. . . .

1

	onconf	ormand	e Repo	rt		
Project BFN	UNIT 3 RPV EXAMIN	NATION	Project No.	C0387	NCR No.	1C7LA-05
Reference Document	s: WO# 92-6	5636-01, ASME SEC	CTION XI, 1986 EDITI	ON, NO ADDE	ENDA	
Description of Nonco	nformance: (State C	Cause)	NCR Code	O45	Cause Code	C04
ULTRASONIC EXAN STANDARDS OF IW AND TVA INSPECTI	IINATION THE RPV, B-3510.1 OF THE RE ON REPORT (IR)	HAS REVEALED IN EFERENCED ASME	DICATIONS EXCEED CODE. SEE ATTACH	NING THE ALL IED SUMMAR	OWABLE Y SHEETS	
Initiated By: 10CFR21 Review: _ I	s (X) is Not ()	Date <u>/2-21-</u> 93 Reportable	QC Supervisor	Say 11	Date 12	<u>- 2)-93</u> 2/-93
Proposed Disposition	and Technical Justif	ication: (Attach Extra	a Sheets, Sketches, E	tc. as Necess	ary)	
Accept-As-Is () TVA NUCLEAR ENG	Repair () Rev INEERING TO DISP	work () Reject OSITION PER TVA I	() Other If Not R BF-T930110	Mat. Or Items	() _.	
 Project Manager		Date <u>/2-21-93</u>	QC Supervisor	Camp 11	1 <u>111111111111111111111111111111111111</u>	- 2/-98
·····						
Final Disposition						
Final Disposition Accept-As-Is & Repa	ir Dispositions, Desig	n Verification Is Prov	ided Per:			
Final Disposition Accept-As-Is & Repa FINAL DISPOSITIO	ir Dispositions, Desig	In Verification Is Prov ATED AND INITIATE	rided Per: D PER TVA IR BF-T	930110		
Final Disposition Accept-As-Is & Repa FINAL DISPOSITIO	ir Dispositions, Desig N SHALL BE EVALUA	n Verification Is Prov ATED AND INITIATE	rided Per: D PER TVA IR BF-TS	930110		
Final Disposition Accept-As-Is & Repa FINAL DISPOSITION * Client (* Required) Project Manager	ir Dispositions, Desig	n Verification Is Prov ATED AND INITIATE Date <u>12/21/</u> 93 Date <u>(2-21-</u> 93	rided Per: D PER TVA IR BF-TS * ANII Review (QC Supervisor)	930110 Mort Caigar	2 Date 12-	<u>2</u> 2-93 21-93
Final Disposition Accept-As-Is & Repa FINAL DISPOSITION * Client (* Required) Project Manager	ir Dispositions, Desig	n Verification Is Prov ATED AND INITIATE Date <u>12/21/</u> 93 Date <u>12-21-93</u>	rided Per: D PER TVA IR BF-TS * ANII Review QC Supervisor	030110 Most	<u>add</u> Date <u>12</u> 2 <u>2</u> 2 <u>2</u> 22	<u>2</u> 2-93 21-93
Final Disposition Accept-As-Is & Repa FINAL DISPOSITION * Client (* Required) Project Manager Preventative Action: NONE REQUIRED	ir Dispositions, Desig	The function is proved to the function is p	rided Per: D PER TVA IR BF-TS * ANII Review (QC Supervisor (930110	2 Date 12-	<u>2</u> 2-93 21-93
Final Disposition Accept-As-Is & Repa FINAL DISPOSITION * Client (* Required) Project Manager Preventative Action: NONE REQUIRED	Ir Dispositions, Desig	on Verification Is Prov ATED AND INITIATE Date $\frac{12/21/93}{2}$ Date $\frac{12-21-93}{2}$	rided Per: D PER TVA IR BF-TS * ANII Review QC Supervisor	930110	Add Date 12	<u>2</u> 2-93 21-93
Final Disposition Accept-As-Is & Repa FINAL DISPOSITION * Client (* Required) Project Manager Preventative Action: NONE REQUIRED QC Approval Disposition Com Nonconformance	Ir Dispositions, Desig	on Verification Is Prov ATED AND INITIATE Date $\frac{12/2}{93}$ Date $\frac{12-21-93}{2}$	rided Per: D PER TVA IR BF-TS * ANII Review QC Supervisor	mart Sole	Lade Date 12	<u>2</u> 2-93 - <u>2</u> 1-93 - <u>2</u> 1-93

BROWNS FERRY UNIT-3 WELD LOCATIONS



シウモイヨ

.....

雷君 的 胎 10 ETTA

Page 3 of 26 Terms and Definitions for "GERIS 2000 Examination Summary Sheet"

NCR# 1C7LA-05

Ind No.

Sequential number identification for the applicable indication

Oriented

Describes the orientation of the indication relative to the RPV (i.e. circ. is a indication oriented in the vessel circumferential direction)

Type

Describes the type of indication (surface or subsurface) as determined by ASME Section XI, IWB-3500.

X Position

The location of the flaw in the circumferential direction in inches from vessel 0° azimuth.

Y Position

The location of the indication relative to RPV 0" (inside surface of the RPV Bottom Head) in inches.

Z Position

The location of the flaw relative to the RPV deposited clad surface.

"S"

The separation distance from the upper flaw extremity to the clad/base material interface as defined by ASME Section XI.

T-Wall

The total through wall dimension of the indication. This value is also the 2A dimension referenced by ASME Section XI and the Flaw Analysis Handbook.

Length

This dimension represents the total length of the flaw.

T Meas

Represents the actual wall thickness of the RPV in the area of the indication minus the deposited clad.

a/l

The value of the required ASME Section XI, IWB-3500 calculation for flaw evaluation. This value is derived using the following formula [(T wall/2)/Length]

% a/t Calculated

The value of the required ASME Section XI, IWB-3500 calculation for flaw evaluation. This value is derived using the following formula [(T wall/2)/T Meas]

% a/t Allowed

This value is the allowed a/t percentage as identified in ASME Section XI, Table IWB-3510-1 "Allowable Planar Flaws". The value given is the linear interpolation of the percentage values for Table IWB-3510-1 as permissible and in accordance with IWA-3200.

NOTE: The final calculated values shown on the summary sheets have been rounded off in accordance with ASME Section XI, IWA-3200.



state genth level

Project: TVA, Browns Ferry Nuclear Plant, Unit 3 Bystem: Reactor Pressure Vessel Weld ID: V4-8 ASME Code Category: B-A Alibration Sheets: C-001 C-001 B-A Upporting Data: Examination Data Sheets E-14-00 and E-14-01, indication Data Sheets 14-001 thru 14-005 and G-100 thru G-108, indication Evaluation Sheets, Screen Prints, Exam Patch Location Map, Exam Coverage Plots and GERIS 2000 Setup Records. Examination Data Sheets E-14-00 and E-14-01, indication Data Sheets 14-001 thru 14-005 and G-100 thru GERIS 2000 Setup Records. Examination of weld V-4-B resulted in one (1) recorded indication that exceeds the allowable standards of IWB-3500, ASMI Section XI 1988 Edition, No Addenda. The ultrasonic examination of weld V-4-B resulted in one (1) recorded indication that exceeds the allowable standards of IWB-3500, ASMI Section XI 1988 Edition, No Addenda. The Section XI required examination volume was examined to the N11-A Nozze at 40°. The total examination coverage was accutated to be easy. CeRIFS 2000 utilizes an array of search units arranged to affectively examine the weld and adjacent base material parallel an oppendicular in the weld axis. Records. The definition ovaluated as being reportable to IMB-3500, ASMI Section XI, 1986 Edition, No Addenda was macroted and sizet in a secondard with Ed-EFLY-00, Rev. 2. This indication was includin weld welds V-4E		GE Nucle	ar Ene	rgy		G	ERIS S	3 200 umm	0 Exa ary S	amir Shee	nation et	· •
Juget and the processed in	Project: TVA, E	Browns Ferry N	luclear Pla	int, Unit 3	•••••• <u>•</u> ••••••••							
ASME Code Category: EA alibration Sheets: C-001 upporting Data: Examination Data Sheets E-14-00 and E-14-01, Indication Data Sheets 14-001 thru 14-005 and G-100 thru G-108, Indication Evaluation Sheets, Screen Prints, Exam Patch Location Map, Exam Coverage Piots and GERIS 2000 Setup Records. Examination of weld V-4-B resulted in one (1) recorded indication that exceeds the allowable standards of IWB-3500, ASMI Section X1, 1986 Edition, No Addenda. The ultrasonic examination of weld V-4-B resulted in one (1) recorded indication that exceeds the allowable standards of IWB-3500, ASMI Section X1, 1986 Edition, No Addenda. The allocation of weld V-4-B resulted in one (1) recorded indication that exceeds the allowable standards of IWB-3500, ASMI Section X1, 1986 Edition, No Addenda. The difference of the asymptotic examination vas limited due to the N11-A Nozzle at 40°. The total examination coverage was calculated to be 83%. The GERIS 2000 utilizes an array of search units arranged to effectively examine the weld and adjacent base material parallel and parpendicular (RL) wave search units. The one indication evaluated as being reportable to IWB-3500, ASME Section X1, 1986 Edition, No Addenda was recorded and sized in accordance with GE-UT-700, Rev. 2 and GE-UT-701, Rev. 2. The indication evaluated as being reportable to IWB-3500, ASME Section X1, 1986 Edition, No Addenda was recorded and sized in accordance with GE-UT-700, Rev. 2 and GE-UT-701, Rev. 2. The indication was indication was learneed during the examinat	ystem: Reacto	or Pressure Ve	ssel	•				•				
AnD Patients C-0.01 Upporting Data: C-0.01 Examination Data Sheets E-14-00 and E-14-01, indication Data Sheets 14-001 thru 14-005 and G-100 thru G-108, indication Evaluation Sheets, Screen Prints, Exam Patch Location Map, Exam Coverage Plots and GERIS 2000 Setup Records. The ultrasonic examination of weld V4-B resulted in one (1) recorded indication that exceeds the allowable standards of IWB-3500, ASMI Section X1, 1986 Edition, No Addenda. The ASME Section X1, required examination volume was examined with the GERIS 2000 System from the RPV inside surface utilizin Procedure No. No Addenda. The GERIS 2000 utilizes an array of search units arranged to effectively examine the weld and adjacent base material parallel an periodicular No. 2 and GE-177-00, Rev. 2. This examination was limited due to the N11-A Nozzle at 40°. The total examination coverage was calculated to be 83%. The GERIS 2000 utilizes an array of search units arranged to effectively examine the weld and adjacent base material parallel an periodicular No. 2 and GE-177-01, Rev. 2. This indication was recorded uning the examination of the weld, and 160° thear wave, and 70° refracted longitudinal (8L-177-00, Rev. 2 and GE-1770, Rev. 2. This indication was recorded uning the examination of tool heredox 4 as 14-002 and C-3-4 as 12-015. The flaw dimensions were determined from weld C-3-4 indication bases examined as 0.102 and C-3-4 as 12-015. The flaw dimensions were determined from weld C-3-4 indication bases at 2-015 with the result atoutate beiow: d. No. Oriented Type X Pos Y Pos Z Pos T well Length T Meas af 60°			004			ASME	: Code Ca	tegory:	В-А			
Examination Summary The ultrasonic examination of weld V4-B resulted in one (1) recorded indication that exceeds the allowable standards of IWB-3500, ASMI Section X1, 1986 Edition, No Addenda. The ASME Section X1 required examination volume was examined with the GERIS 2000 System from the RPV inside surface ultilizing procedure No. GE-UT-700, Rev. 2. This examination was limited due to the N11-A Nozzle at 40°. The total examination coverage was calculated to be 83%. The GERIS 2000 Ultizes an array of search units arranged to effectively examine the weld and adjacent base material parallel an perpendicular to the weld and silcent hase material parallel an coordance with GE-UT-700, Rev. 2 and GE-UT-701, Rev. 2. This indication was recorded during the examination ob the welds '4-4 for and 60° shear wave, and 70' refracted longitudinal (RU) wave search units. The one indication evaluated as being reportable to NMB-3500, ASME Section X1, 1986 Edition, No Addenda was recorded and sized in accordance with GE-UT-700, Rev. 2 and GE-UT-701, Rev. 2. This indication was recorded during the examination of both welds '4-4 tabulate below. Id. No. Oriented Type X Pos Y Pos Z Pos TST T well Length T Meas al All % ard % at Allowed 2015 circ. subsurface 94.35' 525.43' 1.13' 0.94' 44' 1.75' 6.53' 0.13 3.4 2.71 This indication was sized with the 70°RL utilizing the PATT technique. It was also recorded with the 5' and 60' shear waves. The GERIS 2000 also recorded an indication with the 70' weld metal scan that was evaluated and found to be acceptable per the referencing Code section. Geometric indications from the stabilizer bracket at 45' were recorded with the 0' weid metal, 45' and 6	upporting Dat	ia: Ei G	amination 108, Indic ERIS 2000	Data Sheel ation Evalua Setup Rec	ts E-14-00 ation Shee ords.	and E-14-0 s, Screen	01, Indicat Prints, Exa	ion Data Sh am Patch L	eets 14-00 ocation Ma	1 thru 14 o, Exam	-005 and G-1 Coverage Plo	00 thru its and
The ultrasonic examination of weld V-4-B resulted in one (1) recorded indication that exceeds the allowable standards of IWB-3500, ASMI 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 utilizin Procedure No. GE-UT-700, Rev. 2. This examination was limited due to the N11-A Nozzle at 40°. The total examination coverage was calculated to be 63%. 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° infracted longitudinal (41) was escarch units. The one indication evaluated as being reportable to IWB-3500, ASME Section XI, 1986 Edition, No Addenda was recorded and sized in accordance with GE-UT-700, Rev. 2 and GE-UT-701, Rev. 2. This indication was recorded during the examination of both welds V-4-E as 14-002 and C-3-4 as 12-015. The flaw dimensions were determined from weld C-3-4 Indication Data Sheet 12-015 with the results tabulated below: Id. No. Oriented Type X Pos Y Pos Z Pos Ts* T wail Length T Meas a/l 6/a att Alower 12-015 circ. subsurface 94.35* 525.43* 1.13* 0.94* .44* 1.75* 6.53* 0.13 3.4 2.71 This indication was sized with the 70°RL utilizing the PATT technique. It was also recorded with the 45* and 60° shear	N		· · · · · · · · · · · · · · · · · · ·	Ē	xamin	ation S	umma	<u>ry</u>		<u></u>		
2-015 circ. subsurface 94.35" 525.43" 1.13" 0.94" .44" 1.75" 6.53" 0.13 3.4 2.71 This indication was sized with the 70°RL utilizing the PATT technique. It was also recorded with the 45° and 60° shear waves. The GERIS 2000 also recorded an indication with the 0° weld metal scan that was evaluated and found to be acceptable per the referencing Code section. Geometric indications from the stabilizer bracket at 45° were recorded with the 0° weld metal, 45° and 60° shear wave scans. No manual supplemental examination was performed from the RPV outside surface due to access restrictions. Fabrication records and previous examination results were reviewed prior to the completion of this examination summary. RIS Analyst: MULA Limball IEVEL: DATE: 12-21-93 LEVEL: II DATE: 12-21-93	The ASME Secti Procedure No. G calculated to be a The GERIS 2000 perpendicular to refracted longitud The one indicatio accordance with as 14-002 and C tabulated below:	on XI required E-UT-700, Re 13%. D utilizes an a the weld axis inal (RL) wave n evaluated a GE-UT-700, R -3-4 as 12-01	d examinar v. 2. This array of se in two dire e search ur s being re lev. 2 and 5. The fla X Pos	tion volume examinatio parch units ctions. The its. portable to GE-UT-701 w dimensio	was exan n was limi arranged transduc iWB-3500, , Rev. 2. ns were d	nined with ted due to to effective er package ASME Se This indic etermined	the GERI the N11-4 ely examine ection XI, ation was from weld	S 2000 Sys Nozzle at the the weld d of 0° long 1986 Edition recorded d C-3-4 Indi	stem from 1 40°. The 1 and adjac itudinal, 45 n, No Adde uring the e cation Data	the RPV total examination and a was xamination a Sheet 1	inside surface mination cover a material pa a shear wave recorded and on of both we 12-015 with the % a/t	e utilizing arage was railel and e, and 70° d sized in lds V-4-B he results % a/t
12-015 circ. subsurface 94.35" 525.43" 1.13" 0.94" .44" 1.75" 6.53" 0.13 3.4 2.71 This indication was sized with the 70°RL utilizing the PATT technique. It was also recorded with the 45° and 60° shear waves. The GERIS 2000 also recorded an indication with the 0° weld metal scan that was evaluated and found to be acceptable per the referencing Code section. Geometric indications from the stabilizer bracket at 45° were recorded with the 0° weld metal, 45° and 60° shear wave scans. No manual supplemental examination was performed from the RPV outside surface due to access restrictions. Fabrication records and previous examination results were reviewed prior to the completion of this examination summary. IRIS Analyst: USA Limball VEL: III DATE: 12-21-93 LEVEL: LEVEL: IIII DATE: 12-21-93		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		1103	2 - 03	3	i wau	Lengui	INCOS		Calculated	Allowed
This indication was sized with the 70°RL utilizing the PATT technique. It was also recorded with the 45° and 60° shear waves. The GERIS 2000 also recorded an indication with the 0° weld metal scan that was evaluated and found to be acceptable per the referencing Code section. Geometric indications from the stabilizer bracket at 45° were recorded with the 0° weld metal, 45° and 60° shear waves scans. No manual supplemental examination was performed from the RPV outside surface due to access restrictions. Fabrication records and previous examination results were reviewed prior to the completion of this examination summary. RIS Analyst: Justa fumball ILE DATE: 12-21-9.3 LEVEL: DATE: 12-21-9.3	2-015 circ.	subsurface	94.35"	525.43"	1.13"	0.94"	.44"	1.75*	6.53"	0.13	3.4	2.71
ERIS Analyst: Ullura Finball GE Reviewer: R.O. Forman VEL: III DATE: 12-21-93 LEVEL: I DATE: 12-21-93 ILITY Review:	This indication was The GERIS 2000 referencing Code shear wave scans	is sized with the also recorded section. Geol s. emental exami	ne 70°RL u an indicati netric indic nation was	itilizing the f ion with the cations from performed	PATT techi 0° weld m the stabili from the R	nique. It w etal scan ti zer bracke PV outside	as also re hat was ev t at 45° we	corded with aluated and are recorded	n the 45° ar I found to b I with the 0	nd 60° sh ne accept ° weld m	ear waves. able per the etal, 45° and	60°
Ill DATE: 12-21-93 LEVEL: I DATE: 12-21-93	No manual supple Fabrication record	ls and previou	s examina	tion results	were revie	wed prior t	e surface (o the com	fue to acces	ss restrictio is examinal	ns. tion sumr	nary.	-
ILITY Review: IRIS Analyst: UUSA Fimball GE Reviewer: R.O. Forman LEVEL: T DATE: 12-21-93 LEVEL: T DATE: 12-21-93	No manual supple	ls and previou	s examina	tion results	were revie	wed prior t	o the com	fue to acce	ss restrictio is examinat	ns. tion sumr	nary.	-
RIS Analyst: UUSa (-imball GE Reviewer: R.O. Forman VEL: III DATE: 12-21-93 LEVEL: I DATE: 12-21-93	No manual supple	is and previou	s examina	tion results	were revie	wed prior t	e surface o	fue to acce	ss restrictio is examinat	ns. tion sumr	nary.	-
RIS Analyst: Illia (imball GE Reviewer: R.O. Forman /EL: III DATE: 12-21-93 LEVEL: I DATE: 12-21-93 LITY Review:	No manual supple	ls and previou	s examina	tion results	were revie	wed prior t	e surface o	tue to acce	ss restrictio	ns. tion sumr	nary.	•
VEL: III DATE: 12-21-93 LEVEL: I DATE: 12-21-93	No manual supple	ls and previou	s examina	tion results	were revie	wed prior t	e surface o	fue to acce	ss restrictio	ns. tion sumr	nary.	•
VEL: <u>JLL</u> DATE: 12-21-43 LEVEL: <u>DATE: 12-21-93</u>	No manual supple Fabrication record	Is and previou	s examina	tion results	were revie	wed prior to	e surface of the complexity of	fue to access the order of the	ss restrictio	ns. tion sumr	nary.	
	No manual supple Fabrication record	ls and previou	s examina Embal	tion results		wed prior to GE R	e surface o o the com o the com eviewer:	fue to access poletion of th R.O. 7	ss restrictio is examinat	ns. tion sumr	nary.	
	No manual supple Fabrication record ERIS Analyst:	ls and previou III II	s examina Unbal	L ATE: (2 -,	were revie	GE R LEVE	e surface of o the com eviewer: :L: Review:	fue to acces	ss restrictio is examinat	ns. tion sumr	nary. DATE: / 2 • 2	.1-73

•

» 00072



esta cota corea-

Pagelospano

GE Nuclear Energy

C-004

GERIS 2000 Examination Summary Sheet

Project: TVA, Browns Ferry Nuclear Plant, Unit 3

System: Reactor Pressure Vessel Weld ID: C-2-3

ASME Code Category: B-A

Calibration Sheets:

Supporting Data: Examination Data Sheets E-08-00 thru E-08-26, Indication Data Sheets 08-001 thru 08-110, Indication Evaluation Sheets, Screen Prints, Exam Patch Location Map, Exam Coverage Plots and GERIS 2000 Setup Records.

Examination Summary

The ultrasonic examination of weld C-2-3 resulted in two (2) 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 core spray downcomers and surveillance specimen brackets. The total examination coverage was calculated to be 80%.

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 two (2) unacceptable indications were recorded and sized in accordance with GE-UT-700, Rev. 2 and GE-UT-701, Rev. 2 with the results tabulated below:

Ind. No.	Oriented	Туре	X Pos	Y Pos	Z Pos	"S"	T wall	Length	T Meas	a/I	% a/t Calculated	% a/t Allowed
08-026	circ.	subsurface	198.50"	392.42"	1.77"	1.56"	.41"	1.50"	6.60"	.137	3.11	2.79
08-067	círc.	subsurface	558.25"	392.85"	1.65"	1.47"	.37"	1.50"	6.55"	.123	2.82	2.68

Indication 08-026 was sized with 60° shear wave channel 11 utilizing the PATT technique. This indication was also recorded with 70°RL channel 3 as 08-023 and seen with 45° shear wave channel 7.

Indication 08-067 was sized with 70°RL channel 3 utilizing the PATT technique. This indication was also recorded with 45° shear wave channel 7 as 08-073 and seen with 60° shear wave channel 11.

The GERIS 2000 also recorded indications with the 0° weld metal scans, 70°RL, 45° and 60° shear wave scans that were evaluated and found to be acceptable per the referencing Code section.

No manual supplemental examination was performed from the RPV outside surface due to access restrictions.

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

GERIS An	alyst:	sa Kimball	GE Reviewer: R.O.	Forman
EVEL:	Ш	DATE: 12-19-93	LEVEL:	DATE: 12 . 2 0-93
UTILITY R	eview:		ANII Review:	
TITLE:		DATE:	TITLE:	DATE:





计通道部一句句句句 白白字字

C-001, C-004, C-115, C-116, and C-117

Voge 9 0f 26

GE Nuclear Energy

GERIS 2000 Examination Summary Sheet

Proj	ect:	TVA,	Browns	Ferry	Nuclear	Plant,	Unit 3	
------	------	------	--------	-------	---------	--------	--------	--

System: Reactor Pressure Vessel

Weld ID: C-3-4

Calibration Sheets:

ASME Code Category: B-A

Supporting Data: Examination Data Sheets E-12-00 thru E-12-15, indication Data Sheets 12-001 thru 12-163, Indication Evaluation Sheets, Screen Prints, Exam Patch Location Map, Exam Coverage Plots , GERIS 2000 Setup Records and Manual Data Sheets D-034, D-035, D-036, D-037, D-040, D-041, D-044and D-045.

Examination Summary

The ultrasonic examination of weld C-3-4 resulted in six (6) 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 Guide Rods at 0° and 180°°. The total examination coverage was calculated to be 97%.

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 six (6) unacceptable indications were recorded and sized in accordance with GE-UT-700, Rev. 2 and GE-UT-701, Rev. 2 with the results tabulated below:

Ind. No.	Oriented	Туре	X Pos	Y Pos	Z Pos	"S"	T wali	Length	T Meas	aA	% a/t Calculated	% a/t Allowed
12-015	circ.	subsurface	94.35"	525.43"	1.16	75*	.444"	1.75*	6.53*	0.13	3.4	2.71
12-069	circ.	subsurface	424.65"	524.58"	2.30"	1,94"	.34"	1.75*	6.51*	0.10	2.66	2.48
12-116	circ.	subsurface	617.15"	526.14*	3.85*	2.6	.62"	.75*	6.49*	0.21	4.81	3.50
12-144	circ.	subsurface	760.10"	525.11*	.78"	.75*	.325*	2.00"	6.44*	0.10	2.45	2.39
12-145	circ.	subsurface	763.85*	525.68"	.80*	2.40*	.39"	2.40"	6.44"	0.10	3.03	2.39
12-148	circ.	subsurface	771.35"	525.07"	.87"	.43"	.511"	2.75"	6.44"	0.10	3.97	2.46

Indication 12-015 was sized with 70° RL channel 5 utilizing the PATT technique. This indication was also recorded as 12-016 and 12-020. Indication 12-015 was also recorded within the exam volume of weld V-4-8.

Indication 12-069 was sized with 45° shear wave channel 9 utilizing the SPOT technique.

Indication 12-116 and 12-117 is a combined indication in accordance with IWA-3390 and is included in the table above as 12-116. Indication 12-116 and 12-117 were sized with 45° shear wave channel 7 utilizing the SPOT technique.

Indication 12-144 was sized with 70° RL channel 5 utilizing the PATT technique. This indication was also recorded as 12-130, 12-150, and 12-157.

GERIS Analyst:	Ma .	GE Reviewer:	leresa Kimball	- <u></u>
LEVEL: TIL	DATE: 12/21/93	LEVEL:	TIT DATE:	12-21-93
UTILITY Review:		ANII Review:	· .	
TITLE:	DATE:	TITLE:	DATE:	

Page 1 of 2

sess open opre

FogelUTTON NSIR-ICTLA-05

GERIS 2000 Examination Summary

(Continuation)

Indication 12-145 was sized with 70° RL channel 4 utilizing the PATT technique. This indication was also recorded as 12-131, 12-158, 12-161, 12-162 and 12-163.

Indication 12-148 was sized with 70° RL channel 5 utilizing the PATT technique. This indication was also recorded as 12-132 and 12-160.

The GERIS 2000 also recorded indications with the 0° weld metal scans, 70° RL, 45° and 60° shear wave scans that were evaluated and found to be acceptable per the referencing Code section. Geometric indications from the OD surface, Nozzles N11-A, N11-B and N4-F were recorded with the 45° and 60° shear wave scans.

Selected areas were rescanned using 45° RL search units .

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.





			C-3-4			
			ي 524.5" ا	45' 45'		
				12-116 12-117		
	· · ·					
	Nominal Clad T = 3/16" Nominal Base Metal T = 6 3/8"	· · ·	· · · ·	Indication 12– Flaw "X" locat Flaw "Y" locat Flaw Thruwall Flaw Length "T" Measured	116 Combined ion 617,15" ion 526,14" .62" .75" 6,49"	·
	· · · · · · · · · · · · · · · · · · ·				•	la la
	• • • • •		· · · · · · · · · · · · · · · · · · ·			4e 13926
G	E NUCLEAR ENERGY	BROWNS FERRY UNIT 3	WELD C-3-4 IND, 12-1	16 SCALE: NONE	DWG. BFC34IND	REV. 0









00082

			· ·	• •						Vares 5 of 26 14 Jug 2/15/14	NIGOT ICTLA
GE NI	UCLEAR	ENERGY	BROWNS	FERRY	UNIT 3	<u>C-3-4</u> WELD <u>C=4-5</u> IND. 1	2-144	SCALE: NONE	DWG. BFC34IND	REV. O	-6

At 1/12/14

Flaw Thruwall

Flaw Length

"T" Measured

.325" 2.00"

6.44"







Indication 12-148 Flaw "X" location 771.35" 525.07 Flaw "Y" location Flaw Thruwoll .511" 2.75" Flaw Length "T" Measured 6.44"

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

.)

66054

		Det.
		R
·.	. · · · · · · · · · · · · · · · · · · ·	6
		126
• •		Ŭ

GE NUCLEAR ENERGY BROWNS FERRY UNIT 3 WELD C-3-4 IND. 12-148

SCALE: NONE DWG. BFC34IND Ś

ст. ., S.

	G	E Nucle	ar Ene	rgy		G	ERIS S	5 200 umm	0 Exa ary S	amii Shee	nation et)
Project: System	TVA, Br	owns Ferry N Pressure Ve	luclear Pia Issel	nt, Unit 3						-	·	
weia iD			001 0 00	4		ASM	E Code Ca	tegory:	B-A	<u></u>		
Suppor	ting Data	in an	camination dication Ev d GERIS 2	Data Shee aluation Sh 2000 Setup	ts E-16-00 leets, Scre Records.	thru E-16 een Prints,	-12, Indical Exam Pate	tion Data SI ch Location	neets 16-00 Map, Exan	1 thru 16 n Covera	5-094, ge Plots	
The ult	rasonic eva	mination of u	veld C-4-5	E	Examin	ation (Summa				rde of 84/8 26	00 45445
was cal	ERIS 2000	utilizes an a be weld axis	v.2. This of array of se in two dire	examination arch units ctions. The	arranged e transduc	ed due to to effectiv	the Guide I rely examinate consistent	Rods at 0° a ne the weld d of 0° long	and 180°°. I and adja	The tota cent base of and 60	l examination e material pa)° shear wave	coverage
perpent refracte The two results	d longitudir (2) unacc tabulated bi	eptable indic	e search un	iits. e recorded	and sized	l in accord	fance with	GE-UT-700), Rev. 2 a	nd GE-U	T-701, Rev. 2	2 with the
perpen refracte The two results Ind. No.	d longitudir (2) unacc tabulated b Oriented	nal (RL) wave eptable indic elow: Type	e search un cations wer X Pos	its. e recorded Y Pos	and sized	in accord	fance with	GE-UT-700), Rev. 2 a	nd GE-U a/I	T-701, Rev. 2 % a/t Calculated	with the % a/t Allowed
perpent refracte The two results Ind. No. 16-075 16-076	d longitudir c (2) unacc tabulated b Oriented circ. circ.	al (RL) wave eptable indic elow: Type subsurface subsurface	X Pos 603.30" 617.50"	its. e recorded Y Pos 574.70" 574.05"	and sized Z Pos 3.17" 3.85"	"S" 2.83" 2.53"	T wall	GE-UT-700), Rev. 2 a T Meas 6.6"	a/l .055 .147	T-701, Rev. 2 % a/t Calculated 2.27 3.33	2 with the % a/t Allowed 2.23 2.87
perpen- refracte The two results Ind. No. 16-075 16-076 Indication shear w Indication shear w	d longitudir (2) unacc tabulated bu Oriented circ. circ. circ. on 16-075 w vave channe on 16-076 w vave channe	Aal (RL) wave eptable indice elow: Type subsurface subsurface vas sized wit el 9 as 16-07 vas sized witt el 9 as 16-07	x Pos 603.30" 617.50" h 60° shea 2. h 60° shea 4.	Y Pos 574.70" 574.05" Frwave cha	and sized Z Pos 3.17" 3.85" annel 13 ut	I in accord "S" 2.83" 2.53" ilizing the	T wall 30" 44" SPOT tech	GE-UT-700 Length 2.75" 1.50" Inique. This	Rev. 2 a T Meas 6.6" 6.6"	nd GE-U a/I .055 .147 was also was also	T-701, Rev. 2 % a/t Calculated 2.27 3.33 precorded with	2 with the % a/t Allowed 2.23 2.87 h 45°
perpen- refracte The two- results Ind. No. 16-075 16-076 Indication shear w Indication shear w The GE found to weld me No man	d longitudir (2) unacc tabulated by Oriented circ. circ. on 16-075 w rave channe on 16-076 w rave channe RIS 2000 a be accepta etal, 45° and	Aal (RL) wave eptable indice elow: Type subsurface subsubsubsubsubsubsubsubsubsubsubsubsubs	X Pos 603.30" 617.50" h 60° shea 2. h 60° shea 4. indications referencing vave scans	Y Pos 574.70" 574.05" ar wave cha ar wave cha ar wave cha code secti . Geometri	and sized Z Pos 3.17" 3.85" annel 13 ut unnel 13 ut weld met ion. Georr ic indicatio from the E	I in accord "S" 2.83" 2.53" ilizing the ilizing the al scans, 7 netric indic ns from th	T wall 30" .44" SPOT tech SPOT tech 70° RL, 45 ations from e OD surfa	GE-UT-700 Length 2.75" 1.50" Inique. This inique. This and 60° si the stabilizince were re	T Meas T Meas 6.6" 6.6" 6.6" a indication a indication b indication b indication b indication b indication b indication corded with corded with corded with	a/l 055 .147 was also was also scans that s were re- n the 45°	T-701, Rev. 2 % a/t Calculated 2.27 3.33 o recorded with o recorded with at were evalua corded with th shear wave s	2 with the % a/t Allowed 2.23 2.87 h 45° h 45° h 45° h 45° h 45° h 45°
perpen- refracte The two results Ind. No. 16-075 16-076 Indication shear w Indication shear w The GE found to weld me No man Fabricat	d longitudir o (2) unacc tabulated bi Oriented circ. circ. circ. on 16-075 w vave channe on 16-076 w vave channe	Aal (RL) wave eptable indicelow: Type subsurface subsubsurface sub	x Pos 603.30" 617.50" h 60° shea 2. h 60° shea 4. indications referencing vave scans nation was s examinat	Y Pos 574.70" 574.70" 574.05" Ar wave cha ar wave cha ar wave cha ar wave cha ar wave cha ar of the of Code section of Geometric performed ion results	and sized Z Pos 3.17" 3.85" annel 13 ut annel 13 ut weld met ion. Georr ic indicatio from the F were revie	I in accord "S" 2.83" 2.53" ilizing the al scans, 7 netric indic ns from th RPV outsid wed prior	ance with T wall .30" .44" SPOT tech SPOT tech SPOT tech 70° RL, 45 ations from e OD surfa le surface o to the comp	GE-UT-700 Length 2.75" 1.50" anique. This anique. This anique. This anique. This the stabilizace were re- due to access pletion of th	T Meas T Meas 6.6" 6.6" indication indication hear wave corded with ss restriction is examina	a/l .055 .147 was also was also scans tha swere re- n the 45° ins.	T-701, Rev. 2 % a/t Calculated 2.27 3.33 or recorded with at were evalua corded with th shear wave s mary.	2 with the % a/t Allowed 2.23 2.87 h 45° h 45° h 45°
perpen- refracte The two results Ind. No. 16-075 16-076 Indication shear w Indication shear w The GE found to weld me No man Fabricat	d longitudir o (2) unacc tabulated bi Oriented circ. circ. on 16-075 w vave channe on 16-076 w vave channe	Aal (RL) wave eptable indicelow: Type subsurface subsurface subsurface subsurface vas sized with el 9 as 16-07 vas sized with el 9 a	x Pos 603.30" 617.50" h 60° shea 2. h 60° shea 4. indications referencing wave scans nation was s examinat	Y Pos 574.70" 574.05" ar wave cha ar wave cha ar wave cha ar wave cha be with the 0° Code section . Geometric performed	and sized Z Pos 3.17" 3.85" annel 13 ut annel 13 ut weld met ion. Geom ic indicatio from the F were revie	I in accord "S" 2.83" 2.53" ilizing the al scans, 7 hetric indic ns from th RPV outsid wed prior	ance with T wall .30" .44" SPOT tech SPOT tech SPOT tech SPOT tech cons from e OD surfa	GE-UT-700 Length 2.75" 1.50" anique. This anique. This anique. This the stabiliz- the	T Meas 6.6" 6.6" 6.6" 6.6" 6.6" 6.6" 6.6 6.6 6	a/l .055 .147 was also was also scans that s were re- n the 45° ins. tion summ	T-701, Rev. 2 % a/t Calculated 2.27 3.33 b recorded with at were evalua corded with th shear wave s mary.	2 with the % a/t Allowed 2.23 2.87 h 45° h 45° h 45°
perpen- refracte The two- results Ind. No. 16-075 16-076 Indicational shear w Indicational shear w The GE found to weld me No man Fabricat	d longitudir (2) unacc tabulated bi Criented circ. circ. circ. on 16-075 w rave channe on 16-076 w rave channe on 16-076 w rave channe Di 16-076 w rave channe on 16-076 w rave channe	Type subsurface subsubsurface sub	x Pos 603.30" 617.50" h 60° shea 2. h 60° shea 4. indications referencing vave scans nation was s examinat	Y Pos 574.70" 574.05" ar wave cha ar wave cha ar wave cha as with the 0° Code secti . Geometri performed tion results	and sized Z Pos 3.17" 3.85" annel 13 ut annel 13 ut weld met ion. Geom ic indicatio from the F were revie	I in accord "S" 2.83" 2.53" ilizing the ilizing the al scans, 7 netric indic ns from th RPV outsid wed prior	Jance with T wall 30" .44" SPOT tech SPOT tech SPOT tech ations from e OD surfa le surface o to the comp Reviewer:	GE-UT-700 Length 2.75" 1.50" unique. This anique. This and 60° si the stabilizing were re- due to access pletion of the R.O.	T Meas T Meas 6.6" 6.6" 6.6" 6 indication a indication thear wave ther brackets corded with as restriction is examina	a/l .055 .147 was also was also scans that were re- the 45° ins. tion summ	T-701, Rev. 2 % a/t Calculated 2.27 3.33 b recorded with at were evaluated corded with the shear wave states mary.	2 with the % a/t Allowed 2.23 2.87 h 45° h 45° h 45° h 45° h 45° h 45° h 45° h 45°
perpen refracte The two results Ind. No. 16-075 16-076 Indication shear w Indication shear w The GE found to weld me No man Fabricat	d longitudir (2) unacc tabulated by Oriented circ. circ. circ. on 16-075 w rave channe on 16-076 w rave channe RIS 2000 a be accepta atal, 45° and ual supplem tion records	Type subsurface subsubsurface sub	x Pos 603.30" 617.50" h 60° shea 2. h 60° shea 4. indications referencing vave scans nation was s examinat	Y Pos 574.70" 574.05" ar wave cha ar wave cha ar wave cha ar wave cha ar wave cha ar wave cha ar of the of Code section code section performed tion results	and sized Z Pos 3.17" 3.85" annel 13 ut annel 13 ut weld met ion. Geom ic indicatio from the F were revie	I in accord "S" 2.83" 2.53" ilizing the ilizing the al scans, 7 netric indic ns from th RPV outsid wed prior GE F 3 LEVI	ance with T wall 30" .44" SPOT tech SPOT tech SPOT tech ations from e OD surfa to the comp Reviewer: EL: 72	GE-UT-700 Length 2.75" 1.50" anique. This anique. This anique. This a the stabilizing were re- due to access pletion of th	7 Meas T Meas 6.6" 6.	a/l 055 .147 was also was also scans that swere re- n the 45° ns. tion summ	T-701, Rev. 2 % a/t Calculated 2.27 3.33 or recorded with at were evalua corded with the shear wave so mary.	2 with the % a/t Allowed 2.23 2.87 $h 45^{\circ}$ $h 45^{\circ}$
perpen refracte The two results Ind. No. 16-075 16-076 Indication shear w Indication shear w The GE found to weld me No man Fabricat	d longitudir o (2) unacc tabulated bi Oriented circ. circ. on 16-075 w rave channe on 16-076 w rave channe on 16-075 w rave ch	Type subsurface subsur	x Pos 603.30" 617.50" h 60° shea 2. h 60° shea 4. indications referencing vave scans nation was s examinat	Y Pos 574.70" 574.70" 574.05" Tr wave chat with the 0° Code section code section performed tion results	and sized Z Pos 3.17" 3.85" annel 13 ut annel 13 ut weld met ion. Georr ic indicatio from the F were revie	I in accord "S" 2.83" 2.53" ilizing the al scans, 7 netric indic ns from th RPV outsid wed prior GE F 	fance with T wall .30" .44" SPOT tech SPOT tech SPOT tech SPOT tech constrome e OD surfa e Surface of to the comp Reviewer: EL: T Review:	GE-UT-700 Length 2.75" 1.50" anique. This anique. This anique. This a the stabiliz the stabiliz the wre re due to access pletion of th	7 Meas T Meas 6.6" 6.	a/l 055 .147 was also was also scans that swere re- the 45° ins. tion summ	T-701, Rev. 2 % a/t Calculated 2.27 3.33 b recorded with at were evaluated corded with the shear wave states mary.	2 with the % a/t Allowed 2.23 2.87 h 45° h 45° h 45° h 45° ated and te 0° scans. 70-73

.

* 20035





适调 直接 自由的 自己 n na hara sa

GE N	luclear Energy	<i>GERIS 2000 Examination Summary Sheet</i>
Project: TVA, Browns	Ferry Nuclear Plant, Unit 3	
System: Reactor Press	sure Vessel	
Weld ID: C-5-FLG		ASME Code Category: B-A
Calibration Sheets:	C-001, C-104, C-107, C-1	108 and C-109
Supporting Data:	Examination Data Sheets Indication Evaluation Sheet Setup Records and Manua	E-20-00 and E-20-12, Indication Data Sheets 20-001 thru 20-110, G-115 and G-116, ets, Screen Prints, Exam Patch Location Map, Exam Coverage Plots, GERIS 2000 al Examination Data Sheets D-001, D-002, D-007, D-008, D-009 and D-010.
	Ex	amination Summary
The ultrasonic examinat ASME Section XI, 1986	on of weld C-5-FLG resulted in Edition, No Addenda.	five (5) recorded indications that exceed the allowable standards of IWB-3500,
ASME Section XI, 1986 The ASME Section XI re Procedure No. GE-UT-7 Main Steam plug lines a	Edition, No Addenda. quired examination volume wa 00. Rev. 2. This examination w t 74°, 110°, 250°, and 286°. A	s examined with the GERIS 2000 System from the RPV inside surface utilizing vas limited due to a clad patch at 30°, the Guide Rods at 0° and 180° and four (4) reas that could not be examined using the GERIS 2000 and accessible from the

was calculated to be 82%. 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 five (5) unacceptable indications were recorded and sized in accordance with GE-UT-700, Rev. 2 and GE-UT-701, Rev. 2 with the results tabulated below:

Ind. No.	Oriented	Туре	X Pos	Y Pos	Z Pos	"S"	T wall	Length	T Meas	a/i	% a/t Calculated	% a/t Allowed
20-007	circ.	subsurface	83.90"	706.42"	1.01"	.82"	.40"	3.25"	6.54"	.061	3.05	2.27
20-008	circ.	subsurface	88.40"	706.44"	1.02"	.83"	.39"	1.50"	6.55"	.130	2.98	2.74
20-009	circ.	subsurface	95.90"	706.44"	1.03"	.84"	.38"	2.25"	6.59"	.085	2.91	2.41
20-011	circ.	subsurface	100.90"	706.37"	1.23"	1.04"	.39"	1.75"	6.62"	.111	2.92	2.58
20-012	circ.	subsurface	116.90"	706.40"	1.14"	.95"	.48"	1.50"	6.87"	.159	3.47	2.97

Indication 20-007 was sized with the 70°RL channel 3 utilizing the PATT technique. This indication was also recorded with 70°RL channel 5 as 20-016.

Indication 20-008 was sized with the 70°RL channel 3 utilizing the PATT technique. This indication was also recorded with 45° shear wave channel 7 as 20-022.

Indication 20-009 was sized with the 70°RL channel 3 utilizing the PATT technique. This indication was also recorded with 70°RL channel 5 as 20-017, 45° shear wave channels 7 as 20-023 and 9 as 20-027.

Indication 20-011 was sized with the 70°RL channel 3 utilizing the PATT technique. This indication was also recorded with 70°RL channel 5 as 20-018

GERIS Analyst: Oluba (imba	ll	GE Reviewer	
EVEL: TT DATE:	12-21-93	LEVEL: THE	DATE: 12/21/93
UTILITY Review:		ANII Review:	
TITLE: DATE:		TITLE:	DATE:

Page 1 of 2

-1676A-05 2082/15/94

GERIS 2000 Examination Summary

(Continuation)

Indication 20-012 was sized with the 70°RL channel 3 utilizing the PATT technique. This indication was also recorded with 45° shear wave channel 7 as 20-024.

The GERIS 2000 also recorded indications with the 0° weld metal scans, 70°RL, 45° and 60° shear wave scans that were evaluated and found to be acceptable per the referencing Code section. Geometric indications from the flange radius were recorded with the 45° and 60° shear wave scans.

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 materials.

No indications were recorded with the manual technique.

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

ę 706" 70'RL 70 RL Indication No. 20-007 Flaw "X" location Flaw "Y" location 83.90" 706.42" .399" 3.25" 6.54" Nominal Clad T = 3/16"Flaw Thruwali Flaw Length "T" Measured Nominal Base Metal $T = 6 3/8^{\circ}$ This indication confirmed with Channel 5 • 00000 Ś 57 GE NUCLEAR ENERGY **BROWNS FERRY UNIT 3** WELD C-5-FLG INDICATION 20-007 SCALE: NONE DWG. BF3C5FI REV. O



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

Indication No. 20–008 Flaw "X" location 88.40" Flaw "Y" location 706.44" Flaw Thruwall .39" Flaw Length 1.50" "T" Measured 6.55"

This indication confirmed with Channel 7

ті. 25.

AC.

#3

C7LA-05

GE NUCLEAR ENERGY	BROWNS FERRY UNIT 3	WELD C-5-FLG INDICATION 20-008	SCALE: NONE	DWG. BF3C5FI	REV. O

GE	NUCLEAR ENERGY	BROWNS FERRY UNIT	3 WELD C-5-FI	LG INDICATION 20-009	SCALE: NONE DWG. BF30	SFI REV. O
• •						108 12
•.	- 	· · · · ·		1.		生きた
	•					Je le
						2
		· · ·			This indication confirmed with	Ch. 5, Ch. 7 and Ch. 9
1	Nominal Clad T = 3/16" Nominal Base Metal T = 6 3/8"	· · · · · ·			Flow " location 706.44" Flow Thruwoll .383" Flow Length 2.30" "1" Measured 6.50"	· · ·
	· · · ·				Indication No. 20-009	
				1		
	• •					
		· · · · · · · · · · · · · · · · · · ·				
				i \		
				H .		
-	· · · · · · · · · · · · · · · · · · ·	······	70'RL	 	· · · ·	
	· · · ·		7	(بر ۵۵۰		
						-



•

					<u> </u>		5
				,			Je of
				· · · ·			look.
· ·			•		This ind	ication confirmed with Channel	7
	Nominal Clad T = 3/16" Nominal Base Metal T = 6	6 3/8"			Indica Flaw "X Flaw "Y Flaw Tr Flaw Le "1" Met	tion No. 20–012 " location 116.90" " location 708.40" ruwall .477" ngth 1.50" isured 6.87"	
•							
	· <u> </u>				· · ·		
		· · ·				·	

چ 706