

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

May 5, 2016

10 CFR 50.55a

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

Serial No. 16-146  
NLOS/GDM R0  
Docket No. 50-281  
License No. DPR-37

**VIRGINIA ELECTRIC AND POWER COMPANY**  
**SURRY POWER STATION UNIT 2**  
**ASME SECTION XI INSERVICE INSPECTION PROGRAM**  
**RELIEF REQUESTS FOR LIMITED COVERAGE EXAMINATIONS**  
**PERFORMED IN THE FOURTH 10-YEAR INSERVICE INSPECTION INTERVAL**

Virginia Electric and Power Company (Dominion) performed inservice inspection (ISI) examinations at Surry Power Station Unit 2 for the fourth 10-year ISI interval that began on May 10, 2004 and ended on May 9, 2015. As indicated by the interval end date, a one year interval extension was applied as allowed by ASME Section XI IWA-2430(d). During the inspection interval, certain inspected components received less than the required examination coverage due to physical obstructions and limitations imposed by the original design and the geometry of construction.

Accordingly, pursuant to 10 CFR 50.55a(g)(5)(iii), Dominion requests relief for the limited component examinations on the basis that the required examination coverages were impractical due to physical obstructions and limitations imposed by design, geometry, and/or materials of construction of the subject components. The specific relief requests, including the technical basis for each request, are provided in Attachments 1 through 8. These relief requests have been reviewed and approved by the station's Facility Safety Review Committee.

If you have any questions or require additional information, please contact Mr. Gary D. Miller at (804) 273-2771.

Sincerely,



Mark D. Sartain  
Vice President – Nuclear Engineering

Commitments made in this letter: None

A047  
NRR

Attachments:

1. Relief Request LMT-R01, Category R-A, Class 1 Stainless Steel Risk Informed Welds
2. Relief Request LMT-SS01, Category C-F-1, Stainless Steel Pipe Welds
3. Relief Request LMT-CS01, Category C-F-2, Carbon Steel Pipe Welds
4. Relief Request LMT-P01, Category C-F-1 and R-A Preservice Pipe Welds
5. Relief Request LMT-C01, Category B-B, Pressurizer Shell to Head Circumferential and Longitudinal Welds
6. Relief Request LMT-C02, Category B-D, Pressurizer Nozzle Inner Radius Section
7. Relief Request LMT-C03, Category C-C, Main Steam Integral Attachment H001-1
8. Relief Request LMT-C04, Category C-C, Main Steam Integral Attachment H001-2

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

NRC Senior Resident Inspector  
Surry Power Station

Ms. K. R. Cotton Gross, NRC Project Manager - Surry  
U. S. Nuclear Regulatory Commission  
One White Flint North  
Mail Stop O8 G9A  
11555 Rockville Pike  
Rockville, Maryland 20852

Dr. V. Sreenivas, NRC Project Manager – North Anna  
U. S. Nuclear Regulatory Commission  
One White Flint North  
Mail Stop O8 G9A  
11555 Rockville Pike  
Rockville, Maryland 20852

Mr. R. A. Smith  
Authorized Nuclear Inspector  
Surry Power Station

**Attachment 1**

**RELIEF REQUEST LMT-R01**  
**EXAMINATION CATEGORY R-A**  
**RISK INFORMED PIPING WELDS ON STAINLESS STEEL PIPING**

**Virginia Electric and Power Company  
(Dominion)  
Surry Power Station Unit 2**



**Dominion**

**Surry Power Station Unit 2**

**4<sup>th</sup> 10-Year Inservice Inspection Interval  
May 10, 2004 – May 9, 2015**

**Risk Informed Pipe Welds  
Stainless Steel: Non-Alloy 600/82/182**

**Relief Request LMT-R01  
Repetitive/Duplicate Relief Requests in Accordance with 10 CFR 50.55a(g)(5)(iii)  
Inservice Inspection Impracticability**

**1. ASME Code Components Affected**

ASME Code Class:	Code Class 1
Examination Category:	R-A, Risk Informed Piping Examinations
Item Numbers:	R1.11, Elements Subject to Thermal Fatigue R1.16, Elements Subject to Intergranular Stress Corrosion Cracking
Component Identification:	Refer to Specific Table
Material:	Refer to Specific Table

**2. Applicable Code Edition and Addenda**

1998 Edition with 2000 Addenda of ASME Section XI

**3. Applicable Code Requirement**

The examination requirements for piping welds for the Surry Power Station Unit 2 (SPS2) fourth 10-year inservice inspection (ISI) interval were governed by the Risk Informed (RI) Inservice Inspection Program as proposed by the Virginia Electric and Power Company letter dated May 13, 2004 (Serial No. 04-272), "Virginia Electric and Power Company, Surry Power Station Unit 2, ASME Section XI Fourth Inservice Inspection (ISI) Interval Update Risk Informed Inservice (RI-ISI) Program," and approved by NRC letter dated August 8, 2005 (Serial No. 05-555), "Surry Power Station, Unit 2 – American Society of Mechanical Engineers Section XI Risk-Informed Inservice Inspection Interval Update for the Fourth 10-Year Interval." The

SPS2 fourth interval Risk Informed (RI) Program is applicable to Class 1 pipe welds only.

The pipe welds addressed by the Risk Informed Program are assigned to a specific segment with common system, operating conditions and failure mechanism. The number of welds per segment varies.

The welds discussed in this section were selected for volumetric examination by the Risk Informed Program due to the assigned item numbers: R1.11 for thermal fatigue or R1.16 for intergranular stress corrosion cracking (IGSCC).

Neither the approved relief request nor the NRC Safety Evaluation for the Risk Informed Program addressed an alternative for limited examination coverage. Therefore, the rules for ASME Section XI shall apply when limitations are encountered due to the design, geometry and materials of construction of the component. The alternative requirements of ASME Section XI, Code Case N-460, approved for use in Regulatory Guide 1.147, Rev.17, allows credit for essentially 100% coverage of the weld provided greater than 90% of the required volume has been examined.

10 CFR 50.55a(b)(2)(xv)(A) requires the following examination coverage criteria when applying Supplement 2 to Appendix VIII:

- (1) Piping must be examined in two axial directions and when examination in the circumferential direction is required, the circumferential examination must be performed in two directions, provided access is available....
- (2) Where examination from both sides is not possible, full coverage credit may be claimed from a single side for ferritic welds. Where examination from both sides is not possible on austenitic welds..., full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix VIII demonstration using flaws on the opposite side of the weld....

10 CFR 50.55a(b)(2)(xvi)(B) requires that examinations performed from one side of a ferritic or stainless steel pipe weld must be conducted with equipment, procedures, and personnel that have demonstrated proficiency with single-side examinations. To demonstrate equivalency to two sided examinations, the demonstration must be performed in accordance with the requirements of Appendix VIII, as modified by 10 CFR 50.55a(b)(2)(xvi)(B) and 50.55a(b)(2)(xv)(A).

#### **4. Impracticality of Compliance**

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the essentially 100% volumetric examination coverage requirements for the subject austenitic welds due to the geometric configuration that limits the volumetric coverage that can be obtained.

When the examination area is limited to one side of an austenitic weld, examination coverage does not comply with 10 CFR 50.55a(b)(2)(xv)(A), proficiency demonstrations do not comply with 10 CFR 50.55a(b)(2)(xvi)(B), and full coverage credit may not be claimed.

The subject welds were examined with a manual ultrasonic (UT) technique using pulse echo ultrasonic instruments and search units to achieve the maximum examination coverage practical. Personnel, equipment and procedures were qualified in accordance with ASME Section XI, Appendix VIII, as implemented by the Performance Demonstration Initiative (PDI).

There are currently no PDI qualified single-side examination procedures that demonstrate equivalency to two-sided examination procedures on austenitic piping welds. Current technology is not capable of reliably detecting or sizing flaws on the far side of an austenitic weld for configurations common to U.S. nuclear applications.

PDI Performance Demonstration Qualification Summary (PDQS) certificates for austenitic piping list the limitation that single-side examination is performed on a best effort basis. The best effort qualification is provided in place of a complete single-side qualification to demonstrate that the examiners' qualification and the subsequent weld examination are based on application of the best available technology.

Refracted longitudinal (RL) wave was typically used to investigate the far side of the weld to the greatest extent possible if the thickness of the pipe was greater than 0.5 inches. For piping 0.5 inches in thickness or less, a 70 degree sheer wave examination angle is used to interrogate the far side of the weld. Any indications seen with the RL or the additional angle used would have been noted and investigated.

The required examination volume of these welds was interrogated ultrasonically to the maximum extent possible. No alternative techniques or advanced technologies were considered feasible and/or capable of obtaining complete coverage of the examination volume.

- a. The 1-13 welds are the pipe to cold leg loop stop valve welds from the three reactor coolant pumps (RCPs). The pipe to valve configuration confines meaningful ultrasonic examination to one side only. Additionally, an identification plate restricts examination on the three pipe loops. This plate is depicted in Figures 4a2, page 2 of 2, and 4a3, page 2 of 3. Details are provided in Table 4a. The 1-13 welds fall within High Safety Significance (HSS) RI segments RC-010, RC-011, and RC-012 for Reactor Coolant System (RCS) Loops A, B and C, respectively, with a postulated failure mechanism of thermal fatigue. One sample weld (1-13) is required for each of the three segments. Only one alternate weld exists on each of the individual segments, weld 1-12, which is the RCP to pipe weld. The UT scanning area would again be restricted to one side of weld 1-12 due to the pump to pipe configuration and would provide approximately 50% coverage similar to the 1-13 weld coverage. Due to the excessively high dose rates in this area, it is not practical to attempt examination of welds 1-12, which would offer at best only 50% coverage. The similar Surry Unit 1 RCP to pipe 1-12 welds were examined on these segments in accordance with the Unit 1 Fourth Interval Risk Informed Program with only 48% coverage obtained for each weld.

There were no recordable indications (NRI) for any of the three 1-13 welds examined.

**TABLE 4a - Reactor Coolant Pipe to Valve Welds**

Drawing / Line# / ID Item / System / Risk Informed Segment	Pipe Material	Pipe Dia.	Weld Thickness (Nominal)	Coverage Achieved	Limitation / Results / Comments	Fig.
11548-WMKS-RC-10-1 / 27.5"-RC-309-2501R / 1-13 R1.11 / Reactor Coolant / Segment RC-012 "C" Loop	ASTM A-376, Type 316	27.5"	2.375"	49.5% (UT) 21% (UT Best Effort) 45 degree shear wave used, 60 degree RL also used	Single- sided, pipe to valve / NRI	4a1
11548-WMKS-RC-11-1 / 27.5"-RC-306-2501R / 1-13 R1.11 / Reactor Coolant / Segment RC-011 "B" Loop	ASTM A-376, Type 316	27.5"	2.375"	49% (UT) 23% (UT Best Effort) 45 degree shear wave used, 60 degree RL also used	Single- sided, pipe to valve / NRI	4a2

Drawing / Line# / ID Item / System / Risk Informed Segment	Pipe Material	Pipe Dia.	Weld Thickness (Nominal)	Coverage Achieved	Limitation / Results / Comments	Fig.
11548-WMKS-RC-12-1 / 27.5"-RC-309-2501R / 1-13 R1.11 / Reactor Coolant / Segment RC-010 "A" Loop	ASTM A- 376, Type 316	27.5"	2.375"	47% (UT) 24% (UT Best Effort) 45 degree shear wave used, 60 degree RL also used	Single- sided, pipe to valve, NRI	4a3

- b. The pipe welds discussed in this section were examined volumetrically by UT for thermal fatigue concerns (Item R1.11). Weld 2-35 was also examined for IGSCC. Pipe weld description, examination and limitation descriptions are provided in Table 4b.

#### Segment ECC-008

Weld 1-11 was fully UT examined with NRI in addition to weld 1-12BW. The portion of weld 1-12BW that was examined also revealed NRI. The five remaining welds assigned to this segment are Class 1, 2" socket welds and are covered by the VT-2 pressure test performed every refueling outage.

#### Segment RC-051

Weld 2-35 was examined with limited coverage as shown in Table 4b. This weld was also examined as part of the Augmented Program (AUG) for sensitized stainless steel as required by the Surry Technical Specifications (TS 2.1.1) and received a surface examination with NRI. In addition, the following welds on segment RC-051 were examined during the fourth interval:

- Weld 2-29 on line no. 4"-RC-315-1502; 100% RI ISI (also examined for AUG TS 2.1.1)
- Weld 2-30 on line no. 4"-RC-315-1502; 100% RI ISI (also examined for AUG TS 2.1.1 and received a PT examination)
- Weld 2-33 on line no. 4"-RC-315-1502; 100% RI ISI
- Weld 2-34 on line no. 4"-RC-315-1502; 100% RI ISI (also examined for AUG TS 2.1.1 and received a PT)

This segment was reassessed as Low Safety Significance (LSS) in Period 2; consequently, ISI examination requirements were terminated. Weld 2-35 continues to be addressed in the sensitized stainless steel Augmented Program (AUG TS 2.1.1), as do many of the welds assigned to this segment. None of the examinations revealed recordable indications.

**TABLE 4b - Risk Informed Pipe Welds, Stainless Steel**

<b>Drawing / Line# / ID / Item / System / Risk Informed Segment</b>	<b>Pipe Material</b>	<b>Pipe Dia.</b>	<b>Weld Thickness (Nominal)</b>	<b>Coverage Achieved</b>	<b>Limitation / Results/ Comments</b>	<b>Fig.</b>
11548-WMKS-0127J1 / 2-SI-274 / 1-12BW / R1.11 / Safety Injection / Segment ECC-008	Stainless Steel ASTM-376-TP316	2"	0.343"	75% (UT) 5% (UT Best Effort)	Single sided, pipe to reducer / NRI	4b1
11548-WMKS-0125A1 / 4-RC-315 / 2-35 / R1.16/R1.11 / Reactor Coolant / Segment RC-051	Stainless Steel ASTM-376-TP316	4"	0.438"	50% (UT) 32.4% (UT Best Effort)	UT- single sided, pipe to nozzle / NRI / PT- NRI / Also part of the sensitized stainless steel Augmented Program	4b2

- c. The pipe welds addressed in this section were ultrasonically examined for thermal fatigue (Item R1.11). Details are provided in Table 4c and in the referenced figures.

The pipe lines discussed in this section are currently analyzed and inspected under the guidelines of the Materials Reliability Program (MRP-146) for the management of thermal fatigue on normally stagnant non-isolable RCS branch lines. The MRP-146 Program is part of the Surry Augmented Inspection Program under which select welds and pipe areas receive periodic examination as required by the MRP guidelines. The MRP-146 Program did not exist when the initial Risk Informed Program was developed for SPS2; therefore, no credit was allocated for the MRP-146 Program.

### **Segment ECC-005**

Welds 1-08 and 1-09 were examined to meet the requirements of the RI Program. Weld 1-08 was examined volumetrically with no coverage limitations. Weld 1-09 was limited in coverage as shown in Table 4c. These are the only two welds on the segment. No indications were discovered on these welds.

### **Segment RC-042**

Examinations were performed on two welds on this segment, welds 1-02 and 1-03A on line 6-RC-319, both of which were limited as shown in Table 4c. Weld 1-03A was replaced in 2006 at which time a UT and PT examination were performed. No indications were found during any of these exams.

### **Segment RC-041**

In addition to the limited coverage examination completed on weld 1-03, weld 1-04B on segment RC-041, line 6-RC-317, was examined and met complete coverage requirements. The only remaining weld on this segment is a branch connection weld which would only provide limited coverage at best. There were no indications recorded during any of the examinations.

### **Segment RC-043**

Welds 1-02 and 1-03B were examined on line 6-RC-320 with limited coverage as shown in Table 4c. The only remaining weld on this segment is a branch connection, weld 1-01BC, which would only provide limited coverage at best. There were no indications recorded during any of the examinations.

### **Segment RC-018**

Weld 1-08 on line 6-RC-321 was examined with limited coverage. The following welds on segment RC-018, line 6-RC-321, were also UT examined and met code required coverage: welds 1-05, 1-06 and 1-07. There were no recordable indications noted on any examination.

### **Segment ECC-007**

Welds 1-09 and 1-11 were examined with limited coverage as shown in Table 4c and Figures 4c8 and 4c9. The only remaining weld on this segment, weld 1-10, was successfully examined to meet code coverage requirements. There were no recordable indications on any of these examinations.

### Segment RC-017

Branch connection weld 1-01BC was examined with limited coverage as shown in Table 4c and Figure 4c10. The following welds on segment RC-017, line 6-RC-318, were also examined and met code coverage requirements: welds 1-06, 1-07 and 1-08. There were no recordable indications noted on any of these examinations.

**TABLE 4c - Risk Informed Pipe Welds, Stainless Steel, MRP-146**

Drawing / Line# / ID / Item System Risk Informed Segment	Pipe Material	Pipe Dia.	Weld Thickness (Nominal)	Coverage Achieved	Limitation / Results / Comments	Fig.
11548-WMKS-0122H1 / 6-RC-316 / 1-09 R1.11 / Reactor Coolant Segment ECC-005	ASME Spec SA 376 TP 316	6"	0.562"	50% (UT) 12% (UT Best Effort)	UT- single sided, valve to pipe / NRI / Analyzed as part of Augmented Program MRP-146	4c1
11548-WMKS-0127J2 / 6-RC-319 / 1-02 R1.11 / Reactor Coolant Segment RC-042	ASME Spec SA 376 TP 316	6"	0.562"	50% (UT) 2.75% (UT Best Effort)	UT- single sided, elbow to weldolet / NRI / Analyzed as part of Augmented Program MRP-146	4c2
11548-WMKS-0127J2 / 6-RC-319 / 1-03A R1.11 / Reactor Coolant Segment RC-042	ASME Spec SA 376 TP 316	6"	0.562"	50% (UT) 13% (UT Best Effort)	UT- single sided, valve to elbow / NRI / Analyzed as part of Augmented Program MRP-146	4c3
11548-WMKS-0127J1 / 6-RC-317 / 1-03 R1.11 / Reactor Coolant Segment RC-041	ASME Spec SA 376 TP 316	6"	0.562"	50% (UT) 5.5% (UT Best Effort)	UT- single sided, elbow to nozzle / NRI / Analyzed as part of Augmented Program MRP-146	4c4
11548-WMKS-0127J3 / 6-RC-320 / 1-02 R1.11 / Reactor Coolant Segment RC-043	ASME Spec SA 376 TP 316	6"	0.562"	50% (UT) 14% (UT Best Effort)	UT- single sided, pipe to weldolet / NRI / Analyzed as part of Augmented Program MRP-146	4c5



Drawing / Line# / ID / Item System Risk Informed Segment	Pipe Material	Pipe Dia.	Weld Thickness (Nominal)	Coverage Achieved	Limitation / Results / Comments	Fig.
11548-WMKS-0127J3 / 6-RC-320 / 1-03B / R1.11 / Reactor Coolant Segment RC-043	ASME Spec SA 376 TP 316	6"	0.562"	50% (UT) 9% (UT Best Effort)	UT- single sided, pipe to valve / NRI / Analyzed as part of Augmented Program MRP-146	4c6
11548-WMKS-0122J1 / 6-RC-321 / 1-08 / R1.11 / Reactor Coolant Segment RC-018	ASME Spec SA 376 TP 316	6"	0.562"	50% (UT) 6% (UT Best Effort)	UT- single sided, elbow to valve / NRI / Analyzed as part of Augmented Program MRP-146	4c7
11548-WMKS-0122J1 / 6-RC-321 / 1-09 / R1.20 / Reactor Coolant Segment ECC-007	ASME Spec SA 376 TP 316	6"	0.562"	50% (UT) 6% (UT Best Effort)	UT- single sided, valve to elbow / NRI / Analyzed as part of Augmented Program MRP-146	4c8
11548-WMKS-0122J1 / 6- RC-321 / 1-11 / R1.20 / Reactor Coolant Segment ECC-007	ASME Spec SA 376 TP 316	6"	0.562"	50% (UT) 11% (UT Best Effort)	UT- single sided, valve to pipe / NRI / Analyzed as part of Augmented Program MRP-146	4c9
11548-WMKS-0122K1-1 / 6-RC-318 / 1-01BC / R1.20 / Reactor Coolant Segment RC-017	ASME Spec SA 376 TP 316	6"	0.562"	50% (UT) 23.7% (UT Best Effort)	UT- single sided, weldolet to pipe / NRI / Analyzed as part of Augmented Program MRP-146	4c10

## 5. Burden Caused by Compliance

Compliance with the Code requirements would require extensive modification or replacement of components with a design that would allow full examination from both sides of the weld. This option to rebuild components is considered impractical and would cause unnecessary radiation exposure. Furthermore, plant equipment could be impacted in a detrimental manner.

## **6. Proposed Alternative and Basis for Use**

The subject welds received a volumetric examination to the maximum extent practical utilizing the best available techniques. With the incorporation of the PDI for Supplement 2, demonstration for best effort coverage was made for single-sided examination from the accessible side of the weld. Additionally, these components are monitored for through wall leakage as part of the ASME XI System Pressure Test Program and receive visual (VT-2) examination as required by Section XI, Table IWB-2500-1, Category B-P for Class 1 components and IWC-2500-1 at the end of every refueling outage.

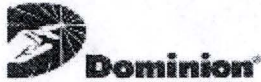
None of the pipe or weld material is constructed with Alloy 600/82/182 materials; therefore, there are no primary water stress corrosion cracking (PWSCC) concerns. In addition, there are no known through-wall failures on the welds discussed in this section at SPS2.

Based on the volumetric coverage that was obtained with acceptable results, the routinely performed visual (VT-2) examinations, and the fact that multiple welds were examined on each risk informed segment, or, in the case discussed in Section 4.a where welds were examined on all three similar loops, it is reasonable to conclude that service induced degradation would have been detected. Therefore, these proposed alternatives provide an acceptable level of quality and safety by providing reasonable assurance of structural integrity of the subject welds. Accordingly, Dominion requests relief in accordance with 10 CFR 50.55a(g)(5)(iii).

## **7. Duration of Proposed Alternative**

This proposed alternative is requested to meet requirements for the fourth ten-year inspection interval for SPS2, which began May 10, 2004 and ended on May 9, 2015.

LMT-R01  
Fig 4a1  
page 1 of 1



Report No: UT-14-059

Summary # S2.R1.11.369

Pg. 4 of 4

Prepared by: W. Thomas

Date: 05/08/2014

DEANUS P. STELLINGSMA MS 5-11-2014

Weld Number  
Thickness

1-13

2.36"

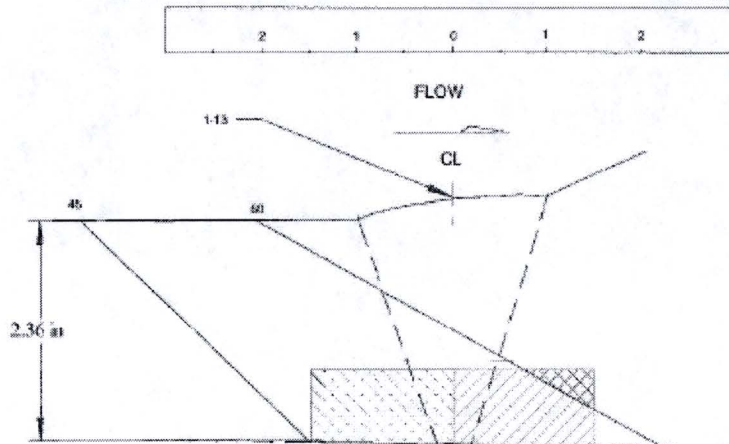
Weld Width  
Weld Length

2"

84.5"

☒ Reviewed  
☐ Witnessed

5/12/14  
7933  
HSB GS



1.18 SQ. IN. X 94.8" LENGTH = 99.75 CU. IN. = REQUIRED EXAM VOLUME US AND DS SIDES  
EXAM LIMITED US SIDE FOR TWO INCHES DUE TO WELDED PAD  
EXAMINED 1.18 SQ. IN. X 82.5" LENGTH = 87.35 CU. IN. / 99.75 = 0.88 X 100 = 98%  
US SIDE AX DIRECTION  
EXAMINED 1.02 SQ. IN. BEST EFFORT DS SIDE AX DIRECTION  
1.02 X 82.5 = 84.15 CUBIC IN. / 99.75 = 0.84 X 100 = 84% DS SIDE AX DIRECTION

Examination Volume Dimensions - Height 0.787" Length 84.5" Width 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	98%	100%		0%
60L			*84%	
Code Coverage Total				49.5%
98+100+0+84=282/4=70.5				*Best Effort Coverage (Max 25%) Total
				21%

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.



## Supplemental Report

Report No.: UT-12-099

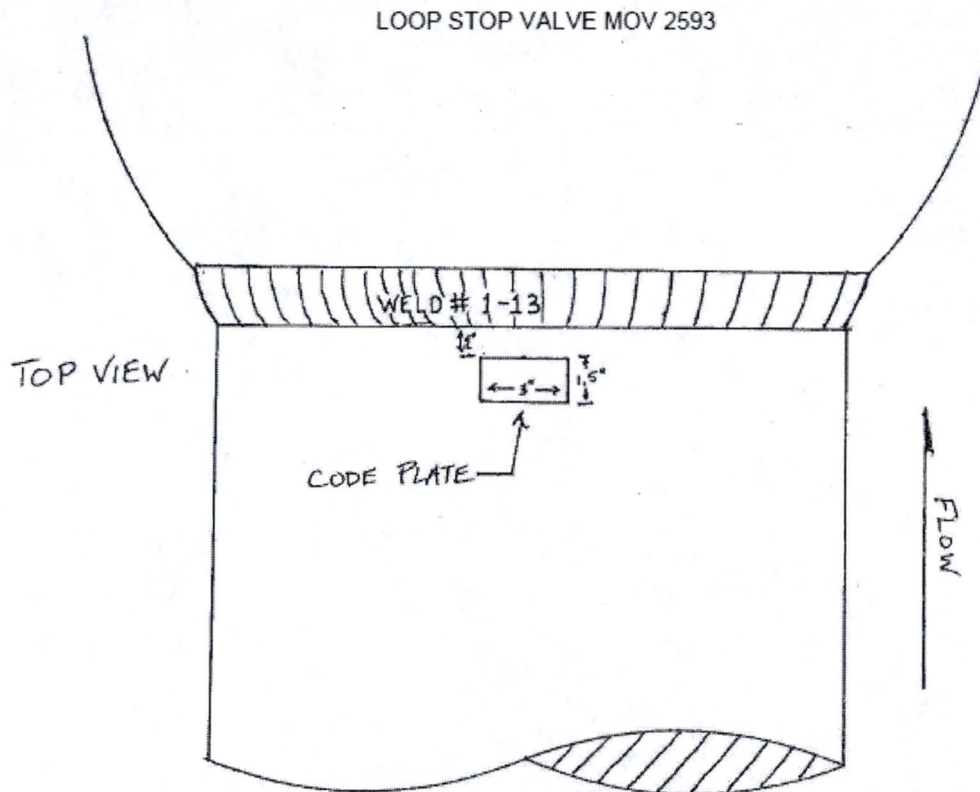
Page: 4 of 4

Summary No.: S2.R1.11.479

Examiner: Kilpela, Jamie	Level: II-PDI	Reviewer: W.L. Thomas	Date: 11-11-12
Examiner: N/A	Level: N/A	Site Review: Raymond T. Shack	Date: 11/13/12
Other: N/A	Level: N/A	ANII Review:	Date:

Comments: 3" of axial scan obstructed for both 45° and 60° RL due to Code Plate @ TDC.  
Dimensions: 3"x1.5", Plate is 1" upstream of toe of weld.

Sketch or Photo:



Additional - Supplemental Reports

W.L. Thomas  
ANII 11/15/12



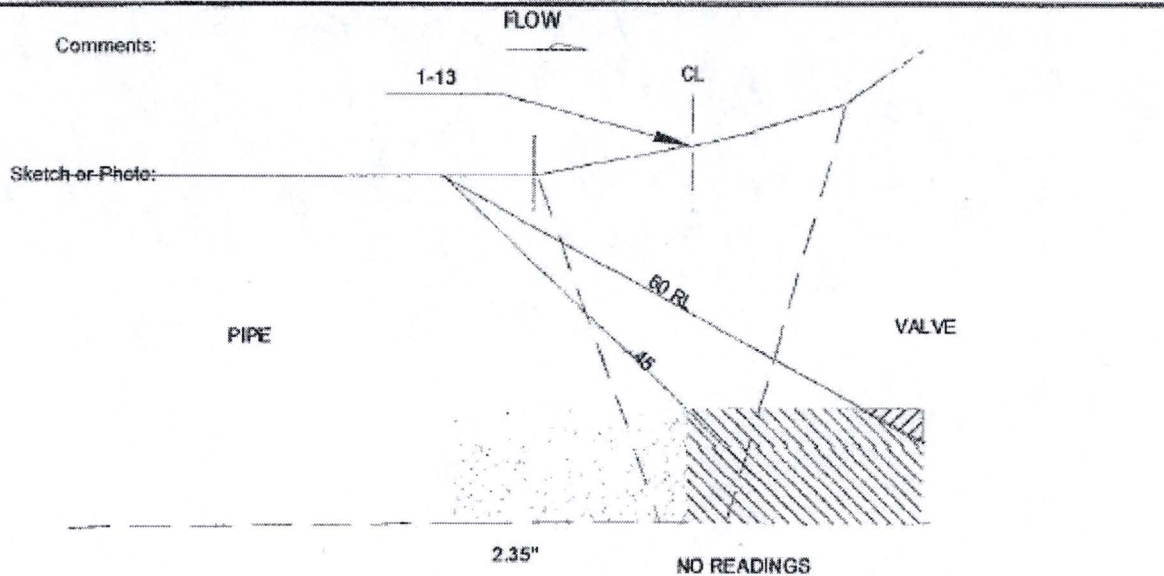


# Supplemental Report

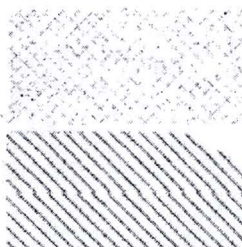
Report No.: UT-09-134  
Page: 3 of 6

Summary No.: S2.R1.11.522

Examiner: <u>Muirhead, Ryan L.</u>	Level: <u>II-PDI</u>	Reviewer: <u>WAYNE THOMAS</u>	Date: <u>11-22-09</u>
Examiner: <u>DiValerio, Paul E.</u>	Level: <u>II</u>	Site Review: <u>R. CHRIS WRAY R. CHLEY</u>	Date: <u>11-22-09</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>Al. Smith</u>	Date: <u>11/24/09</u>



TOTAL CODE REQUIRED VOLUME = 199 CUBIC INCHES



EXAMINATION AREA US SIDE AXIAL DIRECTION  
 $99.5 - 5.265 = 94.235 / 99.5 = .947 \times 100 = 94.7\%$

BEST EFFORT EXAMINATION AREA DS AXIAL DIRECTION  
 $99.5 - 5.49 = 94 / 99.5 = .945 \times 100 = 94.5\%$



NO EXAMINATION .05 SQ. IN. X 84.78" LENGTH = 4.24 CUBIC IN.

CIRC EXAMINATION US SIDE SAME AS US AXIAL DIRECTION - 94.7%



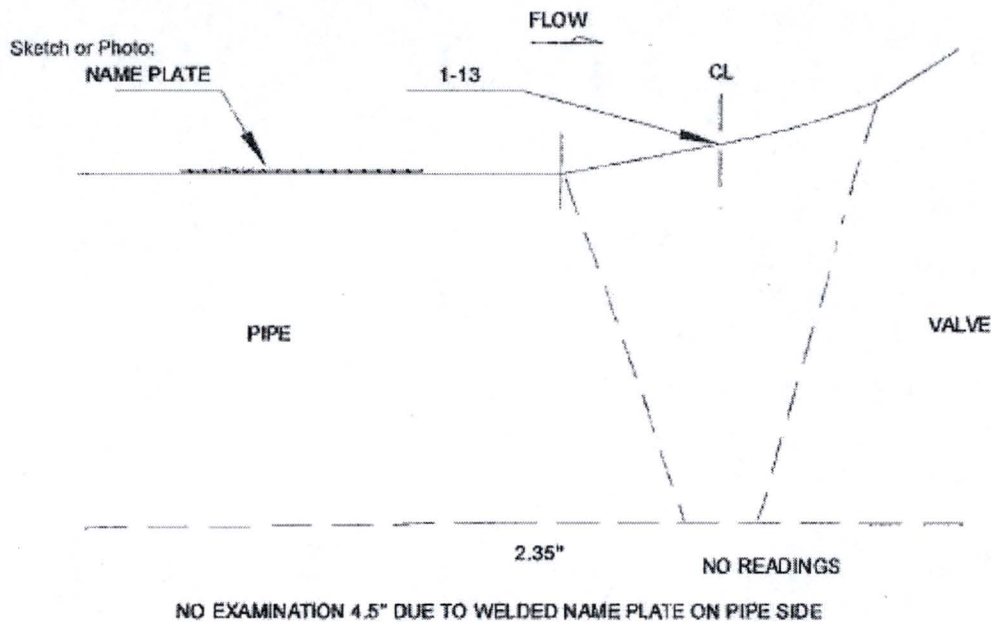
## Supplemental Report

Report No.: UT-09-134  
Page: 4 of 6

Summary No.: S2.R1.11.522

Examiner: <u>Muirhead, Ryan L.</u>	Level: <u>II-PDI</u>	Reviewer: <u>WAYNE THOMAS</u>	Date: <u>8-22-09</u>
Examiner: <u>DiValerio, Paul E.</u>	Level: <u>II</u>	Site Review: <u>R. CHRIS WEAR</u>	Date: <u>11-22-09</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>Al. Smith</u>	Date: <u>11/22/09</u>

Comments:







## Supplemental Report

Report No.: UT-09-134

Page: 5 of 6

Summary No.: S2.R1.11.522

Examiner: Muirhead, Ryan L. *[Signature]* Level: II-PDI Reviewer: WAYNE THOMAS *[Signature]* Date: 11-22-09  
Examiner: DiValerio, Paul E. *[Signature]* Level: II Site Review: R. CHRIS WRAY *[Signature]* Date: 11-22-09  
Other: N/A Level: N/A ANII Review: Al. Smith *[Signature]* Date: 11/22/09

Comments:

### COVERAGE SUMMARY

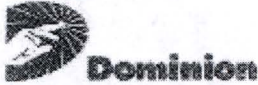
Sketch or Photo: Weld Number 1-13  
Weld Thickness 2.375" NOM  
Weld Length 84.78"  
Weld Width 2"

SEE ATTACHED COVERAGE PLOT

Examination Volume Dimensions - Height .783" Length 84.78" Width 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	94.7%	94.7%		0%
60			*94.5%	
Code Coverage Total				<u>50%</u>
* Best Effort Coverage (Max 25%) Total				<u>24%</u>
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.				

47%  
49%  
RCW  
4-6-16



Report No: UT-12-125

Summary # S2.R1.11.186

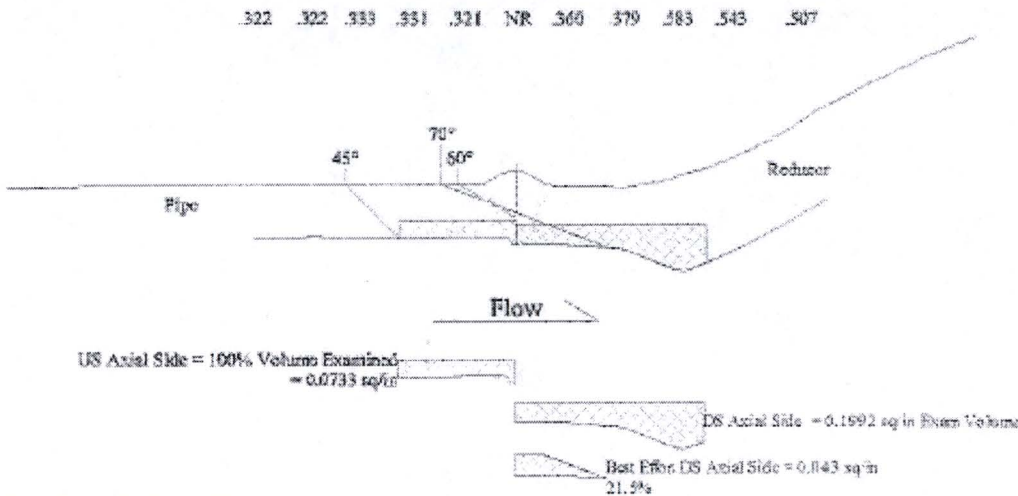
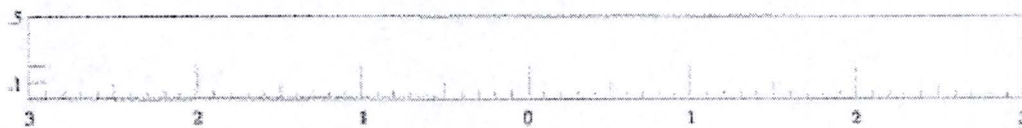
Pg. 5 of 6

Prepared by: T. Carraher

Date: 11/16/2012

*all*  
*NAS ANFF*  
*11/14/12*

Weld Number 1-128W Weld Width 0.4"  
Thickness 0.333 Weld Length 7.5"



$$100 + 100 + 100 + 21.5 = 321.5 / 4 = 80\%$$

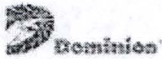
Examination Volume Dimensions - Height 0.111 Length 7.5 Width 1.85

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%	100%
70			21.5%	
			<i>41.1%</i>	
Code Coverage Total				75%
Best Effort Coverage (Max 25%) Total				5%

**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.





# Supplemental Report

Report No.: UT-06-175

Page: 2 of 2

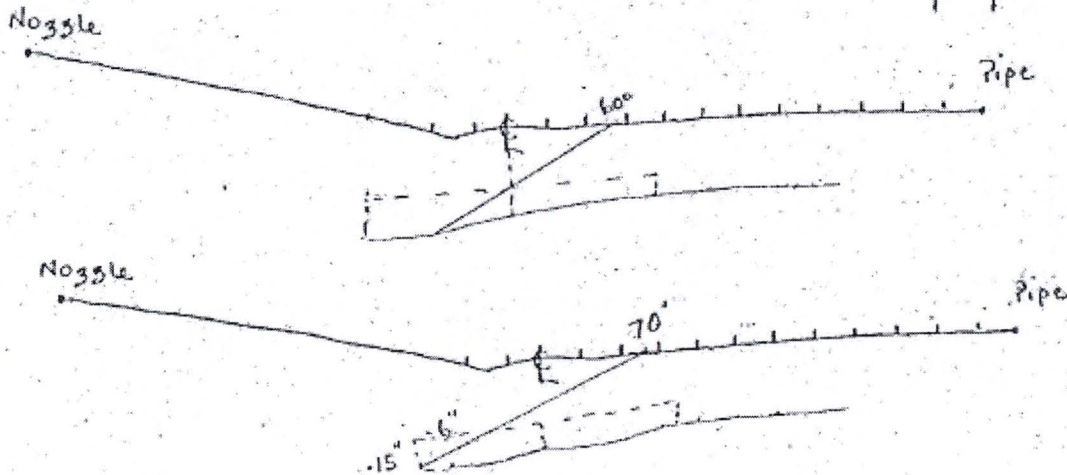
Summary No.: S2.R1.16/R1.11.057

Examiner: <u>Lester, Robert M</u>	Level: <u>II-PDI</u>	Reviewer: <u>N/A</u>	Date: _____
Examiner: <u>Poster, Harry E</u>	Level: <u>II-PDI</u>	Site Review: <u>Dennis P. Strickland</u>	Date: <u>11/28/2006</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>[Signature]</u>	Date: <u>4/5/07</u>

Comments: Limitation due to pipe to nozzle configuration. CODE COVERAGE-60 degree axial upst.-100%, axial dnst.-0%, cw upst.-100%, ccw upst.-100%, cw dnst.-0% and ccw dnst.-0%. Total=50%. BEST EFFORT EXAM W/70 degree-32.4% additional coverage on the far side.

Sketch or Photo:

	US	LS	70
CW		50%	
CCW		50%	
UPSTREAM		50%	
DOWNSTREAM			
			32.4% B.E.



CODE COVERAGE 50%  
BEST EFFORT COVERAGE 10.8%

WIC-.70"  
LENGTH OF BOX=1.7"  
HEIGHT OF BOX=.15"  
AREA OF BOX=.255  
AREA MISSED BY 70°=17.6%  
ADDITIONAL AREA GAINED BY 70°-50°-17.6°=  
32.4%

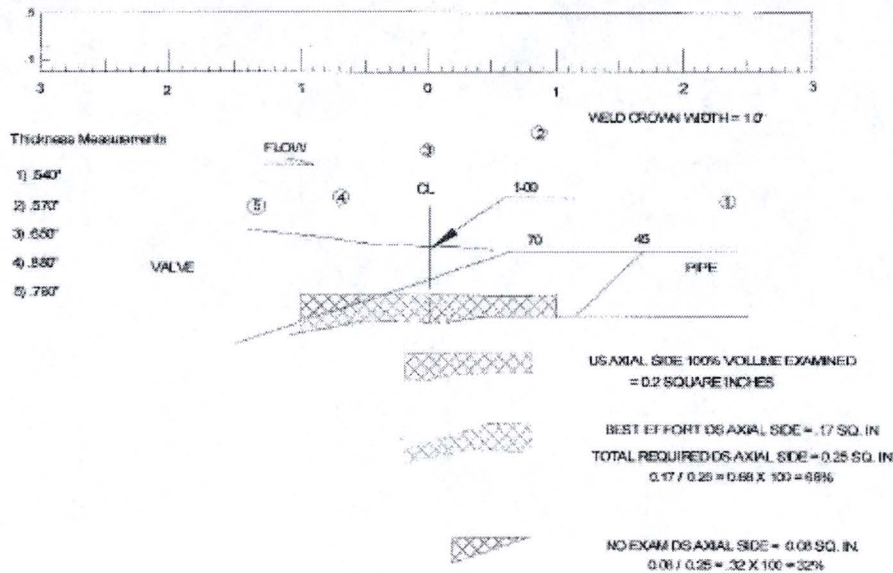
LMT-R01  
Fig 4c1  
page 1 of 1



Report No. UT-11-021  
Summary No. S2.R1.11.074  
Pg. 4 of 4  
Prepared By: TRAVIS THOMAS  
Date: 4/29/2011

Weld Number 1-09  
Weld Thickness .562"

Weld Length 22"  
Weld Width 1.25"



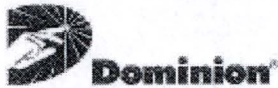
TOTAL RISK INFORMED EXAMINATION AREA = .37 SQUARE INCHES

Examination Volume Dimensions - Height 0.187 Length 22" Width 2.0"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
Angle	Up-St-Ax	Up-St-Circ	Dn-St-Ax	Dn-St-Circ
45 / 70	100%		0%	
45 / 60		100%		0%
70	BEST EFFORT = 12%			
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				12%
<b>Notes:</b> 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.				

*Handwritten:* AN II 5/7/11





Report No: UT-14-045

Summary # S2R1.11.193.

Pg. 5 of 5

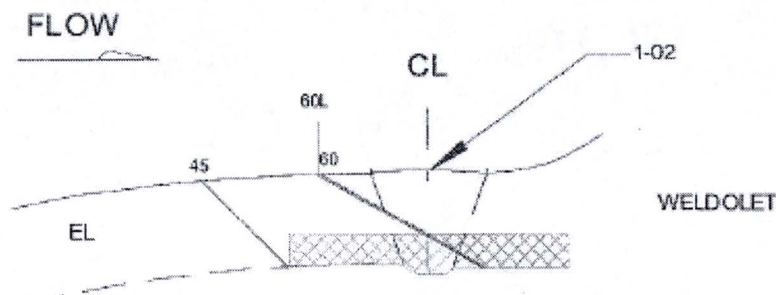
Prepared by: W. Thomas

Date: 05/03/2014

☒ Reviewed  
☐ Witnessed

5/10/14  
7933  
HSB GS

Weld Number	1-02	Weld Width	0.7"
Thickness	0.559"	Weld Length	21.25"



0.186" HT X 0.85" WIDTH = 0.158 SQ. IN. REQUIRED EXAM VOLUME US AND DS SIDES.

EXAMINED 100% OF THE REQUIRED VOLUME US SIDE

EXAMINED 0.018 SQ. IN BEST EFFORT DS SIDE AX DIRECTION  
0.018 / 0.158 = 0.11 X 100 = 11%

NO EXAM DS SIDE AX DIRECTION FOR 89%

Examination Volume Dimensions - Height 0.186" Length 21.25" Width 1.7"

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			*11%	
Code Coverage Total				50%
100+100+0+11=211/4=52.75				*Best Effort Coverage (Max 25%) Total 2.75%

Notes:

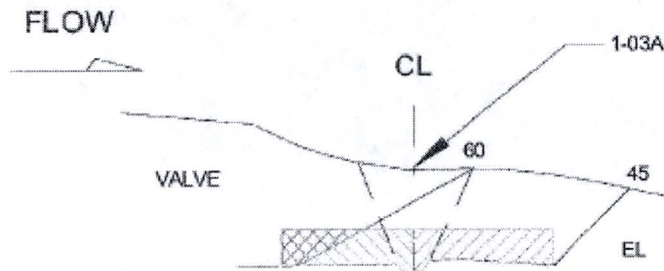
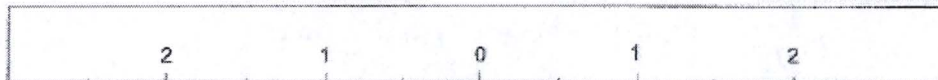
- 1) Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure.
- 2) Best Effort Coverage refers to the required examination volume past the weld centerline that is examined in the axial beam direction with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



Report No: UT-14-058  
Summary # S2.R1.11.950  
Pg. 5 of 5  
Prepared by: W. Thomas  
Date: 05/01/2014

LMT-R01  
Fig 4c3  
Page 1 of 1  
Reviewed  
Witnessed  
5/12/14  
7933  
HSB GS

Weld Number 1-03A Weld Width 0.75"  
Thickness 0.585" Weld Length 19.68"



0.195" HT X .875" WIDTH = 0.17 SQ. IN. =REQUIRED EXAM VOLUME  
US AND DS SIDES

EXAMINED 100% OF THE DS SIDE

EXAMINED 0.09 SQ. IN US SIDE AX DIRECTION BEST EFFORT  
.09 / .17 = 0.53 X 100 = 53% BEST EFFORT US SIDE AX DIR.

NO EXAMINATION FOR 47% US SIDE AX DIRECTION.

Examination Volume Dimensions - Height 0.195" Length 19.68" 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		0%	100%	100%
60L	*53%			
100+100+53+0=253/4=63%				Code Coverage Total
				50%
				*Best Effort Coverage (Max 25%) Total
				13%

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.



LMT-R01  
Fig 4c4  
page 1 of 1



## Supplemental Report

Report No.: UT-09-155

Page: 4 of 5

Summary No.: S2.R1.11.177

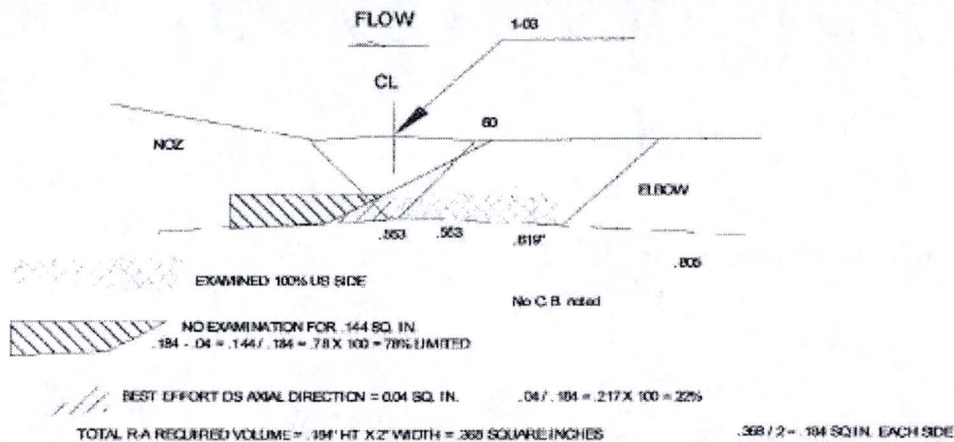
Examiner: Thomas, Travis W. T.T. Level: II-PDI Reviewer: WAYNE THOMAS Date: 11-22-09  
Examiner: Zollner, Brian D. BZ Level: II-PDI Site Review: R-CHRIS WRAY R.Cherry Date: 11-22-09  
Other: N/A Level: N/A ANII Review: Al. Smith Date: 11/22/09

Comments:

### COVERAGE SUMMARY

Weld Number 1-03  
Weld Thickness .553" (.562"nom)  
Weld Length 21"  
Weld Width 1"

Sketch or Photo:



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%
60 RL			*22%	
Code Coverage Total				50%
* Best Effort Coverage (Max 25%) Total				5.5%
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.				

Examination Volume Dimensions - Height .184" Length 21" Width 2"

$$100 + 100 + 0 + 22 = 222 / 4 = 55.5\%$$

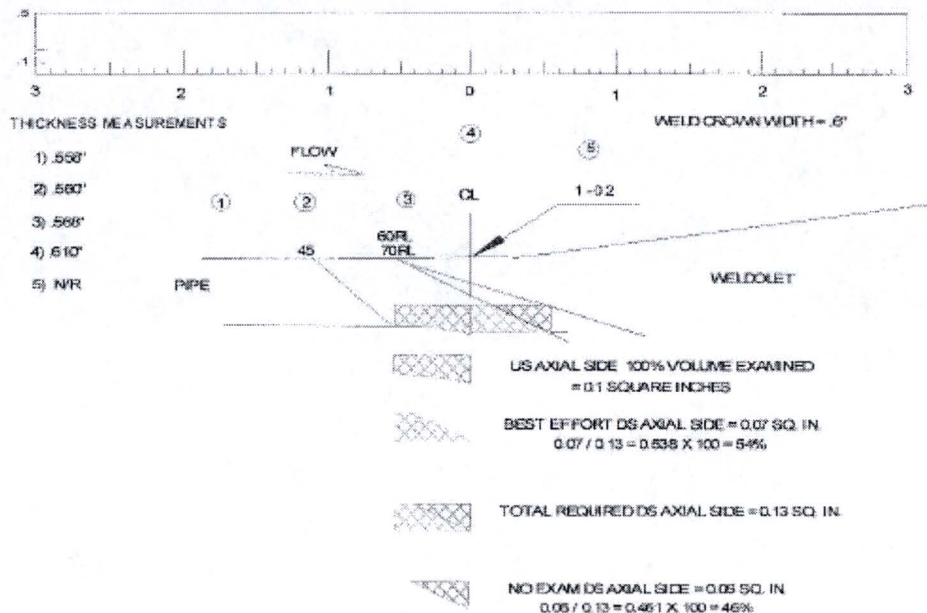
LMT-R01  
Fig 4c5  
page 1 of 1



Report No. UT-11-057  
Summary No. S2.R1.11.210  
Pg. 5 of 5  
Prepared By: TRAVIS THOMAS  
Date: 5/5/2011

Weld Number 1-02  
Weld Thickness .562"

Weld Length 21"  
Weld Width .6"



TOTAL EXAMINATION AREA = .23 SQUARE INCHES

Examination Volume Dimensions - Height .187" Length 21" Width .6"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
Angle	Up-St-Ax	UpSt-Circ	DnSt-Ax	Dn-St-Circ
45 / 60	100%		0%	
45 / 60		100%		0%
60 RL	BEST EFFORT = 14%			
70 RL	BEST EFFORT = 25%			
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				14%
<b>Notes:</b> 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.				

*Handwritten signature:* M. Smith  
ANIT 5/7/11

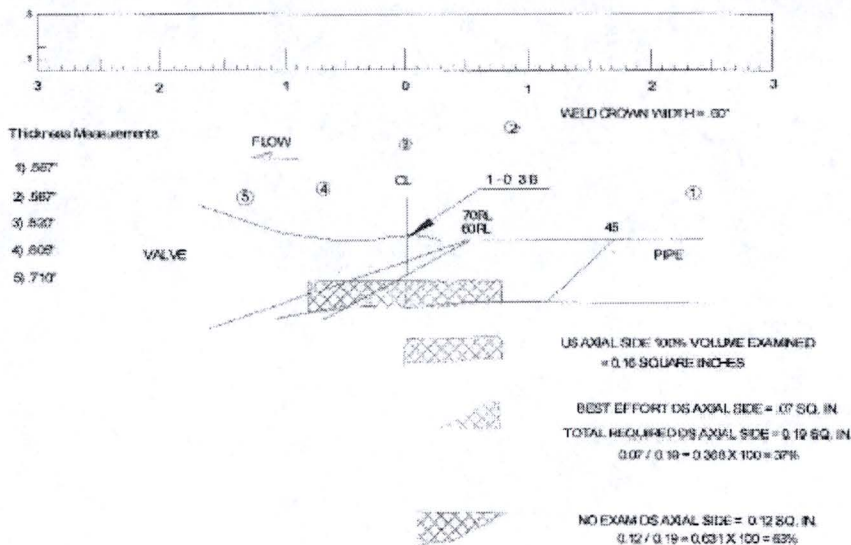


LMT-R01  
Fig 4c8  
page 1 of 1



Report No. UT-11-058  
Summary No. S2.R1.11.211  
Pg. 5 of 5  
Prepared By: TRAVIS THOMAS  
Date: 5/3/2011

Weld Number 1-03B  
Weld Thickness .562"  
Weld Length 21.0"  
Weld Width .6"



TOTAL RISK INFORMED EXAMINATION AREA = .35 SQUARE INCHES

Examination Volume Dimensions - Height .187" Length 21" Width 1.6"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
Angle	Up-St-Ax	UpSt-Circ	DnSt-Ax	Dn-St-Circ
45 / 60	100%		0%	
45 / 60		100%		0%
60	BEST EFFORT = 9%			
70	BEST EFFORT = 22%			
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				9%
<b>Notes:</b> 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.				

*Handwritten signature: A. Smith*  
*Handwritten date: 5/7/11*



# Supplemental Report

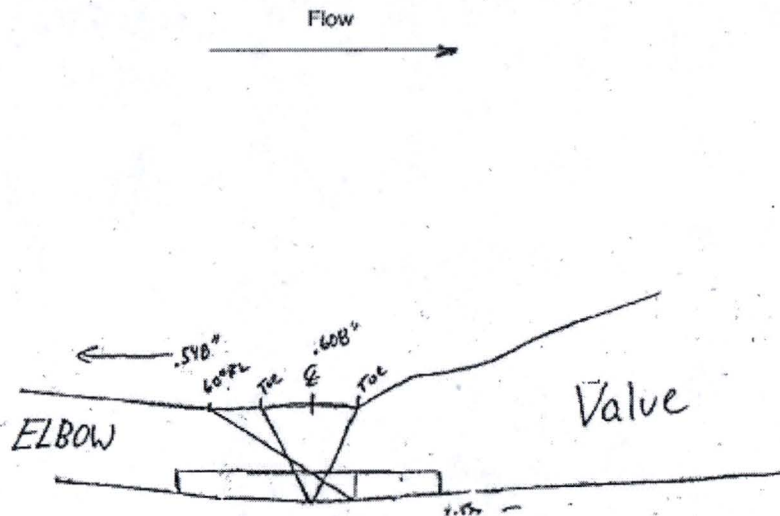
Report No.: UT-06-047  
Page: 2 of 2

Summary No.: S2.R1.11.082

Examiner: <u>Cage, Norman</u>	Level: <u>II-PDI</u>	Reviewer: <u>N/A</u>	Date: <u></u>
Examiner: <u>Tolosky, Ryan J</u>	Level: <u>III</u>	Site Review: <u>Robert Davies LIII</u>	Date: <u>11/5/2006</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>Al Smith</u>	Date: <u>11/5/06</u>

## Comments:

Weld Number 1-08  
Weld Thickness .6"  
Weld Length 19"



Box Dimensions = H .19" L 1.65

Angle	UpSt- Ax	UpSt- CW	UpSt- CCW	DnSt- Ax	DnSt- CW	DnSt- CCW
60°SHEAR	100%	100%	100%	N/A	N/A	N/A
60°RL	N/A	N/A	N/A	6%	0%	0%

Code Coverage Total 50% (50% max)  
Best Effort Coverage Total 6% (50% max)





# Supplemental Report

Report No.: UT-06-045

Page: 2 of 2

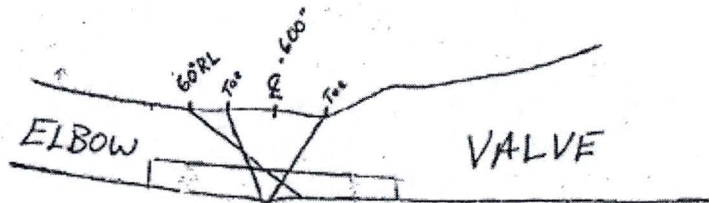
Summary No.: S2.R1.11.083

Examiner: <u>Cage, Norman</u>	Level: <u>II-PDI</u>	Reviewer: <u>N/A</u>	Date: _____
Examiner: <u>Tolosky, Ryan J</u>	Level: <u>III</u>	Site Review: <u>Robert Davies LIT</u>	Date: <u>11/5/2016</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>Al Smith</u>	Date: <u>11/5/16</u>

Comments:

Weld Number 1-09  
Weld Thickness .6"  
Weld Length 19"

Flow  
←



Box Dimensions = H .19" L 1.65"

Angle	UpSt- Ax	UpSt- CW	UpSt- CCW	DnSt- Ax	DnSt- CW	DnSt- CCW
60° RL	N/A	N/A	N/A	100%	100%	100%
60° RL	67%	0%	0%	N/A	N/A	N/A

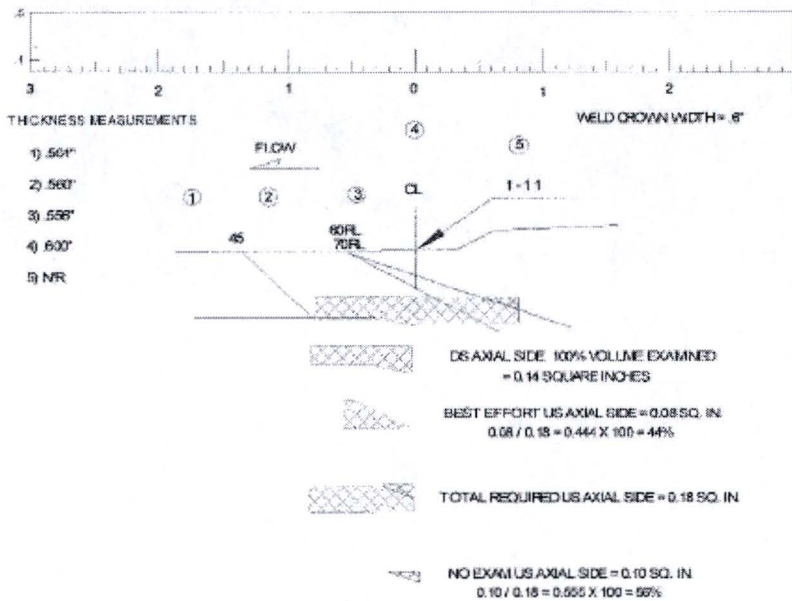
Code Coverage Total 50% (50% max)  
Best Effort Coverage Total 67% (50% max)

LMT-R01  
Fig 4c9  
page 1 of 1



Report No. UT-11-055  
Summary No. S2.R1.11.085  
Pg. 5 of 5  
Prepared By: TRAVIS THOMAS  
Date: 5/3/2011

Weld Number 1-11  
Weld Thickness .562"  
Weld Length 21"  
Weld Width .6"



TOTAL RISK INFORMED EXAMINATION AREA = .32 SQUARE INCHES

Examination Volume Dimensions - Height .187" Length 21" Width 1.6"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
Angle	Up-St-Ax	UpSt-Circ	DnSt-Ax	Dn-St-Circ
45 / 60	0%		100%	
45 / 60		0%		100%
60	BEST EFFORT = 11%			
70	BEST EFFORT = 22%			
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				11%
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.			

*TRAVIS THOMAS*  
5/7/11



LMT-R01  
Fig 4c10  
page 1 of 1



Report No: UT-14-068

Summary # S2.R1.11.086

Pg. 4 of 4

Prepared by: W. Thomas

Date: 05/05/2014

Weld Number  
Thickness

1-01BC  
1.925"

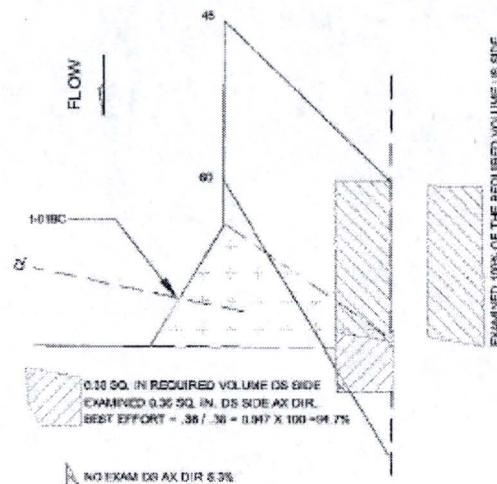
Weld Width  
Weld Length

1.6"  
30.5"



☒ Reviewed  
☐ Witnessed

5/11/14  
7933  
HSB GS



Examination Volume Dimensions - Height 0.642" Length 30.5" Width 2.6"

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%
60			*94.7%	
100+100+94.7+0=294.7/4=73.7				Code Coverage Total
				50%
				*Best Effort Coverage (Max 25%) Total
				23.7%

**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.

**Attachment 2**

**RELIEF REQUEST LMT-SS01**  
**EXAMINATION CATEGORY C-F-1**  
**PIPING WELDS ON STAINLESS STEEL PIPING**

**Virginia Electric and Power Company**  
**(Dominion)**  
**Surry Power Station Unit 2**



**Dominion**

**Surry Power Station Unit 2**

**4<sup>th</sup> 10-Year Inservice Inspection Interval  
May 10, 2004 – May 9, 2015**

**Stainless Steel Pipe Welds: Non-Alloy 600 / 82 / 182**

**Relief Request LMT-SS01**

**Repetitive/Duplicate Relief Requests in Accordance with 10 CFR 50.55a(g)(5)(iii)  
Inservice Inspection Impracticality**

**1. ASME Code Components Affected**

ASME Code Class:	Code Class 2
Examination Category:	C-F-1, Pressure Retaining Welds in Austenitic Stainless Steel High Alloy Piping
Item Numbers:	C5.11, Circumferential Welds: Piping Welds $\geq 3/8$ in. (10mm), Nominal Wall Thickness for Piping >NPS 4 (DN 100)  C5.21, Circumferential Welds: Piping Welds $> 1/5$ in. (5mm), Nominal Wall Thickness for Piping $\geq$ NPS 2 (DN 50) and $\leq$ NPS 4 (DN 100)
Component Identification:	Refer to Table 4a
Material:	Refer to Table 4a

**2. Applicable Code Edition and Addenda**

1998 Edition with 2000 Addenda of ASME Section XI

**3. Applicable Code Requirement**

ASME Section XI, Examination Category C-F-1, Items C5.11 and C5.21, require 100 percent (%) volumetric (UT- ultrasonic) and surface examination (PT- liquid penetrant) coverage for circumferential piping welds. The alternative requirements of ASME Section XI, Code Case N-460, approved for use in Regulatory Guide 1.147, Rev. 17, allows credit for essentially 100% coverage of the weld provided greater than 90% of the required volume or area has been examined.

The Unit 2 Risk Informed Program does not apply to ASME Section XI Class 2 components discussed in this relief request.

10 CFR 50.55a(b)(2)(xv)(A) requires the following examination coverage criteria when applying Supplement 2 to Appendix VIII:

- (1) Piping must be examined in two axial directions and when examination in the circumferential direction is required, the circumferential examination must be performed in two directions, provided access is available....
- (2) Where examination from both sides is not possible, full coverage credit may be claimed from a single side for ferritic welds. Where examination from both sides is not possible on austenitic welds..., full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix VIII demonstration using flaws on the opposite side of the weld....

10 CFR 50.55a(b)(2)(xvi)(B) requires that examinations performed from one side of a ferritic or stainless steel pipe weld must be conducted with equipment, procedures, and personnel that have demonstrated proficiency with single-side examinations. To demonstrate equivalency to two-sided examinations, the demonstration must be performed to the requirements of Appendix VIII as modified by this paragraph and §50.55a(b)(2)(xv)(A).

#### **4. Impracticality of Compliance**

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the essentially 100% volumetric examination coverage requirement for austenitic piping welds with single-side access.

The subject welds were examined with a manual ultrasonic technique using pulse echo ultrasonic instruments and search units to achieve the maximum examination coverage practical. Examinations were performed using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII as implemented by the Performance Demonstration Initiative (PDI).

There are currently no PDI qualified single-side examination procedures that demonstrate equivalency to two-sided examination procedures on austenitic piping welds. Current technology is not capable of reliably detecting or sizing flaws on the far side of an austenitic weld for configurations common to US nuclear applications.

PDI Performance Demonstration Qualification Summary (PDQS) certificates for austenitic piping list the limitation that single-side examination is performed on a best

effort basis. The best effort qualification is provided in place of a complete single-side qualification to demonstrate that the examiners' qualification and the subsequent weld examination are based on application of the best available technology.

Refracted longitudinal (RL) wave was typically used to investigate the far side of the weld to the greatest extent possible if the thickness of the pipe was greater than 0.5 inches. For piping 0.5 inches in thickness or less a 70 degree sheer wave examination angle is used to interrogate the far side of the weld. Any indications seen with the RL or the additional angle used would have been noted and investigated.

When the examination volume is limited to one side of an austenitic weld, examination coverage does not comply with 10 CFR 50.55a(b)(2)(xv)(A), proficiency demonstrations do not comply with 10 CFR 50.55a(b)(2)(xvi)(B), and full coverage credit may not be claimed.

The ASME code required volume of these welds was interrogated ultrasonically to the maximum extent possible. No alternative methods or advanced technologies were considered capable of obtaining complete coverage of the examination volume.

Since the configuration of the piping limits access to a single side, relief is requested on complying with the essentially 100% required examination coverage for the piping welds listed in Table 4a. Note that the examination coverage listed is that which was obtained during the examination with no credit taken for the far side of each weld in which the examination from that side could not be performed.

Supplemental scanning was performed to provide additional best effort (non-code) coverage as documented in the table and figures.

Surface examinations were performed in addition to the volumetric examinations except where Code Case N-663, "Alternative Requirements for Classes 1 and 2 Surface Examinations," was determined to apply. Table 4a indicates if a surface exam (PT) was performed, the coverage achieved, and the examination results. Where indicated in Table 4a, welds are also inspected as part of the SPS Augmented Inspection Program and will continue to be governed by these noted inspection programs.

**TABLE 4a**  
(\*No Best Effort Examination Recorded)

Drawing / Line# / ID Item System	Pipe Material	Pipe Dia.	Weld Thickness (Nominal)	Coverage Achieved	Limitation / Results / Comments	Fig.
11548-WMKS-SI-1 / 12-SI-201 / 0-03 / C5.11 Safety Injection	ASME Spec. SA 312 TP 304	12"	0.375"	19% (UT)* 80% (PT)	UT - one sided and interference with grout, elbow to valve / NRI / PT - no coverage in area of 23" to 31" due to proximity to concrete wall / NRI	4a1
11548-WMKS-SI-1 / 12- SI-201 / 0-05 C5.11 Safety Injection	ASME Spec. SA 312 TP 304	12"	0.375"	38% (UT) 3.5% (UT Best Effort) 77.5% (PT)	UT - one sided and interference with grout, valve to tee / NRI / PT - no coverage in area of 24" to 33" due to proximity to concrete wall / NRI	4a2
11548-WMKS-SI-1 / 12- SI-202 / 0-13 C5.11 Safety Injection	ASME Spec. SA 312 TP 304	12"	0.375"	46% (UT) 4.33% (UT Best Effort) 100% (PT)	UT - one sided, elbow to valve / NRI / PT / NRI	4a3
11548-WMKS-SI-1 / 12- SI-202 / 0-16 C5.11 Safety Injection	ASME Spec. SA 312 TP304	12"	0.375"	39.5% (UT) 0% (UT Best Effort) 100% (PT)	UT - one sided, tee to valve / NRI / PT / NRI	4a4
11548-WMKS-SI-10 / 3- SI-270 / 0-08 C5.21 Safety Injection	ASME Spec. SA 312 TP304	3"	0.438"	85.5% (UT) 14.5% (UT Best Effort)	UT - one sided, elbow to tee / NRI / CC N-663 applied, no surface exam required.	4a5



Drawing / Line# / ID Item System	Pipe Material	Pipe Dia.	Weld Thickness (Nominal)	Coverage Achieved	Limitation / Results / Comments	Fig.
11548-WMKS-SI-12A / 3-SI-272 / 2-08B / C5.21 / Safety Injection	ASME Spec. SA 312 TP304	3"	0.438"	50% (UT) 22.5% (UT Best Effort) 100% (PT)	UT - one sided, pipe to valve / NRI / PT / NRI	4a6
11548-WMKS-SI-12A / 3-SI-272 / 2-09A / C5.21 / Safety Injection	ASME Spec. SA 312 TP304	3"	0.438"	50% (UT) 20.5% (UT Best Effort) 100% (PT)	UT - one sided, valve to pipe / NRI / PT / NRI	4a7
11548-WMKS-SI-15 / 3-SI-346 / 0-02 / C5.21 / Safety Injection	ASME Spec. SA 312 TP304	3"	0.438"	50% (UT) 19.5% (UT Best Effort) 100% (PT)	UT - one sided, reducer to valve / NRI / PT / NRI	4a8
11548-WMKS-SI-15 / 3-SI-346 / 0-03 / C5.21 / Safety Injection	ASME Spec. SA 312 TP304	3"	0.438"	50% (UT) 22% (UT Best Effort) 100% (PT)	UT - one sided, valve to pipe / NRI / PT / NRI	4a9
11548-WMKS-SI-16 / 3-SI-347 / 2-01 / C5.21 / Safety Injection	ASME Spec. SA 312 TP304	3"	0.438"	50% (UT) 22% (UT Best Effort)	UT - one sided, reducer to valve / NRI / CC N-663 applied, no surface exam required	4a10
11548-WMKS-SI-18 / 3-SI-347 / 0-19 / C5.21 / Safety Injection	ASME Spec. SA 312 TP304	3"	0.438"	50% (UT) 16.7% (UT Best Effort)	UT - one sided, pipe to valve / NRI / CC N-663 applied, no surface exam required	4a11
11548-WMKS-SI-2 / 3-SI-270 / 1-12 / C5.21 / Safety Injection	ASME Spec. SA 312 TP304	3"	0.438"	43% (UT) 10.6% (UT Best Effort)	UT - one sided, pipe to valve / NRI / CC N-663 applied, no surface exam required	4a12
11548-WMKS-SI-37 / 16-SI-205 / 0-02 / C5.11 / Safety Injection	ASME Spec. SA 312 TP304	16"	0.375"	50% (UT) 14% (UT Best Effort) 100% (PT)	UT - one sided, valve to elbow / NRI / PT / NRI	4a13

Drawing / Line# / ID Item System	Pipe Material	Pipe Dia.	Weld Thickness (Nominal)	Coverage Achieved	Limitation / Results / Comments	Fig.
11548-WMKS-SI-4 / 12-SI-205 / 0-15 / C5.11 / Safety Injection	ASME Spec. SA 312 TP304	12"	0.375"	43% (UT) 4.66% (UT Best Effort)	UT - one sided, valve to reducer / NRI / CC N-663 applied, no surface exam required	4a14
11548-WMKS-0117A1-1 / 14-RH-102 / 2-15 C5.11 Residual Heat Removal	ASME Spec. SA 358 TP304	14"	0.438"	50% (UT) 12.5% (UT Best Effort) 100% (PT)	UT - one sided, pipe to pump / NRI / PT / NRI	4a15
11548-WMKS-0117A1-1 14-RH-118 / 2-25 / C5.11 / Residual Heat Removal	ASME Spec. SA 358 TP304	14"	0.438"	50% (UT) 25% (UT Best Effort) 100% (PT)	UT - one sided, elbow to valve / NRI / PT / NRI	4a16
11548-WMKS-0117B1 / 12-RH-112 / 2-06A / C5.11 / Residual Heat Removal	ASME Spec. SA 312 TP304	12"	0.375"	50% (UT) 20% (UT Best Effort)	UT - one sided, pipe to flange / NRI / CC N-663 applied, no surface exam required	4a17
11548-WMKS-0122H1 / 6-SI-249 / 2-01 / C5.11 / Safety Injection	ASME Spec. SA 376 TP316	6"	0.562"	50% (UT) 16% (UT Best Effort)	UT - one sided, pipe to valve / NRI / CC N-663 applied, no surface exam required	4a18
11548-WMKS-0122J1 / 6-SI-250 / 2-01 / C5.11 / Safety Injection	ASME Spec. SA 376 TP316	6"	0.562"	50% (UT) 14% (UT Best Effort)	UT - one sided, pipe to valve / NRI / CC N-663 applied, no surface exam required	4a19
11548-WMKS-0122K1-2 / 6-SI-249 / 3-13 / C5.11 / Safety Injection	ASME Spec. SA 376 TP316	6"	0.562"	50% (UT) 25% (UT Best Effort)	UT - one sided, pipe to valve / NRI / CC N-663 applied, no surface exam required	4a20

Drawing / Line# / ID Item System	Pipe Material	Pipe Dia.	Weld Thickness (Nominal)	Coverage Achieved	Limitation / Results / Comments	Fig.
11548-WMKS-0122K1-2 6-SI-249 / 5-35 / C5.11 / Safety Injection	ASME Spec. SA 376 TP316	6"	0.562"	50% (UT) 22% (UT Best Effort)	UT - one sided, valve to pipe / NRI / CC N-663 applied, no surface exam required	4a21
11548-WMKS-0123L1 / 12-CS-102 / 0-09 / C5.11 / Containment Spray	ASME Spec. SA 312 TP304	12"	0.375"	50% (UT) 10% (UT Best Effort)	UT - one sided, elbow to flange / NRI / CC N-663 applied, no surface exam required	4a22
11548-WMKS-0123M1 / 12-CS-101 / 0-06 / C5.11 / Containment Spray	ASME Spec. SA 312 TP304	12"	0.375"	50% (UT) 6% (UT Best Effort)	UT - one sided, pipe to valve / NRI / CC N-663 applied, no surface exam required	4a23
11548-WMKS-0123N1Z 12-RS-107 / 0-01 / C5.11 / Recirculation Spray	ASME Spec. SA 312 TP304	12"	0.375"	26% (UT) 0% (UT Best Effort)	UT - one sided, pipe to valve / NRI / CC N-663 applied, no surface exam required	4a24
11548-WMKS-0123N1Z 12-RS-107 / 0-02 / C5.11 / Recirculation Spray	ASME Spec. SA 312 TP304	12"	0.375"	50% (UT) 25% (UT Best Effort)	UT - one sided, pipe to valve / geometric Indication dispositioned to original construction, not service induced / CC N-663 applied, no surface exam required	4a25
11548-WMKS-0123N1Z 12-RS-108 / 0-04 / C5.11 / Recirculation Spray	ASME Spec. SA 312 TP304	12"	0.375"	45% (UT) 3% (UT Best Effort)	UT - one sided, pipe to flange / NRI / CC N-663 applied, no surface exam required	4a26

Drawing / Line# / ID Item System	Pipe Material	Pipe Dia.	Weld Thickness (Nominal)	Coverage Achieved	Limitation / Results / Comments	Fig.
11548-WMKS-0123N1Z 12-RS-108 / 0-05 / C5.11 / Recirculation Spray	ASME Spec. SA 312 TP304	12"	0.375"	50% (UT) 21.5% (UT Best Effort)	UT - one sided, valve to elbow / geometric Indication dispositioned to original construction, not service induced / CC N-663 applied, no surface exam required	4a27
11548-WMKS-0127C2 / 10-SI-352 / 1-08 / C5.11 / Safety Injection	ASME Spec. SA 376 TP316	10"	1.00"	50% (UT) 31.3% (UT Best Effort)	UT - one sided, valve to pipe / NRI / CC N-663 applied, no surface exam required	4a28
11548-WMKS-0127C2 / 10-SI-348 / 2-12 / C5.11 / Safety Injection	ASME Spec. SA 376 TP316	10"	1.00"	50% (UT) 24.7% (UT Best Effort)	UT - one sided, valve to reducer / NRI / CC N-663 applied, no surface exam required	4a29
11548-WMKS-0127J1 / 6-SI-345 / 2-01 / C5.11 / Safety Injection	ASME Spec. SA 376 TP316	6"	0.562"	50% (UT) 4.5% (UT Best Effort)	UT - one sided, pipe to valve. / NRI / CC N-663 applied, no surface exam required	4a30
11548-WMKS-0127J2 / 6-SI-344 / 3-01 / C5.11 / Safety Injection	ASME Spec. SA 376 TP316	6"	0.562"	50% (UT) 1% (UT Best Effort)	UT - one sided, pipe to valve / NRI / CC N-663 applied, no surface exam required	4a31
11548-WMKS-0127J5 / 6-SI-345 / 1-05 / C5.22 / Safety Injection	ASME Spec. SA 376 TP316	6"	0.562"	71% (UT) 4.25% (UT Best Effort)	UT - one sided, pipe to elbow / NRI / CC N-663 applied, no surface exam required	4a32



Drawing / Line# / ID Item System	Pipe Material	Pipe Dia.	Weld Thickness (Nominal)	Coverage Achieved	Limitation / Results / Comments	Fig.
11548-WMKS-CH-11 / 3-CH-303 / 1-03 / C5.21 / Charging	ASME Spec. SA 312 TP304	3"	0.438"	50% (UT) 14% (UT Best Effort) 100% (PT)	UT - one sided, flange to pipe / NRI / PT / NRI Also examined as part of the SPS sensitized stainless steel Augmented Program and will continue to undergo inspection under this program in the future interval.	4a33
11548-WMKS-CH-11 / 3-CH-303 / 1-10 / C5.21 / Charging	ASME Spec. SA 312 TP304	3"	0.438"	50% (UT) 10% (UT Best Effort)	UT - one sided, pipe to tee / NRI / CC N-663 applied, no surface exam required.	4a34
11548-WMKS-CH-11 / 3-CH-303 / 1-12 / C5.21 / Charging	ASME Spec. SA 312 TP304	3"	0.438"	50% (UT) 23% (UT Best Effort) 100% (PT)	UT - one sided, valve to elbow / NRI / PT / NRI / Also examined as part of the SPS sensitized stainless steel Augmented Program and will continue to undergo inspection under this program in the future interval.	4a35

Drawing / Line# / ID Item System	Pipe Material	Pipe Dia.	Weld Thickness (Nominal)	Coverage Achieved	Limitation / Results / Comments	Fig.
11548-WMKS-CH-11 / 3-CH-302 / 2-03 / C5.21 Charging	ASME Spec. SA 312 TP304	3"	0.438"	40% (UT) 14.3% (UT Best Effort)	UT - one sided, flange to pipe / NRI CC N-663 applied, no surface exam required	4a36
11548-WMKS-CH-11 / 3-CH-302 / 2-05A / C5.21 / Charging	ASME Spec. SA 312 TP304	3"	0.438"	40% (UT) 15.5% (UT Best Effort)	UT - one sided, valve to pipe / NRI CC N-663 applied, no surface exam required	4a37
11548-WMKS-CH-11 / 3-CH-381 / 3-03 / C5.21 / Charging	ASME Spec. SA 312 TP304	3"	0.438"	50% (UT) 25% (UT Best Effort)	UT - one sided, flange to pipe / NRI / CC N-663 applied, no surface exam required	4a38
11548-WMKS-CH-11 / 3-CH-381 / 3-04A / C5.21 / Charging	ASME Spec. SA 312 TP304	3"	0.438"	43.3% (UT) 10% (UT Best Effort)	UT - one sided, valve to pipe / NRI / CC N-663 applied, no surface exam required	4a39
11548-WMKS-CH-11 / 3-CH-381 / 3-05A / C5.21 / Charging	ASME Spec. SA 312 TP304	3"	0.438"	43.3% (UT) 15.6% (UT Best Effort)	UT- one sided, valve to pipe / NRI / CC N-663 applied, no surface exam required	4a40
11548-WMKS-CH-18 / 3-CH-371 / 0-08 / C5.21 / Charging	ASME Spec. SA 312 TP304	3"	0.438"	76% (UT) 4.95% (UT Best Effort)	UT- due to support interference / NRI / CC N-663 applied, no surface exam required	4a41

Drawing / Line# / ID Item System	Pipe Material	Pipe Dia.	Weld Thickness (Nominal)	Coverage Achieved	Limitation / Results / Comments	Fig.
11548-WMKS-CH-24 / 3-CH-413 / 0-16 / C5.21 / Charging	ASME Spec. SA 312 TP304	3"	0.438"	50% (UT) 25% (UT Best Effort)	UT- one sided, pipe to tee. / NRI / CC N-663 applied, no surface exam required.	4a42

#### 5. Burden Caused by Compliance

Compliance with the Code requirements would require extensive modification or replacement of components with a design that would allow full examination from both sides of the weld. This option to rebuild components is considered impractical and would cause unnecessary radiation exposure. Furthermore, plant equipment could be impacted in a detrimental manner.

#### 6. Proposed Alternative and Basis for Use

The subject welds received a volumetric examination to the maximum extent practical using the best available techniques. With the incorporation of the PDI for Supplement 2, demonstration for best effort coverage was made for single-sided examination from the accessible side of the weld. Additionally, these components are monitored for through wall leakage as part of the ASME Section XI System Pressure Test Program and receive visual (VT-2) examination as required by Section XI, IWC-2500-1, Category C-H, for Class 2 components. Surface examinations were also performed where shown in Table 4a.

None of the pipe or weld material is constructed with Alloy 600/82/182 materials; therefore, there are no primary water stress corrosion cracking (PWSCC) concerns. There are no known through-wall failures on the welds discussed in this section at SPS2. Any indications were recorded and dispositioned as geometric or construction related.

Based on the obtained volumetric coverage with acceptable results, the routinely performed visual (VT-2) examinations, and the fact that Best Effort coverage and/or surface examinations were also performed; it is reasonable to conclude that service induced degradation would have been detected. Therefore, these proposed alternatives provide an acceptable level of quality and safety by providing reasonable assurance of structural integrity of the subject welds. Accordingly, Dominion requests relief in accordance with 10 CFR 50.55a(g)(5)(iii).

**7. Duration of Proposed Alternative**

This proposed alternative is requested to meet requirements for the fourth ten-year inspection interval for SPS2, which began May 10, 2004 and ended on May 9, 2015.





## Supplemental Report

LMT-SS01  
Fig 4a1  
page 1 of 1

Report No.: UT-06-084

Page: 2 of 2

Summary No.: S2.C5.11.842

Examiner: Odegard, Jeffrey D	Level: III	Reviewer: N/A	Date:
Examiner: Tolosky, Ryan J	Level: III	Site Review: [Signature]	Date: 11/15/06
Other: N/A	Level: N/A	ANII Review: [Signature]	Date: 11/19/06

Comments: 70 degree shear wave code coverage on upstream side.  
Axially 48%, clockwise 48% and counter clockwise 48% for a total of 19%.  
The total includes limited access due to grout on pipe from 23" to 31".

Sketch or Photo:



## Supplemental Report

Report No.: UT-06-125

Page: 2 of 2

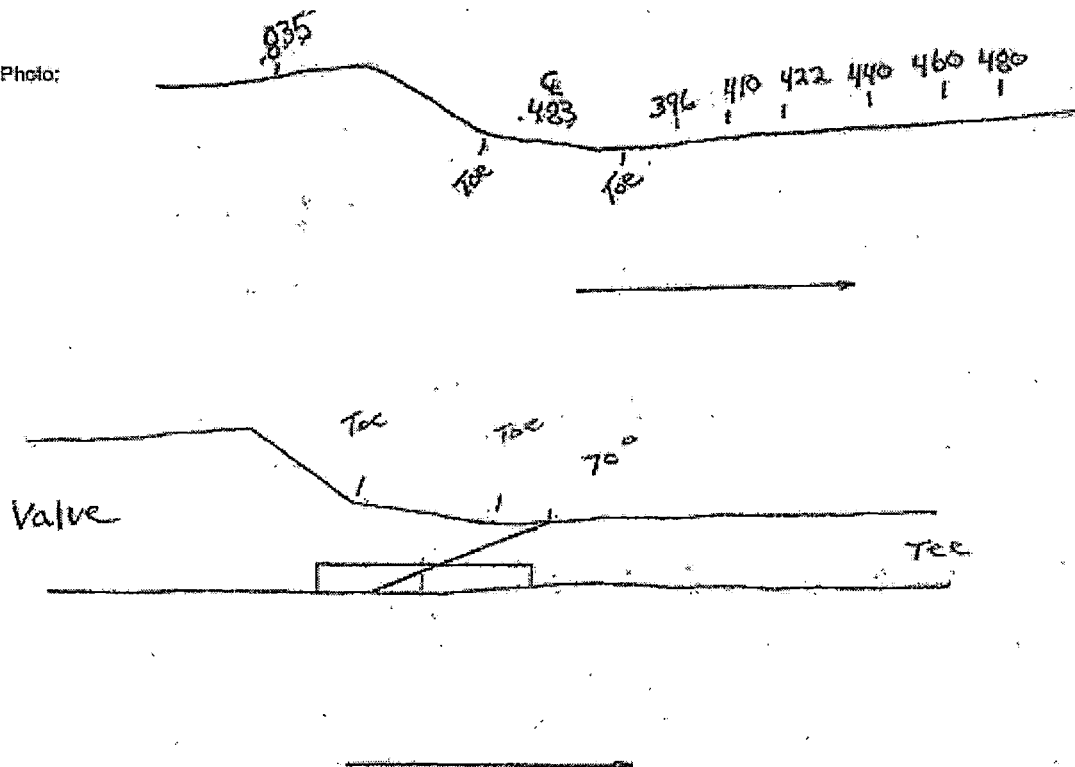
Summary No.: S2.C5.11.844

Examiner: <u>Odegard, Jeffrey D</u>	Level: <u>III</u>	Reviewer: <u>N/A</u>	Date: _____
Examiner: <u>Tolosky, Ryan J</u>	Level: <u>III</u>	Site Review: <u>[Signature]</u>	Date: <u>11/13/06</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>[Signature]</u>	Date: <u>11/14/06</u>

Comments: 70 degree shear wave code coverage on upstream side.  
Axially 99%, Clockwise 99% and counter clockwise 99% for a total 38%. The total also includes limited access due to grout on pipe from 24" to 33".

### WELD 0-05

Sketch or Photo:



LMT-SS01

Fig 4a3  
page 1 of 1



## Supplemental Report

Report No.: UT-06-087

Page: 2 of 2

Summary No.: S2.C5.11.851

Examiner: Odegard, Jeffrey D

Level: III

Reviewer: N/A

Date:

Examiner: Tolosky, Ryan J

Level: III

Site Review: Dennis P. Smith

Date: 11/15/06

Other: N/A

Level: N/A

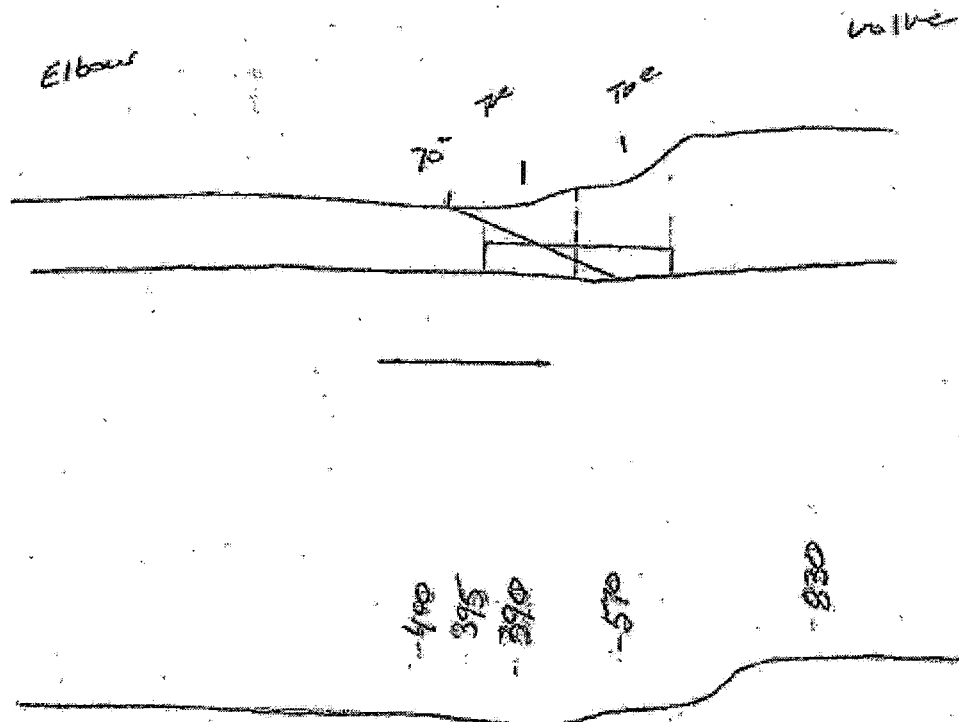
ANII Review: W. Smith

Date: 11/19/06

Comments: 70 degree shear wave code coverage for upstream side.  
Axially 92%, clockwise 92% and counter clockwise 92% for a total of 46%.

### WELD 0-13

Sketch or Photo:



LMT-SS01

Fig 4a4  
page 1 of 1

## Supplemental Report



Report No.: UT-06-090

Page: 2 of 2

Summary No.: S2.C5.11.854

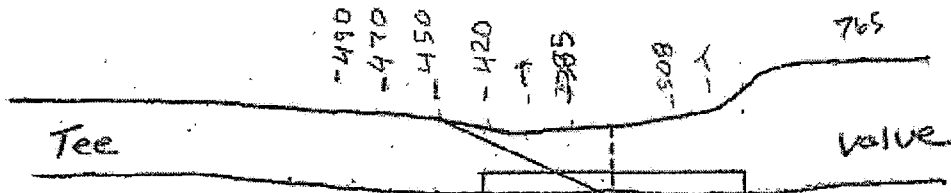
Examiner: <u>Odegard, Jeffrey D</u>	Level: <u>III</u>	Reviewer: <u>N/A</u>	Date: <u></u>
Examiner: <u>Tolosky, Ryan J</u>	Level: <u>III</u>	Site Review: <u>DEVIOL STRICKLAND</u>	Date: <u>11/11/06</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>Al. Strickland</u>	Date: <u>11/14/06</u>

Comments: 70 degree code coverage for upstream side.

Axially 79%, clockwise 79% and counter clockwise 79% for a total of 39.5%.

### WELD 0-16

Sketch or Photo:







# Supplemental Report

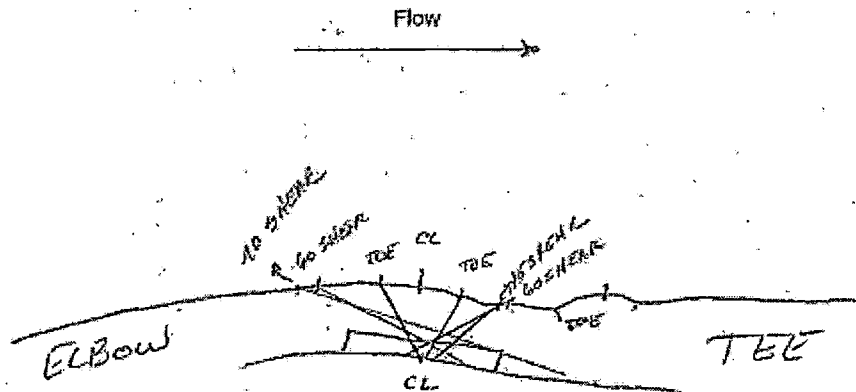
Report No.: UT-06-026  
Page: 2 of 2

Summary No.: S2.C5.21.164

Examiner: Cage, Norman Level: II-PDI Reviewer: N/A Date:   
Examiner: Odegard, Jeffrey D Level: III Site Review: Robert Davies LIII Date: 11/05/2006  
Other: N/A Level: N/A ANII Review: RA. Smith Date: 11/16/06

Comments: For Cal. Sheets 26,74&126

Weld Number 0-08  
Weld Thickness .45"  
Weld Length 10"

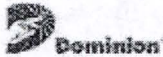


Box Dimensions = H .15 L 1.0

	Angle	UpSt- Ax	UpSt- CW	UpSt- CCW	DnSt- Ax	DnSt- CW	DnSt- CCW
DUAL	60° SHEAR	100%	100%	100%	7%	100%	100%
DUAL	45° SHEAR	N/A	N/A	N/A	5%	N/A	N/A
SINGLE	70° SHEAR				100% BEST EFFORT		

Code Coverage Total 85.5%  
Best Effort Coverage Total 14.5%

LMT-SS01  
Fig 4a8  
page 1 of 1



## Supplemental Report

Report No.: UT-09-102

Page: 4 of 4

Summary No.: S2.C5.21.222

Examiner: Zollner, Brian D. *BZ*

Level: II-PDI

Reviewer: *Wayne T. Thomas*

Date: 11-7-09

Examiner: N/A

Level: N/A

Site Review: *Raymond T. Stalk*

Date: 11-11-09

Other: N/A

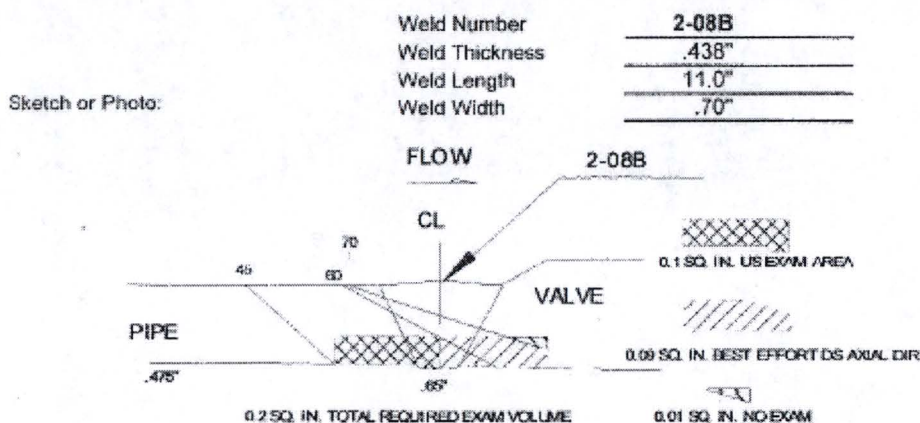
Level: N/A

ANII Review: *Ali Smith*

Date: 11/20/09

Comments:

### COVERAGE SUMMARY



$$100 + 100 + 0 + 90 = 290 / 4 = 72.5\%$$

Examination Volume Dimensions - Height .16" Length 11" Width 1.2"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
ANGLE	UpSt-Ax	UpSt-Circ	DnSt-Ax	DnSt-Circ
45		100%		0%
60	100%			
70			*90%	
Code Coverage Total				50%
* Best Effort Coverage (Max 25%) Total				22.5%
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.				

THICKNESS AND CONTOUR TAKEN FROM  
PREVIOUS DATA.





## Supplemental Report

Report No.: UT-09-103  
Page: 4 of 4

Summary No.: S2.C5.21.223

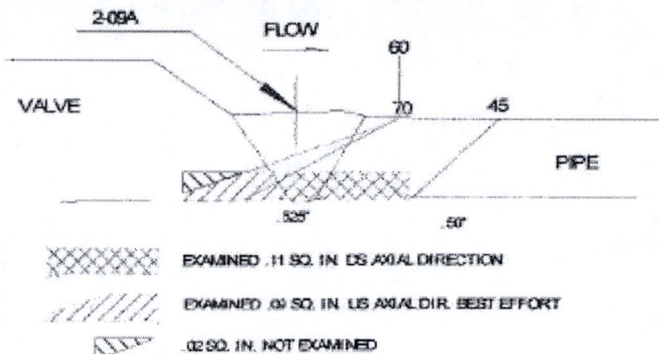
Examiner: Zollner, Brian D. *BZ* Level: II-PDI Reviewer: WAYNE THOMAS *WTH* Date: 11.12.09  
Examiner: N/A Level: N/A Site Review: R. CHRIS WRAT *RCW* Date: 11.22.09  
Other: N/A Level: N/A ANII Review: *Ch. Smith* Date: 11/22/09

### Comments:

Weld Number 2-09A  
Weld Thickness .525" (.438" NOM)  
Weld Length 11.0"  
Weld Width .75"

0.22 SQ. IN. TOTAL REQUIRED VOLUME

Sketch or Photo:

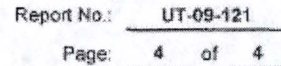


$$100 + 100 + 0 + 82 = 282 / 4 = 70.5\%$$

Examination Volume Dimensions - Height .17" Length 11" Width 1.25"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
ANGLE	UpSt-Ax	UpSt-Circ	DnSt-Ax	DnSt-Circ
45		0%		100%
60			100%	
70	*82%			
Code Coverage Total				50%
* Best Effort Coverage (Max 25%) Total				20.5%
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.				

THICKNESS AND CONTOUR TAKEN FROM  
PREVIOUS DATA.



Examiner: Zollner, Brian D. BD Level: II-PDI Reviewer: WAYNE THOMAS WT Date: 11-11-09  
Examiner: Thomas, Travis W. T.T. Level: II-PDI Site Review: RAYMOND T. STUCK RS Date: 11-11-09  
Other: N/A Level: N/A ANII Review: AL. Smith AS Date: 11/20/09

Weld Number	0-02
Weld Thickness	.438"
Weld Length	11.0"
Weld Width	.675"

Examination Volume Dimensions - Height	.158"	Length	11"	Width	1.175"
--	-------	--------	-----	-------	--------

THICKNESS AND CONTOUR TAKEN FROM  
PREVIOUS DATA.





## Supplemental Report

Report No.: UT-09-122  
Page: 4 of 4

Summary No.: S2.C5.21.243

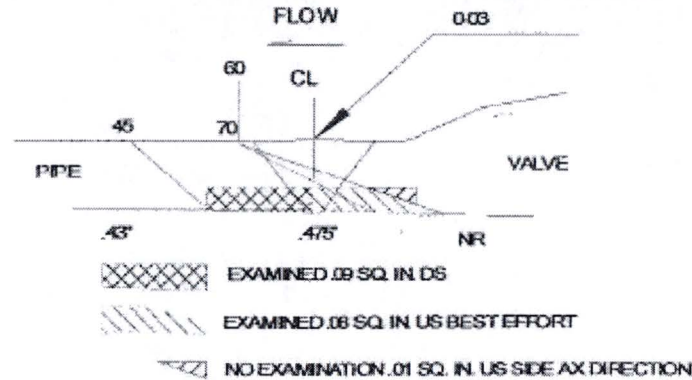
Examiner: Zollner, Brian D. *BZ* Level: II-PDI Reviewer: WYNG THOMAS *WT* Date: 11.13.09  
Examiner: Thomas, Travis W. *T.T.* Level: II-PDI Site Review: Raymond T. Stuck *RS* Date: 11/19/09  
Other: N/A Level: N/A ANII Review: Al Smith *AS* Date: 11/20/09

### COVERAGE SUMMARY

Comments:

Weld Number 0-03  
Weld Thickness .475"  
Weld Length 11.0"  
Weld Width .675"

Sketch or Photo:



0.18 SQ. IN. TOTAL CODE REQUIRED EXAM VOLUME

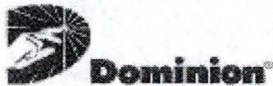
$$100 + 100 + 89 + 0 = 289 / 4 = 72\%$$

Examination Volume Dimensions - Height .143" Length 11" Width 1.175"

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%
70	*89%			
Code Coverage Total				50%
* Best Effort Coverage (Max 25%) Total				22%
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.				

THICKNESS AND CONTOUR TAKEN FROM  
PREVIOUS DATA.

LMT-SS01  
Fig 4a10  
page 1 of 1



Report No: UT-14-066

Summary # S2.C5.21.259

Pg. 6 of 6

Prepared by: W. Thomas

Date: 05/08/2014

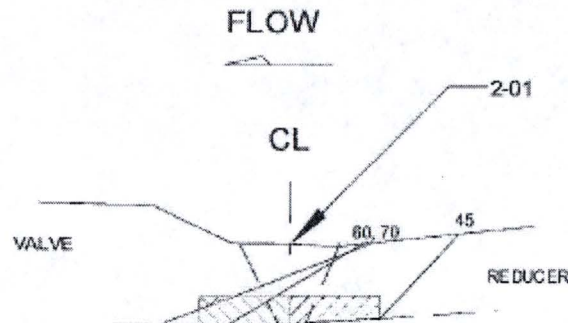
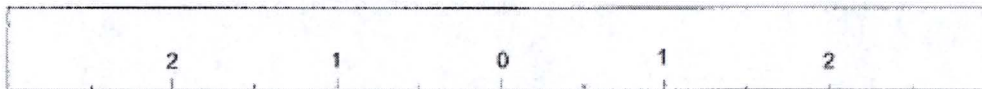
DESIGNED P. STEINER AND ASSOCIATES 5-11-2014

Weld Number 2-01  
Thickness 0.458"

Weld Width 0.6"  
Weld Length 11"

☒ Reviewed  
☐ Witnessed

5/12/14  
7933  
HSB GS



0.153" HT X 0.55" WIDTH = 0.084 SQ. IN = REQUIRED VOLUME US AND DS SIDES

EXAMINED 100% OF THE REQUIRED VOLUME US SIDE

EXAMINED 0.074 SQ. IN. DS SIDE AX DIRECTION  
.074 / .084 = 0.88 X 100 = 88% BEST EFFORT AX DIR. DS SIDE

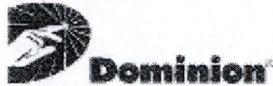
NO EXAM DS SIDE AX DIRECTION FOR 12%

Examination Volume Dimensions - Height 0.153" Length 11" Width 1.1"

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%
70 2.25			*88%	
Code Coverage Total				50%
100+100+88+0=288/4=72%				*Best Effort Coverage (Max 25%) Total 22%
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.				



LMT-SS01  
Fig 4a11  
page 1 of 1



Report No: UT-12-109  
Summary # S2.C5.21.297  
Pg. 4 of 4  
Prepared by: W. Thomas  
Date: 11/12/2012

*W. Thomas*  
11/17/2012

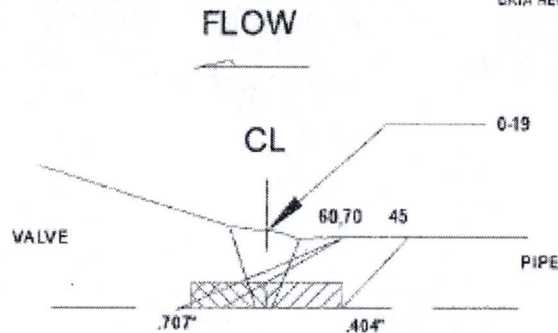
Weld Number 0-19  
Thickness 0.404"

Weld Width 0.4"  
Weld Length 11"

*NAS ANZE*  
11/19/12



NOTE: T AND C WAS TAKEN FROM PREVIOUS  
DATA REPORT UT-RNO 740 DATED 3/28/02.



TOTAL REQUIRED EXAM VOLUME = 0.06 SQ. IN. US AND DS SIDES  
EXAMINED 100% OF THE REQUIRED VOLUME US SIDE  
EXAMINED 0.04 SQ. IN DS SIDE AX DIRECTION BEST EFFORT  
.04 / .06 = 66.7%  
NO EXAM FOR 0.02 SQ. IN DS SIDE AX DIRECTION  
.02 / .06 = 33.3%

$$100+100+66.7+0=266.7/4=66.7\%$$

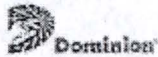
Examination Volume Dimensions - Height 0.135" Length 11" Width 0.9"

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%
70 2.25 MHz			*66.7%	
Code Coverage Total				50%
* Best Effort Coverage (Max 25%) Total				16.7%

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.

LMT-SS01  
Fig 4a12  
page 1 of 1



# Supplemental Report

Report No.: UT-06-099  
Page: 2 of 2

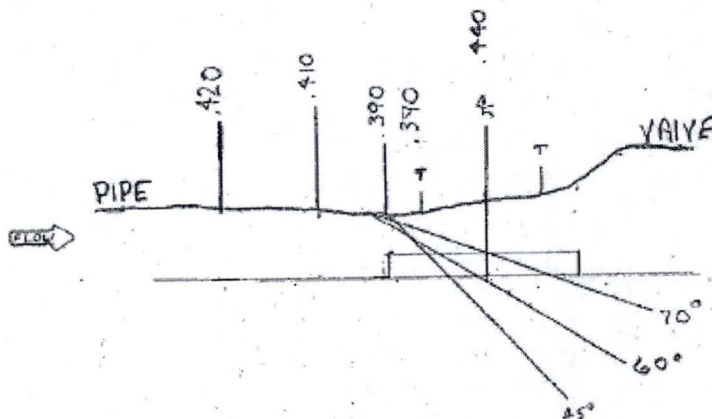
Summary No.: S2.C5.21.310

Examiner: Sistek, Robert P	Level: II-PDI	Reviewer: N/A	Date:
Examiner: N/A	Level: N/A	Site Review: Daniel H. Smith	Date: 11/17/06
Other: N/A	Level: N/A	ANII Review: R. Smith	Date: 11/19/06

Comments:

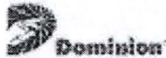
Sketch or Photo:

DWG. NO.: 11540-WMKS-SI-2/3 SI-270  
WELD NO.: 1-12  
SUMMARY NO.: S2.C5.21.310



	45	60	70
CN		39%	
CCW		39%	
UPSTREAM		39%	50%
DOWNSTREAM			32%
BEST EFFORT			18.6%
CODE COVERAGE			43%





## Supplemental Report

Report No.: UT-09-132

Page: 4 of 5

Summary No.: S2.C5.11.860

Examiner: Muirhead, Ryan L.  Level: II-PDI

Reviewer:

WAYNE THOMAS

Date: 11-17-01

Examiner: N/A Level: N/A

Site Review:

RAYMOND T. STACK *RTS*

Date: 11/20/09

Other: N/A Level: N/A

### ANII Review:

Al. Smith

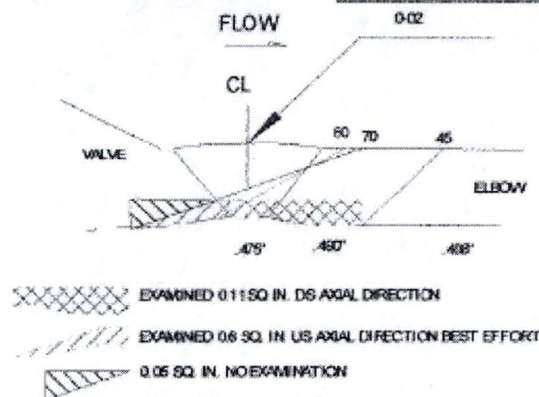
Date: 11/20/09

Comments:

## COVERAGE SUMMARY

Sketch or Photo:

Weld Number	0-02
Weld Thickness	.475" (.375"nom)
Weld Length	50.265"
Weld Width	.875"



0.22 SQ. INCH TOTAL REQUIRED EXAM VOLUME

Examination Volume Dimensions - Height	.163"	Length	50.265"	Width	1.375"
--	-------	--------	---------	-------	--------

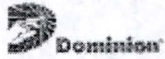
Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
ANGLE	UpSt-Ax	UpSt-Circ	DnSt-Ax	DnSt-Circ
45/60		0%	100%	100%
70	55%			
Code Coverage Total				50%
* Best Effort Coverage (Max 25%) Total				14%

**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.

$$100 + 100 + 0 + 55 = 255 / 4 = 64\%$$





## Supplemental Report

Report No.: UT-06-054

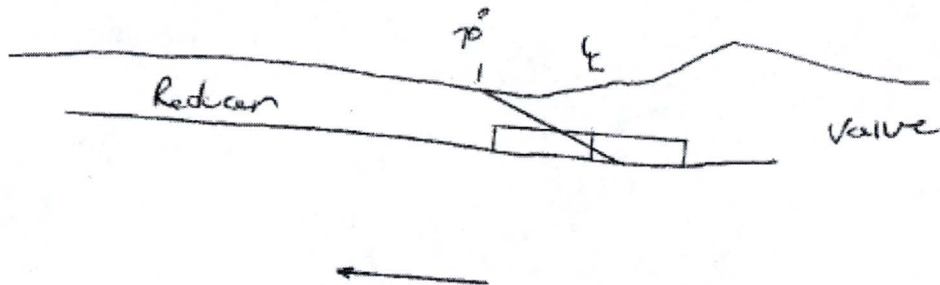
Page: 2 of 2

Summary No.: S2.C5.11.873

Examiner:	<u>Odegard, Jeffrey D</u>	Level:	<u>III</u>	Reviewer:	_____	Date:	_____
Examiner:	<u>Tolosky, Ryan J</u>	Level:	<u>III</u>	Site Review:	_____	Date:	_____
Other:	<u>N/A</u>	Level:	<u>N/A</u>	ANII Review:	_____	Date:	_____

Comments: 70 degree shear wave code coverage for downstream side.  
Axially 86%, clockwise 86% and counter clockwise 86% for a total of 43%.

Sketch or Photo:



LMT-SS01  
Fig 4a15  
page 1 of 1



Report No: UT-12-107  
Summary # S2.C5.11.028  
Pg. 5 of 5  
Prepared by: W. Thomas  
Date: 11/18/2012

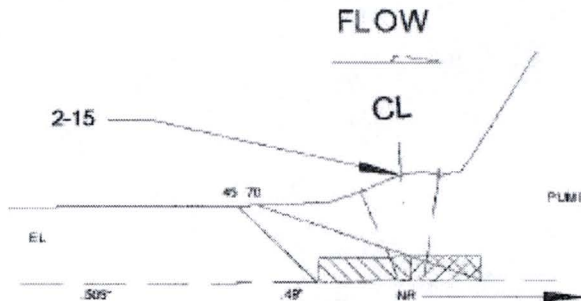
*R. Chappell* 11-21-12  
*NAS Audit*  
11/23/12

Weld Number 2-15 Weld Width 0.5"  
Thickness 0.490" Weld Length 43.98"



100+100+50+0+250+162.5%

NOTE: T AND Q TAKEN FROM PREVIOUS DATA  
REPORT UTRNO 771 DATED 4/9/2002



0.08 SQ. IN. TOTAL REQUIRED VOLUME US AND DS SIDES

EXAMINED 100% OF THE REQUIRED VOLUME US SIDE

EXAMINED 0.04 SQ. IN DS SIDE AX DIRECTION BEST EFFORT

.04 / .08 = 0.50 X 100 = 50% BEST EFFORT DS SIDE AX DIRECTION

NO EXAM DS SIDE AX DIRECTION FOR .04 SQ. IN.

.04 / .08 = .50 X 100 = 50% NO EXAM.

NO CIRC EXAM DS SIDE

Examination Volume Dimensions - Height 0.163" Length 43.98" Width 1"

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%		0%
45/70	100%			
70 2.25 Mhz			*50%	
Code Coverage Total				50%
*Best Effort Coverage (Max 25%) Total				12.5%

**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.



LMT-SS01  
Fig 4a16



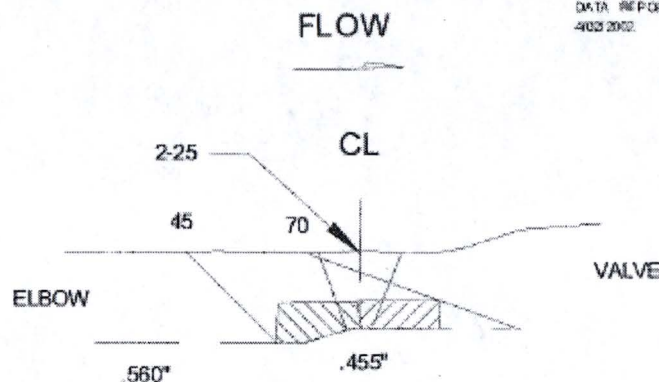
Report No: UT-12-108  
Summary # S2.C5.11.038  
Pg. 5 of 5  
Prepared by: W. Thomas  
Date: 11/18/2012

*R. Chappell* 11-21-12  
*AKS* 11/23/12

Weld Number 2-25 Weld Width 0.5"  
Thickness 0.455" Weld Length 43.98"



NOTE: T AND C WAS TAKEN FROM PREVIOUS DATA. REPORT UTIRING 764 DATED 4/03/2002.



EXAMINED 100% OF THE REQUIRED VOLUME US SIDE  
 EXAMINED 100% OF THE <sup>RCW 11-21-12</sup> REQUIRED VOLUME DS SIDE  
AX DIRECTION BEST EFFORT.

Examination Volume Dimensions - Height 0.152" Length 43.98" Width 1"

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%		0%
45/70	100%			
70 2.25 Mhz			*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.

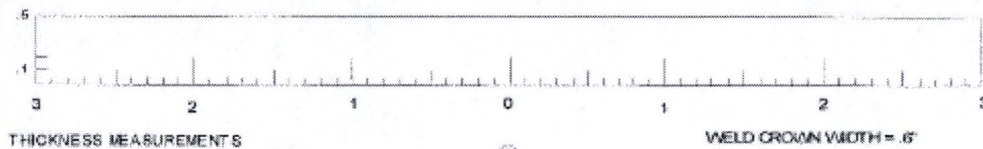
LMT-SS01  
Fig 4a17  
page 1 of 1



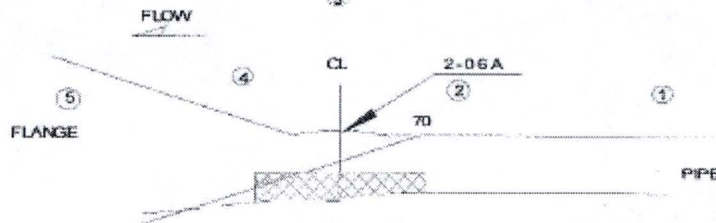
Report No. UT-11-040  
Summary No. S2.C5.11.128  
Pg. 4 of 4  
Prepared By: TRAVIS THOMAS  
Date: 5/3/2011

Weld Number 2-06A  
Weld Thickness .375"

Weld Length 40"  
Weld Width .6"



- 1) .431"
- 2) .434"
- 3) .374"
- 4) .480"
- 5) NR



US AXIAL SIDE 100% VOLUME EXAMINED  
= .09 SQUARE INCHES

BEST EFFORT DS AXIAL SIDE = 0.08 SQ. IN.  
TOTAL REQUIRED DS AXIAL SIDE = 0.10 SQ. IN.  
 $0.08 / 0.10 = 0.8 \times 100 = 80\%$

NO EXAM DS AXIAL SIDE = 0.02 SQ. IN.  
 $0.02 / 0.10 = 0.2 \times 100 = 20\%$

TOTAL EXAMINATION AREA = 0.19 SQUARE INCHES

Examination Volume Dimensions - Height .125" Length 40" Width 1.1"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
Angle	Up-St-Ax	Up-St-Circ	Dn-St-Ax	Dn-St-Circ
45 / 70	100%		100%	
45 / 60		100%		100%
70	BEST EFFORT = 20%			
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				20%
<b>Notes:</b> 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.				

*Al. Mitt*  
*ANII 5/9/11*



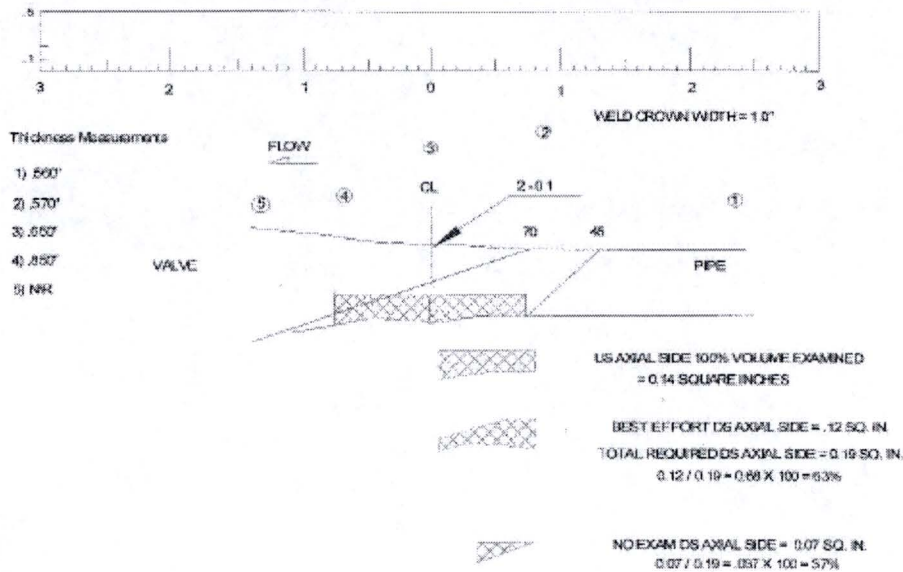
LMT-SS01  
Fig 4a18  
page 1 of 1



Report No. UT-11-020  
Summary No. S2.C5.11.161  
Pg. 4 of 4  
Prepared By: TRAVIS THOMAS  
Date: 4/30/2011

Weld Number 2-01  
Weld Thickness 0.562"

Weld Length 21"  
Weld Width 1.0"



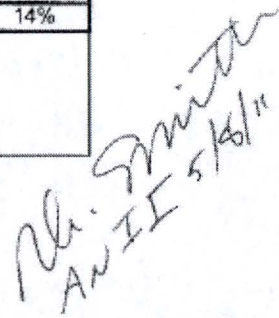
TOTAL RISK INFORMED EXAMINATION AREA = .33 SQUARE INCHES

Examination Volume Dimensions - Height .187" Length 21" Width 1.5"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
Angle	Up-St-Ax	UpSt-Circ	DnSt-Ax	Dn-St-Circ
45 / 70	100%		0%	
45 / 60		100%		0%
70	BEST EFFORT=16%			
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				16%
<b>Notes:</b> 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.				

*Al. Smith*  
An II 5/19/11





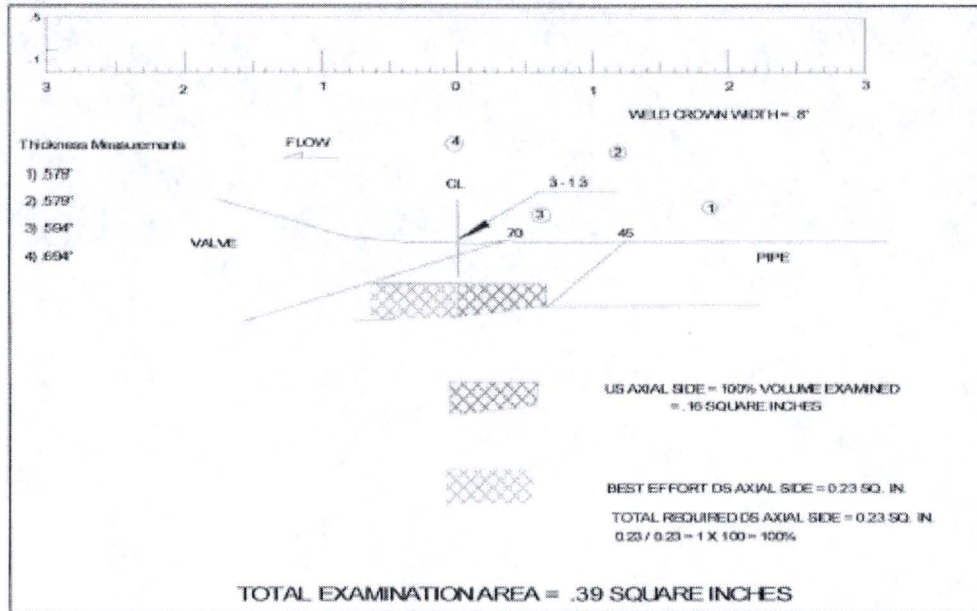
LMT-SS01  
Fig 4a20  
page 1 of 1



Report No. UT-11-034  
Summary No. S2.C5.11.229  
Pg. 4 of 4  
Prepared By: TRAVIS THOMAS  
Date: 5/1/2011

Weld Number 3-13  
Weld Thickness .562"

Weld Length 21.125"  
Weld Width .8"



Examination Volume Dimensions - Height .187" Length 21.125" Width 1.1"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
Angle	Up-St-Ax	UpSt-Circ	DnSt-Ax	Dn-St-Circ
45 / 70	100%		0%	
45 / 60		100%		0%
70	BEST EFFORT = 25%			
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				25%
<b>Notes:</b> 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.				

*Handwritten signature and date:*  
5/5/11

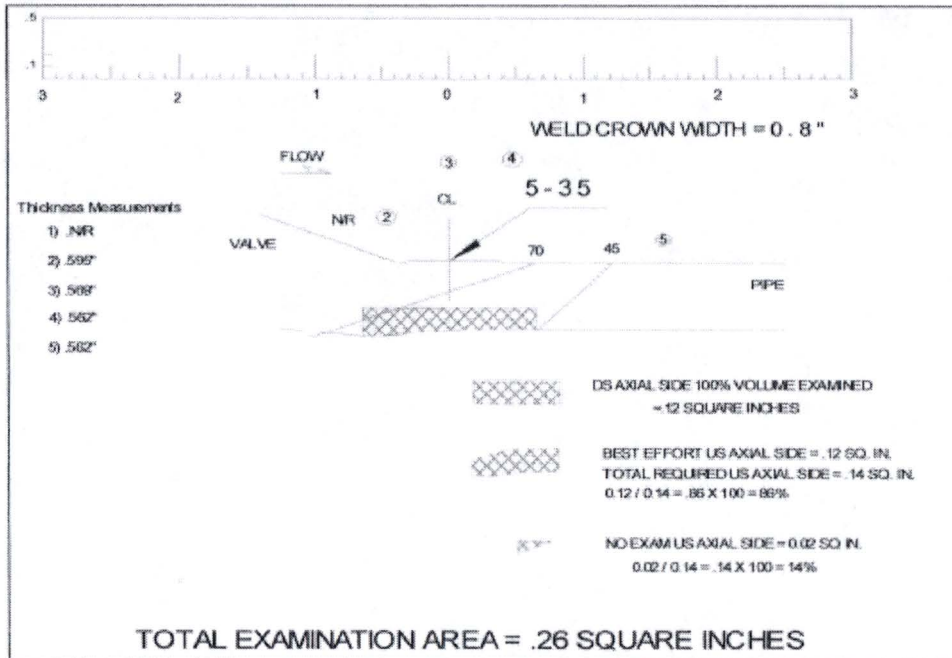


LMT-SS01  
Fig 4a21  
page 1 of 1



Report No. UT-11-024  
Summary No. S2.C5.11.248  
Pg. 4 of 4  
Prepared By: TRAVIS THOMAS T.T. 4-28-11  
Date: 4/28/2011

Weld Number 5-35  
Weld Thickness .562"  
Weld Length 21"  
Weld Width 8"



Examination Volume Dimensions - Height .187" Length 21" Width 1.3"

Coverage Summary					
Required Scans (each has a weighing factor of 100 for complete coverage)					
Angle	Up-St-Ax	UpSt-Circ	DnSt-Ax	Dn-St-Circ	
45 / 70	0%		100%		
45 / 60		0%		100%	
70	BEST EFFORT = 22 %			Code Coverage Total	50%
Best Effort Coverage (Max 25%) Total					22%
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.				

JDO 4/29/11  
Al. Smith  
ANII 5/3/11



## Supplemental Report

LMT-SS01  
Fig 4a22  
page 1 of 1

Report No.: UT-08-051

Page: 2 of 3

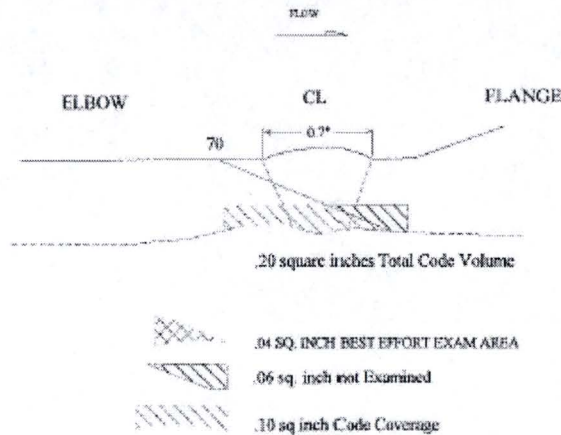
Summary No.: S2.C5.11.293

Examiner: Harmon, Byron H Level: II-PDI Reviewer: W.L. Thomas Date: 05/09/08  
Examiner: N/A Level: N/A Site Review: W. Hach Date: 5/9/08  
Other: N/A Level: N/A ANII Review: W. Smith Date: 5/12/08

Comments:

Weld Number: 0-09  
Weld Thickness: 0.57"  
Weld Length: 40.55"  
Weld Width: 0.70"

Sketch or Photo:



Coverage Summary				
ANGLE	Required Scans (each has a weighing factor of 100 for complete coverage)			
	UpSt - Ax	UpSt - Circ	DnSt - Ax	DnSt - Circ
70	100%		40%	
45/60		100%		0%
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				10%
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.				





## Supplemental Report

LMT-SS01  
Fig 4a23  
page 1 of 1

Report No.: UT-08-049

Page: 2 of 3

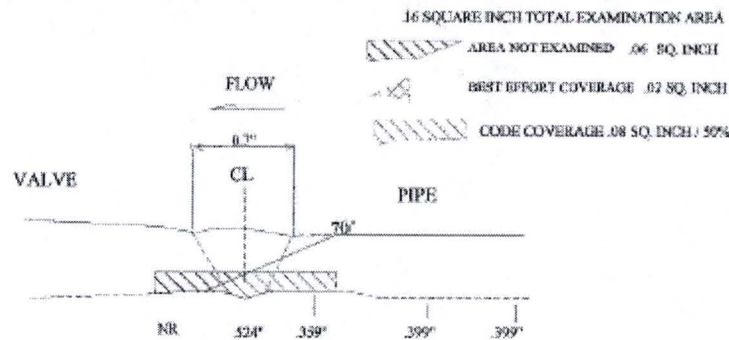
Summary No.: S2.C5.11.321

Examiner: <u>Harmon, Byron H</u>	Level: <u>II-PDI</u>	Reviewer: <u>W.L. Thomas</u>	Date: <u>05/29/08</u>
Examiner: <u>N/A</u>	Level: <u>N/A</u>	Site Review: <u>J. H. Smith</u>	Date: <u>5/9/08</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>W.L. Thomas</u>	Date: <u>5/13/08</u>

Comments:

Weld Number:	<u>0-06</u>
Weld Thickness:	<u>0.524"</u>
Weld Length:	<u>40.55"</u>
Weld Width:	<u>0.70"</u>

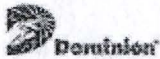
Sketch or Photo:



Coverage Summary				
ANGLE	Required Scans (each has a weighing factor of 100 for complete coverage)			
	UpSt - Ax	UpSt - Circ	DnSt - Ax	DnSt - Circ
70	100%		25%	
45/60		100%		0%
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				6%
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.				



LMT-SS01  
Fig 4a24  
page 1 of 1



## Supplemental Report

Report No.: UT-06-096  
Page: 2 of 2

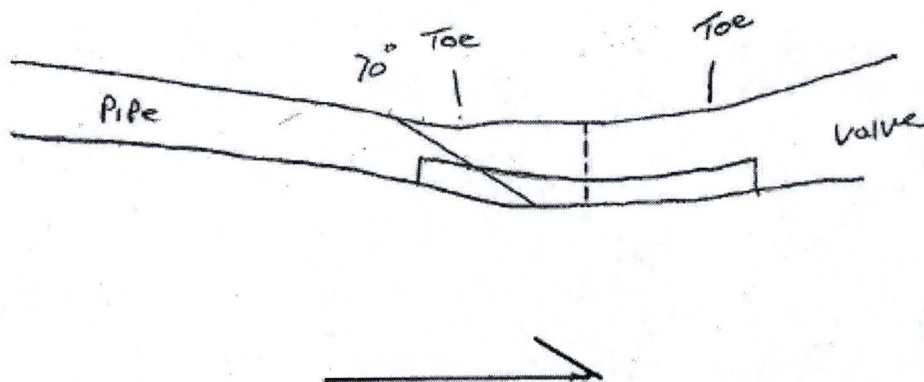
Summary No.: S2.C5.11.348

Examiner: <u>Odegard, Jeffrey D</u>	Level: <u>III</u>	Reviewer: <u>N/A</u>	Date: _____
Examiner: <u>Tolosky, Ryan J</u>	Level: <u>III</u>	Site Review: <u>Robert Davis LMT</u>	Date: <u>11/6/2006</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>RL Spitzer</u>	Date: <u>11/7/06</u>

Comments: 70 degree shear wave code coverage for upstream side.  
Axially 52%, clockwise 52%, and counter clockwise 52% for a total of 26%.  
Best effort coverage for downstream side.  
Axially 0%, clockwise 0% and counter clockwise 0%.

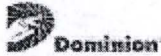
Weld 0-01

Sketch or Photo:



LMT-SS01

Fig 4a25  
page 1 of 1



## Supplemental Report

Report No.: UT-09-108

Page: 5 of 5

Summary No.: S2.C5.11.349

Examiner: Thomas, Travis W. T.T. Level: II-PDI Reviewer: Wayne Thomas Date: 11/9/2009

Examiner: N/A Level: N/A Site Review: Robert Davies Date: 11/10/2009

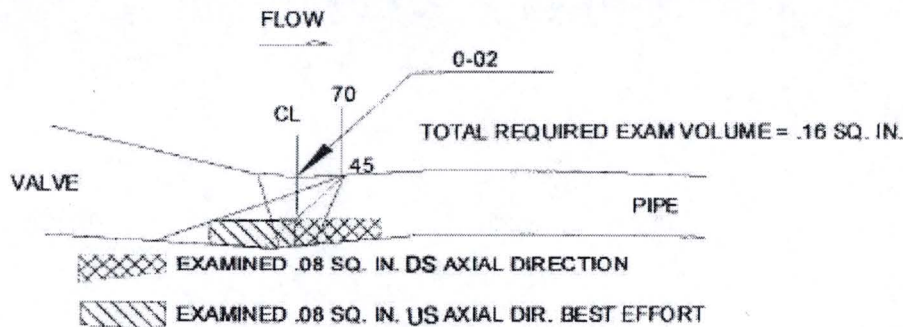
Other: N/A Level: N/A ANII Review: R. Smith Date: 11/11/09

Comments:

### COVERAGE SUMMARY

Weld Number 0-02  
Weld Thickness .375"  
Weld Length 40"  
Weld Width .5"

Sketch or Photo:



$$100 + 100 + 100 + 0 = 300 / 4 = 75\%$$

Examination Volume Dimensions - Height .125" Length 40" Width 1"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
ANGLE	UpSt-Ax	UpSt-Circ	DnSt-Ax	DnSt-Circ
45		0%	100%	100%
70	*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.				

THICKNESS AND CONTOUR TAKEN FROM  
PREVIOUS DATA.







## Supplemental Report

LMT-SS01

Fig 4a27

page 1 of 1

Report No.: UT-09-109

Page: 5 of 5

Summary No.: S2.C5.11.352

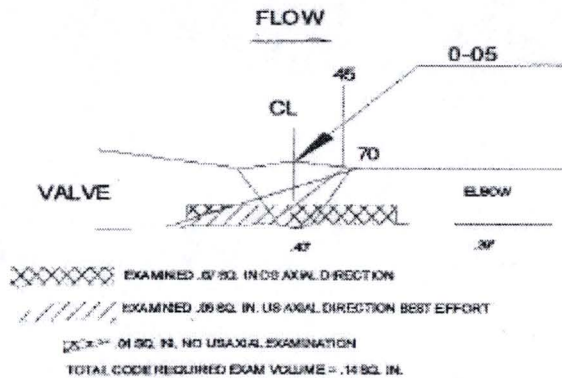
Examiner: Thomas, Travis W. T.T. Level: II-PDI Reviewer: WAYNE THOMAS Date: 11-9-09  
Examiner: N/A Level: N/A Site Review: Robert Davies RD Date: 11/11/09  
Other: N/A Level: N/A ANII Review: Al Smith Date: 11/21/09

Comments:

### COVERAGE SUMMARY

Weld Number 0-05  
Weld Thickness .375"  
Weld Length 40"  
Weld Width .6"

Sketch or Photo:



$$100 + 100 + 86 + 0 = 286 / 4 = 71.5\%$$

Examination Volume Dimensions - Height .13" Length 40" Width 1.1"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
ANGLE	UpSt-Ax	UpSt-Circ	DnSt-Ax	DnSt-Circ
45		0%	100%	100%
70	*86%			
Code Coverage Total				50%
* Best Effort Coverage (Max 25%) Total				21.5%
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.				





## Supplemental Report

LMT-SS01

Fig 4a28  
page 1 of 1

Report No.: UT-06-041

Page: 2 of 2

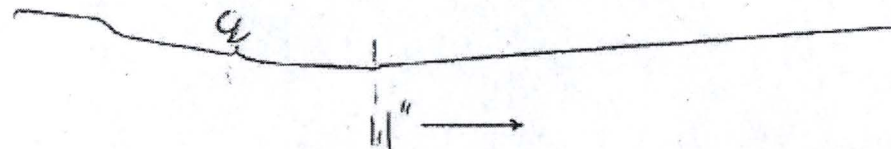
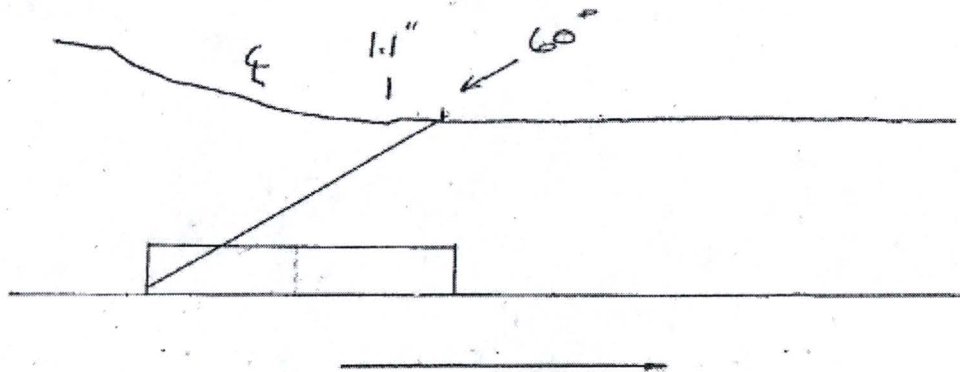
Summary No.: S2.C5.11.440

Examiner: <u>Odegard, Jeffrey D</u>	Level: <u>III</u>	Reviewer: <u>N/A</u>	Date: _____
Examiner: <u>Tolosky, Ryan J</u>	Level: <u>III</u>	Site Review: <u>Dennis P. Stegmann David P. Helt</u>	Date: <u>11/14/06</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>Alb. Smither</u>	Date: <u>11/14/06</u>

Comments: 60 degree shear wave code coverage on downstream side.  
Axially 100%, clockwise 100% and counter clockwise 100% for at total of 100%.

### WELD 1-08

Sketch or Photo:



Additional - Supplemental Reports



LMT-SS01  
Fig 4a29  
page 1 of 1



## Supplemental Report

Report No.: UT-08-053  
Page: 2 of 3

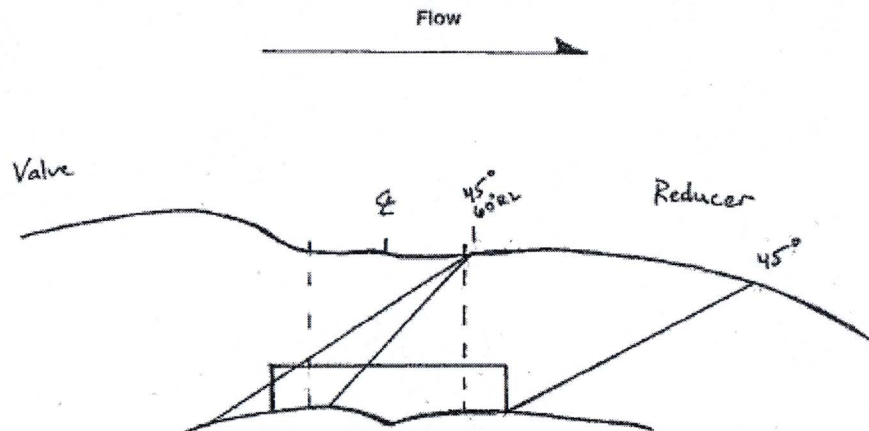
Summary No.: S2,C5,11,448

Examiner: <u>Tolosky, Ryan J.</u> <i>RTT</i>	Level: <u>II-PDI</u>	Reviewer: <u>W.L. Thomas</u> <i>[Signature]</i>	Date: <u>05/02/08</u>
Examiner: <u>Carraher, Terry G.</u> <i>F</i>	Level: <u>II-PDI</u>	Site Review: <u>Black</u> <i>[Signature]</i>	Date: <u>5/9/08</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>Al. Smith</u> <i>[Signature]</i>	Date: <u>5/10/08</u>

Comments:

Weld Number: 2-12  
Weld Thickness: 1.0"  
Weld Length: 33.77"  
Weld Width: 1.0"

### Coverage Plot



Examination Volume Dimensions - Height 0.333" Length 33.77" Width 1.5"

Coverage Summary				
Angle	Required Scans (each scan has a weighting factor of 100 for complete coverage)			
	UpSt- Ax	UpSt- Circ	DnSt- Ax	DnSt- Circ
45	0%	0%	100%	100%
60RL	99%	0%	0%	0%
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				24.7%
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.				

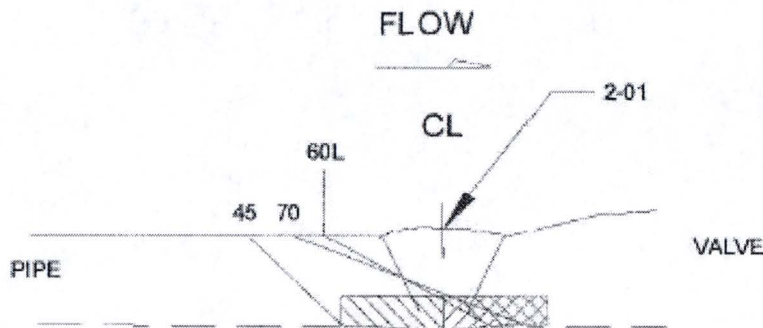
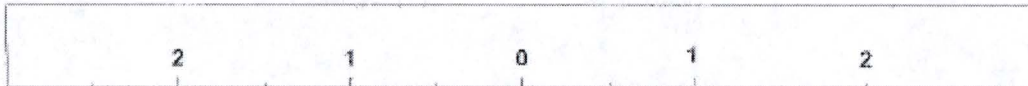
LMT-SS01  
Fig 4a30  
page 1 of 1



Report No: UT-12-103  
Summary # S2.C5.11.702  
Pg. 6 of 6  
Prepared by: W. Thomas  
Date: 11/16/2012

*100% AXIAL  
11/16/12*

Weld Number 2-01 Weld Width 0.7"  
Thickness 0.543" Weld Length 21"



.11 SQ. IN. REQUIRED US AND DS SIDES



EXAMINED 100% OF THE REQUIRED VOLUME US SIDE



EXAMINED 0.02 SQ IN. DS SIDE AX DIRECTION

.02 / .11 = 0.18 x 100 = 18% BEST EFFORT



NO EXAM FOR 82% DS SIDE AX DIRECTION

Examination Volume Dimensions - Height 0.181" Length 21" Width 1.2"

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		100%		0%
45/70	100%			
60L			*18%	
Code Coverage Total				50%
*Best Effort Coverage (Max 25%) Total				4.5%

100+100+18+0=218/4=54.5

**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.

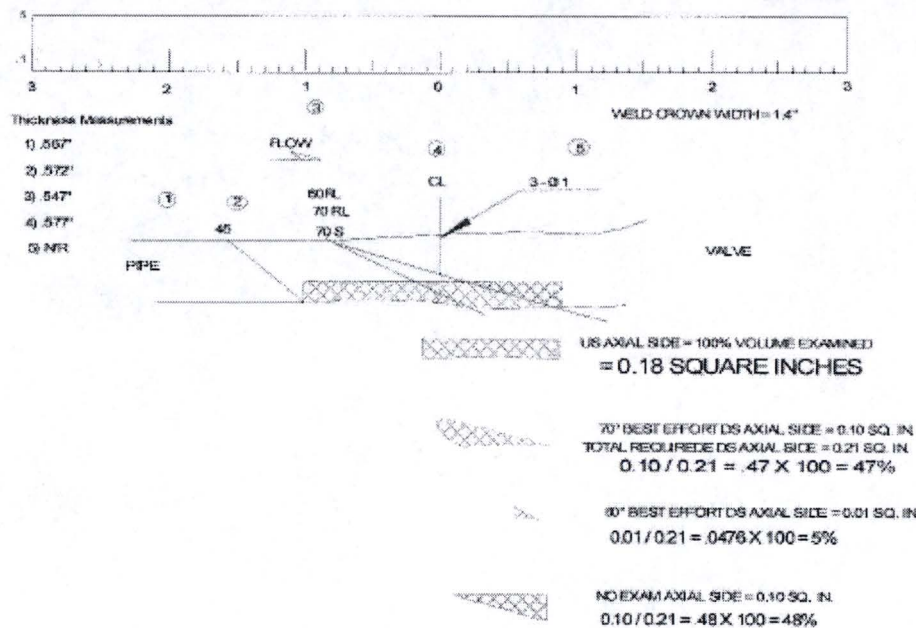


LMT-SS01  
Fig 4a31  
page 1 of 1



Report No. UT-11-016  
Summary No. S2 C5.11.719  
Pg. 5 of 6  
Prepared By: TRAVIS THOMAS  
Date: 4/28/2011

Weld Number 3-01  
Weld Thickness .562"  
Weld Length 20.9"  
Weld Width 1.4"



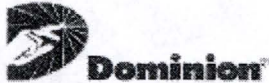
Total Examination Area = .39 SQUARE INCHES

Examination Volume Dimensions - Height .187" Length 20.9" Width 1.9"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
Angle	Up-St-Ax	Up-St-Circ	Dn-St-Ax	Dn-St-Circ
45 / 70	100%		0%	
45 / 60		100%		0%
60 RL	BEST EFFORT = 1%			
70 RL	BEST EFFORT = 12%			
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				1%
<b>Notes:</b> 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.				

*Travis Thomas*  
AWII 5/14/11

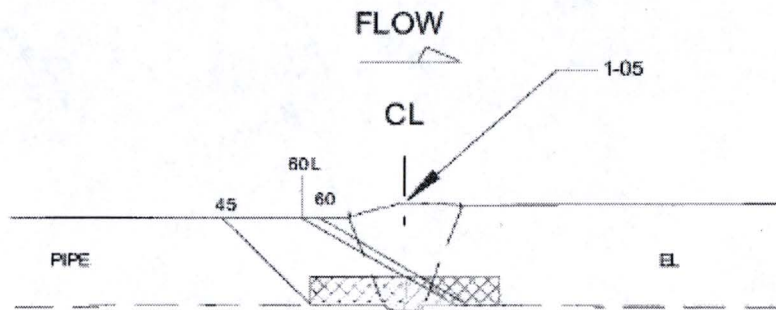
LMT-SS01  
Fig 4a32  
page 1 of 1



Report No: UT-14-079  
Summary # S2.C5.11.758  
Pg. 6 of 6  
Prepared by: W. Thomas  
Date: 05/09/2014

Weld Number	1-05	Weld Width	0.7"
Thickness	0.569"	Weld Length	21.25"

*Mr. Thomas*  
5/13/14



0.19" HT X 0.6" WIDE = 0.114 SQ. IN. X 21.25" LENGTH = 2.42 CU. IN. = REQUIRED VOLUME  
US AND DS SIDES

EXAMINED 100% OF THE REQUIRED VOLUME US SIDE

EXAM LIMITED DS SIDE AX/AN CIRC DIRECTION BY 12.25" TOTAL  $9 / 21.25 = 0.42 \times 100 = 42\%$

EXAMINED 0.034 SQ. IN. DS SIDE FOR 12.25" LENGTH (LIMITED AREA) BEST EFFORT.  
 $.034 \times 12.25 = 0.416$  CU. IN. BEST EFFORT  $.416 / 2.42 = 0.17 \times 100 = 17\%$  BEST EFFORT

NO EXAM DS SIDE FOR 41% AX DIRECTION

Examination Volume Dimensions - Height 0.19 Length 21.25" Width 1.2"

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	100%	100%	42%	42%
60L			*17%	
Code Coverage Total				71%
100+100+59+42=301/4=75.25%				*Best Effort Coverage (Max 25%) Total 4.25%

**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.



LMT-SS01  
Fig 4a33  
page 1 of 1



## Supplemental Report

Report No.: UT-08-039  
Page: 2 of 3

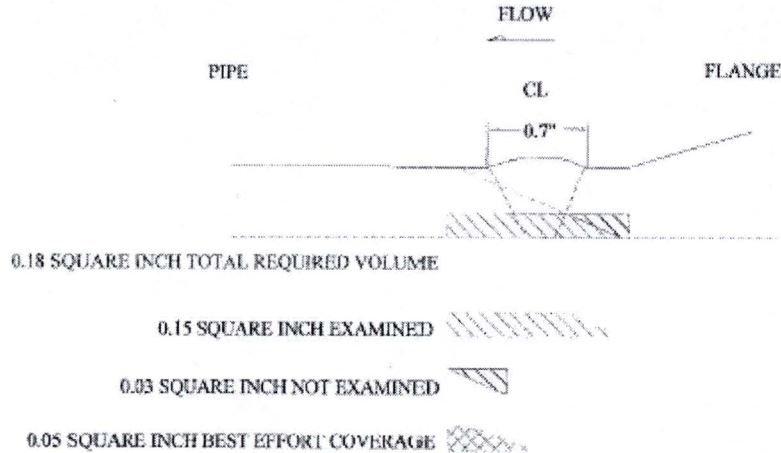
Summary No.: S2.C5.21.003

Examiner: Harmon, Byron H *BH* Level: II-PDI Reviewer: W.C. Thomas *WCT* Date: 05/15/08  
Examiner: N/A Level: N/A Site Review: W.C. Thomas *WCT* Date: 5/14/08  
Other: N/A Level: N/A ANII Review: \_\_\_\_\_ Date: \_\_\_\_\_

Comments:

Weld Number: 1-03  
Weld Thickness: 0.55"  
Weld Length: 10.996"  
Weld Width: 0.70"

Sketch or Photo:

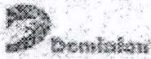


Coverage Summary				
ANGLE	Required Scans (each has a weighing factor of 100 for complete coverage)			
	UpSt - Ax	UpSt - Circ	DnSt - Ax	DnSt - Circ
70	33% 67%		100%	
45/60	5/15/03	0%		100%
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				14%
Notes:				
1) Code Coverage refers to the 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.				

16%  
RCW  
4-6-16

LMT-SS01  
Fig 4a34  
page 1 of 1

## Supplemental Report



Report No.: UT-08-042  
Page: 2 of 3

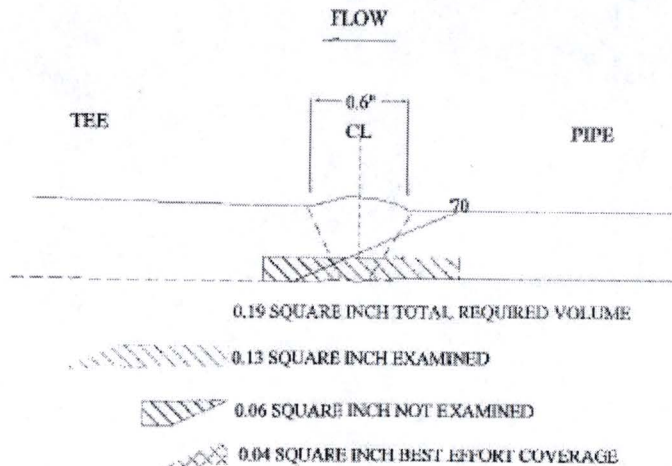
Summary No.: S2.C5.21.010

Examiner: Harmon, Byron H Level: II-PDI Reviewer: W.L. Thomas Date: 05/15/08  
Examiner: N/A Level: N/A Site Review: APD Date: 5/15/08  
Other: N/A Level: N/A ANII Review: Ali-Sm Date: 5/16/08

Comments:

Weld Number: 1-10  
Weld Thickness: 0.55"  
Weld Length: 10.996"  
Weld Width: 0.6"

Sketch or Photo:



Coverage Summary				
ANGLE	Required Scans (each has a weighing factor of 100 for complete coverage)			
	UpSt - Ax	UpSt - Circ	DnSt - Ax	DnSt - Circ
70	40%		100%	
45/60		0%		100%
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				10%
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.				

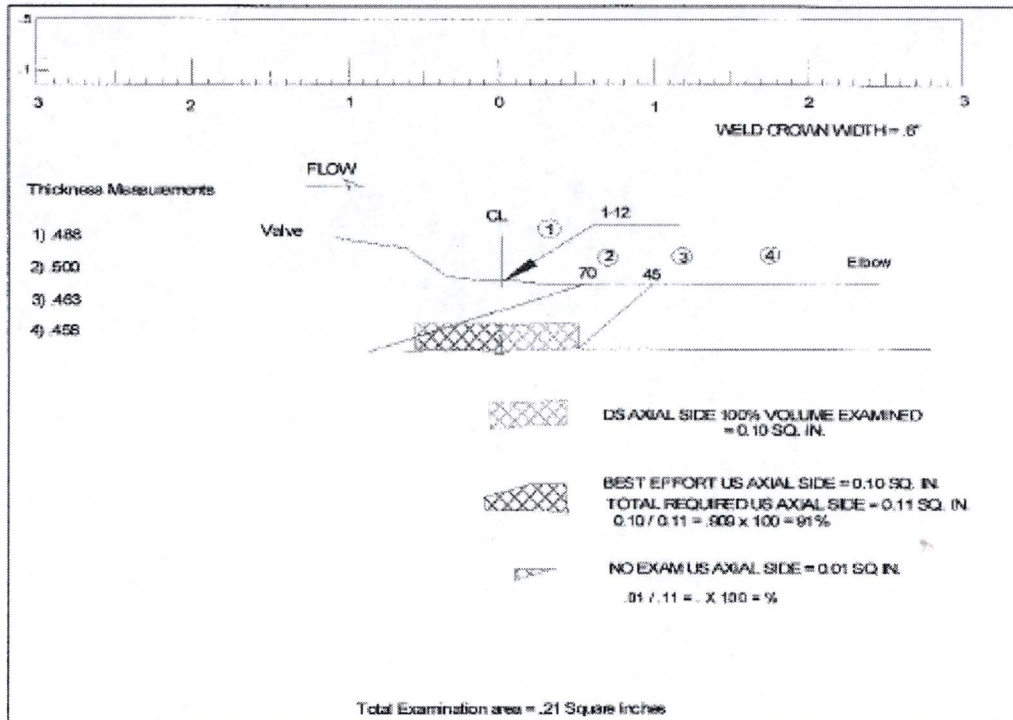


LMT-SS01  
Fig 4a35  
page 1 of 1



Report No. UT-11-003  
Summary No. S2.C5.21.012  
Pg. 4 of 4  
Prepared By: Travis Thomas  
Date: 4/21/2011

Weld Number 1-12 Weld Length 11.25"  
Weld Thickness .438" Weld Width .6"



Examination Volume Dimensions - Height .146" Length 11.25" Width 1.1"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
Angle	Up-St-Ax	Up-St-Circ	Dn-St-Ax	Dn-St-Circ
45 / 70	0%		100%	
45 / 60		0%		100%
70	Best Effort 23%			
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				23%
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.				

*NA - Martin  
ANTI 5/3/11*



LMT-SS01  
Fig 4a36  
page 1 of 1



# Supplemental Report

Report No.: UT-06-014  
Page: 2 of 2

Summary No.: S2.C5.21.019

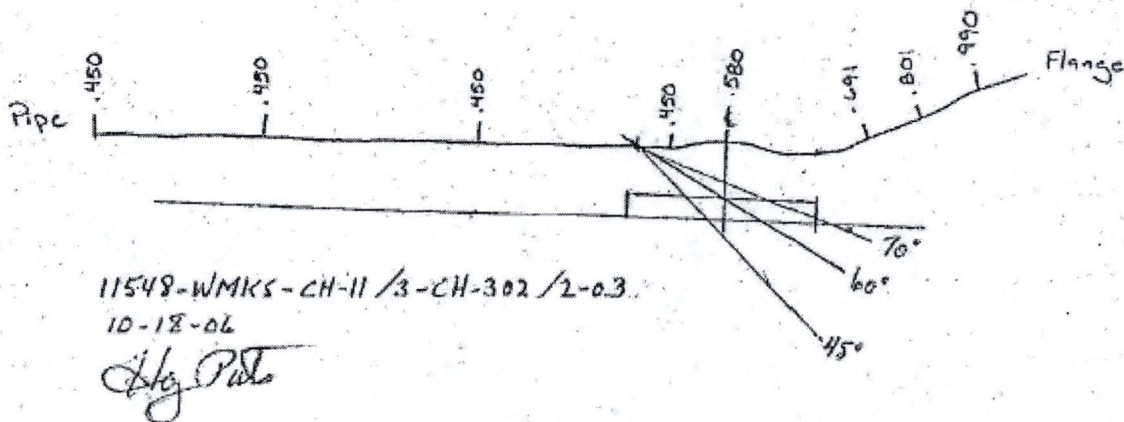
Examiner: <u>Poster, Harry E</u>	Level: <u>II-PDI</u>	Reviewer: <u>N/A</u>	Date: <u></u>
Examiner: <u>N/A</u>	Level: <u>N/A</u>	Site Review: <u>Dennis P. Smith</u>	Date: <u>11/17/06</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>Ali Smith</u>	Date: <u>11/19/06</u>

Comments:

	45°	60°	70°
CW		35%	
CCW		35%	
UPSTREAM		0	0
DOWNSTREAM		50%	
		BEST EFFORT 43%	

Flow →

CODE COVERAGE 40%  
BEST EFFORT COVERAGE 14.3%



LMT-SS01  
Fig 4a37  
page 1 of 1



# Supplemental Report

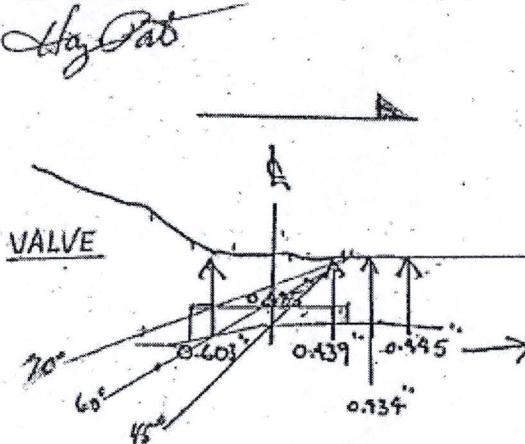
Report No.: UT-06-011  
Page: 2 of 2

Summary No.: S2.C5.21.023

Examiner: <u>Poster, Harry E</u> <i>Hay Pat</i>	Level: <u>II-PDI</u>	Reviewer: <u>N/A</u>	Date: _____
Examiner: <u>N/A</u>	Level: <u>N/A</u>	Site Review: <u>Dennis [Signature]</u>	Date: <u>11/17/06</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: _____	Date: _____

Comments:

11548-WMKS-CH-11/3-CH-302/2-05A  
S2.C5.21.023  
10-18-06  
*Hay Pat*



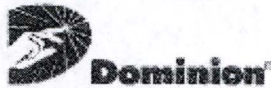
	45	60	70
CW		35%	
CCW		35%	
UPSTREAM	0	0	0
DOWNSTREAM		50%	
		46.5% B.E.	

CODE COVERAGE 40%  
BEST EFFORT COVERAGE 15.5%

ANII [Signature] Date 11/19/06  
Initial ☐ Final ☒  
HSB-CT



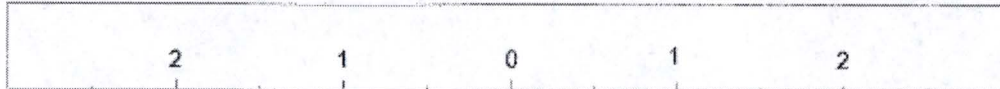
LMT-SS01  
Fig 4a38  
page 1 of 1



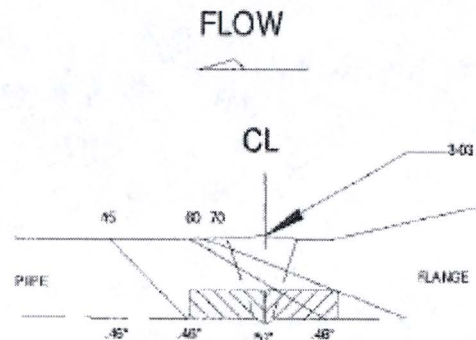
Report No: UT-12-110  
Summary # S2.C5.21.036  
Pg. 4 of 4  
Prepared by: W. Thomas  
Date: 11/17/2012

*Rrs 11/17/2012*  
*NAS AND*  
*11/16/12*

Weld Number 3-03 Weld Width 0.4"  
Thickness 0.46" Weld Length 11"



NOTE: T AND C WAS TAKEN FROM PREVIOUS  
DATA REPORT UTHNO 343 DATED 3/22/02



EXAMINED 100% OF THE REQUIRED VOLUME DS SIDE  
EXAMINED 100% OF THE REQUIRED VOLUME US SIDE AX DIRECTION  
BEST EFFORT.  
NO CIRC SCANS WERE PERFORMED US SIDE

$$100+100+100+0=300/4=75\%$$

Examination Volume Dimensions - Height 0.153" Length 11" Width 0.9"

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%
70 2.25 Mhz	*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.				





## Dominion

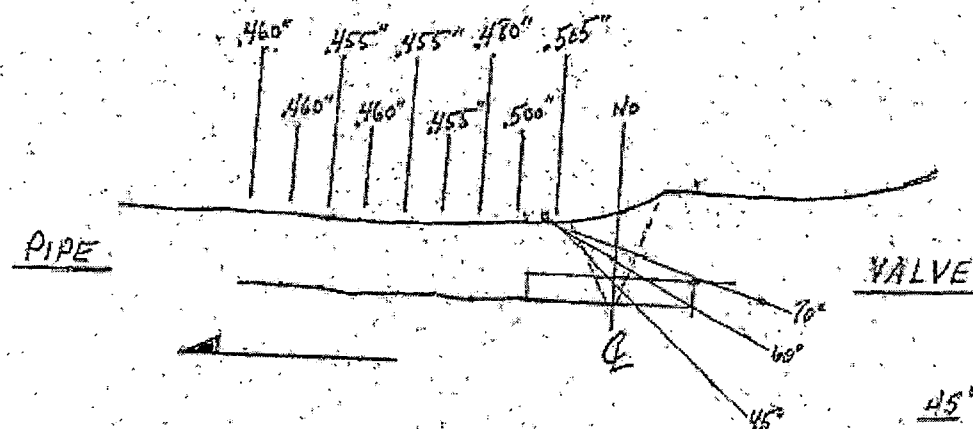
## Supplemental Report

Report No.: UT-06-020

Page: 2 of 3

Reviewed: James H. Smith 11/12/01

Sketch or Photo:



10/18/01

~~Wg. Pats~~  
~~Wg. Pats~~

CW

CCW

UPSTREAM

DOWNSTREAM

Core Coverage 43.3%

BEST EFFORT COVERAGE 10%

<u>45°</u>	<u>60°</u>	<u>70°</u>
	50%	
	50%	
0	0	0
	30%	
		30% B.E.

ANI MS Date 11/19/00  
Initial ☐ Final ☒  
HSE-CT

### Additional • Supplemental Reports

LMT-SS01  
Fig 4a40  
page 1 of 1



# Supplemental Report

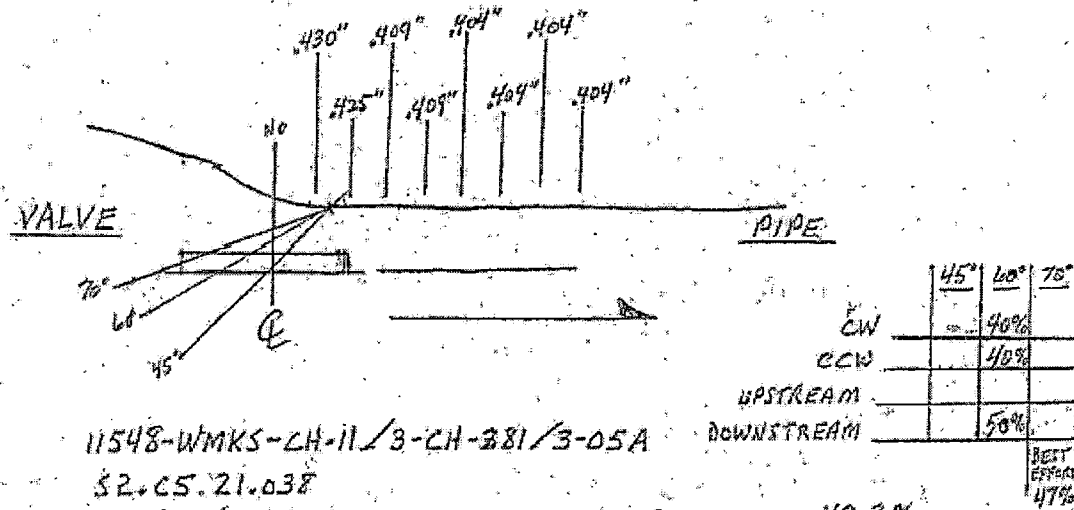
Report No.: UT-06-005

Page: 2 of 3

Summary No.: S2.C5.21.038

SITE REVIEWER: *David A. Smith* 11/17/06

Sketch or Photo:



11548-WMKS-CH-11/3-CH-281/3-05A

S2.C5.21.038

10/18/06

*David A. Smith*  
*David A. Smith*

CODE COVERAGE 43.3%

BEST EFFORT COVERAGE 15.6%

ANL: *AS* Date 11/19/06  
Initial ☐ Final ☒  
HSB-CT

LMT-SS01  
Fig 4a41  
page 1 of 2



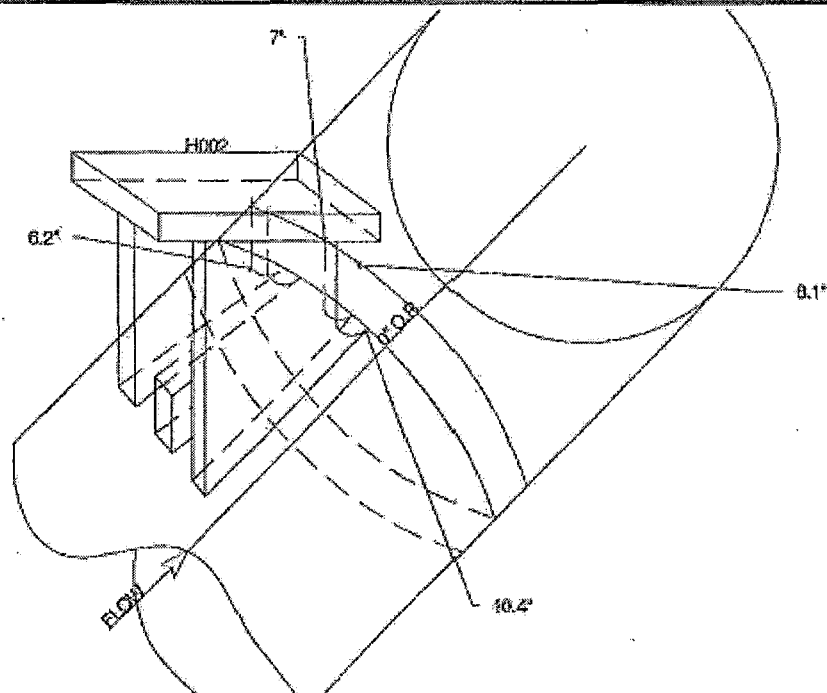
## Supplemental Report

Report No.: UT-08-121  
Page: 3 of 4

Summary No.: S2.C5.21.079

Examiner: <u>Carragher, Terry G.</u>	Level: <u>II-PDI</u>	Reviewer: <u>M. Thomas</u>	Date: <u>05/08/08</u>
Examiner: <u>N/A</u>	Level: <u>N/A</u>	Site Review: <u>Officer</u>	Date: <u>5/9/08</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>J. A. Smith</u>	Date: <u>5/15/08</u>

Comments:



Limitation due to support H002. Upstream side is limited from 6.2" to 10.4" (4.2" total). Downstream side limited by proximity of plate for H002, limitation on downstream side from 7" to 8.1" (1.1" total). Upstream limitation of 4.2" results in 62% examined (4.2"/10.996"). Downstream limitation of 1.1" results in 90% examined (1.1"/10.996"). Additional limitation due to bridging of the transducer on the elbow intradow, this limitation was 3" long, resulting in 72% examined (3"/10.996").

70° transducer used opposite of these limitations, however the 1.1" downstream limitation allows the 70° only 3.1" of scan area opposite support H002 or 74% of the limitation area. The exam volume cross-section = 0.1684 sq. in. one-half this volume is 0.0842 sq. in. The 70° covered 0.0475 sq. in. resulting in 56% coverage of the exam volume scanned with the 70°.

Best effort coverage calculated as follows:

No credit for circumferential exams.

Axial upstream not examined for 38% (100%-62%). Of this 38% only 74% was examined, resulting in 28% total. 56% of 28% equals 15.68%

Axial downstream not examined for 10% (100%-90%). Of this 10% only 74% was examined, resulting in 7.4% total. 56% of 7.4% equals 4.144%

$0 + 0 + 15.68 + 4.144 / 4 = 4.956\%$



LMT-SS01  
Fig 4a41  
page 2 of 2



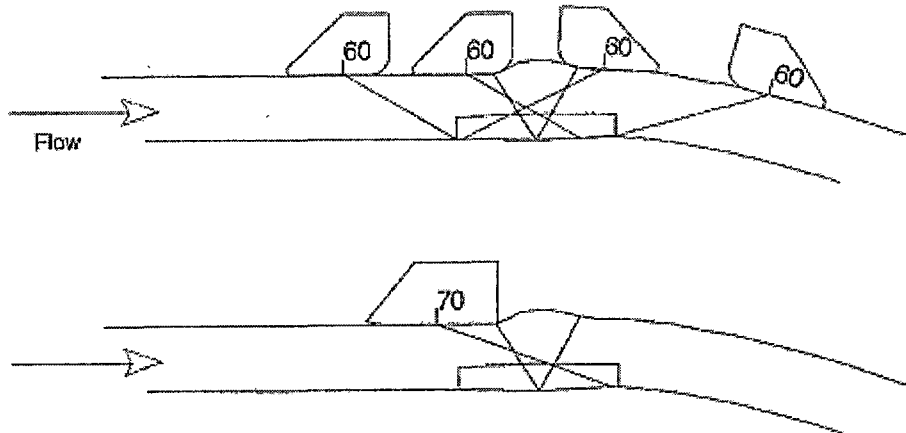
## Supplemental Report

Report No.: UT-08-121  
Page: 4 of 4

Summary No.: S2.C5.21.079

Examiner: <u>Carraher, Terry G.</u>	Level: <u>II-PDI</u>	Reviewer: <u>W.L. Thomas</u>	Date: <u>05/08/08</u>
Examiner: <u>N/A</u>	Level: <u>N/A</u>	Site Review: <u>[Signature]</u>	Date: <u>5/8/08</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>[Signature]</u>	Date: <u>5/15/08</u>

Comments: Weld Number: 0-08  
Weld Thickness: 0.521"  
Weld Length: 10.998"  
Weld Width: 0.55"



Examination Volume Dimensions - Height 0.17" Length 10.998" Width 1.05"

Coverage Summary				
Angle	Required Scans (each scan has a weighting factor of 100 for complete coverage)			
	UpSt- Ax	UpSt- Circ	DnSt- Ax	DnSt- Circ
45/60		62%		90%
60	62%		90%	
Code Coverage Total				76%
Best Effort Coverage (Max 25%) Total				4.956%
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.				

LMT-SS01  
Fig 4a42  
page 1 of 1



Report No: UT-12-120

Summary # S2.C5.21.119

Pg. 5 of 6

Prepared by: W. Thomas

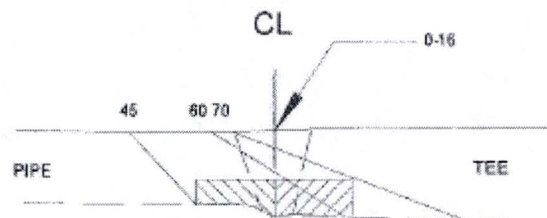
Date: 11/17/2012

*RB 11/17/2012*  
*NAS 11/14/12*

Weld Number	0-16	Weld Width	0.5"
Thickness	0.43"	Weld Length	11"

2 1 0 1 2

FLOW



EXAMINED 100% OF THE REQUIRED VOLUME US SIDE



EXAMINED 100% OF THE REQUIRED VOLUME DS SIDE  
AX DIRECTION BEST EFFORT

100+100+100+0=300/4=75%

Examination Volume Dimensions - Height 0.143" Length 11" Width 1"

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%		0%
45/60	100%			
70 2.25MHz			* 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.

**Attachment 3**

**RELIEF REQUEST LMT-CS01**  
**EXAMINATION CATEGORY C-F-2**  
**PIPING WELDS ON CARBON STEEL PIPING**

**Virginia Electric and Power Company**  
**(Dominion)**  
**Surry Power Station Unit 2**



**Dominion**

**Surry Power Station Unit 2**

**4<sup>th</sup> 10-Year Interval  
May 10, 2004 – May 9, 2015**

**Carbon Steel Pipe Welds**

**Relief Request LMT-CS01  
Repetitive/Duplicate Relief Requests in Accordance with 10 CFR 50.55 a(g)(5)(iii)  
Inservice Inspection Impracticality**

**1. ASME Code Components Affected**

ASME Code Class: Code Class 2

Examination Category: C-F-2, Pressure Retaining Welds in Carbon or Low Alloy Steel Piping.

Item Numbers: C5.51, Circumferential Welds: Piping Welds  $\geq$  3/8 in., Nominal Wall Thickness for Piping > NPS 4

C5.61, Circumferential Welds: Piping Welds > 1/5 in., Nominal Wall Thickness for Piping  $\geq$  NPS 2 and  $\leq$  NPS 4

C5.81, Circumferential Welds: Pipe Branch Connections of Branch Piping  $\geq$  NPS 2

Component Identification: Refer to Table LMT-CS01

Material: Refer to Table LMT-CS01

**2. Applicable Code Edition and Addenda**

1998 Edition with 2000 Addenda of ASME Section XI

**3. Applicable Code Requirement**

ASME Section XI, Examination Category C-F-2, requires 100 percent (%) volumetric and surface examination coverage for Items C5.51 and C5.61 circumferential piping welds. Examination Category C-F-2 requires 100 percent (%) surface examination

coverage for Item C5.81 circumferential piping welds that are branch connections. The alternative requirements of ASME Section XI, Code Case N-460, approved for use in Regulatory Guide 1.147 Rev. 17, allows credit for essentially 100% coverage of the weld provided greater than 90% of the required volume or surface area has been examined. The alternative requirements of ASME Section XI, Code Case N-663, approved for use in Regulatory Guide 1.147 Rev. 17, eliminates the requirement for a surface examination for category C-F-1 and C-F-2 welds that meet specific criteria.

#### 4. Impracticality of Compliance

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the essentially 100% volumetric examination coverage requirement of the subject welds due to the physical configurations that limit the volumetric coverage that can be obtained.

The subject welds were examined with a manual ultrasonic technique using pulse echo ultrasonic instruments and search units to achieve the maximum examination coverage practical. Examinations were performed using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII as implemented by the Performance Demonstration Initiative (PDI). No alternative techniques or advanced technologies were considered capable of obtaining complete coverage of the examination volume.

**TABLE LMT-CS01 - Carbon Steel Pipe Welds**

Drawing / Line# / ID Item System	Pipe Material	Pipe Dia.	Weld Thickness (Nominal)	Coverage Achieved	Limitation / Results / Comments	Fig.
11548-WMKS- 0103A2-4 / 30-SHP-122 / 1-22BC / C5.81 / Main Steam	ASME Spec. A672 N75	30"	0.432"	80.8% (MT)	Interference with two integral attachments prohibited full surface examination / NRI / Part of High Energy AUG Program	4a1

Drawing / Line# / ID Item System	Pipe Material	Pipe Dia.	Weld Thickness (Nominal)	Coverage Achieved	Limitation / Results / Comments	Fig.
11548-WMKS-0118A1 / 3-WAPD-110 / 0-17 / C5.61 Auxiliary Feedwater	ASME Spec. SA106 Gr. B	3"	0.300"	40.17% (UT) Best Effort Not Applicable	UT- valve to elbow / geometric Indication, dispositioned / CC N-663 applied, no surface exam required	4a2
11548-WMKS-0118A1 / 6-WAPD-101 / 0-02A / C5.51 Auxiliary Feedwater	ASME Spec. SA106 Gr. B	6"	0.432"	88.6% (UT) Best Effort Not Applicable	UT- pipe to flange / NRI / CC N-663 applied, no surface exam required	4a3
11548-WMKS-0118A2 / 3-WAPD-109 / 0-108 / C5.61 Auxiliary Feedwater	ASME Spec. SA106 Gr. B	3"	0.300"	66.7% (UT) Best Effort Not Applicable	UT- pipe to tee / NRI / CC N-663 applied, no surface exam required	4a4
11548-WMKS-0118A2 / 3-WAPD-110 / 0-109 / C5.61 Auxiliary Feedwater	ASME Spec. SA106 Gr. B	3"	0.300"	65.2% (UT) Best Effort Not Applicable	UT- tee to pipe / NRI / CC N-663 applied, no surface exam required	4a5

## 5. Burden Caused by Compliance

Compliance with the Code requirements would require extensive modification or replacement of components with a design that would allow full examination from both sides of the weld. This option to rebuild components is considered impractical and could impact plant equipment in a detrimental manner.

## 6. Proposed Alternative and Basis for Use

The subject welds received a volumetric or surface examination to the maximum extent practical utilizing the best available techniques at the time the examination was performed. Additionally, these components are monitored for through wall

leakage either by the ASME Section XI System Pressure Test Program required by Section XI, Table IWC-2500-1 Category C-H, for Class 2 components or a visual examination performed weekly as required by the Surry Augmented Inspection Program for high energy lines.

None of the pipe or weld material is constructed with Alloy 600/82/182 materials; therefore, there are no primary water stress corrosion cracking (PWSCC) concerns. There are no known through-wall failures on these welds at SPS2. Any indications were recorded and dispositioned as geometric or construction related.

Based on the volumetric and area coverage that was obtained with acceptable results and the visual examinations routinely performed to detect through-wall leakage, it is reasonable to conclude that service induced degradation would be detected. Therefore, these proposed alternatives provide an acceptable level of quality and safety by providing reasonable assurance of structural integrity of the subject welds. Accordingly, Dominion requests relief in accordance with 10 CFR 50.55a(g)(5)(iii).

#### **7. Duration of Proposed Alternative**

This proposed alternative is requested to meet requirements for the fourth ten-year inspection interval for SPS2, which began May 10, 2004 and ended on May 9, 2015.





## Supplemental Report

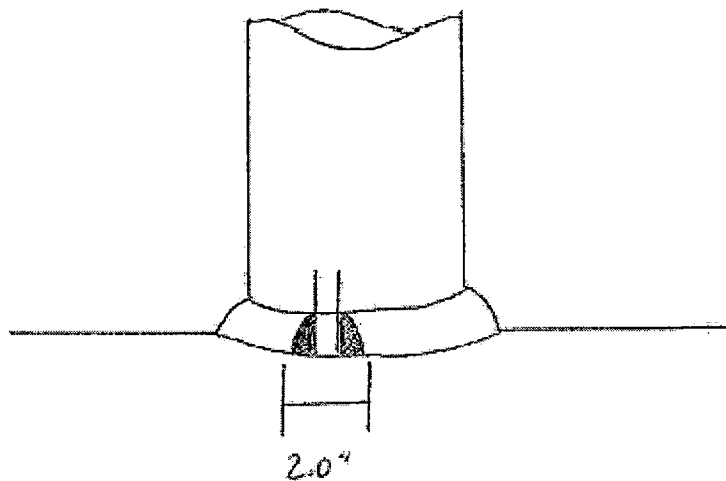
Report No.: MT-06-006  
Page: 2 of 2

Summary No.: S2.C5.81.010

Examiner: Brown, Kevin <i>[Signature]</i>	Level: II	Reviewer: N/A	Date:
Examiner: N/A	Level: N/A	Site Review: Dennis P. Strickland <i>[Signature]</i>	Date: 11/10/2006
Other: N/A	Level: N/A	ANII Review: <i>[Signature]</i>	Date: 11/28/06

### Comments:

Two integral attachments are limitations for weld 1-22BC. (see sketch below) Each attachment covers 2" of the weld causing a 4" limitation. The circumference length of the weld is 20.81". The percentage of the weld that was examined is 80.8%.



LMT-CS01  
Fig 4a2  
page 1 of 1



# Supplemental Report

Report No.: UT-06-138

Page: 23 of 23

RUC 11-8-06

Summary No.: S2.C5.51.006

Examiner: Lester, Robert M Level: II-PDI

Reviewer: N/A

Date:

Examiner: N/A Level: N/A

Site Review: David H. H. H.

Date: 11/11/06

Other: N/A Level: N/A

ANII Review: R. E. Smith

Date: 11/14/06

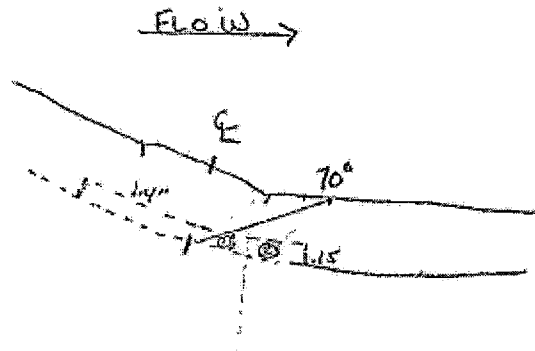
Comments: Coverage Plot

## WELD 0-17

Sketch or Photo:

VALVE

ELBOW



WELD CROWN - .9"  
TOTAL AREA = .15" x 1.4" = .21"  
AREA ① = .25" x .15" / 2 = .019"  
AREA ② = .45" x .15" = .068"  
① + ② = .087"  
AREA COVERED BY 70° = .087 / .21 = 41%

DNST AX - 41%  
UPST AX - 0%  
CW UPST CIRC - 0%  
CCW UPST CIRC - 0%  
60° CW DNST CIRC - 100%  
60° CCW DNST CIRC - 100%

TOTAL 241% / 6 = 40.17%

LMT-CS01  
Fig 4a3  
page 1 of 1

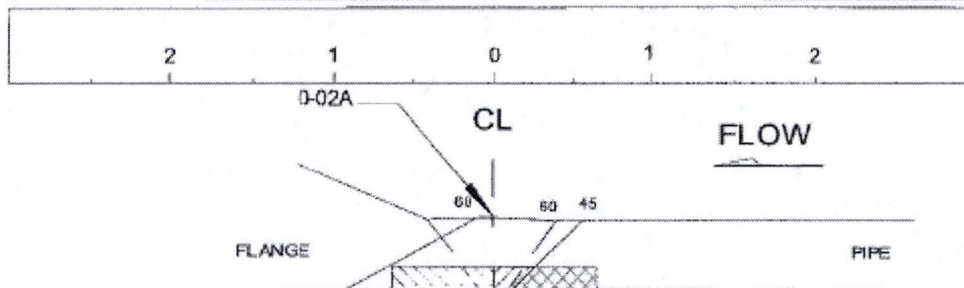


Report No: UT-14-019  
Summary # S2.C5.51.132  
Pg. 4 of 4  
Prepared by: W. Thomas  
Date: 4/24/2014

Reviewed  
Witnessed

5/11/14  
7833  
HSB GS

Weld Number 0-02A Weld Width 0.8"  
Thickness 0.435" Weld Length 20.85"



LIMITATION DUE TO WELDOLET AT BDC US SIDE

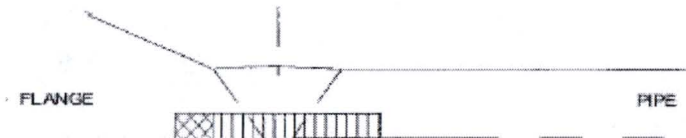
EXAMINED 100% OF THE REQUIRED VOLUME DS SIDE AX DIRECTION



REQUIRED EXAM VOLUME = .094 SQ. IN. X 20.85 LENGTH = 1.96 CUBIC INCHES

NO EXAM FOR .07 SQ. IN. X 2" LIMITATION = 0.14 CUBIC INCHES US SIDE AXIAL DIRECTION

$1.96 - .14 = 1.82 / 1.96 = 0.928 \times 100 = 92.8\%$  AX DIRECTION US SIDE



65" WIDTH X .145" HT = 0.094 SQ. IN. = REQUIRED VOLUME  
 $0.094 - .036 = .058 / .094 = 0.617 \times 100 = 61.7\%$

EXAMINED 61.7% CIRC DIRECTION DS SIDE

Examination Volume Dimensions - Height 0.145" Length 20.85" Width 1.3"

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	92.8%	100%	100%	61.7%
Code Coverage Total				88.6%
100+100+92.8+61.7=354.5/4=88.6				*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.



# Supplemental Report

Report No.: UT-06-077  
Page: 2 of 2

Summary No.: S2.C5.61.030

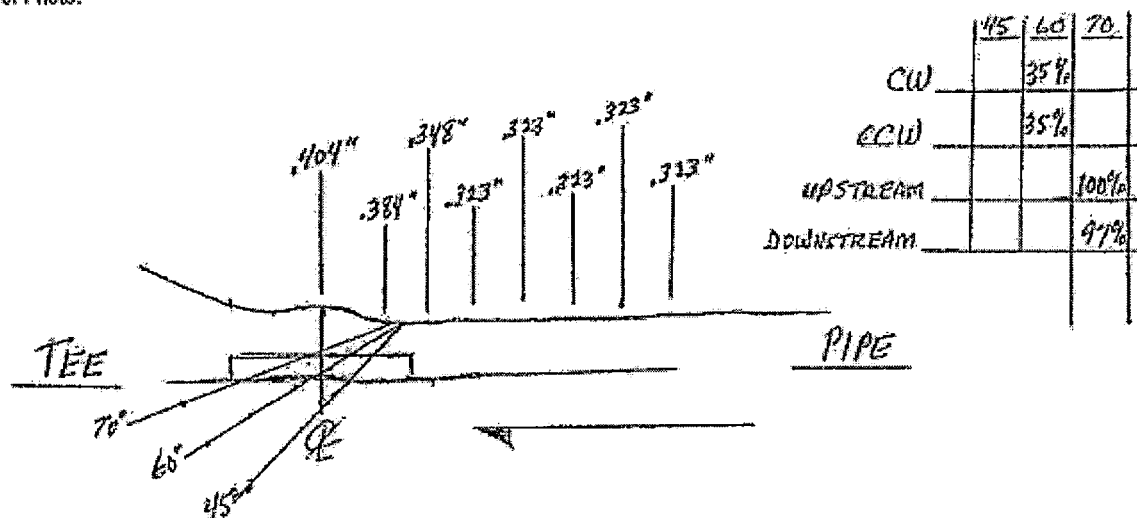
Examiner: Poster, Harry E *Hay-Pate* Level: II-PDI Reviewer: N/A Date: \_\_\_\_\_  
Examiner: N/A Level: N/A Site Review: Dennis P. Trickle Date: 11/12/06  
Other: N/A Level: N/A ANII Review: \_\_\_\_\_ Date: \_\_\_\_\_

Comments:

WELD 0-108

CODE COVERAGE 66.7%  
BEST EFFORT COVERAGE \_\_\_\_\_

Sketch or Photo:



11548-WMKS-011812/3-WAPD-109/0-108

S2.C5.61.030

10-27-06

*Hay-Pate*

ANII *NA* Date 11/19/06  
Initial ☐ Final ☒  
HSB-CT



LMT-CS01  
Fig 4a5  
Page 1 of 1



# Supplemental Report

Report No.: UT-06-032

Page: 2 of 2

Summary No.: S2.C5.61.031

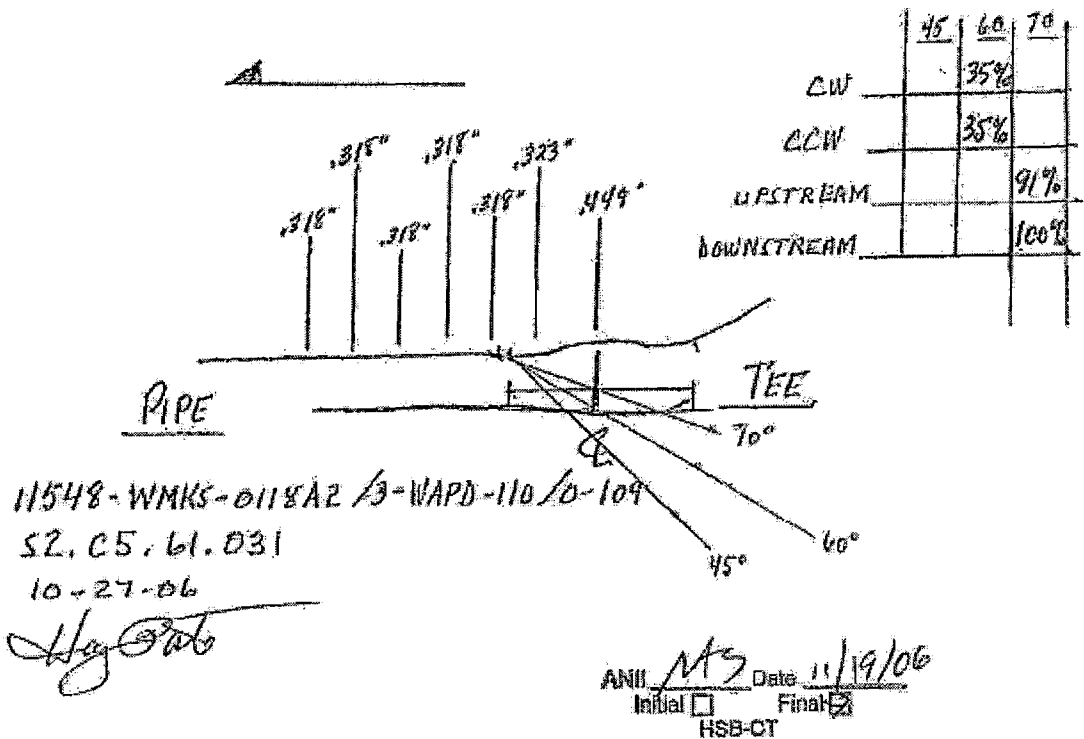
Examiner: Poster, Harry E Level: II-POI Reviewer: N/A Date: 025.11/17/06  
Examiner: N/A Level: N/A Site Review: Dennis P. Stank Date: 11/28/06  
Other: N/A Level: N/A ANII Review:  Date:

Comments:

WELD 0-109

CODE COVERAGE 65.2%  
BEST EFFORT COVERAGE

Sketch or Photo:



**Attachment 4**

**RELIEF REQUEST LMT-P01**  
**EXAMINATION CATEGORY C-F-1 AND R-A**  
**PRESERVICE WELD EXAMINATIONS**

**Virginia Electric and Power Company**  
**(Dominion)**  
**Surry Power Station Unit 2**

**Dominion**  
**Surry Power Station Unit 2**  
**4<sup>th</sup> 10-Year Interval**  
**May 10, 2004 – May 9, 2015**  
**Preservice Pipe Welds**  
**Relief Request # LMT- P01**  
**Repetitive/Duplicate Relief Requests in Accordance with 10 CFR 50.55 a(g)(5)(iii)**  
**Inservice Inspection Impracticality**

**1. ASME Code Components Affected**

ASME Code Class:	Code Class 2
Examination Category:	C-F-1, Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping  R-A, Risk Informed Piping Examinations
Item Numbers:	C5.21, Circumferential Weld, Piping Welds >1/5 in., Nominal Wall Thickness for Piping $\geq$ NPS 2 and $\leq$ NPS 4  R1.11, Elements Subject to Thermal Fatigue
Component Identification:	Refer to Specific Table
Material:	Refer to Specific Table

**2. Applicable Code Edition and Addenda**

1998 Edition with 2000 Addenda of ASME Section XI

**3. Applicable Code Requirement**

Required Method: Surface and Volumetric

The alternative requirements of ASME Section XI, Code Case N-460, approved for use in Regulatory Guide 1.147, Rev.17, allows credit for essentially 100% coverage of the weld provided greater than 90% of the required volume has been examined.

10 CFR 50.55a(b)(2)(xv)(A), requires the following examination coverage criteria when applying Supplement 2 to Appendix VIII:

- (1) Piping must be examined in two axial directions and when examination in the circumferential direction is required, the circumferential examination must be performed in two directions, provided access is available....
- (2) Where examination from both sides is not possible, full coverage credit may be claimed from a single side for ferritic welds. Where examination from both sides is not possible on austenitic welds..., full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix VIII demonstration using flaws on the opposite side of the weld....

10 CFR 50.55a(b)(2)(xvi)(B) requires that examinations performed from one side of a ferritic or stainless steel pipe weld must be conducted with equipment, procedures, and personnel that have demonstrated proficiency with single-side examinations. To demonstrate equivalency to two-sided examinations, the demonstration must be performed in accordance with the requirements of Appendix VIII as modified by 10 CFR 50.55a(b)(2)(xvi)(B) and §50.55a(b)(2)(xv)(A).

#### **4. Impracticality of Compliance**

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the volumetric examination coverage requirements for the subject welds due to the physical configuration which limits the volumetric coverage that can be obtained.

For austenitic welds, when the examination area is limited to one side then the examination coverage does not comply with 10 CFR 50.55a(b)(2)(xv)(A) and proficiency demonstrations do not comply with 10 CFR 50.55a(b)(2)(xvi)(B); full coverage credit may not be claimed. There are currently no Performance Demonstration Initiative (PDI) qualified single-side examination procedures that demonstrate equivalency to two-sided examination procedures on austenitic piping welds. Current technology is not capable of reliably detecting or sizing flaws on the far side of an austenitic weld for configurations common to U.S. nuclear applications. However, PDI Performance Demonstration Qualification Summary (PDQS) certificates for austenitic piping list the limitation that single-side examination is performed on a best effort basis. The best effort qualification is provided in place of



a complete single-side qualification to demonstrate that the examiners' qualification and the subsequent weld examination is based on application of the best available technology.

The subject welds were examined with a manual ultrasonic (UT) technique using pulse echo UT instruments and search units to achieve the maximum examination coverage practical. Examinations were performed using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII as implemented by the Performance Demonstration Initiative (PDI). No alternative welds were considered since these are preservice examinations for each specific weld that was reconstructed.

#### **Weld 2-08C**

This is a stainless steel ASME Section XI, Category C-F-1 weld. This weld also received a final liquid penetrant (surface) examination and a radiography (volumetric) examination before return to service. No indications were discovered during any of the examinations performed.

#### **Weld 2-09B**

This is a stainless steel ASME Section XI, Category C-F-1 weld. This weld also received a final liquid penetrant (surface) examination and a radiography (volumetric) examination before return to service. No indications were discovered during any of the examinations performed.

#### **Weld 1-03A**

This is a stainless steel ASME Section XI, Category R-A, Class 1 weld, which is part of the Risk Informed ISI Program. This weld also received a final liquid penetrant (surface) examination and a radiography (volumetric) examination before return to service. No indications were discovered during any of the examinations performed.

**TABLE LMT-P01 - Preservice Examinations**

<b>Drawing / Line# / ID System / Class Category / Item</b>	<b>Pipe Material</b>	<b>Pipe Dia.</b>	<b>Weld Thickness</b>	<b>Coverage Achieved</b>	<b>Limitation / Results / Comments</b>	<b>Fig.</b>
11548-WMKS-SI- 12A / 3-SI-272 / 2-08C Safety Injection / 2 / C-F-1 / C5.21	ASME Spec. SA 312 TP304	3"	0.438"	50% (UT) 23% (UT Best Effort)	UT- pipe to valve / NRI / Also received 100% PT and RT / NRI	4a1
11548-WMKS-SI- 12A / 3-SI-272 / 2-09B / Safety Injection / 2 / C-F-1 / C5.21	ASME Spec. SA 312 TP304	3"	0.438"	48% (UT) 19% (UT Best Effort)	UT- pipe to valve / NRI / Also received 100% PT and RT / NRI	4a2
11548-WMKS- 0127J2 / 6-SI-319 / 1-03A / Safety Injection / 1 / R-A / R1.11	ASME Spec. SA 376 TP316	6"	0.562"	50% (UT) 26% (UT Best Effort)	UT- valve to elbow / NRI / Also received 100% PT and RT / NRI	4a3

## **5. Burden Caused by Compliance**

Compliance with the Code requirements would require extensive modification or replacement of components with a design that would allow full examination from both sides of the weld. This option to rebuild components is considered impractical and would cause unnecessary radiation exposure. Furthermore, plant equipment could be impacted in a detrimental manner.

## **6. Proposed Alternative and Basis for Use**

The subject welds received a volumetric examination to the maximum extent practical utilizing the best available techniques. With the incorporation of the PDI for Supplement 2, demonstration for best effort coverage was made for single-sided examination from the accessible side of the austenitic welds. Additionally, the components are monitored for through-wall leakage as part of the ASME Section XI System Pressure Test Program and receive visual (VT-2) examination periodically as required by Section XI, IWB-2500-1, Category B-P, every refueling outage for Class 1 components and IWC-2500-1, Category C-H, every period for Class 2 components.

None of the pipe or weld material is constructed with Alloy 600/82/182 materials; therefore, there are no primary water stress corrosion cracking (PWSCC) concerns. No indications were found during any of the examinations discussed.

Based on the volumetric coverage that was obtained with acceptable results, the visual (VT-2) examinations performed routinely and the additional examinations for surface (liquid penetrant) and volumetric (radiography) exams, it is reasonable to conclude that no flaws exist in the new welds. These proposed alternatives provide an acceptable level of quality and safety by providing reasonable assurance of structural integrity of the subject welds. Accordingly, Dominion requests relief in accordance with 10 CFR 50.55a(g)(5)(iii).

## **7. Duration of Proposed Alternative**

This proposed alternative is requested to meet requirements for the fourth ten-year inspection interval for Surry Power Station Unit 2, which began May 10, 2004 and ended May 9, 2015.

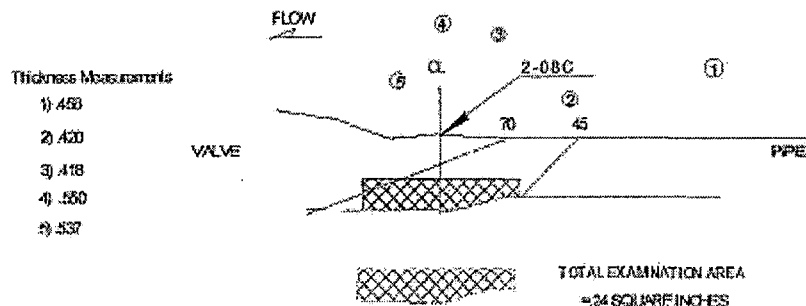
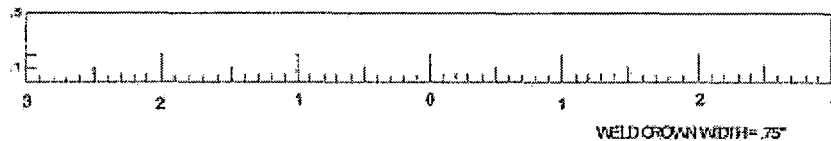
LMT-P01  
Fig 4a1  
page 1 of 1



Report No. UT-11-001  
Summary No. S2.C5.21.348  
Pg. 6 of 6  
Prepared By: TRAVIS THOMAS  
Date: 4/26/2011

Weld Number 2-08C  
Weld Thickness .438"

Weld Length 11"  
Weld Width .75"



BEST EFFORT DS AXIAL SIDE = .11 SQUARE INCHES  
TOTAL REQUIRED DS AXIAL SIDE = .12 SQ. INCHES  
 $0.11 / 0.12 = 0.92 \times 100 = 92\%$

NO EXAM DS AXIAL SIDE = .01 SQUARE INCHES  
 $0.01 / .12 = 0.08 \times 100 = 8\% \text{ SQUARE INCHES}$

Examination Volume Dimensions - Height .146" Length 11" Width 1.25"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
Angle	Up-St-Ax	Up-St-Circ	Dn-St-Ax	Dn-St-Circ
45 / 70	100%		0%	
45 / 60		100%		0%
70	Best effort 23%			
Code Coverage Total				50%
Best Effort Coverage (Max 25%) Total				23%
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.				

*Handwritten signature and date:*  
5/9/11



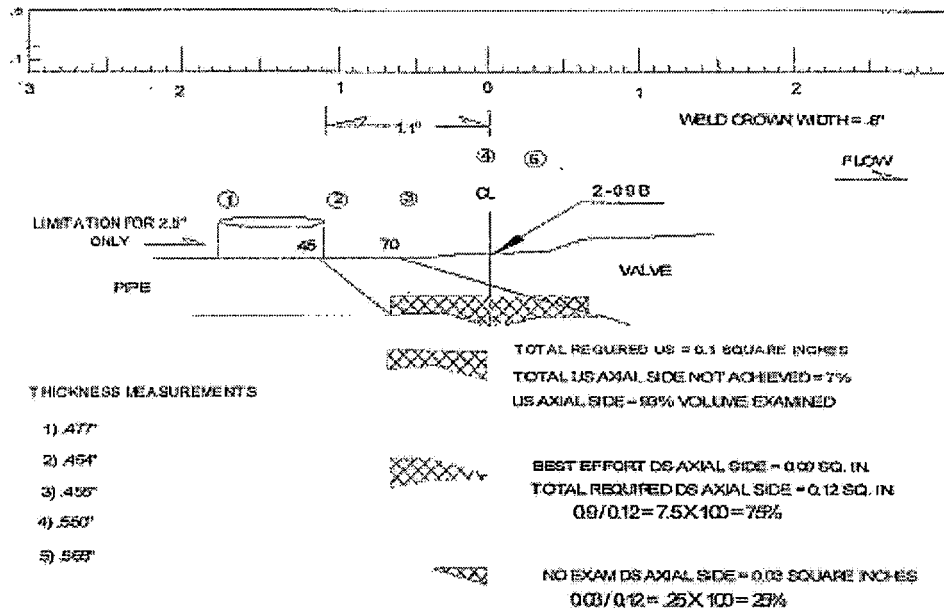
LMT-P01  
Fig 4a2  
page 1 of 1



**Dominion**

Report No. UT-11-082  
Summary No. S2.C5.21.349  
Pg. 4 of 4  
Prepared By: TRAVIS THOMAS  
Date: 5/6/2011

Weld Number 2-09B Weld Length 11.25"  
Weld Thickness .438" Weld Width .8"



**TOTAL EXAMINATION AREA = 2.2 SQUARE INCHES**

Examination Volume Dimensions - Height 146" Length 11.25" Width 1.3"

Coverage Summary				
Required Scans (each has a weighing factor of 100 for complete coverage)				
Angle	Up-St-Ax	Up-St-Circ	Dn-St-Ax	Dn-St-Circ
45 / 70	93%		0%	
45 / 60		100%		0%
70	BEST EFFORT = 19%			
Code Coverage Total				48%
Best Effort Coverage (Max 25%) Total				19%
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.			

*Rev. Smith  
AUII 5/14/11*



# Supplemental Report

Report No.: UT-06-158

Page: 2 of 2

Summary No.: S2.R1.11.926

Examiner: Slatek, Robert P

Level: II-PDI

Reviewer: NA

Date: 11/18/06

Examiner: NA

Level: NA

Site Review: David M. Helle

Date: 11/18/06

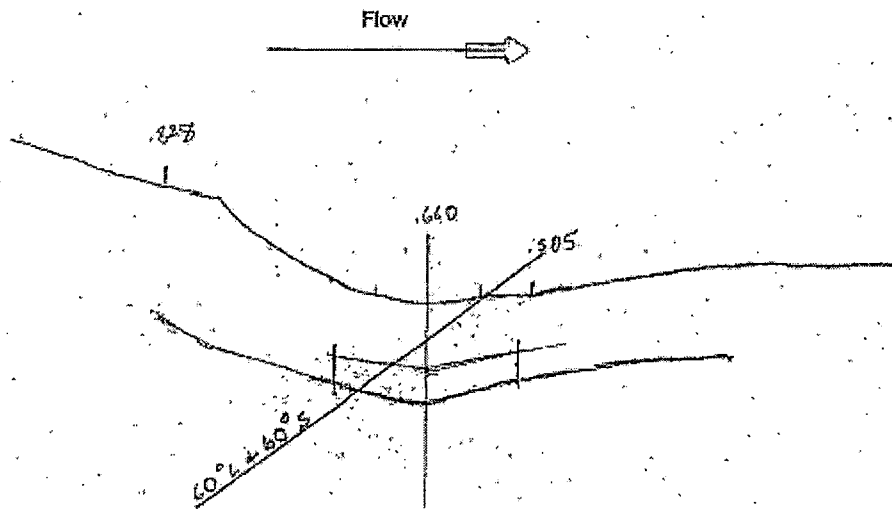
Other: NA

Level: NA

ANII Review: Ch. Smith

Date: 2/2/07

Weld Number 1-03 A  
Weld Thickness 0.660"  
Weld Length 19.68" E.O.



Box Dimensions = H0.220" L1.15"

Angle	UpSt- Ax	UpSt- CW	UpSt- CCW	DnSt- Ax	DnSt- CW	DnSt- CCW
60°	77%	0%	0%	100%	100%	100%

Code Coverage Total 50% (50% max)  
Best Effort Coverage Total 26% (50% max)

**Attachment 5**

**RELIEF REQUEST LMT-C01**  
**EXAMINATION CATEGORY B-B**  
**PRESSURIZER SHELL-TO-HEAD CIRCUMFERENTIAL**  
**AND LONGITUDINAL WELDS**

**Virginia Electric and Power Company**  
**(Dominion)**  
**Surry Power Station Unit 2**

**Dominion**

**Surry Power Station Unit 2**

**4<sup>th</sup> 10-Year Interval  
May 10, 2004 – May 9, 2015**

**Pressurizer Shell-to-Head Circumferential and Longitudinal Welds**

**Relief Request LMT-C01  
In Accordance with 10 CFR 50.55 a(g)(5)(iii)**

**1. ASME Code Components Affected**

Weld No.: 1-07  
Drawing: 11548-WMKS-RC-E-2  
ASME Class: Code Class 1  
ASME Category: B-B  
ASME Item: B2.11  
Description: Pressurizer Shell to Head Circumferential Weld

Weld No.: 1-02  
Drawing: 11548-WMKS-RC-E-2  
ASME Class: Code Class 1  
ASME Category: B-B  
ASME Item: B2.12  
Description: Pressurizer Longitudinal Shell Weld

**2. Applicable Code Edition and Addenda**

1998 Edition with 2000 Addenda of ASME Section XI



### **3. Applicable Code Requirement**

The 1998 Edition with 2000 Addenda of ASME Section XI, Table IWB-2500-1, examination Category B-B, Item B2.11, requires volumetric examination of essentially 100% of the circumferential shell to head welds.

Table IWB-2500-1, Category B-B, Item B2.12, of the 1998 Edition with 2000 Addenda requires volumetric examination of one foot of the longitudinal weld that intersects the selected circumferential shell to head weld.

### **4. Impracticality of Compliance**

The pressurizer is covered with an insulation support ring (Figure 1). The insulation support ring is 6 inches wide where examination interference is encountered for weld 1-07. As seen in Figure 1, this insulation support ring and a power operated relief valve support prevent complete volumetric coverage of both the upper circumferential head weld and the intersecting longitudinal weld 1-02.

### **5. Burden Caused by Compliance**

Total removal of the support ring at the mechanical connections is considered impractical due to the extremely high dose rates in the pressurizer area. Total radiation dose to perform removal of the interfering support and to perform the examination was estimated to be 13.9 man-rem. This includes expended dose necessary for various crafts including mechanical maintenance, insulators, rigging crews, and the Non-destructive Examination (NDE) workers. Partial removal of the support ring could allow some increased coverage; however, the actual increase would be very small in relation to the entire weld length. This is not a viable effort when considering consequential disturbance of interconnected cross supports and the welded connections to safety and power operation relief valve supports. Any removal of the mechanical connections or forced spreading apart of components would create a risk of misalignment and possibly warp the structure. Furthermore, civil engineering proposed that cutting the support could be necessary for removal; thus, destroying the support ring.

### **6. Proposed Alternative and Basis for Use**

Examination of pressurizer shell welds 1-07 and 1-02 was performed during the third inservice inspection interval; as documented in Dominion letter dated March 18, 1994 (Serial No. 94-006) and approved by NRC letter dated August 30, 1995. The previous obstructions (details shown in Fig. 4) were verified during performance of the fourth interval examinations for welds 1-07 and 1-02. Documentation of the

fourth interval examinations are shown in Fig. 2 and 3. The total coverage reported for the fourth interval is as follows:

Weld 1-02 50%

Weld 1-07 82%

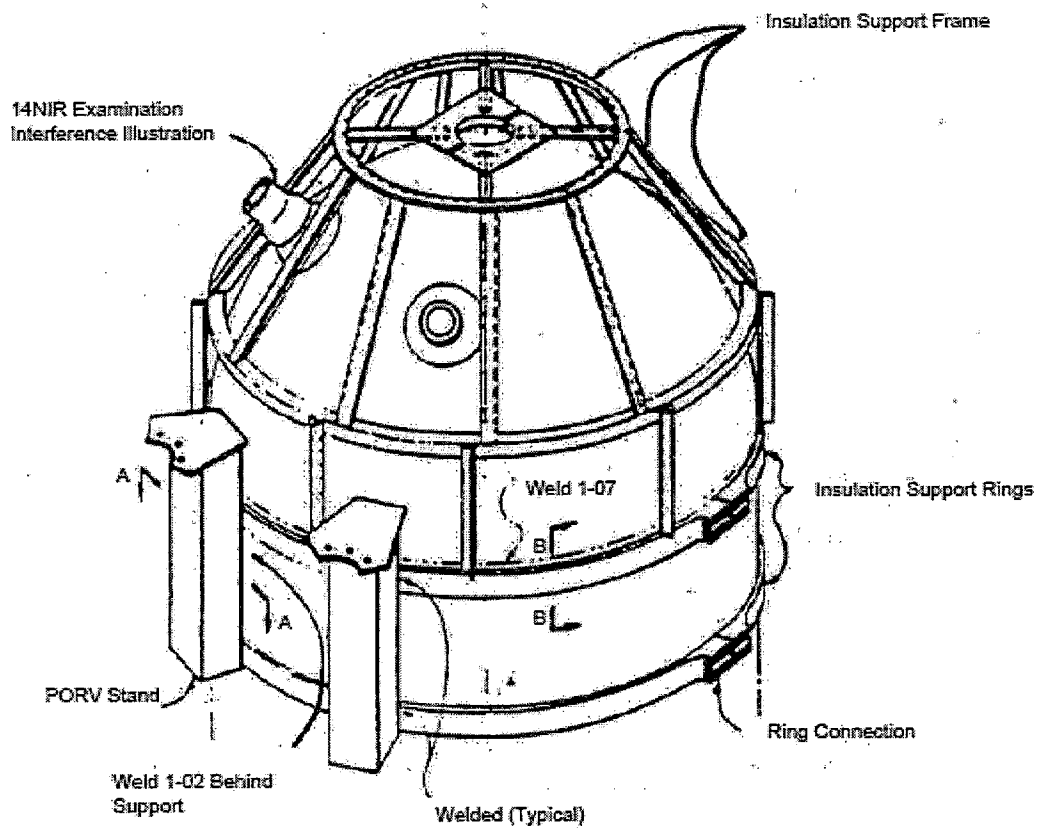
No additional ultrasonic examination techniques would provide meaningful additional data on this clad material for the examination volume not attained. The pressurizer receives a visual (VT-2) examination every refueling outage as required by Section XI, Table IWB-2500-1, Category B-P, for Class 1 components. Any effort to achieve greater coverage would be impractical creating risk for component damage or destruction and excessive personnel dose.

It is proposed that the percentage coverage obtained be considered as meeting Code requirements.

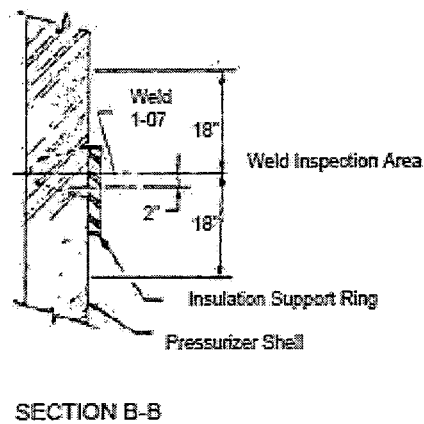
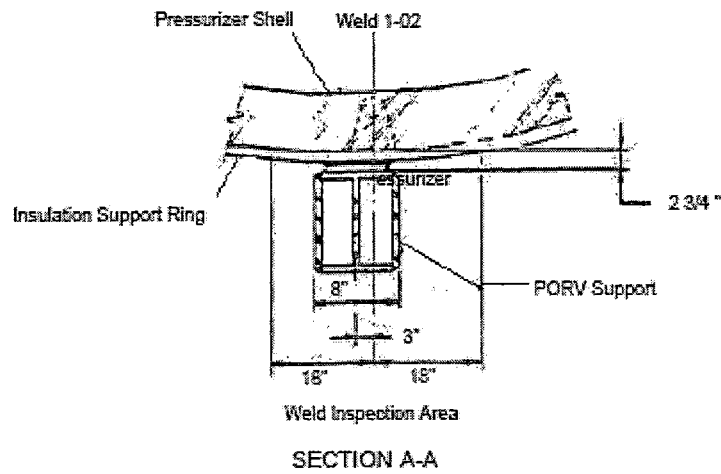
#### **7. Duration of Proposed Alternative**

This proposed alternative is requested to meet requirements for the fourth ten-year inspection interval for Surry Power Station Unit 2, which began May 10, 2004 and ended on May 9, 2015.

Unit 2 Pressurizer Insulation Support Frame



LMT-C01  
Fig 1  
page 2 of 2







## UT Vessel Examination

Site/Unit: <u>Surry / 2</u>	Procedure: <u>ER-AA-NDE-UT-702</u>	Outage No.: <u>S2R26</u>
Summary No.: <u>S2.B2.12.001</u>	Procedure Rev.: <u>4</u>	Report No.: <u>UT-14-093</u>
Workscope: <u>ISI</u>	Work Order No.: <u>38103379817/NDER14-049</u>	Page: <u>1</u> of <u>1</u>

---

Code: <u>ASME 1998 Ed/2000 Add</u>	Cat./Item: <u>B-B/B2.12</u>	Location: <u>PZR 47</u>
Drawing No.: <u>11548-WMKS-RC-E-2</u>	Description: <u>LONGITUDINAL SHELL WELD</u>	
System ID: <u>RC</u>		
Component ID: <u>11548-WMKS-RC-E-2 / 1-02</u>	Size/Length: <u>3.5"/12"</u>	Thickness/Diameter: <u>4.375" / 92"</u>
Limitations: <u>Refer to UTRNO 884</u>	Start Time: <u>2149</u>	Finish Time: <u>2414</u>

---

Examination Surface: Inside <input type="checkbox"/> Outside <input checked="" type="checkbox"/>	Surface Condition: <u>Ground Flush</u>		
Lo Location: <u>Zero Datum Point</u>	Wo Location: <u>Weld Center Line</u>	Couplant: <u>Soundsafe</u>	Batch No.: <u>12120</u>
Temp. Tool Mfg.: <u>SEALED UNIT</u>	Serial No.: <u>4030900351</u>	Surface Temp.: <u>71</u> °F	
Cal. Report No.: <u>CAL-14-017, CAL-14-018, CAL-14-019</u>			

Angle Used	0	45	45T	60	60T	N/A
Scanning dB	10.3	49.5	49.5	57	57	N/A

Indication(s): Yes ☐ No ☒ Scan Coverage: Upstream ☒ Downstream ☒ CW ☒ CCW ☒

Comments:

Examined 50% due to bellyband. All areas were scanned to the extent possible with the 0°, 45°, and 60° transducers.

Results: NRI ☒ RI ☐ Geom ☐ N/A

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

Examiner	Level	II-PDI	Signature	Date	Reviewer	Signature	Date
Hacker, Jonathon				5/6/2014	W.L. Thomas		5/15/14
Examiner	Level	II-PDI	Signature	Date	Site Review	Signature	Date
Hammon, Byron H				5/6/2014	Byron H. Hammon		5-10-2014
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Byron H. Hammon		5/15/14

UT Vessel Examination

LMT-C01  
Fig 2  
Page 1 of 1

Serial No. 16-146  
Docket No. 50-281  
Relief Request LMT-C01  
Attachment 5; Page 6 of 8



Dominion

## UT Vessel Examination

Site/Unit: <u>Surry / 2</u>	Procedure: <u>ER-AA-NDE-UT-702</u>	Outage No.: <u>S2R26</u>
Summary No.: <u>S2.B2.11.002</u>	Procedure Rev.: <u>4</u>	Report No.: <u>UT-14-092</u>
Workscope: <u>ISI</u>	Work Order No.: <u>38103379817/NDER14-049</u>	Page: <u>1</u> of <u>1</u>

---

Code: <u>ASME 1998 Ed/2000 Add</u>	Cat./Item: <u>B-B/B2.11</u>	Location: <u>FZR 47</u>
Drawing No.: <u>11548-WMKS-RC-E-2</u>	Description: <u>CIRC SHELL TO HEAD WELD</u>	
System ID: <u>RC</u>		
Component ID: <u>11548-WMKS-RC-E-2 / 1-07</u>	Size/Length: <u>3.5"/290.25"</u>	Thickness/Diameter: <u>4.375" / 92"</u>
Limitations: <u>Refer to UTNRO 884</u>	Start Time: <u>2149</u>	Finish Time: <u>2414</u>

---

Examination Surface: Inside <input type="checkbox"/> Outside <input checked="" type="checkbox"/>	Surface Condition: <u>Ground Flush</u>
Lo Location: <u>Zero Datum Point</u>	Wo Location: <u>Weld Center Line</u>
Temp. Tool Mfg.: <u>SEALED UNIT</u>	Serial No.: <u>4030900351</u>
Cal. Report No.: <u>Cal-14-017, CAL-14-018, CAL-14-019</u>	Surface Temp.: <u>71</u> °F

Angle Used	0	45	45T	60	60T	N/A
Scanning dB	10.3	49.5	49.5	57	57	N/A

Indication(s): Yes ☐ No ☒ Scan Coverage: Upstream ☒ Downstream ☒ CW ☒ CCW ☒

Comments:

Previous obstructions verified during this examination. All areas were examined to the extent possible with 0°, 45° and 60° transducers, accumulating to aprox. 82%. 100% of circumferential head weld was examined.

Results: NRI ☒ RI ☐ Geom ☐ N/A

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

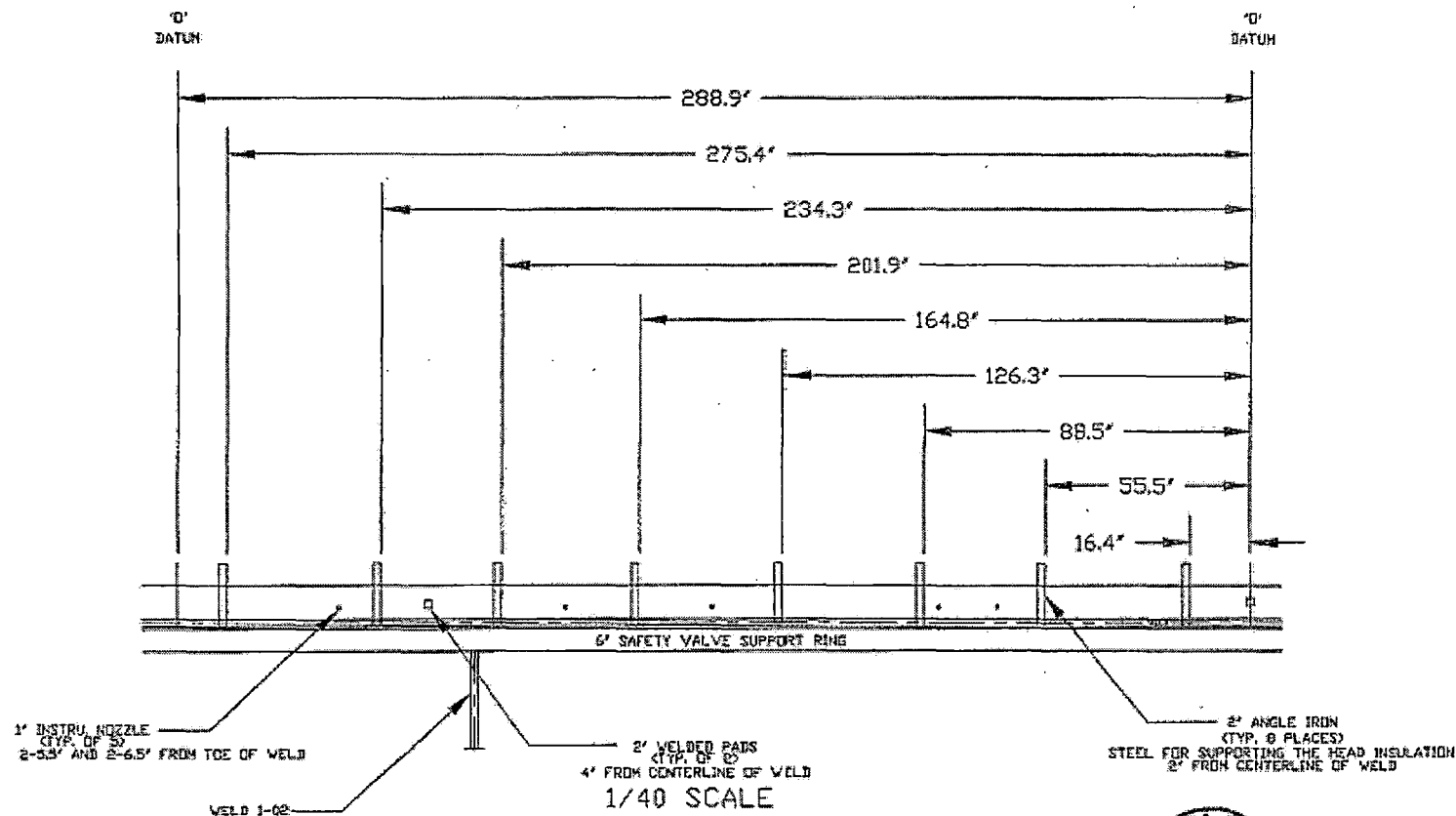
Examiner	Level	II-PDI	Signature	Date	Reviewer	Signature	Date
Hacker, Jonathon				5/6/2014	W.L. Thomas		5/10/14
Examiner	Level	II-PDI	Signature	Date	Site Review	Signature	Date
Harmon, Byron H				5/6/2014	Dennis P. Saccand		5.10.2014
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Alan Smith		5/15/14

UT Vessel Examination

LMT-001  
Fig 3  
Page 1 of 1

Serial No. 16-146  
Docket No. 50-281  
Relief Request LMT-C01  
Attachment 5; Page 7 of 8

# 11548-WMKS-RC-E-2 WELD 1-02 & 1-07 PRESSURIZER HEAD TO SHELL WELD



RT3397A

HSB-GT ANVANI REVIEWS  
INITIAL FINAL  
1/13/03 10/13/03



LMT-C01  
Fig 4  
Page 1 of 1

Serial No. 16-146  
Docket No. 50-281  
Relief Request LMT-C01  
Attachment 5; Page 8 of 8

**Attachment 6**

**RELIEF REQUEST LMT-C02**  
**EXAMINATION CATEGORY B-D**  
**PRESSURIZER NOZZLE INNER RADIUS SECTION**

**Virginia Electric and Power Company**  
**(Dominion)**  
**Surry Power Station Unit 2**



**Dominion**  
**Surry Power Station Unit 2**  
**4<sup>th</sup> 10-Year Interval**  
**May 10, 2004 – May 9, 2015**  
**Pressurizer Nozzle Inner Radius Section**  
**Relief Request LMT-C02**  
**In Accordance with 10 CFR 50.55a(g)(5)(iii)**

**1. ASME Code Components Affected**

Mark No.: 14NIR  
Drawing: 11548-WMKS-RC-E-2  
ASME Class: Code Class 1  
ASME Category: B-D  
ASME Item: B3.110  
Description: Pressurizer Shell to Head Circumferential Weld

**2. Applicable Code Edition and Addenda**

1998 Edition with 2000 Addenda of ASME Section XI

**3. Applicable Code Requirement**

The 1998 Edition with 2000 Addenda of ASME Section XI, Table IWB-2500-1, deleted the requirement to examine the nozzle inner radius (NIR) sections. ASME item B3.110 actually addresses the pressurizer nozzle-to-vessel welds. The NIRs are not welds. This item number assignment was used as it has the closest description for the pressurizer NIRs in the 2000 Addenda of Section XI.

10 CFR 50.55a(2)(xxi) places a condition on the requirements of ASME Section XI, Table IWB-2500-1, Examination Category B-D. The condition mandates that the 1998 Edition of ASME Section XI be used, which requires examination of the

Class 1 NIRs by Items B3.120 and B3.140. Either an ultrasonic or enhanced visual examination shall be performed.

#### **4. Impracticality of Compliance**

The pressurizer is covered with an insulation support ring as indicated in Figure 1, page 2. As can be seen in the figure, the support ring interferes with completion of a full volumetric examination around the circumference of the 14NIR.

#### **5. Burden Caused by Compliance**

Total removal of the support ring at the mechanical connections is considered impractical due to the extreme high dose rates in the pressurizer area. Furthermore, this is not a viable effort when considering consequential disturbance of interconnected cross supports and the welded connections to safety and power operation relief valve supports. Any removal of the mechanical connections or forced spreading apart of components would create a risk of misalignment and possibly warp the structure. Civil engineering proposed that cutting the support could be necessary for removal; thus, destroying the support ring.

#### **6. Proposed Alternative and Basis for Use**

The five remaining pressurizer NIRs, 10NIR, 11NIR, 12NIR, 13NIR and 15NIR, were examined during the fourth interval with no recordable indications. 15NIR on the pressurizer surge nozzle is addressed by NRC approved relief request CMP-001 Rev. 1. (Reference NRC letter and included Safety Evaluation Report dated June 5, 2007). Examination requirements are covered by the Class 1 system pressure test performed every refueling outage. NIRs 10, 11, 12 and 13 were volumetrically examined meeting code coverage requirements. The six pressurizer NIRs receive a visual (VT-2) examination every refueling outage as required by ASME Section XI, Table IWB-2500-1, Category B-P, for Class 1 components.

Any effort to achieve greater volumetric coverage on 14NIR would be impractical and would create the risk of component damage or destruction as well as excessive personnel dose.

It is proposed that the percentage coverage obtained be considered acceptable for meeting the Code requirements.

**7. Duration of Proposed Alternative**

This proposed alternative is requested to meet requirements for the fourth ten-year inspection interval for Surry Power Station Unit 2, which began May 10, 2004 and ended on May 9, 2015.



## Supplemental Report

Report No.: UT-14-096

Page: 2 of 2

Summary No.: S2.B3.110.005

Examiner: Nelson, Kirkland R. *KRN*

Level: II-PDI

Reviewer: *Dennis P. Williams*

Date: *05/10/14*

Examiner: N/A

Level: N/A

Site Review: *Dennis P. Williams*

Date: *5/12/14*

Other: N/A

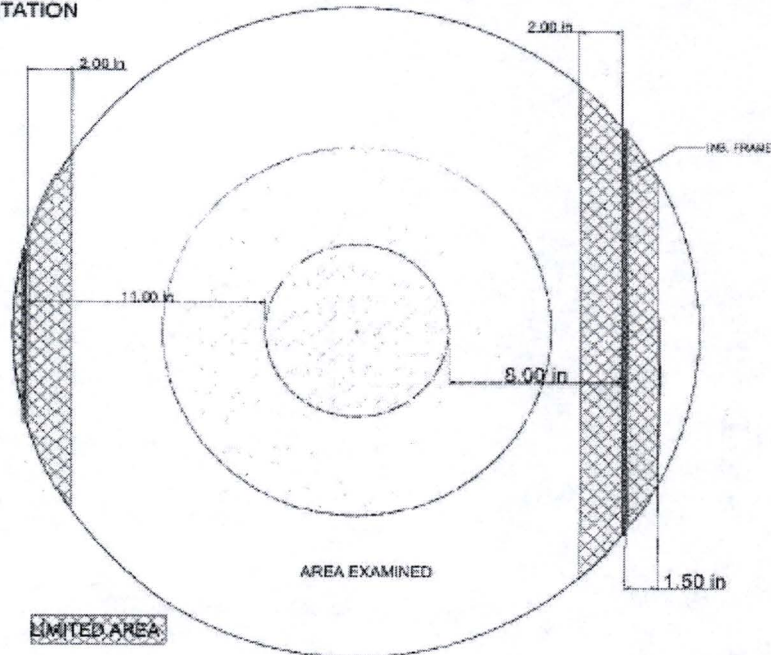
Level: N/A

ANII Review: *Al. Smith*

Date: *5/17/14*

Comments: 65 DEG +/- 14 SCAN LIMITATION

Sketch or Photo:



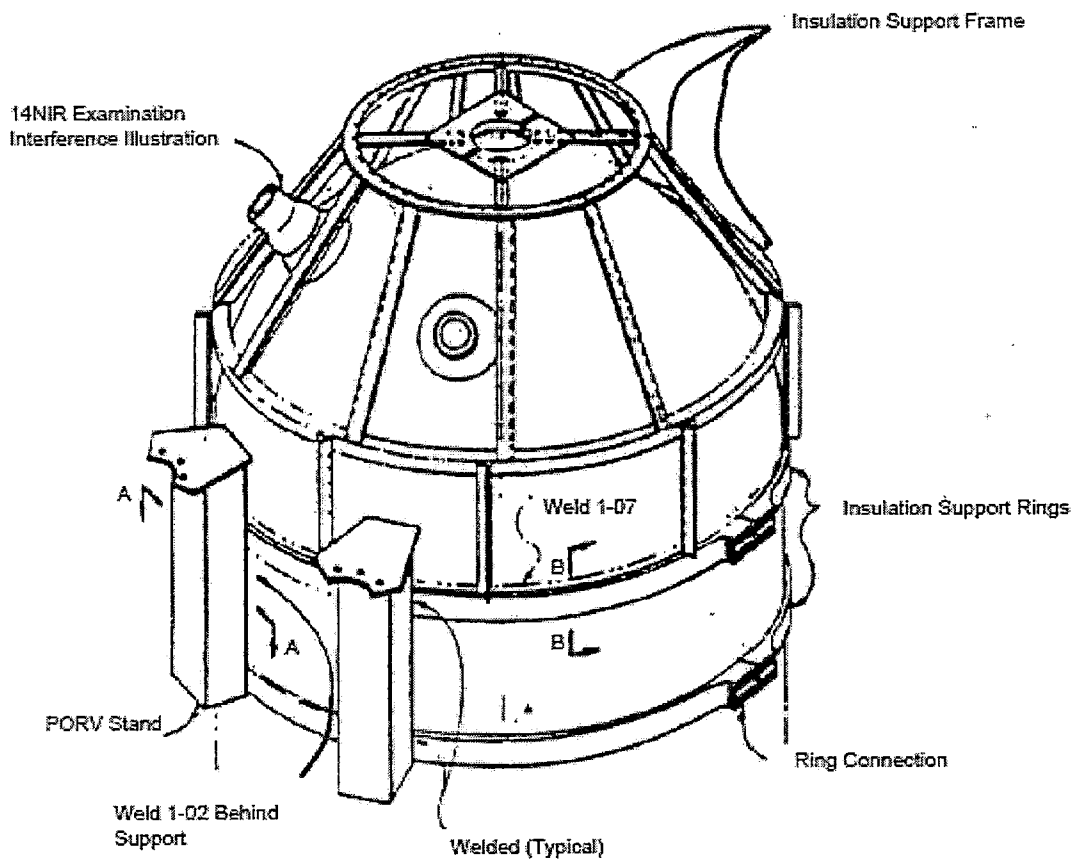
TOTAL REQUIRED SCAN AREA = 535.6 SQ. IN

TOTAL AREA OF LIMITATION = 106 SQ. IN

$535.6 - 106 = 429.6 / 535.6 = 0.80 \times 100 = 80\%$



Unit 2 Pressurizer Insulation Support Frame



**Attachment 7**

**RELIEF REQUEST LMT-C03**  
**EXAMINATION CATEGORY C-C**  
**MAIN STEAM INTEGRAL ATTACHMENT H001-1**

**Virginia Electric and Power Company  
(Dominion)  
Surry Power Station Unit 2**

**Dominion**

**Surry Power Station Unit 2**

**4<sup>th</sup> 10-Year Interval  
May 10, 2004 – May 9, 2015**

**Main Steam Integral Attachment H001-1**

**Relief Request LMT-C03  
In Accordance with 10 CFR 50.55a(g)(5)(iii)**

**1. ASME Code Components Affected**

Weld No.: H001-1  
Drawing: 11548-WMKS-0100D1  
ASME Class: Code Class 2  
ASME Category: C-C  
ASME Item: C3.20  
Description: Integral Attachment

**2. Applicable Code Edition and Addenda**

1998 Edition with 2000 Addenda of ASME Section XI

**3. Applicable Code Requirement**

ASME Section XI, Examination Category C-C, Item C3.20, requires surface examination on 100% of the weld area selected for examination. The alternative requirements of ASME Section XI, Code Case N-460, approved for use in Regulatory Guide 1.147, Rev. 17, allows credit for essentially 100% coverage of the weld provided greater than 90% of the required volume or area has been examined.

**4. Impracticability of Compliance**

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the essentially 100% examination area coverage requirement of the subject welds due to the geometric configuration and obstructions which limit the surface examination coverage.

This integral attachment is part of a spring can support system. The rod seen in the attached typical figures, including the photograph in Fig 3, extends to a spring can above the main steam pipe. Due to interference with the support rod and the narrow opening of the integral attachment, examination of the interior welds is limited.

100% coverage was achieved for the welds on the outside of the integral attachment for a total of 39 linear inches. The inside bottom 4 inches and two 11-inch side welds could not be reached to perform a successful surface examination. Thirty-nine inches of the total 65 linear inches were examined for examination coverage of 60%.

**5. Burden Caused by Compliance**

The purpose of nondestructive examination (NDE) is to perform inspections without destroying the component. Disassembly of a component solely to perform a Section XI examination is not a requirement. Any attempt to achieve greater coverage on the interior welds of this integral attachment would require disassembly of the spring can hanger and rod, which would require seismic support analysis and most likely mandate a temporary support system installation for the 30" main steam line while this support was rendered inoperable. Even if the support were disassembled, it is improbable that a meaningful surface examination could be achieved due to the physical constraints of the narrow opening.

**6. Proposed Alternative and Basis for Use**

This component receives periodic visual (VT-2) examinations in accordance with Category C-H, which should detect any through-wall leakage in the inaccessible areas. It is proposed that the percentage of surface coverage obtained with no recordable indications, in addition to the periodic visual examinations, be considered as meeting Code requirements.

**7. Duration of Proposed Alternative**

This proposed alternative is requested to meet requirements for the fourth ten-year inspection interval for Surry Power Station Unit 2, which began May 10, 2004 and ended on May 9, 2015.



## Supplemental Report

Report No.: MT-06-008  
Page: 2 of 2

Summary No.: S2.C3.20.003

Examiner: <u>Currao, Jeffrey T</u>	Level: <u>II</u>	Reviewer: <u>N/A</u>	Date: _____
Examiner: <u>N/A</u>	Level: <u>N/A</u>	Site Review: <u>Robert Davies</u>	Date: <u>11/4/2006</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>Al Smith</u>	Date: <u>11/5/06</u>

Comments: 60 % Coverage Obtained ( Total Weld Length 65 " Total Length Examined 39 " ) See Photo Below.

(NOT EXAMINED)  
11" Right Side  
11" Left Side  
4" Bottom  
(INSIDE)

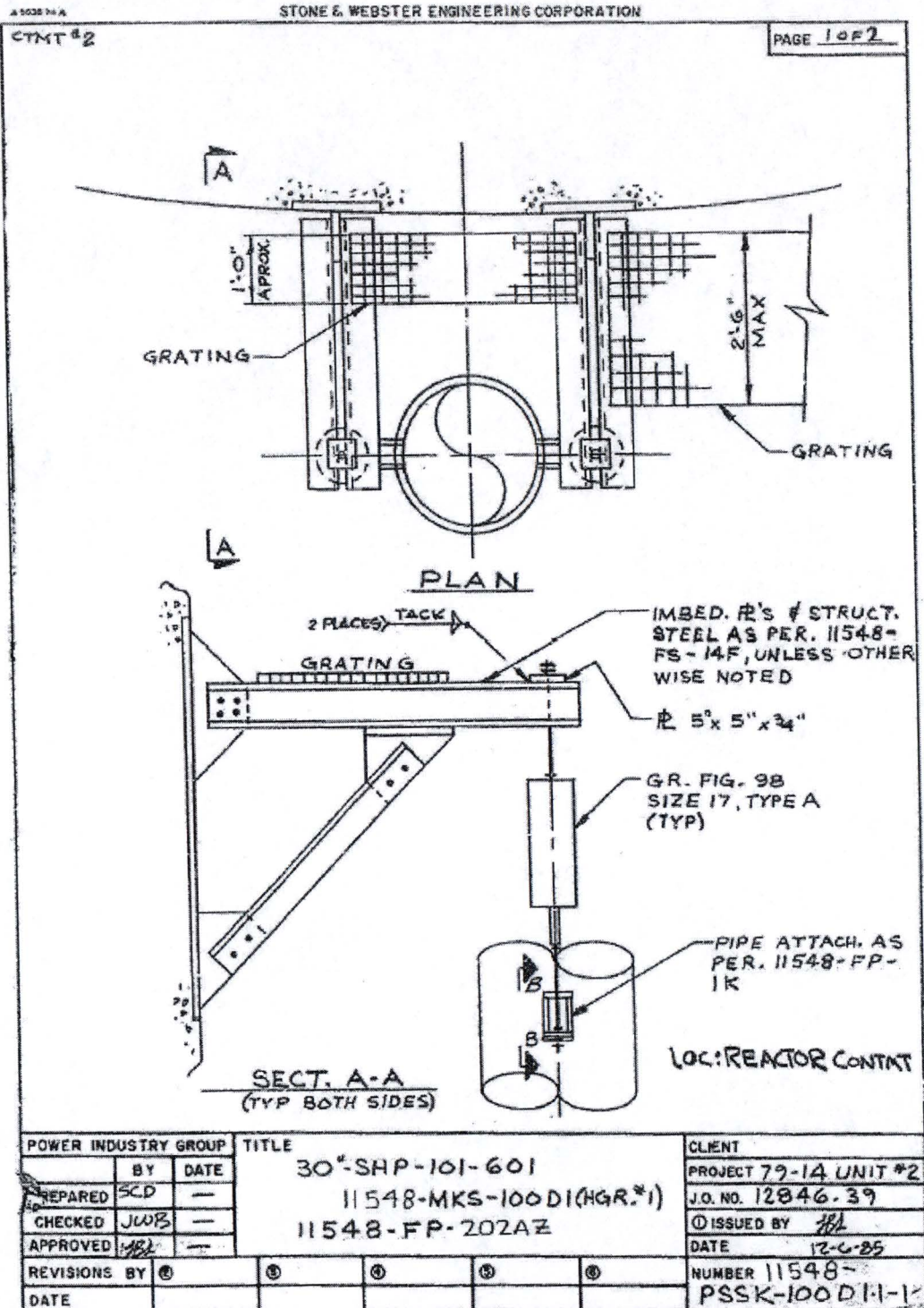
(EXAMINED)  
6" Top  
6" Bottom

EXAMINED  
13.5" Right Side  
13.5" Left Side

Sketch or Photo:  
Typical of this  
Integral Attachment









LMT-C03  
Fig 3  
Page 1 of 1

Typical of Main Steam Hanger Integral Attachment H001-1 and H001-2



**Attachment 8**

**RELIEF REQUEST LMT-C04**  
**EXAMINATION CATEGORY C-C**  
**MAIN STEAM INTEGRAL ATTACHMENT H001-2**

**Virginia Electric and Power Company  
(Dominion)  
Surry Power Station Unit 2**



**Dominion**  
**Surry Power Station Unit 2**  
**4<sup>th</sup> 10-Year Interval**  
**May 10, 2004 – May 9, 2015**  
**Main Steam Integral Attachment H001-2**  
**Relief Request LMT-C04**  
**In Accordance with 10 CFR 50.55 a(g)(5)(iii)**

**1. ASME Code Components Affected**

Weld No.: H001-2  
Drawing: 11548-WMKS-0100D1  
ASME Class: Code Class 2  
ASME Category: C-C  
ASME Item: C3.20  
Description: Integral Attachment

**2. Applicable Code Edition and Addenda**

1998 Edition with 2000 Addenda of ASME Section XI

**3. Applicable Code Requirement**

ASME Section XI, Examination Category C-C, Item C3.20, requires surface examination on 100% of the weld area selected for examination. The alternative requirements of ASME Section XI, Code Case N-460, approved for use in Regulatory Guide 1.147, Rev. 17, allows credit for essentially 100% coverage of the weld provided greater than 90% of the required volume or area has been examined.

**4. Impracticability of Compliance**

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the essentially 100% examination area coverage requirement of the subject welds due to the geometric configuration and obstructions which limit the surface examination coverage.

This integral attachment is part of a spring can support system. The rod seen in the attached typical figures, including the photograph in Fig. 3, extends to a spring can

above the main steam pipe. Due to interference with the support rod and the narrow opening of the integral attachment, examination of the interior welds is limited.

100% coverage was achieved for the welds on the outside of the integral attachment for a total of 39 linear inches. The inside bottom 4 inches and two 11-inch side welds could not be reached to perform a successful surface examination. Thirty-nine inches of the total 65 linear inches were examined for examination coverage of 60%.

**5. Burden Caused by Compliance**

The purpose of nondestructive examination (NDE) is to perform inspections without destroying the component. Disassembly of a component solely to perform a Section XI examination is not a requirement. Any attempt to achieve greater coverage on the interior welds of this integral attachment would require disassembly of the spring can hanger and rod which would require seismic support analysis and most likely mandate a temporary support system installation for the 30" main steam line while this support was rendered inoperable. Even if the support were disassembled it is improbable that a meaningful surface examination could be achieved due to the physical constraints of the narrow opening.

**6. Proposed Alternative and Basis for Use**

This component receives periodic visual (VT-2) examinations in accordance with Category C-H, which should detect any through-wall leakage in the inaccessible areas. It is proposed that the percentage of surface coverage obtained with no recordable indications, in addition to the periodic visual examinations, be considered as meeting Code requirements.

**7. Duration of Proposed Alternative**

This proposed alternative is requested to meet requirements for the fourth ten-year inspection interval for Surry Power Station Unit 2, which began May 10, 2004 and ended on May 9, 2015.





## Supplemental Report

LMT-C04  
Fig 1  
page 1 of 1

Report No.: MT-06-007

Page: 2 of 2

Summary No.: S2.C3.20.004

Examiner: <u>Currao, Jeffrey T</u>	Level: <u>II</u>	Reviewer: <u>N/A</u>	Date: _____
Examiner: <u>N/A</u>	Level: <u>N/A</u>	Site Review: <u>Robert Davies LIII</u>	Date: <u>11/05/2006</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>Mr. Smith</u>	Date: <u>11/5/06</u>

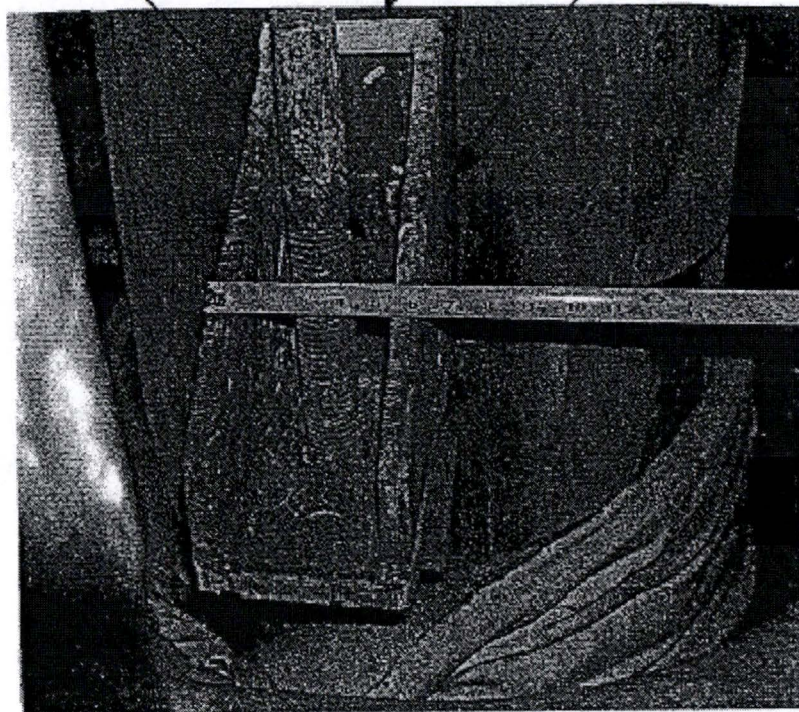
Comments: 60 % Coverage Obtained ( Total Weld Length 65 " Total Length Examined 39 " ) See Photo Below.

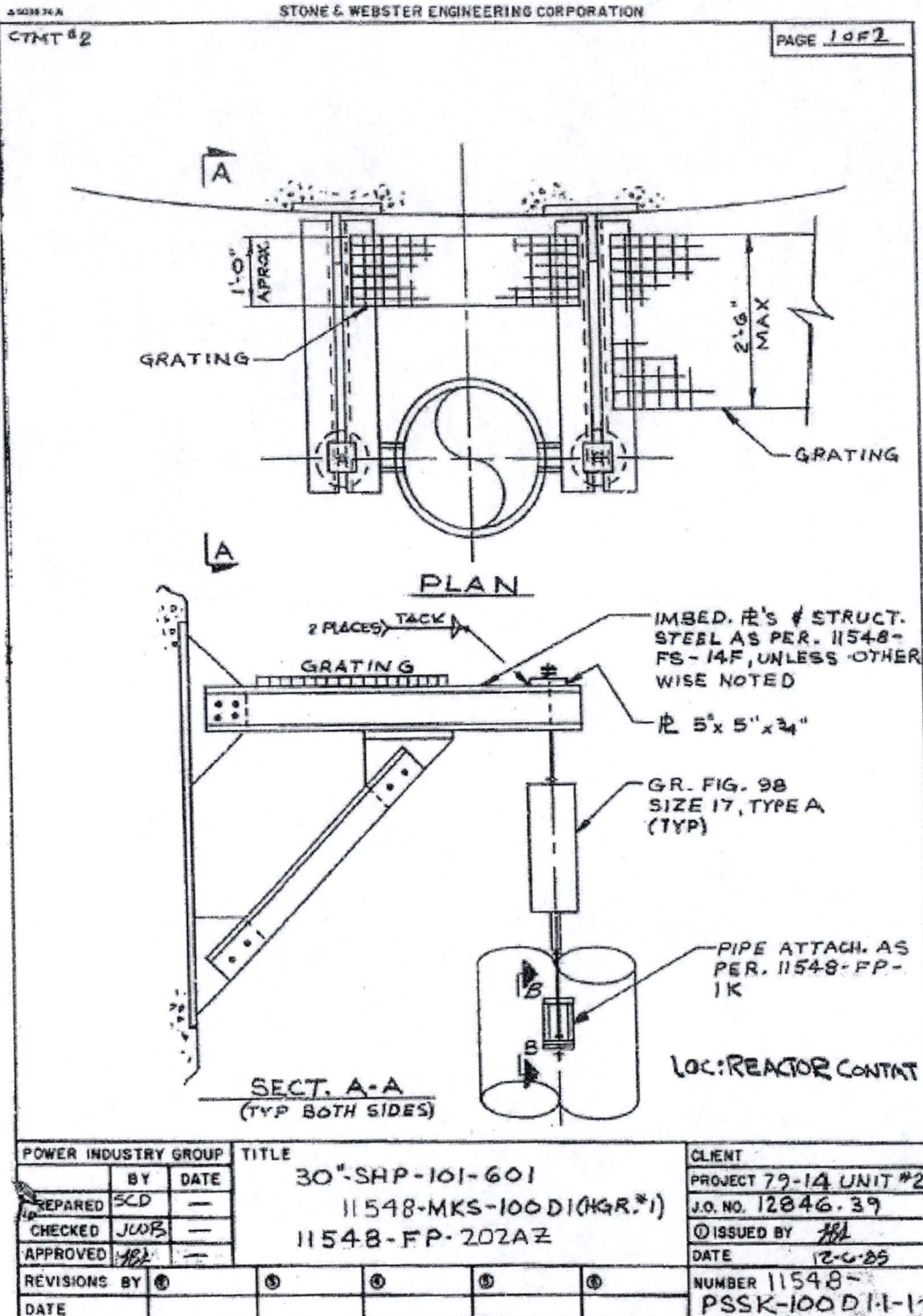
( NOT EXAMINED )  
11" Right Side  
11" Left Side  
4" Bottom  
( INSIDE )

( EXAMINED )  
6" Top  
6" Bottom

( EXAMINED )  
13.5" Right Side  
13.5" Left Side

Sketch or Photo:  
Typical of this Integral  
Attachment







Typical of Main Steam Hanger Integral Attachment H001-1 and H001-2

