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Serial No: MNS-15-048

July 9, 2015

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 2
Docket No. 50-370
Relief Request 15-MN-003
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 2, Third 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
LRR

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xc:

V. M. McCree, Region II Administrator
U.S. Nuclear Regulatory Commission
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245 Peachtree Center Ave., NE Suite 1200
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J. Zeiler
NRC Senior Resident Inspector
McGuire Nuclear Station

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bxc:

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

Relief Request 15-MN-003

ENCLOSURE

McGuire Relief Request 15-MN-003

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 2

Third 10-Year Inservice Inspection Interval

Interval Start Date: 03/01/2004

Interval End Date: 07/14/2014

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	2	2EOC22	2RCHPA-10-1	M2.C1.20.0025	See Attachment A Pages 1-8
3.0 ISI	2	2EOC22	2NC2FW39-1	M2.R1.11.0048	See Attachment B Pages 1-9
4.0 PSI	2	2EOC22	2NC2FW45-5	M2.R1.11.0051	See Attachment C Pages 1-8

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2.0 Weld No. 2RCHPA-10-1

2.1 ASME Code Component(s) Affected

Class 2 Pressure Vessel
Reciprocating Charging Pump Accumulator
Chemical and Volume Control System
Shell to Head Circumferential Weld
Weld ID = 2RCHPA-10-1
Summary Number = M2.C1.20.0025

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

IWC-2500, Table IWC-2500-1, Examination Category C-A, Item Number C1.20
Fig. IWC-2500-1 (a), 100% Volume Coverage of Examination Volume
A-B-C-D

Relief is requested from the requirement of Table IWC-2500-1, Examination Category C-A, Item No. C1.20 to examine the Volume A-B-C-D specified in Figure IWC-2500-1(a), and from the requirement of Note (1) to examine "essentially 100% of the weld length" for the Unit 2 Reciprocating Charging Pump Accumulator Head to Shell Circumferential Weld (Weld ID 2RCHPA-10-1, Summary Number M2.C1.20.0025.)

2.4 Impracticality of Compliance

Component configuration:

- Surface 1: Shell - Stainless Steel (SA-312 F 304)
- Surface 2: Head - Stainless Steel (SA-403 WP 304)
- Weldment: Stainless Steel (ER-308L)
- Diameter: 6.66 in.
- Thickness: .495 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° & 60° shear waves for axial scan (S1 and S2) obtained 50% coverage.
- Exam Volume coverage using 45° shear waves for CW and CCW scans obtained 74.3% coverage.
- The aggregate coverage was calculated to be $(50\% + 74.3\%) / 2 = 62.2\%$.

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Supplemental coverage was obtained using a 70° shear wave in areas that were limited to a single sided scan. This coverage is not included in the reported total aggregate coverage.

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

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 Third 10-Year Inservice Inspection Interval, which ended on 07/14/2014.

2.7 Justification for Granting Relief

Ultrasonic examination of Weld ID 2RCHPA-10-1 (Summary Number M2.C1.20.0025) 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 2RCHPA-10-1 (Summary Number M2.C1.20.0025) 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.

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3.0 Weld No. 2NC2FW39-1

3.1 ASME Code Component(s) Affected

Class 1 Piping Weld
Reactor Coolant System
Pipe to Nozzle Weld (2A Cold Leg Branch Connection)
Weld ID = 2NC2FW39-1
Summary Number = M2.R1.11.0048

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

WCAP-14572, Rev. 1-NP-A, Supplement 2, Table 4.1-1, Examination Category R-A, Item Number R1.11, Figure IWB-2500-8(c), 100% Volume Coverage of Examination Volume C-D-E-F

The NRC authorized the inclusion of the RI-ISI Program as an acceptable alternative to the ASME Code, Section XI requirements for ASME Code Class 1 Piping Welds, Examination Categories B-F and B-J and ASME Code Class 2 Piping Welds, Examination Categories C-F-1 and C-F-2 for the Third ISI Interval by letter dated June 12, 2002.

Relief is requested from the requirement of WCAP-14572, Rev. 1-NP-A, Supplement 2, Table 4.1-1, Examination Category R-A, Item No. R1.11 to examine 100% of the Volume C-D-E-F specified in Figure IWB-2500-8(c) for Reactor Coolant System (NC) Class 1 Pipe to Nozzle Circumferential Weld (Weld ID 2NC2FW39-1, Summary Number M2.R1.11.0048.)

3.4 Impracticability of Compliance

Component configuration:

- Surface 1: Stainless Steel Nozzle (Branch Connection)(SA-182 F-304)
- Surface 2: Stainless Steel Pipe (SA-376 TP-304)
- Weldment: Stainless Steel (ER-308)
- Diameter: 1.5 in.
- Thickness: .281 in.

This component was scanned manually with conventional methods. Scanning requirements are described in 10CFR.50.55a (b)(2)(xv)(A)(1). 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:

- 0% coverage obtained in one axial direction (S1 – nozzle)
- 45°, 60° and 70° shear waves obtained 100% coverage in one axial direction (S2 – pipe)

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- 45° shear waves obtained 50% coverage in one circ. direction (CW).
- 45° shear waves obtained 50% coverage in one circ. direction (CCW).
- The aggregate coverage was calculated to be $(0\% + 100\% + 50\% + 50\%) / 4 = 50\%$.
- Best effort supplemental scanning was performed using 70° shear waves for far side interrogation of the lower 1/3 exam volume on the nozzle side of the weld.

The impracticality was caused by the taper configuration that did not allow meaningful interrogation from the welding boss, therefore coverage could not be obtained by scanning from the welding boss side. In order to scan all of the required volume for this weld, the welding boss would have to be redesigned and replaced, which is impractical.

The McGuire Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage. Therefore, the available coverage will 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

This weld was examined using procedures, equipment and personnel qualified in accordance with ASME Section XI, Appendix VIII. The referenced code requirements for examination were derived from WCAP-14572, Rev. 1-NP-A, Supplement 2, Table 4.1-1. Radiography (RT) is not a desired option because RT is limited in the ability to detect service induced flaws, and has not been qualified through performance demonstration. 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 configuration of the component. 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 Third 10-Year Inservice Inspection Interval, which ended on July 14, 2014.

3.7 Justification for Granting Relief

Ultrasonic examination of Weld ID 2NC2FW39-1 (Summary Number M2.R1.11.0048) 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.

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In addition to the above Code required examinations (volumetric and pressure test), Reactor Building Normal Sump monitoring and other leakage detection systems provide 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 2NC2FW39-1 (Summary Number M2.R1.11.0048) to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination, the pressure testing (VT-2) examinations required by Section XI and the leakage monitoring, it is Duke's position that the combination of examinations provide a reasonable assurance of quality and safety.

4.0 Weld No. 2NC2FW45-5

4.1 ASME Code Component(s) Affected

Class 1 Piping Weld
Reactor Coolant System
Pipe to Nozzle Weld (2D Cold Leg Branch Connection)
Weld ID = 2NC2FW45-5 (Preservice Inspection Exam)
Summary Number = M2.R1.11.0051

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-J, Item Number B9.21.
WCAP-14572, Rev. 1-NP-A, Supplement 2, Table 4.1-1, Examination Category R-A, Item Number R1.11, Figure IWB-2500-8(c), 100% Volume Coverage of Examination Volume C-D-E-F

Relief is requested from the requirement of Table IWB-2500-1, Examination Category B-J, Item No. B9.21 to examine 100% of the Volume C-D-E-F specified in Figure IWB-2500-8(c) for Reactor Coolant System (NC) Class 1 Pipe to Nozzle Circumferential Weld (Weld ID 2NC2FW45-5, Summary Number M2.R1.11.0051.)

4.4 Impracticality of Compliance

Component configuration:

- Surface 1: Stainless Steel Nozzle (Branch Connection) SA-182 F 304
- Surface 2: Stainless Steel Pipe SA-376 TP 304
- Weldment: Stainless Steel (ER-308)
- Diameter: 1.5 in.
- Thickness: .281 in.

This component was scanned manually with conventional methods. Scanning requirements are described in 10CFR.50.55a (b)(2)(xv)(A)(1). These

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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:

- 0% coverage obtained in one axial direction (S1 – nozzle)
- 45°, 60° and 70° shear waves obtained 100% coverage in one axial direction (S2 – pipe)
- 45° shear waves obtained 50% coverage in one circ. direction (CW).
- 45° shear waves obtained 50% coverage in one circ. direction (CCW).
- The aggregate coverage was calculated to be $(0\% + 100\% + 50\% + 50\%) / 4 = 50\%$.
- Best effort supplemental scanning was performed using 70° shear waves for far side interrogation of the lower 1/3 exam volume on the nozzle side of the weld.

The impracticality was caused by the taper configuration that did not allow meaningful interrogation from the welding boss, therefore coverage could not be obtained by scanning from the welding boss side. In order to scan all of the required volume for this weld, the welding boss would have to be redesigned and replaced, which is impractical.

The McGuire Inservice Inspection Plan allows the use of Code Case N-460, which requires greater than 90% volumetric coverage. Therefore, the available coverage will 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

This weld was examined using procedures, equipment and personnel qualified in accordance with ASME Section XI, Appendix VIII. The referenced code requirements for examination were derived from IWB-2500, Table IWB-2500-1, Examination Category B-J, Item Number B9.21, and WCAP-14572, Rev. 1-NP-A, Supplement 2, Table 4.1-1, Examination Category R-A, Item Number R1.11, Figure IWB-2500-8(c).

Radiography (RT) is not a desired option because RT is limited in the ability to detect service induced flaws, and has not been qualified through performance demonstration. 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 configuration of the component. 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 Third 10-Year Inservice Inspection Interval, which ended on 07/14/2014.

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4.7 Justification for Granting Relief

Ultrasonic examination of Weld ID 2NC2FW45-5 (Summary Number M2.R1.11.0051) 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 and other leakage detection systems provide 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 2NC2FW-45-5 (Summary Number M2.R1.11.0051) to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination, the pressure testing (VT-2) examinations required by Section XI and the leakage monitoring, it is Duke's position that the combination of examinations provide a reasonable assurance of quality and safety.

Relief Request 15-MN-003

ATTACHMENT A



UT Calibration/Examination

ATTACHMENT A

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Site/Unit: McGuire / 2
Summary No.: M2.C1.20.0025
Workscope: ISI

Procedure: NDE-3630
Procedure Rev.: 2
Work Order No.: 02094561

Outage No.: M2-22
Report No.: UT-14-389
Page: 1 of 8

SD
6/30/15

Code: 1998/2000 A Cal./Item: C-A/C1.20 Location:
Drawing No.: MCM 1201.04-197 Description: SHELL to HEAD
System ID: NV
Component ID: 2RCHPA-10-1 Size/Length: N/A Thickness/Diameter: SS / .495 / 6.660
Limitations: Yes - See attached sheets Start Time: 1049 Finish Time: 1109

Instrument Settings
Serial No.: 00WHDK
Manufacturer: KRAUTKRAMER
Model: USN-60 Linearity: L-14-188
Delay: 4.0494 Range: 2.0"
M's Cal/Vel: .1234 Energy: High
Damping: 1K Reject: 0
PRF Mode: Auto High SU Freq.: 2.25 MHz
Disp. Start: IP Rectify: Full Wave
Inst. Freq.: 2.25 MHz

Search Unit
Serial No.: SB0492
Manufacturer: GE
Size: .25 Model: Comp - G
Freq.: 2.25 MHz Center Freq.: N/A
Exam Angle: 45° Squint Angle: N/A
Measured Angle: 48 Mode: Shear

Cal. Checks	Time	Date
Initial Cal	0751	3/25/2014
Inter. Cal.	1048	3/25/2014
Inter. Cal.		
Inter. Cal.	1110	3/25/2014
Final Cal	1231	3/25/2014

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	3.1	.609"
OD	35	6.1	1.230"
ID	22	9.3	1.853"

Circumferential Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
ID Notch	80	3.2	.641"

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
46.0	NSDH	80	2.3	.464"

Ax. Gain (dB): 40.4 Circ. Gain (dB): 50.2
1 Screen Div. = .2 in. of Sound Path

Calibration Block
Cal. Block No.: 50319
Thickness: 0.432 Dia.: 6.625
Cal. Blk. Temp.: 81 Temp. Tool: MCNDE40132
Comp. Temp.: 75 Temp. Tool: MCNDE40132

Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0
Scan Coverage
Upstream ☐ Downstream ☒ Scan dB: 46.4
CW ☒ CCW ☒ Scan dB: 56.2
Exam Surface: O.D.
Surface Condition: As Ground

Reference Block
Serial No.: 91-5872
Type: ROMPAS

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

Results: Accept ☒ Reject ☐ Info ☐

Comments: FC 11-16

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

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Leeper, Winfred C.	II-N	<i>Winfred C. Leeper</i>	3/25/2014	JAMES J. McARDLE III	<i>James J. McArdle III</i>	4-10-14
Foss, Steven	II-N	<i>Steven Foss</i>	3/25/2014	Site Review		
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			<i>J.F. Foss</i>	4-13-14	



UT Calibration/Examination

ATTACHMENT A

PAGE 2 OF 8

Site/Unit: McGuire / 2
Summary No.: M2.C1.20.0025
Workscope: ISI

Procedure: NDE-3630
Procedure Rev.: 2
Work Order No.: 02094561

Outage No.: M2-22
Report No.: UT-14-389
Page: 2 of 8

SD
6/30/14

Code: 1998/2000 A Cat/Item: C-AC1.20 Location:
Drawing No.: MCM 1201.04-197 Description: SHELL to HEAD
System ID: NV
Component ID: 2RCHPA-10-1 Size/Length: N/A Thickness/Diameter: SS / .495 / 6.660
Limitations: Yes - See attached sheets Start Time: 1035 Finish Time: 1045

Instrument Settings
Serial No.: 00WHDK
Manufacturer: KRAUTKRAMER
Model: USN-60 Linearity: L-13-182
Delay: 5.7916 Range: 1.810"
M'tl Cal/Vel: .1246 Energy: High
Damping: 1K Reject: 0
PRF Mode: Auto High SU Freq.: 2.25 MHz
Disp. Start: IP Rectify: Full Wave
Inst. Freq.: 2.25 MHz

Search Unit
Serial No.: SB0453
Manufacturer: GE
Size: .25 Model: Comp - G
Freq.: 2.25 MHz Center Freq.: N/A
Exam Angle: 60 Squint Angle: N/A
Measured Angle: 57 Mode: Shear
Exit Point: .25" # of Elements: 1
Config.: Non-Int. Focus: N/A
Shape: Round Contour: Flat
Wedge Style: MSWQC

Ax. Gain (dB): 43.5 Circ. Gain (dB): N/A
1 Screen Div. = .181 in. of Sound Path

Calibration Block
Cal. Block No.: 50319
Thickness: 0.432 Dia.: 6.625
Cal. Blk. Temp.: 81 Temp. Tool: MCNDE40132
Comp. Temp.: 75 Temp. Tool: MCNDE40132

Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0
Scan Coverage
Upstream ☐ Downstream ☒ Scan dB: 50.5
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: O.D.
Surface Condition: As Ground

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

Cal. Checks	Time	Date
Initial Cal	0808	3/25/2014
Inter. Cal.	1034	3/25/2014
Inter. Cal.		
Inter. Cal.	1046	3/25/2014
Final Cal	1232	3/25/2014

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

Reference Block
Serial No.: 91-5872
Type: ROMPAS

Axial Orientated Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
2/8 Hole	80	2.0	.356"	
6/8 Hole	20	6.1	1.093"	
10/8 Hole	10	10.0	1.794"	
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
49.1	NSDH	80	3.4	.617"

Comments: FC 11-16

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

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Leeper, Winfred C.			<i>Winfred C. Leeper</i>	3/25/2014	JAMES J. McARDLE III	<i>James J. Mc Ardle III</i>	4-10-14
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Foss, Steven			<i>Steven Foss</i>	3/25/2014			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>J. F. Swan</i>	<i>4-13-14</i>	



UT Calibration Examination

ATTACHMENT A

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Site/Unit: McGuire / 2
Summary No.: M2.C1.20.0025
Workscope: ISI

Procedure: NDE-3630
Procedure Rev.: 2
Work Order No.: 02094561

Outage No.: M2-22
Report No.: UT-14-389
Page: 3 of 78

SD
6/30/14

Code: 1998/2000 A Cal./Item: C-A/C1.20 Location: _____
Drawing No.: MCM 1201.04-197 Description: SHELL to HEAD
System ID: NV
Component ID: 2RCHPA-10-1 Size/Length: N/A Thickness/Diameter: SS / .495 / 6.660
Limitations: Yes - See attached sheets Start Time: 1451 Finish Time: 1458

Instrument Settings
Serial No.: 00WHDK
Manufacturer: KRAUTKRAMER
Model: USN-60 Linearity: L-14-188
Delay: 8.3075 Range: 2.50"
M'tl Cal/Vel: .1319 Energy: High
Damping: 1K Reject: 0
PRF Mode: Auto High SU Freq.: 2.25 MHz
Disp. Start: IP Rectify: Full Wave
Inst. Freq.: 2.25 MHz

Search Unit
Serial No.: SB0453
Manufacturer: GE
Size: .25 Model: Comp - G
Freq.: 2.25 MHz Center Freq.: N/A
Exam Angle: 70 Squint Angle: N/A
Measured Angle: 67 Mode: Shear
Exit Point: .3" # of Elements: 1
Config.: Non-Int. Focus: N/A
Shape: Round Contour: Flat
Wedge Style: MSWQC

Ax. Gain (dB): 63.9 Circ. Gain (dB): N/A
1 Screen Div. = .25 in. of Sound Path

Calibration Block
Cal. Block No. 50319
Thickness 0.432 Dia.: 6.625
Cal. Blk. Temp. 81 Temp. Tool: MCNDE40132
Comp. Temp. 75 Temp. Tool: MCNDE40132

Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0
Scan Coverage
Upstream ☐ Downstream ☒ Scan dB: 63.9
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: O.D.
Surface Condition: As Ground

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	1400	3/25/2014
Inter. Cal.	1450	3/25/2014
Inter. Cal.		
Inter. Cal.	1459	3/25/2014
Final Cal	1530	3/25/2014

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	80	4.9	1.22"

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
55.3	NSDH	80	3.0	.757"

Comments: FC 11-16

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Leeper, Winfred C.	II-N	<i>Winfred C. Leeper</i>	3/25/2014	JAMES J. McARDLE III	<i>James J. McArdle III</i>	4-10-14
Examiner	Level	Signature	Date	Site Review	Signature	Date
Foss, Steven	II-N	<i>Steven Foss</i>	3/25/2014			
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			<i>JF Swan</i>		4-13-14

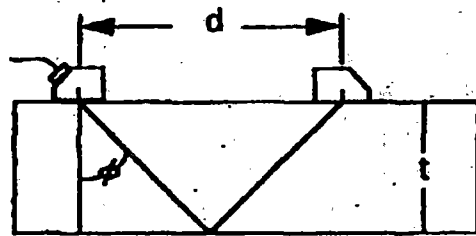
DUKE POWER COMPANY

ISI LIMITATION REPORT

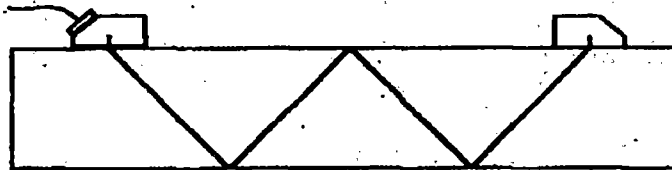
Component/Weld ID: <u>2RCHPA-10-1</u> Item No: <u>M2.C1.20.0025</u>		remarks: Due to Head configuration
<input checked="" type="checkbox"/> NO SCAN SURFACE BEAM DIRECTION <input type="checkbox"/> LIMITED SCAN <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L <u>0.0"</u> to L <u>20.0"</u> INCHES FROM W0 <u>CL</u> to <u>Beyond</u> ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 other _____ FROM <u>0</u> DEG to <u>360</u> DEG	Due to Head configuration	
<input type="checkbox"/> NO SCAN SURFACE BEAM DIRECTION <input checked="" 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>0.0"</u> to L <u>20.0"</u> INCHES FROM W0 <u>0.5"</u> to <u>1.0"</u> ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input type="checkbox"/> 60 other _____ FROM <u>0</u> DEG to <u>360</u> DEG	Due to Head configuration	
<input type="checkbox"/> NO SCAN SURFACE BEAM DIRECTION <input checked="" 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>0.0"</u> to L <u>20.0"</u> INCHES FROM W0 <u>CL</u> to <u>Beyond</u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other <u>70</u> FROM <u>0</u> DEG to <u>360</u> DEG	Due to Head configuration	
<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	UT-14-389 Sketch(s) attached <input checked="" type="checkbox"/> yes <input type="checkbox"/> No	
Prepared By: <u>Steve Foss</u> Level: <u>II</u> Date: <u>03/25/14</u> Sheet <u>4</u> of <u>78</u> SD 6/30/15		
Reviewed By: <u>JAMES J. McARDLE III</u> Date: <u>4-10-14</u>		Authorized Inspector: <u>J. F. Swan</u> Date: <u>4-13-14</u>

DUKE POWER COMPANY

ULTRASONIC BEAM ANGLE MEASUREMENT RECORD

50F 7/8 50
6/30/15

$$\tan \phi = \frac{(d/2)}{t}$$



For thin wall pipe use 2nd Vee path

$$\tan \phi = \frac{(d/2)}{2t}$$

Nominal 45 deg: $d=1.123$; $t=.495$; measured angle= 48 degNominal 60 deg: $d=1.563$; $t=.495$; measured angle= 58 degNominal 70 deg: $d=2.289$; $t=.495$; measured angle= 67 deg

1. Take thickness measurements between wedge locations.
2. Place search unit on straight run of pipe, and peak the signal.
3. Measure distance (d) between exit points.
4. Calculate beam angle with formula as shown using measured wall thickness.
5. Use the measured beam angle to determine coverage and when plotting any indications.

Pipe size: 6.36"Pipe Schedule: N/A

Examiner <u>W. Fred C. Kiefer</u>	Level <u>W. Fred C. Kiefer II</u>	Date <u>3-25-14</u>	Examiner <u>STEVEN T. FOSS</u>	Level <u>Steven T. Foss II</u>	Date <u>3/25/2014</u>
Reviewed By <u>JAMES J. MARDLE III</u>	Level <u>James J. Mardle III</u>	Date <u>4-10-14</u>	Authorized Inspector <u>J. F. Swan</u>		Date <u>4-13-14</u>

Summary No.: M2.C1.20.0025

Examiner: Leeper, Winfred C. *Winfred C. Leeper*

Level: II-N

Reviewer:

JAMES J. McARDLE III *James J. McArdle III* Date: 4-10-74

Examiner: Foss, Steven *Steven Foss*

Level: II-N

Site Review:

Date _____

Other: N/A

Level: N/A

ANII Review.

Date: 4-13-14

Comments:

COVERAGE CALCULATIONS

$$AC = 1.95" \quad AB = 0.5" \quad \text{AREA} = 1.95 \times 0.5 = 0.975 \text{ SQ IN}$$

$$\text{AXIAL SCAN} = 0.975 \div 2 = 0.4875" \text{ SQ IN} \div 0.975 = \underline{50\%}$$

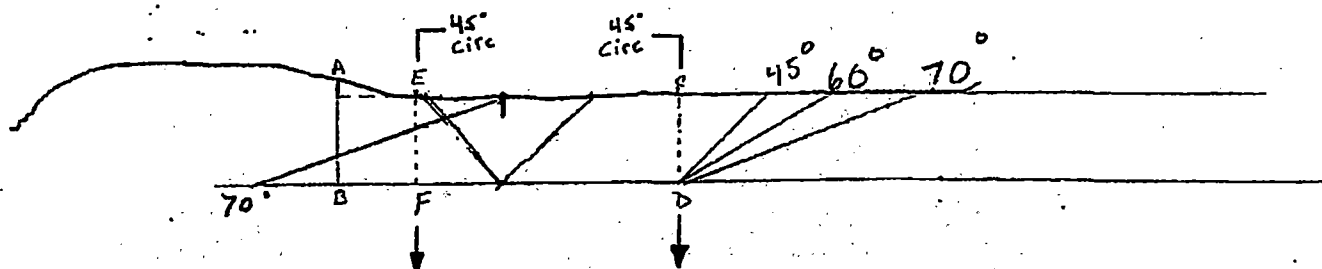
Sketch or Photo:

$$AB = 0.5'' \quad AE = 0.5 \quad \text{AREA LOSS} = .5 \times .5 = 0.25 \text{ SQ IN}$$

CIRC. SCAN $0.975 - 0.25 = 0.725 \text{ sq. in.} \div 0.975 = 74.3\%$

HEAD

SHELL





Supplemental Report

ATTACHMENT A
PAGE 7 OF 8

Report No.: UT-14-389

Page: 7 of 78

SD
6/30/15

Summary No.: M2.C1.20.0025

Examiner: Leeper, Winfred C. *Winfred C. Leeper*

Level: II-N

Reviewer: JAMES J. McARDLE *James J. McARDLE*

Date: 4-10-14

Examiner: Foss, Steven *Steven Foss*

Level: II-N

Site Review:

Date:

Other: N/A

Level: N/A

ANII Review:

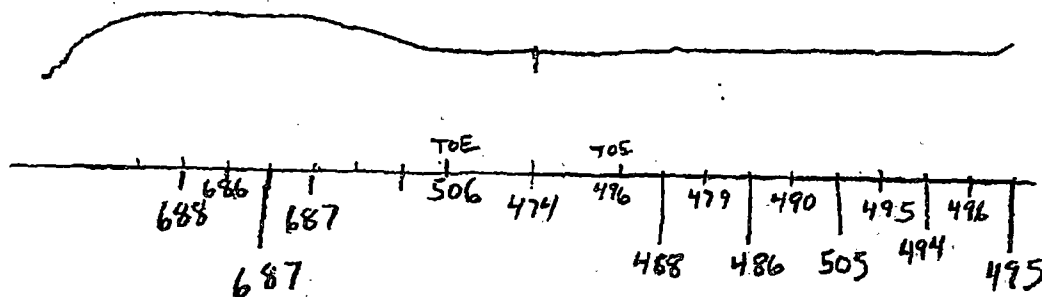
Date:

J. Foss

4-13-14

Comments:

Sketch or Photo:





Determination of Percent Coverage for UT Examinations - Vessels

ATTACHMENT A

PAGE 8 OF 8

Site/Unit:	McGuire / 2	Procedure:	NDE-3630	Outage No.:	M2-22
Summary No.:	M2.C1.20.0025	Procedure Rev.:	2	Report No.:	UT-14-389
Workscope:	ISI	Work Order No.:	02094561	Page:	8 of 8

0 deg Planar

Scan _____ % Length X _____ % volume of length / 100 = _____ % total for 0 deg

45 deg

Upstream _____ % Length X _____ % volume of length / 100 = _____ % total for Upstream

Downstream _____ % Length X _____ % volume of length / 100 = _____ % total for Downstream

CW 100.000 % Length X 74.300 % volume of length / 100 = 74.300 % total for CWCCW 100.000 % Length X 74.300 % volume of length / 100 = 74.300 % total for CCWAdd totals and divide by # scans = 74.300 % total for 45 deg**Other deg 45/60/70**Upstream 100.000 % Length X 0.000 % volume of length / 100 = 0.000 % total for UpstreamDownstream 100.000 % Length X 100.000 % volume of length / 100 = 100.000 % total for Downstream

CW _____ % Length X _____ % volume of length / 100 = _____ % total for CW

CCW _____ % Length X _____ % volume of length / 100 = _____ % total for CCW

Add totals and divide by # scans = 50.000 % total for 45/60/70 deg**Percent complete coverage**

Add totals for each angle and scan required and divide by # of angles to determine;

62.150 % Total for complete exam**Note:**

Supplemental coverage may be achieved by use of other angles / methods. When used, the coverage for volume not obtained with angles as noted above shall be calculated and added to the total to provide the percent total for the complete examination.

Site Field Supervisor:

Steven Dean

Level III

Date:

6/30/15

Relief Request 15-MN-003

ATTACHMENT B



UT Calibration Examination

ATTACHMENT B

PAGE 1 OF 9

Site/Unit: McGuire / 2
Summary No.: M2R1.11.0048
Workscope: ISI

Procedure: NDE-995
Procedure Rev.: 6
Work Order No.: 02147112

Outage No.: M2-22
Report No.: UT-14-388
Page: 1 of 9

Code: 1998/2000 Addenda Cat./Item: R-AR1.11 Location:
Drawing No.: MCFI-2NC39 Description: Pipe to Nozzle
System ID: NC
Component ID: 2NC2FW39-1 Size/Length: N/A Thickness/Diameter: SS / .281/1.50
Limitations: Yes - See attached sheets Start Time: 1110 Finish Time: 1140

Instrument Settings
Serial No.: 0263P4
Manufacturer: GE
Model: USN 60 SW Linearity: L-14-184
Delay: 3.6181 Range: 0.600"
M/I Cal/Vol: .1226 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 5 MHz
Frequency: 5.0 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 100 ns
Ax. Gain (dB): 27.0 Circ. Gain (dB): 29.0
1 Screen Div. = .06 in. of Sound Path

Search Unit
Serial No.: SC2021
Manufacturer: GE
Size: .25" Model: Comp - G
Freq.: 5 MHz Center Freq.: 4.68
Exam Angle: 45 Squint Angle: N/A
Measured Angle: 45 Mode: Shear
Exit Point: 0.2" # of Elements: 1
Config.: Non Int. Focus: N/A
Shape: Round Contour: Flat/Circ 3.8"
Wedge Style: MSWQC

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

Cal. Checks	Time	Date
Initial Cal	1110	4/3/2014
Inter. Cal.	1122	4/3/2014
Inter. Cal.		
Inter. Cal.	1131	4/3/2014
Final Cal	1140	4/3/2014

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

Reference Block
Serial No.: N/A
Type: N/A

Axial Orientated Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
ID Notch	80%	6.6	.397"	
Circumferential Orientated Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
ID Notch	80	7.0	0.42"	
Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A				

Calibration Block
Cal. Block No.: 50202
Thickness: 0.281 Dia.: 1.9
Cal. Blk. Temp.: 75 Temp. Tool: MCNDE40194
Comp. Temp.: 73 Temp. Tool: MCNDE40194
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

Scan Coverage
Upstream ☒ Downstream ☒ Scan dB: 33.0
CW ☒ CCW ☒ Scan dB: 35.0
Exam Surface: O.D.
Surface Condition: As Ground

Comments: Cal block used at component
44° 3.8" contoured wedge used for circ

Examiner	Level	ILN	Signature	Date	Reviewer	Signature	Date
Howard, Dean M.			Dean Howard	4/3/2014	JAMES J. McARDLE III	James J. Mc Ardle III	4-8-14
Examiner	Level	ILN	Signature	Date	Site Review	Signature	Date
Hassel, Matt S.			Matt Hassel	4/3/2014			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					JF Swan	4-11-14	

Signature J. F. Luan Date 4-11-14



UT Calibration Examination

ATTACHMENT B

PAGE 3 OF 9

Site/Unit: McGuire / 2
Summary No.: M2.R1.11.0048
Workscope: ISI

Procedure: NDE-995
Procedure Rev.: 6
Work Order No.: 02147112

Outage No.: M2-22
Report No.: UT-14-388
Page: 3 of 9

Code: 1998/2000 Addenda Cat./Item: R-AR1.11 Location: _____

Drawing No.: MCFI-2NC39 Description: Pipe to Nozzle

System ID: NC

Component ID: 2NC2FW39-1 Size/Length: N/A Thickness/Diameter: SS / .281/1.50

Limitations: Yes - See attached sheets Start Time: 1204 Finish Time: 1212

Instrument Settings
Serial No.: 0263P4
Manufacturer: GE
Model: USN 60 SW Linearity: L-14-184
Delay: 6.4462 Range: 1.250"
M'tl Cal/Vel: .1226 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 5 MHz
Frequency: 5.0 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 100 ns

Ax. Gain (dB): 53.0 Circ. Gain (dB): N/A
1 Screen Div. = .125 In. of Sound Path

Calibration Block
Cal. Block No. 50202
Thickness 0.281 Dia.: 1.9
Cal. Blk. Temp. 75 Temp. Tool: MCNDE40194
Comp. Temp. 73 Temp. Tool: MCNDE40194
Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Search Unit
Serial No.: SC2026
Manufacturer: GE
Size: .25" Model: Comp - G
Freq.: 5 MHz Center Freq.: 4.67
Exam Angle: 70 Squint Angle: N/A
Measured Angle: 70 Mode: Shear
Exit Point 0.3" # of Elements: 1
Config.: Non Int. 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: 53.0
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: O.D.
Surface Condition: As Ground

Cal. Checks	Time	Date
Initial Cal	1204	4/3/2014
Inter. Cal.		
Inter. Cal.		
Inter. Cal.		
Final Cal	1212	4/3/2014

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

Reference Block
Serial No.: N/A
Type: N/A

Axial Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
ID Notch	80%	6.5	.82"

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
N/A				

Comments: Cal block used at component

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

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Howard, Dean M.			<i>Dean Howard</i>	4/3/2014	JAMES J. McARDLE III	<i>James J. McCardle III</i>	4-8-14
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Hassel, Matt S.			<i>Matt Hassel</i>	4/3/2014			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>J.F. Swan</i>	<i>4-11-14</i>	



UT Calibration/Commissioning

ATTACHMENT B

PAGE 4 OF 9

Site/Unit: McGuire / 2
Summary No.: M2.R1.11.0048
Workscope: ISI

Procedure: NDE-995
Procedure Rev.: 6
Work Order No.: 02147112

Outage No.: M2-22
Report No.: UT-14-388
Page: 4 of 9

Code: 1998/2000 Addenda Cat./Item: R-A/R1.11 Location: _____
Drawing No.: MCFI-2NC39 Description: Pipe to Nozzle
System ID: NC
Component ID: 2NC2FW39-1 Size/Length: N/A Thickness/Diameter: SS / .281/1.50
Limitations: Yes - See attached sheets Start Time: 1214 Finish Time: 1220

Instrument Settings
Serial No.: 0263P4
Manufacturer: GE
Model: USN 60 SW Linearity: L-14-184
Delay: 6.4462 Range: 1.250"
M'd Cal/Vel: .1225 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 ns

Ax. Gain (dB): 46.0 Circ. Gain (dB): N/A
1 Screen Div. = .125 in. of Sound Path

Search Unit
Serial No.: SB0253
Manufacturer: GE
Size: .25 Model: Comp - G
Freq.: 2.25 MHz Center Freq.: 2.20
Exam Angle: 70 Squint Angle: N/A
Measured Angle: 70 Mode: Shear
Exit Point: 0.3" # of Elements: 1
Config.: Non Int. Focus: N/A
Shape: Round Contour: Flat
Wedge Style: MSWQC

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

Cal. Checks	Time	Date
Initial Cal	1214	4/3/2014
Inter. Cal.		
Inter. Cal.		
Inter. Cal.		
Final Cal	1220	4/3/2014

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%	6.5	.82"

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
N/A				

Calibration Block
Cal. Block No. 50202
Thickness 0.281 Dia.: 1.9
Cal. Blk. Temp. 75 Temp. Tool: MCNDE40194
Comp. Temp. 73 Temp. Tool: MCNDE40194

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

Scan Coverage
Upstream ☒ Downstream ☐ Scan dB: 46.0
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: O.D.
Surface Condition: As Ground

Reference Block
Serial No.: N/A
Type: N/A

Comments: Cal block used at component

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

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Howard, Dean M.			<i>Dean Howard</i>	4/3/2014	JAMES J. McARDLE III	<i>James J. Mc Ardle III</i>	4-8-14
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Hassel, Matt S.			<i>M. Hassel</i>	4/3/2014			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>J. F. Swann</i>	<i>4-11-14</i>	



UT Calibration Certification

ATTACHMENT B

PAGE 5 OF 9

Site/Unit: McGuire / 2
Summary No.: M2.R1.11.0048
Workscope: ISI

Procedure: NDE-640
Procedure Rev.: 5
Work Order No.: 02147112

Outage No.: M2-22
Report No.: UT-14-388
Page: 5 of 9

Code: 1998/2000 Addenda Cat./Item: R-A/R1.11 Location: _____

Drawing No.: MCFI-2NC39 Description: Pipe to Nozzle

System ID: NC

Component ID: 2NC2FW39-1 Size/Length: N/A Thickness/Diameter: SS / .281/1.50

Limitations: None Start Time: 1055 Finish Time: 1105

Instrument Settings
Serial No.: 0263P4
Manufacturer: GE
Model: USN 60 SW Linearity: L-14-184
Delay: 0.6181 Range: 1.00"
M'tl Cal/Vel: .2280 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 5.0 MHz
Frequency: 5.0 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 100 ns

Ax. Gain (dB): 15.0 Circ. Gain (dB): N/A
1 Screen Div. = .1 in. of Sound Path

Search Unit
Serial No.: K26903
Manufacturer: KBA
Size: 0.25 Model: Gamma
Freq.: 5.0 MHz Center Freq.: N/A
Exam Angle: 0 Squint Angle: N/A
Measured Angle: N/A Mode: Long
Exit Point: N/A # of Elements: 1
Config.: Integral Focus: N/A
Shape: Round Contour: N/A
Wedge Style: N/A

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

Cal. Checks	Time	Date
Initial Cal	1055	4/3/2014
Inter. Cal.		
Inter. Cal.		
Inter. Cal.		
Final Cal	1105	4/3/2014

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
BW	80	2.8	0.28"

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
3.0	.2" Step	80	2.0	.200"
5.0	.5" Step	80	5.0	.500"

Calibration Block
Cal. Block No. _____ Component _____
Thickness 0.281 Dia.: 1.5"
Cal. Blk. Temp. 73 Temp. Tool: MCNDE40194
Comp. Temp. 73 Temp. Tool: MCNDE40194

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

Percent Of Coverage Obtained > 90%: Yes Reviewed Previous Data: Yes

Reference Block
Serial No.: 11-4949
Type: STEP WEDGE

Comments: N/A

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Howard, Dean M.	II-N	<i>Dean Howard</i>	4/3/2014	JAMES J. McARDLE III	<i>James J. McArdle III</i>	4-8-14
Examiner	Level	Signature	Date	Site Review	Signature	Date
Hassel, Matt S.	II-N	<i>Matt Hassel</i>	4/3/2014			
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			<i>J F Swann</i>	<i>4-11-14</i>	

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: <u>2NC2FW39-1</u> Item No: <u>M2.R1.11.0048</u>		remarks:
<input checked="" type="checkbox"/> NO SCAN SURFACE BEAM DIRECTION <input type="checkbox"/> LIMITED SCAN <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> cw <input checked="" type="checkbox"/> ccw FROM L <u>0</u> to L <u>360</u> INCHES FROM W0 <u>CL</u> to <u>Beyond</u> ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 other <u> </u> FROM <u>0</u> DEG to <u>360</u> DEG		No scan due to downstream nozzle configuration.
<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 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 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 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		UT-14-388
<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"/> 5 <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>Matthew Hassel</u> <i>Matthew Hassel</i> Level: <u>II</u> Date: <u>04/03/14</u>	Sheet <u>6</u> of <u>9</u>	
Reviewed By: <u>JAMES S. MARBLE III</u> <i>JAMES S. MARBLE III</i> Date: <u>4-8-14</u>	Authorized Inspector: <u>J. E. Swan</u> <i>J. E. Swan</i> Date: <u>4-11-14</u>	



Supplemental Report

ATTACHMENT B

PAGE 7 OF 9

Report No.: UT-14-388

Page: 7 of 9

Summary No.: M2.R1.11.0048

Examiner: Howard, Dean M. *D Howard*

Examiner: Hassel, Matt S. *M Hassel*

Other: N/A

Level: II-N

Level: II-N

Level: N/A

Reviewer: JAMES J. McARDLE III *James J. McArde III*

Site Review: *J. P. Swan*

ANII Review: *J. P. Swan*

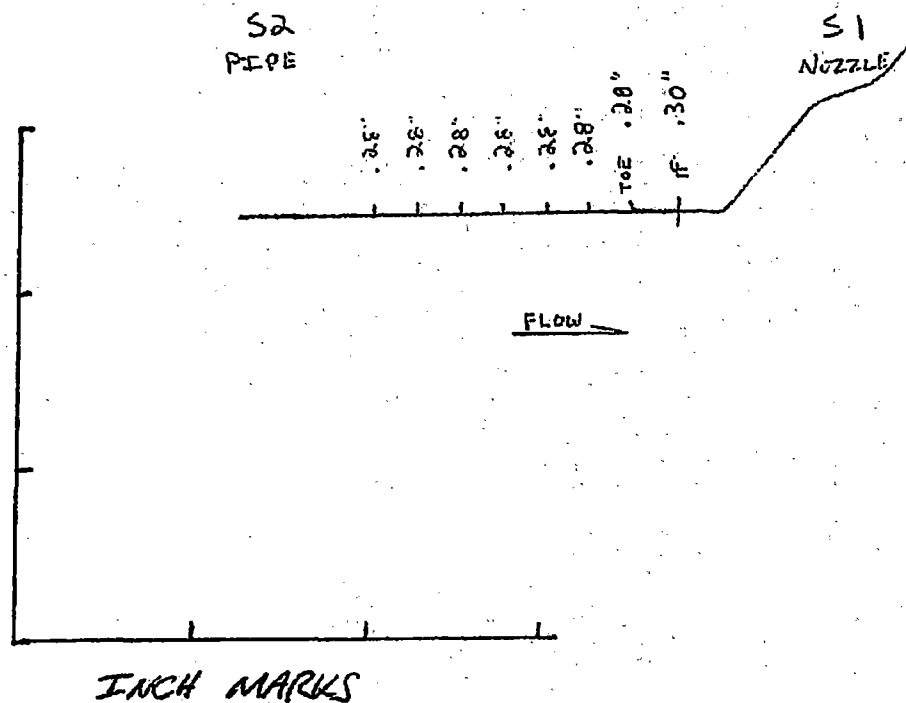
Date: 4-8-14

Date:

Date: 4-11-14

Comments: Thickness & Contour

Sketch or Photo:





Supplemental Report

ATTACHMENT B
PAGE 8 OF 9

Report No.: UT-14-388
Page: 8 of 9

Summary No.: M2.R1.11.0048

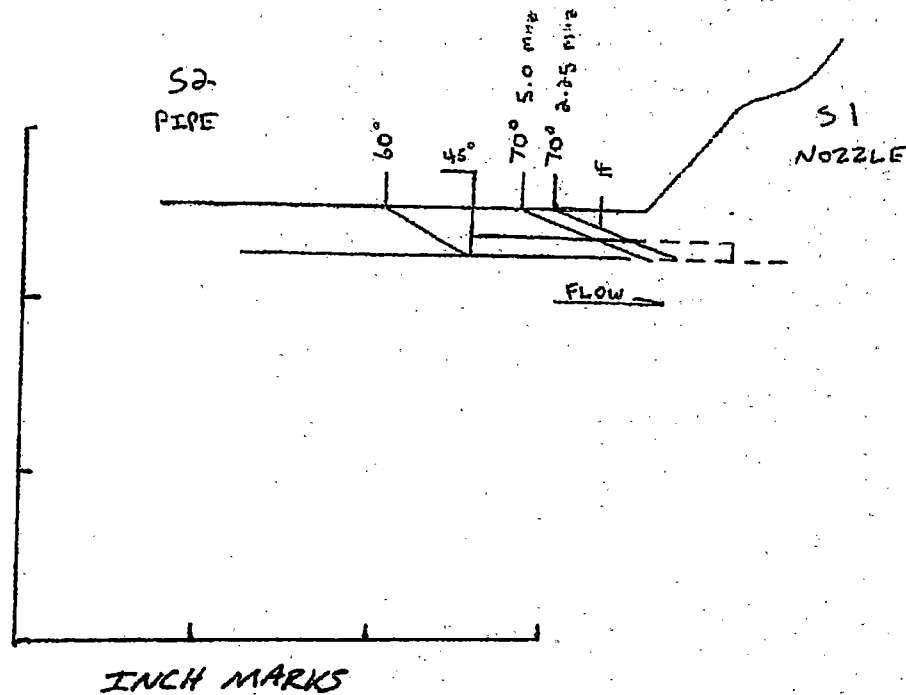
Examiner: Howard, Dean M. *D Howard*
Examiner: Hassel, Matt S. *M Hassel*
Other: N/A

Level: II-N
Level: II-N
Level: N/A

Reviewer: JAMES J. McARDLE *James J. McArde* Date: 4-8-14
Site Review: Date:
ANII Review: *J. Flanagan* Date: 4-11-14

Comments: Coverage Plot

Sketch or Photo:





Determination of Percent Coverage for UT Examinations - Pipe

ATTACHMENT B

PAGE 9 OF 9

Site/Unit:	McGuire / 2	Procedure:	NDE-995	Outage No.:	M2-22
Summary No.:	M2.R1.11.0048	Procedure Rev.:	6	Report No.:	UT-14-388
Workscope:	ISI	Work Order No.:	02147112	Page:	9 of 9

45 deg

Upstream		% Length X		% volume of length / 100 =		% total for Upstream
Downstream	100.000	% Length X	0.000	% volume of length / 100 =	0.000	% total for Downstream
CW	100.000	% Length X	50.000	% volume of length / 100 =	50.000	% total for CW
CCW	100.000	% Length X	50.000	% volume of length / 100 =	50.000	% total for CCW

Add totals and divide by # scans = 33.333 % total for 45 deg**Other deg - 70** (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Upstream	100.000	% Length X	100.000	% volume of length / 100 =	100.000	% total for Upstream
Downstream		% Length X		% volume of length / 100 =		% total for Downstream
CW		% Length X		% volume of length / 100 =		% total for CW
CCW		% Length X		% volume of length / 100 =		% total for CCW

Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

50.000 % Total for complete exam

Site Field Supervisor:


L-III
Steven Dean

Date:

1/27/15

Relief Request 15-MN-003

ATTACHMENT C



UT Calibration/Examination

ATTACHMENT C
PAGE 1 OF 8

Site/Unit: McGuire / 2 Procedure: NDE-995 Outage No.: N/A
Summary No.: M2.R1.11.0051 Procedure Rev.: 6 Report No.: BOP-UT-14-373
Workscope: PSI Work Order No.: 02147122 Page: 1 of 8

Code: N/A Cat/Item: N/A Location: N/A
Drawing No.: N/A Description: Pipa to Nozzle

System ID: NC
Component ID: ZNC2FW45-5 Size/Length: N/A Thickness/Diameter: SS/281/1.5"
Limitations: Yes - See attached sheets Start Time: 0735 Finish Time: 0810

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit			
Serial No.:	<u>0263P4</u>			Serial No.:	<u>SC2021</u>			Initial Cal	<u>0735</u>	<u>4/8/2014</u>	Calibration Reflector	<u>Signal Amplitude %</u>	<u>Sweep Division</u>	<u>Sound Path</u>
Manufacturer:	<u>GE</u>			Manufacturer:	<u>GE</u>			Inter. Cal	<u>0748</u>	<u>4/8/2014</u>	ID Notch	<u>80</u>	<u>6.6</u>	<u>.397"</u>
Model:	<u>USN 60 SW</u>	Linearity:	<u>L-14-184</u>	Size:	<u>.25"</u>	Model:	<u>Comp - G</u>	Inter. Cal						
Delay:	<u>3.8181</u>	Range:	<u>.600"</u>	Freq.:	<u>5 MHz</u>	Center Freq.:	<u>4.88</u>	Inter. Cal	<u>0759</u>	<u>4/8/2014</u>				
M'd Cal/Vel:	<u>.1228</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>45</u>	Squint Angle:	<u>N/A</u>	Final Cal	<u>0810</u>	<u>4/8/2014</u>				
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>45</u>	Mode:	<u>Shear</u>	Couplant						
PRF:	<u>Auto High</u>	SU Freq.:	<u>5 MHz</u>	Exit Point	<u>0.2"</u>	# of Elements:	<u>1</u>	Cal. Batch:	<u>12125</u>					
Frequency:	<u>5.0 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Non-Int.</u>	Focus:	<u>N/A</u>	Type:	<u>ULTRAGEL II</u>					
Voltage:	<u>450</u>	Pulse Width:	<u>100 ns</u>	Shape:	<u>Round</u>	Contour:	<u>Flat/Circ 3.8"</u>	Mfg.:	<u>MAGNAFLUX</u>					
Ax. Gain (dB): <u>27.0</u> Circ. Gain (dB): <u>29.0</u>				Search Unit Cable				Exam Batch:	<u>12125</u>					
<u>1</u> Screen Div. = <u>.06</u> in. of <u>Sound Path</u>				Type:	<u>RG-174</u>	Length:	<u>6'</u>	Type:	<u>ULTRAGEL II</u>					
Calibration Block				Scan Coverage				Mfg.:	<u>MAGNAFLUX</u>					
Cal. Block No.	<u>50202</u>			Upstream <input checked="" type="checkbox"/>	Downstream <input type="checkbox"/>	Scan dB:	<u>33.0</u>	Reference Block						
Thickness	<u>0.281</u>	Dia.:	<u>1.9</u>	CW <input checked="" type="checkbox"/>	CCW <input checked="" type="checkbox"/>	Scan dB:	<u>35.0</u>	Serial No.:	<u>N/A</u>					
Cal. Blk. Temp.	<u>75</u>	Temp. Tool:	<u>MCNDE40194</u>	Exam Surface:	<u>O.D.</u>			Type:	<u>N/A</u>					
Comp. Temp.	<u>80</u>	Temp. Tool:	<u>MCNDE40194</u>	Surface Condition:	<u>As Ground</u>			Reference/Simulator Block						
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)				Percent Of Coverage Obtained > 80%: <u>No</u> Reviewed Previous Data: <u>Yes</u>				Comments: <u>44" 3.8" Circ wedge used for circ Cal block used at the component PSI Initial Exam</u>						
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>														

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Howard, Dean	II-N	<i>Dean Howard</i>	4/8/2014	JAMES J. MCKIDLE III	<i>James J. McKidle III</i>	4-16-14
Hassel, Matt S.	II-N	<i>M. Hassel</i>	4/8/2014	Site Review		
Other	Level	Signature	Date	ANII Review	<i>JF</i>	4-16-14
N/A	N/A					



UT Calibration/Examination

ATTACHMENT C
PAGE 2 OF 8

Site/Unit: McGuire / 2 Procedure: NDE-995 Outage No.: N/A
Summary No.: M2.R1.11.0051 Procedure Rev.: 6 Report No.: BOP-UT-14-373
Workscope: PSI Work Order No.: 02147122 Page: 2 of 8

Code: N/A Cat./Item: N/A Location: N/A
Drawing No.: N/A Description: Pipe to Nozzle
System ID: NC
Component ID: 2NC2FW45-5 Size/Length: N/A Thickness/Diameter: SS/281/1.5"
Limitations: Yes - See attached sheets Start Time: 0815 Finish Time: 0825

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit				
Serial No.:	<u>0263P4</u>			Serial No.:	<u>01F3JT</u>			Initial Cal	<u>0815</u>	<u>4/8/2014</u>	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Manufacturer:	<u>GE</u>			Manufacturer:	<u>KBA</u>			Inter. Cal.			ID Notch	<u>80</u>	<u>6.3</u>	<u>.51"</u>	
Model:	<u>USN 60 SW</u>	Linearity:	<u>L-14-184</u>	Size:	<u>.25</u>	Model:	<u>Comp - G</u>	Inter. Cal.							
Delay:	<u>5.0400</u>	Range:	<u>.75"</u>	Freq.:	<u>5 MHz</u>	Center Freq.:	<u>4.79</u>	Inter. Cal.							
M'd Cal/Vel:	<u>.1226</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>60</u>	Squint Angle:	<u>N/A</u>	Final Cal	<u>0825</u>	<u>4/8/2014</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>5 MHz</u>	Exit Point:	<u>0.25"</u>	# of Elements:	<u>1</u>	Cal. Batch:	<u>12125</u>						
Frequency:	<u>5.0 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Non-Int.</u>	Focus:	<u>N/A</u>	Type:	<u>ULTRAGEL II</u>						
Voltage:	<u>450</u>	Pulse Width:	<u>100 ns</u>	Shape:	<u>Round</u>	Contour:	<u>Flat</u>	Mfg.:	<u>MAGNAFLUX</u>						
Ax. Gain (dB):	<u>45.0</u>	Circ. Gain (dB):	<u>N/A</u>	Wedge Style:	<u>MSWQC</u>			Exam Batch:	<u>12125</u>						
1 Screen Div. =	<u>.075</u>	In. of	<u>Sound Path</u>	Search Unit Cable				Type:	<u>ULTRAGEL II</u>						
Cal. Block No.	<u>50202</u>			Type:	<u>RG-174</u>	Length:	<u>6'</u>	Mfg.:	<u>MAGNAFLUX</u>						
Thickness	<u>0.281</u>	Dia.:	<u>1.9</u>	Scan Coverage				Reference Block							
Cal. Blk. Temp.	<u>75</u>	Temp. Tool:	<u>MCNDE40194</u>	Upstream <input checked="" type="checkbox"/>	Downstream <input type="checkbox"/>	Scan dB:	<u>45.0</u>	Serial No.:	<u>N/A</u>						
Comp. Temp.	<u>80</u>	Temp. Tool:	<u>MCNDE40194</u>	CW <input type="checkbox"/>	CCW <input type="checkbox"/>	Scan dB:	<u>N/A</u>	Type:	<u>N/A</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>Cal block used at component</u> <u>PSI Initial Exam</u>											
Percent Of Coverage Obtained > 90%:	<u>No</u>			Reviewed Previous Data:	<u>Yes</u>										

Examiner	Level	IT-N	Signature	Date	Reviewer	Signature	Date
Howard, Dean			<i>Dean Howard</i>	4/8/2014	JAMES J. McARDLE III	<i>James J. McArdle III</i>	4-16-14
Hassel, Matt S.			<i>M. Hassel</i>	4/8/2014			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A						<i>JF Swan</i>	4-16-14



System ID:	NC
Component ID:	2NC2FW45-5
Limitations:	Yes - See attached sheets
	Size/Length: N/A
	Thickness/Diameter: SS/2.614,5"
	Start Time: 0829
	Finish Time: 0839

Instrument Settings										Search Unit										Reference Block										Calibration Block										Cal Block used at component									
Serial No.: 0263P4										Serial No.: SB0253										Serial No.: N/A										Serial No.: N/A										Serial No.: N/A									
Manufacturer: GE										Manufacturer: GE										Manufacturer: N/A										Manufacturer: N/A										Manufacturer: N/A									
Model: USN 60 SW										Model: Comp - G										Model: N/A										Model: N/A										Model: N/A									
Linearity: L-14-184										Size: 25										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Range: 1.280"										Exam Angle: 70										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Pulser Type: Square										Exit Point: 0.3"										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Recfly: Fullwave										Config: Non-Int.										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
SU Freq: 2.25 MHz										Focus: N/A										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
0%										Measured Angle: 70										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Reject: 0%										Mode: Shear										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Delay: 5.4462										Exam Angle: 70										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
MT CalVel: .1228										Squint Angle: N/A										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Damping: 500 Ohms										# of Elements: 1										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
PRF: Auto High										Contour: Flat										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Frequency: 2.25 MHz										Shape: Round										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Voltage: 450										Wedge Style: HSWQC										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Pulse Width: 220 ns										Search Unit Cable										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Circ. Gain (dB): N/A										Type: RG-174										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Screen Div. = .125										Scan Coverage										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Ax. Gain (dB): 46.0										Upstream <input checked="" type="checkbox"/> Downstream <input type="checkbox"/>										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Comp. Temp. 80										Exam Surface: O.D.										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Temp. Tool: MCNDE40194										Scan dB: 46.0										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Comp. Temp. 75										CCW <input type="checkbox"/> CW <input type="checkbox"/>										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Temp. Tool: MCNDE40194										Surface Condition: As Ground										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Recordable Indication(s):										(If Yes, Rel. Attached Ultrasonic Indication Report.)										Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>																				Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									
Percent of Coverage Obtained > 90%: N/A																				Type: ULTRAGEL II										Type: ULTRAGEL II										Type: ULTRAGEL II									

Examiner	Level: II-N	Signature	Date	Reviewer	Signature	Date
Howard, Dean		<i>Dean Howard</i>	4/8/2014	JAMES J. McKEE III	<i>James J. McKeel III</i>	4/16-14
Examiner	Level: II-N	Signature	Date	Site Review	Signature	Date
Hassel, Mark S.		<i>M. S. Hassel</i>	4/8/2014			
Other	Level: N/A	Signature	Date	Final Review	Signature	Date
N/A					<i>James J. McKeel III</i>	4-16-14



UT Calibration/Examination

ATTACHMENT C
PAGE 4 OF 8

Site/Unit:	McGuire / 2	Procedure:	NDE-640	Outage No.:	N/A
Summary No.:	M2.R1.11.0051	Procedure Rev.:	5	Report No.:	BOP-UT-14-373
Workscope:	PSI	Work Order No.:	02147122	Page:	4 of 8

Code:	N/A	Cal./Item:	N/A	Location:	N/A
Drawing No.:	N/A	Description:	Pipe to Nozzle		
System ID:	NC				
Component ID:	2NC2FW45-5	Size/Length:	N/A	Thickness/Diameter:	SSI/281/1.5"
Limitations:	None	Start Time:	0718	Finish Time:	0730

Instrument Settings Serial No.: 0263P4 Manufacturer: GE Model: USN 60 SW Linearity: L-14-184 Delay: .6181 Range: 1.0" Mfl Cal/Vol: .2280 Pulsar Type: Square Damping: 500 Ohms Reject: 0% PRF: Auto High SU Freq.: 5.0 MHz Frequency: 5.0 MHz Rectify: Fullwave Voltage: 450 Pulse Width: 100 ns		Search Unit Serial No.: K26903 Manufacturer: KBA Size: 0.25 Model: Gamma Freq.: 5.0 MHz Center Freq.: N/A Exam Angle: 0 Squint Angle: N/A Measured Angle: N/A Mode: Long. Exit Point: N/A # of Elements: 1 Config.: Integral Focus: N/A Shape: Round Contour: N/A Wedge Style: N/A		Cal. Checks Initial Cal: 0718 4/8/2014 Inter. Cal.: Inter. Cal.: Inter. Cal.: Final Cal: 0730 4/8/2014	Axial Orientated Search Unit <table border="1"> <thead> <tr> <th>Calibration Reflector</th> <th>Signal Amplitude %</th> <th>Sweep Division</th> <th>Sound Path</th> </tr> </thead> <tbody> <tr> <td>BW</td> <td>80</td> <td>2.8</td> <td>.28"</td> </tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	BW	80	2.8	.28"																				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path																														
BW	80	2.8	.28"																														
Ax. Gain (dB): 15.0 Circ. Gain (dB): N/A 1 Screen Div. = .1 in. of Sound Path		Search Unit Cable Type: RG-174 Length: 6' No. Conn.: 0		Couplant Cal. Batch: 12125 Type: ULTRAGEL II Mfg.: MAGNAFLUX Exam Batch: 12125 Type: ULTRAGEL II Mfg.: MAGNAFLUX	Circumferential Orientated Search Unit <table border="1"> <thead> <tr> <th>Calibration Reflector</th> <th>Signal Amplitude %</th> <th>Sweep Division</th> <th>Sound Path</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td> </td> <td> </td> <td> </td> </tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	N/A																							
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path																														
N/A																																	
Calibration Block Cal. Block No. Component Thickness .281 Dia.: 1.5" Cal. Blk. Temp. 80 Temp. Tool: MCNDE40194 Comp. Temp. 80 Temp. Tool: MCNDE40194		Scan Coverage Upstream <input checked="" type="checkbox"/> Downstream <input checked="" type="checkbox"/> Scan dB: 15.0 CW <input checked="" type="checkbox"/> CCW <input checked="" type="checkbox"/> Scan dB: 15.0 Exam Surface: O.D. Surface Condition: As Ground		Reference Block Serial No.: 11-4949 Type: STEP WEDGE																													
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: Cal block used at component PSI Initial Exam																															
Percent Of Coverage Obtained > 90%: Yes		Reviewed Previous Data: No																															

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Howard, Dean	II-N	<i>Dean Howard</i>	4/8/2014	JAMES J. McARDLE III	<i>James J. McArdle III</i>	4-16-14
Examiner	Level	Signature	Date	Site Review	Signature	Date
Hassel, Matt S.	II-N	<i>M. Hassel</i>	4/8/2014			
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			<i>J.F. Swann</i>		4-16-14

DUKE POWER COMPANY					
ISI LIMITATION REPORT					
Component/Weld ID: <u>2NC2FW45-5</u> Item No: <u>M2.R1.11.0051</u>				remarks:	
<input checked="" type="checkbox"/> NO SCAN SURFACE BEAM DIRECTION <input type="checkbox"/> LIMITED SCAN <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> cw <input checked="" type="checkbox"/> ccw FROM L <u>0</u> to L <u>360</u> INCHES FROM W0 <u>CL</u> to <u>Beyond</u> ANGLE: <input checked="" type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 other <u>70</u> FROM <u>0</u> DEG to <u>360</u> DEG				No scan due to ^{PIPE MP} nozzle to 4.15.14 downstream nozzle configuration	
<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 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 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 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				BOP-UT-14-373	
<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				Sketch(s) attached <input checked="" type="checkbox"/> yes <input type="checkbox"/> No	
Prepared By: <u>Matthew Hassel</u>		Level: <u>II</u>		Date: <u>04/08/14</u>	
Reviewed By: <u>JAMES J. McARDLE III</u>		Date: <u>4-16-14</u>		Authorized Inspector: <u>J. F. Swann</u> Date: <u>4-16-14</u>	



Supplemental Report

Report No.: BOP-UT-14-373

Page: 6 of 8

Summary No.: M2.R1.11.0051

Examiner: Howard, Dean

Level: II-N

Reviewer: JAMES J. McTRADLE III

Date: 4-16-14

Examiner: Hassel, Matt S.

Level: II-N

Site Review:

Date:

Other: N/A

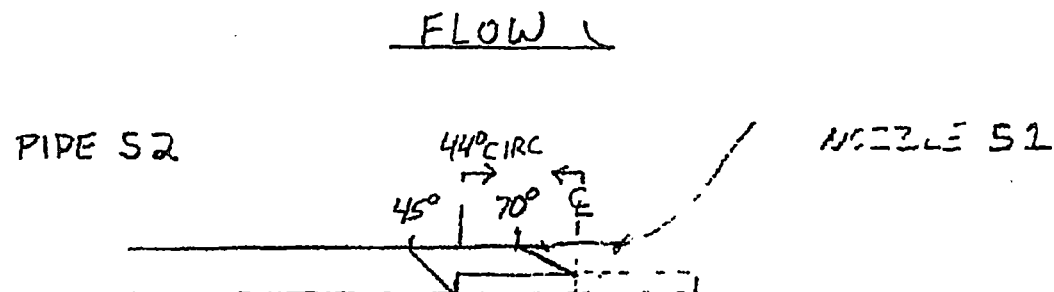
Level: N/A

ANII Review:

Date: 4-16-14

Comments: Coverage Plot

Sketch or Photo:



ALSO SCANNED 1.0" BAND OUT FROM WELD AND 6.75" FROM WELD ON BOTTOM.

Supplemental Report

Report No.: BOP-JT-14-373
Page: 7 of 8



Summary No.: M2.R1.11.0051

Examiner: Howard, Dean
Examiner: Hassel, Matt S.
Other: N/A

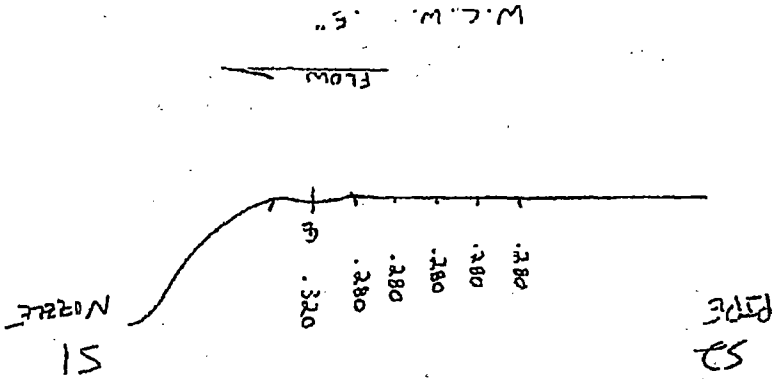
Level: II-N
Level: II-N
Level: N/A

Reviewer: James J. McARDLE III
Site Review: [Signature]
ANII Review: [Signature]

Date: 4-16-14
Date: 4-16-14
Date: 4-16-14

Comments: Thickness and Contour

Sketch or Photo:





Determination of Percent Coverage for
UT Examinations - Pipe

ATTACHMENT C

PAGE 8 OF 8

Site/Unit:	McGuire / 2	Procedure:	NDE-995	Outage No.:	N/A
Summary No.:	M2.R1.11.0051	Procedure Rev.:	6	Report No.:	BOP-UT-14-373
Workscope:	PSI	Work Order No.:	02147122	Page:	8 of 8

45 deg

Upstream		% Length X		% volume of length / 100 =		% total for Upstream
Downstream	100.000	% Length X	0.000	% volume of length / 100 =	0.000	% total for Downstream
CW	100.000	% Length X	50.000	% volume of length / 100 =	50.000	% total for CW
CCW	100.000	% Length X	50.000	% volume of length / 100 =	50.000	% total for CCW

Add totals and divide by # scans = 33.333 % total for 45 deg

Other deg - 70 (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Upstream	100.000	% Length X	100.000	% volume of length / 100 =	100.000	% total for Upstream
Downstream		% Length X		% volume of length / 100 =		% total for Downstream
CW		% Length X		% volume of length / 100 =		% total for CW
CCW		% Length X		% volume of length / 100 =		% total for CCW

Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

50.000 % Total for complete exam

Site Field Supervisor:

Steven Dean L-II

Date:

1/27/15