

May 11, 2007

L-PI-07-037
10 CFR 50.55a

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

Prairie Island Nuclear Generating Plant Unit 1
Docket 50-282
License No. DPR-42

10 CFR 50.55a Request 1-RR-4-6 for the Prairie Island Nuclear Generating Plant Unit 1
Fourth Ten-year Interval Inservice Inspection Program

Reference:

1. Letter from NRR to NMC, "Prairie Island Nuclear Generating Plant, Units 1 and 2 – Issuance of Relief Request for the Risk-Informed Inservice Inspection Program (TAC NOS. MC5644 and MC5645)," ML053270079, dated January 5, 2006.

Pursuant to 10 CFR 50.55a(g)(5)(iii), Nuclear Management Company, LLC (NMC) requests Nuclear Regulatory Commission (NRC) approval of the enclosed request for the Fourth Ten-Year Inservice Inspection (ISI) Interval. As an alternate to existing American Society of Mechanical Engineers (ASME) Section XI requirements for piping weld selection and examination volumes, NMC has implemented the alternative methods specified in Code Case N-578 and EPRI TR-112657B-A for Risk-Informed ISI plans. Prairie Island Nuclear Generating Plant (PINGP) implemented this alternative through 10 CFR 50.55a request number 1-RR-4-5, which was authorized by the NRC on January 5, 2006 (reference 1). Full examination coverage could not be obtained during a piping weld examination completed during the 2006 Unit 1 refueling outage. The exam was limited based on piping design and limited accessibility. Relief for this examination is requested on the basis that compliance with the Code requirement is impractical. The details of the request, including the proposed alternative, are contained in enclosure 1.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.

A handwritten signature in dark ink, appearing to read "Michael D. Wadley". The signature is fluid and cursive, with a long horizontal stroke at the end.

Michael D. Wadley
Site Vice President, Prairie Island Nuclear Generating Plant
Nuclear Management Company, LLC

Enclosures (4)

cc: Administrator, Region III, USNRC
Project Manager, Prairie Island, USNRC
Resident Inspector, Prairie Island, USNRC
Chief Boiler Inspector, State of Minnesota

Enclosure 1
Prairie Island Nuclear Generating Plant Unit 1, 4th Interval ISI
10 CFR 50.55a Request No. 1-RR-4-6, Rev. 0

Relief Request
in Accordance with 10 CFR 50.55a(g)(5)(iii)

--Inservice Inspection Impracticality--

1. ASME Code Component Affected

Code Class:	Class 1
Examination Category:	R-A
Item Number:	R1.16-5
Description:	Elements Subject to Intergranular Stress Corrosion Cracking, Risk Category 5
Component Numbers:	Summary Number 300655-RI, Weld W-17, Reducer to Valve Weld

2. Applicable Code Edition and Addenda

The applicable Code Edition and Addenda for the Prairie Island Unit 1 Fourth Ten-Year Inspection Interval is the 1998 Edition with 2000 Addenda.

3. Applicable Code Requirement

ASME Section XI (1998 Edition, 2000 addenda) Code requires full examination coverage of inservice inspection (ISI) components per Table IWB-2500-1. As an alternative to existing ASME Section XI requirements for piping weld selection and examination volumes, Prairie Island Nuclear Generating Plant (PINGP) has implemented the alternative methods as specified in Code Case N-578 and EPRI TR-112657B-A. Relief Request (RR) number 1-RR-4-5 "Risk Informed Examination of Class 1 and 2 Piping Welds (Code Case N-578 and EPRI TR-112657)," Revision 0, was submitted to the NRC on December 29, 2004 (reference 8.1) and supplemented by letter dated August 30, 2005 (reference 82) in a response to additional information. The NRC approved the use of 1-RR-4-5 on January 5, 2006 (reference 8.3).

From Code Case N-578, Table 1, "Examination Category R-A, Risk-Informed Piping Examinations," Item Number R1.16, "Elements Subject to Intergranular Stress Corrosion Cracking (IGSCC)" piping welds with risk category 5, medium are subject to be examined by volumetric examination method of essentially 100 percent of the examination volume identified in Figure IWB-2500-8(c). Per the Risk-Informed ISI (RI-ISI) Program, this volume must be extended to ½-inch beyond each side of the base material thickness transition or the counter bore. In addition, ultrasonic examinations for welds in piping must be performed using procedures, personnel, and equipment qualified to the requirements of Appendix VIII of the ASME Code, Section XI,

Enclosure 1
Prairie Island Nuclear Generating Plant Unit 1, 4th Interval ISI
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1995 Edition with the 1996 Addenda, "Performance Demonstration for Ultrasonic Examinations Systems."

4. Impracticality of Compliance

Relief is requested on the basis that compliance with the Code requirement is impractical due to limited accessibility for the exam due to piping design. The PINGP construction permit was issued in 1968. The facility was designed and constructed with limited accessibility due to component configurations and/or physical barriers for which 100 percent examination coverage is not achievable on some ISI components examined for the Fourth Ten-Year Interval.

The reducer to valve weld (W-17) is located in the safety injection system piping (see enclosure 2). The reducer and valve material are austenitic stainless steel. The reducer to valve weld (W-17) was subject to volumetric examination using personnel and procedures qualified in accordance with Appendix VIII, Supplement 2, during the 2006 Unit 1 refueling outage. The examination was conducted using 45 degree shear and 60 degree longitudinal transducers. The examination was limited to 50 percent in both the axial and circumferential directions from the reducer side of the weld due to the weld joint configuration connection to the valve. The credited volumetric examination of the Weld Required Volume (WRV) was limited to 50 percent and only a single-sided examination could be performed. It should be noted that the volumetric examination was performed through 92.8 percent of the Code WRV; however, the Performance Demonstration Initiative (PDI) Appendix VIII procedure used is not qualified for the detection of flaws on the far side of single sided access examinations on austenitic stainless steel piping welds. The techniques employed for the examination provide for a best effort examination. The following supporting documentation has been provided:

Enclosure 2, ISI Drawing ISI-24

Enclosure 3, Examination Report Number 2006U047

Enclosure 4, Examination Report Number 2006U055

Additionally, NMC looked at the remaining welds within this segment and risk group and determined no other welds would produce greater code coverage than that obtained on the weld examination performed on weld W-17. Due to the limited amount of welds within this segment and risk group, no other selection was possible.

5. Burden Caused by Compliance

To comply with the code-required examination of the weld, the component would have to be redesigned.

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6. Proposed Alternative and Basis for Use

As an alternative to the code-required examination, NMC requests relief for a limited scan of 50 percent in lieu of the essentially 100 percent volumetric requirement for the reducer to valve weld (W-17). The exam was performed during the 2006 Unit 1 refueling outage and was described in Section 4 of this request. Additionally, the weld is included in the boundary examined by visual examination VT-2 during pressure testing. Pressure testing was completed June 2, 2006, with no evidence of leakage identified in the vicinity of the weld. The performance of the single-sided ultrasonic examination, in addition to the performance of the visual VT-2 examination, provides the best examination coverage possible within the limitations of the current design configuration.

In-service inspections at Prairie Island Unit 1 are completed to the greatest extent practical. When limitations to required inspections are encountered, procedure SWI NDE-LTS-1, "Limitations to NDE," is applied. The procedure requires a review of the procedures to obtain maximum coverage and documentation of the limitation. The procedure also examines whether an alternative method could be used to obtain better coverage as allowed by the Code. This procedure was used and the maximum inspection coverage was achieved. The limitation was noted on the ISI examination reports and was included in the 2006 ISI Outage Summary Report. In accordance with 10 CFR 50.55a(g)(5)(iv), NMC will continue to document these types of limitations.

Additionally, the previous Section XI (SXI) program did not select any of these risk category 5 reactor coolant system welds for inspection. The RI-ISI program selected one of these category 5 welds for inspection. Therefore, there was a small decrease in risk by implementing the RI-ISI inspection. If PINGP were not to take credit for this exam, there would be no change in risk between the previous SXI and the current RI-ISI programs for this risk category in the reactor coolant system and a zero impact on the change in risk from the SXI program.

Using the provisions described above as an alternative to the code requirement will continue to provide reasonable assurance of the structural integrity of this weld. Therefore, pursuant to 10 CFR 50.55a(g)(5)(iii), NMC requests relief from the ASME Section XI examination requirements for performing a volumetric examination of this reducer to valve weld.

7. Duration of Proposed Alternative

NMC requests approval of this proposed alternative for the duration of the PINGP Unit 1 Fourth Ten-Year Interval.

Enclosure 1
Prairie Island Nuclear Generating Plant Unit 1, 4th Interval ISI
10 CFR 50.55a Request No. 1-RR-4-6, Rev. 0

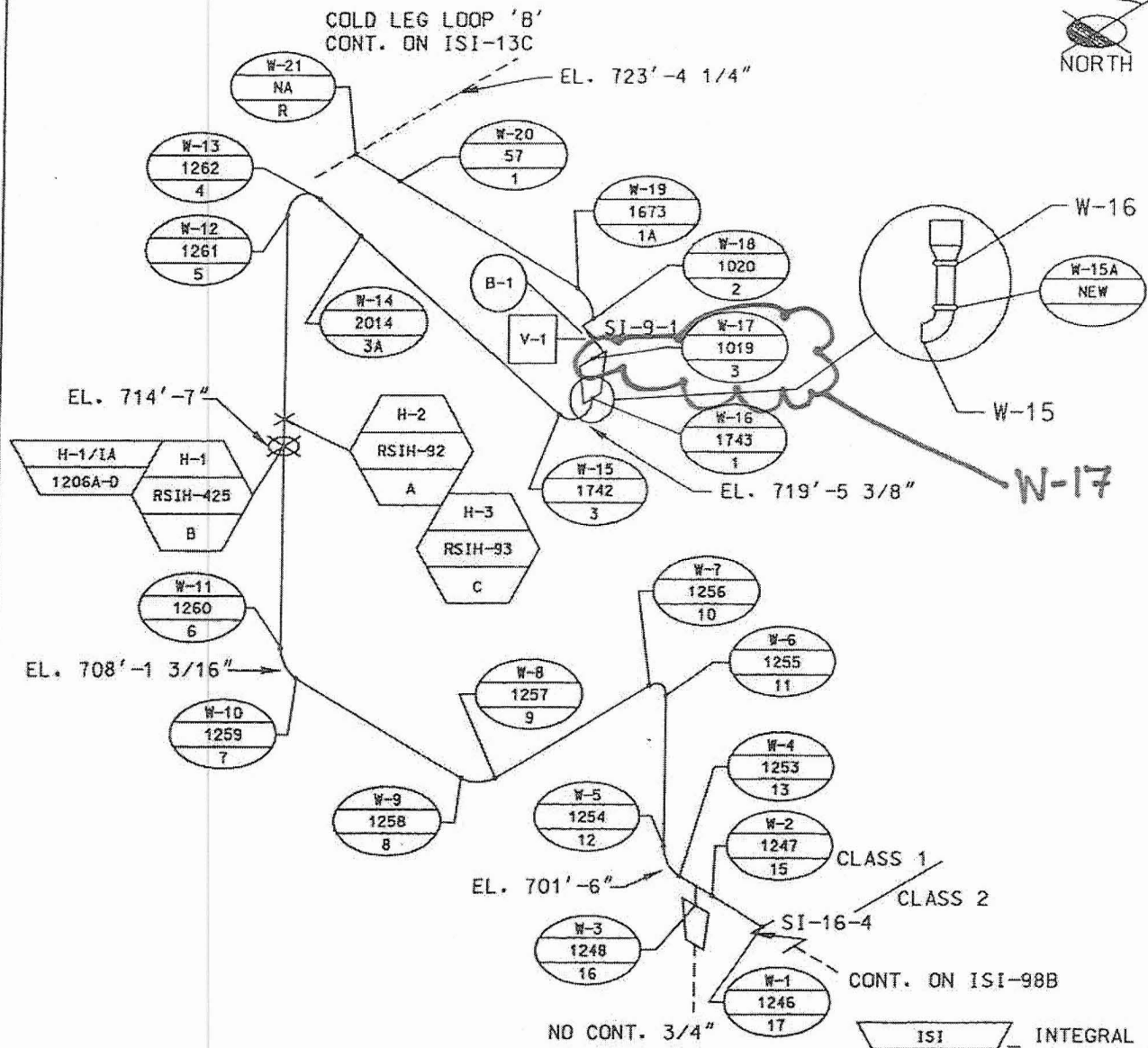
8. References

- 8.1 Letter from NMC to NRC Document Control Desk, "Relief Request to Implement Risk-Informed Inservice Inspection (ISI) Scheduling for the Fourth 10-Year Inspection interval for Prairie Islands Units 1 and 2," dated December 29, 2004 (ML043650201).
- 8.2 Letter from NMC to NRC Document Control Desk, "Response to Request for Additional Information Regarding the "Relief Request to Implement Risk-Informed Inservice Inspection (ISI) Scheduling for the Fourth 10-Year Inspection Interval for Prairie Island Units 1 and 2," dated August 30, 2005 (ML052430399).
- 8.3 Letter from NRR to NMC, "Prairie Island Nuclear Generating Plant, Units 1 and 2 – Issuance of Relief Request for the Risk-Informed Inservice Inspection Program (TAC NOS. MC5644 and MC5645)," dated January 5, 2006 (ML053270079).

Enclosure 2

**Prairie Island Nuclear Generating Plant Unit 1, 4th Interval
10 CFR 50.55a Relief Request No. 1-RR-4-6, Rev. 0**

ISI Drawing ISI-24



6" & 2" SIS HIGH HEAD LOOP 'B'

- ISI WELD = INTEGRAL ATTACHMENT
- ISI NAVCO WEST = HANGER NO.
- ISI NAVCO WEST = WELD NO.
- ISI = BOLT NO.
- ISI = VALVE NO.

XH-106-316		FILE NO:11124R04	
XH-106-1156			
REF:XH-106-3978			
NSP (M&SP)-PI 1 ISI			
DWN: DMN	CHKD: <i>SMH</i>	APPD: <i>JPW</i>	
SYSTEM: SAFETY INJECTION			
LINE: 6-RC-13D, 2-SI-35B			
DWG: ISI-24		REV: 06	

Enclosure 3

**Prairie Island Nuclear Generating Plant Unit 1, 4th Interval
10 CFR 50.55a Relief Request No. 1-RR-4-6, Rev. 0**

Examination Report Number 2006U047



UT Calibration/Examination

Site/Unit: **PI / P11**
 Summary No.: **300655-RI**
 Workscope: **ISI**

Procedure: **SWI NDE-UT-16A**
 Procedure Rev.: **2**
 Work Order No.: **98273**

Outage No.: **P11RFO2006**
 Report No.: **'2006U047**
 Page: **1** of **4**

Code: **1998 Edition, 2000 Addenda** Cat./Item: **R-AR1.16-5** Location: **Containment**
 Drawing No.: **ISI-24** Description: **REDUCER - VALVE**
 System ID: **RC**
 Component ID: **W-17** Size/Length: **1.0" / 21.0"** Thickness/Diameter: **.612" / 6"**
 Limitations: **See attached limitation record** Start Time: **1600** Finish Time: **1610**

Instrument Settings
 Serial No.: **040229207**
 Manufacturer: **Panametrics**
 Model: **Epoch 4**
 Delay: **0.000** Range: **1.751"**
 M'tl Cal/Vel: **.1219** Pulser: **Square/Max**
 Damping: **400 Ω** Reject: **0%**
 Rep. Rate: **Auto** Freq.: **2.00**
 Filter: **.8-3.0** Mode: **Fullwave**
 Voltage: **N/A**
 Ax. Gain (dB): **5.0** Circ. Gain (dB): **5.0**
10 Screen Div. = **1.751** in. of **Sound Path**
 Linearity Report No.: **2006LN004**

Search Unit
 Serial No.: **01DHBB**
 Manufacturer: **KBA**
 Size: **0.375"/Round** Shape: **Round**
 Freq.: **1.5 MHz** Style: **Comp G**
 Exam Angle: **45°** # of Elements: **1**
 Mode: **Shear**
 Measured Angle: **45°**
 Wedge Style: **MSWQC**

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

Calibration Block
 Cal. Block No.: **7536**
 Thickness: **0.5 to 2.0"** Dia.: **Flat**
 Cal. Blk. Temp.: **75** Temp. Tool: **4304**
 Comp. Temp.: **82** Temp. Tool: **4304**
 Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Scan Coverage
 Upstream ☒ Downstream ☒ Scan dB: **29.0**
 CW ☒ CCW ☒ Scan dB: **29.0**
 Exam Surface: **OD**
 Surface Condition: **Ground Flush**

Results: NAD ☒ IND ☐ GEO ☐

Percent Of Coverage Obtained > 90%: **50%** Reviewed Previous Data: **N/A**

Cal. Checks	Time	Date
Initial Cal.	1454	5/7/2006
Inter. Cal.	1600	5/7/2006
Inter. Cal.		
Inter. Cal.	1610	5/7/2006
Final Cal.	1732	5/7/2006

Couplant
 Cal. Batch: **#02243**
 Type: **Sonotrace 40**
 Mfg.: **Sonotech Inc.**
 Exam Batch: **#02243**
 Type: **Sonotrace 40**
 Mfg.: **Sonotech Inc.**

Reference Block
 Serial No.: **LMT-032**
 Type: **SS ROMPAS**

Axial Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.0" Notch	85%	8.0	1.40"
N/A			
Circumferential Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			
Reference/Simulator Block			
Gain dB	Reflector	Signal Amplitude %	Sweep Division
5.0	.7" SDH	20%	5.8
N/A			

Comments: **Single side exam-Best effort exam on far side weld volume. 50% coverage obtained. Reference Rpt# 2006U55 for 60° exam data.**

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Blechniger, Todd P.			<i>T.P. Blechniger</i>	5/7/2006	Timm, Jeremy	<i>Jeremy Timm</i>	5-25-06
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Wren, Jerry P.	<i>Jerry Wren</i>	5-26-06
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Daly, Gerald	<i>Gerald Daly</i>	MAY 29 2006



Supplemental Report

Report No.: 2006U047

Page: 2 of 4

Summary No.: 300655-RI

Examiner: Blechinger, Todd P. *TBP*

Level: III

Reviewer: Timm, Jeremy *JT*

Date: 5-25-06

Examiner: N/A

Level: N/A

Site Review: Wren, Jerry P. *JW*

Date: 5-26-06

Other: N/A

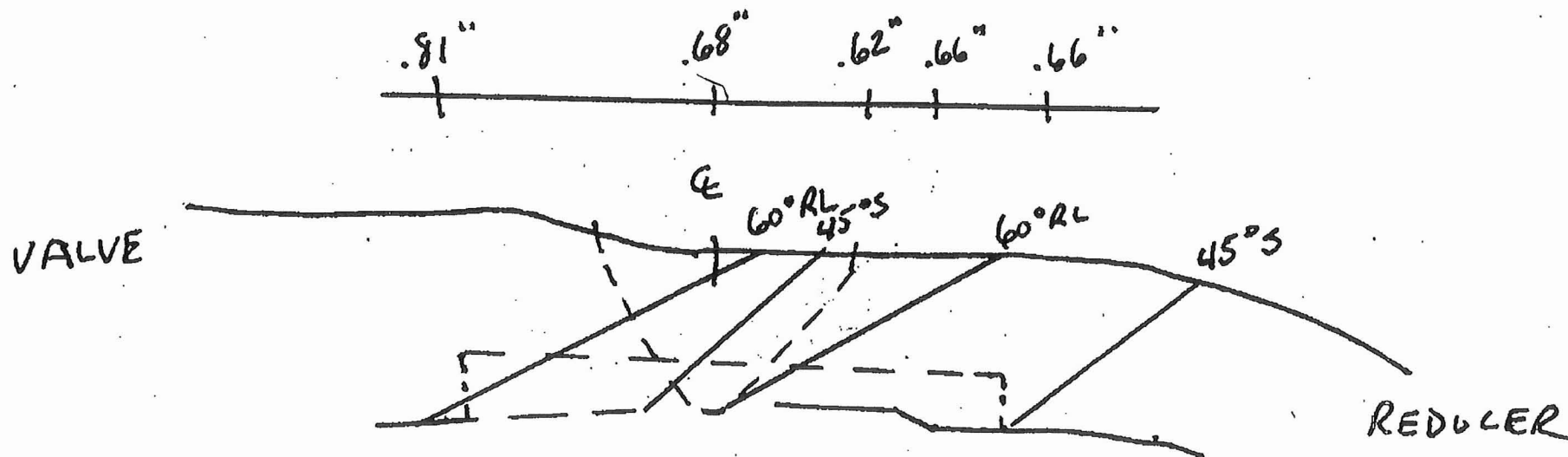
Level: N/A

ANII Review: Daly, Gerald *GD*

Date: MAY 29 2006

Comments: W-17 profile and coverage plot taken @ 0°

Sketch or Photo: J:\ISIData\IS\PI1_06 1R24 outage\Exam Supporting Documentation - Scans-Pics-etcl2006U047_055 300655-RI Supp1.bmp





Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	<u>PI / PI1</u>	Procedure:	<u>SWI NDE-UT-16A</u>	Outage No.:	<u>PI1RFO2006</u>
Summary No.:	<u>300655-RI</u>	Procedure Rev.:	<u>2</u>	Report No.:	<u>2006U047</u>
Workscope:	<u>ISI</u>	Work Order No.:	<u>98273</u>	Page:	<u>3</u> of <u>4</u>

45 deg

Scan 1	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 1
Scan 2	<u>0.000</u>	% Length X	<u>0.000</u>	% volume of length / 100 =	<u>0.000</u>	% total for Scan 2
Scan 3	<u>100.000</u>	% Length X	<u>50.000</u>	% volume of length / 100 =	<u>50.000</u>	% total for Scan 3
Scan 4	<u>100.000</u>	% Length X	<u>50.000</u>	% volume of length / 100 =	<u>50.000</u>	% total for Scan 4

Add totals and divide by # scans = 50.000 % total for 45 deg

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

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

Scan 1	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 1
Scan 2	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 2
Scan 3	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 3
Scan 4	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 4

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:

Date:

5-26-06



Limitation Record

Site/Unit: PI / PI1
Summary No.: 300655-RI
Workscope: ISI

Procedure: SWI NDE-UT-16A
Procedure Rev.: 2
Work Order No.: 98273

Outage No.: PI1RFO2006
Report No.: 2006U047
Page: 4 of 4

Description of Limitation:

No scans on valve due to configuration. Single side exam - Exam performed through 92.8% of code volume, however, procedure not qualified for detection on far side. Best effort exam on far side volume.

Sketch of Limitation: J:\ISIData\ISI\PI1_06 1R24 outage\Exam Supporting Documentation - Scans-Pics-etc\Todd 2006-05-10\DSC02253.JPG



Limitations removal requirements:

None

Radiation field: 150 mR / hr

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Bleching, Todd P.				5/7/2006	Timm, Jeremy		5-25-06
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Wren, Jerry P.		5-26-06
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Daly, Gerald		MAY 29 2006

Additional - Limitation <edit from Setup>

Enclosure 4

**Prairie Island Nuclear Generating Plant Unit 1, 4th Interval
10 CFR 50.55a Relief Request No. 1-RR-4-6, Rev. 0**

Examination Report Number 2006U055



UT Calibration/Examination

Site/Unit: PI / PI1
Summary No.: 300655-RI
Workscope: ISI

Procedure: SWI NDE-UT-16A
Procedure Rev.: 2
Work Order No.: 98273

Outage No.: PI1RFO2006
Report No.: 2006U055
Page: 1 of 2

Code: 1998 Edition, 2000 Addenda Cat./Item: R-A/R1.16-5 Location: Containment
Drawing No.: ISI-24 Description: REDUCER - VALVE
System ID: RC
Component ID: W-17 Size/Length: 1.0" / 21.0" Thickness/Diameter: .612" / 6"
Limitations: See attached limitation record Start Time: 1611 Finish Time: 1617

Instrument Settings
Serial No.: 00XK65
Manufacturer: Krautkramer
Model: USN 52L
Delay: 0.000 Range: .750"
M'tl Cal/Vel: .2289 Pulser: Single
Damping: 1000 Ω Reject: 0%
Rep. Rate: High Freq.: 2-8 MHz
Filter: N/A Mode: Full Wave
Voltage: N/A
Ax. Gain (dB): 62.0 Circ. Gain (dB): N/A
10 Screen Div. = 2.841 in. of Sound Path
Linearity Report No.: 2006LN003

Search Unit
Serial No.: J1043
Manufacturer: Megasonics
Size: .25"x.50"/Rect Shape: Rectangle
Freq.: 2.25 MHz Style: CGD
Exam Angle: 60° # of Elements: 2
Mode: Ref. Long.
Measured Angle: 60°
Wedge Style: Integral

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

Calibration Block
Cal. Block No.: 7536
Thickness: 0.5 to 2.0" Dia.: 0
Cal. Blk. Temp.: 75 Temp. Tool: 4304
Comp. Temp.: 82 Temp. Tool: 4304
Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Scan Coverage
Upstream ☒ Downstream ☐ Scan dB: 68.0
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: OD
Surface Condition: Ground Flush

Results: NAD ☒ IND ☐ GEO ☐

Percent Of Coverage Obtained > 90%: 0% Reviewed Previous Data: N/A

Cal. Checks	Time	Date
Initial Cal.	1530	5/7/2006
Inter. Cal.	1611	5/7/2006
Inter. Cal.	1620	5/7/2006
Inter. Cal.	N/A	
Final Cal.	1730	5/7/2006

Couplant
Cal. Batch: #02243
Type: Sonotrace 40
Mfg.: Sonotech Inc.
Exam Batch: #02243
Type: Sonotrace 40
Mfg.: Sonotech Inc.

Reference Block
Serial No.: LMT-032
Type: SS ROMPAS

Axial Orientated Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
1.0" Notch	80%	8.0	2.31"	
N/A				
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
50.0	.7" SDH	65%	5.5	1.59"

Comments: Reference report #2006U047 for 45° exam.
60° exam performed to interrogate far side volume.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Blechniger, Todd P.				5/7/2006	Timm, Jeremy		5-25-06
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Wren, Jerry P.		5-26-06
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Daly, Gerald		MAY 29 2006



Supplemental Report

Report No.: 2006U055

Page: 2 of 2

Summary No.: 300655-RI

Examiner: Blechinger, Todd P. *TPE*

Level: III

Reviewer: Timm, Jeremy *[Signature]*

Date: 5-25-06

Examiner: N/A

Level: N/A

Site Review: Wren, Jerry P. *[Signature]*

Date: 5-26-06

Other: N/A

Level: N/A

ANII Review: Daly, Gerald *[Signature]*

Date: MAY 29 2006

Comments: W-17 profile and coverage plot taken @ 0°

Sketch or Photo: J:\ISIData\IS\PI1_06 1R24 outage\Exam Supporting Documentation - Scans-Pics-etc\2006U047_055 300655-RI Supp1.bmp

