

50-361

February 4, 1997

Note to: File

From: Mel B. Fields, Project Manager, DRPW

Mel B. Fields

Subject: Enclosure 1 to January 27, 1997 letter from Southern California Edison

Enclosure 1 to Southern California Edison's January 27, 1997, letter (Accession No. 9701300215) consists of an optical computer data disk that was sent only to an NRC consultant. The disk contains eddy current inspection data that can only be accessed using Eddynet95 software (Zetec Inc.) installed on a Hewlett-Packard workstation. The NRC consultant has the appropriate equipment and training and will complete an independent assessment of the inspection data to provide the NRC with his conclusions on the significance of the degradation in the tubes listed in Table 1 and the overall quality of the data. This feedback will augment the staff's assessment of the inspection of the San Onofre Unit 2 steam generator tube inspections completed in January 1997.

The inspection data consists of several binary files on optical data disks containing raw eddy current inspection data. Since the data is in the original format, viewing the data is only possible with Hewlett-Packard workstation using the appropriate eddy current data analysis program. The large size and format of these files precludes printing the data onto paper to place in the public document room. Consequently, it is not possible to provide the Public Document Room with a copy of the information contained in Enclosure 1. Members of the public should direct inquiries regarding the eddy current inspection data contained in the enclosure to the NRC Project Manager for the San Onofre Nuclear Station, Unit 2.

cc: Phillip Rush

9702040163 970204
PDR ADOCK 05000361
G PDR

DF01
111
per Mel Fields



SOUTHERN CALIFORNIA
EDISON

An EDISON INTERNATIONAL Company

January 27, 1997

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

Gentlemen:

Subject: Docket Nos. 50-361
Steam Generator Eddy Current Inspection Data
San Onofre Nuclear Generating Station
Unit 2

Reference: January 24, 1997 NRC Meeting Notice for a January 30, 1997 meeting
on the San Onofre Unit 2 Steam Generator inspection results.

In response to the meeting agenda attached to the referenced NRC Meeting Notice dated January 24, 1997, this letter provides a copy of the specified eddy current data from some of the steam generator tubes inspected during the current San Onofre Unit 2 refueling outage.

Enclosure 1 provides the raw eddy current inspection data from both the Plus Point and bobbin coil inspections for those tubes that are candidates for in-situ pressure testing or pulling during the current refueling outage. This includes data for at least two crack indications detected at dented locations. Enclosure 1, an optical disc copy of Raw Eddy Current Inspection Data, is being sent to NRC Consultant, Dr. Caius Dodd. Enclosure 2 is the drawings of the standards that were used to calibrate the inspection probes. The data is compatible with Eddynet95.

300016

~~9701300215~~ 970127
PDR ADDCK 05000361
G PDR

P.O. Box 128
San Clemente, CA 92674-0128

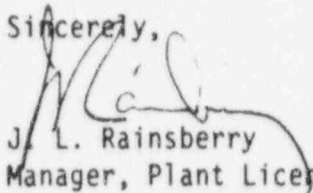
*For
per med fields*

Document Control Desk

-2-

If you have any questions or need additional information, please call me.

Sincerely,


J. L. Rainsberry
Manager, Plant Licensing

Enclosures

cc: L. J. Callan, Regional Administrator, NRC Region IV
K. E. Perkins, Jr., Director, Walnut Creek Field Office, NRC Region IV
J. A. Sloan, NRC Senior Resident Inspector, San Onofre Units 2 & 3
M. B. Fields, NRC Project Manager, San Onofre Units 2 and 3
C. Dodd, NRC Consultant

bcc: (see attached sheet)

ENCLOSURES

ENCLOSURE 1 (optical disc sent to NRC Consultant, Dr. Caius Dodd)

Raw Eddy Current Inspection Data

San Onofre Unit 2 Steam Generators 88 and 89

Steam Generator 89 Tube Pull Candidates (94-32, 61-111, 16-164)

In-Situ Testing Candidates in both Steam Generators

ENCLOSURE 2

Drawings of the Standards Used to Calibrate the Inspection Probes

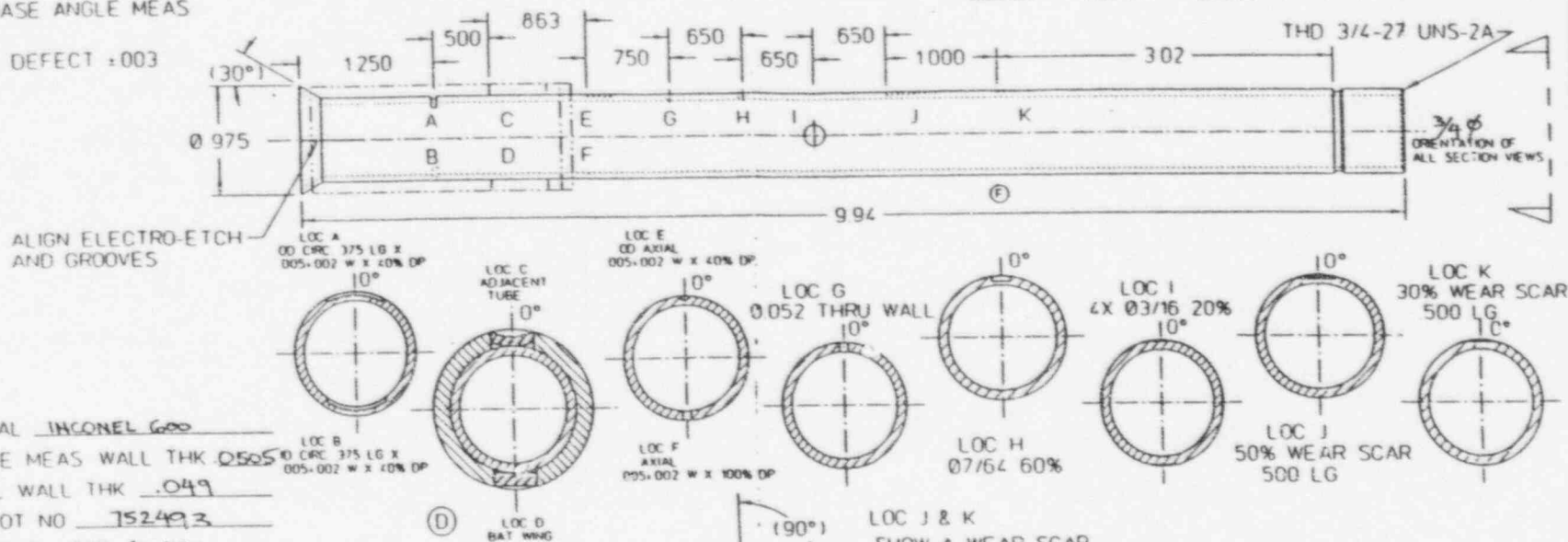
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	Z-15045	Z-15577 Z-15586
	Z-15050	Z-15578 Z-15587
	Z-13325	Z-15579 Z-15588
	Z-13326	Z-15580 Z-15589
	Z-13328	Z-15581 Z-15590
	Z-13329	Z-15582 Z-15591
		Z-15583 Z-15592
		Z-15584 Z-15593
		Z-15585 Z-15594

NOTE SEE 2-415-0004 FOR PLACEMENT
OF NYLON SLEEVE

REVISIONS				REVISIONS				APVD	CK	DR
LTR	DATE	DESCRIPTION								
H	4/5/96	ADDED ORIENTATION FOR SEC. VIEWS								KZ

LOCATION	A	B	C	D	E	F	G	H	I	J	K
PHYSICALLY MEAS DBPTH	.0195	.0205	—	—	.0215	THRU	THRU	.0300	.0100	.0260	.0155
DEPTH IN % OF WALL	39%	41%	—	—	43%	100%	100%	59%	20%	51%	31%
ET PHASE ANGLE MEAS							40°	110°	151°		

DIA OF DEFECT ±.003



MATERIAL INCONEL 600
AVERAGE MEAS WALL THK .0505
NOMINAL WALL THK .049
HEAT LOT NO 752493
TEST FREQ USED 400 KHZ
SERIAL NO Z-15045
P.O. NO 8710
REL NO NA
QUALITY REL NO NA
DATE MFG 5-17-96
O.A. INSP Harry R. Bell
CUSTOMER Rockridge Technologies
RECORDED 40
PROBE USED ACUTEC # 71186
REVIEWED BY [Signature]

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	DATE
G. MATELICH	08/24/94
CHECK	
B. JONES	08/30/94
DESIGN	
APPROV	
G. ATKINS	08/31/94

ZETEC INC.
POST OFFICE BOX 110 ISSAQUAH WASHINGTON
98027-0110 U.S.A. TELEPHONE (206) 282-5310

TITLE **DUAL GUIDE TUBE STD.
W/ MISC. DEFECTS**

SIMILAR DWG NO **2-415-1015**

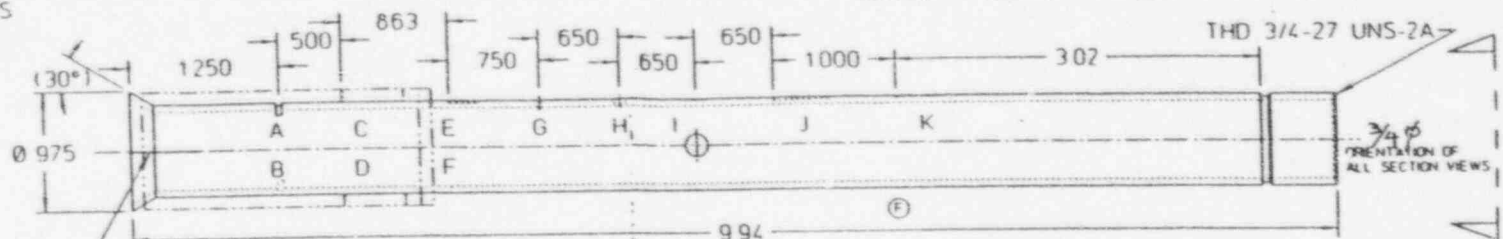
SCALE NTS **2-415-0004** SHEET 1 OF 2

NOTE: SEE 2-415-0004 FOR PLACEMENT
OF NYLON SLEEVE

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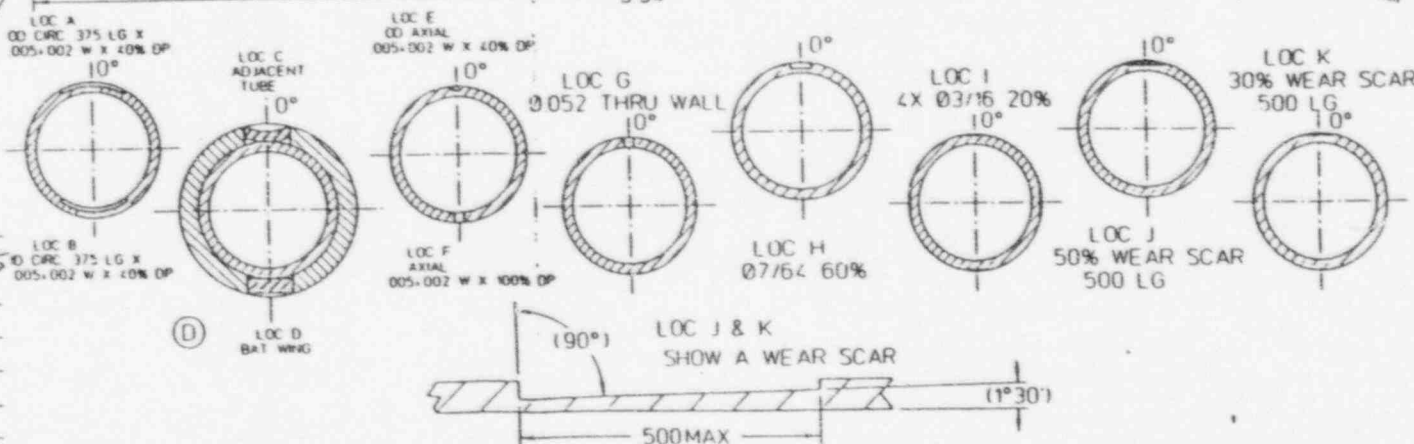
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PHYSICALLY MEAS DEPTH	.0200	.0205	—	—	.0205	THRU	THRU	.0310	.0100	.0260	.0165
DEPTH IN % OF WALL	40%	41%	—	—	41%	100%	100%	61%	20%	51%	33%
E.T. PHASE ANGLE MEAS							40°	111°	153°		

DIA OF DEFECT : .003



MATERIAL INCONEL 600
AVERAGE MEAS WALL THK .0505
NOMINAL WALL THK .049
HEAT LOT NO 752493
TEST FREQ USED 400 KHZ
SERIAL NO Z-15050
PO NO 8710
REL NO NA
QUALITY REL NO NA

DATE MFG 5-17-96
QA INSP Angie R. Jones
CUSTOMER Rockledge Technologies
RECORDED 40
PROBE USED ACCEL # 71186
REVIEWED BY [Signature]



NOTE

DIM ARE IN INCHES TOLERANCES DECIMAL FRACT : 1/16 XXXX : .003 XXX : .015 XX : .050 X : .003 ANGULAR : .3° FRESH	DRAWN	DATE	ZETEC INC POST OFFICE BOX 180 ISSAQUAH WASHINGTON 98027-0180 USA TELEPHONE (206) 387-3316	
	G. MATELICH	08/24/94		
	CHECK	DATE	TITLE DUAL GUIDE TUBE STD. W/ MISC. DEFECTS	
	B. JONES	08/30/94		
	DESIGN		SIMILAR	DWG NO
	APVD QA			
	G. ATKINS	08/31/94	SCALE NTS	2-415-1015
			USED	1 OF 2

				REVISIONS							
		REV. STATUS	REV. NO.	DATE	DESCRIPTION	APVD	CK	DR			
		2	SHEET	E	11/29/94	ADDED WIDTH CALL-OUT LOC. A-B-E-F			BR	BR	KZ

LOCATION	A	B	C	D	E	F	G	H	I	J	K
PHYSICALLY MEAS DEPTH	.0210	.0205	—	—	.0215	THRU	THRU	.0300	.0100	.0240	.0140
DEPTH IN % OF WALL	41%	40%	—	—	42%	100%	100%	58%	19%	47%	27%

DIA OF DEFECT .003

ALIGN ELECTRO-ETCH AND GROOVES

LOC A
OD CIRC 375 LG X
005+.002 W X 40% DP.

LOC B
OD CIRC 375 LG X
005+.002 W X 40% DP.

LOC C
ADJACENT TUBE

LOC D
BAT W/AG

LOC E
OD AXIAL
005+.002 W X 40% DP.

LOC F
OD AXIAL
005+.002 W X 100% DP.

LOC G
0.052 THRU WALL

LOC H
07/64 60%

LOC I
4X 03/16 20%

LOC J
50% WEAR SCAR
500 LG

LOC K
30% WEAR SCAR
500 LG

LOC J & K
SHOW A WEAR SCAR

500 MAX.

NOTE:

MATERIAL INCONEL 600

AVERAGE MEAS WALL THK .0515

NOMINAL WALL THK .049

HEAT LOT NO 752493

TEST FREQ USED NA

SERIAL NO E-13325

P.O. NO 679

REL NO MR5524

QUALITY REL NO NA

DATE MFG 2-1-95

QA INSP NA

CUSTOMER CONNA NUCLEAR

RECORDED NA

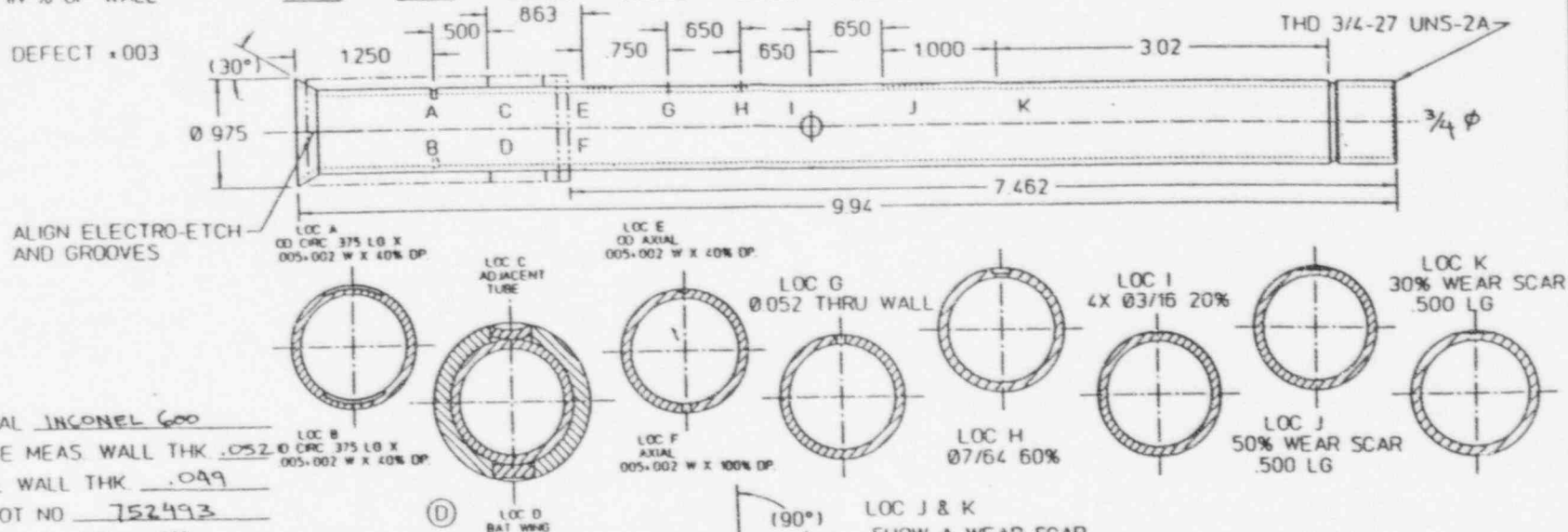
PROBE USED NA

REVIEWED BY NA

DIM. OTHERWISE SPECIFIED		DRAWN		DATE		ZETEC INC.	
DIM ARE IN INCHES		G MATELICH		08/24/94		POST OFFICE BOX 148 ISSAQUAH WASH-00101 98017-0010 U.S.A. TELEPHONE (206) 357-5736	
TOLERANCES		CHECK		08/30/94			
DECIMAL FRACT. 1/16		B JONES				TITLE	
XXXX .003		DESIGN				DUAL GUIDE TUBE STD.	
XXX .015		APVD. OA				W/ MISC. DEFECTS	
XX .050		G ATKINS		08/31/94		SCALE NTS	
X .003						DWG NO	
ANGULAR .3°						2-415-1015	
FRESH						USED ON 2-415-0004	
						SHT 1 OF 2	

				REVISIONS					APVD	CK	DR
REV	STATUS	DATE	DESCRIPTION								
2	SHEET	11/24/94	ADDED WIDTH CALL-OUT LOC. A-B-E-F						BA	BT	KZ

LOCATION	A	B	C	D	E	F	G	H	I	J	K
PHYSICALLY MEAS ¹ DEPTH	.0215	.0200	—	—	.0210	THRU	THRU	.0310	.0110	.0260 ¹	.0145
DEPTH IN % OF WALL	42%	39%	—	—	41%	100%	100%	60%	21%	50%	28%
DIA OF DEFECT ± .003											



MATERIAL INCONEL 600
 AVERAGE MEAS. WALL THK .052
 NOMINAL WALL THK .049
 HEAT LOT NO 752493
 TEST FREQ USED NA
 SERIAL NO E-13326
 PO NO 679
 REL NO MR5524
 QUALITY REL NO NA
 DATE MFG 2-1-95
 O.A. INSP NA
 CUSTOMER CONRAD NUCLEAR
 RECORDED NA
 PROBE USED NA
 REVIEWED BY NA

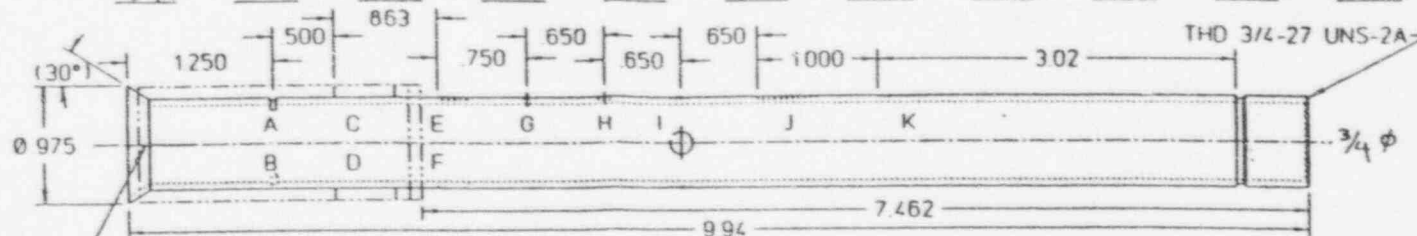
NOTE

UNLESS OTHERWISE SPECIFIED DIM ARE IN INCHES TOLERANCES DECIMAL FRACT. ± 1/16 XXXX ± .003 XXX ± .015 XX ± .050 X ± .003 ANGULAR ± 3° FINISH	DRAWN	DATE	ZETEC INC POST OFFICE BOX 48 ISSAQUAH WASHINGTON 98287 AND U.S.A. TELEPHONE (206) 387-1376	
	G. MATELICH	08/24/94		
	CHECK		TITLE DUAL GUIDE TUBE STD. W/ MISC. DEFECTS	
	B. JONES	08/30/94		
	DESIGN		SIMILAR	DWG NO
	APVD. OA			2-415-1015
	G. ATKINS	08/31/94	SCALE NTS	USED ON 2-415-0004 SHT 1 OF 2

				C	REVISIONS	REVISIONS						
				2	SHEET	REV. STATUS OF SHEETS	LTR	DATE	DESCRIPTION	APVD	CK	DR
							E	11/29/94	ADDED WIDTH CALL-OUT LOC. A-B-E-F	HR	BT	K2

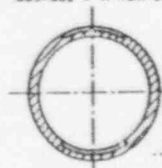
LOCATION	A	B	C	D	E	F	G	H	I	J	K
PHYSICALLY MEAS DEPTH	.0200	.0210	—	—	.0210	THRU	THRU	.0300	.0100	.0250	.0145
DEPTH IN % OF WALL	39%	41%	—	—	41%	100%	100%	58%	19%	49%	28%

DIA OF DEFECT $\pm .003$

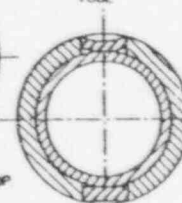


ALIGN ELECTRO-ETCH
AND GROOVES

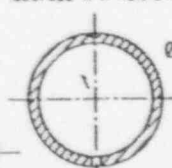
LOC A
OD CIRC 375 LO X
005+.002 W X 40% DP



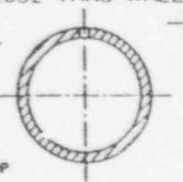
LOC C
ADJACENT
TUBE



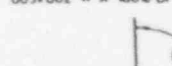
LOC E
OD AXIAL
005+.002 W X 40% DP



LOC G
Ø.052 THRU WALL



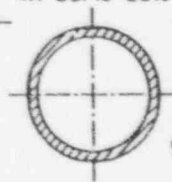
LOC F
AXIAL
005+.002 W X 100% DP



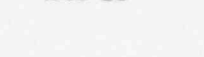
LOC H
Ø7/64 60%



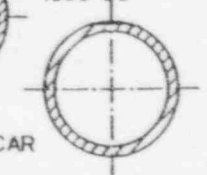
LOC I
4X Ø3/16 20%



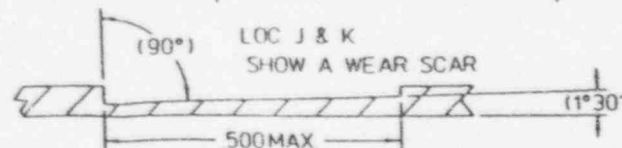
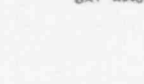
LOC J
50% WEAR SCAR
500 LG



LOC K
30% WEAR SCAR
500 LG



LOC D
BAT WND



MATERIAL INCONEL 600
AVERAGE MEAS WALL THK .0515
NOMINAL WALL THK .049
HEAT LOT NO 752493
TEST FREQ USED NA
SERIAL NO Z-13328
P.O. NO 679
REL NO MR5524
QUALITY REL NO NA
DATE MFG 2-1-95
O.A. INSP Handwritten signature
CUSTOMER CONRAD NUCLEAR
RECORDED NA
PROBE USED Handwritten signature
REVIEWED BY Handwritten signature

NOTE

UNL. OTHERWISE SPECIFIED
DIM ARE IN INCHES
TOLERANCES
DECIMAL FRACT. $\pm 1/16$
XXXX $\pm .003$
XXX $\pm .015$
XX $\pm .050$
X $\pm .003$
ANGULAR $\pm .3^\circ$
FINISH

DRAWN
G. MATELICH
CHECK
B. JONES
DESIGN
APVD. OA
G. ATKINS

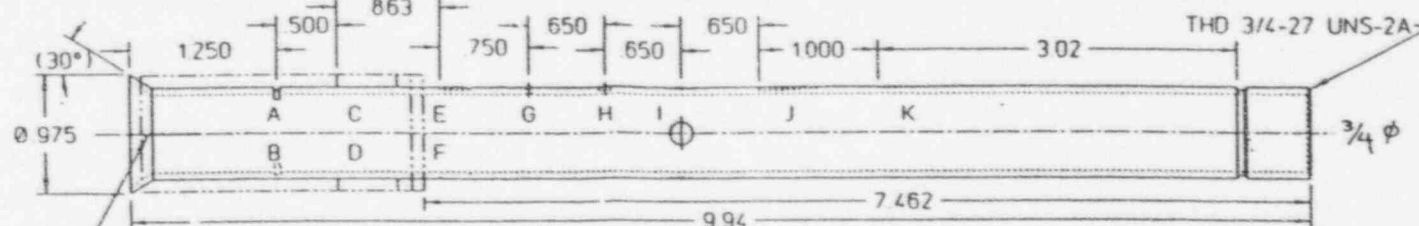
DATE
08/24/94
08/30/94
08/31/94

ZETEC INC.
POST OFFICE BOX 105 BOSTON, MASSACHUSETTS 02277-0105 U.S.A. TELEPHONE 1208 387-5338
TITLE
DUAL GUIDE TUBE STD.
W/ MISC. DEFECTS
SIMILAR
DWG NO
2-415-1015
SCALE NTS
USED ON 2-415-0004 SHIT 1 OF 2

				REVISIONS	REV. STATUS	LTR	DATE	DESCRIPTION	APVD	CK	DR
			2	SHEET	OF SHEETS	E	11/24/94	ADDED WIDTH CALL-OUT LOC. A-B-E-F	HR	BT	KZ

LOCATION	A	B	C	D	E	F	G	H	I	J	K
PHYSICALLY MEAS DEPTH	.0205	.0210	—	—	.0210	THRU	THRU	.0200	.0105	.0240	.0150
DEPTH IN % OF WALL	40%	41%	—	—	41%	100%	100%	58%	20%	47%	29%

DIA OF DEFECT .003



ALIGN ELECTRO-ETCH AND GROOVES

LOC A
OD CIRC 375 LO X
005+.002 W X 40% DP.

LOC C
ADJACENT
TUBE

LOC E
OD AXIAL
005+.002 W X 40% DP.

LOC G
Ø.052 THRU WALL

LOC I
4X Ø3/16 20%

LOC K
30% WEAR SCAR
500 LG

LOC B
OD CIRC 375 LO X
005+.002 W X 40% DP.

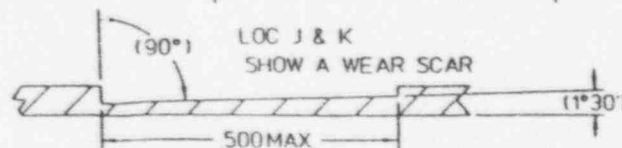
LOC F
AXIAL
005+.002 W X 100% DP.

LOC H
Ø7/64 60%

LOC J
50% WEAR SCAR
500 LG

LOC D
BAT W/WD

LOC J & K
SHOW A WEAR SCAR



MATERIAL INCONEL 600
 AVERAGE MEAS WALL THK .0515
 NOMINAL WALL THK .049
 HEAT LOT NO 752493
 TEST FREQ USED NA
 SERIAL NO Z-13329
 P.O. NO 679
 REL NO MR5524
 QUALITY REL NO NA
 DATE MFG 2-1-95
 O.A. INSP Handwritten signature
 CUSTOMER CONRAD NUCLEAR
 RECORDED NA
 PROBE USED NA
 REVIEWED BY Handwritten signature

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
G. MATELICH
 CHECK
B. JONES
 DESIGN
 APVD OA
G. ATKINS

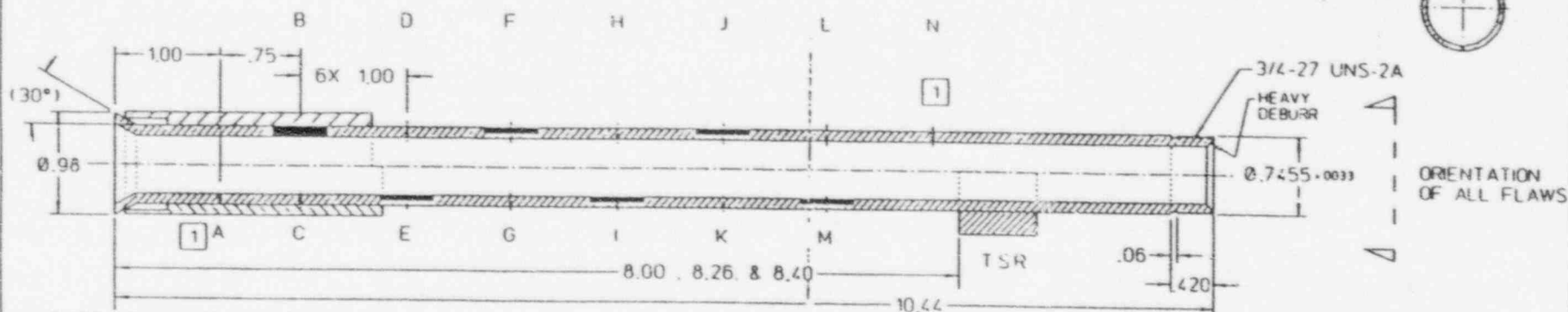
DATE
08/24/94
 08/30/94
 08/31/94

ZETEC INC.
 POST OFFICE BOX 140 BETHLEHEM, PA 18010
 610-770-0100
 TITLE **DUAL GUIDE TUBE STD. W/ MISC. DEFECTS**
 SIMILAR
 DWG NO **2-415-1015**
 SCALE NTS
 USED ON 2-415-0004 SHT 1 OF 2

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 ±.002 WIDE X .500 LONG

REV. NO.		REV. STATUS		LTR		DATE		REVISIONS		DESCRIPTION		APVD	CK	DR
3	2	SHEET												

LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N	
PHYSICALLY MEAS. DEPTH	THRU	THRU	THRU	.0295	.0205	.0315	.0310	.0200	.0205	.0220	.0220	.0095	.0100	THRU	SHOWS 100% THRU HOLE LOC N
DEPTH IN % OF WALL	100%	100%	100%	58%	60%	62%	61%	29%	40%	43%	43%	19%	20%	100%	



1 0.052 ±.003 IN STD. ≤ .75 DIA
0.067 ±.003 IN STD. > .75 DIA

MATERIAL INCONEL 600

AVERAGE MEAS WALL THK .051

NOMINAL WALL THK .049

HEAT LOT NO 752493

TEST FREQ USED NA

SERIAL NO Z-15577

P.O. NO 51148

REL NO NA

QUALITY REL NO NA

DATE MFG 12-16-96

Q.A. INSP Sherry Allen

CUSTOMER ROCKRIDGE TECHNOLOGIES

RECORDED NA

PROBE USED NA

REVIEWED BY Charlotte Butler

SHOWS 100%
AXIAL FLAW
LOC B

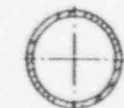
SHOWS 60% ID
CIRC FLAW
LOC D

SHOWS 60% OD
AXIAL FLAW
LOC F

SHOWS 40% ID
CIRC FLAW
LOC H

SHOWS 40% OD
AXIAL FLAW
LOC J

SHOWS 20% ID
CIRC FLAW
LOC L



LOC A
SHOWS 100%
THRU HOLE



LOC C
SHOWS 100%
CIRC FLAW



LOC E
SHOWS 60% ID
AXIAL FLAW



LOC G
SHOWS 60% OD
CIRC FLAW



LOC I
SHOWS 40% ID
AXIAL FLAW



LOC K
SHOWS 40% OD
CIRC FLAW



LOC M
SHOWS 20% ID
AXIAL FLAW

NOTE

3/4" (STOCK) TUBING

UNLESS OTHERWISE SPECIFIED

DIM ARE IN INCHES
TOLERANCES

DECIMAL FRACT. ±1/16

XXXX ±.003

XXX ±.015

XX ±.050

X ±.003

ANGULAR ±.2°

FRESH

DIST 000

DRAWN

K ZEGKE

CHECK

FOR

DESIGN

APVD CA

12/10/96

DATE

12/03/96

12/11/96

12/10/96

12/10/96

12/10/96

12/10/96

12/10/96

12/10/96

12/10/96

ZETEC INC.

POST OFFICE BOX 105343 JIM WASHINGTON
80077 DOW USA TELEPHONE (708) 393-5316

TITLE

G.T. CALIBRATION STANDARD

D=4040-1-A P=3435

SIMILAR

DWG NO

2-415-1059

SCALE N.T.S.

USED

2-415-0215

SHT 1 OF 3

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 .002 WIDE X .500 LONG

REV. NO.		REV. STATUS		REV. NO.		REV. STATUS		REV. NO.		REV. STATUS		REV. NO.		REV. STATUS		REV. NO.		REV. STATUS	
LTR	DATE	DESCRIPTION	APVD	CK	DR	LTR	DATE	DESCRIPTION	APVD	CK	DR	LTR	DATE	DESCRIPTION	APVD	CK	DR	LTR	DATE
3	2	SHEET																	

LOCATION

A B C D E F G H I J K L M N

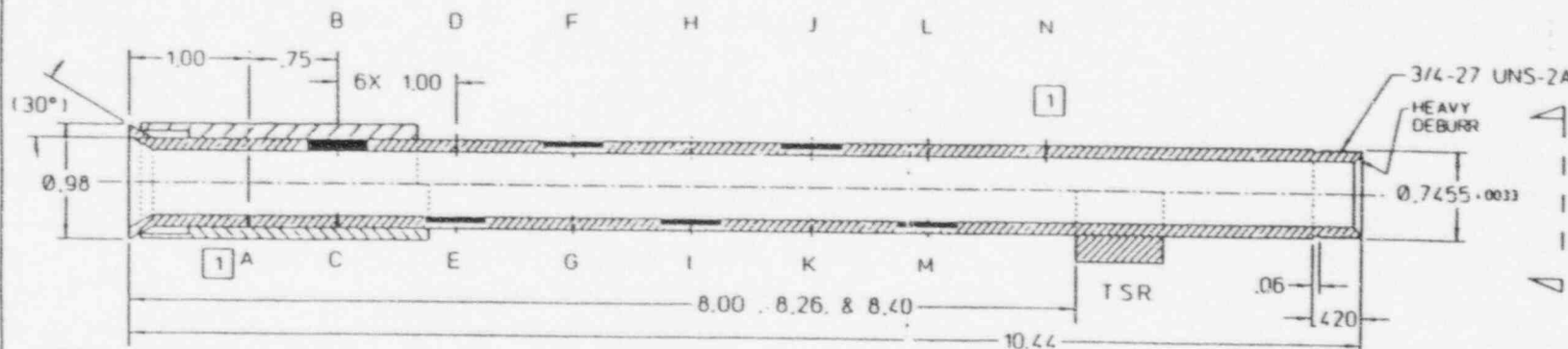
PHYSICALLY MEAS DEPTH

THRU THRU THRU .0285 .0270 .0330 .0300 .0195 .0205 .0276 .0200 .0095 .0109 THRU

DEPTH IN % OF WALL

100% 100% 100% 56% 57% 65% 59% 38% 40% 44% 39% 19% 20% 100%

SHOWS 100%
THRU HOLE
LOC N



ORIENTATION
OF ALL FLAWS

1 0.052+.003 IN STD. \leq .75 DIA
0.067+.003 IN STD. $>$.75 DIA

MATERIAL INCONEL 600

AVERAGE MEAS WALL THK .051

NOMINAL WALL THK .049

HEAT LOT NO 752493

TEST FREQ USED NA

SERIAL NO Z-15576

P.O. NO 51146

REL NO NA

QUALITY REL NO NA

DATE MFG 12-16-96

O.A. INSP Handwritten signature

CUSTOMER Rockwell Technologies

RECORDED NA

PROBE USED NA

REVIEWED BY Charlotte Better

SHOWS 100%
AXIAL FLAW
LOC B



LOC A
SHOWS 100%
THRU HOLE



LOC C
SHOWS 100%
CIRC FLAW

SHOWS 60% ID
CIRC FLAW
LOC D



LOC E
SHOWS 60% ID
AXIAL FLAW

SHOWS 60% OD
AXIAL FLAW
LOC F



LOC G
SHOWS 60% OD
CIRC FLAW

SHOWS 40% ID
CIRC FLAW
LOC H



LOC I
SHOWS 40% ID
AXIAL FLAW

SHOWS 40% OD
AXIAL FLAW
LOC J



LOC K
SHOWS 40% OD
CIRC FLAW

SHOWS 20% ID
CIRC FLAW
LOC L



LOC M
SHOWS 20% ID
AXIAL FLAW

NOTE

3/4" (STOCK) TUBING

LINE DIRECTION SPECIFIED
DIM ARE IN INCHES
TOLERANCES
DECIMAL FRACT $\pm 1/16$
XXXX \pm .003
XXX \pm .015
XX \pm .050
X \pm .033
ANGULAR $\pm 1^\circ$
FINISH

DIST 000

DRAWN

K ZECKE

CHECK

DESIGN

APVD DA

12/10/96

12/10/96

12/10/96

DATE

12/03/96

12/10/96

12/10/96

12/10/96

12/10/96

12/10/96

12/10/96

ZETEC INC

POST OFFICE BOX 10000 WASHINGTON
20017-0000 USA TELEPHONE (202) 387-5236

TITLE

G.T. CALIBRATION STANDARD

D=4040-1-A P=3435

SIMILAR

DWG NO

2-415-1059

SCALE NTS

USED

2-415-0015

SHT

1 OF 3

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 ±.002 WIDE X .500 LONG

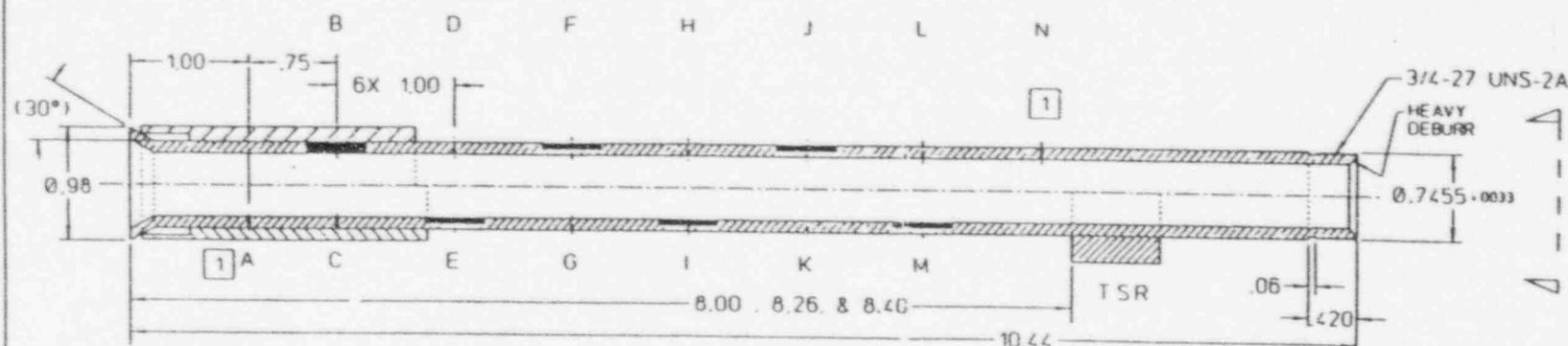
		REV. SHEETS	REV. STATUS OF SHEETS	REVISIONS					
				CTR	DATE	DESCRIPTION	APVD	CK	D
3	2	SHEET							

LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N
PHYSICALLY MEAS DEPTH	THRU	THRU	THRU	.0290	.0280	.0315	.0315	.0190	.0195	.0205	.0205	.0100	.0015	THRU
DEPTH IN % OF WALL	100%	100%	100%	57%	55%	62%	62%	37%	38%	40%	40%	20%	19%	100%

SHOWS 100%
THRU HOLE
LOC N



ORIENTATION
OF ALL FLAWS



1 Ø.052±.003 IN STD. ≤ .75 DIA
Ø.067±.003 IN STD. > .75 DIA

MATERIAL INCONEL 600

AVERAGE MEAS WALL THK .051

NOMINAL WALL THK .049

HEAT LOT NO 752493

TEST FREQ USED NA

SERIAL NO Z-15579

P.O. NO 51145

REL NO NA

QUALITY REL NO NA

DATE MFG 12-16-96

O.A. INSP Mike Altman

CUSTOMER ROCK RIDGE TECHNOLOGIES

RECORDED NA

PROBE USED NA

REVIEWED BY Charlotte Butler

SHOWS 100%
AXIAL FLAW
LOC B



LOC A
SHOWS 100%
THRU HOLE

SHOWS 60% ID
CIRC FLAW
LOC D



LOC C
SHOWS 100%
CIRC FLAW



LOC E
SHOWS 60% ID
AXIAL FLAW

SHOWS 60% OD
AXIAL FLAW
LOC F



LOC G
SHOWS 60% OD
CIRC FLAW

SHOWS 40% ID
CIRC FLAW
LOC H



LOC I
SHOWS 40% ID
AXIAL FLAW

SHOWS 40% OD
AXIAL FLAW
LOC J



LOC K
SHOWS 40% OD
CIRC FLAW

SHOWS 20% ID
CIRC FLAW
LOC L



LOC M
SHOWS 20% ID
AXIAL FLAW

NOT:

3/4" (STOCK) TUBING

ALL DIMENSIONS SPECIFIED
DIM ARE IN INCHES
TOLERANCES
DECIMAL FRACT. 1/16
XXXX ± .03
XXX ± .015
XX ± .05
X ± .003
ANGULAR .1°
FINISH DIST 000

DRAWN

K ZEGKE

CHECK

2.0R

DESIGN

12/10/96

APVD GA

12/10/96

DATE
12/03/96

ZETEC
INC

POST OFFICE BOX 110 HANOVER, MASSACHUSETTS
01927-0110 USA TELEPHONE (508) 387-5316

TITLE

G.T. CALIBRATION STANDARD

D=4040-1-A P=3435

SIMILAR

DWG NO

2-415-1059

SCALE NTS

USED

2-415-0015

SHT

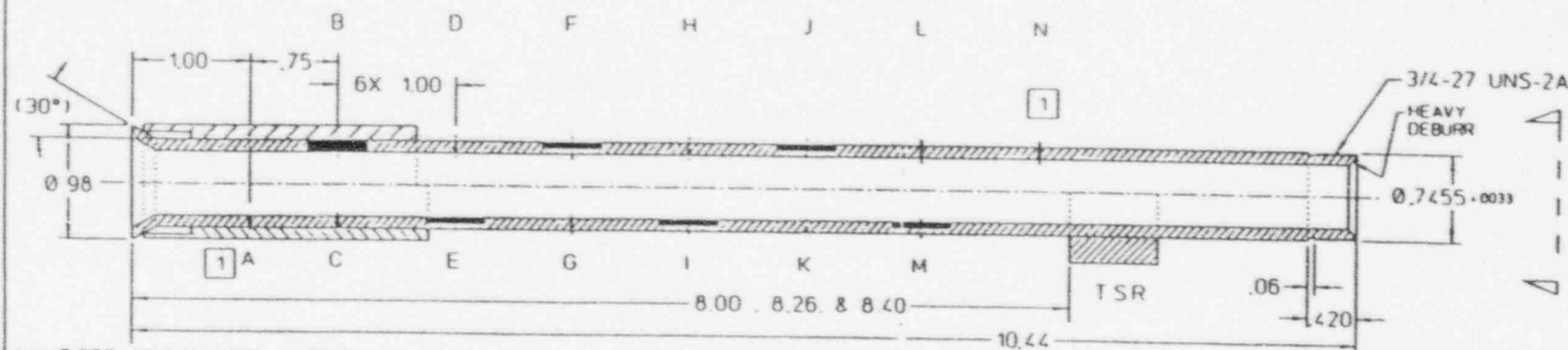
1 OF 3

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 ±.002 WIDE X .500 LONG

REVISES		REV STATUS		LTR		DATE		DESCRIPTION		APVD	CK	DR
3	2	SHEET	OF SHEETS									

LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N
PHYSICALLY MEAS DEPTH	THRU	THRU	THRU	.0295	.0295	.0305	.0310	.0190	.0200	.0210	.0210	.0095	.0100	THRU
DEPTH IN % OF WALL	100%	100%	100%	58%	58%	60%	61%	37%	39%	41%	41%	19%	20%	100%

SHOWS 100%
THRU HOLE
LOC N



ORIENTATION
OF ALL FLAWS

1 0.052 ±.003 IN STD. ≤ .75 DIA
0.067 ±.003 IN STD. > .75 DIA

MATERIAL INCONEL 600

AVERAGE MEAS WALL THK .051

NOMINAL WALL THK .049

HEAT LOT NO 752493

TEST FREQ USED NA

SERIAL NO Z-15580

PO NO 51148

REL NO NA

QUALITY REL NO NA

DATE MFG 12-16-96

O A INSP Handwritten signature

CUSTOMER ROCK RIDGE TECHNOLOGIES

RECORDED NA

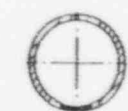
PROBE USED NA

REVIEWED BY Charlotte Butler

SHOWS 100%
AXIAL FLAW
LOC B



LOC A
SHOWS 100%
THRU HOLE



LOC C
SHOWS 100%
CIRC FLAW

SHOWS 60% ID
CIRC FLAW
LOC D



LOC E
SHOWS 60% ID
AXIAL FLAW

SHOWS 60% OD
AXIAL FLAW
LOC F



LOC G
SHOWS 60% OD
CIRC FLAW

SHOWS 40% ID
CIRC FLAW
LOC H



LOC I
SHOWS 40% ID
AXIAL FLAW

SHOWS 40% OD
AXIAL FLAW
LOC J



LOC K
SHOWS 40% OD
CIRC FLAW

SHOWS 20% ID
CIRC FLAW
LOC L



LOC M
SHOWS 20% ID
AXIAL FLAW

NOTE

3/4" φ (STOCK) TUBING

ALL DIMENSIONS SPECIFIED
DIM ARE IN INCHES
TOLERANCES

DECIMAL FRACT .1/16

XXXX ± .003

XXX ± .015

XX ± .050

X ± .003

ANGULAR .3°

FINISH

DIST 000

DRAWN

K ZEGKE

CHECK

FOR

DESIGN

APVD DA

12/10/96

DATE

12/03/96

ZETEC
INC

POST OFFICE BOX 409543 WASHINGTON
DC 20077-0040 USA TELEPHONE (202) 391-3310

TITLE

G.T. CALIBRATION STANDARD

D04040-1-A P03435

SIMILAR

DWG NO

2-415-1059

SCALE NTS

USED

2-415-0015

SHT 1 OF 3

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 ± .002 WIDE X .500 LONG

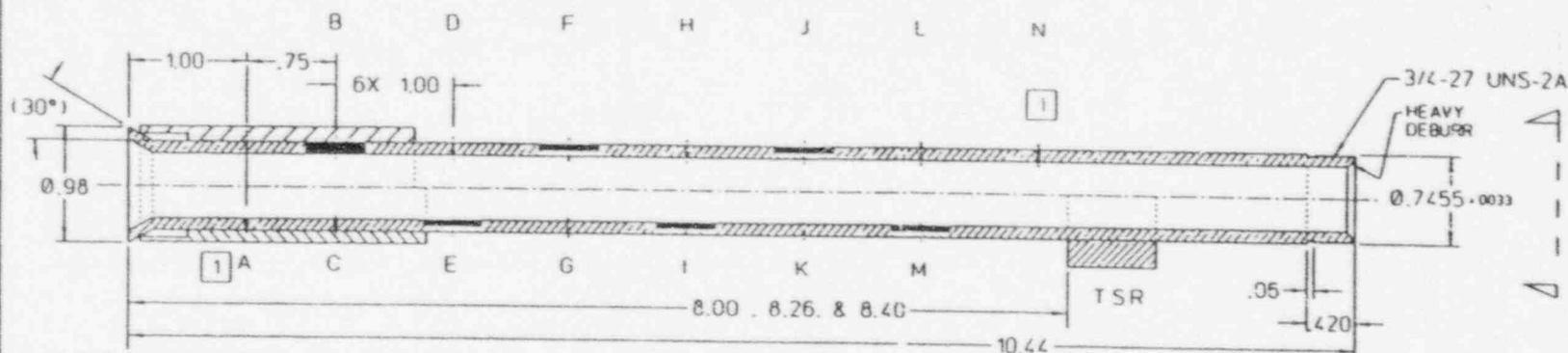
REVISED		REV STATUS		LTR		DATE		REVISIONS		DESCRIPTION		APVD	CK	DR
3	2	SHEET												

LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N
PHYSICALLY MEAS DEPTH	THRU	THRU	THRU	.0295	.0295	.0300	.0300	.0185	.0190	.0210	.0200	.0095	.0095	THRU
DEPTH IN % OF WALL	100%	100%	100%	51%	52%	59%	59%	36%	37%	41%	39%	19%	19%	100%

SHOWS 100%
THRU HOLE
LOC N



ORIENTATION
OF ALL FLAWS



1 0.052 ± .003 IN STD. ≤ .75 DIA
0.067 ± .003 IN STD. > .75 DIA

MATERIAL INCONEL 600

AVERAGE MEAS WALL THK .051

NOMINAL WALL THK .049

HEAT LOT NO 752493

TEST FREQ USED NA

SERIAL NO Z-15581

PO NO 51143

REL NO NA

QUALITY REL NO NA

DATE MFG 12-16-96

O.A. INSP Amey Allen

CUSTOMER Rock Ridge Technologies

RECORDED NA

PROBE USED NA

REVIEWED BY Charlotte Butler

SHOWS 100%
AXIAL FLAW
LOC B

SHOWS 60% ID
CIRC FLAW
LOC D

SHOWS 60% OD
AXIAL FLAW
LOC F

SHOWS 40% ID
CIRC FLAW
LOC H

SHOWS 40% OD
AXIAL FLAW
LOC J

SHOWS 20% ID
CIRC FLAW
LOC L



LOC A
SHOWS 100%
THRU HOLE



LOC C
SHOWS 100%
CIRC FLAW



LOC E
SHOWS 60% ID
AXIAL FLAW



LOC G
SHOWS 60% OD
CIRC FLAW



LOC I
SHOWS 40% ID
AXIAL FLAW



LOC K
SHOWS 40% OD
CIRC FLAW



LOC M
SHOWS 20% ID
AXIAL FLAW

NOTE

3/4" Ø (STOCK) TUBING

ONE TIME-WISE SPECIFIC

DIM ARE .12 INCHES

TOLERANCES

DECIMAL FRACT 1/16

XXXX ± .003

XXX ± .015

XX ± .050

X ± .003

ANGULAR .3°

FRACTION

DIST 000

DRAWN

K ZEGKE

DATE

12/03/96

CHECK

ZOR

DATE

12/11/96

DESIGN

ASD

DATE

12/10/96

APVD OA

ASD

ZETEC

INC

POST OFFICE BOX 110 ISSAQUAH WASHINGTON
98027-0110 U.S.A. TELEPHONE (206) 387-5310

TITLE

G.T. CALIBRATION STANDARD

DWG NO D4040-1-A P435

SIMILAR

DWG NO

2-415-1059

SCALE NTS

USED

2-415-0016

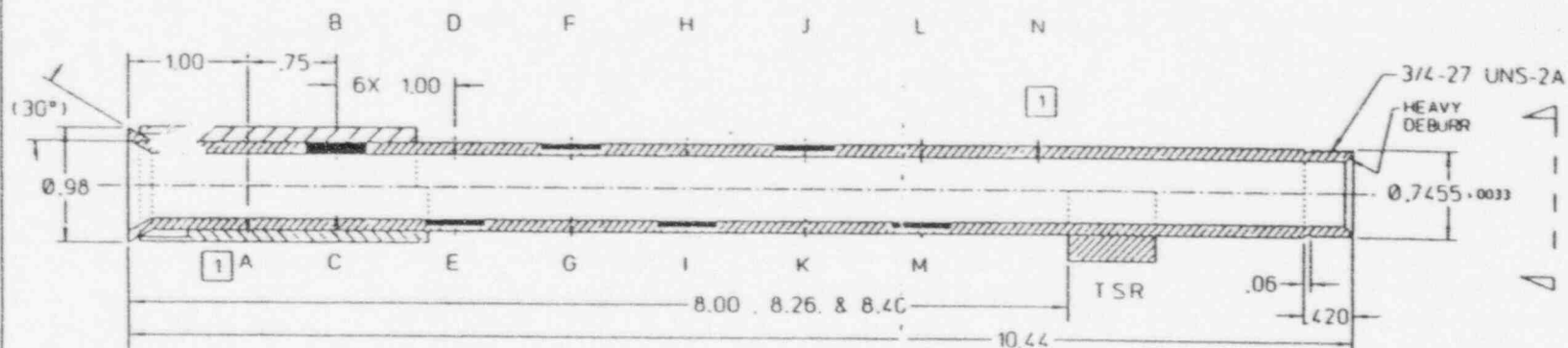
SHEET 1 OF 3

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 ±.002 WIDE X .500 LONG

REV. NO.		REV. STATUS OF SHEETS	REVISIONS		APVD	CK	DR
3	2		DESCRIPTION	DATE			







LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N
PHYSICALLY MEAS DEPTH	THRU	THRU	THRU	.0205	.0205	.0205	.0200	.0200	.0215	.0205	.0200	.0180	.0115	THRU
DEPTH IN % OF WALL	100%	100%	100%	60%	60%	60%	59%	39%	42%	40%	39%	20%	23%	100%

SHOWS 100%
THRU HOLE
LOC N



1 0.052 ±.003 IN STD. ≤ .75 DIA
0.067 ±.003 IN STD. > .75 DIA

MATERIAL INCONEL 600
AVERAGE MEAS WALL THK .051
NOMINAL WALL THK .049
HEAT LOT NO 752493
TEST FREQ USED NA
SERIAL NO Z-15582
P.O. NO 51145
REL NO NA
QUALITY REL NO NA
DATE MFG 12-16-96
O.A. INSP Handwritten signature
CUSTOMER Rockridge Technologies
RECORDED NA
PROBE USED NA
REVIEWED BY Charlotte Potter

SHOWS 100% AXIAL FLAW LOC B	SHOWS 60% ID CIRC FLAW LOC D	SHOWS 60% OD AXIAL FLAW LOC F	SHOWS 40% ID CIRC FLAW LOC H	SHOWS 40% OD AXIAL FLAW LOC J	SHOWS 20% ID CIRC FLAW LOC L
					
LOC C SHOWS 100% CIRC FLAW	LOC E SHOWS 60% ID AXIAL FLAW	LOC G SHOWS 60% OD CIRC FLAW	LOC I SHOWS 40% ID AXIAL FLAW	LOC K SHOWS 40% OD CIRC FLAW	LOC M SHOWS 20% ID AXIAL FLAW

NOTE

3/4" (STOCK) TUBING

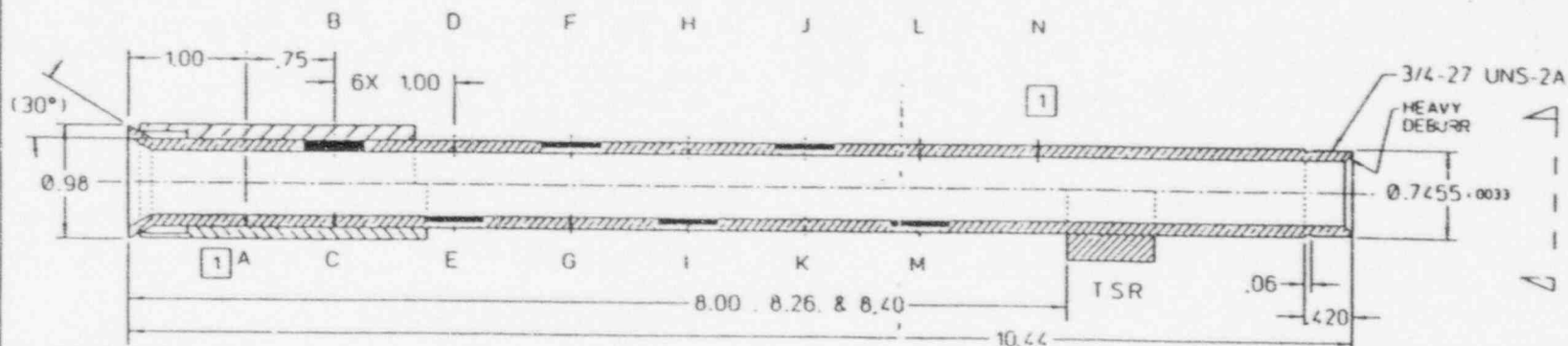
UNLESS OTHERWISE SPECIFIED DIM ARE IN INCHES TOLERANCES DECIMAL FRACT. ±1/16 XXX ±.003 XXX ±.015 XX ±.050 % ±.003 ANGULAR .3° FINISH DIST 000	DRAWN K ZEGKE	DATE 12/03/96	ZETEC INC. POST OFFICE BOX 180 ISSAQUAH WASHINGTON 98277-0180 U.S.A. TELEPHONE (206) 382-5318	
	CHECK ZOR	11/11/96	TITLE G.T. CALIBRATION STANDARD D=4040-1-A P=3435	
	DESIGN PJD	12/11/96	SIMILAR	
	APVD OA H. Potter	12/10/96	DWG NO 2-415-1059	
			SCALE NTS	USED IN 2-415-0015
		SHT 1 OF 3		

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 ±.002 WIDE X .500 LONG

REV. NO.		REV. STATUS		LTR		DATE		DESCRIPTION		APVD	CK	DR
3	2	SHEET										

LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N
PHYSICALLY MEAS DEPTH	THRU	THRU	THRU	.0290	.0295	.0320	.0305	.0200	.0190	.0220	.0205	.0095	.0100	THRU
DEPTH IN % OF WALL	100%	100%	100%	57%	58%	63%	60%	39%	37%	43%	40%	19%	20%	100%

SHOWS 100%
THRU HOLE
LOC N



1 .052 ±.003 IN STD. ≤ .75 DIA
.067 ±.003 IN STD. > .75 DIA

MATERIAL INCONEL 600

AVERAGE MEAS WALL THK .051

NOMINAL WALL THK .049

HEAT LOT NO 752493

TEST FREQ USED NA

SERIAL NO Z-15583

P.O. NO 51148

REL NO NA

QUALITY REL NO NA

DATE MFG 12-16-96







O.A. INSP Handwritten signature

CUSTOMER ROCKWELL TECHNOLOGIES

RECORDED NA

PROBE USED NA

REVIEWED BY Charlotte Potter

SHOWS 100% AXIAL FLAW LOC B	SHOWS 60% ID CIRC. FLAW LOC D	SHOWS 60% OD AXIAL FLAW LOC F	SHOWS 40% ID CIRC. FLAW LOC H	SHOWS 40% OD AXIAL FLAW LOC J	SHOWS 20% ID CIRC. FLAW LOC L
					
LOC C SHOWS 100% CIRC. FLAW	LOC E SHOWS 60% ID AXIAL FLAW	LOC G SHOWS 60% OD CIRC. FLAW	LOC I SHOWS 40% ID AXIAL FLAW	LOC K SHOWS 40% OD CIRC. FLAW	LOC M SHOWS 20% ID AXIAL FLAW

NOTE

3/4" Ø (STOCK) TUBING

ORAL 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
CHECK
ZOR
DESIGN
APVD OA
B. Potter
DATE
12/03/96
12/16/96
12/10/96

ZETEC
INC

POST OFFICE BOX 105404 • KANSAS CITY
MO 64110 • U.S.A. • TELEPHONE (816) 387-5316

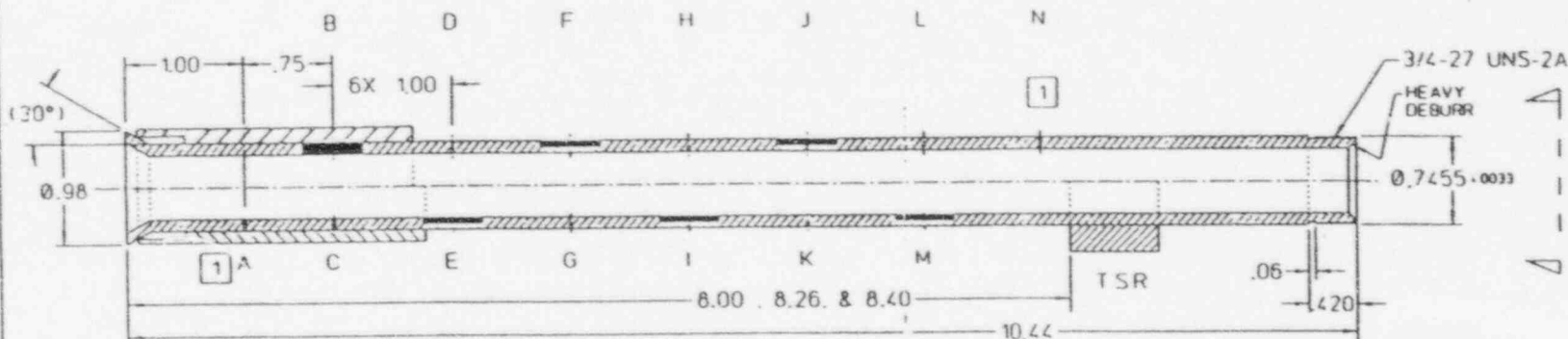
TITLE
G.T. CALIBRATION STANDARD
Dwg NO
2-415-1059
SCALE NTS
1 OF 3

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 ±.002 WIDE X .500 LONG

REVISES		REV STATUS OF SHEETS	LTR	DATE	DESCRIPTION	APVD	CK	DR
3	2							

LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N
PHYSICALLY MEAS DEPTH	THRU	THRU	THRU	.0300	.0270	.0315	.0300	.0195	.0190	.0210	.0210	.0100	.0095	THRU
DEPTH IN % OF WALL	100%	100%	100%	57%	57%	62%	57%	38%	37%	41%	41%	20%	19%	100%








SHOWS 100%
THRU HOLE
LOC N



1 0.052 ±.003 IN STD. ≤ .75 DIA
0.067 ±.003 IN STD. > .75 DIA

MATERIAL INCONEL 600
AVERAGE MEAS WALL THK .051
NOMINAL WALL THK .049
HEAT LOT NO 752493
TEST FREQ USED NA
SERIAL NO Z-15564
P.O. NO 51148
REL NO NA

QUALITY REL NO NA
DATE MFG 12-16-96
O.A. INSP Mike Patton
CUSTOMER Rockwell Technologies
RECORDED NA
PROBE USED NA
REVIEWED BY Charlotte Potter

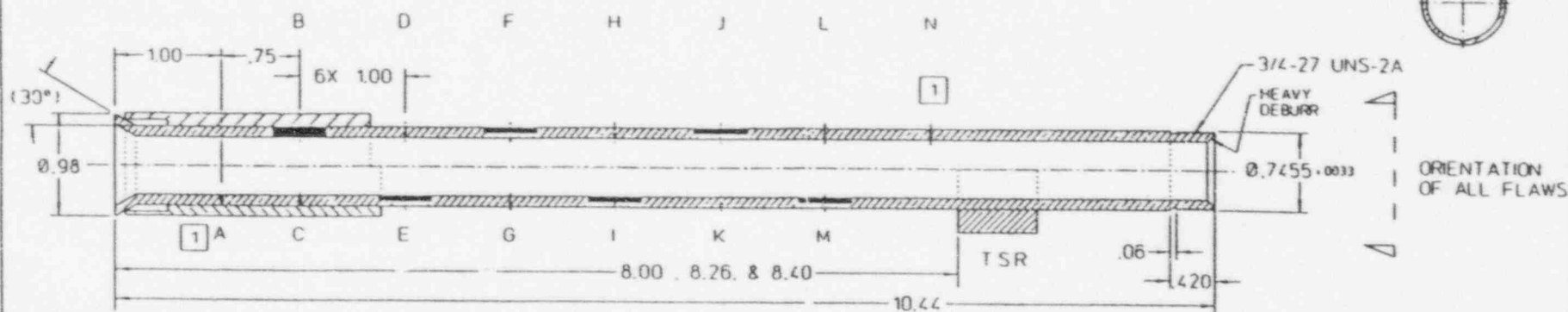
SHOWS 100% AXIAL FLAW LOC B		SHOWS 60% ID CIRC FLAW LOC D		SHOWS 60% OD AXIAL FLAW LOC F		SHOWS 40% ID CIRC FLAW LOC H		SHOWS 40% OD AXIAL FLAW LOC J		SHOWS 20% ID CIRC FLAW LOC L	
											
LOC A	LOC C	LOC E	LOC G	LOC I	LOC K	LOC M					
SHOWS 100% THRU HOLE	SHOWS 100% CIRC FLAW	SHOWS 60% ID AXIAL FLAW	SHOWS 60% OD CIRC FLAW	SHOWS 40% ID AXIAL FLAW	SHOWS 40% OD CIRC FLAW	SHOWS 20% ID AXIAL FLAW					

NOTE

3/4" (STOCK) TUBING

LINE IDENTIFICATION SPECIFIED BY DRAWN		DATE	ZETEC INC	POST OFFICE BOX 46 ISSAQUAH WASHINGTON 98027-0460 U.S.A. TELEPHONE (206) 392-3316	
DIM ARE 1/2 INCHES		K ZEGKE		12/03/96	
TOLERANCES		CHECK		TITLE	
DECIMAL FRACT 1/16		<i>ZOR</i>	12/14/96	1	
XXXX . 003		DESIGN	12/18/96	G.T. CALIBRATION STANDARD	
XXX . 015				D04040-1-A P03435	
XX . 050		APVD DA	12/10/96	SIMILAR	DWG NO
X . 003		B. Patton			2-415-1059
ANGULAR .3°				SCALE NTS	USED IN
FINISH		DIST	000	2-415-0016	SHT 1 OF 3

		REVISIONS	REV STATUS OF SHEETS	REVISIONS				
				LTR	DATE	DESCRIPTION	APVD	CK
3	2	SHEET						



REVIEWED BY Charlotte Better

SHOWS 20% ID
CIRC FLAW
LOC L



LOC A
SHOWS 100%
THRU HOLE



LOC C
SHOWS 100%
CIRC FLAW



LOC E
SHOWS 50% ID
AXIAL FLAW



LOG
SHOWS 60% DD
CIRC FLAW



LOC 1
SHOWS 40% ID
AXIAL FLAW



LOCK
SHOWS 40% OD
CIRC FLAW



LOC M
* SHOWS 20% ID
AXIAL FLAW

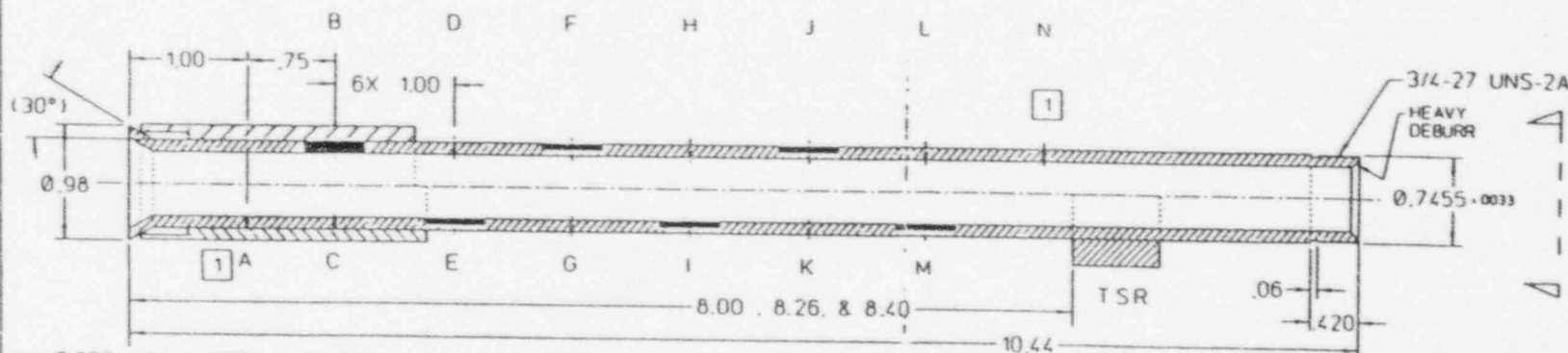
USED 2 / 15 0016 SHI 1 OF 3

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 ±.002 WIDE X .500 LONG

		REVISIONS	REV STATUS OF SHEETS	LTR	DATE	REVISIONS	APVD	CK	DR
3	2	SHEET		DESCRIPTION					

LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N
PHYSICALLY MEAS DEPTH	THRU	THRU	THRU	.0295	.0305	.0215	.0205	.0205	.0215	.0210	.0200	.0285	.0100	THRU
DEPTH IN % OF WALL	100%	100%	100%	58%	60%	62%	60%	40%	42%	41%	39%	17%	20%	100%

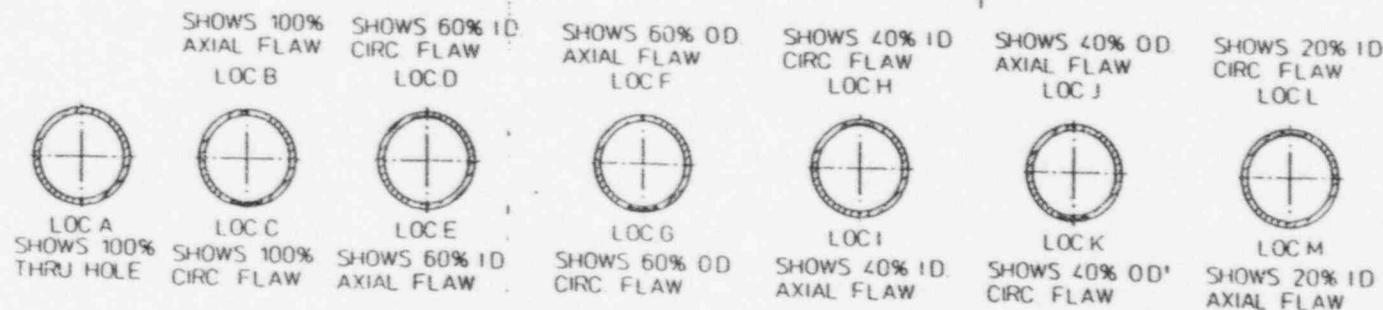
SHOWS 100%
THRU HOLE
LOC N



ORIENTATION
OF ALL FLAWS

1 0.052 ±.003 IN STD. ≤ .75 DIA
0.067 ±.003 IN STD. > .75 DIA

MATERIAL INCONEL 600
AVERAGE MEAS WALL THK .051
NOMINAL WALL THK .049
HEAT LOT NO 752493
TEST FREQ USED NA
SERIAL NO Z-15586
PO NO 51148
REL NO NA
QUALITY REL NO NA
DATE MFG 12-16-96
O A INSP [Signature]
CUSTOMER ROCKRIDGE TECHNOLOGIES
RECORDED NA
PROBE USED NA
REVIEWED BY Charlotte Bitter



NOTE:

3/4" (STOCK) TUBING

UNLESS OTHERWISE SPECIFIED
DIM ARE IN INCHES
TOLERANCES
DECIMAL : FRACT : 1/16
XXXX ± .003
XXX ± .015
XX ± .050
X ± .003
ANGULAR : 3°
FINISH DIST 000

DRAWN
K ZEGKE
CHECK
ZOR
DESIGN
APVD OA
B. [Signature]
DATE
12/03/96
12/11/96
12/10/96

ZETEC INC
POST OFFICE BOX 403340 WASHINGTON
94027-0400 U.S.A. TELEPHONE (202) 397-5346
TITLE
G.T. CALIBRATION STANDARD
D=4040-1-A P=3435
SMBLAR
DWG NO
2-415-1059
SCALE NTS
USED
2-415-0016
SHT 1 OF 3

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 X .002 WIDE X .500 LONG

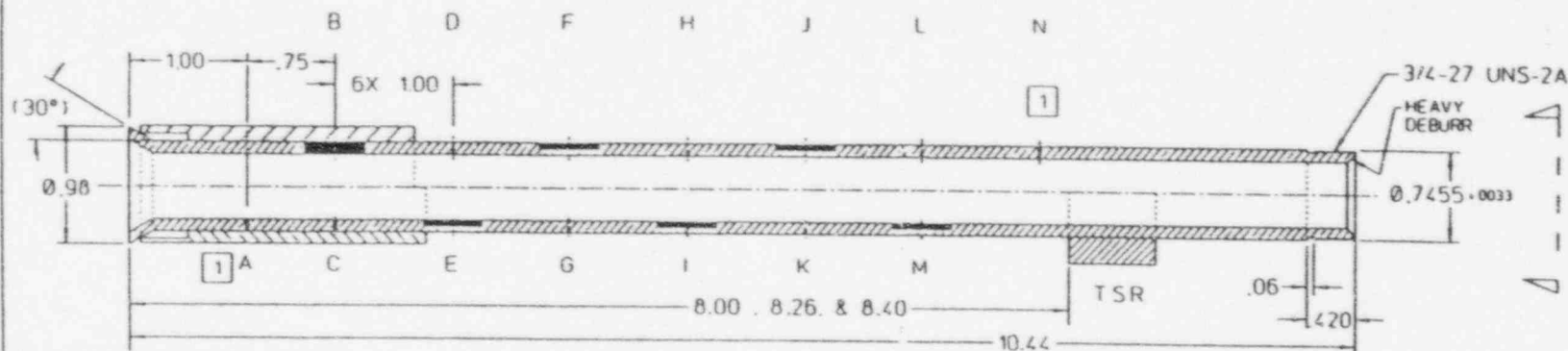
REV. NO.		REV. STATUS		LTR		DATE		DESCRIPTION		APVD	CK	DR
3	2	SHEET	OF SHEETS									

LOCATION	A	B	C	L	E	F	G	H	I	J	K	L	M	N
PHYSICALLY MEAS DEPTH	THRU	THRU	THRU	.0295	.0305	.0315	.0295	.0190	.0190	.0210	.0205	.0090	.0105	THRU
DEPTH IN % OF WALL	100%	100%	100%	58%	60%	62%	58%	37%	37%	41%	40%	18%	21%	100%

SHOWS 100%
THRU HOLE
LOC N



ORIENTATION
OF ALL FLAWS



1 0.052 x .003 IN STD. ≤ .75 DIA
0.067 x .003 IN STD. > .75 DIA

MATERIAL INCONEL 600

AVERAGE MEAS WALL THK .051

NOMINAL WALL THK .049

HEAT LOT NO 752493

TEST FREQ USED NA

SERIAL NO Z-15587

P.O. NO 51148

REL NO NA

QUALITY REL NO NA

DATE MFG 12-16-96

O.A. INSP Handwritten signature

CUSTOMER Rock Ridge Technologies

RECORDED NA

PROBE USED NA

REVIEWED BY Charlotte Better

SHOWS 100%
AXIAL FLAW
LOC B

SHOWS 60% ID
CIRC FLAW
LOC D

SHOWS 60% OD
AXIAL FLAW
LOC F

SHOWS 40% ID
CIRC FLAW
LOC H

SHOWS 40% OD
AXIAL FLAW
LOC J

SHOWS 20% ID
CIRC FLAW
LOC L



LOC A
SHOWS 100%
THRU HOLE



LOC C
SHOWS 100%
CIRC FLAW



LOC E
SHOWS 60% ID
AXIAL FLAW



LOC G
SHOWS 60% OD
CIRC FLAW



LOC I
SHOWS 40% ID
AXIAL FLAW



LOC K
SHOWS 40% OD
CIRC FLAW



LOC M
SHOWS 20% ID
AXIAL FLAW

NOTE

3/4" (STOCK) TUBING

UNLESS OTHERWISE SPECIFIED

DIM ARE IN INCHES

TOLERANCES

DECIMAL : FRACT 1/16

XXXX : .003

XXX : .015

XX : .050

X : .003

ANGULAR .3°

FINISH

DIST 000

DRAWN

K ZEGKE

CHECK

2.0R

DESIGN

Handwritten signature

APVD OA

Handwritten signature

DATE

12/03/96

12/11/96

12/16/96

12/10/96

ZETEC

INC

POST OFFICE BOX 112 ISSAQUAH WASHINGTON

98287-0100 U.S.A. TELEPHONE (206) 782-5316

TITLE

G.T. CALIBRATION STANDARD

D04040-1-A P03435

SIMILAR

DWG NO

2-415-1059

SCALE

NTS

USED

2-415-0016

SHT

1 OF 3

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 ±.002 WIDE X .500 LONG

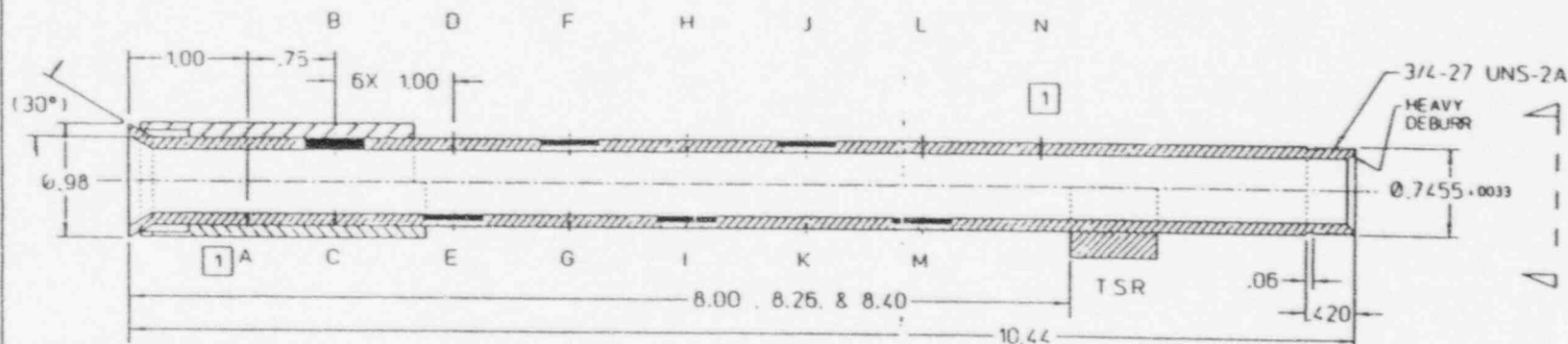
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3	2							
		SHEET						

LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N
PHYSICALLY MEAS DEPTH	THRU	THRU	THRU	.0290	.0300	.0295	.0305	.0190	.0200	.0200	.0205	.0100	.0105	THRU
DEPTH IN % OF WALL	100%	100%	100%	57%	59%	58%	60%	37%	39%	39%	40%	20%	21%	100%

SHOWS 100%
THRU HOLE
LOC N



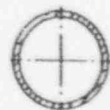
ORIENTATION
OF ALL FLAWS



1 0.052 ± .003 IN STD. ≤ .75 DIA
0.067 ± .003 IN STD. > .75 DIA

MATERIAL INCONEL 600
AVERAGE MEAS WALL THK .051
NOMINAL WALL THK .049
HEAT LOT NO 752493
TEST FREQ USED NA
SERIAL NO Z-15588
P.O. NO 51145
REL NO NA
QUALITY REL NO NA
DATE MFG 12-16-96
O.A. INSP [Signature]
CUSTOMER ROCKRIDGE TECHNOLOGIES
RECORDED NA
PROBE USED NA
REVIEWED BY Charlotte Better

SHOWS 100%
AXIAL FLAW
LOC B



LOC A
SHOWS 100%
THRU HOLE



LOC C
SHOWS 100%
CIRC FLAW

SHOWS 60% ID
CIRC FLAW
LOC D



LOC E
SHOWS 60% ID
AXIAL FLAW

SHOWS 60% OD
AXIAL FLAW
LOC F



LOC G
SHOWS 60% OD
CIRC FLAW

SHOWS 40% ID
CIRC FLAW
LOC H



LOC I
SHOWS 40% ID
AXIAL FLAW

SHOWS 40% OD
AXIAL FLAW
LOC J



LOC K
SHOWS 40% OD
CIRC FLAW

SHOWS 20% ID
CIRC FLAW
LOC L



LOC M
SHOWS 20% ID
AXIAL FLAW

NOTE

3/4" (STICK) TUBING

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

DIST 000

DRAWN
K ZEGKE
CHECK
DESIGN
APVD DA
B. [Signature]

DATE
12/03/96
12/14/96
12/16/96
12/10/96

ZETEC
INC

POST OFFICE BOX 148 ISSAQUAH WASH 98267-0148
TELEPHONE (206) 362-5336

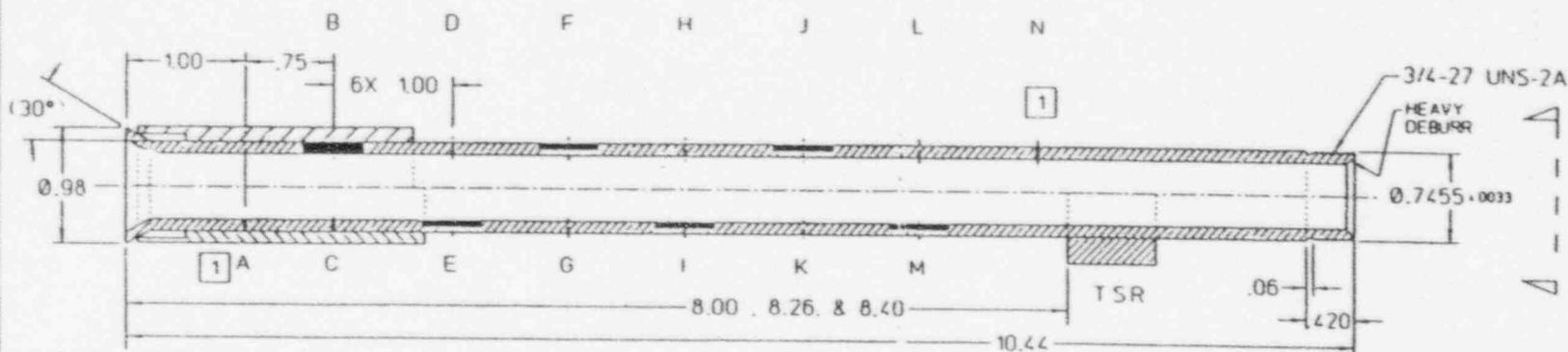
TITLE
G.T. CALIBRATION STANDARD
D=4040-1-A P=3435
DWG NO
2-415-1059
SCALE NTS
2-415-0015
SHEET 1 OF 3

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 ±.002 WIDE X .500 LONG

		REVISIONS	REV STATUS OF SHEETS	REVISIONS				
				LTR	DATE	DESCRIPTION	APVD	CK
3	2	SHEET						

LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N
PHYSICALLY MEAS DEPTH	THRU	THRU	THRU	.0210	.0215	.0305	.0210	.0195	.0195	.0205	.0205	.0100	.0105	THRU
DEPTH IN % OF WALL	100%	100%	100%	57%	58%	60%	61%	38%	38%	40%	40%	20%	21%	100%

SHOWS 100%
THRU HOLE
LOC N



1 Ø.052 ±.003 IN STD. ≤ .75 DIA
Ø.067 ±.003 IN STD. > .75 DIA

MATERIAL INCONEL 600
AVERAGE MEAS WALL THK .051
NOMINAL WALL THK .049
HEAT LOT NO 752493
TEST FREQ USED NA
SERIAL NO Z-15589
P.O. NO 51148
REL NO NA
QUALITY REL NO NA
DATE MFG 12-16-96
O.A. INSP Handwritten signature
CUSTOMER Rock Ridge Technologies
RECORDED NA
PROBE USED NA
REVIEWED BY Charlotte Butler

SHOWS 100% AXIAL FLAW LOC B	SHOWS 60% ID CIRC FLAW LOC D	SHOWS 60% OD AXIAL FLAW LOC F	SHOWS 40% ID CIRC FLAW LOC H	SHOWS 40% OD AXIAL FLAW LOC J	SHOWS 20% ID CIRC FLAW LOC L
LOC A SHOWS 100% THRU HOLE	LOC C SHOWS 100% CIRC FLAW	LOC E SHOWS 60% ID AXIAL FLAW	LOC G SHOWS 60% OD CIRC FLAW	LOC I SHOWS 40% ID AXIAL FLAW	LOC K SHOWS 40% OD CIRC FLAW
LOC M SHOWS 20% ID AXIAL FLAW					

NOTE

3/4" Ø (STOCK) TUBING

UNLESS OTHERWISE SPECIFIED DIM ARE IN INCHES TOLERANCES DECIMAL FRACT 1/16 XXXX ± .003 XXX ± .015 XX ± .050 X ± .003 ANGULAR .5° FINISH DIST 000	DRAWN K ZEGKE CHECK ZOR DESIGN HJ APVD OA H. Butler	DATE 12/03/96 12/11/96 12/18/96 12/10/96	ZETEC INC POST OFFICE BOX 110 ISSAQUAH WASH-STATON 98287-0110 USA TELEPHONE (206) 387-5710
TITLE G.T. CALIBRATION STANDARD Dn 4040-1-A Pn 3435		SIMILAR	DWG NO 2-415-1059
SCALE NTS		USED BY 2-415-0016	SHT 1 OF 3

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 ±.002 WIDE X .500 LONG

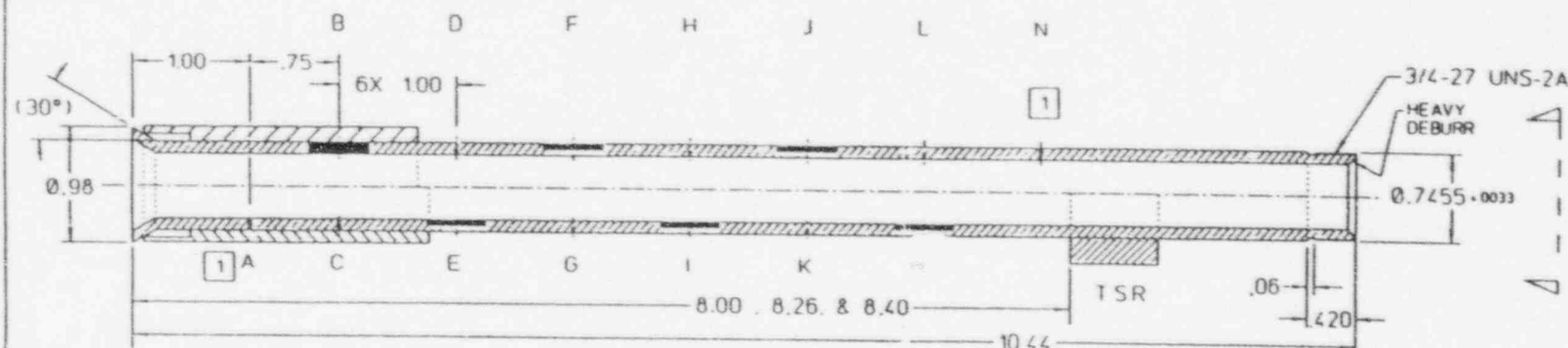
REV. NO.		REV. STATUS		LTR		DATE		DESCRIPTION		APVD	CK	DR
3	2	SHEET	OF SHEETS									

LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N
PHYSICALLY MEAS DEPTH	THRU	THRU	THRU	.0300	.0295	.0310	.0300	.0190	.0200	.0200	.0205	.0095	.0100	THRU
DEPTH IN % OF WALL	100%	100%	100%	59%	58%	63%	59%	37%	39%	39%	40%	19%	20%	100%

SHOWS 100%
THRU HOLE
LOC N



ORIENTATION
OF ALL FLAWS



1 Ø.052 ±.003 IN STD. ≤ .75 DIA
Ø.067 ±.003 IN STD. > .75 DIA

MATERIAL INCONEL 600

AVERAGE MEAS WALL THK .051

NOMINAL WALL THK .049

HEAT LOT NO 752493

TEST FREQ USED NA

SERIAL NO Z-15591

P.O. NO 51145

REL NO NA

QUALITY REL NO NA

DATE MFG 12-16-96

O.A. INSP Handwritten signature

CUSTOMER Rock Ridge Technologies

RECORDED NA

PROBE USED NA

REVIEWED BY Charlotte Better

SHOWS 100%
AXIAL FLAW
LOC B

SHOWS 60% ID
CIRC FLAW
LOC D

SHOWS 60% OD
AXIAL FLAW
LOC F

SHOWS 40% ID
CIRC FLAW
LOC H

SHOWS 40% OD
AXIAL FLAW
LOC J

SHOWS 20% ID
CIRC FLAW
LOC L



LOC A
SHOWS 100%
THRU HOLE



LOC C
SHOWS 100%
CIRC FLAW



LOC E
SHOWS 60% ID
AXIAL FLAW



LOC G
SHOWS 60% OD
CIRC FLAW



LOC I
SHOWS 40% ID
AXIAL FLAW



LOC K
SHOWS 40% OD
CIRC FLAW



LOC M
SHOWS 20% ID
AXIAL FLAW

NOTE

3/4" Ø (STOCK) TUBING
SMALL DENT LOCATED BETWEEN F-G
AND H-I. PROPER FUNCTION OF
STANDARD AND RESPONSE FROM
ADJACENT EDM NOTCHES NOT AFFECTED

ALL OTHERWISE SPECIFIED
DIM ARE IN INCHES
TOLERANCES
DECIMAL FRACT ±1/16
XXXX ±.003
XXX ±.015
XX ±.050
X ±.003
ANGULAR .3°
FINISH DIST 000

DRAWN
K ZEGKE
CHECK
ZOR
DESIGN
PJD
APVD OA
H. Altun

DATE
12/03/96
12/11/96
12/10/96

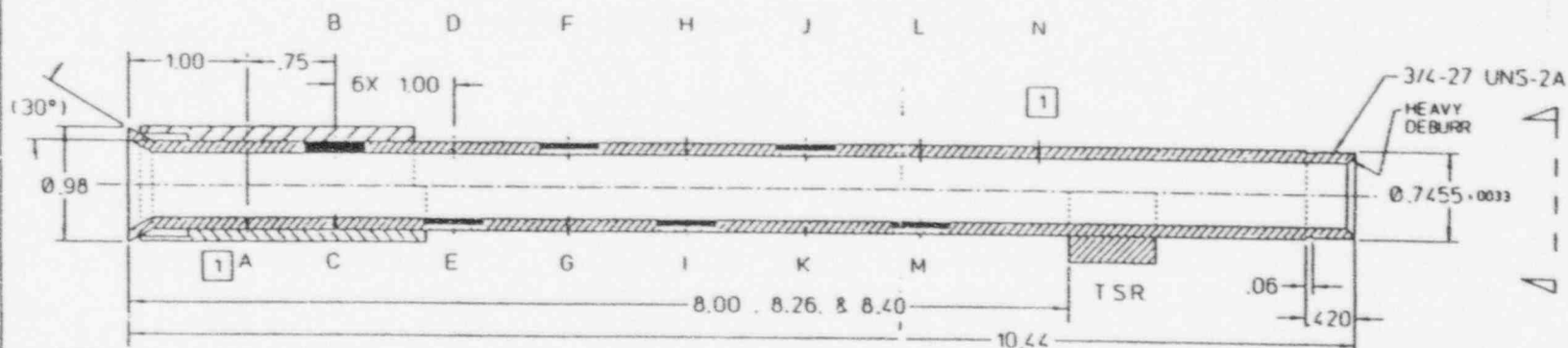
ZETEC INC.
POST OFFICE BOX 100 MISSAUL, MONTANA 59807-0100 TELEPHONE (406) 382-5336
TITLE
G.T. CALIBRATION STANDARD
Dwg No 2-415-1059
SCALE NTS
1 OF 3

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 ± .002 WIDE X .500 LONG

REVISIONS			REV STATUS OF SHEETS	LTR	DATE	REVISIONS DESCRIPTION	APVD	CK	DR
3	2	SHEET							

LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M	N
PHYSICALLY MEAS DEPTH	THRU	THRU	THRU	.0305	.0275	.0300	.0295	.0305	.0195	.0200	.0200	.0085	.0100	THRU
DEPTH IN % OF WALL	100%	100%	100%	60%	58%	59%	58%	40%	38%	39%	39%	17%	20%	100%

SHOWS 100%
THRU HOLE
LOC N



1 0.052 ± .003 IN STD. ≤ .75 DIA
0.067 ± .003 IN STD. > .75 DIA

MATERIAL INCONEL 600
AVERAGE MEAS WALL THK .051
NOMINAL WALL THK .049
HEAT LOT NO 752493
TEST FREQ USED NA
SERIAL NO Z-15592
PO NO 51148
REL NO NA
QUALITY REL NO NA

DATE MFG 12-16-96
O A INSP [Signature]
CUSTOMER ROCKRIDGE TECHNOLOGIES
RECORDED NA
PROBE USED NA
REVIEWED BY Charlotte Bitter

SHOWS 100% AXIAL FLAW LOC B	SHOWS 60% ID CIRC FLAW LOC D	SHOWS 60% OD AXIAL FLAW LOC F	SHOWS 40% ID CIRC FLAW LOC H	SHOWS 40% OD AXIAL FLAW LOC J	SHOWS 20% ID CIRC FLAW LOC L
LOC A SHOWS 100% THRU HOLE	LOC C SHOWS 100% CIRC FLAW	LOC E SHOWS 60% ID AXIAL FLAW	LOC G SHOWS 60% OD CIRC FLAW	LOC I SHOWS 40% ID AXIAL FLAW	LOC K SHOWS 40% OD CIRC FLAW
LOC M SHOWS 20% ID AXIAL FLAW					

NOTE

3/4" (STICK) TUBING

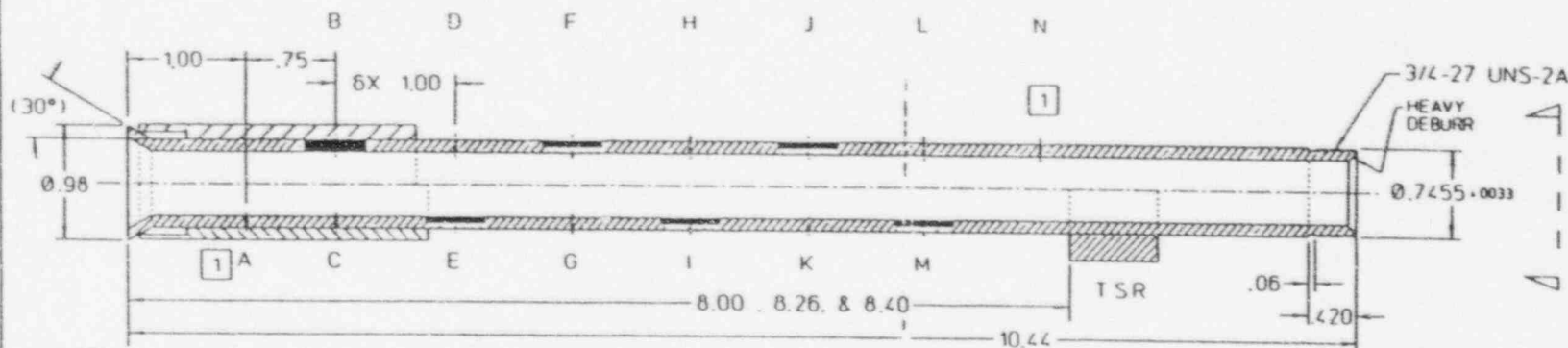
OTHERWISE SPECIFIED		DRAWN	DATE	ZETEC INC. POST OFFICE BOX 140150 DALLAS, TEXAS 75240-0150 TELEPHONE (214) 381-5316
DIM ARE IN INCHES		K ZEGKE	12/03/96	
TOLERANCES		CHECK		
DECIMAL : FRACT : 1/16		ZOR	12/10/96	
XXXX ± .003		DESIGN	12/10/96	
XXX ± .015				TITLE
XX ± .050				G.T. CALIBRATION STANDARD
X ± .003		APVD OA		D=4040-1-A P=3435
ANGULAR .3°		B. [Signature]	12/10/96	SIMILAR
FINISH				DWG NO
DIST 000				2-415-1059
				SCALE NTS
				USED IN 2-415-0016 SHT 1 OF 3

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 ± .002 WIDE X .500 LONG

REVISED		REV STATUS		REVISIONS		REVISIONS		
LTR	DATE	DESCRIPTION	APVD	CK	DR			
3	2	SHEET						

LOCATION A B C D E F G H I J K L M N
PHYSICALLY MEAS DEPTH THRU THRU THRU .0305 .0310 .0310 .0305 .0300 .0200 .0210 .0200 .0095 .0100 THRU
DEPTH IN % OF WALL 100% 100% 100% 60% 61% 61% 60% 39% 39% 41% 39% 19% 20% 100%

SHOWS 100%
THRU HOLE
LOC N



ORIENTATION
OF ALL FLAWS

1 0.052 ± .003 IN STD. ≤ .75 DIA
0.067 ± .003 IN STD. > .75 DIA

MATERIAL INCONEL 600
AVERAGE MEAS WALL THK .051
NOMINAL WALL THK .049
HEAT LOT NO 752493
TEST FREQ USED NA
SERIAL NO Z-15593
P.O. NO 51148
REL NO NA

SHOWS 100%
AXIAL FLAW
LOC B



LOC A
SHOWS 100%
THRU HOLE



LOC C
SHOWS 100%
CIRC FLAW

SHOWS 60% ID
CIRC FLAW
LOC D



LOC E
SHOWS 60% ID
AXIAL FLAW

SHOWS 60% OD
AXIAL FLAW
LOC F



LOC G
SHOWS 60% OD
CIRC FLAW

SHOWS 40% ID
CIRC FLAW
LOC H



LOC I
SHOWS 40% ID
AXIAL FLAW

SHOWS 40% OD
AXIAL FLAW
LOC J



LOC K
SHOWS 40% OD
CIRC FLAW

SHOWS 20% ID
CIRC FLAW
LOC L



LOC M
SHOWS 20% ID
AXIAL FLAW

NOTE:

3/4" (STOCK) TUBING

ALL OTHERWISE SPECIFIED
DIM ARE IN INCHES
TOLERANCES
DECIMAL : FRACT : 1/16
XXXX ± .003
XXX ± .015
XX ± .050
X ± .003
ANGULAR : 3°
FINISH : DIST 000

DRAWN
K ZEGKE
CHECK
DESIGN
APVD OA
12/10/96

DATE
12/03/96
ZETEC INC
TITLE
G.T. CALIBRATION STANDARD
D=4040-1-A P=3435
DWG NO
2-415-1059
SCALE NTS
12/10/96
1 OF 3

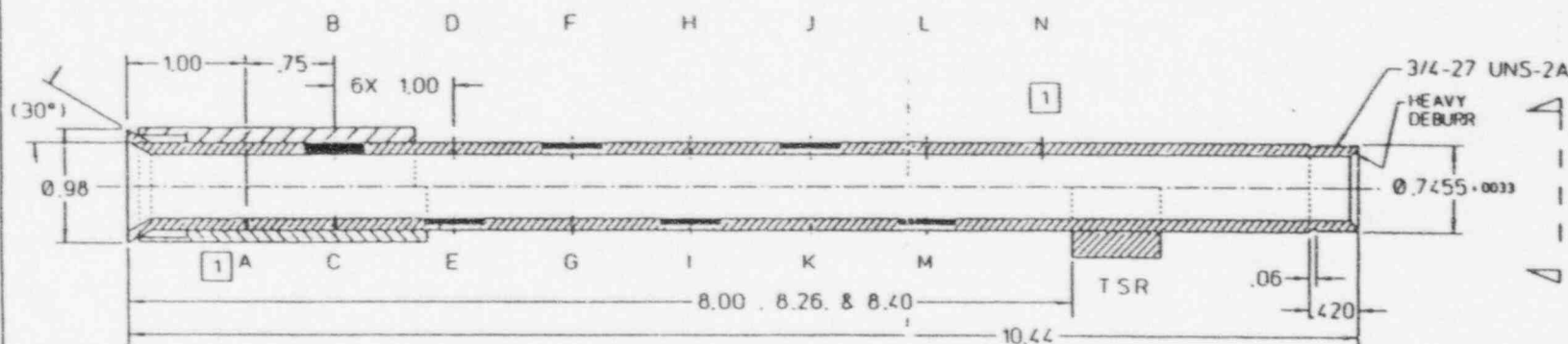
QUALITY REL NO NA
DATE MFG 12-16-96
QA INSP Handwritten signature
CUSTOMER ROCKRIDGE TECHNOLOGIES
RECORDED NA
PROBE USED NA
REVIEWED BY Charlotte Rutter

ALL AXIAL AND CIRC. FLAWS
ARE EDM .005 +.002 WIDE X .500 LONG

REVISED		REV STATUS		LTR		DATE		REVISIONS		DESCRIPTION		APVD	CK	DR
3	2	SHEET	OF SHEETS											

LOCATION A B C D E F G H I J K L M N
PHYSICALLY MEAS DEPTH THRU THRU THRU .0300 .0295 .0310 .0305 .0200 .0205 .0210 .0205 .0105 .0105 THRU
DEPTH IN % OF WALL 100% 100% 100% 59% 58% 61% 60% 39% 40% 41% 40% 21% 21% 100%

SHOWS 100%
THRU HOLE
LOC N



1 0.052+.003 IN STD. ≤ .75 DIA
0.067+.003 IN STD. > .75 DIA

MATERIAL INCONEL 600
AVERAGE MEAS WALL THK .051
NOMINAL WALL THK .049
HEAT LOT NO 752493
TEST FREO USED NA
SERIAL NO Z-15594
P.O. NO 51145
REL NO NA

QUALITY REL NO NA
DATE MFG 12-16-96
O.A. INSP [Signature]

CUSTOMER ROCKWELL TECHNOLOGIES

RECORDED NA

PROBE USED NA

REVIEWED BY Charlotte Beller

SHOWS 100%
AXIAL FLAW
LOC B



LOC A
SHOWS 100%
THRU HOLE

SHOWS 100%
CIRC FLAW
LOC C



LOC C
SHOWS 100%
CIRC FLAW

SHOWS 60% ID
CIRC FLAW
LOC D



LOC D
SHOWS 60% ID
AXIAL FLAW

SHOWS 60% OD
AXIAL FLAW
LOC E



LOC E
SHOWS 60% OD
CIRC FLAW

SHOWS 40% ID
CIRC FLAW
LOC F



LOC F
SHOWS 40% ID
AXIAL FLAW

SHOWS 40% OD
AXIAL FLAW
LOC G



LOC G
SHOWS 40% OD
CIRC FLAW

SHOWS 20% ID
CIRC FLAW
LOC H



LOC H
SHOWS 20% ID
AXIAL FLAW

NOTE

3/4" (STOCK) TUBING

UNLESS OTHERWISE SPECIFIED

DIM ARE IN INCHES
TOLERANCES

DECIMAL FRACT .1/16

XXXX + .003

XXX + .015

XX + .050

X + .003

ANGULAR .3°

FINISH

DIST 000

DRAWN

K ZEGKE

CHECK

ZOR

DESIGN

PD

APVD OA

B. Altun

DATE

12/03/96

CHECK

12/11/96

DESIGN

12/10/96

APVD OA

B. Altun

ZETEC INC

POST OFFICE BOX 105401 WASHINGTON
00027-0400 USA TELEPHONE (202) 392-5310

TITLE

G.T. CALIBRATION STANDARD

DWG NO 04040-1-A P435

SIMILAR

DWG NO

2-415-1059

SCALE NTS

USED

2-415-0016

SHT

1 OF 3