



Steven D. Capps
Vice President
McGuire Nuclear Station

Duke Energy
MG01VP | 12700 Hagers Ferry Road
Huntersville, NC 28078

o: 980.875.4805
f: 980.875.4809
Steven.Capps@duke-energy.com

Serial No: MNS-16-036

April 28, 2016

10 CFR 50.55a

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

Subject: Duke Energy Carolinas, LLC (Duke Energy)
McGuire Nuclear Station, Unit 1
Docket No. 50-369
Relief Request 16-MN-001
Limited Weld Examinations

Pursuant to 10 CFR 50.55a(g)(5)(iii), Duke Energy hereby requests U.S. Nuclear Regulatory Commission's approval of relief for the welds listed in Table 1 of the proposed relief request. These welds were required to be examined in accordance with the Inservice Inspection Plan for McGuire Unit 1, Fourth 10-Year Inservice Inspection Interval. The details of the request are included in the enclosure.

This submittal contains no regulatory commitments.

If you have any questions or require additional information, please contact P.T. Vu of Regulatory Affairs at (980) 875-4302.

Sincerely,

Steven D. Capps

Enclosure

A047
NRR

U.S. Nuclear Regulatory Commission
April 28, 2016
Page 2

xc:

C. Haney, Region II Administrator
U.S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Ave., NE Suite 1200
Atlanta, GA 30303-1257

G. E. Miller, Project Manager
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Mail Stop O-8G9A
Rockville, MD 20852-2738

J. Zeiler
NRC Senior Resident Inspector
McGuire Nuclear Station

U.S. Nuclear Regulatory Commission
April 28, 2016
Page 3

bxc:

Mark Pyne (EC05ZB)
Hoang Dinh (EC05ZB)
Lester Stauffer (EC07C)
Steven Dean (MH01A)
Kay Crane (MG01RC)
Master File MC-801.01 (MG02DM)
ELL (EC02ZF)

Relief Request 16-MN-001

ENCLOSURE

McGuire Relief Request 16-MN-001

1.0 Scope of Relief Request

Relief is requested pursuant to 10 CFR 50.55a(g)(5)(iii) for welds listed in Table 1. These welds were required to be examined in accordance with Inservice Inspection Plans for the following Unit.

McGuire Nuclear Station - Unit 1
Fourth 10-Year Inservice Inspection Interval
Interval Start Date: 12/01/2011
Interval End Date: 11/30/2021

Table 1					
<u>Relief Request Section Number</u>	<u>McGuire Unit Number</u>	<u>Examination Performed (Refueling Outage)</u>	<u>Weld ID Number</u>	<u>Item/Summary Number</u>	<u>Examination Data</u>
2.0 ISI	1	1EOC23	1PZR-12	M1.B3.110.0002	See Attachment A Pages 1-2 Pages 1-15
3.0 ISI	1	1EOC23	1PZR-15	M1.B3.110.0005	See Attachment B Pages 1-2 Pages 1-15
4.0 ISI	1	1EOC23	1PZR-16	M1.B3.110.0006	See Attachment C Pages 1-2 Pages 1-15
5.0 ISI	1	1EOC23	1ASWINJF-2	M1.C1.10.0004	See Attachment D Pages 1-8

2.0 Weld ID No. 1PZR-12

2.1 ASME Code Component(s) Affected

Class 1 Nozzle to Vessel Weld
Pressurizer
Reactor Coolant System
Spray Nozzle to Head Circumferential Weld
Weld ID = 1PZR-12
Summary Number = M1.B3.110.0002

2.2 Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

2.3 Applicable Code Requirements

IWB-2500, Table IWB-2500-1, Examination Category B-D, Item Number B3.110
Fig. IWB-2500-7 (b), 100% Volume Coverage of Examination Volume
A-B-C-D-E-F-G-H

2.4 Impracticability of Compliance

Component configuration:

- Surface 1: Head - Carbon Steel (SA-533, GR-A, Class 2)
- Surface 2: Nozzle - Carbon Steel (SA-508, Class 2)
- Diameter: 12.75 in.
- Thickness: 2.5 in.

This component was scanned manually with conventional methods. Scanning requirements are described in ASME Section V, Article 4, T-441.1.2(a), T-441.1.3, T-441.1.4, T-441.1.5 and T-441.1.6. These requirements describe and are specific to scanning components in two axial and two circumferential directions. This component was scanned to the extent possible to meet these requirements. The aggregate coverage that was obtained is described and calculated from the following:

- Weld coverage using 35°, 45° & 60° shear waves for axial scans (S1 and S2) and 45° & 60° shear waves for circ. scans (CW and CCW) obtained 91.9% coverage.
- Base material coverage using 35°, 45° & 60° shear waves for axial scans (S1) and 45° & 60° shear waves for circ. scans (CW and CCW) obtained 77.5% coverage.
- 0° scan coverage obtained 75.6% coverage.
- The aggregate coverage was calculated to be $(91.9\% + 77.5\% + 75.6\%) / 3 = 81.7\%$.

The impracticability was caused by the configuration of the nozzle radius that does not allow meaningful interrogation from Surface 2 nozzle side. In order to scan all of the required volume for this weld, the head to nozzle weld would have to be redesigned and replaced, which is impractical.

McGuire Relief Request 16-MN-001

The McGuire Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage. The achieved coverage did not meet the acceptance criteria of this Code Case.

This relief request is specific to examination volume coverage limitations only. All other Code requirements were satisfied.

No indications were recorded during this examination.

2.5 Proposed Alternative and Basis for Use

No substitution alternative for this weld is available which would provide better coverage. Radiography (RT) is not a desired option because RT is limited in the ability to detect service induced flaws. Use of other manual or automated techniques, whether conventional or phased array, were considered, but would not increase coverage due to the limitation created by the component configuration. The use of any other technique available would incur the same physical scanning limitations.

2.6 Duration of Proposed Alternative

This request is for the duration of the Fourth 10-Year Inservice Inspection Interval, which will end on 11/30/2021.

2.7 Justification for Granting Relief

Ultrasonic examination of Weld ID 1PZR-12 (Summary Number M1.B3.110.0002) was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

The system leakage test performed each refueling outage in accordance with Table IWB-2500-1; Examination Category B-P requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric and pressure test), Reactor Building Normal Sump monitoring provides additional assurance that, in the event that leakage did occur through this weld, it would be detected and proper action taken.

Duke has examined Weld ID 1PZR-12 (Summary Number M1.B3.110.0002) to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination and the pressure testing (VT-2) examinations required by Section XI, it is Duke's position that the combination of examinations provide a reasonable assurance of quality and safety.

3.0 Weld ID No. 1PZR-15

3.1 ASME Code Component(s) Affected

Class 1 Nozzle to Vessel Weld
Pressurizer
Reactor Coolant System
Safety Nozzle to Head Circumferential Weld
Weld ID = 1PZR-15
Summary Number = M1.B3.110.0005

3.2 Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

3.3 Applicable Code Requirements

IWB-2500, Table IWB-2500-1, Examination Category B-D, Item Number B3.110
Fig. IWB-2500-7 (b), 100% Volume Coverage of Examination Volume
A-B-C-D-E-F-G-H

3.4 Impracticability of Compliance

Component configuration:

- Surface 1: Head - Carbon Steel (SA-533, GR-A, Class 2)
- Surface 2: Nozzle - Carbon Steel (SA-508, Class 2)
- Diameter: 15.0 in.
- Thickness: 2.5 in.

This component was scanned manually with conventional methods. Scanning requirements are described in ASME Section V, Article 4, T-441.1.2(a), T-441.1.3, T-441.1.4, T-441.1.5 and T-441.1.6. These requirements describe and are specific to scanning components in two axial and two circumferential directions. This component was scanned to the extent possible to meet these requirements. The aggregate coverage that was obtained is described and calculated from the following:

- Weld coverage using 35°, 45° & 60° shear waves for axial scans (S1 and S2) and 45° & 60° shear waves for circ. scans (CW and CCW) obtained 91.9% coverage.
- Base material coverage using 35°, 45° & 60° shear waves for axial scans (S1) and 45° & 60° shear waves for circ. scans (CW and CCW) obtained 77.5% coverage.
- 0° scan coverage obtained 75.6% coverage.
- The aggregate coverage was calculated to be $(91.9\% + 77.5\% + 75.6\%) / 3 = 81.7\%$.

The impracticability was caused by the configuration of the nozzle radius that does not allow meaningful interrogation from Surface 2 nozzle side. In order to scan all of the required volume for this weld, the head to nozzle weld would have to be redesigned and replaced, which is impractical.

McGuire Relief Request 16-MN-001

The McGuire Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage. The achieved coverage did not meet the acceptance criteria of this Code Case.

This relief request is specific to examination volume coverage limitations only. All other Code requirements were satisfied.

No indications were recorded during this examination.

3.5 Proposed Alternative and Basis for Use

No substitution alternative for this weld is available which would provide better coverage. Radiography (RT) is not a desired option because RT is limited in the ability to detect service induced flaws. Use of other manual or automated techniques, whether conventional or phased array, were considered, but would not increase coverage due to the limitation created by the component configuration. The use of any other technique available would incur the same physical scanning limitations.

3.6 Duration of Proposed Alternative

This request is for the duration of the Fourth 10-Year Inservice Inspection Interval, which will end on 11/30/2021.

3.7 Justification for Granting Relief

Ultrasonic examination of Weld ID 1PZR-15 (Summary Number M1.B3.110.0005) was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

The system leakage test performed each refueling outage in accordance with Table IWB-2500-1; Examination Category B-P requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric and pressure test), Reactor Building Normal Sump monitoring provides additional assurance that, in the event that leakage did occur through this weld, it would be detected and proper action taken.

Duke has examined Weld ID 1PZR-15 (Summary Number M1.B3.110.0005) to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination and the pressure testing (VT-2) examinations required by Section XI, it is Duke's position that the combination of examinations provide a reasonable assurance of quality and safety.

4.0 Weld ID No. 1PZR-16

4.1 ASME Code Component(s) Affected

Class 1 Nozzle to Vessel Weld
Pressurizer
Reactor Coolant System
Relief Nozzle to Head Circumferential Weld
Weld ID = 1PZR-16
Summary Number = M1.B3.110.0006

4.2 Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

4.3 Applicable Code/Licensing Requirement

IWB-2500, Table IWB-2500-1, Examination Category B-D, Item Number B3.110
Fig. IWB-2500-7 (b), 100% Volume Coverage of Examination Volume
A-B-C-D-E-F-G-H

4.4 Impracticability of Compliance

Component configuration:

- Surface 1: Head - Carbon Steel (SA-533, GR-A, Class 2)
- Surface 2: Nozzle - Carbon Steel (SA-508, Class 2)
- Diameter: 15.0 in.
- Thickness: 2.5 in.

This component was scanned manually with conventional methods. Scanning requirements are described in ASME Section V, Article 4, T-441.1.2(a), T-441.1.3, T-441.1.4, T-441.1.5 and T-441.1.6. These requirements describe and are specific to scanning components in two axial and two circumferential directions. This component was scanned to the extent possible to meet these requirements. The aggregate coverage that was obtained is described and calculated from the following:

- Weld coverage using 35°, 45° & 60° shear waves for axial scans (S1 and S2) and 45° & 60° shear waves for circ. scans (CW and CCW) obtained 91.9% coverage.
- Base material coverage using 35°, 45° & 60° shear waves for axial scans (S1) and 45° & 60° shear waves for circ. scans (CW and CCW) obtained 77.5% coverage.
- 0° scan coverage obtained 75.6% coverage.
- The aggregate coverage was calculated to be $(91.9\% + 77.5\% + 75.6\%) / 3 = 81.7\%$.

The impracticability was caused by the configuration of the nozzle radius that does not allow meaningful interrogation from Surface 2 nozzle side. In order to scan all of the required volume for this weld, the head to nozzle weld would have to be redesigned and replaced, which is impractical.

McGuire Relief Request 16-MN-001

The McGuire Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage. The achieved coverage did not meet the acceptance criteria of this Code Case.

This relief request is specific to examination volume coverage limitations only. All other Code requirements were satisfied.

No indications were recorded during this examination.

4.5 Proposed Alternative and Basis for Use

No substitution alternative for this weld is available which would provide better coverage. Radiography (RT) is not a desired option because RT is limited in the ability to detect service induced flaws. Use of other manual or automated techniques, whether conventional or phased array, were considered, but would not increase coverage due to the limitation created by the component configuration. The use of any other technique available would incur the same physical scanning limitations.

4.6 Duration of Proposed Alternative

This request is for the duration of the Fourth 10-Year Inservice Inspection Interval, which will end on 11/30/2021.

4.7 Justification for Granting Relief

Ultrasonic examination of Weld ID 1PZR-16 (Summary Number M1.B3.110.0006) was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

The system leakage test performed each refueling outage in accordance with Table IWB-2500-1; Examination Category B-P requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric and pressure test), Reactor Building Normal Sump monitoring provides additional assurance that, in the event that leakage did occur through this weld, it would be detected and proper action taken.

Duke has examined Weld ID 1PZR-16 (Summary Number M1.B3.110.0006) to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination and the pressure testing (VT-2) examinations required by Section XI, it is Duke's position that the combination of examinations provide a reasonable assurance of quality and safety.

5.0 Weld ID No. 1ASWINJF-2

5.1 ASME Code Component(s) Affected

Class 2 Pressure Vessel Weld
Seal Water Injection Filter 1A
Chemical and Volume Control System
Shell to Lower Flange Weld
Weld ID = 1ASWINJF-2
Summary Number = M1.C1.10.0004

5.2 Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda

5.3 Applicable Code Requirements

IWC-2500, Table IWC-2500-1, Examination Category C-A, Item Number C1.10
Fig. IWC-2500-1 (c), 100% Volume Coverage of Examination Volume
J-K-L-M

5.4 Impracticability of Compliance

Component configuration:

- Surface 1: Shell - Stainless Steel (Welded 304 SST)
- Surface 2: Flange - Stainless Steel (Welded 304 SST)
- Diameter: 4.0 in.
- Thickness: .438 in.

This component was scanned manually with conventional methods. Scanning requirements are described in ASME Section XI, Appendix III. Appendix III-4420 requires coverage of the examination volume in two beam path directions and Appendix III-4430 requires scanning on the weld crown in two directions. These requirements describe and are specific to scanning components in two axial and two circumferential directions. This component was scanned to the extent possible to meet these requirements. The aggregate coverage that was obtained is described and calculated from the following:

- Exam Volume coverage using 45° & 70° shear waves for axial scans obtained 80.3% S1 coverage and 36.1% S2 coverage.
- Exam Volume coverage using 45° shear waves for CW and CCW scans obtained 65.6% coverage.
- The aggregate coverage was calculated to be $(36.1\% + 80.3\% + 65.6\% + 65.6\%) / 4 = 61.9\%$.

The impracticability was caused by the configuration of the vessel flange surface that limited scanning from Surface 2, Axial, CW, and CCW directions. In order to scan all of the required volume for this weld, the vessel flange would have to be redesigned and replaced, which is impractical.

McGuire Relief Request 16-MN-001

The McGuire Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage. The achieved coverage did not meet the acceptance criteria of this Code Case.

This relief request is specific to examination volume coverage limitations only. All other Code requirements were satisfied.

No indications were recorded during this examination.

5.5 Proposed Alternative and Basis for Use

No substitution alternative for this weld is available which would provide better coverage. Radiography (RT) is not a desired option because RT is limited in the ability to detect service induced flaws. Use of other manual or automated techniques, whether conventional or phased array, were considered, but would not increase coverage due to the limitation created by the component configuration. The use of any other technique available would incur the same physical scanning limitations.

5.6 Duration of Proposed Alternative

This request is for the duration of the Fourth 10-Year Inservice Inspection Interval, which will end on 11/30/2021.

5.7 Justification for Granting Relief

Ultrasonic examination of Weld ID 1ASWINJF-2 (Summary Number M1.C1.10.0004) was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

The system leakage test performed each inspection period in accordance with Table IWC-2500-1; Examination Category C-H requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

Duke has examined Weld ID 1ASWINJF-2 (Summary Number M1.C1.10.0004) to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination and the pressure testing (VT-2) examinations required by Section XI, it is Duke's position that the combination of examinations provide a reasonable assurance of quality and safety.

Relief Request Serial Number

16-MN-001

Attachment A

(Pages 1-2)

(Pages 1-15)



UT Calibration Examination

ATTACHMENT A
PAGE 1 OF 2

Site/Unit: McGuire / 1 Procedure: NDE-640 Outage No.: M1-23
Summary No.: M1.B3.110.0002 Procedure Rev.: 5 Report No.: UT-14-394
Workscope: ISI Work Order No.: 02107308 Page: 1 of 2

Code: 1998/2000 Addenda Cat/Item: B-D/B3.110 Location: _____
Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head
System ID: NC
Component ID: 1PZR-12 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA
Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit				
Serial No.:	<u>13G00171</u>			Serial No.:	<u>G85215</u>			Initial Cal:	<u>0700</u>	<u>9/19/2014</u>	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Manufacturer:	<u>GE</u>			Manufacturer:	<u>Automation</u>			Inter. Cal:							
Model:	<u>USN 60 SW</u>	Linearity:	<u>L-14-212</u>	Size:	<u>0.75</u>	Model:	<u>Gamma</u>	Inter. Cal:	<u>1234</u>	<u>9/19/2014</u>					
Delay:	<u>.9491</u>	Range:	<u>5.0"</u>	Freq.:	<u>2.25 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal:							
M/U Cal/Vol:	<u>2347</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>0</u>	Squint Angle:	<u>N/A</u>	Final Cal:	<u>1445</u>	<u>9/19/2014</u>					
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>0</u>	Mode:	<u>Long</u>	Couplant			Circumferential Orientated Search Unit				
PRF:	<u>Auto High</u>	SU Freq.:	<u>2.25 MHz</u>	Exit Point:	<u>N/A</u>	# of Elements:	<u>1</u>	Cal. Batch:	<u>12125</u>			Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
Frequency:	<u>2.25 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Type:	<u>ULTRAGEL II</u>						
Voltage:	<u>450</u>	Pulse Width:	<u>220</u>	Shape:	<u>Round</u>	Contour:	<u>Flat</u>	Mfg.:	<u>MAGNAFLUX</u>			See Axial			
Ax. Gain (dB): <u>18.5</u> Circ. Gain (dB): <u>18.5</u>				Search Unit Cable				Exam Batch:			Reference/Simulator Block				
<u>1</u> Screen Div. = <u>.5</u> in. of <u>Sound Path</u>				Type: <u>RG-174</u> Length: <u>6'</u> No. Conn.: <u>0</u>				Type: <u>ULTRAGEL II</u>			Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
Calibration Block				Scan Coverage				Mfg.:							
Cal. Block No. <u>50338</u>				Upstream <input checked="" type="checkbox"/> Downstream <input checked="" type="checkbox"/> Scan dB: <u>31.2</u>				Serial No.:							
Thickness <u>3.00</u> Dia.: <u>Flat</u>				CW <input checked="" type="checkbox"/> CCW <input checked="" type="checkbox"/> Scan dB: <u>31.2</u>				Type:							
Cal. Blk. Temp. <u>74</u> Temp. Tool: <u>MCNDE40130</u>				Exam Surface: <u>O.D.</u>				Reference Block							
Comp. Temp. <u>80</u> Temp. Tool: <u>MCNDE40130</u>				Surface Condition: <u>Smooth</u>				Type: <u>ROMPAS</u>							
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)								Comments: <u>FC 14-09, 14-45</u>							
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>								See Report # <u>UT-14-395</u> for limitation							
Percent Of Coverage Obtained > 90%: <u>No</u>				Reviewed Previous Data: <u>Yes</u>											

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith	II-N		9/19/2014	King, D.B.		10/10/2014
Koster, Rickey	II-N		9/19/2014	Site Review		
Other	Level II-N		9/19/2014	ANII Review		
Jensen, Paula J.				Swan, Jerome		

EXHIBIT A-1
PRE/POST-JOB BRIEF SHEETComponent to be Examined 1PZR-12, 15 & 16 WO# 02107308 TASK 1ISI Summary/WO Number M1.B3.110.002, 005 + 0006 M1.B3.120.0002, 0003 + 0005Date 9-19-2014 Time Start (Pre) 0755 Time Finish (Pre) 0806Date 9-19-2014 Time Start (Post) 1506 Time Finish (Post) 1518

Attributes Discussed (Initial those completed and NA those that do not apply)

- 3N. ISI Plan/Work Order Review (if applicable) PRE-JOB
- 3N. Examination purpose (i.e. ASME Section XI, augmented) PRE-JOB
- 3N. Surface condition and configuration PRE-JOB
- 3N. Limitations PRE-JOB
- 3N. Previous Data and Previous PIPs PRE-JOB
- 3N. Drawings PRE-JOB
- 3N. Welding Process and joint configuration PRE-JOB
- 3N. Area of Interest (Section XI, Risk Informed) PRE-JOB
- 3N. Scan Plan PRE-JOB
- 3N. Team Scanning PRE-JOB
- 3N. Mock-Ups PRE-JOB
- 3N. Review of planned examination including angles, modes, etc. PRE-JOB
- 3N. Known failure mechanisms expected flaw types and locations PRE-JOB
- 3N. Unexpected conditions detrimental to the planned examination PRE-JOB
- 3N. Roles of the Regulators and the ANII PRE-JOB
- 3N. OE (company and industry events specific to examination) PRE-JOB
- 3N. Expectations for Corrective Action initiation (PIP or CR) PRE/POST-JOB
- 3N. Physical limitations PRE/POST-JOB
- 3N. Unexpected conditions POST-JOB
- 3N. Indications/conditions detected or observed POST-JOB
- 3N. Indications/conditions requiring further evaluation POST-JOB
- 3N. Coverage limitations and calculations POST-JOB
- 3N. Team Scanning POST-JOB
- 3N. Dose POST-JOB
- 3N. Safety Issues POST-JOB
- 3N. Overall job performance POST-JOB
- 3N. Inadequacies of the ISI Plan, Work Order, and Drawings (Initiate PIP) POST-JOB
- 3N. Examiner concerns POST-JOB



UT Calibration Examination

Site/Unit: McGuire / 1 Procedure: NDE-820 Outage No.: M1-23
 Summary No.: M1.B3.110.0002 Procedure Rev.: 7 Report No.: UT-14-395
 Workscope: ISI Work Order No.: 02107308 Page: 1 of 15

Code: 1998/2000 Addenda Cat./Item: B-D/B3.110 Location: _____
 Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head
 System ID: NC
 Component ID: 1PZR-12 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA
 Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit					
Serial No.:	<u>023K3V</u>			Serial No.:	<u>L29929</u>			Initial Cal	<u>0700</u>	<u>9/19/2014</u>	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path		
Manufacturer:	<u>GE</u>			Manufacturer:	<u>KBA</u>			Inter. Cal.			<u>1/4 T</u>	<u>80</u>	<u>1.2</u>	<u>.857"</u>		
Model:	<u>USN 60 SW</u>	Linearity:	<u>L-14-208</u>	Size:	<u>0.5"x1.0"</u>	Model:	<u>Gamma</u>	Inter. Cal.	<u>1233</u>	<u>9/19/2014</u>	<u>1/2T</u>	<u>65</u>	<u>2.6</u>	<u>1.81"</u>		
Delay:	<u>7.5988</u>	Range:	<u>7.00</u>	Freq.:	<u>2.25 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.			<u>3/4T</u>	<u>61</u>	<u>3.8</u>	<u>2.69"</u>		
MVI Cal/Vol:	<u>0.123</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>35</u>	Squint Angle:	<u>N/A</u>	Final Cal	<u>1446</u>	<u>9/19/2014</u>	<u>5/4T</u>	<u>24</u>	<u>6.5</u>	<u>4.55"</u>		
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>35</u>	Mode:	<u>Shear</u>	Couplant			<u>ID Notch</u>	<u>33</u>	<u>5.4</u>	<u>3.67"</u>		
PRF:	<u>Auto High</u>	SU Freq.:	<u>2.25 MHz</u>	Exit Point	<u>.7</u>	# of Elements:	<u>1</u>	Cal. Batch:	<u>12125</u>			Circumferential Orientated Search Unit				
Frequency:	<u>2.25 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Type:	<u>ULTRAGEL II</u>			Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Voltage:	<u>450</u>	Pulse Width:	<u>220</u>	Shape:	<u>Rect.</u>	Contour:	<u>Flat</u>	Mfg.:	<u>MAGNAFLUX</u>			<u>N/A</u>				
Wedge Style: <u>SWS</u>				Search Unit Cable				Exam Batch:	<u>12125</u>			Reference/Simulator Block				
Type: <u>RG-174</u> Length: <u>6'</u> No. Conn.: <u>0</u>				Scan Coverage				Type:	<u>ULTRAGEL II</u>			Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
Upstream <input checked="" type="checkbox"/> Downstream <input checked="" type="checkbox"/> Scan dB: <u>51.2</u>				Reference Block				Mfg.:	<u>MAGNAFLUX</u>			<u>22.3</u>	<u>2" Radius</u>	<u>80</u>	<u>2.9</u>	<u>2.00"</u>
Cal. Block No. <u>50338</u>				Serial No.: <u>97-5589</u>				Type:			<u>ROMPAS</u>					
Thickness <u>3.00</u> Dia.: <u>Flat</u>				CW <input checked="" type="checkbox"/> CCW <input checked="" type="checkbox"/> Scan dB: <u>51.2</u>												
Cal. Blk. Temp. <u>74</u> Temp. Tool: <u>MCNDE40130</u>				Exam Surface: <u>O.D.</u>												
Comp. Temp. <u>80</u> Temp. Tool: <u>MCNDE40130</u>				Surface Condition: <u>Smooth</u>												
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)				Comments: <u>FC 14-10</u>												
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>				Calibrated reflectors verified												
Percent Of Coverage Obtained > 90%: <u>No</u>				Reviewed Previous Data: <u>Yes</u>												

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith			<i>[Signature]</i>	9/19/2014	J. NEWARD L-III	<i>[Signature]</i>	10-18-14
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Kostar, Rickey			<i>[Signature]</i>	9/19/2014			
Other	Level	II-N	Signature	Date	ANII Review	Signature	Date
Jensen, Paule J.			<i>[Signature]</i>	9/19/2014	J.F. Swan	<i>[Signature]</i>	10-19-14



UT Calibration Examination

ATTACHMENT A
PAGE 2 OF 15

Site/Unit: McGuire / 1 Procedure: NDE-820 Outage No.: M1-23
Summary No.: M1.B3.110.0002 Procedure Rev.: 7 Report No.: UT-14-395
Workscope: ISI Work Order No.: 02107308 Page: 2 of 15

Code: 1998/2000 Addenda Cat./Item: B-D/B3.110 Location: _____
Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head
System ID: NC
Component ID: 1PZR-12 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA
Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit					
Serial No.:	<u>023K3V</u>			Serial No.:	<u>B28024</u>			Initial Cal:	<u>0700</u>	<u>9/19/2014</u>	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path		
Manufacturer:	<u>GE</u>			Manufacturer:	<u>KBA</u>			Inter. Cal:			<u>1/4 T</u>	<u>80</u>	<u>1.1</u>	<u>.943"</u>		
Model:	<u>USN 60 SW</u>	Linearity:	<u>L-14-208</u>	Size:	<u>0.5"x1.0"</u>	Model:	<u>Gamma</u>	Inter. Cal:	<u>1331</u>	<u>9/19/2014</u>	Inter. Cal:	<u>1/2T</u>	<u>60</u>	<u>2.3</u>	<u>1.97"</u>	
Delay:	<u>12.2488</u>	Range:	<u>8.5</u>	Freq.:	<u>2.25 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal:			Inter. Cal:	<u>3/4T</u>	<u>40</u>	<u>3.4</u>	<u>2.89"</u>	
M'tl Cal/Vel:	<u>0.123</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>45</u>	Squint Angle:	<u>N/A</u>	Final Cal:	<u>1447</u>	<u>9/19/2014</u>	Inter. Cal:	<u>5/4T</u>	<u>20</u>	<u>6.2</u>	<u>5.27"</u>	
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>45</u>	Mode:	<u>Shear</u>	Couplant			ID Notch	<u>28</u>	<u>4.8</u>	<u>4.08"</u>		
PRF:	<u>Auto High</u>	SU Freq.:	<u>2.25 MHz</u>	Exit Point:	<u>0.7</u>	# of Elements:	<u>1</u>	Cal. Batch:	<u>12125</u>		Circumferential Orientated Search Unit					
Frequency:	<u>2.25 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Type:	<u>ULTRAGEL II</u>		Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path		
Voltage:	<u>450</u>	Pulse Width:	<u>220</u>	Shape:	<u>Rect.</u>	Contour:	<u>Flat</u>	Mfg.:	<u>MAGNAFLUX</u>		N/A					
Ax. Gain (dB):	<u>47.0</u>	Circ. Gain (dB):	<u>N/A</u>	Wedge Style:	<u>SWS</u>			Exam Batch:	<u>12125</u>							
1 Screen Div. =	<u>.85</u>	in. of	<u>Sound Path</u>	Search Unit Cable				Type:	<u>ULTRAGEL II</u>							
Calibration Block				Type:	<u>RG-174</u>	Length:	<u>5'</u>	No. Conn.:	<u>0</u>							
Cal. Block No.	<u>50338</u>	Upstream	<input checked="" type="checkbox"/>	Downstream	<input checked="" type="checkbox"/>	Scan dB:	<u>61.0</u>	Reference Block			Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Thickness	<u>3.00</u>	Dia.:	<u>Flat</u>	CW	<input checked="" type="checkbox"/>	CCW	<input checked="" type="checkbox"/>	Scan dB:	<u>61.0</u>	Serial No.:	<u>97-5589</u>	<u>26.2</u>	<u>2" Radius</u>	<u>80</u>	<u>2.35</u>	<u>1.998"</u>
Cal. Blk. Temp.	<u>74</u>	Temp. Tool:	<u>MCNDE40130</u>	Exam Surface:	<u>O.D.</u>			Type:	<u>ROMPAS</u>							
Comp. Temp.	<u>80</u>	Temp. Tool:	<u>MCNDE40130</u>	Surface Condition:	<u>Smooth</u>											
Recordable Indication(s):	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	(If Yes, Ref. Attached Ultrasonic Indication Report.)													
Results:	Accept <input checked="" type="checkbox"/>	Reject <input type="checkbox"/>	Info <input type="checkbox"/>	Comments: <u>FC 14-10</u> <u>Calibrated reflectors verified</u>												
Percent Of Coverage Obtained > 90%: <u>No</u> Reviewed Previous Data: <u>Yes</u>																

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith				9/19/2014	JERRY NEWGARD L-TI		10-18-14
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Koster, Rickay				9/19/2014			
Other	Level	II-N	Signature	Date	ANII Review	Signature	Date
Jensen, Paule J.				9/19/2014			10-19-14



UT Calibration Examination

ATTACHMENT A
PAGE 3 OF 15

Site/Unit: McGuire / 1 Procedure: NDE-820 Outage No.: M1-23
Summary No.: M1.B3.110.0002 Procedure Rev.: 7 Report No.: UT-14-395
Workscope: ISI Work Order No.: 02107308 Page: 3 of 15

Code: 1998/2000 Addenda Cat./Item: B-D/B3.110 Location: _____
Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head
System ID: NC
Component ID: 1PZR-12 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA
Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit			
Serial No.:	13G00171			Serial No.:	G14818			Initial Cal:	Time	Date	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
Manufacturer:	GE			Manufacturer:	KBA			Inter. Cal:			1/4 T	78	1:2	1.52"
Model:	USN 60 SW	Linearity:	L-14-212	Size:	5x1.0	Model:	Gamma	Inter. Cal:	1328	9/19/2014	1/2 T	50	2.5	2.94"
Delay:	14.5541	Range:	12.00"	Freq.:	2.25 MHz	Center Freq.:	N/A	Inter. Cal:			3/4 T	38	3.8	4.37"
M'tl Cal/Vel:	0.123	Pulsar Type:	Square	Exam Angle:	60	Squint Angle:	N/A	Final Cal:	1448	9/19/2014	5/4 T	14	6.2	7.44"
Damping:	500 Ohms	Reject:	0%	Measured Angle:	60	Mode:	Shear	Couplant						
PRF:	Auto High	SU Freq.:	2.25 MHz	Exit Point:	0.7	# of Elements:	1	Cal. Batch:	12125					
Frequency:	2.25 MHz	Rectify:	Fullwave	Config.:	Single	Focus:	N/A	Type:	ULTRAGEL II					
Voltage:	450	Pulse Width:	220	Shape:	Rect.	Contour:	Flat	Mfg.:	MAGNAFLUX					
Ax. Gain (dB):	44.0	Circ. Gain (dB):	N/A	Wedge Style:	SWS			Exam Batch:	12125					
1 Screen Div. =	1.2	in. of	Sound Path	Search Unit Cable				Type:	ULTRAGEL II					
Calibration Block				Type:	RG-174	Length:	6'	No. Conn.:	0					
Cal. Block No.				Scan Coverage				Reference Block						
Thickness:	3.00	Dia.:	Flat	Upstream <input checked="" type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB:	58.0	Serial No.:	97-5689					
Cal. Blk. Temp.	74	Temp. Tool:	MCNDE40130	CW <input type="checkbox"/>	CCW <input type="checkbox"/>	Scan dB:	N/A	Type:	ROMPAS					
Comp. Temp.	80	Temp. Tool:	MCNDE40130	Exam Surface:	O.D.			Reference/Simulator Block						
Recordable Indication(s):	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	(If Yes, Ref. Attached Ultrasonic Indication Report.)											
Results:	Accept <input checked="" type="checkbox"/>	Reject <input type="checkbox"/>	Info <input type="checkbox"/>	Comments: FC 14-10 Calibration reflectors verified										
Percent Of Coverage Obtained > 90%: <u>No</u> Reviewed Previous Data: <u>Yes</u>														

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith				9/19/2014	JERRY NEWGARD L-III		10-18-14
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Koster, Rickey				9/19/2014			
Other	Level	II-N	Signature	Date	ANII Review	Signature	Date
Jensen, Paule J.				9/19/2014	JF Jensen		10-19-14



UT Calibration Examination

Site/Unit: McGuire / 1 Procedure: NDE-820 Outage No.: M1-23
 Summary No.: M1.B3.110.0002 Procedure Rev.: 7 Report No.: UT-14-395
 Workscope: ISI Work Order No.: 02107308 Page: 4 of 15

Code: 1998/2000 Addenda Cat./Item: B-D/B3.110 Location:
 Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head
 System ID: NC
 Component ID: 1PZR-12 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA
 Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit				
Serial No.:	13G00171			Serial No.:	G14818			Initial Cal:	0700	9/19/2014	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Manufacturer:	GE			Manufacturer:	KBA			Inter. Cal:			.5"	80	2.0	1.00"	
Model:	USN 60 SW	Linearity:	L-14-212	Size:	.5x1.0			Inter. Cal:	1357	9/19/2014	1.0"	55	4.0	2.00"	
Delay:	14.5541	Range:	5.0	Freq.:	2.25 MHz			Inter. Cal:			.25T	64	3.0	1.46"	
M'tl Cal/Vel:	1230	Pulser Type:	Square	Exam Angle:	60			Final Cal:	1448	9/19/2014					
Damping:	500 Ohms	Reject:	0%	Measured Angle:	60			Couplant							
PRF:	Auto High	SU Freq.:	2.25 MHz	Exit Point:	0.7			Cal. Batch:	12125						
Frequency:	2.25 MHz	Rectify:	Fullwave	Config.:	Single			Type:	ULTRAGEL II						
Voltage:	450	Pulse Width:	220	Shape:	Rect.			Mfg.:	MAGNAFLUX						
				Contour:	Flat			Exam Batch:	12125						
Ax. Gain (dB):	38.5			Search Unit Cable				Type:	ULTRAGEL II						
1 Screen Div. =	.5 in. of Sound Path			Type:	RG-174 Length: 6' No. Conn.: 0			Mfg.:	MAGNAFLUX						
				Scan Coverage				Reference Block							
Cal. Block No.	50338			Upstream <input checked="" type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB:	52.5	Serial No.:	97-5589						
Thickness	3.00			Dia.:	Flat			Type:	ROMPAS						
Cal. Blk. Temp.	74	Temp. Tool:	MCNDE40130	CW <input type="checkbox"/>	CCW <input type="checkbox"/>	Scan dB:	N/A	Reference/Simulator Block							
Comp. Temp.	80	Temp. Tool:	MCNDE40130	Exam Surface:	O.D.			Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path			
Recordable Indication(s):	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			Surface Condition:	Smooth			27.5	2" Radius	80	3.9	1.941"			
Results:	Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>			(If Yes, Ref. Attached Ultrasonic Indication Report.)				Comments: FC 14-10 Calibration reflectors verified							
Percent Of Coverage Obtained > 90%:	No			Reviewed Previous Data:	Yes										

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith				9/19/2014	JERRY NEWGARD L-III		10-18-14
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Kostar, Rickey				9/19/2014			
Other	Level	II-N	Signature	Date	ANII Review	Signature	Date
Jansen, Paule J.				9/19/2014	JF Jansen		10-19-14

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: <u>1PZR-12</u>		Item No: <u>M1.B3.110.0002</u>		remarks:
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Nozzle configuration
<input type="checkbox"/> LIMITED SCAN	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input type="checkbox"/> cw <input type="checkbox"/> ccw	
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>+0.01"</u> to <u>Beyond</u>		
ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input type="checkbox"/> 60 other <u>35</u>		FROM <u>0</u> DEG to <u>360</u> DEG		
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Nozzle configuration
<input type="checkbox"/> LIMITED SCAN	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input type="checkbox"/> cw <input type="checkbox"/> ccw	
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>+0.5"</u> to <u>Beyond</u>		
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 other <u></u>		FROM <u>0</u> DEG to <u>360</u> DEG		
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Nozzle configuration
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> cw <input type="checkbox"/> ccw	
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>-0.2"</u> to <u>Beyond</u>		
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 other <u></u>		FROM <u>0</u> DEG to <u>360</u> DEG		
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Nozzle configuration
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> cw <input type="checkbox"/> ccw	UT-14-395
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>-0.6"</u> to <u>Beyond</u>		Sketch(s) attached
ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input type="checkbox"/> 60 other <u></u>		FROM <u>0</u> DEG to <u>360</u> DEG		<input checked="" type="checkbox"/> yes <input type="checkbox"/> No
Prepared By: <u>Rickey L. Koster</u>		Level: <u>II</u>	Date: <u>09/19/14</u>	Sheet <u>15</u> of <u>15</u>
Reviewed By: <u>J. NEWGARD LIII</u>		Date: <u>10-18-14</u>	Authorized Inspector: <u>JF Swan</u> Date: <u>10-19-14</u>	

DUKE POWER COMPANY			
ISI LIMITATION REPORT			
Component/Weld ID: <u>1PZR-12</u>		Item No: <u>M1.B3.110.0002</u>	
<input checked="" type="checkbox"/> NO SCAN <input type="checkbox"/> LIMITED SCAN		SURFACE <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	
BEAM DIRECTION <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> cw <input checked="" type="checkbox"/> ccw		remarks: Nozzle configuration	
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>1.2"</u> to <u>Beyond</u>	
ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 other <u>35</u>		FROM <u>0</u> DEG to <u>360</u> DEG	
<input checked="" type="checkbox"/> NO SCAN <input type="checkbox"/> LIMITED SCAN		SURFACE <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	
BEAM DIRECTION <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> cw <input checked="" type="checkbox"/> ccw		Nozzle configuration	
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>1.5"</u> to <u>Beyond</u>	
ANGLE: <input checked="" type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other <u> </u>		FROM <u>0</u> DEG to <u>360</u> DEG	
<input type="checkbox"/> NO SCAN <input type="checkbox"/> LIMITED SCAN		SURFACE <input type="checkbox"/> 1 <input type="checkbox"/> 2	
BEAM DIRECTION <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw			
FROM L <u> </u> to L <u> </u>		INCHES FROM W0 <u> </u> to <u> </u>	
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other <u> </u>		FROM <u> </u> DEG to <u> </u> DEG	
<input type="checkbox"/> NO SCAN <input type="checkbox"/> LIMITED SCAN		SURFACE <input type="checkbox"/> 1 <input type="checkbox"/> 2	
BEAM DIRECTION <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		UT-14-395	
FROM L <u> </u> to L <u> </u>		INCHES FROM W0 <u> </u> to <u> </u>	
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other <u> </u>		FROM <u> </u> DEG to <u> </u> DEG	
		Sketch(s) attached <input checked="" type="checkbox"/> yes <input type="checkbox"/> No	
Prepared By: <u>Rickey L. Koster</u>		Level: <u>II</u>	Date: <u>09/19/14</u>
Reviewed By: <u>J. NEWGARD C-III</u>		Date: <u>10-18-14</u>	Authorized Inspector: <u>J. F. Swan</u> Date: <u>10-19-14</u>

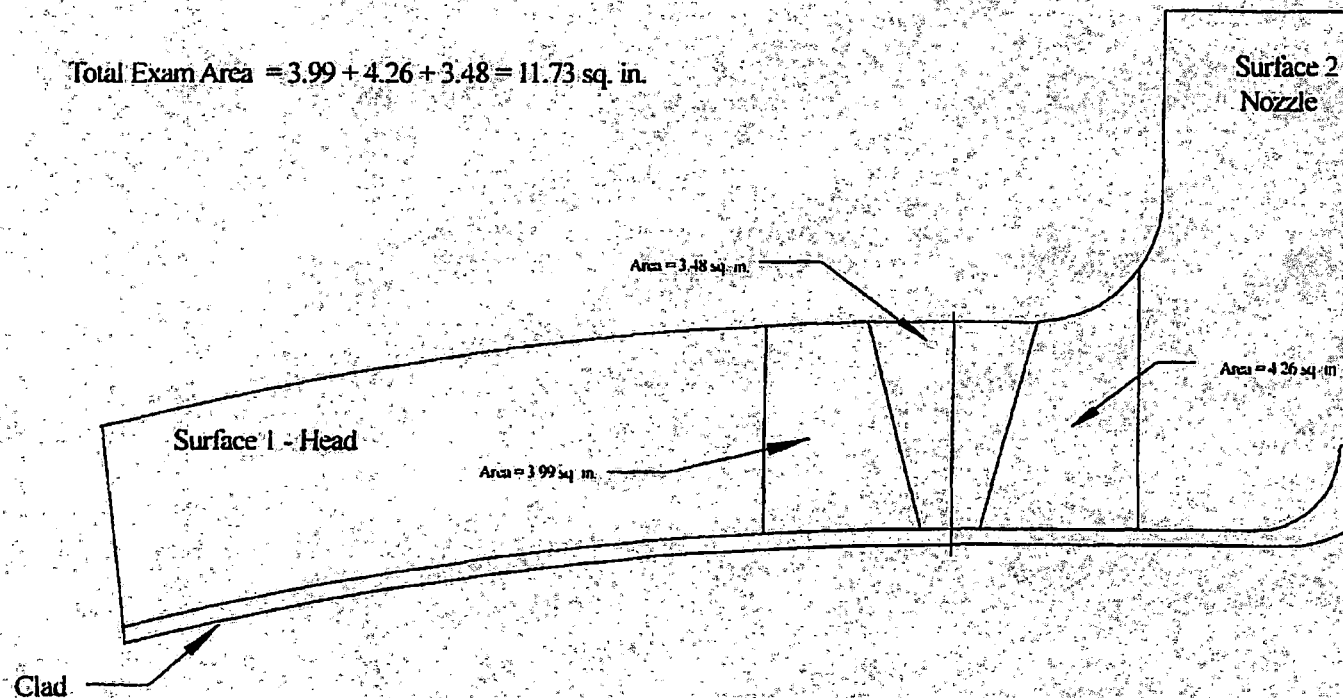
Pressurizer Spray Nozzle to Head

Total Area Weld & Base Material

Item No. : MI.B3.110.0002Weld No. : 1PZR-12

Total Weld Area = 3.48 sq. in.

Scale 1" = 2"

Total Area of Base Material = $3.99 + 4.26 = 8.25$ sq. in.Total Exam Area = $3.99 + 4.26 + 3.48 = 11.73$ sq. in.Reviewed / Date : J. NEWGARD L.M. 10-18-14Page 7 of 15

Pressurizer Spray Nozzle to Head

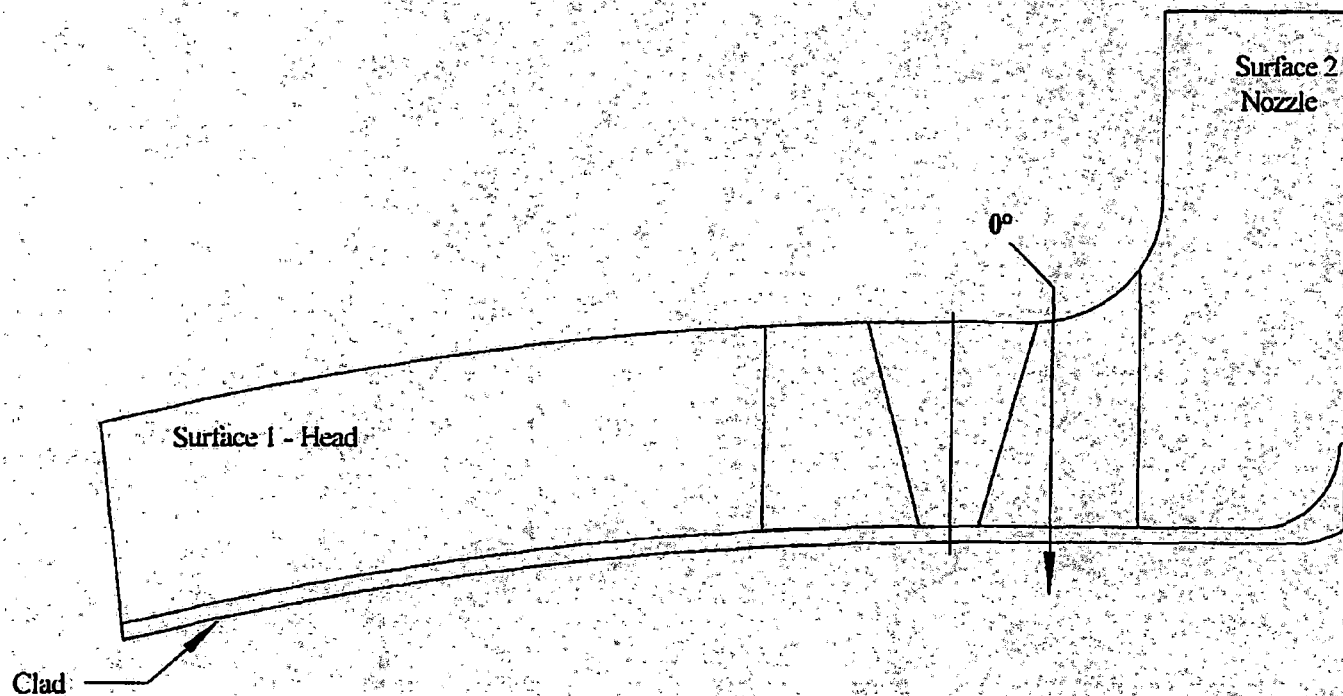
0° Scan Coverage

Item No. : MI.B3.110.0002Weld No. : 1PZR-12

0° Scan Total Area = 8.87 sq. in.

Total 0° Scan Coverage = $8.87 / 11.73 \times 100 = 75.6\%$

Scale 1" = 2"

Reviewed / Date : J. NEWCARD 6-III *Jan 70*Page 8 of 15

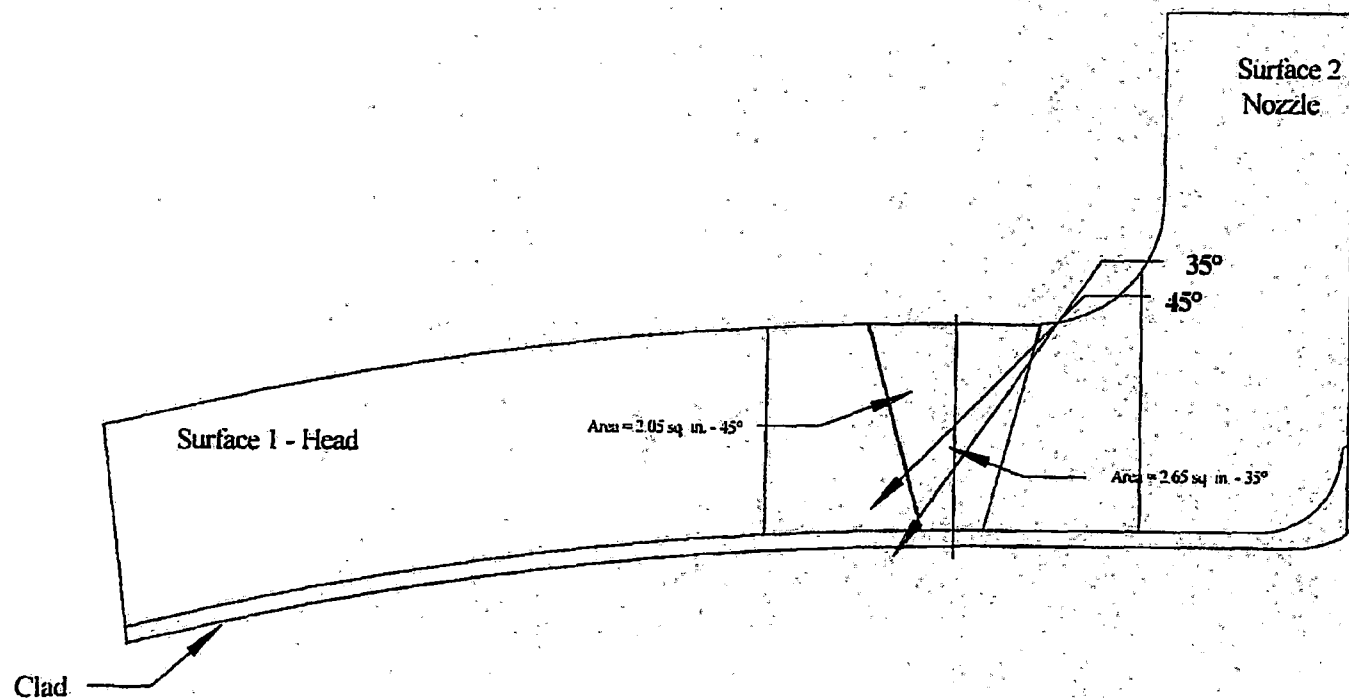
10-18-14

Weld Coverage - Axial & Circumferential Scans

Item No. : ML.B3.110.0002

Weld No.: 1PZR-12

Scale 1"=2"



Reviewed / Date : J. NEWGARD L-III Jan 20

Pressurizer Spray Nozzle to Head

Base Material Coverage - Axial Scans

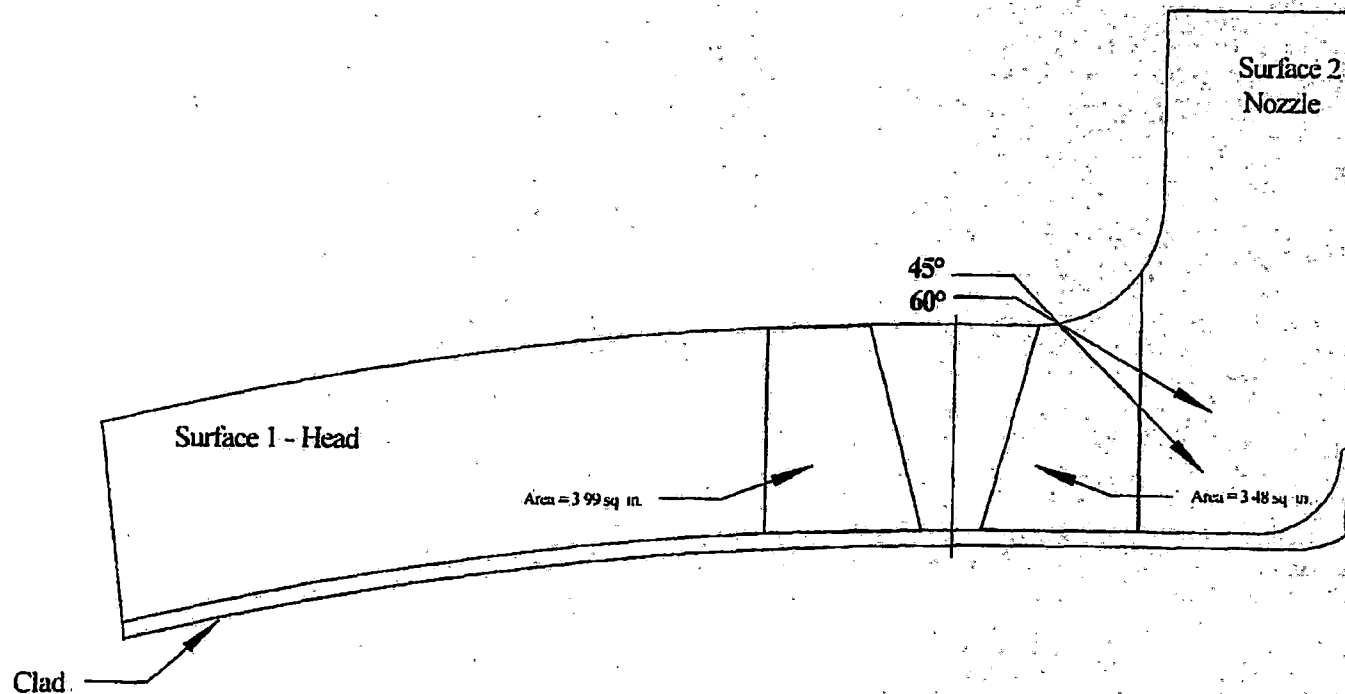
Item No. : M1.B3.110.0002

Weld No. : 1PZR-12

Total Area of Base Material = $3.99 + 3.48 = 7.47$ sq. in.

Total Base Material Coverage = $7.47 / 8.25 \times 100 = 90.5\%$

Scale 1" = 2"



Reviewed / Date : J. NEWGARD 10-18-14

Page 10 of 15

10-18-14

Pressurizer Spray Nozzle to Head

Base Material Coverage - Circumferential Scans

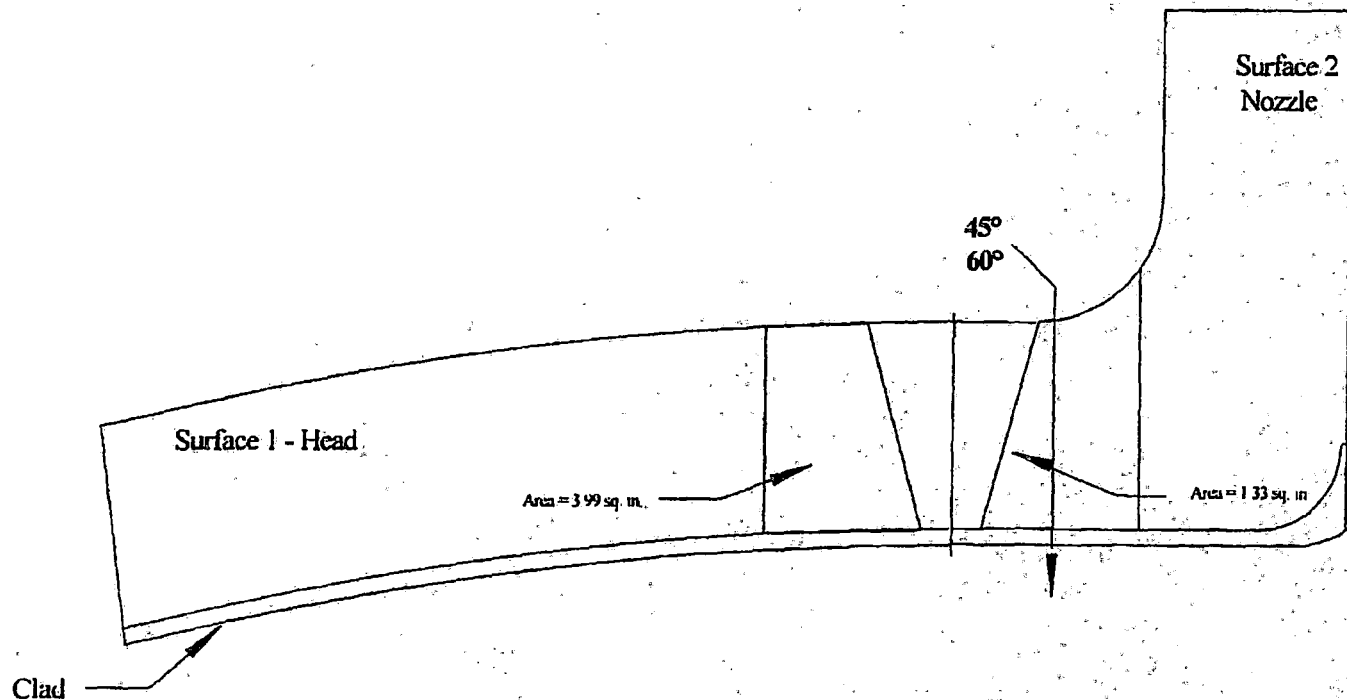
Item No. : MLB3.110.0002

Weld No. : 1PZR-12

Scale 1" = 2"

Total Area of Base Material = $3.99 + 1.33 = 5.32$ sq. in.

Total Base Material Coverage = $5.32 / 8.25 \times 100 = 64.5\%$



Reviewed / Date : J. NEWGARD L-III 10-18-14

Pressurizer Spray Nozzle to Head % of CoverageItem No. : M1.B3.110.0002Weld No. : 1PZR-12Weld Coverage

<u>Scan</u>	<u>Angle</u>	<u>% Coverage Obtained</u>
S1	60°	100
S2	35°	76.1
S1	45°	100
S2	45°	58.9
CW	60°	100
CW	45°	100
CCW	60°	100
CCW	45°	<u>100</u>
Total		735

$$735 \div 8 =$$

91.9

% Coverage

Base Material Coverage

S1	35°, 45° & 60°	90.5
CW & CCW	35°, 45°, & 60°	<u>64.5</u>
Total		155

$$155 \div 2 =$$

77.5

% Coverage

0° Scan Coverage

=

75.6

% Coverage

Aggregate Coverage = Weld + Base Material + 0° ÷ 3

=

81.7

% Coverage

Reviewed / Date : J. NEWGARD 10-18-14Page 12 of 15

Pressurizer Nozzle to Head Welds

Scan Plan

Scale 1" = 2"

Scan Plan Applies To:

Item #'s	Weld #'s	Component
M1.B3.110.0002	1PZR-12	Spray Nozzle
M1.B3.110.0005	1PZR-15	Safety Nozzle
M1.B3.110.0006	1PZR-16	Relief Nozzle

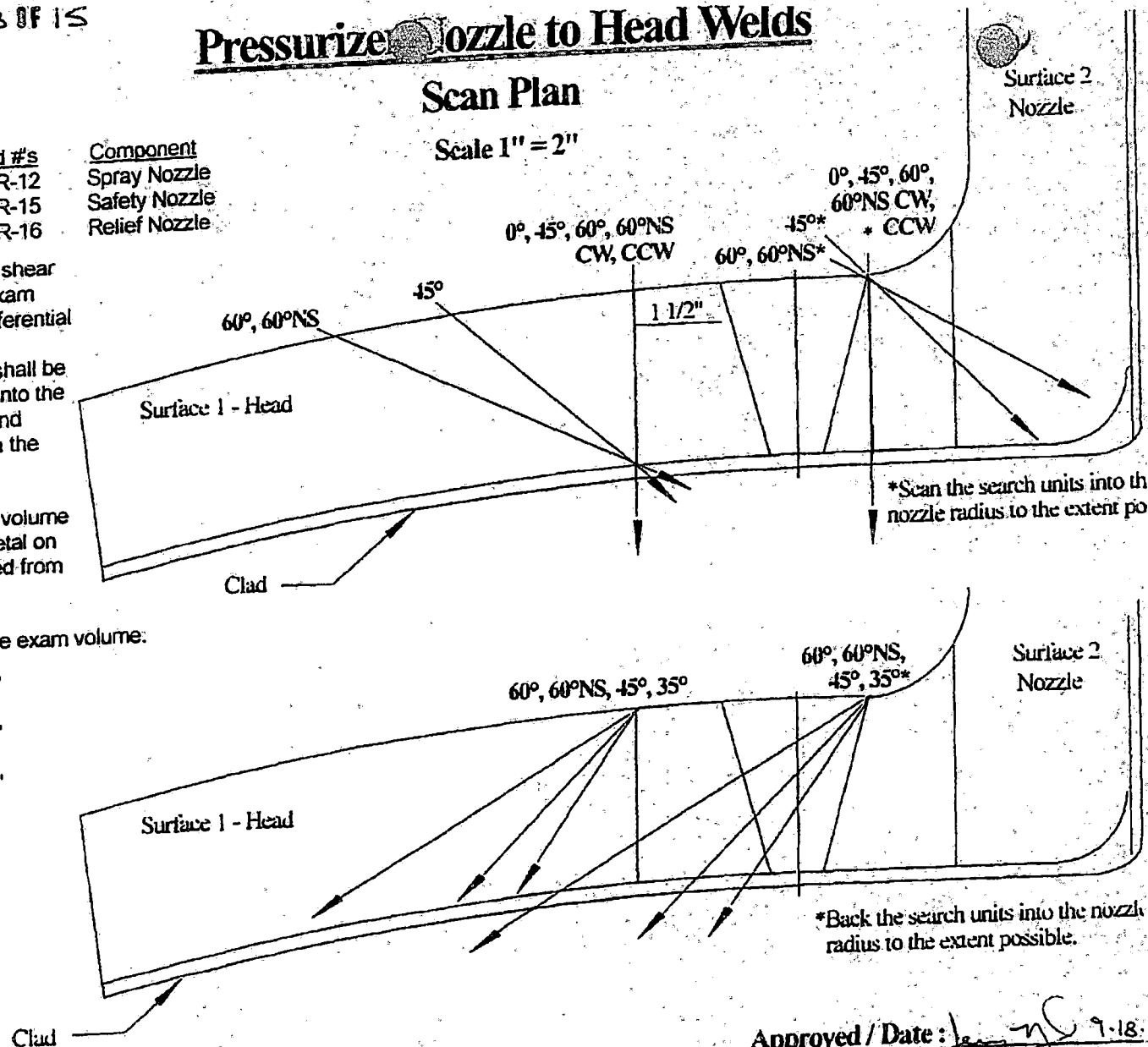
45°, 60°, and 60° near surface shear wave inspection required for exam volume in the axial and circumferential directions as shown.

A 35° shear wave search unit shall be used supplementally, backing into the nozzle to the extent possible and scanning towards and through the vessel head exam volume.

Exam volume includes the full volume of weld, plus 1/2 T of Base Metal on each side of the weld measured from the weld toes.

0° inspection required for entire exam volume:

Component Thickness = 2.5"
 1/2 T = 1.25"
 35° Surface Distance = 1.75"
 45° Surface Distance = 2.5"
 60° Surface Distance = 4.33"

Approved / Date: *Jan 9, 18*

Page 13 of 15

EXHIBIT A-1
PRE/POST-JOB BRIEF SHEETComponent to be Examined 1 PZR-12, 15 & 16 WO# 02107308 TASK 1ISI Summary/WO Number M1.B3.110.002,005+0006 M1.B3.120.0002,0003+0005Date 9-19-2014 Time Start (Pre) 0755 Time Finish (Pre) 0806Date 9-19-2014 Time Start (Post) 1506 Time Finish (Post) 1518

Attributes Discussed (Initial those completed and NA those that do not apply)

- 3 N. ISI Plan/Work Order Review (if applicable) PRE-JOB
- 3 N. Examination purpose (i.e. ASME Section XI, augmented) PRE-JOB
- 3 N. Surface condition and configuration PRE-JOB
- 3 N. Limitations PRE-JOB
- 3 N. Previous Data and Previous PIPs PRE-JOB
- 3 N. Drawings PRE-JOB
- 3 N. Welding Process and joint configuration PRE-JOB
- 3 N. Area of Interest (Section XI, Risk Informed) PRE-JOB
- 3 N. Scan Plan PRE-JOB
- 3 N. Team Scanning PRE-JOB
- 3 N. Mock-Ups PRE-JOB
- 3 N. Review of planned examination including angles, modes, etc. PRE-JOB
- 3 N. Known failure mechanisms expected flaw types and locations PRE-JOB
- 3 N. Unexpected conditions detrimental to the planned examination PRE-JOB
- 3 N. Roles of the Regulators and the ANII PRE-JOB
- 3 N. OE (company and industry events specific to examination) PRE-JOB
- 3 N. Expectations for Corrective Action initiation (PIP or CR) PRE/POST-JOB
- 3 N. Physical limitations PRE/POST-JOB
- 3 N. Unexpected conditions POST-JOB
- 3 N. Indications/conditions detected or observed POST-JOB
- 3 N. Indications/conditions requiring further evaluation POST-JOB
- 3 N. Coverage limitations and calculations POST-JOB
- 3 N. Team Scanning POST-JOB
- 3 N. Dose POST-JOB
- 3 N. Safety Issues POST-JOB
- 3 N. Overall job performance POST-JOB
- 3 N. Inadequacies of the ISI Plan, Work Order, and Drawings (Initiate PIP) POST-JOB
- 3 N. Examiner concerns POST-JOB

PAGE 1 of 2

1/23
12/1/14

REPORT NO: UT-14-3
Pg 14 of 15

EXHIBIT A-1
PRE/POST-JOB BRIEF SHEET

Pre-Job

Comments: DISCUSSED TIGHT WORKING CONDITIONS.

Post-Job

Comments: INADEQUATE LIGHTING, EXAM DELAYS DUE TO
OTHER WORK IN AREA.

PIP/CR

Numbers: NONE

Attendees

Level III SME: Print JERRY NEWGARDSign [Signature]Examiner: Print ECOLEY KOSKESign [Signature]Examiner: Print KEITH BULLSign [Signature]Examiner: Print PAULE JENSENSign [Signature]

Examiner: Print _____

Sign _____

Examiner: Print _____

Sign _____

Examiner: Print _____

Sign _____

Examiner: Print _____

Sign _____

Examiner: Print _____

Sign _____

Relief Request Serial Number

16-MN-001

Attachment B

(Pages 1-2)

(Pages 1-15)



UT Calibration Examination

ATTACHMENT B

PAGE 1 OF 2

Site/Unit: McGuire / 1
Summary No.: M1.B3.110.0005
Workscope: ISI

Procedure: NDE-640
Procedure Rev.: 5
Work Order No.: 02107308

Outage No.: M1-23
Report No.: UT-14-400
Page: 1 of 2

Code: 1998/2000 Addenda Cat./Item: B-D/B3.110 Location: _____
Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head
System ID: NC
Component ID: 1PZR-15 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA
Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings
Serial No.: 13G00171
Manufacturer: GE
Model: USN 60 SW Linearity: L-14-212
Delay: .9491 Range: 5.0"
M'll Cal/Vel: .2347 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 2.25 MHz
Frequency: 2.25 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 220

Search Unit
Serial No.: G85215
Manufacturer: Automation
Size: 0.75 Model: Gamma
Freq.: 2.25 MHz Center Freq.: N/A
Exam Angle: 0 Squint Angle: N/A
Measured Angle: 0 Mode: Long
Exit Point: N/A # of Elements: 1
Config.: Single Focus: N/A
Shape: Round Contour: Flat
Wedge Style: N/A

Cal. Checks	Time	Date
Initial Cal	0700	9/19/2014
Inter. Cal.		
Inter. Cal.	1234	9/19/2014
Inter. Cal.		
Final Cal	1445	9/19/2014

Couplant
Cal. Batch: 12125
Type: ULTRAGEL II
Mfg.: MAGNAFLUX
Exam Batch: 12125
Type: ULTRAGEL II
Mfg.: MAGNAFLUX

Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Calibration Block
Cal. Block No.: 50338
Thickness: 3.00 Dia.: Flat
Cal. Blk. Temp.: 74 Temp. Tool: MCNDE40130
Comp. Temp.: 80 Temp. Tool: MCNDE40130

Scan Coverage
Upstream ☒ Downstream ☒ Scan dB: 31.2
CW ☒ CCW ☒ Scan dB: 31.2
Exam Surface: O.D.
Surface Condition: Smooth

Reference Block
Serial No.: 97-5589
Type: ROMPAS

Axial Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1/4 T	78	1.4	.620"
1/2T	80	2.9	1.40"
3/4T	70	4.4	2.20"
BW	100+	6.2	2.980"

Circumferential Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
See Axial			

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
8.5	1" Radius	80	2.00	1.001"

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: Yes

Comments: FC 14-09, 14-45
See Report # UT-14-401 for limitation

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith				9/19/2014	Jerry Newgard L-III		10/10/2014
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Koster, Rickey				9/19/2014	N/A		
Other	Level	II-N	Signature	Date	ANII Review	Signature	Date
Jensen, Paule J.				9/19/2014	Swan, Jerome		10-19-14

EXHIBIT A-1
PRE/POST-JOB BRIEF SHEETComponent to be Examined 1 PZR-12, 15 & 16 WO# 02107308 TASK 1ISI Summary/WO Number M1.B3.110.002,005 & 0006 M1.B3.120.0002,0003 & 0005Date 9-19-2014 Time Start (Pre) 0755 Time Finish (Pre) 0806Date 9-19-2014 Time Start (Post) 1506 Time Finish (Post) 1518

Attributes Discussed (Initial those completed and NA those that do not apply)

- 3N • ISI Plan/Work Order Review (if applicable) PRE-JOB
- 3N • Examination purpose (i.e. ASME Section XI, augmented) PRE-JOB
- 3N • Surface condition and configuration PRE-JOB
- 3N • Limitations PRE-JOB
- 3N • Previous Data and Previous PIPs PRE-JOB
- 3N • Drawings PRE-JOB
- 3N • Welding Process and joint configuration PRE-JOB
- 3N • Area of Interest (Section XI, Risk Informed) PRE-JOB
- 3N • Scan Plan PRE-JOB
- 3N • Team Scanning PRE-JOB
- 3N • Mock-Ups PRE-JOB
- 3N • Review of planned examination including angles, modes, etc. PRE-JOB
- 3N • Known failure mechanisms expected flaw types and locations PRE-JOB
- 3N • Unexpected conditions detrimental to the planned examination PRE-JOB
- 3N • Roles of the Regulators and the ANII PRE-JOB
- 3N • OE (company and industry events specific to examination) PRE-JOB
- 3N • Expectations for Corrective Action initiation (PIP or CR) PRE/POST-JOB
- 3N • Physical limitations PRE/POST-JOB
- 3N • Unexpected conditions POST-JOB
- 3N • Indications/conditions detected or observed POST-JOB
- 3N • Indications/conditions requiring further evaluation POST-JOB
- 3N • Coverage limitations and calculations POST-JOB
- 3N • Team Scanning POST-JOB
- 3N • Dose POST-JOB
- 3N • Safety Issues POST-JOB
- 3N • Overall job performance POST-JOB
- 3N • Inadequacies of the ISI Plan, Work Order, and Drawings (Initiate PIP) POST-JOB
- 3N • Examiner concerns POST-JOB



UT Calibration Examination

ATTACHMENT B

PAGE 1 OF 15



Site/Unit: McGuire / 1
Summary No.: M1.B3.110.0005
Workscope: ISI

Procedure: NDE-820
Procedure Rev.: 7
Work Order No.: 02107308

Outage No.: M1-23
Report No.: UT-14-401
Page: 1 of 15

Code: 1998/2000 Addenda Cat./Item: B-D/B3.110 Location:

Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head

System ID: NC

Component ID: 1PZR-15 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA

Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit					
Serial No.:	023K3V			Serial No.:	L29929			Initial Cal	Time	Date	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path		
Manufacturer:	GE			Manufacturer:	KBA			Inter. Cal.			1/4 T	80	1.2	.857"		
Model:	USN 60 SW	Linearity:	L-14-208	Size:	0.5"x1.0"	Model:	Gamma	Inter. Cal.	1233	9/19/2014	1/2T	65	2.6	1.81"		
Delay:	7.5988	Range:	7.00"	Freq.:	2.25 MHz	Center Freq.:	N/A	Inter. Cal.			3/4T	51	3.8	2.69"		
M'tl Cal/Vel:	0.123	Pulser Type:	Square	Exam Angle:	35	Squint Angle:	N/A	Final Cal	1446	9/19/2014	5/4T	24	6.5	4.55"		
Damping:	500 Ohms	Reject:	0%	Measured Angle:	35	Mode:	Shear	Couplant								
PRF:	Auto High	SU Freq.:	2.25 MHz	Exit Point	.7"	# of Elements:	1									
Frequency:	2.25 MHz	Rectify:	Fullwave	Config.:	Single	Focus:	N/A	Cal. Batch:	12125							
Voltage:	450	Pulse Width:	220	Shape:	Rect.	Contour:	Flat	Type:	ULTRAGEL II							
				Wedge Style:	SWS			Mfg.:	MAGNAFLUX							
				Search Unit Cable				Exam Batch:	12125							
				Type:	RG-174	Length:	6'	No. Conn.:	0							
				Scan Coverage				Type:	ULTRAGEL II							
				Calibration Block				Mfg.:	MAGNAFLUX							
				Cal. Block No.				Reference Block				Reference/Simulator Block				
				Thickness				Upstream <input checked="" type="checkbox"/> Downstream <input checked="" type="checkbox"/> Scan dB: 51.2				Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
				Dia.:				CW <input checked="" type="checkbox"/> CCW <input checked="" type="checkbox"/> Scan dB: 51.2				22.3	2" Radius	80	2.9	2.00"
				Cal. Bik. Temp.				Exam Surface:								
				Temp. Tool:				O.D.								
				Comp. Temp.				Surface Condition:								
				Temp. Tool:				Smooth								
				Recordable Indication(s):				Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)								
				Results:				Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>								
				Percent Of Coverage Obtained > 90%:				No				Reviewed Previous Data: Yes				
												Comments: FC 14-10 Calibrated reflectors verified				

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith				9/19/2014	JERRY NEWGARD L-III		10.18.14
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Koster, Rickey				9/19/2014			
Other	Level	II-N	Signature	Date	ANII Review	Signature	Date
Jensen, Paule J.				9/19/2014	JF Swan		10-19-14



UT Calibration Examination

ATTACHMENT B

PAGE 2 OF 15



Site/Unit: McGuire / 1
Summary No.: M1.B3.110.0005
Workscope: ISI

Procedure: NDE-820
Procedure Rev.: 7
Work Order No.: 02107308

Outage No.: M1-23
Report No.: UT-14-401
Page: 2 of 15

Code: 1998/2000 Addenda Cat./Item: B-D/B3.110 Location: _____
Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head
System ID: NC
Component ID: 1PZR-15 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA
Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings
Serial No.: 023K3V
Manufacturer: GE
Model: USN 60 SW Linearity: L-14-208
Delay: 12.2488 Range: 8.5"
M'tl Cal/Vel: 0.123 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 2.25 MHz
Frequency: 2.25 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 220
Ax. Gain (dB): 47.0 Circ. Gain (dB): N/A
1 Screen Div. = .85 in. of Sound Path

Search Unit
Serial No.: B28024
Manufacturer: KBA
Size: 0.5"x1.0" Model: Gamma
Freq.: 2.25 MHz Center Freq.: N/A
Exam Angle: 45 Squint Angle: N/A
Measured Angle: 45 Mode: Shear
Exit Point: 0.7" # of Elements: 1
Config.: Single Focus: N/A
Shape: Rect. Contour: Flat
Wedge Style: SWS
Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Cal. Checks	Time	Date
Initial Cal	0700	9/19/2014
Inter. Cal.		
Inter. Cal.	1331	9/19/2014
Inter. Cal.		
Final Cal	1447	9/19/2014

Couplant
Cal. Batch: 12125
Type: ULTRAGEL II
Mfg.: MAGNAFLUX
Exam Batch: 12125
Type: ULTRAGEL II
Mfg.: MAGNAFLUX

Axial Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1/4 T	80	1.1	.943"
1/2T	60	2.3	1.97"
3/4T	40	3.4	2.89"
5/4T	20	6.2	5.27"
ID Notch	28	4.8	4.08"

Circumferential Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
26.2	2" Radius	80	2.35	1.998"

Calibration Block
Cal. Block No. 50338
Thickness 3.00 Dia.: Flat
Cal. Blk. Temp. 74 Temp. Tool: MCNDE40130
Comp. Temp. 80 Temp. Tool: MCNDE40130
Scan Coverage
Upstream ☒ Downstream ☒ Scan dB: 61.0
CW ☒ CCW ☒ Scan dB: 61.0
Exam Surface: O.D.
Surface Condition: Smooth
Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Reference Block
Serial No.: 97-5589
Type: ROMPAS

Comments: FC 14-10
Calibrated reflectors verified

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: Yes

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith	II-N		9/19/2014	JERRY NEWBARD L-III		10-18-14
Koster, Rickey	II-N		9/19/2014	Site Review		
Jensen, Paule J.	II-N		9/19/2014	ANII Review		10-19-14



UT Calibration Examination

ATTACHMENT B

PAGE 3 OF 15



Site/Unit: McGuire / 1
Summary No.: M1.B3.110.0005
Workscope: ISI

Procedure: NDE-820
Procedure Rev.: 7
Work Order No.: 02107308

Outage No.: M1-23
Report No.: UT-14-401
Page: 3 of 15

Code: 1998/2000 Addenda Cat./Item: B-D/B3.110 Location: _____
Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head
System ID: NC
Component ID: 1PZR-15 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA
Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings
Serial No.: 13G00171 Manufacturer: GE Model: USN 60 SW Linearity: L-14-212 Delay: 14.5541 Range: 12.00" M'td Cal/Vel: 0.123 Pulser Type: Square Damping: 500 Ohms Reject: 0% PRF: Auto High SU Freq.: 2.25 MHz Frequency: 2.25 MHz Rectify: Fullwave Voltage: 450 Pulse Width: 220

Search Unit
Serial No.: G14818 Manufacturer: KBA Size: .5x1.0 Model: Gamma Freq.: 2.25 MHz Center Freq.: N/A Exam Angle: 60 Squint Angle: N/A Measured Angle: 60 Mode: Shear Exit Point: 0.7" # of Elements: 1 Config.: Single Focus: N/A Shape: Rect. Contour: Flat Wedge Style: SWS

Ax. Gain (dB): 44.0 Circ. Gain (dB): N/A
1 Screen Div. = 1.2 in. of Sound Path
Type: RG-174 Length: 6' No. Conn.: 0

Calibration Block
Cal. Block No.: 50338 Thickness: 3.00 Dia.: Flat Cat. Blk. Temp.: 74 Temp. Tool: MCNDE40130 Comp. Temp.: 80 Temp. Tool: MCNDE40130

Scan Coverage
Upstream ☒ Downstream ☒ Scan dB: 58.2 CW ☐ CCW ☐ Scan dB: N/A Exam Surface: O.D. Surface Condition: Smooth

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: Yes

Cal. Checks	Time	Date
Initial Cal	0700	9/19/2014
Inter. Cal.		
Inter. Cal.	1328	9/19/2014
Inter. Cal.		
Final Cal	1448	9/19/2014

Couplant
Cal. Batch: 12125
Type: ULTRAGEL II
Mfg.: MAGNAFLUX
Exam Batch: 12125
Type: ULTRAGEL II
Mfg.: MAGNAFLUX

Axial Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1/4 T	78	1.2	1.52"
1/2T	50	2.5	2.94"
3/4T	38	3.6	4.37"
5/4T	14	6.2	7.44"
ID Notch	30	5.0	6.0"

Circumferential Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
30.0	2" Radius	80	1.65	1.980"

Comments: FC 14-10
Calibration reflectors verified

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith				9/19/2014	JERRY NEWGARD L-III		10-18-14
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Kostar, Rickey				9/19/2014			
Other	Level	II-N	Signature	Date	ANII Review	Signature	Date
Jensen, Paule J.				9/19/2014	JF Swan		10-19-14



UT Calibration Examination

ATTACHMENT B

PAGE 4 OF 5

Site/Unit: McGuire / 1
Summary No.: M1.B3.110.0005
Workscope: ISI

Procedure: NDE-820
Procedure Rev.: 7
Work Order No.: 02107308

Outage No.: M1-23
Report No.: UT-14-401
Page: 4 of 15

Code: 1998/2000 Addenda Cat./Item: B-D/B3.110 Location: _____
Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head
System ID: NC
Component ID: 1PZR-15 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA
Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings
Serial No.: 13G00171
Manufacturer: GE
Model: USN 60 SW Linearity: L-14-212
Delay: 14.5541 Range: 5.0
M'U Cal/Vel: .1230 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 2.25 MHz
Frequency: 2.25 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 220

Search Unit
Serial No.: G14818
Manufacturer: KBA
Size: .5x1.0 Model: Gamma
Freq.: 2.25 MHz Center Freq.: N/A
Exam Angle: 60 Squint Angle: N/A
Measured Angle: 60 Mode: Shear
Exit Point: 0.7 # of Elements: 1
Config.: Single Focus: N/A
Shape: Rect. Contour: Flat
Wedge Style: SWS

Ax. Gain (dB): 38.5 Circ. Gain (dB): N/A
1 Screen Div. = .5 in. of Sound Path

Calibration Block
Cal. Block No.: 50338
Thickness: 3.00 Dia.: Flat
Cal. Blk. Temp.: 74 Temp. Tool: MCNDE40130
Comp. Temp.: 80 Temp. Tool: MCNDE40130

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: Yes

Cal. Checks	Time	Date
Initial Cal.	0700	9/19/2014
Inter. Cal.		
Inter. Cal.	1357	9/19/2014
Inter. Cal.		
Final Cal.	1449	9/19/2014

Couplant
Cal. Batch: 12125
Type: ULTRAGEL II
Mfg.: MAGNAFLUX
Exam Batch: 12125
Type: ULTRAGEL II
Mfg.: MAGNAFLUX

Axial Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
.5"	80	2.0	1.00"
1.0"	65	4.0	2.00"
.25T	64	3.0	1.46"

Circumferential Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference Block
Serial No.: 97-5589
Type: ROMPAS

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
27.5	2" Radius	80	3.9	1.941"

Comments: FC 14-10
Calibration reflectors verified

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith	II-N		9/19/2014	JERRY NEWGARD L-II		10-18-14
Examiner	Level	Signature	Date	Site Review	Signature	Date
Koster, Rickey	II-N		9/19/2014			
Other	Level	Signature	Date	ANII Review	Signature	Date
Jensen, Paula J.	II-N		9/19/2014	JF Swan		10-19-14

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: <u>1PZR-15</u>		Item No: <u>M1.B3.110.0005</u>		remarks:
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Nozzle configuration
<input type="checkbox"/> LIMITED SCAN	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>+0.1"</u> to <u>Beyond</u>		
ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input type="checkbox"/> 60 other <u>35</u>		FROM <u>0</u> DEG to <u>360</u> DEG		
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Nozzle configuration
<input type="checkbox"/> LIMITED SCAN	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>+0.5"</u> to <u>Beyond</u>		
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 other <u> </u>		FROM <u>0</u> DEG to <u>360</u> DEG		
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Nozzle configuration
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>-0.2"</u> to <u>Beyond</u>		
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 other <u> </u>		FROM <u>0</u> DEG to <u>360</u> DEG		
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Nozzle configuration
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		UT-14-401
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>-0.6"</u> to <u>Beyond</u>		Sketch(s) attached
ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input type="checkbox"/> 60 other <u> </u>		FROM <u>0</u> DEG to <u>360</u> DEG		<input checked="" type="checkbox"/> yes <input type="checkbox"/> No
Prepared By: <u>Rickey L. Koster</u>		Level: <u>II</u>	Date: <u>09/19/14</u>	Sheet <u>5</u> of <u>15</u>
Reviewed By: <u>J. NEWGARD L. III</u>		Date: <u>10-18-14</u>	Authorized Inspector: <u>J. Swan</u> Date: <u>10-19-14</u>	

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: <u>1PZR-15</u> Item No: <u>M1B3.110.0005</u>		remarks: Nozzle configuration
<input checked="" type="checkbox"/> NO SCAN <input type="checkbox"/> LIMITED SCAN	SURFACE <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	BEAM DIRECTION <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> cw <input checked="" type="checkbox"/> ccw
FROM L <u>N/A</u> to L <u>N/A</u> INCHES FROM W0 <u>1.2"</u> to <u>Beyond</u>		
ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 other <u>35</u> FROM <u>0</u> DEG to <u>360</u> DEG		
<input checked="" type="checkbox"/> NO SCAN <input type="checkbox"/> LIMITED SCAN	SURFACE <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	BEAM DIRECTION <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> cw <input checked="" type="checkbox"/> ccw
FROM L <u>N/A</u> to L <u>N/A</u> INCHES FROM W0 <u>1.5"</u> to <u>Beyond</u>		
ANGLE: <input checked="" type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other _____ FROM <u>0</u> DEG to <u>360</u> DEG		
<input type="checkbox"/> NO SCAN <input type="checkbox"/> LIMITED SCAN	SURFACE <input type="checkbox"/> 1 <input type="checkbox"/> 2	BEAM DIRECTION <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw
FROM L _____ to L _____ INCHES FROM W0 _____ to _____		
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other _____ FROM _____ DEG to _____ DEG		
<input type="checkbox"/> NO SCAN <input type="checkbox"/> LIMITED SCAN	SURFACE <input type="checkbox"/> 1 <input type="checkbox"/> 2	BEAM DIRECTION <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw
FROM L _____ to L _____ INCHES FROM W0 _____ to _____		UT-14-401 Sketch(s) attached <input checked="" type="checkbox"/> yes <input type="checkbox"/> No
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other _____ FROM _____ DEG to _____ DEG		
Prepared By: <u>Rickey L. Koster</u> Level: <u>II</u> Date: <u>09/19/14</u>		Sheet <u>6</u> of <u>15</u>
Reviewed By: <u>J. NEWGARD LIII</u> Date: <u>10-18-14</u>		Authorized Inspector: <u>JF Swan</u> Date: <u>10-19-14</u>

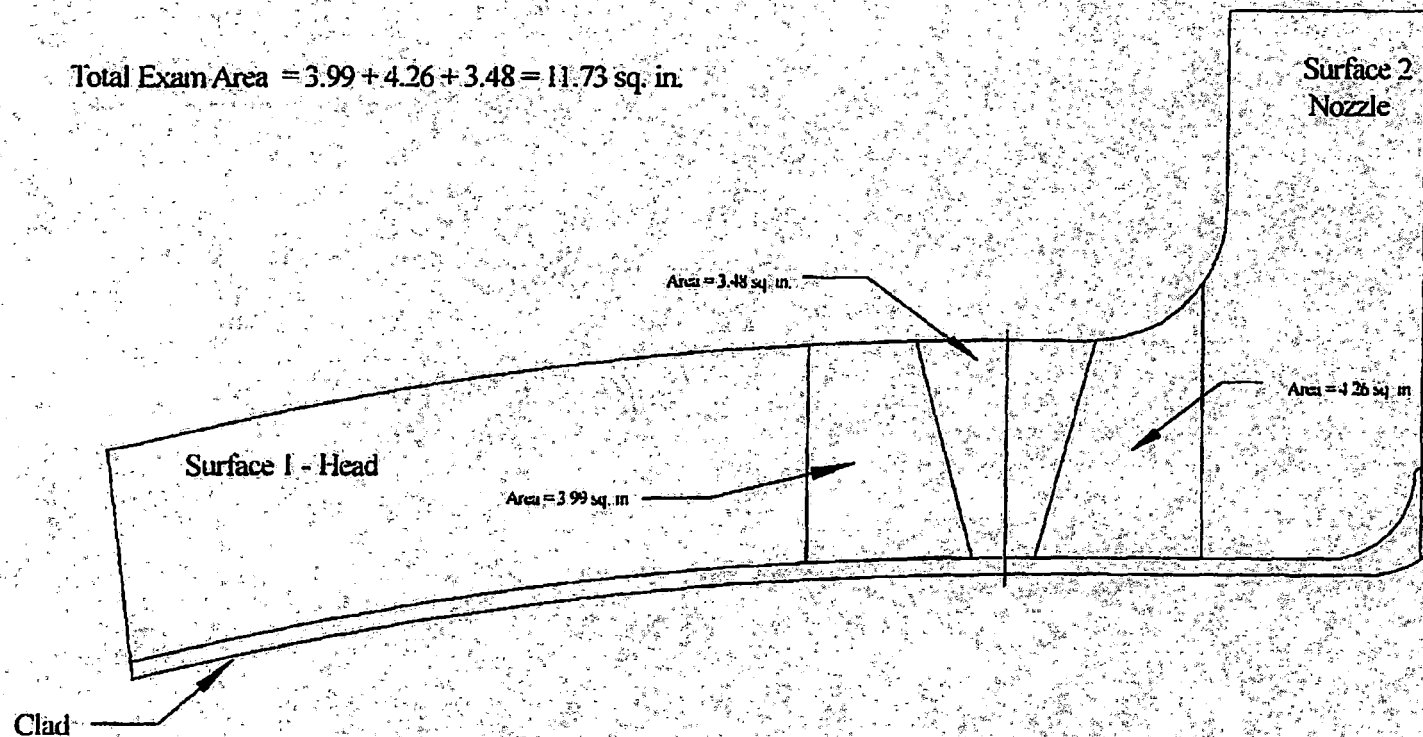
Pressurizer Safety Nozzle to Head

Total Area Weld & Base Material

Item No. : M1.B3.110.0005Weld No. : 1PZR-15

Scale 1" = 2"

Total Weld Area = 3.48 sq. in.

Total Area of Base Material = $3.99 + 4.26 = 8.25$ sq. in.Total Exam Area = $3.99 + 4.26 + 3.48 = 11.73$ sq. in.Reviewed / Date : J. NEWCARD Jan 70 10-18-14Page 7 of 15

Pressurizer Safety Nozzle to Head

Weld Coverage - Axial & Circumferential Scans

100% Coverage 45° & 60° Scans CW, CCW and Axial from Surface 1

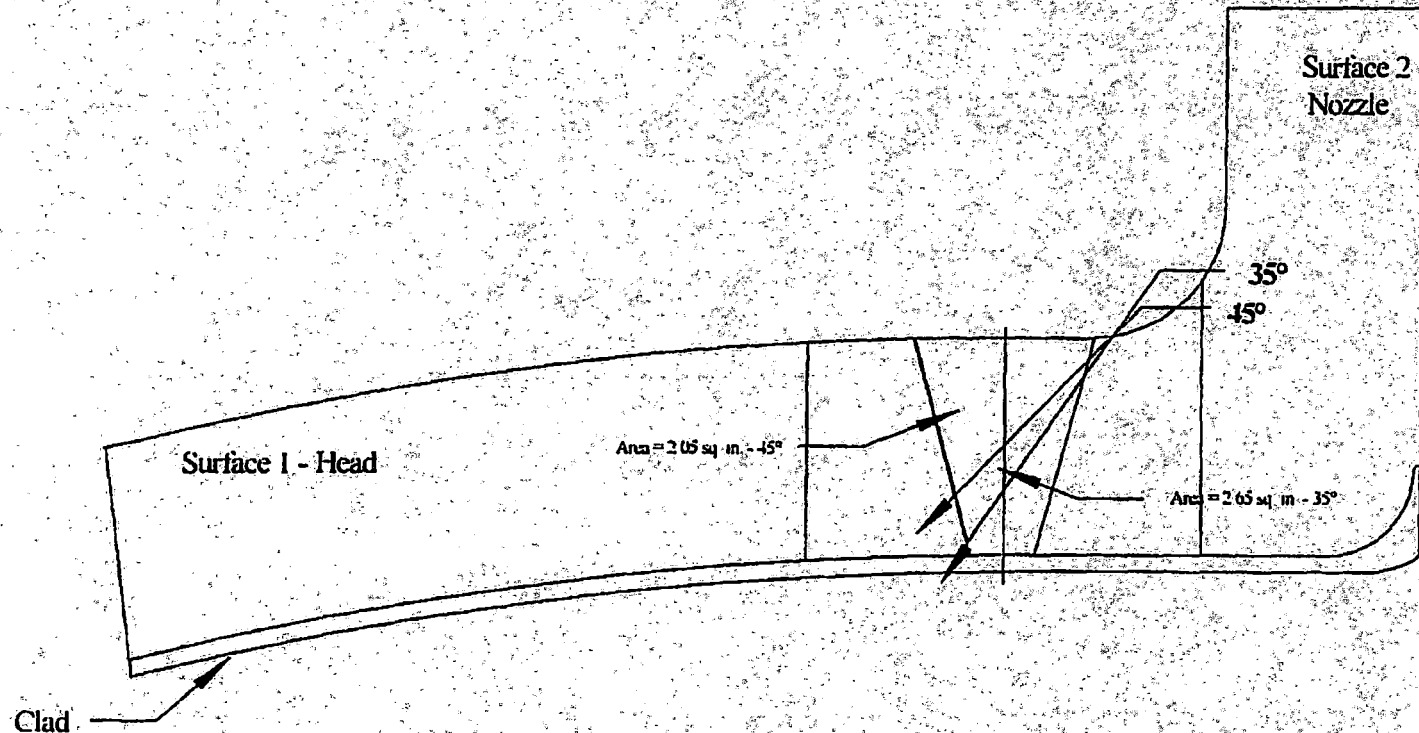
Item No. : M1.B3.110.0005

Total Weld Coverage 35° from Surface 2 = $2.65 / 3.48 \times 100 = 76.1\%$

Weld No. : 1PZR-15

Scale 1" = 2"

Total Weld Coverage 45° from Surface 2 = $2.05 / 3.48 \times 100 = 58.9\%$



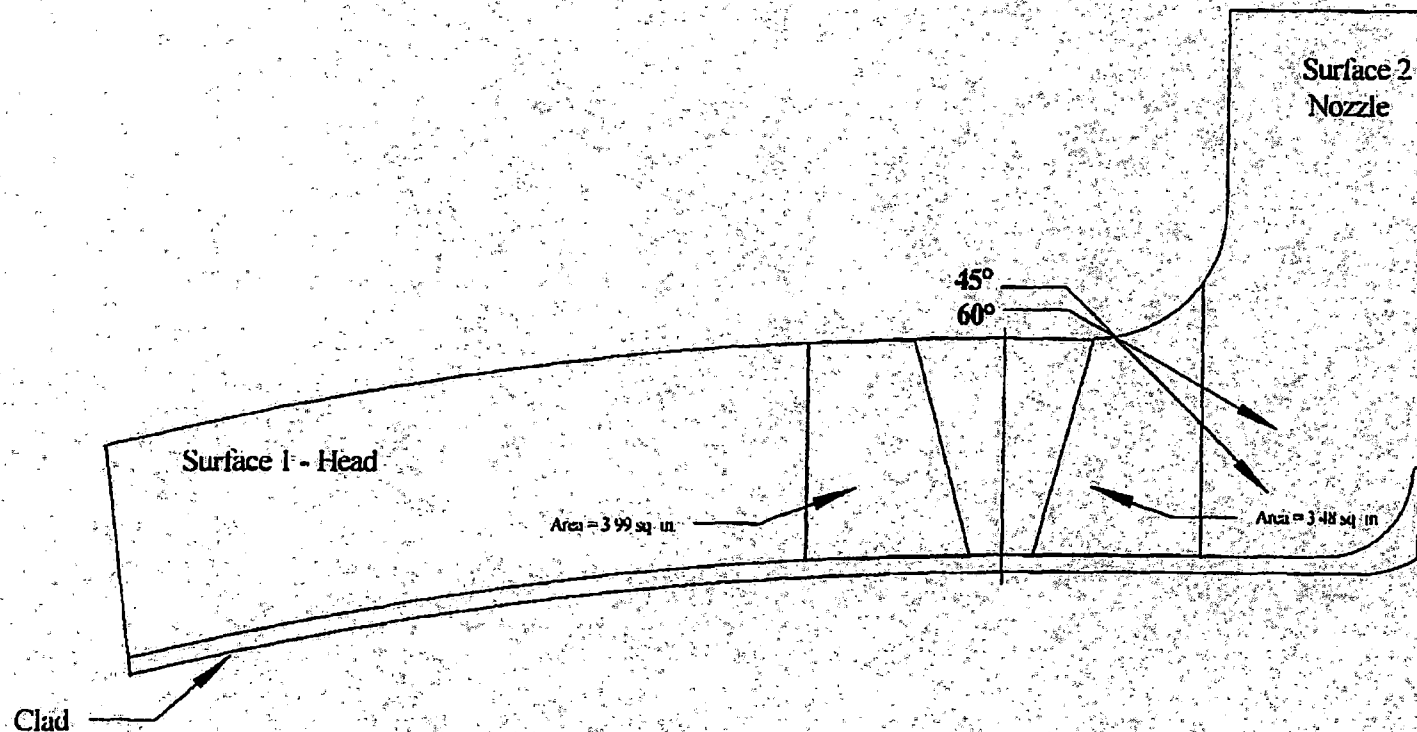
Reviewed / Date : J. NEWGARD 10-18-14

Pressurizer Safety Nozzle to Head

Base Material Coverage - Axial Scans

Item No. : M1.B3.110.0005Weld No. : 1PZR-15Total Area of Base Material = $3.99 + 3.48 = 7.47$ sq. in.Total Base Material Coverage = $7.47 / 8.25 \times 100 = 90.5 \%$

Scale 1" = 2"

Reviewed / Date : J. NEWGARD Jan 10-18-14Page 9 of 15

Pressurizer Safety Nozzle to Head

Base Material Coverage - Circumferential Scans

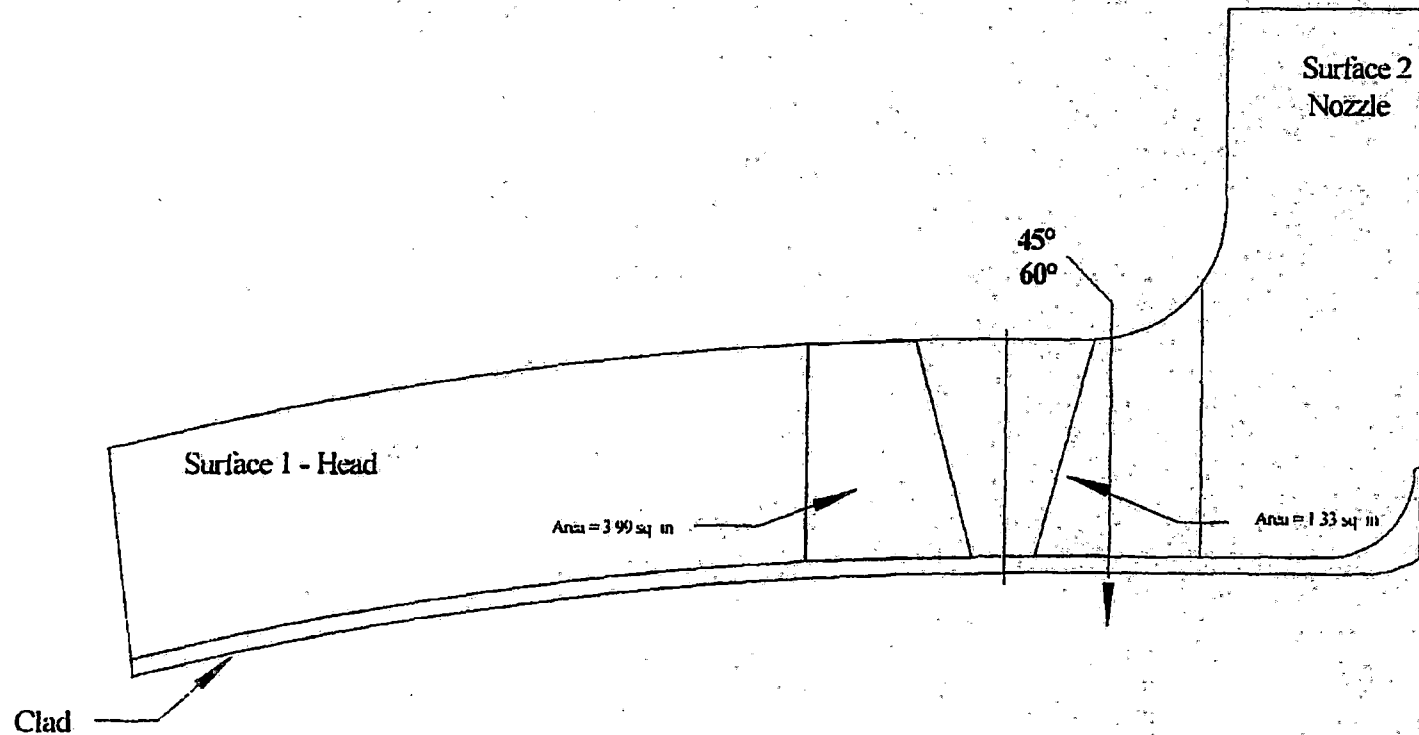
Item No. : MLB3.110.0005

Weld No. : 1PZR-15

Scale 1" = 2"

Total Area of Base Material = $3.99 + 1.33 = 5.32$ sq. in.

Total Base Material Coverage = $5.32 / 8.25 \times 100 = 64.5 \%$



Reviewed / Date : J. DEWGARD 10-18-14

Page 10 of 15

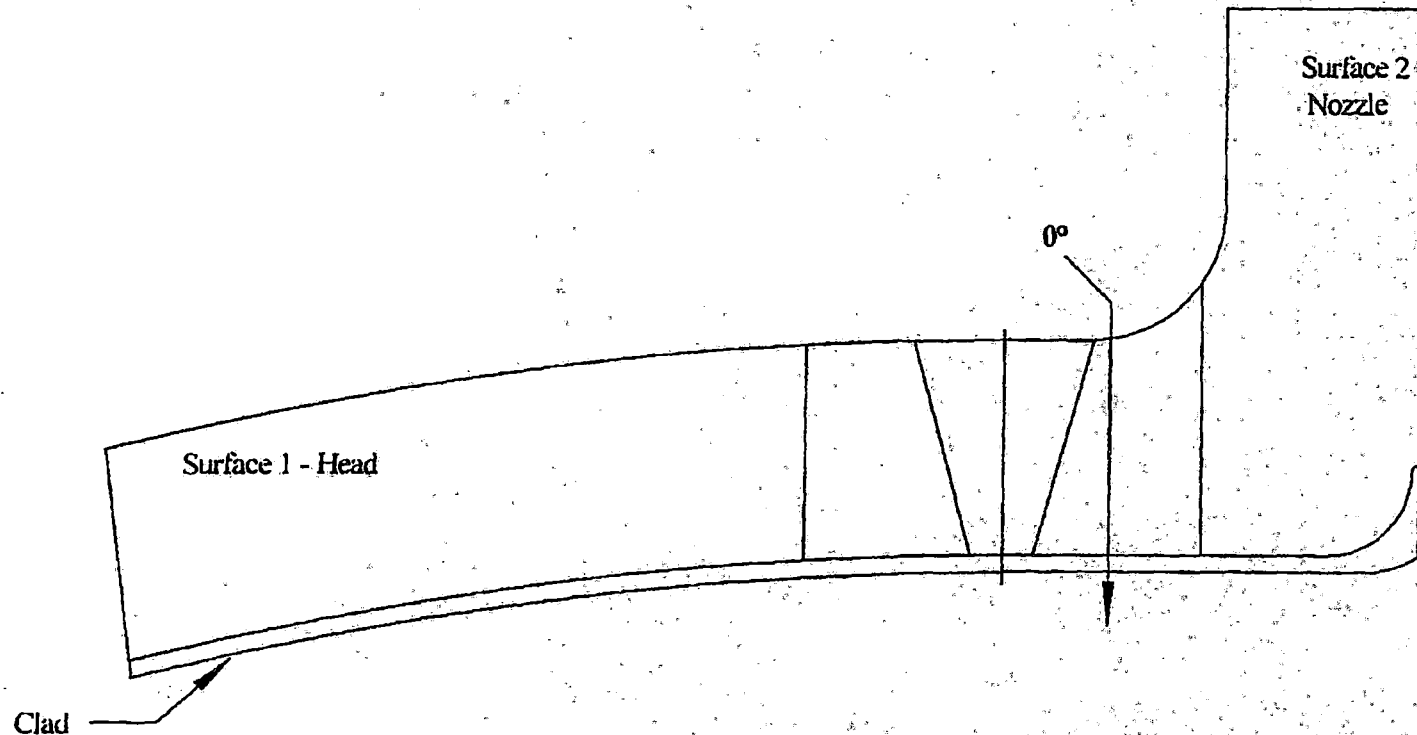
Pressurizer Safety Nozzle to Head

0° Scan Coverage

Item No. : M1.B3.110.0005Weld No. : 1PZR-15

Scale 1" = 2"

0° Scan Total Area = 8.87 sq. in.

Total 0° Scan Coverage = $8.87 / 11.73 \times 100 = 75.6\%$ Reviewed / Date : S. DEEGARD 10-10-14Page 11 of 15

Pressurizer Safety Nozzle to Head % of Coverage PAGE 12 OF 15Item No. : M1.B3.110.0005Weld No. : 1PZR-15Weld Coverage

<u>Scan</u>	<u>Angle</u>	<u>% Coverage Obtained</u>
S1	60°	100
S2	35°	76.1
S1	45°	100
S2	45°	58.9
CW	60°	100
CW	45°	100
CCW	60°	100
CCW	45°	<u>100</u>
Total		735

735 ÷ 8 =

91.9

% Coverage

Base Material Coverage

S1	35°, 45° & 60°	90.5
CW & CCW	35°, 45°, & 60°	<u>64.5</u>
Total		155

155 ÷ 2 =

77.5

% Coverage

0° Scan Coverage

=

75.6

% Coverage

Aggregate Coverage = Weld + Base Material + 0° ÷ 3

=

81.7

% Coverage

Reviewed / Date : J. NEWGARD 10-18-14Page 12 of 15

Pressurizer Nozzle to Head Welds

Scan Plan

Scale 1" = 2"

ATTACHMENT B

PAGE 13 OF 15

Scan Plan Applies To:

Item #s	Weld #s	Component
M1.B3.110.0002	1PZR-12	Spray Nozzle
M1.B3.110.0005	1PZR-15	Safety Nozzle
M1.B3.110.0006	1PZR-16	Relief Nozzle

Surface 2
Nozzle

45°, 60°, and 60° near surface shear wave inspection required for exam volume in the axial and circumferential directions as shown.

A 35° shear wave search unit shall be used supplementally, backing into the nozzle to the extent possible and scanning towards and through the vessel head exam volume.

Exam volume includes the full volume of weld, plus 1/2 T of Base Metal on each side of the weld measured from the weld toes.

0° inspection required for entire exam volume.

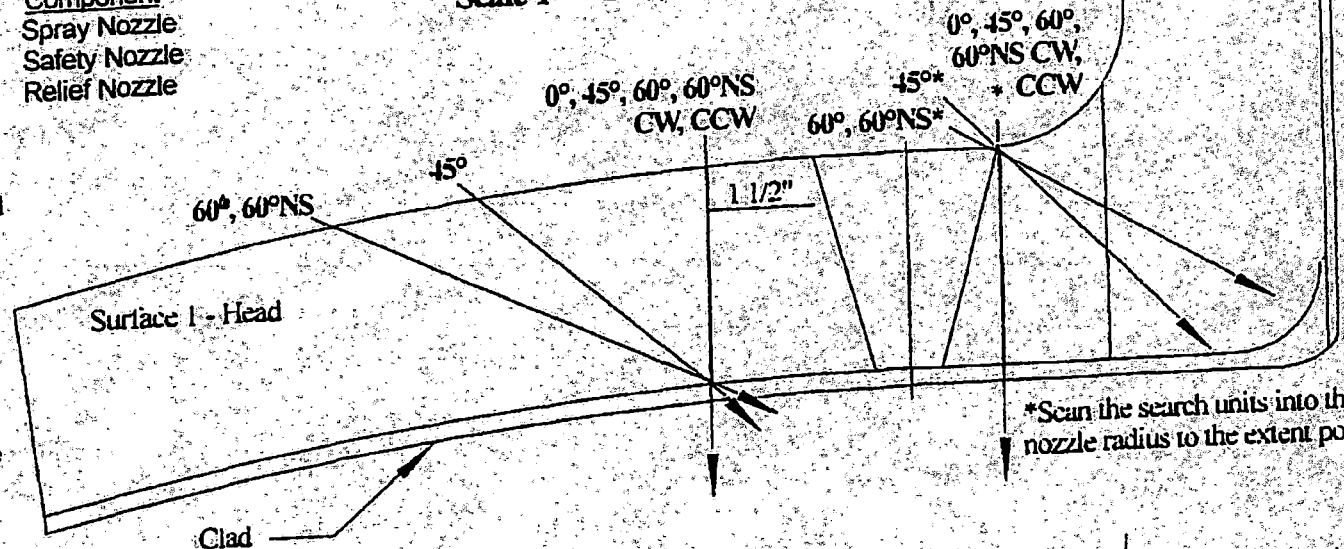
Component Thickness = 2.5"

1/2 T = 1.25"

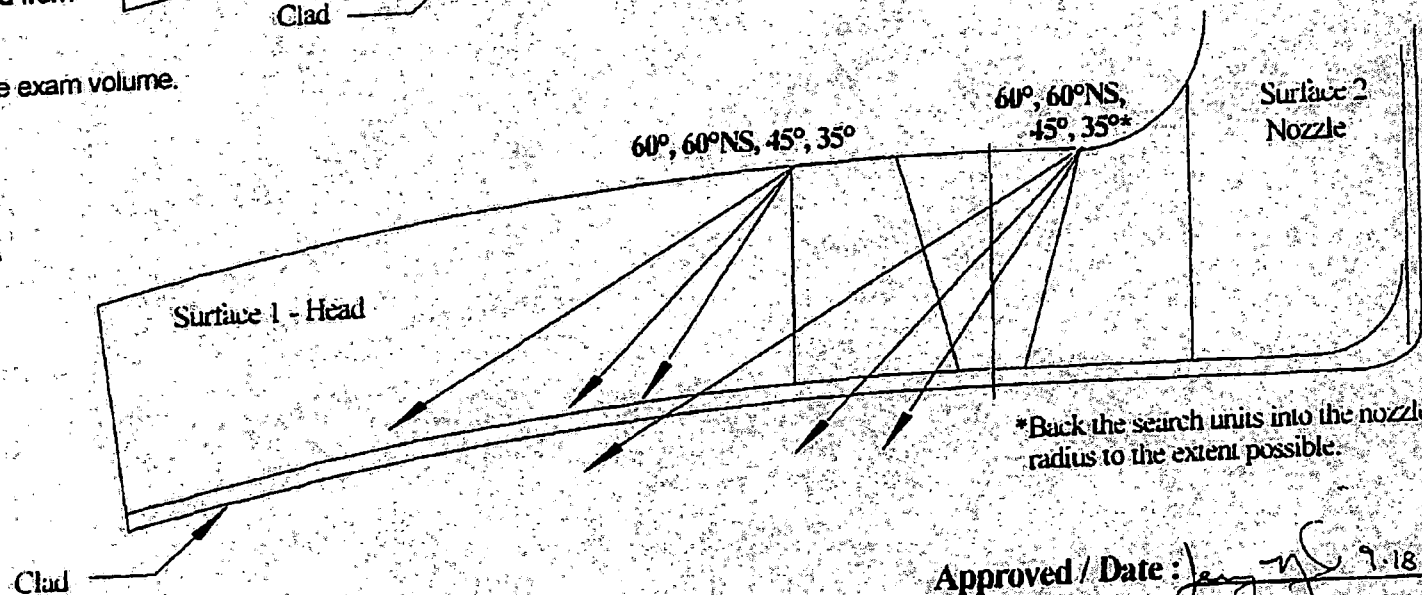
35° Surface Distance = 1.75"

45° Surface Distance = 2.5"

60° Surface Distance = 4.33"



*Scan the search units into the nozzle radius to the extent possible



*Back the search units into the nozzle radius to the extent possible.

Approved / Date: *Jan 29, 18*

Page 13 of 15

EXHIBIT A-1
PRE/POST-JOB BRIEF SHEETComponent to be Examined 1PZR-12, 15 & 16 WO# 02107308 TASK 1ISI Summary/WO Number M1.B3.110.002,005 + 0006 M1.B3.120.0002,0003 + 0005Date 9-19-2014 Time Start (Pre) 0755 Time Finish (Pre) 0806Date 9-19-2014 Time Start (Post) 1506 Time Finish (Post) 1518

Attributes Discussed (Initial those completed and NA those that do not apply)

- 3N • ISI Plan/Work Order Review (if applicable) PRE-JOB
- 3N • Examination purpose (i.e. ASME Section XI, augmented) PRE-JOB
- 3N • Surface condition and configuration PRE-JOB
- 3N • Limitations PRE-JOB
- 3N • Previous Data and Previous PIPs PRE-JOB
- 3N • Drawings PRE-JOB
- 3N • Welding Process and joint configuration PRE-JOB
- 3N • Area of Interest (Section XI, Risk Informed) PRE-JOB
- 3N • Scan Plan PRE-JOB
- 3N • Team Scanning PRE-JOB
- 3N • Mock-Ups PRE-JOB
- 3N • Review of planned examination including angles, modes, etc. PRE-JOB
- 3N • Known failure mechanisms expected flaw types and locations PRE-JOB
- 3N • Unexpected conditions detrimental to the planned examination PRE-JOB
- 3N • Roles of the Regulators and the ANII PRE-JOB
- 3N • OE (company and industry events specific to examination) PRE-JOB
- 3N • Expectations for Corrective Action initiation (PIP or CR) PRE/POST-JOB
- 3N • Physical limitations PRE/POST-JOB
- 3N • Unexpected conditions POST-JOB
- 3N • Indications/conditions detected or observed POST-JOB
- 3N • Indications/conditions requiring further evaluation POST-JOB
- 3N • Coverage limitations and calculations POST-JOB
- 3N • Team Scanning POST-JOB
- 3N • Dose POST-JOB
- 3N • Safety Issues POST-JOB
- 3N • Overall job performance POST-JOB
- 3N • Inadequacies of the ISI Plan, Work Order, and Drawings (Initiate PIP) POST-JOB
- 3N • Examiner concerns POST-JOB

EXHIBIT A-1
PRE/POST-JOB BRIEF SHEET

Pre-Job

Comments: DISCUSSED TIGHT WORKING CONDITIONS

Post-Job

Comments: INADEQUATE LIGHTING, EXAM DELAYS DUE TO
OTHER WORK IN AREA.

PIP/CR

Numbers: NONE

Attendees

Level III/SME: Print JERRY NEWGARDExaminer: Print Robert KoserExaminer: Print Keith BullExaminer: Print HAILE JENSEN

Examiner: Print

Examiner: Print

Examiner: Print

Examiner: Print

Examiner: Print

Examiner: Print

Sign

Sign

Sign

Sign

Sign

Sign

Sign

Sign

Sign

Sign

Relief Request Serial Number

16-MN-001

Attachment C

(Pages 1-2)

(Pages 1-15)



UT Calibration Examination

ATTACHMENT C

PAGE 1 OF 2



Site/Unit: McGuire / 1
Summary No.: M1.B3.110.0006
Workscope: ISI

Procedure: NDE-640
Procedure Rev.: 5
Work Order No.: 02107308

Outage No.: M1-23
Report No.: UT-14-398
Page: 1 of 2

Code: 1998/2000 Addenda Cat./Item: B-D/B3.110 Location:
Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head
System ID: NC
Component ID: 1PZR-16 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA
Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit				
Serial No.:	13G00171			Serial No.:	G85215			Cal. Checks	Time	Date	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Manufacturer:	GE			Manufacturer:	Automation			Initial Cal	0700	9/19/2014	1/4 T	78	1.4	.620"	
Model:	USN 60 SW	Linearity:	L-14-212	Size:	0.75	Model:	Gamma	Inter. Cal.			1/2T	80	2.9	1.40"	
Delay:	.9491	Range:	5.0"	Freq.:	2.25 MHz	Center Freq.:	N/A	Inter. Cal.	1234	9/19/2014	3/4T	70	4.4	2.20"	
M'tl Cal/Vel:	.2347	Pulsar Type:	Square	Exam Angle:	0	Squint Angle:	N/A	Final Cal	1445	9/19/2014	BW	100+	6.2	2.980"	
Damping:	500 Ohms	Reject:	0%	Measured Angle:	0	Mode:	Long.								
PRF:	Auto High	SU Freq.:	2.25 MHz	Exit Point	N/A	# of Elements:	1	Couplant							
Frequency:	2.25 MHz	Rectify:	Fullwave	Config.:	Single	Focus:	N/A	Cal. Batch:	12125						
Voltage:	450	Pulse Width:	220	Shape:	Round	Contour:	Flat	Type:	ULTRAGEL II						
				Wedge Style:	N/A			Mfg.:	MAGNAFLUX						
				Search Unit Cable				Exam Batch:	12125						
Ax. Gain (dB): 18.5 Circ. Gain (dB): 18.5				Type:	RG-174 Length: 6' No. Conn.: 0			Type:	ULTRAGEL II						
1 Screen Div. = .5 in. of Sound Path								Mfg.:	MAGNAFLUX						
Calibration Block				Scan Coverage				Reference Block							
Cal. Block No.	50338			Upstream <input checked="" type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB:	31.2	Serial No.:	97-5589						
Thickness	3.00	Dia.:	Flat	CW <input checked="" type="checkbox"/>	CCW <input checked="" type="checkbox"/>	Scan dB:	31.2	Type:	ROMPAS						
Cal. Blk. Temp.	74	Temp. Tool:	MCNDE40130	Exam Surface:	O.D.										
Comp. Temp.	80	Temp. Tool:	MCNDE40130	Surface Condition:	Smooth										
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)															
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>															
Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: Yes															

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith				9/19/2014	Jerry Newgard L-III		10/10/2014
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Koster, Rickey				9/19/2014	N/A		
Other	Level	II-N	Signature	Date	ANII Review	Signature	Date
Jansen, Paule J.				9/19/2014	Swan, Jerome		10-19-14

EXHIBIT A-1
PRE/POST-JOB BRIEF SHEETComponent to be Examined 1 PZR-12, 15 & 16 WO# 02107308 TASK 1ISI Summary/WO Number M1.B3.110.002,005 + 0006 M1.B3.120.0002,0003 + 0005Date 9-19-2014 Time Start (Pre) 0755 Time Finish (Pre) 0806Date 9-19-2014 Time Start (Post) 1506 Time Finish (Post) 1518

Attributes Discussed (Initial those completed and NA those that do not apply)

- 3N. ISI Plan/Work Order Review (if applicable) PRE-JOB
- 3N. Examination purpose (i.e. ASME Section XI, augmented) PRE-JOB
- 3N. Surface condition and configuration PRE-JOB
- 3N. Limitations PRE-JOB
- 3N. Previous Data and Previous PIPs PRE-JOB
- 3N. Drawings PRE-JOB
- 3N. Welding Process and joint configuration PRE-JOB
- 3N. Area of Interest (Section XI, Risk Informed) PRE-JOB
- 3N. Scan Plan PRE-JOB
- 3N. Team Scanning PRE-JOB
- 3N. Mock-Ups PRE-JOB
- 3N. Review of planned examination including angles, modes, etc. PRE-JOB
- 3N. Known failure mechanisms expected flaw types and locations PRE-JOB
- 3N. Unexpected conditions detrimental to the planned examination PRE-JOB
- 3N. Roles of the Regulators and the ANI PRE-JOB
- 3N. OE (company and industry events specific to examination) PRE-JOB
- 3N. Expectations for Corrective Action initiation (PIP or CR) PRE/POST-JOB
- 3N. Physical limitations PRE/POST-JOB
- 3N. Unexpected conditions POST-JOB
- 3N. Indications/conditions detected or observed POST-JOB
- 3N. Indications/conditions requiring further evaluation POST-JOB
- 3N. Coverage limitations and calculations POST-JOB
- 3N. Team Scanning POST-JOB
- 3N. Dose POST-JOB
- 3N. Safety Issues POST-JOB
- 3N. Overall job performance POST-JOB
- 3N. Inadequacies of the ISI Plan, Work Order, and Drawings (Initiate PIP) POST-JOB
- 3N. Examiner concerns POST-JOB



UT Calibration Examination

ATTACHMENT C

PAGE 1 OF 15



Site/Unit: McGuire / 1
Summary No.: M1.B3.110.0006
Workscope: ISI

Procedure: NDE-820
Procedure Rev.: 7
Work Order No.: 02107308

Outage No.: M1-23
Report No.: UT-14-399
Page: 1 of 15

Code: 1998/2000 Addenda Cat/Item: B-D/B3.110 Location:
Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head
System ID: NC
Component ID: 1PZR-16 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA
Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit			
Serial No.:	023K3V			Serial No.:	L29929			Initial Cal	Time	Date	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
Manufacturer:	GE			Manufacturer:	KBA			Inter. Cal.	0700	9/19/2014	1/4 T	80	1.2	.857"
Model:	USN 60 SW	Linearity:	L-14-208	Size:	0.5"x1.0"	Model:	Gamma	Inter. Cal.	1233	9/19/2014	1/2T	65	2.5	1.81"
Delay:	7.5988	Range:	7.00"	Freq.:	2.25 MHz	Center Freq.:	N/A	Inter. Cal.			3/4T	51	3.8	2.69"
M/I Cal/Vel:	0.123	Pulser Type:	Square	Exam Angle:	35	Squint Angle:	N/A	Final Cal	1446	9/19/2014	5/4T	24	6.5	4.56"
Damping:	500 Ohms	Reject:	0%	Measured Angle:	35	Mode:	Shear	Couplant						
PRF:	Auto High	SU Freq.:	2.25 MHz	Exit Point	.7"	# of Elements:	1	Cal. Batch:	12125					
Frequency:	2.25 MHz	Rectify:	Fullwave	Config.:	Single	Focus:	N/A	Type:	ULTRAGEL II					
Voltage:	450	Pulse Width:	220	Shape:	Rect.	Contour:	Flat	Mfg.:	MAGNAFLUX					
				Wedge Style:	SWS			Exam Batch:	12125					
				Search Unit Cable				Type:	ULTRAGEL II					
				Type:	RG-174	Length:	6'	Mfg.:	MAGNAFLUX					
				Scan Coverage				Reference Block						
				Upstream <input checked="" type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB:	51.2	Serial No.:	97-5589					
				CW <input checked="" type="checkbox"/>	CCW <input checked="" type="checkbox"/>	Scan dB:	51.2	Type:	ROMPAS					
				Exam Surface:	O.D.			Reference/Simulator Block						
				Surface Condition:	Smooth			Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path		
				Recordable Indication(s):	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)									
				Results:	Accept <input checked="" type="checkbox"/>	Reject <input type="checkbox"/>	Info <input type="checkbox"/>	Comments: FC 14-10 Calibrated reflectors verified						
				Percent Of Coverage Obtained > 90%:	No									
				Reviewed Previous Data:	Yes									

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith				9/19/2014	JERRY NEWGARD L-III		10-18-14
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Koster, Rickey				9/19/2014			
Other	Level	II-N	Signature	Date	ANII Review	Signature	Date
Jensen, Paula J.				9/19/2014	JF Swan		10-19-14



UT Calibration Lamination

ATTACHMENT C

PAGE 2 OF 15

Site/Unit: McGuire / 1
Summary No.: M1.B3.110.0006
Workscope: ISI

Procedure: NDE-820
Procedure Rev.: 7
Work Order No.: 02107308

Outage No.: M1-23
Report No.: UT-14-399
Page: 2 of 15

Code: 1998/2000 Addenda Cat./Item: B-D/B3.110 Location:
Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head
System ID: NC
Component ID: 1PZR-16 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA
Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings
Serial No.: 023K3V
Manufacturer: GE
Model: USN 60 SW Linearity: L-14-208
Delay: 12.2488 Range: 8.5"
M'tl Cal/Vel: 0.123 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 2.25 MHz
Frequency: 2.25 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 220
Ax. Gain (dB): 47.0 Circ. Gain (dB): N/A
1 Screen Div. = .85 in. of Sound Path

Search Unit
Serial No.: B28024
Manufacturer: KBA
Size: 0.5"x1.0" Model: Gamma
Freq.: 2.25 MHz Center Freq.: N/A
Exam Angle: 45 Squint Angle: N/A
Measured Angle: 45 Mode: Shear
Exit Point: 0.7" # of Elements: 1
Config.: Single Focus: N/A
Shape: Rect. Contour: Flat
Wedge Style: SWS
Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Cal. Checks	Time	Date
Initial Cal.	0700	9/19/2014
Inter. Cal.		
Inter. Cal.	1331	9/19/2014
Inter. Cal.		
Final Cal.	1447	9/19/2014

Couplant
Cal. Batch: 12125
Type: ULTRAGEL II
Mfg.: MAGNAFLUX
Exam Batch: 12125
Type: ULTRAGEL II
Mfg.: MAGNAFLUX

Axial Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1/4 T	80	1.1	.943"
1/2 T	60	2.3	1.97"
3/4 T	40	3.4	2.89"
5/4 T	20	6.2	5.27"
ID Notch	28	4.8	4.08"

Circumferential Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
26.2	2" Radius	80	2.35	1.998"

Calibration Block
Cal. Block No.: 50338
Thickness: 3.00 Dia.: Flat
Cal. Blk. Temp.: 74 Temp. Tool: MCNDE40130
Comp. Temp.: 80 Temp. Tool: MCNDE40130
Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Scan Coverage
Upstream ☒ Downstream ☒ Scan dB: 61.0
CW ☒ CCW ☒ Scan dB: 61.0
Exam Surface: O.D.
Surface Condition: Smooth

Reference Block
Serial No.: 97-5589
Type: ROMPAS

Comments: FC 14-10
Calibrated reflectors verified

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: Yes

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith				9/19/2014	JERRY NEWGARD L-III		10-18-14
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Koster, Rickey				9/19/2014			
Other	Level	II-N	Signature	Date	ANII Review	Signature	Date
Jensen, Paule J.				9/19/2014			10-19-14



UT Calibration Examination

ATTACHMENT C
PAGE 3 OF 15



Site/Unit: McGuire / 1
Summary No.: M1.B3.110.0006
Workscope: ISI

Procedure: NDE-820
Procedure Rev.: 7
Work Order No.: 02107308

Outage No.: M1-23
Report No.: UT-14-399
Page: 3 of 15

Code: 1998/2000 Addenda Cat./Item: B-D/B3.110 Location:
Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head
System ID: NC
Component ID: 1PZR-16 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA
Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit					
Serial No.:	13G00171			Serial No.:	G14818			Initial Cal	Time	Date	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path		
Manufacturer:	GE			Manufacturer:	KBA			Inter. Cal.			1/4 T	78	1.2	1.52"		
Model:	USN 60 SW	Linearity:	L-14-212	Size:	.5x1.0	Model:	Gamma	Inter. Cal.	1328	9/19/2014	1/2T	50	2.5	2.94"		
Delay:	14.5541	Range:	12.00"	Freq.:	2.25 MHz	Center Freq.:	N/A	Inter. Cal.			3/4T	38	3.6	4.37"		
M'tl Cal/Vol:	0.123	Pulser Type:	Square	Exam Angle:	60	Squint Angle:	N/A	Final Cal	1448	9/19/2014	5/4T	14	6.2	7.44"		
Damping:	500 Ohms	Reject:	0%	Measured Angle:	60	Mode:	Shear	Couplant			ID Notch	30	5.0	6.0"		
PRF:	Auto High	SU Freq.:	2.25 MHz	Exit Point	0.7"	# of Elements:	1	Cal. Batch:	12125			Circumferential Orientated Search Unit				
Frequency:	2.25 MHz	Rectify:	Fullwave	Config.:	Single	Focus:	N/A	Type:	ULTRAGEL II			Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Voltage:	450	Pulse Width:	220	Shape:	Rect.	Contour:	Flat	Mfg.:	MAGNAFLUX			N/A				
Ax. Gain (dB):	44.0	Circ. Gain (dB):	N/A	Wedge Style:	SWS			Exam Batch:	12125							
1 Screen Div. =	1.2	in. of	Sound Path	Search Unit Cable	Type: RG-174 Length: 6' No. Conn.: 0			Type:	ULTRAGEL II							
Calibration Block				Scan Coverage				Reference Block			Reference/Simulator Block					
Cal. Block No.	50338			Upstream <input checked="" type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB:	58.2	Serial No.:	97-5589			Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
Thickness	3.00	Dia.:	Flat	CW <input type="checkbox"/>	CCW <input type="checkbox"/>	Scan dB:	N/A	Type:	ROMPAS			30.0	2' Radius	80	1.65	1.980"
Cal. Bik. Temp.	74	Temp. Tool:	MCNDE40130	Exam Surface:	O.D.											
Comp. Temp.	80	Temp. Tool:	MCNDE40130	Surface Condition:	Smooth											

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Comments: FC 14-10
Calibration reflectors verified

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: Yes

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith				9/19/2014	JERRY NEWGARD L-III		10-18-14
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Koster, Rickey				9/19/2014			
Other	Level	II-N	Signature	Date	ANII Review	Signature	Date
Jensen, Paule J.				9/19/2014	JF Jensen		10-19-14



UT Calibration Examination

ATTACHMENT C

PAGE 4 OF 15

Site/Unit: McGuire / 1
Summary No.: M1.B3.110.0006
Workscope: ISI

Procedure: NDE-820
Procedure Rev.: 7
Work Order No.: 02107308

Outage No.: M1-23
Report No.: UT-14-399
Page: 4 of 15

Code: 1998/2000 Addenda Cat./Item: B-D/B3.110 Location: _____
Drawing No.: MC-ISIN4-1553-02.00 Description: Nozzle to Head
System ID: NC
Component ID: 1PZR-16 Size/Length: N/A Thickness/Diameter: CS / 2.500 / NA
Limitations: Yes - See attached sheets Start Time: 1235 Finish Time: 1420

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit			
Serial No.:	<u>13G00171</u>			Serial No.:	<u>G14818</u>			Cal. Checks	Time	Date	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
Manufacturer:	<u>GE</u>			Manufacturer:	<u>KBA</u>			Initial Cal	<u>0700</u>	<u>9/19/2014</u>	<u>.5"</u>	<u>80</u>	<u>2.0</u>	<u>1.00"</u>
Model:	<u>USN 60 SW</u>	Linearity:	<u>L-14-212</u>	Size:	<u>.5x1.0</u>	Model:	<u>Gamma</u>	Inter. Cal.			<u>1.0"</u>	<u>55</u>	<u>4.0</u>	<u>2.00"</u>
Delay:	<u>14.5541</u>	Range:	<u>5.0"</u>	Freq.:	<u>2.25 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>1357</u>	<u>9/19/2014</u>	<u>.25T</u>	<u>64</u>	<u>3.0</u>	<u>1.46"</u>
M/I Cal/Vel:	<u>.1230</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>60</u>	Squint Angle:	<u>N/A</u>	Final Cal	<u>1448</u>	<u>9/19/2014</u>				
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>60</u>	Mode:	<u>Shear</u>	Couplant						
PRF:	<u>Auto High</u>	SU Freq.:	<u>2.25 MHz</u>	Exit Point	<u>0.7"</u>	# of Elements:	<u>1</u>	Cal. Batch:	<u>12125</u>					
Frequency:	<u>2.25 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Type:	<u>ULTRAGEL II</u>					
Voltage:	<u>450</u>	Pulse Width:	<u>220</u>	Shape:	<u>Rect.</u>	Contour:	<u>Flat</u>	Mfg.:	<u>MAGNAFLUX</u>					
Ax. Gain (dB): <u>38.5</u> Circ. Gain (dB): <u>N/A</u>				Search Unit Cable				Exam Batch: <u>12125</u>						
<u>1</u> Screen Div. = <u>.5</u> in. of <u>Sound Path</u>				Type: <u>RG-174</u> Length: <u>6'</u> No. Conn.: <u>0</u>				Type: <u>ULTRAGEL II</u>						
Calibration Block				Scan Coverage				Mfg.: <u>MAGNAFLUX</u>						
Cal. Block No.	<u>50338</u>			Upstream <input checked="" type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB:	<u>52.5</u>	Reference Block						
Thickness	<u>3.00</u>	Dia.:	<u>Flat</u>	CW <input type="checkbox"/>	CCW <input type="checkbox"/>	Scan dB:	<u>N/A</u>	Serial No.:	<u>97-5589</u>					
Cal. Blk. Temp.	<u>74</u>	Temp. Tool:	<u>MCNDE40130</u>	Exam Surface:	<u>O.D.</u>			Type:	<u>ROMPAS</u>					
Comp. Temp.	<u>80</u>	Temp. Tool:	<u>MCNDE40130</u>	Surface Condition:	<u>Smooth</u>			Reference/Simulator Block						
Recordable Indication(s):	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)			Gain dB Reflector Signal Amplitude % Sweep Division Sound Path										
Results:	Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>			27.5 2" Radius 80 3.9 1.941"										
Percent Of Coverage Obtained > 90%: <u>No</u> Reviewed Previous Data: <u>Yes</u>														

Comments: FC 14-10
Calibration reflectors verified

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Bull, W. Keith				9/19/2014	JERRY NEWGARD L-III		10-18-14
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Koster, Rickey				9/19/2014			
Other	Level	II-N	Signature	Date	ANII Review	Signature	Date
Jensen, Paule J.				9/19/2014	J.F. Swan		10-19-14

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: <u>1PZR-16</u>		Item No: <u>M1B3.110.0006</u>		remarks:
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Nozzle configuration
<input type="checkbox"/> LIMITED SCAN	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input type="checkbox"/> cw <input type="checkbox"/> ccw	
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>+0.01"</u> to <u>Beyond</u>		
ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input type="checkbox"/> 60 other <u>35</u>		FROM <u>0</u> DEG to <u>360</u> DEG		
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Nozzle configuration
<input type="checkbox"/> LIMITED SCAN	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input type="checkbox"/> cw <input type="checkbox"/> ccw	
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>+0.5"</u> to <u>Beyond</u>		
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 other <u> </u>		FROM <u>0</u> DEG to <u>360</u> DEG		
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Nozzle configuration
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> cw <input type="checkbox"/> ccw	
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>-0.2"</u> to <u>Beyond</u>		
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 other <u> </u>		FROM <u>0</u> DEG to <u>360</u> DEG		
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Nozzle configuration
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> cw <input type="checkbox"/> ccw	UT-14-399
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>-0.6"</u> to <u>Beyond</u>		Sketch(s) attached
ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input type="checkbox"/> 60 other <u> </u>		FROM <u>0</u> DEG to <u>360</u> DEG		<input checked="" type="checkbox"/> yes <input type="checkbox"/> No
Prepared By: <u>Rickey L. Koster</u>		Level: <u>II</u>	Date: <u>09/19/14</u>	Sheet <u>5</u> of <u>15</u>
Reviewed By: <u>J. NEWGARD L-III</u>		Date: <u>10-18-14</u>	Authorized Inspector: <u>JF Swan</u> Date: <u>10-19-14</u>	

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: <u>1PZR-16</u>		Item No: <u>M1B3.110.0006</u>		remarks:
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Nozzle configuration
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> cw <input checked="" type="checkbox"/> ccw		
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>1.2"</u> to <u>Beyond</u>		
ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 other <u>35</u>		FROM <u>0</u> DEG to <u>360</u> DEG		
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Nozzle configuration
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> cw <input checked="" type="checkbox"/> ccw		
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>1.5"</u> to <u>Beyond</u>		
ANGLE: <input checked="" type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other <u> </u>		FROM <u>0</u> DEG to <u>360</u> DEG		
<input type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		
FROM L <u> </u> to L <u> </u>		INCHES FROM W0 <u> </u> to <u> </u>		
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other <u> </u>		FROM <u> </u> DEG to <u> </u> DEG		
<input type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		UT-14-399
FROM L <u> </u> to L <u> </u>		INCHES FROM W0 <u> </u> to <u> </u>		Sketch(s) attached
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other <u> </u>		FROM <u> </u> DEG to <u> </u> DEG		<input checked="" type="checkbox"/> yes <input type="checkbox"/> No
Prepared By: <u>Rickey L. Koster</u>		Level: <u>II</u>	Date: <u>09/19/14</u>	Sheet <u>6</u> of <u>15</u>
Reviewed By: <u>J. NEWGARD L-III</u>		Date: <u>10-18-14</u>	Authorized Inspector: <u>J. Flanagan</u>	Date: <u>10-19-14</u>

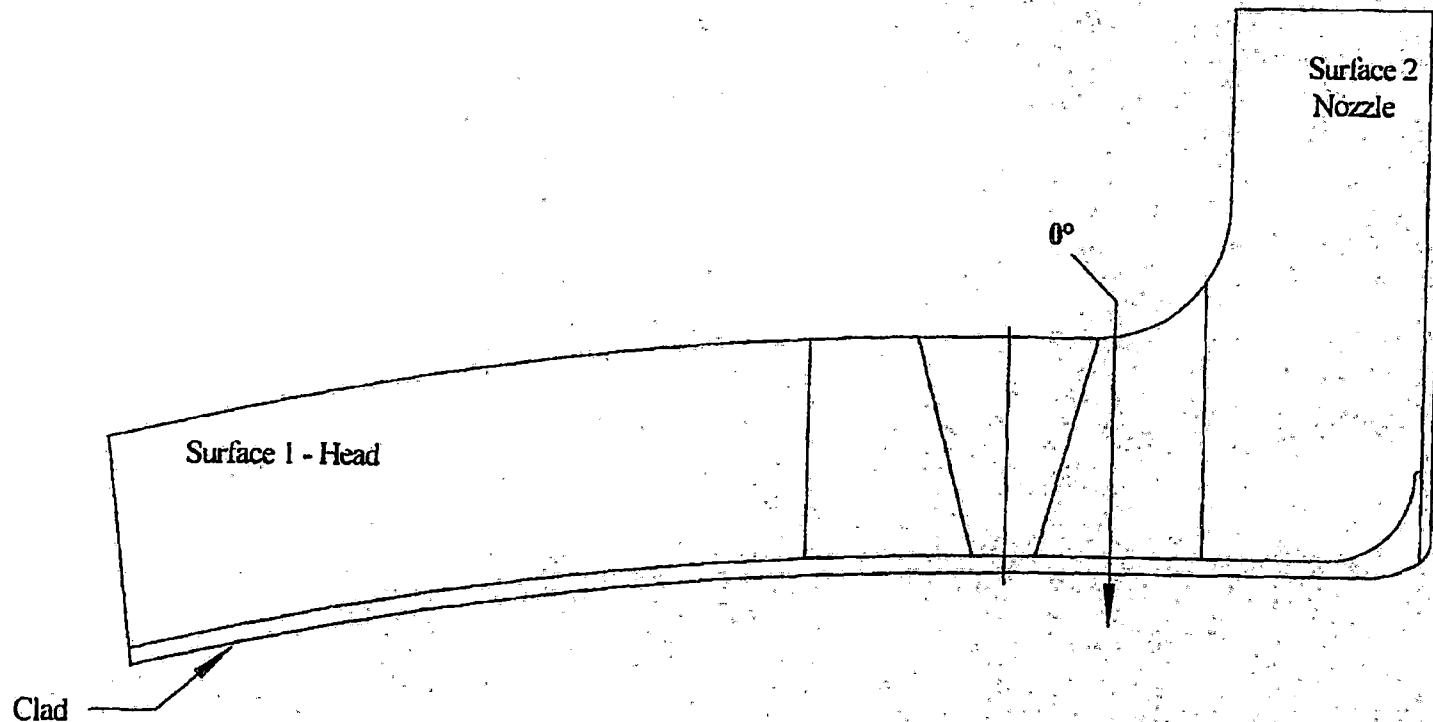
Pressurizer Relief Nozzle to Head

0° Scan Coverage

Item No. : M1.B3.110.0006Weld No. : 1PZR-16

Scale 1" = 2"

0° Scan Total Area = 8.87 sq. in.

Total 0° Scan Coverage = $8.87 / 11.73 \times 100 = 75.6 \%$ Reviewed / Date : J. NEWGARD L-III *[Signature]*
Page 7 of 15 16-18-14

Pressurizer Relief Nozzle to Head

Weld Coverage - Axial & Circumferential Scans

100% Coverage 45° & 60° Scans CW, CCW and Axial from Surface 1

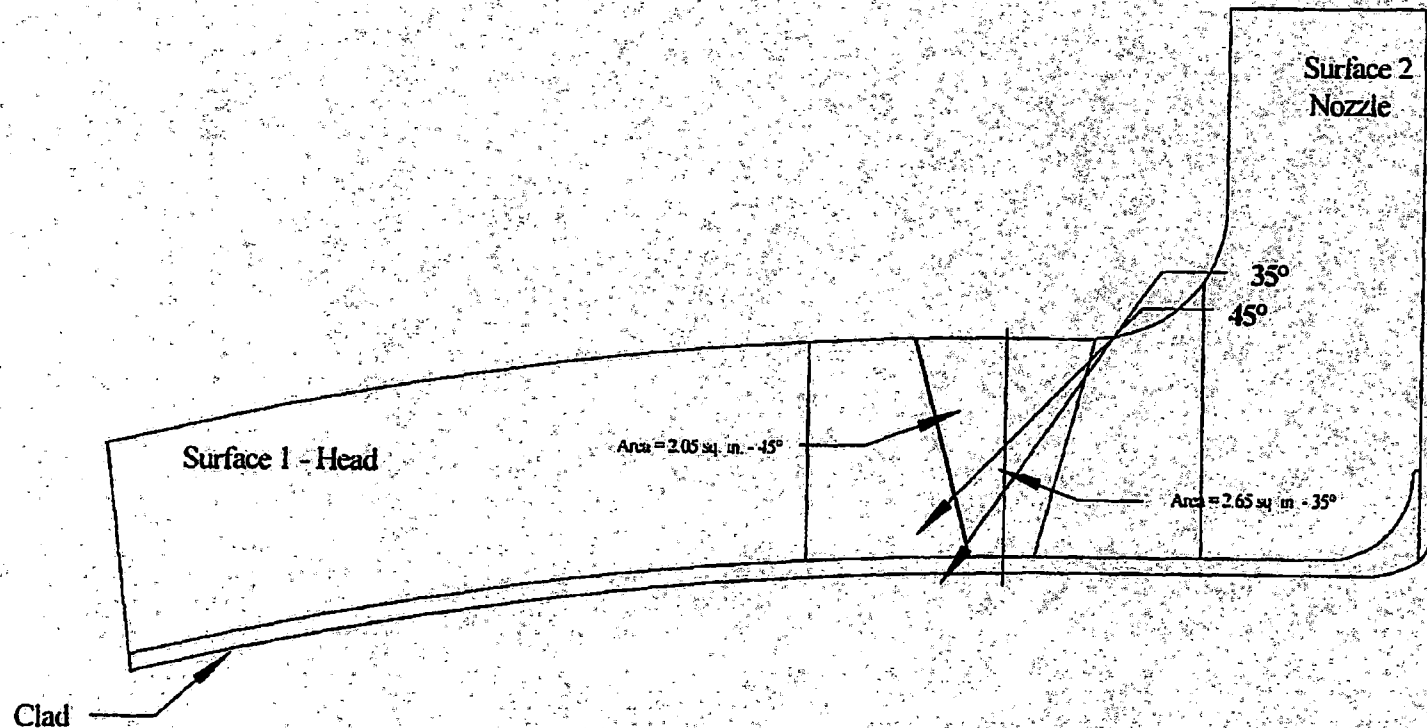
Item No. : M1.B3.110.0006

Total Weld Coverage 35° from Surface 2 = $2.65 / 3.48 \times 100 = 76.1\%$

Weld No. : 1PZR-16

Scale 1" = 2"

Total Weld Coverage 45° from Surface 2 = $2.05 / 3.48 \times 100 = 58.9\%$



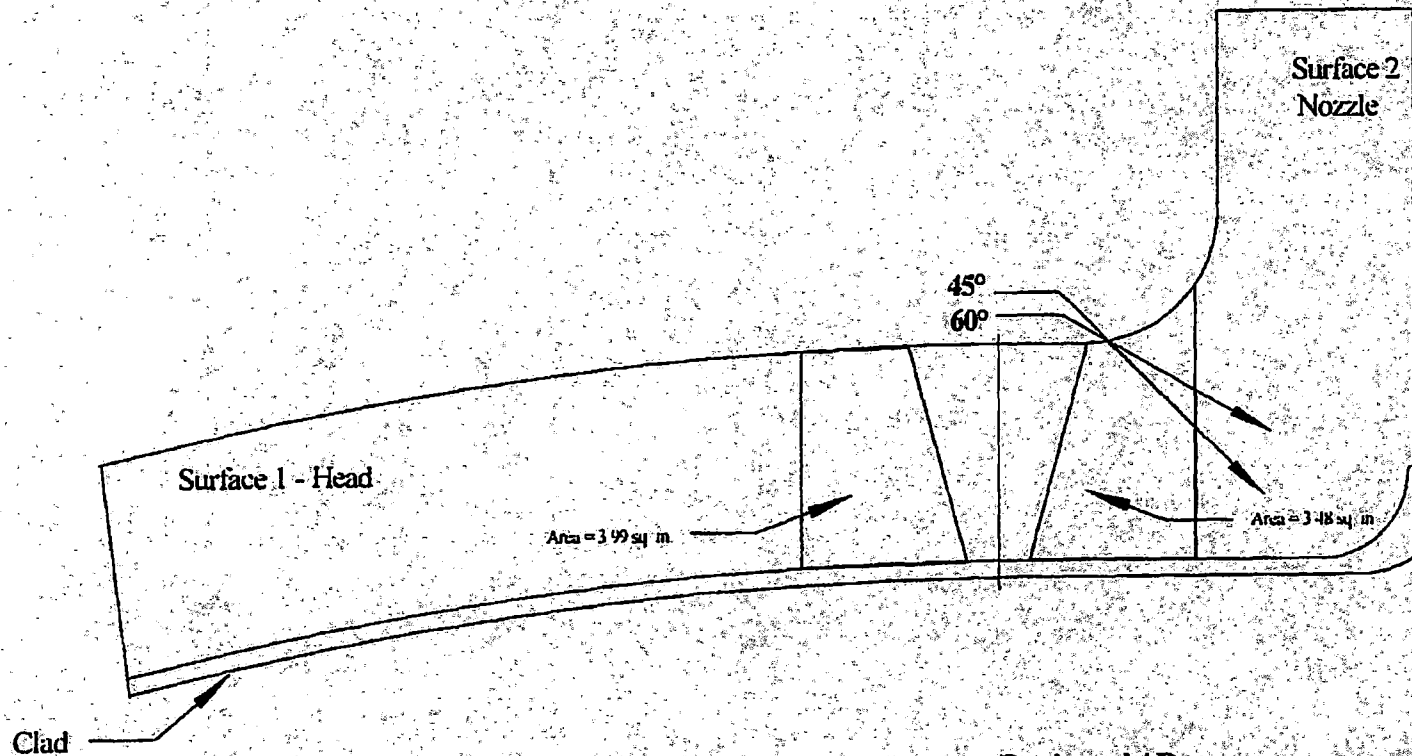
Reviewed / Date : J. NEWARD 1-11-14
Page 8 of 15 10-18-14

Pressurizer Relief Nozzle to Head

Base Material Coverage - Axial Scans

Item No. : M1.B3.110.0006Weld No. : 1PZR-16Total Area of Base Material = $3.99 + 3.48 = 7.47$ sq. in.

Scale 1" = 2"

Total Base Material Coverage = $7.47 / 8.25 \times 100 = 90.5\%$ Reviewed / Date : J. NEWGARD LTDPage 9 of 15

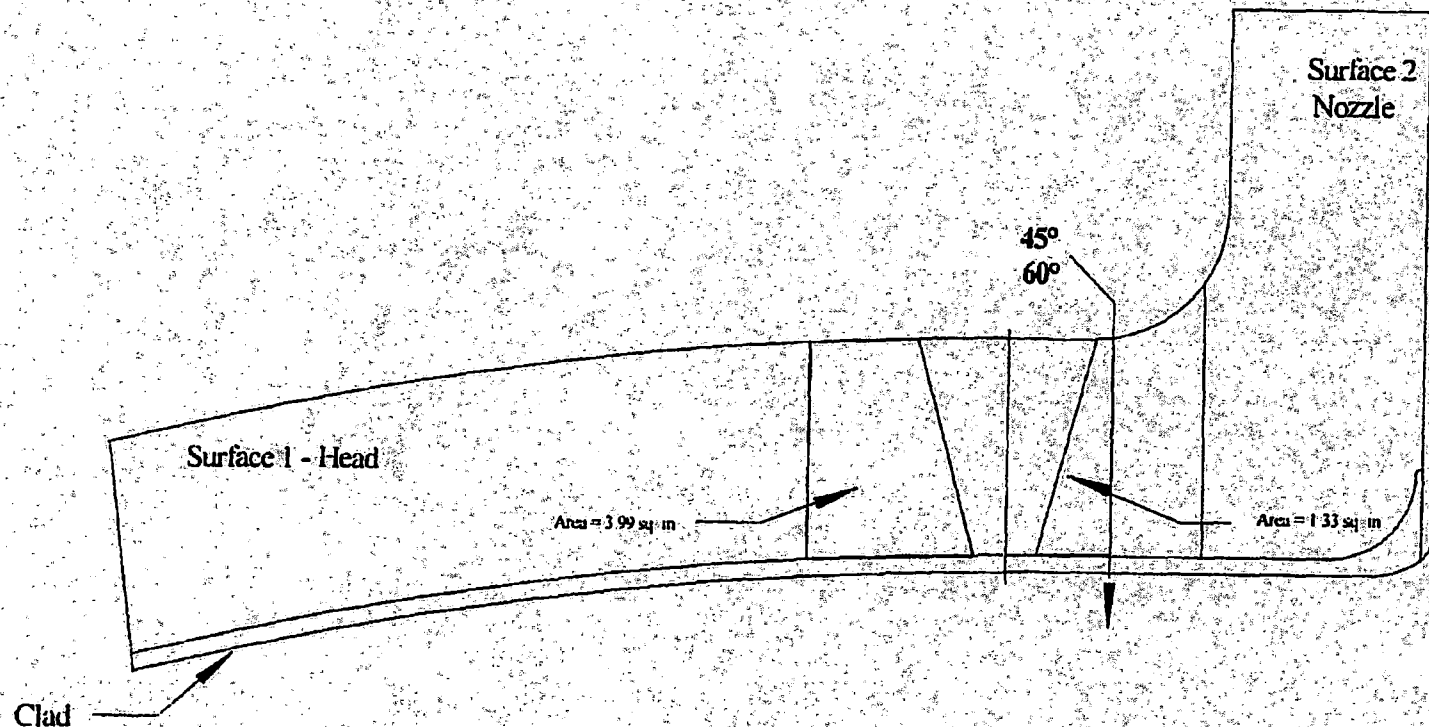
10-18-14

Pressurizer Relief Nozzle to Head

Base Material Coverage - Circumferential Scans

Item No. : M1.B3.110.0006Weld No. : 1PZR-16

Scale 1" = 2"

Total Area of Base Material = $3.99 + 1.33 = 5.32$ sq. in.Total Base Material Coverage = $5.32 / 8.25 \times 100 = 64.5\%$ Reviewed / Date : J. NEWGARD L-IT 10-13-14Page 10 of 15

10-13-14

Pressurizer Relief Nozzle to Head

Total Area Weld & Base Material

Item No. : M1.B3.110.0006

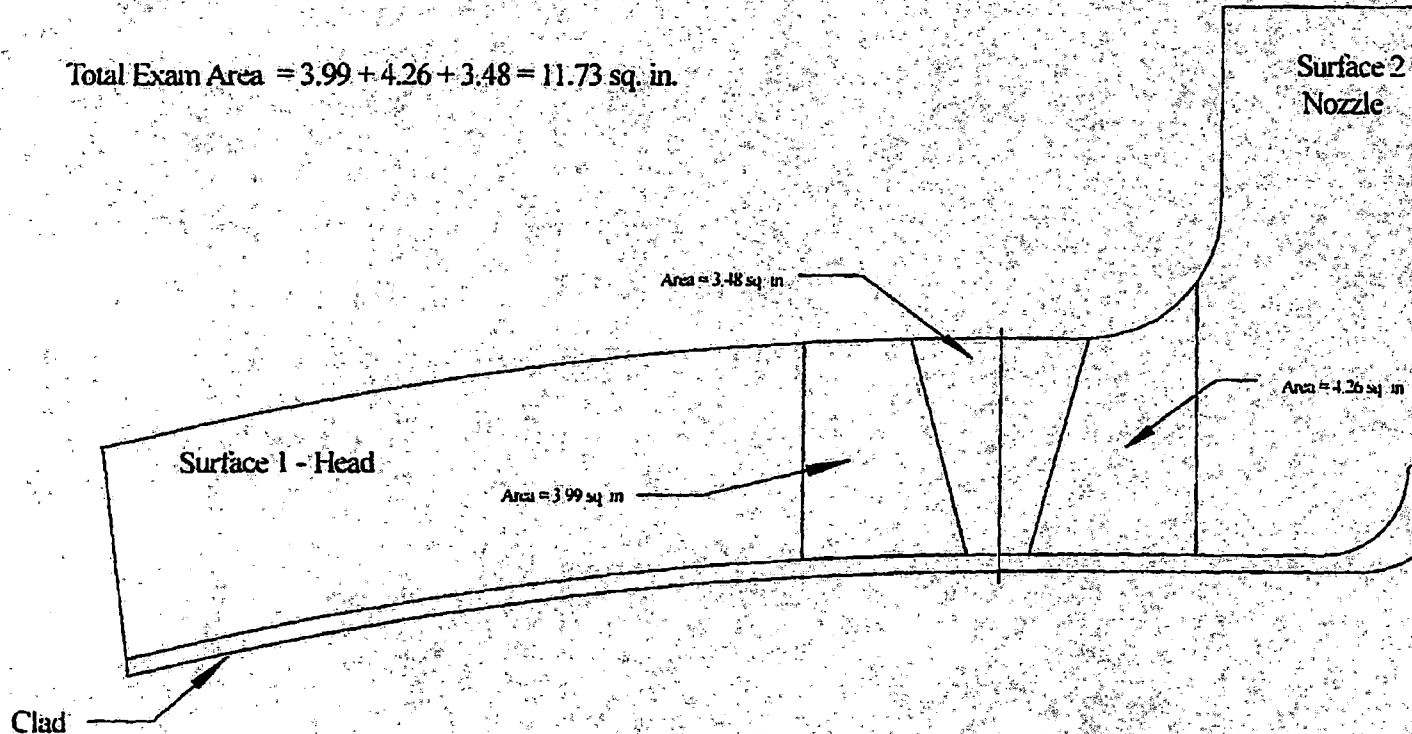
Weld No. : 1PZR-16

Scale 1" = 2"

Total Weld Area = 3.48 sq. in.

Total Area of Base Material = $3.99 + 4.26 = 8.25$ sq. in.

Total Exam Area = $3.99 + 4.26 + 3.48 = 11.73$ sq. in.



Reviewed / Date : J. NEWGARD 10-18-14

Pressurizer Relief Nozzle to Head % of CoverageItem No. : M1.B3.110.0006Weld No. : 1PZR-16Weld Coverage

<u>Scan</u>	<u>Angle</u>	<u>% Coverage Obtained</u>
S1	60°	100
S2	35°	76.1
S1	45°	100
S2	45°	58.9
CW	60°	100
CW	45°	100
CCW	60°	100
CCW	45°	100
Total		735

$$735 \div 8 =$$

91.9

% Coverage

Base Material Coverage

S1	35°, 45° & 60°	90.5
CW & CCW	35°, 45°, & 60°	64.5
Total		155

$$155 \div 2 =$$

77.5

% Coverage

0° Scan Coverage

=

75.6

% Coverage

Aggregate Coverage = Weld + Base Material + 0° ÷ 3

=

81.7

% Coverage

Reviewed / Date : J. NEWGARD L.M. Jan 7 10-18-14Page 12 of 15

Scan Plan Applies To:

Item #'s	Weld #'s	Component
M1.B3.110.0002	1PZR-12	Spray Nozzle
M1.B3.110.0005	1PZR-15	Safety Nozzle
M1.B3.110.0006	1PZR-16	Relief Nozzle

45°, 60°, and 60° near surface shear wave inspection required for exam volume in the axial and circumferential directions as shown.

A 35° shear wave search unit shall be used supplementally, backing into the nozzle to the extent possible and scanning towards and through the vessel head exam volume.

Exam volume includes the full volume of weld, plus 1/2 T of Base Metal on each side of the weld measured from the weld toes.

0° inspection required for entire exam volume.

Component Thickness = 2.5"

1/2 T = 1.25"

35° Surface Distance = 1.75"

45° Surface Distance = 2.5"

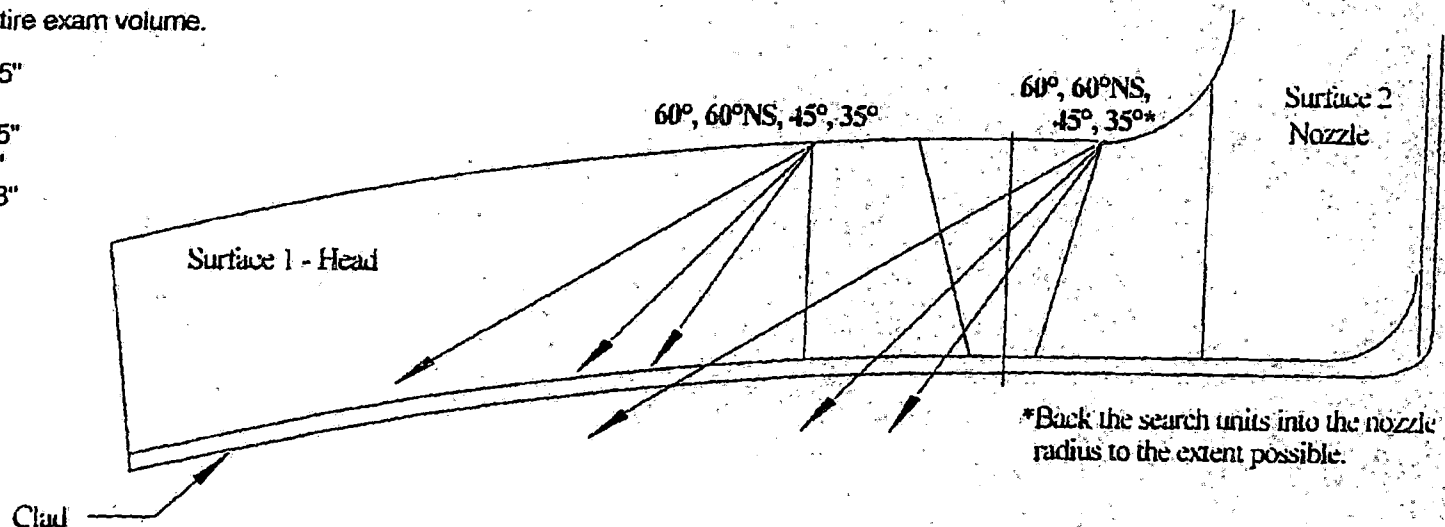
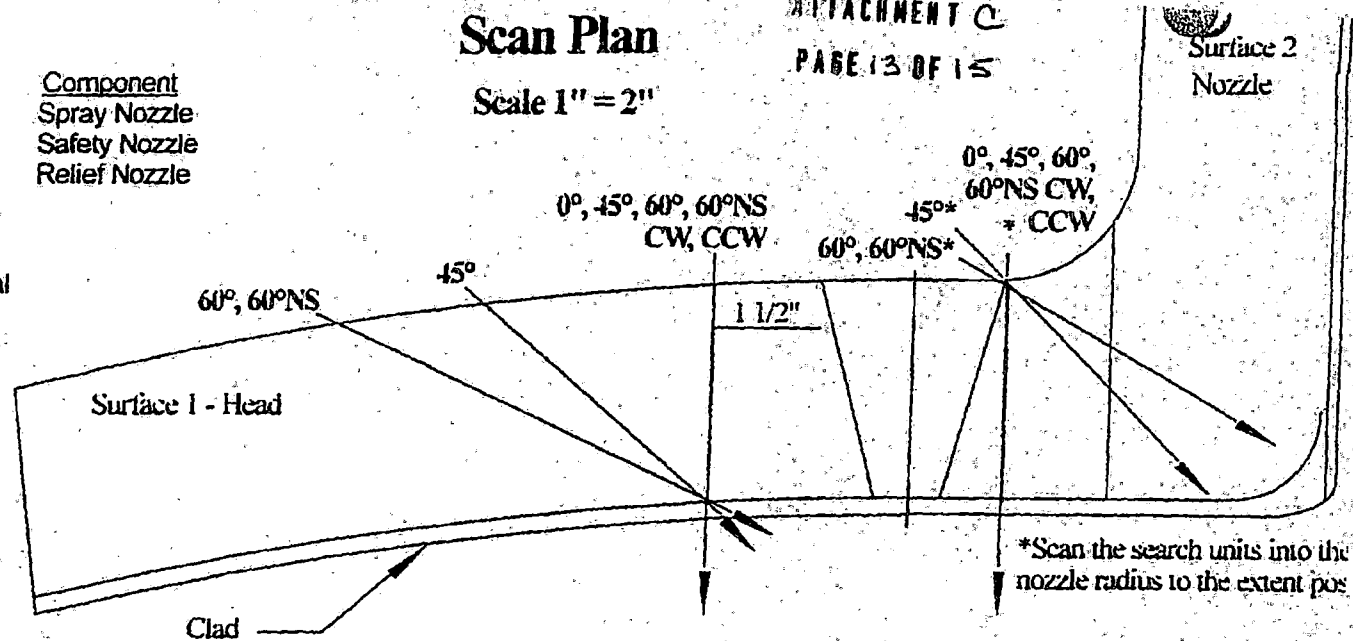
60° Surface Distance = 4.33"

Scan Plan

Scale 1" = 2"

ATTACHMENT C

PAGE 13 OF 15



Approved / Date: *Jerry N. 9-18-*

Page 13 of 15

EXHIBIT A-1
PRE/POST-JOB BRIEF SHEETComponent to be Examined 1 PZR-12, 15 & 16 WO# 02107308 TASK 1ISI Summary/WO Number M1.B3.110.002,005+0006 M1.B3.120.0002,0003+0005Date 9-19-2014 Time Start (Pre) 0755 Time Finish (Pre) 0806Date 9-19-2014 Time Start (Post) 1506 Time Finish (Post) 1518

Attributes Discussed (Initial those completed and NA those that do not apply)

- 3N. ISI Plan/Work Order Review (if applicable) PRE-JOB
- 3N. Examination purpose (i.e. ASME Section XI, augmented) PRE-JOB
- 3N. Surface condition and configuration PRE-JOB
- 3N. Limitations PRE-JOB
- 3N. Previous Data and Previous PIPs PRE-JOB
- 3N. Drawings PRE-JOB
- 3N. Welding Process and joint configuration PRE-JOB
- 3N. Area of Interest (Section XI, Risk Informed) PRE-JOB
- 3N. Scan Plan PRE-JOB
- 3N. Team Scanning PRE-JOB
- 3N. Mock-Ups PRE-JOB
- 3N. Review of planned examination including angles, modes, etc. PRE-JOB
- 3N. Known failure mechanisms expected flaw types and locations PRE-JOB
- 3N. Unexpected conditions detrimental to the planned examination PRE-JOB
- 3N. Roles of the Regulators and the ANII PRE-JOB
- 3N. OE (company and industry events specific to examination) PRE-JOB
- 3N. Expectations for Corrective Action initiation (PIP or CR) PRE/POST-JOB
- 3N. Physical limitations PRE/POST-JOB
- 3N. Unexpected conditions POST-JOB
- 3N. Indications/conditions detected or observed POST-JOB
- 3N. Indications/conditions requiring further evaluation POST-JOB
- 3N. Coverage limitations and calculations POST-JOB
- 3N. Team Scanning POST-JOB
- 3N. Dose POST-JOB
- 3N. Safety Issues POST-JOB
- 3N. Overall job performance POST-JOB
- 3N. Inadequacies of the ISI Plan, Work Order, and Drawings (Initiate PIP) POST-JOB
- 3N. Examiner concerns POST-JOB

EXHIBIT A-1
PRE/POST-JOB BRIEF SHEET

Pre-Job

Comments: DISCUSSED TIGHT WORKING CONDITIONS.

Post-Job

Comments: INADEQUATE LIGHTING, EXAM DELAYS DUE TO
OTHER WORK IN AREA.

PIP/CR

Numbers: NONE

Attendees

Level III/SME: Print JERRY NEWGARDExaminer: Print KEITH KOSKEExaminer: Print KEITH BULLExaminer: Print PAUL JENSEN

Examiner: Print _____

Examiner: Print _____

Examiner: Print _____

Examiner: Print _____

Examiner: Print _____

Sign [Signature]Sign [Signature]Sign [Signature]Sign [Signature]

Sign _____

Sign _____

Sign _____

Sign _____

Sign _____

Relief Request Serial Number

16-MN-001

Attachment D
(Pages 1-8)



UT Calibration Examination

ATTACHMENT D

PAGE 1 OF 8

Site/Unit: McGuire / 1

Procedure: NDE-3630

Outage No.: M1-23

Summary No.: M1.C1.10.0004

Procedure Rev.: 2

Report No.: UT-14-432

Workscope: ISI

Work Order No.: 02107541

Page: 1 of 7

Code: 1998/2000 Addenda Cat./Item: C-A/C1.10 Location:
 Drawing No.: MC-ISIN4-1554-03.00 Description: Shell To Lower flange
 System ID: NV
 Component ID: 1ASWINJF-2 Size/Length: N/A Thickness/Diameter: SS / .438 / 4.0
 Limitations: Yes - See attached sheets Start Time: 1035 Finish Time: 1143

Instrument Settings **Search Unit**
 Serial No.: 023DP0 Serial No.: SB0202
 Manufacturer: GE Manufacturer: KBA
 Model: USN 60 SW Linearity: L-14-202 Size: 0.25 Model: Comp - G
 Delay: 3.8847 Range: 1.25" Freq.: 2.25 MHz Center Freq.: N/A
 M'tl Cal/Vel: 0.1211 Pulsar Type: Square Exam Angle: 45 Squint Angle: N/A
 Damping: 500 Ohms Reject: 0% Measured Angle: 45 Mode: Shear
 PRF: Auto High SU Freq.: 2.25 MHz Exit Point: 0.3" # of Elements: 1
 Frequency: 2.25 MHz Rectify: Fullwave Config.: Single Focus: N/A
 Voltage: 450 Pulse Width: 220 Shape: Round Contour: Flat
 Wedge Style: MSWQC

Cal. Checks	Time	Date
Initial Cal	0840	10/9/2014
Inter. Cal.		
Inter. Cal.	1035	10/9/2014
Inter. Cal.		
Final Cal	1347	10/9/2014

Couplant
 Cal. Batch: 12125
 Type: ULTRAGEL II
 Mfg.: MAGNAFLUX
 Exam Batch: 12125
 Type: ULTRAGEL II
 Mfg.: MAGNAFLUX

Axial Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
ID Notch	80	5.0	.620"

Circumferential Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
ID Notch	80	5.1	.634"

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
17.0	1" Radius	80	8.0	1.00"

Ax. Gain (dB): 22.0 Circ. Gain (dB): 26.0
 1 Screen Div. = .125 in. of Sound Path

Calibration Block
 Cal. Block No. 50424
 Thickness 0.438 Dia.: 4.5
 Cal. Blk. Temp. 83 Temp. Tool: MCNDE40135
 Comp. Temp. 84 Temp. Tool: MCNDE40194

Search Unit Cable
 Type: RG-174 Length: 6' No. Conn.: 0
Scan Coverage
 Upstream ☒ Downstream ☐ Scan dB: 28.0
 CW ☒ CCW ☒ Scan dB: 34.0
 Exam Surface: O.D.
 Surface Condition: Smooth

Reference Block
 Serial No.: 800622
 Type: ROMPAS

Recordable Indication(s): Yes ☒ No ☐ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Comments: FC 14-16, 14-28

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: Yes

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Jensen, Paule J.			<i>Paul J. Jensen</i>	10/9/2014	Newgard, Jerry	<i>Jerry Newgard</i>	10/17/2014
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Griebel, David M.			<i>David M. Griebel</i>	10/9/2014	N/A		
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Swan, Jerome	<i>J. F. Swan</i>	10/18/2014



UT Calibration Examination

ATTACHMENT D

PAGE 2 OF 8

Site/Unit: McGuire / 1 Procedure: NDE-3630
Summary No.: M1.C1.10.0004 Procedure Rev.: 2
Workscope: ISI Work Order No.: 02107541
Code: 1998/2000 Addenda Cat./Item: C-A/C1.10 Location: _____
Drawing No.: MC-ISIN4-1554-03.00 Description: Shell To Lower flange
System ID: NV
Component ID: 1ASWINJF-2
Limitations: Yes - See attached sheets Size/Length: N/A Thickness/Diameter: SS / .438 / 4.0
Start Time: 1105 Finish Time: 1143

Instrument Settings
Serial No.: 023DP0
Manufacturer: GE
Model: USN 60 SW Linearity: L-14-202
Delay: 6.6706 Range: 2.5"
M'tl Cal/Vel: 0.1228 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 2.25 MHz
Frequency: 2.25 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 220
Ax. Gain (dB): 44.0 Circ. Gain (dB): N/A
1 Screen Div. = .25 in. of Sound Path

Search Unit
Serial No.: SB0492
Manufacturer: GE
Size: 0.25 Model: Comp - G
Freq.: 2.25 MHz Center Freq.: N/A
Exam Angle: 70 Squint Angle: N/A
Measured Angle: 71 Mode: Shear
Exit Point .3" # of Elements: 1
Config.: Single Focus: N/A
Shape: Round Contour: Flat
Wedge Style: MSWQC

Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Scan Coverage
Upstream ☒ Downstream ☐ Scan dB: 50.0
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: O.D.
Surface Condition: Smooth

Reference Block
Serial No.: 800622
Type: ROMPAS

Cal. Checks
Time Date
Initial Cal 0855 10/9/2014
Inter. Cal. 1105 10/9/2014
Inter. Cal. 1400 10/9/2014

Axial Orientated Search Unit
Calibration Reflector Signal Amplitude % Sweep Division Sound Path
ID Notch 80 5.4 1.34"

Circumferential Orientated Search Unit
Calibration Reflector Signal Amplitude % Sweep Division Sound Path
N/A

Reference/Simulator Block
Gain dB Reflector Signal Amplitude % Sweep Division Sound Path
28.0 1" Radius 80 4.0 1.00"

Recordable Indication(s): Yes ☒ No ☐ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐
Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: Yes

Comments: FC 11-16, 14-28

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Jensen, Paule J.	II-N		10/9/2014	Newgard, Jerry		10/21/14
Griebel, David M.	II-N		10/9/2014	Site Review		10/17/2014
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			Swan, Jerome		10/18/2014

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: <u>1ASWINJF-2</u>		Item No: <u>M1.C1.10.0004</u>		remarks:
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		Vessel - Flange Configuration
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> cw <input checked="" type="checkbox"/> ccw		
FROM L <u>N/A</u> to L <u>N/A</u>		INCHES FROM W0 <u>CL</u> to <u>Beyond</u>		
ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input type="checkbox"/> 60 other <u>70</u>		FROM <u>0</u> DEG to <u>360</u> DEG		
<input type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		
FROM L _____ to L _____		INCHES FROM W0 _____ to _____		
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other <u>70</u>		FROM _____ DEG to _____ DEG		
<input type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		
FROM L _____ to L _____		INCHES FROM W0 _____ to _____		
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other _____		FROM _____ DEG to _____ DEG		
<input type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		UT-14-432
FROM L _____ to L _____		INCHES FROM W0 _____ to _____		Sketch(s) attached
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 5 <input type="checkbox"/> 60 other <u>4</u>		FROM _____ DEG to _____ DEG		<input checked="" type="checkbox"/> yes <input type="checkbox"/> No
Prepared By: <u>David Griebel</u>	Level: <u>II</u>	Date: <u>10/09/14</u>	Sheet <u>3</u> of <u>7</u>	
Reviewed By: <u>JERRY NEWGARD L-III</u>	Date: <u>10-17-14</u>	Authorized Inspector: <u>J. F. Swan</u>	Date: <u>10-18-14</u>	



Supplemental Report

ATTACHMENT D

PAGE 4 OF 8

Report No.: UT-14-432

Page: 4 of 7

Summary No.: M1.C1.10.0004

Examiner: Jensen, Paule J.

Level: II-N

Reviewer: J. NEWGARD I-III

Date: 10-17-14

Examiner: Griebel, David M.

Level: II-N

Site Review: N/A

Date: 10-18-14

Other: N/A

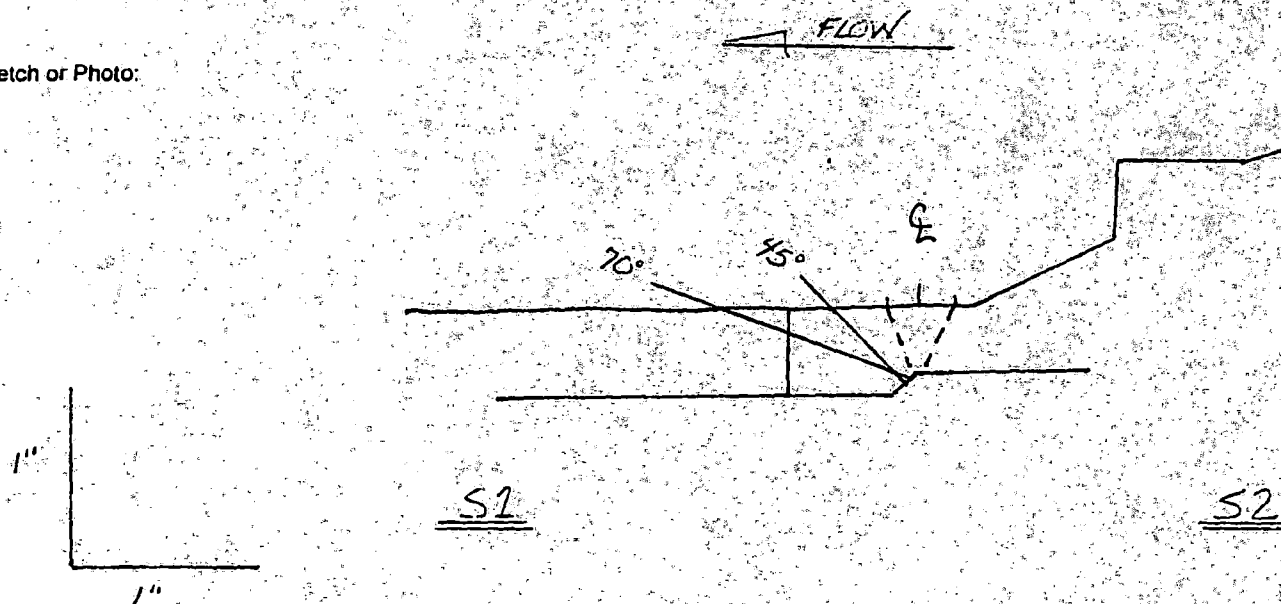
Level: N/A

ANII Review: J. Newgard

Date: 10-18-14

Comments: INDICATION PLOT

Sketch or Photo:

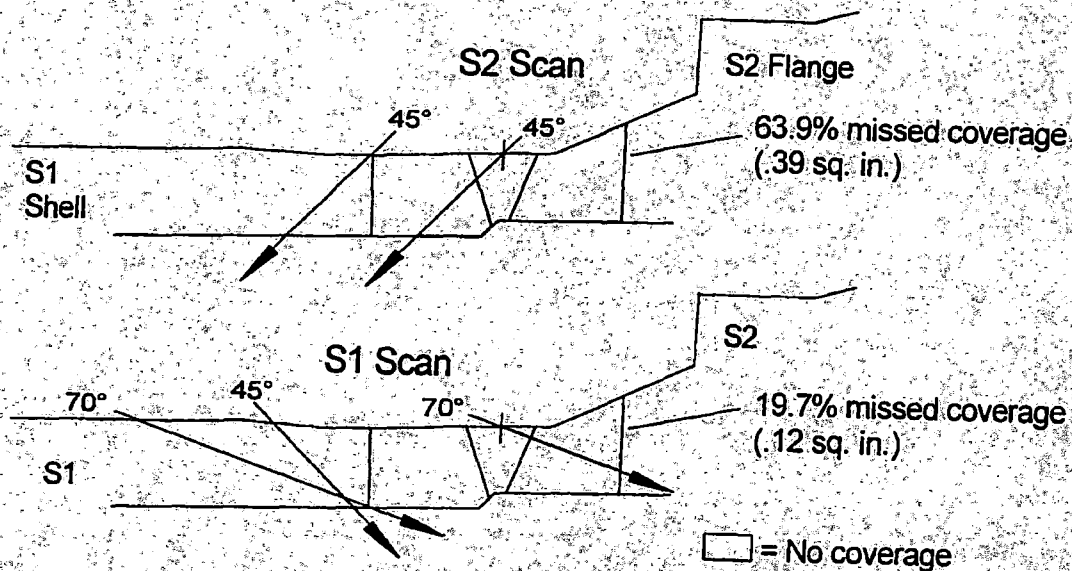
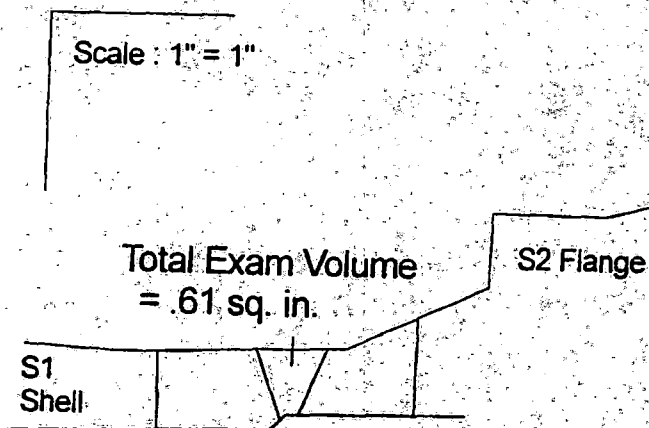


Summary # M1.C1.10.0004
 Component # 1ASWINJF-2
 Weld Volume Coverage

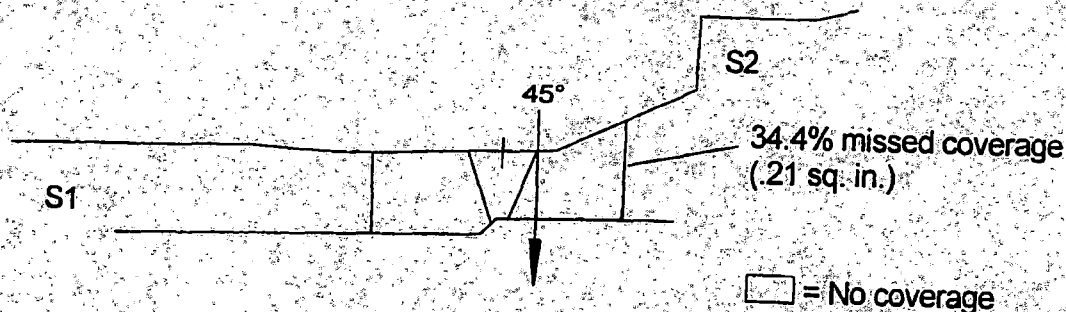
Axial Examination Coverage

ATTACHMENT D

PAGE 5 OF 8



Circumferential Examination Coverage



Composite Coverage = $36.1\% + 80.3\% + 65.6\% + 65.6\% = 247.6 / 4 = 61.9\%$ Exam Coverage

PG 5 OF 7

Reviewed: J. NEWCARD L-III *[Signature]* Date: 10-17-14

EXHIBIT A-1
PRE/POST-JOB BRIEF SHEETComponent to be Examined 1A SEAL WATER INJECTION FILTERISI Summary/WO Number MLC/10 0003/0004Date 10-7-14 Time Start (Pre) 1044 Time Finish (Pre) 1050Date 10/9/14 Time Start (Post) 1427 Time Finish (Post) 1438

Attributes Discussed (Initial those completed and NA those that do not apply)

- ✓ ISI Plan Work Order Review (if applicable) PRE-JOB BK
- ✓ Examination purpose (i.e. ASME Section XI, augmented) PRE-JOB BK
- ✓ Surface condition and configuration PRE-JOB BK
- ✓ Limitations PRE-JOB BK yes
- ✓ Previous Data and Previous PIPs PRE-JOB BK
- ✓ Drawings PRE-JOB BK
- ✓ Welding Process and Joint configuration PRE-JOB BK
- ✓ Area of Interest (Section XI, Risk Informed) PRE-JOB BK
- ✓ Scan Plan PRE-JOB BK
- ✓ Team Scanning PRE-JOB BK
- ✓ Mock-Ups PRE-JOB BK no mockup available for this configuration.
- ✓ Review of planned examination including angles, modes, etc. PRE-JOB BK
- ✓ Known failure mechanisms expected flaw types and locations PRE-JOB BK
- ✓ Unexpected conditions detrimental to the planned examination PRE-JOB BK
- ✓ Roles of the Regulators and the ANII PRE-JOB BK
- ✓ OE (company and industry events specific to examination) PRE-JOB BK
- ✓ Expectations for Corrective Action initiation (PIP or CR) PRE/POST-JOB BK/BK
- ✓ Physical limitations PRE/POST-JOB BK/BK yes Branch connection
- ✓ Unexpected conditions POST-JOB BK Component ID Tag placed on wrong component
- ✓ Indications/conditions detected or observed POST-JOB BK geometry
- ✓ Indications/conditions requiring further evaluation POST-JOB BK none
- ✓ Coverage limitations and calculations POST-JOB BK yes Branch connection
- ✓ Team Scanning POST-JOB BK n/a
- ✓ Dose POST-JOB BK 210mR cumulative dose
- ✓ Safety Issues POST-JOB BK
- ✓ Overall job performance POST-JOB BK good
- ✓ Inadequacies of the ISI Plan, Work Order, and Drawings (Initiate PIP) POST-JOB BK yes see PIP
- ✓ Examiner concerns POST-JOB BK

EXHIBIT A-1
PRE/POST-JOB BRIEF SHEETPre-Job
Comments:Post-Job
Comments:PIP/CR
Numbers: PIP

Attendees

Level III SME: Print

Examiner: Print

Examiner: Print

Examiner: Print

Examiner: Print

Examiner: Print

Examiner: Print

Examiner: Print

Examiner: Print

Sign

Sign

Sign

Sign

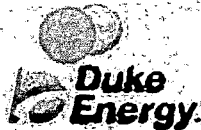
Sign

Sign

Sign

Sign

Sign



Ultrasonic Indication Report

ATTACHMENT D

PAGE 8 OF 8

Site/Unit: McGuire / 1
Summary No.: M1.C1.10.0004
Workscope: ISI

Procedure: NDE-3630
Procedure Rev.: 2
Work Order No.: 02107541

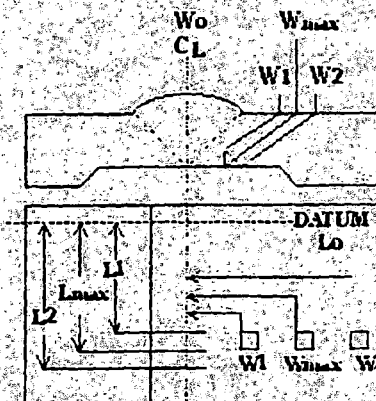
Outage No.: M1-23
Report No.: UT-14-432
Page: 7 of 7

Search Unit Angle: 45 / 70
Wo Location: Weld Centerline
Lo Location: 0° North

- ☐ Piping Welds
☐ Ferritic Vessels $\geq 2''$
☒ Other Vessel $\leq 2''$

MP	Metal Path	Wmax	Distance From Wo To S.U. At Maximum Response
RBR	Remaining Back Reflection	W1	Distance From Wo At Of Max (Forward)
L	Distance From Datum	W2	Distance From Wo At Of Max (Backward)

Comments: See sketch



Angle	Indication No.	% Of DAC	W Max		Forward Of Max		Backward Of Max		L1 Of Max	L Max	L2 Of Max	RBR Amp.	Remarks
			W	MP	W1	MP	W2	MP					
45	1	91	0.5	0.6"	N/A	N/A	N/A	N/A	N/A	7.0 CW	N/A	N/A	Geometry = seen 360° intermittent
70	2	48	1.2	1.2"	N/A	N/A	N/A	N/A	N/A	7.0 CW	N/A	N/A	Geometry = seen 360° intermittent

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Jensen, Paule J.			<i>Paule J. Jensen</i>	10/9/2014	JERRY NEWGARD L-III	<i>Jerry Newgard</i>	10-17-14
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Griebel, David M.			<i>David M. Griebel</i>	10/9/2014	N/A		
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>J. F. Swan</i>	<i>10-18-14</i>	