VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

10 CFR 50.55a

December 13, 2021

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Serial No.: 21-087
NRA/ENC: R0
Docket No.: 50-339
License No.: NPF-4

VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION ENERGY VIRGINIA)
NORTH ANNA POWER STATION UNIT 2
ASME SECTION XI INSERVICE INSPECTION PROGRAM
RELIEF REQUEST N2-I4-LMT-003
FOURTH INTERVAL THIRD PERIOD LIMITED EXAMINATIONS

Pursuant to 10 CFR 50.55a(g)(5)(iii), Virginia Electric and Power Company (Dominion Energy Virginia) requests relief from the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," requirement for "essentially 100 percent" volumetric examination coverage of certain risk-informed piping welds performed during inservice inspection (ISI) examinations in the third period of the fourth 10-year ISI interval for North Anna Power Station Unit 2 (NAPS2). Examinations of these welds were performed to meet the requirements of the 2004 Edition of ASME Code Section XI with no Addenda and the Risk-Informed/Safety-Based Inservice Inspection (RI-ISI) Program Plan based on Code Case N-716, "Alternative Piping Classification and Examination Requirements." Limited access and configuration of these components prevents full volumetric examination coverage of these welds. The attached Relief Request N2-I4-LMT-004, "Fourth Interval Third Period Limited Examinations," provides the basis for this request and supports the determination that the applicable ASME Code requirements are impractical.

In accordance with 10 CFR 50.55a(g)(5)(iii), the requested relief must be submitted to the Nuclear Regulatory Commission (NRC) no later than 12 months after the expiration of the 120-month inspection interval for which relief is sought. The NAPS2 fourth interval ended December 13, 2020.

If you have any questions or require additional information, please contact Erica Combs at (804)-273-3386.

Sincerely,

Mark D. Sartain
Vice President – Nuclear Engineering and Fleet Support

Attachment:

Relief Request N2-I4-LMT-004, "Fourth Interval Third Period Limited Examinations"

Commitments made in this letter: None

cc: Regional Administrator, Region II
U. S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, Georgia 30303-1257

G. E. Miller
NRC Senior Project Manager – North Anna Power Station
U. S. Nuclear Regulatory Commission
Mail Stop 09 E-3
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852-2738

Old Dominion Electric Cooperative
R-North-Anna-Correspondence@odec.com

NRC Senior Resident Inspector
North Anna Power Station

Serial No.: 21-087
Docket No.: 50-339

ATTACHMENT

Relief Request N2-I4-LMT-004,
"Fourth Interval Third Period Limited Examinations"

Virginia Electric and Power Company
(Dominion Energy Virginia)
North Anna Power Station Unit 2

TABLE OF CONTENTS

1.0 ASME Code Component(s) Affected 3

2.0 Applicable Code Edition and Addenda 3

3.0 Applicable Code Requirement 3

R1 Elements Subject To Thermal Fatigue 5

4.R1 Impracticality of Compliance
5.R1 Burden Caused by Compliance
6.R1 Proposed Alternative and Basis for Use

R2 Elements Subject To Intergranular or Transgranular Stress Corrosion Cracking 28

4.R2 Impracticality of Compliance
5.R2 Burden Caused by Compliance
6.R2 Proposed Alternative and Basis for Use

R3 Elements Not Subject To A Degradation Mechanism 44

4.R3 Impracticality of Compliance
5.R3 Burden Caused by Compliance
6.R3 Proposed Alternative and Basis for Use

7.0 Duration of Proposed Alternative 67

8.0 Precedents 67

9.0 References 67

LIST OF ENCLOSURES

Enclosure R1-1: 12050-WMKS-0109D / 14-RC-410 / 3 Data Report.....9

Enclosure R1-2: 12050-WMKS-0103AG / 6-RC-416 / 3A Data Report 15

Enclosure R1-3: 12050-WMKS-0103AH / 6-RC-421 / 1 Data Report.....23

Enclosure R2-1: 12050-WMKS-0103AH / 6-SI-416 / 10 Data Report.....31

Enclosure R2-2: 12050-WMKS-0103BN / 6-SI-532 / 19 Data Report.....35

Enclosure R2-3: 12050-WMKS-0113C-1 / 12-SI-469 / 8 Data Report 40

Enclosure R3-1: 12050-WMKS-0102D / 6-WFPD-419 / SW-60W (BPL 473) Data Report 47

Enclosure R3-2: 12050-WMKS-0101A-4 / 32-SHP-457 / SW-8 (BPL 116) Data Report 54

Enclosure R3-3: 12050-WMKS-0101A-4 / 32-SHP-458 / SW-7 (BPL 209) Data Report 60

LIST OF TABLES

Table 1. Repetitive/Duplicative Requests Requested in Accordance with 10 CFR 50.55a(g)(5)(iii), Inservice Inspection Impracticality 4

RELIEF REQUEST N2-I4-LMT-004:
NAPS2 FOURTH INTERVAL THIRD PERIOD LIMITED EXAMINATIONS

Relief Request in Accordance with 10 CFR 50.55a(g)(5)(iii)
-- Notification of impractical ISI Code requirements --

1.0 ASME CODE COMPONENT(S) AFFECTED

Refer to Table 1, Columns 1 and 2.

2.0 APPLICABLE CODE EDITION AND ADDENDA

The North Anna Power Station Unit 2 (NAPS2) applicable Code for the fourth 10-year inservice inspection (ISI) interval and the ISI Program is the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC), Section XI, 2004 Edition with no Addenda [Reference 1]. The NAPS2 fourth interval started on December 14, 2010 and ends on December 13, 2020.

3.0 APPLICABLE CODE REQUIREMENT

Refer to Table 1, Column 3.

Components identified in this request require examination of essentially 100 percent of the weld length. "Essentially 100 percent" as clarified by ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds," [Reference 2] is greater than 90 percent coverage of the examination volume or surface area, as applicable.

The risk-informed welds described in this request are governed by the Risk-Informed / Safety-Based Inservice Inspection (RI-ISI) Program Plan that was approved by the NRC for NAPS2 by letter dated January 21, 2011 [Reference 3]. The welds are assigned category R-A, Items R1.11, R1.16, and R1.20, and require ultrasonic examination. The NAPS2 RI-ISI Program Plan, in accordance with Request for Alternative N2-I4-RI-001, applies the requirements of ASME Code Case N-716, "Alternative Piping Classification and Examination Requirements." The Item R1.11 elements are considered subject to Thermal Fatigue as the most likely degradation mechanism. The Item R1.16 elements are considered subject to Intergranular or Transgranular Stress Corrosion Cracking (IGSCC or TGSCC) as the most likely degradation mechanism. The Item R1.20 elements are not subject to a degradation mechanism. Limited examinations in this request are in accordance with section 3.3.2 of approved request N2-I4-RI-001 [Reference 3].

Table 1. Repetitive / Duplicative Requests

Request No.	1 ASME Code Component	2 Component ID No.	3 Applicable Code Requirement	4 Impracticality of Compliance	5 Burden Caused by Compliance	6 Proposed Alternative and Basis for Use	7 Duration of Proposed Alternative
R1	Elements Subject to Thermal Fatigue		Exam Category R-A Item No. R1.11	See Paragraph 4.R1	See Paragraph 5.R1	See Paragraph 6.R1	See Paragraph 7
		12050-WMKS-0109D / 14-RC-410 / 3		50% Volume Coverage			
		12050-WMKS-0103AG / 6-RC-416 / 3A		50% Volume Coverage			
		12050-WMKS-0103AH / 6-RC-421 / 1		50% Volume Coverage			
R2	Elements Subject to IGSCC or TGSCC		Exam Category R-A Item No. R1.16	See Paragraph 4.R2	See Paragraph 5.R2	See Paragraph 6.R2	See Paragraph 7
		12050-WMKS-0103AH / 6-SI-416 / 10		50% Volume Coverage			
		12050-WMKS-0103BN / 6-SI-532 / 19		50% Volume Coverage			
		12050-WMKS-0113C-1 / 12-SI-469 / 8		50% Volume Coverage			
R3	Elements Not Subject to a Degradation Mechanism		Exam Category R-A Item No. R1.20	See Paragraph 4.R3	See Paragraph 5.R3	See Paragraph 6.R3	See Paragraph 7
		12050-WMKS-0102D / 6-WFPD-419 / SW-60W (BPL 473)		75% Volume Coverage			
		12050-WMKS-0101A-4 / 32-SHP-457 / SW-8 (BPL 116)		75% Volume Coverage			
		12050-WMKS-0101A-4 / 32-SHP-458 / SW-7 (BPL 209)		75% Volume Coverage			

R1. Risk-Informed Piping Welds Subject to Thermal Fatigue

4.R1 IMPRACTICALITY OF COMPLIANCE

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested from the "essentially 100 percent" volumetric examination coverage requirement for the piping welds identified below. This requirement is considered impractical primarily due to single-sided access and the configuration of these components.

Weld	Line No.	Scan Coverage (%)[2]	Enclosure	Exam[1]	Exam Date	Angle (degree)	Mode	Frequency (MHz)
3	14"-RC-410	50% + 25% BE	R1-1	Dwn/CW/CCW Dwn/CW/CCW Up	3/09/2018	45 60 60	Shear Sheer Longitudinal	2.25 2.25 2.0
3A	6"-RC-416	50% +25% BE	R1-2	Dwn/CW/CCW Dwn/CW/CCW Up Up	3/12/2019	45 60 60 70	Shear Shear Longitudinal Sheer	2.25 2.25 2.0 2.25
1	6"-RC-421	50% +25% BE	R1-3	Dwn/CW/CCW Dwn/CW/CCW Up	3/11/2019	45 60 60	Shear Shear Longitudinal	2.25 2.25 2.0

NOTES:

[1] Up — Axial scan on the upstream side of weld
Dwn — Axial scan on the downstream side of weld
CW — Circumferential scan in the clockwise direction
CCW — Circumferential scan in the counterclockwise direction

[2] BE — Best Effort non-Code coverage used to gain additional information

The above examinations were performed manually using advanced ASME Section XI, Appendix VIII demonstrated procedures and techniques in accordance with the performance demonstration requirements. Based on the access and physical limitations of these welds, alternative or other advanced technologies would not have provided complete coverage of the examination volume at the time of these examinations.

Enclosures R1-1 through R1-3 include the complete Ultrasonic Examination Data Records for each Category R-A, Item R1.11, examination included in this relief request. Each report includes details of the UT scanning apparatus, including transducer size,

frequency, angle, wave modality and insonification angles. Also included are scan plots for each of the examinations showing the piping configuration and percent coverage for each individual scan. No recordable indications were identified for any of these examinations other than geometry indications at the valve ID of weld 3A.

Weld 3 (14"-RC-410), Reactor Coolant System (RCS) Class 1, was a single-sided examination (50 percent coverage) due to the weldolet to pipe configuration, limiting upstream scans. The weld is at the loop piping weldolet to the Pressurizer Surge Line. An additional "Best Effort" (non-Code) scan with a 60-degree Longitudinal search unit obtained an additional 25 percent total coverage of the upstream side of the weld. A Liquid Penetrant examination was also performed on the weld, with no reportable indications. Line# 14"-RC-410 is 2,485 lb., centrifugally cast stainless-steel piping, SA-376 Type 304, 304-N, or Type 316 with pipe wall thickness corresponding to Schedule 160. The nozzle conforms to ASTM A182 Grade F304, F304N, or Type 316. Weld 3 is constructed with Type 308 welding filler metal. Similar relief was granted in the third interval for the pressurizer nozzle-to-pipe weld SW-5 [Reference 5].

Weld 3A (6"-RC-416), RCS Class 1, was a single-sided examination (50% coverage) due to the valve-to-elbow configuration, limiting upstream scans. The weld is at the check valve from the Low Head Safety Injection (SI) system into the RCS hot leg (29"-RC-401). An additional "Best Effort" (non-Code) scan with a 60-degree Longitudinal search unit obtained 25 percent additional total coverage of the upstream side of the weld. Line# 6"-RC-416 is 1,500 lb., Type 316 seamless stainless-steel piping. Weld 3A is constructed with welding filler metal SFA 5.4 E316L-16, SFA 5.9 ER316L, and/or SFA 5.30 IN316L procured with 8-20 FN delta ferrite and 75 ksi minimum tensile strength. Weld 3A is also managed as part of the augmented thermal fatigue examination requirements of MRP-146 like other welds with similar configurations. Similar relief was granted in the third interval for weld 1(6-RC-417) and weld 1(6-RC-420) [Reference 5].

Weld 1 (6"-RC-421), RCS Class 1, was a single-sided examination (50% coverage) due to the valve-to-elbow configuration, limiting upstream scans. The weld is at the check valve from the Low Head SI system into the RCS hot leg (29"-RC-407). An additional "Best Effort" (non-Code) scan with a 60-degree Longitudinal search unit obtained 25 percent additional total coverage of the upstream side of the weld. Line# 6"-RC-421 is 1,500 lb., Type 316 seamless stainless-steel piping. Weld 1 is constructed with welding filler metal SFA 5.4 E316L-16, SFA 5.9 ER316L, and/or SFA 5.30 IN316L procured with 8-20 FN delta ferrite and 75 ksi minimum tensile strength. Similar relief was granted in the third interval for weld 1(6-RC-417) and weld 1(6-RC-420) [Reference 5].

The NAPS2 RI-ISI Program is based on ASME Code Case N-716 as identified in approved request N2-I4-RI-001 [Reference 3]. The subject limitations have been

evaluated as acceptable, with no impact on risk analysis, and no further actions necessary to provide reasonable assurance of pressure boundary leak tightness. The subject welds are included in the Class 1 pressure boundary, receiving visual examinations at the beginning of each refueling outage (RFO) as part of the Boric Acid Corrosion Control Program and VT-2 visual examinations at the end of the RFO after operating pressure and temperature is achieved before unit startup.

Weld examinations for welds 3, 3A, and 1 were single-sided, but additional non-Code coverage was obtained (Best Effort Coverage) on the critical inside surface volume of both the weld and heat-affected area. These additional measures provide reasonable assurance that these welds are structurally sound. The subject welds were selected as part of an examination program that includes selections from different piping configurations, as well as selections from piping configurations categorized with different degradation mechanisms.

5.R1 BURDEN CAUSED BY COMPLIANCE

The physical configuration of these welds, valve-to-pipe, elbow-to-branch, and a welded tag at an elbow, confines inspection capabilities. Detailed sketches of the limitations and inspection areas achieved have been provided. No further action can be taken to enable better examination coverage without destroying the component.

6.R1 PROPOSED ALTERNATIVE AND BASIS

These welds were selected as they are determined to be of High Safety Significance with possible active degradation mechanisms. Selections were made based on plant specific operating experience or history of examination, weld repairs, random selection across different pipe sizes and configurations, and radiation concerns. These welds were selected, in part, because a previous Section XI examination history exists. Comparison of examination results over time is critical to detect service induced degradation. Inspection of these particular welds are considered the best choice for meaningful examination results.

It is proposed that the examinations already completed at the reduced coverage be accepted for meeting the Code requirements. 100% of the pipe-to-valve welds were volumetrically examined from one side. No indications were discovered. The limited volumetric examinations performed should detect any general patterns of degradation that may occur in the areas covered, therefore providing reasonable assurance of the continued structural integrity of the subject welds. In addition, these welds receive a visual

examination during the system leakage test performed at the end of each RFO. As a result of the completed examinations, any pattern of degradation should be detected, thereby providing reasonable assurance of operational readiness.

The purpose of the ISI program is to assure the structural and pressure-retaining integrity of safety-related nuclear power plant components in accordance with the rules of the ASME Code, Section XI and the requirements of 10 CFR 50.55a. Although Dominion could select only weld locations where greater than 90% examination coverage is possible (when available based on selection criteria), meeting the purpose of the Code requires selecting a mix of not only piping-to-piping welds (where essentially 100 percent coverage is more likely), but also piping-to-valve welds, piping-to-pump welds, piping-to-vessel welds, socket welds, nozzle-to-pipe welds, etc. The ASME Code allows only 50 percent Code coverage for single-sided examinations. In cases other than most piping-to-piping welds the majority of weld examinations are considered single-sided examinations.

The risk-informed weld limitations are considered in ASME Code Case N-716 periodic updates to the Risk-Informed Program Plan, where the program is reevaluated to determine if any changes to the examination selections need to be made, including additional examinations if they are warranted. The limited examinations identified in this request have no impact on the change-in-risk evaluation for the third period, and no new examinations were added as a result of these limitations.

UT Calibration/Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-UT-802	Outage No.:	N2R26
Summary No.:	N2.R1.11.314	Procedure Rev.:	5	Report No.:	UT-19 -073
Workscope:	ISI	Work Order No.:	59203136641	Page:	1 of 5

Code:	2004 Edition	Cat./Item:	R-A/R1.11	Location:	C-LOOP
Drawing No.:	12050-WMKS-0109D	Description:	Weldolet to Elbow		
System ID:	RC				
Component ID:	12050-WMKS-0109D / 14-RC-410 / 3	Size/Length:	1.25" / 44.0"	Thickness/Diameter:	1.406" / 14.0"
Limitations:	Single sided due to weld-o-let. See attached	Start Time:	1258	Finish Time:	1313

Instrument Settings

Serial No.:	140723807		
Manufacturer:	Olympus		
Model:	EPOCH 600	Linearity:	L-19 -001
Delay:	6.611	Range:	4.00
M'tl Cal/Vel:	0.1230	Pulser:	Square
Damping:	400	Reject:	0
Rep. Rate:	Auto	Freq.:	2.25
Filter:	0.5-4.0	Mode:	FW
Voltage:	400	Other:	N/A

Ax. Gain (dB): 13.0 Circ. Gain (dB): N/A

10 Screen Div. = 4.00 in. of Sound Path

Calibration Block

Cal. Block No.	05-8514		
Thickness	2.25"	Dia.:	0
Cal. Blk. Temp.	71	Temp. Tool:	ATK-2
Comp. Temp.	86	Temp. Tool:	ATK-2

Search Unit

Serial No.:	01CXBL		
Manufacturer:	KBA		
Size:	0.5"	Model:	Comp-G
Freq.:	2.25 MHZ	Center Freq.:	N/A
Exam Angle:	45	Squint Angle:	N/A
Measured Angle:	45	Mode:	Shear
Exit Point	0.20	# of Elements:	1
Config.:	Single	Focus:	N/A
Shape:	Round	Contour:	Flat
Wedge Style:	MSWQC		

Search Unit Cable

Type: RG 174 Length: 6 No. Conn.: 0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 25.0

CW ☑ CCW ☑ Scan dB: 25.0

Exam Surface: OD

Surface Condition: Ground Smooth

Cal. Checks	Time	Date
Initial Cal.	1015	3/9/2019
Inter. Cal.	1258	3/9/2019
Inter. Cal.	N/A	
Inter. Cal.	1313	3/9/2019
Final Cal.	1559	3/9/2019

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.:	05-6533
Type:	SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.50" Notch	80	5.3	2.11"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
13.0	SDH	22	2.6	1.054

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

Results: NRI ☑ RI ☐ Geom ☐

Comments: None

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: N/A

Examiner	Level	Signature	Date	Reviewer		Signature	Date
Johnson, Jeffrey M.	II PDI		3/9/2019	W.L. THOMAS	LEV III		3.10.19
Examiner	Level	Signature	Date	Site Review		Signature	Date
Zollner, Brian D	II PDI		3/9/2019	DENNIS P. STRICKLAND	LVL II		3/22/2019
Other	Level	Signature	Date	ANII Review		Signature	Date
N/A	N/A						3/23/19

UT Calibration/Examination

Dominion

Site/Unit: NAPS / 2 | Procedure: ER-AA-NDE-UT-802 | Outage No.: N2R26
Summary No.: N2.R1.11.314 | Procedure Rev.: 5 | Report No.: UT-19 -073
Workscope: ISI | Work Order No.: 59203136641 | Page: 2 of 5

Code: 2004 Edition | Cat./Item: R-A/R1.11 | Location: C-LOOP
Drawing No.: 12050-WMKS-0109D | Description: Weldolet to Elbow
System ID: RC
Component ID: 12050-WMKS-0109D / 14-RC-410 / 3 | Size/Length: 1.25" / 44.0" | Thickness/Diameter: 1.406" / 14.0"
Limitations: Single sided due to weld-o-let. See attached. | Start Time: 1314 | Finish Time: 1328

Instrument Settings

Serial No.: 140723807
Manufacturer: Olympus
Model: EPOCH 600 | Linearity: L-19 -001
Delay: 8.311 | Range: 5.00
M'tl Cal/Vel: 0.1230 | Pulser: Square
Damping: 400 | Reject: 0
Rep. Rate: Auto | Freq.: 2.25
Filter: 0.5-4.0 | Mode: FW
Voltage: 400 | Other: N/A

Ax. Gain (dB): 30.0 | Circ. Gain (dB): N/A
10 Screen Div. = 5.00 in. of Sound Path

Calibration Block

Cal. Block No. 05-8514
Thickness 2.25" | Dia.: 0
Cal. Blk. Temp. 71 | Temp. Tool: ATK-2
Comp. Temp. 86 | Temp. Tool: ATK-2

Search Unit

Serial No.: 00F1DL
Manufacturer: KBA
Size: 0.50" | Model: Comp-G
Freq.: 2.25 MHZ | Center Freq.: N/A
Exam Angle: 60 | Squint Angle: N/A
Measured Angle: 60 | Mode: Shear
Exit Point 0.30 | # of Elements: 1
Config.: Single | Focus: N/A
Shape: Round | Contour: Flat
Wedge Style: MSWQC

Search Unit Cable

Type: RG 174 | Length: 6 | No. Conn.: 0

Scan Coverage

Upstream ☐ | Downstream ☑ | Scan dB: 42.0
CW ☑ | CCW ☑ | Scan dB: 42.0
Exam Surface: OD
Surface Condition: Ground Smooth

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: NRI ☑ RI ☐ Geom ☐

Cal. Checks	Time	Date
Initial Cal.	1034	3/9/2019
Inter. Cal.	1314	3/9/2019
Inter. Cal.	N/A	
Inter. Cal.	1328	3/9/2019
Final Cal.	1601	3/9/2019

Couplant

Cal. Batch: 17F087
Type: Sonotech
Mfg.: Sonotech
Exam Batch: 17F087
Type: Sonotech
Mfg.: Sonotech

Reference Block

Serial No.: 05-6533
Type: SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.50" Notch	80	5.3	2.634

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
30.0	FSDH	75	2.9	1.483

Comments: Effective coverage using the 60 Deg search unit has been verified by the presence of the weld root response during the required scans.

Percent Of Coverage Obtained > 90%: No | Reviewed Previous Data: N/A

Examiner	Level		Signature	Date	Reviewer		Signature	Date
Johnson, Jeffrey M.	II-PDI			3/9/2019	W.L. THOMAS	LEVIII		3/10/19
Examiner	Level		Signature	Date	Site Review		Signature	Date
Zollner, Brian D	II-PDI			3/9/2019	DENNIS P. STRICKLAND	LVA		3/22/2019
Other	Level		Signature	Date	ANII Review		Signature	Date
N/A	N/A							3/23/19

UT Calibration/Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-UT-802	Outage No.:	N2R26
Summary No.:	N2.R1.11.314	Procedure Rev.:	5	Report No.:	UT-19 -073
Workscope:	ISI	Work Order No.:	59203136641	Page:	3 of 5

Code:	2004 Edition	Cat./Item:	R-A/R1.11	Location:	C-LOOP
Drawing No.:	12050-WMKS-0109D	Description:	Weldolet to Elbow		
System ID:	RC				
Component ID:	12050-WMKS-0109D / 14-RC-410 / 3			Size/Length:	1.25" / 44.0"
Thickness/Diameter:	1.406" / 14.0"				
Limitations:	Single sided due to weld-o-let. See attached			Start Time:	1342
Finish Time:	1350				

Instrument Settings

Serial No.:	140723807		
Manufacturer:	Olympus		
Model:	EPOCH 600	Linearity:	L-19 -001
Delay:	10.211	Range:	5.700
M'tl Cal/Vel:	0.2320	Pulser:	Square
Damping:	400	Reject:	0
Rep. Rate:	Auto	Freq.:	2.0
Filter:	0.5-4.0	Mode:	FW
Voltage:	400	Other:	N/A

Ax. Gain (dB): 54.0 Circ. Gain (dB): N/A

10 Screen Div. = 5.70 in. of Sound Path

Calibration Block

Cal. Block No.	05-8514		
Thickness	2.25"	Dia.:	0
Cal. Blk. Temp.	71	Temp. Tool:	ATK-2
Comp. Temp.	86	Temp. Tool:	ATK-2

Recordable Indication(s): Yes ☐ No ☑

Results: NRI ☑ RI ☐ Geom ☐

Search Unit

Serial No.:	06-109		
Manufacturer:	RTD		
Size:	2(15X25)	Model:	TRL2-AUST
Freq.:	2.0 MHZ	Center Freq.:	N/A
Exam Angle:	60	Squint Angle:	N/A
Measured Angle:	61	Mode:	Longitudinal
Exit Point	.75	# of Elements:	2
Config.:	D-SBS	Focus:	FD.1.3"
Shape:	Retangular	Contour:	FLAT
Wedge Style:	Integral		

Search Unit Cable

Type: RG 174 Length: 6 No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 60.0

CW ☐ CCW ☐ Scan dB: N/A

Exam Surface: OD

Surface Condition: Ground Smooth

(If Yes, Ref. Attached Ultrasonic Indication Report.)

Cal. Checks	Time	Date
Initial Cal.	1105	3/9/2019
Inter. Cal.	1342	3/9/2019
Inter. Cal.	N/A	
Inter. Cal.	1350	3/9/2019
Final Cal.	1604	3/9/2019

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.: 05-6533

Type: SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.50" Notch	80	5.0	2.869

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
48.0	FSDH	45	2.7	1.556

Comments: None.

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: N/A

Examiner	Level	Signature	Date	Reviewer		Signature	Date
Johnson, Jeffrey M.	II-PDI		3/9/2019	W.L. THOMAS	LEVEL III		3/10/19
Examiner	Level	Signature	Date	Site Review		Signature	Date
Zollner, Brian D	II-PDI		3/9/2019	DENNIS P. STRICKLAND	LEVEL III		3/22/2019
Other	Level	Signature	Date	ANII Review		Signature	Date
N/A	N/A						3/23/19

Dominion

Supplemental Report

Report No.: UT-19 -073

Page: 4 of 5

Summary No.: N2.R1.11.314

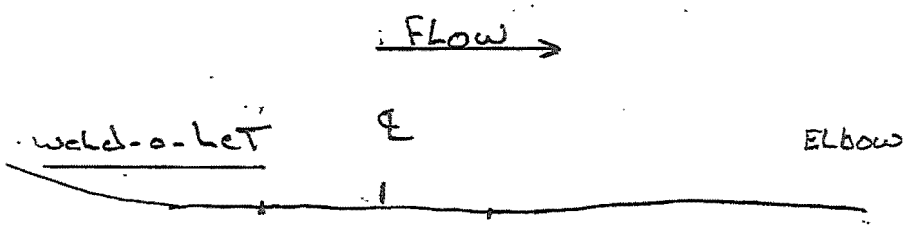
Examiner: Johnson, Jeffrey M. Level: II-PDI Reviewer: W.L. THOMAS LOI. III Date: 3-10-19

Examiner: Zollner, Brian D Level: II-PDI Site Review: DENNIS P. STRICCANO LOII 805 Date: 3/22/2019

Other: N/A Level: N/A ANII Review: Date: 3/23/19

Comments:

Sketch or Photo:



- 1.5" US - 1.271"
US Toe - 1.283"
Weld ℄ - 1.435"
DS Toe - 1.396"
1.5" DS - 1.403"
2.5" DS - 1.397"

WCW - 1.250"

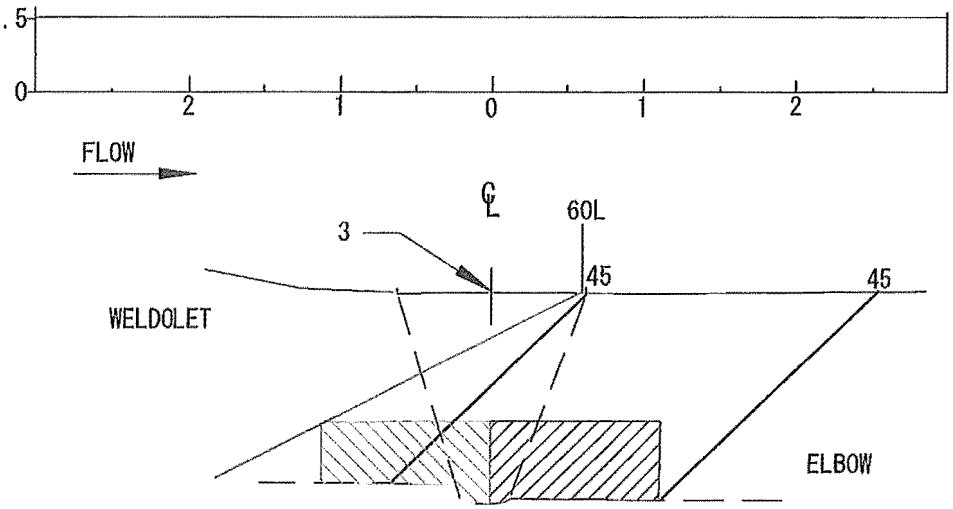
14-RC-410/3

Additional - Supplemental Data

Dominion

Report No: UT-19-073
Summary # N2.R1.11.314
Pg. 5 of 5
Prepared by: W. Thomas LEV III
Date: 3/10/2019

Weld Number	3	Weld Width	1.25"
Thickness	1.283"	Weld Length	44"



EXAMINED 100% OF THE REQUIRED VOLUME DS SIDE.

EXAMINED 100% OF THE REQUIRED VOLUME US SIDE

BEST EFFORT

Examination Volume Dimensions - Height 0.428" Length 44" Width 2.25"

Coverage Summary				
	Required Scans (each has a weighing factor of 100 for complete coverage)			
ANGLE	UpSt-Ax	UpSt-Circ	DnSt-Ax	DnSt-Circ
45 / 60		0%	100%	100%
60L	*100%			
			Code Coverage Total	50%
100+100+100+0=300/400=.75		* Best Effort Coverage (Max 25%) Total		25%

Notes:

1) Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure.
2) Best Effort Coverage refers to the required examination volume past the weld centerline that is examined in the axial beam direction with an Appendix VIII demonstrated procedure for single sided coverage.

☑ Reviewed
☐ Witnessed
3/23/19
Hartford Steam Boiler
9531
HSB

Dennis P. Strickland LVII Dennis P Strickland 3/22/2019

Liquid Penetrant Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-PT-300	Outage No.:	N2R26
Summary No.:	N2.R1.11.314	Procedure Rev.:	7	Report No.:	PT-19 -012
Workscope:	AUG	Work Order No.:	59203136641	Page:	1 of 1

Code: 2004 Edition Cat./Item: R-A/R1.11 Location: C-LOOP

Drawing No.: 12050-WMKS-0109D Description: WELDOLET-TO-ELBOW

System ID: RC

Component ID: 12050-WMKS-0109D / 14-RC-410 / 3 Mat./Thickness: SS / 1.406" ~~1.406" / 14"~~

Limitations: None

JLL 5/22/19

Light Meter Mfg.: N/A Serial No.: N/A Illumination: N/A

Temp. Tool Mfg.: ATKINS Serial No.: ATK-2 Surface Temp.: 80 °F

Comparator Block Temp.: Side A: N/A °F Side B: N/A °F Resolution: 0.044" Character Card

Lo/Wo Location: TDC / Weld Center Line Surface Condition: Ground Smooth

	Cleaner	Penetrant (Visible ☑ / Fluorescent ☐)	Remover	Developer
Brand	MAGNAFLUX	MAGNAFLUX	MAGNAFLUX	MAGNAFLUX
Type	SKC-S	SKL-SP2	SKC-S	SKD-S2
Batch No.	18C21K	15J02K	18C21K	14K04K
Time	Evap. 3 Min	Dwell 10 Min	Evap. 1 Min	Develop 10 Min
	Time Exam Started: 2151		Time Exam Completed: 2225	

Indication No.	Loc L	Loc W	Diameter	Length	Type R/L	Remarks
NRI						

Comments:
DOM-2016-0156
Flashlight used to resolve character card

Results: NRI ☑ RI ☐ Eval ☐ N/A

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

Examiner	Level II	Signature	Date	Reviewer		Signature	Date
Flood, Steven			3/8/2019	N/A			
Examiner	Level N/A	Signature	Date	Site Review		Signature	Date
N/A			3/8/2019	Dennis Strickland Lv II			3/18/2019
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A				N/A			

UT Calibration/Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-UT-802	Outage No.:	N2R26
Summary No.:	N2.R1.11.459	Procedure Rev.:	5	Report No.:	UT-19 -070
Workscope:	ISI	Work Order No.:	59203136641	Page:	1 of 8

Code:	2004 Edition	Cat./Item:	R-A/R1.11	Location:	A-LOOP
Drawing No.:	12050-WMKS-0103AG	Description:	Valve to Elbow		
System ID:	RC				
Component ID:	12050-WMKS-0103AG / 6-RC-416 / 3A	Size/Length:	1.20" / 21.0"	Thickness/Diameter:	0.719" / 6.0"
Limitations:	Single Sided	Start Time:	2010	Finish Time:	2032

Instrument Settings

Serial No.:	140723807		
Manufacturer:	Olympus		
Model:	EPOCH 600	Linearity:	L-19 -001
Delay:	4.900 µs	Range:	2.0"
M'ti Cal/Vel:	0.1230 in/µs	Pulser:	Square
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.25
Filter:	0.5-4.0 MHz	Mode:	Fullwave
Voltage:	400	Other:	N/A

Ax. Gain (dB): 29 Circ. Gain (dB): N/A

1 Screen Div. = 0.20 in. of Sound Path

Calibration Block

Cal. Block No.: 05-8514

Thickness: 2.25" Dia.: 0

Cal. Blk. Temp.: 71° Temp. Tool: ATK-2

Comp. Temp.: 69° Temp. Tool: ATK-2

Search Unit

Serial No.:	SI0321		
Manufacturer:	G E		
Size:	.375"	Model:	Comp-G
Freq.:	2.25 MHZ	Center Freq.:	N/A
Exam Angle:	45°	Squint Angle:	N/A
Measured Angle:	45°	Mode:	Shear
Exit Point	0.25"	# of Elements:	1
Config.:	Single	Focus:	N/A
Shape:	Round	Contour:	Flat
Wedge Style:	MSWQC		

Search Unit Cable

Type: RG 174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 35

CW ☑ CCW ☑ Scan dB: 35

Exam Surface: OD

Surface Condition: Ground Smooth

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

Results: NRI ☑ RI ☐ Geom ☐

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

Cal. Checks	Time	Date
Initial Cal.	1740	3/12/2019
Inter. Cal.	2010	3/12/2019
Inter. Cal.	2032	3/12/2019
Inter. Cal.	N/A	
Final Cal.	2351	3/12/2019

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.: 05-6533

Type: SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1" Notch	80%	7.1	1.415"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
29.0	FSDH	80%	5.4	1.065"

Comments: Examined per the requirements of MRP-146.
CR 1118871 issued for coverage not greater than 90%.

Examiner	Level II-PDI	Signature	Date	Reviewer	LEV III	Signature	Date
Wertman, Justin			3/12/2019	WL THOMAS			3-28-19
Examiner	Level II-PDI	Signature	Date	Site Review		Signature	Date
Hacker, Jonathan			3/12/2019	R. CHRISTOPHER WRAY	LV-III	R. Christopher Wray	3-22-19
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A							3/25/19

UT Calibration/Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-UT-802	Outage No.:	N2R26
Summary No.:	N2.R1.11.459	Procedure Rev.:	5	Report No.:	UT-19 -070
Workscope:	ISI	Work Order No.:	59203136641	Page:	2 of 8

Code:	2004 Edition	Cat./Item:	R-A/R1.11	Location:	A-LOOP
Drawing No.:	12050-WMKS-0103AG	Description:	Valve to Elbow		
System ID:	RC				
Component ID:	12050-WMKS-0103AG / 6-RC-416 / 3A	Size/Length:	1.20" / 21.0"	Thickness/Diameter:	0.719" / 6.0"
Limitations:	Single Sided	Start Time:	2032	Finish Time:	2042

Instrument Settings

Serial No.:	140723507		
Manufacturer:	Olympus		
Model:	EPOCH 600	Linearity:	L-19 -003
Delay:	5.600 µs	Range:	2.875"
M'tl Cal/Vel:	0.1230 in/µs	Pulser:	Square
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.25
Filter:	0.5-4.0 MHz	Mode:	Fullwave
Voltage:	400	Other:	N/A

Ax. Gain (dB): 30 Circ. Gain (dB): N/A

10 Screen Div. = 2.875 in. of Sound Path

Calibration Block

Cal. Block No. 05-8514

Thickness 2.25" Dia.: 0

Cal. Blk. Temp. 71° Temp. Tool: ATK-2

Comp. Temp. 69° Temp. Tool: ATK-2

Search Unit

Serial No.:	SI0328		
Manufacturer:	G E		
Size:	.375"	Model:	Comp-G
Freq.:	2.25 MHZ	Center Freq.:	N/A
Exam Angle:	60°	Squint Angle:	N/A
Measured Angle:	59°	Mode:	Shear
Exit Point	0.30"	# of Elements:	1
Config.:	Single	Focus:	N/A
Shape:	Round	Contour:	Flat
Wedge Style:	MSWQC		

Search Unit Cable

Type: RG 174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 36

CW ☑ CCW ☑ Scan dB: 36

Exam Surface: OD

Surface Condition: Ground Smooth

Cal. Checks	Time	Date
Initial Cal.	1742	3/12/2019
Inter. Cal.	2032	3/12/2019
Inter. Cal.	2042	3/12/2019
Inter. Cal.	N/A	
Final Cal.	2353	3/12/2019

Couplant

Cal. Batch: 17F087

Type: Sonotech

Mfg.: Sonotech

Exam Batch: 17F087

Type: Sonotech

Mfg.: Sonotech

Reference Block

Serial No.: 05-6533

Type: SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1" Notch	80%	6.3	1.816"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
30	FSDH	87%	5.1	1.477"

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

Results: NRI ☑ RI ☐ Geom ☐

Comments: Effective coverage using the 60° search unit has been verified by the presence of the weld root response during the required scans.

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

Examiner	Level II-PDI	Signature	Date	Reviewer	LEV III	Signature	Date
Wertman, Justin			3/12/2019	W.L. THOMAS			3-21-19
Examiner	Level II-PDI	Signature	Date	Site Review		Signature	Date
Hacker, Jonathan			3/12/2019	R. CHRISTOPHER WRAY	LV-III	R. Christopher Wray	3-22-19
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A							3/25/19

UT Calibration/Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-UT-802	Outage No.:	N2R26
Summary No.:	N2.R1.11.459	Procedure Rev.:	5	Report No.:	UT-19 -070
Workscope:	ISI	Work Order No.:	59203136641	Page:	3 of 8

Code:	2004 Edition	Cat./Item:	R-A/R1.11	Location:	A-LOOP
Drawing No.:	12050-WMKS-0103AG	Description:	Valve to Elbow		
System ID:	RC				
Component ID:	12050-WMKS-0103AG / 6-RC-416 / 3A	Size/Length:	1.20" / 21.0"	Thickness/Diameter:	0.719" / 6.0"
Limitations:	Single sided	Start Time:	2042	Finish Time:	2102

Instrument Settings

Serial No.:	140723507		
Manufacturer:	Olympus		
Model:	EPOCH 600	Linearity:	L-19 -003
Delay:	9.1000	Range:	2.875"
M'tl Cal/Vel:	0.2298	Pulser:	Square
Damping:	400	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0
Filter:	0.5-4.0	Mode:	Fullwave
Voltage:	400	Other:	N/A

Ax. Gain (dB): 48 Circ. Gain (dB): N/A

1 Screen Div. = .2875 in. of Sound Path

Calibration Block

Cal. Block No.: 05-8514

Thickness: 2.25" Dia.: 0

Cal. Blk. Temp.: 71° Temp. Tool: ATK-2

Comp. Temp.: 69° Temp. Tool: ATK-2

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

Results: NRI ☐ RI ☐ Geom ☑

Search Unit

Serial No.:	06-108		
Manufacturer:	RTD		
Size:	2(8X14)	Model:	TRL2-AUST
Freq.:	2.0 MHZ	Center Freq.:	N/A
Exam Angle:	60°	Squint Angle:	N/A
Measured Angle:	60°	Mode:	Longitudinal
Exit Point:	0.30	# of Elements:	2
Config.:	D-SBS	Focus:	FD.0.6"
Shape:	Retangular	Contour:	FLAT
Wedge Style:	Integral		

Search Unit Cable

Type: RG 174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 54

CW ☐ CCW ☐ Scan dB: N/A

Exam Surface: OD

Surface Condition: Ground Smooth

Cal. Checks	Time	Date
Initial Cal.	1745	3/12/2019
Inter. Cal.	2042	3/12/2019
Inter. Cal.	2102	3/12/2019
Inter. Cal.	N/A	
Final Cal.	2355	3/12/2019

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.: 05-6533

Type: SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1" Notch	80%	6.8	1.944"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
42	FSDH	80%	4.9	1.408"

Comments: Utilized for far side coverage and geometric indication plot.

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

Examiner	Level II-PDI	Signature	Date	Reviewer	LEV. III	Signature	Date
Wertman, Justin			3/12/2019	W.L. THOMAS			3-21-19
Examiner	Level II-PDI	Signature	Date	Site Review		Signature	Date
Hacker, Jonathan			3/12/2019	R. CHRISTOPHER WRAY	LV. III	R. Christopher Wray	3-22-19
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A							3/25/19

UT Calibration/Examination

Dominion

Site/Unit: NAPS / 2 | Procedure: ER-AA-NDE-UT-802 | Outage No.: N2R26

Summary No.: N2.R1.11.459 | Procedure Rev.: 5 | Report No.: UT-19 -070

Workscope: ISI | Work Order No.: 59203136641 | Page: 4 of 8

Code: 2004 Edition | Cat./Item: R-A/R1.11 | Location: A-LOOP

Drawing No.: 12050-WMKS-0103AG | Description: Valve to Elbow

System ID: RC

Component ID: 12050-WMKS-0103AG / 6-RC-416 / 3A | Size/Length: 1.20" / 21.0" | Thickness/Diameter: 0.719" / 6.0"

Limitations: Indication discrimination only | Start Time: 2103 | Finish Time: 2107

Instrument Settings

Serial No.: 140723507

Manufacturer: Olympus

Model: EPOCH 600 | Linearity: L-19 -013

Delay: 7.900 µs | Range: 4.20"

M'tl Cal/Vel: 0.1230 in/µs | Pulser: Square

Damping: 400 Ω | Reject: 0%

Rep. Rate: Auto | Freq.: 2.25

Filter: 0.5-4.0 MHz | Mode: Fullwave

Voltage: 400 | Other: N/A

Ax. Gain (dB): 38 | Circ. Gain (dB): N/A

1 Screen Div. = 0.42 in. of Sound Path

Calibration Block

Cal. Block No. 05-8514

Thickness 2.25" | Dia.: 0

Cal. Blk. Temp. 71° | Temp. Tool: ATK-2

Comp. Temp. 69° | Temp. Tool: ATK-2

Search Unit

Serial No.: SI0331

Manufacturer: G E

Size: .375" | Model: Comp-G

Freq.: 2.25 MHZ | Center Freq.: N/A

Exam Angle: 70° | Squint Angle: N/A

Measured Angle: 70° | Mode: Shear

Exit Point 0.35" | # of Elements: 1

Config.: Single | Focus: N/A

Shape: Round | Contour: Flat

Wedge Style: MSWQC

Search Unit Cable

Type: RG 174 | Length: 6' | No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 40

CW ☐ CCW ☐ Scan dB: N/A

Exam Surface: OD

Surface Condition: Ground Smooth

Cal. Checks	Time	Date
Initial Cal.	1747	3/12/2019
Inter. Cal.	2103	3/12/2019
Inter. Cal.	N/A	
Inter. Cal.	2107	3/12/2019
Final Cal.	2357	3/12/2019

Couplant

Cal. Batch: 17F087

Type: Sonotech

Mfg.: Sonotech

Exam Batch: 17F087

Type: Sonotech

Mfg.: Sonotech

Reference Block

Serial No.: 05-6533

Type: SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1" Notch	80%	6.2	2.631"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
26.0	NSDH	56%	2.2	0.924

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

Results: NRI ☑ RI ☐ Geom ☐

Comments: Used for indication discrimation

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

Examiner	Level II-PDI	Signature	Date	Reviewer	LEV III	Signature	Date
Wertman, Justin			3/12/2019	W.L. THOMAS			3.21.19
Examiner	Level II-PDI	Signature	Date	Site Review		Signature	Date
Hacker, Jonathan			3/12/2019	R. CHRISTOPHER WRAY	LV. III	R. Christopher Wray	3-22-19
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A							3/25/19

Supplemental Report

Dominion

Report No.: UT-19 -070

Page: 5 of 8

Summary No.: N2.R1.11.459

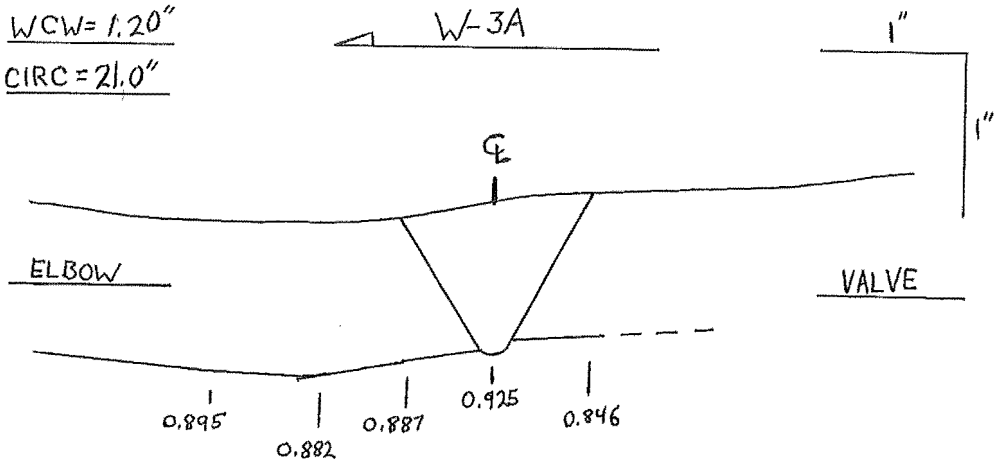
Examiner: Wertman, Justin Level: II-PDI Reviewer: W.L. THOMAS Lev III Date: 3.21.19

Examiner: Hacker, Jonathan Level: II-PDI Site Review: R. CHRISTOPHER WRAY Lv. III RCW Date: 3-22-19

Other: N/A Level: N/A ANII Review: MAe Date: 3/25/19

Comments:

Sketch or Photo:



R. Christ Wry Lv. III 3-22-19

Supplemental Report

Dominion

Report No.: UT-19 -070

Page: 6 of 8

Summary No.: N2.R1.11.459

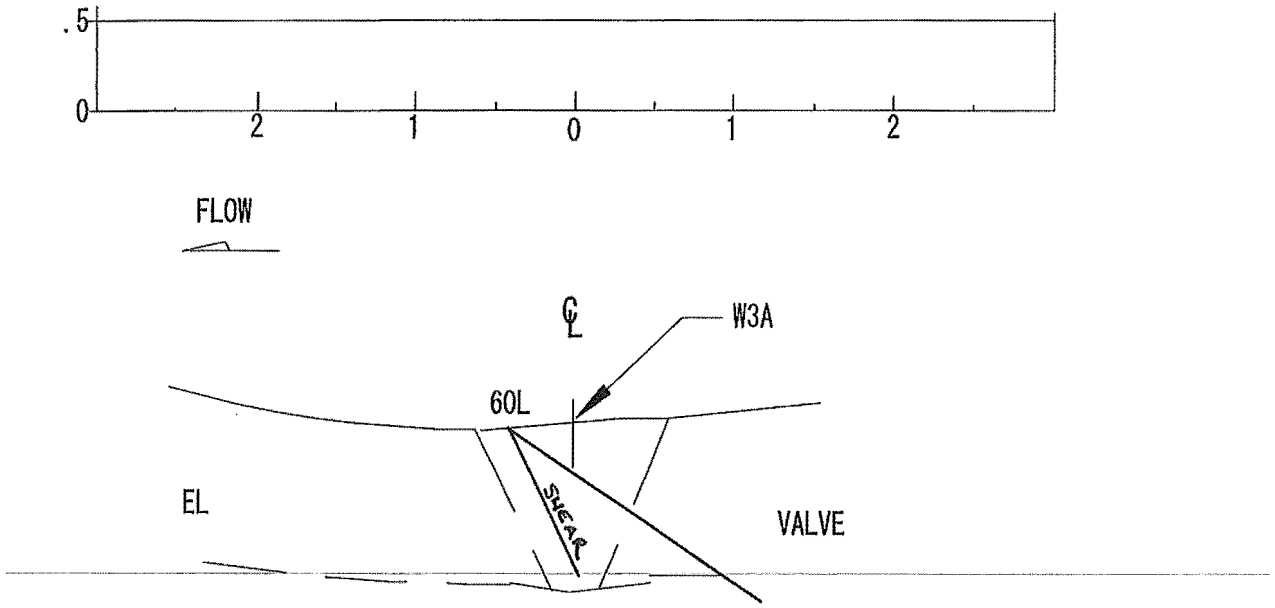
Examiner: Wertman, Justin Level: II-PDI Reviewer: W.L. THOMAS GEN III Date: 3·21·19

Examiner: Hacker, Jonathan Level: II-PDI Site Review: R. CHRISTOPHER WRAY LV. III RCW Date: 3·22·19

Other: N/A Level: N/A ANII Review: M He Date: 3/25/19

Comments:

Sketch or Photo:

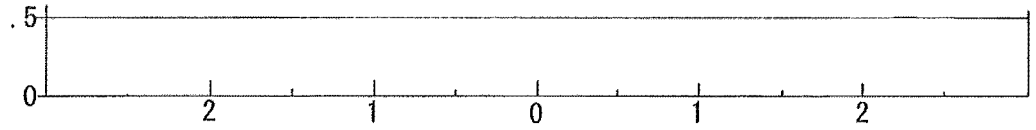


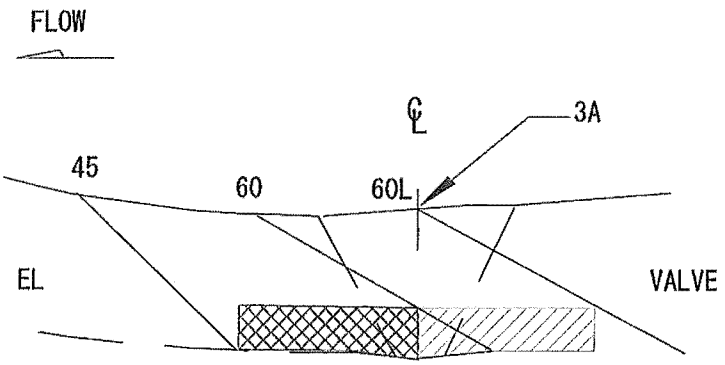
INDICATION 1

Dominion®

Report No: UT-19-070
Summary # N2.R1.11.459
Pg. 7 of 8
Prepared by: W. Thomas LEV III
Date: 3/21/2019

Weld Number	3A	Weld Width	1.20"
Thickness	0.887"	Weld Length	21"





EXAMINED 100% OF THE REQUIRED VOLUME EL SIDE

EXAMINED 100% OF THE RQUIRED VOLUME VALVE SIDE AX DIR. BEST EFFORT

Examination Volume Dimensions - Height 0.296" Length 21" Width 2.2"

Coverage Summary					
	Required Scans (each has a weighing factor of 100 for complete coverage)				
ANGLE	UpSt-Ax	UpSt-Circ	DnSt-Ax	DnSt-Circ	
45 / 60		0%	100%	100%	
60L	100%				
			Code Coverage Total		50%
100+100+100+0=300/400=.75			* Best Effort Coverage (Max 25%) Total		25%

Notes:

1) Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure.
2) Best Effort Coverage refers to the required examination volume past the weld centerline that is examined in the axial beam direction with an Appendix VIII demonstrated procedure for single sided coverage.

R. Christopher Wing Lv III 3-22-19

☑ Reviewed
☐ Witnessed
Hartford Steam Boiler
9531
HSB
3/25/19

Ultrasonic Indication Report

Dominion

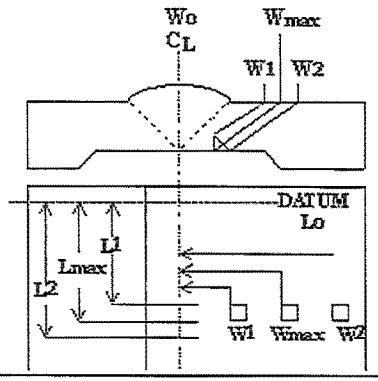
Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-UT-802	Outage No.:	N2R26
Summary No.:	N2.R1.11.459	Procedure Rev.:	5	Report No.:	UT-19 -070
Workscope:	ISI	Work Order No.:	59203136641	Page:	8 of 8

Search Unit Angle: 60 RL °

Wo Location: TDC

Lo Location: CL

(•) Piping Welds
( ) Ferritic Vessels ≥ 2"T
( ) Other _____



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

Comments: VERIFIED BY PLOT. WJ

Angle	Indication No.	% Of DAC	W Max W	W Max MP	Forward Of Max W1	Forward Of Max MP	Backward Of Max W2	Backward Of Max MP	L1 Of Max	L Max	L2 Of Max	RBR Amp.	Remarks
60RL	1	109	-0.4	1.862					17.3	0.8	3.5		Valve ID geometry

Examiner Level II-PDI Wertman, Justin	Signature	Date 3/12/2019	Reviewer LEV III W.L. THOMAS	Signature	Date 3-21-19
Examiner Level II-PDI Hacker, Jonathan	Signature	Date 3/12/2019	Site Review R. CHRISTOPHER WRAY LV. III	Signature R. Christopher Wray	Date 3-22-19
Other Level N/A N/A	Signature	Date	ANII Review	Signature 3/25/19	Date

Additional - UT Indication Data <Edit From Setup>

UT Calibration/Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-UT-802	Outage No.:	N2R26
Summary No.:	N2.R1.11.461	Procedure Rev.:	5	Report No.:	UT-19 -069
Workscope:	ISI	Work Order No.:	59203136641	Page:	1 of 5

Code:	2004 Edition	Cat./Item:	R-A/R1.11	Location:	C-LOOP
Drawing No.:	12050-WMKS-0103AH	Description:	Valve to Elbow		
System ID:	RC				
Component ID:	12050-WMKS-0103AH / 6-RC-421 / 1			Size/Length:	1.30" / 21.1"
				Thickness/Diameter:	0.719" / 6.0"
Limitations:	Single Sided			Start Time:	2129
				Finish Time:	2212

Instrument Settings

Serial No.:	140723807		
Manufacturer:	Olympus		
Model:	EPOCH 600	Linearity:	L-19 -001
Delay:	4.900	Range:	2.0"
Mfr Cal/Ver:	0.1230	Pulser:	Square
Damping:	400	Reject:	0%
Rec. Rate:	Auto	Freq.:	2.25
Filter:	0.5-4.0	Mode:	Fullwave
Voltage:	400	Other:	N/A

Ax. Gain (dB): 29 Circ. Gain (dB): N/A

1 Screen Div. = .2" in. of Sound Path

Calibration Block

Cal. Block No.: 05-8514

Thickness: 2.25" Dia.: 0

Cal. Blk. Temp.: 71° Temp. Tool: ATK-2

Comp. Temp.: 69° Temp. Tool: ATK-2

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

Results: NRI ☑ RI ☐ Geom ☐

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

Search Unit

Serial No.:	SI0321		
Manufacturer:	G E		
Size:	.375"	Model:	Comp-G
Freq.:	2.25 MHZ	Center Freq.:	N/A
Exam Angle:	45°	Squint Angle:	N/A
Measured Angle:	45°	Mode:	Shear
Exit Point:	0.25"	# of Elements:	1
Config.:	Single	Focus:	N/A
Shape:	Round	Contour:	Flat
Wedge Style:	MSWQC		

Search Unit Cable

Type: RG 174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 35

CW ☑ CCW ☑ Scan dB: 35

Exam Surface: OD

Surface Condition: Ground Smooth

Cal. Checks	Time	Date
Initial Cal.	1930	3/11/2019
Inter. Cal.	2129	3/11/2019
Inter. Cal.	2212	3/11/2019
Inter. Cal.	N/A	
Final Cal.	2347	3/11/2019

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.:	05-8533
Type:	SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1" Notch	80%	7.1	1.415"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
29.0	FSDH	80%	5.4	1.065"

Comments: Examined per the requirements of MRP-146. CR 1118871 issued for coverage of 90% or less.

Examiner: Wertman, Justin	Level: II-PDI	Signature	Date: 3/11/2019	Reviewer: Wayne Thomas Lv III	Signature / Date: 3/20/2019
Examiner: Hacker, Jonathan	Level: II-PDI	Signature	Date: 3/11/2019	Site Review: R. Christopher Wray Lv II	Signature / Date: 3/21/2019
Other: N/A	Level: N/A	Signature	Date	ANII Review	Signature / Date

UT Calibration/Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-UT-802	Outage No.:	N2R26
Summary No.:	N2.R1.11.461	Procedure Rev.:	3	Report No.:	UT-19 -069
Workscope:	ISI	Work Order No.:	59203136641	Page:	2 of 5

Code:	2004 Edition	Cat./Item:	R-A/R1.11	Location:	C-LOOP
Drawing No.:	12050-WMKS-0103AH	Description:	Valve to Elbow		
System ID:	RC				
Component ID:	12050-WMKS-0103AH / 6-RC-421 / 1	Size/Length:	1.30" / 21.1"	Thickness/Diameter:	0.719" / 6.0"
Limitations:	Single Sided	Start Time:	2147	Finish Time:	2214

Instrument Settings

Serial No.:	140723507		
Manufacturer:	Olympus		
Model:	EPOCH 600	Linearity:	L-19 -003
Delay:	5.600	Range:	2.0"
MM Cal/Vel:	0.1230	Pulser:	Square
Damping:	400	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.25
Filter:	0.5-4.0	Mode:	Fullwave
Voltage:	400	Other:	N/A

Ax. Gain (dB): 30 Circ. Gain (dB): N/A

1 Screen Div. = 0.2" in. of Sound Path

Calibration Block

Cal. Block No.:	05-8514		
Thickness:	2.25"	Dia.:	0
Cal. Blk. Temp.:	71°	Temp. Tool:	ATK-2
Comp. Temp.:	69°	Temp. Tool:	ATK-2

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

Results: NRI ☑ RI ☐ Geom ☐

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

Search Unit

Serial No.:	SI0328		
Manufacturer:	G E		
Size:	.375"	Model:	Comp-G
Freq.:	2.25 MHZ	Center Freq.:	N/A
Exam Angle:	60°	Squint Angle:	N/A
Measured Angle:	59°	Mode:	Shear
Exit Point:	0.30"	# of Elements:	1
Config.:	Single	Focus:	N/A
Shape:	Round	Contour:	Flat
Wedge Style:	MSWQC		

Search Unit Cable

Type: RG 174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 36

CW ☑ CCW ☑ Scan dB: 36

Exam Surface: OD

Surface Condition: Ground Smooth

Cal. Checks	Time	Date
Initial Cal.	1935	3/11/2019
Inter. Cal.	2147	3/11/2019
Inter. Cal.	2214	3/11/2019
Inter. Cal.	N/A	
Final Cal.	2348	3/11/2019

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.:	05-8533
Type:	SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1" Notch	80%	6.3	1.816"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
30	FSDH	87%	5.1	1.477"

Comments: Effective coverage using the 60° search unit has been verified by the presence of the weld root response during the required scans.

Examiner: Wertman, Justin	Level: II-PDI	Signature:	Date: 3/11/2019	Reviewer: Wayne Thomas Lv III	Signature:	Date: 3/20/2019
Examiner: Hacker, Jonathan	Level: II-PDI	Signature:	Date: 3/11/2019	Site Review: R. Christopher Wray Lv III	Signature:	Date: 3/21/2019
Other: N/A	Level: N/A	Signature:	Date:	ANII Review:	Signature:	Date:

UT Calibration/Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-UT-802	Outage No.:	N2R26
Summary No.:	N2.R1.11.461	Procedure Rev.:	5	Report No.:	UT-19 -069
Workscope:	ISI	Work Order No.:	99203136841	Page:	3 of 5

Code: 2004 Edition | Cat./Item: R-A/R1.11 | Location: C-LOOP

Drawing No.: 12050-WMKS-0103AH | Description: Valve to Elbow

System ID: RC

Component ID: 12050-WMKS-0103AH / 6-RC-421 / 1 | Size/Length: 1.30" / 21.1" | Thickness/Diameter: 0.719" / 6.0"

Limitations: Single sided | Start Time: 2214 | Finish Time: 2231

Instrument Settings

Serial No.:	140723507		
Manufacturer:	Olympus		
Model:	EPOCH 600	Linearity:	L-19 -003
Delay:	9.1000	Range:	2.875"
Mfl Cal/Ver:	0.2286	Pulser:	Square
Damping:	400	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0
Filter:	0.5-4.0	Mode:	Fullwave
Voltage:	400	Other:	N/A

Ax. Gain (dB): 48 | Circ. Gain (dB): N/A

1 Screen Div. = .2875 in. of Sound Path

Calibration Block

Cal. Block No.:	05-8514		
Thickness:	2.25"	Dia.:	0
Cal. Blk. Temp.:	71°	Temp. Tool:	ATK-2
Comp. Temp.:	69°	Temp. Tool:	ATK-2

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

Results: NRI ☑ RI ☐ Geom ☐

Search Unit

Serial No.:	06-108		
Manufacturer:	RTD		
Size:	2(8X14)	Model:	TRL2-AUST
Freq.:	2.0 MHZ	Center Freq.:	N/A
Exam Angle:	60°	Squint Angle:	N/A
Measured Angle:	60°	Mode:	Longitudinal
Exit Point:	0.30	# of Elements:	2
Config.:	D-SBS	Focus:	FD.0.6"
Shape:	Rectangular	Contour:	Flat
Wedge Style:	Integral		

Search Unit Cable

Type: RG 174 | Length: 6' | No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 54

CW ☐ CCW ☐ Scan dB: N/A

Exam Surface: OD

Surface Condition: Ground Smooth

Cal. Checks	Time	Date
Initial Cal.	1940	3/11/2019
Inter. Cal.	2214	3/11/2019
Inter. Cal.	2231	3/11/2019
Inter. Cal.	N/A	
Final Cal.	2350	3/11/2019

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.:	05-8532
Type:	SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1" Notch	80%	6.8	1.944"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
42	FSDH	80%	4.9	1.406"

Comments: Utilized for far side best effort coverage

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

Examiner: Wertman, Justin	Level: II-PDI	Signature	Date: 3/11/2019	Reviewer: W.L. THOMAS LEV III	Signature / Date: 3-20-19
Examiner: Hacker, Jonathan	Level: II-PDI	Signature	Date: 3/11/2019	Site Review: R. CHRISTOPHER WRAY LV. III	Signature / Date: R. Christopher Wray 3-21-19
Other: N/A	Level: N/A	Signature	Date	ANII Review	Signature / Date

UT Calibration/Examination

Supplemental Report

Dominion

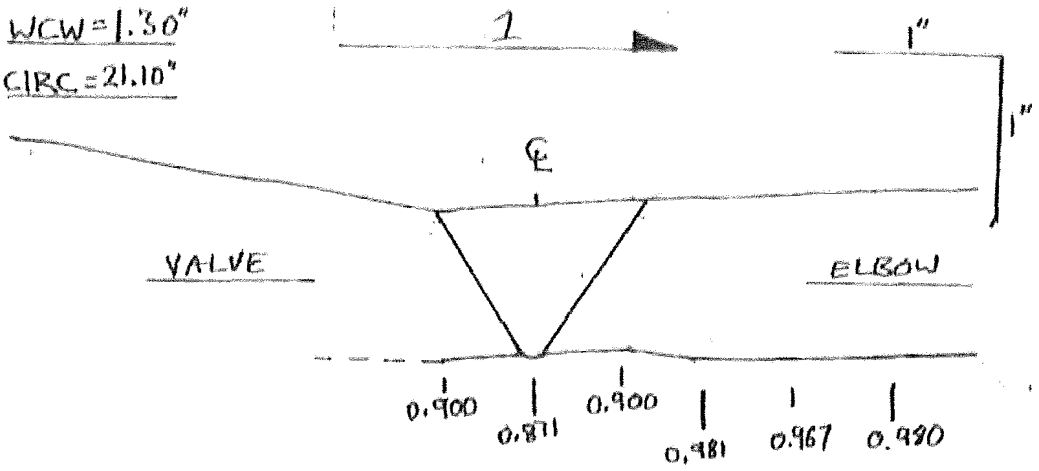
Report No: UT-19-069
Page: 4 of 5

Summary No: N2.R1.11.461

Examiner:	Wertman, Justin	Level	II-PDI	Reviewer:	W.L. THOMAS LEVEL III	Date	3-20-19
Examiner:	Hacker, Jonathan	Level	II-PDI	Site Review:	R. CHRISTOPHER WEST LEVEL III RCW	Date	3-21-19
Other:	N/A	Level	N/A	ANII Review:		Date:	

Comments

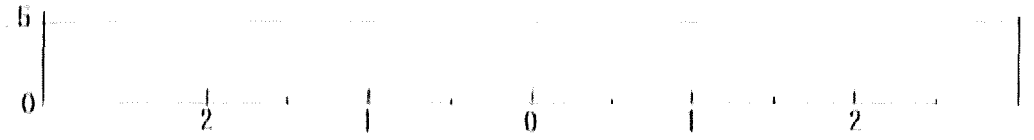
Sketch or Photo

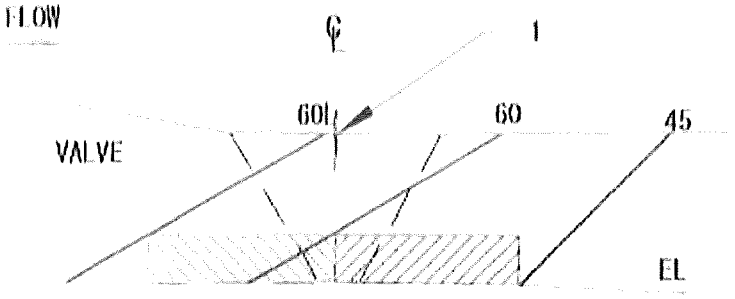


Dominion

Report No: UT-19-069
Summary # N2.R1.11.461
Pg. 5 of 5
Prepared by: W. Thomas
Date: 3/20/2019

Weld Number	1	Weld Width	1.3"
Thickness	0.9"	Weld Length	21.1"





EXAMINED 100% OF THE REQUIRED VOLUME ELBOW SIDE

EXAMINED 100% OF THE REQUIRED VOLUME VALVE SIDE AX DIR. BEST EFFORT

Examination Volume Dimensions - Height 0.3" Length 21.1" Width 2.3"

Coverage Summary					
	Required Scans (each has a weighing factor of 100 for complete coverage)				
ANGLE	UpSt-Ax	UpSt-Circ	DnSt-Ax	DnSt-Circ	
45 / 60		0%	100%	100%	
60L	*100%				
			Code Coverage Total		50%
100+100+0+100=300/400=.75			* Best Effort Coverage (Max 25%) Total		25%

Notes:

1) Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure.
2) Best Effort Coverage refers to the required examination volume past the weld centerline that is examined in the axial beam direction with an Appendix VIII demonstrated procedure for single sided coverage.

☑ Reviewed
☐ Witnessed
Hartford Steam Boiler
9531
HSB
3/25/19

R. Clutterbuck Lv III 3-21-19

R2. Risk-Informed Piping Welds Subject to Intergranular or Transgranular Stress Corrosion Cracking (IGSCC or TGSCC)

4.R2 IMPRACTICALITY OF COMPLIANCE

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested from the "essentially 100 percent" volumetric examination coverage requirement for the identified piping welds. This requirement is considered impractical primarily due to single-sided access for these components.

Weld	Line No.	Scan Coverage (%)[2]	Enclosure	Exam[1]	Exam Date	Angle (degree)	Mode	Frequency (MHz)
10	6"-SI-416	50% + 3.6% BE	R2-1	Up/CW/CCW Up/CW/CCW Dwn	3/21/2019	45 60 60	Shear Shear Longitudinal	1.5 1.5 2.0
19	6"-RC-532	50% + 25% BE	R2-2	Up/CW/CCW Up/CW/CCW Dwn	3/21/2019	45 60 60	Shear Shear Longitudinal	1.5 1.5 2.0
8	12"-SI-469	50% + 14.75% BE	R2-3	Up/CW/CCW Dwn	3/13/2019	45 60	Shear Longitudinal	1.5 2.0

NOTES:
[1] Up — Axial scan on the upstream side of weld
Dwn — Axial scan on the downstream side of weld
CW — Circumferential scan in the clockwise direction
CCW — Circumferential scan in the counterclockwise direction
[2] BE — Best Effort non-Code coverage used to gain additional information

These examinations were performed manually using advanced ASME Section XI, Appendix VIII demonstrated procedures and techniques in accordance with the performance demonstration requirements. Based on access and physical limitations of theses welds, alternative or other advanced technologies would not have provided complete coverage of the examination volume at the time of this examination.

The attached enclosures include the complete Ultrasonic Examination Data Record for the Category R-A, Item R1.16, examinations included in this request. The report includes

details of the UT scanning apparatus, including transducer size, frequency, angle, wave modality and insonification angles. Also included are scan plots for the examinations showing the piping configuration and percent coverage for each individual scan. There were no recordable indications identified for these examinations.

Weld 10 (6"-SI-416) was a single-sided examination due to the pipe-to-valve configuration, limiting downstream scans. Weld 10 is considered a R1.16 element subject to IGSCC as the most likely degradation mechanism. The weld is on the upstream side of Low Head SI check valve, 2-SI-125, in the safety injection pipe to RCS hot leg (29"-RC-407). An additional "Best Effort" (non-Code) scan with a 60-degree Longitudinal search unit obtained an additional 3.6 percent total coverage of the downstream side of the weld. Weld 10 in Line# 6"-SI-416, is 1,500 lb., Type 316 seamless stainless-steel piping, with welding filler metal SFA 5.4 E316L-16, SFA 5.9 ER316L, and/or SFA 5.30 1N316L procured with 8-20 FN delta ferrite and 75 ksi minimum tensile strength.

Weld 19 (6"-RC-532) was a single-sided examination due to the pipe-to-valve configuration, limiting downstream scans. Weld 19 is considered a R1.16 element subject to IGSCC as the most likely degradation mechanism. The weld is on the upstream side of Low Head SI check valve, 2-SI-106, in the safety injection pipe to the RCS cold leg (27.5"-RC-409). An additional "Best Effort" (non-Code) scan with a 60-degree Longitudinal search unit obtained an additional 25 percent total coverage of the downstream side of the weld. Weld 19 in Line# 6"-SI-532, is 1,500 lb., Type 316 seamless stainless-steel piping, with welding filler metal SFA 5.4 E316L-16, SFA 5.9 ER316L, and/or SFA 5.30 1N316L procured with 8-20 FN delta ferrite and 75 ksi minimum tensile strength.

Weld 8 (12"-SI-469) was a single-sided examination due to the elbow-to-valve configuration, limiting downstream scans. Weld 8 is considered a R1.16 element subject to IGSCC as the most likely degradation mechanism. The weld is on the upstream side of Low Head SI check valve, 2-SI-187, in the safety injection pipe to the RCS cold leg (27.5"-RC-409). An additional "Best Effort" (non-Code) scan with a 60-degree Longitudinal search unit obtained an additional 14.75 percent total coverage of the downstream side of the weld. Weld 8 in Line# 6"-SI-416, is 1,500 lb., Type 316 seamless stainless-steel piping, with welding filler metal SFA 5.4 E316L-16, SFA 5.9 ER316L, and/or SFA 5.30 1N316L procured with 8-20 FN delta ferrite and 75 ksi min tensile strength.

Similar relief was granted for NAPS1 weld 12 (6"-SI-133), 50 percent coverage, during the Fourth Interval [Reference 8]. Relief was granted for three similar welds for the NAPS2 Third Interval [Reference 5].

5.R2 BURDEN CAUSED BY COMPLIANCE

The purpose of NDE is to perform inspections without destroying the component. The physical configuration of this weld, pipe-to-valve and elbow-to-valve connections, confines inspection capabilities. Detailed sketches of the limitations and inspection areas achieved have been provided. No further actions can enable better examination coverage.

6.R2 PROPOSED RELIEF AND BASIS

It is proposed that the examinations already completed at the reduced coverage be acceptable for meeting the Code requirements. All welds in these groups of High Safety Significant areas are pipe-to-valve welds and inspection would result in similar limitations. Therefore, no alternative selections are available to meet greater than 90 percent coverage. The limited volumetric examination should detect any general patterns of degradation that may occur in the areas covered, therefore providing reasonable assurance of the continued structural integrity of the subject weld. A portion of each of the subject welds was examined volumetrically. In addition, these welds receive a visual examination during the system leakage test. Any pattern of degradation should be detected by this examination ensuring reasonable assurance of operational readiness.

UT Calibration/Examination

Dominion

Site/Unit:	NAPS 2	Procedure:	ER-AA-NDE-UT-802	Outage No.:	N3R26
Summary No.:	N2.R1.16.001	Procedure Rev.:	5	Report No.:	UT-19 -024
Workscope:	ISI	Work Order No.:	58203136841	Page:	1 of 5

Code:	2004 Edition	Cat./Item:	R-A/R1.16	Location:	C-LOOP
Drawing No.:	12050-WMKS-0103AH	Description:	Pipe to Valve		
System ID:	SI				
Component ID:	12050-WMKS-0103AH / 6-SI-416 / 10	Size/Length:	1.2" / 21"	Thickness/Diameter:	0.718" / 6.0"
Limitations:	Single sided exam due to pipe to valve configuration.	Start Time:	1045	Finish Time:	1053

Instrument Settings

Serial No.:	01XK03		
Manufacturer:	Krautkramer		
Model:	USN 60 SW	Linearity:	L-19 -004
Delay:	6.0216 us	Range:	2.000"
M'll Cal/Vel:	0.1230 in/us	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	1.5 MHZ
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	330

Ax. Gain (dB): 17.8 Circ. Gain (dB): N/A

10 Screen Div. = 2.00 in. of Sound Path

Calibration Block

Cal. Block No.:	05-8514		
Thickness:	2.25"	Dia.:	0
Cal. Blk. Temp.:	71°	Temp. Tool:	ATK-2
Comp. Temp.:	75°	Temp. Tool:	ATK-2

Search Unit

Serial No.:	00VBYF		
Manufacturer:	KBA		
Size:	0.375"	Model:	Comp-G
Freq.:	1.5 MHZ	Center Freq.:	N/A
Exam Angle:	45°	Squint Angle:	N/A
Measured Angle:	45°	Mode:	Shear
Exit Point:	0.3"	# of Elements:	1
Config.:	Single	Focus:	N/A
Shape:	Round	Contour:	N/A
Wedge Style:	MSWQC		

Search Unit Cable

Type: RG 174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 35.8

CW ☑ CCW ☑ Scan dB: 35.8

Exam Surface: OD

Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0955	3/21/2019
Inter. Cal.	1045	3/21/2019
Inter. Cal.	N/A	
Inter. Cal.	1053	3/21/2019
Final Cal.	1150	3/21/2019

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.:	05-8258
Type:	SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.00" Notch	80%	7.1	1.416"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
17.8	SDH	20%	5.3	1.853"

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

Results: NRI ☑ RI ☐ Geom ☐

Comments: See UT-19-075 for lamination examination.

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: N/A

Examiner	Level	II-PDI	Signature	Date	Reviewer	Signature	Date
Fuechtmann, Gary P				3/21/2019	Wayne Thomas Lv III		3/21/2019
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					R. Christopher Wray Lv III		3/22/2019
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A							

UT Calibration/Examination

Dominion

Site/Unit:	NAPS 2	Procedure:	ER-AA-NDE-UT-802	Outage No.:	N2R26
Summary No.:	N2-R1.16.001	Procedure Rev.:	5	Report No.:	UT-19 -024
Workscope:	ISI	Work Order No.:	59203136641	Page:	2 of 5

Code: 2004 Edition Cat./Item: R-A/R1.16 Location: C-LOOP

Drawing No.: 12050-WMKS-0103AH Description: Pipe to Valve

System ID: SI

Component ID: 12050-WMKS-0103AH / 6-SI-416 / 10 Size/Length: 1.2" / 21" Thickness/Diameter: 0.718" / 6.0"

Limitations: Single sided exam due to pipe to valve configuration. Start Time: 1054 Finish Time: 1100

Instrument Settings

Serial No.: 01XK03
Manufacturer: Krautkramer
Model: USN 60 SW Linearity: L-19 -004
Delay: 7.200 µs Range: 2.900"
Mfr Cal/Vel: 0.1230 in/µs Pulser Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 1.5 MHZ
Frequency: 2.0 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 330

Ax. Gain (dB): 33.9 Circ. Gain (dB): N/A
10 Screen Div. = 2.90 in. of Sound Path

Calibration Block

Cal. Block No.: 05-8514
Thickness: 2.25" Dia.: 0
Cal. Blk. Temp.: 71° Temp. Tool: ATK-2
Comp. Temp.: 75° Temp. Tool: ATK-2
Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: NRI ☑ RI ☐ Geom ☐

Search Unit

Serial No.: 01V29Y
Manufacturer: KBA
Size: 0.375" Model: MSWQC
Freq.: 1.5 MHZ Center Freq.: N/A
Exam Angle: 60° Squint Angle: N/A
Measured Angle: 60° Mode: Shear
Bot Point: 0.1" # of Elements: 1
Config.: Single Focus: N/A
Shape: Round Contour: N/A
Wedge Style: MSWQC

Search Unit Cable

Type: RG 174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 33.9
CW ☑ CCW ☑ Scan dB: 33.9
Exam Surface: OD
Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0700	3/21/2019
Inter. Cal.	1054	3/21/2019
Inter. Cal	N/A	
Inter. Cal	1100	3/21/2019
Final Cal.	1151	3/21/2019

Couplant

Cal. Batch: 17F087
Type: Sonotech
Mfg.: Sonotech
Exam Batch: 17F087
Type: Sonotech
Mfg.: Sonotech

Reference Block

Serial No.: 05-8258
Type: SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.00" Notch	80%	6.2	1.793"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
33.9	SDH	60%	5.2	1.516"

Comments: Effective coverage using the 60° search unit has been verified by the presence of the weld root response during the required scans.

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: N/A

Examiner	Level II-PDI	Signature	Date	Reviewer	Signature	Date
Fuechtmann, Gary P			3/21/2019	Wayne Thomas Lv III		3/21/2019
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				R. Christopher Wray Lv III	R. Christopher Wray	3/22/2019
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A						

UT Calibration/Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-UT-802	Outage No.:	N2R26
Summary No.:	N2.R1.16.001	Procedure Rev.:	5	Report No.:	UT-19 -024
Workscope:	ISI	Work Order No.:	59203136841	Page:	3 of 5

Code:	2004 Edition	Cat./Item:	R-A/R1.16	Location:	C-LOOP
Drawing No.:	12050-WMKS-0103AH	Description:	Pipe to Valve		
System ID:	SI				
Component ID:	12050-WMKS-0103AH / 6-SI-416 / 10	Size/Length:	1.3" / 21"	Thickness/Diameter:	0.718" / 6.0"
Limitations:	Single sided exam due to pipe to valve configuration.	Start Time:	1101	Finish Time:	1110

Instrument Settings

Serial No.:	01XK03		
Manufacturer:	Krautkramer		
Model:	USN 60 SW	Linearity:	L-19 -004
Delay:	9.100 µs	Range:	2.000"
M'tl Cal/Vel:	0.1230 in/µs	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq:	2.0 MHZ
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	250
Ax. Gain (dB):	52.4	Circ. Gain (dB):	N/A
10 Screen Div. =	2.00	ea. of	Sound Path

Calibration Block

Cal. Block No.:	05-8514		
Thickness:	2.25"	Dia.:	0
Cal. Blk. Temp.:	71°	Temp. Tool:	ATK-2
Comp. Temp.:	75	Temp. Tool:	ATK-2

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

Results: NRI ☑ RI ☐ Geom ☐

Search Unit

Serial No.:	06-108		
Manufacturer:	RTD		
Size:	2(8X14)	Model:	TRL2-AUST
Freq.:	2.0 MHZ	Center Freq.:	N/A
Exam Angle:	60°	Squint Angle:	3°
Measured Angle:	60°	Mode:	Longitudinal
Exit Point:	0.30"	# of Elements:	2
Config.:	D-SBS	Focus:	FD.0.6"
Shape:	Rectangular	Contour:	FLAT
Wedge Style:	Integral		

Search Unit Cable

Type:	RG 174	Length:	6"
No. Cores:	0		

Scan Coverage

Upstream ☐	Downstream ☑	Scan dB:	52.4
CW ☐	CCW ☐	Scan dB:	N/A
Exam Surface:	OD		
Surface Condition:	Ground		

Cal. Checks	Time	Date
Initial Cal.	0705	3/21/2019
Inter. Cal.	1101	3/21/2019
Inter. Cal.	N/A	
Inter. Cal.	1110	3/21/2019
Final Cal.	1155	3/21/2019

Couplant

Cal. Batch:	17F057
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.:	05-8533
Type:	SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.00" Notch	80%	6.4	1.656"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
46.4	SDH	80%	5.2	1.513"

Comments: Utilized for best effort coverage on the far side of weld.

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: N/A

Examiner	Level	II-PDI	Signature	Date	Reviewer	Signature	Date
Fuechtmann, Gary P				3/21/2019	Wayne Thomas Lv III		3/21/2019
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					R. Christopher Wray Lv III		3/22/2019
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A							

Supplemental Report

Dominion

Report No: 01-19-024

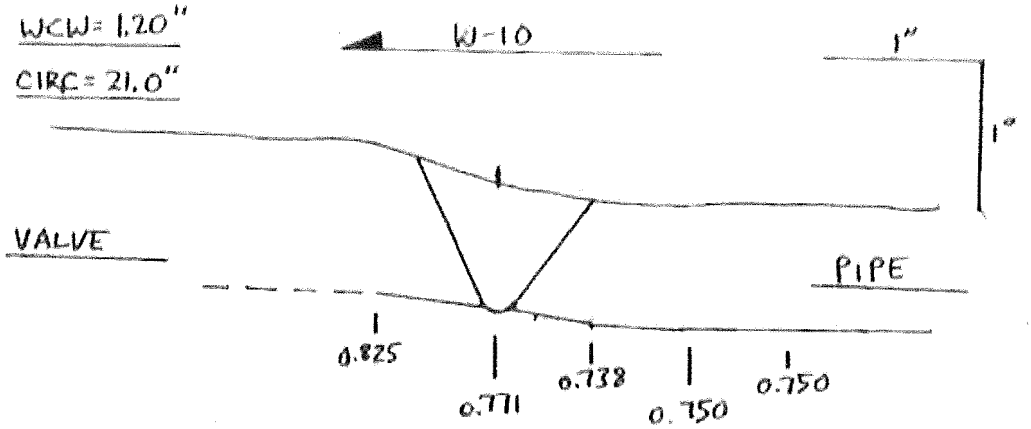
Page: 4 of 5

Summary No: N2.R1.16.001

Examiner	Wertman, Justin	Level	II-PDI	Reviewer	M.L. Thomas LEVIII	Date	3-17-19
Examiner	Hacker, Jonathan	Level	II-PDI	Site Review		Date	
Other	N/A	Level	N/A	ANII Review		Date	

Comments: Profile developed by Justin Wertman and Jonathan Hacker. Examinations were performed by the examiner with the required qualifications, Gary P. Fuechtmann.

Sketch or Plots



R. Christopher Way Lt III 3-22-19

Additional - Supplemental Data

UT Calibration/Examination

Dominion

Site/Unit:	NAPS 2	Procedure:	ER-AA-NDE-UT-002	Outage No.:	N2R26
Summary No.:	N2.R1.16.002	Procedure Rev.:	5	Report No.:	UT-19-020
Workscope:	ISI	Work Order No.:	59203136641	Page:	1 of 5

Code:	2004 Edition	Cat./Item:	R-A/R1.16	Location:	C-LOOP
Drawing No.:	12050-WMKS-0103BN	Description:	Pipe to Valve		
System ID:	SI				
Component ID:	12050-WMKS-0103BN / 6-SI-532 / 18			Size/Length:	0.75" / 20.80"
Thickness/Diameter:	0.719" / 6.0"				
Limitations:	Single sided exam due to pipe to valve configuration.			Start Time:	1020
Finish Time:	1028				

Instrument Settings

Serial No.:	01XK03		
Manufacturer:	Krautkramer		
Model:	USN 60 SW	Linearity:	L-19 -004
Delay:	6.0216 µs	Range:	2.000"
M/I Cal/Vel:	0.1230 in/µs	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	1.5 MHZ
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	330
Ax. Gain (dB):	17.8	Circ. Gain (dB):	N/A
10 Screen Div. =	2.00	in. of	Sound Path

Calibration Block

Cal. Block No.:	05-6514		
Thickness:	2.25"	Dia.:	0
Cal. Blk. Temp.:	71°	Temp. Tool:	ATK-2
Comp. Temp.:	75°	Temp. Tool:	ATK-2

Search Unit

Serial No.:	00VBYF		
Manufacturer:	KBA		
Size:	0.375"	Model:	Comp-G
Freq.:	1.5 MHZ	Center Freq.:	N/A
Exam Angle:	45°	Squint Angle:	N/A
Measured Angle:	45°	Mode:	Shear
Exit Point:	0.3"	# of Elements:	1
Config.:	Single	Focus.:	N/A
Shape:	Round	Contour:	N/A
Wedge Style:	MSWQC		

Search Unit Cable

Type:	RG 174	Length:	6'
No. Comp.:	0		

Scan Coverage

Upstream:	☑	Downstream:	☐
Scan dB:	35.8		
CW:	☑	CCW:	☑
Scan dB:	35.8		
Exam Surface:	OD		
Surface Condition:	Ground		

Cal. Checks	Time	Date
Initial Cal.	0655	3/21/2019
Inter. Cal.	1020	3/21/2019
Inter. Cal.	N/A	
Inter. Cal.	1028	3/21/2019
Final Cal.	1150	3/21/2019

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.:	05-6258
Type:	SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.00" Notch	80%	7.1	1.415"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
17.8	SDH	20%	5.3	1.052"

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

Results: NRI ☑ RI ☐ Geom ☐

Percent Of Coverage Obtained > 90%: No

Reviewed Previous Data: N/A

Comments: See UT-19-021 for lamination examination.

Examiner: Fuechtmann, Gary P	Level: II-PDI	Signature:	Date: 3/21/2019	Reviewer: W.L. THOMAS	LEV III	Signature:	Date: 3/21/19
Examiner: N/A	Level: N/A	Signature:	Date:	Site Review: R. CHRISTOPHER WRAT	Lv. III	Signature:	Date: 3.22.19
Other: N/A	Level: N/A	Signature:	Date:	ANII Review:		Signature:	Date:

UT Calibration/Examination

Dominion

Site/Unit: NAPS / 2 | Procedure: ER-AA-NDE-UT-602 | Outage No.: N2R36

Summary No.: N2.R1.16.002 | Procedure Rev.: 5 | Report No.: UT-19-020

Workscope: ISI | Work Order No.: 39203136641 | Page: 2 of 5

Code: 2004 Edition | Cal./Item: R-A/R1.16 | Location: C-LOOP

Drawing No.: 12050-WMKS-0103BN | Description: Pipe to Valve

System ID: SI

Component ID: 12050-WMKS-0103BN / 6-SI-632 / 19 | Size/Length: 0.75" / 20.80" | Thickness/Diameter: 0.719" / 6.0"

Limitations: Single sided exam due to pipe to valve configuration. | Start Time: 1028 | Finish Time: 1037

Instrument Settings

Serial No.:	01XK03		
Manufacturer:	Krautkramer		
Model:	USN 60 SW	Linearity:	L-19-004
Delay:	7.200 µs	Range:	2.900"
Mtl Cal/Vel:	0.1230 in/µs	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	1.5 MHZ
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	330

Ax. Gain (dB): 33.9 | Circ. Gain (dB): N/A

10 Screen Div. = 2.90 in. of Sound Path

Calibration Block

Cal. Block No.: 05-5514

Thickness: 2.25" | Dia.: 0

Cal. Blk. Temp.: 71° | Temp. Tool: ATK-2

Comp. Temp.: 75° | Temp. Tool: ATK-2

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

Results: NRI ☑ RI ☐ Geom ☐

Percent Of Coverage Obtained > 90%: No | Reviewed Previous Data: N/A

Search Unit

Serial No.:	01V28Y		
Manufacturer:	KBA		
Size:	0.375"	Model:	MSWQC
Freq.:	1.5 MHZ	Center Freq.:	N/A
Exam Angle:	60°	Sound Angle:	N/A
Measured Angle:	60°	Mode:	Shear
Exit Point:	0.1"	# of Elements:	1
Config.:	Single	Focus:	N/A
Shape:	Round	Contour:	N/A
Wedge Style:	MSWQC		

Search Unit Cable

Type: RG 174 | Length: 6' | No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 33.9

CW ☑ CCW ☑ Scan dB: 33.9

Exam Surface: OD

Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0700	3/21/2019
Inter. Cal.	1028	3/21/2019
Inter. Cal.	N/A	
Inter. Cal.	1037	3/21/2019
Final Ca.	1151	3/21/2019

Couplant

Cal. Batch: 17F087

Type: Sonotech

Mfg.: Sonotech

Exam Batch: 17F087

Type: Sonotech

Mfg.: Sonotech

Reference Block

Serial No.: 05-5258

Type: SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.00" Notch	80%	5.2	1.753"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
33.9	SDH	80%	5.2	1.518"

Comments: Effective coverage using the 60° search unit has been verified by the presence of the weld root response during the required scans.

Examiner: Fuechtmann, Gary P	Level: II-PDI	Signature:	Date: 3/21/2019	Reviewer: W.L. THOMAS	LEV III	Signature:	Date: 3-21-19
Examiner: N/A	Level: N/A	Signature:	Date:	Site Reviewer: R. CHRISTOPHER WEAV	Lv. III	Signature:	Date: 3-22-19
Other: N/A	Level: N/A	Signature:	Date:	ANII Review:		Signature:	Date:

UT Calibration/Examination

Dominion

Site/Unit: NAPS / 2 | Procedure: ER-AA-NDE-UT-802 | Outage No.: N2R26
Summary No.: N2.R1.16.002 | Procedure Rev.: 5 | Report No.: UT-19 -020
Workscope: ISI | Work Order No.: 59203136641 | Page: 3 of 5

Code: 2004 Edition | Cat./Item: R-A/R1.16 | Location: C-LOOP
Drawing No.: 12050-WMKS-0103BN | Description: Pipe to Valve
System ID: SI
Component ID: 12050-WMKS-0103BN / 6-SI-532 / 19 | Size/Length: 0.75" / 20.80" | Thickness/Diameter: 0.719" / 6.0"
Limitations: Single sided exam due to pipe to valve configuration. | Start Time: 1037 | Finish Time: 1042

Instrument Settings

Serial No.:	01XK03		
Manufacturer:	Krautkramer		
Model:	USN 60 SW	Linearity:	L-19 -004
Delay:	9.100 µs	Range:	2.900"
Mtl Cal/Vel:	0.1230 in/µs	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	2.0 MHZ
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	250

Ax. Gain (dB): 52.4 | Circ. Gain (dB): N/A
10 Screen Div. = 2.90 in. of Sound Path

Calibration Block

Cal. Block No.: 05-6514
Thickness: 2.25" | Dia.: 0
Cal. Blk. Temp.: 71° | Temp. Tool: ATK-2
Comp. Temp.: 75 | Temp. Tool: ATK-2
Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: NRI ☑ RI ☐ Geom ☐

Search Unit

Serial No.:	06-108		
Manufacturer:	RTD		
Size:	2(8X14)	Model:	TRL2-AUST
Freq.:	2.0 MHZ	Center Freq.:	N/A
Exam Angle:	60°	Squint Angle:	N/A
Measured Angle:	60°	Mode:	Longitudinal
Exit Point:	0.30"	# of Elements:	2
Config.:	D-SBS	Focus:	FD - 0.5"
Shape:	Retangular	Contour:	FLAT
Wedge Style:	Integral		

Search Unit Cable

Type: RG 174 | Length: 6' | No. Conn.: 0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 52.4
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: OD
Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0705	3/21/2019
Inter. Cal.	1037	3/21/2019
Inter. Cal.	N/A	
Inter. Cal.	1042	3/21/2019
Final Cal.	1155	3/21/2019

Couplant

Cal. Batch: 17F087
Type: Sonotech
Mfg.: Sonotech
Exam Batch: 17F087
Type: Sonotech
Mfg.: Sonotech

Reference Block

Serial No.: 05-6533
Type: SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.00" Notch	80%	6.4	1.856"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
46.4	SDH	80%	5.2	1.513"

Comments: Utilized for best effort coverage on the far side of weld.

Percent Of Coverage Obtained > 90%: No | Reviewed Previous Data: N/A

Examiner: Fuechtmann, Gary P	Level: II-PDI	Signature	Date: 3/21/2019	Reviewer: W.L. Thomas	LEV III	Signature	Date: 3-21-19
Examiner: N/A	Level: N/A	Signature	Date	Site Review: R. Christopher Wiant	Lv. III	Signature	Date: 3-22-19
Other: N/A	Level: N/A	Signature	Date	ANII Review		Signature	Date: 3/25/19

Supplemental Report

Dominion

Report No.: UT-19-020

Page: 4 of 5

Summary No.: N2.R1.16.002

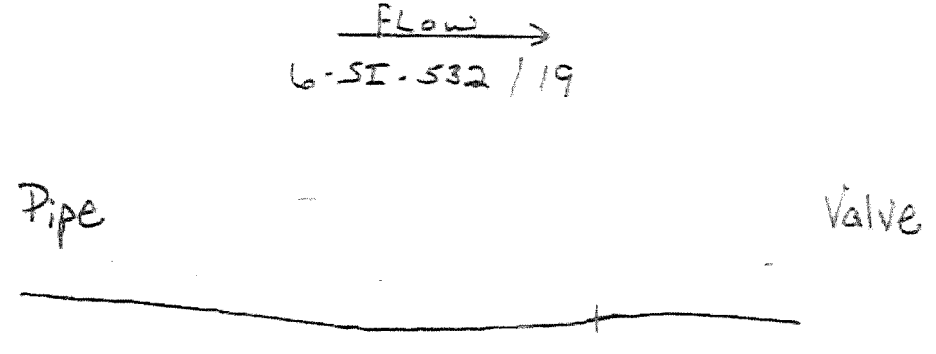
Examiner: Fuechtmann, Gary P — Level: II-PDI — Reviewer: [illegible] LVL III — Date: 3-21-19

Examiner: N/A — Level: N/A — Site Review: — Date:

Other: N/A — Level: N/A — ANII Review: — Date:

Comments:

Sketch or Photo:



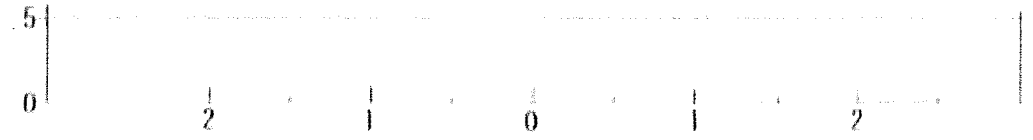
R. Chitwood LVL III 3-22-19

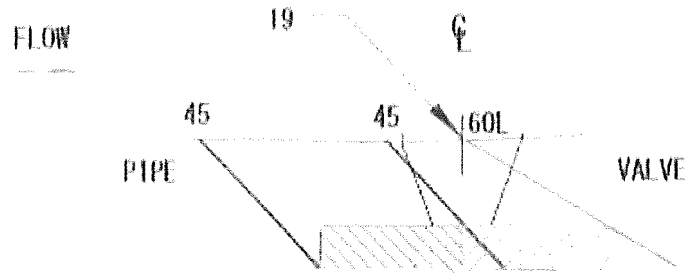
Additional - Supplemental Data

Dominion

Report No: UT-19-021
Summary # N2.R1-16.002
Pg. 5 of 5
Prepared by: W. Thomas
Date: 3/21/2019

Weld Number	19	Weld Width	0.75"
Thickness	0.73"	Weld Length	20.8"





EXAMINED 100% OF THE REQUIRED VOLUME PIPE SIDE

EXAMINED 100% OF THE REQUIRED VOLUME VALVE SIDE BEST EFFORT

Examination Volume Dimensions: Height 0.243" Length 20.8" Width 1.75"

Coverage Summary				
	Required Scans (each has a weighing factor of 100 for complete coverage)			
ANGLE	UpSt-Ax	UpSt-Circ	DnSt-Ax	DnSt-Circ
45 / 60	100%	100%		0%
60L			100%	
			Code Coverage Total	50%
			* Best Effort Coverage (Max 25%) Total	25%

Notes:

1) Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure.
2) Best Effort Coverage refers to the required examination volume past the weld centerline that is examined in the axial beam direction with an Appendix VIII demonstrated procedure for single sided coverage.

☑ Reviewed
☐ Witnessed
Hartford Steam Boiler
9531
HSB
3/25/19

R. Chitgle Wy Lv. III 3.22.19

UT Calibration/Examination

Dominion

Site/Unit: NAPS / 2 | Procedure: ER-AA-NDE-UT-502 | Outage No.: N2R26

Summary No.: N2.R1.16.003 | Procedure Rev.: 5 | Report No.: UT-19 -035

Workscope: ISI | Work Order No.: 80203136641 | Page: 1 of 4

Code: 2004 Edition | Cal./Item: R-A/R1.16 | Location: "C" Loop Room

Drawing No.: 12050-WMKS-0113C-1 | Description: Elbow to valve

System ID: SI

Component ID: 12050-WMKS-0113C-1 / 12-SI-469 / 8 | Size/Length: 1.30" / 40.10" | Thickness/Diameter: 1.125" / 12.0"

Limitations: Single sided exam due to valve to pipe configuration. | Start Time: 1133 | Finish Time: 1147

Instrument Settings

Serial No.: 081624211

Manufacturer: Panametrics

Model: EPOCH 4 | Linearity: L-19 -008

Delay: 7.045 µs | Range: 3.200"

Mfr Cal/Vel: 0.1230 in/µs | Pulser: Square

Damping: 400 Ω | Reject: 0%

Rep. Rate: Auto | Freq.: 2.0 MHZ

Filter: 0.8 - 3.0 MHZ | Mode: Fullwave

Voltage: Max | Other: N/A

Ax. Gain (dB): 0.0 | Circ. Gain (dB): N/A

10 Screen Div. = 3.20 in. of Sound Path

Calibration Block

Cal. Block No.: 05-8514

Thickness: 2.25" | Dia.: 0

Cal. Blk. Temp.: 70° | Temp. Tool: ATK-2

Comp. Temp.: 80° | Temp. Tool: ATK-2

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

Results: NRI ☑ RI ☐ Geom ☐

Percent Of Coverage Obtained > 90%: No | Reviewed Previous Data: N/A

Search Unit

Serial No.: 01CHD8

Manufacturer: KBA

Size: 0.5" | Model: Comp-G

Freq.: 1.5 MHZ | Center Freq.: N/A

Exam Angle: 45° | Squint Angle: N/A

Measured Angle: 45° | Mode: Shear

Exit Point: 0.35" | # of Elements: 1

Config.: Single | Focus: N/A

Shape: Round | Contour: Flat

Wedge Style: MSWQC

Search Unit Cable

Type: RG 174 | Length: 6' | No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 18.0

CW ☑ CCW ☑ Scan dB: 18.0

Exam Surface: OD

Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0845	3/13/2019
Inter. Cal.	1133	3/13/2019
Inter. Cal	N/A	
Inter. Cal	1147	3/13/2019
Final Cal.	1426	3/13/2019

Couplant

Cal. Batch: 17F087

Type: Sonotech

Mfg.: Sonotech

Exam Batch: 17F087

Type: Sonotech

Mfg.: Sonotech

Reference Block

Serial No.: 05-8534

Type: SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.50" Notch	80%	5.7	2.120"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.0	SDH	25%	3.3	1.066"

Comments: See UT-19-036 for lamination examination.

Examiner	Level: II-PDI	Signature	Date	Reviewer	W L Thomas LEV III	Signature	Date
Fuechtmann, Gary P			3/13/2019				03.17.19
Examiner	Level: II-PDI	Signature	Date	Site Review	Dennis P. Stricklett	Signature	Date
Zollner, Brian D			3/13/2019				03/20/2019
Other	Level: N/A	Signature	Date	ANII Review		Signature	Date
N/A							3-25-19

UT Calibration/Examination

Dominion

Site/Unit: NAPS 2 | Procedure: ER-AA-NDE-UT-802 | Outage No.: N2R26

Summary No.: N2.R1.16.003 | Procedure Rev.: 5 | Report No.: UT-19 -035

Workscope: ISI | Work Order No.: 59203136641 | Page: 2 of 4

Code: 2004 Edition | Cat./Item: R-A/R1.16 | Location: "C" Loop Room

Drawing No.: 12050-WMKS-0113C-1 | Description: Elbow to valve

System ID.: SI

Component ID: 12050-WMKS-0113C-1 / 12-SI-469 / 8 | Size/Length: 1.00" / 40.10" | Thickness/Diameter: 1.125" / 12.0"

Limitations: Single sided exam due to valve to pipe configuration. | Start Time: 1148 | Finish Time: 1156

Instrument Settings

Serial No.:	081624211		
Manufacturer:	Panametrics		
Model:	EPOCH 4	Linearity:	L-19 -008
Delay:	9.939 µs	Range:	4.500"
Mtl Cal/Vel.:	0.2331 in/µs	Pulser:	Square
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0 MHZ
Filter:	0.8 - 3.0 MHZ	Mode:	Fullwave
Voltage:	Max	Other:	N/A

Ax. Gain (dB): 41.7 | Circ. Gain (dB): N/A

10 Screen Div. = 4.50 in. of Sound Path

Calibration Block

Cal. Block No.: 05-6514

Thickness: 2.25" | Dia.: 0

Cal. Blk. Temp.: 70° | Temp. Tool: ATK-2

Comp. Temp.: 80° | Temp. Tool: ATK-2

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

Results: NR: ☑ RI: ☐ Geom: ☐

Search Unit

Serial No.: 06-110

Manufacturer: RTD

Size: 2(10X16) | Model: TRL2-AUST

Freq.: 2.0 MHZ | Center Freq.: N/A

Exam Angle: 60° | Squint Angle: N/A

Measured Angle: 60° | Mode: Longitudinal

Exit Point: 0.40" | # of Elements: 2

Config.: D-SBS | Focus: FD - 0.9"

Shape: Rectangular | Contour: Flat

Wedge Style: Integral

Search Unit Cable

Type: RG 174 | Length: 6' | No. Conn.: 0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 47.7

CW ☐ CCW ☐ Scan dB: N/A

Exam Surface: OD

Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0919	3/13/2019
Inter. Cal.	1148	3/13/2019
Inter. Cal.	N/A	
Inter. Cal.	1156	3/13/2019
Final Cal.	1428	3/13/2019

Couplant

Cal. Batch: 17F087

Type: Sonotech

Mfg.: Sonotech

Exam Batch: 17F087

Type: Sonotech

Mfg.: Sonotech

Reference Block

Serial No.: 05-6534

Type: SS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.50" Notch	80%	6.0	2.700"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
29.7	SDH	54%	3.2	1.435"

Comments: Utilized for best effort coverage on the far side of weld.

Percent Of Coverage Obtained > 90%: No | Reviewed Previous Data: N/A

	Level		Signature	Date
Examiner: Fuechtmann, Gary P	II-PDI			3/13/2019
Examiner: Zollner, Brian D	II-PDI			3/13/2019
Other: N/A	N/A			
Reviewer: W.L. THOMAS	LEVEL III			3.17.19
Site Review: DENNIS P. STRICKLAND	LVII			3/20/2019
ANII Review				3/25/19

UT Calibration/Examination

Dominion

Supplemental Report

Report No.: UT-19-035

Page: 3 of 4

Summary No.: N2.R1.16.003

Examiner:	Fuechtmann, Gary P	Level:	II-PDI	Reviewer:	W.L. Thomas LEV II	Date:	3.17.19
Examiner:	Zollner, Brian D	Level:	II-PDI	Site Review:	[illegible]	Date:	3/22/2019
Other:	N/A	Level:	N/A	ANII Review:	[illegible]	Date:	[illegible]

Comments:

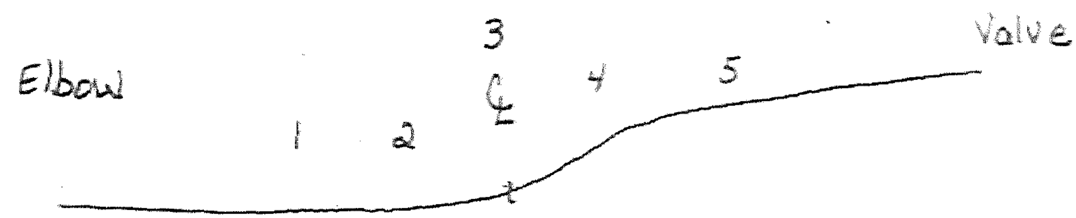
WCW = 1.30"   # 8

Sketch or Photo:

WL = 40.10"

FLOW →

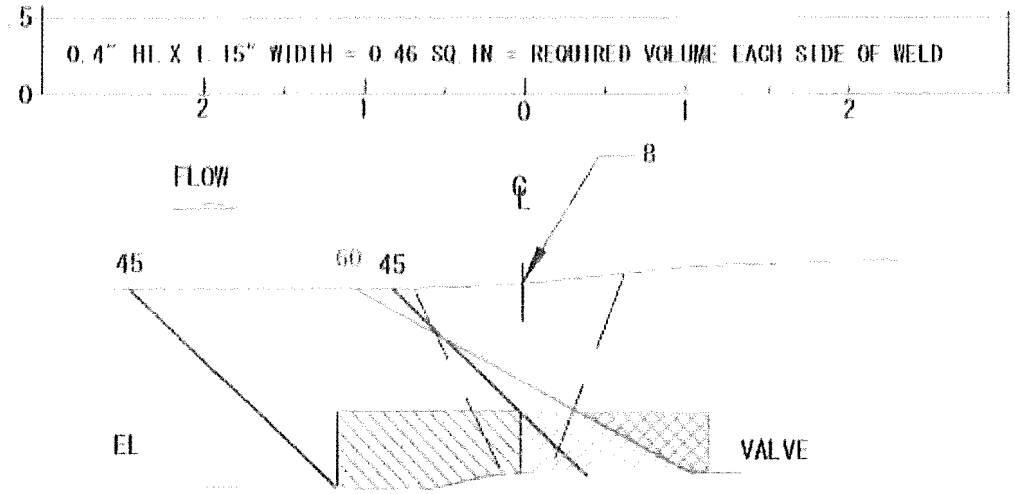
1 1.330"
2 1.20"
3 1.250"
4 N/A
5 N/A



Dominion

Report No: UT-19-035
Summary # N2.R1.16.003
Pg. 4 of 4
Prepared by: W. Thomas LEV III
Date: 3/17/2019

Weld Number	8	Weld Width	1.3"
Thickness	1.2"	Weld Length	40.10"



EXAMINED 100% OF THE REQUIRED VOLUME ELBOW SIDE

EXAMINED 0.27 SQ. IN. BEST EFFORT AX DIR. .27 / .46 = 59%

NO EXAM VALVE SIDE AX DIR. 0.19 SQ. IN.

Examination Volume Dimensions - Height 0.4" Length 40.1" Width 2.3"

Coverage Summary				
	Required Scans (each has a weighing factor of 100 for complete coverage)			
ANGLE	UpSt-Ax	UpSt-Circ	DnSt-Ax	DnSt-Circ
45	100%	100%		0%
60L			*59%	
			Code Coverage Total	50%
100+100+59+0=259/400=.6475			* Best Effort Coverage (Max 25%) Total	14.75%

Notes:

1) Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure.
2) Best Effort Coverage refers to the required examination volume past the weld centerline that is examined in the axial beam direction with an Appendix VIII demonstrated procedure for single sided coverage.

Reviewed
Witnessed
Hartford Steam Boiler
9531
HSB
3/25/19

Dennis P. Strickland Lvl II 3/22/2019

R3. Risk-Informed Piping Welds Not Subject to a Degradation Mechanism

4.R3 IMPRACTICALITY OF COMPLIANCE

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested from the "essentially 100 percent" volumetric examination coverage requirement for the piping welds identified below. This requirement is considered impractical primarily due to single-sided access and configuration of these components.

Weld	Line No.	Scan Coverage (%)	Enclosure	Exam[1]	Exam Date	Angle (degree)	Mode	Frequency (MHz)
SW-60W (BPL 473)	6"-WFPD-419	75%	R3-1	Up/CW/CCW CW/CCW Dwn	9/17/2020	45 60 70	Shear Shear Shear	2.25 2.25 2.25
SW-8 (BPL 116)	32"-SHP-457	75%	R3-2	Up/CW/CCW Up/CW/CCW Up	9/17/2020	45 60 70	Shear Shear Shear	2.25 2.25 2.25
SW-7 (BPL 209)	32"-SHP-458	75%	R3-3	Up/CW/CCW Up/CW/CCW Up	9/17/2020	45 60 70	Shear Shear Shear	2.25 2.25 2.25

NOTES: [1] Up — Axial scan on the upstream side of weld
Dwn — Axial scan on the downstream side of weld
CW — Circumferential scan in the clockwise direction
CCW — Circumferential scan in the counterclockwise direction

The above examinations were performed manually using advanced ASME Section XI, Appendix VIII demonstrated procedures and techniques in accordance with the performance demonstration requirements. Based on the access and physical limitations of these welds, alternative or other advanced technologies would not have provided complete coverage of the examination volume at the time of these examinations.

Enclosures R3-1 through R3-3 include the complete Ultrasonic Examination Data Records for each Category R-A, Item R1.20, examination included in this relief request. Each report includes details of the UT scanning apparatus, including transducer size, frequency, angle, wave modality and insonification angles. Also included are scan plots

for each of the examinations showing the piping configuration and percent coverage for each individual scan. No recordable indications were identified for any of these examinations other than geometry indications at the bore of welds SW-60W and SW-7.

Weld SW-60W (BPL 473) (6"-WFPD-419) is a Main Feedwater Isolation Valve Bypass piping weld. The 6-inch and 16-inch piping it connects to is carbon steel, A-106 GR B seamless pipe, and the weldolet are A-105 SCH 80. The limitations are due to the single-sided exam of the pipe-to-weldolet configuration of this weld. Only geometry indications were identified from the inside diameter (ID) bore due to the branch configuration (see attached report R3-1 for details). The weld is non-class included as a high safety significant, break exclusion region, RIS_B location requiring greater than 90 percent coverage per request N1-I4-RI-001 [Reference 3], and as such is included in this request. Augmented magnetic particle examination was also performed at this location with no reportable indications identified.

Welds SW-8 (BPL 116) (32"-SHP-457) and SW-7 (BPL 209) (32"-SHP-458) are Main Steam (MS) piping from Containment to the MS header welds. The configuration is mitered shop welds from 32-inch piping to the horizontal 40-inch MS header. The 32-inch piping is carbon steel, A155EFW, CLI, CMS 75, and the 40-inch header is carbon steel, A155EFW, CLI, KC 70. Full coverage was obtained at the tops and bottoms of the welds, but limitations were at the sides where the angle between the pipe and the header is at right angles. Weld SW-7 had intermittent 360-degree indications recorded using the 70-degree search unit from ID geometry signals from bore (see attached report R3-3 for details). These welds are non-class welds included as high safety significant, break exclusion region, RIS_B locations requiring greater than 90 percent coverage per request N1-I4-RI-001 [Reference 3], and as such are included in this request. Augmented magnetic particle examinations were also performed at these locations with no reportable indications identified.

The NAPS1 RI-ISI Program is based on ASME Code Case N-716 as identified in approved request N1-I4-RI-001 [Reference 3]. The subject limitations have been evaluated as acceptable, with no impact on risk analysis, and no further actions necessary to provide reasonable assurance of pressure boundary leak tightness.

5.R3 BURDEN CAUSED BY COMPLIANCE

The physical configuration of these welds, weldolet-to-pipe and pipe-to-header, confines inspection capabilities. Detailed sketches of the limitations and inspection areas achieved have been provided. No further action can be taken to enable better examination coverage without destroying the component.

6.R3 PROPOSED ALTERNATIVE AND BASIS

These welds were selected as they are determined to be of High Safety Significance with no specific active degradation mechanisms. Selections were made based on plant specific operating experience or history of examination, weld repairs, random selection across different pipe sizes and configurations, and radiation concerns. Inspection of these particular welds are considered the best choice for meaningful examination results.

It is proposed that the examinations already completed at the reduced coverage be accepted for meeting the Code requirements. 100 percent of the welds were volumetrically examined from the accessible side. No indications were discovered other than the geometry indications. The limited volumetric examinations performed should detect any general patterns of degradation that may occur in the areas covered, therefore providing reasonable assurance of the continued structural integrity of the subject weld. As a result of the completed examinations, any pattern of degradation should be detected, thereby providing reasonable assurance of operational readiness.

The purpose of the ISI program is to assure the structural and pressure-retaining integrity of safety-related nuclear power plant components in accordance with the rules of the ASME Code, Section XI and the requirements of 10 CFR 50.55a. Although only weld locations where greater than 90 percent examination coverage is possible (when available based on selection criteria) could be selected, meeting the purpose of the Code requires selecting a mix of not only piping-to-piping welds (where essentially 100 percent coverage is more likely), but also piping-to-valve welds, piping-to-pump welds, piping-to-vessel welds, socket welds, nozzle-to-pipe welds, etc. The ASME Code allows only 50 percent Code coverage for single-sided examinations. In cases other than most piping-to-piping welds the majority of weld examinations are considered single-sided examinations.

The risk-informed weld limitations are considered in ASME Code Case N-716 periodic updates to the Risk-Informed Program Plan, where the program is reevaluated to determine if any changes to the examination selections need to be made, including additional examinations if they are warranted. The limited examinations identified in this request have no impact on the change-in-risk evaluation for the third period, and no new examinations were added as a result of these limitations.

UT Calibration/Examination

Dominion

Site/Unit:	NAPS 2	Procedure:	ER-AA-NDE-UT-801	Outage No.:	N2R27
Summary No.:	N2.R1.20.0015	Procedure Rev.:	8	Report No.:	UT-20 -010
Workscope:	ISI	Work Order No.:	59203276663	Page:	1 of 6

Code:	2004 Edition	Cat./Item:	R-A/R1.20	Location:	SB
Drawing No.:	12050-WMKS-0102D	Description:	Feedwater (BPL)		
System ID:	WFPD				
Component ID:	12050-WMKS-0102D / 6-WFPD-419 / SW-60W (BPL 473)			Size/Length:	1.0"/27.1"
Thickness/Diameter:	0.843"/8.0"				
Limitations:	Single sided exam due to configuration			Start Time:	1045
Finish Time:	1051				

Instrument Settings

Serial No.:	140723807		
Manufacturer:	Olympus		
Model:	EPOCH 600	Linearity:	L-20 -004
Delay:	5.476 µs	Range:	2.400"
Mtl Cal/Vel:	1259 in/µs	Pulser:	Square
Damping:	400Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.25 Mhz
Filter:	.5-4.0	Mode:	Fullwave
Voltage:	400V	Other:	N/A

Ax. Gain (dB): 15.0 Circ. Gain (dB): N/A

1 Screen Div. = .24 in. of Sound Path

Calibration Block

Cal. Block No.:	10871		
Thickness:	2.25"	Dia.:	0
Cal. Blk. Temp.:	72.0	Temp. Tool:	ATK-1
Comp. Temp.:	98.0	Temp. Tool:	ATK-1

Search Unit

Serial No.:	SI0312		
Manufacturer:	G E		
Size:	.375"	Model:	Comp-G
Freq.:	2.25 MHZ	Center Freq.:	N/A
Exam Angle:	45°	Squint Angle:	N/A
Measured Angle:	45°	Mode:	Shear
Exit Point:	0.4"	# of Elements:	1
Config.:	Single	Focus:	N/A
Shape:	Round	Contour:	Flat
Wedge Style:	MSWQC		

Search Unit Cable

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

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 27.0

CW ☑ CCW ☑ Scan dB: 27.0

Exam Surface: OD

Surface Condition: Ground Smooth

Cal. Checks	Time	Date
Initial Cal.	0655	9/17/2020
Inter. Cal.	1045	9/17/2020
Inter. Cal.	N/A	
Inter. Cal.	1051	9/17/2020
Final Cal.	1218	9/17/2020

Couplant

Cal. Batch: 17F087

Type: Sonotech

Mfg.: Sonotech

Exam Batch: 17F087

Type: Sonotech

Mfg.: Sonotech

Reference Block

Serial No.: 05-5560

Type: CS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.0" Notch	80%	6.0	1.424"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
15.0	FSDH	25%	4.4	1.046"

Comments: None

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

Results: NRI ☑ RI ☐ Geom ☐

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

Examiner: Sauter, Nathaniel A.	Level: II-PDI	Signature:	Date: 9/17/2020	Reviewer: N.L. Thomas	LEV. III	Signature:	Date: 9/25/2020
Examiner: N/A	Level: N/A	Signature:	Date:	Site Review: Jeff Odegaard		Signature:	Date: 9/27/20
Other: N/A	Level: N/A	Signature:	Date:	ANII Review:		Signature:	Date: 10/2/20

UT Calibration/Examination

Dominion

Site/Unit:	NAPS 2	Procedure:	ER-AA-NDE-UT-801	Outage No.:	N2R27
Summary No.:	N2.R1.20.0015	Procedure Rev.:	8	Report No.:	UT-20 -010
Workscope:	ISI	Work Order No.:	59203276663	Page:	2 of 6

Code: 2004 Edition Cat./Item: R-A/R1.20 Location: SB

Drawing No.: 12050-WMKS-0102D Description: Feedwater (BPL)

System ID: WFPD

Component ID: 12050-WMKS-0102D / 6-WFPD-419 / SW-60W (BPL 473) Size/Length: 1.0"/27.1" Thickness/Diameter: 0.843"/8.0"

Limitations: Single sided exam due to configuration Start Time: 1053 Finish Time: 1059

Instrument Settings

Serial No.: 140723807
Manufacturer: Olympus
Model: EPOCH 600 Linearity: L-20 -004
Delay: 6.600 µs Range: 3.000"
M'tl Cal/Vel: .1259 in/µs Pulser: Square
Damping: 400Ω Reject: 0%
Rep. Rate: Auto Freq.: 2.25 Mhz
Filter: 5-4.0 Mode: Fullwave
Voltage: 400V Other: N/A

Ax. Gain (dB): 33.0 Circ. Gain (dB): N/A
1 Screen Div. = ~~25~~ 0.30 in. of Sound Path

Calibration Block

Cal. Block No.: 10871
Thickness: 2.25" Dia.: 0
Cal. Blk. Temp.: 72.0 Temp. Tool: ATK-1
Comp. Temp.: 98.0 Temp. Tool: ATK-1

Search Unit

Serial No.: SI0315
Manufacturer: G E
Size: .375" Model: Comp-G
Freq.: 2.25 MHZ Center Freq.: N/A
Exam Angle: 60° Squint Angle: N/A
Measured Angle: 60° Mode: Shear
Exit Point: 0.4" # of Elements: 1
Config.: Single Focus: N/A
Shape: Round Contour: Flat
Wedge Style: MSWQC

Search Unit Cable

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

Scan Coverage

Upstream ☐ Downstream ☐ Scan dB: N/A
CW ☑ CCW ☑ Scan dB: 39.0
Exam Surface: OD
Surface Condition: Ground Smooth

Cal. Checks	Time	Date
Initial Cal.	0730	9/17/2020
Inter. Cal.	1053	9/17/2020
Inter. Cal.	N/A	
Inter. Cal.	1059	9/17/2020
Final Cal.	1220	9/17/2020

Couplant

Cal. Batch: 17F087
Type: Sonotech
Mfg.: Sonotech
Exam Batch: 17F087
Type: Sonotech
Mfg.: Sonotech

Reference Block

Serial No.: 05-5560
Type: CS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.0" Notch	80%	6.0	1.782"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
33.0	FSDH	49%	5.0	1.500"

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

Results: NRI ☑ RI ☐ Geom ☐

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

Comments: Effective coverage using the 60° search unit has been verified by the presence of the weld root response during the required scans.

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Sauter, Nathaniel A.	II-PDI	[signature]	9/17/2020	W.L. THOMAS LEV. III	[signature]	9/25/20
N/A	N/A			Jeff Odegard	[signature]	9/27/20
N/A	N/A			ANII Review	[signature]	10/2/20

UT Calibration/Examination

UT Calibration/Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-UT-801	Outage No.:	N2R27
Summary No.:	N2.R1.20.0015	Procedure Rev.:	8	Report No.:	UT-20 -010
Workscope:	ISI	Work Order No.:	59203276663	Page:	3 of 6

Code: 2004 Edition Cat./Item: R-A/R1.20 Location: SB

Drawing No.: 12050-WMKS-0102D Description: Feedwater (BPL)

System ID: WFPD

Component ID: 12050-WMKS-0102D / 6-WFPD-419 / SW-60W (BPL 473) Size/Length: 1.0"/27.1" Thickness/Diameter: 0.843"/8.0"

Limitations: Single sided exam due to configuration Start Time: 1101 Finish Time: 1107

Instrument Settings

Serial No.: 140723807
Manufacturer: Olympus
Model: EPOCH 600 Linearity: L-20 -004
Delay: 7.300 µs Range: 5.000"
M/t Cal/Vel: .1259 in/µs Pulser: Square
Damping: 400Ω Reject: 0%
Rep. Rate: Auto Freq.: 2.25 Mhz
Filter: .5-4.0 Mode: Fullwave
Voltage: 400V Other: N/A

Ax. Gain (dB): 37.0 Circ. Gain (dB): N/A
1 Screen Div. = ~~55~~ 0.50 in. of Sound Path
ADC III 09-21-20

Calibration Block

Cal. Block No.: 10871
Thickness: 2.25" Dia.: 0
Cal. Blk. Temp.: 72.0 Temp. Tool: ATK-1
Comp. Temp.: 98.0° Temp. Tool: ATK-1

Search Unit

Serial No.: SI0331
Manufacturer: G E
Size: .375" Model: Comp-G
Freq.: 2.25 MHZ Center Freq.: N/A
Exam Angle: 70° Squint Angle: N/A
Measured Angle: 70° Mode: Shear
Exit Point: 0.5" # of Elements: 1
Config.: Flat 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: 43.0
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: OD
Surface Condition: Ground Smooth

Cal. Checks	Time	Date
Initial Cal.	0739	9/17/2020
Inter. Cal.	1101	9/17/2020
Inter. Cal.	N/A	
Inter. Cal.	1107	9/17/2020
Final Cal.	1222	9/17/2020

Couplant

Cal. Batch: 17F087
Type: Sonotech
Mfg.: Sonotech
Exam Batch: 17F087
Type: Sonotech
Mfg.: Sonotech

Reference Block

Serial No.: 05-5560
Type: CS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.0" Notch	81%	6.3	3.127"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
36.7	NSDH	96%	2.1	1.032"

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

Results: NRI ☐ RI ☐ Geom ☑

Comments: ID bore signal seen at varying metal paths and amplitudes due to configuration of branch connection to pipe.

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

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Sauter, Nathaniel A.	II-PDI	[signature]	9/17/2020	W.L. Thomas LEV. III	[signature]	9/25/20
N/A	N/A			Jeff Odegard	[signature]	9/22/20
N/A	N/A			ANII Review	[signature]	10/2/20

UT Calibration/Examination

Supplemental Report

Dominion

Report No.: UT-20 -010

Page: 4 of 6

Summary No.: N2.R1.20.0015

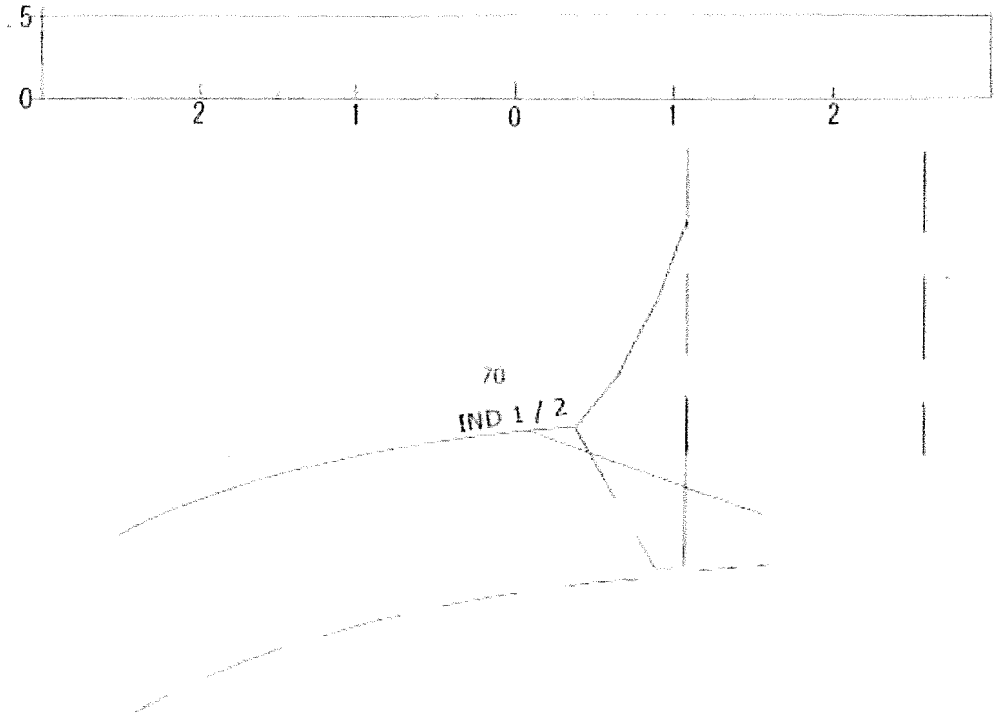
Examiner: Sauter, Nathaniel A. NS Level: II-PDI Reviewer: LEV. III W.L. THOMAS Date: 09/25/20

Examiner: N/A Level: N/A Site Review: Jeff Odegard JO Date: 9/27/20

Other: N/A Level: N/A ANII Review: M Lee Date: 10/2/20

Comments:

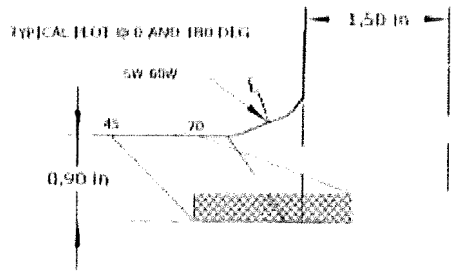
Sketch or Photo:



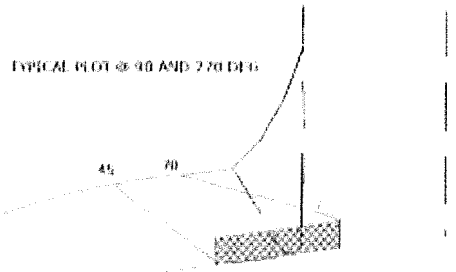
Dominion

Report No: UT-20-010
Summary # N2.R1.20.0015
Pg. 5 of 6
Prepared by: W. Thomas
Date: 9/25/2020

Weld Number	SW-60SW	Weld Width	1"
Thickness	0.9"	Weld Length	27.1"



EXAMINED 100% OF THE REQUIRED VOLUME AX DIR.



Jeff Odegard 9/27/20

☑ Reviewed
☐ Witnessed
10/2/20
Hartford Steam Boiler
9531
HSB

Examination Volume Dimensions - Height 0.3" Length 27.1" Width 2"

Coverage Summary				
	Required Scans (each has a weighing factor of 100 for complete coverage)			
ANGLE	UpSt-Ax	UpSt-Circ	DnSt-Ax	DnSt-Circ
45/60/70	100%	100%	100%	0%
			Code Coverage Total	75%
100+100+100+0=300/4=75			* Best Effort Coverage (Max 25%) Total	N/A

Notes:

1) Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure.
2) Best Effort Coverage refers to the required examination volume past the weld centerline that is examined in the axial beam direction with an Appendix VIII demonstrated procedure for single sided coverage.

Ultrasonic Indication Report

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-UT-801	Outage No.:	N2R27
Summary No.:	N2.R1.20.0015	Procedure Rev.:	8	Report No.:	UT-20 -010
Workscope:	ISI	Work Order No.:	59203276663	Page:	6 of 6

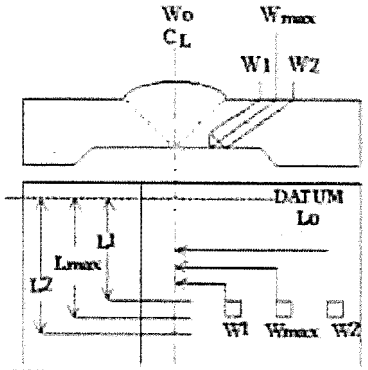
Search Unit Angle: 70 °

Wo Location: **Weld Center Line**

Lo Location: **US Side Main Run ***

(●) Piping Welds
( ) Ferritic Vessels ≥ 2"T
( ) Other _____

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



Comments: * **US Side Main Run (side closest to 2-FW-50-VALV)**

Angle	Indication No.	% Of DAC	W Max W	W Max MP	Forward Of Max W1	Forward Of Max MP	Backward Of Max W2	Backward Of Max MP	L1 Of Max	L Max	L2 Of Max	RBR Amp.	Remarks
70°	1	67%	1.0"	1.437"	N/A	N/A	N/A	N/A	4.0"	N/A	9.0"		Geometry from ID bore due to branch configuration
70°	2	56%	1.0"	1.412"	N/A	N/A	N/A	N/A	19.0"	N/A	24"		Geometry from ID bore due to branch configuration

Examiner: Sauter, Nathaniel A.	Level: II-PDI	Signature: [signature]	Date: 9/17/2020	Reviewer: W.L. THOMAS LEV. III	Signature: [signature]	Date: 9/25/2020
Examiner: N/A	Level: N/A	Signature:	Date:	Site Review: Jeff Odegard	Signature: [signature]	Date: 9/27/20
Other: N/A	Level: N/A	Signature:	Date:	ANII Review: [signature]	Signature: [signature]	Date: 10/2/20

Additional - UT Indication Data <Edit From Setup>

Magnetic Particle Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-MT-200	Outage No.:	N2R27
Summary No.:	N2 R1.20.0015	Procedure Rev.:	8	Report No.:	MT-20 -007
Workscope:	AUG	Work Order No.:	59203276663	Page:	1 of 1

Code: 2004 Edition Cat./Item: R-A/R1.20 Location: SB

Drawing No.: 12050-WMKS-0102D Description: Feedwater (BPL)

System ID: WFPD

Component ID: 12050-WMKS-0102D / 6-WFPD-419 / SW-60W (BPL 473) Mat./Thickness: CS / 0.562"

Limitations: None

Light Meter Mfg.: N/A Serial No.: N/A Illumination: N/A

Temp. Tool Mfg.: N/A Serial No.: N/A Surface Temp: N/A °F

Resolution: 0.044" Character Card

Lift Block Serial No.: MT-40 Surface Condition: Contour Ground

Lo/Wo Location: N/A Field Orientation: 0/90° Field Orientation

Magnetic Particle Material

Brand: MAGNAFLUX Wet: [ ] Dry: [x] Mixed: Yes [ ] No [x] Applied By: Dusting [x] Spraying [ ]

Type: 8A Red Visible: [x] Fluorescent: [ ] With: N/A Flooding: [ ]

Batch No.: 18G065

Equipment: PARKER Serial No.: 17868

Head Shot: [ ] N/A Amperes Fixed Spacing: [ ] AC: [ ] DC: [ ]

Adj. Spacing: [x] 3-8 inches Encircling Coils: [ ] N/A Turns

Prods. Spacing: [ ] N/A inches Current (machine setting): [ ] N/A Amperes

Indication No.	Loc L	Loc W	Diameter	Length	Type R/L	Remarks
N/A						

Comments:
Flashlight Used.
Character Card SN:DOM-2016-0118

Results: NRI [x] RI [ ] Eval: [ ] N/A

Percent Of Coverage Obtained > 90%: Yes Reviewed Previous Data: N/A Exam Time: 0800

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Strickland, Joseph A.	II		9/17/2020	N/A		
Examiner	Level	Signature	Date	Site Review	Signature	Date
N/A	N/A			L-II J.STRICKLAND		9/17/2020
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			N/A		

UT Calibration/Examination

Dominion

Site/Unit:	NAPS 2	Procedure:	ER-AA-NDE-UT-801	Outage No.:	N2R27
Summary No.:	N2.R1.20.0017	Procedure Rev.:	8	Report No.:	UT-20 -008
Workscope:	ISI	Work Order No.:	59101919553	Page:	1 of 5

Code: 2004 Edition Cat./Item: R-A/R1.20 Location: TB

Drawing No.: 12050-WMKS-0101A-4 Description: Main Steam (BPL)

System ID: SHP

Component ID.: 12050-WMKS-0101A-4 / 32"-SHP-457 / SW-8 (BPL 116) Size/Length: 1.8" / 100.5" Thickness/Diameter: 1.195" / 32.0"

Limitations: Single-sided exam due to configuration Start Time: 2251 Finish Time: 2329

Instrument Settings

Serial No.:	01XK03		
Manufacturer:	Krautkramer		
Model:	USN 60 SW	Linearity:	L-20 -003
Delay:	5.759 µs	Range:	3.380"
Mtl Cal/Ver:	0.1257 in/µs	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
Ax. Gain (dB):	16	Circ. Gain (dB):	N/A
1 Screen Div. =	0.33 in. of	Sound Path	

Calibration Block

Cal. Block No.:	10871		
Thickness:	2.25"	Dia.:	0
Cal. Blk. Temp.:	76°	Temp. Tool:	ATK-2
Comp. Temp.:	72°	Temp. Tool:	ATK-2

Search Unit

Serial No.:	00H58D		
Manufacturer:	KBA		
Size:	0.50"	Model:	Comp-G
Freq.:	2.25 MHZ	Center Freq.:	NA
Exam Angle:	45°	Squint Angle:	NA
Measured Angle:	45°	Mode:	Shear
Exit Point:	.35"	# of Elements:	Single
Config.:	Single	Focus:	NA
Shape:	Round	Contour:	NA
Wedge Style:	MSWQC		

Search Unit Cable

Type: RG 174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 28

CW ☑ CCW ☑ Scan dB: 28

Exam Surface: OD

Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	2050	9/16/2020
Inter. Cal.	2251	9/16/2020
Inter. Cal.	N/A	
Inter. Cal.	2329	9/16/2020
Final Cal.	0049	9/17/2020

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.:	05-5560
Type:	CS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" Notch	80	6.5	2.211"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
16	FSDH	22	3.2	1.08"

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

Results: NRI ☑ RI ☐ Geom ☐

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

Comments: Examination performed concurrently with adjacent weld SW-7.

Examiner: Wertman, Justin	Level: II-PDI	Signature	Date: 9/17/2020	Reviewer: W.L. Thomas	Level: III	Signature	Date: 9-28-20
Examiner: Coburn, Timothy M.	Level: II-PDI	Signature	Date: 9/17/2020	Site Review: Jeff Odegard		Signature	Date: 9/28/20
Other: N/A	Level: N/A	Signature	Date	ANII Review:		Signature	Date

UT Calibration/Examination

UT Calibration/Examination

Dominion

Site/Unit:	NAPS 2	Procedure:	ER-AA-NDE-UT-801	Outage No.:	N2R27
Summary No.:	N2.R1.20.0017	Procedure Rev.:	8	Report No.:	UT-20 -008
Workscope:	ISI	Work Order No.:	59101919553	Page:	2 of 5

Code:	2004 Edition	Cat./Item:	R-A/R1.20	Location:	TB
Drawing No.:	12050-WMKS-0101A-4	Description:	Main Steam (BPL)		
System ID:	SHP				
Component ID:	12050-WMKS-0101A-4 / 32"-SHP-457 / SW-8 (BPL 116)			Size/Length:	1.8" / 100.5"
Thickness/Diameter:	1.195" / 32.0"				
Limitations:	Single-sided exam due to configuration			Start Time:	2357
Finish Time:	0015				

Instrument Settings

Serial No.:	01XK03		
Manufacturer:	Krautkramer		
Model:	USN 60 SW	Linearity:	L-20 -003
Delay:	15.663 µs	Range:	5.0"
M'S Cal/Vel:	0.1257 in/µs	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
Ax. Gain (dB):	36.0	Circ. Gain (dB):	N/A
1 Screen Div. =	0.50 in. of	Sound Path	

Calibration Block

Cal. Block No.:	10871		
Thickness:	2.25"	Dia.:	0
Cal. Blk. Temp.:	77°	Temp. Tool:	ATK-2
Comp. Temp.:	72°	Temp. Tool:	ATK-2

Search Unit

Serial No.:	01CXBP		
Manufacturer:	KBA		
Size:	0.5"	Model:	Comp-Q
Freq.:	2.25 MHZ	Center Freq.:	N/A
Exam Angle:	60°	Sound Angle:	N/A
Measured Angle:	60°	Mode:	Shear
Exit Point:	0.35"	# of Elements:	Single
Config.:	Single	Focus:	N/A
Shape:	Round	Contour:	Flat
Wedge Style:	MSWQC		

Search Unit Cable

Type:	RG 174	Length:	6'
No. Conn.:	0		

Scan Coverage

Upstream: ☑	Downstream: ☐	Scan dB:	50.0
CW: ☑	CCW: ☑	Scan dB:	50.0
Exam Surface:	OD		
Surface Condition:	Ground		

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

Results: NRI ☑ RI ☐ Geom ☐

Percent Of Coverage Obtained > 90%: NS RTS 2/23/2021 Reviewed Previous Data: Yes

Cal. Checks	Time	Date
Initial Cal.	2058	9/16/2020
Inter. Cal.	2357	9/16/2020
Inter. Cal.	N/A	
Inter. Cal.	0015	9/17/2202
Final Cal.	0051	9/17/2020

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.:	05-5560
Type:	CS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" Notch	80	6.7	3.376"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
30.0	FSDH	50	3.2	1.613"

Comments: Effective coverage using the 60° search unit has been verified by the presence of the weld root response during the required scans.

Examiner: Wertman, Justin	Level: II-PDI	Signature:	Date: 9/17/2020	Reviewer: W.L. Thomas LEVEL III	Signature:	Date: 9-28-20
Examiner: Coburn, Timothy M.	Level: II-PDI	Signature:	Date: 9/17/2020	Site Review: Jeff Odegard	Signature:	Date: 9/28/20
Other: N/A	Level: N/A	Signature:	Date:	ANI Review:	Signature:	Date:

UT Calibration/Examination

Dominion

Site/Unit:	NAPS 2	Procedure:	ER-AA-NDE-UT-301	Outage No.:	N2R27
Summary No.:	N2.R1.20.0017	Procedure Rev.	6	Report No.:	UT-20 -008
Workscope:	ISI	Work Order No.:	59101919553	Page:	3 of 5

Code:	2004 Edition	Cat./Item:	R-A/R1.20	Location:	TB
Drawing No.:	12050-WMKS-0101A-I	Description:	Main Steam (BPL)		
System ID:	SHP				
Component ID:	12050-WMKS-0101A-4 / 32"-SHP-457 / SW-6 (BPL 116)			Size/Length:	1.5" / 100.5"
Thickness/Diameter:	1.195" / 32.0"				
Limitations:	Single-sided exam due to configuration			Start Time:	2330
Finish Time:	2355				

Instrument Settings

Serial No.:	01XK03		
Manufacturer:	Krautkramer		
Model:	USN 60 SW	Linearity:	L-20 -003
Delay:	15.663 µs	Range:	7.0"
Mtl Cal/Vel:	0.1257 in/µs	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

Ax. Gain (dB): 36 Circ. Gain (dB): N/A

1 Screen Div. = 0.72 in. of Sound Path

Calibration Block

Cal. Block No.:	10871		
Thickness:	2.25"	Dia.:	0
Cal. Blk. Temp.:	77	Temp. Tool:	ATK-2
Comp. Temp.:	72°	Temp. Tool:	ATK-2

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

Results: NRI ☑ RI ☐ Geom ☐

Search Unit

Serial No.:	00F1DF		
Manufacturer:	KBA		
Size:	0.50"	Model:	Comp-G
Freq.:	2.25 MHZ	Center Freq.:	N/A
Exam Angle:	70°	Squint Angle:	N/A
Measured Angle:	68°	Mode:	Shear
Exit Point:	0.35"	# of Elements:	Single
Config.:	Single	Focus:	N/A
Shape:	Round	Contour:	Flat
Wedge Style:	MSWQC		

Search Unit Cable

Type: RG 174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 54.0

CW ☐ CCW ☐ Scan dB: 54.0

Exam Surface: OD

Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	2056	9/16/2020
Inter. Cal.	2330	9/16/2020
Inter. Cal.	N/A	
Inter. Cal.	2355	9/16/2020
Final Cal.	0051	9/17/2020

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.: 05-5560

Type: CS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" Notch	80	5.3	3.70"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
30	NSDH	40	1.5	1.047"

Comments: ID geometry noted intermittently 360° at less than recordable levels.

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

Examiner	Level: II-PDI	Signature	Date	Reviewer		Signature	Date
Wertman, Justin			9/17/2020	W.L. Thomas			9-28-20
Examiner	Level: II-PDI	Signature	Date	Site Review		Signature	Date
Coburn, Timothy M.			9/17/2020	Jeff Odegard			9/29/20
Other	Level: N/A	Signature	Date	ANII Review		Signature	Date
N/A							10/2/20

Supplemental Report

Dominion

Report No: UT-20-008

Page: 4 of 5

Summary No: N2.R1.20.0017

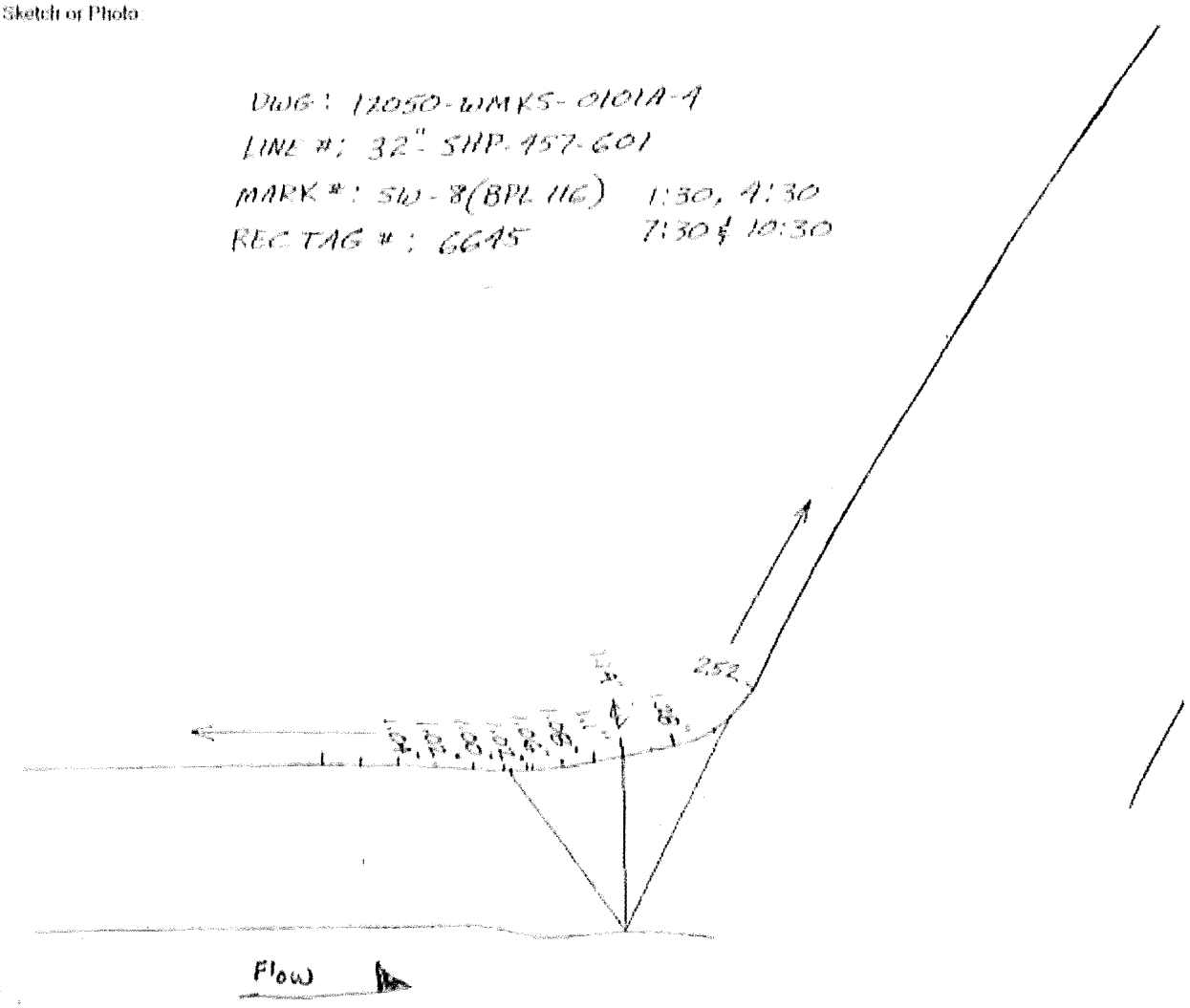
Examiner: Wertman, Justin Level: II-PDI Reviewer: DL THOMAS LEV III Date: 7.28.20

Examiner: Coburn, Timothy M. Level: II-PDI Site Review: Jeff Edgerd JE Date: 7/28/20

Other: N/A Level: N/A ANII Review: [illegible] Date: 7/30/20

Comments:

Sketch or Photo



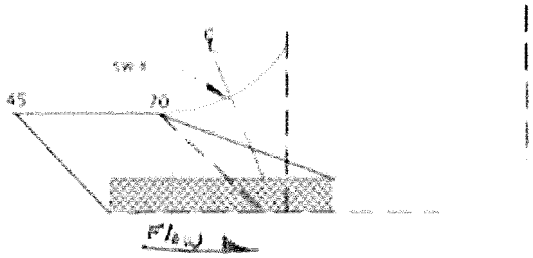
Additional / Supplemental Data

Dominion

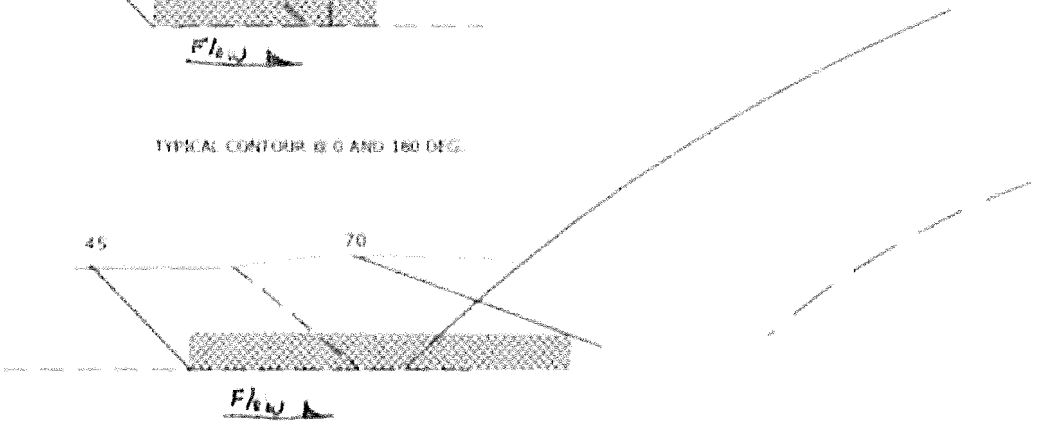
Report No: UT-20-008
Summary # N2.R1.20.0017
Pg. 5 of 5
Prepared by: W. Thomas
Date: 9/28/2020

Weld Number	SW-8	Weld Width	1.8"
Thickness	1.02"	Weld Length	100.5"

TYPICAL CONTOUR @90 AND 270 DEG



TYPICAL CONTOUR @ 0 AND 180 DEG



Examination Volume Dimensions - Height 0.34" Length 100.5" Width 2.8"

Coverage Summary				
	Required Scans (each has a weighing factor of 100 for complete coverage)			
ANGLE	UpSt-Ax	UpSt-Circ	DnSt-Ax	DnSt-Circ
45/60/70	100%	100%	100%	0%
			Code Coverage Total	75%
100+100+100+0=300/4=75			* Best Effort Coverage (Max 25%) Total	N/A

Notes:

1) Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure.
2) Best Effort Coverage refers to the required examination volume past the weld centerline that is examined in the axial beam direction with an Appendix VIII demonstrated procedure for single sided coverage.

Magnetic Particle Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-MT-200	Outage No.:	N2R27
Summary No.:	N2.R1.20.0017	Procedure Rev.:	8	Report No.:	MT-20 -004
Workscope:	AUG	Work Order No.:	59101919553	Page:	1 of 1

Code: 2004 Edition Cat./Item: R-A/R1.20 Location: TB

Drawing No.: 12050-WMKS-0101A-4 Description: Main Steam (BPL)

System ID: SHP

Component ID: 12050-WMKS-0101A-4 / 32`-SHP-457 / SW-8 (BPL 116) Mat./Thickness: CS/1.195"

Limitations: None

Light Meter Mfg.: N/A Serial No.: N/A Illumination: N/A

Temp. Tool Mfg.: N/A Serial No.: N/A Surface Temp.: N/A °F

Resolution: 0.044" Character Card

Lift Block Serial No.: MT-40 Surface Condition: Ground Smooth

Lo/Wo Location: TDC / Weld Center Line Field Orientation: 0/90° Field Orientation

Magnetic Particle Material

Brand: MAGNAFLUX Wet ☐ Dry ☑ Mixed: Yes ☐ No ☐ Applied By: Dusting ☑ Spraying ☐

Type: #2 Yellow Visible ☑

Batch No.: 18H017 Fluorescent ☐ With: N/A Flooding ☐

Equipment: MAGNAFLUX Serial No.: 3400

Head Shot ☐ N/A Amperes Fixed Spacing ☐ AC ☑ DC ☐

Adj. Spacing ☑ 3-8 inches Encircling Coils ☐ N/A Turns

Prods. Spacing ☐ N/A inches Current (machine setting) ☐ N/A Amperes

Indication No.	Loc L	Loc W	Diameter	Length	Type R/L	Remarks
NRI						

Comments:

Flashlight Used.
Character Card SN:DOM-2016-0028

Results: NRI ☑ RI ☐ Eval ☐

Percent Of Coverage Obtained > 90%: Yes Reviewed Previous Data: Yes Exam Time: 21:00

Examiner Summers, Harold W.	Level II	Signature	Date 9/16/2020	Reviewer N/A		Signature	Date
Examiner N/A	Level N/A	Signature	Date	Site Review Percy McFadden		Signature	Date 09/19/2020
Other N/A	Level N/A	Signature	Date	ANII Review N/A		Signature	Date

UT Calibration/Examination

Dominion

Site/Unit:	NAPS 2	Procedure:	ER-AA-NDE-UT-801	Outage No.:	N2R27
Summary No.:	N2.R1.20.0019	Procedure Rev.:	8	Report No.:	UT-20 -007
Workscope:	ISI	Work Order No.:	59101919553	Page:	1 of 6

Code:	2004 Edition	Cat./Item:	R-A/R1.20	Location:	TB
Drawing No.:	12050-WMKS-0101A-4	Description:	Main Steam (BPL)		
System ID:	SHP				
Component ID:	12050-WMKS-0101A-4 / 32"-SHP-458 / SW-7 (BPL 209)			Size/Length:	1.8" / 100.5"
Thickness/Diameter:	1.195" / 32.0"				
Limitations:	Single-sided exam due to configuration			Start Time:	2251
Finish Time:	2329				

Instrument Settings

Serial No.:	01XK03		
Manufacturer:	Krautkramer		
Model:	USN 60 SW	Linearity:	L-20 -003
Delay:	5.759 us	Range:	3.380"
Mtl Cal/Vel:	0.1257 in/us	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

Ax. Gain (dB): 16 Circ. Gain (dB): N/A

1 Screen Div. = 0.33 in. of Sound Path

Calibration Block

Cal. Block No.:	10871		
Thickness:	2.25"	Dia.:	0
Cal. Blk. Temp.:	77°	Temp. Tool:	ATK-2
Comp. Temp.:	72°	Temp. Tool:	ATK-2

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

Results: NRI ☑ RI ☐ Geom ☐

Percent Of Coverage Obtained > 90%: NO RTC 9/23/2020 Reviewed Previous Data: Yes

Search Unit

Serial No.:	00H58D		
Manufacturer:	KBA		
Size:	0.50"	Model:	Comp-G
Freq.:	2.25 MHZ	Center Freq.:	NA
Exam Angle:	45°	Sound Angle:	NA
Measured Angle:	45°	Mode:	Shear
Exit Point:	.35"	# of Elements:	1
Config.:	Single	Focus:	NA
Shape:	Round	Contour:	NA
Wedge Style:	MSWQC		

Search Unit Cable

Type: RG 174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 28

CW ☑ CCW ☑ Scan dB: 28

Exam Surface: OD

Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	2050	9/16/2020
Inter. Cal.	2251	9/16/2020
Inter. Cal.	N/A	
Inter. Cal.	2329	9/16/2020
Final Cal.	0049	9/17/2020

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.: 05-5560

Type: CS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" Notch	80	6.5	2.211"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
16	.7" SDH	22	3.2	1.06"

Comments: Examination performed concurrently with adjacent weld SW-8.

Examiner	Level II-PDI	Signature	Date	Reviewer		Signature	Date
Wertman, Justin			9/17/2020	W.L. Thomas LEVIII			9.27.20
Examiner	Level II-PDI	Signature	Date	Site Review		Signature	Date
Coburn, Timothy M.			9/17/2020	Jeff Odegard			9/27/20
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A							10/1/2020

UT Calibration/Examination

Dominion

Site/Unit:	NAPS 2	Procedure:	ER-AA-NDE-UT-801	Outage No.:	N2R27
Summary No.:	N2.R1.20.0019	Procedure Rev.:	8	Report No.:	UT-20 -007
Workscope:	ISI	Work Order No.:	59101919553	Page:	2 of 6

Code:	2004 Edition	Cat./Item:	R-A/R1.20	Location:	TB
Drawing No.:	12050-WMKS-0101A-4	Description:	Main Steam (BPL)		
System ID:	SHP				
Component ID:	12050-WMKS-0101A-4 / 32"-SHP-458 / SW-7 (BPL 209)			Size/Length:	1.8" / 100.5"
Thickness/Diameter:	1.195" / 32.0"				
Limitations:	Single-sided exam due to configuration			Start Time:	2330
Finish Time:	2355				

Instrument Settings

Serial No.:	01XK03		
Manufacturer:	Krautkramer		
Model:	USN 60 SW	Linearity:	L-20 -003
Delay:	15.663 µs	Range:	5.0"
M'tl Cal/Vel:	0.1257 in/µs	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

Ax. Gain (dB): 36 Circ. Gain (dB): N/A

1 Screen Div. = 0.50 in. of Sound Path

Calibration Block

Cal. Block No.:	10871		
Thickness:	2.25"	Dia.:	0
Cal. Blk. Temp.:	77	Temp. Tool:	ATK-2
Comp. Temp.:	72"	Temp. Tool:	ATK-2

Recordable Indication(s): Yes ☐ No ☑

Results: NRI ☑ RI ☐ Geom ☐

Percent Of Coverage Obtained > 90%: Yes NO RPS 2/22/2021

Search Unit

Serial No.:	01CXBP		
Manufacturer:	KBA		
Size:	0.5"	Model:	Comp-G
Freq.:	2.25 MHZ	Center Freq.:	N/A
Exam Angle:	60°	Squint Angle:	NA
Measured Angle:	60°	Mode:	Shear
Ext Point:	.35"	# of Elements:	1
Config.:	Single	Focus:	NA
Shape:	Round	Contour:	NA
Wedge Style:	MSWQC		

Search Unit Cable

Type: RG 174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 50.0

CW ☑ CCW ☑ Scan dB: 50.0

Exam Surface: OD

Surface Condition: Ground

(If Yes, Ref. Attached Ultrasonic Indication Report.)

Cal. Checks	Time	Date
Initial Cal.	2056	9/16/2020
Inter. Cal.	2330	9/16/2020
Inter. Cal.	N/A	
Inter. Cal.	2355	9/16/2020
Final Cal.	0051	9/17/2020

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.:	05-5560
Type:	CS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" Notch	80	6.7	3.376"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
30	FSDH	50	3.2	1.613"

Comments: Effective coverage using the 60° search unit has been verified by the presence of the weld root response during the required scans.

Reviewed Previous Data: Yes

Examiner	Level	Signature	Date	Reviewer		Signature	Date
Wertman, Justin	II-PDI		9/17/2020	W.L. THOMAS	LEVEL III		9.27.20
Examiner	Level	Signature	Date	Site Review		Signature	Date
Coburn, Timothy M.	II-PDI		9/17/2020	Jeff Odegaard			9/27/20
Other	Level	Signature	Date	ANII Review		Signature	Date
N/A	N/A						10/19/2020

UT Calibration/Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-UT-801	Outage No.:	N2R27
Summary No.:	N2.R1.20.0019	Procedure Rev.:	8	Report No.:	UT-20 -007
Workscope:	ISI	Work Order No.:	59101919553	Page:	3 of 6

Code:	2004 Edition	Cat./Item:	R-A/R1.20	Location:	TB
Drawing No.:	12050-WMKS-0101A-4	Description:	Main Steam (BPL)		
System ID:	SHP				
Component ID:	12050-WMKS-0101A-4 / 32`-SHP-458 / SW-7 (BPL 209)			Size/Length:	1.6" / 100.5"
Thickness/Diameter:	1.195" / 32.0"				
Limitations:	Single-sided exam due to configuration			Start Time:	2357
Finish Time:	0015				

Instrument Settings

Serial No.:	01XK03		
Manufacturer:	Krautkramer		
Model:	USN 60 SW	Linearity:	L-20 -003
Delay:	8.228 µs	Range:	7.0"
Mtl Cal/Vel:	0.1257 in/µs	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
Ax. Gain (dB):	42	Circ. Gain (dB):	N/A
1 Screen Div. =	0.70	in. of	Sound Path

Calibration Block

Cal. Block No.:	10871		
Thickness:	2.25"	Dia.:	0
Cal. Blk. Temp.:	77°	Temp. Tool:	ATK-2
Comp. Temp.:	72°	Temp. Tool:	ATK-2

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

Results: NRI ☐ RI ☐ Geom ☑

Search Unit

Serial No.:	00F1DL		
Manufacturer:	KBA		
Size:	0.50"	Model:	Comp-G
Freq.:	2.25 MHZ	Center Freq.:	NA
Exam Angle:	70°	Squint Angle:	NA
Measured Angle:	68°	Mode:	Shear
Exit Point:	.35"	# of Elements:	1
Config.:	Single	Focus:	NA
Shape:	Round	Contour:	NA
Wedge Style:	MSWQC		

Search Unit Cable

Type:	RG 174	Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑	Downstream ☐	Scan dB:	54
CW ☐	CCW ☐	Scan dB:	N/A
Exam Surface:	OD		
Surface Condition:	Ground		

Cal. Checks	Time	Date
Initial Cal.	2058	9/16/2020
Inter. Cal.	2357	9/16/2020
Inter. Cal.	N/A	
Inter. Cal.	0015	9/17/2202
Final Cal.	0051	9/17/2020

Couplant

Cal. Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech
Exam Batch:	17F087
Type:	Sonotech
Mfg.:	Sonotech

Reference Block

Serial No.:	05-5560
Type:	CS Rompus Block

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" Notch	80	5.3	3.70"

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
30	NSDH	40	1.5	1.047"

Comments: See indication report.

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

Examiner: Wertman, Justin	Level: II-PDI	Signature:	Date: 9/17/2020	Reviewer: W.L. Thomas		Signature:	Date: 9-27-20
Examiner: Coburn, Timothy M.	Level: II-PDI	Signature:	Date: 9/17/2020	Site Review: Jeff Odegard		Signature:	Date: 9/22/20
Other: N/A	Level: N/A	Signature:	Date:	Addl Review:		Signature:	Date: 10/13/20

Supplemental Report

Dominion

Report No.: UT-20-007

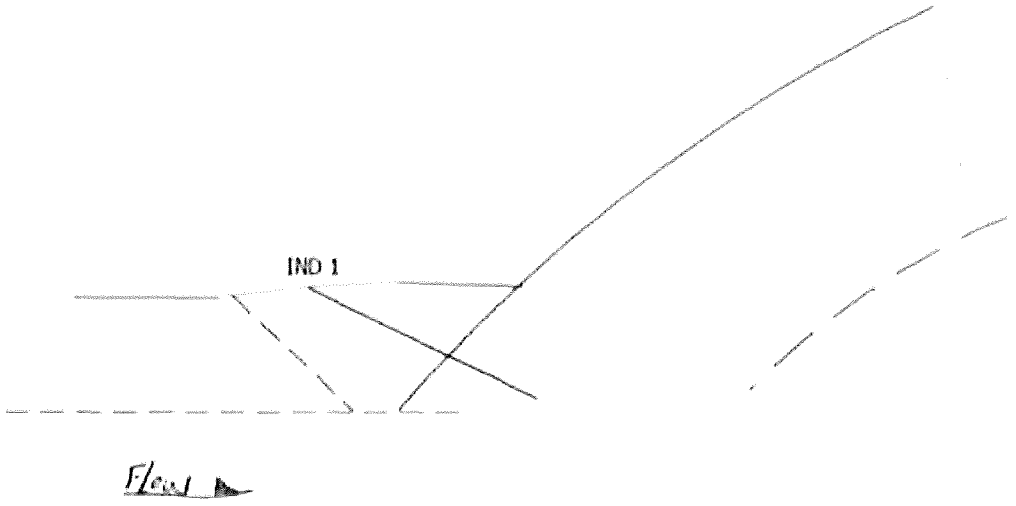
Page 4 of 6

Summary No.: N2.R1.20.0019

Examiner:	Wertman, Justin	Level:	II-PDI	Reviewer:	NL Thomas LEV III	Date:	9/24/20
Examiner:	Coburn, Timothy M.	Level:	II-PDI	Site Review:	Jeff Odegard JR	Date:	9/27/20
Other:	N/A	Level:	N/A	ANII Review:	[illegible]	Date:	[illegible]

Comments:

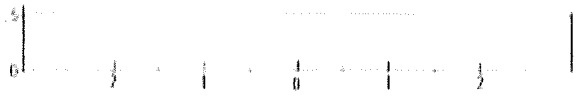
Sketch or Photo:



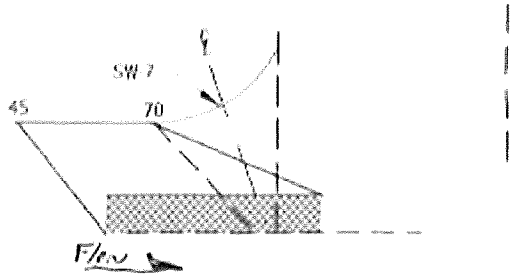
Dominion

Report No: UT-20-007
Summary # N2.R1.20.0019
Pg. 5 of 6
Prepared by: W. Thomas
Date: 9/24/2020

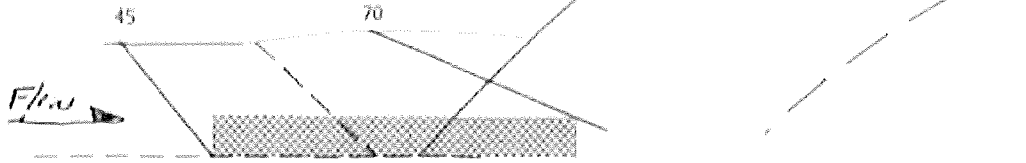
Weld Number	SW-7	Weld Width	1.8"
Thickness	1"	Weld Length	100.5"



TYPICAL CONTOUR @90 AND 270 DEG



TYPICAL CONTOUR @ 0 AND 180 DEG



Examination Volume Dimensions - Height 0.333" Length 100.5" Width 2.8"

Coverage Summary				
	Required Scans (each has a weighing factor of 100 for complete coverage)			
ANGLE	UpSt-Ax	UpSt-Circ	DnSt-Ax	DnSt-Circ
45/60/ 70	100%	100%	100%	0%
			Code Coverage Total	75%
100+100+100+0= 300 / 4=			* Best Effort Coverage (Max 25%) Total	N/A

Notes:

1) Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure.

2) Best Effort Coverage refers to the required examination volume past the weld centerline that is examined in the axial beam direction with an Appendix VIII demonstrated procedure for single sided coverage.

Ultrasonic Indication Report

Dominion

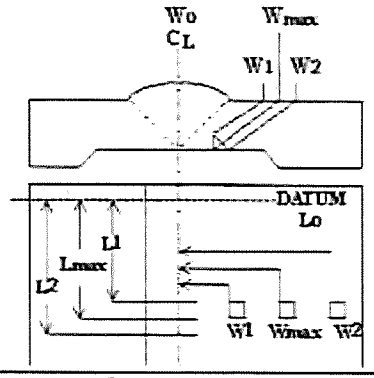
Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-UT-801	Outage No.:	N2R27
Summary No.:	N2.R1.20.0019	Procedure Rev.:	8	Report No.:	UT-20 -007
Workscope:	ISI	Work Order No.:	59101919553	Page:	6 of 6

Search Unit Angle: 70 °

Wo Location: Weld Centerline

Lo Location: TDC

(•) Piping Welds
( ) Ferritic Vessels ≥ 2"T
( ) Other _____



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

Comments: **Indications recorded using 70° search unit are ID geometry signals from bore.**

Angle	Indication No.	% Of DAC	W Max W	W Max MP	Forward Of Max W1	Forward Of Max MP	Backward Of Max W2	Backward Of Max MP	L1 Of Max	L Max	L2 Of Max	RBR Amp.	Remarks
70°	1	94	1.05	2.3	N/A	N/A	N/A	N/A	"	0"	"	N/A	360° intermittent

Examiner	Level	Signature	Date	Reviewer		Signature	Date
Wertman, Justin	II-PDI		9/17/2020	W.L. THOMAS	LEV III		9/21/20
Examiner	Level	Signature	Date	Site Review		Signature	Date
Coburn, Timothy M.	II-PDI		9/17/2020	Jeff Odegard			9/22/20
Other	Level	Signature	Date	ANII Review		Signature	Date
N/A	N/A						10/13/20

Additional - UT Indication Data <Edit From Setup>

Magnetic Particle Examination

Dominion

Site/Unit:	NAPS / 2	Procedure:	ER-AA-NDE-MT-200	Outage No.:	N2R27
Summary No.:	N2.R1.20.0019	Procedure Rev.:	8	Report No.:	MT-20 -005
Workscope:	AUG	Work Order No.:	59101919553	Page	1 of 1

Code: 2004 Edition Cat./Item: R-A/R1.20 Location: TB

Drawing No.: 12050-WMKS-0101A-4 Description: Main Steam (BPL)

System ID: SHP

Component ID: 12050-WMKS-0101A-4 / 32'-SHP-458 / SW-7 (BPL 209) Mat./Thickness: CS/1.195"

Limitations: None

Light Meter Mfg.: N/A Serial No.: N/A Illumination: N/A

Temp. Tool Mfg.: N/A Serial No.: N/A Surface Temp.: N/A °F

Resolution: 0.044" Character Card

Lift Block Serial No.: MT-40 Surface Condition: Ground Smooth

Lo/Wo Location: TDC / Weld Center Line Field Orientation: 0/90° Field Orientation

Magnetic Particle Material

Brand: MAGNAFLUX Wet ☐ Dry ☑ Mixed: Yes ☐ No ☐ Applied By: Dusting ☑ Spraying ☐ Flooding ☐

Type: #2 Yellow Visible ☑ Fluorescent ☐ With: N/A

Batch No.: 18H017

Equipment: MAGNAFLUX Serial No.: 3400

Head Shot ☐ N/A Amperes Fixed Spacing ☐ AC ☑ DC ☐

Adj. Spacing ☑ 3-8 inches Encircling Coils ☐ N/A Turns

Prods. Spacing ☐ N/A inches Current (machine setting) ☐ N/A Amperes

Indication No.	Loc L	Loc W	Diameter	Length	Type R/L	Remarks
NRI						

Comments:

Flashlight Used.
Character Card SN:DOM-2016-0028

Results: NRI ☑ RI ☐ Eval ☐

Percent Of Coverage Obtained > 90%: Yes Reviewed Previous Data: Yes Exam Time: 21:00

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Summers, Harold W.	II	[signature]	9/16/2020	N/A		
Examiner	Level	Signature	Date	Site Review	Signature	Date
N/A	N/A			Percy McFadden	[signature]	9/19/2020
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			N/A		

Magnetic Particle Examination

7.0 DURATION OF PROPOSED ALTERNATIVE

The proposed alternatives in this request, if approved, will be applicable for the fourth 10-year ISI interval for NAPS2 which began on December 14, 2010 and ended on December 13, 2020.

8.0 PRECEDENTS

Although Fourth Interval Risk-Informed selections are different from those for the Third Interval, alternative requests were granted for examinations in similar locations with the same service conditions as identified in requests N1-I3-PRT-004-Part D [Reference 4] and N2-I3-PRT-002-R1 [Reference 5].

NAPS1 was granted similar alternative requests for Fourth Interval First Period Limitations in requests N1-I4-LMT-001 [Reference 6], Second Period Limitations in request N1-I4-LMT-002 [Reference 7], and Third Period Limitations in request N1-I4-LMT-003 [Reference 8].

NAPS2 was granted similar alternative requests for Fourth Interval First Period Limitations in request N2-I4-LMT-002 [Reference 9] and Second Period Limitations in request N2-I4-LMT-003 [Reference 10].

9.0 REFERENCES

1. ASME Code Section XI, 2004 Edition with No Addenda.
2. ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds."
3. North Anna Power Station, Unit Nos. 1 and 2, "Fourth 10-Year Inservice Inspection (ISI) Program, Relief Requests (RRs) for Alternative N1-I4-RI-001 and N2-I4-RI-001," dated January 21, 2011. (ADAMS Accession No.: ML110050003)
4. North Anna Power Station, Unit No. 1, "Third 10-Year Inservice Inspection Interval Program, Relief Request N1-I3-PRT-004, Part A through Part G," dated January 7, 2011. (ADAMS Accession No.: ML110060011)
5. North Anna Power Station, Unit No. 2, "Relief Request N2-I3-PRT-002, Limited Coverage Examinations for the Third 10-Year Inservice Inspection Interval," dated August 17, 2012. (ADAMS Accession No.: ML12227A773)
6. North Anna Power Station, Unit No. 1, "Relief Request N1-I4-LMT-001, Limited Examinations for the Fourth 10-Year Inservice Inspection Interval Period 1," dated August 30, 2013. (ADAMS Accession No.: ML13234A353)

7. North Anna Power Station, Unit No. 1, "Relief Request N1-I4-LMT-002, Limited Examinations for the Fourth 10-Year Inservice Inspection Interval Period 2," dated January 10, 2018. (ADAMS Accession No.: ML18005A190)

8. North Anna Power Station, Unit No. 1, "Relief Request N1-I4-LMT-003, Limited Examinations for the Fourth 10-Year Inservice Inspection Interval Period 3," dated January 15, 2021. (ADAMS Accession No.: ML20364A040)

9. North Anna Power Station, Unit No. 2, "Relief Request N2-I4-LMT-002, Limited Examinations for the Fourth 10-Year Inservice Inspection Interval Period 1," dated February 3, 2015. (ADAMS Accession No.: ML15023A219)

10. North Anna Power Station, Unit No. 2, "Relief Request N2-I4-LMT-003, Limited Examinations for the Fourth 10-Year Inservice Inspection Interval Period 2," dated May 29, 2019. (ADAMS Accession No.: ML19143A342)