HITACHI

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R19
Procedure: GE-UT-300

Data Report Number: 2QR19-120 Linearity Sheet: L-007
Data Sheet Number: D-071
Rev.: 10 DRR: N/A

Calibration Block: CAL-IIW2-045

CS	N/A	4.0"
Material	Size	Thickness

Initial Cal: 1255 Exam Start: 1345
Cal Check: N/A Exam End: 1500
Cal Check: N/A Ultragel II Couplant: 06225 Batch
Final Cal: 1623

255562 Thermometer | 89° F Initial Cal Temp. | 88° F Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
SDH	0.6"	1X	80%	1.2"	0.7"	3.7
		1X				
		1X				
		1X				
		1X				

DAC 1X= 59.4dB
Sweep 0-10 = 2.0" Depth
Note: N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

Sigma	22BC-03009	2(1.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:

0.7"	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	9'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 Manufacturer/Model: 031572811 Serial Number:

6.120 µs	0.2127 in./µsec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	4.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N9 NOZ
VESSEL-NOZZLE (CRD RETURN) Configuration:
OD Plate Exam Surface: 102° F Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	73.4	NRI	60°
Plate cw/ccw	P	73.4	NRI	60°
N/A				
N/A				

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 2/21/2008

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.
Calibration for near surface examination.
Exams performed a minimum of 14 dB above reference.
45° S not used.

Scott R Erickson LIII FOR PHILLIP HOPKINS — Phillip Hopkins — II — 3/7/2008
Initials: Examiner Level: Cal/Exam Date:

Utility Reviewed By: 3/17/08 Date:

N/A — N/A
Initials: Examiner Level:

ANI Reviewed By: 3/21/08 Date:

GE Reviewed By: III 3/19/08
Level: Date:

REPORT NO. 2QR19-120

MANUAL DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT: Quad 2

PREPARED BY: S.C. MORTENSON DATE: 02/25/08

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	OFFSET	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
MAIN STEAM									
N/V Weld (M)	PLATE	0 - 4.0"	60.0°	-	± 25° - 70°	FLAT	14.0"	1 MHz	
N/V Weld/Zone 1 (M)	PLATE	0 - 6.0"	70.0°	-	± 46°	FLAT	25.3"	1 MHz	
Zone 2a (M)	ODBR	60° - 90°	66.4°	-	24.1°	4.0"	16.3"	1 MHz	W-039 ✓
CORE SPRAY									
N/V Weld/Zone 1 (M)	PLATE	0 - 7.0"	60.0°	-	± 55°	FLAT	14.0"	1 MHz	
Zone 1 (M)	PLATE	0 - 6.0"	70.0°	-	± 25°	FLAT	19.6"	1 MHz	
Zone 2A (M)	ODBR	55° - 90°	66.3°	-	16.7°	3.1"	10.6"	1 MHz	W-031, W-032 ✓
CRD. N9									
N/V Weld (M)	PLATE	0 - 6.5"	45°		± 20.0° - 60.0°	FLAT	9.3"	1 MHz	
Zone 1 (M)	PLATE	0 - 7.5"	60.0°		± 15°	FLAT	13.9"	1 MHz	
Zone 2A (M)	PLATE	0 - 11.0"	70.0°		± 15°	FLAT	17.2"	1 MHz	
Zone 2A (M)	ODBR	55° - 90°	66.3°		16.7°	3.1"	3.6"	1 MHz	W-031, W-032 ✓
JET PUMP INSTRUMENT									
N/V Weld (M)	PLATE	5.0 - 10.0"	55.0°	-	± 20° - 60°	FLAT	11.8"	1 MHz	
Zone 1 (M)	PLATE	6.0 - 11.0"	60.0°	-	± 20°	FLAT	13.9"	1 MHz	
Zone 2A (M)	PLATE	0 - 14.0"	70.0°	-	± 25°	FLAT	17.2"	1 MHz	
Zone 2A (M)	PLATE	0 - 6.0"	80.0°	-	± 20°	FLAT	9.0"	1 MHz	
TOP HEAD VENT (N7) - 0° Offset									
N/V Weld (M)	PLATE	0 - 9.0"	60.0°	-	± 25.0° - 55.0°	FLAT	8.4"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 8.0"	70.0°	-	±20°	FLAT	13.6"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 8.0"	80.0°	-	±17°	FLAT	13.0"	1.0 MHz	
ZONE 2A (M)	ODBR	40° - 90°	50.0°	-	26°	1.9"	2.5"	1.0 MHz	W-131 ✓
TOP HEAD SPRAY (N6) - 45° Offset									
N/V Weld (M)	PLATE	0 - 8.0"	45.0°	-	± 15.0° - 85.0°	FLAT	5.7"	1.0 MHz	
N/V Weld (M)	PLATE	0 - 6.0"	60.0°	-	± 15.0° - 90.0°	FLAT	8.4"	1.0 MHz	
ZONE 1 (M)	PLATE	0 - 7.5"	70.0°	-	±45°	FLAT	13.6"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 9.0"	80.0°	-	±21°	FLAT	17.0"	1.0 MHz	
ZONE 2A (M)	ODBR	25° - 85°	50.0°	-	13°	1.9"	6.8"	1.0 MHz	W-180 ✓
ZONE 2A (M)	ODBR	25° - 85°	50.0°	-	30°	1.9"	6.4"	1.0 MHz	W-132 ✓
ZONE 2A (M)	ODBR	45° - 70°	50.0°	-	26°	1.9"	9.4"	1.0 MHz	W-131 ✓
SBLC N10									
N/V Weld (M)	PLATE	4.5" - 9.0"	45.0°	-	± 17° - 51°	FLAT	9.1"	1 MHz	

NOTES: (M) MANUAL
XXX° (XX.X") WEDGE / (FIXTURE) ROTATION ANGLE

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ (704) 577-3770

Chris Minor
SME Review / Date

R.C. MAY 03/04/08
Site Review / Date

QUAD CITIES UNIT 2, Q2R19

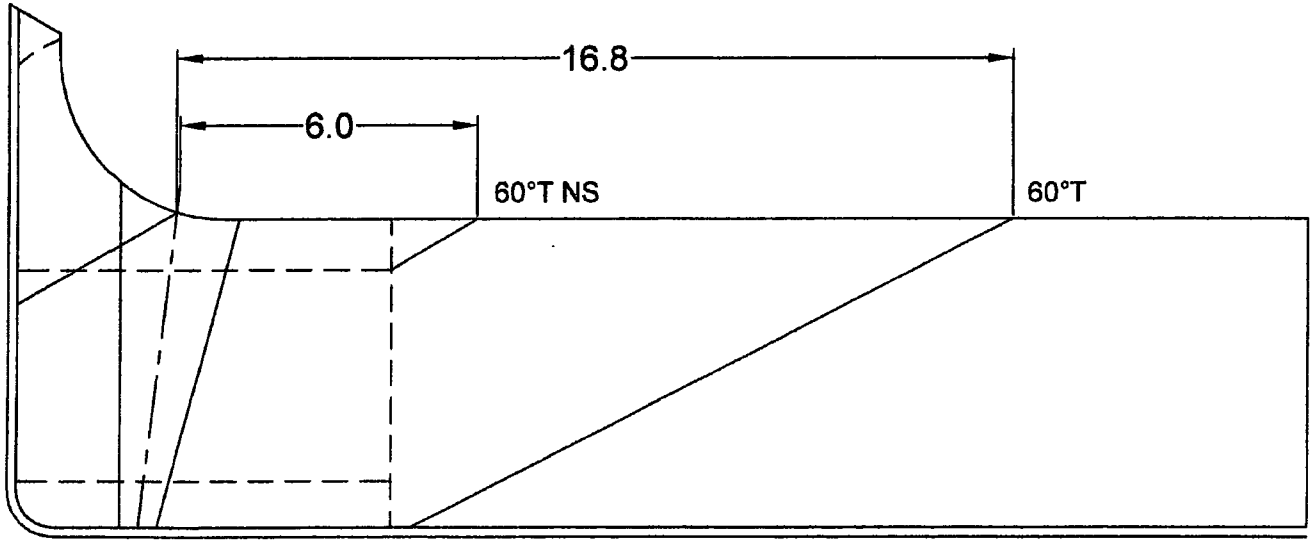
PAGE 5 OF 11

QUAD CITIES UNIT 2, Q2R19

Quad Cities Unit-2
N9 - CRD

60° NS Exam Volume = 13.5 Sq. In.
60° FV S6 Exam Volume = 31.4 Sq. In.
60° FV S4 / 15%T IRS Exam Volume = 6.6 Sq. In.

60° NS T-Scan achieved = 5.7 Sq. In.
60° FV S6 T-Scan achieved = 31.0 Sq. In.
60° FV S4 T-Scan achieved = 6.6 Sq. In.



REPORT NO. 2QR19-120

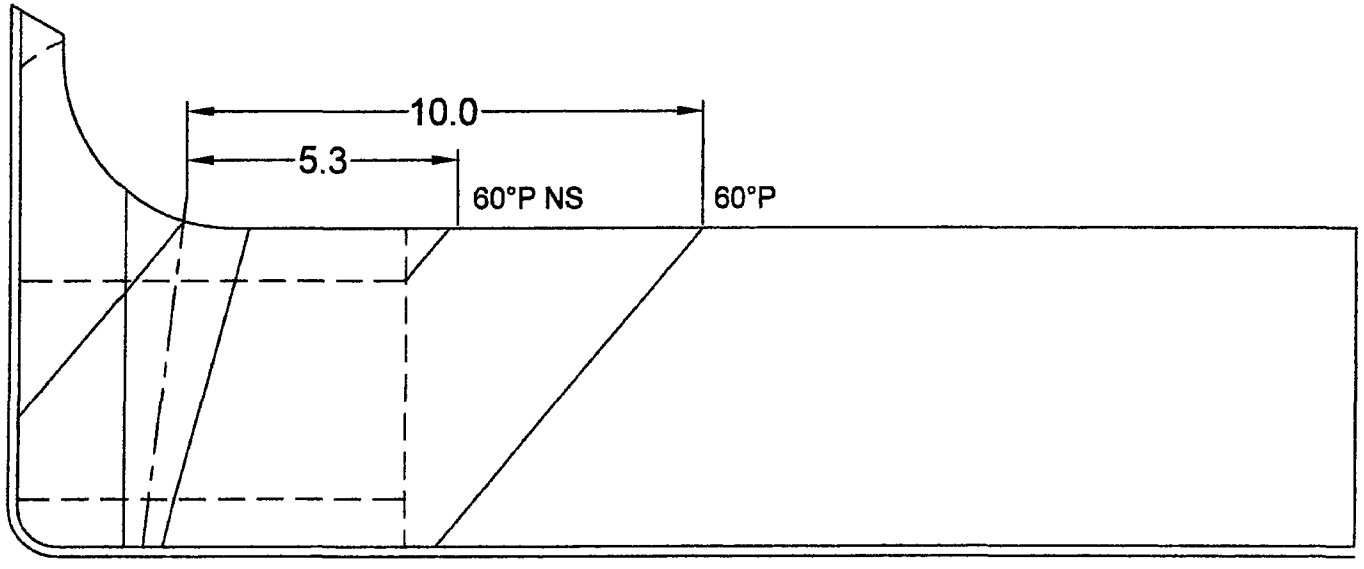
PAGE 4 OF 11

QUAD CITIES UNIT 2, 02R19

Quad Cities Unit-2
N9 - CRD

60° NS Exam Volume = 13.5 Sq. In.
60° FV S8 Exam Volume = 31.4 Sq. In.
60° FV S4 / 15%T IRS Exam Volume = 6.6 Sq. In.

60° NS P-Scan achieved = 5.0 Sq. In.
60° FV S8 P-Scan achieved = 28.5 Sq. In.
Inner 15%T IRS-Scan achieved = 6.6 Sq. In. (By modeling.)



REPORT NO. 2QR19-170

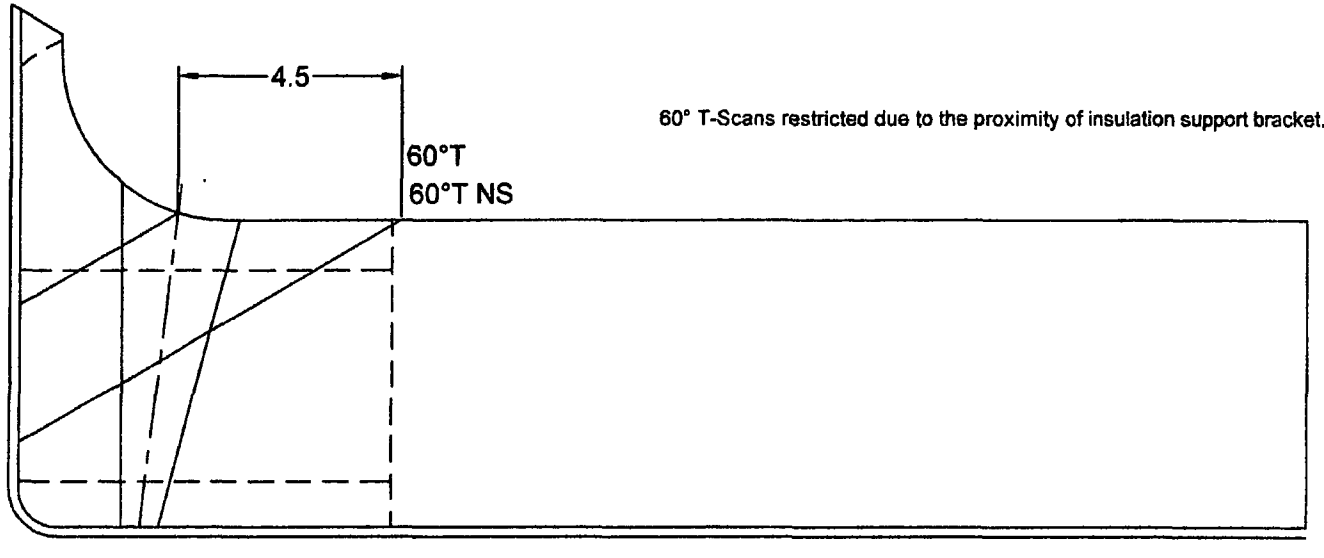
PAGE 7 OF 11

QUAD CITIES UNIT 2, Q2R19

Quad Cities Unit-2
N9 - CRD

60° NS Exam Volume = 13.5 Sq. In.
60° FV S6 Exam Volume = 31.4 Sq. In.
60° FV S4 / 15%T IRS Exam Volume = 6.6 Sq. In.

60° NS T-Scan achieved = 5.0 Sq. In.
60° FV S6 T-Scan achieved = 9.7 Sq. In.
60° FV S4 T-Scan achieved = 0.0 Sq. In.



60° T-Scans restricted due to the proximity of insulation support bracket.

REPORT NO. Q2R19-120

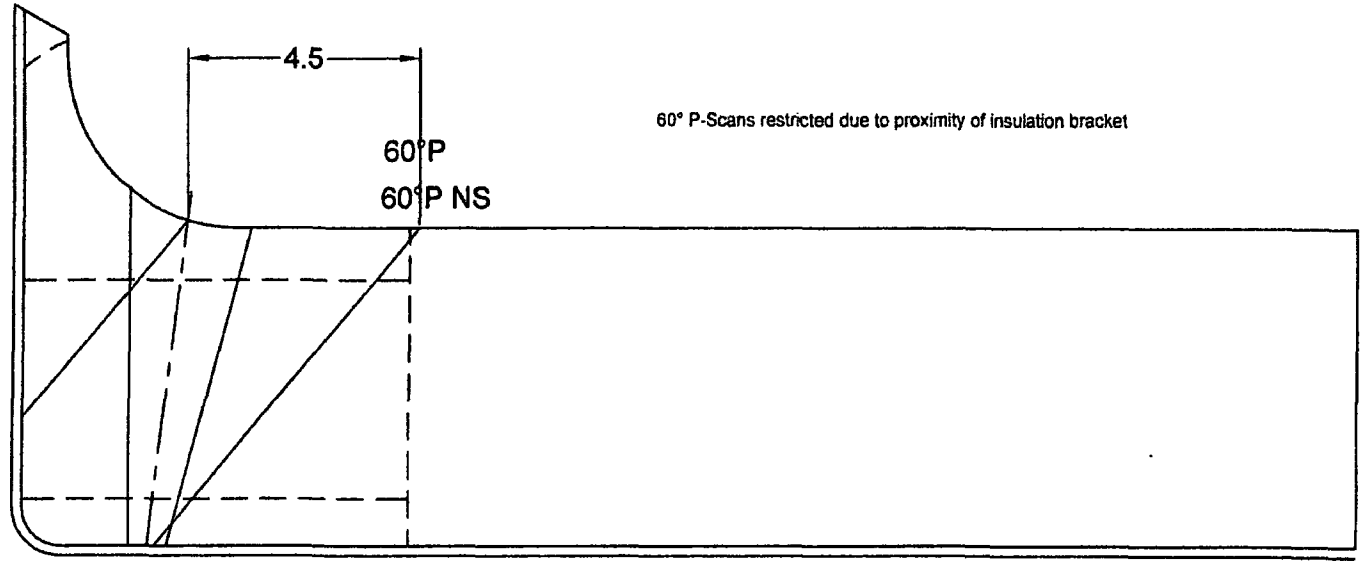
PAGE 8 OF 11

QUAD CITIES UNIT 2, Q2R19

Quad Cities Unit-2
N9 - CRD

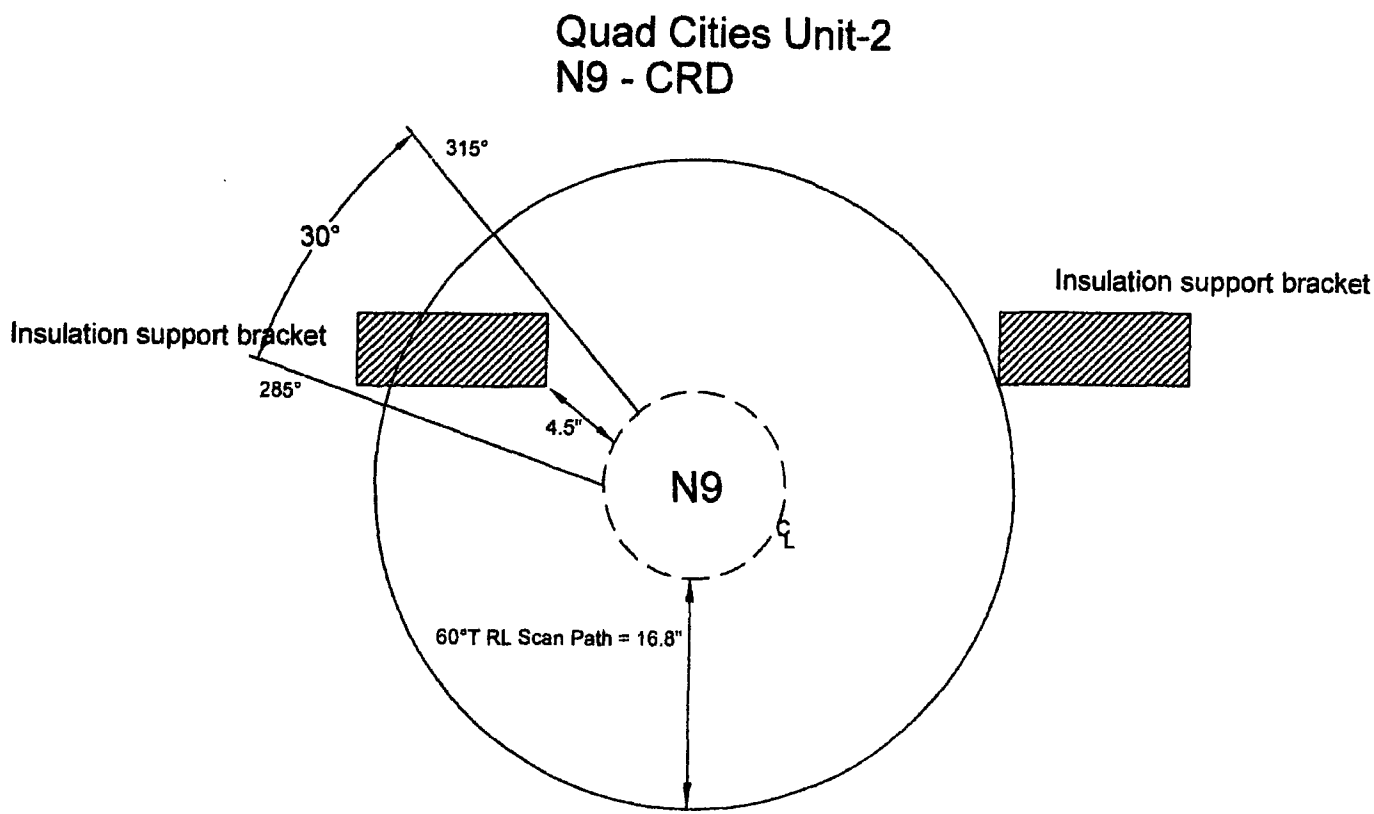
60° NS Exam Volume = 13.5 Sq. In.
60° FV S6 Exam Volume = 31.4 Sq. In.
60° FV S4 / 15%T IRS Exam Volume = 6.6 Sq. In.

60° NS P-Scan achieved = 4.9 Sq. In.
60° FV S6 P-Scan achieved = 16.6 Sq. In.
Inner 15%T IRS-Scan achieved = 2.3 Sq. In.



60° P-Scans restricted due to proximity of insulation bracket

REPORT NO. 2QR19-120



Quad cities Unit 2, Q2R19

Page 10 of 11

REPORT NO. 2QR19-120

GE Hitachi Nuclear Energy

Reactor Pressure Vessel Coverage Calculation Sheet

Quad Cities Unit 2 / Q2R19
N9 VES-NOZ (CRD)
Spring / 2008

Weld Length = 360. / Exam Volume = 51.5		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° T-Scan (S4 UC)	A	6.6	6.6	12.8%	330	5.9%
60° T-Scan (S6 FV)	A	31.4	31	60.2%	330	27.6%
60° T-Scan (S6 NS)	A	13.5	5.7	11.1%	330	5.1%
IRS P-Scan (S4 UC)	A	6.6	6.6	12.8%	330	5.9%
60° P-Scan (S6 FV)	A	31.4	28.5	55.3%	330	25.4%
60° P-Scan (S6 NS)	A	13.5	5	9.7%	330	4.4%
60° T-Scan (S4 UC)	B	6.6	0	0.0%	30	0.0%
60° T-Scan (S6 FV)	B	31.4	9.7	18.8%	30	0.8%
60° T-Scan (S6 NS)	B	13.5	5	9.7%	30	0.4%
IRS P-Scan (S4 UC)	B	6.6	2.3	4.5%	30	0.2%
60° P-Scan (S6 FV)	B	31.4	18.6	36.1%	30	1.5%
60° P-Scan (S6 NS)	B	13.5	4.9	9.5%	30	0.4%
60° T-Scan (S4 UC)						
60° T-Scan (S6 FV)						
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						

% Total Composite Coverage = 77.5%

Rev. 0 9/23/05

Comments: A - Manual exam was restricted due to the nozzle configuration and the proximity of an insulation support bracket.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in inches or degrees.

REPORT NO. 2QR19-120

GE NUCLEAR ENERGY
UT EXAMINATION SUMMARY SHEET

Report No: Q2R17-85
WO No: 579936, 579937

PROJECT	Quad Cities Unit-2, Q2R17
WELD ID:	N2A NOZ and N2A IRS
SYSTEM:	Reactor Pressure Vessel

CALIBRATION ID:	NOZ.IN, NOZ.IN.2, IRS.IN
GERIS DATA:	Scan file types: P1, P2, P3, TL and Z1
MANUAL DATA:	UT-095, UT-096
EXAMINERS:	S. Gauthier Lv II, K. Montgomery Lv II, B. Dummer Lv III

Ultrasonic examination results were acceptable to the requirements of ASME B&PV Code Section XI, 1995 Edition with the 1996 Addenda as modified by the PDI program description and the Federal Register, Part II, Nuclear Regulatory Commission, 10 CFR Part 50 for Category B-D Reactor Pressure Vessel (RPV) Assembly Welds.

Examination volumes were in accordance with Section XI, Figure IWB-2500-7 (a).

Automated transverse and parallel scans were performed in accordance with procedure GE-UT-705 V4, using 0° L, 60° RL, and 45° S, search units. Nozzle Inner Radius and Inner 15%T examination volume parallel scans were performed using model validated shear wave search units.

Manual examinations from the ODBR surface (Zone 2A) were performed in accordance with procedure GE-UT-311 V10.

Scanning was performed from the vessel OD shell and OD Blend Radius surfaces examining the nozzle to shell weld and nozzle inner radius section regions.

Six (6) acceptable indications were recorded.

Previous data (R-167, R-170, R-173, R-176 from 1997) was reviewed prior to completing this summary. No significant changes were noted.

Scanning was limited due to the nozzle configuration.

Coverage = 28% Nozzle to Shell weld.

Coverage = 100% Nozzle Inner Radius Section.

PREPARED BY / DATE	REVIEWED BY / DATE	UTILITY REVIEW / DATE	ANII REVIEW / DATE
3/9/04	3-10-04	3/10/04	3/10/04
UT Level: III	UT Level: III		

Page 1 of 24

GE Nuclear Energy

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N2A-NOZ

Report No.: Q2R17-85
Exam Data Sheet: N2A-01

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n2a.p1.1	06B	P1	~	NRI	~	NRI	~	~	~	~	~	~	~	~	~	~	1
n2a.p2.1	06A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	~
n2a.p2.2	06A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	~
n2a.p2.3	06A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	2
n2a.p2.4	06A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	2
n2a.p3.1	06A	P3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n2a.tl.1	06A	TL	NRI	001	NRI	~	~	~	~	~	~	~	~	~	~	~	1
n2a.tl.2	06A	TL	NRI	003	002	~	~	~	~	~	~	~	~	~	~	~	1

Comments: 1 - Plate segregates observed plate side. 2 - Store process error, data acceptable.

Scanning performed with high profile triple pack, low profile tractor and 11" arm.
The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: CBM
Level: II
Date: 3/9/04

Reviewed By: BJMD
Level: III
Date: 3-10-04

GE Nuclear Energy

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N2A-IRS

Report No.: Q2R17-85
Exam Data Sheet: N2A-02

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n2a.70z1.1	06B	Z1	~	~	NRI	NRI	~	~	~	~	~	~	~	~	~	~	~
n2a.68z1.1	06B	Z1	~	~	~	~	NRI	NRI	~	~	~	~	~	~	~	~	~

Comments: Scanning performed with high profile triple pack, low profile tractor and 11" arm.

The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: CPM
Level: III
Date: 3/9/04

Reviewed By: B/M Dunn
Level: III
Date: 3-10-04

Quad Cities Unit-2

GE Nuclear Energy

GERIS 2000
Indication Data Sheet

Project : Quad Cities Unit-2
Component : N2A NOZ
Scan File Name : n2a.tl.1

Channel : 2
Angle : 45°
Direction : 351°

Report No.: Q2R17-085
Exam Data Sheet: N2A-01
Ind. Data Sheet: N2A-001

Ind. No.	Max Amp	SU Radial	Min Azimuth	Depth	Max Amp Azimuth	Depth	Max Azimuth	Depth	Length	Through Wall	Remarks
1	20	19.30	300.0°	5.47	301.5°	5.31	301.5°	5.31	0.51	N/A	None
2	26	19.06	305.5°	5.37	309.4°	5.21	310.1°	5.08	1.53	N/A	None

Comments: Indications 1 and 2 have no determinable throughwall dimensions and are acceptable to the requirements of IWB-3000.

The symbol ~ indicates "No entry required" or "Not Applicable".

Analyst: CP M
Level: TII
Date: 3/9/04

Reviewed By: B/MD
Level: III
Date: 3-10-04

Page 4 of 24

Quad Cities Unit-2

GE Nuclear Energy

GERIS 2000
Indication Data Sheet

Project : Quad Cities Unit-2
Component : N2A NOZ
Scan File Name : n2a.tl.2

Channel : 3
Angle : 60°
Direction : 7°

Report No.: Q2R17-085
Exam Data Sheet: N2A-01
Ind. Data Sheet: N2A-002

Ind. No.	Max Amp	SU Radial	Min Azimuth	Depth	Max Amp Azimuth	Depth	Max Azimuth	Depth	Length	Through Wall	Remarks
3	53	23.20	326.7°	6.44	330.2°	6.49	330.6°	6.34	1.58	N/A	None
4	70	23.30	1.4°	6.44	3.0°	6.43	3.8°	6.40	0.98	N/A	None

Comments: Indications 3 and 4 have no determinable throughwall dimensions and are acceptable to the requirements of IWB-3000.

The symbol ~ indicates "No entry required" or "Not Applicable".

Analyst: CPW
Level: III
Date: 3/9/04

Reviewed By: R M D
Level: III
Date: 3-10-04

Page 5 of 24

Quad Cities Unit-2

GE Nuclear Energy

GERIS 2000
Indication Data Sheet

Project : Quad Cities Unit-2
Component : N2A NOZ
Scan File Name : n2a.tl.2

Channel : 2
Angle : 45°
Direction : 351°

Report No.: Q2R17-085
Exam Data Sheet: N2A-01
Ind. Data Sheet: N2A-003

Ind. No.	Max Amp	SU Radial	Min Azimuth	Depth	Max Amp Azimuth	Depth	Max Azimuth	Depth	Length	Through Wall	Remarks
5	24	23.50	189.7°	5.66	190.3°	5.82	191.5°	5.84	0.74	N/A	None
6	31	20.40	128.4°	5.67	130.0°	5.66	132.3°	5.50	1.39	N/A	None

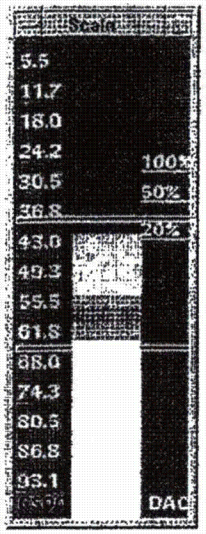
Comments: Indications 5 and 6 have no determinable throughwall dimensions and are acceptable to the requirements of IWB-3000.

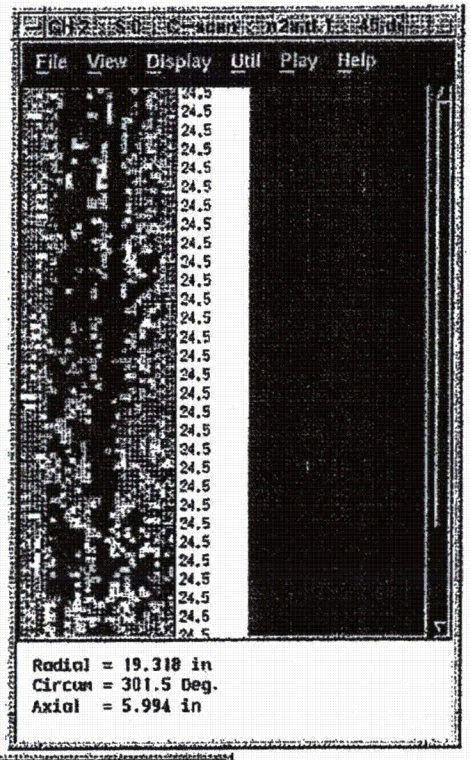
The symbol – indicates "No entry required" or "Not Applicable".

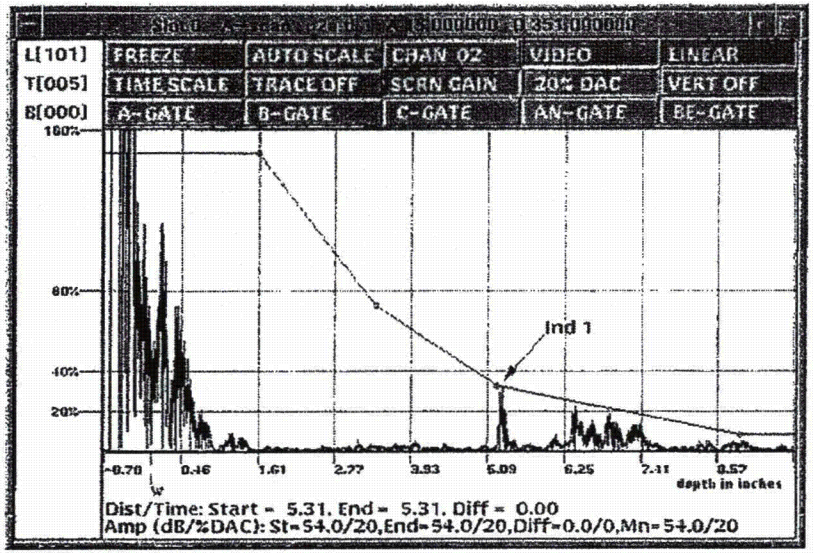
Analyst: CD M
Level: III
Date: 3/9/04

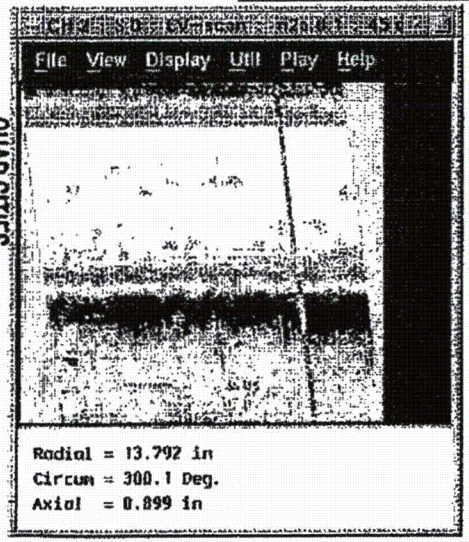
Reviewed By: B/M D
Level: III
Date: 3-10-04

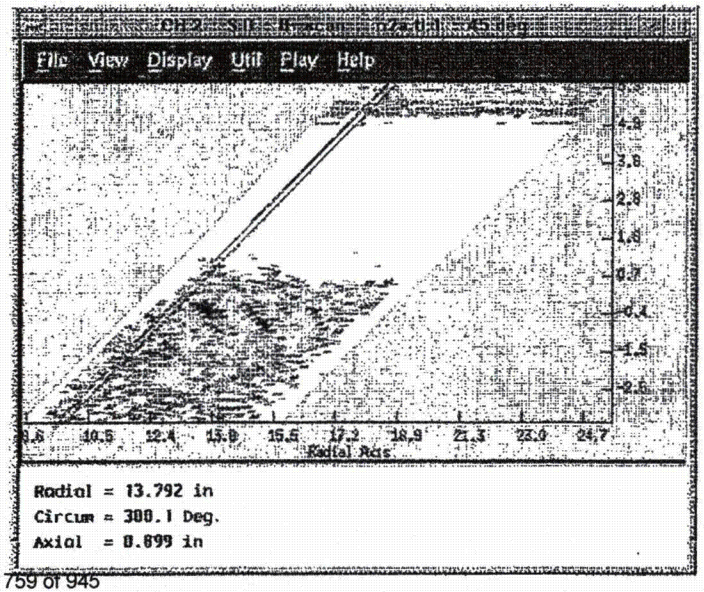
Page 6 of 24



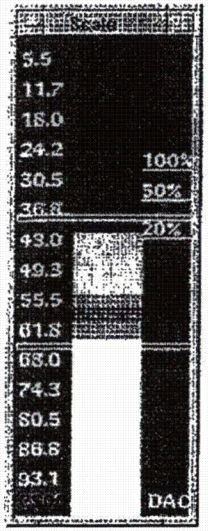


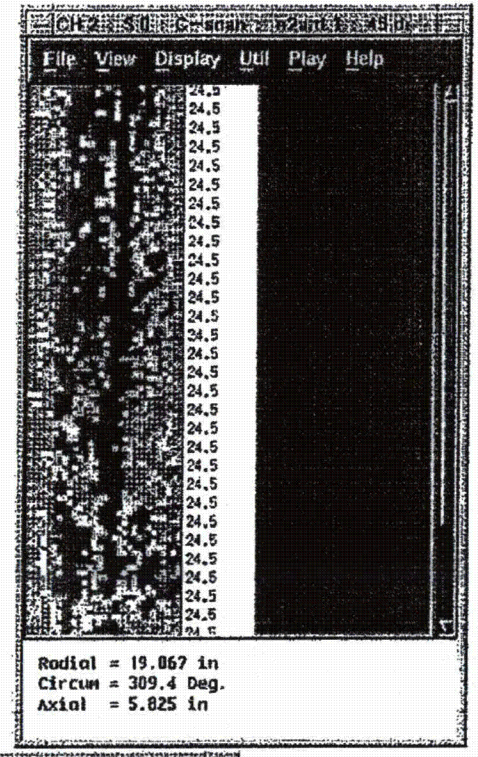


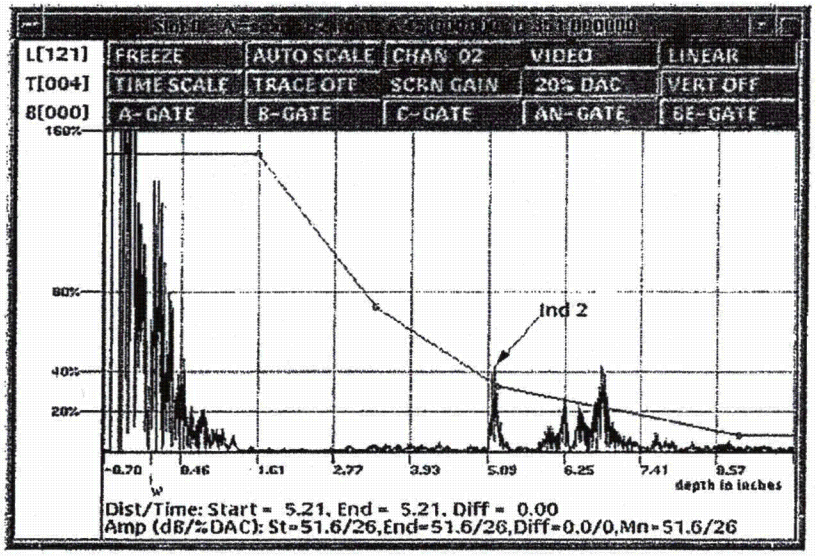


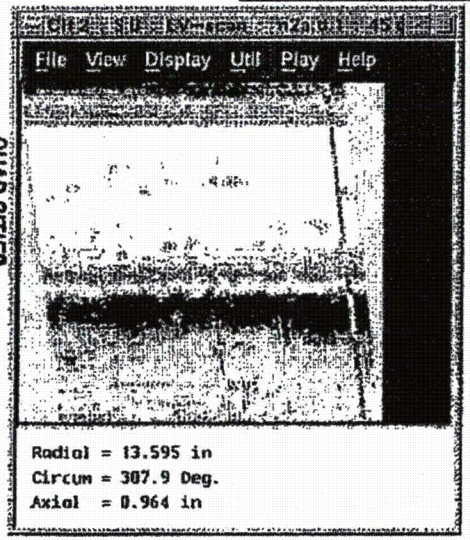


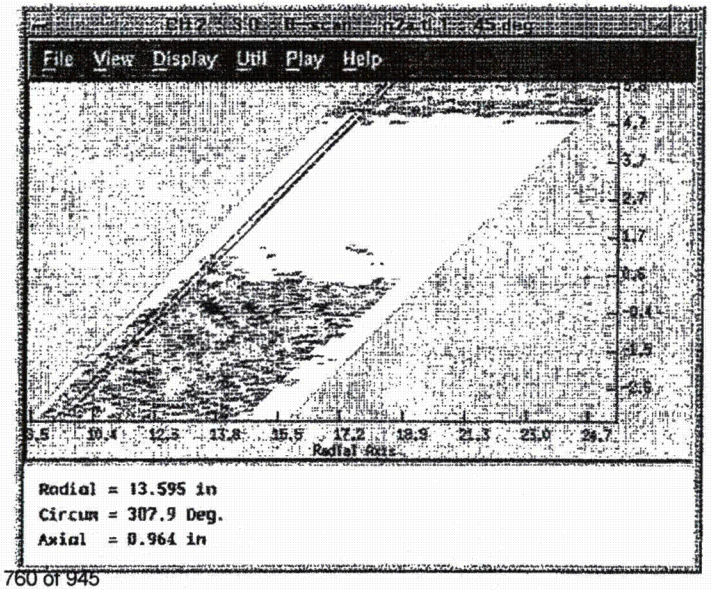
QUAD CITIES
REPORT NO. Q3-R17-085
PAGE 7 OF 24



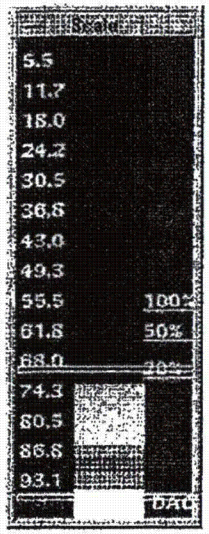


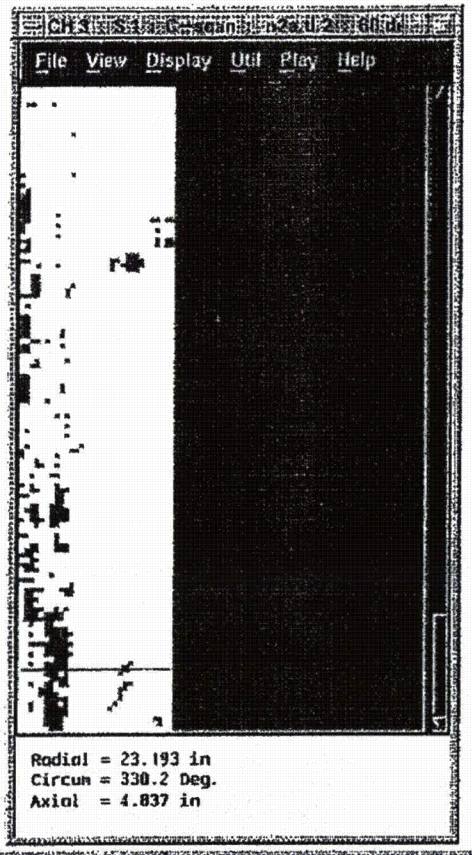


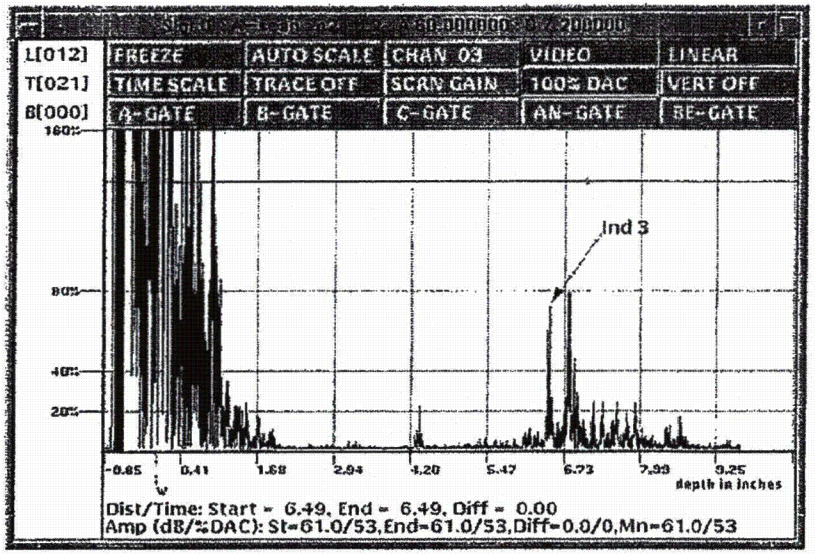


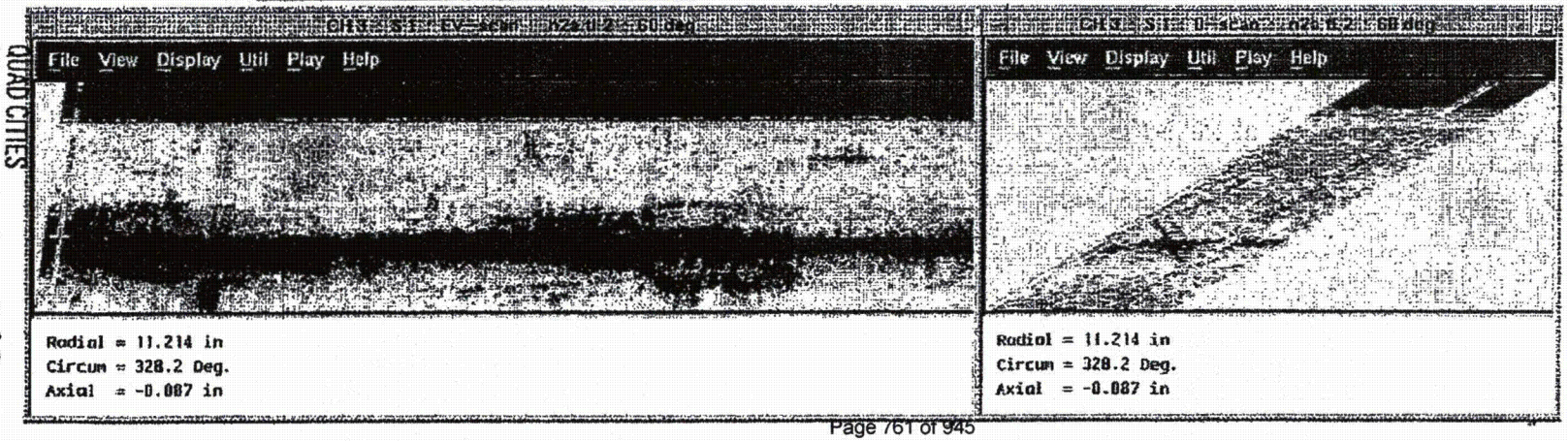


QUAD CITIES
REPORT NO. 92R17-085
PAGE 8 OF 24

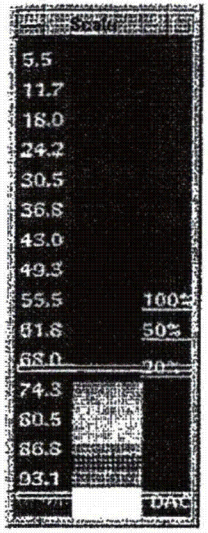


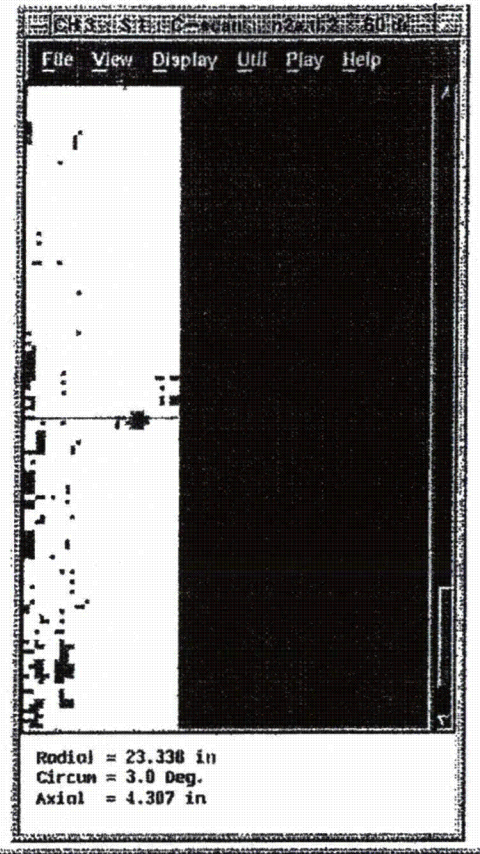


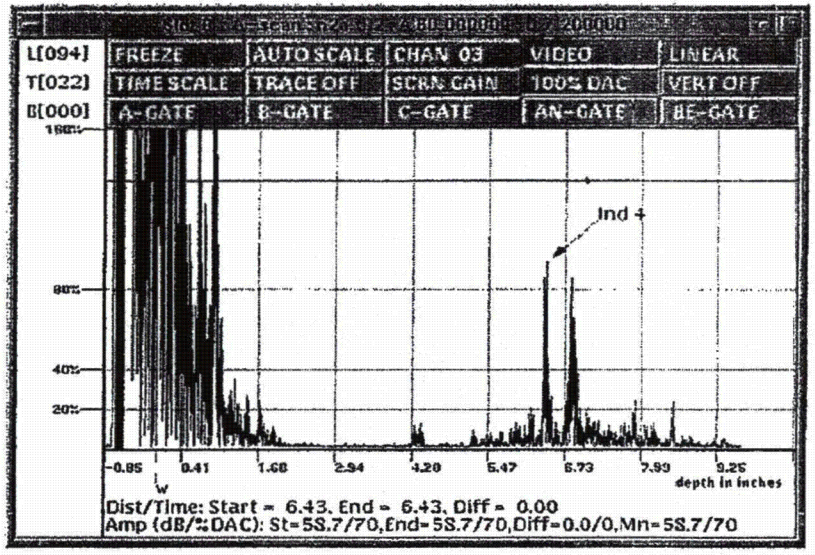


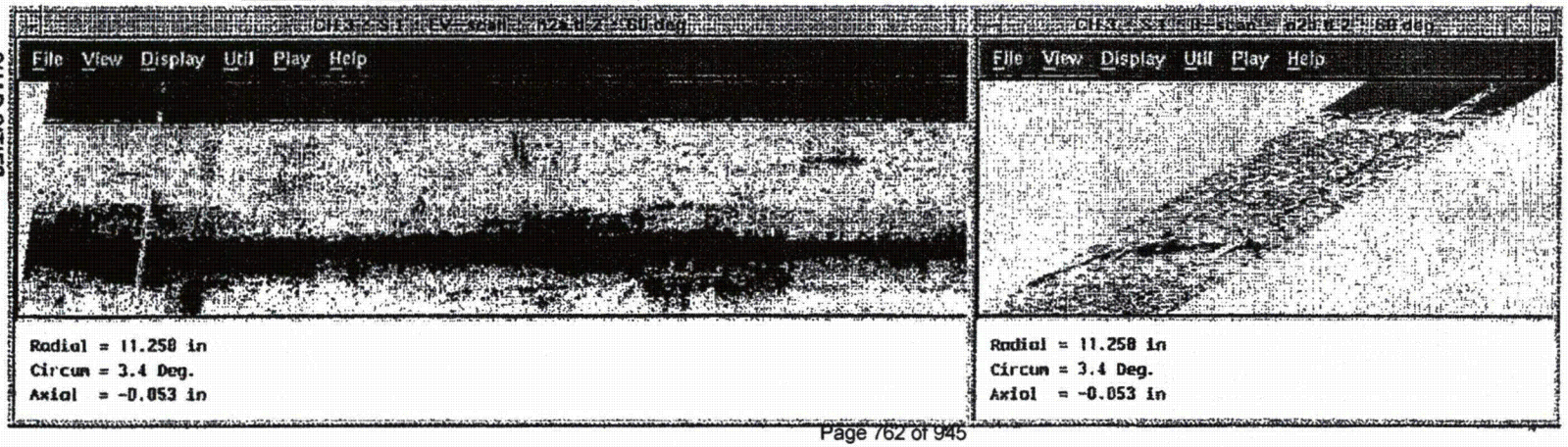


QUAD CITIES
REPORT NO. Q2R17-0YS
PAGE 9 OF 24

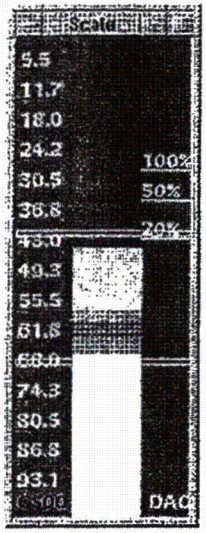


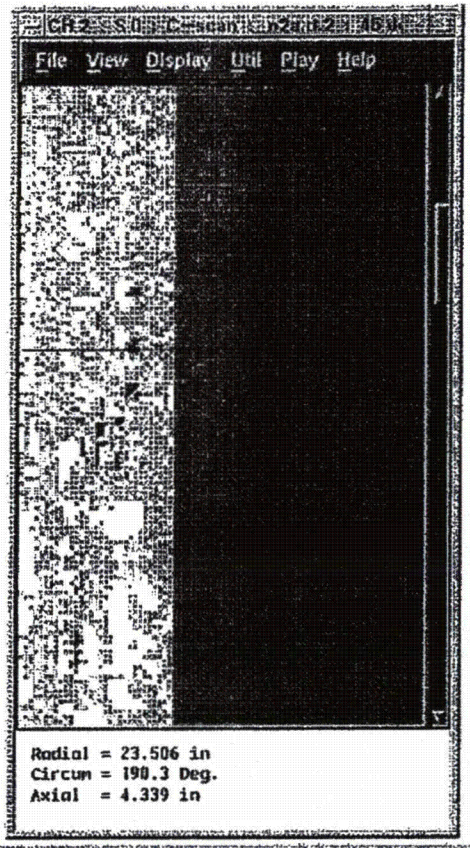


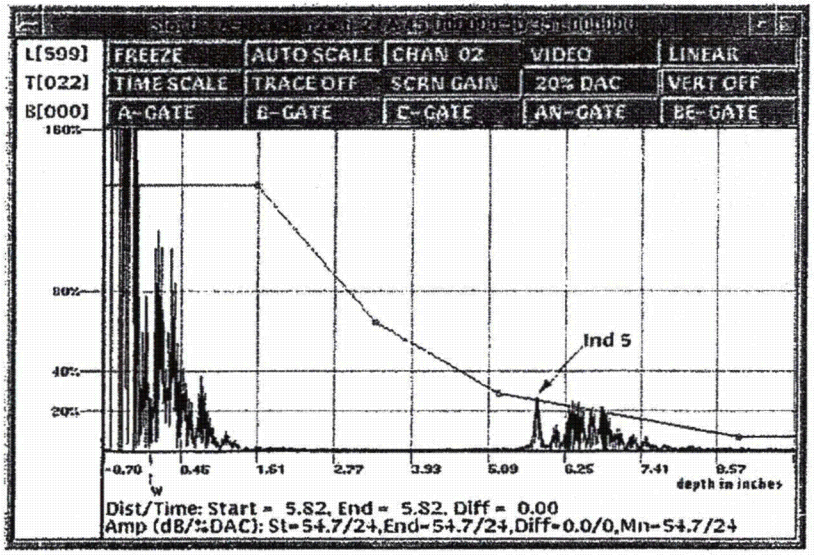


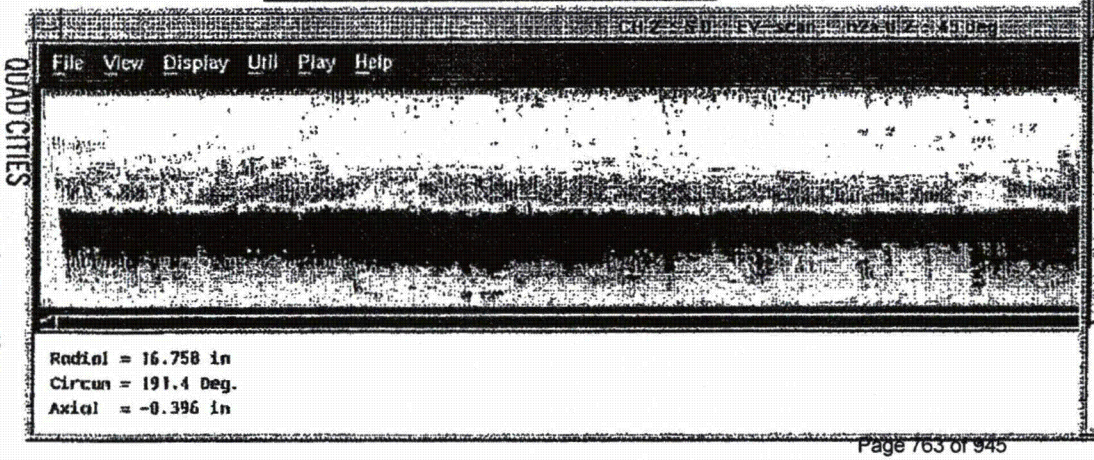


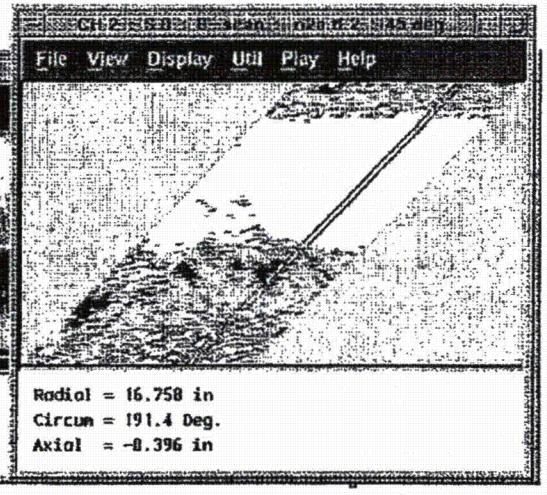
QUAD CITIES
REPORT NO. Q2R17-085
PAGE 10 OF 24



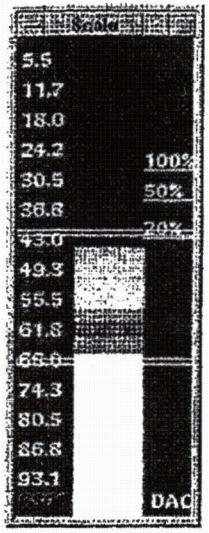


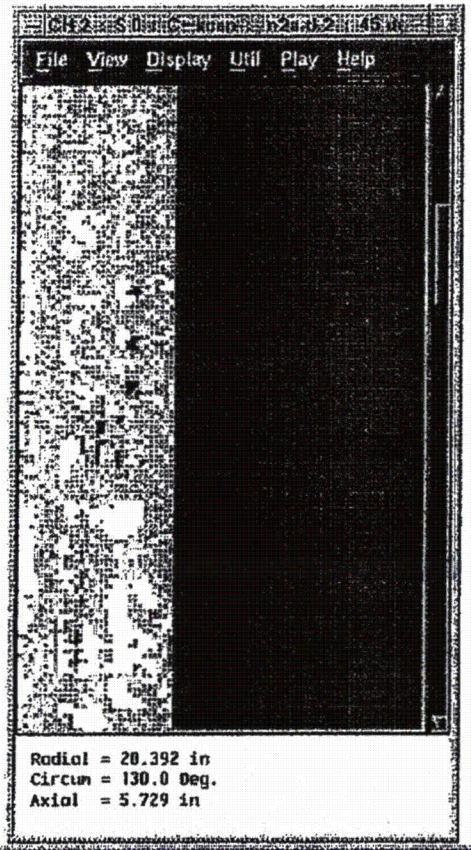


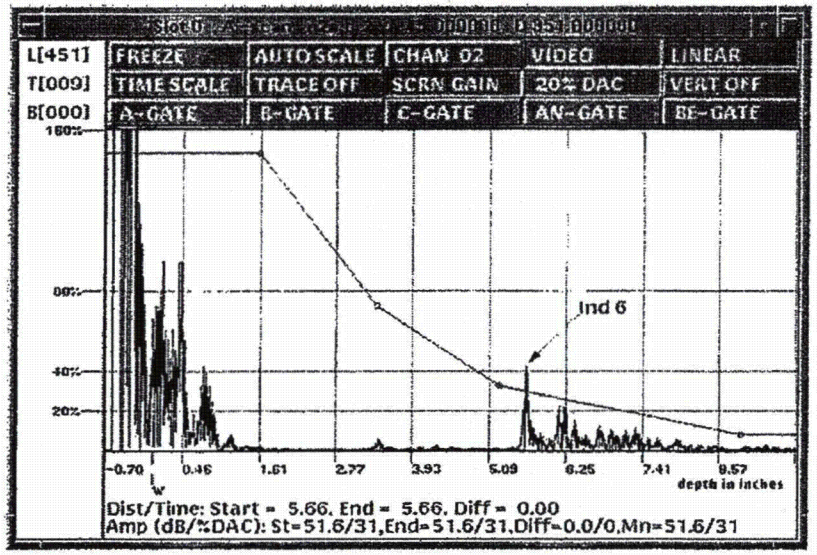


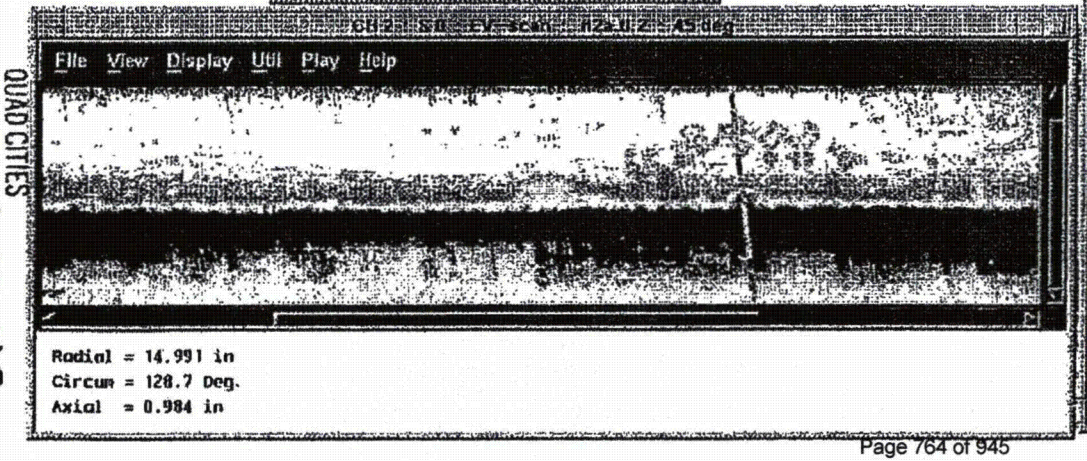


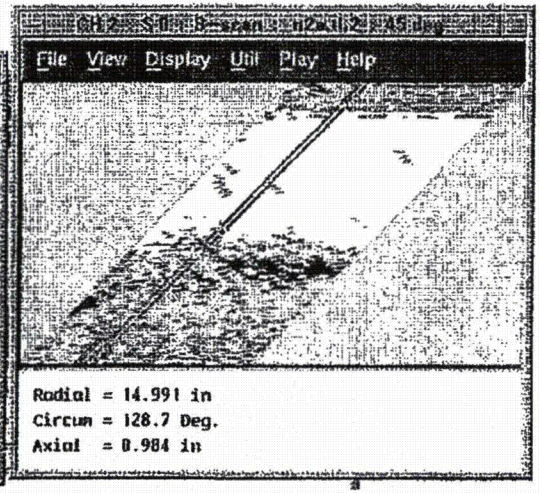
QUAD CITIES
REPORT NO. Q2R17-09S
PAGE 11 OF 24











QUAD CITIES
REPORT NO. Q2R17-085
PAGE 12 OF 24

Quad Cities Unit-2, Q2R17

GERIS 2000 OD EXAMINATION SCAN FILES DATA SHEET

CUSTOMER: **Exelon**
SITE: **Quad Cities Unit-2**
OUTAGE: **Q2R17**

PROCEDURE NO. : GE-UT-705 V4 **REVISION :** N/A **DRR :** N/A

FILE NAME	WELD	DISK NO.	DATE	EXAM START TIME	EXAM STOP TIME	SCAN START	SCAN STOP	SCAN AREA	VESSEL TEMP. (°F)	CAL RECHECK IN	CAL RECHECK OUT	CAL RECORD
n2a.p2.1	N2A	06A	03/08/04	16:37	17:27	270°	82°	-189°	98°	N/A	N/A	NOZ.IN
n2a.p2.2	N2A	06A	03/08/04	17:41	17:49	83°	51°	-32°	98°	N/A	N/A	NOZ.IN
n2a.p2.3	N2A	06A	03/08/04	19:39	20:00	53°	270°	-143°	98°	N/A	N/A	NOZ.IN
n2a.p2.4	N2A	06A	03/08/04	20:08	20:09	272°	269°	-3°	98°	N/A	N/A	NOZ.IN
n2a.tl.1	N2A	06A	03/08/04	23:13	23:26	270°	317°	47°	98°	N/A	N/A	NOZ.IN.2
n2a.tl.2	N2A	06A	03/08/04	23:37	00:50	318°	271°	313°	98°	N/A	N/A	NOZ.IN.2
n2a.p3.1	N2A	06A	03/09/04	01:16	02:29	270°	269°	-361°	98°	N/A	N/A	NOZ.IN.2
n2a.p1.1	N2A	06B	03/09/04	02:55	03:43	270°	271°	361°	98°	N/A	N/A	NOZ.IN.2

COMMENTS : * Rotation angles for TL and P exams per the GERIS 2000 nozzle to vessel scan-plan sheet (attached).
The GERIS 0° reference is located 90° CW of nozzle TDC.

Automated scanning was restricted due to the nozzle weld configuration.

OPERATORS: SHANE GAUTHIER LvII
KENT MONTGOMERY LvII

SOFTWARE REVISION: 5.26
THERMOMETER S/N : 235018
COUPLANT : Demineralized Water

Search Unit Data:

No.	Model / Mode	S/N	Size	Freq. (MHz.)	Rot. Angle
1	RTD, 0° L2.25 / L	01-231	1.0 Dia	2.25	N/A
2	RTD, 45° T1-St / S	01-233	32x22mm	1.00	*
3	RTD, 60° L2-St / L	97-152	30x25mm	2.00	*
4	RTD, 45° T1-St /S	04-8	32x22mm	1.00	*
6	RTD, 70° TRL2-St / L	96-228	2(12x25)mm	2.00	*
13	RTD, 60° T1-St / S	01-234	32x18mm	1.00	*
14	RTD, 60° T1-St / S	01-235	32x18mm	1.00	*

Q2R17-85

Page 13 of 24

Quad Cities Unit-2, Q2R17

GERIS 2000 OD EXAMINATION SCAN FILES DATA SHEET

CUSTOMER: **Exelon**
SITE: **Quad Cities Unit-2**
OUTAGE: **Q2R17**

PROCEDURE NO. : GE-UT-705 V4 **REVISION :** N/A **DRR :** N/A

FILE NAME	WELD	DISK NO.	DATE	EXAM START TIME	EXAM STOP TIME	SCAN START	SCAN STOP	SCAN AREA	VESSEL TEMP. (°F)	CAL RECHECK IN	CAL RECHECK OUT	CAL RECORD
n2a.70z1.1	N2A-IRS	06B	03/09/04	05:50	07:07	270°	271°	361°	98°	N/A	N/A	IRS.IN
n2a.68z1.1	N2A-IRS	06B	03/09/04	04:13	05:22	270°	269°	-361°	98°	N/A	N/A	IRS.IN

COMMENTS : * Rotation angles for all exams per the GERIS 2000 nozzle to vessel scan-plan sheet (attached).
The GERIS 0° reference is located 90° CW of nozzle TDC.

Automated scanning was restricted due to the nozzle weld configuration.

OPERATORS: SHANE GAUTHIER LvII
KENT MONTGOMERY LvII

SOFTWARE REVISION: 5.26
THERMOMETER S/N : 235018
COUPLANT : Demineralized Water

Search Unit Data:

No.	Model / Mode	S/N	Size	Freq. (MHz.)	Rot. Angle
3	RTD, 68° T1-St / S	98-287	32x16mm	1.00	*
4	RTD, 68° T1-St / S	98-288	32x16mm	1.00	*
5	RTD, 70° T1-St / S	94-503	32x16mm	1.00	*
6	RTD, 70° T1-St / S	01-237	32x16mm	1.00	*

Q2R17-85

Page 14 of 24

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R17
Procedure: GE-UT-311 Rev: V10 DRR: N/A

Data Report Number: Q2R17-85 Linearity Sheet: L-008
Data Sheet Number: UT-095

Calibration Data for Block: 99978 AQC

CSCL	N/A	7.3"
Material	Size	Thickness

Initial Cal: 1145 Exam Start 12:10
Cal Check: N/A Exam End 13:05
Cal Check: N/A Ultragel II 01225
Final Cal: 1320 Couplant: Batch

~~255018~~ 235018 88° F 88° F
Thermometer Initial Cal Temp. Final Cal Temp:

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID	7.3	1X	80	19.4	20.65	7.9
		1X				

DAC @ 1X 51.3

Sweep 0-10 26 Metal Path

Acceptable Linearity performed : 2/10/2004

Search Unit Data

KBA	00L323	0.5"x1.0" / Rect.
Manufacturer:	Serial No.:	Size/Shape:
0.85 in.	70°	68°
Incident Point:	Nominal Angle:	Measured Angle:
1.0 MHz	113-291-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4		031573711	
Maufacturer/Model:		Serial No.:	
16.43 us	0.1283 in /usec		0.8 - 3.0 MHz
Zero:	Velocity:		Narrowband Filter:
Auto	Full	26.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	Off	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Component: N2A IRS

VESSEL-NOZZLE (RECIRCULATION)
Configuration:

ODBR 98° F
Exam Surface: Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
360°	67.5	18.1	W-025A	64	NRI

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration.

Calibration for Zone 2A Clockwise

Exams performed to maintain a 20% - 30% FSH ID roll

RD	Brad Dummer	III	3/9/04		3/10/04
Initials:	Examiner:	Level	Cal/Exam Date:	Utility Reviewed By:	Date:
		III	3/9/04		3/10/04
GE Reviewed By:		Level:	Date:	ANII Reviewed By:	Date:

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R17
Procedure: GE-UT-311 Rev: V10 DRR: N/A

Data Report Number: Q2R17-85 Linearity Sheet: L-008
Data Sheet Number: UT-096

Calibration Data for Block: 99978 AQC

Material	Size	Thickness
CSCL	N/A	7.3"

Initial Cal: 1145 Exam Start 12:10
Cal Check: N/A Exam End 13:05
Cal Check: N/A Ultragel II Couplant: 01225 Batch
Final Cal: 1320

~~255019~~ 235018 88° F 88° F
Thermometer Initial Cal Temp. Final Cal Temp:

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID	7.3	1X	80	19.4	20.65	7.9
		1X				

DAC @ 1X 51.3

Sweep 0-10 26 Metal Path

Acceptable Linearity performed : 2/10/2004

Search Unit Data

Manufacturer:	Serial No.:	Size/Shape:
KBA	00L321	0.5"x1.0" / Rect.

Incident Point:	Nominal Angle:	Measured Angle:
0.85 in.	70°	68°

Frequency:	Model:	Mode:
1.0 MHz	113-291-600	Shear

Search Unit Cable

Cable Type:	Length:	Connectors:
RG-174	12'	0

Instrument Settings

Panametrics / Epoch 4 — Manufacturer/Model:
031573711 — Serial No.:

Zero:	Velocity:	Narrowband Filter:
16.43 us	0.1283 in /usec	0.8 - 3.0 MHz

Rep Rate:	Rectification:	Range:	Pulser/Energy
Auto	Full	26.0 in.	Sq. / Med

Damping:	Reject:	Frequency:	Mode:
400 Ohms	Off	1.0 MHz	P/E

DAC:	TVG:	CSC:	DGS:
Off:	Off:	Off:	Off:

Exam Data for Component: N2A IRS

VESSEL-NOZZLE (RECIRCULATION)
Configuration:

ODBR — Exam Surface:
98° F — Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
360°	67.5	18.1	W-025B	64	NRI

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration.

Calibration for Zone 2A Counter-clockwise

Exams performed to maintain a 20% - 30% FSH ID roll.

BD Brad Dummer III 3/9/04
Initials: Examiner: Level Cal/Exam Date:

Utility Reviewed By: 3/10/04 Date:

GE Reviewed By: Level: 3/19/04 Date:

ANII Reviewed By: 3/19/04 Date:

Page 16 of 24

Report No.: Q2R17-85

Recirculation Inlet N2A-NOZ
Quad Cities Unit-2, 2004

Weld Length = 360. Exam Volume = 80.5		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Auto	Percent of Area Auto	Weld Length Auto	Percent Auto
70° T-Scan	A	29.3	2	2.5%	360	1.2%
45° T-Scan	A	42.1	17	21.1%	360	10.6%
60° T-Scan	A	9.1	5.9	7.3%	360	3.7%
70° P-Scan	A	29.3	0	0.0%	360	0.0%
45° P-Scan	A	42.1	11.7	14.5%	360	7.3%
60° P-Scan	A	9.1	9.1	11.3%	360	5.7%
70° T-Scan						
45° T-Scan						
60° T-Scan						
70° P-Scan						
45° P-Scan						
60° P-Scan						
70° T-Scan						
45° T-Scan						
60° T-Scan						
70° P-Scan						
45° P-Scan						
60° P-Scan						

% Total Composite Coverage = 28%

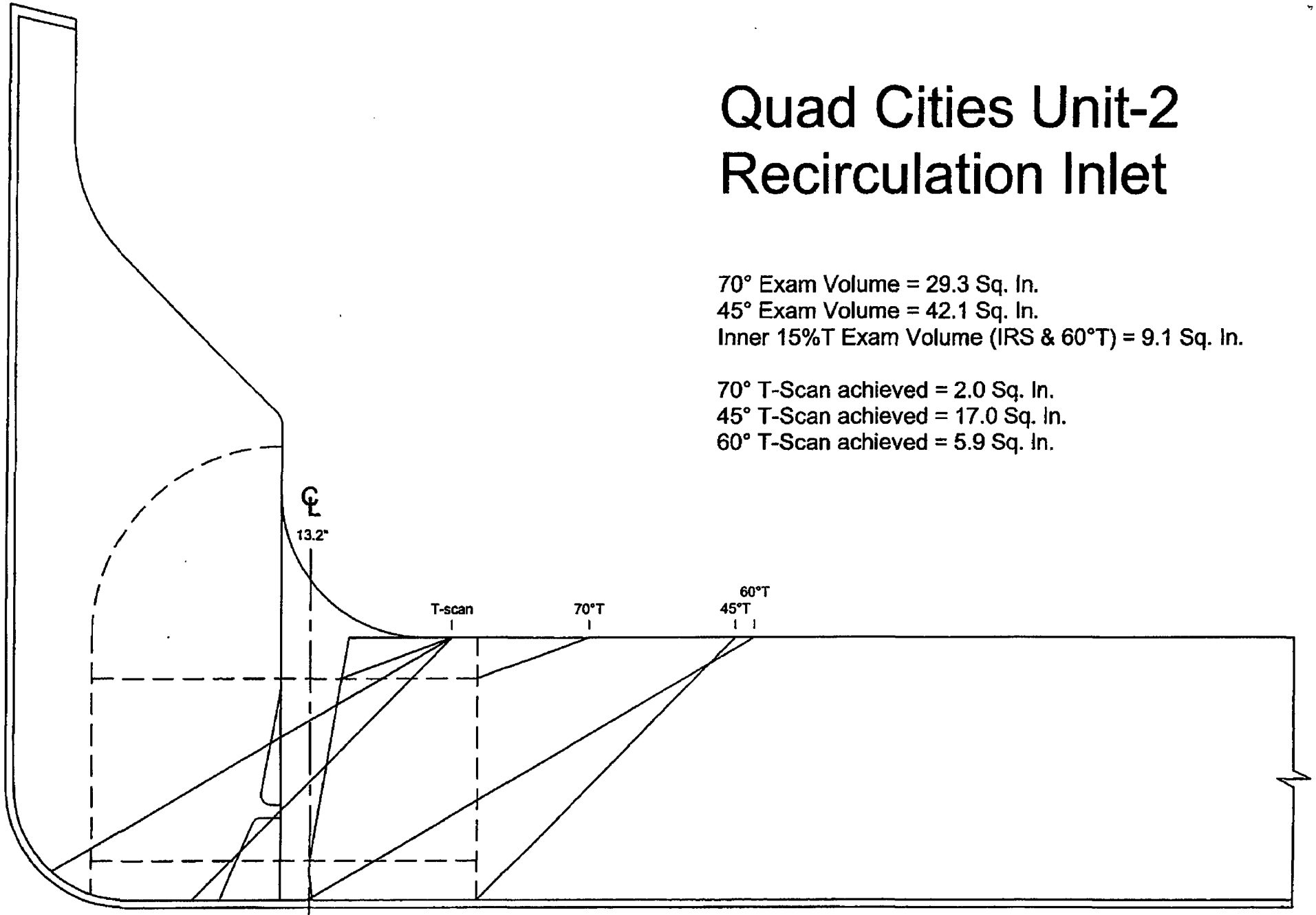
Comments: A - Examined accessible length. Scanning limited due to scanner access.

Note - Rounding methods may make calculated values appear in error.

Quad Cities Unit-2 Recirculation Inlet

70° Exam Volume = 29.3 Sq. In.
45° Exam Volume = 42.1 Sq. In.
Inner 15%T Exam Volume (IRS & 60°T) = 9.1 Sq. In.

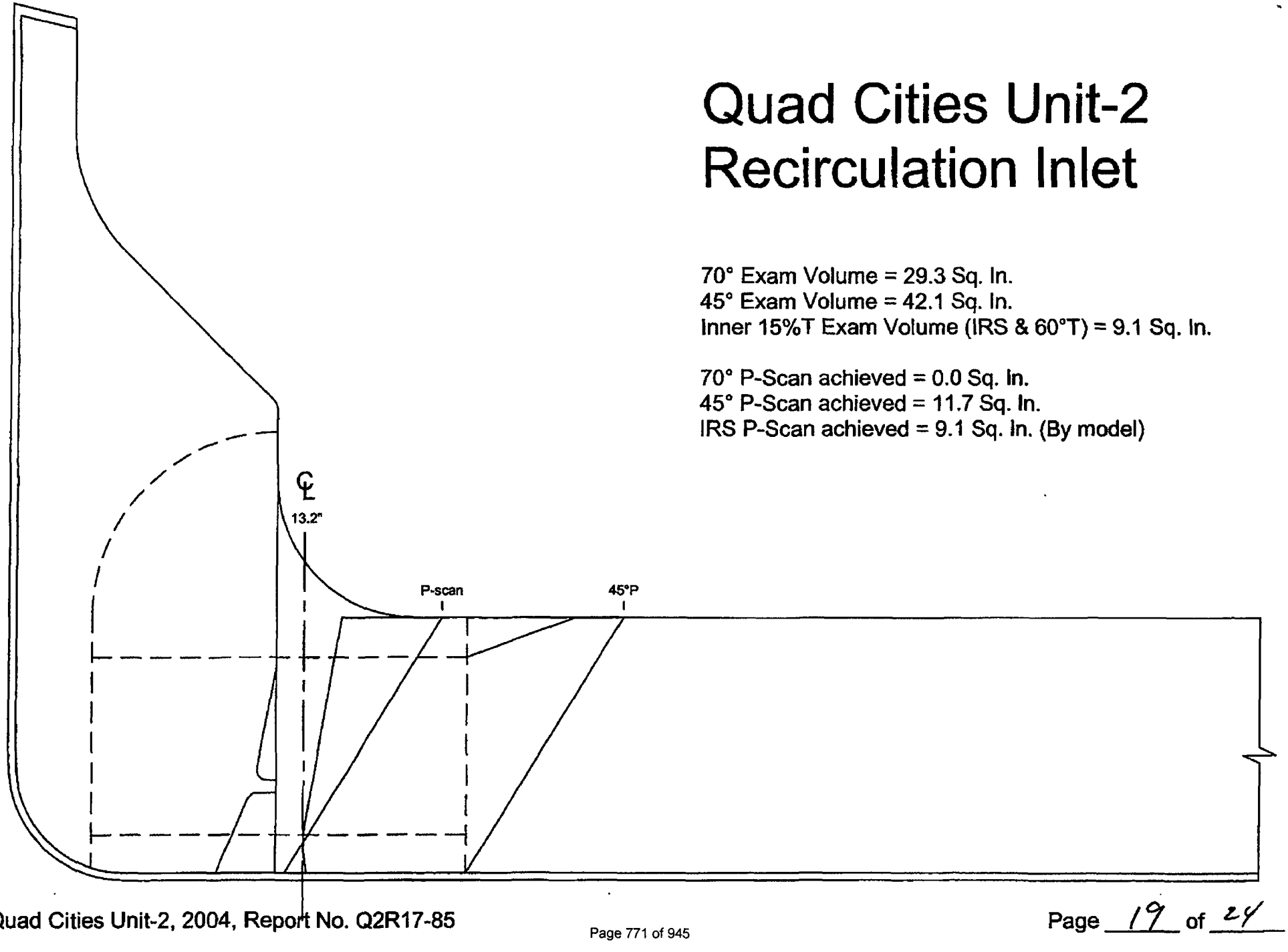
70° T-Scan achieved = 2.0 Sq. In.
45° T-Scan achieved = 17.0 Sq. In.
60° T-Scan achieved = 5.9 Sq. In.



Quad Cities Unit-2 Recirculation Inlet

70° Exam Volume = 29.3 Sq. In.
45° Exam Volume = 42.1 Sq. In.
Inner 15%T Exam Volume (IRS & 60°T) = 9.1 Sq. In.

70° P-Scan achieved = 0.0 Sq. In.
45° P-Scan achieved = 11.7 Sq. In.
IRS P-Scan achieved = 9.1 Sq. In. (By model)



Guideline for Deciding when to Perform Manual UT Examination of Areas Not Covered by Automated Examinations

Component/Configuration: N2A N02

A. DETERMINE

1. Percent coverage obtained with automated UT: 28 %

2. Approximate radiation dose received to complete automated UT: 1800 mR

B. ESTIMATE

1. Percent coverage increases if manual UT was performed: + 9 % *

2. Radiation dose expected if manual UT was performed: 1500 mR

Decision to Proceed: ____ YES X NO **Based On:** Dose

Prepared By: R. L. May **Date:** 03/09/04

* ALL SHELL BASE METAL COVERAGE, NOT WELD OR HAZ ON I.D.

Q2R17-85
20 of 24

Report No.: Q2R17-85

Recirculation Inlet N2A-IRS
Quad Cities Unit-2, 2004

Weld Length = 360. Exam Volume = 100%		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area %	Area Scanned Auto	Percent of Area Auto	Weld Length Auto	Percent Auto
Z1 CW	A	100%	100%	100.0%	360	50.0%
Z1 CCW	A	100%	100%	100.0%	360	50.0%
					% Total Composite Coverage =	100.0%
Z2A CW	B	100%	100%	100.0%	360	50.0%
Z2A CCW	B	100%	100%	100.0%	360	50.0%
					% Total Composite Coverage =	100.0%
					% Total Composite Coverage =	
					% Total Composite Coverage =	

Comments: A - Examined accessible length with the GERIS 2000. Exam volume determined by modeling, 100% assigned volume.
B - Examined accessible length using manual techniques. Exam volume determined by modeling, 100% assigned volume.

Note - Rounding methods may make calculated values appear in error.

GE Nuclear Energy

GERIS 2000 OD
Nozzle Examination Scan Plan

Quad Cities Unit-2, 2004
Nozzle Scanning Limits
Nozzle(s) N2

12.85	Weld CL Radius	125.50	Vessel ID Radius
17.67	ASME OD Radius	6.38	Vessel Nom. Thickness
15.25	Outside Radius of ODBR	131.88	Vessel OD Radius
12.50	Outside Radius of NOZOD	1.0	Overscan Distance

Package Configuration: Triple Pack and ODBR Package.

Channel	Beam Angle	CPU Angle	Fixture Angle	Type	SU Parameters Delay	Velocity	X-Off	Y-Off	Scan Area	Scanner Min	Max	A-Gate Start	Stop	Max MP	C-Gate Start	Stop
N2	**T-Scan.** Supplement 4 and 6 radial scans.									Step →	0.25	Index →	0.4°			
1	0	0.0	0.0	WM	4	0.233	0.0	0.0	N/A	Note 1	18.75	0	75	8.3	18	54
2	45	-9.0	9.0	T	15	0.128	3.0	0.0	N/A	Note 1	12.75	0	230	13.8	37	191
3	60	7.2	352.8	T	15	0.233	-3.0	0.0	N/A	Note 1	18.75	0	180	19.2	32	152
N2	**P1.** 45° S for outer 85%T volume.									Step →	0.25	Index →	0.6°			
2	45	51.5	308.5	P	15	0.128	3.0	0.0	N/A	Note 1	10.75	0	230	13.8	37	191
4	45	-51.5	51.5	P	15	0.128	-3.0	0.0	N/A	Note 1	10.75	0	230	13.8	37	191
N2	**P2.** N/V Inner 15%T P-scan examination from **PLATE with 70T-scan.**									Step →	0.15	Index →	0.5°			
13	60	27.3	332.7	N/V	15	0.128	-3.0	0.0	8.5	Note 1	12.00	0	300	14.0	120	250
6	70	0.0	0.0	T	10	0.233	0.0	0.0	N/A	Note 1	8.70	0	50	4.7	10	48
14	60	-27.3	27.3	N/V	15	0.128	3.0	0.0	8.5	Note 1	12.00	0	300	14.0	120	250
N2	**P3.** N/V Inner 15%T P-scan examination from **PLATE.**									Step →	0.15	Index →	0.5°			
13	60	35.5	324.5	N/V	15	0.128	-3.0	0.0	8.5	Note 1	12.00	0	300	14.0	120	250
14	60	-35.5	35.5	N/V	15	0.128	3.0	0.0	8.5	Note 1	12.00	0	300	14.0	120	250
N2	**Z1.** Z1 Inner Radius Section examination from **PLATE.**									Step →	0.15	Index →	0.5°			
3	68	16.0	344.0	Z1	15	0.128	-3.0	0.0	8.0	Note 1	11.40	0	450	21.2	180	365
4	68	-16.0	16.0	Z1	15	0.128	3.0	0.0	8.0	Note 1	11.40	0	450	21.2	180	365

Channel	Beam Angle	CPU Angle	Fixture Angle	Type	SU Parameters Delay	Velocity	X-Off	Y-Off	Scan Area	Scanner Min	Max	A-Gate Start	Stop	Max MP	C-Gate Start	Stop
N2	**Z1.** Z1 Inner Radius Section examination from **PLATE.**									Step →	0.15	Index →	0.5°			
5	70	8.5	351.5	Z1	15	0.128	-3.0	0.0	9.0	Note 1	12.45	0	485	22.9	190	390
6	70	-8.5	8.5	Z1	15	0.128	3.0	0.0	9.0	Note 1	12.45	0	485	22.9	190	390
N2	**Z2A.** Z2A Inner Radius Section examination from **ODBR**									Step →	0.07	Index →	1.8°			
7	67.5	8.2	351.8	Z2A	15	0.128	-2.5	0.0	N/A	55°	90°	0	260	12.0	105	220
8	67.5	-8.2	8.2	Z2A	15	0.128	2.5	0.0	N/A	55°	90°	0	260	12.0	105	220

Notes: Vessel ID radius from B&W drawing Shell Course Subassembly 151825E-1.
Vessel nominal thickness from B&W drawing Shell Forming Details 104186D-1 (ordered thickness).

Note 1 - Scan into nozzle until onset of liftoff or limited by physical limitations.

Site Revision 0 2/22/04

Q2R17-81-
23 of 24

Nir_PDI Qc2.XLS

MANUAL/GERIS 2000 DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT **Quad Cities 2**

PREPARED BY S.C. MORTENSON DATE 01/17/04

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
RECIRC OUTLET								
N/V Weld	PLATE	0 - 9.0"	66.0°	57.8° (52.4°) *	FLAT	18.5"	1 MHz	
N/V Weld	PLATE	0 - 9.0"	70.0°	42.1° 37.0°) *	FLAT	25.3"	1 MHz	
Zone 1/NV (M)	ODBR	20° - 45°	35.0°	90.0°	5.5"	20.7"	1 MHz	W-021, W-022
Zone 2A	ODBR	45° - 90°	60.0°	35.0° (30.6°) **	5.5"	20.4"	1 MHz	W-023, W-024
RECIRC INLET								
N/V Weld	PLATE	0 - 8.0"	60.0°	38.0° (27.3°) *	FLAT	14.0"	1 MHz	
N/V Weld	PLATE	0 - 8.5"	60.0°	45.0° (35.5°) *	FLAT	14.0"	1 MHz	
N/V Weld / Zone 1	PLATE	0 - 8.0"	68.0°	25.7° (16.0°) *	FLAT	21.2"	1 MHz	
Zone 1	PLATE	0 - 9.0"	70.0°	15.6° (8.5°) *	FLAT	22.9"	1 MHz	
Zone 2A	ODBR	55° - 90°	67.5°	18.1° (8.2°) **	3.3"	12.0"	1 MHz	W-025, W-026
FEEDWATER								
N/V Weld	PLATE	0 - 8.0"	60.0°	48.2° (39.2°) *	FLAT	14.0"	1 MHz	
N/V Weld	PLATE	0 - 8.0"	60.0°	38.9° (28.3°) *	FLAT	14.0"	1 MHz	
N/V Weld / Zone 1	ODBR	50° - 90°	43.8°	40.3°(31.8°) **	3.5"	19.3"	2.25 MHz	W-027, W-028
Zone 2A	ODBR	50° - 90°	67.5°	21.7° (13.2°) **	3.5"	13.4"	2.25 MHz	W-029, W-030
Zone 2B	NOZOD	ALL	28.0°	68.0°	FLAT	7.5"	2 MHz	
Zone 3	NOZOD	ALL	28.0°	90°	FLAT	6.7"	2 MHz	

NOTES:		
	*	DESIGN / (FIXTURE) ROTATION FOR 3.0" PKG OFFSET
	#	DESIGN / (FIXTURE) ROTATION FOR 1.45" PKG OFFSET
	**	WEDGE / (FIXTURE) ROTATION ANGLE FOR 2.5" OFFSET
	***	DESIGN / (FIXTURE) ROTATION FOR 1.5" PKG OFFSET
	(M)	MANUAL

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ 704 948-0253

Q2R17-85
24 of 24

GE NUCLEAR ENERGY	EXAMINATION SUMMARY SHEET	Report No.: Q2R18-102

Site: **Quad Cities** Component ID: **N2B NOZ**

Outage: **Q2R18** **Nozzle to Shell**

System **Recirc** ASME Cat.: **B-D** ASME Item **B3.90** Aug Req **N/A**

Exams Performed	Data Sheet	Cal Sheet	Procedure	Calibration Block	Examination Personnel	Cert Level	Date
60° RL	D-168	N/A	GE-UT-300 Ver/Rev 8	CAL-IIW2-052	Mark Hilborn	II	4/1/2006
60° RL	D-169	N/A	GE-UT-300 Ver/Rev 8	99978AQC	Mark Hilborn	II	4/1/2006
60° Shear	D-170	N/A	GE-UT-311 Ver/Rev 10	99978AQC	Mark Hilborn	II	4/1/2006

Examination Results:

Ultrasonic examination results were acceptable to the requirements of ASME B&PV Code Section XI, 1995 Edition with the 1996 Addenda as modified by the PDI program description and the Federal Register, Part II, Nuclear Regulatory Commission, 10 CFR Part 50 for Category B-D Reactor Pressure Vessel (RPV) Assembly Welds.

The Inner 15% and the Supplement 6 Examination volume scans performed from the vessel OD surface in accordance with procedure GE-UT-300 V10, using shear and longitudinal wave search units as specified by the General Electric "Quad Cities Unit 2 Nozzle Modeling" document.

Examined 360 degrees.

Composite Examination Coverage = 37.2%

On calibration/data sheets, reject is recorded as 0% as indicated on the UT instrument used. The procedure essential variable calls this setting as "off". This is the same as 0%. Therefore this meets the essential variables of the procedure.

Examination results were compared to data report D-065 *from* Q2R13 *outage with* ☑ *No Change*

These examinations were performed under Work Order: 00828881-02 ☐ *Change*

This Summary and the following data sheets have been reviewed and accepted by the following personnel:

Prepared By: [signature] Level: TJB Date: 4-7-06

Utility Review: [signature] Date: 04-07-06

ANII Review: [signature] Date: 4/8/06

RWP: *5984*

Dose: *120* mr.

Page 1 of 8

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R18
Procedure: GE-UT-300
Data Report Number: Q2R18-102
Data Sheet Number: D-168
Linearity Sheet: L-011
Rev.: 8
DRR: N/A

Calibration Block: CAL-IIW2-052

CS	N/A	4.0"
Material	Size	Thickness

Initial Cal: 0800 4/01 — Exam Start: 13:31
Cal Check: N/A — Exam End: 13:50
Cal Check: N/A
Final Cal: 1615 4/01

Ultragel II (Couplant) — 04225 (Batch)

246540	80° F	67° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
1/4	0.6"	1X	80%	1.17	1.2	3
1/2	N/A	1X	N/A	N/A	N/A	N/A
3/4	N/A	1X	N/A	N/A	N/A	N/A
ID	N/A	1X	N/A	N/A	N/A	N/A
5/4	N/A	1X	N/A	N/A	N/A	N/A

DAC 1X= 61.4 Db
Sweep 0-10 2.0 Depth
Note N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

Sigma	22BC-03006	2(1.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:

0.65"	60°	61°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 (Manufacturer/Model:) — 031573011 (Serial Number:)

9.628 µs	0.2345 in./µsec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	4.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N2B NOZ

Nozzle to Shell (Configuration:)

OD Plate (Exam Surface:) — 94° F (Component Temperature)

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	75.4	NRI	60°
Plate CW/CCW	P	75.4	NRI	60°
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 3/28/2006

Comments: Cal/Exam Date is the date of initial calibration.
Calibration for near surface examination.
Exams performed a minimum of 14 dB above reference.
Scanned 360°.

MRH	Mark Hilborn	II	4/1/2006
Initials:	Examiner	Level	Cal/Exam Date:

Utility Reviewed By: 04-07-06 Date:

N/A	N/A	
Initials: Examiner	Level	

ANII Reviewed By: 4/8/06 Date:

GE Reviewed By: Level: TII Date: 4-7-06

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2 | Data Report Number: Q2R18-102 | Linearity Sheet: L-011
Outage: Q2R18 | Data Sheet Number: D-169
Procedure: GE-UT-300 | Rev.: 8 | DRR: N/A

Calibration Block: 99978AQC

CS	Flat	7.0"
Material	Size	Thickness

Initial Cal: 0826 4/01 — Exam Start: 12:30
Cal Check: N/A — Exam End: 13:30
Cal Check: N/A — Ultragel II — 04225
Final Cal: 1617 4/01 — Couplant — Batch

246540 (Thermometer) | 80° F (Initial Cal Temp.) | 67° F (Final Cal Temp:)

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
1/4	N/A	1X	N/A	N/A	N/A	N/A
1/2	N/A	1X	N/A	N/A	N/A	N/A
3/4	N/A	1X	N/A	N/A	N/A	N/A
ID	7.0"	1X	80%	12.05	13.82	6.9
5/4	N/A	1X	N/A	N/A	N/A	N/A

DAC 1X= 72.1 Db
Sweep 0-10 10.0 Depth
Note N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

Sigma	22BC-03006	2(1.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:

0.65"	60°	61°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 (Maufacturer/Model:) — 031573011 (Serial Number:)

9.628 µs	0.2345 in./usec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	20.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N2B NOZ

Nozzle to Shell (Configuration:)
OD Plate (Exam Surface:) — 94° F (Component Temperature)

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	72.1	NRI	60°
Plate CW/CCW	P	72.1	NRI	60°
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 3/28/2006

Comments: Cal/Exam Date is the date of initial calibration.
Calibration for full volume examination.
Exams performed to maintain a 10-20% FSH clad roll.
Scanned 360°.

MHB Mark Hilborn II 4/1/2006
Initials: Examiner Level Cal/Exam Date:

N/A N/A N/A
Initials: Examiner Level

GE Reviewed By: Level: 4.7.06 Date:

Utility Reviewed By: 4-07-06 Date:

ANII Reviewed By: 4/8/06 Date:

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2 | Data Report Number: Q2R18-102 | Linearity Sheet: L-011
Outage: Q2R18 | Data Sheet Number: D-170
Procedure: GE-UT-311 | Rev.: 10 | DRR: N/A

Calibration Block: 99978AQC

CS	Flat	7.0"
Material	Size	Thickness

Initial Cal: 0845 4/01 | Exam Start: 13:51
Cal Check: N/A | Exam End: 14:15
Cal Check: N/A | Ultragel II | 04225
Final Cal: 1619 4/01 | Couplant: | Batch

246540	80° F	67° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
1/4	N/A	1X	N/A	N/A	N/A	N/A
1/2	N/A	1X	N/A	N/A	N/A	N/A
3/4	N/A	1X	N/A	N/A	N/A	N/A
ID	7.0"	1X	80%	12"	14.29	5.75
5/4	N/A	1X	N/A	N/A	N/A	N/A

DAC 1X= 44.5 dB
Sweep 0-10 25 Metal Path
Note N/A dB difference between 3/8 and 5/8 Vee

Exam Data for Weld: N2B NOZ

Nozzle to Shell
Configuration:

OD Plate	94° F
Exam Surface:	Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
0-4.5"	T	70	NRI	60°
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Search Unit Data

KBA	010HWX	.50" x 1.0" / Rect.
Manufacturer:	Serial Number:	Size / Shape:
.700	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:
1.0 MHz	113-891-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4			031573011
Maufacturer/Model:			Serial Number:
15.38 µs	0.1289 in./µsec.		0.8 - 3.0 MHz
Delay/Zero:	Velocity:		Narrowband Filter:
Auto	Fullwave	25.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:
400 Ohms	0%	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 3/28/2006

Comments: Cal/Exam Date is the date of initial calibration.
Calibration for nozzle to vessel weld N/V.
Exams performed to maintain a 20-30% FSH clad roll.
Rotational angle is ±30°-60°.
Scanned CW and CCW.
Scanned 360°.

MH	Mark Hilborn	II	4/1/2006
Initials:	Examiner	Level	Cal/Exam Date:

Utility Reviewed By: [signature] Date: 04-07-06

n/a	N/A	N/A
Initials:	Examiner	Level

ANII Reviewed By: [signature] Date: 4/8/06

GE Reviewed By: [signature] Level: III Date: 4-7-06

Quad Cities Unit-2

Quad Cities Unit-2
N2 Recirc Inlet
Spring 2006

Weld Length = 360. / Exam Volume = 80.5		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° NS T-Scan	A	29.3	1.5	1.9%	360.0	0.9%
60° S6 T-Scan	A	42.1	27.4	34.0%	360.0	17.0%
60° S4 T-Scan	A	9.1	9.1	11.3%	360.0	5.7%
60° NS P-Scan	A	29.3	1.0	1.2%	360.0	0.6%
60° S6 P-Scan	A	42.1	11.8	14.7%	360.0	7.3%
IRS S4 P-Scan	A	9.1	9.1	11.3%	360.0	5.7%
60° NS T-Scan						
60° S6 T-Scan						
60° S4 T-Scan						
60° NS P-Scan						
60° S6 P-Scan						
IRS S4 P-Scan						

% Total Composite Coverage = 37.2%

Comments: A - Examined 360° scan limited due to nzzle configuration only.

Note - Rounding methods may affect calculated values.

QR18-102
4-7-06

Page 5 of 8

Nir_PDI Qc2_Rev 1.XLS

MANUAL / GERIS DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT **Quad 2**

PREPARED BY S.C. MORTENSON DATE 02/11/06

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	OFFSET	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
RECIRC OUTLET									
N/V Weld (M)	PLATE	0 - 4.5"	60.0°	-	±40°- 80°	FLAT	14.0"	1 MHz	
N/V Weld (M)	PLATE	0 - 4.0"	70.0°	-	±40°- 75°	FLAT	25.3"	1 MHz	
Zone 1 (M)	ODBR	20° - 45°	35.0°	-	90.0°	5.5"	20.7"	1 MHz	W-021, W-022
Zone 2a (M)	ODBR	45° - 90°	60.0°	-	35.0°	5.5"	20.4"	1 MHz	W-023, W-024
RECIRC INLET									
N/V Weld (M)	PLATE	0 - 5.5"	60.0°	-	±30°- 60°	FLAT	14.0"	1 MHz	
Zone 1 (M)	PLATE	0 - 9.0"	70.0°	-	± 30°	FLAT	24.4"	1 MHz	
Zone 2a (M)	ODBR	55° - 90°	67.5°	-	18.1°	3.3"	12.0"	1 MHz	W-025, W-026

NOTES: (M) MANUAL
XX.X° (XX.X°) WEDGE / (FIXTURE) ROTATION ANGLE

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ (704) 948-0253

Q2R18-102
6 of 8
JWS. 4-7-06

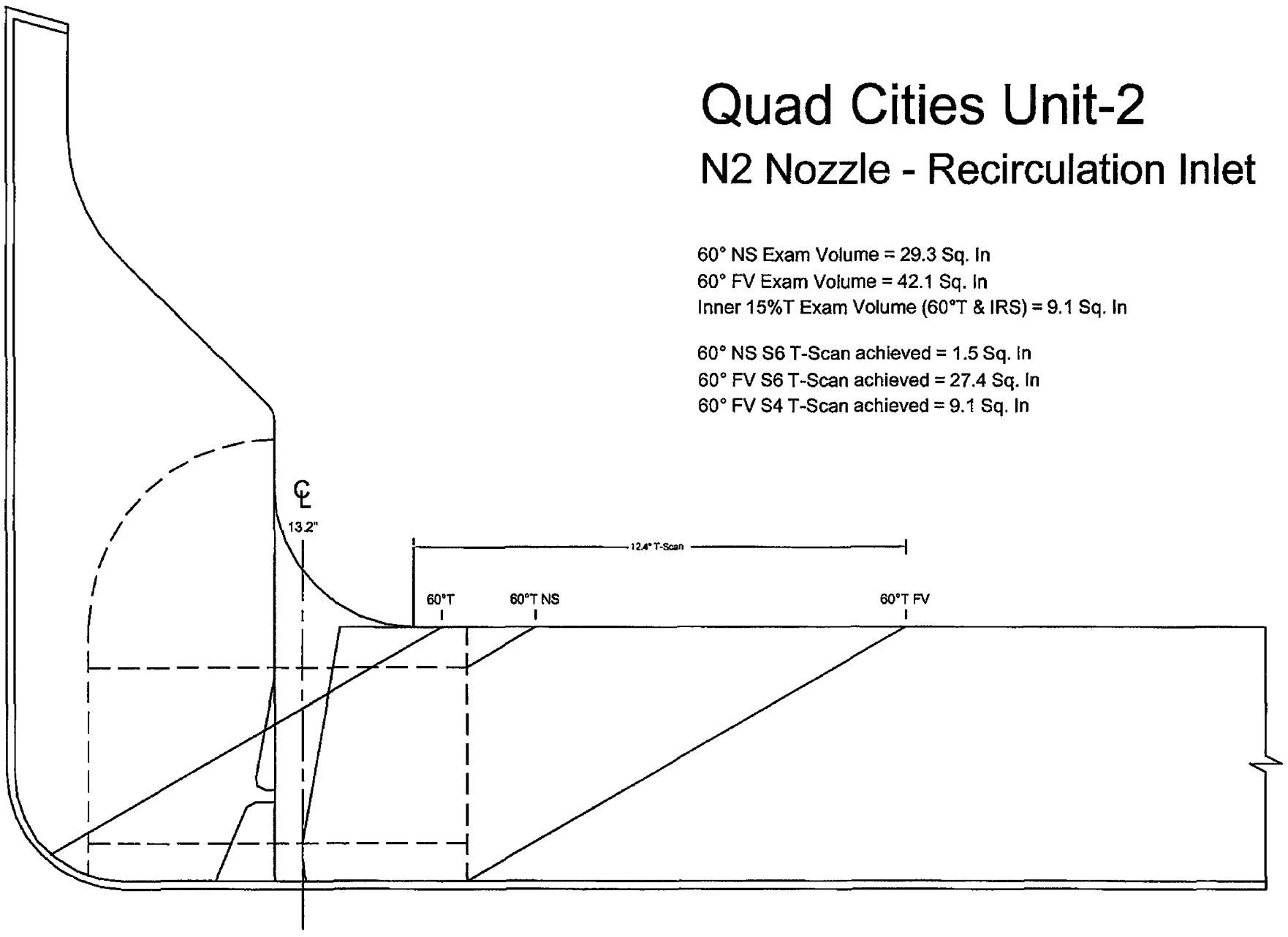
Quad Cities Unit-2, 2006

Quad Cities Unit-2

N2 Nozzle - Recirculation Inlet

60° NS Exam Volume = 29.3 Sq. In
60° FV Exam Volume = 42.1 Sq. In
Inner 15%T Exam Volume (60°T & IRS) = 9.1 Sq. In

60° NS S6 T-Scan achieved = 1.5 Sq. In
60° FV S6 T-Scan achieved = 27.4 Sq. In
60° FV S4 T-Scan achieved = 9.1 Sq. In



Q2R18-102
Jul 5. 4-7-06
Page 7 of 8

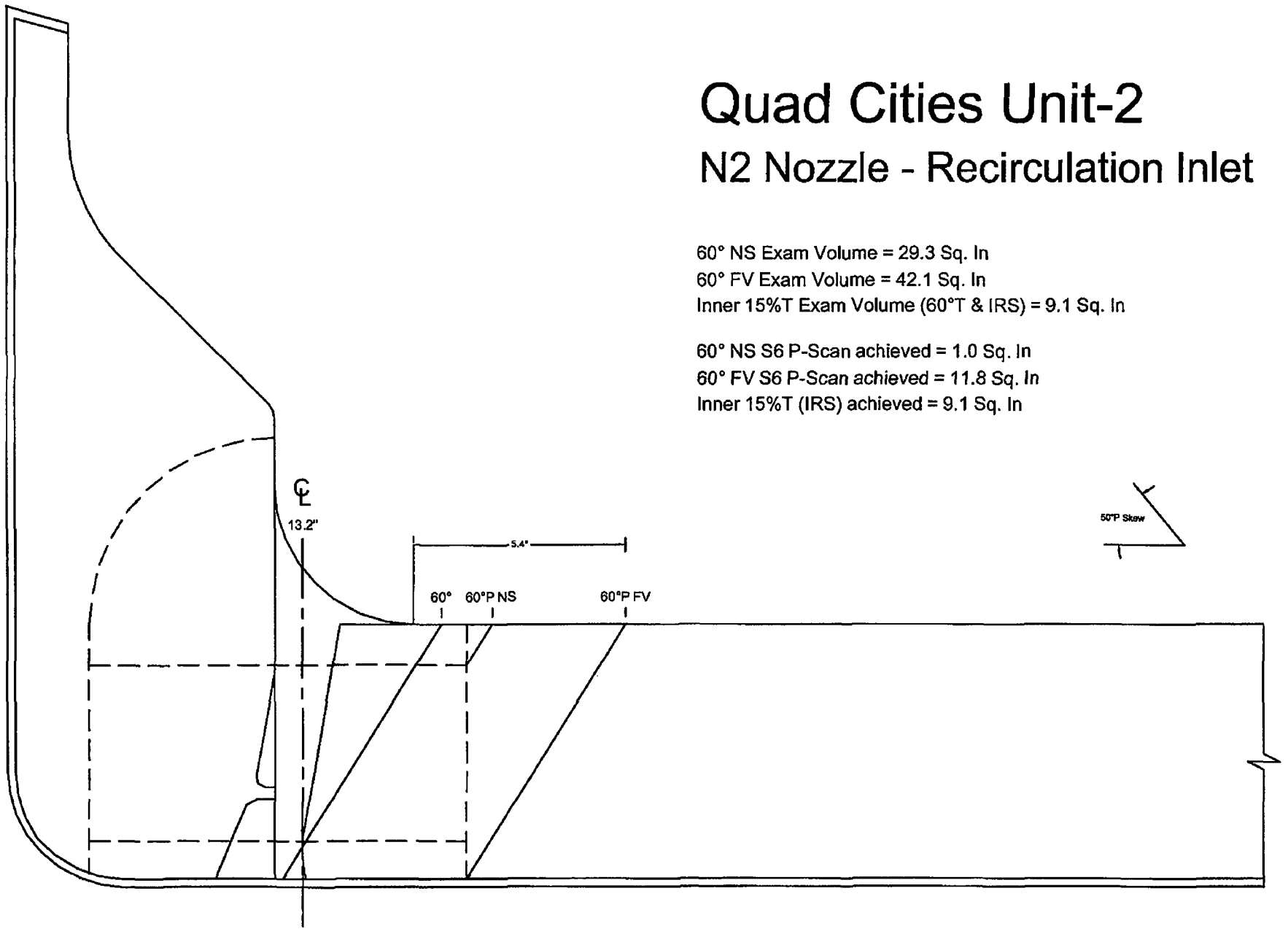
Quad Cities Unit-2, 2006

Quad Cities Unit-2

N2 Nozzle - Recirculation Inlet

60° NS Exam Volume = 29.3 Sq. In
60° FV Exam Volume = 42.1 Sq. In
Inner 15%T Exam Volume (60°T & IRS) = 9.1 Sq. In

60° NS S6 P-Scan achieved = 1.0 Sq. In
60° FV S6 P-Scan achieved = 11.8 Sq. In
Inner 15%T (IRS) achieved = 9.1 Sq. In



Page 8 of 8

GE NUCLEAR ENERGY
UT EXAMINATION SUMMARY SHEET

Report No: Q2R17-87
WO No: 579932, 579933

PROJECT	Quad Cities Unit-2, Q2R17
WELD ID:	N2C NOZ and N2C IRS
SYSTEM:	Reactor Pressure Vessel
CALIBRATION ID:	NOZ.IN, NOZ.IN.2, IRS.IN
GERIS DATA:	Scan file types: P1, P2, P3, TL and Z1
MANUAL DATA:	UT-101, UT-102, UT-104
EXAMINERS:	S. Gauthier Lv II, K. Montgomery Lv II, B. Dummer Lv III

Ultrasonic examination results were acceptable to the requirements of ASME B&PV Code Section XI, 1995 Edition with the 1996 Addenda as modified by the PDI program description and the Federal Register, Part II, Nuclear Regulatory Commission, 10 CFR Part 50 for Category B-D Reactor Pressure Vessel (RPV) Assembly Welds.

Examination volumes were in accordance with Section XI, Figure IWB-2500-7 (a).

Automated transverse and parallel scans were performed in accordance with procedure GE-UT-705 V4, using 0° L, 60° RL, and 45° S, search units. Nozzle Inner Radius and Inner 15%T examination volume parallel scans were performed using model validated shear wave search units.

Manual examinations from the vessel OD shell and ODBR surfaces (Nozzle to Vessel P-scan and Zone 2A) were performed in accordance with procedure GE-UT-311 V10.

Scanning was performed from the vessel OD shell and OD Blend Radius surfaces examining the nozzle to shell weld and nozzle inner radius section regions.

No indications were recorded.

Previous data (R-168, R-171, R-174, R-177 from 1997) was reviewed prior to completing this summary. No significant changes were noted.

Scanning was limited due to the nozzle configuration.

Coverage = 28% Nozzle to Shell weld.

Coverage = 100% Nozzle Inner Radius Section.

PREPARED BY / DATE	REVIEWED BY / DATE	UTILITY REVIEW / DATE	ANII REVIEW / DATE
3/11/04	3-11-04	3/12/04	3/19/04
UT Level: III	UT Level: III		

GE Nuclear Energy

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N2C-NOZ

Report No.: Q2R17-87
Exam Data Sheet: N2C-01

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n2c.p1.1	09A	P1	~	NRI	~	NRI	~	~	~	~	~	~	~	~	~	~	~
n2c.p1.2	09A	P1	~	NRI	~	NRI	~	~	~	~	~	~	~	~	~	~	~
n2c.p2.1	07B	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	~
n2c.p2.2	07B	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	~
n2c.p2.3	Void	Void	~	~	~	~	~	Void	~	~	~	~	~	~	Void	Void	~
n2c.p2.4	09A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	~
n2c.p3.1	09A	P3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n2c.p3.2	09A	P3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n2c.p3.3	09A	P3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n2c.tl.1	07B	TL	NRI	NRI	NRI	~	~	~	~	~	~	~	~	~	~	~	1
n2c.tl.2	07B	TL	NRI	NRI	NRI	~	~	~	~	~	~	~	~	~	~	~	1

Comments: Scan file n2c.p2.3 void.
1 - Repair areas observed at 60° and 90° GERIS azimuth.

Scanning performed with high profile triple pack, low profile tractor and 11" arm.
The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: CDM
Level: III Date: 3/10/04

Reviewed By: RMD
Level: III Date: 3-11-04

GE Nuclear Energy

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N2C-IRS

Report No.: Q2R17-87
Exam Data Sheet: N2C-02

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n2c.68z1.1	07A	Z1	~	~	NRI	NRI	~	~	~	~	~	~	~	~	~	~	~
n2c.68z1.2	07A	Z1	~	~	NRI	NRI	~	~	~	~	~	~	~	~	~	~	~
n2c.70z1.1	07A	Z1	~	~	~	~	NRI	NRI	~	~	~	~	~	~	~	~	~

Comments: Scanning performed with high profile triple pack, low profile tractor and 11" arm.

The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: C M
Level: II
Date: 3/10/04

Reviewed By: R M Dun
Level: III
Date: 3-10-04

GE Nuclear Energy

GERIS 2000 OD EXAMINATION SCAN FILES DATA SHEET

CUSTOMER: **Exelon**
SITE: **Quad Cities Unit-2**
OUTAGE: **Q2R17**

PROCEDURE NO.: GE-UT-705 V4 **REVISION:** N/A **DRR:** N/A

FILE NAME	WELD	DISK NO.	DATE	EXAM START TIME	EXAM STOP TIME	SCAN START	SCAN STOP	SCAN AREA	VESSEL TEMP. (°F)	CAL RECHECK IN	CAL RECHECK OUT	CAL RECORD
n2c.p1.1	N2C NOZ	09A	03/09/04	2046	2117	270°	70°	200°	98°	N/A	N/A	NOZ.IN
n2c.p1.2	N2C NOZ	09A	03/09/04	2135	2159	72°	269°	163°	98°	N/A	N/A	NOZ.IN
n2c.p2.1	N2C NOZ	07B	03/09/04	1709	1801	270°	161°	251°	98°	N/A	N/A	NOZ.IN
n2c.p2.2	N2C NOZ	07B	03/09/04	1825	1844	160°	255°	95°	98°	N/A	N/A	NOZ.IN
n2c.p2.3	Void	Void	~	~	~	~	~	~	~	~	~	~
n2c.p2.4	N2C NOZ	09A	03/09/04	2009	2013	253°	271°	18°	98°	N/A	N/A	NOZ.IN
n2c.p3.1	N2C NOZ	09A	03/09/04	2239	2246	270°	305°	35°	98°	N/A	N/A	NOZ.IN
n2c.p3.2	N2C NOZ	09A	03/09/04	2331	0003	300°	103°	163°	98°	N/A	N/A	NOZ.IN
n2c.p3.3	N2C NOZ	09A	03/10/04	0009	0034	101°	132°	31°	98°	N/A	N/A	NOZ.IN
n2c.tl.1	N2C NOZ	07B	03/09/04	1508	1555	270°	78°	192°	98°	N/A	N/A	NOZ.IN.2
n2c.tl.2	N2C NOZ	07B	03/09/04	1605	1645	79°	270°	169°	98°	N/A	N/A	NOZ.IN.2

COMMENTS: * Rotation angles for TL and P exams per the GERIS 2000 nozzle to vessel scan-plan sheet (attached).
The GERIS 0° reference is located 90° CW of nozzle TDC.
P3 scans skipped from 132° CW thru 270°.
Automated scanning was restricted due to the nozzle weld configuration.

OPERATORS: SHANE GAUTHIER LvII
KENT MONTGOMERY LvII

SOFTWARE REVISION: 5.26
THERMOMETER S/N: 235018, 235074
COUPLANT: Demineralized Water

Search Unit Data:

No.	Model / Mode	S/N	Size	Freq. (MHz.)	Rot. Angle
1	RTD, 0° L2.25 / L	01-231	1.0 Dia	2.25	N/A
2	RTD, 45° T1-St / S	01-233	32x22mm	1.00	*
3	RTD, 60° L2-St / L	97-152	30x25mm	2.00	*
4	RTD, 45° T1-St /S	04-8	32x22mm	1.00	*
6	RTD, 70° TRL2-St / L	96-228	2(12x25)mm	2.00	*
13	RTD, 60° T1-St / S	01-234	32x18mm	1.00	*
14	RTD, 60° T1-St / S	01-235	32x18mm	1.00	*

Q2R17-87

Quad Cities Unit-2, Q2R17

GE Nuclear Energy

GERIS 2000 OD EXAMINATION SCAN FILES DATA SHEET

CUSTOMER: **Exelon**
SITE: **Quad Cities Unit-2**
OUTAGE: **Q2R17**

PROCEDURE NO. : GE-UT-705 V4 **REVISION :** N/A **DRR :** N/A

FILE NAME	WELD	DISK NO.	DATE	EXAM START TIME	EXAM STOP TIME	SCAN START	SCAN STOP	SCAN AREA	VESSEL TEMP. (°F)	CAL RECHECK IN	CAL RECHECK OUT	CAL RECORD
n2c.68z1.1	N2C IRS	07A	03/09/04	1228	1339	270°	178°	268°	98°	N/A	N/A	IRS.IN
n2c.68z1.2	N2C IRS	07A	03/09/04	1347	1406	177°	271°	94°	98°	N/A	N/A	IRS.IN
n2c.70z1.1	N2C IRS	07A	03/09/04	1045	1200	270°	269°	361°	98°	N/A	N/A	IRS.IN

COMMENTS : * Rotation angles for all exams per the GERIS 2000 nozzle to vessel scan-plan sheet (attached).
The GERIS 0° reference is located 90° CW of nozzle TDC.

Zone 1 exams unrestricted.

OPERATORS: SHANE GAUTHIER LvII
KENT MONTGOMERY LvII

SOFTWARE REVISION: 5.26
THERMOMETER S/N : 235018
235074
COUPLANT : Demineralized Water

Search Unit Data:

No.	Model / Mode	S/N	Size	Freq. (MHz.)	Rot. Angle
3	RTD, 68°T1-St / S	98-287	32x16mm	1.00	*
4	RTD, 68°T1-St / S	98-288	32x16mm	1.00	*
5	RTD, 70°T1-St / S	94-503	32x16mm	1.00	*
6	RTD, 70°T1-St / S	01-237	32x16mm	1.00	*

Q2R17 - 87

Page 5 of 14

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R17
Procedure: GE-UT-311 Rev: V10 DRR: N/A

Data Report Number: Q2R17-87 Linearity Sheet: L-008
Data Sheet Number: UT-101

Calibration Data for Block: 99978 AQC

CSCL	N/A	7.3"
Material	Size	Thickness

Initial Cal: 1510 Exam Start 15:35
Cal Check: N/A Exam End 16:10
Cal Check: N/A Ultragel II 01225
Final Cal: 1705 Couplant: Batch

MW 3-4-04 ~~255048~~ 235018 78° F 78° F
Thermometer Initial Cal Temp. Final Cal Temp:

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID	7.3	1X	80	12.1	14.1	7.0
		1X				

DAC @ 1X 52.1

Sweep 0-10 20 Metal Path

Acceptable Linearity performed : 2/10/2004

Search Unit Data

KBA	0000LT	0.5"x1.0" / Round
Manufacturer:	Serial No.:	Size/Shape:
0.65 in.	60°	58°
Incident Point:	Nominal Angle:	Measured Angle:
1.0 MHz	113-291-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4		031573711	
Maufacturer/Model:		Serial No.:	
15.2 µs	0.1283 in /usec		0.8 - 3.0 MHz
Zero:	Velocity:		Narrowband Filter:
Auto	Full	20.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	Off	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Component: N2C NOZZLE

Vessel-Nozzle (Recirculation)
Configuration:

ODBR 94° F
Exam Surface: Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
Note 1	60	+/- 95	N/A	70	NRI

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration.

Calibration for nozzle to vessel weld (N/V) CW and CCW.

Note 1: Examined from 120° CW through 280°

Exams performed to maintain a 20% - 30% FSH ID roll.

BD Brad Dummer III 3/10/04 3/12/04
Initials: Examiner: Level Cal/Exam Date: Utility Reviewed By: Date:

GE Reviewed By: Level: 3/11/04 Date: ANII Reviewed By: 3/19/04 Date:

Page 6 of 16

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R17
Procedure: GE-UT-311

Data Report Number: Q2R17-87 Linearity Sheet: L-008
Data Sheet Number: UT-104
Rev: V10 DRR: N/A

Calibration Data for Block: 99978 AQC

Material: CSCL Size: N/A Thickness: 7.3"

Initial Cal: 1505 Exam Start: 15:35
Cal Check: N/A Exam End: 16:10
Cal Check: N/A Couplant: Ultragel II Batch: 01225
Final Cal: 1702

Thermometer: ~~955910~~ 235018 (NLY 3-14-04) Initial Cal Temp.: 78° F Final Cal Temp: 78° F

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID	7.3	1X	80	19.4	20.65	7.9
		1X				

DAC @ 1X 51.3

Sweep 0-10 26 Metal Path

Acceptable Linearity performed : 2/10/2004

Search Unit Data

Manufacturer: KBA Serial No.: 00L323 Size/Shape: 0.5"x1.0" / Rect.
Incident Point: 0.85 In. Nominal Angle: 70° Measured Angle: 68°
Frequency: 1.0 MHz Model: 113-291-600 Mode: Shear

Search Unit Cable

Cable Type: RG-174 Length: 12' Connectors: 0

Instrument Settings

Maufacturer/Model: Panametrics / Epoch 4 Serial No.: 031573711
Zero: 16.43 µs Velocity: 0.1283 In /µsec Narrowband Filter: 0.8 - 3.0 MHz
Rep Rate: Auto Rectification: Full Range: 26.0 In. Pulser/Energy: Sq. / Med
Damping: 400 Ohms Reject: Off Frequency: 1.0 MHz Mode: P/E
DAC: Off: TVG: Off: CSC: Off: DGS: Off:

Exam Data for Component: N2C IRS

VESSEL-NOZZLE (RECIRCULATION)
Configuration:

Exam Surface: ODBR Component Temp.: 94° F

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
360°	67.5	18.1	W-025A	64	NRI

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration.
Calibration for Zone 2A Clockwise.
Exams performed to maintain a 20% - 30% FSH ID roll.

Initials: BD Examiner: Brad Dummer Level: III Cal/Exam Date: 3/10/04
Utility Reviewed By: [signature] Date: 3/12/04
GE Reviewed By: [signature] Level: II Date: 3/11/04
ANII Reviewed By: [signature] Date: 3/19/04

Page 7 of 16

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R17
Procedure: GE-UT-311 Rev: V10 DRR: N/A

Data Report Number: Q2R17-87 Linearity Sheet: L-008
Data Sheet Number: UT-102

Calibration Data for Block: 99978 AQC

CSCL	N/A	7.3"
Material	Size	Thickness

Initial Cal: 1500 Exam Start 15:35
Cal Check: N/A Exam End 16:10
Cal Check: N/A Ultragel II 01225
Final Cal: 1700 Couplant: Batch

MW 3-19-04 ~~255018~~ 235018 78° F 78° F
Thermometer Initial Cal Temp. Final Cal Temp:

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID	7.3	1X	80	19.4	20.65	7.9
		1X				

DAC @ 1X 51.3

Sweep 0-10 26 Metal Path

Acceptable Linearity performed : 2/10/2004

Search Unit Data

KBA	00L321	0.5"x1.0" / Rect.
Manufacturer:	Serial No.:	Size/Shape:
0.85 in.	70°	68°
Incident Point:	Nominal Angle:	Measured Angle:
1.0 MHz	113-291-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4		031573711	
Maufacturer/Model:		Serial No.:	
16.43 us	0.1283 in /usec		0.8 - 3.0 MHz
Zero:	Velocity:		Narrowband Filter:
Auto	Full	26.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	Off	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Component: N2C IRS

Vessel-Nozzle (Recirculation)
Configuration:

ODBR 94° F
Exam Surface: Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
360°	67.5	18.1	W-025B	64	NRI

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration.

Calibration for Zone 2A Counter-clockwise.

Exams performed to maintain a 20% - 30% FSH ID roll.

BD Brad Dummer III 3/10/04 3/12/04
Initials: Examiner: Level Cal/Exam Date: Utility Reviewed By: Date:

GE Reviewed By: Level: 3/11/04 Date: AIII Reviewed By: 3/19/04 Date:

Page 8 of 16

Report No.: Q2R17-87

Recirculation Inlet N2C-NOZ
Quad Cities Unit-2, 2004

Weld Length = 360. Exam Volume = 80.5		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Auto	Percent of Area Auto	Weld Length Auto	Percent Auto
70° T-Scan	A	29.3	2	2.5%	360	1.2%
45° T-Scan	A	42.1	17	21.1%	360	10.6%
60° T-Scan	A	9.1	5.9	7.3%	360	3.7%
70° P-Scan	A	29.3	0	0.0%	360	0.0%
45° P-Scan	A	42.1	11.7	14.5%	360	7.3%
60° P-Scan	A	9.1	9.1	11.3%	360	5.7%
70° T-Scan						
45° T-Scan						
60° T-Scan						
70° P-Scan						
45° P-Scan						
60° P-Scan						
70° T-Scan						
45° T-Scan						
60° T-Scan						
70° P-Scan						
45° P-Scan						
60° P-Scan						

% Total Composite Coverage = 28%

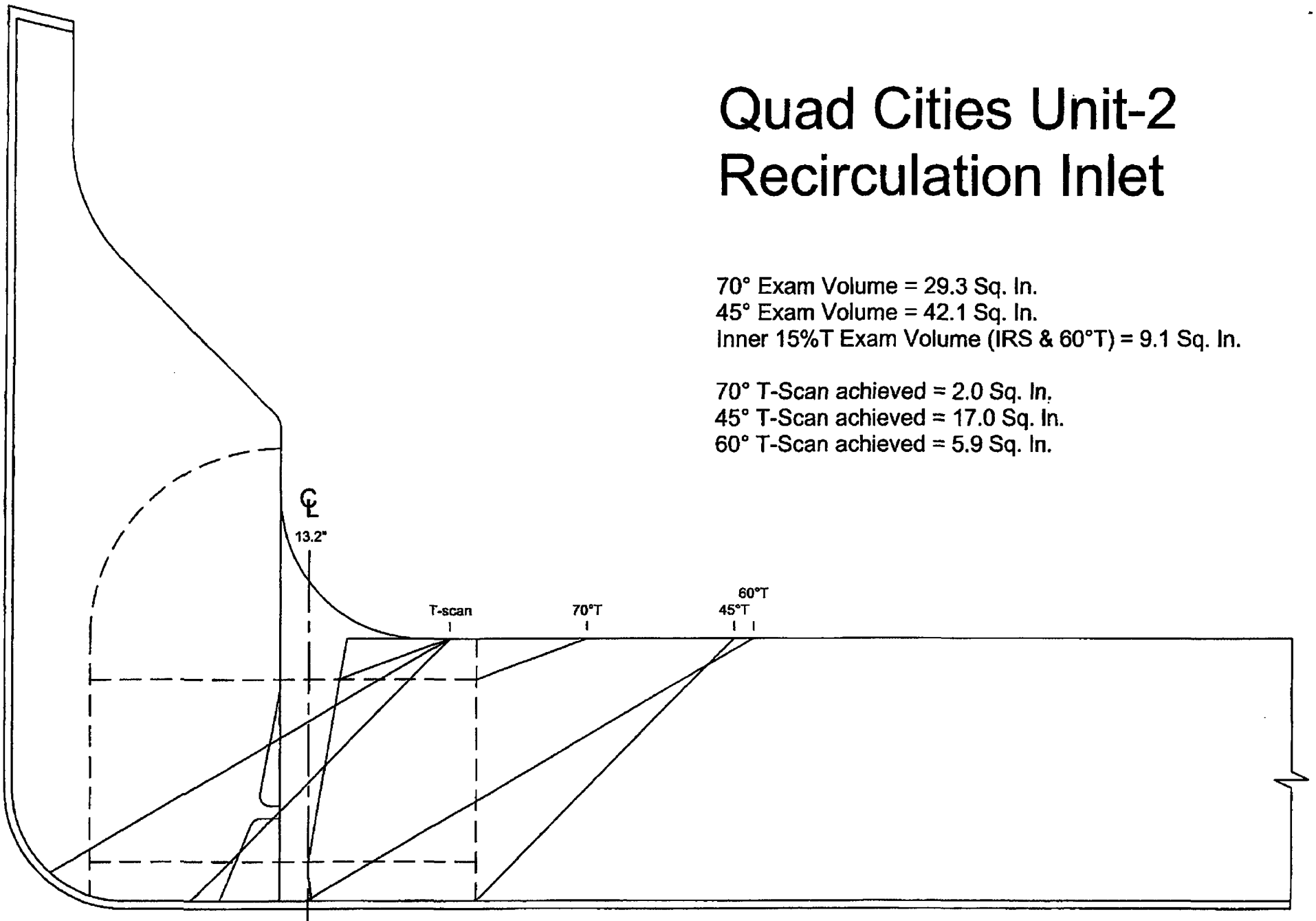
Comments: A - Examined accessible length. Scanning limited due to scanner access.
A - Weld length includes manually examined portion from 120° CW thru 280° 60° P-scan due to ALARA considerations.

Note - Rounding methods may make calculated values appear in error.

Quad Cities Unit-2 Recirculation Inlet

70° Exam Volume = 29.3 Sq. In.
45° Exam Volume = 42.1 Sq. In.
Inner 15%T Exam Volume (IRS & 60°T) = 9.1 Sq. In.

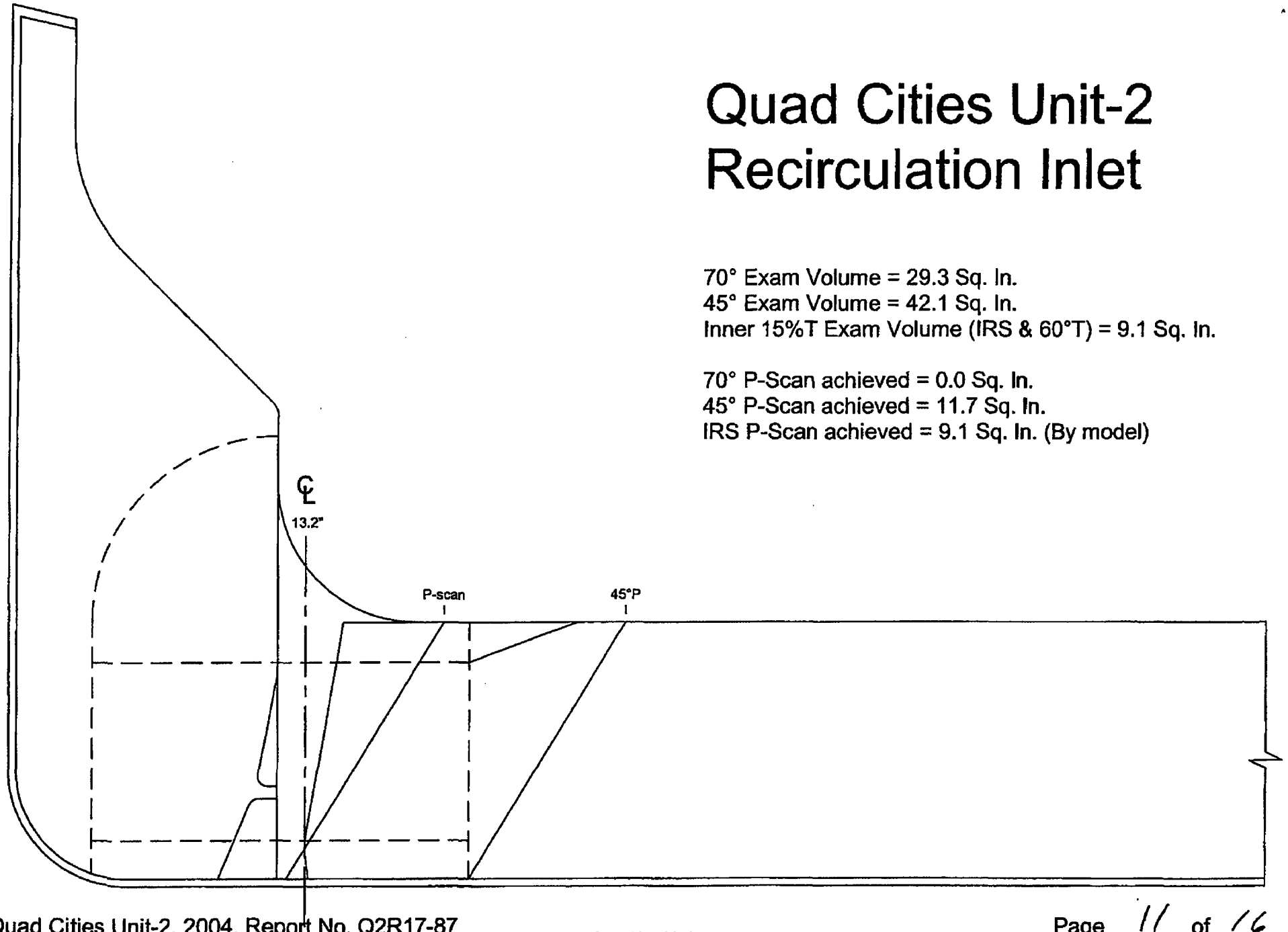
70° T-Scan achieved = 2.0 Sq. In.
45° T-Scan achieved = 17.0 Sq. In.
60° T-Scan achieved = 5.9 Sq. In.



Quad Cities Unit-2 Recirculation Inlet

70° Exam Volume = 29.3 Sq. In.
45° Exam Volume = 42.1 Sq. In.
Inner 15%T Exam Volume (IRS & 60°T) = 9.1 Sq. In.

70° P-Scan achieved = 0.0 Sq. In.
45° P-Scan achieved = 11.7 Sq. In.
IRS P-Scan achieved = 9.1 Sq. In. (By model)



Guideline for Deciding when to Perform Manual UT Examination of Areas Not Covered by Automated Examinations

Component/Configuration: N2C N02

A. DETERMINE

1. Percent coverage obtained with automated UT: 28 %

2. Approximate radiation dose received to complete automated UT: 1800 mR

B. ESTIMATE

1. Percent coverage increases if manual UT was performed: +9 % *

2. Radiation dose expected if manual UT was performed: 1500 mR

Decision to Proceed: ____YES X NO **Based On:** DOSE

Prepared By: R. L. My **Date:** 03/09/04

* ALL SHELL BASE METAL COVERAGE, NOT WELD OR HAZ ON I.D.

Q2R17-87
12 OF 16

Report No.: Q2R17-87

Recirculation Inlet N2C-IRS
Quad Cities Unit-2, 2004

Weld Length = 360. Exam Volume = 100%		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area %	Area Scanned Auto	Percent of Area Auto	Weld Length Auto	Percent Auto
Z1 CW	A	100%	100%	100.0%	360	50.0%
Z1 CCW	A	100%	100%	100.0%	360	50.0%
				% Total Composite Coverage =		100.0%
Z2A CW	B	100%	100%	100.0%	360	50.0%
Z2A CCW	B	100%	100%	100.0%	360	50.0%
				% Total Composite Coverage =		100.0%
				% Total Composite Coverage =		
				% Total Composite Coverage =		

Comments: A - Examined accessible length with the GERIS 2000. Exam volume determined by modeling, 100% assigned volume.
B - Examined accessible length using manual techniques. Exam volume determined by modeling, 100% assigned volume.

Note - Rounding methods may make calculated values appear in error.

GE Nuclear Energy

GERIS 2000 OD
Nozzle Examination Scan Plan

Quad Cities Unit-2, 2004
Nozzle Scanning Limits
Nozzle(s) N2

12.85 Weld CL Radius
17.67 ASME OD Radius
15.25 Outside Radius of ODBR
12.50 Outside Radius of NOZOD

125.50 Vessel ID Radius
6.38 Vessel Nom. Thickness
131.88 Vessel OD Radius
1.0 Overscan Distance

Package Configuration: Triple Pack and ODBR Package.

Channel	Beam Angle	CPU Angle	Fixture Angle	Type	SU Parameters Delay	Velocity	X-Off	Y-Off	Scan Area	Scanner Min	Max	A-Gate Start	Stop	Max MP	C-Gate Start	Stop
N2	**T-Scan.** Supplement 4 and 6 radial scans.									Step →	0.25	Index →	0.4°			
1	0	0.0	0.0	WM	4	0.233	0.0	0.0	N/A	Note 1	18.75	0	75	8.3	18	54
2	45	-9.0	9.0	T	15	0.128	3.0	0.0	N/A	Note 1	12.75	0	230	13.8	37	191
3	60	7.2	352.8	T	15	0.233	-3.0	0.0	N/A	Note 1	18.75	0	180	19.2	32	152
N2	**P1.** 45° S for outer 85%T volume.									Step →	0.25	Index →	0.6°			
2	45	51.5	308.5	P	15	0.128	3.0	0.0	N/A	Note 1	10.75	0	230	13.8	37	191
4	45	-51.5	51.5	P	15	0.128	-3.0	0.0	N/A	Note 1	10.75	0	230	13.8	37	191
N2	**P2.** N/V Inner 15%T P-scan examination from **PLATE with 70T-scan.**									Step →	0.15	Index →	0.5°			
13	60	27.3	332.7	N/V	15	0.128	-3.0	0.0	8.5	Note 1	12.00	0	300	14.0	120	250
6	70	0.0	0.0	T	10	0.233	0.0	0.0	N/A	Note 1	8.70	0	50	4.7	10	48
14	60	-27.3	27.3	N/V	15	0.128	3.0	0.0	8.5	Note 1	12.00	0	300	14.0	120	250
N2	**P3.** N/V Inner 15%T P-scan examination from **PLATE.**									Step →	0.15	Index →	0.5°			
13	60	35.5	324.5	N/V	15	0.128	-3.0	0.0	8.5	Note 1	12.00	0	300	14.0	120	250
14	60	-35.5	35.5	N/V	15	0.128	3.0	0.0	8.5	Note 1	12.00	0	300	14.0	120	250
N2	**Z1.** Z1 Inner Radius Section examination from **PLATE.**									Step →	0.15	Index →	0.5°			
3	68	16.0	344.0	Z1	15	0.128	-3.0	0.0	8.0	Note 1	11.40	0	450	21.2	180	365
4	68	-16.0	16.0	Z1	15	0.128	3.0	0.0	8.0	Note 1	11.40	0	450	21.2	180	365

QUAD CITIES REPORT NO. Q2R17-87 PAGE 14 OF 14

Channel	Beam Angle	CPU Angle	Fixture Angle	Type	SU Parameters Delay	Velocity	X-Off	Y-Off	Scan Area	Scanner Min	Max	A-Gate Start	Stop	Max MP	C-Gate Start	Stop
N2	**Z1.** Z1 Inner Radius Section examination from **PLATE.**									Step →	0.15	Index →	0.5°			
5	70	8.5	351.5	Z1	15	0.128	-3.0	0.0	9.0	Note 1	12.45	0	485	22.9	190	390
6	70	-8.5	8.5	Z1	15	0.128	3.0	0.0	9.0	Note 1	12.45	0	485	22.9	190	390
N2	**Z2A.** Z2A Inner Radius Section examination from **ODBR**									Step →	0.07	Index →	1.8°			
7	67.5	8.2	351.8	Z2A	15	0.128	-2.5	0.0	N/A	55°	90°	0	260	12.0	105	220
8	67.5	-8.2	8.2	Z2A	15	0.128	2.5	0.0	N/A	55°	90°	0	260	12.0	105	220

Notes: Vessel ID radius from B&W drawing Shell Course Subassembly 151825E-1.
Vessel nominal thickness from B&W drawing Shell Forming Details 104186D-1 (ordered thickness).

Note 1 - Scan into nozzle until onset of liftoff or limited by physical limitations.

Site Revision 0 2/22/04

QUAD CITIES
REPORT NO. Q2R17-87
PAGE 15 OF 14

Nir_PDI Qc2.XLS

MANUAL/GERIS 2000 DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT **Quad Cities 2**

PREPARED BY S.C. MORTENSON DATE 01/17/04

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
RECIRC OUTLET								
N/V Weld	PLATE	0 - 9.0"	66.0°	57.8° (52.4°) *	FLAT	18.5"	1 MHz	
N/V Weld	PLATE	0 - 9.0"	70.0°	42.1° 37.0°) *	FLAT	25.3"	1 MHz	
Zone 1/NV (M)	ODBR	20° - 45°	35.0°	90.0°	5.5"	20.7"	1 MHz	W-021, W-022
Zone 2A	ODBR	45° - 90°	60.0°	35.0° (30.6°) **	5.5"	20.4"	1 MHz	W-023, W-024
RECIRC INLET								
N/V Weld	PLATE	0 - 8.0"	60.0°	38.0° (27.3°) *	FLAT	14.0"	1 MHz	
N/V Weld	PLATE	0 - 8.5"	60.0°	45.0° (35.5°) *	FLAT	14.0"	1 MHz	
N/V Weld / Zone 1	PLATE	0 - 8.0"	68.0°	25.7° (16.0°) *	FLAT	21.2"	1 MHz	
Zone 1	PLATE	0 - 9.0"	70.0°	15.6° (8.5°) *	FLAT	22.9"	1 MHz	
Zone 2A	ODBR	55° - 90°	67.5°	18.1° (8.2°) **	3.3"	12.0"	1 MHz	W-025, W-026
FEEDWATER								
N/V Weld	PLATE	0 - 8.0"	60.0°	48.2° (39.2°) *	FLAT	14.0"	1 MHz	
N/V Weld	PLATE	0 - 8.0"	60.0°	38.9° (28.3°) *	FLAT	14.0"	1 MHz	
N/V Weld / Zone 1	ODBR	50° - 90°	43.8°	40.3°(31.8°) **	3.5"	19.3"	2.25 MHz	W-027, W-028
Zone 2A	ODBR	50° - 90°	67.5°	21.7° (13.2°) **	3.5"	13.4"	2.25 MHz	W-029, W-030
Zone 2B	NOZOD	ALL	28.0°	68.0°	FLAT	7.5"	2 MHz	
Zone 3	NOZOD	ALL	28.0°	90°	FLAT	6.7"	2 MHz	

NOTES:		
	*	DESIGN / (FIXTURE) ROTATION FOR 3.0" PKG OFFSET
	#	DESIGN / (FIXTURE) ROTATION FOR 1.45" PKG OFFSET
	**	WEDGE / (FIXTURE) ROTATION ANGLE FOR 2.5" OFFSET
	***	DESIGN / (FIXTURE) ROTATION FOR 1.5" PKG OFFSET
	(M)	MANUAL

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ 704 948-0253

QUAD CITIES
REPORT NO. Q2R17-87
PAGE 16 OF 16

GE NUCLEAR ENERGY	EXAMINATION SUMMARY SHEET	Report No.: Q2R18-104

Site: **Quad Cities** Component ID: **N2D NOZ**

Outage: **Q2R18** **Nozzle to Shell**

System **Recirc** ASME Cat.: **B-D** ASME Item **B3.90** Aug Req **N/A**

Exams Performed	Data Sheet	Cal Sheet	Procedure	Calibration Block	Examination Personnel	Cert Level	Date
60° RL	D-173	N/A	GE-UT-300 Ver/Rev 8	CAL-IIW2-052	Mark Hilborn	II	4/2/2006
60° RL	D-174	N/A	GE-UT-300 Ver/Rev 8	99978AQC	Mark Hilborn	II	4/2/2006
60° Shear	D-175	N/A	GE-UT-311 Ver/Rev 10	99978AQC	Mark Hilborn	II	4/2/2006

Examination Results:

Ultrasonic examination results were acceptable to the requirements of ASME B&PV Code Section XI, 1995 Edition with the 1996 Addenda as modified by the PDI program description and the Federal Register, Part II, Nuclear Regulatory Commission, 10 CFR Part 50 for Category B-D Reactor Pressure Vessel (RPV) Assembly Welds.

The Inner 15% and the Supplement 6 Examination volume scans performed from the vessel OD surface in accordance with procedure GE-UT-300 V10, using shear and longitudinal wave search units as specified by the General Electric "Quad Cities Unit 2 Nozzle Modeling" document.

Examined 360 degrees.

Composite Examination Coverage = 37.2%

On calibration/data sheets, reject is recorded as 0% as indicated on the UT instrument used. The procedure essential variable calls this setting as "off". This is the same as 0%. Therefore this meets the essential variables of the procedure.

Examination results were compared to data report R-172 *from* Q2R14 *outage with* ☑ *No Change*

These examinations were performed under Work Order: 00828881-02 ☐ *Change*

This Summary and the following data sheets have been reviewed and accepted by the following personnel:

Prepared By: [signature] Level: II Date: 4-7-06

Utility Review: [signature] Date: 04-07-06

ANII Review: [signature] Date: 4/18/06

RWP: 5984

Dose: 188 mr.

Page 1 of 8

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R18
Procedure: GE-UT-300
Data Report Number: Q2R18-104 Linearity Sheet: L-011
Data Sheet Number: D-173
Rev.: 8 DRR: N/A

Calibration Block: CAL-IIW2-052

CS	N/A	4.0"
Material	Size	Thickness

Initial Cal: 0937 4/02 Exam Start 13:16
Cal Check: N/A Exam End 13:30
Cal Check: N/A Ultragel II 04225
Final Cal: 1630 4/02 Couplant: Batch

246540 Thermometer | 90° F Initial Cal Temp. | 70° F Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
1/4	0.6"	1X	80%	1.17	1.2	3
1/2	N/A	1X	N/A	N/A	N/A	N/A
3/4	N/A	1X	N/A	N/A	N/A	N/A
	N/A	1X	N/A	N/A	N/A	N/A
5/4	N/A	1X	N/A	N/A	N/A	N/A

DAC 1X= 61.4 dB
Sweep 0-10 2.0 Depth
Note N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

Sigma	22BC-03006	2(1.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:

0.65"	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 — Manufacturer/Model: 031573011 — Serial Number:

9.628 µs	0.2345 in./µsec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	4.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N2D NOZ
Nozzle to Shell — Configuration:
OD Plate — Exam Surface: 97° F — Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	75.4	NRI	60°
Plate CW/CCW	P	75.4	NRI	60°
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 3/28/2006

Comments: Cal/Exam Date is the date of initial calibration.
Calibration for near surface examination.
Exams performed a minimum of 14 dB above reference.
Scanned 360°.

MRH Mark Hilborn II 4/2/2006
Initials: Examiner Level Cal/Exam Date:

N/A N/A N/A
Initials: Examiner Level

GE Reviewed By: Level: 4-7-06 Date:

Utility Reviewed By: 04-07-06 Date:

ANII Reviewed By: 4/8/06 Date:

Page 2 of 8

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R18
Data Report Number: Q2R18-104 Linearity Sheet: L-011
Data Sheet Number: D-174
Procedure: GE-UT-300 Rev.: 8 DRR: N/A

Calibration Block: 99978AQC

CS	Flat	7.0"
Material	Size	Thickness

Initial Cal: 0935 4/02 Exam Start 12:31
Cal Check: N/A Exam End 13:15
Cal Check: N/A Ultragel II 04225
Final Cal: 1625 4/02 Couplant: Batch

246540	90° F	70° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
1/4	N/A	1X	N/A	N/A	N/A	N/A
1/2	N/A	1X	N/A	N/A	N/A	N/A
3/4	N/A	1X	N/A	N/A	N/A	N/A
	7.0"	1X	80%	12.05	13.82	6.9
5/4	N/A	1X	N/A	N/A	N/A	N/A

DAC 1X= 72.1 dB
Sweep 0-10 10.0 Depth
Note N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

Sigma	22BC-03006	2(1.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:

0.65"	60°	61°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4	031573011
Manufacturer/Model:	Serial Number:

9.628 µs	0.2345 in./usec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	20.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N2D NOZ

Nozzle to Shell
Configuration:

OD Plate	97° F
Exam Surface:	Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	72.1	NRI	60°
Plate CW/CCW	P	72.1	NRI	60°
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 3/28/2006

Comments: Cal/Exam Date is the date of initial calibration.
Calibration for full volume examination.
Exams performed to maintain a 10-20% FSH clad roll.
Scanned 360°.

MEH Mark Hilborn II 4/2/2006
Initials: Examiner Level Cal/Exam Date:

N/A N/A N/A
Initials: Examiner Level

GE Reviewed By: Level: 4-7-06 Date:

Utility Reviewed By: 04-07-06 Date:

ANII Reviewed By: 4/8/06 Date:

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2 | Data Report Number: Q2R18-104 | Linearity Sheet: L-011
Outage: Q2R18 | Data Sheet Number: D-175
Procedure: GE-UT-311 | Rev.: 10 | DRR: N/A

Calibration Block: 99978AQC

CS	Flat	7.0"
Material	Size	Thickness

Initial Cal: 0945 4/02 — Exam Start: 12:00
Cal Check: N/A — Exam End: 12:30
Cal Check: N/A — Couplant: Ultragel II — Batch: 04225
Final Cal: 1620 4/02
246540 (Thermometer) | 90° F (Initial Cal Temp.) | 70° F (Final Cal Temp:)

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
1/4	N/A	1X	N/A	N/A	N/A	N/A
1/2	N/A	1X	N/A	N/A	N/A	N/A
3/4	N/A	1X	N/A	N/A	N/A	N/A
	7.0"	1X	80%	12"	14.29	5.75
5/4	N/A	1X	N/A	N/A	N/A	N/A

DAC 1X= 44.5 dB
Sweep 0-10 25 Metal Path
Note N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

KBA	010HWX	.50" x 1.0" / Rect.
Manufacturer:	Serial Number:	Size / Shape:

.700	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:

1.0 MHz	113-891-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 (Manufacturer/Model:) | 031573011 (Serial Number:)

15.38 µs	0.1289 in./usec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	25.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N2D NOZ
Nozzle to Shell (Configuration:)
OD Plate (Exam Surface:) | 97° F (Component Temperature)

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
0-4.5"	T	70	NRI	60°
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 3/28/2006

Comments: Cal/Exam Date is the date of initial calibration.
Calibration for nozzle to vessel weld N/V.
Exams performed to maintain a 20-30% FSH clad roll.
Rotational angle is ±30°-60°.
Scanned CW and CCW.
Scanned 360°.

MRH Mark Hilborn II 4/2/2006
Initials: Examiner Level Cal/Exam Date:

N/A N/A N/A
Initials: Examiner Level

GE Reviewed By: Level: 4-7-06 Date:

Utility Reviewed By: 04-07-06 Date:

ANII Reviewed By: 9/8/06 Date:

Quad Cities Unit-2

Quad Cities Unit-2
N2D Recirc Inlet
Spring 2006

Weld Length = 360. / Exam Volume = 80.5		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° NS T-Scan	A	29.3	1.5	1.9%	360.0	0.9%
60° S6 T-Scan	A	42.1	27.4	34.0%	360.0	17.0%
60° S4 T-Scan	A	9.1	9.1	11.3%	360.0	5.7%
60° NS P-Scan	A	29.3	1.0	1.2%	360.0	0.6%
60° S6 P-Scan	A	42.1	11.8	14.7%	360.0	7.3%
IRS S4 P-Scan	A	9.1	9.1	11.3%	360.0	5.7%
60° NS T-Scan						
60° S6 T-Scan						
60° S4 T-Scan						
60° NS P-Scan						
60° S6 P-Scan						
IRS S4 P-Scan						

% Total Composite Coverage = 37.2%

Comments: A - Examined 360° scan limited due to nzzle configuration only.

Note - Rounding methods may affect calculated values.

Q2R18-104

Page 5 of 28

Nir_PDI Qc2_Rev 1.XLS

MANUAL / GERIS DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT **Quad 2**

PREPARED BY S.C. MORTENSON DATE 02/11/06

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	OFFSET	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
RECIRC OUTLET									
N/V Weld (M)	PLATE	0 - 4.5"	60.0°	-	±40°- 60°	FLAT	14.0"	1 MHz	
N/V Weld (M)	PLATE	0 - 4.0"	70.0°	-	±40°- 75°	FLAT	25.3"	1 MHz	
Zone 1 (M)	ODBR	20° - 45°	35.0°	-	90 0°	5.5"	20.7"	1 MHz	W-021, W-022
Zone 2a (M)	ODBR	45° - 90°	60.0°	-	35.0°	5.5"	20.4"	1 MHz	W-023, W-024
RECIRC INLET									
N/V Weld (M)	PLATE	0 - 5 5"	60 0°	-	±30°- 60°	FLAT	14.0"	1 MHz	
Zone 1 (M)	PLATE	0 - 9.0"	70.0°	-	± 30°	FLAT	24.4"	1 MHz	
Zone 2a (M)	ODBR	55° - 90°	67.5°	-	18.1°	3.3"	12.0"	1 MHz	W-025, W-026

NOTES: (M) MANUAL
xx.x° (xx.x°) WEDGE / (FIXTURE) ROTATION ANGLE

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ (704) 948-0253

QCRIB-104
6 of 8
JWS. 4-706

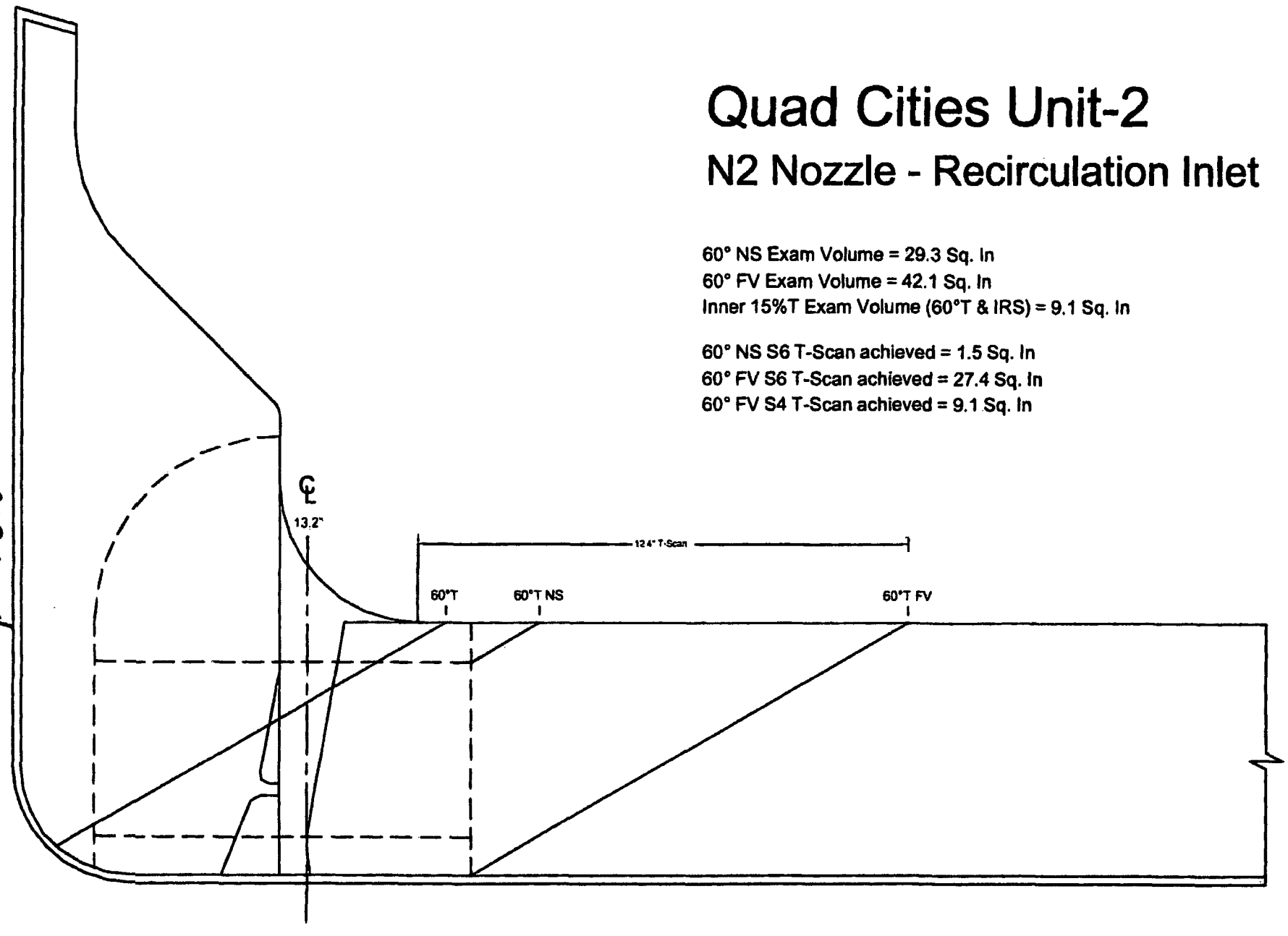
Quad Cities Unit-2, 2006

Quad Cities Unit-2

N2 Nozzle - Recirculation Inlet

60° NS Exam Volume = 29.3 Sq. In
60° FV Exam Volume = 42.1 Sq. In
Inner 15%T Exam Volume (60°T & IRS) = 9.1 Sq. In

60° NS S6 T-Scan achieved = 1.5 Sq. In
60° FV S6 T-Scan achieved = 27.4 Sq. In
60° FV S4 T-Scan achieved = 9.1 Sq. In



Q2218-104
Jul's. 4-7-06

Page 7 of 8

Quad Cities Unit-2, 2006

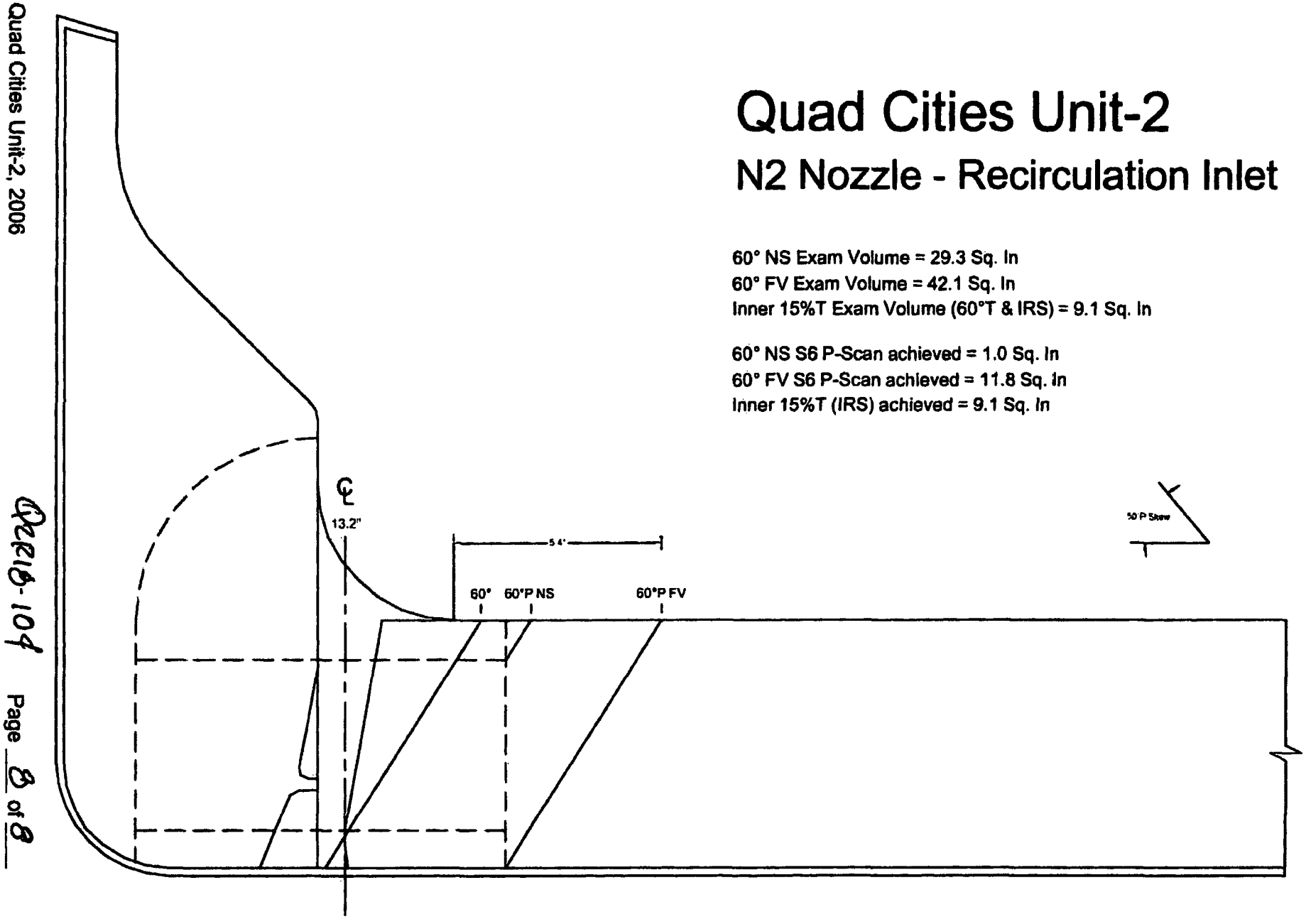
QRR16-104 Page 8 of 8
4-7-06

Quad Cities Unit-2

N2 Nozzle - Recirculation Inlet

60° NS Exam Volume = 29.3 Sq. In
60° FV Exam Volume = 42.1 Sq. In
Inner 15%T Exam Volume (60°T & IRS) = 9.1 Sq. In

60° NS S6 P-Scan achieved = 1.0 Sq. In
60° FV S6 P-Scan achieved = 11.8 Sq. In
Inner 15%T (IRS) achieved = 9.1 Sq. In



GE NUCLEAR ENERGY

EXAMINATION SUMMARY SHEET

Report No.: Q2R18-106

Site: **Quad Cities** Component ID: **N2E NOZ**

Outage: **Q2R18** **Nozzle to Shell**

System **Recirc** ASME Cat.: **B-D** ASME Item **B3.90** Aug Req **N/A**

Exams Performed	Data Sheet	Cal Sheet	Procedure	Calibration Block	Examination Personnel	Cert Level	Date
60° RL	D-179	N/A	GE-UT-300 Ver/Rev 8	CAL-IIW2-052	Mark Hilborn	II	4/4/2006
60° RL	D-180	N/A	GE-UT-300 Ver/Rev 8	99978AQC	Mark Hilborn	II	4/4/2006
60° Shear	D-181	N/A	GE-UT-311 Ver/Rev 10	99978AQC	Mark Hilborn	II	4/4/2006

Examination Results:

Ultrasonic examination results were acceptable to the requirements of ASME B&PV Code Section XI, 1995 Edition with the 1996 Addenda as modified by the PDI program description and the Federal Register, Part II, Nuclear Regulatory Commission, 10 CFR Part 50 for Category B-D Reactor Pressure Vessel (RPV) Assembly Welds.

The Inner 15% and the Supplement 6 Examination volume scans performed from the vessel OD surface in accordance with procedure GE-UT-300 V10, using shear and longitudinal wave search units as specified by the General Electric "Quad Cities Unit 2 Nozzle Modeling" document.

Examined 360 degrees.

Composite Examination Coverage = 37.2%

On calibration/data sheets, reject is recorded as 0% as indicated on the UT instrument used. The procedure essential variable calls this setting as "off". This is the same as 0%. Therefore this meets the essential variables of the procedure.

Examination results were compared to data report D-069 - D-072 *from* Q2R13 *outage with* ☑ *No Change*

These examinations were performed under Work Order: 00828881-02 ☐ *Change*

This Summary and the following data sheets have been reviewed and accepted by the following personnel:

Prepared By: Level: III Date: 4-7-06 Utility Review: Date: 04/07/06

ANII Review: Date: 4/19/06

RWP: 5984

Dose: 204 mr.

Page 1 of 8

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R18
Procedure: GE-UT-300

Data Report Number: Q2R18-106 Linearity Sheet: L-011
Data Sheet Number: D-179
Rev.: 8 DRR: N/A

Calibration Block: CAL-IIW2-052

CS	N/A	4.0"
Material	Size	Thickness

Initial Cal: 0940 4/04 Exam Start 16:26
Cal Check: N/A Exam End 16:40
Cal Check: N/A Ultragel II 04225
Final Cal: 1730 4/04 Couplant: Batch

246540	90° F	69° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
1/4	0.6"	1X	80%	1.17	1.2	3
1/2	N/A	1X	N/A	N/A	N/A	N/A
3/4	N/A	1X	N/A	N/A	N/A	N/A
ID	N/A	1X	N/A	N/A	N/A	N/A
5/4	N/A	1X	N/A	N/A	N/A	N/A

DAC 1X= 61.4 dB
Sweep 0-10 2.0 Depth
Note N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

Sigma	22BC-03006	2(1.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:

0.65"	60°	61°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4		031573011	
Maufacturer/Model:		Serial Number:	
9.628 µs	0.2345 in./µsec.	0.8 - 3.0 MHz	
Delay/Zero:	Velocity:	Narrowband Filter:	
Auto	Fullwave	4.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:
400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N2E NOZ
Nozzle to Shell
Configuration:

OD Plate	94° F
Exam Surface:	Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	75.4	NRI	60°
Plate CW/CCW	P	75.4	NRI	60°
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 3/28/2006

Comments: Cal/Exam Date is the date of initial calibration.
Calibration for near surface examination.
Exams performed a minimum of 14 dB above reference.
Scanned 360°.

MP-H	Mark Hilborn	II	4/4/2006
Initials:	Examiner	Level	Cal/Exam Date:

N/A	N/A	N/A	
Initials:	Examiner	Level	

GE Reviewed By: Level: 4.7.06 Date:

Utility Reviewed By: 04-07-06 Date:

ANII Reviewed By: 4/9/06 Date:

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R18
Procedure: GE-UT-300

Data Report Number: Q2R18-106 Linearity Sheet: L-011
Data Sheet Number: D-180
Rev.: 8 DRR: N/A

Calibration Block: 99978AQC

CS	Flat	7.0"
Material	Size	Thickness

Initial Cal: 0943 4/04 Exam Start 15:40
Cal Check: N/A Exam End 16:25
Cal Check: N/A Ultragel II 04225
Final Cal: 1733 4/04 Couplant: Batch

246540	90° F	69° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
1/4	N/A	1X	N/A	N/A	N/A	N/A
1/2	N/A	1X	N/A	N/A	N/A	N/A
3/4	N/A	1X	N/A	N/A	N/A	N/A
ID	7.0"	1X	80%	12.05	13.82	6.9
5/4	N/A	1X	N/A	N/A	N/A	N/A

DAC 1X= 72.1 dB
Sweep 0-10 10.0 Depth
Note N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

Sigma	22BC-03006	2(1.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:

0.65"	60°	61°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4	031573011
Manufacturer/Model:	Serial Number:

9.628 µs	0.2345 in./µsec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	20.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N2E NOZ

Nozzle to Shell
Configuration:

OD Plate	94° F
Exam Surface:	Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	72.1	NRI	60°
Plate CW/CCW	P	72.1	NRI	60°
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 3/28/2006

Comments: Cal/Exam Date is the date of initial calibration.
Calibration for full volume examination.
Exams performed to maintain a 10-20% FSH clad roll.
Scanned 360°.

MLH	Mark Hilborn	II	4/4/2006
Initials:	Examiner	Level	Cal/Exam Date:

N/A	N/A	N/A
Initials:	Examiner	Level

GE Reviewed By: Level: 4-7-06 Date:

Utility Reviewed By: 04-07-06 Date:

ANII Reviewed By: 4/19/06 Date:

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R18
Procedure: GE-UT-311

Data Report Number: Q2R18-106 Linearity Sheet: L-011
Data Sheet Number: D-181
Rev.: 10 DRR: N/A

Calibration Block: 99978AQC

CS (Material) Flat (Size) 7.0" (Thickness)
Initial Cal: 0948 4/04 Exam Start 16:41
Cal Check: N/A Exam End 17:10
Cal Check: N/A Ultragel II (Couplant) 04225 (Batch)
Final Cal: 1739 4/04
246540 (Thermometer) 90° F (Initial Cal Temp.) 69° F (Final Cal Temp:)

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
1/4	N/A	1X	N/A	N/A	N/A	N/A
1/2	N/A	1X	N/A	N/A	N/A	N/A
3/4	N/A	1X	N/A	N/A	N/A	N/A
ID	7.0"	1X	80%	12"	14.29	5.75
5/4	N/A	1X	N/A	N/A	N/A	N/A

DAC 1X= 44.5 dB
Sweep 0-10 25 Metal Path
Note N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

KBA (Manufacturer:) 010HWX (Serial Number:) .50" x 1.0" / Rect. (Size / Shape:)
.700 (Incident Point:) 60° (Nominal Angle:) 60° (Measured Angle:)
1.0 MHz (Frequency:) 113-891-600 (Model:) Shear (Mode:)

Search Unit Cable

RG-174 (Cable Type:) 12' (Length:) 0 (Connectors:)

Instrument Settings

Panametrics / Epoch 4 (Manufacturer/Model:) 031573011 (Serial Number:)
15.38 µs (Delay/Zero:) 0.1289 in./usec. (Velocity:) 0.8 - 3.0 MHz (Narrowband Filter:)
Auto (Rep Rate:) Fullwave (Rectification:) 25.0 in. (Range:) Sq. / Med (Pulser:)
400 Ohms (Damping:) 0% (Reject:) 1.0 MHz (Frequency:) P/E (Mode:)
Off: (DAC:) Off: (TVG:) Off: (CSC:) Off: (DGS:)

Exam Data for Weld: N2E NOZ

Nozzle to Shell (Configuration:)
OD Plate (Exam Surface:) 94° F (Component Temperature)

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
0-4.5"	I	70	NRI	60°
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 3/28/2006

Comments: Cal/Exam Date is the date of initial calibration.
Calibration for nozzle to vessel weld N/V.
Exams performed to maintain a 20-30% FSH clad roll.
Rotational angle is ±30°-60°.
Scanned CW and CCW.
Scanned 360°.

MRH Mark Hilborn II 4/4/2006
Initials: Examiner Level Cal/Exam Date:

N/A N/A N/A
Initials: Examiner Level

GE Reviewed By: Level: 4 Date: 4.7.06

Utility Reviewed By: 04-07-06 Date:

ANII Reviewed By: 4/9/06 Date:

Quad Cities Unit-2

Quad Cities Unit-2
N2E Recirc Inlet
Spring 2006

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 80.5		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° NS T-Scan	A	29.3	1.5	1.9%	360.0	0.9%
60° S6 T-Scan	A	42.1	27.4	34.0%	360.0	17.0%
60° S4 T-Scan	A	9.1	9.1	11.3%	360.0	5.7%
60° NS P-Scan	A	29.3	1.0	1.2%	360.0	0.6%
60° S6 P-Scan	A	42.1	11.8	14.7%	360.0	7.3%
IRS S4 P-Scan	A	9.1	9.1	11.3%	360.0	5.7%
60° NS T-Scan						
60° S6 T-Scan						
60° S4 T-Scan						
60° NS P-Scan						
60° S6 P-Scan						
IRS S4 P-Scan						

% Total Composite Coverage = 37.2%

Comments: A - Examined 360° scan limited due to nzzle configuration only.

Note - Rounding methods may affect calculated values.

Q2R18-106
Page 5 of 18
4-7-06

Nir_PDI Qc2_Rev 1 XLS

MANUAL / GERIS DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENT

PLANT **Quad 2**

PREPARED BY S.C. MORTENSON DATE 02/11/06

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	OFFSET	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
RECIRC OUTLET									
N/V Weld (M)	PLATE	0 - 4.5"	60.0°	-	±40°- 80°	FLAT	14.0"	1 MHz	
N/V Weld (M)	PLATE	0 - 4.0"	70.0°	-	±40°- 75°	FLAT	25.3"	1 MHz	
Zone 1 (M)	ODBR	20° - 45°	35.0°	-	90.0°	5.5"	20.7"	1 MHz	W-021, W-022
Zone 2a (M)	ODBR	45° - 90°	60.0°	-	35.0°	5.5"	20.4"	1 MHz	W-023, W-024
RECIRC INLET									
N/V Weld (M)	PLATE	0 - 5.5"	60.0°	-	±30°- 60°	FLAT	14.0"	1 MHz	
Zone 1 (M)	PLATE	0 - 9.0"	70.0°	-	± 30°	FLAT	24.4"	1 MHz	
Zone 2a (M)	ODBR	55° - 90°	67.5°	-	18.1°	3.3"	12.0"	1 MHz	W-025, W-026

NOTES: (M) MANUAL
XX.X° (XX.X°) WEDGE / (FIXTURE) ROTATION ANGLE

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ (704) 948-0253

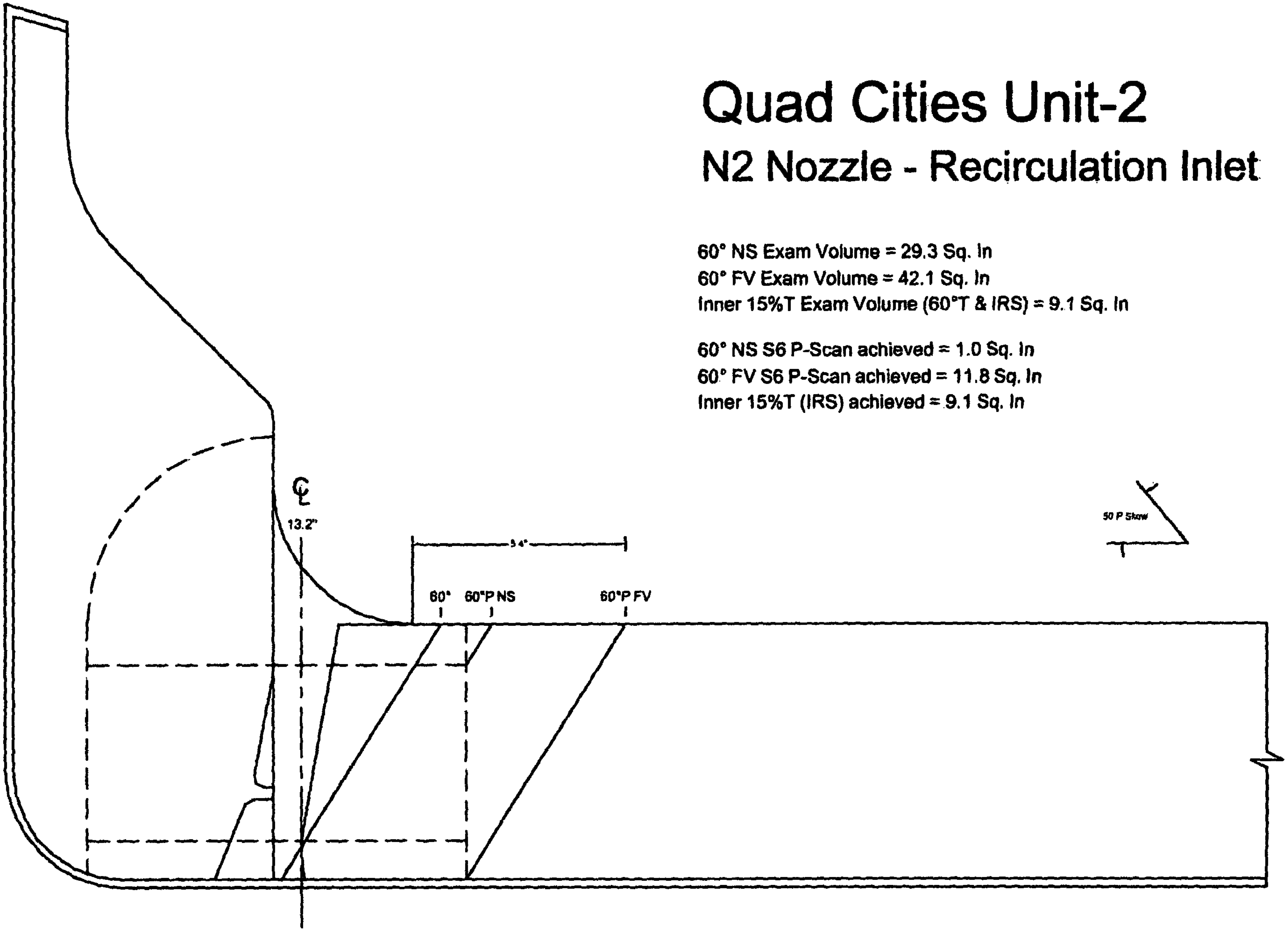
Q2R18-106
JWC 4-7-06
6 of 8

Quad Cities Unit-2

N2 Nozzle - Recirculation Inlet

60° NS Exam Volume = 29.3 Sq. In
60° FV Exam Volume = 42.1 Sq. In
Inner 15%T Exam Volume (60°T & IRS) = 9.1 Sq. In

60° NS S6 P-Scan achieved = 1.0 Sq. In
60° FV S6 P-Scan achieved = 11.8 Sq. In
Inner 15%T (IRS) achieved = 9.1 Sq. In



Quad Cities Unit-2, 2006

Q2R18-106
SWS 4.7.06

Page 7 of 8

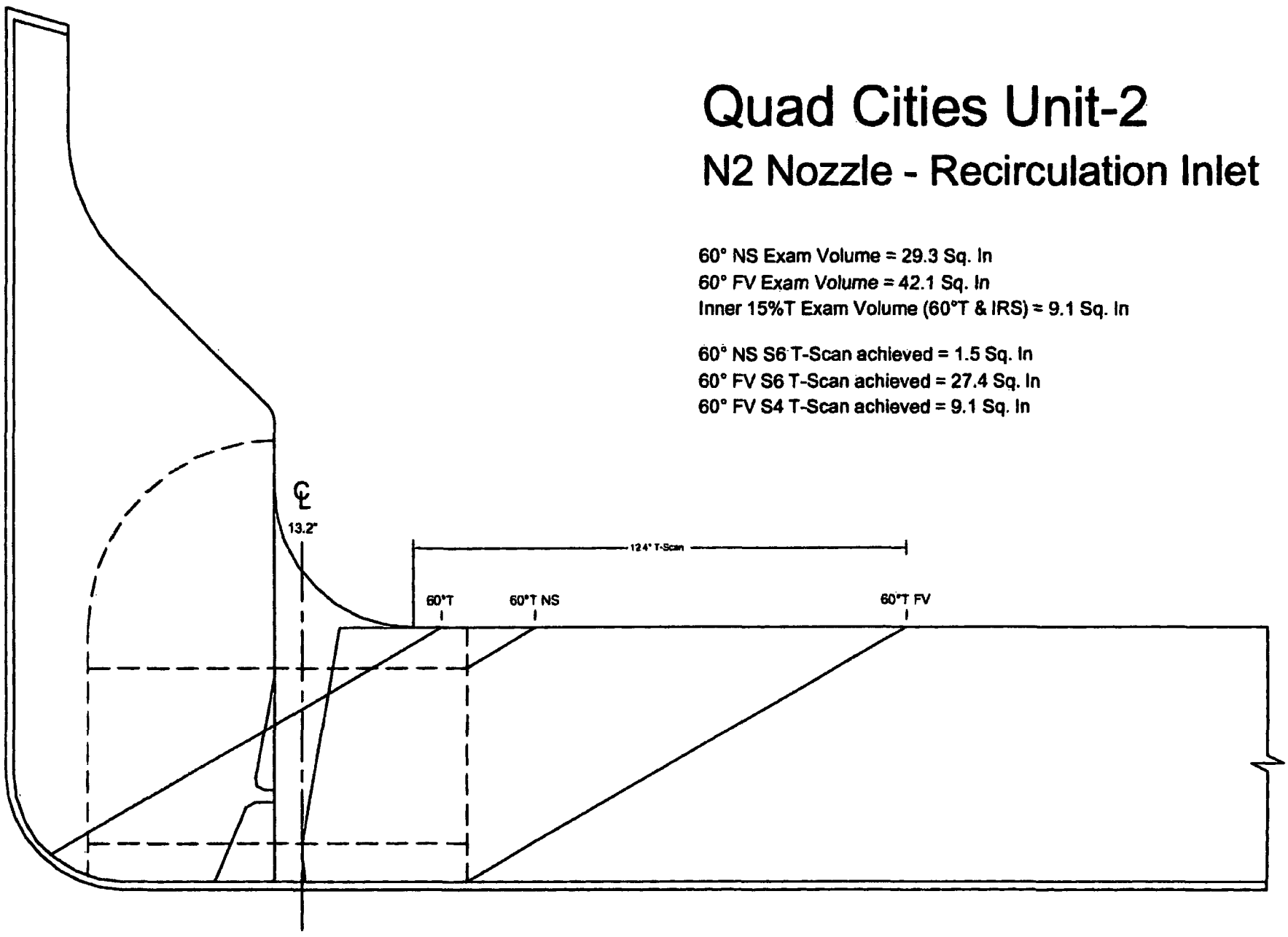
Quad Cities Unit-2, 2006

Quad Cities Unit-2

N2 Nozzle - Recirculation Inlet

60° NS Exam Volume = 29.3 Sq. In
60° FV Exam Volume = 42.1 Sq. In
Inner 15%T Exam Volume (60°T & IRS) = 9.1 Sq. In

60° NS S6 T-Scan achieved = 1.5 Sq. In
60° FV S6 T-Scan achieved = 27.4 Sq. In
60° FV S4 T-Scan achieved = 9.1 Sq. In



QR1B-106
SWS 4-7-06
Page 20 of 28

GE NUCLEAR ENERGY

EXAMINATION SUMMARY SHEET

Report No.: Q2R18-100

Site: **Quad Cities** Component ID: **N1A NOZ**

Outage: **Q2R18** **Nozzle to Shell**

System **Recirc** ASME Cat.: **B-D** ASME Item **B3.90** Aug Req **N/A**

Exams Performed	Data Sheet	Cal Sheet	Procedure	Calibration Block	Examination Personnel	Cert Level	Date
60° RL	D-163	N/A	GE-UT-300 Ver/Rev 8	99978AQC	Mark Hilborn	II	4/1/2006
60° Shear	D-164	N/A	GE-UT-311 Ver/Rev 10	99978AQC	Jack Reisewitz	II	4/1/2006
70° Shear	D-165	N/A	GE-UT-311 Ver/Rev 10	99978AQC	Mark Hilborn	II	4/1/2006

Examination Results:

Ultrasonic examination results were acceptable to the requirements of ASME B&PV Code Section XI, 1995 Edition with the 1996 Addenda as modified by the PDI program description and the Federal Register, Part II, Nuclear Regulatory Commission, 10 CFR Part 50 for Category B-D Reactor Pressure Vessel (RPV) Assembly Welds.

The Inner 15% and the Supplement 6 Examination volume scans performed from the vessel OD surface in accordance with procedure GE-UT-300 V10, using shear and longitudinal wave search units as specified by the General Electric "Quad Cities Unit 2 Nozzle Modeling" document.

Examined 360 degrees.

Composite Examination Coverage = 21%

On calibration/data sheets, reject is recorded as 0% as indicated on the UT instrument used. The procedure essential variable calls this setting as "off". This is the same as 0%. Therefore this meets the essential variables of the procedure.

Examination results were compared to data report D-116 - D-120 *from* 1995 *outage with* ☑ *No Change*

These examinations were performed under Work Order: 00828881-02 ☐ *Change*

This Summary and the following data sheets have been reviewed and accepted by the following personnel:

Prepared By: _____ Level: III Date: 4-7-06

Utility Review: _____ Date: 04-07-06

ANII Review: _____ Date: 4/8/06

RWP: 5984

Dose: 168 mr.

Page 1 of 8

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R18
Procedure: GE-UT-300

Data Report Number: Q2R18-100 Linearity Sheet: L-011
Data Sheet Number: D-163
Rev.: 8 DRR: N/A

Calibration Block: 99978AQC

CS	Flat	7.0"
Material	Size	Thickness

Initial Cal: 0826 4/01 Exam Start 10:40
Cal Check: N/A Exam End 11:20
Cal Check: N/A Ultragel II 04225
Final Cal: 1617 4/01 Couplant: Batch

246540 Thermometer | 80° F Initial Cal Temp. | 67° F Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
1/4	N/A	1X	N/A	N/A	N/A	N/A
1/2	N/A	1X	N/A	N/A	N/A	N/A
3/4	N/A	1X	N/A	N/A	N/A	N/A
ID	7.0"	1X	80%	12.05	13.82	6.9
5/4	N/A	1X	N/A	N/A	N/A	N/A

DAC 1X= 72.1 dB
Sweep 0-10 10.0 Depth
Note N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

Sigma	22BC-03006	2(1.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:

0.65"	60°	61°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 Maufacturer/Model: 031573011 Serial Number:

9.628 µs	0.2345 in./usec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	20.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N1A NOZ

Nozzle to Shell
Configuration:

OD Plate Exam Surface: 94° F Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	72.1	NRI	60°
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 3/28/2006

Comments: Cal/Exam Date is the date of initial calibration.
Calibration for full volume examination.
Exams performed to maintain a 10-20% FSH clad roll.
Scanned 360°.

MH Mark Hilborn II 4/1/2006
Initials: Examiner Level Cal/Exam Date:

N/A N/A N/A
Initials: Examiner Level

GE Reviewed By: Level: 4-7-06 Date:

Utility Reviewed By: 4-07-06 Date:

ANII Reviewed By: 4/8/06 Date:

Page 2 of 8

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R18
Procedure: GE-UT-311

Data Report Number: Q2R18-100 Linearity Sheet: L-010
Data Sheet Number: D-164
Rev.: 10 DRR: N/A

Calibration Block: 99978AQC

CS	Flat	7.0"
Material	Size	Thickness

Initial Cal: 0925 4/01 Exam Start 10:43
Cal Check: N/A Exam End 12:27
Cal Check: N/A Ultragel II Couplant: 04225 Batch
Final Cal: 1642 4/01

246540 Thermometer | 80° F Initial Cal Temp. | 67° F Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
1/4	N/A	1X	N/A	N/A	N/A	N/A
1/2	N/A	1X	N/A	N/A	N/A	N/A
3/4	N/A	1X	N/A	N/A	N/A	N/A
ID	7.0"	1X	80%	12.15	14.03	5.6
5/4	N/A	1X	N/A	N/A	N/A	N/A

DAC 1X= 44.5 dB
Sweep 0-10 25 Metal Path
Note N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

KBA	010HWX	.50" x 1.0" / Rect.
Manufacturer:	Serial Number:	Size / Shape:
.700	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:
1.0 MHz	113-891-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4			031526704
Maufacturer/Model:			Serial Number:
14.65 µs	0.1275 in./µsec.		0.8 - 3.0 MHz
Delay/Zero:	Velocity:		Narrowband Filter:
Auto	Fullwave	25.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:
400 Ohms	0%	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N1A NOZ

Nozzle to Shell
Configuration:

OD Plate Exam Surface: 94° F Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
0-6.5"	Tangental	70	NRI	60°
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 3/28/2006

Comments: Cal/Exam Date is the date of initial calibration.
Calibration for nozzle to vessel weld N/V
Rotational angle is ±40°-80°
Scanned CW and CCW
Exams performed to maintain a 20-30% FSH clad roll
Scanned 360°

JAR Jack Reisewitz II 4/1/2006
Initials: Examiner Level Cal/Exam Date:

n/a N/A N/A
Initials: Examiner Level

GE Reviewed By: Level: 4.7.06 Date:

Utility Reviewed By: 04-07-06 Date:

ANII Reviewed By: 4/8/06 Date:

Page 3 of 8

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R18
Procedure: GE-UT-311

Data Report Number: Q2R18-100 Linearity Sheet: L-011
Data Sheet Number: D-165
Rev.: 10 DRR: N/A

Calibration Block: 99978AQC

CS	Flat	7.0"
Material	Size	Thickness

Initial Cal: 0840 4/01 Exam Start 11:21
Cal Check: N/A Exam End 12:00
Cal Check: N/A Ultragel II 04225
Final Cal: 1620 4/01 Couplant: Batch

246540 Thermometer | 80° F Initial Cal Temp. | 67° F Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
1/4	N/A	1X	N/A	N/A	N/A	N/A
1/2	N/A	1X	N/A	N/A	N/A	N/A
3/4	N/A	1X	N/A	N/A	N/A	N/A
ID	7.0"	1X	80%	19.25	20.54	6.4
5/4	N/A	1X	N/A	N/A	N/A	N/A

DAC 1X= 45.3 dB
Sweep 0-10 32 Metal Path
Note N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

KBA	010HWY	.50" x 1.0" / Rect.
Manufacturer:	Serial Number:	Size / Shape:

.850	70°	70°
Incident Point:	Nominal Angle:	Measured Angle:

1.0 MHz	113-891-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 — Maufacturer/Model:
031573011 — Serial Number:

16.68 µs	0.1266 in./µsec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	32.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N1A NOZ

Nozzle to Shell — Configuration:
OD Plate — Exam Surface:
94° F — Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
0-4.0"	T	73	NRI	70°
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 3/28/2006

Comments: Cal/Exam Date is the date of initial calibration.
Exams performed to maintain a 20-30% FSH clad roll.
Calibration for nozzle to vessel weld N/V.
Scanned CW and CCW.
Exam rotation angle ±40°-75°.
Scanned 360°.

MLH Mark Hilborn II 4/1/2006
Initials: Examiner Level Cal/Exam Date:

N/A N/A N/A
Initials: Examiner Level

GE Reviewed By: Level: 4-7-06 Date:

Utility Reviewed By: 04-07-06 Date:

ANII Reviewed By: 4/8/06 Date:

Quad Cities Unit-2

Quad Cities Unit-2
N1 Recirc Inlet
Spring 2006

Weld Length = 360. / Exam Volume = 73.2		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° NS T-Scan	A	30.1	0.0	0.0%	360.0	0.0%
60° S6 T-Scan	A	35.4	15.6	21.3%	360.0	10.7%
60° S4 T-Scan	A	7.7	7.4	10.1%	360.0	5.1%
60° NS P-Scan	A	30.1	0.0	0.0%	360.0	0.0%
60° S6 P-Scan	A	35.4	0.0	0.0%	360.0	0.0%
IRS S4 P-Scan	A	7.7	7.7	10.5%	360.0	5.3%
60° NS T-Scan						
60° S6 T-Scan						
60° S4 T-Scan						
60° NS P-Scan						
60° S6 P-Scan						
IRS S4 P-Scan						

% Total Composite Coverage = 21.0%

Comments: A - Examined 360° scan limited due to nozzle configuration only.
No 60° P-scans due to ODBR configuration.

Note - Rounding methods may affect calculated values.

Q2R18-100

Page 5 of 18

JWS 4-7-06

Nir_PDI Qc2_Rev 1.XLS

MANUAL / GERIS DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT **Quad 2**

PREPARED BY S.C. MORTENSON DATE 02/11/06

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	OFFSET	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
RECIRC OUTLET									
N/V Weld (M)	PLATE	0 - 4.5"	60.0°	-	±40°- 80°	FLAT	14.0"	1 MHz	
N/V Weld (M)	PLATE	0 - 4.0"	70.0°	-	±40°- 75°	FLAT	25.3"	1 MHz	
Zone 1 (M)	ODBR	20° - 45°	35.0°	-	90.0°	5.5"	20.7"	1 MHz	W-021, W-022
Zone 2a (M)	ODBR	45° - 90°	60.0°	-	35.0°	5.5"	20.4"	1 MHz	W-023, W-024
RECIRC INLET									
N/V Weld (M)	PLATE	0 - 5.5"	60.0°	-	±30°- 60°	FLAT	14.0"	1 MHz	
Zone 1 (M)	PLATE	0 - 9.0"	70.0°	-	± 30°	FLAT	24.4"	1 MHz	
Zone 2a (M)	ODBR	55° - 90°	67.5°	-	18.1°	3.3"	12.0"	1 MHz	W-025, W-026

NOTES: (M) MANUAL
XX.X° (XX.X°) WEDGE / (FIXTURE) ROTATION ANGLE

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ (704) 948-0253

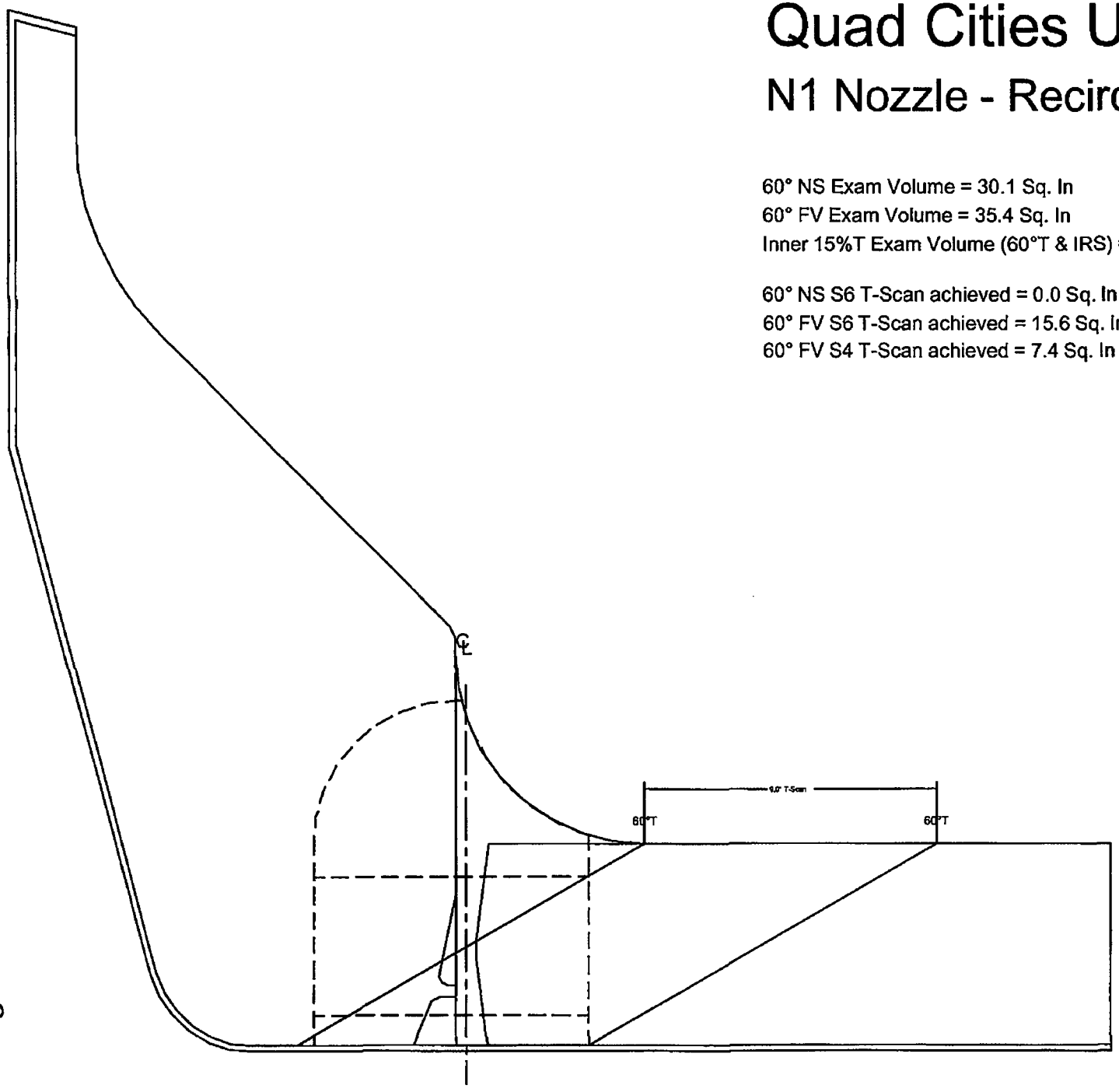
Q2R18-100
6 of 8
JWS 4-7-06

Quad Cities Unit-2

N1 Nozzle - Recirc. Outlet

60° NS Exam Volume = 30.1 Sq. In
60° FV Exam Volume = 35.4 Sq. In
Inner 15%T Exam Volume (60°T & IRS) = 7.7 Sq. In

60° NS S6 T-Scan achieved = 0.0 Sq. In
60° FV S6 T-Scan achieved = 15.6 Sq. In
60° FV S4 T-Scan achieved = 7.4 Sq. In



Q2R18-100 Page 7 of 8
Juls. 4.7.06

Quad Cities Unit-2, 2006

Q2R18-100

4.7.06

Page 8 of 8

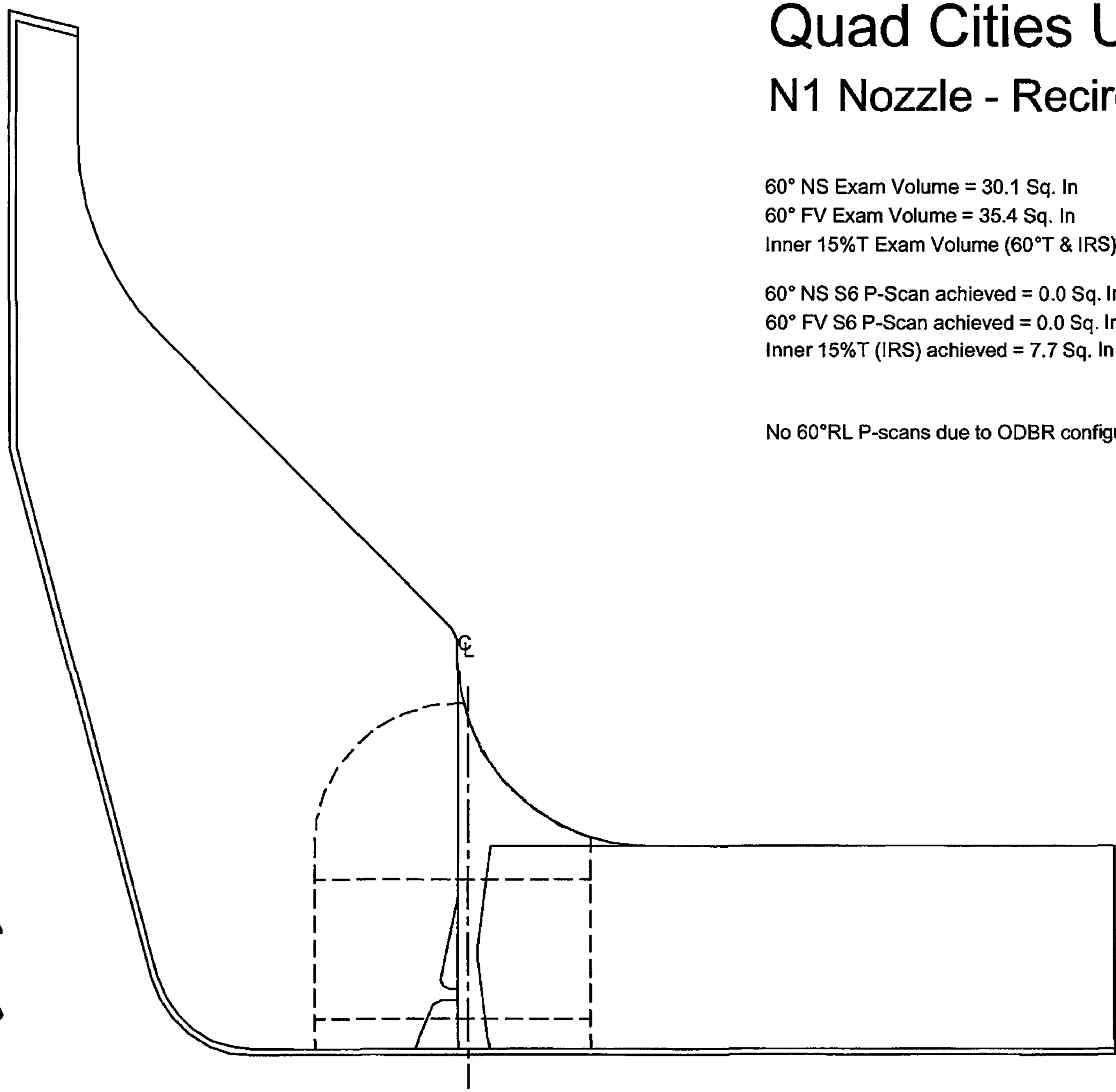
Quad Cities Unit-2

N1 Nozzle - Recirc. Outlet

60° NS Exam Volume = 30.1 Sq. In
60° FV Exam Volume = 35.4 Sq. In
Inner 15%T Exam Volume (60°T & IRS) = 7.7 Sq. In

60° NS S6 P-Scan achieved = 0.0 Sq. In
60° FV S6 P-Scan achieved = 0.0 Sq. In
Inner 15%T (IRS) achieved = 7.7 Sq. In

No 60°RL P-scans due to ODBR configuration.



HITACHI	EXAMINATION SUMMARY SHEET	Report No.: Q2R20-072

Site: Quad Component ID: N1B NOZ

Outage: RFO 20 VESSEL-NOZZLE (RECIRCULATION)

System: RPV ASME Cat.: B-D ASME Item B3.90 Aug Req N/A

Exams Performed	Data Sheet	Cal Sheet	Procedure	Calibration Block	Exam / Oper. Personnel	Cert Level	Date
60° Shear	D-066	N/A	GEH-UT-311 Ver/Rev V16A	99978AQC	Jimmy Johnson	II	3/22/2010
70° Shear	D-067	N/A	GEH-UT-311 Ver/Rev V16A	99978AQC	Jimmy Johnson	II	3/22/2010
60° RL	D-068	N/A	GE-UT-300 Ver/Rev V10	CAL-IIW2-045	David Hancock	II	3/22/2010
60° RL	D-069	N/A	GE-UT-300 Ver/Rev V10	99978AQC	David Hancock	II	3/22/2010

Examination Results:

During the manual ultrasonic examination of the above referenced nozzle to shell weld, no recordable indications were detected utilizing the above procedures. The inner 15% examination volume as defined by 10 CFR 50 (Supplement 7), searching for flaws oriented perpendicular to the weld axis, was performed per procedure GEH-UT-311 V16A utilizing search units validated by modeling.

Manual examinations were restricted due to the nozzle configuration.

35.4% code coverage was achieved.

This examination meets the requirements of ASME Section XI, 1995 Edition through 1996 Addenda.

Examination results were compared to Data Report Q2R16-79 *from:* Q2R16 ☐ *Change*

These examinations were performed under Work Order: 1179267 ☑ *No Change*

This Summary and the following data sheets have been reviewed and accepted by the following personnel:

Scott R Erickson III 03/24/10 — Prepared By: / Level: / Date:

[signature] III 3-29-10 — Utility Review: / Date:

Scott R Erickson III 03/24/10 — GE Review By: / Level: / Date:

Jeff Snyder 3/30/10 — ANII Review: / Date:

RWP: 10010890

Dose: 47 mr.

Page 1 of 11

HITACHI

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad / 2
Outage: RFO 20
Procedure: GEH-UT-311 Rev: V16A DRR: 10-02

Data Report Number: Q2R20-072 Linearity Sheet: L-008
Data Sheet Number: D-066

Calibration Data for Block: 99978AQC

CS	N/A	7.0"
Material	Size	Thickness

Initial Cal: 0925 Exam Start: 1005
Cal Check: N/A Exam End: 1207
Cal Check: N/A Ultragel II (Couplant) 08125 (Batch)
Final Cal: 1416

269040	72° F	72° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Reflector	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID Notch	7.0	1X	80%	12.1	14.40	7.2
N/A	N/A	1X	N/A	N/A	N/A	N/A

DAC @ 1X= 46.8

Sweep 0-10 = 20.0" METAL PATH

Acceptable Linearity performed : 3/11/2010

Exam Data for Component: N1B NOZ

VESSEL-NOZZLE (RECIRCULATION)
Configuration:

O.D. PLATE	95° F
Exam Surface:	Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
0-4.5"	60°	±40°-80°	N/A	67	NRI
N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A

Search Unit Data

KBA	01LK56	0.50" x 1.0"/Rect
Manufacturer:	Serial No.:	Size/Shape:
0.8 in.	60°	61°
Incident Point:	Nominal Angle:	Measured Angle:
1.0 MHz	113-891-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	6'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4	031538006
Manufacturer/Model:	Serial No.:

16.52 µs	0.1296 in /µsec	0.8 - 3.0 MHz
Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	20.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	0%	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.

Calibration for vessel to nozzle weld (V/N).
Exams performed to maintain a 20-30% FSH clad roll.
Scanned CW and CCW.
Calibration Sweep is 30.0" metal path, Examination Range setting is 20.0".

JJ Jimmy Johnson II 3/22/2010 — See Summary Sheet for Signature
Initials: Examiner: Level: Cal/Exam Date: Utility Reviewed By: Date:

Scott R Erickson III 03/24/10 — See Summary Sheet for Signature
GE Reviewed By: Level: Date: ANII Reviewed By: Date:

Page 2 of 11

HITACHI

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad / 2
Outage: RFO 20
Procedure: GEH-UT-311

Data Report Number: Q2R20-072
Data Sheet Number: D-067
Linearity Sheet: L-008
Rev: V16A
DRR: 10-02

Calibration Data for Block: 99978AQC

CS	N/A	7.0"
Material	Size	Thickness

Initial Cal: 0929 Exam Start: 1005
Cal Check: N/A Exam End: 1207
Cal Check: N/A Ultragel II (Couplant) 08125 (Batch)
Final Cal: 1419

269040	72° F	72° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Reflector	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID Notch	7.0	1X	80%	19.7	21.56	6.6
N/A	N/A	1X	N/A	N/A	N/A	N/A

DAC @ 1X= 46.7

Sweep 0-10 = 32.5" METAL PATH

Acceptable Linearity performed : 3/11/2010

Search Unit Data

KBA	010HX4	0.50" x 1.0"/Rect.
Manufacturer:	Serial No.:	Size/Shape:
1.0 in.	70°	70°
Incident Point:	Nominal Angle:	Measured Angle:
1.0 MHz	113-891-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	6'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4		031538006
Manufacturer/Model:		Serial No.:
16.44 µs	0.1287 in /µsec	0.8 - 3.0 MHz
Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	32.5 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	0%	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Component: N1B NOZ

VESSEL-NOZZLE (RECIRCULATION)
Configuration:

O.D. Plate	95° F
Exam Surface:	Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
0-4.0"	70°	±40°-75°	N/A	68	NRI
N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.

Calibration for vessel to nozzle weld (V/N).
Exams performed to maintain a 20-30% FSH clad roll.
Scanned CW and CCW.

JJ	Jimmy Johnson	II	3/22/2010	See Summary Sheet for Signature	
Initials:	Examiner:	Level:	Cal/Exam Date:	Utility Reviewed By:	Date:
Scott R Erickson		III	03/24/10	See Summary Sheet for Signature	
GE Reviewed By:		Level:	Date:	ANII Reviewed By:	Date:

Page 3 of 11

HITACHI

Ultrasonic Calibration and Examination Record
RPV Components

Site/Unit: Quad / 2
Outage: RFO 20
Procedure: GE-UT-300

Data Report Number: Q2R20-072
Data Sheet Number: D-068
Linearity Sheet: L-007
Ver.: V10
DRR: N/A

Calibration Block: CAL-IIW2-045

CS	N/A	4.0"
Material	Size	Thickness

Initial Cal: 0935
Cal Check: N/A
Cal Check: N/A
Final Cal: 1410
Exam Start: 1005
Exam End: 1207

Ultragel II — Couplant: 08125 — Batch

269040	72° F	72° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
SDH	0.6"	1X	80%	1.0	0.6	3.0
N/A	N/A	1X	N/A	N/A	N/A	N/A
N/A	N/A	1X	N/A	N/A	N/A	N/A
N/A	N/A	1X	N/A	N/A	N/A	N/A
N/A	N/A	1X	N/A	N/A	N/A	N/A

DAC 1X= 55.0
Sweep 0-10 = 2.0" DEPTH
Note: N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

Sigma	228C-06006	2(1.1"X.62") / Rect
Manufacturer:	Serial Number:	Size / Shape:

0.7"	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 — Manufacturer/Model: — 031526804 — Serial Number:

8.941 µs	0.2334 in./µsec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	4.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	DUAL
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N1B NOZ

VESSEL-NOZZLE (RECIRCULATION)
Configuration:

PLATE	95° F
Exam Surface:	Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
360°	T	69.0	NRI	60°
360°	P	69.0	NRI	60°
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed: 3/11/2010

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.
Calibration for near surface examination.
Exams performed a minimum of 14 dB above reference.

David Hancock — II — 3/22/2010
Initials: Examiner — Level: — Cal/Exam Date:

See Summary Sheet for Signature — Date:
Utility Reviewed By:

N/A — N/A
Initials: Examiner — Level:

See Summary Sheet for Signature — Date:
ANII Reviewed By:

Scott R Beacham — III — 03/24/10
GE Reviewed By: — Level: — Date:

NRO 3/24/10

HITACHI

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad / 2
Outage: RFO 20
Procedure: GE-UT-300

Data Report Number: Q2R20-072
Data Sheet Number: D-069
Linearity Sheet: L-007
Ver.: V10
DRR: N/A

Calibration Block: 99978AQC

CS	N/A	730"
Material	Size	Thickness

Initial Cal: 0940
Exam Start: 1005
Cal Check: N/A
Exam End: 1207
Cal Check: N/A
Ultragel II / 08125
Final Cal: 1410
Couplant / Batch

269040	72° F	72° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
I.D. NOTCH	7.0"	1X	80%	11.9	6.86	6.9
N/A	N/A	1X	N/A	N/A	N/A	N/A
N/A	N/A	1X	N/A	N/A	N/A	N/A
N/A	N/A	1X	N/A	N/A	N/A	N/A
N/A	N/A	1X	N/A	N/A	N/A	N/A

DAC 1X= 69.7
Sweep 0-10 = 10.0" DEPTH
Note: N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

Sigma	22BC-06006	2(1.1"X.62") / Rect
Manufacturer:	Serial Number:	Size / Shape:

0.7	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 / 031526804
Manufacturer/Model: / Serial Number:

8.941 µs	0.2334 in./µsec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	20.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	DUAL
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N1B NOZ

VESSEL-NOZZLE (RECIRCULATION)
Configuration:

PLATE / 95° F
Exam Surface: / Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
360°	T	75.7	NRI	60°
360°	P	75.7	NRI	60°
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 3/11/2010

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.
Calibration for full volume examination.
Exams performed to maintain a 10 - 20% clad roll.

David Hancock / II / 3/22/2010
Initials: Examiner / Level: / Cal/Exam Date:

See Summary Sheet for Signature
Utility Reviewed By: / Date:

N/A / N/A
Initials: Examiner / Level:

See Summary Sheet for Signature
ANII Reviewed By: / Date:

Scott R Erickson / III / 03/24/10
GE Reviewed By: / Level: / Date:

NA 3/24/10

Q2R20-072

HITACHI

Reactor Pressure Vessel Coverage Calculation Sheet

Quad Cities Unit 2 / Q2R20
N1(Noz-Sh)
Spring / 2010

Weld Length = 360. Exam Volume = 79.2		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° T-Scan (S4 UC)	A	30.2	8.7	11.0%	360	5.5%
45° T-Scan (S6 FV)	A	40.3	25.6	32.3%	360	16.2%
70° T-Scan (S6 NS)	A	8.7	1.1	1.4%	360	0.7%
IRS P-Scan (S4 UC)	A	30.2	8.7	11.0%	360	5.5%
45° P-Scan (S6 FV)	A	40.3	11.2	14.1%	360	7.1%
70° P-Scan (S6 NS)	A	8.7	0.7	0.9%	360	0.4%
60° T-Scan (S4 UC)						
45° T-Scan (S6 FV)						
70° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
45° P-Scan (S6 FV)						
70° P-Scan (S6 NS)						
60° T-Scan (S4 UC)						
45° T-Scan (S6 FV)						
70° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
45° P-Scan (S6 FV)						
70° P-Scan (S6 NS)						
				% Total Composite Coverage =		35.4%

Rev. 0 9/23/05

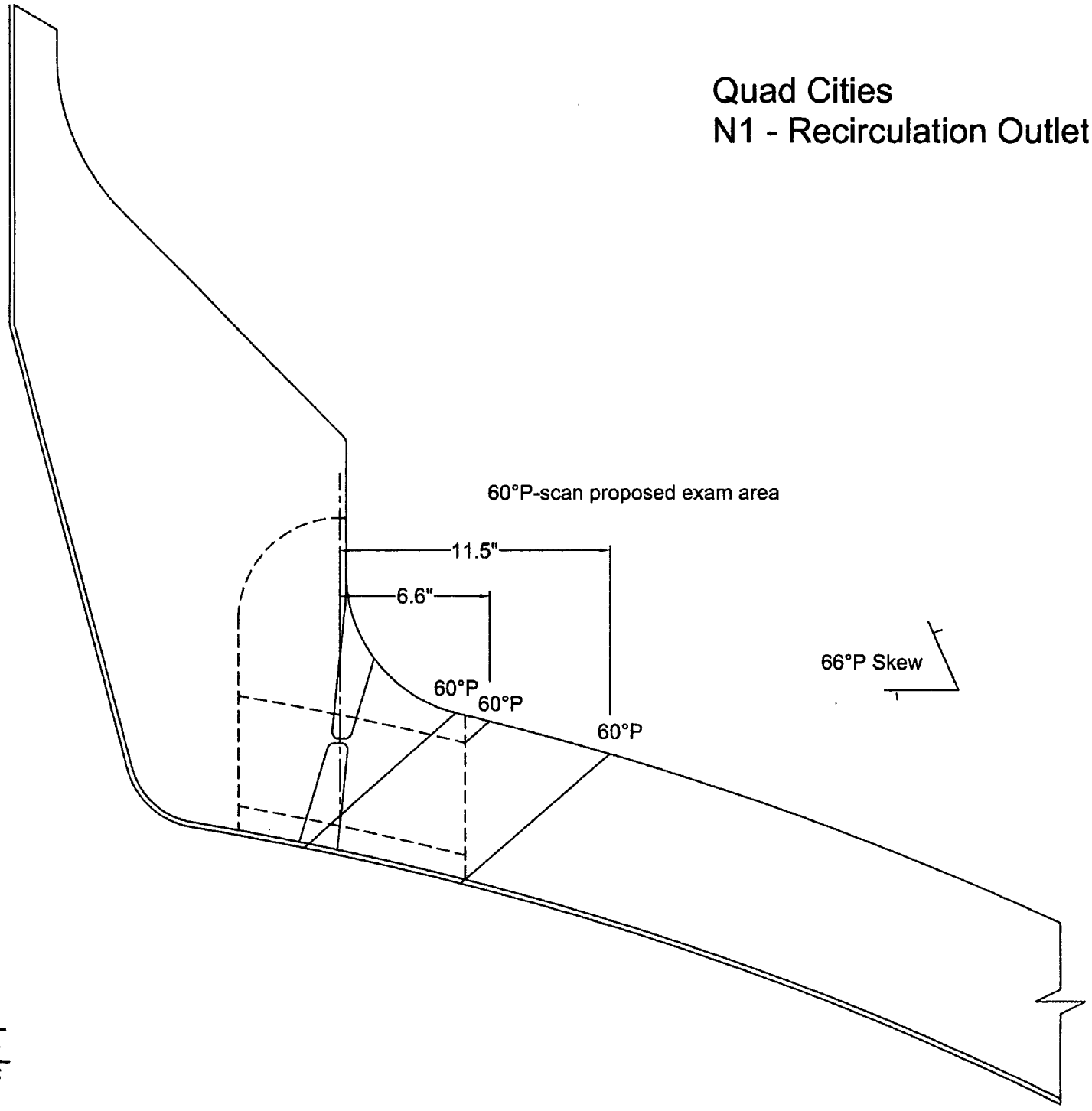
Comments: A - Manual UT scanning was restricted due to the nozzle configuration.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in degrees.

Pg 6 of 11

NAB 3/26/10

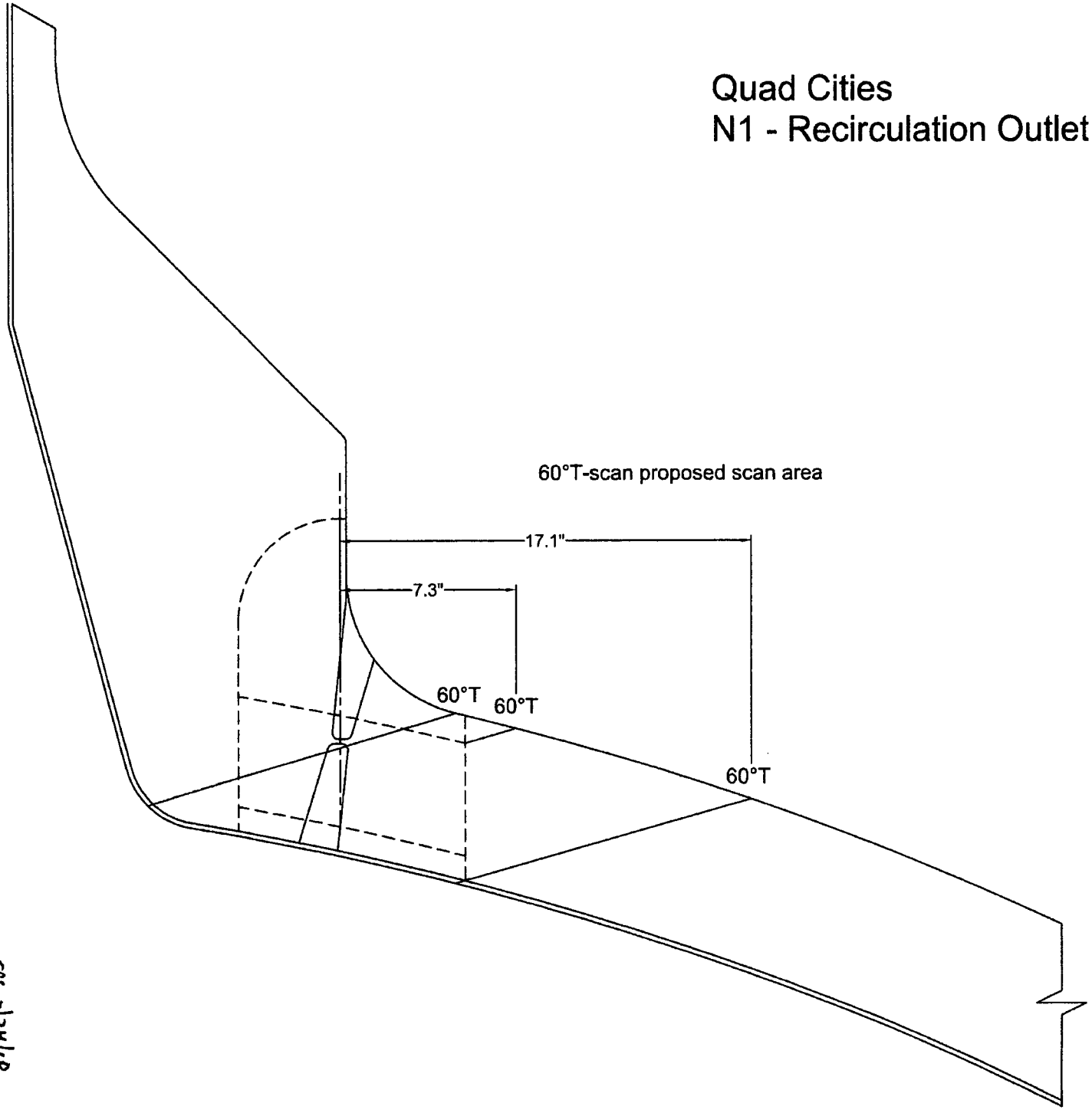
Quad Cities
N1 - Recirculation Outlet



Quad Cities Unit 2, 2010

Quad Cities Unit 2, 2010

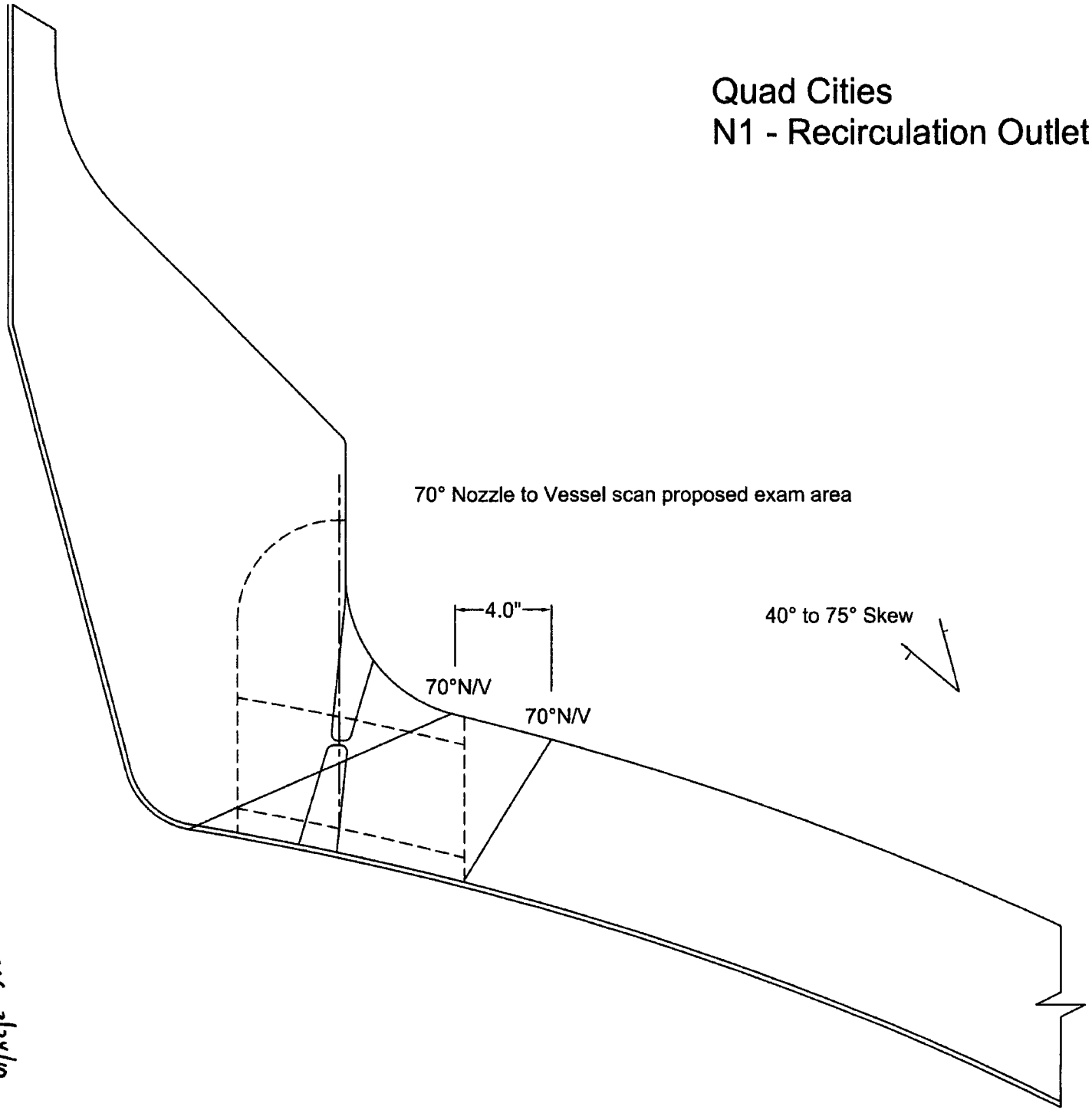
Quad Cities
N1 - Recirculation Outlet



Q2120-072

Quad Cities Unit 2, 2010

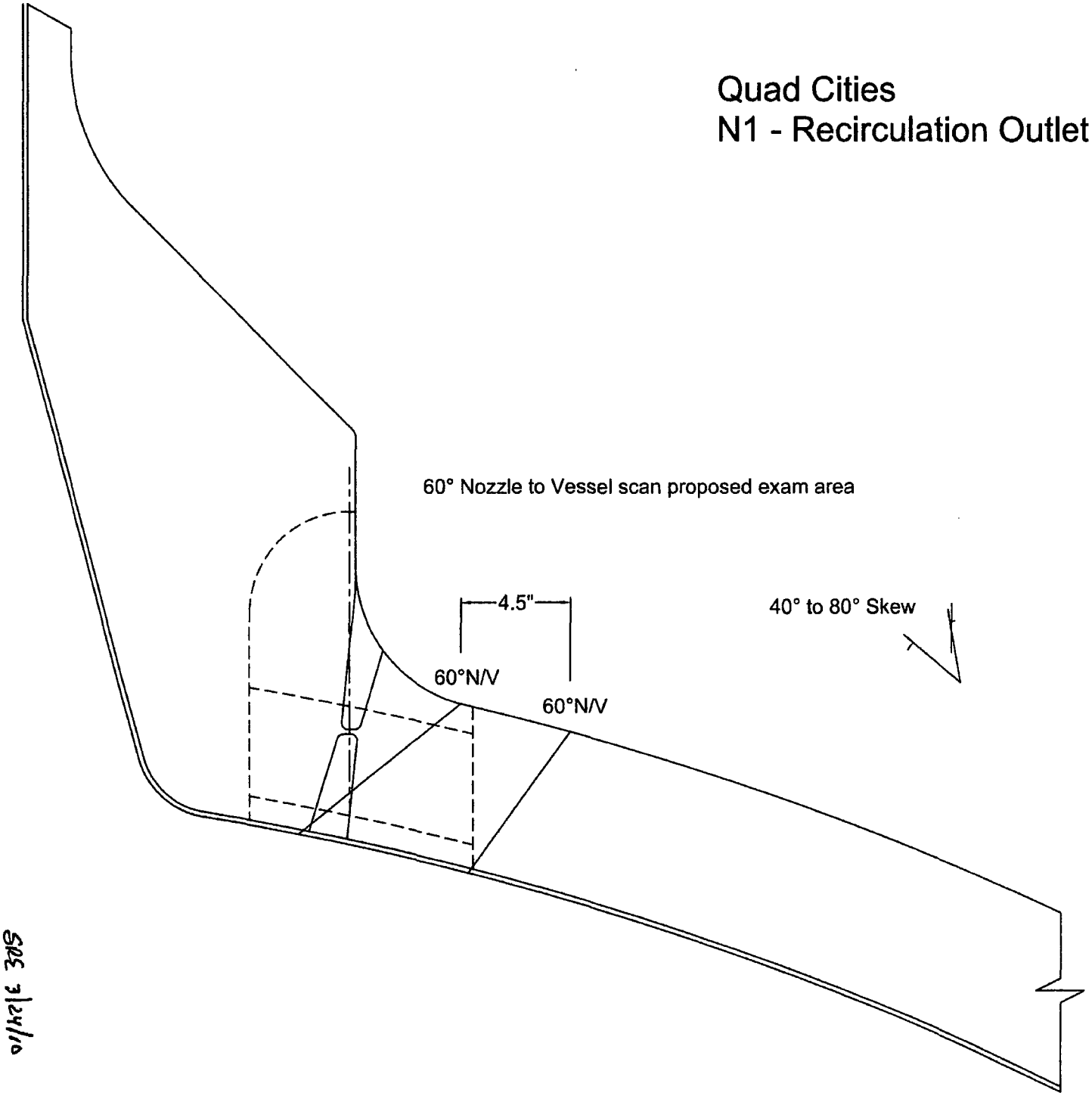
Quad Cities
N1 - Recirculation Outlet



Q2R20-072

Quad Cities Unit 2, 2010

Quad Cities
N1 - Recirculation Outlet



Q2R20-072

Manual Detection Nir_PDI Qc2_Rev 4.XLS

MANUAL DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT **Quad 2**

PREPARED BY S.C. MORTENSON DATE 02/21/2010

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	OFFSET	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
RECIRC OUTLET									
N/V Weld (M)	PLATE	0 - 4.5"	60.0°	-	±40°- 80°	FLAT	14.0"	1 MHz	
N/V Weld (M)	PLATE	0 - 4.0"	70.0°	-	±40°- 75°	FLAT	25.3"	1 MHz	
Zone 1 (M)	ODBR	20° - 45°	35.0°	-	90.0°	5.5"	20.7"	1 MHz	W-021, W-022
Zone 2a (M)	ODBR	45° - 90°	60.0°	-	35.0°	5.5"	20.4"	1 MHz	W-023, W-024
SBLC N10									
N/V Weld (M)	PLATE	4.5" - 9.0"	45.0°	-	± 17°- 51°	FLAT	9.1"	1 MHz	

NOTES: (M) MANUAL
XXX° (XXX°) WEDGE / (FIXTURE) ROTATION ANGLE

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ (704) 577-3770

Chris Minor
SME Review / Date

3-9-10
Site Review / Date

MAB 3/26/10

Pg 11 of 11

HITACHI	EXAMINATION SUMMARY SHEET	Report No.: 2QR19-093

Site: **Quad Cities** Component ID: **N5A NOZ**

Outage: **Q2R19** **VESSEL-NOZZLE (CORE SPRAY)**

System: **RPV** ASME Cat.: **B-D** ASME Item **B3.90** Aug Req **N/A**

Exams Performed	Data Sheet	Cal Sheet	Procedure	Calibration Block	Exam / Oper. Personnel	Cert Level	Date
60° RL	D-087	N/A	GE-UT-300 Ver/Rev 10	CAL-IIW2-045	Edward Fish	II	3/8/2008
60° RL	D-088	N/A	GE-UT-300 Ver/Rev 10	99978AQC	Edward Fish	II	3/8/2008
60° Shear	D-089	N/A	GE-UT-311 Ver/Rev 15	99978AQC	Mark Hilborn	III	3/8/2008

Examination Results:

During the manual ultrasonic examination of the above referenced nozzle to vessel weld, no recordable indications were detected utilizing the above procedure. The inner 15%T examination volume as defined by 10 CFR 50 (Supplement 7) searching for flaws oriented perpendicular to the weld axis was performed per procedure GE-UT-311 V15, utilizing search units validated by modeling.

This examination is acceptable to the requirements of ASME B&PV Code Section XI, 1995 Edition with the 1996 Addenda.

Manual examinations were restricted due to the nozzle configuration and insulation support bracket..

43.1% code coverage was achieved.

Previous examination results supplied by customer for review from ISI Program documents? ☑ Yes ☐ Change

These examinations were performed under Work Order: 1025573 ☐ No ☑ No Change

This Summary and the following data sheets have been reviewed and accepted by the following personnel:

Prepared By: [signature] Level: III Date: 3/10/08

Utility Review: [signature] Date: 3/15/08

ANII Review: [signature] Date: 3/19/08

RWP: 8603

Dose: 155 mr.

HITACHI

Ultrasonic Calibration and Examination Record
RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R19
Procedure: GE-UT-300

Data Report Number: 2QR19-093 Linearity Sheet: L-005
Data Sheet Number: D-087
Rev.: 10 DRR: N/A

Calibration Block: CAL-IIW2-045

CS	N/A	4.0"
Material	Size	Thickness

Initial Cal: 2227 Exam Start: 0255
Cal Check: N/A Exam End: 0415
Cal Check: N/A Ultragel II (Couplant) 07225 (Batch)
Final Cal: 0427

255223	85° F	85° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
SDH	.6"	1X	80%	1.179"	0.681"	3.5
		1X				
		1X				
		1X				
		1X				

DAC 1X= 53.4dB
Sweep 0-10 = 2.0" Depth
Note: N/A dB difference between 3/8 and 5/8 Vee

Exam Data for Weld: N5A NOZ
VESSEL-NOZZLE (CORE SPRAY)
Configuration:

OD Plate	105° F
Exam Surface:	Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	67.4	NRI	60°
Plate cw/ccw	P	67.4	NRI	60°

Search Unit Data

Sigma	22BC-06006	20.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:

0.7"	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 (Manufacturer/Model:) 031574912 (Serial Number:)

6.645 µs	0.2120 in./µsec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	4.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed: 2/21/2008

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.
Calibration for near surface examination.
Exams performed a minimum of 14 dB above reference.
45° Shear not used.

EWF — Edward Fish — II — 3/8/2008
Initials: Examiner — Level: — Cal/Exam Date:

Utility Reviewed By: — 3/15/08 Date:

N/A — N/A
Initials: Examiner — Level:

ANII Reviewed By: — 3/19/08 Date:

GE Reviewed By: — III — 3/13/08
Level: — Date:

HITACHI

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R19
Procedure: GE-UT-300

Data Report Number: 2QR19-093 Linearity Sheet: L-005
Data Sheet Number: D-088
Rev.: 10 DRR: N/A

Calibration Block: 99978AQC

CS	N/A	7.0"
Material	Size	Thickness

Initial Cal: 2226 Exam Start: 0255
Cal Check: N/A Exam End: 0415
Cal Check: N/A Ultragel II 07225
Final Cal: 0426 Couplant: Batch

255223 Thermometer | 85° F Initial Cal Temp. | 85° F Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID Notch	7.0"	1X	80%	11.99"	6.92"	6.9
		1X				
		1X				
		1X				
		1X				

DAC 1X= 69.5dB
Sweep 0-10 = 10.0" Depth
Note: N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

Sigma	22BC-06006	2(1.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:

0.7"	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 Manufacturer/Model: 031574912 Serial Number:

6.645 µs	0.2119 in./µsec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	20.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N5A NOZ
VESSEL-NOZZLE (CORE SPRAY) Configuration:
OD Plate Exam Surface: 105° F Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	69.5	NRI	60°
Plate cw/ccw	P	69.5	NRI	60°

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed: 2/21/2008

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.
Calibration for full volume examination.
Exams performed to maintain a 10-20% clad roll.
Scanning limited due to insulation support.
45° Shear not used.

EWF Edward Fish II 3/8/2008
Initials: Examiner Level: Cal/Exam Date:

Utility Reviewed By: 3-15-08
Date:

N/A N/A
Initials: Examiner Level:

ANII Reviewed By: 3/19/08
Date:

JWC. Reed III 3/13/08
GE Reviewed By: Level: Date:

Page 3 of 9

HITACHI

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R19
Procedure: GE-UT-311

Data Report Number: 2QR19-093 Linearity Sheet: L-006
Data Sheet Number: D-089
Rev: 15 DRR: N/A

Calibration Data for Block: 99978AQC

CS	N/A	7.0"
Material	Size	Thickness

Initial Cal: 2225 Exam Start: 0255
Cal Check: N/A Exam End: 0415
Cal Check: N/A Ultragel II 07225
Final Cal: 0435 Couplant: Batch

255223	85° F	85° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID Notch	7.0'	1X	80%	11.95"	13.8'	8.1
		1X				

DAC @ 1X= 48.1dB

Sweep 0-10 = 17.0' Metal Path

Acceptable Linearity performed : 2/21/2008

Search Unit Data

KBA	01FRPD	.50"x1"/Rect.
Manufacturer:	Serial No.:	Size/Shape:
0.7 in.	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:
1.0 MHz	113-891-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	9'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4		031536006
Manufacturer/Model:		Serial No.:
15.57 µs	0.1291 in /µsec	0.8 - 3.0 MHz
Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	17.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	0%	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Component: N5A NOZ

VESSEL-NOZZLE (CORE SPRAY)
Configuration:

Plate	105° F
Exam Surface:	Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
0-7.0"	60°	±55°	N/A	66.7	NRI

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.

Exams performed to maintain a 20 -30% FSH clad roll.
Scanned CW and CCW.
Calibration for nozzle to vessel weld (N/V).

MRH	Mark Hilborn	III	3/8/2008		3-15-08
Initials:	Examiner:	Level:	Cal/Exam Date:	Utility Reviewed By:	Date:
		III	3/13/08		3/19/08
GE Reviewed By:		Level:	Date:	ANII Reviewed By:	Date:

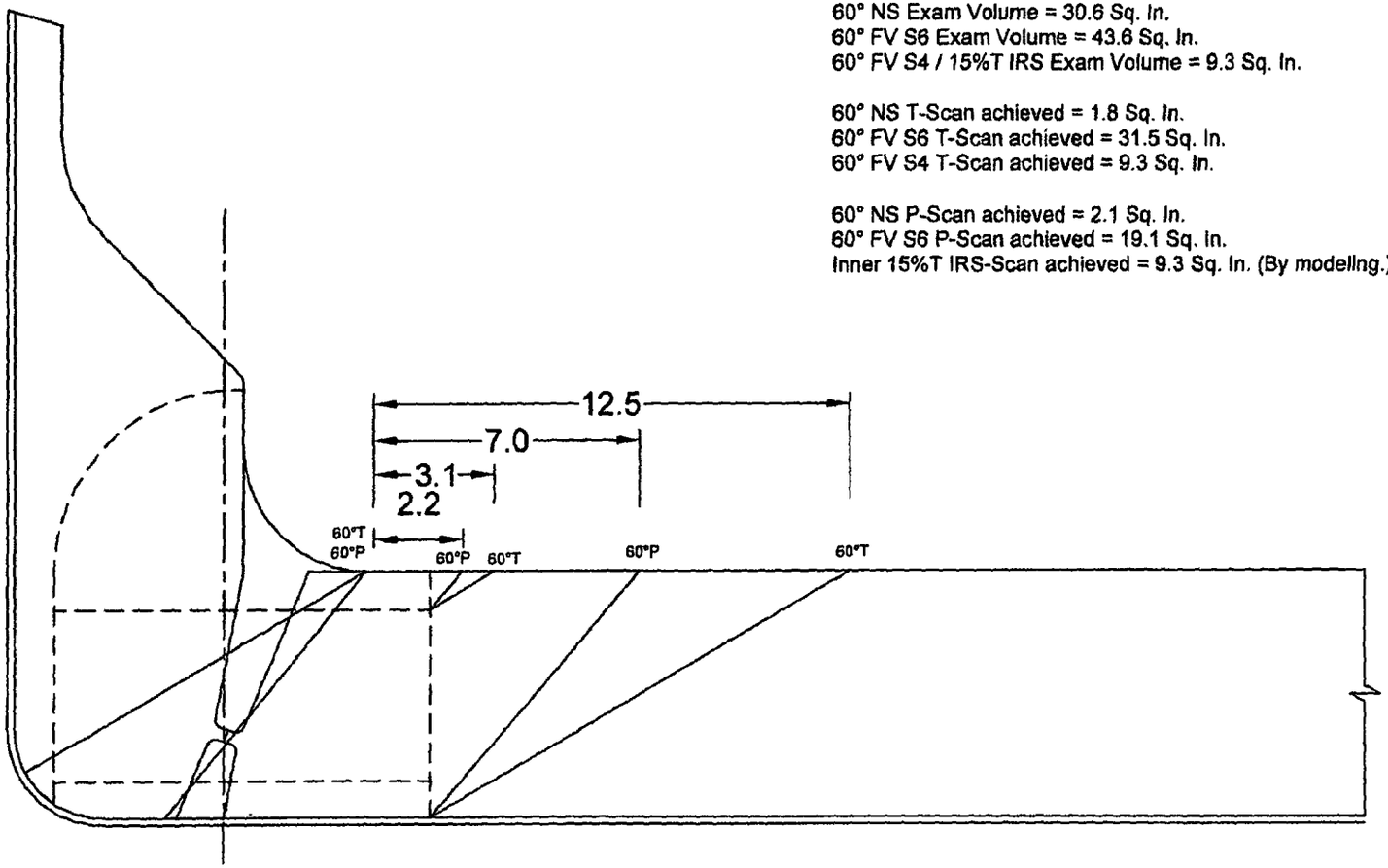
Page 4 of 9

Quad Cities Unit-2
N5 - Core Spray

60° NS Exam Volume = 30.6 Sq. In.
60° FV S6 Exam Volume = 43.6 Sq. In.
60° FV S4 / 15%T IRS Exam Volume = 9.3 Sq. In.

60° NS T-Scan achieved = 1.8 Sq. In.
60° FV S6 T-Scan achieved = 31.5 Sq. In.
60° FV S4 T-Scan achieved = 9.3 Sq. In.

60° NS P-Scan achieved = 2.1 Sq. In.
60° FV S6 P-Scan achieved = 19.1 Sq. In.
Inner 15%T IRS-Scan achieved = 9.3 Sq. In. (By modelling.)



Quad Cites Unit-2, 2008

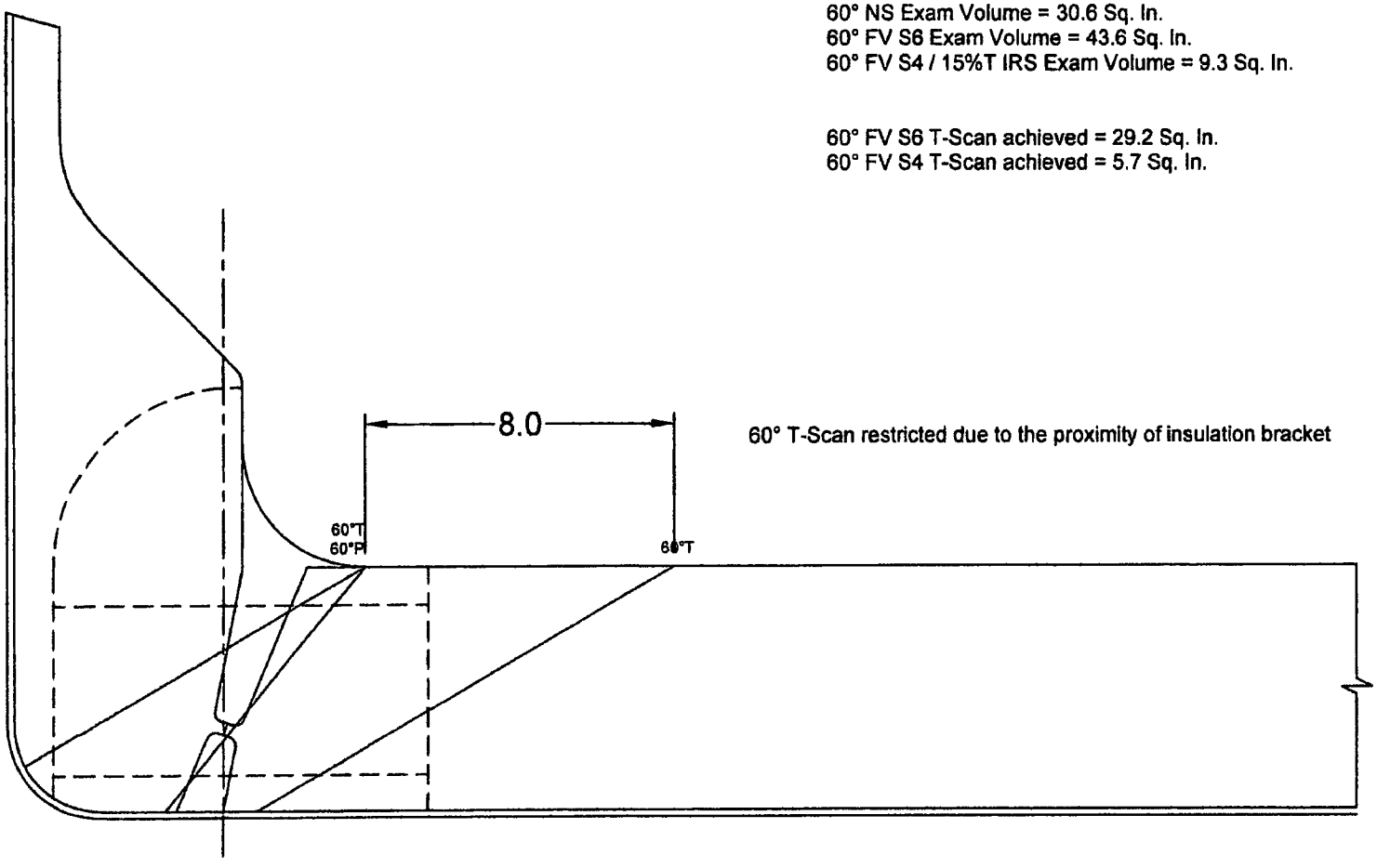
Page 5 of 9

REPORT NO. ZQR19-093

Quad Cities Unit-2
N5 - Core Spray

60° NS Exam Volume = 30.6 Sq. In.
60° FV S6 Exam Volume = 43.6 Sq. In.
60° FV S4 / 15%T IRS Exam Volume = 9.3 Sq. In.

60° FV S6 T-Scan achieved = 29.2 Sq. In.
60° FV S4 T-Scan achieved = 5.7 Sq. In.



60° T-Scan restricted due to the proximity of insulation bracket

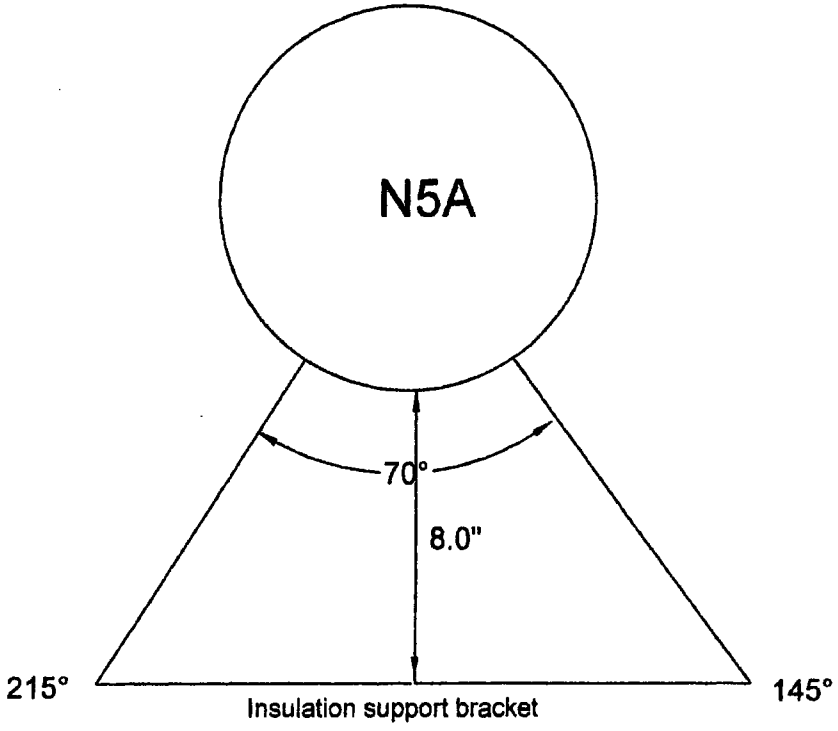
Quad Cites Unit-2, 2008

Page 6 of 9

REPORT NO. 2QR19-093

Quad Cities Unit 2

N5A Core Spray



REPORT NO. 2QR19-093

MANUAL DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT: Quad 2

PREPARED BY: S.C. MORTENSON DATE: 02/25/08

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	OFFSET	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
MAIN STEAM									
N/V Weld (M)	PLATE	0 - 4.0"	60.0°	-	± 25° - 70°	FLAT	14.0"	1 MHz	
N/V Weld/Zone 1 (M)	PLATE	0 - 6.0"	70.0°	-	± 46°	FLAT	25.3"	1 MHz	
Zone 2a (M)	ODBR	60° - 90°	66.4°	-	24.1°	4.0"	16.3"	1 MHz	W-039 ✓
CORE SPRAY									
N/V Weld/Zone 1 (M)	PLATE	0 - 7.0"	60.0°	-	± 55°	FLAT	14.0"	1 MHz	
Zone 1 (M)	PLATE	0 - 6.0"	70.0°	-	± 25°	FLAT	19.6"	1 MHz	
Zone 2A (M)	ODBR	55° - 90°	66.3°	-	16.7°	3.1"	10.6"	1 MHz	W-031, W-032 ✓
CRD									
N/V Weld (M)	PLATE	0 - 6.5"	45°		± 20.0° - 60.0°	FLAT	9.3"	1 MHz	
Zone 1 (M)	PLATE	0 - 7.5"	60.0°		± 15°	FLAT	13.9"	1 MHz	
Zone 2A (M)	PLATE	0 - 11.0"	70.0°		± 15°	FLAT	17.2"	1 MHz	
Zone 2A (M)	ODBR	55° - 90°	66.3°		16.7°	3.1"	3.6"	1 MHz	W-031, W-032 ✓
JET PUMP INSTRUMENT									
N/V Weld (M)	PLATE	5.0 - 10.0"	55.0°	-	± 20° - 60°	FLAT	11.8"	1 MHz	
Zone 1 (M)	PLATE	6.0 - 11.0"	60.0°	-	± 20°	FLAT	13.9"	1 MHz	
Zone 2A (M)	PLATE	0 - 14.0"	70.0°	-	± 25°	FLAT	17.2"	1 MHz	
Zone 2A (M)	PLATE	0 - 6.0"	80.0°	-	± 20°	FLAT	9.0"	1 MHz	
TOP HEAD VENT (N7) - 0° Offset									
N/V Weld (M)	PLATE	0 - 9.0"	60.0°	-	± 25.0° - 55.0°	FLAT	8.4"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 8.0"	70.0°	-	±20°	FLAT	13.6"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 8.0"	80.0°	-	±17°	FLAT	13.0"	1.0 MHz	
ZONE 2A (M)	ODBR	40° - 90°	50.0°	-	26°	1.9"	2.5"	1.0 MHz	W-131 ✓
TOP HEAD SPRAY (N6) - 48° Offset									
N/V Weld (M)	PLATE	0 - 8.0"	45.0°	-	± 15.0° - 85.0°	FLAT	5.7"	1.0 MHz	
N/V Weld (M)	PLATE	0 - 6.0"	60.0°	-	± 15.0° - 90.0°	FLAT	8.4"	1.0 MHz	
ZONE 1 (M)	PLATE	0 - 7.5"	70.0°	-	±45°	FLAT	13.6"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 9.0"	80.0°	-	±21°	FLAT	17.0"	1.0 MHz	
ZONE 2A (M)	ODBR	25° - 85°	50.0°	-	13°	1.9"	6.8"	1.0 MHz	W-180 ✓
ZONE 2A (M)	ODBR	25° - 85°	50.0°	-	30°	1.9"	6.4"	1.0 MHz	W-132 ✓
ZONE 2A (M)	ODBR	45° - 70°	50.0°	-	26°	1.9"	9.4"	1.0 MHz	W-131 ✓
SBLC N10									
N/V Weld (M)	PLATE	4.5° - 9.0"	45.0°	-	± 17° - 51°	FLAT	9.1"	1 MHz	

NOTES: (M) MANUAL
XXX° (XXX") WEDGE / (FIXTURE) ROTATION ANGLE

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ (704) 577-3770

Chris Minor
SME Review / Date

R.C. MAY 03/04/08
Site Review / Date

QUAD CITIES UNIT 2, Q2R19

PAGE 8 OF 9

GE Hitachi Nuclear Energy

Reactor Pressure Vessel Coverage Calculation Sheet

Quad Cities Unit 2 / Q2R19
N5A VES-NOZ (Core Spray)
Spring / 2008

Weld Length = 360.		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Exam Volume = 83.5		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° T-Scan (S4 UC)	A	9.3	9.3	11.1%	290	4.5%
60° T-Scan (S6 FV)	A	43.6	31.5	37.7%	290	15.2%
60° T-Scan (S6 NS)	A	30.6	1.8	2.2%	360	1.1%
IRS P-Scan (S4 UC)	A	9.3	9.3	11.1%	360	5.6%
60° P-Scan (S6 FV)	A	43.6	19.1	22.9%	360	11.4%
60° P-Scan (S6 NS)	A	30.6	2.1	2.5%	360	1.3%
60° T-Scan (S4 UC)	B	9.3	5.7	6.8%	70	0.7%
60° T-Scan (S6 FV)	B	43.6	29.2	35.0%	70	3.4%
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						
60° T-Scan (S4 UC)						
60° T-Scan (S6 FV)						
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						

% Total Composite Coverage = 43.1%

Rev. 0 9/23/05

Comments: A - Manual scanning was restricted due to the nozzle configuration.
Comments: B - 60° T-Scan S4 and S6 scans were restricted due to insulation support bracket.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in inches or degrees.

HITACHI	EXAMINATION SUMMARY SHEET	Report No: 2QR19-122

Site: Quad Cities Component ID: N5B NOZ
Outage: Q2R19 VESSEL-NOZZLE (CORE SPRAY)
System: RPV ASME Cat: B-D ASME Item B3.90 Aug Req N/A

Exams Performed	Data Sheet	Cal Sheet	Procedure	Calibration Block	Exam / Oper. Personnel	Cert Level	Date
60° Shear	D-082	N/A	GE-UT-311 Ver/Rev 15	99978AQC	Mark Hilborn	III	3/7/2008
60° RL	D-083	N/A	GE-UT-300 Ver/Rev 10	CAL-IIW2-045	Edward Fish	II	3/7/2008
60° RL	D-084	N/A	GE-UT-300 Ver/Rev 10	99978AQC	Edward Fish	II	3/7/2008

Examination Results:

During the manual ultrasonic examination of the above referenced nozzle to vessel weld, no recordable indications were detected utilizing the above procedure. The inner 15%T examination volume as defined by 10 CFR 50 (Supplement 7) searching for flaws oriented perpendicular to the weld axis was performed per procedure GE-UT-311 V15, utilizing search units validated by modeling.

This examination is acceptable to the requirements of ASME B&PV Code Section XI, 1995 Edition with the 1996 Addenda.

Manual examinations were restricted due to the nozzle configuration and insulation support bracket.

43.1% code coverage was achieved.

Previous examination results supplied by customer for review from ISI Program documents? ☑ Yes ☐ Change

These examinations were performed under Work Order: 1025573 ☐ No ☑ No Change

This Summary and the following data sheets have been reviewed and accepted by the following personnel

Prepared By: Level: III Date: 3/12/08 Utility Review: Date: 3/17/08

ANII Review: Date: 3/18/08

RWP: 8603
Dose: 138 mr.

HITACHI

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R19
Procedure: GE-UT-311

Data Report Number: 2QR19-122 Linearity Sheet: L-006
Data Sheet Number: D-082
Rev: 15 DRR: N/A

Calibration Data for Block: 99978AQC

CS	N/A	7.0"
Material	Size	Thickness

Initial Cal: 2140 Exam Start: 0135
Cal Check: N/A Exam End: 0250
Cal Check: N/A Ultragel II Couplant: 07225 Batch
Final Cal: 0340

255223	87° F	87° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID Notch	7.0"	1X	80%	11.95	13.8	8.1
		1X				

DAC @ 1X= 48.1dB

Sweep 0-10 = 17.0"

Acceptable Linearity performed: 2/21/2008

Search Unit Data

KBA	01FRPD	.50"x1"/Rect.
Manufacturer:	Serial No.:	Size/Shape:
0.7 in.	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:
1.0 MHz	113-891-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	9'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4	031536006
Manufacturer/Model:	Serial No.:

15.57 µs	0.1291 in/µsec	0.8 - 3.0 MHz
Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	17.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	0%	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Component: N5B NOZ

VESSEL-NOZZLE (CORE SPRAY)
Configuration:

Plate	105° F
Exam Surface:	Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
0 - 7.0"	60°	±55°	N/A	66.7	NRI

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.

Exams performed to maintain a 20 - 30% FSH clad roll.
Scanned CW and CCW.
Calibration for nozzle to vessel weld (N/V).

MRH	Mark Hilborn	III	3/7/2008		3/11/08
Initials:	Examiner:	Level:	Cal/Exam Date:	Utility Reviewed By:	Date:
		III	3/11/08		3/19/08
GE Reviewed By		Level:	Date:	ANII Reviewed By:	Date:

Page 2 of 9

HITACHI

Ultrasonic Calibration and Examination Record RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R19
Procedure: GE-UT-300

Data Report Number: 2QR19-122 Linearity Sheet: L-005
Data Sheet Number: D-083
Rev.: 10 DRR: N/A

Calibration Block: CAL-IIW2-045

CS	N/A	4.0"
Material	Size	Thickness

Initial Cal: 2215 Exam Start: 0115
Cal Check: N/A Exam End: 0204
Cal Check: N/A Ultragel II Couplant: 07225 Batch
Final Cal: 0328

255223	87° F	87° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
SDH	.6	1X	80%	1.179	0.681	3.5
		1X				
		1X				
		1X				
		1X				

DAC 1X= 53.4
Sweep 0-10 = 2.0" Depth
Note: N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

Sigma	228C-06006	2(1.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:

0.7	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4		031574912
Manufacturer/Model:		Serial Number:

6.645 µs	0.2120 in./µsec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	4.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N5B NOZ
VESSEL-NOZZLE (CORE SPRAY)
Configuration:

OD Plate	105° F
Exam Surface:	Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	67.4	NRI	60°
Plate CW/CCW	P	67.4	NRI	60°

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed: 2/21/2008

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.
Calibration for near surface examination.
Exams performed a minimum of 14 dB above reference.
45° Shear not used.

Edward Fish	II	3/7/2008
Initials: Examiner	Level:	Cal/Exam Date:

Utility Reviewed By: 3/17/08 Date:

N/A	N/A	
Initials: Examiner	Level	

ANI Reviewed By: 3/19/08 Date.

GE Reviewed By: Level: III Date: 3/11/08

Page 3 of 9

HITACHI

Ultrasonic Calibration and Examination Record
RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R19
Procedure: GE-UT-300

Data Report Number: 2QR19-122 Linearity Sheet: L-005
Data Sheet Number: D-084
Rev.: 10 DRR: N/A

Calibration Block: 99978AQC

CS	N/A	7.0"
Material	Size	Thickness

Initial Cal: 2214 Exam Start: 0115
Cal Check: N/A Exam End: 0204
Cal Check: N/A Ultragel II Couplant: 07225 Batch
Final Cal: 0328

255223	87° F	87° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID Notch	7.0	1X	80%	11.99	6.92	6.9
		1X				
		1X				
		1X				
		1X				

DAC 1X= 69.5
Sweep 0-10 = 10.0" Depth
Note: N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

Sigma	22BC-06006	20(1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:

0.7"	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4		031574912
Manufacturer/Model:		Serial Number:

6.645 µs	0.2119 in./µsec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	20.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N5B NOZ
VESSEL-NOZZLE (CORE SPRAY)
Configuration:

OD Plate	105° F
Exam Surface:	Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	69.5	NRI	60°
Plate CW/CCW	P	69.5	NRI	60°

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed: 2/21/2008

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.
Exams performed to maintain a 10 - 20% clad roll.
Calibration for full volume examination.
Scanning limited due to insulation support.
45° Shear not used.

EWF Edward Fish II 3/7/2008
Initials: Examiner Level: Cal/Exam Date:

N/A N/A
Initials: Examiner Level:

GE Reviewed By: Level: 3/11/08 Date:

Utility Reviewed By: 3/17/08 Date:

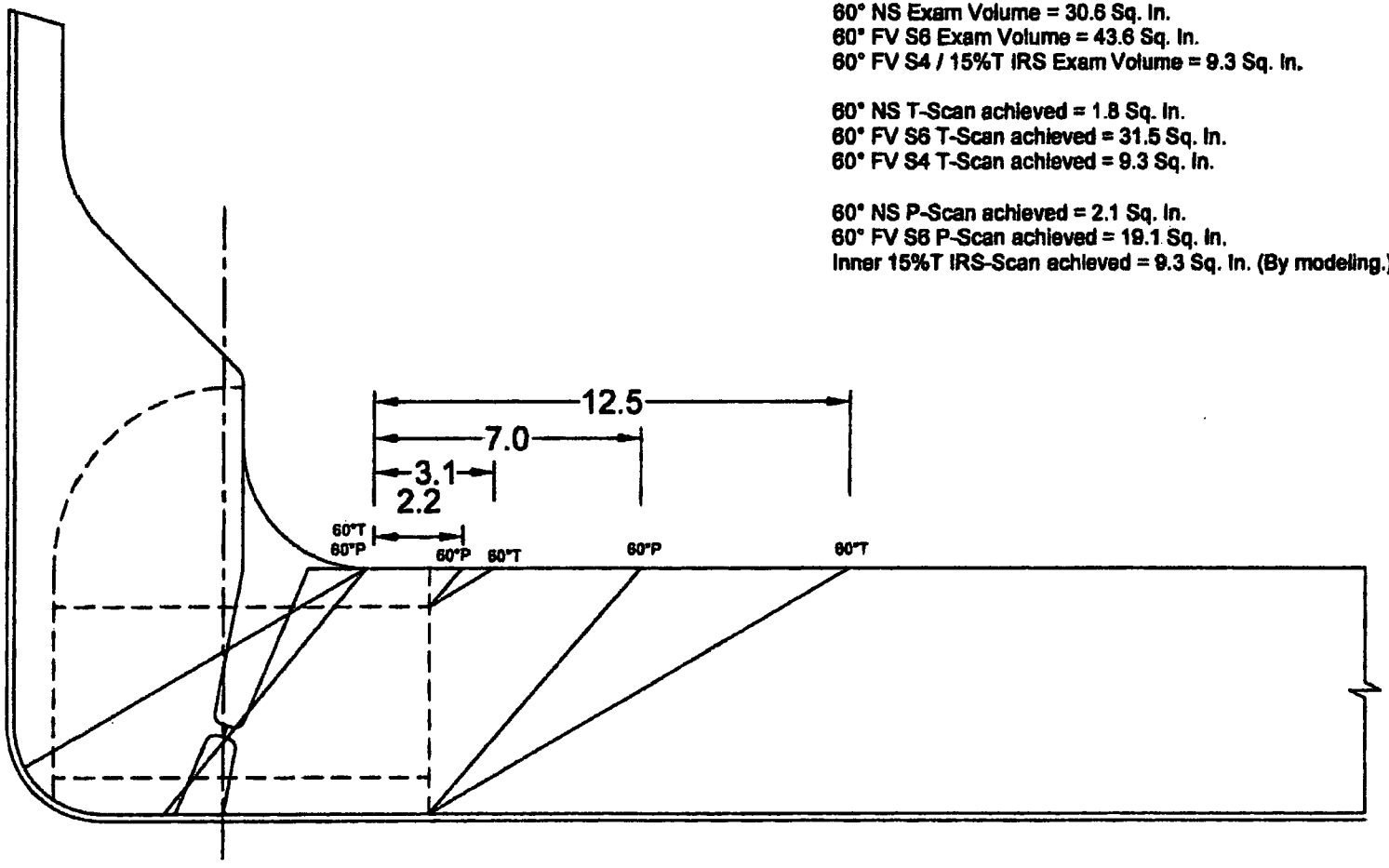
ANI Reviewed By: 3/19/08 Date.

Quad Cities Unit-2
N5 - Core Spray

60° NS Exam Volume = 30.6 Sq. In.
60° FV S6 Exam Volume = 43.6 Sq. In.
60° FV S4 / 15%T IRS Exam Volume = 9.3 Sq. In.

60° NS T-Scan achieved = 1.8 Sq. In.
60° FV S6 T-Scan achieved = 31.5 Sq. In.
60° FV S4 T-Scan achieved = 9.3 Sq. In.

60° NS P-Scan achieved = 2.1 Sq. In.
60° FV S6 P-Scan achieved = 19.1 Sq. In.
Inner 15%T IRS-Scan achieved = 9.3 Sq. In. (By modeling.)



Quad Cites Unit-2, 2008

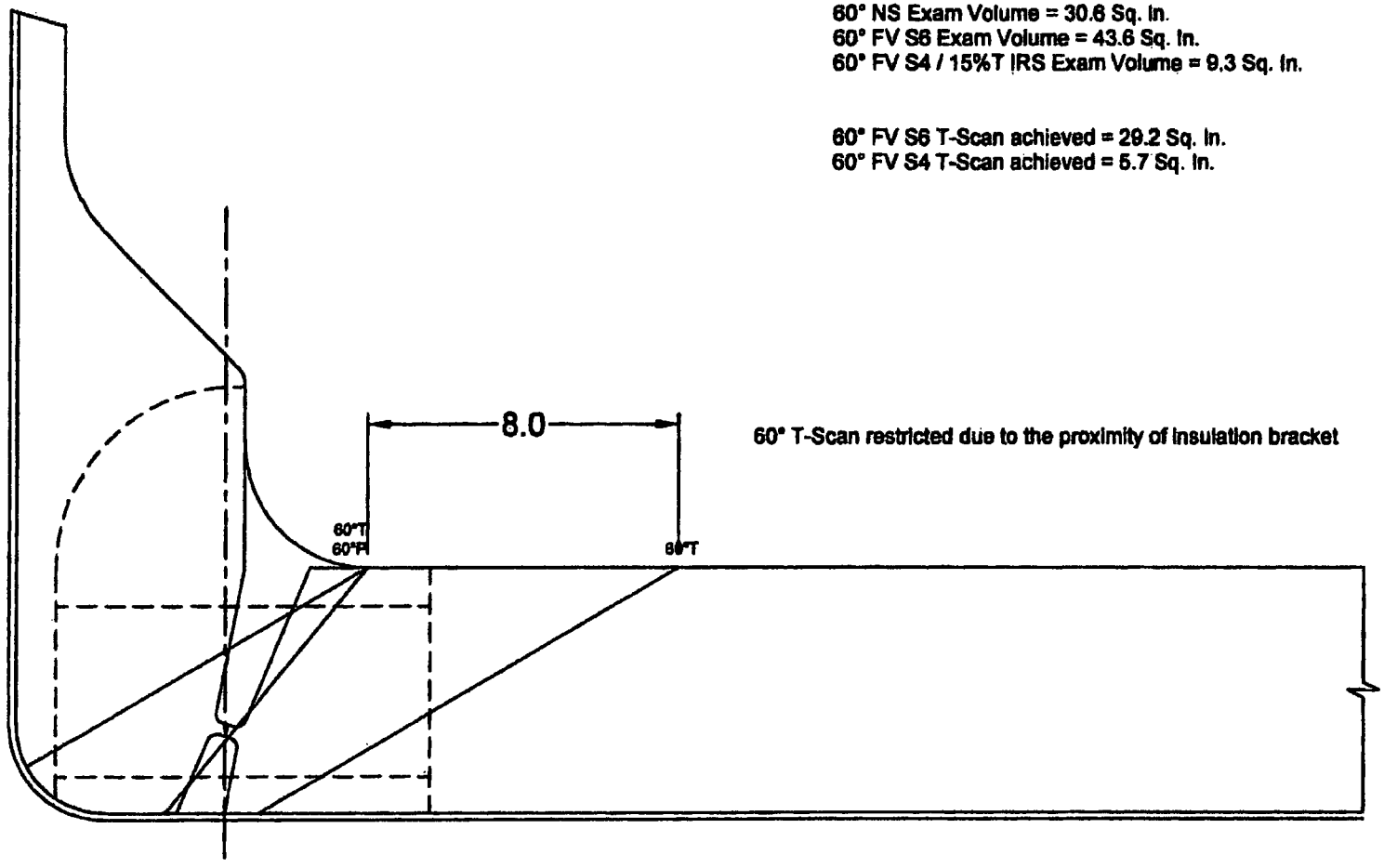
Page 5 of 9

REPORT NO. 2QR19-122

Quad Cities Unit-2
N5 - Core Spray

60° NS Exam Volume = 30.6 Sq. In.
60° FV S6 Exam Volume = 43.6 Sq. In.
60° FV S4 / 15%T IRS Exam Volume = 9.3 Sq. In.

60° FV S6 T-Scan achieved = 29.2 Sq. In.
60° FV S4 T-Scan achieved = 5.7 Sq. In.



60° T-Scan restricted due to the proximity of insulation bracket

Quad Cites Unit-2, 2008

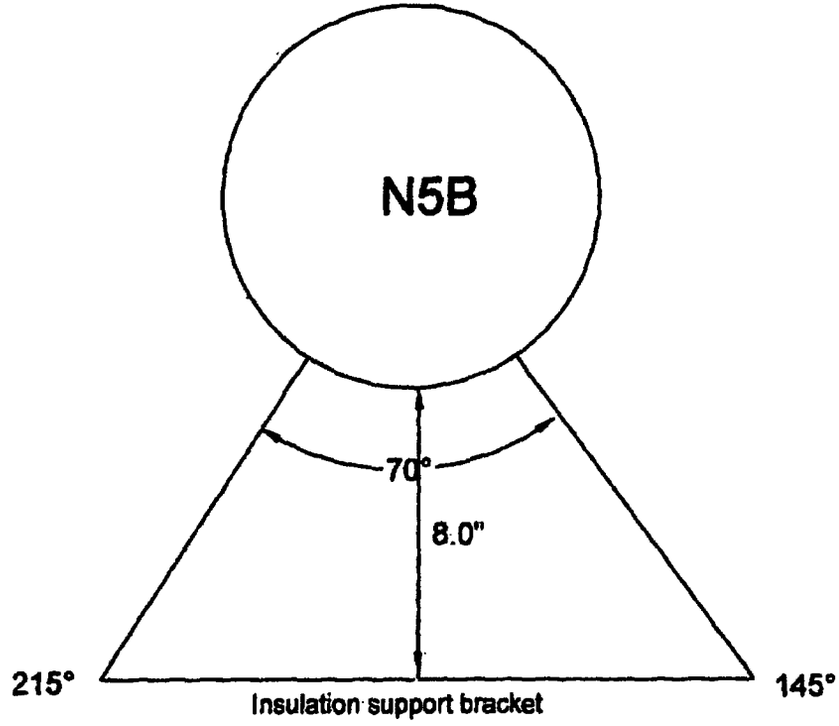
Page 6 of 9

RS Point No. 2QR19-122

Quad Cities Unit 2, Q2R19

Page 7 of 9

Quad Cities Unit 2
N5B Core Spray



Report No. Q2R19-122

REPORT NO. 2QR19-122

MANUAL DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT: Quad 2

PREPARED BY: S.C. MORTENSON DATE: 02/25/08

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	OFFSET	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
MAIN STEAM									
N/V Weld (M)	PLATE	0 - 4.0"	60.0°	-	±25° - 70°	FLAT	14.0"	1 MHz	
N/V Weld/Zone 1 (M)	PLATE	0 - 6.0"	70.0°	-	±45°	FLAT	25.3"	1 MHz	
Zone 2a (M)	ODBR	60° - 90°	66.4°	-	24.1°	4.0"	16.3"	1 MHz	W-039 ✓
CORE SPRAY									
N/V Weld/Zone 1 (M)	PLATE ✓	0 - 7.0"	60.0°	-	±65°	FLAT	14.0"	1 MHz	
Zone 1 (M)	PLATE	0 - 6.0"	70.0°	-	±25°	FLAT	19.6"	1 MHz	
Zone 2A (M)	ODBR	55° - 90°	66.3° ✓	-	16.7°	3.1"	10.6"	1 MHz	W-031, W-032 ✓
CRD									
N/V Weld (M)	PLATE	0 - 6.5"	45°		± 20.0° - 60.0°	FLAT	9.3"	1 MHz	
Zone 1 (M)	PLATE	0 - 7.5"	60.0°		± 15°	FLAT	13.9"	1 MHz	
Zone 2A (M)	PLATE	0 - 11.0"	70.0°		± 15°	FLAT	17.2"	1 MHz	
Zone 2A (M)	ODBR	55° - 90°	66.3°		16.7°	3.1"	3.6"	1 MHz	W-031, W-032 ✓
JET PUMP INSTRUMENT									
N/V Weld (M)	PLATE	5.0 - 10.0"	55.0°	-	± 20° - 60°	FLAT	11.8"	1 MHz	
Zone 1 (M)	PLATE	6.0 - 11.0"	60.0°	-	± 20°	FLAT	13.9"	1 MHz	
Zone 2A (M)	PLATE	0 - 14.0"	70.0°	-	± 25°	FLAT	17.2"	1 MHz	
Zone 2A (M)	PLATE	0 - 6.0"	80.0°	-	± 20°	FLAT	9.0"	1 MHz	
TOP HEAD VENT (N7) - 0° Offset									
N/V Weld (M)	PLATE	0 - 9.0"	60.0°	-	± 25.0° - 55.0°	FLAT	8.4"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 8.0"	70.0°	-	±20°	FLAT	13.6"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 8.0"	80.0°	-	±17°	FLAT	13.0"	1.0 MHz	
ZONE 2A (M)	ODBR	40° - 90°	50.0°	-	26°	1.9"	2.5"	1.0 MHz	W-131 ✓
TOP HEAD SPRAY (N6) - 48° Offset									
N/V Weld (M)	PLATE	0 - 8.0"	45.0°	-	± 15.0° - 85.0°	FLAT	5.7"	1.0 MHz	
N/V Weld (M)	PLATE	0 - 6.0"	60.0°	-	± 15.0° - 90.0°	FLAT	8.4"	1.0 MHz	
ZONE 1 (M)	PLATE	0 - 7.5"	70.0°	-	±45°	FLAT	13.6"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 9.0"	80.0°	-	±21°	FLAT	17.0"	1.0 MHz	
ZONE 2A (M)	ODBR	25° - 85°	50.0°	-	13°	1.9"	6.8"	1.0 MHz	W-180 ✓
ZONE 2A (M)	ODBR	25° - 85°	50.0°	-	30°	1.9"	6.4"	1.0 MHz	W-132 ✓
ZONE 2A (M)	ODBR	45° - 70°	50.0°	-	26°	1.9"	9.4"	1.0 MHz	W-131 ✓
SBLC N10									
N/V Weld (M)	PLATE	4.5" - 9.0"	45.0°	-	± 17° - 51°	FLAT	9.1"	1 MHz	

NOTES: (M) MANUAL
XXLX" (xxLx") WEDGE / (FIXTURE) ROTATION ANGLE

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ (704) 577-3770

Chris Minor
SME Review / Date

P.C. MAY
for 03/04/08
Site Review / Date

GE Hitachi Nuclear Energy

Reactor Pressure Vessel Coverage Calculation Sheet

Quad Cities Unit 2 / Q2R19
N5B VES-NOZ (Core Spray)
Spring / 2008

Weld Length = 360. Exam Volume = 83.5		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° T-Scan (S4 UC)	A	9.3	9.3	11.1%	290	4.5%
60° T-Scan (S6 FV)	A	43.6	31.5	37.7%	290	15.2%
60° T-Scan (S6 NS)	A	30.6	1.8	2.2%	360	1.1%
IRS P-Scan (S4 UC)	A	9.3	9.3	11.1%	360	5.6%
60° P-Scan (S6 FV)	A	43.6	19.1	22.9%	360	11.4%
60° P-Scan (S6 NS)	A	30.6	2.1	2.5%	360	1.3%
60° T-Scan (S4 UC)	B	9.3	5.7	6.8%	70	0.7%
60° T-Scan (S6 FV)	B	43.6	29.2	35.0%	70	3.4%
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						
60° T-Scan (S4 UC)						
60° T-Scan (S6 FV)						
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						

% Total Composite Coverage = 43.1%

Rev. 0 9/23/05

Comments: A - Manual scanning was restricted due to the nozzle configuration.
Comments: B - 60° T-Scan S4 and S6 scans were restricted due to insulation support bracket.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in inches or degrees.

REPORT NO. 2Q19-122

HITACHI	EXAMINATION SUMMARY SHEET	Report No.: 2QR19-067

Site: Quad Cities Component ID: N3B NOZ

Outage: Q2R19 VESSEL-NOZZLE (MAIN STEAM)

System: RPV ASME Cat.: B-D ASME Item B3.90 Aug Req N/A

Exams Performed	Data Sheet	Cal Sheet	Procedure	Calibration Block	Exam / Oper. Personnel	Cert Level	Date
60° RL	D-056	N/A	GE-UT-300 Ver/Rev 10	CAL-IIW2-045	Phillip Hopkins	II	3/5/2008
60° RL	D-057	N/A	GE-UT-300 Ver/Rev 10	99978AQC	Phillip Hopkins	II	3/5/2008
60° Shear	D-058	N/A	GE-UT-311 Ver/Rev 15	99978AQC	Wallace Reid	II	3/5/2008
70° Shear	D-059	N/A	GE-UT-311 Ver/Rev 15	99978AQC	Wallace Reid	II	3/5/2008

Examination Results:

During the manual ultrasonic examination of the above referenced nozzle to vessel weld, no recordable indications were detected utilizing the above procedure. The inner 15%T examination volume as defined by 10 CFR 50 (Supplement 7) searching for flaws oriented perpendicular to the weld axis was performed per procedure GE-UT-311 V15, utilizing search units validated by modeling.

This examination is acceptable to the requirements of ASME B&PV Code Section XI, 1995 Edition with the 1996 Addenda.

Manual examinations were restricted due to the nozzle configuration.

40.8% code coverage was achieved.

Previous examination results supplied by customer for review from ISI Program documents? ☑ Yes ☐ Change

These examinations were performed under Work Order: 1025573 ☐ No ☑ No Change

This Summary and the following data sheets have been reviewed and accepted by the following personnel:

Prepared By: [signature] Level: III Date: 3/9/08

Utility Review: [signature] Date: 3/11/08

ANI Review: [signature] Date: 3/19/08

RWP: 8603

Dose: 61 mr.

Page 1 of 8

HITACHI

Ultrasonic Calibration and Examination Record
RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R19
Procedure: GE-UT-300

Data Report Number: 2QR19-067
Data Sheet Number: D-056
Linearity Sheet: L-007
Rev.: 10
DRR: N/A

Calibration Block: CAL-IIW2-045

CS	N/A	4.0"
Material	Size	Thickness

Initial Cal: 1030 — Exam Start: 1200
Cal Check: N/A — Exam End: 1330
Cal Check: N/A — Ultragel II — 07225
Final Cal: 1515 — Couplant — Batch

255562 Thermometer | 90° F Initial Cal Temp. | 90° F Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
SDH	0.6"	1X	80%	1.2"	0.7"	3.7
		1X				
		1X				
		1X				
		1X				

DAC 1X= 61.3dB
Sweep 0-10 = 2.0" Depth
Note: N/A dB difference between 3/8 and 5/8 Vee

Search Unit Data

Sigma	22BC-03009	2(1.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:
0.7"	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:
3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	9'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 — Manufacturer/Model: — 031572811 — Serial Number:

6.120 µs	0.2127 in./µsec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	4.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Weld: N3B NOZ
VESSEL-NOZZLE (MAIN STEAM)
Configuration:

OD Plate — Exam Surface: — 100° F — Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	75.3	NRI	60°
Plate cw/ccw	P	75.3	NRI	60°

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed: 2/21/2008

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.
Calibration for near surface examination.
Exams performed a minimum of 14 dB above reference.
45° S not used.

Scott R Erickson for Phillip Hopkins GE Lvl III
Phillip Hopkins — II — 3/5/2008
Initials: Examiner — Level: — Cal/Exam Date:

Utility Reviewed By: — Date: 3/17/08

N/A — N/A
Initials: Examiner — Level:

ANII Reviewed By: — Date: 3/19/08

GE Reviewed By: — Level: III — Date: 3/8/08

HITACHI

Ultrasonic Calibration and Examination Record
RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R19
Procedure: GE-UT-300

Data Report Number: 2QR19-067 Linearity Sheet: L-007
Data Sheet Number: D-057
Rev.: 10 DRR: N/A

Calibration Block: 99978AQC

CS	N/A	7.0"
Material	Size	Thickness

Initial Cal: 1052 Exam Start: 1233
Cal Check: N/A Exam End: 1330
Cal Check: N/A Ultragel II Couplant: 07225 Batch
Final Cal: 1520

255562	91° F	90° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID Notch	7.0"	1X	80%	12.3"	6.5"	6.5
		1X				
		1X				
		1X				
		1X				

DAC 1X= 72.9dB
Sweep 0-10 = 10.0" Depth
Note: N/A dB difference between 3/8 and 5/8 Vee

Exam Data for Weld: N3B NOZ
VESSEL-NOZZLE (MAIN STEAM)
Configuration:

OD Plate	100° F
Exam Surface:	Component Temperature

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	65.6	NRI	60°
Plate cw/ccw	P	65.6	NRI	60°

Search Unit Data

Sigma	22BC-03009	2(1.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:
0.7"	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:
3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	9'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4		031572811	
Manufacturer/Model:		Serial Number:	
6.120 µs	0.2127 in./µsec.	0.8 - 3.0 MHz	
Delay/Zero:	Velocity:	Narrowband Filter:	
Auto	Fullwave	20.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:
400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed: 2/21/2008

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.
Calibration for full volume examination.
Exams performed to maintain a 10 -20% clad roll.
45° S not used.

Scott R. Erickson for Phillip Hopkins — Phillip Hopkins — II — GE Lvl III — 3/5/2008
Initials: Examiner — Level: — Cal/Exam Date:

Kevin Hess — 03/17/08
Utility Reviewed By: — Date:

N/A — N/A
Initials: Examiner — Level:

Jeff Snyder — 3/19/08
ANII Reviewed By: — Date:

John C. Reid — III — 3/8/08
GE Reviewed By: — Level: — Date:

HITACHI

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R19
Procedure: GE-UT-311

Data Report Number: 2QR19-067
Data Sheet Number: D-058
Linearity Sheet: L-009
Rev: 15
DRR: N/A

Calibration Data for Block: 99978AQC

CS	N/A	7.0"
Material	Size	Thickness

Initial Cal: 1040 — Exam Start: 1200
Cal Check: N/A — Exam End: 1315
Cal Check: N/A — Ultragel II (Couplant) — 07225 (Batch)
Final Cal: 1515

255562	90° F	90° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID Notch	7.0"	1X	80%	12.0"	13.9"	8.2
		1X				

DAC @ 1X= 51.2dB

Sweep 0-10 = 17.0" Metal Path

Acceptable Linearity performed: 2/21/2008

Exam Data for Component: N3B NOZ

VESSEL-NOZZLE (MAIN STEAM)
Configuration:

OD Plate	100° F
Exam Surface:	Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
0 - 4.0"	60°	±25°-70°	N/A	63.2	NRI
0 - 4.0"	60°	±25°-70°	N/A	63.2	NRI

Search Unit Data

KBA	01FRPD	.50"x1"/Rect.
Manufacturer:	Serial No.:	Size/Shape:
0.75 in.	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:
1.0 MHz	113-891-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	9'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4	031574011
Manufacturer/Model:	Serial No.:

15.75 µs	0.1272 in /µsec	0.8 - 3.0 MHz
Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	17.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	0%	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.

Exams performed to maintain a 20 - 30% FSH clad roll.
Scanned CW and CCW.
Calibration for nozzle to vessel weld (N/V).

WWR	Wallace Reid	II	3/5/2008		3/7/08
Initials:	Examiner:	Level:	Cal/Exam Date:	Utility Reviewed By:	Date:
	GE Reviewed By:	III	3/8/08	ANII Reviewed By: Jeff Snyder	3/19/08
		Level:	Date:		Date:

Page 4 of 8

HITACHI

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R19
Procedure: GE-UT-311

Data Report Number: 2QR19-067 Linearity Sheet: L-009
Data Sheet Number: D-059
Rev: 15 DRR: N/A

Calibration Data for Block: 99978AQC

CS	N/A	7.0"
Material	Size	Thickness

Initial Cal: 1042 Exam Start: 1200
Cal Check: N/A Exam End: 1315
Cal Check: N/A Ultragel II (Couplant) 07225 (Batch)
Final Cal: 1518

255562	90° F	90° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID Notch	7.0"	1X	80%	19.3"	20.7"	6.7
		1X				

DAC @ 1X= 43.3dB

Sweep 0-10 = 31.0" Metal Path

Acceptable Linearity performed : 2/21/2008

Exam Data for Component: N3B NOZ

VESSEL-NOZZLE (MAIN STEAM)
Configuration:

OD Plate	100° F
Exam Surface:	Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
0 - 6.0"	70°	±46°	N/A	64.3	NRI

Search Unit Data

KBA	01FRPF	.50"x1"/Rect.
Manufacturer:	Serial No.:	Size/Shape:
1.0 in.	70°	70°
Incident Point:	Nominal Angle:	Measured Angle:
1.0 MHz	113-891-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	9'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4	031574011
Manufacturer/Model:	Serial No.:

17.13 µs	0.1273 in /µsec	0.8 - 3.0 MHz
Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	31.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	0%	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.

Exams performed to maintain a 20 - 30% FSH clad roll.
Scanned CW and CCW.
Calibration for nozzle to vessel weld (N/V).

WWR	Wallace Reid	II	3/5/2008		3/17/08
Initials:	Examiner:	Level:	Cal/Exam Date:	Utility Reviewed By:	Date:
		III	3/18/08		3/19/08
GE Reviewed By:		Level:	Date:	ANI Reviewed By:	Date:

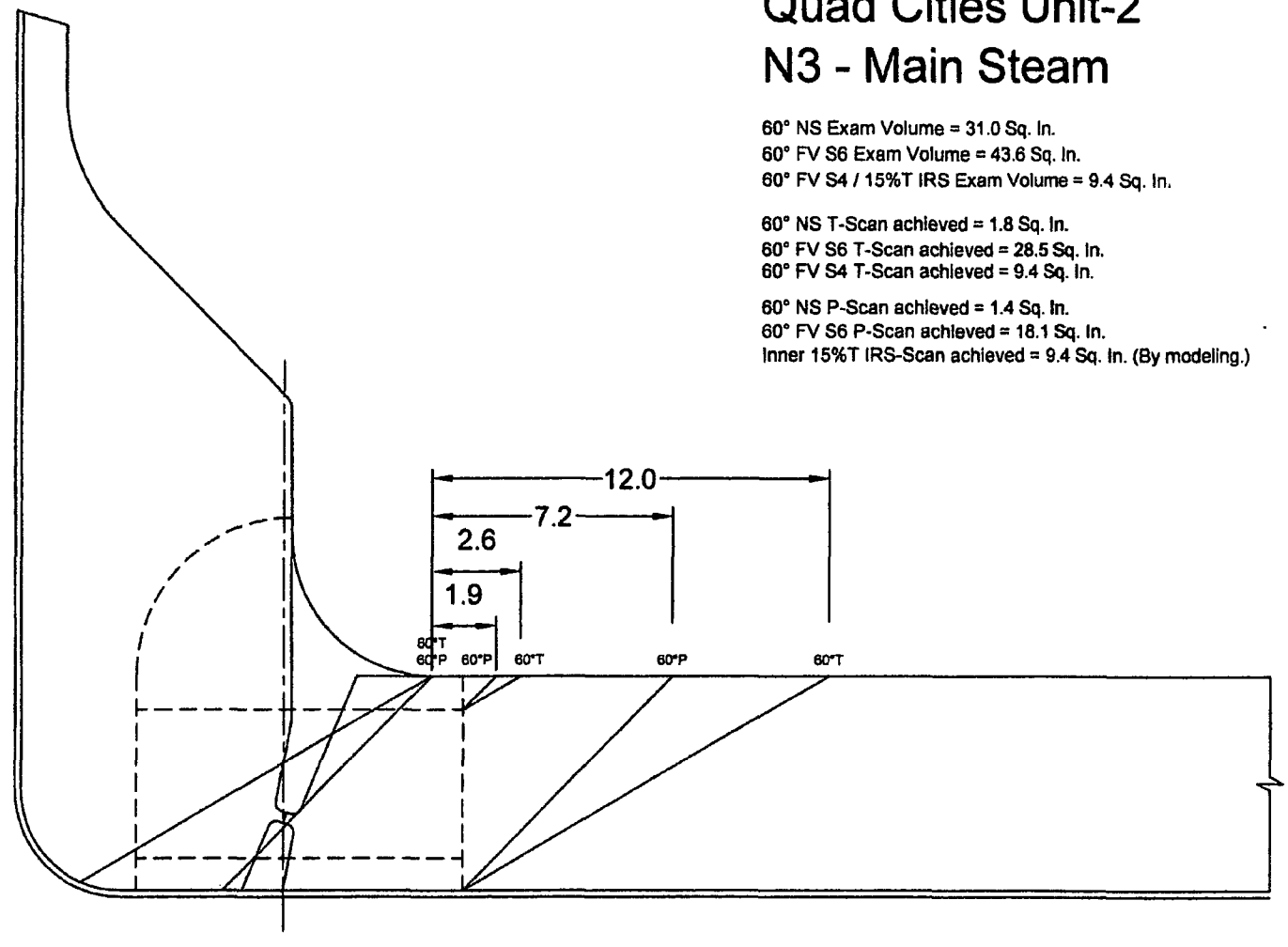
Page 5 of 8

Quad Cities Unit-2
N3 - Main Steam

60° NS Exam Volume = 31.0 Sq. In.
60° FV S6 Exam Volume = 43.6 Sq. In.
60° FV S4 / 15%T IRS Exam Volume = 9.4 Sq. In.

60° NS T-Scan achieved = 1.8 Sq. In.
60° FV S6 T-Scan achieved = 28.5 Sq. In.
60° FV S4 T-Scan achieved = 9.4 Sq. In.

60° NS P-Scan achieved = 1.4 Sq. In.
60° FV S6 P-Scan achieved = 18.1 Sq. In.
Inner 15%T IRS-Scan achieved = 9.4 Sq. In. (By modeling.)



REPORT NO. 2R R19 - 067

REPORT NO. 2QR19-067

MANUAL DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT: Quad 2

PREPARED BY: S.C. MORTENSON DATE: 02/25/08

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	OFFSET	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
MAIN STEAM									
N/V Weld (M)	PLATE	0 - 4.0"	60.0°	-	± 25° - 70°	FLAT	14.0"	1 MHz	
N/V Weld/Zone 1 (M)	PLATE	0 - 6.0"	70.0°	-	± 46°	FLAT	25.3"	1 MHz	
Zone 2a (M)	ODBR	60° - 90°	66.4°	-	24.1°	4.0"	16.3"	1 MHz	W-039 ✓
CORE SPRAY									
N/V Weld/Zone 1 (M)	PLATE	0 - 7.0"	60.0°	-	± 55°	FLAT	14.0"	1 MHz	
Zone 1 (M)	PLATE	0 - 6.0"	70.0°	-	± 25°	FLAT	19.6"	1 MHz	
Zone 2A (M)	ODBR	55° - 90°	66.3°	-	16.7°	3.1"	10.6"	1 MHz	W-031, W-032 ✓
CRD									
N/V Weld (M)	PLATE	0 - 6.5"	45°		± 20.0° - 60.0°	FLAT	9.3"	1 MHz	
Zone 1 (M)	PLATE	0 - 7.5"	60.0°		± 15°	FLAT	13.9"	1 MHz	
Zone 2A (M)	PLATE	0 - 11.0"	70.0°		± 15°	FLAT	17.2"	1 MHz	
Zone 2A (M)	ODBR	55° - 90°	66.3°		16.7°	3.1"	3.6"	1 MHz	W-031, W-032 ✓
JET PUMP INSTRUMENT									
N/V Weld (M)	PLATE	5.0 - 10.0"	55.0°	-	± 20° - 60°	FLAT	11.8"	1 MHz	
Zone 1 (M)	PLATE	6.0 - 11.0"	60.0°	-	± 20°	FLAT	13.9"	1 MHz	
Zone 2A (M)	PLATE	0 - 14.0"	70.0°	-	± 25°	FLAT	17.2"	1 MHz	
Zone 2A (M)	PLATE	0 - 6.0"	80.0°	-	± 20°	FLAT	9.0"	1 MHz	
TOP HEAD VENT (N7) - 0° Offset									
N/V Weld (M)	PLATE	0 - 9.0"	60.0°	-	± 25.0° - 55.0°	FLAT	8.4"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 8.0"	70.0°	-	±20°	FLAT	13.6"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 8.0"	80.0°	-	±17°	FLAT	13.0"	1.0 MHz	
ZONE 2A (M)	ODBR	40° - 90°	50.0°	-	26°	1.9"	2.5"	1.0 MHz	W-131 ✓
TOP HEAD SPRAY (N6) - 45° Offset									
N/V Weld (M)	PLATE	0 - 8.0"	45.0°	-	± 15.0° - 85.0°	FLAT	5.7"	1.0 MHz	
N/V Weld (M)	PLATE	0 - 6.0"	60.0°	-	± 15.0° - 90.0°	FLAT	8.4"	1.0 MHz	
ZONE 1 (M)	PLATE	0 - 7.5"	70.0°	-	±45°	FLAT	13.6"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 9.0"	80.0°	-	±21°	FLAT	17.0"	1.0 MHz	
ZONE 2A (M)	ODBR	25° - 85°	50.0°	-	13°	1.9"	6.8"	1.0 MHz	W-180 ✓
ZONE 2A (M)	ODBR	25° - 85°	50.0°	-	30°	1.9"	6.4"	1.0 MHz	W-132 ✓
ZONE 2A (M)	ODBR	45° - 70°	50.0°	-	26°	1.9"	9.4"	1.0 MHz	W-131 ✓
SBLC N10									
N/V Weld (M)	PLATE	4.5" - 9.0"	45.0°	-	± 17° - 51°	FLAT	9.1"	1 MHz	

NOTES: (M) MANUAL
xxx° (xxx°) WEDGE / (FIXTURE) ROTATION ANGLE

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ (704) 577-3770

Chris Minor
SME Review / Date

R.L. MAY 03/04/08
Site Review / Date

QUAD CITIES UNIT 2, Q2R19

PAGE 7 OF 8

GE Hitachi Nuclear Energy

Reactor Pressure Vessel Coverage Calculation Sheet

Quad Cities Unit 2 / Q2R19
N3B VES-NOZ (Main Steam)
Spring / 2008

Weld Length = 360. Exam Volume = 84.		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° T-Scan (S4 UC)	A	9.4	9.4	11.2%	360	5.6%
60° T-Scan (S6 FV)	A	43.6	28.5	33.9%	360	17.0%
60° T-Scan (S6 NS)	A	31	1.8	2.1%	360	1.1%
IRS P-Scan (S4 UC)	A	9.4	9.4	11.2%	360	5.6%
60° P-Scan (S6 FV)	A	43.6	18.1	21.5%	360	10.8%
60° P-Scan (S6 NS)	A	31	1.4	1.7%	360	0.8%
60° T-Scan (S4 UC)						
60° T-Scan (S6 FV)						
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						
60° T-Scan (S4 UC)						
60° T-Scan (S6 FV)						
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						

% Total Composite Coverage = 40.8%

Rev. 0 9/23/05

Comments: A - Manual exam was restricted due to the nozzle configuration.
IRS P-Scan coverage validated by modeling.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in inches or degrees.

REPORT NO. 2Q19-0

HITACHI	EXAMINATION SUMMARY SHEET	Report No.: 2QR19-083

Site: **Quad Cities** Component ID: **N3D NOZ**

Outage: **Q2R19** **VESSEL-NOZZLE (MAIN STEAM)**

System: **RPV** ASME Cat.: **B-D** ASME Item **B3.90** Aug Req **N/A**

Exams Performed	Data Sheet	Cal Sheet	Procedure	Calibration Block	Exam / Oper. Personnel	Cert Level	Date
60° RL	D-052	N/A	GE-UT-300 Ver/Rev 10	CAL-IIW2-045	Phillip Hopkins	II	3/5/2008
60° RL	D-053	N/A	GE-UT-300 Ver/Rev 10	99978AQC	Phillip Hopkins	II	3/5/2008
60° Shear	D-054	N/A	GE-UT-311 Ver/Rev 15	99978AQC	Wallace Reid	II	3/5/2008
70 Shear	D-055	N/A	GE-UT-311 Ver/Rev 15	99978AQC	Wallace Reid	II	3/5/2008

Examination Results:

During the manual ultrasonic examination of the above referenced nozzle to vessel weld, no recordable indications were detected utilizing the above procedure. The inner 15%T examination volume as defined by 10 CFR 50 (Supplement 7) searching for flaws oriented perpendicular to the weld axis was performed per procedure GE-UT-311 V15, utilizing search units validated by modeling.

This examination is acceptable to the requirements of ASME B&PV Code Section XI, 1995 Edition with the 1996 Addenda.

Manual examinations were restricted due to the nozzle configuration.

40.8% code coverage was achieved.

Previous examination results supplied by customer for review from ISI Program documents? ☑ Yes ☐ Change

These examinations were performed under Work Order: 1025573 ☐ No ☑ No Change

This Summary and the following data sheets have been reviewed and accepted by the following personnel:

Prepared By: [signature] Level: III Date: 3/9/08

Utility Review: [signature] Date: 3/18/08

ANII Review: [signature] Date: 3/22/08

RWP: 8603

Dose: 61 mr.

Page 1 of 8

HITACHI

Ultrasonic Calibration and Examination Record
RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R19
Procedure: GE-UT-300

Data Report Number: 2QR19-083
Data Sheet Number: D-052
Rev.: 10
Linearity Sheet: L-007
DRR: N/A

Calibration Block: CAL-IIW2-045

CS	N/A	4.0"
Material	Size	Thickness

Initial Cal: 1030
Cal Check: N/A
Cal Check: N/A
Final Cal: 1515
Exam Start: 1332
Exam End: 1445
Ultragel II (Couplant) 07225 (Batch)
255562 (Thermometer) 90° F (Initial Cal Temp.) 90° F (Final Cal Temp:)

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
SDH	0.6"	1X	80%	1.2	0.7	3.7
		1X				
		1X				
		1X				
		1X				

DAC 1X= 61.3dB
Sweep 0-10 = 2.0" Depth
Note: N/A dB difference between 3/8 and 5/8 Vee

Exam Data for Weld: N3D NOZ
VESSEL-NOZZLE (MAIN STEAM)
Configuration:
OD Plate (Exam Surface:) 100° F (Component Temperature)

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	75.3	NRI	60°
Plate CW/CCW	P	75.3	NRI	60°

Search Unit Data

Sigma	22BC-03009	2(1.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:

0.7"	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	9'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 (Manufacturer/Model:) 031572811 (Serial Number:)

6.120 µs	0.2127 in./µsec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fulwave	4.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed: 2/21/2008

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.
Calibration for near surface examination.
Exams performed a minimum of 14 dB above reference.
45° Not used

Scott R Erickson GE Lv II for PHILLIP HOPKINS
Phillip Hopkins (Initials: Examiner) II (Level:) 3/5/2008 (Cal/Exam Date:)

N/A (Initials: Examiner) N/A (Level:)

GE Reviewed By: III (Level:) 3/8/08 (Date:)

Utility Reviewed By: 3-18-08 (Date:)

ANII Reviewed By: 3/22/08 (Date:)

Page 2 of 8

HITACHI

Ultrasonic Calibration and Examination Record
RPV Components

Site/Unit: Quad Cities / 2
Outage: Q2R19
Procedure: GE-UT-300

Data Report Number: 2QR19-083 Linearity Sheet: L-007
Data Sheet Number: D-053
Rev.: 10 DRR: N/A

Calibration Block: 99978AQC

CS	N/A	7.0"
Material	Size	Thickness

Initial Cal: 1052 Exam Start: 1332
Cal Check: N/A Exam End: 1445
Cal Check: N/A Ultragel II (Couplant) 07225 (Batch)
Final Cal: 1520

255562 (Thermometer) 91° F (Initial Cal Temp.) 90° F (Final Cal Temp:)

DAC Construction

Reflector	Hole Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID Notch	7.0"	1X	80%	12.3	6.5	6.5
		1X				
		1X				
		1X				
		1X				

DAC 1X= 72.9dB
Sweep 0-10 = 10.0" Depth
Note: N/A dB difference between 3/8 and 5/8 Vee

Exam Data for Weld: N3D NOZ
VESSEL-NOZZLE (MAIN STEAM) (Configuration:)
OD Plate (Exam Surface:) 100° F (Component Temperature)

Weld Examination Area:	Exam Access	Scan dB	Recordable Indications	Exam Angle
Plate	T	65.6	NRI	60°
Plate CW/CCW	P	65.6	NRI	60°

Search Unit Data

Sigma	22BC-03009	21(1.1"X.62") / Rect.
Manufacturer:	Serial Number:	Size / Shape:

0.7"	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:

3.0 MHz	SDC-3	RL
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	9'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 (Manufacturer/Model:) 031572811 (Serial Number:)

6.120 µs	0.2127 in./µsec.	0.8 - 3.0 MHz
Delay/Zero:	Velocity:	Narrowband Filter:

Auto	Fulwave	20.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser:

400 Ohms	0%	3.03 MHz	Dual
Damping:	Reject:	Frequency:	Mode:

Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Acceptable Linearity performed : 2/21/2008

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.
Calibration for full volume examination.
Exams performed to maintain a 10-20% clad roll.
45° Not used

Scott R. Erickson GE LVIII FOR PHILLIP HOPKINS — Phillip Hopkins — II — 3/5/2008
Initials: Examiner Level: Cal/Exam Date:

Utility Reviewed By: [signature] Date: 03/18/08

N/A — N/A
Initials: Examiner Level:

ANII Reviewed By: [signature] Date: 3/22/08

[signature] — III — 3/18/08
GE Reviewed By: Level: Date:

HITACHI

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R19
Data Report Number: 2QR19-083 Linearity Sheet: L-009
Data Sheet Number: D-054
Procedure: GE-UT-311 Rev: 15 DRR: N/A

Calibration Data for Block: 99978AQC

CS	N/A	7.0"
Material	Size	Thickness

Initial Cal: 1040 Exam Start: 1200
Cal Check: N/A Exam End: 1445
Cal Check: N/A Ultragel II 07225
Final Cal: 1515 Couplant: Batch

255562	90° F	90° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID Notch	7.0"	1X	80%	12.0"	13.9"	8.2
		1X				

DAC @ 1X= 51.2

Sweep 0-10 = 17.0" MP

Acceptable Linearity performed : 2/21/2008

Search Unit Data

KBA	01FRPD	.50"x1"/Rect.
Manufacturer:	Serial No.:	Size/Shape:
0.75 in.	60°	60°
Incident Point:	Nominal Angle:	Measured Angle:
1.0 MHz	113-891-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	9'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4	031574011
Manufacturer/Model:	Serial No.:

15.75 µs	0.1272 in /µsec	0.8 - 3.0 MHz
Zero:	Velocity:	Narrowband Filter:

Auto	Fullwave	17.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	0%	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Component: N3D NOZ

VESSEL-NOZZLE (MAIN STEAM)
Configuration:

OD Plate	100° F
Exam Surface:	Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
0-4.0"	60°	±25°-70°	N/A	63.2	NRI
0-4.0"	60°	±25°-70°	N/A	63.2	NRI

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.

Exams performed to maintain a 20% - 30% FSH clad roll. (IRS, clad material)
Scanned CW and CCW.
Calibration for nozzle to vessel weld (N/V).

WWR	Wallace Reid	II	3/5/2008		3/18/08
Initials:	Examiner:	Level:	Cal/Exam Date:	Utility Reviewed By:	Date:
	GE Reviewed By:	III	3/18/08	ANII Reviewed By:	3/22/08
		Level:	Date:		Date:

Page 4 of 8

HITACHI

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R19
Procedure: GE-UT-311

Data Report Number: 2QR19-083 Linearity Sheet: L-009
Data Sheet Number: D-055
Rev: 15 DRR: N/A

Calibration Data for Block: 99978AQC

CS/CL	N/A	7.0"
Material	Size	Thickness

Initial Cal: 1042 Exam Start: 1:18:00 PM
Cal Check: N/A Exam End: 2:45:00 PM
Cal Check: N/A Ultragel II Couplant: 07225 Batch
Final Cal: 1518

255562	90° F	90° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID Notch	7.0"	1X	80%	1.93"	20.7"	6.7
		1X				

DAC @ 1X= 43.3

Sweep 0-10 = 31" MP

Acceptable Linearity performed : 2/21/2008

Search Unit Data

KBA	01FRPF	.50"x1"/Rect.
Manufacturer:	Serial No.:	Size/Shape:
1.0 in.	70	70°
Incident Point:	Nominal Angle:	Measured Angle:
1.0 MHz	113-891-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	9'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4			031574011
Manufacturer/Model:			Serial No.:
17.13 µs	0.1273 in /µsec		0.8 - 3.0 MHz
Zero:	Velocity:		Narrowband Filter:
Auto	Fullwave	31.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	0%	1.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Component: N3D NOZ

VESSEL-NOZZLE (MAIN STEAM)
Configuration:

OD Plate	100° F
Exam Surface:	Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
0-6.0"	70°	±46	N/A	64.3	NRI

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration. See coverage sheet for limitations. 0% Reject = Off.

Exams performed to maintain a 20% - 30% FSH clad roll. (IRS, clad material)
Scanned CW and CCW.
Calibration for nozzle to vessel weld (N/V).

WWR	Wallace Reid	II	3/5/2008		3/18/08
Initials:	Examiner:	Level:	Cal/Exam Date:	Utility Reviewed By:	Date:
		III	3/18/08		3/22/08
GE Reviewed By:		Level:	Date:	ANII Reviewed By:	Date:

REPORT NO. Q2R19-083

MANUAL DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT: Quad 2

PREPARED BY: S.C. MORTENSON DATE: 02/25/08

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	OFFSET	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
MAIN STEAM									
N/V Weld (M)	PLATE	0 - 4.0"	60.0°	-	± 25° - 70°	FLAT	14.0"	1 MHz	
N/V Weld/Zone 1 (M)	PLATE	0 - 6.0"	70.0°	-	± 46°	FLAT	25.3"	1 MHz	
Zone 2a (M)	ODBR	60° - 90°	66.4°	-	24.1°	4.0"	16.3"	1 MHz	W-039 ✓
CORE SPRAY									
N/V Weld/Zone 1 (M)	PLATE	0 - 7.0"	60.0°	-	± 55°	FLAT	14.0"	1 MHz	
Zone 1 (M)	PLATE	0 - 6.0"	70.0°	-	± 25°	FLAT	19.6"	1 MHz	
Zone 2A (M)	ODBR	55° - 90°	66.3°	-	16.7°	3.1"	10.6"	1 MHz	W-031, W-032 ✓
CRD									
N/V Weld (M)	PLATE	0 - 6.5"	45°		± 20.0° - 60.0°	FLAT	9.3"	1 MHz	
Zone 1 (M)	PLATE	0 - 7.5"	60.0°		± 15°	FLAT	13.9"	1 MHz	
Zone 2A (M)	PLATE	0 - 11.0"	70.0°		± 15°	FLAT	17.2"	1 MHz	
Zone 2A (M)	ODBR	55° - 90°	66.3°		16.7°	3.1"	3.6"	1 MHz	W-031, W-032 ✓
JET PUMP INSTRUMENT									
N/V Weld (M)	PLATE	5.0 - 10.0"	55.0°	-	± 20° - 60°	FLAT	11.8"	1 MHz	
Zone 1 (M)	PLATE	6.0 - 11.0"	60.0°	-	± 20°	FLAT	13.9"	1 MHz	
Zone 2A (M)	PLATE	0 - 14.0"	70.0°	-	± 25°	FLAT	17.2"	1 MHz	
Zone 2A (M)	PLATE	0 - 6.0"	80.0°	-	± 20°	FLAT	9.0"	1 MHz	
TOP HEAD VENT (N7) - 0° Offset									
N/V Weld (M)	PLATE	0 - 9.0"	60.0°	-	± 25.0° - 55.0°	FLAT	8.4"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 8.0"	70.0°	-	±20°	FLAT	13.6"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 8.0"	80.0°	-	±17°	FLAT	13.0"	1.0 MHz	
ZONE 2A (M)	ODBR	40° - 90°	50.0°	-	26°	1.9"	2.5"	1.0 MHz	W-131 ✓
TOP HEAD SPRAY (N6) - 48° Offset									
N/V Weld (M)	PLATE	0 - 8.0"	45.0°	-	± 15.0° - 85.0°	FLAT	5.7"	1.0 MHz	
N/V Weld (M)	PLATE	0 - 6.0"	60.0°	-	± 15.0° - 90.0°	FLAT	8.4"	1.0 MHz	
ZONE 1 (M)	PLATE	0 - 7.5"	70.0°	-	±45°	FLAT	13.6"	1.0 MHz	
ZONE 2A (M)	PLATE	0 - 9.0"	80.0°	-	±21°	FLAT	17.0"	1.0 MHz	
ZONE 2A (M)	ODBR	25° - 85°	50.0°	-	13°	1.9"	6.8"	1.0 MHz	W-180 ✓
ZONE 2A (M)	ODBR	25° - 85°	50.0°	-	30°	1.9"	6.4"	1.0 MHz	W-132 ✓
ZONE 2A (M)	ODBR	45° - 70°	50.0°	-	26°	1.9"	9.4"	1.0 MHz	W-131 ✓
SBLC N10									
N/V Weld (M)	PLATE	4.5" - 9.0"	45.0°	-	± 17° - 51°	FLAT	9.1"	1 MHz	

NOTES: (M) MANUAL
XX.X° (XX.X°) WEDGE / (FIXTURE) ROTATION ANGLE

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ (704) 577-3770

Chris Minor
SME Review / Date

R.L. MAY 03/04/08
Site Review / Date

QUAD CITIES UNIT 2, Q2R19

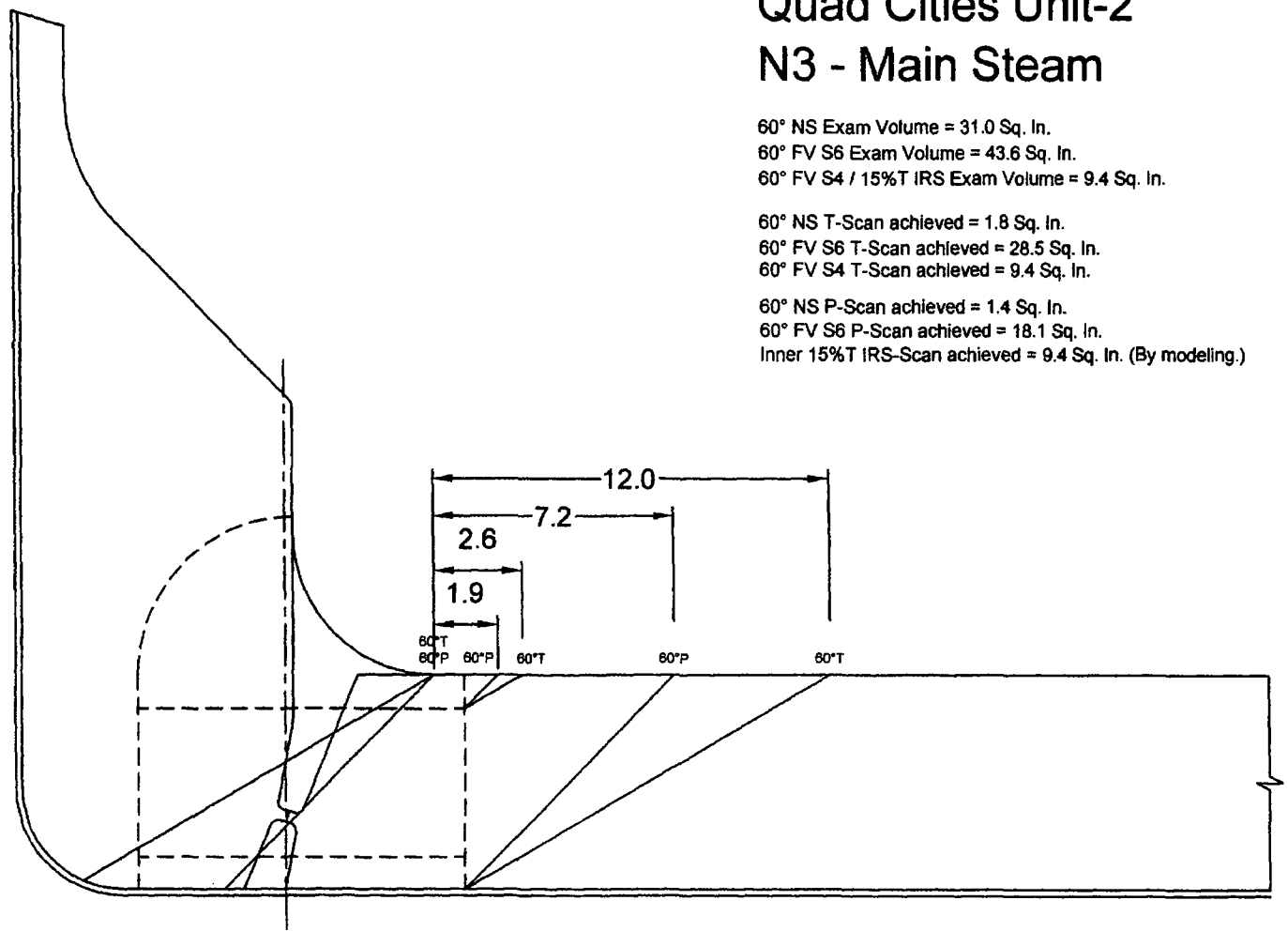
PAGE 6 OF 8

Quad Cities Unit-2
N3 - Main Steam

60° NS Exam Volume = 31.0 Sq. In.
60° FV S6 Exam Volume = 43.6 Sq. In.
60° FV S4 / 15%T IRS Exam Volume = 9.4 Sq. In.

60° NS T-Scan achieved = 1.8 Sq. In.
60° FV S6 T-Scan achieved = 28.5 Sq. In.
60° FV S4 T-Scan achieved = 9.4 Sq. In.

60° NS P-Scan achieved = 1.4 Sq. In.
60° FV S6 P-Scan achieved = 18.1 Sq. In.
Inner 15%T IRS-Scan achieved = 9.4 Sq. In. (By modeling.)



GE Hitachi Nuclear Energy

Reactor Pressure Vessel Coverage Calculation Sheet

Quad Cities Unit 2 / Q2R19
N3D VES-NOZ (Main Steam)
Spring / 2008

Weld Length = 360. Exam Volume = 84.		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° T-Scan (S4 UC)	A	9.4	9.4	11.2%	360	5.6%
60° T-Scan (S6 FV)	A	43.6	28.5	33.9%	360	17.0%
60° T-Scan (S6 NS)	A	31	1.8	2.1%	360	1.1%
IRS P-Scan (S4 UC)	A	9.4	9.4	11.2%	360	5.6%
60° P-Scan (S6 FV)	A	43.6	18.1	21.5%	360	10.8%
60° P-Scan (S6 NS)	A	31	1.4	1.7%	360	0.8%
60° T-Scan (S4 UC)						
60° T-Scan (S6 FV)						
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						
60° T-Scan (S4 UC)						
60° T-Scan (S6 FV)						
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						
				% Total Composite Coverage =		40.8%

Rev. 0 9/23/05

Comments: A - Manual exam was restricted due to the nozzle configuration.
IRS P-Scan coverage validated by modeling.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in inches or degrees.

REPORT NO. Q2R19-083

GE NUCLEAR ENERGY
UT EXAMINATION SUMMARY SHEET

Report No: Q2R17-90
WO No: 580048, 573013

PROJECT	Quad Cities Unit-2, Q2R17
WELD ID:	N4A NOZ, N4A IRS and N4A (NUREG 0619)
SYSTEM:	Reactor Pressure Vessel

CALIBRATION ID:	NOZ.IN, NOZ.IN.1, IRS.IN
GERIS DATA:	Scan file types: P1, P2, P3, TL, Z1, Z2A, Z2B and Z3
MANUAL DATA:	UT-063, UT-064, UT-065, UT-066
EXAMINERS:	S. Gauthier Lv II, K. Montgomery Lv II, B. Dummer Lv III

Ultrasonic examination results were acceptable to the requirements of ASME B&PV Code Section XI, 1995 Edition with the 1996 Addenda as modified by the PDI program description and the Federal Register, Part II, Nuclear Regulatory Commission, 10 CFR Part 50 for Category B-D Reactor Pressure Vessel (RPV) Assembly Welds and NUREG-0619.

Examination volumes were in accordance with Section XI, Figure IWB-2500-7 (a) and NUREG-0619.

Automated transverse and parallel scans were performed in accordance with procedure GE-UT-705 V4, using 0° L, 60° RL, and 45° S, search units. Nozzle Inner Radius and Inner 15%T examination volume parallel scans were performed using model validated shear wave search units.

Supplemental manual examinations from the ODBR surface (Zones 1 and 2A) were performed in accordance with procedure GE-UT-311 V10 to obtain additional coverage, in areas examined by the automated system, due to inadequate ID signal characteristics.

Scanning was performed from the vessel OD shell, OD Blend Radius and OD Nozzle Boss surfaces examining the nozzle to shell weld, nozzle inner radius section and NUREG 0619 specified bore regions.

No indications were recorded.

Previous data (QDC-001 and QDC-005 from 1995) was reviewed prior to completing this summary. No significant changes were noted.

Scanning was limited due to the nozzle configuration, thermocouple pad and bioshield interferences.

Coverage = 33%	Nozzle to Shell weld.
Coverage = 100%	Nozzle Inner Radius Section
Coverage = 100%	NUREG-0619 Bore regions.

PREPARED BY / DATE	REVIEWED BY / DATE	UTILITY REVIEW / DATE	ANII REVIEW / DATE
3/1/04	3-10-04	3/10/04	3/19/04
UT Level: III	UT Level: III		

Page 1 of 19

GE Nuclear Energy

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N4A-NOZ

Report No.: Q2R17-90
Exam Data Sheet: N4A-01

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n4a.p1.1	02B	P1	~	NRI	~	NRI	~	~	~	~	~	~	~	~	~	~	1
n4a.p2.1	02B	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	1
n4a.p2.2	02B	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	1
n4a.p2.3	02B	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	1
n4a.p2.4	02B	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	1
n4a.p3.1	02B	P3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	1
n4a.p3.2	02B	P3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	1
n4a.p3.3	02B	P3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	1
n4a.tl.1	01B	TL	NRI	NRI	NRI	~	~	~	~	~	~	~	~	~	~	~	1
n4a.tl.2	01B	TL	NRI	NRI	NRI	~	~	~	~	~	~	~	~	~	~	~	1, 2
n4a.tl.3	01B	TL	NRI	NRI	NRI	~	~	~	~	~	~	~	~	~	~	~	1

Comments: (1) - Plate segregates observed in vessel plate.
Scanning performed with high profile triple pack, low profile tractor and 11" arm.
(2) - Poor contact / liftoff Ch. 1, 0° L-wave channel for indication characterization. Not required for detection.

The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: C M
Level: III
Date: 2/29/04

Reviewed By: B/M Dun
Level: III
Date: 3-10-04

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N4A-IRS

Report No.: Q2R17-90
Exam Data Sheet: N4A-02

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n4a.z1.1	01B	Z1	~	~	~	~	~	~	~	~	NRI	NRI	~	~	~	~	~
n4a.z2a.1	01B	Z2A	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~	~	~
n4a.z2a.2	01B	Z2A	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~	~	~
n4a.z2a.3	01B	Z2A	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~	~	~

Comments: None.

Scanning performed with ODBR package, low profile tractor and 11" arm.
The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: [signature]
Level: ~~III~~
Date: 2/29/04

Reviewed By: [signature]
Level: III
Date: 3-1-04

GE Nuclear Energy

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N4A-IRS

Report No.: Q2R17-90
Exam Data Sheet: N4A-03

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n4a.z2b.1	06A	Z2B	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4a.z3.1	06A	Z3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4a.z3.2	06A	Z3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4a.z3.3	06A	Z3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~

Comments: Scanning performed with NOZOD package, safe end tractor and safe end arm.

The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

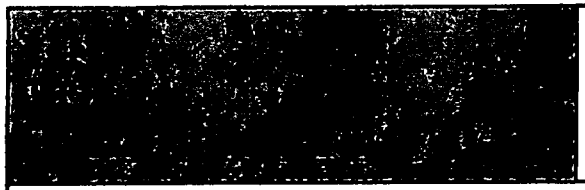
Analyst: [signature]
Level: III
Date: 3/4/04

Reviewed By: [signature]
Level: III
Date: 3-6-04

Quad Cities Unit-2, Q2R17

Q2R17-90

Page 5 of 19



GERIS 2000 OD EXAMINATION SCAN FILES DATA SHEET

CUSTOMER: **Exelon**
SITE: **Quad Cities Unit-2**
OUTAGE: **Q2R17**

PROCEDURE NO. : GE-UT-705 V4 **REVISION :** N/A **DRR :** N/A

FILE NAME	WELD	DISK NO.	DATE	EXAM START TIME	EXAM STOP TIME	SCAN START	SCAN STOP	SCAN AREA	VESSEL TEMP. (°F)	CAL RECHECK IN	CAL RECHECK OUT	CAL RECORD
n4a.tl.1	N4A	01B	02/28/04	0056	0130	282°	166°	116°	92°	N/A	N/A	NOZ.IN
n4a.tl.2	N4A	01B	02/28/04	0754	0817	280°	4°	84°	92°	N/A	N/A	NOZ.IN
n4a.tl.3	N4A	01B	02/28/04	0850	0928	2°	168°	166°	92°	N/A	N/A	NOZ.IN
n4a.p3.1	N4A	02B	02/28/04	1001	1040	270°	110°	200°	92°	N/A	N/A	NOZ.IN
n4a.p3.2	N4A	02B	02/28/04	1045	1055	109°	141°	32°	92°	N/A	N/A	NOZ.IN
n4a.p3.3	N4A	02B	02/28/04	1733	1758	271°	141°	131°	92°	N/A	N/A	NOZ.IN
n4a.p1.1	N4A	02B	02/28/04	1822	1942	270°	271°	361°	92°	N/A	N/A	NOZ.IN
n4a.p2.1	N4A	02B	02/28/04	2008	2057	270°	23°	247°	92°	N/A	N/A	NOZ.IN
n4a.p2.2	N4A	02B	02/28/04	2115	2130	25°	340°	45°	92°	N/A	N/A	NOZ.IN
n4a.p2.3	N4A	02B	02/28/04	2207	2215	342°	329°	13°	92°	N/A	N/A	NOZ.IN
n4a.p2.4	N4A	02B	02/29/04	0611	0622	269°	330°	61°	92°	N/A	N/A	NOZ.IN

COMMENTS : * Rotation angles for TL and P exams per the GERIS 2000 nozzle to vessel scan-plan sheet (attached).
The GERIS 0° reference is located 90° CW of nozzle TDC.

Automated scanning was restricted due to the nozzle weld configuration.

OPERATORS: SHANE GAUTHIER LvII
KENT MONTGOMERY LvII

SOFTWARE REVISION: 5.26
THERMOMETER S/N : 235018
COUPLANT : Demineralized Water

Search Unit Data:

No.	Model / Mode	S/N	Size	Freq. (MHz.)	Rot. Angle
1	RTD, 0° L2.25 / L	01-231	1.0 Dia	2.25	N/A
2	RTD, 45° T1-St / S	01-233	32x22mm	1.00	*
3	RTD, 60° L2-St / L	97-154	30x25mm	2.00	*
4	RTD, 45° T1-St /S	04-8	32x22mm	1.00	*
6	RTD, 70° TRL2-St / L	96-228	2(12x25)mm	2.00	*
13	RTD, 60° T1-St / S	01-234	32x18mm	1.00	*
14	RTD, 60° T1-St / S	01-235	32x18mm	1.00	*

Quad Cities Unit-2, Q2R17

GERIS 2000 OD EXAMINATION SCAN FILES DATA SHEET

CUSTOMER: **Exelon**
SITE: **Quad Cities Unit-2**
OUTAGE: **Q2R17**

PROCEDURE NO. : GE-UT-705 V4 **REVISION :** N/A **DRR :** N/A

FILE NAME	WELD	DISK NO.	DATE	EXAM START TIME	EXAM STOP TIME	SCAN START	SCAN STOP	SCAN AREA	VESSEL TEMP. (°F)	CAL RECHECK IN	CAL RECHECK OUT	CAL RECORD
n4a.z1.1	N4A IRS	01B	02/29/04	1135	1154	271°	272°	361°	92°	N/A	N/A	IRS.IN
n4a.z2a.1	N4A IRS	01B	02/27/04	2301	2319	282°	178°	104°	92°	N/A	N/A	IRS.IN
n4a.z2a.2	N4A IRS	01B	02/27/04	2337	2347	180°	59°	121°	92°	N/A	N/A	IRS.IN
n4a.z2a.3	N4A IRS	01B	02/28/04	0913	0923	281°	61°	140°	92°	N/A	N/A	IRS.IN
n4a.z2b.1	N4A IRS	06A	03/03/04	0834	0859	323°	35°	288°	98°	N/A	N/A	IRS.IN
n4a.z3.1	N4A IRS	06A	03/04/04	0712	0725	35°	202°	167°	98°	N/A	N/A	IRS.IN
n4a.z3.2	N4A IRS	06A	03/04/04	0729	0739	200°	310°	110°	98°	N/A	N/A	IRS.IN
n4a.z3.3	N4A IRS	06A	03/04/04	0743	0745	308°	323°	15°	98°	N/A	N/A	IRS.IN

COMMENTS : * Rotation angles for all exams per the GERIS 2000 nozzle to vessel scan-plan sheet (attached).
The GERIS 0° reference is located 90° CW of nozzle TDC.
Z1 and Z2A exams unrestricted. Z2B and Z3 scans limited by thermocouples and bioshield interference.

OPERATORS: SHANE GAUTHIER LvII
KENT MONTGOMERY LvII

SOFTWARE REVISION: 5.26
THERMOMETER S/N : 235018
COUPLANT : Demineralized Water

Search Unit Data:

No.	Model / Mode	S/N	Size	Freq. (MHz.)	Rot. Angle
9	KBA, 389-018-980 / S	00XL6V	0.5 x 1.0	2.25	N/A
10	KBA, 389-018-980 / S	00XL6Y	0.5 x 1.0	2.25	*
11	KBA, 389-018-980 / S	00XL6L	0.5 x 1.0	2.25	*
12	KBA, 389-018-980 / S	00XL6M	0.5 x 1.0	2.25	*
13	RTD, 28° T2-St / S	98-1178	18 x 14mm	2.00	*
14	RTD, 28° T2-St / S	01-240	18 x 14mm	2.00	*

Q2 R17-90

Page 16 of 19

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R17
Procedure: GE-UT-311 Rev: V10 DRR: N/A

Data Report Number: Q2R17-90 Linearity Sheet: L-008
Data Sheet Number: UT-063

Calibration Data for Block: 99978 AQC

CSCL	N/A	7.3"
Material	Size	Thickness

Initial Cal: 1520 Exam Start 16:40
Cal Check: N/A Exam End 17:10
Cal Check: N/A Ultragel II Couplant: 01225 Batch
Final Cal: 1725

255018	89° F	89° F
Thermometer	Initial Cal Temp.	Final Cal Temp:

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID	7.3	1X	80	19.4	20.65	8.2
		1X				

DAC @ 1X 58

Sweep 0-10 25 Metal Path

Acceptable Linearity performed : 2/10/2004

Exam Data for Component: N4A IRS

VESSEL-NOZZLE (FEEDWATER)
Configuration:

ODBR	99° F
Exam Surface:	Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
360°	67.5	21.7	W-029A	70	NRI

Search Unit Data

KBA	010HXL	0.5"x1.0"/Rect
Manufacturer:	Serial No.:	Size/Shape:
0.0 in.	70°	68°
Incident Point:	Nominal Angle:	Measured Angle:
2.25 MHz	113-892-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4	031573711
Maufacturer/Model:	Serial No.:

16.4 µs	0.1283 in /µsec	0.8 - 3.0 MHz
Zero:	Velocity:	Narrowband Filter:

Auto	Full	25.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	Off	2.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration.

Calibration for Zone 2A CW
Exams performed to maintain a 5% FSH ID roll.

BD	Brad Dummer	III	3/5/04		3/4/04
Initials:	Examiner:	Level	Cal/Exam Date:	Utility Reviewed By:	Date:
			3/16/04		3/19/04
GE Reviewed By:		Level:	Date:	AMI Reviewed By:	Date:

Page 7 of 19

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R17
Procedure: GE-UT-311 Rev: V10 DRR: N/A

Data Report Number: Q2R17-90 Linearity Sheet: L-008
Data Sheet Number: UT-064

Calibration Data for Block: 99978 AQC

CSCL	N/A	7.3"
Material	Size	Thickness

Initial Cal: 1520 Exam Start 16:40
Cal Check: N/A Exam End 17:10
Cal Check: N/A Ultragel II 01225
Final Cal: 1725 Couplant: Batch

255018 Thermometer | 89° F Initial Cal Temp. | 89° F Final Cal Temp:

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID	7.3	1X	80	19.4	20.65	8.2
		1X				

DAC @ 1X 61

Sweep 0-10 25 Metal Path

Acceptable Linearity performed : 2/10/2004

Search Unit Data

KBA	004NMY	0.5"x1.0" / Rect.
Manufacturer:	Serial No.:	Size/Shape:
0.0 in.	70°	68°
Incident Point:	Nominal Angle:	Measured Angle:
2.25 MHz	113-292-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4 Manufacturer/Model: 031573711 Serial No.:

16.4 µs	0.1283 in /usec	0.8 - 3.0 MHz
Zero:	Velocity:	Narrowband Filter:

Auto	Full	25.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	Off	2.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Component: N4A IRS

VESSEL-NOZZLE (FEEDWATER)
Configuration:

ODBR Exam Surface: 99° F Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
360°	67.5	21.7	W-029B	70	NRI

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration.

Calibration for Zone 2A CCW
Exams performed to maintain a 5% FSH ID roll.

RD	Brad Dummer	III	3/5/04		3/6/04
Initials:	Examiner:	Level	Cal/Exam Date:	Utility Reviewed By:	Date:
			3/6/04		3/11/04
GE Reviewed By:		Level:	Date:	ANII Reviewed By:	Date:

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R17
Procedure: GE-UT-311

Data Report Number: Q2R17-90 Linearity Sheet: L-008
Data Sheet Number: UT-065
Rev: V10 DRR: N/A

Calibration Data for Block: 99978 AQC

CSCL	N/A	7.3"
Material	Size	Thickness

Initial Cal: 1520 Exam Start 16:40
Cal Check: N/A Exam End 17:10
Cal Check: N/A Ultragel II 01225
Final Cal: 1725 Couplant: Batch

255018 Thermometer | 89° F Initial Cal Temp. | 89° F Final Cal Temp:

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID	7.3	1X	80	7.0	10.2	4.1
		1X				

DAC @ 1X 47

Sweep 0-10 25 Metal Path

Acceptable Linearity performed : 2/10/2004

Exam Data for Component: N4A IRS

VESSEL-NOZZLE (FEEDWATER)
Configuration:

ODBR Exam Surface: | 99° F Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
360°	43.8	40.3	W-027B	60	NRI

Search Unit Data

KBA	010HXJ	0.5"x1.0" / Rect
Manufacturer:	Serial No.:	Size/Shape:
0.0 in.	45°	44°
Incident Point:	Nominal Angle:	Measured Angle:
2.25 MHz	113-892-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4	031573711
Maufacturer/Model:	Serial No.:

12.3 µs	0.1283 in /usec	0.8 - 3.0 MHz
Zero:	Velocity:	Narrowband Filter:

Auto	Full	25.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	Off	2.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration.

Calibration for Zone 1 CCW.
Exams performed to maintain a 5% FSH ID roll.

BD Brad Dummer III 3/5/04
Initials: Examiner: Level Cal/Exam Date:

Utility Reviewed By: 3/10/04
Date:

GE Reviewed By: Level: 3/10/04 Date:

ANII Reviewed By: 3/10/04 Date:

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R17
Procedure: GE-UT-311

Data Report Number: Q2R17-90 Linearity Sheet: L-008
Data Sheet Number: UT-068
Rev: V10 DRR: N/A

Calibration Data for Block: 99978 AQC

CSCL	N/A	7.3"
Material	Size	Thickness

Initial Cal: 1520 Exam Start 16:40
Cal Check: N/A Exam End 17:10
Cal Check: N/A Ultragel II 01225
Final Cal: 1725 Couplant: Batch

255018 89° F 89° F
Thermometer Initial Cal Temp. Final Cal Temp:

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID	7.3	1X	80	7.0	0.2	4.1
		1X				

DAC @ 1X 47

Sweep 0-10 25 Metal Path

Acceptable Linearity performed : 2/10/2004

Search Unit Data

KBA	0103X1	0.5"x1.0" / Rect
Manufacturer:	Serial No.:	Size/Shape:
0.0 in.	45°	44°
Incident Point:	Nominal Angle:	Measured Angle:
2.25 MHz	113-892-600	Shear
Frequency:	Model:	Mode:

Search Unit Cable

RG-174	12'	0
Cable Type:	Length:	Connectors:

Instrument Settings

Panametrics / Epoch 4	031573711
Maufacturer/Model:	Serial No.:

12.3 µs	0.1283 in /usec	0.8 - 3.0 MHz
Zero:	Velocity:	Narrowband Filter:

Auto	Full	25.0 in.	Sq. / Med
Rep Rate:	Rectification:	Range:	Pulser/Energy
400 Ohms	Full	2.0 MHz	P/E
Damping:	Reject:	Frequency:	Mode:
Off:	Off:	Off:	Off:
DAC:	TVG:	CSC:	DGS:

Exam Data for Component: N4A IRS

VESSEL-NOZZLE (FEEDWATER)
Configuration:

ODBR 99° F
Exam Surface: Component Temp.

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
360°	43.8	40.3	W-027A	60	NRI

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration.

Calibration for Zone 1 CW
Exams performed to maintain a 5% FSH ID roll.

BD Brad Dummer III 3/5/04 3/10/04
Initials: Examiner: Level Cal/Exam Date: Utility Reviewed By: Date:

GE Reviewed By: III 3/6/04 3/11/04
GE Reviewed By: Level: Date: ANII Reviewed By: Date:

Page 10 of 19

Report No.: Q2R17-90

Feedwater N4A-NOZ
Quad Cities Unit-2, 2004

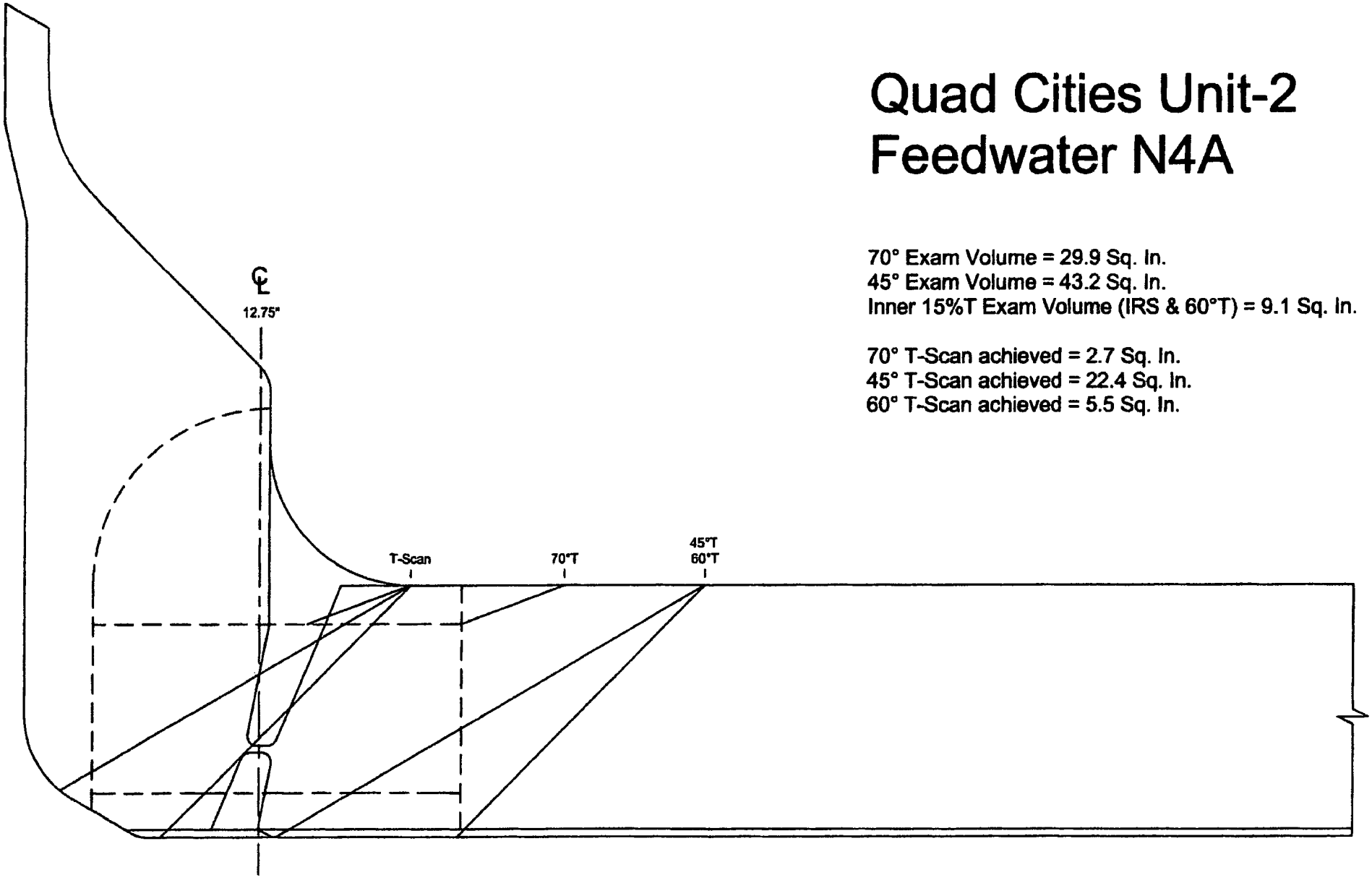
Weld Length = 360. Exam Volume = 82.2		CODE CROSS-SECTIONAL AREA Required Exam Area Sq. In.	 Area Scanned Auto	TOTAL CODE COVERAGE Percent of Area Auto	 Weld Length Auto	 Percent Auto
70° T-Scan	A	29.9	2.7	3.3%	360	1.6%
45° T-Scan	A	43.2	22.4	27.3%	360	13.6%
60° T-Scan	A	9.1	5.5	6.7%	360	3.3%
70° P-Scan	A	29.9	0	0.0%	360	0.0%
45° P-Scan	A	43.2	14.9	18.1%	360	9.1%
60° P-Scan	A	9.1	9.1	11.1%	360	5.5%
70° T-Scan						
45° T-Scan						
60° T-Scan						
70° P-Scan						
45° P-Scan						
60° P-Scan						
70° T-Scan						
45° T-Scan						
60° T-Scan						
70° P-Scan						
45° P-Scan						
60° P-Scan						

% Total Composite Coverage = 33%

Comments: A - Examined accessible length. Scanning limited due to scanner access.

Note - Rounding methods may make calculated values appear in error.

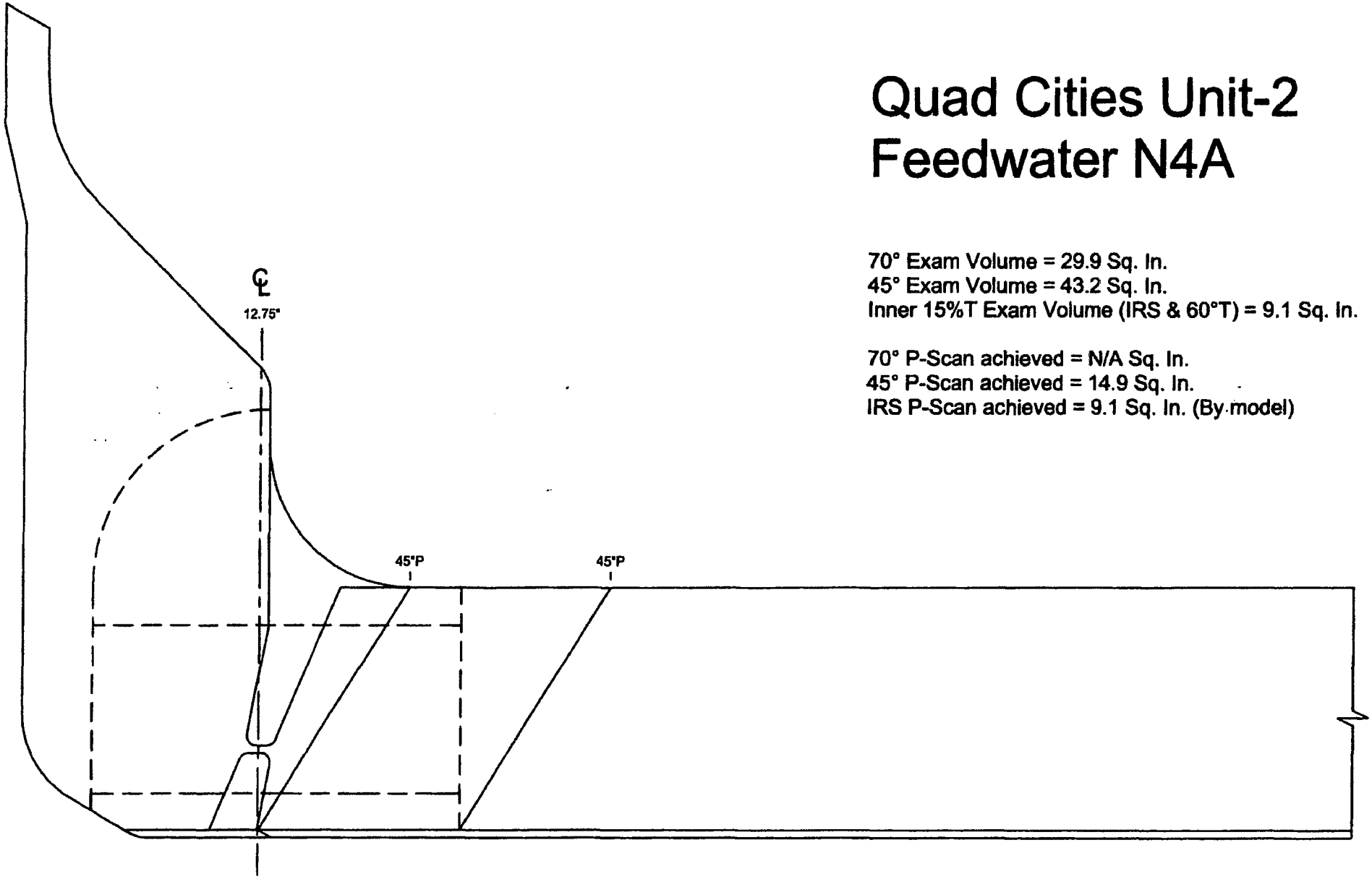
Quad Cities Unit-2 Feedwater N4A



70° Exam Volume = 29.9 Sq. In.
45° Exam Volume = 43.2 Sq. In.
Inner 15%T Exam Volume (IRS & 60°T) = 9.1 Sq. In.

70° T-Scan achieved = 2.7 Sq. In.
45° T-Scan achieved = 22.4 Sq. In.
60° T-Scan achieved = 5.5 Sq. In.

Quad Cities Unit-2 Feedwater N4A



70° Exam Volume = 29.9 Sq. In.
45° Exam Volume = 43.2 Sq. In.
Inner 15%T Exam Volume (IRS & 60°T) = 9.1 Sq. In.

70° P-Scan achieved = N/A Sq. In.
45° P-Scan achieved = 14.9 Sq. In.
IRS P-Scan achieved = 9.1 Sq. In. (By model)

Guideline for Deciding when to Perform Manual UT Examination of Areas Not Covered by Automated Examinations

Component/Configuration: N4A N02

A. DETERMINE

1. Percent coverage obtained with automated UT: 33 %

2. Approximate radiation dose received to complete automated UT: 1800 mR

B. ESTIMATE

1. Percent coverage increases if manual UT was performed: + 7 % *

2. Radiation dose expected if manual UT was performed: 2000 mR

Decision to Proceed: ____YES X NO **Based On:** DOSE

Prepared By: L. L. My **Date:** 03/05/04

* ALL UPPER WELD COVERAGE, NOT WELD OR HAZ ON ID.

Q2R17-90
14 OF 19

Report No.: Q2R17-90

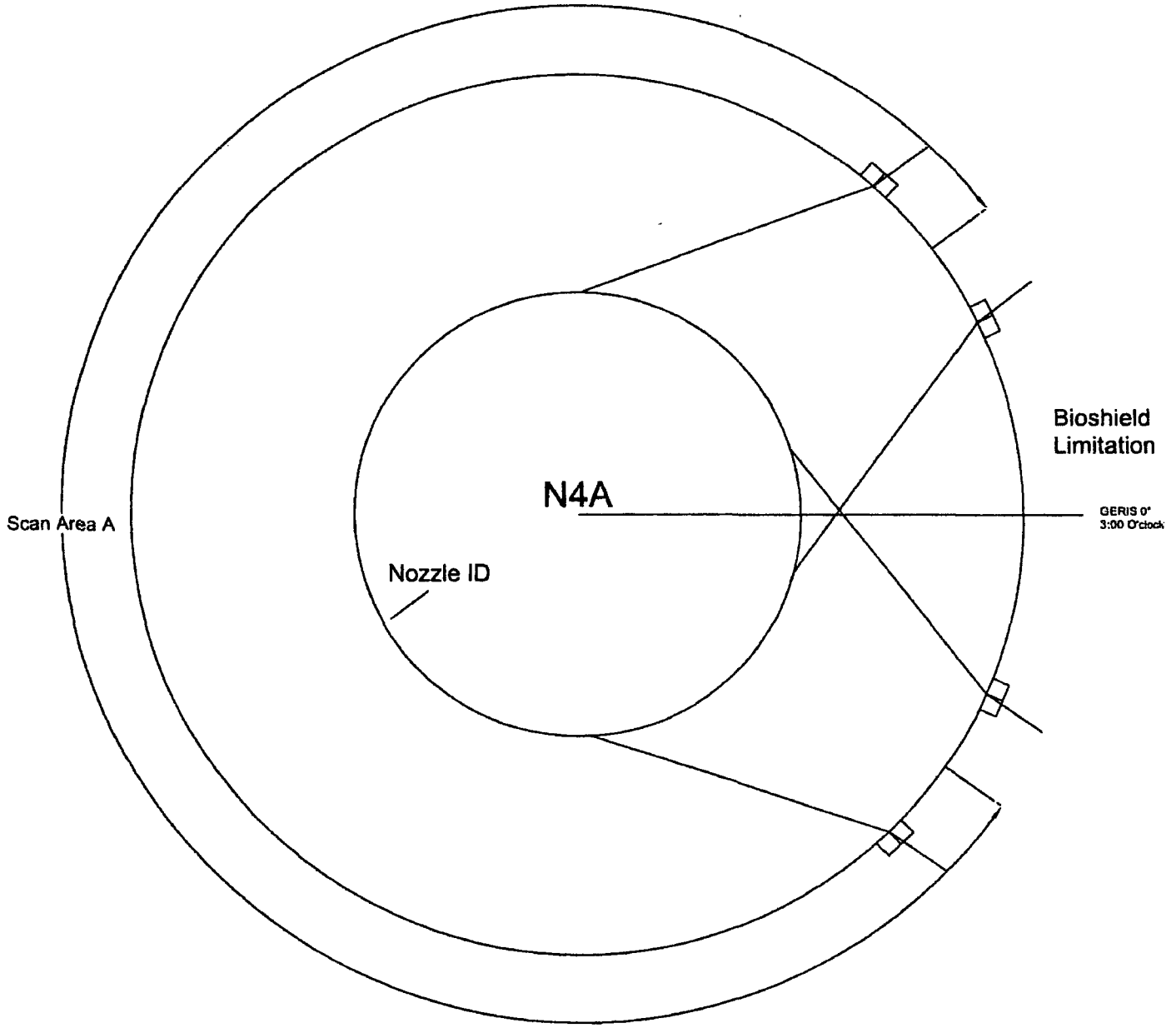
Feedwater N4A-IRS
Quad Cities Unit-2, 2004

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. **Exam Volume = 100%**		**Required Exam Area %**	**Area Scanned Auto**	**Percent of Area Auto**	**Weld Length Auto**	**Percent Auto**
Z1 CW	A	**100%**	**100%**	100.0%	360	50.0%
Z1 CCW	A	**100%**	**100%**	100.0%	360	50.0%
				% Total Composite Coverage =		100.0%
Z2A CW	A	**100%**	**100%**	100.0%	360	50.0%
Z2A CCW	A	**100%**	**100%**	100.0%	360	50.0%
				% Total Composite Coverage =		100.0%
Z2B CW	A	**100%**	**100%**	100.0%	285	39.6%
Z2B CCW	A	**100%**	**100%**	100.0%	285	39.6%
				% Total Composite Coverage =		79.2%
Z3 CW	A	**100%**	**100%**	100.0%	285	39.6%
Z3 CCW	A	**100%**	**100%**	100.0%	285	39.6%
				% Total Composite Coverage =		79.2%

Comments: A - Examined accessible length. Exam volume determined by modeling, 100% assigned volume.
Scanning limited due to bioshield interference at 320° CW to 35°.
100% Z2B and Z3 Coverage (Single side access) obtained throughout. See attached drawing. Non-PDI exam.

Note - Rounding methods may make calculated values appear in error.

Zone 2B and Zone 3 Scan Areas
100% Coverage (Single Side) Obtained Throughout.



Nir_PDI Qc2.XLS

MANUAL/GERIS 2000 DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT **Quad Cities 2**

PREPARED BY S.C. MORTENSON DATE 01/17/04

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
RECIRC OUTLET								
N/V Weld	PLATE	0 - 9.0"	66.0°	57.8° (52.4°) *	FLAT	18.5"	1 MHz	
N/V Weld	PLATE	0 - 9.0"	70.0°	42.1° 37.0°) *	FLAT	25.3"	1 MHz	
Zone 1/NV (M)	ODBR	20° - 45°	35.0°	90.0°	5.5"	20.7"	1 MHz	W-021, W-022
Zone 2A	ODBR	45° - 90°	60.0°	35.0° (30.6°) **	5.5"	20.4"	1 MHz	W-023, W-024
RECIRC INLET								
N/V Weld	PLATE	0 - 8.0"	60.0°	38.0° (27.3°) *	FLAT	14.0"	1 MHz	
N/V Weld	PLATE	0 - 8.5"	60.0°	45.0° (35.5°) *	FLAT	14.0"	1 MHz	
N/V Weld / Zone 1	PLATE	0 - 8.0"	68.0°	25.7° (16.0°) *	FLAT	21.2"	1 MHz	
Zone 1	PLATE	0 - 9.0"	70.0°	15.6° (8.5°) *	FLAT	22.9"	1 MHz	
Zone 2A	ODBR	55° - 90°	67.5°	18.1° (8.2°) **	3.3"	12.0"	1 MHz	W-025, W-026
FEEDWATER								
N/V Weld	PLATE	0 - 8.0"	60.0°	48.2° (39.2°) *	FLAT	14.0"	1 MHz	
N/V Weld	PLATE	0 - 8.0"	60.0°	38.9° (28.3°) *	FLAT	14.0"	1 MHz	
N/V Weld / Zone 1	ODBR	50° - 90°	43.8°	40.3°(31.8°) **	3.5"	19.3"	2.25 MHz	W-027, W-028
Zone 2A	ODBR	50° - 90°	67.5°	21.7° (13.2°) **	3.5"	13.4"	2.25 MHz	W-029, W-030
Zone 2B	NOZOD	ALL	28.0°	68.0°	FLAT	7.5"	2 MHz	
Zone 3	NOZOD	ALL	28.0°	90°	FLAT	6.7"	2 MHz	

NOTES:		
	*	DESIGN / (FIXTURE) ROTATION FOR 3.0" PKG OFFSET
	#	DESIGN / (FIXTURE) ROTATION FOR 1.45" PKG OFFSET
	**	WEDGE / (FIXTURE) ROTATION ANGLE FOR 2.5" OFFSET
	***	DESIGN / (FIXTURE) ROTATION FOR 1.5" PKG OFFSET
	(M)	MANUAL

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ 704 948-0253

03/17/04
17 of 19
QUAD CITIES
REPORT NO. Q2R17-90
PAGE 16 OF

GE Nuclear Energy

GERIS 2000 OD
Nozzle Examination Scan Plan

Quad Cities Unit-2, 2004
Nozzle Scanning Limits
Nozzle(s) N4

12.75	Weld CL Radius	125.50	Vessel ID Radius
18.10	ASME OD Radius	6.38	Vessel Nom. Thickness
16.75	Outside Radius of ODBR	131.88	Vessel OD Radius
13.00	Outside Radius of NOZOD	1.0	Overscan Distance

Package Configuration: Triple Pack and ODBR Package.

Channel	Beam Angle	CPU Angle	Fixture Angle	Type	SU Parameters Delay	Velocity	X-Off	Y-Off	Scan Area	Scanner Min	Scanner Max	A-Gate Start	A-Gate Stop	A-Gate Max MP	C-Gate Start	C-Gate Stop
N4	**T-Scan.** Supplement 4 and 6 radial scans.									Step →	0.25	Index →	0.4°			
1	0	0.0	0.0	WM	4	0.233	0.0	0.0	N/A	Note 1	19.25	0	75	8.3	18	54
2	45	-9.0	9.0	T	15	0.128	3.0	0.0	N/A	Note 1	13.25	0	230	13.8	37	191
3	60	7.2	352.8	T	15	0.233	-3.0	0.0	N/A	Note 1	19.25	0	180	19.2	32	152
N4	**P1.** 45° S for outer 85%T volume.									Step →	0.25	Index →	0.5°			
2	45	51.3	308.7	P	15	0.128	3.0	0.0	N/A	Note 1	11.50	0	230	13.8	37	191
4	45	-51.3	51.3	P	15	0.128	-3.0	0.0	N/A	Note 1	11.50	0	230	13.8	37	191
N4	**P2.** N/V Inner 15%T P-scan examination from **PLATE with 70T-scan.**									Step →	0.15	Index →	0.5°			
13	60	39.2	320.8	N/V	15	0.128	-3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
6	70	0.0	0.0	T	10	0.233	0.0	0.0	N/A	Note 1	9.30	0	50	4.7	10	48
14	60	-39.2	39.2	N/V	15	0.128	3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
N4	**P3.** N/V Inner 15%T P-scan examination from **PLATE.**									Step →	0.15	Index →	0.5°			
13	60	28.3	331.7	N/V	15	0.128	-3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
14	60	-28.3	28.3	N/V	15	0.128	3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
N4	**Z1.** Z1 Inner Radius Section examination from **ODBR**									Step →	0.07	Index →	1.7°			
9	43.8	31.8	328.2	Z1	15	0.128	-2.5	0.0	N/A	50°	90°	0	410	19.3	165	335
10	43.8	-31.8	31.8	Z1	15	0.128	2.5	0.0	N/A	50°	90°	0	410	19.3	165	335

QUAD CITIES
REPORT NO. QR 17-90
PAGE 12 OF 19

Channel	Beam Angle	CPU Angle	Fixture Angle	Type	SU Parameters Delay	Velocity	X-Off	Y-Off	Scan Area	Scanner Min	Max	A-Gate Start	Stop	Max MP	C-Gate Start	Stop
N4	**Z2A.** Z2A Inner Radius Section examination from **ODBR**									Step →	0.07	Index →	1.7°			
11	67.5	13.2	346.8	Z2A	15	0.128	-2.5	0.0	N/A	50°	90°	0	290	13.4	115	240
12	67.5	-13.2	13.2	Z2A	15	0.128	2.5	0.0	N/A	50°	90°	0	290	13.4	115	240
N4	**Z2B.** Z2A Inner Radius Section examination from **NOZOD.**									Step →	0.07	Index →	2.2°			
13	28	68.0	292.0	Z2B	15	0.128	-2.5	0.0	N/A	All	All	0	170	7.5	70	150
14	28	-68.0	68.0	Z2B	15	0.128	2.5	0.0	N/A	All	All	0	170	7.5	70	150
N4	**Z3.** Z3 Inner Radius Section examination from **NOZOD.**									Step →	0.07	Index →	2.2°			
13	28	90.0	270.0	Z3	15	0.128	-2.5	0.0	N/A	All	All	0	170	7.5	70	150
14	28	-90.0	90.0	Z3	15	0.128	2.5	0.0	N/A	All	All	0	170	7.5	70	150

Notes: Vessel ID radius from B&W drawing Shell Course Subassembly 151825E-1.
Vessel nominal thickness from B&W drawing Shell Forming Details 104186D-1 (ordered thickness).

Note 1 - Scan into nozzle until onset of liftoff or limited by physical limitations.

Site Revision 0 2/22/04

QUAD CITIES
REPORT NO. Q2 R17-90
PAGE 19 OF 19

GE NUCLEAR ENERGY
UT EXAMINATION SUMMARY SHEET

Report No: Q2R17-91
WO No: 580046, 580047

PROJECT	Quad Cities Unit-2, Q2R17
WELD ID:	N4B NOZ, N4B IRS and N4B (NUREG 0619)
SYSTEM:	Reactor Pressure Vessel
CALIBRATION ID:	NOZ.IN, NOZ.IN.1, IRS.IN
GERIS DATA:	Scan file types: P1, P2, P3, TL, Z1, Z2A, Z2B and Z3
MANUAL DATA:	N/A
EXAMINERS:	S. Gauthier Lv II, K. Montgomery Lv II

Ultrasonic examination results were acceptable to the requirements of ASME B&PV Code Section XI, 1995 Edition with the 1996 Addenda as modified by the PDI program description and the Federal Register, Part II, Nuclear Regulatory Commission, 10 CFR Part 50 for Category B-D Reactor Pressure Vessel (RPV) Assembly Welds and NUREG-0619.

Examination volumes were in accordance with Section XI, Figure IWB-2500-7 (a) and NUREG-0619.

Automated transverse and parallel scans were performed in accordance with procedure GE-UT-705 V4, using 0° L, 60° RL, and 45° S, search units. Nozzle Inner Radius and Inner 15%T examination volume parallel scans were performed using model validated shear wave search units.

Scanning was performed from the vessel OD shell, OD Blend Radius and OD Nozzle Boss surfaces examining the nozzle to shell weld, nozzle inner radius section and NUREG 0619 specified bore regions.

No indications were recorded.

Previous data (QDC-002 and QDC-006 from 1995) was reviewed prior to completing this summary. No significant changes were noted.

Scanning was limited due to the nozzle configuration and bioshield interferences.

Coverage = 33%	Nozzle to Shell weld.
Coverage = 100%	Nozzle Inner Radius Section
Coverage = 100%	NUREG-0619 Bore regions.

PREPARED BY / DATE	REVIEWED BY / DATE	UTILITY REVIEW / DATE	ANII REVIEW / DATE
3/4/04	3-7-04	3/11/04	3/19/04
UT Level: III	UT Level: III		

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N4B-NOZ

Report No.: Q2R17-91
Exam Data Sheet: N4B-01

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n4b.p1.1	01A	P1	~	NRI	~	NRI	~	~	~	~	~	~	~	~	~	~	1
n4b.p1.2	01A	P1	~	NRI	~	NRI	~	~	~	~	~	~	~	~	~	~	1
n4b.p2.1	01A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	1
n4b.p2.2	01A	P2	~	~	~	~	~	Void	~	~	~	~	~	~	Void	Void	Void
n4b.p2.3	01A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	1
n4b.p2.4	01A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	1
n4b.p2.5	01A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	1
n4b.p2.6	01A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	1
n4b.p2.7	01A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	1

Comments: Scan file n4b.p2.2 voided.

Scanning performed with high profile triple pack, low profile tractor and 11" arm.

(1) - Plate segregates observed in vessel plate.

The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: C M T
Level: III
Date: 2/27/04

Reviewed By: R M D
Level: III
Date: 2-28-04

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N4B-NOZ

Report No.: Q2R17-91
Exam Data Sheet: N4B-02

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n4b.p3.1	02A	P3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	1
n4b.p3.2	02A	P3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	1
n4b.tl.1	02A	TL	NRI	NRI	NRI	~	~	~	~	~	~	~	~	~	~	~	1
n4b.tl.2	02A	TL	NRI	NRI	NRI	~	~	~	~	~	~	~	~	~	~	~	1

Comments: Scanning performed with high profile triple pack, low profile tractor and 11" arm.
(1) - Plate segregates observed in vessel plate.

The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: CO MT
Level: III Date: 2/28/04

Reviewed By: B/M Dun
Level: III Date: 2-28-04

Quad Cities Unit-2, 2004

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N4B-IRS

Report No.: Q2R17-91
Exam Data Sheet: N4B-03

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n4b.z1.1	03A	Z1	~	~	~	~	~	~	~	~	NRI	NRI	~	~	~	~	~
n4b.z1.2	03A	Z1	~	~	~	~	~	~	~	~	NRI	NRI	~	~	~	~	~
n4b.z2a.1	01B	Z2A	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~

Comments: Scanning performed with ODBR package, low profile tractor and 11" arm.

The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: COM

Level: III

Date: 3/2/04

Reviewed By: BMD

Level: III

Date: 3-3-04

Page 4 of 16

Quad Cities Unit-2, 2004

GE Nuclear Energy

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N4B-IRS

Report No.: Q2R17-91
Exam Data Sheet: N4B-04

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n4b.z2b.1	08A	Z2B	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4b.z2b.2	08A	Z2B	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4b.z3.1	08A	Z3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4b.z3.2	08A	Z4	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~

Comments: Scanning performed with NOZOD package, safe end tractor and safe end arm.

The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: CD NT
Level: III
Date: 3/5/04

Reviewed By: BLM Dun
Level: III
Date: 3-6-04

Page 5 of 16

Quad Cities Unit-2, Q2R17

Q2 R17-91

GERIS 2000 OD EXAMINATION SCAN FILES DATA SHEET

CUSTOMER: **Exelon**
SITE: **Quad Cities Unit-2**
OUTAGE: **Q2R17**

PROCEDURE NO. : GE-UT-705 V4 **REVISION :** N/A **DRR :** N/A

FILE NAME	WELD	DISK NO.	DATE	EXAM START TIME	EXAM STOP TIME	SCAN START	SCAN STOP	SCAN AREA	VESSEL TEMP. (°F)	CAL RECHECK IN	CAL RECHECK OUT	CAL RECORD
n4b.p1.1	N4B	01A	02/27/04	1036	1140	270°	251°	341°	92°	N/A	N/A	NOZ.IN
n4b.p1.2	N4B	01A	02/27/04	1146	1152	249°	271°	22°	92°	N/A	N/A	NOZ.IN
n4b.p2.1	N4B	01A	02/27/04	0134	0146	337°	28°	51°	92°	N/A	N/A	NOZ.IN
n4b.p2.2	~	~	~	~	~	~	~	~	~	~	~	~
n4b.p2.3	N4B	01A	02/27/04	0524	0533	27°	64°	37°	92°	N/A	N/A	NOZ.IN
n4b.p2.4	N4B	01A	02/27/04	0911	0939	224°	126°	98°	92°	N/A	N/A	NOZ.IN
n4b.p2.5	N4B	01A	02/27/04	0945	0948	127°	113°	14°	92°	N/A	N/A	NOZ.IN
n4b.p2.6	N4B	01A	02/27/04	1230	1251	222°	339°	117°	92°	N/A	N/A	NOZ.IN
n4b.p2.7	N4B	01A	02/27/04	1308	1318	62°	116°	54°	92°	N/A	N/A	NOZ.IN
n4b.p3.1	N4B	02A	02/27/04	1403	1510	270°	272°	358°	92°	N/A	N/A	NOZ.IN
n4b.p3.2	N4B	02A	02/27/04	1531	1532	273°	269°	4°	92°	N/A	N/A	NOZ.IN
n4b.tl.1	N4B	02A	02/27/04	1608	1646	270°	77°	167°	92°	N/A	N/A	NOZ.IN
n4b.tl.2	N4B	02A	02/27/04	1702	1747	76°	271°	195°	92°	N/A	N/A	NOZ.IN

COMMENTS : * Rotation angles for TL and P exams per the GERIS 2000 nozzle to vessel scan-plan sheet (attached).
The GERIS 0° reference is located 90° CW of nozzle TDC.

Automated scanning was restricted due to the nozzle weld configuration.

OPERATORS: SHANE GAUTHIER LvII
KENT MONTGOMERY LvII

SOFTWARE REVISION: 5.26
THERMOMETER S/N : 235018
COUPLANT : Demineralized Water

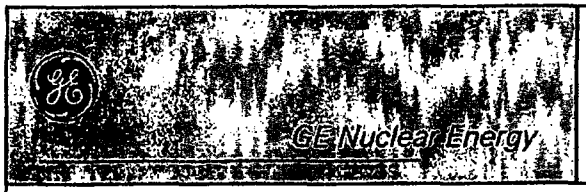
Search Unit Data:

No.	Model / Mode	S/N	Size	Freq. (MHz.)	Rot. Angle
1	RTD, 0° L2.25 / L	01-231	1.0 Dia	2.25	N/A
2	RTD, 45° T1-St / S	01-233	32x22mm	1.00	*
3	RTD, 60° L2-St / L	97-154	30x25mm	2.00	*
4	RTD, 45° T1-St /S	04-8	32x22mm	1.00	*
6	RTD, 70° TRL2-St / L	96-228	2(12x25)mm	2.00	*
13	RTD, 60° T1-St / S	01-234	32x18mm	1.00	*
14	RTD, 60° T1-St / S	01-235	32x18mm	1.00	*

Page 6 of 16

Quad Cities Unit-2, Q2R17

Q2R17-91



GERIS 2000 OD EXAMINATION SCAN FILES DATA SHEET

CUSTOMER: **Exelon**
SITE: **Quad Cities Unit-2**
OUTAGE: **Q2R17**

PROCEDURE NO. : GE-UT-705 V4 **REVISION :** N/A **DRR :** N/A

FILE NAME	WELD	DISK NO.	DATE	EXAM START TIME	EXAM STOP TIME	SCAN START	SCAN STOP	SCAN AREA	VESSEL TEMP. (°F)	CAL RECHECK IN	CAL RECHECK OUT	CAL RECORD
n4b.z1.1	N4B	03A	03/02/04	0553	0549	268°	60°	208°	92°	N/A	N/A	IRS.IN
n4b.z1.2	N4B	03A	03/02/04	0601	0609	62°	266°	156°	92°	N/A	N/A	IRS.IN
n4b.z2a.1	N4B	01B	02/27/04	1848	1914	270°	269°	361°	92°	N/A	N/A	IRS.IN
n4b.z2b.1	N4B	08A	03/05/04	0519	0526	198°	316°	118°	98°	N/A	N/A	IRS.IN
n4b.z2b.2	N4B	08A	03/05/04	0538	0544	145°	37°	108°	98°	N/A	N/A	IRS.IN
n4b.z3.1	N4B	08A	03/05/04	0159	0207	198°	316°	118°	98°	N/A	N/A	IRS.IN
n4b.z3.2	N4B	08A	03/05/04	0243	0249	37°	145°	108°	98°	N/A	N/A	IRS.IN

COMMENTS : * Rotation angles for all exams per the GERIS 2000 nozzle to vessel scan-plan sheet (attached).
The GERIS 0° reference is located 90° CW of nozzle TDC.
Z1 and Z2A exams unrestricted. Z2B and Z3 scans limited by thermocouples and bioshield interference.

OPERATORS: SHANE GAUTHIER LvII
KENT MONTGOMERY LvII

SOFTWARE REVISION: 5.26
THERMOMETER S/N : 235018
235074
COUPLANT : Demineralized Water

Search Unit Data:

No.	Model / Mode	S/N	Size	Freq. (MHz.)	Rot. Angle
9	KBA, 389-018-980 / S	00XL6V	0.5 x 1.0	2.25	N/A
10	KBA, 389-018-980 / S	00XL6Y	0.5 x 1.0	2.25	*
11	KBA, 389-018-980 / S	00XL6L	0.5 x 1.0	2.25	*
12	KBA, 389-018-980 / S	00XL6M	0.5 x 1.0	2.25	*
13	RTD, 28° T2-St / S	98-1178	18 x 14mm	2.00	*
14	RTD, 28° T2-St / S	01-240	18 x 14mm	2.00	*

Page 7 of 16

Report No.: Q2R17-91

Feedwater N4B-NOZ
Quad Cities Unit-2, 2004

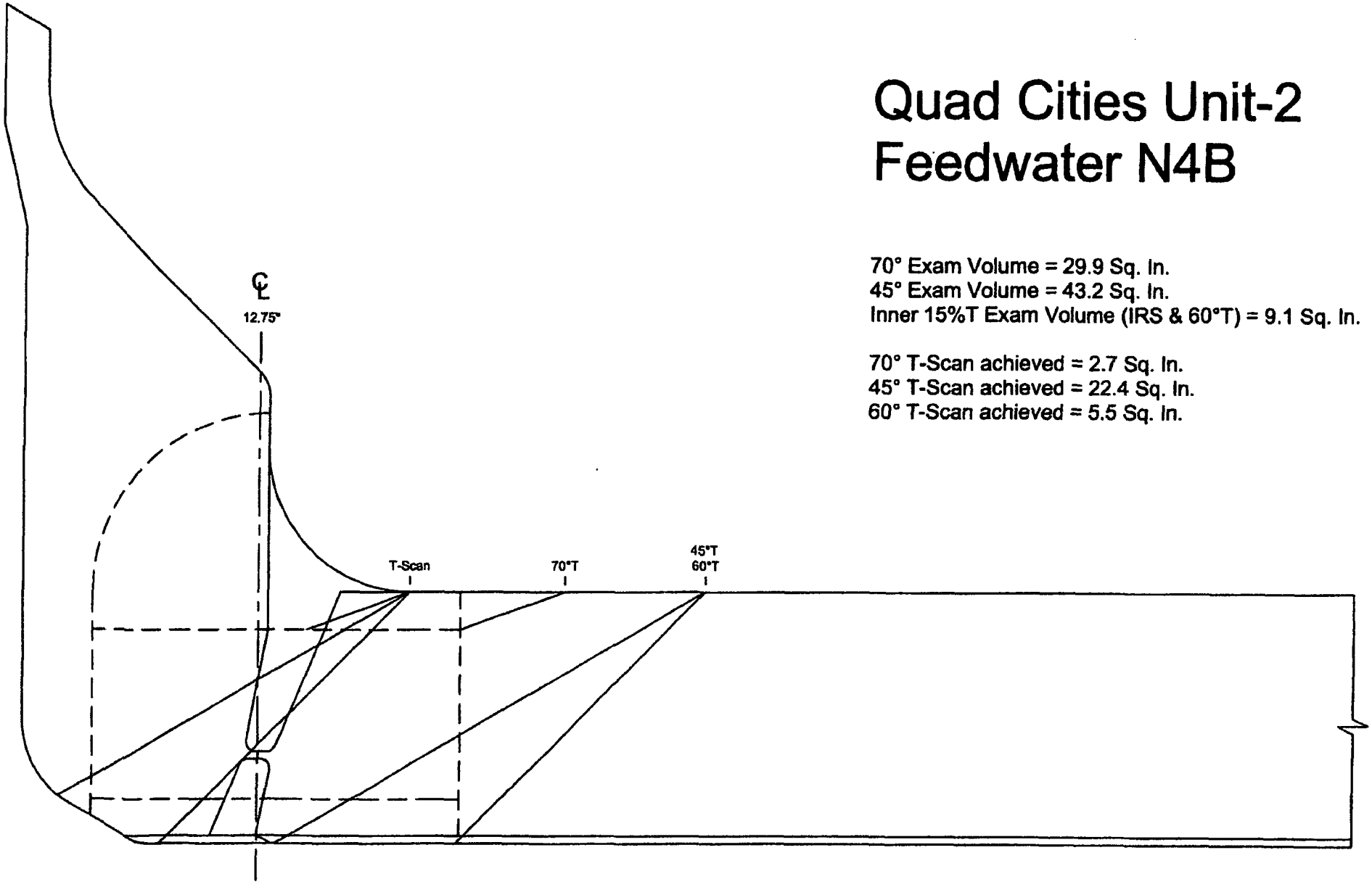
		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 82.2		Required Exam Area Sq. In.	Area Scanned Auto	Percent of Area Auto	Weld Length Auto	Percent Auto
70° T-Scan	A	29.9	2.7	3.3%	360	1.6%
45° T-Scan	A	43.2	22.4	27.3%	360	13.6%
60° T-Scan	A	9.1	5.5	6.7%	360	3.3%
70° P-Scan	A	29.9	0	0.0%	360	0.0%
45° P-Scan	A	43.2	14.9	18.1%	360	9.1%
60° P-Scan	A	9.1	9.1	11.1%	360	5.5%
70° T-Scan						
45° T-Scan						
60° T-Scan						
70° P-Scan						
45° P-Scan						
60° P-Scan						
70° T-Scan						
45° T-Scan						
60° T-Scan						
70° P-Scan						
45° P-Scan						
60° P-Scan						

% Total Composite Coverage = 33%

Comments: A - Examined accessible length. Scanning limited due to scanner access.

Note - Rounding methods may make calculated values appear in error.

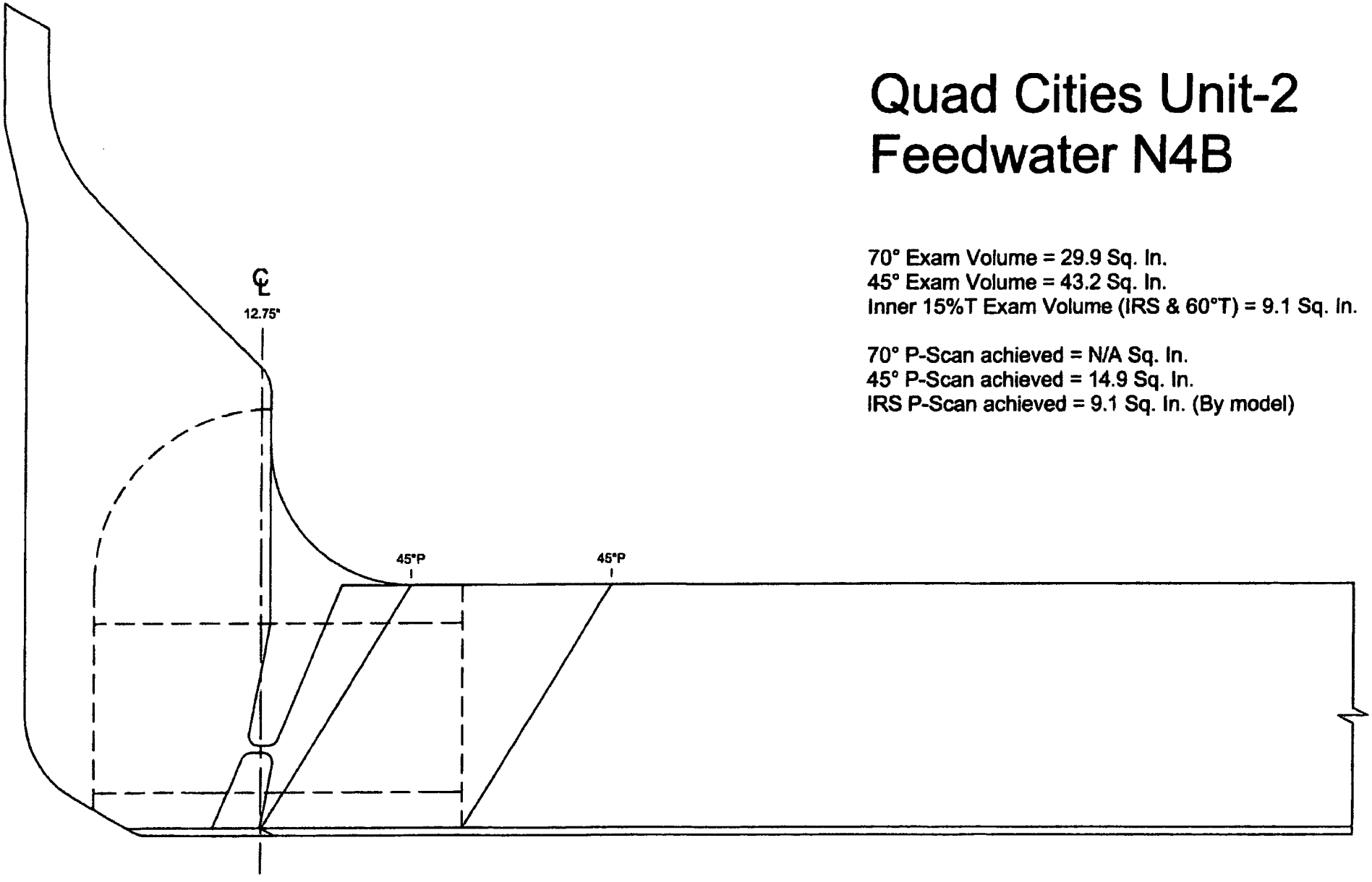
Quad Cities Unit-2
Feedwater N4B



70° Exam Volume = 29.9 Sq. In.
45° Exam Volume = 43.2 Sq. In.
Inner 15%T Exam Volume (IRS & 60°T) = 9.1 Sq. In.

70° T-Scan achieved = 2.7 Sq. In.
45° T-Scan achieved = 22.4 Sq. In.
60° T-Scan achieved = 5.5 Sq. In.

Quad Cities Unit-2
Feedwater N4B



70° Exam Volume = 29.9 Sq. In.
45° Exam Volume = 43.2 Sq. In.
Inner 15%T Exam Volume (IRS & 60°T) = 9.1 Sq. In.

70° P-Scan achieved = N/A Sq. In.
45° P-Scan achieved = 14.9 Sq. In.
IRS P-Scan achieved = 9.1 Sq. In. (By model)

Guideline for Deciding when to Perform Manual UT Examination of Areas Not Covered by Automated Examinations

Component/Configuration: N4B N02

A. DETERMINE

1. Percent coverage obtained with automated UT: 33 %

2. Approximate radiation dose received to complete automated UT: 1800 mR

B. ESTIMATE

1. Percent coverage increases if manual UT was performed: + 7 % *

2. Radiation dose expected if manual UT was performed: 2000 mR

Decision to Proceed: ____YES X NO **Based On:** DOSE

Prepared By: L. L. May **Date:** 03/05/04

* ALL UPPER WELD COVERAGE, NOT WELD OR HAZ ON I.D.

Q2R17-91
11 OF 16

Report No.: Q2R17-91

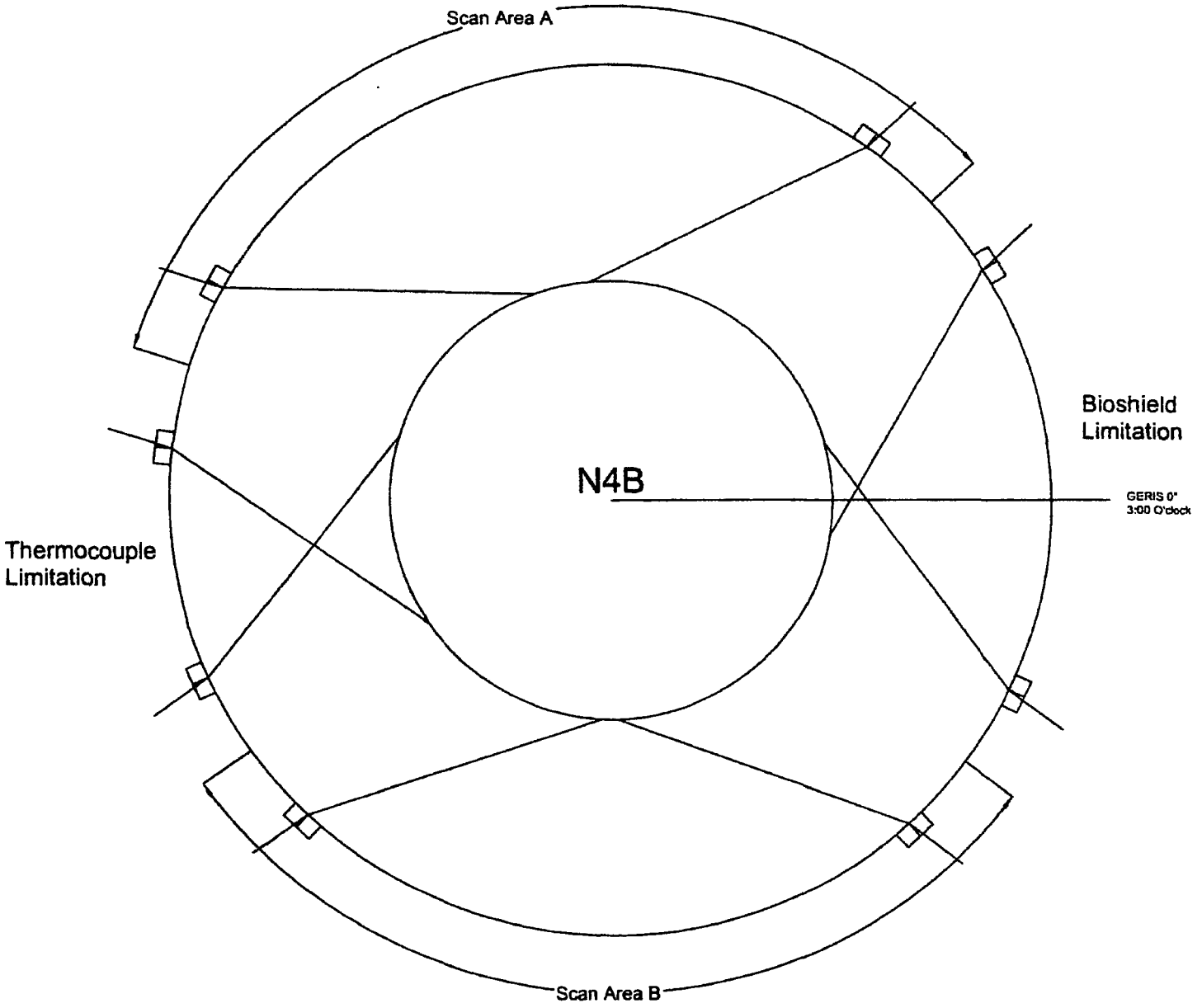
Feedwater N4B-IRS
Quad Cities Unit-2, 2004

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. **Exam Volume = 100%**		**Required Exam Area %**	**Area Scanned Auto**	**Percent of Area Auto**	**Weld Length Auto**	**Percent Auto**
Z1 CW	A/B	**100%**	**100%**	100.0%	360	50.0%
Z1 CCW	A/B	**100%**	**100%**	100.0%	360	50.0%
				% Total Composite Coverage =		100.0%
Z2A CW	A/B	**100%**	**100%**	100.0%	360	50.0%
Z2A CCW	A/B	**100%**	**100%**	100.0%	360	50.0%
				% Total Composite Coverage =		100.0%
Z2B CW	A/B	**100%**	**100%**	100.0%	226	31.4%
Z2B CCW	A/B	**100%**	**100%**	100.0%	226	31.4%
				% Total Composite Coverage =		62.8%
Z3 CW	A/B	**100%**	**100%**	100.0%	226	31.4%
Z3 CCW	A/B	**100%**	**100%**	100.0%	226	31.4%
				% Total Composite Coverage =		62.8%

Comments: A/B - Examined accessible length. Exam volume determined by modeling, 100% assigned volume.
Scanning limited due to bioshield interference at 316° CW to 37° and thermocouple at 145° CW to 198°.
100% Z2B and Z3 Coverage (Single side access) obtained throughout. See attached drawing. Non-PDI exam.

Note - Rounding methods may make calculated values appear in error.

Zone 2B and Zone 3 Scan Areas
100% Coverage (Single Side) Obtained Throughout.



Q2R17-91

Nir_PDI Qc2.XLS

MANUAL/GERIS 2000 DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT **Quad Cities 2**

PREPARED BY S.C. MORTENSON DATE 01/17/04

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
RECIRC OUTLET								
N/V Weld	PLATE	0 - 9.0"	66.0°	57.8° (52.4°) *	FLAT	18.5"	1 MHz	
N/V Weld	PLATE	0 - 9.0"	70.0°	42.1° 37.0°) *	FLAT	25.3"	1 MHz	
Zone 1/NV (M)	ODBR	20° - 45°	35.0°	90.0°	5.5"	20.7"	1 MHz	W-021, W-022
Zone 2A	ODBR	45° - 90°	60.0°	35.0° (30.6°) **	5.5"	20.4"	1 MHz	W-023, W-024
RECIRC INLET								
N/V Weld	PLATE	0 - 8.0"	60.0°	38.0° (27.3°) *	FLAT	14.0"	1 MHz	
N/V Weld	PLATE	0 - 8.5"	60.0°	45.0° (35.5°) *	FLAT	14.0"	1 MHz	
N/V Weld / Zone 1	PLATE	0 - 8.0"	68.0°	25.7° (16.0°) *	FLAT	21.2"	1 MHz	
Zone 1	PLATE	0 - 9.0"	70.0°	15.6° (8.5°) *	FLAT	22.9"	1 MHz	
Zone 2A	ODBR	55° - 90°	67.5°	18.1° (8.2°) **	3.3"	12.0"	1 MHz	W-025, W-026
FEEDWATER								
N/V Weld	PLATE	0 - 8.0"	60.0°	48.2° (39.2°) *	FLAT	14.0"	1 MHz	
N/V Weld	PLATE	0 - 8.0"	60.0°	38.9° (28.3°) *	FLAT	14.0"	1 MHz	
N/V Weld / Zone 1	ODBR	50° - 90°	43.8°	40.3°(31.8°) **	3.5"	19.3"	2.25 MHz	W-027, W-028
Zone 2A	ODBR	50° - 90°	67.5°	21.7° (13.2°) **	3.5"	13.4"	2.25 MHz	W-029, W-030
Zone 2B	NOZOD	ALL	28.0°	68.0°	FLAT	7.5"	2 MHz	
Zone 3	NOZOD	ALL	28.0°	90°	FLAT	6.7"	2 MHz	

NOTES:		
	*	DESIGN / (FIXTURE) ROTATION FOR 3.0" PKG OFFSET
	#	DESIGN / (FIXTURE) ROTATION FOR 1.45" PKG OFFSET
	**	WEDGE / (FIXTURE) ROTATION ANGLE FOR 2.5" OFFSET
	***	DESIGN / (FIXTURE) ROTATION FOR 1.5" PKG OFFSET
	(M)	MANUAL

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ 704 948-0253

GE Nuclear Energy

GERIS 2000 OD
Nozzle Examination Scan Plan

Quad Cities Unit-2, 2004
Nozzle Scanning Limits
Nozzle(s) N4

12.75	Weld CL Radius	125.50	Vessel ID Radius
18.10	ASME OD Radius	6.38	Vessel Nom. Thickness
16.75	Outside Radius of ODBR	131.88	Vessel OD Radius
13.00	Outside Radius of NOZOD	1.0	Overscan Distance

Package Configuration: Triple Pack and ODBR Package.

Channel	Beam Angle	CPU Angle	Fixture Angle	Type	SU Parameters Delay	Velocity	X-Off	Y-Off	Scan Area	Scanner Min	Max	A-Gate Start	Stop	Max MP	C-Gate Start	Stop
N4	**T-Scan.** Supplement 4 and 6 radial scans.									Step →	0.25	Index →	0.4°			
1	0	0.0	0.0	WM	4	0.233	0.0	0.0	N/A	Note 1	19.25	0	75	8.3	18	54
2	45	-9.0	9.0	T	15	0.128	3.0	0.0	N/A	Note 1	13.25	0	230	13.8	37	191
3	60	7.2	352.8	T	15	0.233	-3.0	0.0	N/A	Note 1	19.25	0	180	19.2	32	152
N4	**P1.** 45° S for outer 85%T volume.									Step →	0.25	Index →	0.5°			
2	45	51.3	308.7	P	15	0.128	3.0	0.0	N/A	Note 1	11.50	0	230	13.8	37	191
4	45	-51.3	51.3	P	15	0.128	-3.0	0.0	N/A	Note 1	11.50	0	230	13.8	37	191
N4	**P2.** N/V Inner 15%T P-scan examination from **PLATE with 70T-scan.**									Step →	0.15	Index →	0.5°			
13	60	39.2	320.8	N/V	15	0.128	-3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
6	70	0.0	0.0	T	10	0.233	0.0	0.0	N/A	Note 1	9.30	0	50	4.7	10	48
14	60	-39.2	39.2	N/V	15	0.128	3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
N4	**P3.** N/V Inner 15%T P-scan examination from **PLATE.**									Step →	0.15	Index →	0.5°			
13	60	28.3	331.7	N/V	15	0.128	-3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
14	60	-28.3	28.3	N/V	15	0.128	3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
N4	**Z1.** Z1 Inner Radius Section examination from **ODBR**									Step →	0.07	Index →	1.7°			
9	43.8	31.8	328.2	Z1	15	0.128	-2.5	0.0	N/A	50°	90°	0	410	19.3	165	335
10	43.8	-31.8	31.8	Z1	15	0.128	2.5	0.0	N/A	50°	90°	0	410	19.3	165	335

QUAD CITIES REPORT NO. Q2R17-01 PAGE 15 OF 16

Channel	Beam Angle	CPU Angle	Fixture Angle	Type	SU Parameters Delay	Velocity	X-Off	Y-Off	Scan Area	Scanner Min	Max	A-Gate Start	Stop	Max MP	C-Gate Start	Stop
N4	**Z2A.** Z2A Inner Radius Section examination from **ODBR**									Step →	0.07	Index →	1.7°			
11	67.5	13.2	346.8	Z2A	15	0.128	-2.5	0.0	N/A	50°	90°	0	290	13.4	115	240
12	67.5	-13.2	13.2	Z2A	15	0.128	2.5	0.0	N/A	50°	90°	0	290	13.4	115	240
N4	**Z2B.** Z2A Inner Radius Section examination from **NOZOD.**									Step →	0.07	Index →	2.2°			
13	28	68.0	292.0	Z2B	15	0.128	-2.5	0.0	N/A	All	All	0	170	7.5	70	150
14	28	-68.0	68.0	Z2B	15	0.128	2.5	0.0	N/A	All	All	0	170	7.5	70	150
N4	**Z3.** Z3 Inner Radius Section examination from **NOZOD.**									Step →	0.07	Index →	2.2°			
13	28	90.0	270.0	Z3	15	0.128	-2.5	0.0	N/A	All	All	0	170	7.5	70	150
14	28	-90.0	90.0	Z3	15	0.128	2.5	0.0	N/A	All	All	0	170	7.5	70	150

Notes: Vessel ID radius from B&W drawing Shell Course Subassembly 151825E-1.
Vessel nominal thickness from B&W drawing Shell Forming Details 104186D-1 (ordered thickness).

Note 1 - Scan into nozzle until onset of liftoff or limited by physical limitations.

Site Revision 0 2/22/04

QUAD CITIES
REPORT NO. Q2-RI7-91
PAGE 16 OF 16

GE NUCLEAR ENERGY
UT EXAMINATION SUMMARY SHEET

Report No: Q2R17-92
WO No: 580044, 580045

PROJECT	Quad Cities Unit-2, Q2R17
WELD ID:	N4C NOZ, N4C IRS and N4C (NUREG 0619)
SYSTEM:	Reactor Pressure Vessel

CALIBRATION ID:	NOZ.IN, NOZ.IN.1, IRS.IN
GERIS DATA:	Scan file types: P1, P2, P3, TL, Z1, Z2A, Z2B and Z3
MANUAL DATA:	UT-067, UT-068
EXAMINERS:	S. Gauthier Lv II, K. Montgomery Lv II, B. Dummer Lv III

Ultrasonic examination results were acceptable to the requirements of ASME B&PV Code Section XI, 1995 Edition with the 1996 Addenda as modified by the PDI program description and the Federal Register, Part II, Nuclear Regulatory Commission, 10 CFR Part 50 for Category B-D Reactor Pressure Vessel (RPV) Assembly Welds and NUREG-0619.

Examination volumes were in accordance with Section XI, Figure IWB-2500-7 (a) and NUREG-0619.

Automated transverse and parallel scans were performed in accordance with procedure GE-UT-705 V4, using 0° L, 60° RL, and 45° S, search units. Nozzle Inner Radius and Inner 15%T examination volume parallel scans were performed using model validated shear wave search units.

Supplemental manual examinations from the ODBR surface (Zones 2A and 3) were performed in accordance with procedure GE-UT-311 V10 to obtain additional coverage, in areas examined by the automated system, due to inadequate ID signal characteristics.

Scanning was performed from the vessel OD shell, OD Blend Radius and OD Nozzle Boss surfaces examining the nozzle to shell weld, nozzle inner radius section and NUREG 0619 specified bore regions.

Two (2) acceptable indications were recorded.

Previous data (QDC-003 and QDC-007 from 1995) was reviewed prior to completing this summary. No significant changes were noted.

Scanning was limited due to the nozzle configuration, thermocouple pad and bioshield interferences.

Coverage = 33%	Nozzle to Shell weld.
Coverage = 100%	Nozzle Inner Radius Section
Coverage = 100%	NUREG-0619 Bore regions.

PREPARED BY / DATE	REVIEWED BY / DATE	UTILITY REVIEW / DATE	ANII REVIEW / DATE
3/6/04	3-6-04	3/16/04	3/19/04
UT Level: III	UT Level: III		

GE Nuclear Energy

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N4C-NOZ

Report No.: Q2R17-92
Exam Data Sheet: N4C-01

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n4c.p1.1	04A	P1	~	NRI	~	NRI	~	~	~	~	~	~	~	~	~	~	1
n4c.p2.1	05A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	1, 2
n4c.p2.2	05A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	1
n4c.p3.1	04A	P3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	1
n4c.tl.1	05A	TL	NRI	001	NRI	~	~	~	~	~	~	~	~	~	~	~	1
n4c.tl.2	05A	TL	NRI	NRI	NRI	~	~	~	~	~	~	~	~	~	~	~	1

Comments: 1 - Plate segregates observed in vessel plate.
2 - Poor contact channel 14, coverage obtained from the opposite direction and P3 channel 14 scans.

Scanning performed with high profile triple pack, low profile tractor and 11" arm. Indication sheet numbers preceeded by "N4C-".
The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: C M
Level: III
Date: 3/4/04

Reviewed By: B M D
Level: III
Date: 3-4-04

Quad Cities Unit-2

GE Nuclear Energy

GERIS 2000
Indication Data Sheet

Project : Quad Cities Unit-2
Component : N4C NOZ
Scan File Name : n4c.tl.1

Channel : 2
Angle : 45°
Direction : 351°

Report No.: Q2R17-92
Exam Data Sheet: N4C-01
Ind. Data Sheet: N4C-001

Ind. No.	Max Amp	SU Radial	Min Azimuth	Depth	Max Amp Azimuth	Depth	Max Azimuth	Depth	Length	Through Wall	Remarks
1	31	18.73	286.4°	5.67	287.6°	5.37	290.1°	5.88	1.21	0.13	PATT
2	34	19.46	298.0°	5.67	299.2°	5.50	300.9°	5.48	0.98	N/A	None.

Comments: See Indication Evaluation Sheet for indication 1.
Indication 2 has no determinable through wall dimension and is acceptable to IWB-3000.
The symbol ~ indicates "No entry required" or "Not Applicable".

Analyst: CB MT
Level: II Date: 3/4/04

Reviewed By: RM Dunn
Level: III Date: 3-4-04

Page 3 of 21

GE Nuclear Energy

GERIS 2000 Indication Evaluation Data Sheet

Project : Quad Cities Unit-2
Weld ID : N4C NOZ
Indication : 1

Report No.: Q2R17-92
Exam Data Sheet : N4C-01
Indication Data Sheet : N4C-001

Flaw Through Wall = 0.13
Flaw Length "l" = 1.21
Surface Separation "S" = 1.0

"T" nominal = 6.38
"T" measured = N/A
Clad "T" nominal = 0.1875

ASME Section XI, 1995 Edition, 1996 Addenda
TABLE IWB-3510-1 for 4" to 12"

a/l	Surface %	Subsurface %	Surface %	Subsurface %
0.00	1.9	2.0	-	-
0.05	2.0	2.2	2.01	2.22 Y
0.10	2.2	2.5	-	-
0.15	2.5	2.9	-	-
0.20	2.8	3.3	-	-
0.25	3.3	3.8	-	-
0.30	3.8	4.4	-	-
0.35	4.4	5.1	-	-
0.40	5.0	5.8	-	-
0.45	5.1	6.7	-	-
0.50	5.2	7.6	-	-
			Allowed 2.01	Allowed 2.22

a = 0.065
a/l value = 0.054
Y = 1.000

Flaw is Subsurface

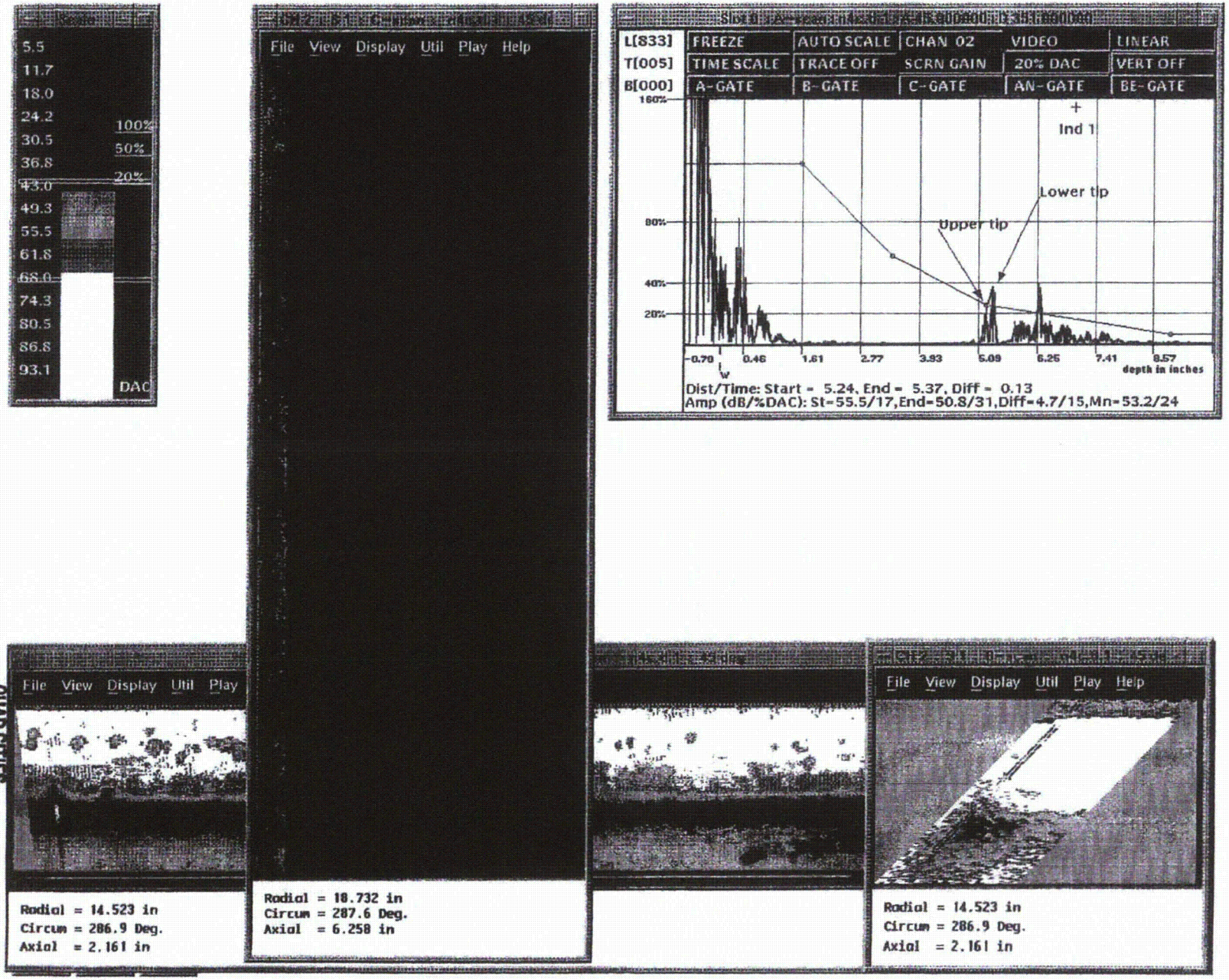
Allowed a/t = 2.22%
ACTUAL a/t = 1.02%

Flaw is acceptable by Table IWB-3510-1.

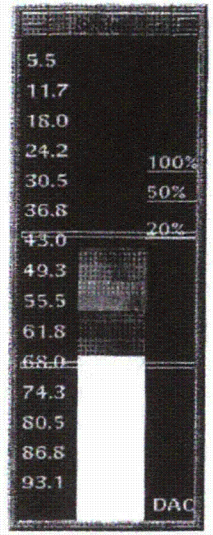
Comments : Indication is a planar flaw aligned with the shell side fusion line, IWB-3510-1 used per IWB-3512.1(b).

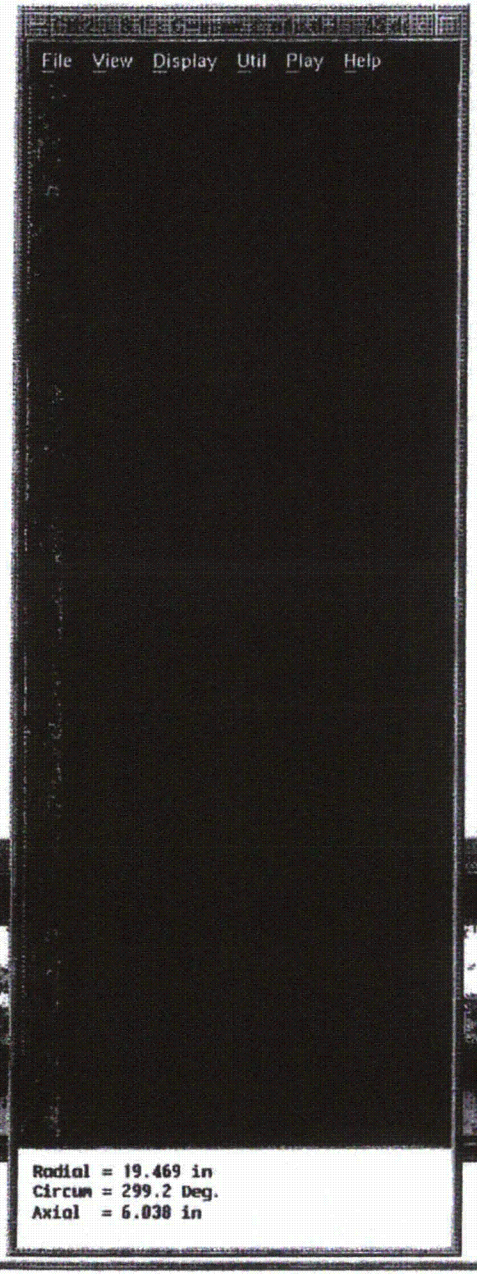
Analyzed By: CBM
Level: III Date: 3/4/04

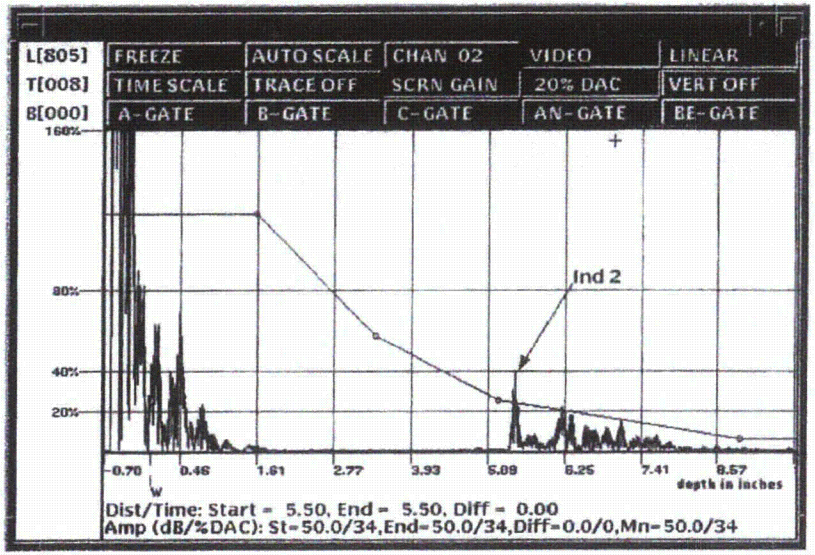
Reviewed By: RMD
Level: III Date: 3-6-04

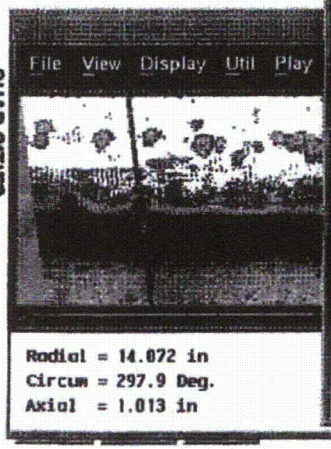


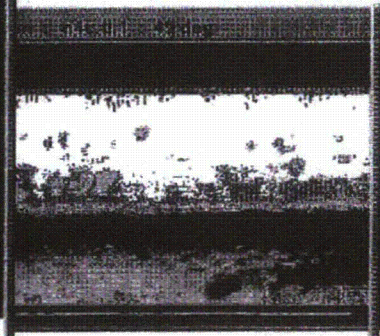
QUAD CITIES
REPORT NO. Q2R17-92
PAGE 5 OF 21

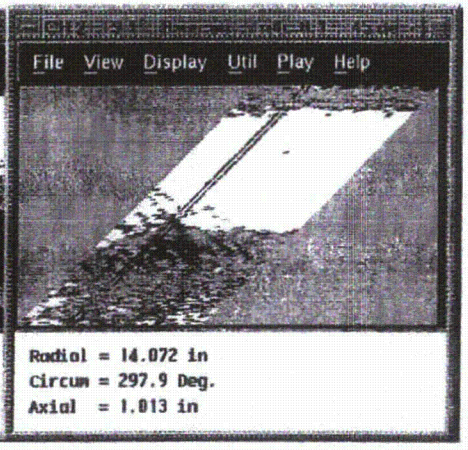












QUAD CITIES
REPORT NO. Q2R17-97
PAGE 77

GE Nuclear Energy

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N4C-IRS

Report No.: Q2R17-92
Exam Data Sheet: N4C-02

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n4c.z1.1	04A	Z1	~	~	~	~	~	~	~	~	NRI	NRI	~	~	~	~	~
n4c.z1.2	04A	Z1	~	~	~	~	~	~	~	~	NRI	NRI	~	~	~	~	~
n4c.z2a.1	04A	Z2A	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~	~	~
n4c.z2a.2	04A	Z2A	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~	~	~

Comments: Scanning performed with ODBR package, low profile tractor and 11" arm.

The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: C M
Level: II
Date: 3/3/04

Reviewed By: B M Dun
Level: III
Date: 3-6-04

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N4C-IRS

Report No.: Q2R17-92
Exam Data Sheet: N4C-03

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n4c.z2b.1	05A	Z2B	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4c.z2b.2	05A	Z2B	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4c.z2b.3	05A	Z2B	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4c.z3.1	06A	Z3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4c.z3.2	06A	Z3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~

Comments: Scanning performed with NOZOD package, safe end tractor and safe end.

The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: CPM
Level: TII Date: 3/4/04

Reviewed By: RMD
Level: III Date: 3-6-04

Quad Cities Unit-2, Q2R17

GERIS 2000 OD EXAMINATION SCAN FILES DATA SHEET

CUSTOMER: **Exelon**
SITE: **Quad Cities Unit-2**
OUTAGE: **Q2R17**

PROCEDURE NO. : GE-UT-705 V4 **REVISION :** N/A **DRR :** N/A

FILE NAME	WELD	DISK NO.	DATE	EXAM START TIME	EXAM STOP TIME	SCAN START	SCAN STOP	SCAN AREA	VESSEL TEMP. (°F)	CAL RECHECK IN	CAL RECHECK OUT	CAL RECORD
n4c.p3.1	N4C NOZ	04A	02/03/04	0232	0340	270°	271°	361°	102°	N/A	N/A	NOZ.IN
n4c.p1.1	N4C NOZ	04A	02/03/04	0433	0539	270°	269°	361°	102°	N/A	N/A	NOZ.IN
n4c.p2.1	N4C NOZ	05A	02/03/04	0620	0647	270°	51°	141°	102°	N/A	N/A	NOZ.IN
n4c.p2.2	N4C NOZ	05A	02/03/04	0753	0850	340°	271°	291°	102°	N/A	N/A	NOZ.IN
n4c.tl.1	N4C NOZ	05A	02/03/04	0951	1126	270°	291°	339°	102°	N/A	N/A	NOZ.IN.1
n4c.tl.2	N4C NOZ	05A	02/03/04	1132	1136	285°	268°	17°	102°	N/A	N/A	NOZ.IN.1

Q2R17-92

COMMENTS : * Rotation angles for TL and P exams per the GERIS 2000 nozzle to vessel scan-plan sheet (attached).
The GERIS 0° reference is located 90° CW of nozzle TDC.
Recalibration due to Ch. 3, 60°L, 97-154 failing, replaced with 97-153 after recalibration
Automated scanning was restricted due to the nozzle weld configuration.

OPERATORS: SHANE GAUTHIER LvII
KENT MONTGOMERY LvII

SOFTWARE REVISION: 5.26
THERMOMETER S/N : 235018
COUPLANT : Demineralized Water

Search Unit Data:

No.	Model / Mode	S/N	Size	Freq. (MHz.)	Rot. Angle
1	RTD, 0° L2.25 / L	01-231	1.0 Dia	2.25	N/A
2	RTD, 45° T1-St / S	01-233	32x22mm	1.00	*
3	RTD, 60° L2-St / L	97-153	30x25mm	2.00	*
4	RTD, 45° T1-St /S	04-8	32x22mm	1.00	*
6	RTD, 70° TRL2-St / L	96-228	2(12x25)mm	2.00	*
13	RTD, 60° T1-St / S	01-234	32x18mm	1.00	*
14	RTD, 60° T1-St / S	01-235	32x18mm	1.00	*

Page 9 of 21

Quad Cities Unit-2, Q2R17

Q2R17-92

GERIS 2000 OD EXAMINATION SCAN FILES DATA SHEET

CUSTOMER: **Exelon**
SITE: **Quad Cities Unit-2**
OUTAGE: **Q2R17**

PROCEDURE NO. : GE-UT-705 V4 **REVISION :** N/A **DRR :** N/A

FILE NAME	WELD	DISK NO.	DATE	EXAM START TIME	EXAM STOP TIME	SCAN START	SCAN STOP	SCAN AREA	VESSEL TEMP. (°F)	CAL RECHECK IN	CAL RECHECK OUT	CAL RECORD
n4c.z1.1	N4C IRS	04A	03/03/04	1423	1440	268°	98°	170°	102°	N/A	N/A	IRS.IN
n4c.z1.2	N4C IRS	04A	03/03/04	1448	1505	100°	268°	192°	102°	N/A	N/A	IRS.IN
n4c.z2a.1	N4C IRS	04A	03/03/04	1246	1301	271°	58°	147°	102°	N/A	N/A	IRS.IN
n4c.z2a.2	N4C IRS	04A	03/03/04	1319	1354	57°	272°	215°	102°	N/A	N/A	IRS.IN
n4c.z2b.1	N4C IRS	05A	03/04/04	1143	1153	321°	193°	128°	98°	N/A	N/A	IRS.IN
n4c.z2b.2	N4C IRS	05A	03/04/04	1223	1242	321°	193°	128°	98°	N/A	N/A	IRS.IN
n4c.z2b.3	N4C IRS	05A	03/04/04	1248	1256	138°	35°	103°	98°	N/A	N/A	IRS.IN
n4c.z3.1	N4C IRS	06A	03/04/04	1545	1553	321°	193°	128°	98°	N/A	N/A	IRS.IN
n4c.z3.2	N4C IRS	06A	03/04/04	1600	1610	138°	36°	102°	98°	N/A	N/A	IRS.IN

COMMENTS : * Rotation angles for all exams per the GERIS 2000 nozzle to vessel scan-plan sheet (attached).
The GERIS 0° reference is located 90° CW of nozzle TDC.
Z1 and Z2A exams unrestricted. Z2B and Z3 scans limited by thermocouples and bioshield interference.

OPERATORS: SHANE GAUTHIER Lvll
KENT MONTGOMERY Lvll

SOFTWARE REVISION: 5.26
THERMOMETER S/N : 235018
COUPLANT : Demineralized Water

Search Unit Data:

No.	Model / Mode	S/N	Size	Freq. (MHz.)	Rot. Angle
9	KBA, 389-018-980 / S	00XL6V	0.5 x 1.0	2.25	N/A
10	KBA, 389-018-980 / S	00XL6Y	0.5 x 1.0	2.25	*
11	KBA, 389-018-980 / S	00XL6L	0.5 x 1.0	2.25	*
12	KBA, 389-018-980 / S	00XL6M	0.5 x 1.0	2.25	*
13	RTD, 28° T2-St / S	98-1178	18 x 14mm	2.00	*
14	RTD, 28° T2-St / S	01-240	18 x 14mm	2.00	*

Page 10 of 21

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record
Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R17
Procedure: GE-UT-311

Data Report Number: Q2R17-92   Linearity Sheet: L-008
Data Sheet Number: UT-087
Rev: V10   DRR: N/A

Calibration Data for Block: 99978 AQC

Material: CSCL   Size: N/A   Thickness: 7.3"

Initial Cal: 1520   Exam Start: 16:10
Cal Check: N/A   Exam End: 16:30
Cal Check: N/A   Couplant: Ultragel II   Batch: 01225
Final Cal: 1725

Thermometer: ~~255010~~ 213501 3/19/04   Initial Cal Temp: 89° F   Final Cal Temp: 89° F

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID	7.3	1X	80	19.4	20.65	8.2
		1X				

DAC @ 1X 61

Sweep 0-10 25 Metal Path

Acceptable Linearity performed : 2/10/2004

Exam Data for Component: N4C IRS

Configuration: VESSEL-NOZZLE (FEEDWATER)

Exam Surface: ODBR   Component Temp: 99° F

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
360°	67.5	21.7	W-029B	70	NRI

Search Unit Data

Manufacturer: KBA   Serial No.: 004NMY   Size/Shape: 0.5"x1.0" / Rect.
Incident Point: 0.0 In.   Nominal Angle: 70°   Measured Angle: 68°
Frequency: 2.25 MHz   Model: 113-292-600   Mode: Shear

Search Unit Cable

Cable Type: RG-174   Length: 12'   Connectors: 0

Instrument Settings

Maufacturer/Model: Panametrics / Epoch 4   Serial No.: 031573711
Zero: 16.4 µs   Velocity: 0.1283 in /µsec   Narrowband Filter: 0.8 - 3.0 MHz
Rep Rate: Auto   Rectification: Full   Range: 25.0 In.   Pulser/Energy: Sq. / Med
Damping: 400 Ohms   Reject: Off   Frequency: 2.0 MHz   Mode: P/E
DAC: Off: TVG: Off: CSC: Off: DGS: Off:

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration.

Calibration for Zone 2A CCW.
Exams performed to maintain a 5% FSH ID roll.

Initials: BD   Examiner: Brad Dummer   Level: III   Cal/Exam Date: 3/5/04
Utility Reviewed By: [signature]   Date: 3/10/04

GE Reviewed By: [signature]   Level: III   Date: 3/6/04
ANII Reviewed By: [signature]   Date: 3/19/04

Page 11 of 21

GE NUCLEAR ENERGY

Ultrasonic Calibration and Examination Record Inner Radius Examinations

Site/Unit: Quad Cities / 2
Outage: Q2R17
Procedure: GE-UT-311

Data Report Number: Q2R17-92 Linearity Sheet: L-008
Data Sheet Number: UT-068
Rev: V10 DRR: N/A

Calibration Data for Block: 99978 AQC

Material	Size	Thickness
CSCL	N/A	7.3"

Initial Cal: 1520 Exam Start 16:10
Cal Check: N/A Exam End 16:30
Cal Check: N/A Couplant: Ultragel II Batch: 01225
Final Cal: 1725

Thermometer: ~~285018~~ 285018 (3-14-04) Initial Cal Temp.: 89° F Final Cal Temp: 89° F

DAC Construction

Side	Depth	Gain @ 1X	Max Amp	"W" Dim.	Sweep	Screen Div.
ID	7.3	1X	80	19.4	20.65	8.2
		1X				

DAC @ 1X 58

Sweep 0-10 25 Metal Path

Acceptable Linearity performed : 2/10/2004

Search Unit Data

Manufacturer:	Serial No.:	Size/Shape:
KBA	010HXL	0.5"x1.0" / Rect

Incident Point:	Nominal Angle:	Measured Angle:
0.0 in.	70°	68°

Frequency:	Model:	Mode:
2.25 MHz	113-892-600	Shear

Search Unit Cable

Cable Type:	Length:	Connectors:
RG-174	12'	0

Instrument Settings

Maufacturer/Model: Panametrics / Epoch 4 Serial No.: 031573711

Zero:	Velocity:	Narrowband Filter:
16.4 µs	0.1283 in /µsec	0.8 - 3.0 MHz

Rep Rate:	Rectification:	Range:	Pulser/Energy
Auto	Full	25.0 in.	Sq. / Med

Damping:	Reject:	Frequency:	Mode:
400 Ohms	Off	2.0 MHz	P/E

DAC:	TVG:	CSC:	DGS:
Off:	Off:	Off:	Off:

Exam Data for Component: N4C IRS

VESSEL-NOZZLE (FEEDWATER)
Configuration:

Exam Surface: ODBR Component Temp.: 89° F

Examination Area	Exam Angle	Rotation Angle	Wedge S/N	Scan dB	Recordable Indications
360°	67.5	21.7	W-029A	70	NRI

Calibration Verification

Field Simulator Block S/N: N/A

Reflector	N/A	N/A	N/A
Amplitude	N/A	N/A	N/A
Gain (dB)	N/A	N/A	N/A
Sweep (SD)	N/A	N/A	N/A

Comments: Cal/Exam Date is the date of initial calibration.

Calibration for Zone 2A CW.
Exams performed to maintain a 5% FSH ID roll.

Initials:	Examiner:	Level	Cal/Exam Date:	Utility Reviewed By:	Date:
BD	Brad Dummer	III	3/5/04	[signature]	3/4/04

GE Reviewed By:	Level:	Date:	ANII Reviewed By:	Date:
[signature]	III	3/6/04	[signature]	3/19/04

Page 12 of 21

Report No.: Q2R17-92

Feedwater N4C-NOZ
Quad Cities Unit-2, 2004

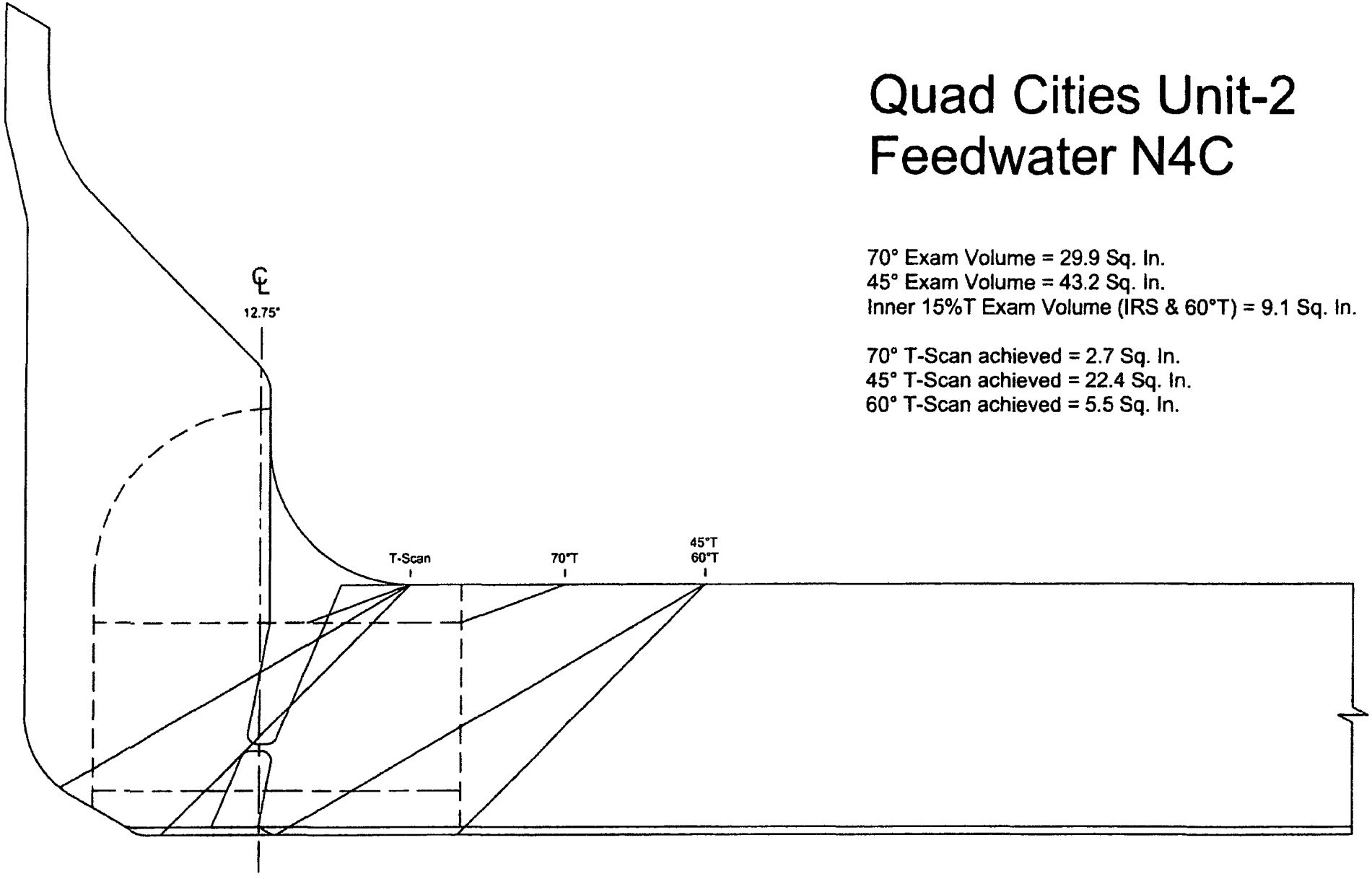
		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 82.2		**Required Exam Area Sq. In.**	**Area Scanned Auto**	**Percent of Area Auto**	**Weld Length Auto**	**Percent Auto**
70° T-Scan	A	29.9	2.7	3.3%	356	1.6%
45° T-Scan	A	43.2	22.4	27.3%	356	13.5%
60° T-Scan	A	9.1	5.5	6.7%	356	3.3%
70° P-Scan	A	29.9	0	0.0%	360	0.0%
45° P-Scan	A	43.2	14.9	18.1%	360	9.1%
60° P-Scan	A	9.1	9.1	11.1%	360	5.5%
70° T-Scan						
45° T-Scan						
60° T-Scan						
70° P-Scan						
45° P-Scan						
60° P-Scan						
70° T-Scan						
45° T-Scan						
60° T-Scan						
70° P-Scan						
45° P-Scan						
60° P-Scan						

% Total Composite Coverage = 33%

Comments: A - Examined accessible length. Scanning limited due to scanner access.
N4C TL scans lost 4° coverage due to position error.

Note - Rounding methods may make calculated values appear in error.

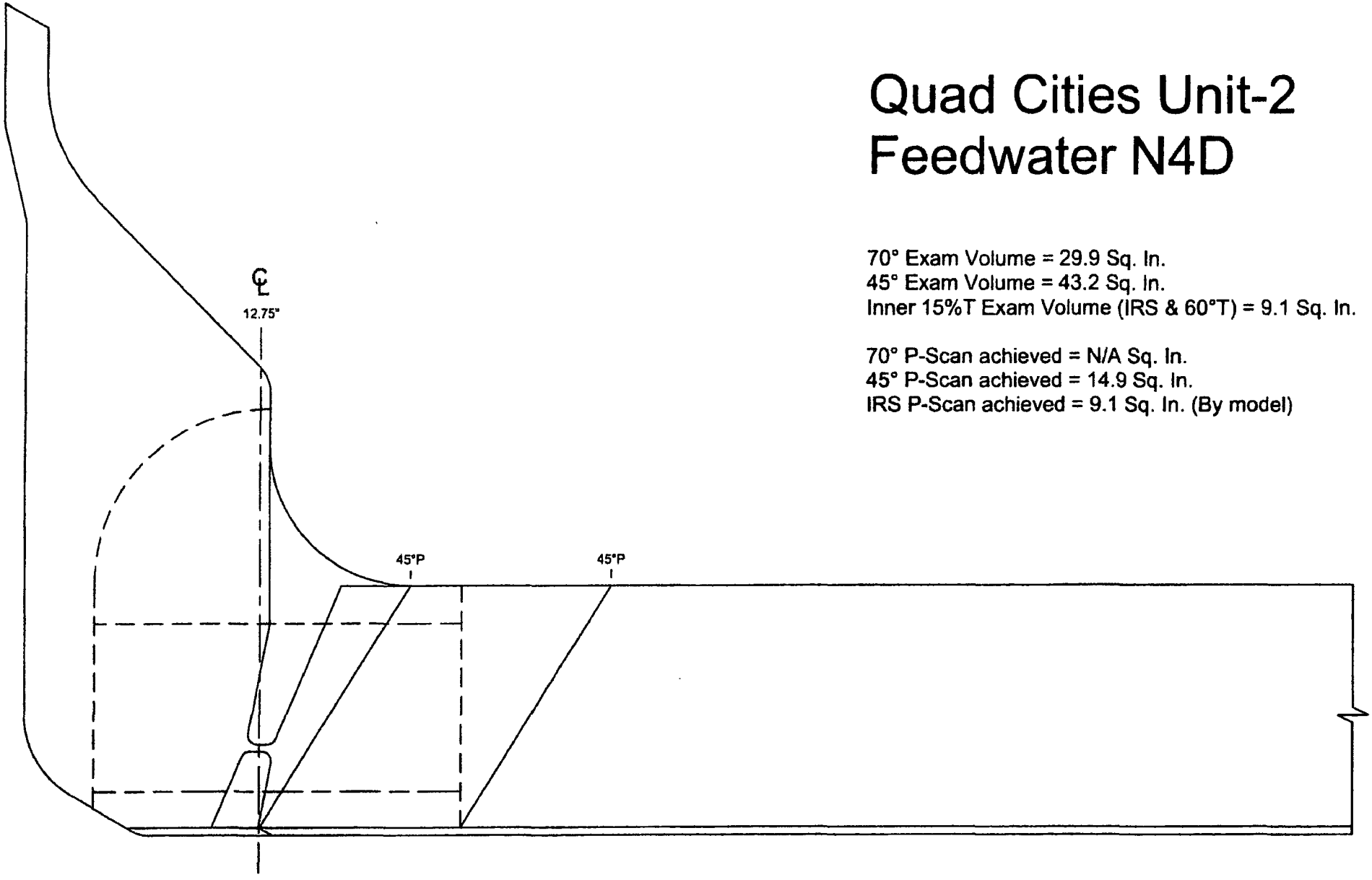
Quad Cities Unit-2 Feedwater N4C



70° Exam Volume = 29.9 Sq. In.
45° Exam Volume = 43.2 Sq. In.
Inner 15%T Exam Volume (IRS & 60°T) = 9.1 Sq. In.

70° T-Scan achieved = 2.7 Sq. In.
45° T-Scan achieved = 22.4 Sq. In.
60° T-Scan achieved = 5.5 Sq. In.

Quad Cities Unit-2 Feedwater N4D



70° Exam Volume = 29.9 Sq. In.
45° Exam Volume = 43.2 Sq. In.
Inner 15%T Exam Volume (IRS & 60°T) = 9.1 Sq. In.

70° P-Scan achieved = N/A Sq. In.
45° P-Scan achieved = 14.9 Sq. In.
IRS P-Scan achieved = 9.1 Sq. In. (By model)

Guideline for Deciding when to Perform Manual UT Examination of Areas Not Covered by Automated Examinations

Component/Configuration: N4C N02

A. DETERMINE

1. Percent coverage obtained with automated UT: 33 %

2. Approximate radiation dose received to complete automated UT: 1800 mR

B. ESTIMATE

1. Percent coverage increases if manual UT was performed: +7 % *

2. Radiation dose expected if manual UT was performed: 2000 mR

Decision to Proceed: ____YES X NO **Based On:** DOSE

Prepared By: R. L. May **Date:** 03/05/04

* ALL UPPER WELD COVERAGE, NOT WELD OR HAZ ON I.S.

Q2R17-92
16 of 21

Report No.: Q2R17-92

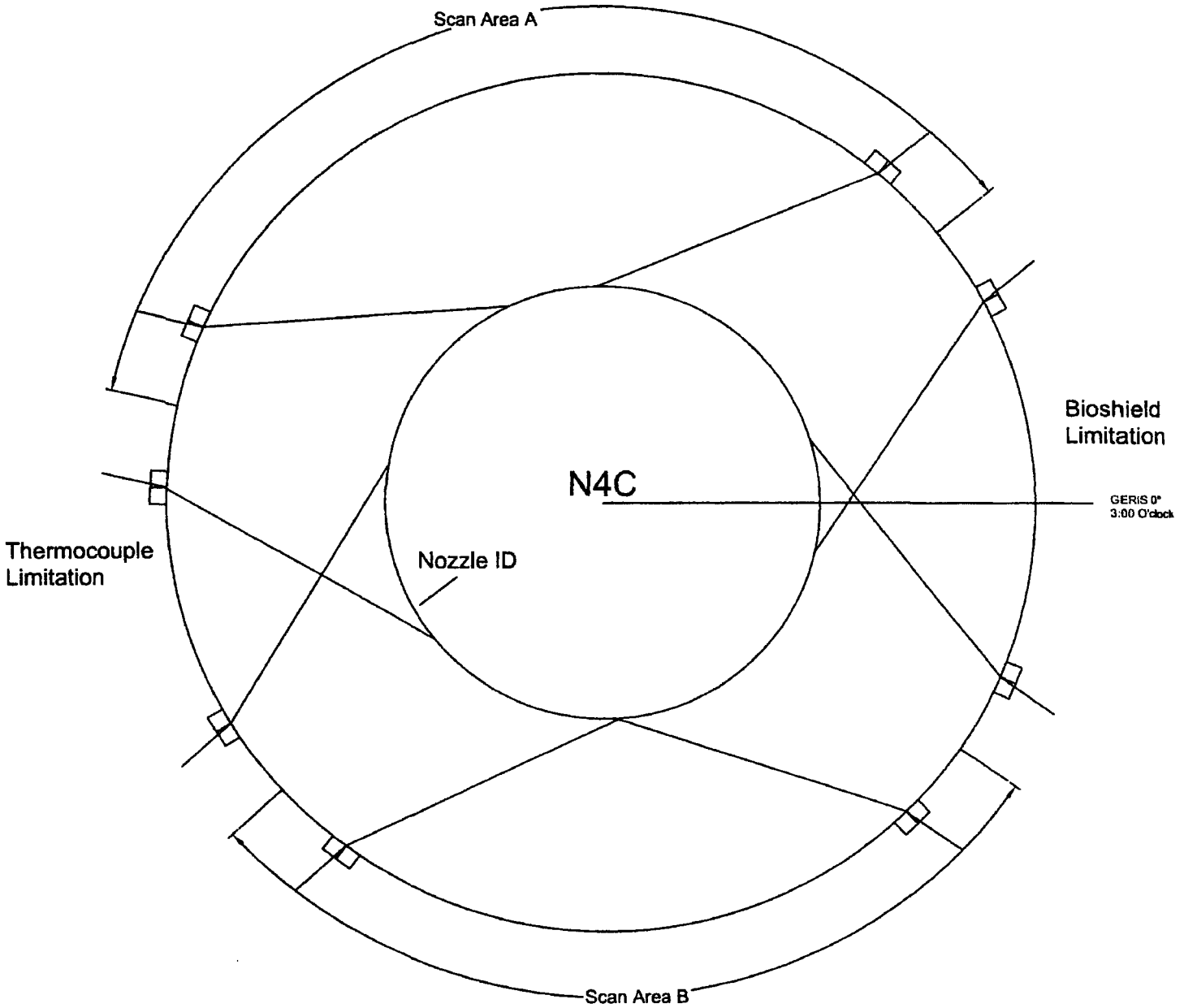
Feedwater N4C-IRS
Quad Cities Unit-2, 2004

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 100%		**Required Exam Area %**	**Area Scanned Auto**	**Percent of Area Auto**	**Weld Length Auto**	**Percent Auto**
Z1 CW	A/B	**100%**	**100%**	100.0%	360	50.0%
Z1 CCW	A/B	**100%**	**100%**	100.0%	360	50.0%
				% Total Composite Coverage =		100.0%
Z2A CW	A/B	**100%**	**100%**	100.0%	360	50.0%
Z2A CCW	A/B	**100%**	**100%**	100.0%	360	50.0%
				% Total Composite Coverage =		100.0%
Z2B CW	A/B	**100%**	**100%**	100.0%	230	31.9%
Z2B CCW	A/B	**100%**	**100%**	100.0%	230	31.9%
				% Total Composite Coverage =		63.9%
Z3 CW	A/B	**100%**	**100%**	100.0%	230	31.9%
Z3 CCW	A/B	**100%**	**100%**	100.0%	230	31.9%
				% Total Composite Coverage =		63.9%

Comments: A/B - Examined accessible length. Exam volume determined by modeling, 100% assigned volume.
Scanning limited due to bioshield interference at 321° CW to 36° and thermocouple at 138° CW to 193°.
100% Z2B and Z3 Coverage (Single side access) obtained throughout. See attached drawing. Z2A and Z3 are non-PDI exams.

Note - Rounding methods may make calculated values appear in error.

Zone 2B and Zone 3 Scan Areas
100% Coverage (Single Side) Obtained Throughout.



Q2R17-92

Nir_PDI Qc2.XLS

MANUAL/GERIS 2000 DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT **Quad Cities 2**

PREPARED BY S.C. MORTENSON DATE 01/17/04

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
RECIRC OUTLET								
N/V Weld	PLATE	0 - 9.0"	66.0°	57.8° (52.4°) *	FLAT	18.5"	1 MHz	
N/V Weld	PLATE	0 - 9.0"	70.0°	42.1° 37.0°) *	FLAT	25.3"	1 MHz	
Zone 1/NV (M)	ODBR	20° - 45°	35.0°	90.0°	5.5"	20.7"	1 MHz	W-021, W-022
Zone 2A	ODBR	45° - 90°	60.0°	35.0° (30.6°) **	5.5"	20.4"	1 MHz	W-023, W-024
RECIRC INLET								
N/V Weld	PLATE	0 - 8.0"	60.0°	38.0° (27.3°) *	FLAT	14.0"	1 MHz	
N/V Weld	PLATE	0 - 8.5"	60.0°	45.0° (35.5°) *	FLAT	14.0"	1 MHz	
N/V Weld / Zone 1	PLATE	0 - 8.0"	68.0°	25.7° (16.0°) *	FLAT	21.2"	1 MHz	
Zone 1	PLATE	0 - 9.0"	70.0°	15.6° (8.5°) *	FLAT	22.9"	1 MHz	
Zone 2A	ODBR	55° - 90°	67.5°	18.1° (8.2°) **	3.3"	12.0"	1 MHz	W-025, W-026
FEEDWATER								
N/V Weld	PLATE	0 - 8.0"	60.0°	48.2° (39.2°) *	FLAT	14.0"	1 MHz	
N/V Weld	PLATE	0 - 8.0"	60.0°	38.9° (28.3°) *	FLAT	14.0"	1 MHz	
N/V Weld / Zone 1	ODBR	50° - 90°	43.8°	40.3°(31.8°) **	3.5"	19.3"	2.25 MHz	W-027, W-028
Zone 2A	ODBR	50° - 90°	67.5°	21.7° (13.2°) **	3.5"	13.4"	2.25 MHz	W-029, W-030
Zone 2B	NOZOD	ALL	28.0°	68.0°	FLAT	7.5"	2 MHz	
Zone 3	NOZOD	ALL	28.0°	90°	FLAT	6.7"	2 MHz	

NOTES:		
	*	DESIGN / (FIXTURE) ROTATION FOR 3.0" PKG OFFSET
	#	DESIGN / (FIXTURE) ROTATION FOR 1.45" PKG OFFSET
	**	WEDGE / (FIXTURE) ROTATION ANGLE FOR 2.5" OFFSET
	***	DESIGN / (FIXTURE) ROTATION FOR 1.5" PKG OFFSET
	(M)	MANUAL

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ 704 948-0253

GE Nuclear Energy

GERIS 2000 OD
Nozzle Examination Scan Plan

Quad Cities Unit-2, 2004
Nozzle Scanning Limits
Nozzle(s) N4

12.75	Weld CL Radius	125.50	Vessel ID Radius
18.10	ASME OD Radius	6.38	Vessel Nom. Thickness
16.75	Outside Radius of ODBR	131.88	Vessel OD Radius
13.00	Outside Radius of NOZOD	1.0	Overscan Distance

Package Configuration: Triple Pack and ODBR Package.

Channel	Beam Angle	CPU Angle	Fixture Angle	Type	SU Parameters Delay	Velocity	X-Off	Y-Off	Scan Area	Scanner Min	Max	A-Gate Start	Stop	Max MP	C-Gate Start	Stop
N4	**T-Scan.** Supplement 4 and 6 radial scans.									Step →	0.25	Index →	0.4°			
1	0	0.0	0.0	WM	4	0.233	0.0	0.0	N/A	Note 1	19.25	0	75	8.3	18	54
2	45	-9.0	9.0	T	15	0.128	3.0	0.0	N/A	Note 1	13.25	0	230	13.8	37	191
3	60	7.2	352.8	T	15	0.233	-3.0	0.0	N/A	Note 1	19.25	0	180	19.2	32	152
N4	**P1.** 45° S for outer 85%T volume.									Step →	0.25	Index →	0.5°			
2	45	51.3	308.7	P	15	0.128	3.0	0.0	N/A	Note 1	11.50	0	230	13.8	37	191
4	45	-51.3	51.3	P	15	0.128	-3.0	0.0	N/A	Note 1	11.50	0	230	13.8	37	191
N4	**P2.** N/V Inner 15%T P-scan examination from **PLATE with 70T-scan.**									Step →	0.15	Index →	0.5°			
13	60	39.2	320.8	N/V	15	0.128	-3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
6	70	0.0	0.0	T	10	0.233	0.0	0.0	N/A	Note 1	9.30	0	50	4.7	10	48
14	60	-39.2	39.2	N/V	15	0.128	3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
N4	**P3.** N/V Inner 15%T P-scan examination from **PLATE.**									Step →	0.15	Index →	0.5°			
13	60	28.3	331.7	N/V	15	0.128	-3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
14	60	-28.3	28.3	N/V	15	0.128	3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
N4	**Z1.** Z1 Inner Radius Section examination from **ODBR**									Step →	0.07	Index →	1.7°			
9	43.8	31.8	328.2	Z1	15	0.128	-2.5	0.0	N/A	50°	90°	0	410	19.3	165	335
10	43.8	-31.8	31.8	Z1	15	0.128	2.5	0.0	N/A	50°	90°	0	410	19.3	165	335

QUAD CITIES REPORT NO. 22R17-92 PAGE 21 OF 21

Channel	Beam Angle	CPU Angle	Fixture Angle	Type	SU Parameters Delay	Velocity	X-Off	Y-Off	Scan Area	Scanner Min	Max	A-Gate Start	Stop	Max MP	C-Gate Start	Stop
N4	**Z2A.** Z2A Inner Radius Section examination from **ODBR**									Step →	0.07	Index →	1.7°			
11	67.5	13.2	346.8	Z2A	15	0.128	-2.5	0.0	N/A	50°	90°	0	290	13.4	115	240
12	67.5	-13.2	13.2	Z2A	15	0.128	2.5	0.0	N/A	50°	90°	0	290	13.4	115	240
N4	**Z2B.** Z2A Inner Radius Section examination from **NOZOD.**									Step →	0.07	Index →	2.2°			
13	28	68.0	292.0	Z2B	15	0.128	-2.5	0.0	N/A	All	All	0	170	7.5	70	150
14	28	-68.0	68.0	Z2B	15	0.128	2.5	0.0	N/A	All	All	0	170	7.5	70	150
N4	**Z3.** Z3 Inner Radius Section examination from **NOZOD.**									Step →	0.07	Index →	2.2°			
13	28	90.0	270.0	Z3	15	0.128	-2.5	0.0	N/A	All	All	0	170	7.5	70	150
14	28	-90.0	90.0	Z3	15	0.128	2.5	0.0	N/A	All	All	0	170	7.5	70	150

Notes: Vessel ID radius from B&W drawing Shell Course Subassembly 151825E-1.
Vessel nominal thickness from B&W drawing Shell Forming Details 104186D-1 (ordered thickness).

Note 1 - Scan into nozzle until onset of liftoff or limited by physical limitations.

Site Revision 0 2/22/04

QUAD CITIES
REPORT NO. Q2R17-92
PAGE 21 OF 21

GE NUCLEAR ENERGY
UT EXAMINATION SUMMARY SHEET

Report No: Q2R17-93
WO No: 580042, 580043

PROJECT	Quad Cities Unit-2, Q2R17
WELD ID:	N4D NOZ, N4D IRS and N4D (NUREG 0619)
SYSTEM:	Reactor Pressure Vessel

CALIBRATION ID:	NOZ.IN, NOZ.IN.1, IRS.IN
GERIS DATA:	Scan file types: P1, P2, P3, TL, Z1, Z2A, Z2B and Z3
MANUAL DATA:	N/A
EXAMINERS:	S. Gauthier Lv II, K. Montgomery Lv II

Ultrasonic examination results were acceptable to the requirements of ASME B&PV Code Section XI, 1995 Edition with the 1996 Addenda as modified by the PDI program description and the Federal Register, Part II, Nuclear Regulatory Commission, 10 CFR Part 50 for Category B-D Reactor Pressure Vessel (RPV) Assembly Welds and NUREG-0619.

Examination volumes were in accordance with Section XI, Figure IWB-2500-7 (a) and NUREG-0619.

Automated transverse and parallel scans were performed in accordance with procedure GE-UT-705 V4, using 0° L, 60° RL, and 45° S, search units. Nozzle Inner Radius and Inner 15%T examination volume parallel scans were performed using model validated shear wave search units.

Scanning was performed from the vessel OD shell, OD Blend Radius and OD Nozzle Boss surfaces examining the nozzle to shell weld, nozzle inner radius section and NUREG 0619 specified bore regions.

No indications were recorded.

Previous data (QDC-004 and QDC-008 from 1995) was reviewed prior to completing this summary. No significant changes were noted.

Scanning was limited due to the nozzle configuration and bioshield interferences.

Coverage = 33%	Nozzle to Shell weld.
Coverage = 100%	Nozzle Inner Radius Section
Coverage = 100%	NUREG-0619 Bore regions.

PREPARED BY / DATE	REVIEWED BY / DATE	UTILITY REVIEW / DATE	ANII REVIEW / DATE
3/6/04	3-6-04	3/11/04	3/19/04
UT Level: III	UT Level: III		

GE Nuclear Energy

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N4D-NOZ

Report No.: Q2R17-93
Exam Data Sheet: N4D-01

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n4d.p1.1	03B	P1	~	NRI	~	NRI	~	~	~	~	~	~	~	~	~	~	~
n4d.p1.2	03B	P1	~	NRI	~	NRI	~	~	~	~	~	~	~	~	~	~	~
n4d.p2.1	03A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	~
n4d.p2.2	03A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	~
n4d.p2.3	03A	P2	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	~
n4d.p3.1	03B	P3	~	~	~	~	~	NRI	~	~	~	~	~	~	NRI	NRI	~
n4d.p3.2	Void	Void	~	~	~	~	~	~	~	~	~	~	~	~	Void	Void	~
n4d.p3.3	03B	P3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4d.p3.4	03B	P3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4d.p3.5	03B	P3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4d.tl.1	04A	TL	NRI	NRI	NRI	~	~	~	~	~	~	~	~	~	~	~	~

Comments: Scan file n4dp3.2 void.

Scanning performed with high profile triple pack, low profile tractor and 11" arm.
The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: [signature]
Level: III Date: 3/3/03

Reviewed By: [signature]
Level: III Date: 3-6-04

Quad Cities Unit-2, 2004

GE Nuclear Energy

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N4D-IRS

Report No.: Q2R17-93
Exam Data Sheet: N4D-02

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n4d.z1.1	03A	Z1	~	~	~	~	~	~	~	~	~	Void	Void	~	~	~	Void
n4d.z1.2	03A	Z1	~	~	~	~	~	~	~	~	~	NRI	NRI	~	~	~	~
n4d.z2a.1	03A	Z2A	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~	~
n4d.z2a.2	03A	Z2A	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~

Comments: Scanning performed with ODBR package, low profile tractor and 11" arm.

The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: [signature]
Level: II
Date: 3/2/04

Reviewed By: [signature]
Level: III
Date: 3-6-04

Page 3 of 15

Quad Cities Unit-2, 2004

GE Nuclear Energy

GERIS 2000
Examination Data Sheet

Project : Quad Cities Unit-2, 2004
Component : N4D-IRS

Report No.: Q2R17-93
Exam Data Sheet: N4D-03

File	Disk	Scan Type	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	Remarks
n4d.z2b.1	06A	Z2B	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4d.z2b.2	06A	Z2B	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
n4d.z3.1	06A	Z3	~	~	~	~	~	~	~	~	~	~	~	~	NRI	NRI	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~

Comments: Scanning performed with NOZOD package, safe end tractor and safe end arm.

The symbol ~ indicates "No entry required" or "Not Applicable". NRI indicates "No Recordable Indications".

Analyst: [signature] Level: III Date: 3/4/04

Reviewed By: [signature] Level: III Date: 3-6-04

Page 4 of 15

Quad Cities Unit-2, Q2R17

Q2R17-93

GERIS 2000 OD EXAMINATION SCAN FILES DATA SHEET

CUSTOMER: **Exelon**
SITE: **Quad Cities Unit-2**
OUTAGE: **Q2R17**

PROCEDURE NO. : GE-UT-705 V4 **REVISION :** N/A **DRR :** N/A

FILE NAME	WELD	DISK NO.	DATE	EXAM START TIME	EXAM STOP TIME	SCAN START	SCAN STOP	SCAN AREA	VESSEL TEMP. (°F)	CAL RECHECK IN	CAL RECHECK OUT	CAL RECORD
n4d.p1.1	N4D NOZ	03B	03/02/04	1337	1408	270°	120°	150°	92°	N/A	N/A	NOZ.IN
n4d.p1.2	N4D NOZ	03B	03/02/04	1425	1453	121°	269°	212°	92°	N/A	N/A	NOZ.IN
n4d.p2.1	N4D NOZ	03A	03/02/04	1113	1139	270°	326°	56°	92°	N/A	N/A	NOZ.IN
n4d.p2.2	N4D NOZ	03A	03/02/04	1158	1253	325°	237°	272°	92°	N/A	N/A	NOZ.IN
n4d.p2.3	N4D NOZ	03A	03/02/04	1308	1315	236°	271°	35°	92°	N/A	N/A	NOZ.IN
n4d.p3.1	N4D NOZ	03B	03/02/04	1535	1614	270°	12°	102°	92°	N/A	N/A	NOZ.IN
n4d.p3.2	Void	Void	Void	~	~	~	~	~	~	~	~	Void
n4d.p3.3	N4D NOZ	03B	03/02/04	1803	1834	271°	137°	134°	92°	N/A	N/A	NOZ.IN
n4d.p3.4	N4D NOZ	03B	03/02/04	1845	1854	150°	124°	26°	92°	N/A	N/A	NOZ.IN
n4d.p3.5	N4D NOZ	03B	03/02/04	1946	2007	11°	120°	109°	92°	N/A	N/A	NOZ.IN
n4d.tl.1	N4D NOZ	04A	03/02/04	2153	2318	270°	271°	361°	97°	N/A	N/A	NOZ.IN

COMMENTS : * Rotation angles for TL and P exams per the GERIS 2000 nozzle to vessel scan-plan sheet (attached).
The GERIS 0° reference is located 90° CW of nozzle TDC.

Automated scanning was restricted due to the nozzle weld configuration.

OPERATORS: SHANE GAUTHIER LvII
KENT MONTGOMERY LvII

SOFTWARE REVISION: 5.26
THERMOMETER S/N : 235018, 235074
COUPLANT : Demineralized Water

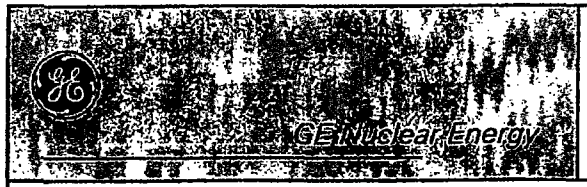
Search Unit Data:

No.	Model / Mode	S/N	Size	Freq. (MHz.)	Rot. Angle
1	RTD, 0° L2.25 / L	01-231	1.0 Dia	2.25	N/A
2	RTD, 45° T1-St / S	01-233	32x22mm	1.00	*
3	RTD, 60° L2-St / L	97-154	30x25mm	2.00	*
4	RTD, 45° T1-St /S	04-8	32x22mm	1.00	*
6	RTD, 70° TRL2-St / L	96-228	2(12x25)mm	2.00	*
13	RTD, 60° T1-St / S	01-234	32x18mm	1.00	*
14	RTD, 60° T1-St / S	01-235	32x18mm	1.00	*

Page 5 of 15

Quad Cities Unit-2, Q2R17

Q2R17-93



GERIS 2000 OD EXAMINATION SCAN FILES DATA SHEET

CUSTOMER: **Exelon**
SITE: **Quad Cities Unit-2**
OUTAGE: **Q2R17**

PROCEDURE NO. : GE-UT-705 V4 **REVISION :** N/A **DRR :** N/A

FILE NAME	WELD	DISK NO.	DATE	EXAM START TIME	EXAM STOP TIME	SCAN START	SCAN STOP	SCAN AREA	VESSEL TEMP. (°F)	CAL RECHECK IN	CAL RECHECK OUT	CAL RECORD
n4d.z1.1	N4D IRS	~	~	~	~	~	~	~	~	~	~	~
n4d.z1.2	N4D IRS	03A	03/03/04	0817	0850	271°	272°	360°	92°	N/A	N/A	IRS.IN
n4d.z2a.1	N4D IRS	03A	03/02/04	0919	0937	270°	119°	151°	92°	N/A	N/A	IRS.IN
n4d.z2a.2	N4D IRS	03A	03/02/04	1034	1047	120°	269°	211°	92°	N/A	N/A	IRS.IN
n4d.z2b.1	N4D IRS	Void	Void	~	~	~	~	~	~	~	~	Void
n4d.z2b.2	N4D IRS	05A	03/04/04	0454	0520	323°	33°	290°	98°	N/A	N/A	IRS.IN
n4d.z3.1	N4D IRS	05A	03/04/04	0534	0553	323°	33°	290°	98°	N/A	N/A	IRS.IN

COMMENTS : * Rotation angles for all exams per the GERIS 2000 nozzle to vessel scan-plan sheet (attached).
The GERIS 0° reference is located 90° CW of nozzle TDC.

Z1 and Z2A exams unrestricted. Z2B and Z3 scans limited by bioshield interference.

OPERATORS: SHANE GAUTHIER LvII
KENT MONTGOMERY LvII

SOFTWARE REVISION: 5.26
THERMOMETER S/N : 235018
235074
COUPLANT : Demineralized Water

Search Unit Data:

No.	Model / Mode	S/N	Size	Freq. (MHz.)	Rot. Angle
9	KBA, 389-018-980 / S	00XL6V	0.5 x 1.0	2.25	N/A
10	KBA, 389-018-980 / S	00XL6Y	0.5 x 1.0	2.25	*
11	KBA, 389-018-980 / S	00XL6L	0.5 x 1.0	2.25	*
12	KBA, 389-018-980 / S	00XL6M	0.5 x 1.0	2.25	*
13	RTD, 28° T2-St / S	98-1178	18 x 14mm	2.00	*
14	RTD, 28° T2-St / S	01-240	18 x 14mm	2.00	*

Page 6 of 15

Report No.: Q2R17-93

Feedwater N4D-NOZ
Quad Cities Unit-2, 2004

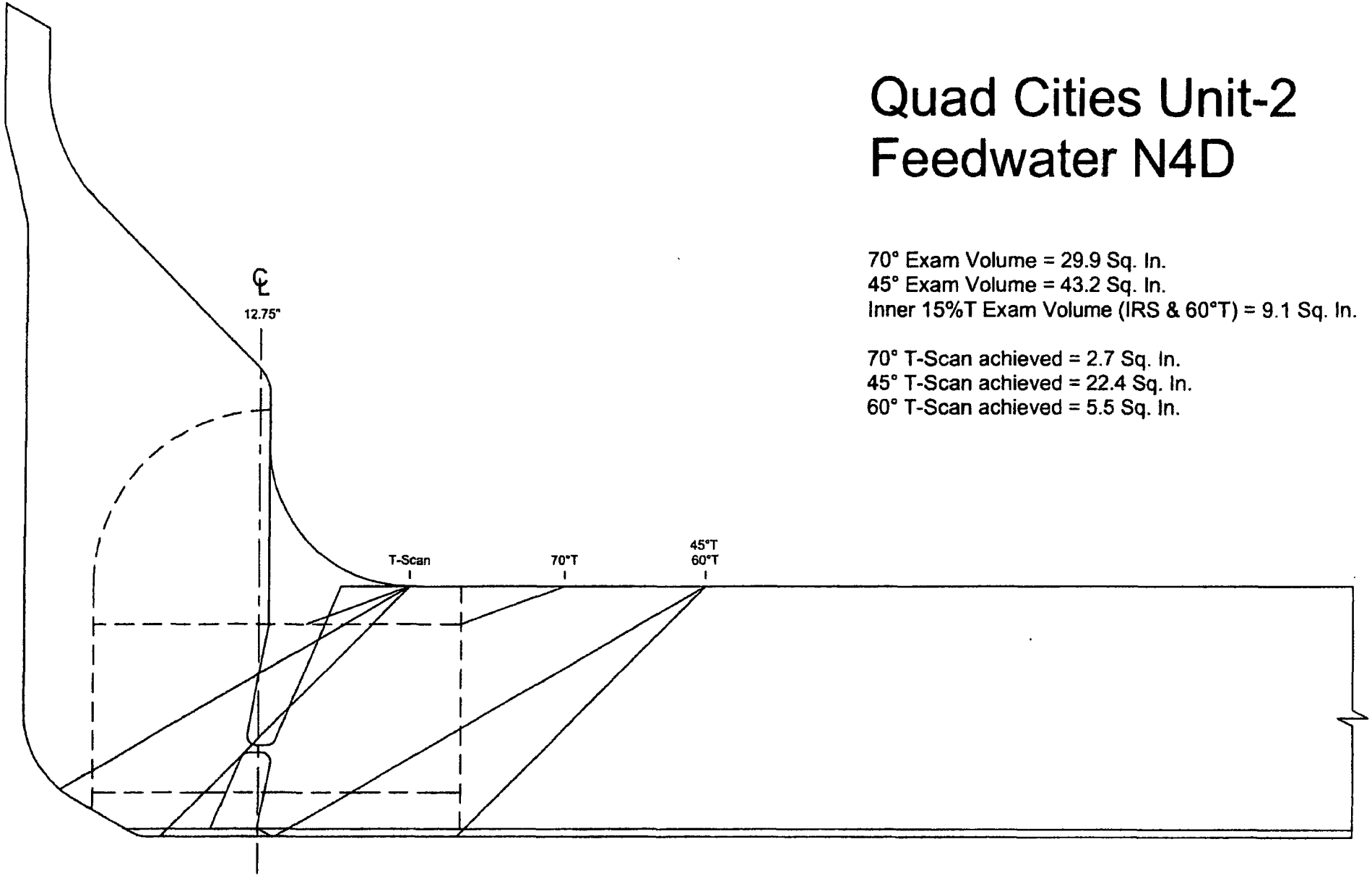
Weld Length = 360. Exam Volume = 82.2		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Auto	Percent of Area Auto	Weld Length Auto	Percent Auto
70° T-Scan	A	29.9	2.7	3.3%	360	1.6%
45° T-Scan	A	43.2	22.4	27.3%	360	13.6%
60° T-Scan	A	9.1	5.5	6.7%	360	3.3%
70° P-Scan	A	29.9	0	0.0%	360	0.0%
45° P-Scan	A	43.2	14.9	18.1%	360	9.1%
60° P-Scan	A	9.1	9.1	11.1%	360	5.5%
70° T-Scan						
45° T-Scan						
60° T-Scan						
70° P-Scan						
45° P-Scan						
60° P-Scan						
70° T-Scan						
45° T-Scan						
60° T-Scan						
70° P-Scan						
45° P-Scan						
60° P-Scan						

% Total Composite Coverage = 33%

Comments: A - Examined accessible length. Scanning limited due to scanner access.

Note - Rounding methods may make calculated values appear in error.

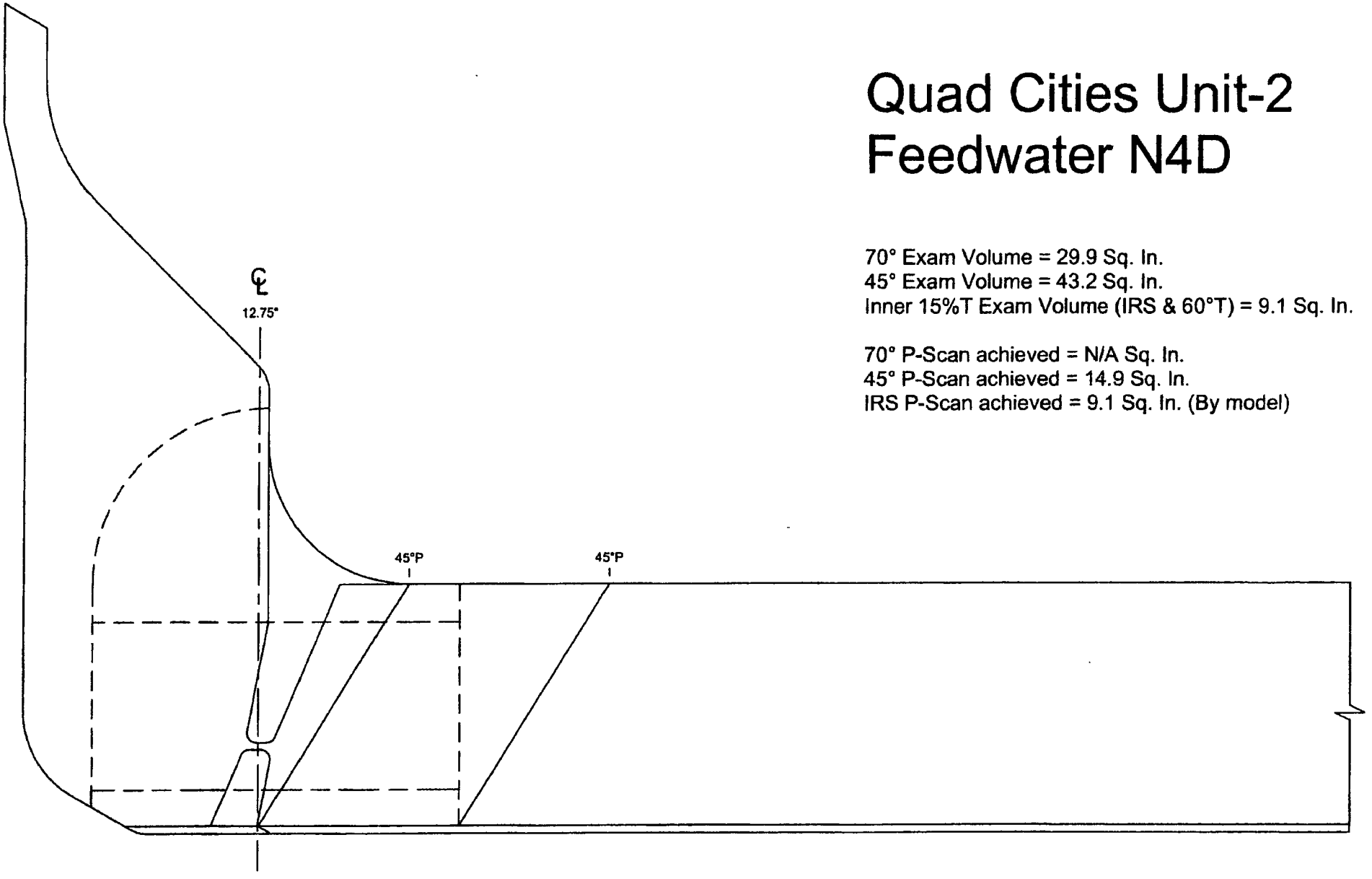
Quad Cities Unit-2 Feedwater N4D



70° Exam Volume = 29.9 Sq. In.
45° Exam Volume = 43.2 Sq. In.
Inner 15%T Exam Volume (IRS & 60°T) = 9.1 Sq. In.

70° T-Scan achieved = 2.7 Sq. In.
45° T-Scan achieved = 22.4 Sq. In.
60° T-Scan achieved = 5.5 Sq. In.

Quad Cities Unit-2 Feedwater N4D



70° Exam Volume = 29.9 Sq. In.
45° Exam Volume = 43.2 Sq. In.
Inner 15%T Exam Volume (IRS & 60°T) = 9.1 Sq. In.

70° P-Scan achieved = N/A Sq. In.
45° P-Scan achieved = 14.9 Sq. In.
IRS P-Scan achieved = 9.1 Sq. In. (By model)

Guideline for Deciding when to Perform Manual UT Examination of Areas Not Covered by Automated Examinations

Component/Configuration: N4D N0Z

A. DETERMINE

1. Percent coverage obtained with automated UT: 33 %

2. Approximate radiation dose received to complete automated UT: 1800 mR

B. ESTIMATE

1. Percent coverage increases if manual UT was performed: + 7 % *

2. Radiation dose expected if manual UT was performed: 2000 mR

Decision to Proceed: ____YES X NO **Based On:** DOSE

Prepared By: R. L. My **Date:** 03/05/04

* ALL UPPER WELD COVERAGE, NOT WELD OR HAZ ON I.D.

Q2R17-93
10 OF 15

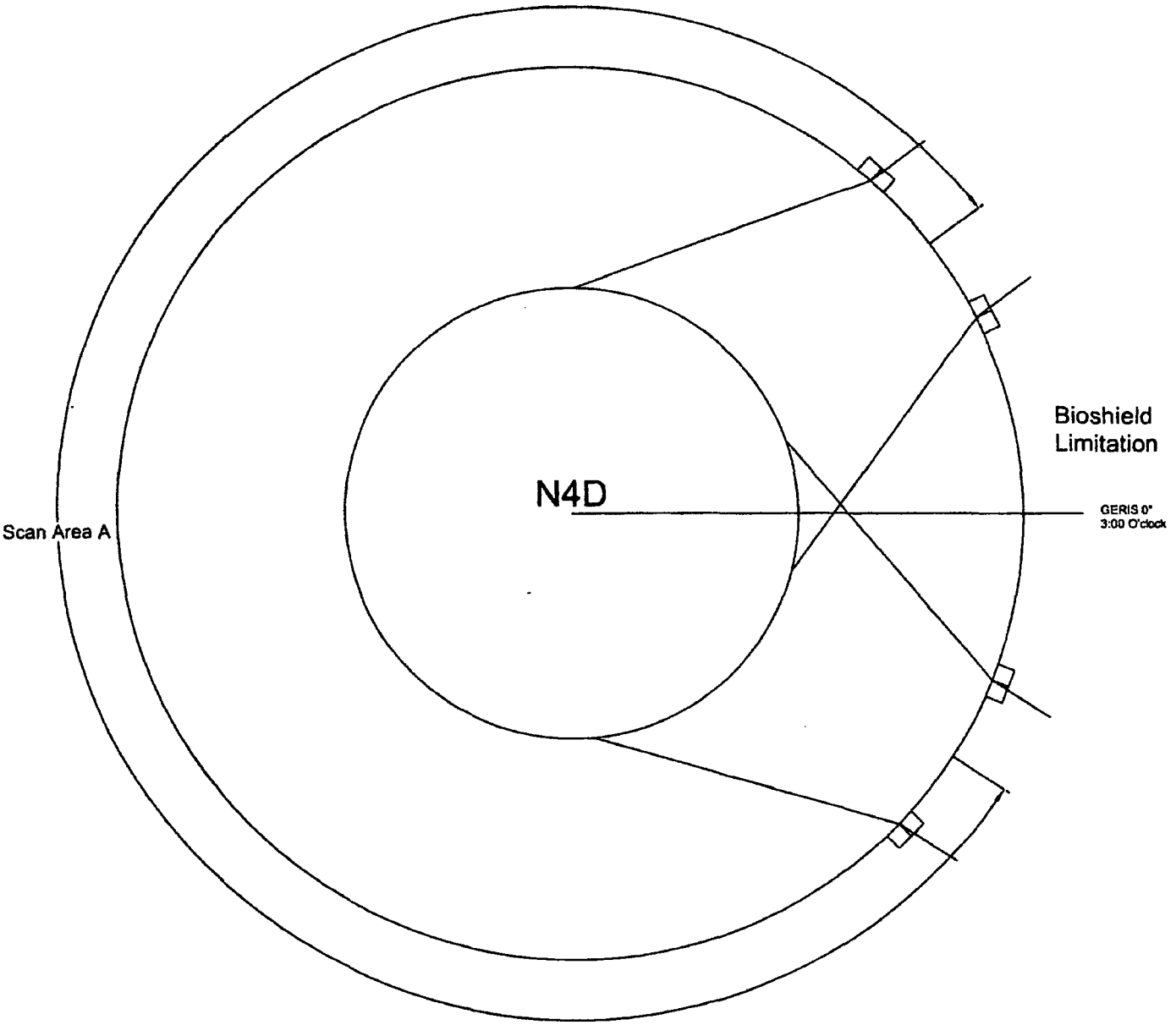
Report No.: Q2R17-93

Feedwater N4D-IRS
Quad Cities Unit-2, 2004

Weld Length = 360. Exam Volume = 100%		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area %	Area Scanned Auto	Percent of Area Auto	Weld Length Auto	Percent Auto
Z1 CW	A	100%	100%	100.0%	360	50.0%
Z1 CCW	A	100%	100%	100.0%	360	50.0%
				% Total Composite Coverage =		100.0%
Z2A CW	A	100%	100%	100.0%	360	50.0%
Z2A CCW	A	100%	100%	100.0%	360	50.0%
				% Total Composite Coverage =		100.0%
Z2B CW	A	100%	100%	100.0%	290	40.3%
Z2B CCW	A	100%	100%	100.0%	290	40.3%
				% Total Composite Coverage =		80.6%
Z3 CW	A	100%	100%	100.0%	290	40.3%
Z3 CCW	A	100%	100%	100.0%	290	40.3%
				% Total Composite Coverage =		80.6%

Comments: A - Examined accessible length. Exam volume determined by modeling, 100% assigned volume.
Scanning limited due to bioshield interference at 323° CW to 33°.
100% Z2B and Z3 Coverage (Single side access) obtained throughout. See attached drawing. Z2A and Z3 are non-PDI exams.
Note - Rounding methods may make calculated values appear in error.

Zone 2B and Zone 3 Scan Areas
100% Coverage (Single Side) Obtained Throughout.



Q2R17-93

Nir_PDI Qc2.XLS

MANUAL/GERIS 2000 DETECTION
NOZZLE INNER RADIUS AND BORE INSPECTION REQUIREMENTS

PLANT **Quad Cities 2**

PREPARED BY S.C. MORTENSON DATE 01/17/04

NOZZLE EXAM ZONE	SCAN SURFACE	SCAN AREA	BEAM ANGLE	ROTATION ANGLE	WEDGE RADIUS	MAX MP	FREQ	
RECIRC OUTLET								
N/V Weld	PLATE	0 - 9.0"	66.0°	57.8° (52.4°) *	FLAT	18.5"	1 MHz	
N/V Weld	PLATE	0 - 9.0"	70.0°	42.1° 37.0°) *	FLAT	25.3"	1 MHz	
Zone 1/NV (M)	ODBR	20° - 45°	35.0°	90.0°	5.5"	20.7"	1 MHz	W-021, W-022
Zone 2A	ODBR	45° - 90°	60.0°	35.0° (30.6°) **	5.5"	20.4"	1 MHz	W-023, W-024
RECIRC INLET								
N/V Weld	PLATE	0 - 8.0"	60.0°	38.0° (27.3°) *	FLAT	14.0"	1 MHz	
N/V Weld	PLATE	0 - 8.5"	60.0°	45.0° (35.5°) *	FLAT	14.0"	1 MHz	
N/V Weld / Zone 1	PLATE	0 - 8.0"	68.0°	25.7° (16.0°) *	FLAT	21.2"	1 MHz	
Zone 1	PLATE	0 - 9.0"	70.0°	15.6° (8.5°) *	FLAT	22.9"	1 MHz	
Zone 2A	ODBR	55° - 90°	67.5°	18.1° (8.2°) **	3.3"	12.0"	1 MHz	W-025, W-026
FEEDWATER								
N/V Weld	PLATE	0 - 8.0"	60.0°	48.2° (39.2°) *	FLAT	14.0"	1 MHz	
N/V Weld	PLATE	0 - 8.0"	60.0°	38.9° (28.3°) *	FLAT	14.0"	1 MHz	
N/V Weld / Zone 1	ODBR	50° - 90°	43.8°	40.3°(31.8°) **	3.5"	19.3"	2.25 MHz	W-027, W-028
Zone 2A	ODBR	50° - 90°	67.5°	21.7° (13.2°) **	3.5"	13.4"	2.25 MHz	W-029, W-030
Zone 2B	NOZOD	ALL	28.0°	68.0°	FLAT	7.5"	2 MHz	
Zone 3	NOZOD	ALL	28.0°	90°	FLAT	6.7"	2 MHz	

NOTES:		
	*	DESIGN / (FIXTURE) ROTATION FOR 3.0" PKG OFFSET
	#	DESIGN / (FIXTURE) ROTATION FOR 1.45" PKG OFFSET
	**	WEDGE / (FIXTURE) ROTATION ANGLE FOR 2.5" OFFSET
	***	DESIGN / (FIXTURE) ROTATION FOR 1.5" PKG OFFSET
	(M)	MANUAL

Questions on this NIR requirements sheet shall be directed to S.C. Mortenson @ 704 948-0253

GE Nuclear Energy

GERIS 2000 OD
Nozzle Examination Scan Plan

Quad Cities Unit-2, 2004
Nozzle Scanning Limits
Nozzle(s) N4

12.75	Weld CL Radius	125.50	Vessel ID Radius
18.10	ASME OD Radius	6.38	Vessel Nom. Thickness
16.75	Outside Radius of ODBR	131.88	Vessel OD Radius
13.00	Outside Radius of NOZOD	1.0	Overscan Distance

Package Configuration: Triple Pack and ODBR Package.

Channel	Beam Angle	CPU Angle	Fixture Angle	Type	SU Parameters Delay	Velocity	X-Off	Y-Off	Scan Area	Scanner Min	Scanner Max	A-Gate Start	A-Gate Stop	A-Gate Max MP	C-Gate Start	C-Gate Stop
N4	**T-Scan.** Supplement 4 and 6 radial scans.									Step →	0.25	Index →	0.4°			
1	0	0.0	0.0	WM	4	0.233	0.0	0.0	N/A	Note 1	19.25	0	75	8.3	18	54
2	45	-9.0	9.0	T	15	0.128	3.0	0.0	N/A	Note 1	13.25	0	230	13.8	37	191
3	60	7.2	352.8	T	15	0.233	-3.0	0.0	N/A	Note 1	19.25	0	180	19.2	32	152
N4	**P1.** 45° S for outer 85%T volume.									Step →	0.25	Index →	0.5°			
2	45	51.3	308.7	P	15	0.128	3.0	0.0	N/A	Note 1	11.50	0	230	13.8	37	191
4	45	-51.3	51.3	P	15	0.128	-3.0	0.0	N/A	Note 1	11.50	0	230	13.8	37	191
N4	**P2.** N/V Inner 15%T P-scan examination from **PLATE with 70T-scan.**									Step →	0.15	Index →	0.5°			
13	60	39.2	320.8	N/V	15	0.128	-3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
6	70	0.0	0.0	T	10	0.233	0.0	0.0	N/A	Note 1	9.30	0	50	4.7	10	48
14	60	-39.2	39.2	N/V	15	0.128	3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
N4	**P3.** N/V Inner 15%T P-scan examination from **PLATE.**									Step →	0.15	Index →	0.5°			
13	60	28.3	331.7	N/V	15	0.128	-3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
14	60	-28.3	28.3	N/V	15	0.128	3.0	0.0	8.0	Note 1	13.05	0	300	14.0	120	250
N4	**Z1.** Z1 Inner Radius Section examination from **ODBR**									Step →	0.07	Index →	1.7°			
9	43.8	31.8	328.2	Z1	15	0.128	-2.5	0.0	N/A	50°	90°	0	410	19.3	165	335
10	43.8	-31.8	31.8	Z1	15	0.128	2.5	0.0	N/A	50°	90°	0	410	19.3	165	335

QUAD CITIES REPORT NO. QCRI-93 PAGE 14 OF 15

Channel	Beam Angle	CPU Angle	Fixture Angle	Type	SU Parameters Delay	Velocity	X-Off	Y-Off	Scan Area	Scanner Min	Max	A-Gate Start	Stop	Max MP	C-Gate Start	Stop
N4	**Z2A.** Z2A Inner Radius Section examination from **ODBR**									Step →	0.07	Index →	1.7°			
11	67.5	13.2	346.8	Z2A	15	0.128	-2.5	0.0	N/A	50°	90°	0	290	13.4	115	240
12	67.5	-13.2	13.2	Z2A	15	0.128	2.5	0.0	N/A	50°	90°	0	290	13.4	115	240
N4	**Z2B.** Z2A Inner Radius Section examination from **NOZOD.**									Step →	0.07	Index →	2.2°			
13	28	68.0	292.0	Z2B	15	0.128	-2.5	0.0	N/A	All	All	0	170	7.5	70	150
14	28	-68.0	68.0	Z2B	15	0.128	2.5	0.0	N/A	All	All	0	170	7.5	70	150
N4	**Z3.** Z3 Inner Radius Section examination from **NOZOD.**									Step →	0.07	Index →	2.2°			
13	28	90.0	270.0	Z3	15	0.128	-2.5	0.0	N/A	All	All	0	170	7.5	70	150
14	28	-90.0	90.0	Z3	15	0.128	2.5	0.0	N/A	All	All	0	170	7.5	70	150

Notes: Vessel ID radius from B&W drawing Shell Course Subassembly 151825E-1.
Vessel nominal thickness from B&W drawing Shell Forming Details 104186D-1 (ordered thickness).

Note 1 - Scan into nozzle until onset of liftoff or limited by physical limitations.

Site Revision 0 2/22/04

QUAD CITIES
REPORT NO. QR RT-93
PAGE 15 OF 15

HITACHI	EXAMINATION SUMMARY SHEET	Report No.: Q2R21-010

Site: Quad Cities Component ID: 0200-W-178

Outage: Q2R21 RPV SKIRT

System: RPV ASME Cat.: F-A ASME Item F1.40 Aug Req N/A

Exams Performed	Data Sheet	Cal Sheet	Procedure	Calibration Block	Exam / Oper. Personnel	Cert Level	Date
VT-3	VT-042	N/A	ER-AA-335-016 Ver/Rev 7	N/A	Steve Snyder	II	3/24/2012

Examination Results:

During the visual examination of the above referenced component, no recordable indications were observed.

Examination was limited due to permanent insulation.
RPV Skirt is approximately ~~230" long by 72" high.~~ 730" LONG by 72" HIGH
Total area = ~~16,560 sq. inches~~ 52,560 SQ. inches
Area examined = ~~230" x 7.5" + 216"x12") = 1869 sq. inches~~ 730"x 7.5" + 2(6"x12")= 5619 sq. inches
~~1869 / 16,560 = 0.113 x 100 = 11.3%~~ 5619 / 52,560 = 0.106 x 100 = 10.6%
~~11.3% of the required area was examined.~~
10.6% of the required OD area was examind. 0% of the required ID area was examined.
This examination meets the requirements of ASME Section XI, 1995 Edition through 1996 addenda.

Scott R Erickson 4/2/12

Examination results were compared to Data Report N/A *from:* N/A ☐ *Change*

These examinations were performed under Work Order: 1356987 ☐ *No Change*

This Summary and the following data sheets have been reviewed and accepted by the following personnel

Scott R Erickson — Prepared By: — Level: III — Date: 03/25/12

Utility Review: — Date: 3-29-12

ANII Review: — Date: 4/1/12

RWP: 10012939
Dose: 10 mr.

Page 1 of 2

Note: IR 0134 7632 generated to document coverage.
3.29.12

NOTE: IR 01347660 generated for drawing revision level Scott R Erickson 4-1-12

Exelon Nuclear

ATTACHMENT 2

VT-3 Visual Examination NDE Report for Component Supports, Attachments and Interiors of Reactor Vessels

Page 1 of 1 VT-042

STATION: Quad Cities	UNIT: 2	DATE: 3/24/12	REPORT NO: Q2R21-010
SYSTEM: RPV	COMP. NO.: 0200-W-178		WO. NO.: 1356987
VT-3 ☒	LIMITED VT-3 ☐	DIRECT ☒	REMOTE ☐	SNUBBER S/N: N/A
DRAWING(S): 149900 E	REV.: 5	DESIGN C.S.: N/A	DESIGN H.S. N/A
AIDS: FLASHLIGHT ☒	MIRROR ☒	TEST CARD ☒	OTHER: N/A

	ATTRIBUTE	RI	NRI	IO	EXPLANATIONS/ COMMENTS
1	CRACK/LINEAR/ROUNDED/PITTING/SEVERED		X		
2	ARC STRIKES/WELD SPATTER/SCORING/ROUGHNESS				N/A
3	EROSION/CORROSION/WEAR/GOUGING/SCRAPING		X		Light Surface Rust
4	DEFORMED/BENT/LOOSE/DETACHED/MISSING PARTS		X		
5	THREAD ENGAGEMENT/BOLT ELONGATION/WELDMENT		X		
6	SPALLED CONCRETE OR GROUT/ANCHORS/IMBED				N/A
7	CLEARANCES/TRAVEL STOPS/PINS				N/A
8	DRAWINGS/ENVIRONMENT		X		
9	LOCKNUT/PIN/TACKWELD SECURING CAN SETTING				N/A
10	NON-INTEGRAL ATTACHMENT LOOSE/INSUL. DAMAGED		X		
11	SPRINGS/ROLLERS/BEARINGS				N/A
12	FLUID LEVEL/FLUID LEAKS/WEEPAGE/INDICATOR STUD				N/A
14	OTHER				N/A
15	* SUPPORT SETTING WITHIN TOLERANCE OF DESIGN	INCHES N/A			LBS. N/A
	* THESE ITEMS NEED NOT BE EVALUATED WHEN EXAM PERFORMED IS A STATION APPLICABLE LIMITED VT-3.				

RESULTS: RI = RECORDABLE INDICATION NRI = NO RECORDABLE INDICATION IO = INFO ONLY

COMMENTS: Examination of SKIRT to bottom head weld was limited to the upper 7.5" and 2-6"x12" inspection ports. One at approximately 57° and the other at 300°.

DOCUMENTATION OF LIMITATIONS/OBSTRUCTIONS

Permanently attached insulation from the bottom of the skirt up to 7.5" below the skirt to bottom head weld.

ISI Interval: 4th		ISI Period: 3rd	
EXAMINER: Steve Snyder		LEVEL: II	DATE: 3/24/2012

Further Evaluation Required: ☐ Yes ☒ No

Additional Actions: N/A

(Action Request, Work Order, Issue Report, etc. initiated for Corrective Action)

REVIEWER: [signature] III DATE: 3-28-12

ANII: [signature] DATE: 4/1/12

Page 2 of 2

Create another New Issue | Create another Issue from '01347632' | Print | Close window

****AS REQUIRED, PRINT ISSUE REPORT AND PROVIDE TO YOUR SUPERVISOR****
Note: This is your only notice. You will not have an opportunity to print this confirmation later.

Exelon Nuclear Issue - Statement of Confirmation

Issue #: 01347632 **Originator:** JAY MILLER **Submit Date:** March 29, 2012

Basic Information

Affected Facility:	Quad Cities
Dscv Date:	03/29/2012 18:00
How Discovered Code:	H02
Event Date:	03/29/2012 18:00
Affected Unit:	02
Affected Sys:	RX
Subject:	COVERAGE LESS THAN 90% FOR ISI COMPONENT 0200-W-178
Work Against:	N
Name:	COVERAGE LESS THAN 90% FOR ISI COMPONENT 0200-W-178
Equipment Location:	Quad Cities Unit 2

Required Information

Condition Description:	During Q2R21 an ISI examination was scheduled to be performed on component 200-W-178 for the Unit 2 RPV Skirt. A VT-3 examination was performed in accordance with ER-AA-335-016 Revision 7 on the examination area specified in ASME Section XI, IWF-2500. Due to the physical limitations of the permanent insulation only 11.3% coverage could be obtained. ASME Section XI requires a minimum of 90% coverage, If 90% coverage can not be achieved a relief request will be required to document the coverage achieved. It was also determined that no other examination methods could have been used to obtain additional coverage. This IR is being generated as required by ER-AA-335-010 to document the coverage achieved during this examination – No indications were discovered and there are no operability issues.
Immediate actions taken:	Notified the ISI Program Owner Wrote IR
Recommendation for action:	Generate an AT for the Engineering ISI Program Owner to update the ISI database and ISI Program with the actual coverage achieved.
Supervisor Verbally Contacted:	Mac Rice

Optional Additional Information

Routing

Owed To Group:	ACAPALL
Routed to Group:	CR-OSC

Go Back | Print | New Search | Home

AR 01347660 Report

Aff Fac:	Quad Cities	**AR Type:**	CR	**Status:**	APPROVED
Aff Unit:	00	**Owed To:**	A8450ENCAP	**Due Date:**	04/28/2012
Aff System:	--			**Event Date:**	03/29/2012
CR Level/Class:	4/D			**Disc Date:**	03/29/2012
How Discovered:	H02			**Orig Date:**	03/29/2012
WR/PIMS AR:		**Equip Tag:**	-		

Action Request Details

Subject: PASSPORT DRAWING REVISION LEVEL DOES NOT MATCH OLE

Description: Originator: DAVID J KNOX Supv Contacted: J. Campagna

Condition Description:
In Passport, the controlled documents panel (C010) for Babcock & Wilcox vendor drawing 1499900E shows revision level 006. The drawing viewed via the OLE is revision level 5.

Immediate actions taken:
Wrote IR.

Recommended Actions:
Update Passport to show correct revision level of the drawing

Operable Basis:

Reportable Basis:

Functional Basis:

SOC Reviewed by: MICHAEL A GRAHAM 03/31/2012 08:38:30 CDT
SOC Comments:
The apcard image was imported in 2006.
*
From Mike Stephenson: Current practice is to start vendor drawings at Rev A, regardless of what the vendor revision is. This is because the vendors can and do revise their own drawings. This does not mean our installed equipment has changed, therefore our drawing revisions remain the same until we alter the equipment such that a revision is necessary to our drawing. Records Management added Mike Stephensons notes to passport as it is an old legacy issue. Close to actions taken and information provided.
(Finks 3/30/12) (SOC 3/31/12)

Assignments

Assign #:	Assigned To:	Status:	COMPLETE

	01				
Aff Fac:	Quad Cities	**Prim Grp:**	ACAPALL	**Due Date:**	04/03/2012
Assign Type:	TRKG	**Sec Grp:**		**Orig Due Date:**	
Priority:					
Schedule Ref:					
Unit Condition:					
Subject/Description:	PASSPORT DRAWING REVISION LEVEL DOES NOT MATCH OLE				