

Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

May 25, 2012

10 CFR 50.4 10 CFR 50.55a

ATTN: Document Control Desk U.S. Nuclear Regulatory Commission Washington, D.C. 20555-0001

> Browns Ferry Nuclear Plant, Unit 2 Facility Operating License No. DPR-52 NRC Docket No. 50-260

- Subject: American Society of Mechanical Engineers, Section XI Code, Inservice Inspection Program for the Unit 2 Third Ten-Year Inspection Interval, Request for Relief 2-ISI-29
- Reference: Letter from the Tennessee Valley Authority to the Nuclear Regulatory Commission, "American Society of Mechanical Engineers Section XI, Inservice Inspection, System Pressure Test, Containment Inspection, and Repair and Replacement Programs – Owner's Activity Report for Cycle 16 Operation," dated July 6, 2011

In accordance with 10 CFR 50.55a(g)(5)(iii), the Tennessee Valley Authority (TVA) is requesting relief from weld examination coverage requirements specified in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 1995 Edition, 1996 Addenda as amended by 10 CFR 50.55a(b)(2)(xv)(A)(2), for three (3) full penetration austenitic stainless piping welds and one (1) full penetration dissimilar metal piping weld, due to access limitations caused by design. This relief is requested for the Browns Ferry Nuclear Plant (BFN) Unit 2 third Ten-Year Inspection Interval which began May 25, 2001 and ended May 24, 2011.

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Specifically, this request for relief addresses two Reactor Water Cleanup (RWCU) System full penetration piping welds, one Residual Heat Removal (RHR) System full penetration piping weld, and one Recirculation (RECIRC) System full penetration piping weld. The enclosure to this letter contains BFN Unit 2, Request for Relief 2-ISI-29, for NRC review and approval.

This request for relief is similar to, and consistent with the following BFN requests for relief: 1) Unit 3 request for relief 3-ISI-22 submitted by TVA letter dated August 24, 2007 and approved by NRC letter dated May 20, 2008: 2) Unit 2 request for relief 2-ISI-18 submitted by TVA letters dated June 2, and December 16, 2003, and approved by NRC letter dated April 12, 2004; and 3) Unit 3 request for relief 3-ISI-25 submitted by TVA letters dated June 21, July 18, and November 9, 2011, and approved by NRC letter dated January 20, 2012.

There are no new regulatory commitments contained in this letter. If you have any questions, please contact Tom Hess at (423) 751-3487.

Respectfully,

Månager, Corporate Nuclear Licensing

Enclosure: Browns Ferry Nuclear Plant, Unit 2, American Society of Mechanical Engineers, Section XI Code Inservice Inspection Program, third Ten-Year Inspection Interval, Request for Relief 2-ISI-29

cc (Enclosure):

NRC Regional Administrator - Region II NRC Senior Resident Inspector - Browns Ferry Nuclear Plant

Enclosure

Tennessee Valley Authority Browns Ferry Nuclear Plant Unit 2

American Society of Mechanical Engineers, Section XI Code Inservice Inspection Program, Third Ten-Year Inspection Interval

Request for Relief 2-ISI-29

(See Attached)

Enclosure

Tennessee Valley Authority Browns Ferry Nuclear Plant Unit 2

American Society of Mechanical Engineers, Section XI Code Inservice Inspection Program, Third Ten-Year Inspection Interval

Request for Relief 2-ISI-29

Executive Summary: In accordance with 10 CFR 50.55a(g)(5)(iii), the Tennessee Valley Authority (TVA) is requesting relief from weld examination coverage requirements specified in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 1995 Edition, 1996 Addenda as amended by 10 CFR 50.55a(b)(2)(xv)(A)(2), for three (3) full penetration austenitic stainless piping welds and one (1) full penetration dissimilar metal piping weld, due to access limitations caused by design.

Ultrasonic examinations were performed on the subject welds to the maximum extent practical, within the limitations of design, geometry and materials of construction of the components; using the latest ultrasonic techniques, procedures, equipment, and personnel qualified to the requirements of the Performance Demonstration Initiative (PDI) Program in accordance with 10 CFR 50.55a(g)(4) and 10 CFR 50.55a(g)(6)(ii)(C). 10 CFR 50.55a(b)(2)(xv)(A)(2), states, "Where examination from both sides is not possible on austenitic or dissimilar metal welds, full coverage credit from a single side may be claimed only after completing a successful single sided Appendix VIII demonstration using flaw on the opposite side of the weld." There is currently no single sided Appendix VIII Program for austenitic stainless welds. However, a single sided program has been established for dissimilar metal welds. This information was considered during the determination of credit for the ultrasonic examination coverage of the components included in this request for relief. The coverage credit ranges from 50.0 percent to 85.5 percent, as detailed in this request.

This relief is requested for the Browns Ferry Nuclear Plant (BFN) Unit 2 third Ten-Year Inspection Interval which began May 25, 2001 and ended May 24, 2011

Unit: Browns Ferry Nuclear Plant, Unit 2

ASME Code Components Affected: Four (4) Full penetration Piping Welds

(2) Reactor Water Cleanup (RWCU) System full penetration piping welds,

(1) Residual Heat Removal (RHR) System full penetration piping weld, and

(1) Recirculation (RECIRC) System full penetration piping weld.

ASME Code Class: ASME Code Class 1

<u>Section XI Edition</u>: 1995 Edition, 1996 Addenda. Additionally, for ultrasonic examinations, 2001 Edition of Section XI, Appendix VIII, "Performance Demonstration for Ultrasonic Examination System,"

Code Table: Code Case N-577, N-577-2500 Table 1 and IWB-2500-1

<u>Code Examination Category</u>: R-A, Risk-Informed Piping Examinations and B-J, Pressure Retaining Welds in Piping

<u>Code Examination Item Number</u>: R1.16, Elements Subject to Intergranular Stress Corrosion Cracking (IGSCC)

<u>Code Requirement</u>: Code Case N-577, N-577-2500, Table 1 Examination Category R1.16, requires volumetric examination of 100 percent of the weld and adjacent base material as depicted in Figure IWB-2500-8(c).

List of Components Associated with this Request for Relief:

- For RWCU System weld RWCU-2-003-070 (U2C16, Inservice Inspection), only 85.5 percent coverage can be claimed. The weld joint is configured as a Pipe to Weld-O-Let, which limits the access in a portion of the upstream inspection volume for the Clockwise and Counter-Clockwise (Circumferential) scanning directions.
- For RWCU System weld RCRD-2-50 (U2C16 Inservice Inspection), only 53.4 percent coverage can be claimed. The weld joint is configured as a carbon steel Elbow to forged stainless steel Valve (dissimilar metal weld). The weld width and joint configuration contributed to reduced coverage. Six inches of the weld in the elbow inner radius could not be scanned in the axial direction with the RL transducers due to bridging, though the shear wave transducers were not impeded by the elbow radius. Both the RL and shear wave transducers were limited in the circumferential scanning direction, due to the taper in the valve configuration.
- For RHR System weld DRHR-2-03 (U2C16 Inservice Inspection), only 50.0 percent coverage can be claimed. The reduced coverage is attributed to joint geometry and product form. The joint configuration is penetration Flued Head to cast Valve. The examination was conducted from two sides. However, the qualified portion of this examination was limited to a single side, due to the opposite side of the weld being a casting. The portion of the weld on the IGSCC susceptible side was interrogated with the qualified techniques. Since the opposite side of the weld was a casting, the techniques used to interrogate this portion of the weld were not qualified. Further, the techniques intended to aid the examination in this limited condition were not performed. Thus, the examination of this weld is considered incomplete (Reference PER 443133).
- For RECIRC System weld GR-2-09 (U2C16 Inservice Inspection), only 75 percent coverage can be claimed. The weld joint is configured as Pipe to Branch Connection (Tee). The joint geometry prevents using a bi-directional coverage technique in the axial direction, due to inside and outside diameter (ID/OD) non-parallel surfaces (reference: PDI-UT-2, Revision C, paragraph 1.8b). Clockwise and Counter-Clockwise (Circumferential) examinations were not impeded.

<u>Reason for Request</u>: The design configurations of the listed welds preclude a UT examination of essentially 100 percent of the required volume. In the case of RECIRC System weld GR-2-09, it is not possible to perform the volumetric ultrasonic examination from both sides of the weld, in the axial scan direction, due to the configuration of these components. 10 CFR 50.55a(b)(2)(xv)(A)(2) states, "Where examination from both sides is not possible on austenitic welds or dissimilar metal welds, full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix VIII demonstration using flaws on the opposite side of the weld." The component design configuration limits UT examination coverage of the welds to the percentages shown in Table 1. Therefore, only the stated coverage ranging from 50.0 to 85.5 percent can be claimed for these welds.

Proposed Alternative and Basis for Use: None. In lieu of the ASME Section XI Code required essentially 100 percent volumetric ultrasonic examination, TVA proposes credit for ultrasonic examination of accessible areas to the maximum extent practical given the component design configuration of the aforementioned piping welds.

Basis For Relief:

The welds were examined with the latest ultrasonic techniques, procedures, equipment, and personnel qualified to the requirements of the Performance Demonstration Initiative (PDI) Program, in accordance with the requirements of the 1995 Edition, 1996 Addenda, as amended by 10CFR 50.55a(b)(2)(xv)(A) and 10 CFR 50.55a(b)(2)(xxiv), of ASME Section XI, Division 1, Appendix VIII as mandated by 10 CFR50.55a(g)(4). These examinations were of the accessible areas to the maximum extent practical due to the design configuration of the weld joints.

These examinations provided an acceptable level of quality and safety because the information and data obtained provides sufficient information to judge the overall integrity of the piping welds.

Therefore, pursuant to 10 CFR 50.55a(g)(5)(iii), TVA requests that relief be granted for the BFN Unit 2 third Ten-Year ISI inspection interval.

Implementation Schedule:

This request for relief is applicable to the BFN Unit 2 third Ten-Year ISI inspection interval which began May 25, 2001 and ended May 24, 2011. The welds described above are listed in the Table of this enclosure. The welds were examined during the third period (Cycle 16 - Spring 2011) of the third Ten-Year inspection interval.

Precedent:

This request for relief is similar to, and consistent with the following BFN requests for relief: 1) Unit 3 request for relief 3-ISI-22 submitted by TVA letter dated August 24, 2007 and approved by NRC letter dated May 20, 2008; 2) Unit 2 request for relief 2-ISI-18 submitted by TVA letters dated June 2, and December 16, 2003, and approved by NRC letter dated April 12, 2004; and 3) Unit 3 request for relief 3-ISI-25 submitted by TVA letters dated January 21, July 18, and November 9, 2011, and approved by NRC letter dated January 20, 2012.

Attachments:

Inservice Inspection Drawings (Attachment A):

2-ISI-0221-C-01 2-ISI-0270-C-01 2-ISI-0272-C-01

Weld Examination Data Reports (Attachment B):

Examination Report UT-11-019 - RWCU-2-003-070 (Cycle16) Examination Report UT-11-043 - RCRD-2-50 (Cycle16) Examination Report UT-11-032 - RHR System: DRHR-2-03 (Cycle16) Examination Report UT-11-023 - RECIRC System: GR-2-09 (Cycle16)

Attachment A

Inservice Inspection Drawings

2-ISI-0221-C-01 2-ISI-0270-C-01 2-ISI-0272-C-01

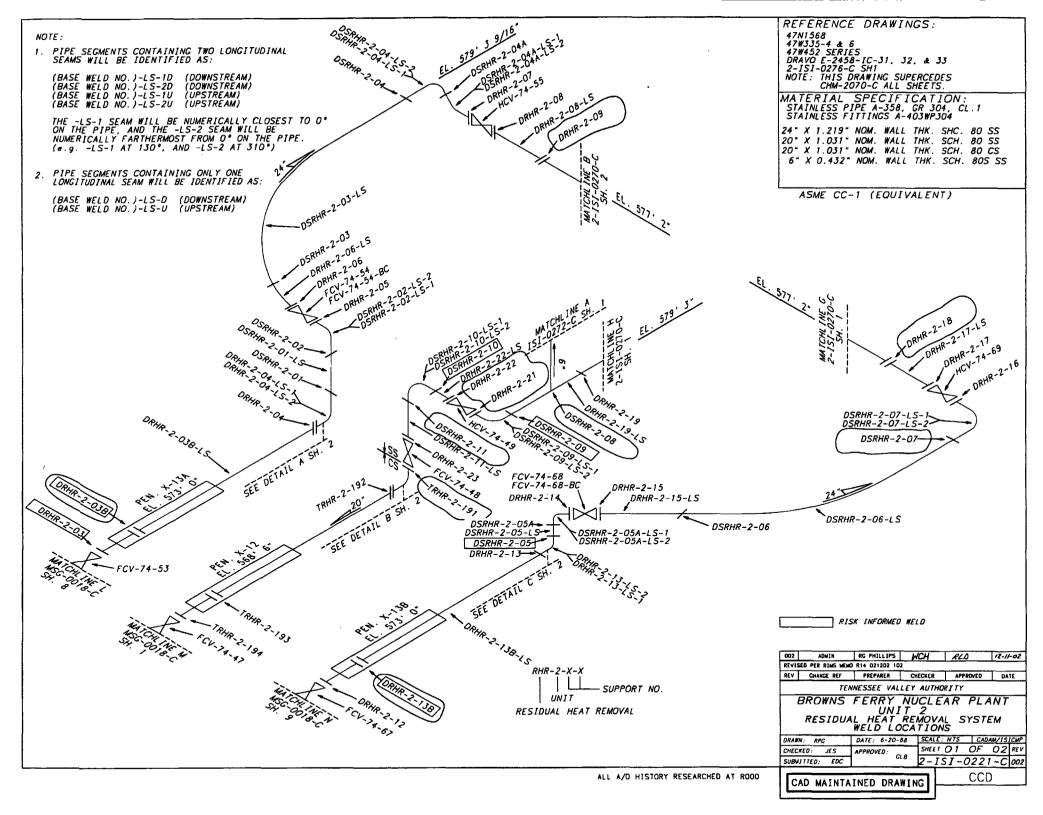
Table

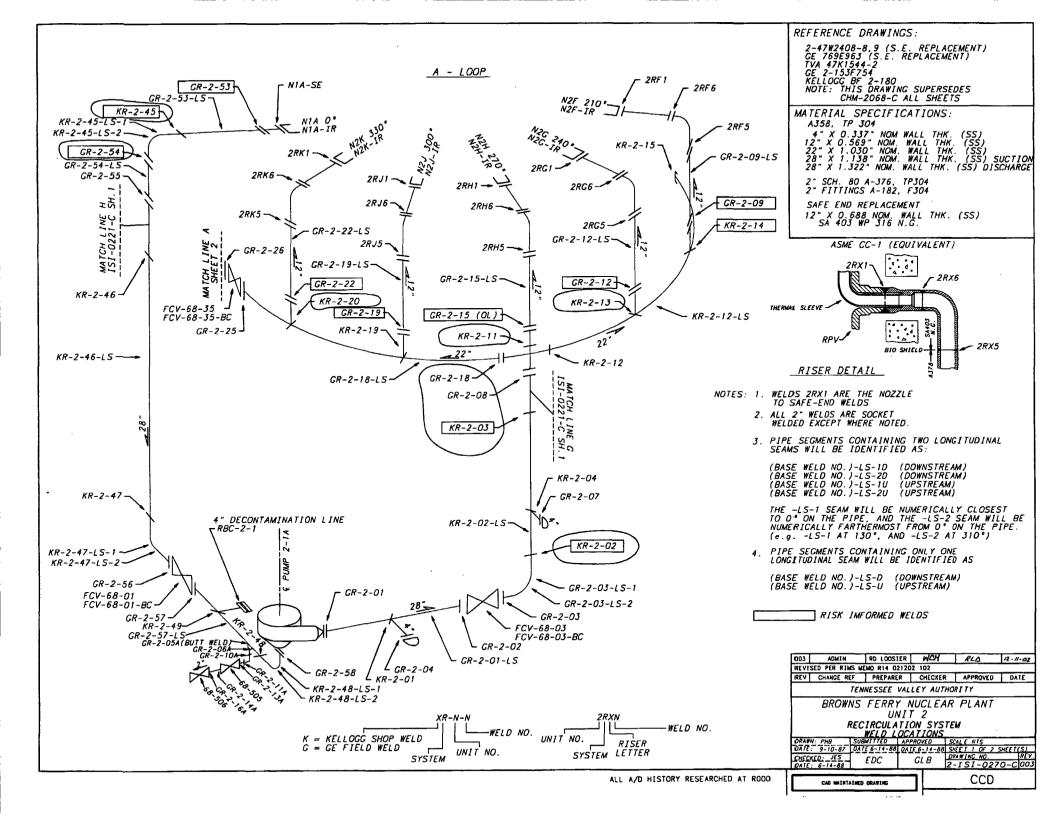
Weld Number / (System)	Nominal Pipe Size (NPS)	ISI Drawing Number	Examination Coverage Percent	Unit / Cycle Inspection Performed	Comments
RWCU-2-003-070 (Reactor Water Cleanup System)	6"	2-ISI-0272-C	85.5%	2 / 16 (Spring 2011)	Limitations due to component configuration, Weld-O-let to pipe, which limits the access in a portion of the upstream inspection volume for the Clockwise and Counter-Clockwise (Circumferential) scanning directions. Therefore, only 85.5% coverage can be claimed.
RCRD-2-50 (Reactor Water Cleanup System)	4"	2-1SI-0272-C	53.4%	2 / 16 (Spring 2011)	The weld joint is configured as a carbon steel Elbow to forged stainless steel Valve (dissimilar metal weld). The weld width and joint configuration contributed to reduced coverage. Six inches of the weld in the elbow inner radius could not be scanned in the axial direction with the RL transducers due to bridging, though the shear wave transducers were not impeded by the elbow radius. Both the RL and shear wave transducers were limited in the circumferential scanning direction, due to the taper in the valve configuration. Therefore, only 53.4% coverage can be claimed.

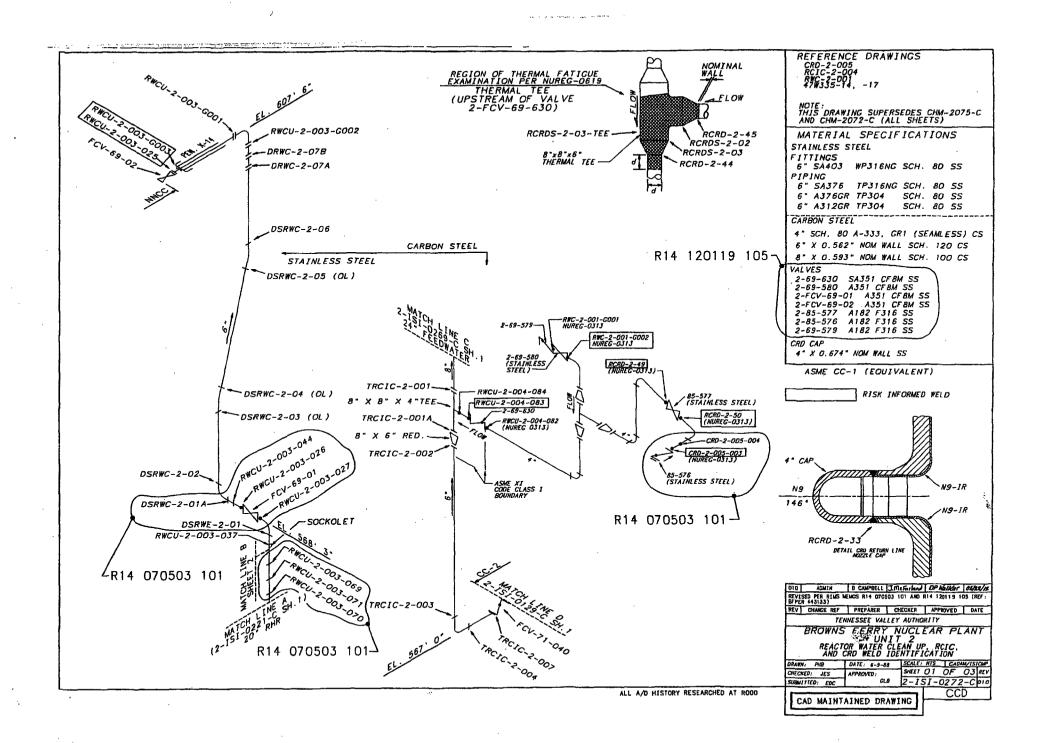
Table (cont.)

Weld Number / (System)	Nominal Pipe Size (NPS)	ISI Drawing Number	Examination Coverage Percent	Unit / Cycle	Comments
DRHR-2-03 (Residual Heat Removal System)	24"	2-ISI-0221-C-01	50.0%	2 / 16 (Spring 2011)	Limitations due to component configuration, flued head to cast valve. At this time there is no Appendix VIII Supplement for the examination of cast austenitic stainless steel. Therefore, the qualified portion of this examination was limited to a single side. The portion of the weld on the IGSCC susceptible side was interrogated with the qualified techniques. Since the opposite side of the weld was a casting, the techniques used to interrogate this portion of the weld were not qualified. Further, the techniques intended to aid the examination in this limited condition were not performed. Thus, the examination of this weld is considered incomplete (Reference PER 443133). Therefore, only 50.0% coverage of the code required volume can be claimed.
GR-2-09 (Recirculation System)	12"	2-ISI-0270-C	75%	2 / 16 (Spring 2011)	Limitations due to configuration, Pipe to Branch Connection. The requirement in 10 CFR 50.55a(b)(2)(xv)(A)(2), which requires UT of one side of austenitic welds to be qualified to Appendix VIII Program to claim full Code coverage. At the time of the examination, there was no Appendix VIII Program for single sided austenitic welds. Therefore, only 75% coverage can be claimed.

E-7







Attachment B

Examination Report UT-11-019 - RWCU-2-003-070 Examination Report UT-11-043 - RCRD-2-50 Examination Report UT-11-032 - RHR System: DRHR-2-03 Examination Report UT-11-023 - RECIRC System: GR-2-09

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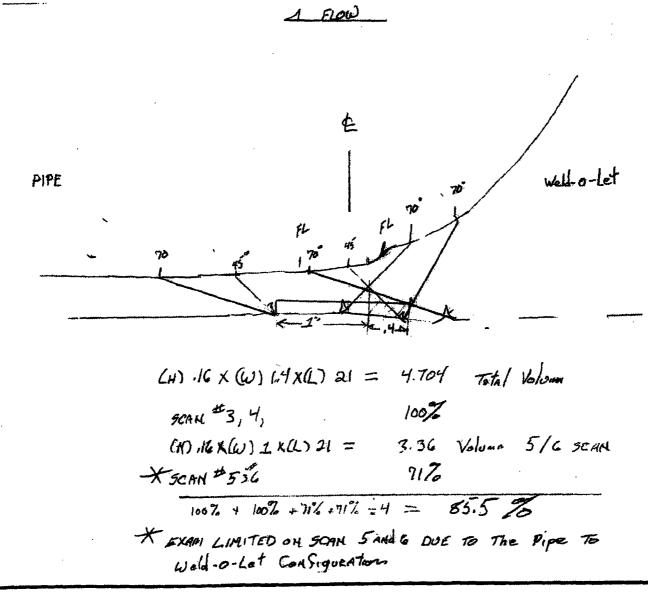
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		Sup	plerr	nental Rep	oort	0	00;	374
					Report No.:	<u> </u>	T-11-0	19
					Page:	4	of	5
Summary No.:	01859-ISI-BFN2				MATT WELCH LET		- ,	
Examiner:	Kleinjan, Michael W.	Hak Kly Evel:	11(N)	Reviewer:	MATT WELCH LTT	Date:	<u> 3/16</u>	11
Examiner:	N/A	Level:	N/A	Site Review:		Date:		
Other:	N/A	Level:	<u>N/A</u>	ANII Review:	_ Jonen Hoge Alege	Date:	<u>s 120/1</u>	<u>'a</u>
						·		

Comments: None

Sketch or Photo: O:\/ddeai_Server\/Iddeai_BFN\Documentation\U2R16 Scanned Data\RWCU-2-003-070 Coverage Plot.jpg



Supplemental Report

		Sur	plem	ental Rep	ort		00037
		•	-			Report No.:	UT-11-019
					14	Page:	5 of 5
Jummary No.: 01						Tulkel	
Examiner: Kle	ainjan, Michael W.	Unit, fly Eevet				4 LTE	
Examiner: N/			<u>N/A</u>				Date:
Other: <u>N/</u>	A	Level	<u>N/A</u>	ANII Review:	- Jun Nag	e Maya	Date: <u>\$/20/11</u>
Comments:	None						
	1		4	18 Separad Data	BWC11 0 000 070 1		
Sketch of Photo:	0:\lddeal_Server\ldde	al_BFN\Documenta		10 Stanned Data	NW00-2-003-070	r ac·lhâ	~
Record Thickness Indicated, Includi	s Measurements As		•		Weld Centerline		• Weld Edg
Edge-To-Edge At	0-			2.5"		**************************************	
Position 0	90" 180" 270		1	2	3	4	5
	6 /	11 7		1			5
2 18		11 }	81	de			- Side
3 H] }		_			~ }
.4					Flow		
5 4	의/						
CROWN HEIGHT		SH		DIAMETER:		6	· · · · · · · · · · · · · · · · · · ·
CROWN WIDTH:	19			. WELD LEN	QTH:	21	
<u></u>					· · · · · ·		د. مربع
			1 1	-LOW			مس در ج ح
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PIP)E			et.		Weld-0-	lat
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	- Antonia and a support fragmant and a support of the support of the support			and a second	e		
المب							
Supplemental Report	rt						

			U	Calibratio	r kar	ninatio	n					•	
	Site/Unit:	BFN /	2		Proc	edure:		N-UT-82			Outage I	io.: (J2RF16
	Summary No.:	05510-	ISI-BFN2		Procedure	Rev.:		4		-	Report N	la.: U	T-11-043
	Workscope:		SI ·		Work Orde	ar No.:		2- SI-4.6 .G		_	Pa	ge: <u>1</u>	of 8
Code:	Section XI 1995	Ed/1998 Add	(Cat./Item:	R-A/R1.16	D	L	ocation:	R	eactor Bui	iding, Main S	iteam Tun	nel
Drawing No.:	2-1	SI-0272-C-01		Description:	EL - VLV								·
System ID:	069 - Reactor Water Cl	eanup System											
Component ID:	RCRD-2-50						Size/Lo	ength:	N/A		Thickness/Dia	meter	0.531 / 4"
Limitations:	None		· · ·					Start	Time:	2245	Finist	Time:	2255
	Instrument Settings			Search Unit		Cal.	Time	Date		Axial	Orientated S	earch Unit	
Serial No.:	E37688		Serial No.:			Checks Initial Cal.	↓	· · · · · ·	Calibi		Signal	Sweep	Sound Path
Manufacturer:	KRAUTKR		Manufacturer:			Inter. Cal.	2100 N/A	3/16/2011	Refle		mplitude %	Division	
	N 60 Linearity:	L-11-002	· <u> </u>	<u>Bmm)</u> Model:	CSS	Inter. Cal.	N/A		0.6 9		80%	5.3	1.05"
Delay: M'ti Cal/Vei:		inge: <u>2.000</u> ergy: High	Freq.: 2.0 MH		<u>N/A</u>	Inter. Cal.	N/A		<u>├</u> -				<u> </u>
Damping:		iject: 0	Exam Angle:	60° Squint Ang		Final Cal.	0027	3/17/2011					
PRF Mode:		req.: 2.0 MHz	_ Measured Angle	e: Mode: 4 / .68 # of Elem	Long	•	Couplant	t					<u> </u>
Disp. Start:		ctify: Full Wave		SBS Focus:	FS~17	- Cal. Batch:		6125			ential Orlent	ited Searc	h Unit
Inst. Freq.:	2.0 MHz	·	· · ·	ect Contour:	6" Ax	. Type: Mfg.:	Ultrag Sonol		Calibi Refie		Signal mplitude %	Sweep Division	Sound Path
			Wedge Style:	Integral		• Exam Bato			N	A	N/A	N/A	N/A
Ax. Gain (dB):	63.0 Circ. Gai	n (dB): <u>N/A</u>	S	earch Unit Cable		Туре:	Ultrag						
1 Screen D)iv. = .20 in. of	Sound Path	Type: RG-174	Length: 6' No	. Conn.: 0	Mfg.:	Sonot						
	Calibration Block			Scan Coverage		-			<u>├</u>	Refe	rence/Simula	tor Block	1
Cal. Block No.:			•	Downstream Sca			ference B		Gain		Signal	Sweep	Sound Path
Thickness:			⊂w 🗌	CCW Sca	n dB: <u>N/A</u>	Serial No.: Type:	Cai B	F-131	dB		Amplitude %	1	
•	.: 70° Temp. Tool:	558272	Exam Surface:	••••••		·)po.			63.0	0.6 SDH	80%	5.3	1.05"
Recordable in	Temp, Tool: dication(s): Yes	558272 No 🔽	Surface Condition	·····									
Results:			fo 📋	thed Ultrasonic Indic	ation report		Cor	nments: E37		Due Date 1 Due Date 1			
Percent Of Cov	versoe Obtained > 90%:		Reviewed Previo	ous Data [.]	(es				% Code				
Examiner Brown, Thom	Level III(N) as D.	J 7	gnature B	L 3/17/2	Date Review	ver Veich, Lili			Űld	<u>Signatu</u>		- 3	Date 23/11
Examiner	Level N/A		gnature	C	Date Site Re		<u></u>			Signatu	 Ine	<i>L</i>	Date
N/A Other	lovol		an church		N/A Date ANII R					Ginert			
Other N/A	Level N/A	8	ignature	L	Date ANII R	eview			No	Signatu	ile .	41	Date 3/1/
						······		A ler	Ha	К	<u></u>		

alibration/i=xamination

			ι	JT Calibra	atior x	aminatio	n						". 1
	Site/Unit:	BFN	/ 2		P	rocedure:		N-UT-82			Outage I	No.:	J2RF16
	Summary No.:	055	10-ISI-BFN2		Proces	ure Rev.:		4		_	Report 1	No.: V	T-11-043
	Workscope:		ISI		Work C	Order No.:		2-81-4.6.G		-	Pa	ige: 2	of 8
Code:	Section XI 1995 E	d/1996 Add		Cat./Item:	R-A/R1	.16D		Location:	R	eactor Bu	Ilding, Main S	Steam Tun	nel
Drawing No.:	2-151	-0272-C-01		Descrip	tion: EL - VL	/							
System ID:	069 - Reactor Water Clea	anup System							_				
Component ID:	RCRD-2-50						Size/l	.ength:	N/A		Thickness/Di	ameter	0.531 / 4"
Limitations:	None	· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·			Star	t Time:	2235	Finis	h Time:	2245
	Instrument Settings			Search Unit		Cal.	Time	Date		Axia	Orientated S	learch Unii	
Serial No.:	E37688		Serial No.:	U01	10	Checks	111110		Calibr	ation	Signal	Sweep	Sound Path
Manufacturer:	KRAUTKRAN		Manufacturer		sonics	Initial Cal.	2050 N/A	3/16/2011	Refie		Amplitude %	Division	<u> </u>
	N 60 Linearity:	L-11-002	Size:2 (10)			Inter. Cal.	N/A		0.6 5	Н	80%	5.6	1.118"
	8.3669µ Rang		Freq.: 2.0			Inter, Cal.	N/A						╂────┤
M'ti Cal/Vei:	.2330 Energ		Exam Angle:		it Angle:	- Final Cal.	0025	3/17/2011					╂────┥
	1000 Ω Reje Auto High SU Fre	·	Measured An		de: Long		Couplar	nt					+
Disp. Start:		fy: Full Way			Elements:	Cal. Batch	:	06125		Circumfe	rential Orient	ated Searc	h Unit
· · · · · · · · · · · · · · · · · · ·	2.0 MHz		Coung	D-SBS Foo		— Туре:	Ultra	gei II	Calibr		Signal	Sweep	Sound Path
			Shape:	Rect Conto	·	Mfg.:	Sond	otech	. Refle	ctor /	Amplitude %	Division	·}
Ax. Gain (dB);	70.0 Circ. Gain	(dB): N/A	Wedge Style:	Search Unit Ca	egral	Exam Bate	ch:	06125	N/	<u>A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
1 Screen Div	iv, = .20 in. of	Sound Path	Type [,] RG.1	74 Length: 6		o Type:	Ultra	gel II	[+			┿╍╍╼╴┨
	Calibration Block			Scan Coverag	-	Mfg.:	Sono	otech	.				+
Cal. Block No.:	BF-131		Upstream	Downstream		n Rei	ference	Block		Ref	erence/Simul	ator Block	
Thickness: 0.	.6" SDH Dia.:	4"		CCW []		· · · · · ·		3F-131	Gain dB	Reflecto	Signal r Amplitude 9	Sweep 6 Division	Sound Path
Cal. Bik. Temp.:	70° Temp. Tool:	558272	Exam Surface		OD	Туре:	Cal	Block	70.0	0.6 SDH		5.6	1.118"
Comp. Temp.:	78° Temp. Tool:	558272	Surface Cond		Flush								
Recordable indi	lication(s): Yes	No 🖌		tached Ultrasonic		port.)							
Results:			info 📋				Ca	omments: E					
Percent Of Cove	erage Obtained > 90%:	No	Reviewed Pr	evious Data:	Yes				3.4% Code		e 1/29/2012 e		
Examiner	Level III(N)		Signature		Date R	eviewer			11	Signat	ture	/ _	Date
Brown, Thomas	is D.	don.	D Dem	<u> </u>	3/17/2011 M	att Welch, Lili			M	au	Ull	<u> </u>	(3/11
Examiner	Level N/A	1	Signature			te Review				Signa	ture		Date
N/A	<u></u>				N			<u></u>		}			
					6 - i - i - A i	III Charlesteres				/ Signal	11100		Date
Other N/A	Level N/A		Signature	•	Date Al	III Review				Hu	_		

	en e		UT Calibra	ation	xaminatio	n						 }
	Site/Unit:	BFN /	2	I	Procedure:		N-UT-82			Outage I	ło.: (U2RF16
	Summary No.:	05510	ISI-BFN2	Proce	edure Rev.:		4			Report I	ło.: U	T-11-043
	Workscope:		181	Work	Order No.:		2-81-4.6.G	· · · · · · · · · · · · · · · · · · ·	-	Pa	ge: <u>3</u>	of 8
Code:	Section XI 1995	Ed/1996 Add	Cat./item:	R-A/R	1.16D	_	Location:	R	eactor Bui	ilding, Main S	iteam Tun	nei
Drawing No.:	2-15	I-0272-C-01	Descri	ption: EL - VL	LV							
System ID:	069 - Reactor Water Cie	anup System										
Component ID:	RCRD-2-50	······································				Size/	Length:	N/A		Thickness/Dia	ameter.	0.531 / 4"
Limitations:	None				······		Start	Time:	2325	Finist	Time:	2335
	Instrument Settings		Search Unit		Cal.	Time	Date		Axiai	Orientated S	earch Unit	
Serial No.:	E37688		Serial No.: U02	270	Checks			Calibr		Signal	Sweep	·
Manufacturer:	KRAUTKRA	MER	Manufacturer: Mega	sonics	Initial Cal.	2130	3/18/2011	Refie		mplitude %	Division	Sound Path
Model: US	IN 60 Linearity:	L-11-002	Size: 2 (4x14mm) Mod	el: <u>CSS</u>	Inter. Cal.	N/A N/A		N/	A	N/A	N/A	N/A
Delay:	9.0675µ Ran	ge: <u>1.000</u>	Freq.: 2.0 MHz Center i	Freq.: N/A	Inter. Cal.	N/A		ļ				· · · · · · · · · · · · · · · · · · ·
M'ti Cal/Vel:	.2330 Ener	gy: High	Exam Angle: <u>42°</u> Squir	nt Angle: N	/A Final Cal.	0033	3/17/2011				·	·
Damping:	1000 Ω Rej		Measured Angle: 42* Mo	de: Long				<u> </u>	<u> </u>		- <u></u>	
	Auto High SU Fr		Exit Point: .34 / .36 # of	f Elements:	2	Couplai				ential Orlenta	tod Board	
Disp. Start:	IP Rec	lify: Full Wave	Config.: D-SBS For	cus: F8~1	Cal. Batch:		06125 Igel II	ļ				1
Inst. Freq.:	2.0 MHz		Shape: Rect Conto	our: 6" Cin	Type: Mfg.:	Sono		Calibi Refle		Signal Mitude %	Sweep Division	Sound Path
Ax. Gain (dB):	56.5 Circ. Gain	(dB): N/A		tegral	Exam Batc		06125	0.5	SDH	80%	6.7	.687**
• •		Sound Path	- Search Unit Ca		Type:		igei lì	 			·	
Screen U	Div. = <u>.10</u> in. of		Type: RG-174 Length: 6	No. Conn.	: 0 Mfg.:		otech	 				- <u></u>
Col. Block No.	Calibration Block		Scan Covera	-				<u>}</u>	 Rofe	erence/Simula	ator Block	
Cal. Block No.: Thickness:	والمستعدين والمستجد والمستعد والمتحد والمستعدية فيستعد وأدر	4"	Upstream Downstream			erence	•	Gain		Signal	Sweep	Coursed Dath
	0.3 301 Dia .: 70° Temp. Tooi:			Scan dB:			BF-132	dB	Reflector	+		Sound Path
•	78° Temp. Tool:	558272	- Exam Surface:	OD	Туре:	Gal	Block	58.5	0.5 SDH	80%	8.7	.667"
Recordable In			- Surface Condition:	Flush						+	<u> </u>	
Results:			(If Yes, Ref. Attached Ultrasonic fo	c Indication Re	eport.)	C	omments: E3	7888 - Ca	i Due Date	10/5/2011	<u></u>	k
				Man			55	8272 - Ca		1/28/2012		
	verage Obtained > 90%:	No	Reviewed Previous Data:	Yes				.4 /8 COUR		<u>مرد من المر</u>		
Examiner	Level III(N)	7 s	ignature $\sim \mathcal{P}$	1	Reviewer		/	////	Signati		3/	Date
Brown, Thoma Examiner	C	ton	V LAN MARCE		latt Weich, Lill			uu	Signat	ure	-70	Date
N/A	Level N/A	1 3	ignature						oigilau	410		Udle
Other												
	Level N/A	9	ionatura	Data A	NII Review				🖌 Siánati	ure		Date i
N/A	Level N/A	S	ignature	Date A	NII Review			/	Signati	ure 10.0		Date 4/3/11

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			U	T Calibratio	on ka	minatio	n)
I 1/4 1	Site/Unit:	BFN	/ 2		Pro	cedure:		N-UT-82			Outage I	No.:	U2RF16
	Summary No.:	0551	0-151-8FN2		Procedui	ne Rev.:		4	<u></u>	-	Report I	No.: U	T-11-043
	Workscope:	<u> </u>	ISI		Work Ord	ler No.:		2-81-4.6.G		-	Pa	ige: 4	of 8
Code:	Section XI 1998	i Ed/1996 Add		Cat./item:	R-A/R1.1	6D		Location:	R	eactor Bui	liding, Main S	Steam Tun	nəi
Drawing No.:	2-1	SI-0272-C-01		Description:	EL - VLV		_				•	•	
System ID:	059 - Reactor Water C	leanup System											
Component ID:	RCRD-2-50		++				Size/	Length:	N/A	<u>,</u>	Thickness/Di	ameter:	0.531 / 4"
Limitations:	None							Start	Time:	2315	Finis	h Time:	2325
	Instrument Settings			Search Unit		Cal.	Time	Data		Axial	Orientated S	learch Uni	
Serial No.:	E3768	6	Serial No.:	U0271		Checks	111110	Date	Calib		Signal	Sweep	
Manufacturer:	KRAUTKR	AMER	Manufacturer:	Megasoni	cs	Initial Cal.	2120	3/16/2011	Refle		mpiltude %	Division	Sound Path
Model: US	N 60 Linearity:	L-11-002	Size: 2 (4x1	4mm) Model:	CSS	Inter. Cal.	N/A		N	Α	N/A	N/A	N/A
Delay:	<u>9.0675µ</u> Ra	inge: <u>1.000</u>	Freq.: 2.0 M	Hz Center Freq.:	<u>N/A</u>	Inter. Cal.	• N/A		ļ				
M'ti Cal/Vel:	<u>.2330</u> En	ergy: <u>High</u>	Exam Angle:	42° Squint Ang	le: <u>N/A</u>	- Final Cal.	<u>N/A</u> 0031	3/17/2011	ļ			 .	
Damping:		eject: 0	Measured Angl	e: <u>42°</u> Mode:	Long			الي هم بالكندية بيني اليو	 				
PRF Mode:	Auto High SU F			32 / .38 # of Elem	nents: 2		Coupla				i	atad Raam	1
Disp. Start:	IP Re	ctify: Full Wav	e Config.: D	-SBS Focus:	FS~14	Cal. Batch		06125			ential Orient		
Inst. Freq.:	2.0 MHz		Shape: R	ect Contour:	6" Circ	Type: Mfg.;		agel II otech	Calib Refle		Signal Mpiitude %	Sweep Division	Sound Path
Ax. Gain (dB):	56.5 Circ. Ga	in (dB): N/A	Wedge Style:	integra	l			08125	0.6	SDH	80%	8.0	.823"
		Sound Path		Search Unit Cable		Type:		agel II	J			·····	4
1 Screen D			Type: RG-17	4 Length: <u>6'</u> No	o. Conn.: _0	- Mfg.:		otech					+
Col Block No.	Calibration Block			Scan Coverage					 		erence/Simul	ator Block	
Cal. Block No.:		4"		Downstream Sca		_	lerence		Gain		Signal	Sweep	1
Cal Bit Temp	.: 70° Temp. Tool:	658272	cw []	CCW 🖌 Sca	in dB: <u>59</u>	Serial No.:		BF-132	dB		Amplitude 9	6 Division	1
•		558272	- Exam Surface:			Туре:	Cal	Block	56.5	0.6 SDH	80%	8.0	.823"
Recordable in			Surface Condit			-			 		<u> </u>	<u> </u>	
Results:		□ Nº 2	(If Yes, Ref. Attai	ched Ultrasonic Indic	ation Repo	nt.)	C	omments: E3	7688 - Cs	i	10/5/2011		L
	verage Obtained > 90%:	۳ لیا ۳ No	Reviewed Prev	Joue Data:	Yes		Ū	55	8272 - Ca		1/29/2012		
									17				Contra 1
Examiner Brown, Thom	Level (II(N)	7	Signature			ewer Weich, Lill			II A A		une	3/2	Date
Examiner	·····	Coto	Signature	3/17/2		Review				Signati		-10	Date
N/A	Level N/A		allugraie	•	N/A	1.04104				Giller			240
Other	Level N/A		Signature			Review		·····		Signati	ure	···	Date
N/A				•						/	10.0	u	13/11
UT Calibration	/Examination								(``		1 mm	/	1 - 1 · (

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Site/Unit: BFN / 2 Summary No.: 05510-ISI-BFN2 Workscope: ISI Code: Section XJ 1995 Ed/1996 Add Co Drawing No.: 2-ISI-0272-C-01 System System ID: 069 - Reactor Water Clearup System Component ID: Component ID: RCRD-2-50 Instrument Settings Serial No.: E37688 Serial No.: Manufacturer: KRAUTKRAMER Manufacturer: Model: USN 60 Linearity: L-11-002 Size: 0.256 Delay: 4.136µ Range: 4.000 Freq.: 2.25 Mit M*tl Cal/Vel: .1217 Energy: High Exam Angle: Damping: 1000 Q Reject: Q Measured Angle	Cat./item: Description: Search Unit SB0450 KBA 50" Model:	Proce Procedure Work Orde R-A/R1.16 EL - VLV	Rev.:	-	N-UT-82 4 2-SI-4.8.G Location: ength: Start	N/A	- 	Outage I Report I Pa iilding, Main S Thickness/Dia	lo.: U ge: 5 liteam Tuni	J2RF16 T-11-043 of <u>8</u> nel
Workscope: ISI Code: Section XJ 1995 Ed/1996 Add C Drawing No.: 2-ISI-0272-C-01 System ID: 069 - Reactor Water Cleanup System Component ID: RCRD-2-50 Limitations: None Instrument Settings Serial No.: E37688 Manufacturer: KRAUTKRAMER Model: USN 60 Linearity: L-11-002 Delay: 4.136µ Mature Cal/Vel: .1217 Energy: High Exam Angle:	Description: Search Unit SB0450 KBA	Work Orde R-A/R1.16	r No.:	-	2-SI-4.8.G Location:	N/A	actor Bu	Pa Iliding, Main S	ge: 5 iteam Tuni	of
Code: Section XI 1995 Ed/1996 Add Color Drawing No.: 2-ISI-0272-C-01 System ID: 069 - Reactor Water Cleanup System Component ID: RCRD-2-50 Limitations: None Instrument Settings Serial No.: E37688 Serial No.: E37688 Manufacturer: KRAUTKRAMER Model: USN 60 Linearity: L-11-002 Delay: 4.136µ Range: 4.000 Freq.: 2.25 MH M*tl Cal/Vel: .1217 Energy: High Exam Angle:	Description: Search Unit SB0450 KBA	R-A/R1.16) Cal.	-	Location:	N/A		ailding, Main S	iteam Tuni	
Drawing No.: 2-ISI-0272-C-01 System ID: 069 - Reactor Water Cleanup System Component ID: RCRD-2-50 Limitations: None Instrument Settings Serial No.: E37688 Manufacturer: KRAUTKRAMER Model: USN 60 Linearity: L-11-002 Delay: 4.136µ M'tl Cal/Vel: .1217 Energy: High Exam Angle:	Description: Search Unit SB0450 KBA		Cal.	- 		N/A	eactor Bu			191
System ID: 069 - Reactor Water Cleanup System Component ID: RCRD-2-50 Limitations: None Instrument Settings Serial No.: E37688 Manufacturer: KRAUTKRAMER Model: USN 60 Linearity: L-11-002 Size: 0.250 Delay: 4.136µ Range: 4.000 M'tl Cal/Vel: .1217 Energy: High Exam Angle: Delay: Delay: Delay: Delay:	Search Unit SB0450 KBA	EL - VLV		Size/l			·····	Thickness/Dia		
Component ID: RCRD-2-50 Limitations: None Instrument Settings Serial No.: E37688 Manufacturer: KRAUTKRAMER Model: USN 60 Linearity: L-11-002 Delay: 4.136µ M'tl Cal/Vel: .1217 Energy: High Exam Angle:	SB0450 KBA			Size/l				Thickness/Di		
Limitations: None Instrument Settings Serial No.: E37688 Manufacturer: KRAUTKRAMER Model: USN 60 Linearity: L-11-002 Delay: 4.136µ M'tl Cal/Vel: .1217 Energy: High Exam Angle:	SB0450 KBA			Size/l				Thickness/Di		
Instrument Settings Serial No.: E37688 Serial No.: Manufacturer: KRAUTKRAMER Manufacturer: Model: USN 60 Linearity: L-11-002 Size: 0.256 Delay: 4.136µ Range: 4.000 Freq.: 2.25 Mł M'tl Cal/Vel: .1217 Energy: High Exam Angle:	SB0450 KBA				Start	Time			meter:	0.531 / 4"
Serial No.: E37688 Serial No.: Manufacturer: KRAUTKRAMER Manufacturer: Model: USN 60 Linearity: L-11-002 Delay: 4.136µ Range: 4.000 M'tl Cal/Vel: .1217 Energy: High	SB0450 KBA					i une.	2328	Finist	Time:	2336
Manufacturer: KRAUTKRAMER Manufacturer: Model: USN 60 Linearity: L-11-002 Size: 0.256 Delay: 4.136µ Range: 4.000 Freq.: 2.25 Mł M'ti Cal/Vel: .1217 Energy: High Exam Angle:	KBA			T	Dete		Axia	l Orientated S	earch Unit	
Model: USN 60 Linearity: L-11-002 Size: 0.250 Delay: 4.136µ Range: 4.000 Freq.: 2.25 Million M'ti Cal/Vel: .1217 Energy: High Exam Angle:			Checke	Time	Date	Calibr		Signal	Sweep	
Delay: 4.136µ Range: 4.003 Freq.: 2.25 Mi M'tl Cal/Vel: .1217 Energy: High Exam Angle:	10" Model:		initial Cal.	2140	3/16/2011	Refle		Amplitude %	Division	Scund Path
M'ti Cal/Vel: .1217 Energy: High Exam Angle:		Comp G	Inter. Cal.	N/A		1.0" N	otch	80%	3.4	1.40"
	Hz Center Freq.:	N/A	inter. Cal. Inter. Cal.	N/A N/A						
Damping: 1000 Q Reject: 0 Measured Angle	45° Squint Angi	e: <u>N/A</u>	Final Cal.	0042	3/17/2011					<u> </u>
	e: 45° Mode:	Shear		Couplar	nt					╋╍╌╍╍╍╌┥
	N/A # of Elem	ents: <u>1</u>	Cal. Batch:	-	06125		Circumfe	rential Orienta	ted Searc	h Unit
Disp. Start: IP Rectify: Full Wave Config.: SI Inst. Freq.: 2.25 MHz Share Page	il ngle Focus:	<u>N/A</u>	Туре:	Ultra		Calibr	ation	Signal	Sweep	
Inst. Field. 2.20 mitz Shape: Rot	ound Contour:	Flat	Mfg.:	<u></u>	otech	Refle		Amplitude %	Division	Sound Path
Wedge Style: Ax. Gain (dB): 28.0 Circ. Gain (dB): 28.0	Non-Integr	rai	Exam Batc	h:	06125	. 1.0" N	otch	80%	3.4	1.40"
S S S S S S S S S S S S S S S S S S S	Search Unit Cable		Туре:	Ultra	gel li					╉╼╼╼╼┥
	4 Length: 6' No	. Conn.: 0	Mfg.:	Sono	otech				<u> </u>	╉╼╼╼╼┥
	Scan Coverage			erence	Block		Ref	erence/Simul	tor Block	1
	L]	n dB: N/A n dB: 38	Serial No.:		3Q-123	Gain		Signal	Sweep	Sound Path
Cat Bik Temp : 70° Temp Tool: 558272			Туре:		Block	dB 28.0	Reflecto 1.0" Noto		Division 3.4	1.40"
Comp. Temp.: 78 Temp. Tool: 558272 Exam Surface: Surface Condition						20.0	1.0 1104			
	ched Ultrasonic Indica		}		-					
Results: NRI 🖉 RI 🗌 Info 🗍				Co	omments: E3					
Percent Of Coverage Obtained > 90%: No Reviewed Previ	vicus Data: Y	68					Due Dat Coverag	e 1/29/2012 e 		
Examiner Level III(N) Signature		ate Review	wer				Signa	Ture	11 -	L Date
Brown, Thomas D. Roman Drom	3/17/2	011 Matt V	Velch, Lill			l	Ma	um	1-2	123/11
Examiner Level N/A Signature	D	Date Site R	eview				Signa	ture		Date
N/A Other Level N/A Signature	<u></u>	Date ANII F	loview				Signa	ture		Date
Other Level _{N/A} Signature	U		(9 T 9 T							
UT Calibration/Examination							10 -	Hal	11	12100 1

	~		UT	Calibration	xan	ninatio	n				••	· .	
1 1/2 1 * *	Site/Unit:	BFN /	2		Proce	enube:		N-UT-82			Outage N	to.; t	U2RF16
	Summary No.:	05510-	ISI-BFN2		Procedure	Rev.:		4		-	Report N	lo.: U	T-11-043
	Workscope:		ISI		Nork Orde	er No.:		2-SI-4.6.G		-	Pa	ge: 6	of <u>8</u>
Code:	Section XI 19	95 Ed/1996 Add	Ci	at./item: F	R-A/R1,16	D		Location:	R	eactor Bui	iding, Main S	team Tuni	net
Drawing No.:	2	-ISI-0272-C-01		Description: El	L-VLV			-					·
System ID:	069 - Reactor Water	Cleanup System											
Component ID:	RCRD-2-50			<u></u>			Size/	Length:	N/A		Thickness/Dia	meter	0.531 / 4"
Limitations:	None					<u> </u>		Start	Time:	2338	Finish	Time:	2344
Call States in the second states of the second states of the second states of the second states of the second s	Instrument Setting]8		Search Unit		Cal.	Time	Date		Axial	Orientated S	earch Unit	
Serial No.:	E376		Serial No.:	SB0450		Checks			Calib	ation	Signal	Sweep	Sound Path
Manufacturer:	KRAUTKI	RAMER	Manufacturer:	KBA		Initial Cal.	2130	3/16/2011	Refle	ctor A	mplitude %	Division	Sound Paul
Model: US	IN 60 Linearity:	L-11-002	Size: 0.250	" Model: <u>C</u>	omp G	Inter. Cal. Inter. Cal.	N/A N/A		0.5" N	lotch	80%	6.1	.915ª
Delay:	4.885µ F	lange: <u>1.500</u>	Freq.: 2.25 MH	z Center Freq.:	N/A	Inter. Cal.	N/A						
M'ti Cal/Vel:		nergy: <u>High</u>	Exam Angle:	60° Squint Angle:	<u>N/A</u>	Final Cal.	0040	3/17/2011					+
Damping:		Reject: 0	Measured Angle:	60° Mode:	Shear	.	Couplai	nt	 				+
PRF Mode:		Freq.: 2.25 MHz	Exit Point:	V/A # of Elemen	nts:	Cal. Batch:	•	06125	<u> </u>	Circumfer	ential Orienta	ited Searc	h Unit
Disp. Start:		tectify: Full Wave	Config.: Sin	igie Focus:	N/A	Type:		igel II	Calib		Signal	Sweep	
Inst. Freq.:	2.25 MHz		Shape: Rou	nd Contour:	Flat	Mfg.:		otech	Refle		mplitude %	Division	Sound Path
Ax. Gain (dB):	45.0 Circ. G	ain (dB): N/A	Wedge Style:	Non-Integra	1	Exam Bato	#:	06125	N	A	N/A	N/A	N/A
		Sound Path		arch Unit Cablé		Туре:		iget li	[
1 Screen E				Length:No. (Conn.: 0	Mfg.:	Son	otech	<u> </u>				
Cal. Block No.:	Calibration Bloc SQ-			Scan Coverage		Pa	erence	Block		Refe	rence/Simula	tor Block	- L
Thickness:	0.5" Dia.:	Flat		ownstream Scan		Serial No.:		SQ-123	Gain		Signal	Sweep	Sound Path
	.: 70° Temp. Tool:	558272	_ CW []		dB: N/A	Туре:		Block	dB		Amplitude %		
Comp. Temp.:		558272	- Exam Surface:	00					45.0	0.5" Nothe	80%	6.1	.915"
Recordable in	<u> </u>	s 🗋 No 🔽	- Surface Conditio	n: Flush ned Ultrasonic Indicat	ion Report				<u> </u>		<u> </u>	1	
Results:			ifo 📋			··)	C	omments: E3	7688 - Ca	I Due Date	10/5/2011		A
				nuo Datas — Va	. .			55	8272 - Ca	Due Date	1/29/2012		
	verage Obtained > 90%		Reviewed Previo						-/-				Deta
Examiner Brown, Thom	Level III(N)	7 72	ignature	Da 3/17/201		wer Welch, Lill			M		h lela	3/	Date
Examiner	Level N/A	Nor a	ignature	Da		Review				Signatu	118		Date
N/A	LOVE IVA	<i>·</i>			N/A				-				
Other	Level N/A	s	ignature	Da		Review				Signati			Date
N/A										Ve	Howl		1/3/11
UT Calibration	/Examination	······	<u></u>						7				

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$\begin{array}{c c c c c c c c c c c c c c c c c c c $	I VA					Report No.:	UT-11-043
Examine: Brown, Thomas D. J. 2. Level: III, N. Reviewe: Matt Welch, LII Date: $3/21/1$ Examine: NIA Level: NIA Site Review: NIA Date: $3/21/1$ Date: $3/21/1$ Comments: None Sketch or Photo: O.Wddeal_BENDOcumentationU2R18 Scanned DataWCRD-2-50 Coverage Picting EQUIRED EXAM VOLUME = $(.15 \times h0) \times 14.15 = 2.12$ cubic inclus EQUIRED EXAM VOLUME (E_1) = 2.12 cubic inclus EQUIRED EXAM VOLUME (E_1 cubic inclus EQUIRED EXAM VOLUME					1/10-7. 1.		7 of 8
Examine: N/A Level: N/A Site Review: N/A Date: Other: N/A Level: N/A ANII Review: M/A Date: Comments: None Sketch or Photo: O.Uddeel_ServerUddeel_BFNDocumentationU2R18 Scenned Data RCRD-2-50 Coverage Plotjog REQUIRED EXAM VOLUME ($LI = 2.12$ cubic wickes $Low Level: N/A$ ANII Review: M/A Date: $1/0^{4}$ EQUIRED EXAM VOLUME ($LI = 2.12$ cubic wickes $Low Level: N/A$ ANII Review: M/A Date: $1/0^{4}$ $Low Level: Level: Level: Level: Level: Level: Level: 1/0^{4}M/A ANII Review: M/A Date: 1/0^{4}Low Level: Level: Level: Level: Level: Level: 1/0^{4}M/A ANII Review: M/A Date: 1/0^{4}M/A ANII Review: M/A Date: 1/0^{4}Low Level: Level: Level: Level: Level: Level: 1/0^{4}M/A ANII Review: M/A Date: 1/0^{4} A Da$				Boulouper	v v v v v v v		Data 3/22/11
Other: \overline{MA} Level: \overline{MA} ANII Review: \overline{Aud} Dete: $\overline{4/3/11}$ Dete: $\overline{4/3/11}$ Comments: None Sketch or Photo: O.1(ddeal_ServerViddeal_BFNIDocumentationU/2R18 Scenned Deta/RCRD-2-60 Coverage Plot.jpg REQUIRED EXAM VOLUME = $(15 \times h0) \times 1/4.15 = 2.12$ cubic inclus EQUIRED EXAM VOLUME = $(15 \times h0) \times 1/4.15 = 2.12$ cubic inclus REQUIRED EXAM VOLUME = $(215 \times h0) \times 1/4.15 = 2.12$ cubic inclus REQUIRED EXAM VOLUME = $(215 \times h0) \times 1/4.15 = 2.12$ cubic inclus REQUIRED EXAM VOLUME = $(215 \times h0) \times 1/4.15 = -0.15 \times 1/4.15 = .212$ calici inclus * 2.12212 = 1.41 cubic inclus RL = 6^{10} of Cinc on ellboru intradiuse for afted Scan RL = 015 Sich of Will (value body) fix Cill SCan . RL = 015 Sich of Will (value body) fix Cill SCan . RL = 015 Sich of Will (value R/L Cyriad Scan : $= 2.12 - [(32 \times 1/5) \times 1/4.15] = 1.424 \div 2.12 = .575 \times 100 = 57.5\%$ Obstanced Afacts volume R/L Circ Scans: $= 2.12 - [(32 \times 1/5) \times 1/4.15] = 1.444 \div 2.12 = .474 \times 100 = .67.9\%$ 05 thinced Afacts volume shear wave agrical and circ scand : $[(.32x, 15)+[(.06 \times 1/5) \div 2.]] \times 1/4.15 = .743 \div 2.12 = .570 \times 100 = .35\%$					······	<u> </u>	
Comments: None Sketch or Photo: Orliddeel_BFNDocumentationU2R18 Scenned DetaIRCRD-2-50 Coverage Ploting REQUIRED EXAM VOLUME $+ (15 \times 1/0) \times 1/4.15 = 2.12$ cubic inclus EQUIRED EXAM VOLUME $(RL) = 2.12$ cubic inclus REQUIRED EXAM VOLUME $(RL) = 2.12$ cubic inclus * 2.12212 = 1.91 cubic inclus * 2.12212 = 1.91 cubic inclus $RL = 6^{3}$ of circ on ellboru in Euclose for after scan: RL = 015 sich of willd (valit body) fix cub scan: $= 2.12 - [6 \times .15] = 1.22 \div 2.12 \div 5.75 \times 100 = 57.578$ $Obtanical against volume R/L cure scans: = 2.12 - [(.32 \times 1.15) \pm 1.22 \div 2.12 = .474 \times 100 = 67.978Obtanical Against volume R/L cure scans: = 2.12 - [(.32 \times 1.15) \pm 1.15] = 1.44 \div 2.12 = .743 \div 2.12 = .750 \times 100 = 3576$		-				1	
Sketch or Photo: O. Uddeal, Serverilddeal, BFNDocumentation U2R18 Scanned Data VRCRD-2-50 Coverage Plot, jpg LEQUIRED EXAM VOLUME ($(15 \times 100) \times 14.15 = 2.12$ cubic inches LEQUIRED EXAM VOLUME ($(RL) = 2.12$ cubic inches REQUIRED EXAM VOLUME ($(RL) = 2.12$ cubic inches $(10^{+}+)$ (1				· · · · · · · · · · · · · · · · · · ·			
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$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} $	ENDER EXAM VOLUME/RL) = 2	.12 cub	ic we	hes	• •		
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$= 2.12212 = 1.41 \text{ cubic withor}$ FORGED 3/5 VALUE FORGED 3/5 VALUE $= \frac{1.41}{1.0} = 1$	SUIDED EXAM VOLUME (SHEAR) :	=[[.2#.]	10)÷z	x.15= 🗲		15=212-046	z webs
$\frac{1}{10}$	(EQUICED EXAMINE CONTRACT	5	A : A			9 ₄	
Chi Pipe Then $\frac{1}{10}$ $\frac{1}{$	# 2.12212 = 1.91 cubic with			FORGED	5/5 VALNE	\frown	<u>ل</u> ــــــــــــــــــــــــــــــــــــ
$\frac{1}{10} + \frac{1}{10} $			1	1	1-		[10 ^{**}
$\frac{1}{10} = \frac{1}{10} $		1	يا و لا	1		/	
$\frac{1}{10} = \frac{1}{10} $			4.4				
Scan limitations: $RL = 6^{\circ} \circ i$ cinc on elbow intraduse for arial scan RL = 015 sich of welld (value body) for cinc scans. $Obtained extant volume R/L arial scan: = 2.12 - [6x, 15] = 1.22 \div 2.12 = .575 \times 100 = 57.5\%Obtained extant volume R/L cinc scans: = 2.12 - [(.32 \times .15) \times 14.15] = 1.444 \div 2.12 = .679 \times 100 = 67.9\%Obtained Arans volume shear wave arial and cinc scans: = (.32 \times .15) + ((.06 \times .15) \div 2)] \times 14.15 = .743 \div 2.12 = .350 \times 100 = 35\%$	CB YIYE	ستنقف ا				+ $+$	
Scan limitations: $RL = 6^{\circ} \circ i$ cinc on elbow intraduse for arial scan RL = 015 sich of welld (value body) for cinc scans. $Obtained extant volume R/L arial scan: = 2.12 - [6x, 15] = 1.22 \div 2.12 = .575 \times 100 = 57.5\%Obtained extant volume R/L cinc scans: = 2.12 - [(.32 \times .15) \times 14.15] = 1.444 \div 2.12 = .679 \times 100 = 67.9\%Obtained Arans volume shear wave arial and cinc scans: = (.32 \times .15) + ((.06 \times .15) \div 2)] \times 14.15 = .743 \div 2.12 = .350 \times 100 = 35\%$	CR PIPE					t +)	•
Scan limitations: $RL = 6^{\circ} \circ $ cinc on elbow intraduse for aftial scan RL = D15 side of whele (value body) for circ scan. D15 side of whele (value body) for circ scan. P15 side of whele R/L again scan. P15 scan value R/L again scan. P15 scan. P15 scan value R/L again scan. P15	< <u></u> <th>[<u>.</u></th> <th>- </th> <th></th> <th>i</th> <th></th> <th>•</th>	[<u>.</u>	- 		i		•
$RL = 6^{\circ} \circ i cinc on elbow intraduse for afted scan RL = 015 sich of wheld (value body) for cite scan. RL = 015 sich of wheld (value body) for cite scan. 06 + aincat exam volume R/L agriad scan: = 2.12 - [6x.15] = 1.22 ÷ 2.12 = 575 x 100 = 57.5% Ob + aincot exam volume R/L circ scans: = 2.12 - [(.32 x.15) x 14.15] = 1.44 ÷ 2.12 = .679 x 100 = 67.9% Ob + aincet Agaen volume shear wave agrial and circ scans: [(.32 x.15)+((.06 x.15) ÷ 2)] x 14.15 = .743 ÷ 2.12 = .350 x 100 = 35%$	and the second		स्त <u>म्</u> तः सन् <u>त</u> ः		4		1
= 2.12 - [6x.15] = 1.22 - 2.12 = 575 x100 = 51.5% Obtained exam volume R/L cire scans: = 2.12 - [(.32x.15) x 14.15] = 1.44 - 2.12 = 679 x100 = 67.9% Obtained graces value shear wave ageal and cire scans: [(.32x.15)+((.06x.15)+2)] × 14.15 = .743 - 2.12 = .350 × 100 = 35%			नग <u>-</u> ।.० —		1		*
= 2.12 - [6x.15] = 1.22 - 2.12 = 575 x100 = 51.5% Obtained exam volume R/L cire scans: = 2.12 - [(.32x.15) x 14.15] = 1.44 - 2.12 = 679 x100 = 67.9% Obtained graces value shear wave ageal and cire scans: [(.32x.15)+((.06x.15)+2)] × 14.15 = .743 - 2.12 = .350 × 100 = 35%	Scan limitations:		नग <u>न्</u> , 1.0 —		. ·	- 1.55°	*
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= 2.12 - [6x.15] = 1.22 - 2.12 = 575 x100 = 51.5% Obtained exam volume R/L cire scans: = 2.12 - [(.32x.15) x 14.15] = 1.44 - 2.12 = 679 x100 = 67.9% Obtained graces volume shear wave agricf and cire scans: [(.32x.15)+((.06x.15)+2)] × 14.15 = .743 + 2.12 = .350 × 100 = 35%	Scan limitations:	[10- +-	use f	n agial	. ·	SCAN LIMITATI	n ⁿ BA
= 2.12 - [6x.15] = 1.22 - 2.12 = 575 x100 = 51.5% Obtained exam volume R/L cire scans: = 2.12 - [(.32x.15) x 14.15] = 1.44 - 2.12 = 679 x100 = 67.9% Obtained graces volume shear wave agricf and cire scans: [(.32x.15)+((.06x.15)+2)] × 14.15 = .743 + 2.12 = .350 × 100 = 35%	Scan limitations:	- [15. + h trad, body)	no-	n afial	. ·	SCAN LIMITATI DUETO ELISION IN	TRA DOSE
$= 2.12 - [6x.15] = 1.22 - 2.12 = 575 \times 100 = 51.5\%$ Obtained exam volume R/L cire scans: $= 2.12 - [(.32 \times .15) \times 14.15] = 1.44 + 2.12 = .679 \times 100 = 67.9\%$ Obtained graces volume shear wave agricf and cire scans: $[(.32 \times .15) + ((.06 \times .15) + 2)] \times 14.15 = .743 + 2.12 = .350 \times 100 = 35\%$	Scan limitations:	ntiad, body)	use for	n afial	. ·	SCAN LIMITATI DUETO ELISON IN RAL TEANSBALOR	TRA DOSE a: anly
Obtained exam volume R/L cire serves: = 2.12 - [[132 x.15) x 14.15] = 1.44 ÷ 2.12 = 679 x 100 = 67.9% Obtained graces volume shear wave agrial and cire scans: [(132 x.15)+((106 x.15) ÷ 2)] × 14.15 = ,743 ÷ 2.12 = .350 × 100 = 35%	Front	ntiad body) Laxia	use for	n afial cic scan	scan.	SCAN LIMITATI DUETO ELISON IN RAL TEANSBALOR	TRA DOSE a: anly
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= 2.12 - [[132 × 15) × 14.15] = 1.44 + 2.12 = 679 × 100 = 67.9% Obtained graces value shear wave agrial and circ scans: [(132 × 15)+((106 × 115) + 2)] × 14.15 = 1743 + 2.12 = .350 × 100 = 35%	Front	2.12	* 57.	5 X 100 =	scan.	SCAN LIMITATI DUETO ELISON IN RAL TEANSBALOR	TRA DOSE a: anly
Obtained Acaen value shin wave agial and circ scans: [(.32x.15)+((.06x.15)+2)]× 14.15 = ,743 + 2.12= . 350 × 100 = 35%	Front	2.12	* 57.	5 X 100 =	scan.	SCAN LIMITATI DUETO ELISON IN RAL TEANSBALOR	TRA DOSE a: anly
(32x.15)+((.06x.15)+2) × 14.15 = ,745 + 2112=, 950 × 100 = 95/0	Front — Scan limitations: RL = 6° of cine on elbou in RL = DIS side of weld (value Obtained estam volume R/ = 2.12 - [6x.13] = 1.22 ÷ Obtained estam volume R/L	Z.IL Cùk	* 57: Scam	5 X.100. ⊂ 14:1	57.5%	9,86° SCAN LIMITATI DUETO ELBON IN R/L TENISDAUGE 4.075° - 10.	TRA DOSE a: anly
(32x.15)+((.06x.15)+2) × 14.15 = ,745 + 2112=, 950 × 100 = 95/0	Front — Scan limitations: RL = 6° of cine on elbou in RL = DIS sider of well (value Obtained estam volume R/ = 2.12 - [6x.15] = 1.22 ÷ Obtained estam volume R/L	Z.IL Cùk	* 57: Scam	5 X.100. ⊂ 14:1	57.5%	9,86° SCAN LIMITATI DUETO ELBON IN R/L TENISDAUGE 4.075° - 10.	TRA DOSE a: anly
(32x.15)+((.06x.15)+2) × 14.15 = ,745 + 2112=, 950 × 100 = 95/0	Front Scan limitations: RL = 6° of cine on elborn in RL = DIS side of welld (value Obtained estam volume R/ = 2.12 - [6x.15] = 1.22 ÷ Obtained estam volume R/L = 2.12 - [(.32x.15) × 14.15] = 1	2.12 Cine 1.44÷	- 57 5 <i>cau</i> - 2.17	5 × 100 = 125 12 = 679 1	SCAN 57.5% (100 = 67.9%	9,00 3000 LIMITATI DUETO ELBOW IN R/L TEANSONICE 4.075" - 10.	TRA DOSE a: anly
(32x.15)+((.06x.15)+2) × 14.15 = ,745 + 2112=, 950 × 100 = 95/0	Front — Scan limitations: RL = 6° of cine on elbow in RL = DIS side of welld (value Obtained estam volume R/ = 2.12 - [6x, 15] = 1.22 ÷ Obtained exam volume R/L = 2.12 - [(.32x, 15) × 14.15] = 1	2.12 Cine 1.44 -	= 57: 5CAU 2.19 Vave	L = 679 ; axial as	57.5% (100 = 67.9% nd cine scar	9,00 3CAN LIMITATI DUETO ELBOW IN R/L TEANSONCOR 4.075" - 10.	(πα dose) 4 αμιγ 675 °
	Front — Scan limitations: RL = 6° of cine on elbow in RL = DIS side of welld (value Obtained estam volume R/ = 2.12 - [6x, 15] = 1.22 ÷ Obtained exam volume R/L = 2.12 - [(.32x, 15) × 14.15] = 1	2.12 Cine 1.44 -	= 57: 5CAN 2.19 Nave	L = 679 ; axial as	57.5% (100 = 67.9% nd cine scar	9,00 3CAN LIMITATI DUETO ELBOW IN R/L TEANSONCOR 4.075" - 10.	(πα μος μ ² 4) αμιγ 675 °
Obtained your = 37.5+ 67.9+ 35 = 160.4/3 = 53.4%	Find Scan limitations: RL = 6° of cine on elbow in RL = DIS side of welld (value Obtained extant Volume R/ = 2.12 - [6x, 15] = 1.22 ÷ Obtained extant volume R/L = 2.12 - [(.32x, 15) × 14.15] = 1	2.12 Cine 1.44 -	= 57: 5CAN 2.19 Nave	L = 679 ; axial as	57.5% (100 = 67.9% nd cine scar	9,00 3CAN LIMITATI DUETO ELBOW IN R/L TEANSONCOR 4.075" - 10.	(πα μος μ ² 4) αμιγ 675 °
Obtained your = 27.5+67.9+ 23= 1001713= 2217 10	Front Scan limitations: RL = 6° of cine on elbow in RL = DIS side of welld (value Obtained extern volume R/ = 2.12 - [6x.13] = 1.22 ÷ Obtained exam volume R/L = 2.12 - [(.32x.15) × 14.15] = 1 · Obtained grain values [(.32x.15)+((.06x.15))	2.12 Cine 1.44÷ hear 1 2)]×	- ,575 5 CAU 2 . 17 Nave 14,15	c = .679 ayiafan $a_{1},7+3$	SCAN 57.5% (100 = 67.9% nd cine scan + 2:12 = . 350	9,00 3CAN LIMITATI DUETO ELBOW IN R/L TEANSONCOR 4.075" - 10.	(πα dose) 4 αμιγ 675 °
	Front Scan limitations: RL = 6° of cine on elbow in RL = DIS side of welld (value Obtained exam volume R/ = 2.12 - [6x.15] = 1.22 ÷ Obtained exam volume R/L = 2.12 - [(.32x.15) × 14.15] = 1 Obtained grain values [(.32x.15)+((.06x.15))	2.12 Cine 1.44÷ hear 1 2)]×	- ,575 5 CAU 2 . 17 Nave 14,15	c = .679 ayiafan $a_{1},7+3$	SCAN 57.5% (100 = 67.9% nd cine scan + 2:12 = . 350	9,00 3CAN LIMITATI DUETO ELBOW IN R/L TEANSONCOR 4.075" - 10.	(πα dose) 4 αμιγ 675 °
	Front Scan limitations: RL = 6° of circ on elbow in RL = DIS side of welld (value Obtained even volume R/ = 2.12 - [6x.15] = 1.22 ÷ Obtained exam volume R/L = 2.12 - [(.32x.15) × 14.15] = 1 Obtained grain volume 3 [(.32x.15)+((.06x.15))	2.12 Cine 1.44÷ hear 1 2)]×	- ,575 5 CAU 2 . 17 Nave 14,15	c = .679 ayiafan $a_{1},7+3$	SCAN 57.5% (100 = 67.9% nd cine scan + 2:12 = . 350	9,00 3CAN LIMITATI DUETO ELBOW IN R/L TEANSONCOR 4.075" - 10.	(πα dose) 4 αμιγ 675 °
	Front Scan limitations: RL = 6° of circ on elbow in RL = DIS side of well (value Obtained exam volume R/ = 2.12 - [6x.15] = 1.22 ÷ Obtained exam volume R/L = 2.12 - [(.32×.15)×14.15] = 1 Obtained grain values [(.32x.15)+((.06x.15))	2.12 Cine 1.44÷ hear 1 2)]×	- ,575 5 CAU 2 . 17 Nave 14,15	c = .679 ayiafan $a_{1},7+3$	SCAN 57.5% (100 = 67.9% nd cine scan + 2:12 = . 350	9,00 3CAN LIMITATI DUETO ELBOW IN R/L TEANSONCOR 4.075" - 10.	(πα dose) 4 αμιγ 675 °
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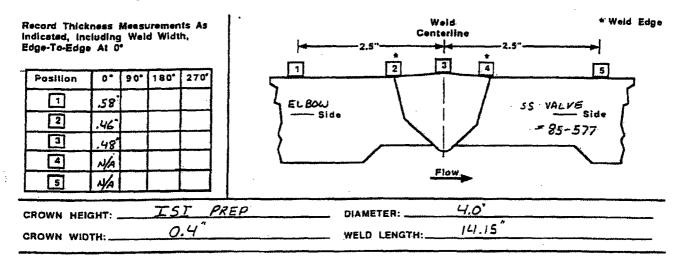
Supplemental Report

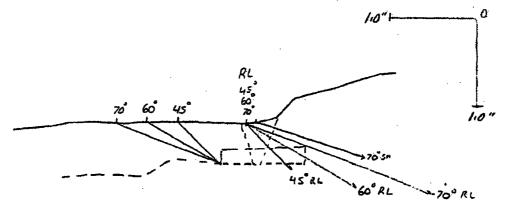
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<u>'1</u>

Comments: None

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Sketch or Photo: O:\lddeal_Server\lddeal_BFN\Documentation\U2R16 Scanned Data\RCRD-2-50 T&C.jpg





COULD NOT SCAN 6.0" OF WELD IN THE ELBOW INNER RADIUS WITH THE RL TRANSDUCERS DUE TO BRIDGING. THE SHEAR WAVE TRANSDUCERS WERE USED FOR THE ENTIRE CIRCUMPERENCE OF THE WELD.

Supplemental Report

IVAL S	Site/I Init:	BFN		l Calibrati		edure:		N-UT-84			Outage	No	U2RF16
	Site/Unit:		2 - \$1-BFN2		Procedure			11		-	Report	-	T-11-032
	Summary No.: Workscope:		ISI		Work Orde			2-Si-4.6.G			•	age: 1	of
					·								
ide: 		95 Ed/1996 Add		Cat./Item:	R-A/R1.16		-	Location:			leactor Bullo	ing	
wing No.:		2-ISI-0221-C-01		Description	n: <u>VLV - FH</u>								·····
stem ID:	074 - Residual Heat I						Size/		 N/A		Thickness/D	lamotor	4 240 / 24
•						<u></u>	5129/	Length:					1.219 / 24
itations:	See Coverage Plot							Start		1555		ih Time:	1745
	Instrument Setting	-		Search Unit		Cal.	Time	Date		Axial	Orientated	Search Unit	
nial No.:	E3630		Serial No.:	01FFWK	·····	Checks Initial Cal.	1453	3/12/2011	Calibr		Signal	Sweep	Sound P
inufacturer:	KRAUTK		Manufacturer:	KBA		Inter. Cal.	1561	3/12/2011	1.5" N		Amplitude %	Division	2.14"
idei: <u>US</u> i lay:	<u>N 60</u> Linearity: 8.2275µ F	L-11-005 Range: 5.000	_ Size: 0.5	~	Comp G	inter. Cal.	1626	3/12/2011	1.0 1			7:6	2.14
i Cal/Vel:		inergy: High	Freq.: 1.5 MI Exam Angle:	tz Center Freq 45° Squint Ar	· · · · · · · · · · · · · · · · · · ·	Inter. Cal.	N/A						
mping:		Reject: 0	Measured Angle	·		Final Cal.	1755	3/12/2011					
F Mode:	······································	Freq.: 1.5 MHz	Exit Point:		ements: 1		Coupla						<u> </u>
sp. Start:	IP F	Rectify: Full Wave		ingle Focus:		Cal. Batch:		10325	┣		rential Orien		
it. Freq.:	2.0 MHz			und Contour:	Flat	Туре: Mfg.:		igel II otech	Calibi Refie		Signal Amplitude %	Sweep Division	Sound P
			Wedge Style:	Non-Inte	egral	Exam Batc		10325	1.5" N	lotch	80%	4.2	2.14"
. Gain (dB):	23.0 Circ. G	ain (dB): 23.0	9	learch Unit Cable		Type:		agel II	ļ		•••••		
Screen D	iv. = <u>.50</u> in. of	Sound Path	Type: RG-174	Length: 6' I	No. Conn.: 0	Mfg.:		otech	 				╂────
	Calibration Bloc	k		Scan Coverage			erence	Block	<u>}</u>	I Ref	erence/Simu	lator Block	1
al. Block No.:			_	Downstream So		Serial No.:		790398	Gain		Signal	Sweep	Sound P
lickness:	1.5" Dia.:	Flat	CW 🔽		can dB: <u>42</u>	Туре:		mpas	dB 33.0	Reflector SDH	r Amplitude 50%	% Division 1.9	1.04"
al. Bik. Temp.	: 70° Temp. Tool:	<u> </u>	_ Exam Surface:	******		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			35.0	301	50 %	1.0	1.04
cordable in			Surface Conditi (If Yes, Ref, Attac	ched Ultrasonic Inc	ound	`\							
esults:		· ·	1fo []			•	Ca	omments: E36			1 <i>2/2/20</i> 11 1/28/2012		
read Of Cou	verage Obtained > 90%		Reviewed Previ	ous Data.	Yes					Coverage			
aminer	Level II(N)		ignature		Date Review				ATT	Signat	lure	3//	1/1 ⁰
einjan, Mich Aminer		Mile X4		3/12	Date Site Re	/eich, Lili			-	Signat			
laminer /A	Levei <u>N/A</u>		Signature		N/A					ังเล่าสเ			
ther	Level N/A		Signature		Date ANII R	eview	T	<u> </u>		Signat	ure		Da
I/A	117/2					mony Ma				\overline{a}	1		3/21/1

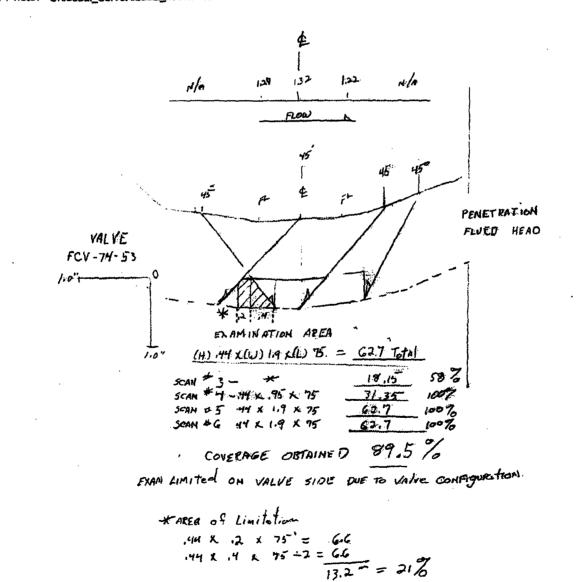
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7	Su	ppleme	ntal Rep	ort		00()	48	5
		• •	-		Report No.: Page:	UT 2	-11-03 of	3
•	05507-ISI-BFN2 Kleinjan, Michael W	el: <u>li(N)</u>	Reviewer:	Meletuda Matt Weich, Lili		Date: _	<u>3/17</u>	1/11
Examiner: Other:			Site Review: ANII Review:	N/A Journ stopminto	 ¥	Date:	<u> * / 2. / 1.</u>	

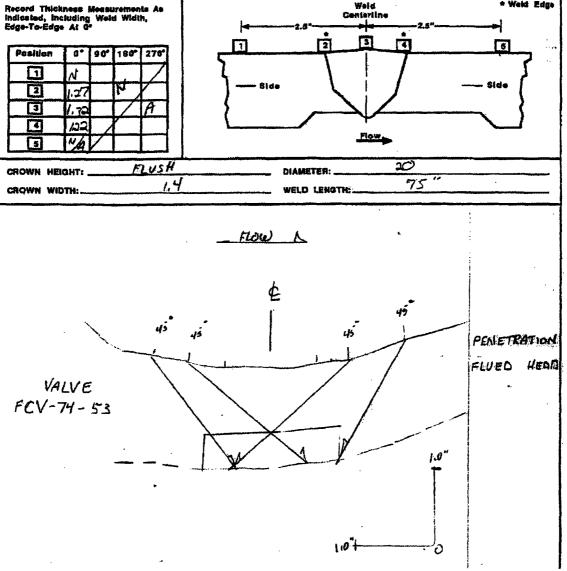
Comments: None

Sketch or Photo: O:\lddeal_Server\lddeal_BFN\Documentation\U2R16 Scanned Data\DRHR-2-03 Coverage Plot.jpg



Supplemental Report

		Supplem	port	000486				
VA				Report No	o.:U	T-11-032		
-		Level: II(N) Level: N/A Level: N/A	Reviewer: Site Review: ANII Review:		Date:	of <u>3</u> 3/7/11 s/21/11		
Comme	nts: None	· · · · · · · · · · · · · · · · · · ·	· ,		-	· · · · · · · · · · · · · · · · · · ·		



Supplemental Report

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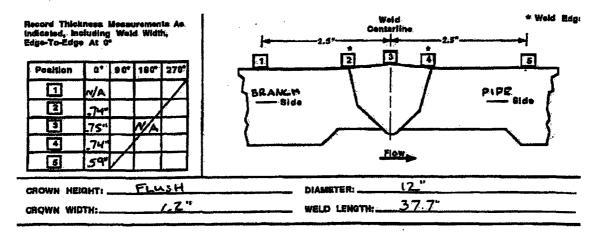
	,		UT C	Calibration	kam	inatio	n						ò
IN VAN 🛸	Site/Unit:	BFN	2		Procedu	ire:		N-UT-64			Outage N	io.: l	J2RF16
	Summary No.:	05479	-ISI-BFN2	— · P	rocedure R	ev.:		11		-	Report N	10.: U	T-11-023
	Workscope:		181		ork Order N	No.:		2-91-4.6.G		-	Pa	ge: 1	of 4
Code:	Section XI 1	995 Ed/1998 Add	Cat.	/item: R·	-A/R1.16C			Location:		React	or Building -	Drywell	
Drawing No.:		2-181-0270-C-01		Description: SD	L-P		-						
System ID:	068 - Reactor Wate	r Recirculating Syst	em			<u>_</u>						·····	
Component ID:	GR-2-09						Size/	Length:	N/A		Thickness/Di	ameter	0.569 / 12"
Limitations:	None			· ·				Start	Time:	1428	Finisl	n Time:	1449
	instrument Settir		<u>Se</u>	arch Unit	r	Cal				Arrial	Ordersteded 8		
Serial No .:	E363	-	Serial No.:			Cal. Checks	emiT	Date	Calibi		Orientated S Signal	Sweep	T
Manufacturer:	KRAUT	KRAMER	Manufacturer:	KBA		nitial Cal.	0930	3/15/2011	Refle		mplitude %	Division	Sound Pa
Model: USI	N 60 Linearity:	L-11-006	Size: 0.5*	Model: Co	mpG ŀ∽	nter. Cal.	1427	3/15/2011	1.0 ^m P	lotch	80%	4.7	1.40"
Delay:	6.9697µ	Range: 3.000	Freq.: 1.5 MHz	Center Freq.:	N/A -	nter. Cal. Inter. Cal.	N/A N/A	{					<u> </u>
M'ti Cal/Vel:	.1251	Energy: High	Exam Angle: 45	Squint Angle:	H	Final Cal.	1555	3/16/2011		<u> </u>			
Damping:	1000 Ω	Reject: 0	Measured Angle:	45° Mode: 5	Shear		Coupla						
PRF Mode:		U Freq.: 1.5 MHz	_ Exit Point:N/A	# of Element	^{18:}	cai. Batch:	-	10325		Circumfer	ential Orient	ated Searc	h Unit
Disp. Start:	IP	Rectify: Full Wave	Config.: Singl	e Focus:	N/A	ype:	_	igel II	Calib	ration	Signal	Sweep	
inst. Freq.:	2.0 MHz		Shape: Round	Contour:	Flat _	Vifg.:		otech	Refle		mplitude %	Division	Sound Pa
			Wedge Style:	Non-Integral	E	Exam Bato	:h:	10325	1.0"	Notch	80%	4.7	1.40°
Ax. Gain (dB):		Gain (dB): 21.4	-	ch Unit Cable		Гуре:	Ultra	igel II	ļ				
1 Screen Di	iv. = <u>.30</u> in. of	Sound Path		Length: <u>6'</u> No. C	ionn.: 0	Mfg.:	Зол	otech	 				+
	Calibration Blo					Ref	erence	Block	 	Refe	erence/Simul	ator Block	
Cal. Block No.:		-123		nstream Scan d		Serial No.:		789631	Gain		Signal	Sweep	Sound Pa
Thickness:	1.0 [*] Dia.:		CW 🗹	CCW 🗹 Scan d	D. 33	Гуре:		mpas	<u>dB</u> 21,4	FSDH	Amplitude 9	6 Division 3.5	1.02"
	: 68° Temp. Tool: 77° Temp. Tool:	<u>531993</u> 531993	_ Exam Surface:	<u>OD</u>	<u> </u>						10 //		
Recordable Ind		es [7] No 🔽	Surface Condition: (If Yes, Ref. Attached	Ground									
Results:	NRI 🖌		nfo		n report.)		Co	omments: E30		Due Date			
				D _1					6 Code C		9/10/2011.		
Percent Of Cov	erage Obtained > 90	%: <u>No</u>	_ Reviewed Previous	Data: Yes									
Examiner	Level II(N)		Signature		Reviewe					A Signat	ure	-	Lu Dat
Hilborn, Mark		Mart		3/15/2011					nu		selet	- 3/	
Examiner N/A	Level N/A		Signature	Date	e Site Revi N/A	8W				Signat	ure		Dat
Other	Level N/A	<u> </u>	Signature		e ANII Rev	iew				Signat			Dat
N/A	LOVO: N/A		- gratero	Date		m Mayo				1			3 Inla
UT Calibration/E			·		J vere	<u>ut in nuti</u>				~/ som Way	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		

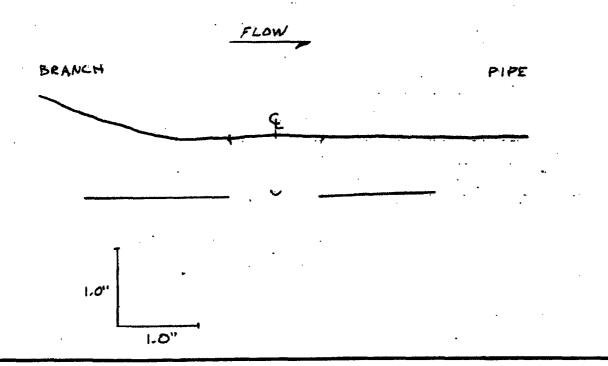
ππ	}		UT	Calibration	xamin	atio	n)	r
	Site/Unit:	BFN	/ 2		Procedure:			N-UT-64			Outage N	o.: I	U2RF16	
	Summary No.:	054	79-ISI-BFN2	 Pi	rocedure Rev.			11		-	Report N	o.: U	T-11-023	-
	Workscope:		ISI	W	ork Order No.:			2-SI-4.6.G	·····		Pag	je: 2	of 4	-
Code:	Section XI 1995	Ed/1996 Add	Cat	./item: R-	A/R1.16C			Location:		Reac	tor Building - I	Dryweli		2
Drawing No.:	2-1	SI-0270-C-01		Description: SDI	L - P	· ·	•						<u> </u>	-
System ID:	068 - Reactor Water R	ecirculating Sys	stem		·····								· · · · · · · ·	-
Component ID:	GR-2-09			····	<u></u>		Size/l	ength:	N/A		Thickness/Dia	meter	0.569 / 12"	-
Limitations:	None							Star	t Time:	1451	Finish	Time:	1507	-
	Instrument Settings		S	earch Unit		al.	Time	Date		Axia	l Orientated Se	arch Unit		i
Serial No.:	E36302		Serial No.:	86-699		ecks			Calibr		Signal	Sweep	Sound Path	1
Manufacturer:	KRAUTKRA		Manufacturer:	RTD	<u></u>	al Cai. r. Cai.	0937 1450	3/15/2011 3/16/2011	Refle		Amplitude %	Division		1
Model: USN Delay:		L-11-006 nge: 3.500	Size: 2 (10x18mi		inte	r. Cal.	N/A	UT UT	1.0" N	otch	80%	5.5	1.90"	4
M'tl Cal/Vel:		argy: High	Freq.: <u>2.0 MHz</u> Exam Angle: 60			r. Cal.	N/A							4
Damping:		ject: 0	Measured Angle:		ONG	al Cai.	1601	3/15/2011					†	1
PRF Mode:	Auto High SU Fi					C	ouplar	ıt]
Disp. Start:	IP Red	ctify: Full Way			S~30 Cal.	Batch:	, 	10325	·	Cį rcum fe	rential Orienta	ted Searc	h Unit	
Inst. Freq.:	2.0 MHz		Shape: RECT	Contour:	Flat Mfg		Ultra Sono	gei il otech	Calibr Refie		Signal Amplitude %	Sweep Division	Sound Path	4
Ax. Gain (dB):	84.1 Circ. Gai	n (dB): N/A	Wedge Style:	Integral	-	n Batch		10325	. N/	A	N/A	N/A	N/A	1.
	••••	Sound Path		rch Unit Cable	Type		Ultra		•				- 	4.
1 Screen Di				Length: 6' No. Co	onn.: 0 Mfg.		Sono		·					- ·
Cal. Block No.:	Calibration Block SQ-12	3		an Coverage		(Defe	rence E		·	Ref	erence/Simula	tor Block	<u> </u>	1
- Thickness:	1.0" Dia.:	Flat		mstream Scan dB		al No.:	-	/89631	Gain		Signal	Sweep	Sound Path	1
Cal. Bik. Temp.:	68° Temp. Tool:	531993		CCW Scan dB	. м/д Сели Туре			npas	dB 79.4	Reflecto FSDH	r Amplitude % 80%	Division 4.0	1.40**	1
Comp. Temp.:	77° Temp. Tool:	531993	Exam Surface: Surface Condition:	OD Ground	· · · · · · · · · · · · · · · · ·	··				гари	0076	4.0	1.40	1
Recordable ind	ication(s): Yes	No 🔽		d Ultrasonic Indication	Report.)]
Results:			Info 🔲		,		Co				e 9/18/2011.			-
Percent Of Cove	arage Obtained > 90%:	No	Reviewed Previou	s Data: Yes		_		5. 7(51993 - Cai 5% Code C	overage	e 9/18/2011.			_
Examiner	Level II(N)		Signature	Date	1				1	Signa	ture / /	1 -	, Pate	İ
Hilborn, Mark F		Mon	L H.L.	3/15/2011	Matt Weich				n		tikler	$-\tilde{c}$		8
Examiner N/A	Level N/A		Signature	Date	Site Review	,				Signa	ture		Date	
Other	Lavel N/A		Signature	Date	ļ	v				Signa	ture		Date	30
N/A					Jerney				0	h. 1/.	Allen		3/21/11	ν 2
UT Calibration/E	Examination	·······							1	77	7		<u></u>	

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VA					Report No.	بنابس بالكسيب يسمعهم
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	05479-ISI-BFN2 Hilborn, Mark R. Mad ALL	Loval II/N)	Reviewer	Matt Welch, Lill	uch	Date: 3/16
Examiner:		Level: N/A	Site Review:		· · · · · · · · · · · · · · · · · · ·	Date:
Other:		Level: N/A	ANII Review:			Date: 3/21/11
				777	/	
Commen	ts: None					
Commen	(3. NON8					
ketch or Pho	to: O:\lddeal_Server\lddeal_BFN\Doc	umentation\U2R1	6 Scanned Data	\GR-2-09 Coverage P	lot.jpg	
					.	
		H - ~ 2 5" ×	W 1.7" × 31	h. 7.7** = \&.02	.in ³	_
	CRV	H - 0.25" X	W 1.7" × 3" - 4.5+6=	- 7.7" = 16.02 0.2.5"+1.7"	_in ³ *37.7" = 16	6.02 in ³
	A Side and	VOL SCAT	- 4,5+6=	0.22 +1./	~ J-1-1 ~ 1	6.02 in ¹
	Achieved Achieved V	VOL SCON	- 4,5+6= 4,5+6	÷ <u></u> ⊆₽V=(= \00%	
	Achieved Achieved V	VOL SCON	- 4,5+6= 4,5+6	0.22 +1./	= \00%	Vol.
BRANC	Achieved Achieved Scan #3	VOL SCON	- 4,5+6= 4,5+6 = 300/4	÷ <u></u> ⊆₽V=(= (0.0% chieveol	
BRANC	Achieved Achieved Scan #3	VO1 5000 101 5000 +4+5 +6	- 4,5+6= 4,5+6 = 300/4	÷ <u></u> ⊆₽V=(= (0.0% chieveol	Vol.
BRANC	Achieved Achieved Scan #3	VO1 5000 101 5000 +4+5 +6	- 4,5+6= 4,5+6 = 300/4	÷ <u></u> ⊆₽V=(= (0.0% chieveol	Vol.
BRANC	Achieved Achieved Scan #3	VO1 5000 101 5000 +4+5 +6	- 4,5+6= 4,5+6 = 300/4	÷ <u></u> ⊆₽V=(= \00%	Vol.
BRANC	Achieved Achieved Scan #3	VO1 5000 101 5000 +4+5 +6	- 4,5+6= 4,5+6 = 300/4	÷ <u></u> ⊆₽V=(= (0.0% chieveol	Vol.
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	Achieved Achieved Scan #3	VO1 5000 101 5000 +4+5 +6	- 4,5+6= 4,5+6 = 300/4	÷ <u></u> ⊆₽V=(= (0.0% chieveol	Vol.
	Achieved Achieved Scan #3	VO1 5000 101 5000 +4+5 +6	- 4,5+6= 4,5+6 = 300/4	÷ <u></u> ⊆₽V=(= (0.0% chieveol	Vol.
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	Achieved Achieved Scan #3	VO1 5000 101 5000 +4+5 +6	- 4,5+6= 4,5+6 = 300/4	÷ <u></u> ⊆₽V=(= (0.0% chieveol	Vol.

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ummary No.:	05479-ISI-BFN2				Mandeleh		— ,	,
Examiner:	Hilborn, Mark R. Mal All	Level:	li(N)	Reviewer:	Matt Welch, Lill	Date	<u>3//</u>	2/11
Examiner:	<u>N/A</u>	Level:	N/A	Site Review:	<u>N/A</u>	Date:		
Other:	N/A	Levei:	N/A	ANII Review:	Down Way May	Date	3/21	<u>/</u>

Sketch or Photo: O:\Iddeai_Server\Iddeai_BFN\Documentation\U2R16 Scanned Data\GR-2-09 T&C.jpg





Supplemental Report

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