



GE Nuclear Energy

GERIS 2000 Examination
Summary Sheet

Project: TVA, Browns Ferry Nuclear Plant, Unit 3

System: Reactor Pressure Vessel

Weld ID: V-3-A

ASME Code Category: B-A

Calibration Sheets: C-004, C-115, C-116 and C-117

Supporting Data: Examination Data Sheets E-09-00 thru E-09-03, Indication Data Sheets 09-001 thru 09-004, Sheets, Screen Prints, Exam Patch Location Map, Exam Coverage Plots, GERIS 2000 Setup Records and Manual Examination Data Sheets D-030, D-031, D-038 and D-042.

Examination Summary

The ultrasonic examination of weld V-3-A resulted in no recorded indications that exceed the allowable standards of IWB-3500, ASME Section XI, 1986 Edition, No Addenda.

The ASME Section XI required examination volume was examined with the GERIS 2000 System from the RPV inside surface utilizing Procedure No. GE-UT-700, Rev. 2. This examination was limited due to the feedwater sparger and core spray downcomer. Areas that could not be examined using the GERIS 2000 and accessible from the outside surface were examined by the manual technique utilizing Procedure No. GE-UT-300, Rev. 6, FRR-004. The total examination coverage was calculated to be 99%.

The GERIS 2000 utilizes an array of search units arranged to effectively examine the weld and adjacent base material parallel and perpendicular to the weld axis in two directions. The transducer package consisted of 0° longitudinal, 45° and 60° shear wave, and 70° refracted longitudinal (RL) wave search units.

The GERIS 2000 recorded indications with the 70°RL and 45° shear wave scans that were evaluated and found to be acceptable per the referencing Code section.

The manual technique utilized 0° longitudinal, 45° and 60° shear wave search units both parallel and perpendicular to the weld axis in two directions to effectively examine the weld and adjacent base material.

No indications were recorded with the manual technique.

Fabrication records and previous examination results were reviewed prior to the completion of this examination summary.

GERIS Analyst: *Ch M*

GE Reviewer: *Deena Kimball*

LEVEL: *III* DATE: *12/15/93*

LEVEL: *III* DATE: *12-15-93*

UTILITY Review: *J. J. Woody*

ANII Review:

TITLE: *III* DATE: *1/26/94*

TITLE: *Albert Ladd* DATE: *9/8/94*



GERIS 2000 Examination Data Sheet

Cal. ID: C-004

Ind. Data Sheet Series: 09-XXX

[illegible]

Comments: N/A

Indication Codes: 1 = Flaw, 2 = OD Surface, 3 = OD Attachment, 4 = Nozzle, 5 = Other

Level: III Date: 12/12/93

Level: II Date: 12/13/93



GERIS 2000 Examination Data Sheet

Ind. Data Sheet Series: 09-XXX

[illegible]

Comments: N/A

Indication Codes: 1 = Flaw, 2 = OD Surface, 3 = OD Attachment, 4 = Nozzle, 5 = Other

Analyst: Q M5

Level: III Date: 12/12/93

Reviewed By: [Signature]

Level: II Date: 12/13/93



GERIS 2000 Examination Data Sheet



GERIS 2000 Indication Data Sheet

Ind. Data Sheet No.: 09-001

Direction: 0

00074

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GE Nuclear Energy

GERIS 2000 Indication Data Sheet

Project: TVA, Browns Ferry, Unit 3

Weld ID: V-3-A

Cal. ID: C-004

Exam Data Sheet No.: E-09-02**Patch ID:** BF-053**Ind. Data Sheet No.: 09-002**

Indication: 09-002

Channel: 3

Angle: 70

Direction: 0

[illegible]

Comments: No apparent tip signals.

Indication has no determinable thruwall dimension and is acceptable to IWB-3510-1.

Analyst: CS/MJS

Level: III Date: 12/14/93

Reviewed By: R. D. Fournan

Level: II Date: 12-16-93

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GE Nuclear Energy

GERIS 2000 Indication Data Sheet

Project: TVA, Browns Ferry, Unit 3

Weld ID: V-3-A

Cal. ID: C-004

Exam Data Sheet No.: E-09-02**Patch ID:** BF-053

Ind. Data Sheet No.: 09-003

Indication: 09-003

Channel: 7

Angle: 45

Direction: 0

[illegible]

Comments: No apparent tip signals.

Thruwall determined by the Reg. Guide 20% beam spread corrected method.

Indication has no determinable thruwall dimension and is acceptable to IWB-3510-1.

$$\text{TW} = 0$$
$$L = 0.5$$

S = 1.41

Analyst:

Analyst: CS M

Reviewed By:

Reviewed By: John C. Reed

Level:

Level: IV Date: 12/12/93

Level: VI

Date: 12/13/93



GE Nuclear Energy

GERIS 2000 Indication Data Sheet

Project: TVA, Browns Ferry, Unit 3

Weld ID: V-3-A

Cal. ID: C-004

Exam Data Sheet No.: E-09-02**Patch ID:** BF-051R**Ind. Data Sheet No.: 09-004**

Indication: 09-004

Channel: 5

Angle: 70

Direction: 180

[illegible]

Comments: No apparent tip signals.

Indication has no determinable thruwall dimension and is acceptable to IWB-3510-1.

Analyst:

Analyst: CG M

Level:

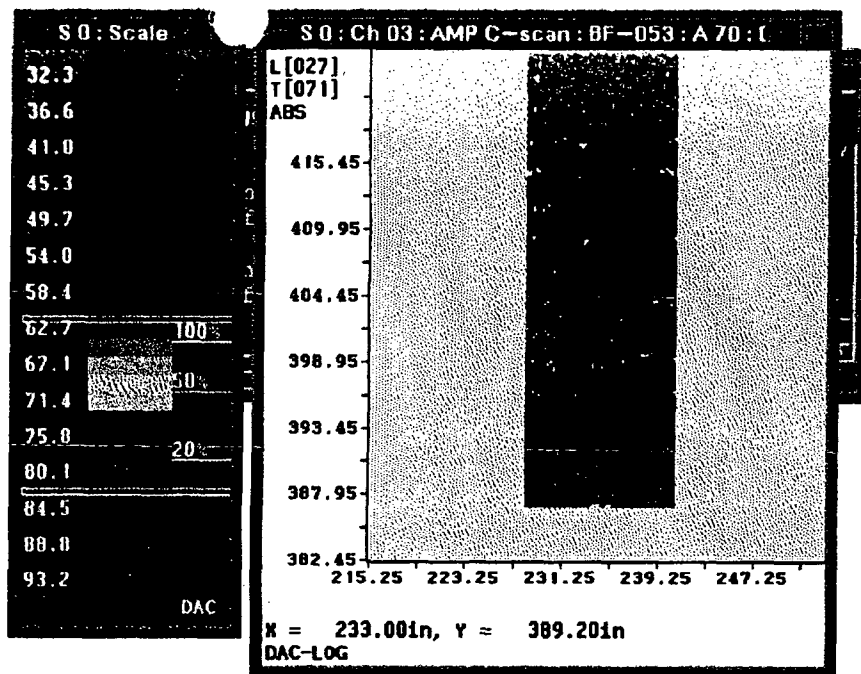
Level: III Date: 12/12/93

Reviewed By:

Reviewed By: Joe C. Durr

Level:

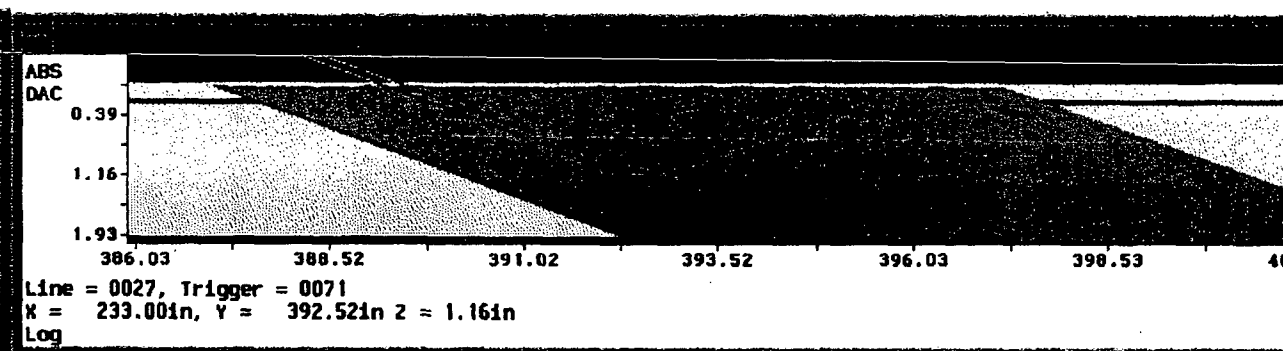
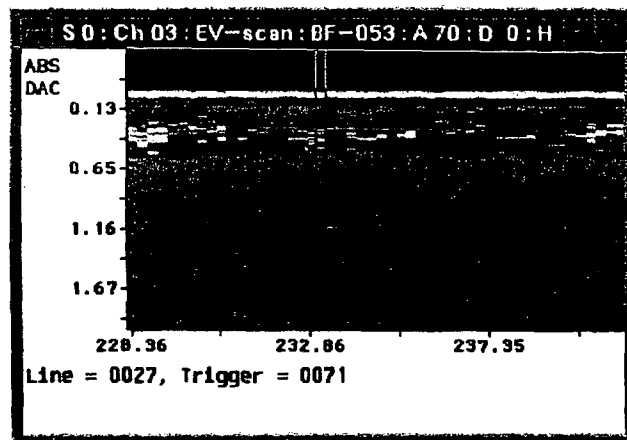
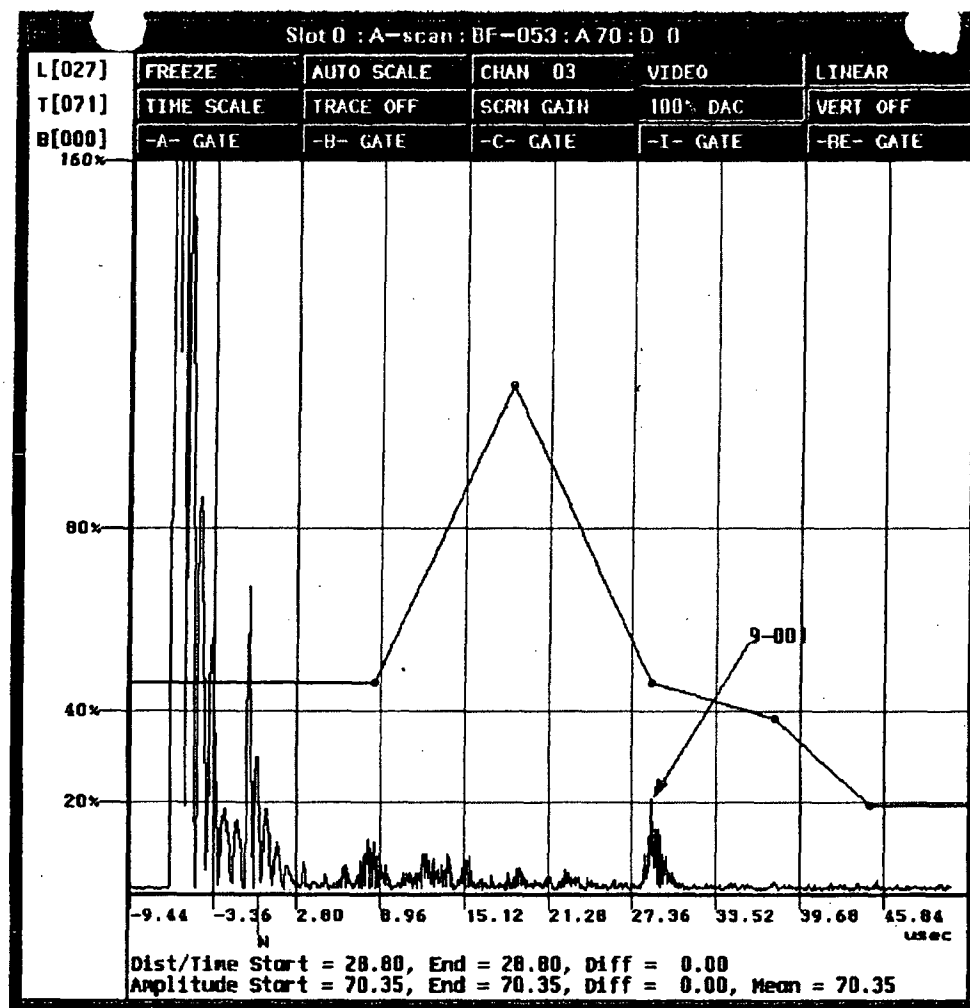
Level: III Date: 12/13/93



Top Terminal
on 3/9-001

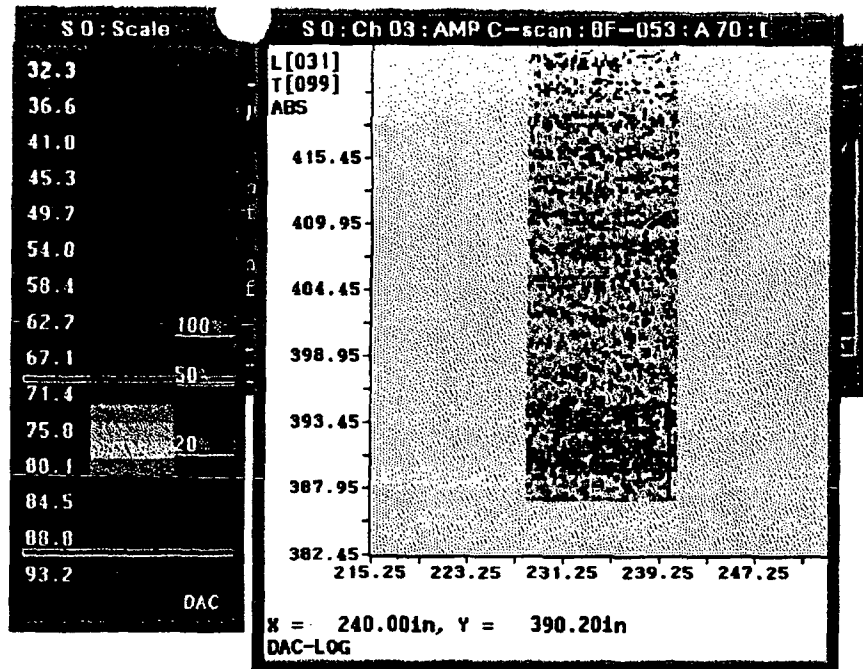
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00078

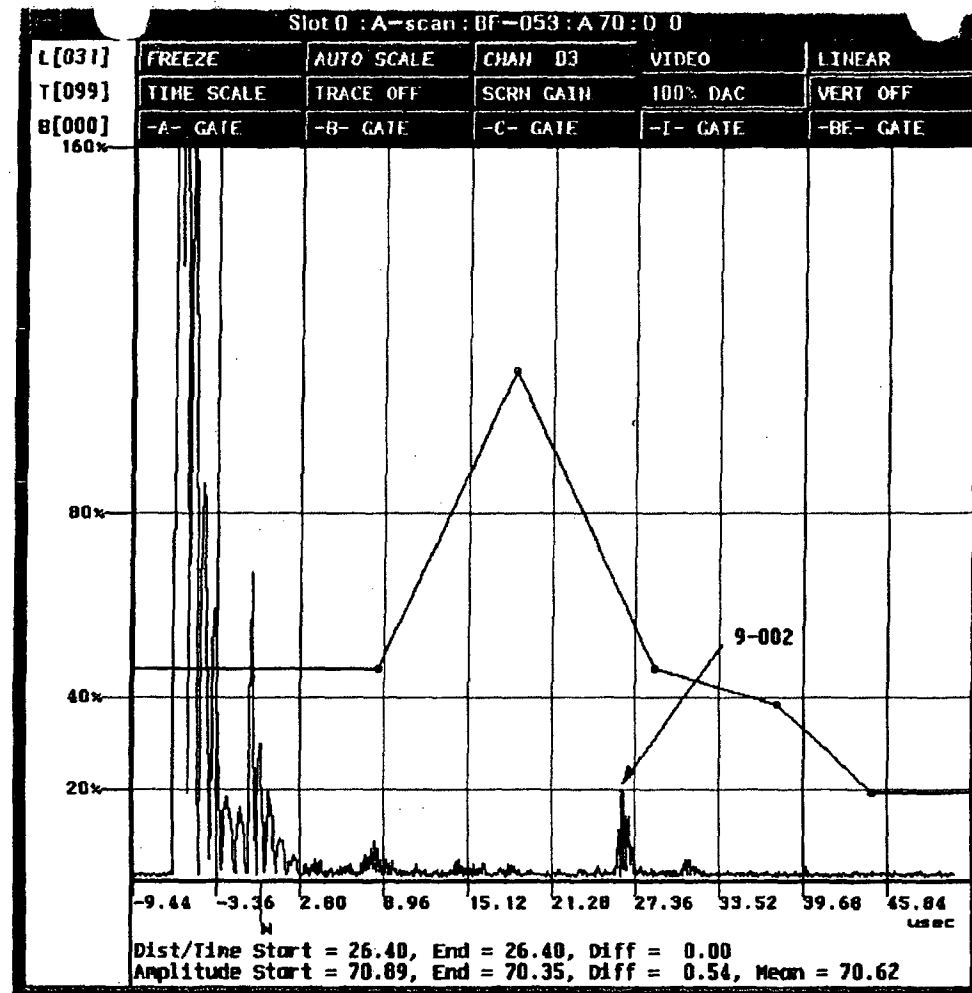


10 OF 21

R1163

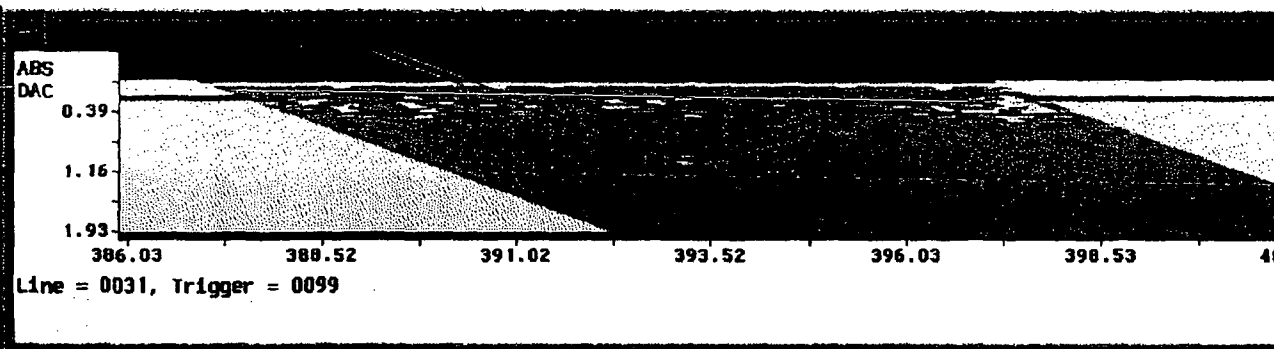
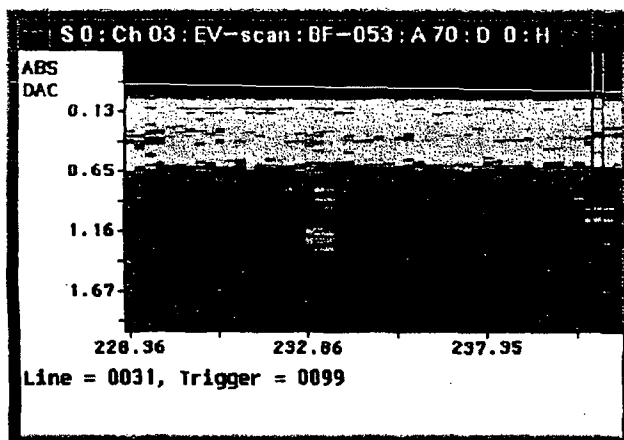


Top Terminal
03/8-002



0000 0073

00079



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R1163

32.3	
36.6	
41.0	100%
45.3	
49.7	50%
54.0	
58.4	20%
62.7	
67.1	
71.4	
75.8	
80.1	
84.5	
88.8	
93.2	

DAC

**L [045]
T [088]
ABS**

X = 240.10in, Y = 391.50in
DAC-LOG

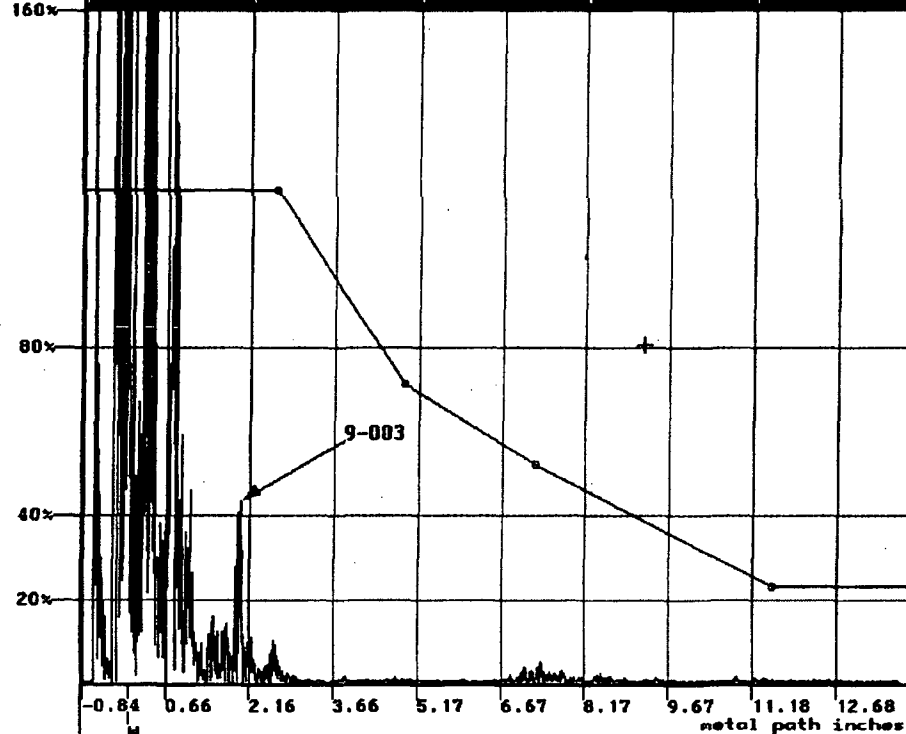
Top Terminal

03

Line = 0045, Trigger = 0088

L[045]
T[088]
B[000]
160x

FREEZE	AUTO SCALE	CHAN 07	VIDEO	LINEAR
TIME SCALE	TRACE OFF	SCRN GAIN	100% DAC	VERT OFF
-A- GATE	-B- GATE	-C- GATE	-I- GATE	-BE- GATE



Dist/Time Start = 2.00, End = 2.00, Diff = 0.00
Amplitude Start = 51.87, End = 51.87, Diff = 0.00, Mean = 51.87

Line = 0045, Trigger = 0008
X = 240.10in, Y = 393.04in Z = 1.34in

120721 00080

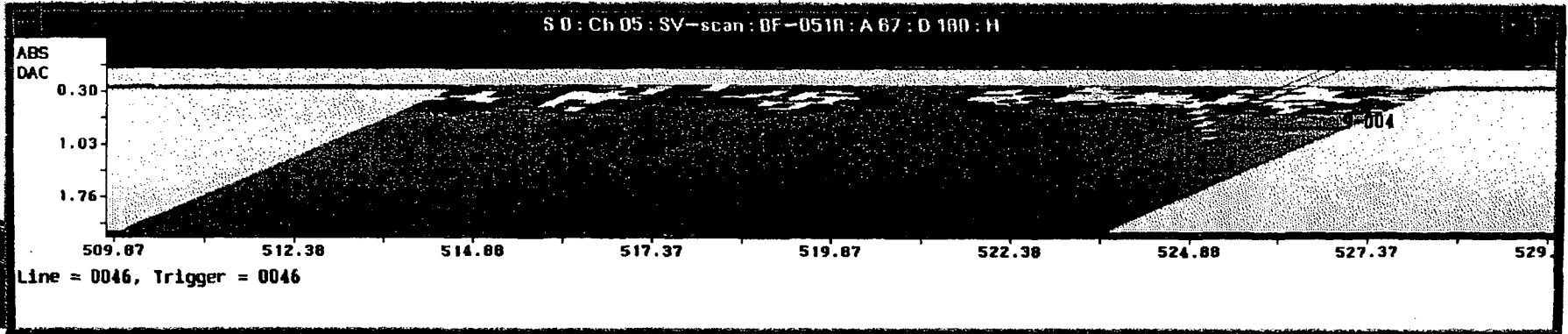
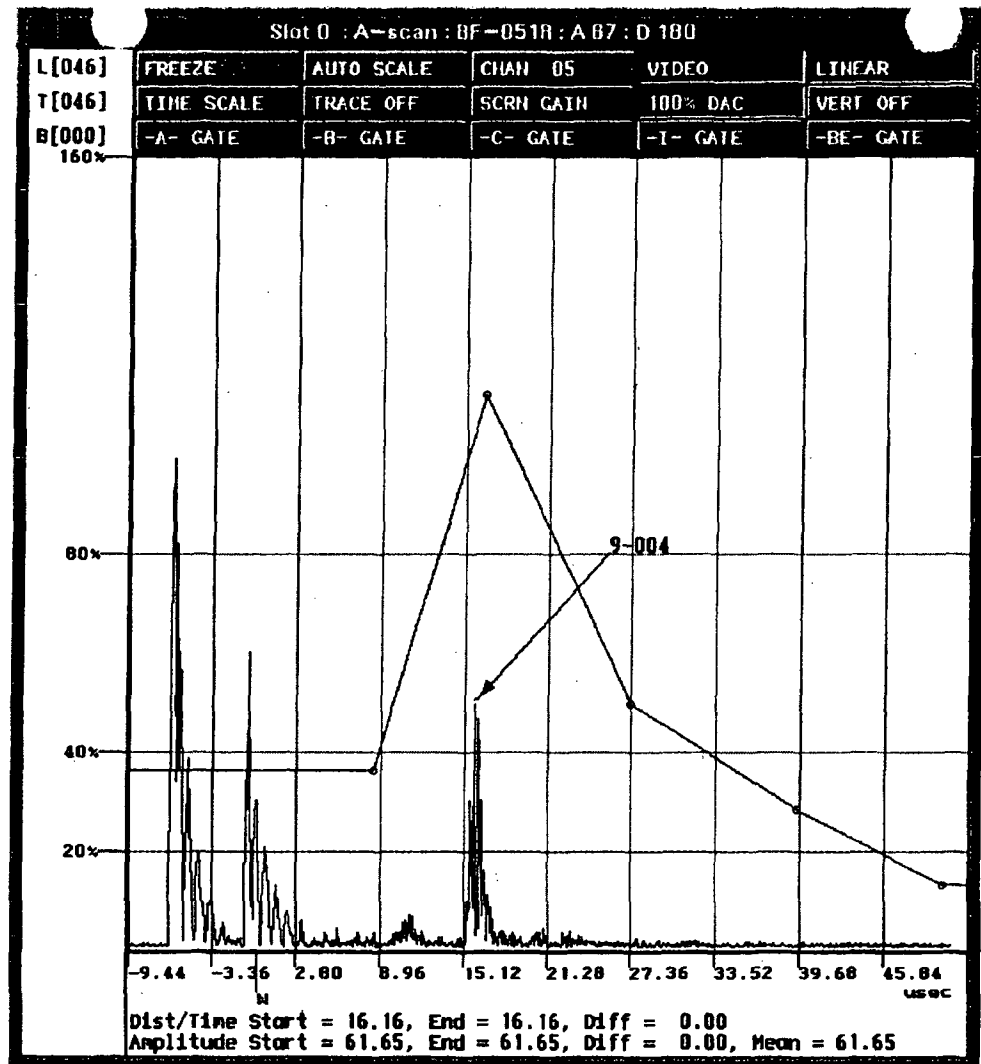
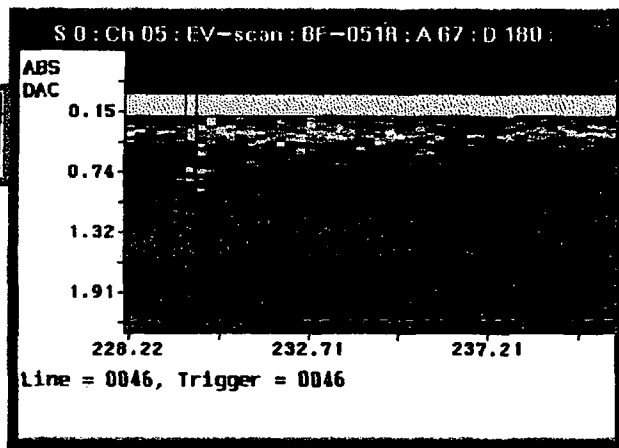
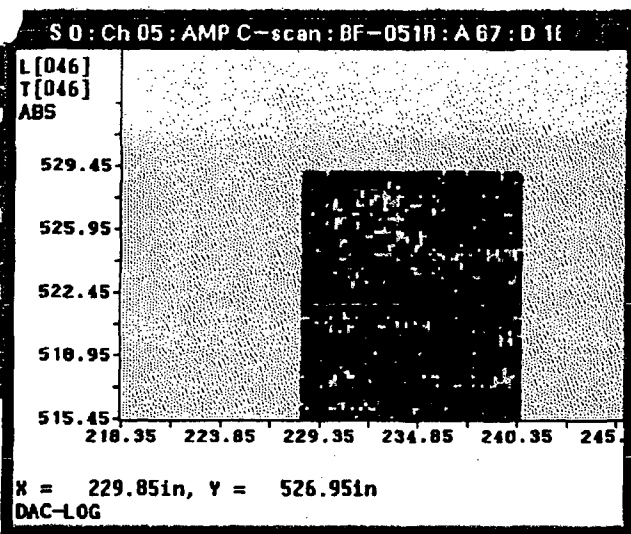
五二六

S 0 : Scale

32.3
36.6
41.0
45.3
49.7
54.0
58.4
62.7
67.1
71.4
75.8
80.1
84.5
88.8
93.2

100%
50%
20%

DAC

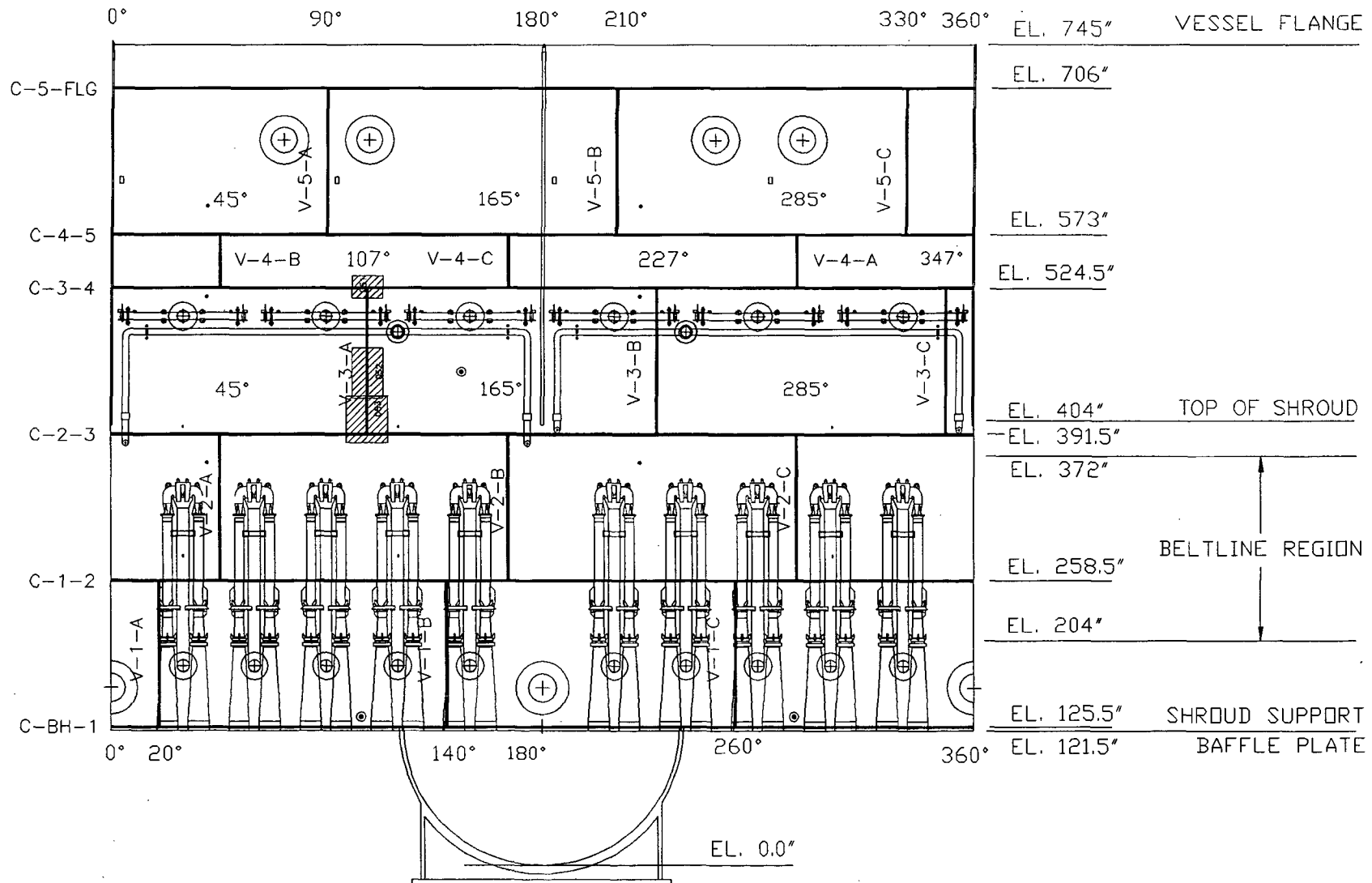


180001

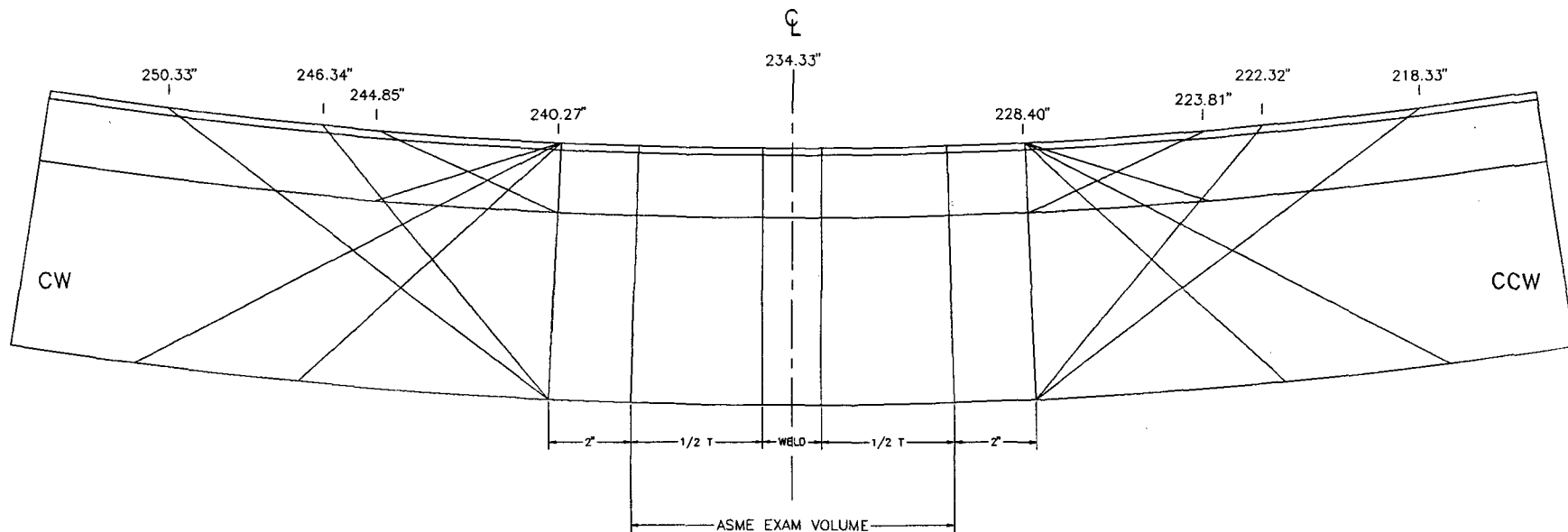
130721

21163

BROWNS FERRY UNIT-3 WELD LOCATIONS



K1163
150721



Nominal Clad T = 3/16"
Nominal Base Metal T = 6 3/8"
1 Degree = 2.19"

CH.	ANGLE	DIR.	MIN X	MAX X
1	0 W	0	228.40	240.27
2	0 W	90	228.40	240.27
3	70 UP	0	228.40	240.27
4	70 CW	90	223.81	240.27
5	70 DN	180	228.40	240.27
6	70 CCW	270	228.40	244.85
7	45 UP	0	228.40	240.27
8	45 CW	90	222.32	240.27
9	45 DN	180	228.40	240.27
10	45 CCW	270	228.40	246.34
11	60 UP	0	228.40	240.27
12	60 CW	90	218.33	240.27
13	60 DN	180	228.40	240.27
14	60 CCW	270	228.40	250.33
15	0 BM	0	228.40	250.33
16	0 BM	90	218.33	240.27

00083

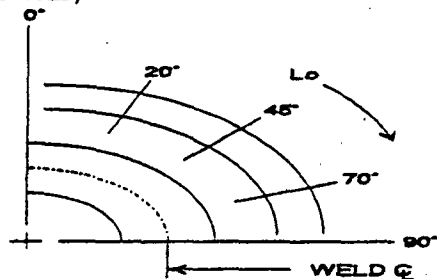
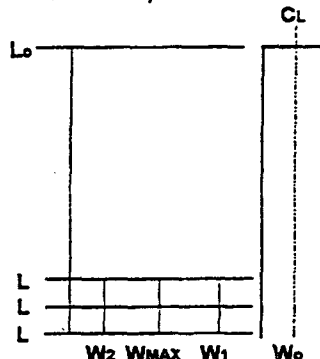
R1163



GE Nuclear Energy

ULTRASONIC EXAMINATION DATA SHEET

(MANUAL RPV VESSEL WELDS)

SITE: BROWNS FERRYPROCEDURE NO.: GE-UT-300REPORT NO.: E-09UNIT: 3REVISION NO.: 6DATA SHEET NO.: D-030PROJECT NO.: 00387FRR NO.: 004CALIBRATION SHEET NO.: 0° C-11545° N/A 60° N/ASYSTEM: RPV EXAM SURFACE TEMP: 73 °F COUPLANT: ULTRAGEL EXAM START: 1112WELD ID: K-3-A THERMOMETER S/N: L0250CL BATCH NO.: 093011 EXAM END: 1117BEAM ANGLE: ☒ 0° ☐ 45° ☐ 60° ☐ OTHER N/ASURFACE CONDITION: ☒ SMOOTH ☐ GROUND ☐ OTHER N/AMATERIAL TYPE: ☒ CS ☐ SS ☐ OTHER N/AEXAM SURFACE: ☐ ID ☒ ODL₀ REFERENCE TOE OF WELD C-3-40° SCAN SENSITIVITY 61 dBW₀ REFERENCE WELD C45° SCAN SENSITIVITY N/A dB60° SCAN SENSITIVITY N/A dBNOZZLE WELD REFERENCE SYSTEM (L₀ AND W₀ ARE INTERCHANGED WHEN SCANNING FOR REFLECTORS TRANSVERSE TO THE WELD)WELD REFERENCE SYSTEM (L₀ AND W₀ ARE INTERCHANGED WHEN SCANNING FOR REFLECTORS TRANSVERSE TO THE WELD)

L/R	% DAC (MAX)	W1 20% DAC	WF1 50% DAC	WM MAX DAC	WF2 50% DAC	W2 20% DAC	MP1 20% DAC	MPF1 50% DAC	MP MAX DAC	MPF2 50% DAC	MP2 20% DAC	CONTINUOUS (C) OR SPOT (S) TRANSVERSE (T) OR PARALLEL (P)	CW/CW TOP OR BOTTOM

REMARKS: EXAMINED FROM AN ELEVATION OF 471.5" TO 524.5" Area below elevation 471.5" was not examined due to the proximity of an insulation ring and non-removable insulation.

Edmund Cator II 11-4-93
EXAMINED BY LEVEL DATE

CE MA 12/1/93
GE REVIEWED BY DATE

J M Wood 12/15/93
UTILITY REVIEW DATE

Albert Hall 9/25/94
ANII REVIEW DATE

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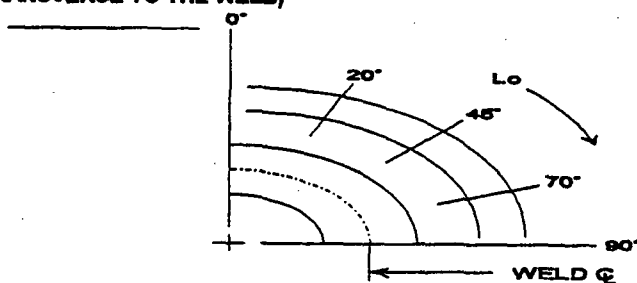
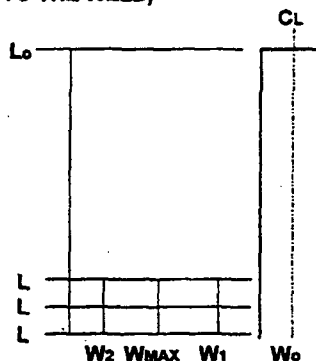
R 1163



GE Nuclear Energy

ULTRASONIC EXAMINATION DATA SHEET

(MANUAL RPV VESSEL WELDS)

SITE: Browns FerryPROCEDURE NO.: GE-UT-300REPORT NO.: E-09UNIT: 3REVISION NO.: 6DATA SHEET NO.: D-031PROJECT NO.: 00387FRR NO.: 004CALIBRATION SHEET NO.: 0° C-11545° N/A 60° N/ASYSTEM: RPV EXAM SURFACE TEMP: 73 °F COUPLANT: Ultrage II EXAM START: 1105WELD ID: V-3-A THERMOMETER S/N: L0250CL BATCH NO.: 093011 EXAM END: 1112BEAM ANGLE: ☒ 0° ☐ 45° ☐ 60° ☐ OTHER N/ASURFACE CONDITION: ☒ SMOOTH ☐ GROUND ☐ OTHER N/AMATERIAL TYPE: ☒ CS ☐ SS ☐ OTHER N/AEXAM SURFACE: ☐ ID ☒ ODL₀ REFERENCE TOP OF WELD C-3-40° SCAN SENSITIVITY 61 dBW₀ REFERENCE WELD E45° SCAN SENSITIVITY N/A dB60° SCAN SENSITIVITY N/A dBNOZZLE WELD REFERENCE SYSTEM (L₀ AND W₀ ARE INTERCHANGED WHEN SCANNING FOR REFLECTORS TRANSVERSE TO THE WELD)WELD REFERENCE SYSTEM (L₀ AND W₀ ARE INTERCHANGED WHEN SCANNING FOR REFLECTORS TRANSVERSE TO THE WELD)

L/R	% DAC (MAX)	W1 20% DAC	WF1 50% DAC	WM MAX DAC	WF2 50% DAC	W2 20% DAC	MP1 20% DAC	MPF1 50% DAC	MP MAX DAC	MPF2 50% DAC	MP2 20% DAC	CONTINUOUS (C) OR SPOT (S) TRANSVERSE (T) OR PARALLEL (P)	CW/CCW TOP OR BOTTOM

A/D RECORDABLE INDICATIONS, BASE METAL EXAM

REMARKS: EXAMINED FROM AN ELEVATION OF 471.5 TO 524.5" Area below elevation 471.5" was not examined due to the proximity of an insulation ring and non-removable insulation.Examined by E. Carter II 11-4-93
LEVEL DATEUTILITY REVIEW John Wood 12/15/93
DATEGE REVIEWED BY CE M5 12/1/93
DATEANII REVIEW Albert Hall 8/25/94
DATEPAGE: 1 OF: 1

FORM UT-14 REV. 8

00085

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(MANUAL RPV VESSEL WELDS)

R1163

SITE: BROWNS FERRY

UNIT: 3

PROJECT NO.: 00387

PROCEDURE NO.: GE-4T-300

REVISION NO.: 6

FRR NO.: 004

REPORT NO.: E-09

DATA SHEET NO.: D-038

CALIBRATION SHEET NO.: 0° N/A

45° C-116 60° N/A

SYSTEM: RIV EXAM SURFACE TEMP: 73 °F COUPLANT: Ultragel IF EXAM START: 1119

WELD ID: V-3-A THERMOMETER S/N: L0250CL BATCH NO.: 093011 EXAM END.: 1128

BEAM ANGLE: ☐ 0° ☒ 45° ☐ 60° ☐ OTHER N/A SURFACE CONDITION: ☒ SMOOTH ☐ GROUND ☐ OTHER N/A

MATERIAL TYPE: ☒ CS ☐ SS ☐ OTHER NIA EXAM SURFACE: ☐ ID ☒ OD

Lo REFERENCE TOE OF C-3-4 WELD

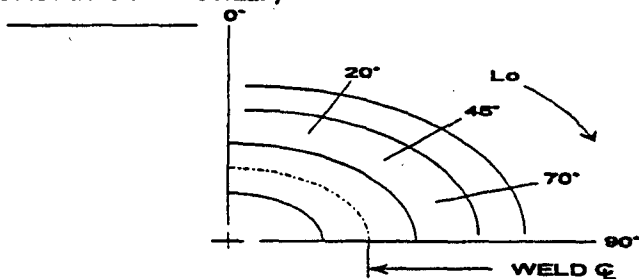
W. REFERENCE Weld G

0° SCAN SENSITIVITY N/A dB

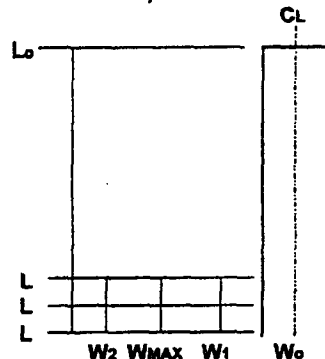
45° SCAN SENSITIVITY 65.6 dB

60° SCAN SENSITIVITY N/A dB

NOZZLE WELD REFERENCE SYSTEM (Lo AND Wo ARE INTERCHANGED WHEN SCANNING FOR REFLECTORS TRANSVERSE TO THE WELD)



WELD REFERENCE SYSTEM (Lo AND Wo ARE INTERCHANGED WHEN SCANNING FOR REFLECTORS TRANSVERSE TO THE WELD)

[illegible]

REMARKS: Examined from an elevation of 471.5" To 524.5" Area Below elevation 471.5 was not examined due to the proximity of a insulation ring and non-removable insulation.

Eam Cator II 11-4-93
EXAMINED BY LEVEL DATE

GE REVIEWED BY CA M5 DATE 12/1/93

Penobscot 12/15/93
WITH MY REVIEW DATE

Albert Todd
ANII REVIEW

8/25/94
DATE

PAGE: 1 OF: 1

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GE Nuclear Energy

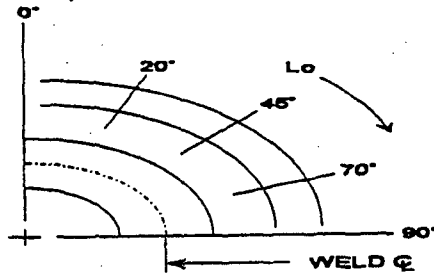
ULTRASONIC EXAMINATION DATA SHEET

(MANUAL RPV VESSEL WELDS)

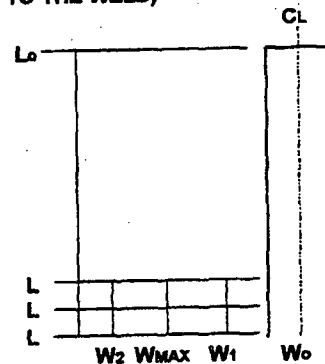
R 1163

SITE: Browns FerryPROCEDURE NO.: GE-UT-300REPORT NO.: E-09UNIT: 3REVISION NO.: 6DATA SHEET NO.: D-042PROJECT NO.: 00382FRR NO.: 004CALIBRATION SHEET NO.: 0° N/A45° N/A 60° C-117SYSTEM: RPV EXAM SURFACE TEMP: 73 °F COUPLANT: Ultracel II EXAM START: 1130WELD ID: V-3-A THERMOMETER S/N: L0250CL BATCH NO.: 093011 EXAM END: 1138BEAM ANGLE: ☐ 0° ☐ 45° ☒ 60° ☐ OTHER N/ASURFACE CONDITION: ☒ SMOOTH ☐ GROUND ☐ OTHER N/AMATERIAL TYPE: ☒ CS ☐ SS ☐ OTHER N/AEXAM SURFACE: ☐ ID ☒ ODLo REFERENCE TDE OF C-3-4 WELD0° SCAN SENSITIVITY N/A dBWo REFERENCE WELD 645° SCAN SENSITIVITY N/A dB60° SCAN SENSITIVITY 73 dB

NOZZLE WELD REFERENCE SYSTEM (Lo AND Wo ARE INTERCHANGED WHEN SCANNING FOR REFLECTORS TRANSVERSE TO THE WELD)



WELD REFERENCE SYSTEM (Lo AND Wo ARE INTERCHANGED WHEN SCANNING FOR REFLECTORS TRANSVERSE TO THE WELD)



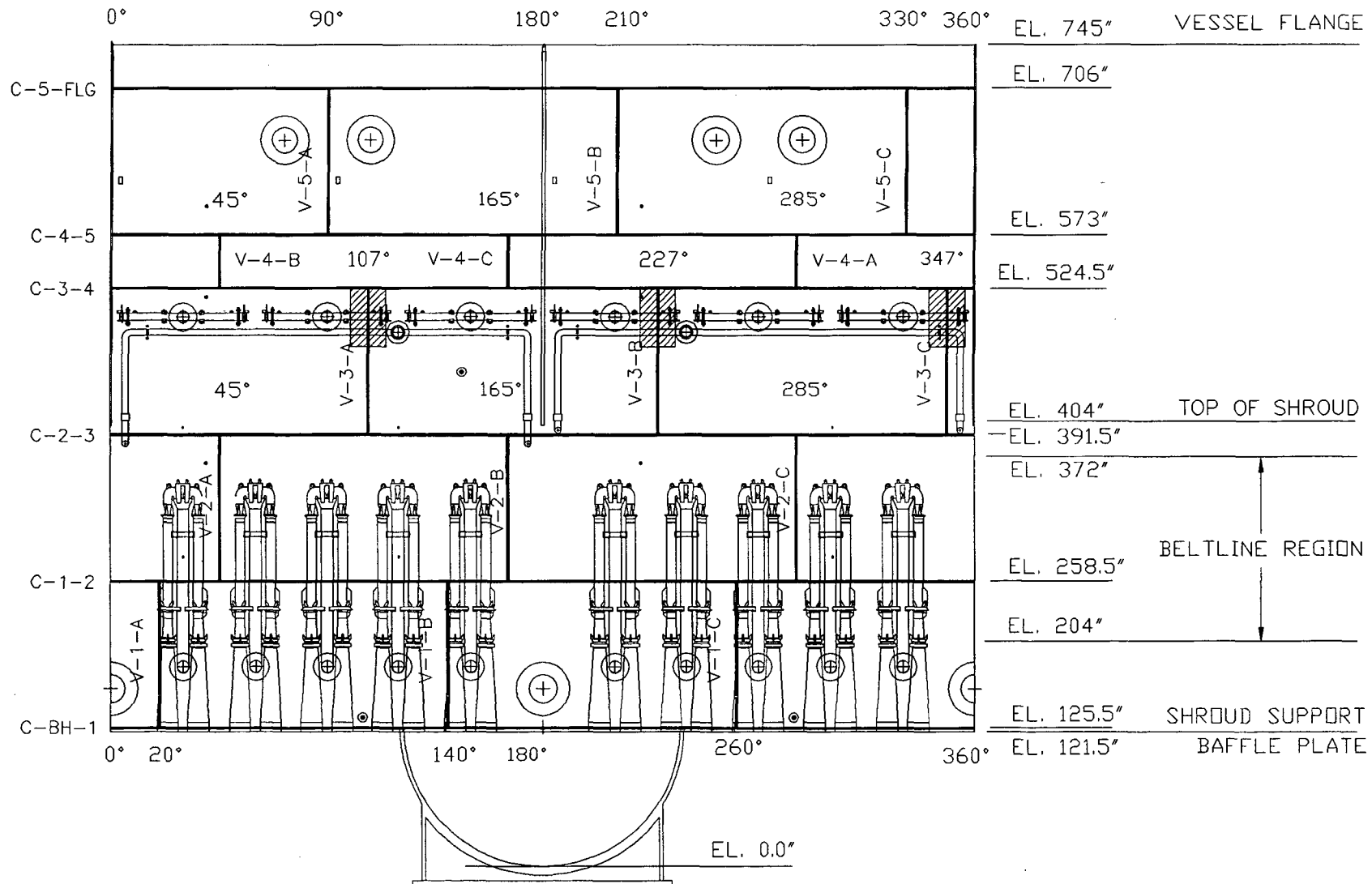
LR	% DAC (MAX)	W1 20% DAC	WF1 50% DAC	WM MAX DAC	WF2 50% DAC	W2 20% DAC	MP1 20% DAC	MPF1 50% DAC	MP MAX DAC	MPF2 50% DAC	MP2 20% DAC	CONTINUOUS (C) OR SPOT (S) TRANSVERSE (T) OR PARALLEL (P)	CW/CCW TOP OR BOTTOM

REMARKS: Examined from an elevation of 471.5" to 524.5" Area below elevation 471.5" was not examined due to the proximity of an insulation ring and non-removable insulation.Examined by Chant Caton II 11-4-93
LEVEL DATEReviewed by Ch M 12/1/93
GE REVIEWED BY DATEUtility Review 222222 12/15/93
DATEANII Review Albat 8/25/94
DATEPAGE: 1 OF: 1

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BROWNS FERRY UNIT-3 WELD LOCATIONS



8115



REV. 0