39	0.02	77
0.04	75	2.69	25	2.69	0.04	75
0.06	72	2.69	24	2.69	0.06	72
0.08	77	2.50	26	2.50	0.08	77
0.10	80	2.20	27	2.20	0.10	80
0.12	83	1.93	28	1.93	0.12	83
0.14	77	2.01	26	2.01	0.14	77
0.17	75	1.87	25	1.87	0.17	75
0.19	67	1.44	22	1.44	0.19	67
0.21	72	1.18	24	1.18	0.21	72
0.23	67	1.01	22	1.01	0.23	67
0.25	69	0.90	23	0.90	0.25	69
0.27	69	0.82	23	0.82	0.27	69
0.29	0	0.00	0	0.00	0.29	0
Max. Volts				3.15		
Max. Depth (%)				88.00		
Length (in.)				0.80		
Avg. Depth (%)				72.74		

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.53	0	0.00	0	0.00	-0.53	0
-0.51	52	0.66	18	0.66	-0.51	52
-0.49	47	0.70	16	0.70	-0.49	47
-0.47	44	0.74	15	0.74	-0.47	44
-0.45	41	0.86	14	0.86	-0.45	41
-0.43	47	0.95	16	0.95	-0.43	47
-0.4	49	0.97	17	0.97	-0.4	49
-0.38	47	1.22	16	1.22	-0.38	47
-0.36	55	1.46	19	1.46	-0.36	55
-0.34	64	1.80	22	1.80	-0.34	64
-0.32	70	2.14	24	2.14	-0.32	70
-0.3	73	2.43	25	2.43	-0.3	73
-0.28	73	2.45	25	2.45	-0.28	73
-0.25	73	2.25	25	2.25	-0.25	73
-0.23	79	2.25	27	2.25	-0.23	79
-0.21	73	2.61	25	2.61	-0.21	73
-0.19	70	2.93	24	2.93	-0.19	70
-0.17	73	2.85	25	2.85	-0.17	73
-0.15	79	2.60	27	2.60	-0.15	79
-0.13	76	2.45	26	2.45	-0.13	76
-0.1	79	2.46	27	2.46	-0.1	79
-0.08	76	2.41	26	2.41	-0.08	76
-0.06	76	2.18	26	2.18	-0.06	76
-0.04	79	1.90	27	1.90	-0.04	79
-0.02	79	1.74	27	1.74	-0.02	79
0	76	1.77	26	1.77	0	76
0.03	70	1.81	24	1.81	0.03	70
0.05	70	1.95	24	1.95	0.05	70
0.07	67	2.09	23	2.09	0.07	67
0.09	67	2.20	23	2.20	0.09	67
0.11	64	2.42	22	2.42	0.11	64
0.13	64	2.42	22	2.42	0.13	64
0.15	64	2.35	22	2.35	0.15	64
0.18	70	1.98	24	1.98	0.18	70
0.2	70	1.84	24	1.84	0.2	70
0.22	64	1.76	22	1.76	0.22	64
0.24	64	1.63	22	1.63	0.24	64
0.26	67	1.36	23	1.36	0.26	67
0.28	70	1.08	24	1.08	0.28	70
0.31	64	0.90	22	0.90	0.31	64
0.33	67	0.74	23	0.74	0.33	67
0.35	58	0.61	20	0.61	0.35	58
0.37	64	0.49	22	0.49	0.37	64
0.39	61	0.40	21	0.40	0.39	61
0.41	0	0.00	0	0.00	0.41	0.00
Max. Volts				2.93		
Max. Depth (%)				79.00		
Length (in.)				0.94		
Avg. Depth (%)				64.63		

Table J-22 (continued)
Sample 10 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth ⁽⁴⁾
-0.57	0	0.00	0	0.00	-0.57	0
-0.54	63	0.63	18	0.63	-0.54	63
-0.52	60	0.66	17	0.66	-0.52	60
-0.50	55	0.69	16	0.69	-0.50	55
-0.48	53	0.82	15	0.82	-0.48	53
-0.46	49	0.90	14	0.90	-0.46	49
-0.44	53	0.95	15	0.95	-0.44	53
-0.42	49	1.22	14	1.22	-0.42	49
-0.39	53	1.48	15	1.48	-0.39	53
-0.37	67	1.84	19	1.84	-0.37	67
-0.35	73	2.18	21	2.18	-0.35	73
-0.33	73	2.46	21	2.46	-0.33	73
-0.31	77	2.48	22	2.48	-0.31	77
-0.29	77	2.28	22	2.28	-0.29	77
-0.26	83	2.28	24	2.28	-0.26	83
-0.24	77	2.64	22	2.64	-0.24	77
-0.22	73	2.97	21	2.97	-0.22	73
-0.20	77	2.87	22	2.87	-0.20	77
-0.18	80	2.63	23	2.63	-0.18	80
-0.16	80	2.49	23	2.49	-0.16	80
-0.13	77	2.48	22	2.48	-0.13	77
-0.11	77	2.45	22	2.45	-0.11	77
-0.09	77	2.23	22	2.23	-0.09	77
-0.07	80	1.93	23	1.93	-0.07	80
-0.05	77	1.78	22	1.78	-0.05	77
-0.03	77	1.79	22	1.79	-0.03	77
-0.01	73	1.85	21	1.85	-0.01	73
0.02	70	2.00	20	2.00	0.02	70
0.04	67	2.15	19	2.15	0.04	67
0.06	67	2.26	19	2.26	0.06	67
0.08	63	2.49	18	2.49	0.08	63
0.10	63	2.49	18	2.49	0.10	63
0.12	67	2.38	19	2.38	0.12	67
0.15	73	2.00	21	2.00	0.15	73
0.17	73	1.85	21	1.85	0.17	73
0.19	67	1.78	19	1.78	0.19	67
0.21	67	1.65	19	1.65	0.21	67
0.23	70	1.38	20	1.38	0.23	70
0.25	63	1.06	18	1.06	0.25	63
0.28	57	0.87	16	0.87	0.28	57
0.30	60	0.73	17	0.73	0.30	60
0.32	53	0.62	15	0.62	0.32	53
0.34	67	0.50	19	0.50	0.34	67
0.36	63	0.40	18	0.40	0.36	63
0.38	0	0.00	0	0.00	0.38	0
Max. Volts				2.97		
Max. Depth (%)				83.00		
Length (in.)				0.95		
Avg. Depth (%)				66.13		

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽⁴⁾	Depth ⁽⁴⁾
-0.47	0	0	0	0	-0.47	0
-0.44	80	0.16	27	0.16	-0.44	80
-0.42	70	0.2	24	0.2	-0.42	70
-0.4	67	0.31	23	0.31	-0.4	67
-0.38	61	0.43	21	0.43	-0.38	61
-0.36	64	0.51	22	0.51	-0.36	64
-0.34	58	0.64	20	0.64	-0.34	58
-0.32	67	0.79	23	0.79	-0.32	67
-0.3	64	0.96	22	0.96	-0.3	64
-0.28	70	1.16	24	1.16	-0.28	70
-0.26	67	1.45	23	1.45	-0.26	67
-0.23	64	1.69	22	1.69	-0.23	64
-0.21	67	1.81	23	1.81	-0.21	67
-0.19	70	1.9	24	1.9	-0.19	70
-0.17	70	2.1	24	2.1	-0.17	70
-0.15	61	2.41	21	2.41	-0.15	61
-0.13	64	2.46	22	2.46	-0.13	64
-0.11	67	2.42	23	2.42	-0.11	67
-0.09	67	2.22	23	2.22	-0.09	67
-0.07	67	2.11	23	2.11	-0.07	67
-0.04	70	1.95	24	1.95	-0.04	70
-0.02	77	1.81	26	1.81	-0.02	77
0	77	1.8	26	1.8	0	77
0.02	80	1.8	27	1.8	0.02	80
0.04	80	1.99	27	1.99	0.04	80
0.06	77	2.27	26	2.27	0.06	77
0.08	74	2.4	25	2.4	0.08	74
0.1	80	2.51	27	2.51	0.1	80
0.12	77	2.53	26	2.53	0.12	77
0.14	80	2.7	27	2.7	0.14	80
0.17	74	2.92	25	2.92	0.17	74
0.19	74	2.92	25	2.92	0.19	74
0.21	74	2.59	25	2.59	0.21	74
0.23	74	2.3	25	2.3	0.23	74
0.25	77	2.32	26	2.32	0.25	77
0.27	74	2.49	25	2.49	0.27	74
0.29	70	2.41	24	2.41	0.29	70
0.31	70	2.1	24	2.1	0.31	70
0.33	67	1.69	23	1.69	0.33	67
0.35	58	1.42	20	1.42	0.35	58
0.38	55	1.15	19	1.15	0.38	55
0.4	48	0.96	17	0.96	0.4	48
0.42	45	0.91	16	0.91	0.42	45
0.44	42	0.83	15	0.83	0.44	42
0.46	42	0.73	15	0.73	0.46	42
0.48	45	0.71	16	0.71	0.48	45
0.5	55	0.62	19	0.62	0.5	55
0.52	83	0.31	28	0.31	0.52	83
0.54	61	0.15	21	0.15	0.54	61
0.56	0	0	0	0	0.56	0
Max. Volts				2.92		
Max. Depth (%)				83.00		
Length (in.)				1.03		
Avg. Depth (%)				65.61		

Table J-23
Sample 10 - 1H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth ⁽⁴⁾
NQ						

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE									
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽⁴⁾	
0.1	0	0.00	0	0.10	0	0.00	0.1	0	
0.12	41	0.23	14	0.12	41	0.23	0.12	41	
0.14	47	0.29	16	0.14	47	0.29	0.14	47	
0.17	61	0.29	21	0.17	61	0.29	0.17	61	
0.19	58	0.34	20	0.19	58	0.34	0.19	58	
0.21	52	0.37	18	0.21	52	0.37	0.21	52	
0.23	61	0.37	21	0.23	61	0.37	0.23	61	
0.25	55	0.35	19	0.25	55	0.35	0.25	55	
0.27	55	0.31	19	0.27	55	0.31	J	55	
0.29	58	0.27	20	0.29	58	0.27	0.29	58	
0.32	55	0.26	19	0.32	55	0.26	0.32	55	
0.34	58	0.27	20	0.34	58	0.27	0.34	58	
0.36	47	0.29	16	0.36	47	0.29	0.36	47	
0.38	52	0.27	18	0.38	52	0.27	0.38	52	
0.4	0	0.00	0	0.40	0	0.00	0.4	0	
					Max. Volts	0.37			0.37
					Max. Depth (%)	61.00			61
					Length (in.)	0.30			0.3
					Avg. Depth (%)	50.35			50.35

Table J-23 (continued)
Sample 10 - 1H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 3

Crack 2 - MR + Point - Analyst 4

Unadjusted NDE								
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Final with Adjustments		
						Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.12	0	0.00	0	-0.12	0	0.00	-0.12	0.00
-0.10	34	0.16	10	-0.1	34	0.16	-0.10	29.58
-0.08	38	0.24	11	-0.08	38	0.24	-0.08	33.06
-0.06	53	0.23	15	-0.06	53	0.23	-0.06	46.12
-0.04	46	0.18	13	-0.04	46	0.18	-0.04	40.03
-0.02	70	0.07	20	-0.02	70	0.07	-0.02	60.91
0.01	67	0.07	19	0.01	67	0.07	0.01	58.30
0.03	77	0.04	22	0.03	77	0.04	0.03	67.00
0.05	67	0.11	19	0.05	67	0.11	0.05	58.30
0.07	53	0.20	15	0.07	53	0.20	0.07	46.12
0.09	38	0.24	11	0.09	38	0.24	0.09	33.06
0.11	49	0.32	14	0.11	49	0.32	0.11	42.64
0.14	73	0.35	21	0.14	73	0.35	0.14	63.52
0.16	60	0.41	17	0.16	60	0.41	0.16	52.21
0.18	63	0.45	18	0.18	63	0.45	0.18	54.82
0.18	57	0.45	16	0.18	57	0.45	0.18	49.60
0.20	67	0.45	19	0.2	67	0.45	0.20	58.30
0.22	67	0.42	19	0.22	67	0.42	0.22	58.30
0.24	70	0.39	20	0.24	70	0.39	0.24	60.91
0.26	73	0.36	21	0.26	73	0.36	0.26	63.52
0.29	77	0.36	22	0.29	77	0.36	0.29	67.00
0.31	70	0.39	20	0.31	70	0.39	0.31	60.91
0.33	60	0.41	17	0.33	60	0.41	0.33	52.21
0.35	57	0.35	16	0.35	57	0.35	0.35	49.60
0.37	0	0.00	0	0.37	0	0.00	0.37	0.00
		Max. Volts		0.45		0.45		0.45
		Max. Depth (%)		77.00		67.00		67.00
		Length (in.)		0.49		0.49		0.49
		Avg. Depth (%)		58.30		50.73		50.73

Unadjusted NDE								
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Final with Adjustments		
						Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.43	0	0	0	-0.43	0	0	-0.43	0.00
-0.41	45	0.09	16	-0.41	45	0.09	-0.41	40.57
-0.39	39	0.2	14	-0.39	39	0.2	-0.39	35.16
-0.37	42	0.27	15	-0.37	42	0.27	-0.37	37.87
-0.35	55	0.29	19	-0.35	55	0.29	-0.35	49.59
-0.33	58	0.27	20	-0.33	58	0.27	-0.33	52.30
-0.31	58	0.27	20	-0.31	58	0.27	-0.31	52.30
-0.29	58	0.3	20	-0.29	58	0.3	-0.29	52.30
-0.27	55	0.34	19	-0.27	55	0.34	-0.27	49.59
-0.24	55	0.37	19	-0.24	55	0.37	-0.24	49.59
-0.22	55	0.38	19	-0.22	55	0.38	-0.22	49.59
-0.2	55	0.35	19	-0.2	55	0.35	-0.2	49.59
-0.18	55	0.3	19	-0.18	55	0.3	-0.18	49.59
-0.16	48	0.28	17	-0.16	48	0.28	-0.16	43.28
-0.14	39	0.24	14	-0.14	39	0.24	-0.14	35.16
-0.12	39	0.17	14	-0.12	39	0.17	-0.12	35.16
-0.1	55	0.11	19	-0.1	55	0.11	-0.1	49.59
-0.08	58	0.07	20	-0.08	58	0.07	-0.08	52.30
-0.06	61	0.06	21	-0.06	61	0.06	-0.06	55.00
-0.03	61	0.09	21	-0.03	61	0.09	-0.03	55.00
-0.01	51	0.15	18	-0.01	51	0.15	-0.01	45.98
0.01	48	0.22	17	0.01	48	0.22	0.01	43.28
0.03	42	0.23	15	0.03	42	0.23	0.03	37.87
0.05	36	0.17	13	0.05	36	0.17	0.05	32.46
0.07	33	0.11	12	0.07	33	0.11	0.07	29.75
0.09	0	0	0	0.09	0	0	0.09	0.00
		Max. Volts		0.38		0.38		0.38
		Max. Depth (%)		61.00		55.00		55.00
		Length (in.)		0.52		0.52		0.52
		Avg. Depth (%)		48.42		43.66		43.66

Table J-24
Sample 10 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth ⁽⁴⁾
-0.67	93	0.12	43			
-0.65	0	0.00	0	0.17	-0.65	0
-0.63	75	0.29	35	0.29	-0.63	75
-0.61	75	0.45	25	0.45	-0.61	75
-0.58	67	0.69	25	0.69	-0.58	67
-0.56	64	0.84	22	0.84	-0.56	64
-0.54	77	0.85	21	0.85	-0.54	77
-0.52	85	0.85	26	0.85	-0.52	85
-0.50	80	1.05	29	1.05	-0.50	80
-0.48	80	1.25	27	1.25	-0.48	80
-0.46	80	1.55	27	1.55	-0.46	80
-0.44	88	1.63	27	1.63	-0.44	88
-0.42	88	1.77	30	1.77	-0.42	88
-0.40	90	1.83	30	1.83	-0.40	90
-0.38	98	1.74	31	1.74	-0.38	98
-0.36	95	1.96	34	1.96	-0.36	95
-0.34	90	2.09	33	2.09	-0.34	90
-0.32	95	2.07	31	2.07	-0.32	95
-0.30	95	2.07	33	2.07	-0.30	95
-0.28	90	2.06	33	2.06	-0.28	90
-0.26	88	1.99	31	1.99	-0.26	88
-0.23	88	1.89	30	1.89	-0.23	88
-0.21	85	1.79	30	1.79	-0.21	85
-0.19	90	1.63	29	1.63	-0.19	90
-0.17	85	1.69	31	1.69	-0.17	85
-0.15	83	1.69	29	1.69	-0.15	83
-0.13	80	1.53	28	1.53	-0.13	80
-0.11	75	1.39	27	1.39	-0.11	75
-0.09	72	1.15	25	1.15	-0.09	72
-0.07	75	1.12	24	1.12	-0.07	75
-0.05	69	1.11	25	1.11	-0.05	69
-0.03	75	1.04	23	1.04	-0.03	75
-0.01	61	1.17	25	1.17	-0.01	61
0.01	69	1.37	20	1.37	0.01	69
0.03	77	1.58	23	1.58	0.03	77
0.05	77	1.74	26	1.74	0.05	77
0.07	77	1.57	26	1.57	0.07	77
0.09	83	1.53	26	1.53	0.09	83
0.12	88	1.47	28	1.47	0.12	88
0.14	85	1.54	30	1.54	0.14	85
0.16	88	1.46	29	1.46	0.16	88
0.18	93	1.34	30	1.34	0.18	93
0.20	85	1.26	32	1.26	0.20	85
0.22	83	1.15	29	1.15	0.22	83
0.24	83	1.10	28	1.10	0.24	83
0.26	80	1.02	28	1.02	0.26	80
0.28	80	0.97	27	0.97	0.28	80
0.30	80	0.91	27	0.91	0.30	80
0.32	75	0.87	27	0.87	0.32	75
0.34	75	0.75	25	0.75	0.34	75
0.36	72	0.60	25	0.60	0.36	72
0.38	77	0.49	24	0.49	0.38	77
0.40	77	0.47	26	0.47	0.40	77
0.42	83	0.44	28	0.44	0.42	83
0.45	0	0.00	0	0.26	0.45	0
Max. Volts				2.09		
Max. Depth (%)				98.00		
Length (in.)				1.10		
Avg. Depth (%)				79.42		

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.64	0	0.00	0			
-0.61	85	0.13	29			
-0.59	67	0.26	23	0.26	-0.59	0
-0.57	52	0.56	18	0.56	-0.57	52
-0.55	58	0.74	20	0.74	-0.55	58
-0.53	73	0.75	25	0.75	-0.53	73
-0.51	79	0.75	27	0.75	-0.51	79
-0.49	76	0.83	26	0.83	-0.49	76
-0.46	73	0.95	25	0.95	-0.46	73
-0.44	70	1.17	24	1.17	-0.44	70
-0.42	73	1.26	25	1.26	-0.42	73
-0.40	76	1.38	26	1.38	-0.40	76
-0.38	79	1.41	27	1.41	-0.38	79
-0.36	82	1.50	28	1.50	-0.36	82
-0.33	88	1.56	30	1.56	-0.33	88
-0.31	94	1.62	32	1.62	-0.31	94
-0.29	88	1.81	30	1.81	-0.29	88
-0.27	88	1.92	30	1.92	-0.27	88
-0.25	88	1.88	30	1.88	-0.25	88
-0.23	85	1.88	29	1.88	-0.23	85
-0.20	82	1.84	28	1.84	-0.20	82
-0.18	79	1.80	27	1.80	-0.18	79
-0.16	76	1.73	26	1.73	-0.16	76
-0.14	79	1.81	27	1.81	-0.14	79
-0.12	79	1.59	27	1.59	-0.12	79
-0.10	76	1.56	26	1.56	-0.10	76
-0.07	76	1.50	26	1.50	-0.07	76
-0.05	73	1.33	25	1.33	-0.05	73
-0.03	79	1.12	27	1.12	-0.03	79
-0.01	88	1.01	30	1.01	-0.01	88
0.01	79	1.04	27	1.04	0.01	79
0.03	85	1.06	29	1.06	0.03	85
0.06	82	1.10	28	1.10	0.06	82
0.08	79	1.22	27	1.22	0.08	79
0.10	73	1.47	25	1.47	0.10	73
0.12	70	1.57	24	1.57	0.12	70
0.14	73	1.53	25	1.53	0.14	73
0.16	79	1.42	27	1.42	0.16	79
0.19	79	1.39	27	1.39	0.19	79
0.21	76	1.41	26	1.41	0.21	76
0.23	76	1.39	26	1.39	0.23	76
0.25	79	1.30	27	1.30	0.25	79
0.27	76	1.20	26	1.20	0.27	76
0.29	70	1.21	24	1.21	0.29	70
0.32	70	1.03	24	1.03	0.32	70
0.34	64	0.97	22	0.97	0.34	64
0.36	64	0.89	22	0.89	0.36	64
0.38	61	0.84	21	0.84	0.38	61
0.40	58	0.79	20	0.79	0.40	58
0.42	52	0.72	18	0.72	0.42	52
0.45	47	0.57	16	0.57	0.45	47
0.47	47	0.44	16	0.44	0.47	47
0.49	41	0.34	14	0.34	0.49	41
0.51	49	0.30	17	0.30	0.51	0
0.53	52	0.21	18			
0.55	67	0.11	23			
0.57	0	0.00	0			
Max. Volts				1.92		
Max. Depth (%)				94.00		
Length (in.)				1.10		
Avg. Depth (%)				72.54		

Table J-24 (continued)
Sample 10 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE								
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Final with Adjustments		
						Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.67	98	0.06	34	-0.67	98			
-0.65	93	0.06	41	-0.65	93			
-0.63	89	0.13	26	-0.63	89			
-0.61	67	0.27	19	-0.61	67	0.27	-0.61	0
-0.58	53	0.57	15	-0.58	53	0.57	-0.58	53
-0.56	60	0.74	17	-0.56	60	0.74	-0.56	60
-0.54	77	0.76	22	-0.54	77	0.76	-0.54	77
-0.52	83	0.76	24	-0.52	83	0.76	-0.52	83
-0.50	80	0.85	23	-0.50	80	0.85	-0.50	80
-0.48	77	0.97	22	-0.48	77	0.97	-0.48	77
-0.46	73	1.18	21	-0.46	73	1.18	-0.46	73
-0.43	77	1.28	22	-0.43	77	1.28	-0.43	77
-0.41	83	1.40	24	-0.41	83	1.40	-0.41	83
-0.39	83	1.45	24	-0.39	83	1.45	-0.39	83
-0.37	86	1.57	25	-0.37	86	1.57	-0.37	86
-0.35	92	1.64	27	-0.35	92	1.64	-0.35	92
-0.33	97	1.68	29	-0.33	97	1.68	-0.33	97
-0.30	89	1.86	26	-0.30	89	1.86	-0.30	89
-0.28	89	1.96	26	-0.28	89	1.96	-0.28	89
-0.26	89	1.90	26	-0.26	89	1.90	-0.26	89
-0.24	86	1.90	25	-0.24	86	1.90	-0.24	86
-0.22	86	1.84	25	-0.22	86	1.84	-0.22	86
-0.20	80	1.80	23	-0.20	80	1.80	-0.20	80
-0.17	80	1.75	23	-0.17	80	1.75	-0.17	80
-0.15	77	1.61	22	-0.15	77	1.61	-0.15	77
-0.13	80	1.60	23	-0.13	80	1.60	-0.13	80
-0.11	73	1.60	21	-0.11	73	1.60	-0.11	73
-0.09	73	1.54	21	-0.09	73	1.54	-0.09	73
-0.07	73	1.38	21	-0.07	73	1.38	-0.07	73
-0.04	77	1.19	22	-0.04	77	1.19	-0.04	77
-0.02	80	1.09	23	-0.02	80	1.09	-0.02	80
0.00	73	1.10	21	0.00	73	1.10	0.00	73
0.00	73	1.10	21	0.00	73	1.10	0.00	73
0.02	70	1.10	20	0.02	70	1.10	0.02	70
0.04	73	1.14	21	0.04	73	1.14	0.04	73
0.07	73	1.27	21	0.07	73	1.27	0.07	73
0.09	70	1.54	20	0.09	70	1.54	0.09	70
0.11	67	1.65	19	0.11	67	1.65	0.11	67
0.13	73	1.61	21	0.13	73	1.61	0.13	73
0.15	80	1.50	23	0.15	80	1.50	0.15	80
0.17	77	1.47	22	0.17	77	1.47	0.17	77
0.20	73	1.49	21	0.20	73	1.49	0.20	73
0.22	77	1.46	22	0.22	77	1.46	0.22	77
0.24	77	1.37	22	0.24	77	1.37	0.24	77
0.26	77	1.26	22	0.26	77	1.26	0.26	77
0.28	73	1.19	21	0.28	73	1.19	0.28	73
0.30	73	1.08	21	0.30	73	1.08	0.30	73
0.33	67	1.04	19	0.33	67	1.04	0.33	67
0.35	67	0.95	19	0.35	67	0.95	0.35	67
0.37	63	0.87	18	0.37	63	0.87	0.37	63
0.39	60	0.80	17	0.39	60	0.80	0.39	60
0.41	53	0.73	15	0.41	53	0.73	0.41	53
0.43	42	0.58	12	0.43	42	0.58	0.43	42
0.46	46	0.45	13	0.46	46	0.45	0.46	46
0.48	42	0.36	12	0.48	42	0.36	0.48	42
0.50	49	0.31	14	0.50	49	0.31	0.50	49
0.52	49	0.22	14	0.52	49	0.22	0.52	49
0.54	77	0.10	22	0.54	77	0.10	0.54	0
0.59	92	0.03	27	0.59	92			
0.61	46	0.04	13	0.61	46			
0.56	96	0.03	37	0.56	96			
0.65	77	0.02	22	0.65	77			

Max. Volts	1.96
Max. Depth (%)	97.00
Length (in.)	1.15
Avg. Depth (%)	71.35

Unadjusted NDE								
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Final with Adjustments		
						Volts	Length ⁽²⁾	Depth ⁽⁴⁾
NO DATA								

Table J-25
Sample 10 - 2H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.43	93	0.19	32	-0.43	0	0.19	-0.43	0
-0.41	80	0.30	27	-0.41	80	0.30	-0.41	63
-0.39	85	0.39	29	-0.39	85	0.39	-0.39	67
-0.37	93	0.40	32	-0.37	93	0.40	-0.37	73
-0.35	93	0.43	32	-0.35	93	0.43	-0.35	73
-0.33	83	0.48	28	-0.33	83	0.48	-0.33	66
-0.31	77	0.54	26	-0.31	77	0.54	-0.31	61
-0.29	83	0.52	28	-0.29	83	0.52	-0.29	66
-0.27	83	0.46	28	-0.27	83	0.46	-0.27	66
-0.25	58	0.39	19	-0.25	58	0.39	-0.25	46
-0.22	41	0.27	13	-0.22	41	0.27	-0.22	32
-0.20	64	0.18	21	-0.20	64	0.18	-0.20	51
-0.18	47	0.28	15	-0.18	47	0.28	-0.18	37
-0.16	55	0.50	18	-0.16	55	0.50	-0.16	43
-0.14	67	0.63	22	-0.14	67	0.63	-0.14	53
-0.12	83	0.62	28	-0.12	83	0.62	-0.12	66
-0.10	85	0.60	29	-0.10	85	0.60	-0.10	67
-0.08	72	0.65	24	-0.08	72	0.65	-0.08	57
-0.06	93	0.35	32	-0.06	93	0.35	-0.06	73
-0.04	93	0.45	32	-0.04	93	0.45	-0.04	73
-0.02	85	0.58	29	-0.02	85	0.58	-0.02	67
0.00	75	0.69	25	0.00	75	0.69	0.00	59
0.02	67	0.68	22	0.02	67	0.68	0.02	53
0.04	85	0.57	29	0.04	85	0.57	0.04	67
0.06	69	0.62	23	0.06	69	0.62	0.06	54
0.08	95	0.43	33	0.08	95	0.43	0.08	75
0.10	72	0.57	24	0.10	72	0.57	0.10	57
0.13	75	0.52	25	0.13	75	0.52	0.13	59
0.15	67	0.50	22	0.15	67	0.50	0.15	53
0.17	72	0.46	24	0.17	72	0.46	0.17	57
0.19	77	0.38	26	0.19	77	0.38	0.19	61
0.21	67	0.35	22	0.21	67	0.35	0.21	53
0.23	58	0.25	19	0.23	58	0.25	0.23	46
0.25	58	0.38	19	0.25	58	0.38	0.25	46
0.27	55	0.34	18	0.27	55	0.34	0.27	43
0.29	64	0.27	21	0.29	64	0.27	0.29	51
0.31	69	0.20	23	0.31	0	0.20	0.31	0
0.33	80	0.09	27					
0.35	69	0.10	23					
				Max. Volts	0.69			0.69
				Max. Depth (%)	95.00			75.00
				Length (in.)	0.74			56.28
				Avg. Depth (%)	71.28			95.00

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.39	0	0.00	0	-0.39	0	0.00	-0.39	0
-0.37	47	0.28	16	-0.37	47	0.28	-0.37	34
-0.35	49	0.31	17	-0.35	49	0.31	-0.35	35
-0.32	70	0.34	24	-0.32	70	0.34	-0.32	50
-0.30	73	0.35	25	-0.30	73	0.35	-0.30	52
-0.28	64	0.40	22	-0.28	64	0.40	-0.28	46
-0.26	58	0.49	20	-0.26	58	0.49	-0.26	42
-0.24	67	0.50	23	-0.24	67	0.50	-0.24	48
-0.22	67	0.46	23	-0.22	67	0.46	-0.22	48
-0.19	61	0.42	21	-0.19	61	0.42	-0.19	44
-0.17	61	0.33	21	-0.17	61	0.33	-0.17	44
-0.15	70	0.25	24	-0.15	70	0.25	-0.15	50
-0.13	58	0.32	20	-0.13	58	0.32	-0.13	42
-0.11	55	0.52	19	-0.11	55	0.52	-0.11	39
-0.09	58	0.69	20	-0.09	58	0.69	-0.09	42
-0.06	73	0.69	25	-0.06	73	0.69	-0.06	52
-0.04	85	0.62	29	-0.04	85	0.62	-0.04	61
-0.02	73	0.60	25	-0.02	73	0.60	-0.02	52
0.00	64	0.61	22	0.00	64	0.61	0.00	46
0.02	67	0.59	23	0.02	67	0.59	0.02	48
0.04	70	0.59	24	0.04	70	0.59	0.04	50
0.07	67	0.64	23	0.07	67	0.64	0.07	48
0.09	61	0.69	21	0.09	61	0.69	0.09	44
0.11	61	0.72	21	0.11	61	0.72	0.11	44
0.13	64	0.66	22	0.13	64	0.66	0.13	46
0.15	70	0.57	24	0.15	70	0.57	0.15	50
0.17	64	0.53	22	0.17	64	0.53	0.17	46
0.20	61	0.49	21	0.20	61	0.49	0.20	44
0.22	61	0.48	21	0.22	61	0.48	0.22	44
0.24	61	0.44	21	0.24	61	0.44	0.24	44
0.26	58	0.42	20	0.26	58	0.42	0.26	42
0.28	61	0.39	21	0.28	61	0.39	0.28	44
0.30	52	0.41	18	0.30	52	0.41	0.30	37
0.33	55	0.45	19	0.33	55	0.45	0.33	39
0.35	52	0.47	18	0.35	52	0.47	0.35	37
0.37	55	0.40	19	0.37	55	0.40	0.37	39
0.39	64	0.28	22	0.39	0	0.28	0.39	0
0.41	64	0.16	22					
0.43	0	0.00	0					
				Max. Volts	0.72			0.72
				Max. Depth (%)	85.00			61.00
				Length (in.)	0.78			0.78
				Avg. Depth (%)	61.02			43.79

Table J-25 (continued)
Sample 10 - 2H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 3

Crack 2 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.40	31	0.15	9	-0.40	0	0.15	-0.40	0
-0.38	38	0.29	11	-0.38	38	0.29	-0.38	30
-0.36	38	0.40	11	-0.36	38	0.40	-0.36	30
-0.34	49	0.38	14	-0.34	49	0.38	-0.34	39
-0.32	46	0.38	13	-0.32	46	0.38	-0.32	36
-0.31	63	0.32	18	-0.31	63	0.32	-0.31	50
-0.29	46	0.48	13	-0.29	46	0.48	-0.29	36
-0.29	67	0.41	19	-0.29	67	0.41	-0.29	53
-0.27	46	0.54	13	-0.27	46	0.54	-0.27	36
-0.27	60	0.49	17	-0.27	60	0.49	-0.27	47
-0.25	57	0.53	16	-0.25	57	0.53	-0.25	45
-0.23	53	0.50	15	-0.23	53	0.50	-0.23	42
-0.21	57	0.47	16	-0.21	57	0.47	-0.21	45
-0.18	60	0.39	17	-0.18	60	0.39	-0.18	47
-0.16	67	0.30	19	-0.16	67	0.30	-0.16	53
-0.14	70	0.32	20	-0.14	70	0.32	-0.14	55
-0.12	57	0.50	16	-0.12	57	0.50	-0.12	45
-0.10	60	0.67	17	-0.10	60	0.67	-0.10	47
-0.08	73	0.68	21	-0.08	73	0.68	-0.08	57
-0.05	80	0.62	23	-0.05	80	0.62	-0.05	63
-0.03	73	0.61	21	-0.03	73	0.61	-0.03	57
-0.01	63	0.61	18	-0.01	63	0.61	-0.01	50
0.01	70	0.59	20	0.01	70	0.59	0.01	55
0.03	70	0.60	20	0.03	70	0.60	0.03	55
0.05	73	0.60	21	0.05	73	0.60	0.05	57
0.05	70	0.65	20	0.05	70	0.65	0.05	55
0.08	60	0.73	17	0.08	60	0.73	0.08	47
0.08	63	0.71	18	0.08	63	0.71	0.08	50
0.10	63	0.75	18	0.10	63	0.75	0.10	50
0.12	67	0.68	19	0.12	67	0.68	0.12	53
0.14	70	0.59	20	0.14	70	0.59	0.14	55
0.16	63	0.54	18	0.16	63	0.54	0.16	50
0.18	63	0.50	18	0.18	63	0.50	0.18	50
0.21	63	0.48	18	0.21	63	0.48	0.21	50
0.23	60	0.46	17	0.23	60	0.46	0.23	47
0.25	60	0.44	17	0.25	60	0.44	0.25	47
0.27	60	0.43	17	0.27	60	0.43	0.27	47
0.29	53	0.46	15	0.29	53	0.46	0.29	42
0.31	46	0.47	13	0.31	46	0.47	0.31	36
0.34	53	0.47	15	0.34	53	0.47	0.34	42
0.36	60	0.42	17	0.36	60	0.42	0.36	47
0.38	60	0.28	17	0.38	60	0.28	0.38	47
0.40	34	0.15	10	0.40	34	0.15	0.40	27
0.42	23	0.13	7	0.42	23	0.13	0.42	18
0.45	23	0.07	7	0.45	0	0.07	0.45	0
		Max. Volts			0.75			0.75
		Max. Depth (%)			80.00			63.00
		Length (in.)			0.85			0.85
		Avg. Depth (%)			56.92			44.83

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length	Depth
NO DATA								

Table J-26
Sample 10 - 2H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.43	93	0.19	32	-0.43	0	0.19	-0.43	0
-0.41	80	0.30	27	-0.41	80	0.30	-0.41	63
-0.39	85	0.39	29	-0.39	85	0.39	-0.39	67
-0.37	93	0.40	32	-0.37	93	0.40	-0.37	73
-0.35	93	0.43	32	-0.35	93	0.43	-0.35	73
-0.33	83	0.48	28	-0.33	83	0.48	-0.33	66
-0.31	77	0.54	26	-0.31	77	0.54	-0.31	61
-0.29	83	0.52	28	-0.29	83	0.52	-0.29	66
-0.27	83	0.46	28	-0.27	83	0.46	-0.27	66
-0.25	58	0.39	19	-0.25	58	0.39	-0.25	46
-0.22	41	0.27	13	-0.22	41	0.27	-0.22	32
-0.20	64	0.18	21	-0.20	64	0.18	-0.20	51
-0.18	47	0.28	15	-0.18	47	0.28	-0.18	37
-0.16	55	0.50	18	-0.16	55	0.50	-0.16	43
-0.14	67	0.63	22	-0.14	67	0.63	-0.14	53
-0.12	83	0.62	28	-0.12	83	0.62	-0.12	66
-0.10	85	0.60	29	-0.10	85	0.60	-0.10	67
-0.08	72	0.65	24	-0.08	72	0.65	-0.08	57
-0.06	93	0.35	32	-0.06	93	0.35	-0.06	73
-0.04	93	0.45	32	-0.04	93	0.45	-0.04	73
-0.02	85	0.58	29	-0.02	85	0.58	-0.02	67
0.00	75	0.69	25	0.00	75	0.69	0.00	59
0.02	67	0.68	22	0.02	67	0.68	0.02	53
0.04	85	0.57	29	0.04	85	0.57	0.04	67
0.06	69	0.62	23	0.06	69	0.62	0.06	54
0.08	95	0.43	33	0.08	95	0.43	0.08	75
0.10	72	0.57	24	0.10	72	0.57	0.10	57
0.13	75	0.52	25	0.13	75	0.52	0.13	59
0.15	67	0.50	22	0.15	67	0.50	0.15	53
0.17	72	0.46	24	0.17	72	0.46	0.17	57
0.19	77	0.38	26	0.19	77	0.38	0.19	61
0.21	67	0.35	22	0.21	67	0.35	0.21	53
0.23	58	0.25	19	0.23	58	0.25	0.23	46
0.25	58	0.38	19	0.25	58	0.38	0.25	46
0.27	55	0.34	18	0.27	55	0.34	0.27	43
0.29	64	0.27	21	0.29	64	0.27	0.29	51
0.31	69	0.20	23	0.31	0	0.20	0.31	0
0.33	80	0.09	27					
0.35	69	0.10	23					
		Max. Volts		0.69				0.69
		Max. Depth (%)		95.00				75.00
		Length (in.)		0.74				56.28
		Avg. Depth (%)		71.28				95.00

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.39	0	0.00	0	-0.39	0	0.00	-0.39	0
-0.37	47	0.28	16	-0.37	47	0.28	-0.37	34
-0.35	49	0.31	17	-0.35	49	0.31	-0.35	35
-0.32	70	0.34	24	-0.32	70	0.34	-0.32	50
-0.30	73	0.35	25	-0.30	73	0.35	-0.30	52
-0.28	64	0.40	22	-0.28	64	0.40	-0.28	46
-0.26	58	0.49	20	-0.26	58	0.49	-0.26	42
-0.24	67	0.50	23	-0.24	67	0.50	-0.24	48
-0.22	67	0.46	23	-0.22	67	0.46	-0.22	48
-0.19	61	0.42	21	-0.19	61	0.42	-0.19	44
-0.17	61	0.33	21	-0.17	61	0.33	-0.17	44
-0.15	70	0.25	24	-0.15	70	0.25	-0.15	50
-0.13	58	0.32	20	-0.13	58	0.32	-0.13	42
-0.11	55	0.52	19	-0.11	55	0.52	-0.11	39
-0.09	58	0.69	20	-0.09	58	0.69	-0.09	42
-0.06	73	0.69	25	-0.06	73	0.69	-0.06	52
-0.04	85	0.62	29	-0.04	85	0.62	-0.04	61
-0.02	73	0.60	25	-0.02	73	0.60	-0.02	52
0.00	64	0.61	22	0.00	64	0.61	0.00	46
0.02	67	0.59	23	0.02	67	0.59	0.02	48
0.04	70	0.59	24	0.04	70	0.59	0.04	50
0.07	67	0.64	23	0.07	67	0.64	0.07	48
0.09	61	0.69	21	0.09	61	0.69	0.09	44
0.11	61	0.72	21	0.11	61	0.72	0.11	44
0.13	64	0.66	22	0.13	64	0.66	0.13	46
0.15	70	0.57	24	0.15	70	0.57	0.15	50
0.17	64	0.53	22	0.17	64	0.53	0.17	46
0.20	61	0.49	21	0.20	61	0.49	0.20	44
0.22	61	0.48	21	0.22	61	0.48	0.22	44
0.24	61	0.44	21	0.24	61	0.44	0.24	44
0.26	58	0.42	20	0.26	58	0.42	0.26	42
0.28	61	0.39	21	0.28	61	0.39	0.28	44
0.30	52	0.41	18	0.30	52	0.41	0.30	37
0.33	55	0.45	19	0.33	55	0.45	0.33	39
0.35	52	0.47	18	0.35	52	0.47	0.35	37
0.37	55	0.40	19	0.37	55	0.40	0.37	39
0.39	64	0.28	22	0.39	0	0.28	0.39	0
0.41	64	0.16	22					
0.43	0	0.00	0					
		Max. Volts		0.72				0.72
		Max. Depth (%)		85.00				61.00
		Length (in.)		0.78				0.78
		Avg. Depth (%)		61.02				43.79

Table J-26 (continued)
 Sample 10 - 2H
 Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length ⁽¹⁾	Depth ⁽²⁾
NO DATA								

Crack 2 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽¹⁾	Depth	Volts	Length	Depth
NO DATA								

Table J-27
Sample 10 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.46	0	0.00	0	0.00	-0.46	0
-0.44	67	0.50	22	0.50	-0.44	67
-0.42	67	0.69	22	0.69	-0.42	67
-0.40	67	0.82	22	0.82	-0.40	67
-0.38	69	0.87	23	0.87	-0.38	69
-0.36	72	0.89	24	0.89	-0.36	72
-0.34	80	0.96	27	0.96	-0.34	80
-0.32	75	1.16	25	1.16	-0.32	75
-0.30	69	1.36	23	1.36	-0.30	69
-0.28	80	1.48	27	1.48	-0.28	80
-0.26	80	1.69	27	1.69	-0.26	80
-0.24	77	2.13	26	2.13	-0.24	77
-0.22	77	2.42	26	2.42	-0.22	77
-0.20	80	2.41	27	2.41	-0.20	80
-0.17	80	2.36	27	2.36	-0.17	80
-0.15	75	2.49	25	2.49	-0.15	75
-0.13	75	2.66	25	2.66	-0.13	75
-0.11	72	2.77	24	2.77	-0.11	72
-0.09	72	2.78	24	2.78	-0.09	72
-0.07	72	2.77	24	2.77	-0.07	72
-0.05	69	2.79	23	2.79	-0.05	69
-0.03	69	2.80	23	2.80	-0.03	69
-0.01	72	2.84	24	2.84	-0.01	72
0.01	77	2.93	26	2.93	0.01	77
0.03	80	3.01	27	3.01	0.03	80
0.05	80	3.29	27	3.29	0.05	80
0.07	80	3.54	27	3.54	0.07	80
0.09	77	3.78	26	3.78	0.09	77
0.11	80	3.72	27	3.72	0.11	80
0.13	83	3.48	28	3.48	0.13	83
0.15	83	3.40	28	3.40	0.15	83
0.17	77	3.54	26	3.54	0.17	77
0.19	77	3.33	26	3.33	0.19	77
0.21	83	2.80	28	2.80	0.21	83
0.23	80	2.52	27	2.52	0.23	80
0.25	75	2.40	25	2.40	0.25	75
0.28	75	2.02	25	2.02	0.28	75
0.30	77	1.42	26	1.42	0.30	77
0.32	75	1.31	25	1.31	0.32	75
0.34	72	1.05	24	1.05	0.34	72
0.36	75	0.71	25	0.71	0.36	75
0.38	80	0.55	27	0.55	0.38	80
0.40	0	0.00	0	0.00	0.40	0
Max. Volts						3.78
Max. Depth (%)						83.00
Length (in.)						0.86
Avg. Depth (%)						73.94

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽¹⁾
-0.43	0	0.00	0	0.00	-0.43	0
-0.40	52	0.66	18	0.66	-0.40	52
-0.38	52	0.83	18	0.83	-0.38	52
-0.36	58	0.91	20	0.91	-0.36	58
-0.34	67	0.96	23	0.96	-0.34	67
-0.32	73	1.05	25	1.05	-0.32	73
-0.30	70	1.27	24	1.27	-0.30	70
-0.28	67	1.45	23	1.45	-0.28	67
-0.25	70	1.61	24	1.61	-0.25	70
-0.23	73	1.85	25	1.85	-0.23	73
-0.21	70	2.15	24	2.15	-0.21	70
-0.19	70	2.35	24	2.35	-0.19	70
-0.17	73	2.43	25	2.43	-0.17	73
-0.15	70	2.49	24	2.49	-0.15	70
-0.12	67	2.59	23	2.59	-0.12	67
-0.10	67	2.67	23	2.67	-0.10	67
-0.08	67	2.67	23	2.67	-0.08	67
-0.06	70	2.69	24	2.69	-0.06	70
-0.04	70	2.71	24	2.71	-0.04	70
-0.02	70	2.73	24	2.73	-0.02	70
0.00	70	2.86	24	2.86	0.00	70
0.03	73	2.91	25	2.91	0.03	73
0.05	76	2.93	26	2.93	0.05	76
0.07	73	3.03	25	3.03	0.07	73
0.09	73	3.26	25	3.26	0.09	73
0.11	73	3.37	25	3.37	0.11	73
0.13	70	3.55	24	3.55	0.13	70
0.15	76	3.33	26	3.33	0.15	76
0.18	79	3.12	27	3.12	0.18	79
0.20	70	3.34	24	3.34	0.20	70
0.22	70	3.31	24	3.31	0.22	70
0.24	73	2.86	25	2.86	0.24	73
0.26	76	2.49	26	2.49	0.26	76
0.28	70	2.36	24	2.36	0.28	70
0.31	67	2.00	23	2.00	0.31	67
0.33	70	1.40	24	1.40	0.33	70
0.35	67	1.19	23	1.19	0.35	67
0.37	67	0.98	23	0.98	0.37	67
0.39	70	0.66	24	0.66	0.39	70
0.41	76	0.43	26	0.43	0.41	76
0.44	0	0.00	0	0.00	0.44	0
Max. Volts						3.55
Max. Depth (%)						79.00
Length (in.)						0.87
Avg. Depth (%)						67.22

Table J-27 (continued)
Sample 10 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.47	0	0.00	0	0.00	-0.47	0
-0.44	53	0.45	15	0.45	-0.44	53
-0.42	49	0.70	14	0.70	-0.42	49
-0.40	49	0.88	14	0.88	-0.40	49
-0.38	57	0.95	18	0.95	-0.38	57
-0.36	63	0.97	18	0.97	-0.36	63
-0.34	77	1.07	22	1.07	-0.34	77
-0.31	73	1.29	21	1.29	-0.31	73
-0.29	70	1.47	20	1.47	-0.29	70
-0.27	67	1.64	19	1.64	-0.27	67
-0.25	73	1.88	21	1.88	-0.25	73
-0.23	70	2.19	20	2.19	-0.23	70
-0.21	70	2.36	20	2.36	-0.21	70
-0.19	73	2.46	21	2.46	-0.19	73
-0.16	70	2.51	20	2.51	-0.16	70
-0.14	67	2.64	19	2.64	-0.14	67
-0.12	67	2.74	19	2.74	-0.12	67
-0.10	70	2.75	20	2.75	-0.10	70
-0.08	70	2.77	20	2.77	-0.08	70
-0.06	70	2.78	20	2.78	-0.06	70
-0.03	70	2.82	20	2.82	-0.03	70
-0.01	70	2.95	20	2.95	-0.01	70
0.01	70	3.00	20	3.00	0.01	70
0.03	73	3.01	21	3.01	0.03	73
0.05	73	3.11	21	3.11	0.05	73
0.07	73	3.35	21	3.35	0.07	73
0.10	73	3.46	21	3.46	0.10	73
0.12	70	3.65	20	3.65	0.12	70
0.14	77	3.42	22	3.42	0.14	77
0.16	80	3.17	23	3.17	0.16	80
0.18	73	3.42	21	3.42	0.18	73
0.20	70	3.40	20	3.40	0.20	70
0.22	77	2.94	22	2.94	0.22	77
0.25	77	2.55	22	2.55	0.25	77
0.27	73	2.39	21	2.39	0.27	73
0.29	67	2.06	19	2.06	0.29	67
0.31	70	1.46	20	1.46	0.31	70
0.33	67	1.24	19	1.24	0.33	67
0.35	70	1.04	20	1.04	0.35	70
0.38	67	0.72	19	0.72	0.38	67
0.40	73	0.48	21	0.48	0.40	73
0.42	0	0.00	0	0.00	0.42	0
				Max. Volts	3.65	
				Max. Depth (%)	80.00	
				Length (in.)	0.89	
				Avg. Depth (%)	67.46	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NO DATA						

Table J-28
Sample 11 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽¹⁾
-0.45	0	0.00	0	0.00	-0.45	0
-0.43	56	0.32	19	0.32	-0.43	56
-0.41	56	0.64	19	0.64	-0.41	56
-0.39	65	0.96	22	0.96	-0.39	65
-0.37	62	1.21	21	1.21	-0.37	62
-0.34	65	1.28	22	1.28	-0.34	65
-0.32	68	1.47	23	1.47	-0.32	68
-0.30	74	1.62	25	1.62	-0.30	74
-0.28	77	1.76	26	1.76	-0.28	77
-0.26	81	1.92	27	1.92	-0.26	81
-0.24	81	2.02	27	2.02	-0.24	81
-0.22	74	2.24	25	2.24	-0.22	74
-0.20	71	2.33	24	2.33	-0.20	71
-0.18	74	2.22	25	2.22	-0.18	74
-0.15	68	2.23	23	2.23	-0.15	68
-0.13	74	2.10	25	2.10	-0.13	74
-0.11	81	2.14	27	2.14	-0.11	81
-0.09	77	2.35	26	2.35	-0.09	77
-0.07	74	2.63	25	2.63	-0.07	74
-0.05	71	2.78	24	2.78	-0.05	71
-0.03	74	2.73	25	2.73	-0.03	74
-0.01	77	2.64	26	2.64	-0.01	77
0.02	74	2.71	25	2.71	0.02	74
0.04	68	3.00	23	3.00	0.04	68
0.06	68	3.14	23	3.14	0.06	68
0.08	74	3.09	25	3.09	0.08	74
0.10	71	3.21	24	3.21	0.10	71
0.12	77	2.96	26	2.96	0.12	77
0.14	81	2.86	27	2.86	0.14	81
0.16	81	2.87	27	2.87	0.16	81
0.19	81	2.74	27	2.74	0.19	81
0.21	81	2.53	27	2.53	0.21	81
0.23	81	2.22	27	2.22	0.23	81
0.25	81	1.78	27	1.78	0.25	81
0.27	81	1.46	27	1.46	0.27	81
0.29	74	1.32	25	1.32	0.29	74
0.31	74	1.03	25	1.03	0.31	74
0.33	71	0.77	24	0.77	0.33	71
0.36	52	0.60	18	0.60	0.36	52
0.38	37	0.41	13	0.41	0.38	37
0.40	0	0.00	0	0.00	0.40	0
				Max. Volts	3.21	
				Max. Depth (%)	81.00	
				Length (in.)	0.85	
				Avg. Depth (%)	70.19	

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽¹⁾
-0.45	0	0.00	0	0.00	-0.45	0
-0.43	55	0.43	19	0.43	-0.43	55
-0.41	55	0.94	19	0.94	-0.41	55
-0.39	67	1.09	23	1.09	-0.39	67
-0.36	64	1.21	22	1.21	-0.36	64
-0.34	61	1.29	21	1.29	-0.34	61
-0.32	67	1.44	23	1.44	-0.32	67
-0.30	73	1.57	25	1.57	-0.30	73
-0.28	76	1.72	26	1.72	-0.28	76
-0.26	76	1.91	26	1.91	-0.26	76
-0.23	76	2.05	26	2.05	-0.23	76
-0.21	70	2.22	24	2.22	-0.21	70
-0.19	70	2.26	24	2.26	-0.19	70
-0.17	73	2.18	25	2.18	-0.17	73
-0.15	70	2.17	24	2.17	-0.15	70
-0.13	70	2.13	24	2.13	-0.13	70
-0.10	76	2.15	26	2.15	-0.10	76
-0.08	73	2.37	25	2.37	-0.08	73
-0.06	70	2.59	24	2.59	-0.06	70
-0.04	73	2.63	25	2.63	-0.04	73
-0.02	76	2.54	26	2.54	-0.02	76
0.00	76	2.57	26	2.57	0.00	76
0.03	70	2.80	24	2.80	0.03	70
0.05	67	2.97	23	2.97	0.05	67
0.07	70	3.09	24	3.09	0.07	70
0.09	70	3.07	24	3.07	0.09	70
0.11	70	3.13	24	3.13	0.11	70
0.13	73	3.02	25	3.02	0.13	73
0.16	76	2.92	26	2.92	0.16	76
0.18	76	2.85	26	2.85	0.18	76
0.20	79	2.66	27	2.66	0.20	79
0.22	79	2.44	27	2.44	0.22	79
0.24	79	2.13	27	2.13	0.24	79
0.26	79	1.69	27	1.69	0.26	79
0.29	79	1.35	27	1.35	0.29	79
0.31	67	1.24	23	1.24	0.31	67
0.33	67	1.05	23	1.05	0.33	67
0.35	58	0.81	20	0.81	0.35	58
0.37	55	0.56	19	0.56	0.37	55
0.40	29	0.35	10	0.35	0.40	29
0.42	0	0.00	0	0.00	0.42	0
				Max. Volts	3.13	
				Max. Depth (%)	79.00	
				Length (in.)	0.87	
				Avg. Depth (%)	67.85	

Table J-28 (continued)
Sample 11 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽¹⁾	Depth ⁽²⁾
-0.44	0	0.00	0	0.00	-0.44	0
-0.42	57	0.64	16	0.64	-0.42	57
-0.40	60	0.97	17	0.97	-0.40	60
-0.38	70	1.13	20	1.13	-0.38	70
-0.36	70	1.22	20	1.22	-0.36	70
-0.34	70	1.45	20	1.45	-0.34	70
-0.31	77	1.60	22	1.60	-0.31	77
-0.29	80	1.73	23	1.73	-0.29	80
-0.27	83	1.89	24	1.89	-0.27	83
-0.25	83	2.00	24	2.00	-0.25	83
-0.23	73	2.24	21	2.24	-0.23	73
-0.21	73	2.33	21	2.33	-0.21	73
-0.18	73	2.26	21	2.26	-0.18	73
-0.16	70	2.19	20	2.19	-0.16	70
-0.14	77	2.13	22	2.13	-0.14	77
-0.12	83	2.18	24	2.18	-0.12	83
-0.10	80	2.39	23	2.39	-0.10	80
-0.08	73	2.66	21	2.66	-0.08	73
-0.05	73	2.79	21	2.79	-0.05	73
-0.03	73	2.73	21	2.73	-0.03	73
-0.01	77	2.65	22	2.65	-0.01	77
-0.01	77	2.65	22	2.65	-0.01	77
0.01	77	2.74	22	2.74	0.01	77
0.01	77	2.74	22	2.74	0.01	77
0.03	70	3.01	20	3.01	0.03	70
0.05	70	3.15	20	3.15	0.05	70
0.08	73	3.06	21	3.06	0.08	73
0.10	73	3.21	21	3.21	0.10	73
0.12	80	2.98	23	2.98	0.12	80
0.14	83	2.88	24	2.88	0.14	83
0.16	80	2.89	23	2.89	0.16	80
0.18	80	2.75	23	2.75	0.18	80
0.21	83	2.51	24	2.51	0.21	83
0.23	83	2.25	24	2.25	0.23	83
0.25	80	1.78	23	1.78	0.25	80
0.27	83	1.48	24	1.48	0.27	83
0.29	77	1.33	22	1.33	0.29	77
0.32	63	1.16	18	1.16	0.32	63
0.34	63	0.85	18	0.85	0.34	63
0.36	57	0.62	16	0.62	0.36	57
0.38	53	0.40	15	0.40	0.38	53
0.40	0	0.00	0	0.00	0.40	0
				Max. Volts	3.21	
				Max. Depth (%)	83.00	
				Length (in.)	0.84	
				Avg. Depth (%)	72.01	

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth
NO DATA						

Table J-29
Sample 11 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE						Final with Adjustments					
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾			
-0.52	0	0.00	0	-0.52	0	0.00	-0.52	0			
-0.50	43	0.45	15	-0.50	43	0.45	-0.50	43			
-0.48	46	0.67	16	-0.48	46	0.67	-0.48	46			
-0.46	56	0.87	19	-0.46	56	0.87	-0.46	56			
-0.44	68	1.07	23	-0.44	68	1.07	-0.44	68			
-0.41	68	1.30	23	-0.41	68	1.30	-0.41	68			
-0.39	68	1.55	23	-0.39	68	1.55	-0.39	68			
-0.37	65	1.88	22	-0.37	65	1.88	-0.37	65			
-0.35	71	2.19	24	-0.35	71	2.19	-0.35	71			
-0.33	71	2.51	24	-0.33	71	2.51	-0.33	71			
-0.31	74	2.59	25	-0.31	74	2.59	-0.31	74			
-0.29	77	2.68	26	-0.29	77	2.68	-0.29	77			
-0.27	81	2.73	27	-0.27	81	2.73	-0.27	81			
-0.25	81	2.87	27	-0.25	81	2.87	-0.25	81			
-0.23	77	3.08	26	-0.23	77	3.08	-0.23	77			
-0.21	77	3.17	26	-0.21	77	3.17	-0.21	77			
-0.18	77	3.44	26	-0.18	77	3.44	-0.18	77			
-0.16	77	3.51	26	-0.16	77	3.51	-0.16	77			
-0.14	77	3.47	26	-0.14	77	3.47	-0.14	77			
-0.12	77	3.34	26	-0.12	77	3.34	-0.12	77			
-0.10	74	3.33	25	-0.10	74	3.33	-0.10	74			
-0.08	74	3.42	25	-0.08	74	3.42	-0.08	74			
-0.06	74	3.60	25	-0.06	74	3.60	-0.06	74			
-0.04	74	4.15	25	-0.04	74	4.15	-0.04	74			
-0.02	74	4.36	25	-0.02	74	4.36	-0.02	74			
0.00	77	4.56	26	0.00	77	4.56	0.00	77			
0.02	77	4.60	26	0.02	77	4.60	0.02	77			
0.04	77	4.55	26	0.04	77	4.55	0.04	77			
0.07	77	4.79	26	0.07	77	4.79	0.07	77			
0.09	77	4.97	26	0.09	77	4.97	0.09	77			
0.11	81	5.13	27	0.11	81	5.13	0.11	81			
0.13	84	5.43	28	0.13	84	5.43	0.13	84			
0.15	90	5.16	30	0.15	90	5.16	0.15	90			
0.17	94	5.04	31	0.17	94	5.04	0.17	94.00			
0.19	94	4.84	31	0.19	94	4.84	0.19	94			
0.21	100	4.85	33	0.21	100	4.85	0.21	100			
0.23	100	4.96	33	0.23	100	4.96	0.23	100			
0.25	97	5.12	32	0.25	97	5.12	0.25	97			
0.28	97	4.76	32	0.28	97	4.76	0.28	97			
0.30	94	4.25	31	0.30	94	4.25	0.30	94			
0.32	84	3.56	28	0.32	84	3.56	0.32	84			
0.34	68	3.07	23	0.34	68	3.07	0.34	68			
0.36	65	2.46	22	0.36	65	2.46	0.36	65			
0.38	65	1.91	22	0.38	65	1.91	0.38	65			
0.40	74	1.40	25	0.40	74	1.40	0.40	74			
0.42	74	1.05	25	0.42	74	1.05	0.42	74			
0.44	84	0.73	28	0.44	84	0.73	0.44	84			
0.46	0	0.00	0	0.46	0	0.00	0.46	0			
Max. Volts				5.43		5.43					
Max. Depth (%)				100.00		100					
Length (in.)				0.98		0.98					
Avg. Depth (%)				75.32		75.32					

Unadjusted NDE						Final with Adjustments					
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾			
-0.48	0	0.00	0	-0.48	0	0.00	-0.48	0			
-0.46	44	0.49	15	-0.46	44	0.49	-0.46	45.4			
-0.44	47	0.72	16	-0.44	47	0.72	-0.44	48.5			
-0.41	58	0.91	20	-0.41	58	0.91	-0.41	59.8			
-0.39	67	1.09	23	-0.39	67	1.09	-0.39	69.1			
-0.37	64	1.31	22	-0.37	64	1.31	-0.37	66.0			
-0.35	64	1.59	22	-0.35	64	1.59	-0.35	66.0			
-0.33	64	1.91	22	-0.33	64	1.91	-0.33	66.0			
-0.31	67	2.21	23	-0.31	67	2.21	-0.31	69.1			
-0.29	73	2.46	25	-0.29	73	2.46	-0.29	75.3			
-0.26	73	2.59	25	-0.26	73	2.59	-0.26	75.3			
-0.24	76	2.64	26	-0.24	76	2.64	-0.24	78.4			
-0.22	79	2.72	27	-0.22	79	2.72	-0.22	81.4			
-0.2	79	2.84	27	-0.20	79	2.84	-0.2	81.4			
-0.18	79	3.00	27	-0.18	79	3.00	-0.18	81.4			
-0.16	76	3.22	26	-0.16	76.00	3.22	-0.16	78.4			
-0.14	76	3.34	26	-0.14	76.00	3.34	-0.14	78.4			
-0.11	76	3.39	26	-0.11	76.00	3.39	-0.11	78.4			
-0.09	76	3.38	26	-0.09	76.00	3.38	-0.09	78.4			
-0.07	73	3.25	25	-0.07	73	3.25	-0.07	75.3			
-0.05	73	3.25	25	-0.05	73	3.25	-0.05	75.3			
-0.03	73	3.45	25	-0.03	73	3.45	-0.03	75.3			
-0.01	73	3.84	25	-0.01	73	3.84	-0.01	75.3			
0.01	73	4.18	25	0.01	73	4.18	0.01	75.3			
0.04	73	4.41	25	0.04	73	4.41	0.04	75.3			
0.06	76	4.44	26	0.06	76	4.44	0.06	78.4			
0.08	76	4.40	26	0.08	76	4.40	0.08	78.4			
0.10	76	4.48	26	0.10	76	4.48	0.1	78.4			
0.12	76	4.59	26	0.12	76	4.59	0.12	78.4			
0.14	76	4.90	26	0.14	76	4.90	0.14	78.4			
0.17	82	5.06	28	0.17	82	5.06	0.17	84.5			
0.19	88	5.05	30	0.19	88	5.05	0.19	90.7			
0.21	91	4.86	31	0.21	91	4.86	0.21	93.8			
0.23	91	4.78	31	0.23	91	4.78	0.23	93.8			
0.25	94	4.75	32	0.25	94	4.75	0.25	96.9			
0.27	97	4.84	33	0.27	97	4.84	0.27	100.0			
0.29	97	4.88	33	0.29	97	4.88	0.29	100.0			
0.32	97	4.72	33	0.32	97	4.72	0.32	100.0			
0.34	94	4.32	32	0.34	94	4.32	0.34	96.9			
0.36	88	3.80	30	0.36	88	3.80	0.36	90.7			
0.38	73	3.25	25	0.38	73	3.25	0.38	75.3			
0.40	64	2.65	22	0.40	64	2.65	0.4	66.0			
0.42	64	2.11	22	0.42	64	2.11	0.42	66.0			
0.44	64	1.63	22	0.44	64	1.63	0.44	66.0			
0.46	67	1.25	23	0.46	67	1.25	0.46	69.1			
0.49	0	0.00	0	0.49	0	0.00	0.49	0			
Max. Volts				5.06		5.06					
Max. Depth (%)				97.00		100					
Length (in.)				0.97		0.97					
Avg. Depth (%)				73.18		75.44					

Table J-29 (continued)
Sample 11 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE					Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽⁴⁾	
-0.48	0	0.00	0	-0.48	0	0.00	-0.48	0	
-0.46	49	0.42	14	-0.46	49	0.42	-0.46	49	
-0.44	46	0.66	13	-0.44	46	0.66	-0.44	46	
-0.41	57	0.86	16	-0.41	57	0.86	-0.41	57	
-0.39	70	1.05	20	-0.39	70	1.05	-0.39	70	
-0.37	67	1.30	19	-0.37	67	1.30	-0.37	67	
-0.35	67	1.54	19	-0.35	67	1.54	-0.35	67	
-0.33	67	1.86	19	-0.33	67	1.86	-0.33	67	
-0.31	73	2.14	21	-0.31	73	2.14	-0.31	73	
-0.29	73	2.47	21	-0.29	73	2.47	-0.29	73	
-0.27	80	2.55	23	-0.27	80	2.55	-0.27	80	
-0.24	80	2.64	23	-0.24	80	2.64	-0.24	80	
-0.22	80	2.67	23	-0.22	80	2.67	-0.22	80	
-0.20	80	2.85	23	-0.20	80	2.85	-0.20	80	
-0.18	80	3.02	23	-0.18	80	3.02	-0.18	80	
-0.16	80	3.10	23	-0.16	80	3.10	-0.16	80	
-0.14	77	3.42	22	-0.14	77	3.42	-0.14	77	
-0.12	73	3.48	21	-0.12	73	3.48	-0.12	73	
-0.09	77	3.45	22	-0.09	77	3.45	-0.09	77	
-0.07	77	3.31	22	-0.07	77	3.31	-0.07	77	
-0.05	70	3.30	20	-0.05	70	3.30	-0.05	70	
-0.03	73	3.40	21	-0.03	73	3.40	-0.03	73	
-0.01	70	3.62	20	-0.01	70	3.62	-0.01	70	
0.01	73	4.18	21	0.01	73	4.18	0.01	73	
0.03	77	4.37	22	0.03	77	4.37	0.03	77	
0.06	73	4.57	21	0.06	73	4.57	0.06	73	
0.08	73	4.59	21	0.08	73	4.59	0.08	73	
0.10	77	4.54	22	0.10	77	4.54	0.10	77	
0.12	77	4.75	22	0.12	77	4.75	0.12	77	
0.14	77	4.92	22	0.14	77	4.92	0.14	77	
0.16	83	5.07	24	0.16	83	5.07	0.16	83	
0.18	86	5.35	25	0.18	86	5.35	0.18	86	
0.21	92	5.09	27	0.21	92	5.09	0.21	92	
0.23	94	4.96	28	0.23	94	4.96	0.23	94	
0.25	94	4.76	28	0.25	94	4.76	0.25	94	
0.27	100	4.77	30	0.27	100	4.77	0.27	100	
0.29	100	4.88	30	0.29	100	4.88	0.29	100	
0.31	97	5.04	29	0.31	97	5.04	0.31	97	
0.33	97	4.69	29	0.33	97	4.69	0.33	97	
0.36	94	4.19	28	0.36	94	4.19	0.36	94	
0.38	86	3.51	25	0.38	86	3.51	0.38	86	
0.40	70	3.02	20	0.40	70	3.02	0.40	70	
0.42	67	2.45	19	0.42	67	2.45	0.42	67	
0.44	63	1.90	18	0.44	63	1.90	0.44	63	
0.46	77	1.37	22	0.46	77	1.37	0.46	77	
0.48	77	1.04	22	0.48	77	1.04	0.48	77	
0.50	86	0.72	25	0.50	86	0.72	0.50	86	
0.53	0	0.37	35	0.53	0	0.37	0.53	0	
		Max. Volts			5.35			5.35	
		Max. Depth (%)			100.00			100	
		Length (In.)			1.01			1.01	
		Avg. Depth (%)			75.46			75.46	

Unadjusted NDE					Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽⁴⁾	
NO DATA									

Table J-30
Sample 11 - 5H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 1

Crack 2 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth ⁽¹⁾
-0.53	0	0.00	0	0.00	-0.53	0
-0.51	46	0.17	16	0.17	-0.51	46
-0.49	49	0.24	17	0.24	-0.49	49
-0.47	62	0.27	21	0.27	-0.47	62
-0.45	56	0.36	19	0.36	-0.45	56
-0.43	52	0.45	18	0.45	-0.43	52
-0.40	49	0.54	17	0.54	-0.40	49
-0.38	49	0.53	17	0.53	-0.38	49
-0.36	56	0.47	19	0.47	-0.36	56
-0.34	62	0.42	21	0.42	-0.34	62
-0.32	62	0.47	21	0.47	-0.32	62
-0.30	59	0.45	20	0.45	-0.30	59
-0.28	49	0.69	17	0.69	-0.28	49
-0.26	49	0.78	17	0.78	-0.26	49
-0.24	59	0.76	20	0.76	-0.24	59
-0.22	59	0.77	20	0.77	-0.22	59
-0.20	62	0.79	21	0.79	-0.20	62
-0.17	65	0.81	22	0.81	-0.17	65
-0.15	62	0.91	21	0.91	-0.15	62
-0.13	56	1.05	19	1.05	-0.13	56
-0.11	59	1.10	20	1.10	-0.11	59
-0.09	59	1.10	20	1.10	-0.09	59
-0.07	59	1.13	20	1.13	-0.07	59
-0.05	59	1.17	20	1.17	-0.05	59
-0.03	59	1.23	20	1.23	-0.03	59
-0.01	59	1.22	20	1.22	-0.01	59
0.01	62	1.29	21	1.29	0.01	62
0.03	62	1.22	21	1.22	0.03	62
0.06	59	1.23	20	1.23	0.06	59
0.08	59	1.19	20	1.19	0.08	59
0.10	56	1.17	19	1.17	0.10	56
0.12	52	1.15	18	1.15	0.12	52
0.14	52	1.07	18	1.07	0.14	52
0.16	52	0.92	18	0.92	0.16	52
0.18	56	0.83	19	0.83	0.18	56
0.20	52	0.76	18	0.76	0.20	52
0.22	49	0.80	17	0.80	0.22	49
0.24	49	0.81	17	0.81	0.24	49
0.26	49	0.78	17	0.78	0.26	49
0.29	49	0.71	17	0.71	0.29	49
0.31	46	0.56	16	0.56	0.31	46
0.33	0	0.00	0	0.00	0.33	0
Max. Volts				1.29		
Max. Depth (%)				65		
Length (in.)				0.86		
Avg. Depth (%)				54.25		

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length ⁽²⁾	Depth ⁽¹⁾
-0.49	0	0.00	0	0.00	-0.49	0.0
-0.47	49	0.20	17	0.20	-0.47	49.0
-0.45	55	0.25	19	0.25	-0.45	55.0
-0.43	58	0.30	20	0.30	-0.43	58.0
-0.4	55	0.37	19	0.37	-0.4	55.0
-0.38	49	0.47	17	0.47	-0.38	49.0
-0.36	47	0.52	16	0.52	-0.36	47.0
-0.34	52	0.50	18	0.50	-0.34	52.0
-0.32	61	0.43	21	0.43	-0.32	61.0
-0.3	61	0.41	21	0.41	-0.3	61.0
-0.28	58	0.48	20	0.48	-0.28	58.0
-0.25	49	0.61	17	0.61	-0.25	49.0
-0.23	52	0.71	18	0.71	-0.23	52.0
-0.21	52	0.74	18	0.74	-0.21	52.0
-0.19	58	0.74	20	0.74	-0.19	58.0
-0.17	61	0.76	21	0.76	-0.17	61.0
-0.15	61	0.78	21	0.78	-0.15	61.0
-0.12	64	0.86	22	0.86	-0.12	64.0
-0.10	58	0.96	20	0.96	-0.10	58.0
-0.08	58	1.03	20	1.03	-0.08	58.0
-0.06	58	1.05	20	1.05	-0.06	58.0
-0.04	64	1.06	22	1.06	-0.04	64.0
-0.02	58	1.09	20	1.09	-0.02	58.0
0.00	58	1.17	20	1.17	0	58.0
0.03	58	1.21	20	1.21	0.03	58.0
0.05	61	1.23	21	1.23	0.05	61.0
0.07	61	1.21	21	1.21	0.07	61.0
0.09	61	1.18	21	1.18	0.09	61.0
0.11	58	1.16	20	1.16	0.11	58.0
0.13	55	1.13	19	1.13	0.13	55.0
0.15	52	1.11	18	1.11	0.15	52.0
0.18	52	1.08	18	1.08	0.18	52.0
0.20	52	0.95	18	0.95	0.20	52.0
0.22	55	0.83	19	0.83	0.22	55.0
0.24	55	0.74	19	0.74	0.24	55.0
0.26	52	0.75	18	0.75	0.26	52.0
0.28	49	0.79	17	0.79	0.28	49.0
0.30	49	0.80	17	0.80	0.3	49.0
0.33	49	0.74	17	0.74	0.33	49.0
0.35	49	0.63	17	0.63	0.35	49.0
0.37	49	0.42	17	0.42	0.37	49.0
0.39	0	0.00	0	0.00	0.39	0.0
Max. Volts				1.23		
Max. Depth (%)				64		
Length (in.)				0.88		
Avg. Depth (%)				54.06		

Table J-30 (continued)
Sample 11 - 5H
Laboratory Specimen NDE Analysis

Crack 2 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Volts	Length	Depth ⁽⁴⁾
-0.49	0	0.00	0	0.00	-0.49	0
-0.47	14	0.20	5	0.20	-0.47	14
-0.45	23	0.24	7	0.24	-0.45	23
-0.43	49	0.29	14	0.29	-0.43	49
-0.41	49	0.38	14	0.38	-0.41	49
-0.38	53	0.46	15	0.46	-0.38	53
-0.36	46	0.55	13	0.55	-0.36	46
-0.34	42	0.54	12	0.54	-0.34	42
-0.32	46	0.49	13	0.49	-0.32	46
-0.30	49	0.42	14	0.42	-0.30	49
-0.28	53	0.49	15	0.49	-0.28	53
-0.26	46	0.59	13	0.59	-0.26	46
-0.23	46	0.74	13	0.74	-0.23	46
-0.21	46	0.83	13	0.83	-0.21	46
-0.19	55	0.80	15.5	0.80	-0.19	55
-0.17	57	0.79	16	0.79	-0.17	57
-0.15	60	0.81	17	0.81	-0.15	60
-0.13	63	0.83	18	0.83	-0.13	63
-0.11	60	0.93	17	0.93	-0.11	60
-0.08	53	1.06	15	1.06	-0.08	53
-0.06	57	1.10	16	1.10	-0.06	57
-0.04	57	1.12	16	1.12	-0.04	57
-0.02	57	1.17	16	1.17	-0.02	57
0.00	53	1.20	15	1.20	0.00	53
0.02	53	1.26	15	1.26	0.02	53
0.04	60	1.27	17	1.27	0.04	60
0.07	60	1.31	17	1.31	0.07	60
0.09	57	1.24	16	1.24	0.09	57
0.11	57	1.26	16	1.26	0.11	57
0.13	57	1.21	16	1.21	0.13	57
0.15	57	1.18	16	1.18	0.15	57
0.17	53	1.17	15	1.17	0.17	53
0.19	49	1.10	14	1.10	0.19	49
0.22	53	0.97	15	0.97	0.22	53
0.24	49	0.87	14	0.87	0.24	49
0.26	53	0.80	15	0.80	0.26	53
0.28	46	0.82	13	0.82	0.28	46
0.30	49	0.82	14	0.82	0.30	49
0.32	49	0.81	14	0.81	0.32	49
0.34	49	0.73	14	0.73	0.34	49
0.37	46	0.56	13	0.56	0.37	46
0.39	0	0.00	0	0.00	0.39	0
				Max. Volts	1.31	
				Max. Depth (%)	63	
				Length (in.)	0.88	
				Avg. Depth (%)	49.70	

Crack 2 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts Length ⁽²⁾ Depth ⁽⁴⁾
NO DATA						

Table J-31
Sample 12 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.05	0	0.00	0	-0.05	0	0.00	-0.05	0
-0.03	8	0.17	3	-0.03	8	0.17	-0.03	2
-0.01	11	0.18	4	-0.01	11	0.18	-0.01	2
0.01	31	0.17	11	0.01	31	0.17	0.01	7
0.03	37	0.17	13	0.03	37	0.17	0.03	8
0.05	46	0.16	16	0.05	46	0.16	0.05	10
0.07	46	0.16	16	0.07	46	0.16	0.07	10
0.09	49	0.16	17	0.09	49	0.16	0.09	11
0.11	0	0.00	0	0.11	0	0.00	0.11	0
		Max. Volts		0.18				0.18
		Max. Depth (%)		49.00				11
		Length (in.)		0.16				0.16
		Avg. Depth (%)		28.50				6.40

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
NDD								

Table J-31 (continued)
 Sample 12 - 1H
 Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
NO DATA								

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
NO DATA								

Table J-32
Sample 12 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.19	0	0.00	0	-0.19	0.0	0.00	-0.19	0
-0.17	28	0.16	10	-0.17	28.0	0.16	-0.17	22
-0.15	37	0.25	13	-0.15	37.0	0.25	-0.15	29
-0.13	34	0.30	12	-0.13	34.0	0.30	-0.13	27
-0.11	34	0.37	12	-0.11	34.0	0.37	-0.11	27
-0.09	37	0.40	13	-0.09	37.0	0.40	-0.09	29
-0.07	37	0.44	13	-0.07	37.0	0.44	-0.07	29
-0.05	37	0.47	13	-0.05	37.0	0.47	-0.05	29
-0.02	34	0.48	12	-0.02	34.0	0.48	-0.02	27
0.00	34	0.47	12	0.00	34.0	0.47	0.00	27
0.02	34	0.46	12	0.02	34.0	0.46	0.02	27
0.04	34	0.40	12	0.04	34.0	0.40	0.04	27
0.06	34	0.30	12	0.06	34.0	0.30	0.06	27
0.08	43	0.21	15	0	43.0	0.21	0.08	34
0.10	28	0.19	10	0	28.0	0.19	0.10	22
0.12	20	0.17	7	0.12	20.00	0.17	0.12	16
0.14	20	0.12	7	0.14	20.00	0.12	0.14	16
0.16	0	0.00	0	0.16	0.00	0.00	0.16	0
				Max. Volts	0.48	0.48		
				Max. Depth (%)	43.00	34		
				Length (in.)	0.35	0.35		
				Avg. Depth (%)	31.01	24.52		

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.16	0	0.00	0	-0.16	0	0.00	-0.16	0.00
-0.13	38	0.24	13	-0.13	38	0.24	-0.13	32.82
-0.11	35	0.30	12	-0.11	35	0.30	-0.11	30.23
-0.09	35	0.36	12	-0.09	35	0.36	-0.09	30.23
-0.07	38	0.39	13	-0.07	38	0.39	-0.07	32.82
-0.05	38	0.43	13	-0.05	38	0.43	-0.05	32.82
-0.03	38	0.46	13	-0.03	38	0.46	-0.03	32.82
-0.01	35	0.46	12	-0.01	35	0.46	-0.01	30.23
0.01	35	0.46	12	0.01	35	0.46	0.01	30.23
0.03	35	0.44	12	0.03	35.00	0.44	0.03	30.23
0.06	35	0.39	12	0.06	35.00	0.39	0.06	30.23
0.08	35	0.29	12	0.08	35.00	0.29	0.08	30.23
0.10	44	0.21	15	0.10	44.00	0.21	0.10	38.00
0.12	29	0.18	10	0.12	29.00	0.18	0.12	25.05
0.14	0	0.00	0	0.14	0.00	0.00	0.14	0.00
				Max. Volts	0.46	0.46		
				Max. Depth (%)	44.00	38		
				Length (in.)	0.30	0.3		
				Avg. Depth (%)	33.13	28.62		

Table J-32 (continued)
 Sample 12 - 5H
 Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE					Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾	
-0.12	0	0.00	0	-0.12	0	0.00	-0.12	0	
-0.10	23	0.34	7	-0.10	23	0.34	-0.10	15	
-0.08	27	0.39	8	-0.08	27	0.39	-0.08	18	
-0.06	27	0.44	8	-0.06	27	0.44	-0.06	18	
-0.04	27	0.49	8	-0.04	27	0.49	-0.04	18	
-0.01	18	0.54	6	-0.01	18	0.54	-0.01	12	
0.01	27	0.53	8	0.01	27	0.53	0.01	18	
0.03	27	0.50	8	0.03	27	0.50	0.03	18	
0.05	23	0.41	7	0.05	23	0.41	0.05	15	
0.07	27	0.31	8	0.07	27	0.31	0.07	18	
0.09	10	0.22	4	0.09	10	0.22	0.09	7	
0.11	0	0.00	0	0.11	0	0.00	0.11	0	
Max. Volts					0.54				
Max. Depth (%)					27.00				
Length (in.)					0.23				
Avg. Depth (%)					21.50				
					0.54				
					18.00				
					0.23				
					14.33				

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE					Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾	
NO DATA									

Table J-33
Sample 13 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE									
Axial			Phase	Final with Adjustments					
Position	Depth	Volts	Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽³⁾	
-0.25	0	0.00	0	-0.25	0	0.00	-0.25	0	
-0.23	17	0.24	6	-0.23	17	0.24	-0.23	8	
-0.21	17	0.36	6	-0.21	17	0.36	-0.21	8	
-0.19	25	0.44	9	-0.19	25	0.44	-0.19	11	
-0.17	28	0.47	10	-0.17	28	0.47	-0.17	13	
-0.14	34	0.53	12	-0.14	34	0.53	-0.14	16	
-0.12	37	0.59	13	-0.12	37	0.59	-0.12	17	
-0.10	31	0.66	11	-0.10	31	0.66	-0.10	14	
-0.08	34	0.65	12	-0.08	34	0.65	-0.08	16	
-0.06	37	0.60	13	-0.06	37	0.60	-0.06	17	
-0.04	46	0.54	16	-0.04	46	0.54	-0.04	21	
-0.02	59	0.49	20	-0.02	59	0.49	-0.02	27	
0.00	68	0.45	23	0.00	68	0.45	0.00	31	
0.02	56	0.43	19	0.02	56	0.43	0.02	26	
0.04	56	0.39	19	0.04	56	0.39	0.04	26	
0.06	49	0.35	17	0.06	49	0.35	0.06	22	
0.08	37	0.40	13	0.08	37	0.40	0.08	17	
0.10	28	0.48	10	0.10	28	0.48	0.10	13	
0.13	25	0.54	9	0.13	25	0.54	0.13	11	
0.15	31	0.51	11	0.15	31	0.51	0.15	14	
0.17	34	0.46	12	0.17	34	0.46	0.17	16	
0.19	43	0.36	15	0.19	43	0.36	0.19	20	
0.21	25	0.47	9	0.21	25	0.47	0.21	11	
0.23	25	0.44	9	0.23	25	0.44	0.23	11	
0.25	28	0.41	10	0.25	28	0.41	0.25	13	
0.27	14	0.34	5	0.27	14	0.34	0.27	6	
0.29	0	0.00	0	0.29	0	0.00	0.29	0	
		Max. Volts		0.66		0.66		0.66	
		Max. Depth (%)		68.00		31.00		31.00	
		Length (in.)		0.54		0.54		0.54	
		Avg. Depth (%)		33.81		15.41		15.41	

Unadjusted NDE									
Axial			Phase	Final with Adjustments					
Position	Depth	Volts	Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽³⁾	
-0.21	0	0.00	0	-0.21	0	0.00	-0.21	0	
-0.19	14	0.36	5	-0.19	14	0.36	-0.19	7	
-0.17	26	0.43	9	-0.17	26	0.43	-0.17	14	
-0.15	29	0.46	10	-0.15	29	0.46	-0.15	15	
-0.12	35	0.51	12	-0.12	35	0.51	-0.12	18	
-0.1	38	0.57	13	-0.10	38	0.57	-0.10	20	
-0.08	32	0.64	11	-0.08	32	0.64	-0.08	17	
-0.06	35	0.64	12	-0.06	35	0.64	-0.06	18	
-0.04	38	0.59	13	-0.04	38	0.59	-0.04	20	
-0.02	47	0.53	16	-0.02	47.00	0.53	-0.02	25	
0.00	58	0.47	20	0.00	58.00	0.47	0.00	30	
0.02	67	0.44	23	0.02	67.00	0.44	0.02	35	
0.05	55	0.42	19	0.05	55.00	0.42	0.05	29	
0.07	55	0.38	19	0.07	55.00	0.38	0.07	29	
0.09	49	0.34	17	0.09	49.00	0.34	0.09	26	
0.11	38	0.39	13	0.11	38.00	0.39	0.11	20	
0.13	29	0.47	10	0.13	29.00	0.47	0.13	15	
0.15	26	0.52	9	0.15	26.00	0.52	0.15	14	
0.17	32	0.50	11	0.17	32.00	0.50	0.17	17	
0.19	35	0.45	12	0.19	35.00	0.45	0.19	18	
0.22	32	0.45	11	0.22	32.00	0.45	0.22	17	
0.24	35	0.46	12	0.24	35.00	0.46	0.24	18	
0.26	28	0.43	9	0.26	28.00	0.43	0.26	14	
0.28	26	0.40	9	0.28	26.00	0.40	0.28	14	
0.30	14	0.33	5	0	14	0.33	0.30	7	
0.32	0	0.00	0	0	0	0.00	0.32	0	
		Max. Volts		0.64		0.64		0.64	
		Max. Depth (%)		67.00		35.00		35.00	
		Length (in.)		0.53		0.53		0.53	
		Avg. Depth (%)		35.25		18.42		18.42	

Table J-33 (continued)
Sample 13 - 1H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.21	0	0.00	0	-0.21	0	0.00	-0.21	0
-0.19	6	0.36	3	-0.19	6	0.36	-0.19	3
-0.17	10	0.48	4	-0.17	10	0.48	-0.17	4
-0.15	19	0.51	6	-0.15	19	0.51	-0.15	8
-0.13	25	0.56	8	-0.13	25	0.56	-0.13	10
-0.11	26	0.63	8	-0.11	26	0.63	-0.11	11
-0.09	21	0.68	7	-0.09	21	0.68	-0.09	9
-0.06	23	0.68	7	-0.06	23	0.68	-0.06	10
-0.04	26	0.62	8	-0.04	26	0.62	-0.04	11
-0.02	30	0.56	9	-0.02	30	0.56	-0.02	13
0.00	42	0.50	12	0.00	42	0.50	0.00	18
0.02	55	0.47	15	0.02	55	0.47	0.02	23
0.04	40	0.45	12	0.04	40	0.45	0.04	17
0.06	38	0.41	11	0.06	38	0.41	0.06	16
0.08	28	0.38	9	0.08	28	0.38	0.08	12
0.11	20	0.42	7	0.11	20	0.42	0.11	8
0.13	15	0.50	5	0.13	15	0.50	0.13	6
0.15	19	0.51	6	0.15	19	0.51	0.15	8
0.17	21	0.48	7	0.17	21	0.48	0.17	9
0.19	26	0.46	8	0.19	26	0.46	0.19	11
0.21	23	0.46	7	0.21	23	0.46	0.21	10
0.23	23	0.46	7	0.23	23	0.46	0.23	10
0.25	27	0.41	8	0.25	27	0.41	0.25	11
0.28	10	0.38	4	0.28	10	0.38	0.28	4
0.30	18	0.33	6	0.30	18	0.33	0.30	8
0.32	0	0.00	0	0.32	0	0.00	0.32	0
		Max. Volts		0.68		0.68		0.68
		Max. Depth (%)		55.00		23.00		23.00
		Length (In.)		0.53		0.53		0.53
		Avg. Depth (%)		23.52		9.84		9.84

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
NO DATA								

Table J-34
Sample 13 - 2H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.22	0	0.00	0	-0.22	0	0.00	-0.22	0
-0.20	20	0.20	7	-0.20	20	0.20	-0.20	12
-0.18	25	0.27	9	-0.18	25	0.27	-0.18	15
-0.16	43	0.39	15	-0.16	43	0.39	-0.16	26
-0.14	43	0.54	15	-0.14	43	0.54	-0.14	26
-0.12	43	0.76	15	-0.12	43	0.76	-0.12	26
-0.10	43	0.88	15	-0.10	43	0.88	-0.10	26
-0.08	40	0.94	14	-0.08	40	0.94	-0.08	25
-0.06	43	0.86	15	-0.06	43	0.86	-0.06	26
-0.04	40	0.79	14	-0.04	40	0.79	-0.04	25
-0.02	43	0.75	15	-0.02	43	0.75	-0.02	26
0.01	49	0.71	17	0.01	49	0.71	0.01	30
0.03	59	0.68	20	0.03	59	0.68	0.03	36
0.05	59	0.63	20	0.05	59	0.63	0.05	36
0.07	65	0.46	22	0.07	65	0.46	0.07	40
0.09	52	0.57	18	0.09	52	0.57	0.09	32
0.11	46	0.47	16	0.11	46	0.47	0.11	28
0.13	43	0.37	15	0.13	43	0.37	0.13	26
0.15	34	0.23	12	0.15	34	0.23	0.15	21
0.17	23	0.13	8	0.17	23	0.13	0.17	14
0.19	0	0.00	0	0.19	0	0.00	0.19	0
				Max. Volts	0.94			0.94
				Max. Depth (%)	65.00			40.00
				Length (in.)	0.41			0.41
				Avg. Depth (%)	40.78			25.10

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽³⁾
-0.23	0	0.00	0	-0.23	0	0.00	-0.23	0
-0.21	20	0.22	7	-0.21	20	0.22	-0.21	14
-0.19	26	0.27	9	-0.19	26	0.27	-0.19	18
-0.17	44	0.37	15	-0.17	44	0.37	-0.17	31
-0.15	41	0.53	14	-0.15	41	0.53	-0.15	29
-0.13	44	0.74	15	-0.13	44	0.74	-0.13	31
-0.11	44	0.85	15	-0.11	44	0.85	-0.11	31
-0.08	41	0.91	14	-0.08	41	0.91	-0.08	29
-0.06	44	0.83	15	-0.06	44	0.83	-0.06	31
-0.04	41	0.77	14	-0.04	41.00	0.77	-0.04	29
-0.02	44	0.73	15	-0.02	44.00	0.73	-0.02	31
0.00	49	0.70	17	0.00	49.00	0.70	0.00	35
0.02	58	0.66	20	0.02	58.00	0.66	0.02	41
0.04	58	0.62	20	0.04	58.00	0.62	0.04	41
0.06	55	0.59	19	0.06	55.00	0.59	0.06	39
0.09	52	0.55	18	0.09	52.00	0.55	0.09	37
0.11	47	0.47	16	0.11	47.00	0.47	0.11	33
0.13	47	0.36	16	0.13	47.00	0.36	0.13	33
0.15	32	0.24	11	0.15	32.00	0.24	0.15	23
0.17	0	0.00	0	0.17	0.00	0.00	0.17	0
				Max. Volts	0.91			0.91
				Max. Depth (%)	58.00			41.00
				Length (in.)	0.40			0.40
				Avg. Depth (%)	41.75			29.51

**Table J-34 (continued)
Sample 13 - 2H
Laboratory Specimen NDE Analysis**

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE						Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽⁴⁾	
-0.23	0	0.00	0	-0.23	0	0.00	-0.23	0	
-0.21	14	0.28	5	-0.21	14	0.28	-0.21	11	
-0.19	38	0.41	11	-0.19	38	0.41	-0.19	29	
-0.17	38	0.57	11	-0.17	38	0.57	-0.17	29	
-0.15	34	0.79	10	-0.15	34	0.79	-0.15	26	
-0.12	38	0.91	11	-0.12	38	0.91	-0.12	29	
-0.10	38	0.97	11	-0.10	38	0.97	-0.10	29	
-0.08	34	0.90	10	-0.08	34	0.90	-0.08	26	
-0.06	38	0.83	11	-0.06	38	0.83	-0.06	29	
-0.04	34	0.78	10	-0.04	34	0.78	-0.04	26	
-0.02	46	0.74	13	-0.02	46	0.74	-0.02	36	
0.00	49	0.71	14	0.00	49	0.71	0.00	38	
0.02	49	0.67	14	0.02	49	0.67	0.02	38	
0.04	42	0.65	12	0.04	42	0.65	0.04	33	
0.07	42	0.61	12	0.07	42	0.61	0.07	33	
0.09	34	0.52	10	0.09	34	0.52	0.09	26	
0.11	27	0.42	8	0.11	27	0.42	0.11	21	
0.13	27	0.22	8	0.13	27	0.22	0.13	21	
0.15	0	0.00	0	0.15	0	0.00	0.15	0	
		Max. Volts			0.97			0.97	
		Max. Depth (%)			49.00			38.00	
		Length (In.)			0.38			0.38	
		Avg. Depth (%)			34.79			26.98	

Unadjusted NDE						Final with Adjustments			
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽⁴⁾	
NO DATA									

Table J-35
Sample 13 - 4H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.18	0	0.00	0	-0.18	0	0.00	-0.18	0
-0.16	17	0.34	6	-0.16	17	0.34	-0.16	9
-0.14	31	0.46	11	-0.14	31	0.46	-0.14	17
-0.12	37	0.47	13	-0.12	37	0.47	-0.12	20
-0.10	40	0.45	14	-0.10	40	0.45	-0.10	22
-0.08	46	0.41	16	-0.08	46	0.41	-0.08	25
-0.06	52	0.36	18	-0.06	52	0.36	-0.06	28
-0.03	68	0.32	23	-0.03	68	0.32	-0.03	37
-0.01	65	0.35	22	-0.01	65	0.35	-0.01	35
0.01	52	0.41	18	0.01	52	0.41	0.01	28
0.03	49	0.42	17	0.03	49	0.42	0.03	27
0.05	37	0.47	13	0.05	37	0.47	0.05	20
0.07	31	0.45	11	0.07	31	0.45	0.07	17
0.09	28	0.44	10	0.09	28	0.44	0.09	15
0.11	20	0.38	7	0.11	20	0.38	0.11	11
0.13	17	0.33	6	0.13	17	0.33	0.13	9
0.15	11	0.28	4	0.15	11	0.28	0.15	6
0.17	8	0.23	3	0.17	8	0.23	0.17	4
0.19	0	0.00	0	0.19	0	0.00	0.19	0
				Max. Volts	0.47		0.47	
				Max. Depth (%)	68.00		37.00	
				Length (in.)	0.37		0.37	
				Avg. Depth (%)	34.54		18.79	

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽²⁾
-0.17	0	0.00	0	-0.17	0	0.00	-0.17	0
-0.15	17	0.26	6	-0.15	17	0.26	-0.15	10
-0.13	23	0.36	8	-0.13	23	0.36	-0.13	13
-0.11	32	0.44	11	-0.11	32	0.44	-0.11	18
-0.08	38	0.46	13	-0.08	38	0.46	-0.08	22
-0.06	41	0.44	14	-0.06	41	0.44	-0.06	23
-0.04	47	0.40	16	-0.04	47	0.40	-0.04	27
-0.02	52	0.35	18	-0.02	52	0.35	-0.02	29
0	67	0.31	23	0.00	67	0.31	0.00	38
0.02	64	0.34	22	0.02	64.00	0.34	0.02	36
0.04	52	0.40	18	0.04	52.00	0.40	0.04	29
0.06	44	0.45	15	0.06	44.00	0.45	0.06	25
0.09	38	0.46	13	0.09	38.00	0.46	0.09	22
0.11	32	0.44	11	0.11	32.00	0.44	0.11	18
0.13	29	0.43	10	0.13	29.00	0.43	0.13	16
0.15	20	0.39	7	0.15	20.00	0.39	0.15	11
0.17	14	0.33	5	0.17	14.00	0.33	0.17	8
0.19	0	0.00	0	0.19	0.00	0.00	0.19	0
				Max. Volts	0.46		0.46	
				Max. Depth (%)	67.00		38.00	
				Length (in.)	0.36		0.36	
				Avg. Depth (%)	36.00		20.42	

**Table J-35 (continued)
Sample 13 - 4H
Laboratory Specimen NDE Analysis**

Crack 1 - MR + Point - Analyst 3

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.16	0	0.00	0	-0.16	0	0.00	-0.16	0
-0.14	10	0.39	4	-0.14	10	0.39	-0.14	6
-0.12	27	0.45	8	-0.12	27	0.45	-0.12	15
-0.09	27	0.48	8	-0.09	27	0.48	-0.09	15
-0.07	31	0.49	9	-0.07	31	0.49	-0.07	17
-0.05	34	0.46	10	-0.05	34	0.46	-0.05	19
-0.03	42	0.41	12	-0.03	42	0.41	-0.03	23
-0.01	42	0.38	12	-0.01	42	0.38	-0.01	23
0.01	49	0.41	14	0.01	49	0.41	0.01	27
0.03	42	0.47	12	0.03	42	0.47	0.03	23
0.06	34	0.50	10	0.06	34	0.50	0.06	19
0.08	27	0.51	8	0.08	27	0.51	0.08	15
0.10	18	0.49	6	0.10	18	0.49	0.10	10
0.12	10	0.42	4	0.12	10	0.42	0.12	6
0.14	0	0.00	0	0.14	0	0.00	0.14	0
Max. Volts				0.51		0.51		
Max. Depth (%)				49.00		27.00		
Length (in.)				0.30		0.30		
Avg. Depth (%)				28.37		15.63		

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE				Final with Adjustments				
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
NO DATA								

Table J-36
Sample 13 - 5H
Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 1

Crack 1 - MR + Point - Analyst 2

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.22	0	0.00	0	-0.22	0	0.00	-0.22	0
-0.20	28	0.20	10	-0.20	28	0.20	-0.20	17
-0.18	34	0.31	12	-0.18	34	0.31	-0.18	21
-0.16	34	0.43	12	-0.16	34	0.43	-0.16	21
-0.14	37	0.55	13	-0.14	37	0.55	-0.14	22
-0.11	37	0.63	13	-0.11	37	0.63	-0.11	22
-0.09	34	0.66	12	-0.09	34	0.66	-0.09	21
-0.07	34	0.69	12	-0.07	34	0.69	-0.07	21
-0.05	34	0.70	12	-0.05	34	0.70	-0.05	21
-0.03	37	0.66	13	-0.03	37	0.66	-0.03	22
-0.01	46	0.65	16	-0.01	46	0.65	-0.01	28
0.01	46	0.65	16	0.01	46	0.65	0.01	28
0.03	56	0.59	19	0.03	56	0.59	0.03	34
0.05	46	0.56	16	0.05	46	0.56	0.05	28
0.08	37	0.38	13	0.08	37	0.38	0.08	22
0.10	31	0.30	11	0.10	31	0.30	0.10	19
0.12	28	0.29	10	0.12	28	0.29	0.12	17
0.14	23	0.27	8	0.14	23	0.27	0.14	14
0.16	20	0.22	7	0.16	20	0.22	0.16	12
0.18	0	0.00	0	0.18	0.00	0.00	0.18	0
Max. Volts				0.70		0.70		
Max. Depth (%)				56.00		34.00		
Length (in.)				0.40		0.40		
Avg. Depth (%)				34.06		20.68		

Unadjusted NDE						Final with Adjustments		
Axial Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.24	0	0.00	0	-0.24	0	0.00	-0.24	0
-0.22	29	0.19	10	-0.22	29	0.19	-0.22	18
-0.2	35	0.30	12	-0.20	35	0.30	-0.20	22
-0.18	35	0.42	12	-0.18	35	0.42	-0.18	22
-0.16	38	0.53	13	-0.16	38	0.53	-0.16	24
-0.13	38	0.61	13	-0.13	38	0.61	-0.13	24
-0.11	38	0.64	13	-0.11	38	0.64	-0.11	24
-0.09	35	0.67	12	-0.09	35	0.67	-0.09	22
-0.07	35	0.68	12	-0.07	35	0.68	-0.07	22
-0.05	38	0.64	13	-0.05	38.00	0.64	-0.05	24
-0.03	47	0.63	16	-0.03	47.00	0.63	-0.03	30
0.00	47	0.64	16	0.00	47.00	0.64	0.00	30
0.02	55	0.57	19	0.02	55.00	0.57	0.02	35
0.04	47	0.55	16	0.04	47.00	0.55	0.04	30
0.06	35	0.40	12	0.06	35.00	0.40	0.06	22
0.08	32	0.30	11	0.08	32.00	0.30	0.08	20
0.10	20	0.28	7	0.10	20.00	0.28	0.10	13
0.12	23	0.27	8	0.12	23.00	0.27	0.12	15
0.15	20	0.21	7	0.15	20.00	0.21	0.15	13
0.17	0	0.00	0	0.17	0.00	0.00	0.17	0
Max. Volts				0.68		0.68		
Max. Depth (%)				55.00		35.00		
Length (in.)				0.41		0.41		
Avg. Depth (%)				34.16		21.74		

Table J-37 (continued)
 Sample 14-1H
 Laboratory Specimen NDE Analysis

Crack 1 - MR + Point - Analyst 3

Crack 1 - MR + Point - Analyst 4

Unadjusted NDE						Final with Adjustments		
Acid Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
-0.05	0	0.00	0	0.05	0	0.00	0.05	6
-0.03	44	0.26	11.5	0.03	44	0.26	0.03	39
-0.01	52.5	0.34	13.5	0.01	52.5	0.34	0.01	48
0.01	60	0.29	15.5	0.01	60	0.29	0.01	53
0.04	28	0.13	8	0.04	28	0.13	0.04	23
0.06	0	0.00	0	0.06	0	0.00	0.06	0
Max. Volts						0.34	0.34	
Max. Depth (%)						60.00	52.5	
Length (in.)						0.11	0.11	
Avg. Depth (%)						37.09	32.45	

Unadjusted NDE						Final with Adjustments		
Acid Position	Depth	Volts	Phase Angle	Length ⁽²⁾	Depth ⁽⁴⁾	Volts	Length ⁽²⁾	Depth ⁽⁴⁾
NO DATA								