CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9601230067 DOC.DATE: 96/01/19 NOTARIZED: YES DOCKET #
FACIL:50-305 Kewaunee Nuclear Power Plant, Wisconsin Public Servic 05000305
AUTH.NAME AUTHOR AFFILIATION
STEINHARDT,C.R. Wisconsin Public Service Corp.
RECIP.NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

SUBJECT: Responds to RAI for proposed amend 136 to plant NPP TS re pressure boundary redefinition for HEJ sleeves.

DISTRIBUTION CODE: A001D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 14
TITLE: OR Submittal: General Distribution

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD3-3 LA	1	1	PD3-3 PD	1	1
	LAUFER,R	1	1			
INTERNAL:	ACRS	6	6	FILE CENTER 01	1	1
	NRR/DE/EMCB	1	1	NRR/DRCH/HICB	1	1
	NRR/DSSA/SPLB	1	1	NRR/DSSA/SRXB	1	1
	NUDOCS-ABSTRACT	1	1	OGC/HDS2	1	0
EXTERNAL:	NOAC	1	1	NRC PDR	1	1

NOTE TO ALL "RIDS" RECIPIENTS:
PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM OWFN 5D-5(EXT. 415-2083) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 18 ENCL 17

CATEGORY 1 DOCUMENT

WPSC (414) 433-1598
TELECOPIER (414) 433-5544

NRC-96-6

WISCONSIN PUBLIC SERVICE CORPORATION

600 North Adams • P.O. Box 19002 • Green Bay, WI 54307-9002

January 19, 1996

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

Ladies/Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Response to Request for Additional Information for Proposed Amendment 136 to the Kewaunee Nuclear Power Plant Technical Specifications; Pressure Boundary Redefinition for HEJ Sleeves

References:
1) Letter from C.R. Steinhardt (WPSC) to U.S. Nuclear Regulatory Commission dated October 6, 1995.

2) Letter from C.R. Steinhardt (WPSC) to U.S. Nuclear Regulatory Commission dated November 8, 1995.

3) Letter from R.J. Laufer (NRC) to M.L. Marchi (WPSC) dated November 30, 1995.

4) Letter from R.J. Laufer (NRC) to WPSC dated December 13, 1995.

5) Letter from R.J. Laufer (NRC) to M.L. Marchi (WPSC) dated January 4, 1996.

6) Letter from C.R. Steinhardt (WPSC) to U.S. Nuclear Regulatory Commission dated January 8, 1996.

On October 6, 1995, Wisconsin Public Service Corporation (WPSC) submitted a proposed Technical Specification (TS) amendment to redefine the pressure boundary for Westinghouse hybrid expansion joint (HEJ) sleeved steam generator (SG) tubes; reference 1. Supplemental information was provided to the NRC staff on the HEJ crevice chemistry environment and far field residual stress levels for HEJ sleeved tubes on November 8, 1995; reference 2. By letter dated November 30, 1995, the NRC staff requested additional information (RAI) in order to complete review of the proposed TS amendment; referenee 3. Our response to the RAI was

A001

discussed in a meeting among the NRC staff and representatives from WPSC, Westinghouse and Zetec on December 8, 1995. Reference 4 is a summary of the information presented at that meeting. Subsequent to the December 8th meeting, three additional questions were received from the NRC staff regarding the abilities and qualification of the probe we propose to use for locating the parent tube indications; reference 5.

We provided a written response to questions 2, 3 and 4 from the November 30th RAI on January 8, 1996; reference 6. The attachment to this letter provides a written response to the January 4th RAI and question 1 of the November 30th RAI. As requested, this response provides a technical description of the proposed eddy current technique and variables affecting the probe's ability to precisely locate the parent tube indications.

As discussed with our NRC Project Manager, we feel that a technical meeting among ourselves, the NRC staff and Zetec, the probe vendor, would be beneficial to discuss this RAI response and to address any additional staff questions. We would like to propose a meeting at Zetec in the late January time frame.

The additional information provided by this submittal does not alter the previously docketed safety evaluation, significant hazards determination or environmental considerations. In accordanee with the requirements of 10 CFR 50.36(b), this submittal has been signed and notarized. A copy of this submittal has been transmitted to the State of Wisconsin as required by 10 CFR 50.91(b)(1). Please contact a member of my staff if you have any questions or require additional information.

Sincerely,

Mark L. Marchi for

Clark R. Steinhardt
Senior Vice President - Nuclear Power

SLB

Attach.

cc - US NRC, Region III
US NRC Senior Resident Inspector
Mr. Lanny Smith, PSCW

Subscribed and Sworn to
Before Me This 19th Day
of January 1996

Joanne M. Ferris
Notary Public, State of Wisconsin

My Commission Expires:
June 13, 1999

ATTACHMENT

Letter from C. R. Steinhardt (WPSC)

To

Document Control Desk (NRC)

Dated

January 19, 1996

n:\group\nuclear\wpfiles\lic\nrc\pa136rai.rsp

Response to Request for Additional Information Related to Proposed Technical Specification Amendment 136: Redefining the Pressure Boundary for Westinghouse HEJ Sleeves

NRC Question 1 (January 4, 1996)

Submit a description of the eddy current technique (including the probe). Include a description of the development and qualification process that was followed to ensure that cracks can be accurately located relative to the lower tangent point of the transition region. What quality assurance (QA) checks and calibrations will be employed to demonstrate that the "as manufactured" probes will exhibit the necessary performance?

Response to Question 1

The proposed Technical Specification (TS) amendment request demonstrates that tubes with parent tube indications (PTIs) located 1.1 inches or farther below the bottom of the hard roll upper transition (HRUT) have sufficient structural and leakage integrity, and do not compromise the safety of the steam generator (SG) tube bundle. The reference location for determination of the pressure boundary, i.e., bottom of HRUT, was selected based on the ability to measure the elevation of the PTIs using existing eddy current probe technology.

During the Fall 1996 refueling outage, all of the upper hybrid expansion joints (HEJ) will be inspected using the motorized rotating pancake coil (MRPC) +Point probe to detect PTIs. Sleeved tubes with confirmed PTIs will then be re-inspected to determine indication elevation relative to the HRUT. For determining the relative crack elevation two eddy current coils, a +Point coil and a bobbin coil, on one probe head will be used. Figure 1 is a drawing of the proposed +Point/bobbin coil combination probe.

The combination +Point/bobbin probe will use the bobbin coil to profile the ID surface of the sleeve and locate the bottom of the HRUT, and the +Point coil will be used to locate the peak amplitude of the PTI. The distanee between the two coils will be fixed during the probe manufacturing at the TS defined distance. If the peak amplitude of the PTI is detected after, or concurrent with the bottom of the HRUT as the probe is pushed through the upper HEJ, then the critical distance is not satisfied

and the tube will be plugged or repaired. If the peak amplitude of the PTI is seen before the bottom of the HRUT is located, then the distance is greater than the TS defined distance and the tube is acceptable for continued operation.

The lower tangent point of the HRUT will be determined using the bobbin coil and Eddynet Bebbin Profile software. The bobbin coil gives an accurate profile of the ID surface of the slceve and the software gives a graphic interface and measurement capability. The system will be calibrated using a standard with a known EDM notch and known hydraulic and hard roll expansion diameters. The process of locating the bottom of the hard roll will be performed using an algorithm contained within the Eddynet Bobbin Profile software. Use of an algorithni will ensure consistent location of the initial change in diameter from a plot of the eddy current data; Figure 2. The measurements taken froni the eddy current profile data will not compensate for the coil thickness or field look ahcad. Figure 3 is a bell curve that illustrates the field look ahead of a bobbin coil at 600 kHZ when pulled past an ASME 0.052 inch diameter drilled hole. The plot shows that the eddy current measured distance consistently exceeds the physical dimension. Therefore, using this technique to determine the lower tangent point of the HRUT will provide an added conservatism to determination of the critical distance between the bottom of the HRUT and PTI.

Coil spacing, i.e., the distance between the centerline of the bobbin coil and the centerline of the +Point coil, will initially be determined by drawing an adjustable combination probe through a sample containing an approximate 70% OD circumferential EDM notch. The notch will be located at the TS required distance below the bottom of the HRUT. The coil spacing will be adjusted until the EDM notch peak signal amplitude from the +Point coil and the computer selected roll transition lower tangent point occur simultaneously. Once the coil spacing is determined the probes will be manufactured in accordance with the Zetec quality assurance program.

All of the probes manufactured for the Kewaunee inspection will be calibrated using the standard described above prior to leaving the factory. The Eddynet software is capable of slewing the data to compensate for any offset between the two coil response. Figure 4 is a conceptual drawing of the combination probe moving through a HEJ. During the on-site inspection system performance will be verified by performing a calibration run before and after each HEJ inspection. These quality checks will minimize concerns such as probe wear and system noise.

NRC Question 2 (January 4, 1996)

Identify all variables (e.g., distance between coils, changes in tube diameter, transition slope, inside diameter (ID) versus outside diameter (OD) cracks, probe wear) affecting the precision at which the probe can locate flaws relative to the lower tangent point of the transition region. How are each of these variables to be controlled or monitored?

Response to Question 2

By using the +Point/bobbin combination probe the process of defining the relative distance between the PTI peak amplitude and lower tangent point of the HRUT is not dependent on setting scales and referencing a distant landmark. Therefore, the uncertainties associated with setting scales are eliminated. The surface riding ability of the +Point will be enhanced by using a gimbaled delivery assembly. This delivery assembly will compensate for variations in diameter and surface conditions eliminating any uncertainties associated with changes in diameter and transition slopes. During the on-site inspection system performance will be regularly monitored by performing a calibration run before and after each HEJ inspection to minimize concerns with probe wear. Therefore, the only variables affecting the precision with which the PTIs can be located relative to the bottom of the HRUT are the determination of indication peak amplitude using the +Point coil, and locating the lower tangent point of the HRUT using the bobbin coil.

Location of the crack peak amplitude using the +Point coil will be accomplished by monitoring the MRPC C scan presentation. The analyst will use the circumferential and axial strip charts to select the location of the peak signal; Figure 5. Figure 6 is a radar plot of the response of the +Point coil from an EDM notch. This illustrates that the signal amplitude is symmetric and has a well defined peak amplitude when the center of the coil is located over the center of the notch. Therefore, identifying the location of the flaw centerline using the peak amplitude is consistent and repeatable.

The location of the lower tangent point of the HRUT will be accomplished using the bobbin coil and Eddynet Profile software as described in response to question 1. Using the software to define the lower tangent point will be consistent and repeatable. Additionally, as previously discussed, the measured eddy current response will consistently be greater than the actual physical dimension of the hard roll providing conservatism to the measurement.

During the field analysis, each PTI will be subject to dual analysts verification of PTI location relative to the lower HRUT. Any discrepancies on the location will be subject to resolution by two Level III analysts.

NRC Questiou 3 (January 4, 1996)

Describe plans for a performance demonstration of the entire test system (i.e. equipment, including probes, procedures and personnel) in accordance with a protocol similar to that for Appendices G and H of the EPRI Guidelines involving a statistically significant set of flawed tube specimens.

Response to Question 3

As stated in response to question 1, a +Point probe will be used to inspect all of the upper HEJs durmg the 1996 refueling outage. The +Point probe that will be used has previously been qualified in accordance with Appendix H for detection of PTIs. The combination probe will only be used to determine location of the PTI relative to the lower tangent point of the HRUT.

As discussed in response to question 2, only two factors can affect the precision of the coınbination probe. These two variables will be controlled during the probe manufacturing process and verified usıng a standard prior to leaving the factory. The analysts personnel used during the field inspection will be qualified in accordance with the Kewaunee site specific program.

NRC Question 1 (Novemher 30, 1995)

The location of a steam generator (SG) tube indication with respect to the reference upper hard roll transition is critical in determining the acceptability of continued operation with that indication in serviee.

a. What procedures will be instituted to demonstrate and verify the accuracy, precision, and repeatability of a given probe's capability in these respects?

b. Will mock-ups with laboratory grown cracks be used?

c. What will be available for field verification and periodic checking of probes used for inspection?

d. If different probes are used for subsequent inspections, how will new probes be tested for correlation with the formerly employed probe?

Response to Question I

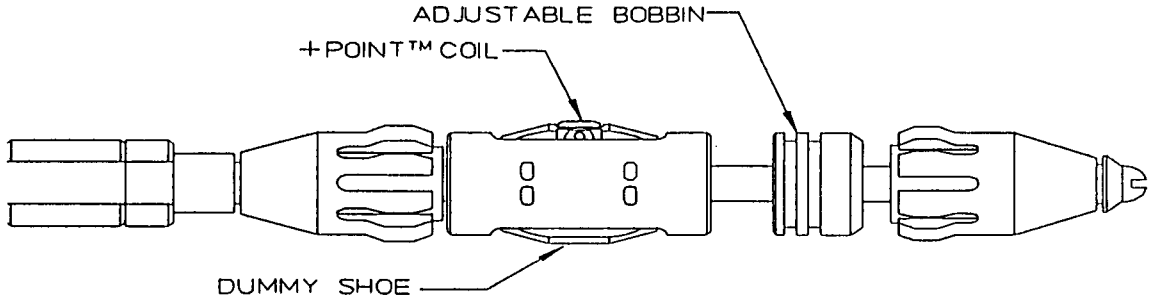
a. Plcase refer to the response to questions 1 and 2 above.

b. An Appendix H qualified +Point probe will be used for detection. Location of the PTIs relative to the lower tangent point of the HRUT will be performed using the combination probe. The coil spacing will be set during the manufacturing process and verified by running each probe through a standard with an EDM notch set at the TS dimension.

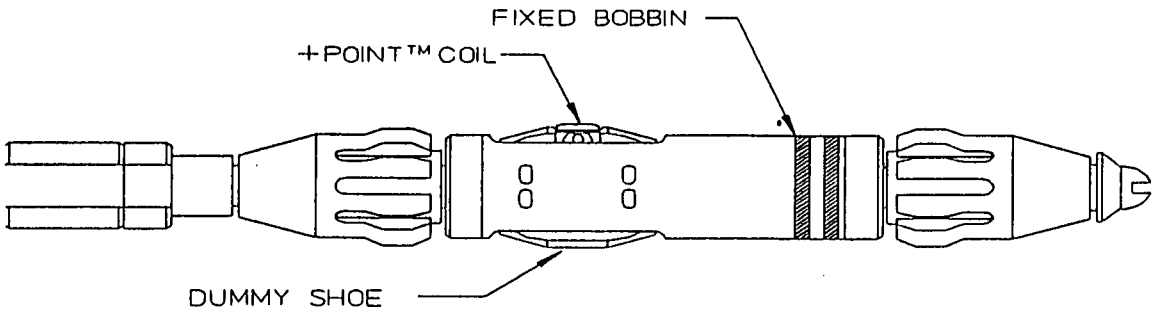
c During the on-site inspection the system will be run through a calibration check before and after each HEJ inspection.

d. If different probes are used for future inspections we will work with the probe vendor to ensure steps are taken to correlate the new probe design to the formerly used probe.

Figure 1



PROTOTYPE COMBINATION PROBE



PRODUCTION COMBINATION PROBE

Figure 2

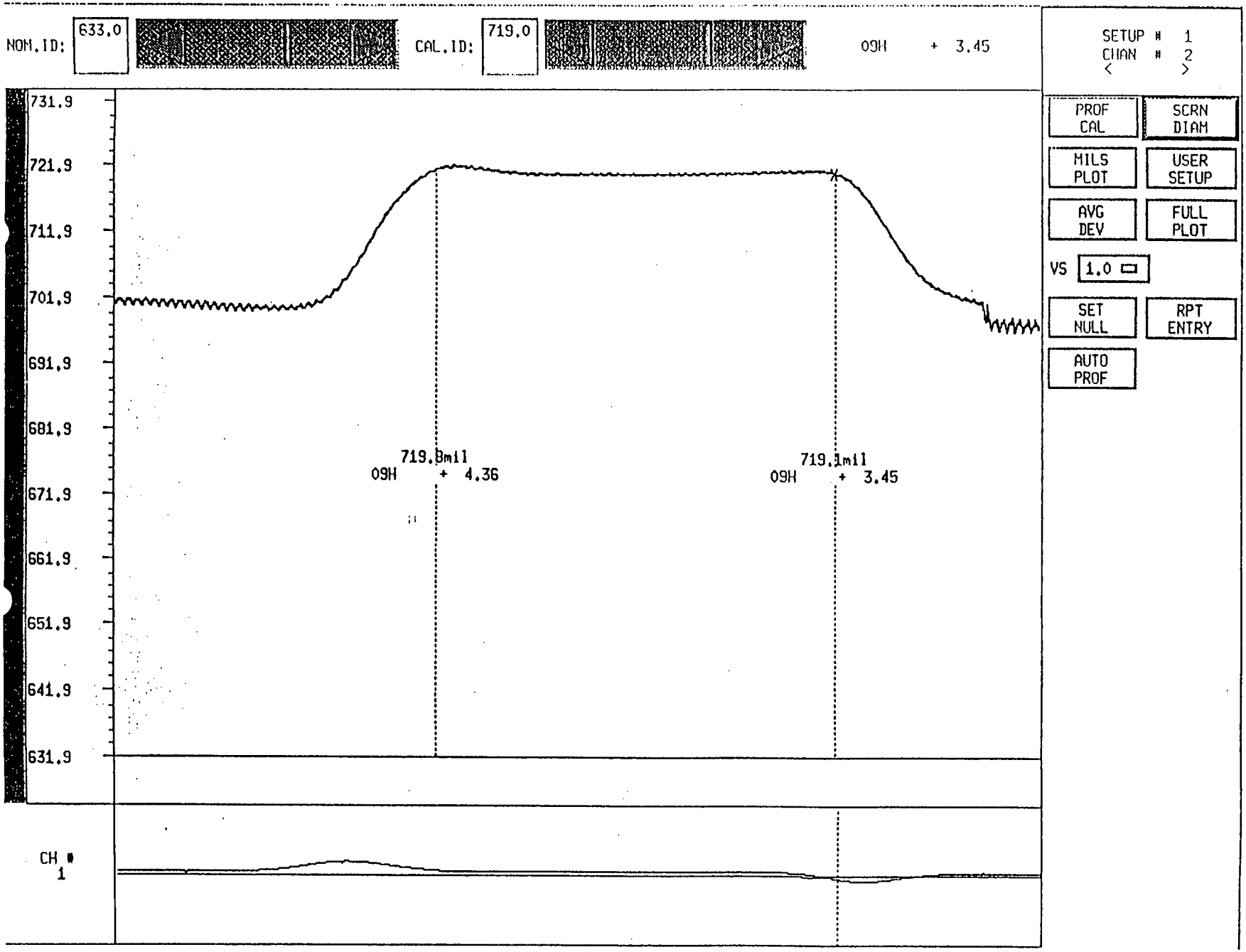

NOM.ID:
633.0
CAL.ID:
719.0
09H + 3.45
SETUP # 1
CHAN # 2
< >
PROF CAL
SCRN DIAM
MILS PLOT
USER SETUP
AVG DEV
FULL PLOT
VS 1.0
SET NULL
RPT ENTRY
AUTO PROF
731.9
721.9
711.9
701.9
691.9
681.9
671.9
661.9
651.9
641.9
631.9
719.8mil
09H + 4.36
719.1mil
09H + 3.45
CH #
1

Figure 3

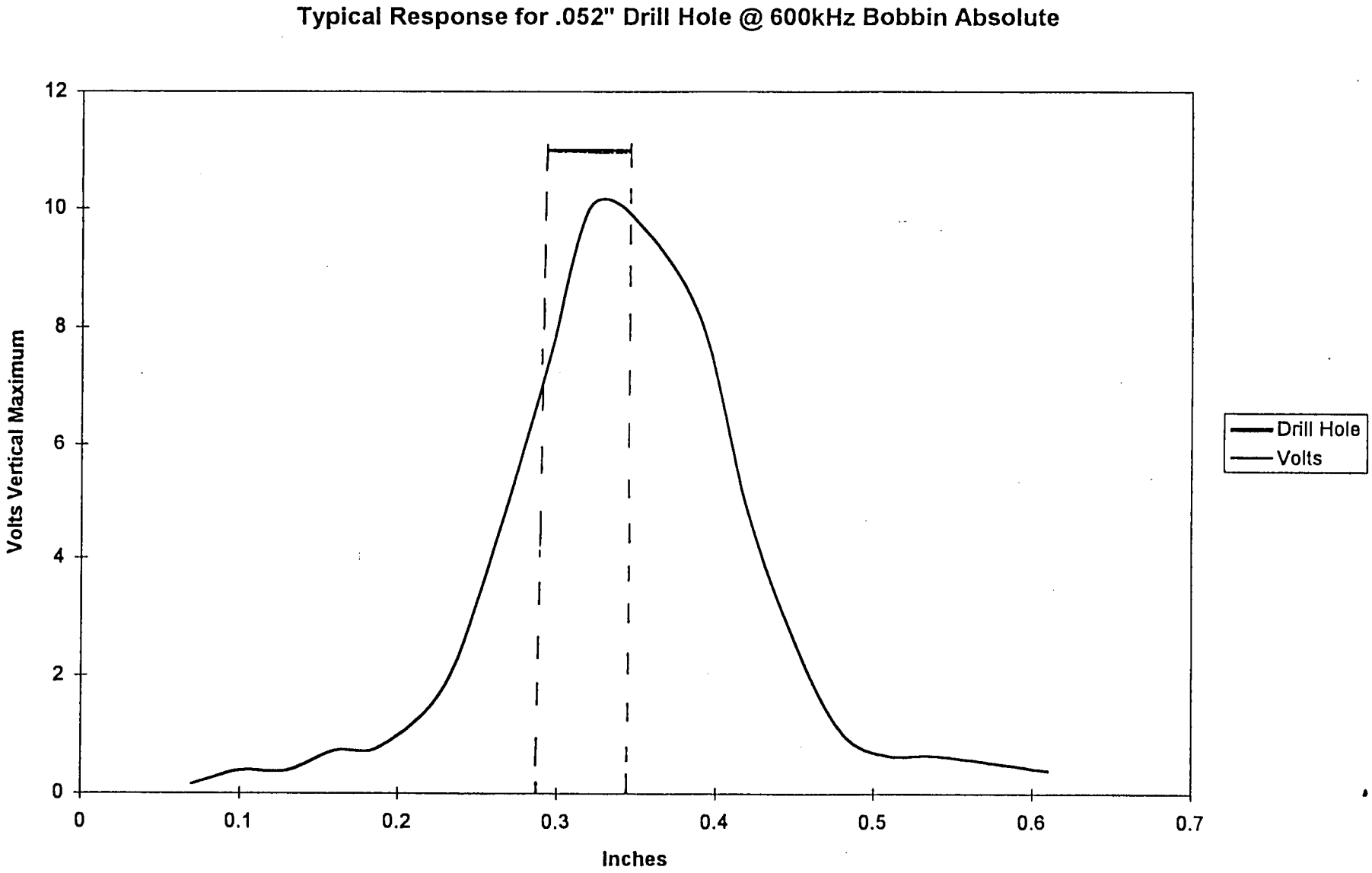

Typical Response for .052" Drill Hole @ 600kHz Bobbin Absolute
Volts Vertical Maximum
12
10
8
6
4
2
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Inches
Drill Hole
Volts

Figure 4

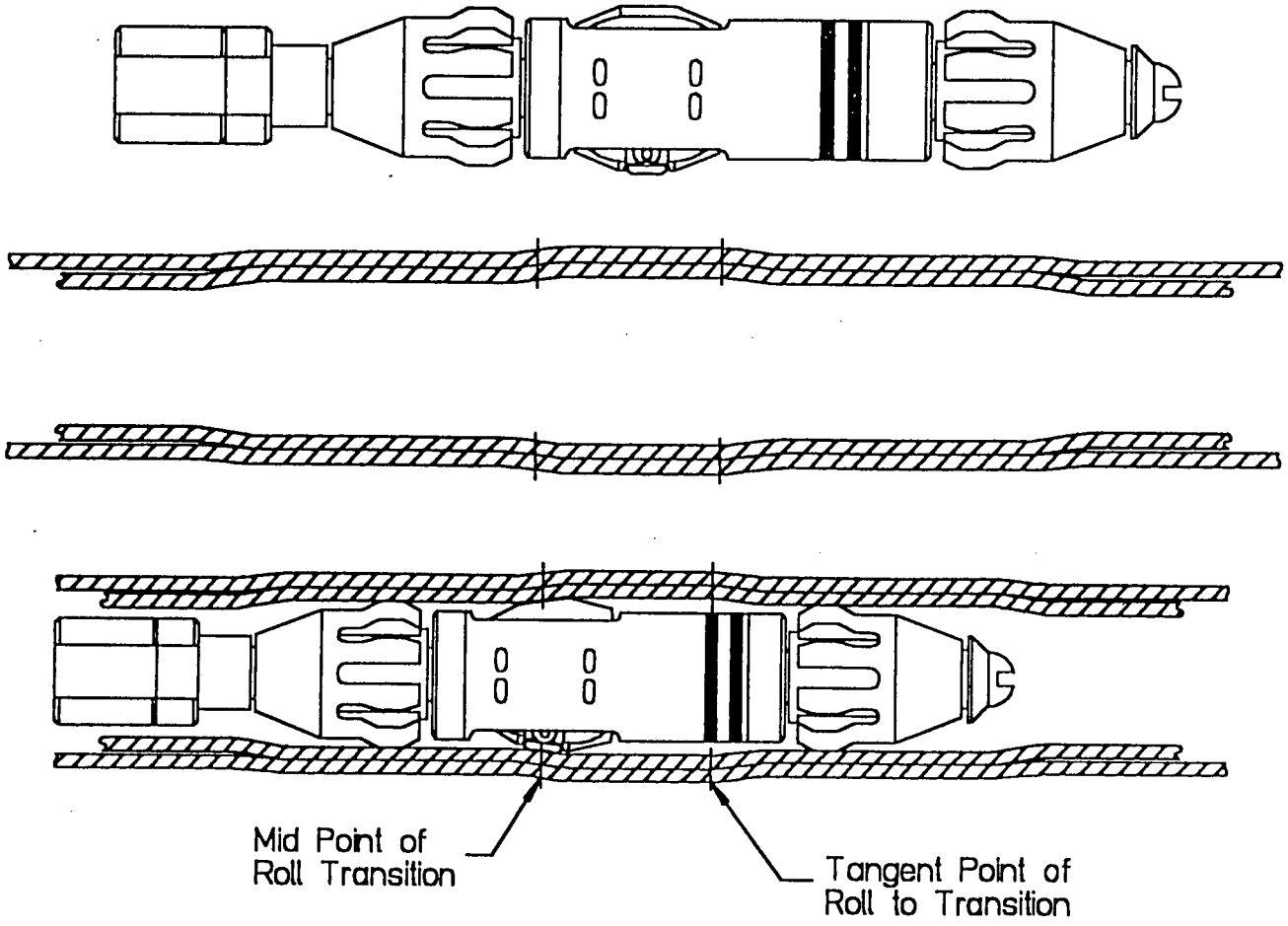

Mid Point of
Roll Transition
Tangent Point of
Roll to Transition

Figure 5

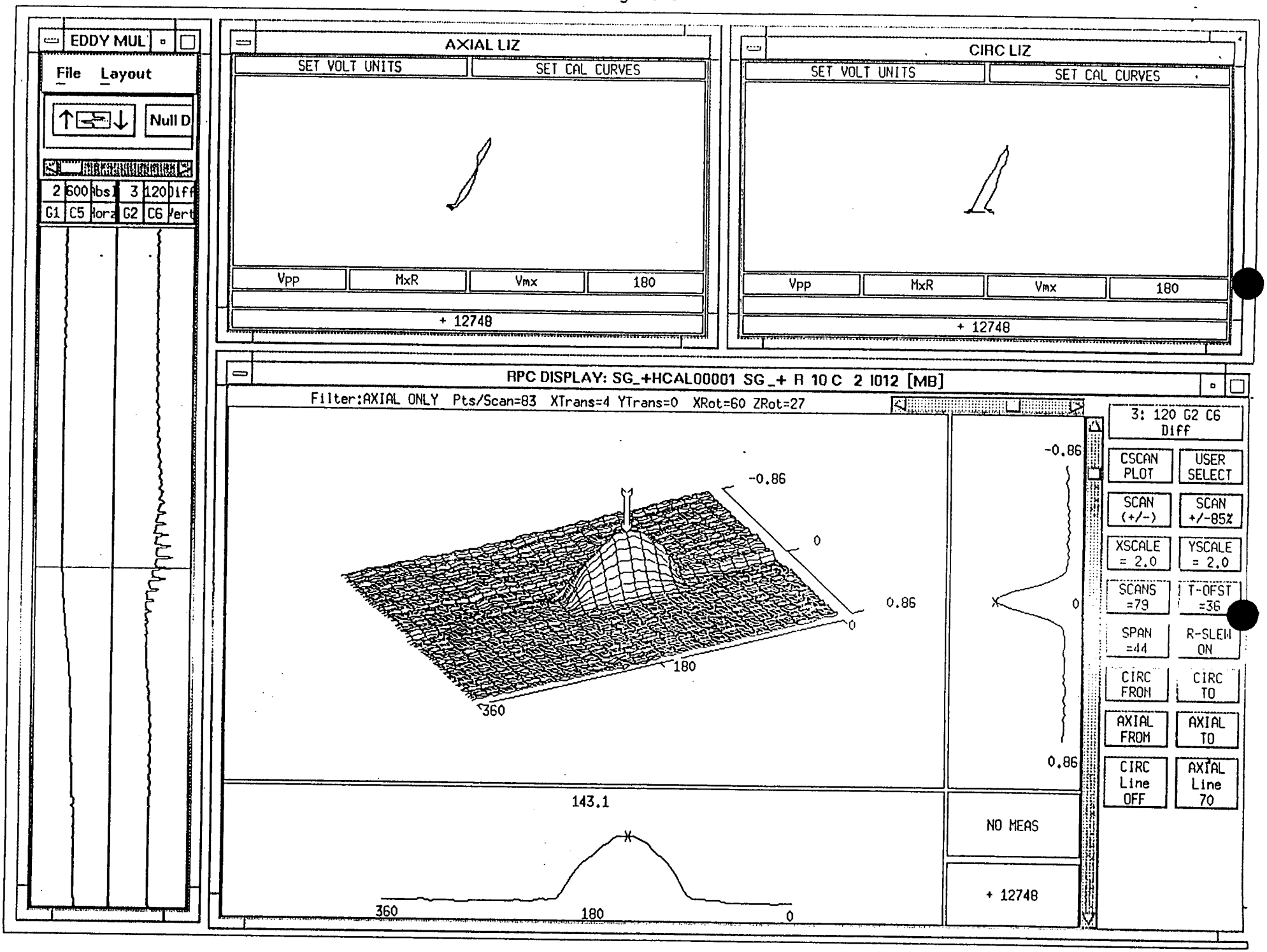
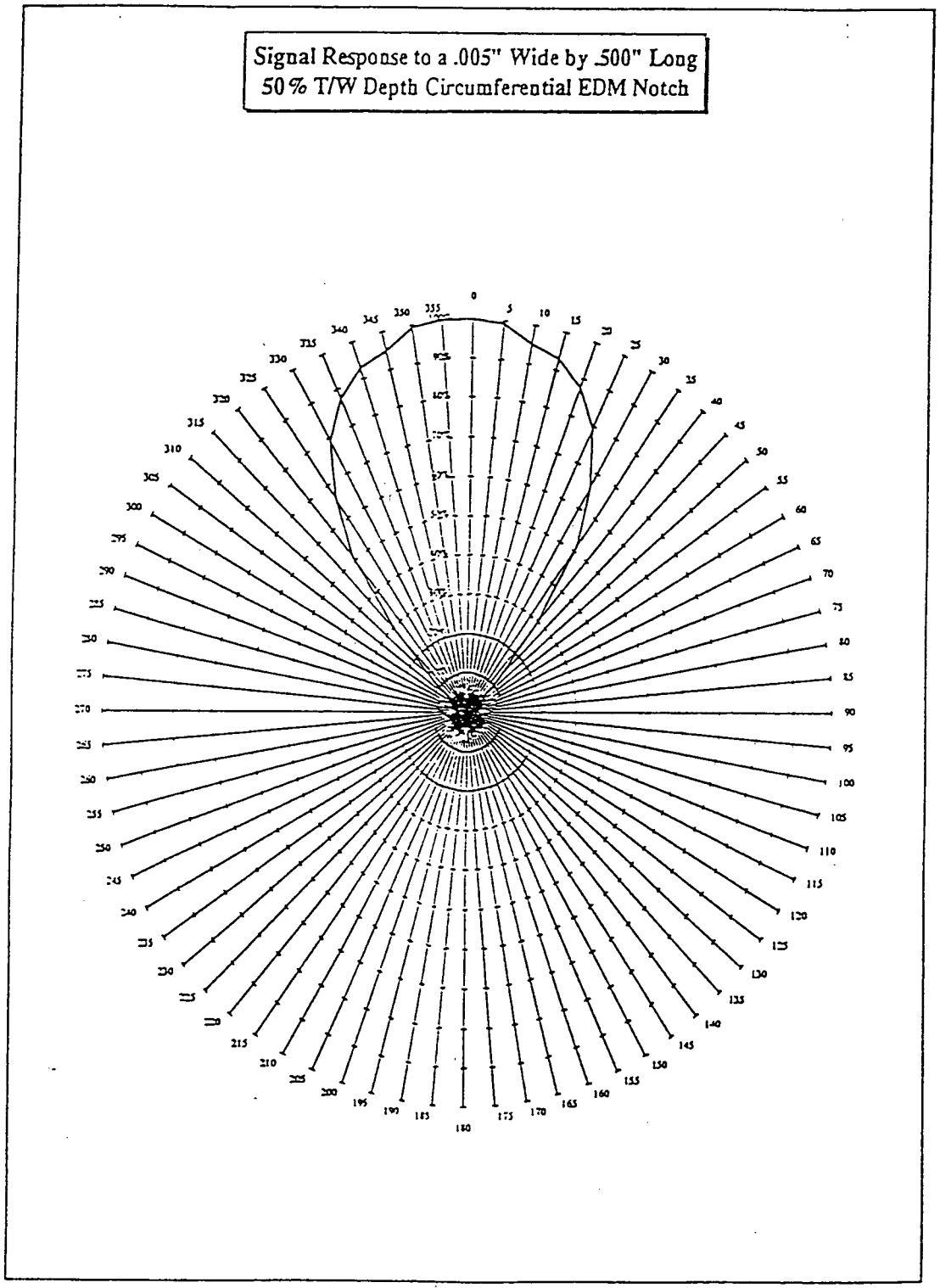

EDDY MUL
File Layout
Null D
2 600 Abs1 3 120 Diff
G1 C5 Horz G2 C6 Vert
AXIAL LIZ
SET VOLT UNITS
SET CAL CURVES
Vpp
MxR
Vmx
180
+ 12748
CIRC LIZ
SET VOLT UNITS
SET CAL CURVES
Vpp
MxR
Vmx
180
+ 12748
RPC DISPLAY: SG_+HCAL00001 SG_+ R 10 C 2 1012 [MB]
Filter:AXIAL ONLY Pts/Scan=83 XTrans=4 YTrans=0 XRot=60 ZRot=27
-0.86
0
0.86
0
180
360
-0.86
0
0.86
143.1
360
180
0
NO MEAS
+ 12748
3: 120 G2 C6 Diff
CSCAN PLOT
USER SELECT
SCAN (+/-)
SCAN +/-85%
XSCALE = 2.0
YSCALE = 2.0
SCANS =79
T-OFST =36
SPAN =44
R-SLEW ON
CIRC FROM
CIRC TO
AXIAL FROM
AXIAL TO
CIRC Line OFF
AXIAL Line 70

Figure 6


Signal Response to a .005" Wide by .500" Long
50 % T/W Depth Circumferential EDM Notch