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CALVERT CLIFFS
NUCLEAR POWER PLANT

December 16, 2010

U. S. Nuclear Regulatory Commission Washington, DC 20555

**ATTENTION:** 

Document Control Desk

**SUBJECT:** 

Calvert Cliffs Nuclear Power Plant

Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318

Response to Request for Additional Information – American Society of Mechanical Engineers Code Required Weld Inspections Relief Requests (TAC Nos. ME4220 through ME4223)

**REFERENCES:** 

- (a) Letter from Mr. J. J. Stanley (CCNPP) to Document Control Desk (NRC) dated June 30, 2010, American Society of Mechanical Engineers Code Required Weld Inspections Relief Requests
- (b) Letter from Mr. D. V. Pickett (NRC) to Mr. G. H. Gellrich (CCNPP), dated October 13, 2010, Request for Additional Information Re: American Society of Mechanical Engineers Code Required Weld Inspections Relief Requests Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 (TAC Nos. ME4220 through ME4223)

In Reference (a), Calvert Cliffs Nuclear Power Plant, LLC submitted relief requests RR-ISI-24, 25, 26, and 27, for Calvert Cliffs Units 1 and 2, requesting relief from the performance of American Society of Mechanical Engineers Code required weld inspections that were scheduled to be performed during the recently completed Third Ten Year Inservice Inspection Program Plan period. In Reference (b), the Nuclear Regulatory Commission requested additional information be submitted to support their review of Reference (a). Attachment (1) provides the responses to the Nuclear Regulatory Commission's request for additional information contained in Reference (b).

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Should you have questions regarding this matter, please contact Mr. Douglas E. Lauver at (410) 495-5219.

James J. Stanley

Manager-Engineering Services

#### JJS/KLG/bjd

Attachment:

(1) Response to Request for Additional Information – Relief Requests ISI-24, 25, 26,

and 27

Enclosures: 1 Relief Request ISI-24 for CCNPP Unit 1 Class 1 Components

2 Relief Request ISI-25 for CCNPP Unit 1 Class 2 Components

3 Relief Request ISI-26 for CCNPP Unit 2 Class 1 Components

4 Relief Request ISI-27 for CCNPP Unit 2 Class 2 Components

cc: D. V. Pickett, NRC

W. M. Dean, NRC

Resident Inspector, NRC

S. Gray, DNR

# RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION – RELIEF REQUESTS ISI-24, 25, 26, AND 27

# RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION – RELIEF REQUESTS ISI-24, 25, 26, AND 27

The numbers assigned for the request for additional information reflect the numbers used in Reference 1.

#### **NRC RAI 2.1.1**:

2.1 General – Additional Information Required on All Requests for Relief

The licensee has provided only general, and somewhat vague, information regarding impracticality of obtaining ASME Code-required volumetric examinations. Statements such as "physical barriers and scanning surface," "component configurations," or "curvature/taper," are inadequate to describe the bases for not obtaining the ASME Code-required examination volumes. No sketches with dimensional information showing the causes of limited accessibility have been included.

- 2.1.1 Please provide detailed and specific information to support the bases for limited examination in all requests for relief, and therefore, demonstrate impracticality.
  - (a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.
  - (b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.
  - (c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.
  - (d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### **Calvert Cliffs Response RAI 2.1.1:**

The requested, specific, information to support the bases for limited examination is provided for each of the individual relief requests in the following enclosures:

Enclosure 1 – Relief Request ISI-24 for CCNPP Unit 1 Class 1 Components

Enclosure 2 – Relief Request ISI-25 for CCNPP Unit 1 Class 2 Components

Enclosure 3 – Relief Request ISI-26 for CCNPP Unit 2 Class 1 Components

Enclosure 4 – Relief Request ISI-27 for CCNPP Unit 2 Class 2 Components

Each of these enclosures provides responses to RAI 2.1.1(a-d) and provides detailed sketch(es) for each of the applicable welds that were listed in Table 1 of the original relief requests (Reference 2).

For some of the welds, the examination coverage percentage values calculated in the above enclosures are different than the coverage percentage values that were listed in Reference 2, Table 1. In those cases, the values in the above enclosures take precedence as they reflect additional reviews and revised calculations performed since the original submittal. Over the 10 year ISI interval several different ultrasonic examination procedures and vendors were utilized. This created some differences in how volumetric coverage was calculated. The revised volumetric coverages provided in this response reflect a standardized calculation approach applied to all welds and is aligned with current industry practice for performing these calculations.

#### NRC RAI 2.1.2:

It is unclear whether the licensee used the appropriate ASME Code requirements for the examinations. In Section 4 under the individual component descriptions of Attachments 1 through 4, the licensee stated that for all examination categories contained in the requests for relief, the NDE techniques and procedures incorporated (or were similar to) examination techniques qualified under Appendix VIII. In

# RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION – RELIEF REQUESTS ISI-24, 25, 26, AND 27

Section 6, Paragraph 3 of Attachments 1 through 4, the licensee claimed that ultrasonic procedures complied with the requirements of ASME Section V, Article 4 and the personnel were qualified in accordance with ASME Code Section XI, Appendix VII. Please identify the ASME Code requirements for procedure, equipment, and personnel qualifications used for examination of the subject welds.

2.1.2 Please state the actual ASME Code section that was followed for each Examination Category. If Appendix VIII- qualified techniques were applied to Examination Categories B-D, C-A, and C-B, please discuss whether this alternative was approved by NRC.

#### **Calvert Cliffs Response RAI 2.1.2:**

Calvert Cliffs Inservice Inspection (ISI) inspections were performed in accordance with the 1998 ASME Section XI (no addenda) as amended by 10 CFR 50.55a and Regulatory Guide 1.147. In 2003, Calvert Cliffs implemented a risk informed inspection program for Class 1 and 2 piping welds (examination categories B-F, B-J, C-F-1, and C-F-2). These risk informed category designations were reassigned to reflect those established by Code Case N-578-1. Appendix VIII qualified techniques were not applied to Categories B-D, C-A, or C-B.

Per Calvert Cliffs procedures and the 1998 Edition of ASME Section XI (no addenda) Code, the following applies:

Code Category	Description	Ultrasonic Procedure and Equipment Requirements per IWA-2232 (ASME Section XI, Appendix I)	Personnel Qualifications
B-D	Full Penetration Welded Nozzles in Vessels > 2"	ASME V, Article 4, as supplemented by Table I-2000-1	ASME XI IWA-2300
C-A	Pressure Retaining Welds in Pressure Vessels < or = 2"	ASME XI, Appendix III, as supplemented by Table I-2000-1	ASME XI IWA-2300
C-B	Pressure Retaining Nozzle Welds in Vessels < or = 2"	ASME XI, Appendix III, as supplemented by Table I-2000-1	ASME XI IWA-2300
R-A	Risk Informed Piping Welds	ASME XI Appendix VIII	ASME XI Appendix VII

#### **NRC RAI 2.2.1**:

- 2.2 <u>Requests for Relief ISI-24, ISI-25, ISI-26, and ISI-27, Examination Category R-A, Items R1.11, R1.16, and R1.20, Risk Informed Piping Examinations (Units 1 and 2)</u>
- 2.2.1 In addition to the specific information requested in Item 2.1.1 above, discuss whether alternate welds could have been examined to address the reduced volumetric coverage resulting from the limited examinations of the subject welds.

#### **Calvert Cliffs Response RAI 2.2.1:**

The Third 10-Year ISI Interval for which Calvert Cliffs is requesting relief is the first interval in which risk informed methodologies have been applied at Calvert Cliffs. The Calvert Cliffs risk-informed approach was developed in accordance with Reference 3. In the development of risk-informed selections done in accordance with the process outlined in Reference 3, it was foreseen that relief would be required for any risk informed ISI piping element selection for which greater than 90% examination coverage is not achieved (see Reference 3, Section 6.4). This is especially true in light of the fact that it was

# RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION – RELIEF REQUESTS ISI-24, 25, 26, AND 27

recognized that welds would be selected which had never previously been ultrasonically examined under our station's ISI program. For welds that are subject to a degradation mechanism (Items R1.11 and R1.16) those welds were selected for examination on the basis of predicted degradation severity; often at locations inherently more difficult to obtain coverage on, e.g., a pipe-to-valve weld. The methodology used in Reference 3 states that less than 90 percent coverage at the location most susceptible to a potential degradation mechanism "will yield far more valuable information than 100 percent coverage of a less susceptible location". These insights were used by the "expert panel" convened by Calvert Cliffs to make the original element selections for the program, fully expecting that relief would be required for some welds, rather than picking less susceptible welds for which greater than 90 percent coverage could be obtained. It was also recognized, for Calvert Cliffs Units 1 and 2, that when alternative location welds for Items R1.11 and R1.16 were available with the same degradation mechanism they were typically of the identical configuration in a sister piping loop so no improvement in coverage would be achieved by selecting them.

For welds which are not subject to a degradation mechanism (Item R1.20); Reference 3 recommends selection of welds for examination "be focused at terminal ends and structural discontinuity locations of high stress and/or high fatigue usage". These were the guiding principles used by the "expert panel" convened by Calvert Cliffs to make the original element selections for the program, again fully expecting that relief would be required for some welds, rather than picking less stressed weld locations for which greater than 90 percent coverage could be obtained. This follows the fundamental tenet of the riskinformed approach that less than 90 percent coverage at the location more highly stressed, and therefore more likely to undergo inservice degradation, will yield more valuable information than 100 percent coverage of a weld at a less stressed location. In cases where a known physical obstruction, like a pipe hanger, was identified which prevented examination of a selected weld a more suitable, preferably equivalent, location was chosen. Conversely, geometrical configurations, (e.g., valve taper, angled penetration, tight radius elbow), and/or material type, (e.g., cast stainless steel safe ends), were not used as bases for selecting alternate locations even if limited coverage was expected. While the above types of weld configurations make-up the vast majority of welds for which relief is being requested, they represent only 13 percent of the total number of Item R1.20 welds selected for examination (i.e., for the remaining 87 percent of Item R1.20 welds the examination volume coverage exceeded 90 percent). For those welds with a cast stainless steel component; even though American Society of Mechanical Engineers (ASME) Code coverage was not credited for scanning performed from the cast stainless steel safe end side of the weld; if the geometry allowed it, volumetric coverage of that side was obtained using the ASME Appendix VIII procedure (PDI-UT-2) qualified for non-cast stainless steel product forms.

Even though it was impractical to meet the ASME Code-required 90 percent examination coverage for these welds, the nature of the limited coverage did not generally prevent the most critical area, the internal diameter surface at the weld root, from being insonified from at least one direction. Therefore, a service-induced defect, if present, would likely be detected even though the Code-required volumetric coverage was limited. In addition small gaps in the internal diameter coverage occurred at azimuthal locations where transducer access was restricted, e.g., at angled "stab-in" branch connections and at the intrados of tight radius elbows. As part of the defense in depth approach, all the welds in the risk informed program also received, under the System Pressure Testing Program (Category B-P), a VT-2 examination for evidence of leakage during each refueling outage. No leaking piping welds have been encountered under this testing program.

# RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION – RELIEF REQUESTS ISI-24, 25, 26, AND 27

#### REFERENCES

- 1 Letter from Mr. D. V. Pickett (NRC) to Mr. G. H. Gellrich (CCNPP), dated October 13, 2010, Request for Additional Information Re: American Society of Mechanical Engineers Code Required Weld Inspections Relief Requests Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 (TAC Nos. ME4220 through ME4223)
- Letter from Mr. J. J. Stanley (CCNPP) to Document Control Desk (NRC), dated June 30, 2010, American Society of Mechanical Engineers Code Required Weld Inspections Relief Requests
- 3 Electric Power Research Institute, Revised Risk-Informed Inservice Inspection Evaluation Procedure, TR-112657, Rev. B-A, December 1999

# **ENCLOSURE 1**

Relief Request ISI-24 for CCNPP Unit 1 Class 1 Components

#### **Responses to Request for Additional Information** Summary No.: 004050 Comp ID: 4-404 Page 1 of 11

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

#### Response:

PZR Surge Nozzle to Lower Head / Due to nozzle configuration, coverage of nozzle side base metal and weld was limited. The pressurizer nozzle-to-vessel head welds are accessible only from the head side based on the nozzle curvature. The scanning surface of the nozzle is essentially perpendicular to the head surface which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The nondestructive examination (NDE) techniques and procedures used incorporated examination techniques qualified under Article 4 of Section V of the ASME Code as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed 2.1.1 b) obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

#### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

- id

ased

4

Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations. 2.1.1 c)

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used 2.1.1 d) during the examination.

#### Response:

See attached sketches derived from examination data on file at CCNPP for cross sectional coverage plots and calculations.

**CCNPP** 

Exam Area:

Exam Angle:

Component ID:

4 - 404 004050

45°

NDE Report No.: Summary No.:

CC04-1U-014 004050

LTP No.: Coverage Sketch No:

Weld Metal / 33" Scale:

MO No.:

1200300701

50%

Diameter: On Head Thickness: 4.40" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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3.331

44

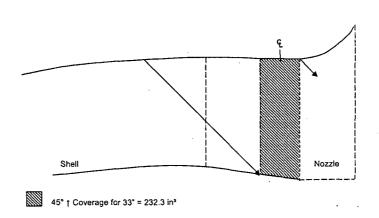
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1

4

(Sketch Resized for Relief Request)



	Weld Metal:	: Volume =	520.96	Cubic Inch	ies			Base Metal	: Volume =	1432.64	Cubic Inch	105
			Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Cub. In.)	Total	520.96		Beam No.	Angle	Sketch	(Cub. In.)	Total	1432.64
-	45°↑	1	232.30	492.90	94.61%	***************************************	1+2	45°/60°†1	8	586.08	1272.83	88.85%
' (	40	2	260.60	492.90	94.01%			45 700 11	9	686.75	1212.03	88.85%
2	45°↓	3	106.60	106.60	20.46%		3	45°←	10	716.32	716.32	50.00%
3	60%	4	232.30	520.96	100.00%		4	45°→	10	716.32	716.32	50.00%
3	60°†	5 .	288.66	520.90	100.00%	1	5	60°←	10	716.32	716.32	50.00%
4	60°↓	6	154.00	154.00	29.56%		6	60°→	10	716.32	716.32	50.00%
5	45°←	7	520.96	520.96	100.00%	A. 311	7	0° WRV	10	716.32	716.32	50.00%
6	45°→	7	520.96	520.96	100.00%	***************************************						
7	60°←	7	520.96	520.96	100.00%	1-11-1	I	ĺ				
8	60°→	7	520.96	520.96	100.00%							
9	0° WRV	7	520.96	520.96	100.00%	·····			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		·······	**************************************
To	tal Beams:	9	То	tal Percent:	744.64%		To	otal Beams:	7	Tot	al Percent:	427.69%
· · · · · · · · · · · · · · · · · · ·		Tota	i Weld Metal	Coverage:	82.74%	~~~			Total	Base Metal	Coverage:	61.10%
	······································		<u> </u>		Com	bined Cov	erage			<u> </u>	to, ,	<b>***</b>
	······································			Coverage				Total				
				Percent	X	Volume	+	Volume	=	Result		
************	CONTRACTOR STATE OF S	<i>"</i>	Weld Metal:	82.74%	***************************************	520.96		1953.60		22.06%		
			Base Metal:	61.10%		1432.64		1953.60		44.81%		
		2000 rommanna					T	otal Exam C	overage =	66.87%	and the second second second	

CCNPP

Component ID: 4 - 404

LTP No.: 004050

NDE Report No.: CC04-1U-014 Summary No.: 004050

Coverage Sketch No: 2 Exam Area: Weld Metal / 41"

Exam Angle: 45°

MO No.: 1200300701

Scale: 50%

Diameter: On Head

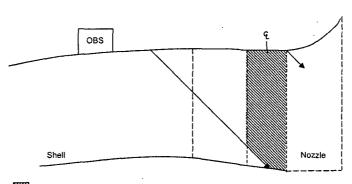
Thickness: 4.40" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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(Sketch Resized for Relief Request)



45° † Coverage for 41" = 260.6 in<sup>3</sup>

	Weld Metal	: Volume =	520.96	Cubic Inch	les			Base Metal	: Volume =	1432.64	Cubic Inch	es
			Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Cub. In.)	Total	520.96		Beam No.	Angle	Sketch	(Cub. In.)	Total	1432.64
1	45°↑	11	232.30	492.90	94.61%		1+2	45°/60°↑1	8	586.08	1272.83	88.85%
	45	2	260.60	452.50	34.0176		172	45 700 11	9	686.75	1272.00	88.85%
2	45°↓	3	106.60	106.60	20.46%	]	3	45°←	10	716.32	716.32	50.00%
3	60°↑	4	232.30	520.96	100.00%		4	45°→	10	716.32	716.32	50.00%
		5	288.66				5	60°←-	10	716.32	716.32	50.00%
4	60°↓	6	154.00	154.00	29.56%	]	6	60°→	10	716.32	716.32	50.00%
5	45°←	7	520.96	520.96	100.00%		7	0° WRV	10	716.32	716.32	50.00%
6	45°→	7	520.96	520.96	100.00%							
7	60°←	7	520.96	520.96	100.00%						•	
8	60°→	7	520.96	520.96	100.00%							
9	0° WRV	7	520.96	520.96	100.00%				~~~~~~~		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
To	otal Beams:	9	То	tal Percent:	744.64%		Тс	tal Beams:	7	To	al Percent:	427.69%
		Tota	l Weld Meta	Coverage:	82.74%	,			Tota	Base Metal	Coverage:	61.10%
	<b>!</b>		<u> </u>		Com	bined Cove	rage		<u> </u>		* O'Company of the Company of the Co	
				Coverage				Total				***************************************
				Percent	×	Volume	+	Volume	=	Result		
***************************************	1	1	Weld Metal:	82.74%		520.96		1953.60		22.06%		
			Base Metal:	61.10%		1432.64		1953.60		44.81%		
					•••••••••••		T	otal Exam (	Coverage =	66.87%	-	

**CCNPP** 

Component ID: 4 - 404 LTP No.: 004050

0: 4 - 404 ND

NDE Report No.: CC04-1U-014 Summary No.: 004050

Coverage Sketch No: 3

Fyam Area: Wold Metal / 7

Exam Area: Weld Metal / 74"
Exam Angle: 45°

MO No.: 1200300701

Scale: 50%

on. On Hood

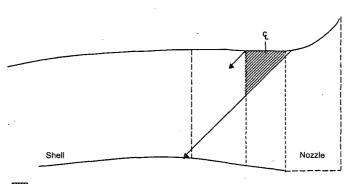
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Diameter: On Head Thickness: 4.40" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° 1 Coverage for 74" = 106.6 in³

	Weld Metal:	Volume =	520.96	Cubic Inch	es			Base Metal	: Volume =	1432.64	Cubic Inch	ies
	1		Coverage	Beam	Percent of	***************************************				Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Cub. In.)	Total	520.96		Beam No.	Angle	Sketch	(Cub. In.)	Total	1432.64
1	45°↑	1	232.30	492.90	94.61%		1+2	45°/60°↑1	8	586.08	1272.83	88.85%
'	45	2	260.60	492.90	94.01%		1 + 2	45 /00  1	9	686.75	12/2.03	88.85%
2.	45°↓	3	106.60	106.60	20.46%		3	45°←	10	716.32	716.32	50.00%
3	60°↑.	4	232.30	520.96	100.00%	,	4	45°-→	10	716.32	716.32	50.00%
3	001.	5	288.66	520.96	100.00%		5	60°←	10	716.32	716.32	50.00%
4	60°↓	6	154.00	154.00	29.56%	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	6_	60°→	10	716.32	716.32	50.00%
5 ,	45°←	7	520.96	520.96	100.00%		7	0° WRV	10	716.32	716.32	50.00%
6	45°→	7	520.96	520.96	100.00%							
7	60°←	7	520.96	520.96	100.00%							
8	60°→	7	520.96	520.96	100.00%	7000-200 percent approximation						
9	0° WRV	7	520.96	520.96	100.00%							
Тс	ital Beams:	9	То	tal Percent:	744.64%		Тс	otal Beams:	7	To	al Percent:	427.69%
		Tota	Weld Metal	Coverage:	82.74%			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Tota	Base Metal	Coverage:	61.10%
	44		<u> </u>		Com	bined Cove	erage					
	.,			Coverage				Total				
				Percent	X	Volume	+	Volume	=	Result		
************		Ĭ	Weld Metal:	82.74%		520.96	Ī	1953.60		22.06%		
		E	Base Metal:	61.10%		1432.64		1953.60		44.81%		
		**************************************	***********				<u></u>	stal Evam (	overage =	66.87%		····

**CCNPP** 

Component ID: 4 - 404

LTP No.: 004050

NDE Report No.: CC04-1U-014 Summary No.: 004050

Coverage Sketch No: 4 Exam Area: Weld Metal / 33" Exam Angle: 60°

MO No.: 1200300701 **Scale:** 50%

Diameter: On Head Thickness: 4.40"

Result

22.06%

44.81%

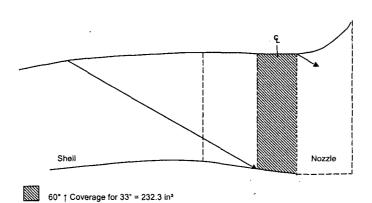
Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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(Sketch Resized for Relief Request)



Base Metal: Volume = Weld Metal: Volume = 520.96 Cubic Inches 1432.64 Cubic Inches Coverage Beam Percent of Coverage Beam Percent of Beam No. Beam No. Sketch Angle (Cub. In.) Total 520.96 Angle (Cub. In.) Total 1432.64 232.30 586.08 88.85% 1 + 2 45°/60°11 1272.83 1 45°1 492.90 94.61% 260.60 9 686.75 88.85% 45°← 45°→ 716.32 2 50.00% 50.00% 45°1 106.60 106.60 20.46% 10 716.32 716.32 232.30 10 716.32 3 60°† 520.96 100.00% 716.32 716.32 50.00% 50.00% 288.66 5 60°← 10 716.32 <u>6</u>0°→ 154.00 29.56% 716.32 60°1 154.00 6 10 45° 520.96 520.96 100.00% 0° WRV 716.32 45°→ 520.96 520.96 100.00% 520.96 520.96 60°←-520.96 100.00% 60°--100.00% 0° WRV 520.96 520.96 100.00% Total Beams: Total Percent: 744.64% Total Beams: Total Percent: 427.69% Total Weld Metal Coverage: 82.74% Total Base Metal Coverage Combined Coverage Total Coverage

Volume

520.96

1432.64

Volume

1953.60

1953.60

Total Exam Coverage =

Percent

82.74%

61.10%

Weld Metal:

Base Metal:

**CCNPP** 

Component ID: 4 - 404

NDE Report No.: CC04-1U-014

Coverage Sketch No: 5

LTP No.: 004050

**Summary No.:** 004050 MO No.: 1200300701

Exam Area: Weld Metal / 41" Exam Angle: 60°

**Scale:** 50%

Diameter: On Head

Thickness: 4.40" Material: CC/S

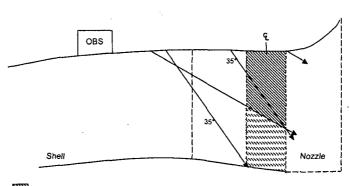
CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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1 :

(Sketch Resized for Relief Request)



60° † Coverage for 41" = 172.2 in<sup>3</sup>

Supplemental 35° ↑ Coverage for 41" = 116.46 in³

Total: (172.2 + 116.46) = 288.66 in<sup>3</sup>

	Weld Metal	: Volume =	520.96	Cubic Inch	les	1		Base Metal	: Volume =	1432.64	Cubic Inch	es
			Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Cub. In.)	Total	520.96		Beam No.	Angle	Sketch	(Cub. In.)	Total	1432.64
4	45°↑	1	232.30	492.90	94.61%		1+2	45°/60°↑1	8	586.08	1272.83	88.85%
1	451	2	260.60	492.90	94.01%		172	45 700 11	9	686.75	1212.03	88.85%
2	45°↓	3	106.60	106.60	20.46%		3	45°←	10	716.32	716.32	50.00%
3	60°↑	4	232.30	520.96	100.00%		4	45°→	10	716.32	716.32	50.00%
3	60 }	5	288.66	520.96	100.00%		5	60°←	10	716.32	716.32	50.00%
4	60°1	6	154.00	154.00	29.56%		6	60°→	10	716.32	716.32	50.00%
5	45°←	7	520.96	520.96	100.00%		7	0° WRV	10	716.32	716.32	50.00%
6	45°→	7	520.96	520.96	100.00%							
7	60°←	7	520.96	520.96	100.00%							
8	60°→	7	520.96	520.96	100.00%	,						
9	0° WRV	7	520.96	520.96	100.00%			····		·····	A	
To	otal Beams:	9	То	lal Percent:	744.64%		То	otal Beams:	7	То	al Percent:	427.69%
//////////////////////////////////////		Tota	l Weld Metal	Coverage:	82.74%				Tota	Base Meta	Coverage:	61.10%
*.,			1		Com	bined Cove	erage					<b>***</b> *********************************
				Coverage			1	Total				
	,			Percent	X	Volume	<b>†</b> +	Volume	=	Result		
		1	Weld Metal:	82.74%		520.96		1953.60		22.06%		
			Base Metal:	61.10%		1432.64		1953.60		44.81%		
······································	-			AND TO SERVICE TO THE SERVICE OF THE			Ī	otal Exam C	overage =	66.87%	***************************************	********************

**CCNPP** 

Component ID: 4 - 404

LTP No.: 004050

Coverage Sketch No: 6 Exam Area: Weld Metal / 74"

Exam Angle: 60°

NDE Report No.: CC04-1U-014

Summary No.: 004050 MO No.: 1200300701

Scale: 50%

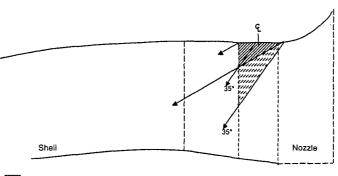
Diameter: On Head

Thickness: 4.40" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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(Sketch Resized for Relief Request)



60° ↓ Coverage for 74" = 65.1 in<sup>3</sup>

Supplemental 35° 1 Coverage for 74" = 88.9 in<sup>3</sup>

Total: (65.1 + 88.9) = 154 in<sup>3</sup>

	Weld Metal	Volume =	520.96	Cubic Inch	es			Base Metal	: Volume =	1432.64	Cubic Inch	ies
	1 1		Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Cub. In.)	Total	520.96		Beam No.	Angle	Sketch	(Cub. In.)	Total	1432.64
1	45°↑	1	232.30	492.90	94.61%		1+2	45°/60°11	8	586.08	1272.83	88.85%
'	1 49 1	2	260.60	492.90	94.01%		1 1 7 2	45 /60 []	9	686.75	12/2.03	88.85%
2	45°↓	3	106.60	106.60	20.46%		3	45°←-	10	716.32	716.32	50.00%
3	60°†	4	232.30	520,96	100.00%		4	45°→	10	716.32	716.32	50.00%
3	001	5	288.66	520.96	100.00%		5	60°←	10	716.32	716.32	50.00%
4	60°L	6	154.00	154.00	29.56%		6	60°→	10	716.32	716.32	50.00%
5	45°←	7	520.96	520.96	100.00%		7	0° WRV	10	716.32	716.32	50.00%
6	45°→	7	520.96	520.96	100.00%							
7	60°←	7	520.96	520.96	100.00%	1						
8	60°→	7	520.96	520.96	100.00%							
9	0° WRV	7	520.96	520.96	100.00%			~~~~				
To	tal Beams:	9	То	tal Percent:	744.64%	,	To	i otal Beams:	7	То	al Percent:	427.69%
······································		Tota	Weld Metal	Coverage:	82.74%				Tota	Base Meta	Coverage:	61.10%
					Com	bined Cove	rage	<u> </u>	<u> </u>		**************************************	
*******************				Coverage		1		Total			Michael Contraction	\$0000000000000000000000000000000000000
		Marie and American American Control Control		Percent	X	Volume	+	Volume	=	Result	***************************************	<u> </u>
	<b>****</b> ********************************		Veld Metal:	82.74%	en	520.96	Section of the sectio	1953.60		22.06%	**************************************	
	· · · · · · · · · · · · · · · · · · ·	E	Base Metal:	61.10%		1432.64		1953.60		44.81%		
		······································		<b>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</b>			<u> </u>	otal Exam (	Coverage =	66.8 <u>7%</u>	***************************************	

**CCNPP** 

10

Component ID: 4 - 404 LTP No.: 004050 Coverage Sketch No: 7 NDE Report No.: CC04-1U-014 Summary No.: 004050 MO No.: 1200300701

Scale: 50%

Diameter: On Head Thickness: 4.40"

Material: CC/S

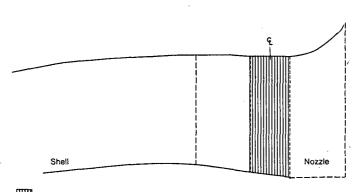
CC/S = Clad Carbon Steel

S/S = Stainless Steel
CASS = Cast Stainless Steel

Page 8 of 11

(Sketch Resized for Relief Request)

Exam Area: Weld Metal / 74"
Exam Angle: 45° / 60° / 0° WRV



45° ↔ / 60° ↔ / 0° WRV Coverage for 74" = 520.96 in³

	Weld Metal	: Volume =	520.96	Cubic Inch	ies			Base Metal	: Volume =	1432.64	Cubic Inch	les
			Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Cub. In.)	. Total	520.96		Beam No.	Angle	Sketch	(Cub. In.)	Total	1432.64
4	45°↑	1	232.30	492.90	94.61%		1+2	45°/60°1⊥	8	586.08	1272.83	88.85%
J	45 ]	2	260.60	492.90	94.01%		1 1 7 2	45 760 []	9	686.75	1272.03	88.85%
2	45°↓	3	106.60	106.60	20.46%		3	45°←	10	716.32	716.32	50.00%
3	60°↑	4	232.30	520.96	100.00%		4	45°→	10	716.32	716.32	50.00%
3	_ `	5	288.66	l	L		5	60°←	10	716.32	716.32	50.00%
4	60°t	6	154.00	154.00	29.56%		6	60°→	10	716.32	716.32	50.00%
5	45°←	7	520.96	520.96	100.00%		7	0° WRV	10	716.32	716.32	50.00%
6	45°→	7	520.96	520.96	100.00%					•		
7	60°←	7	520.96	520.96	100.00%							
8	60°→	7	520.96	520.96	100.00%							
9	0° WRV	7	520.96	520.96	100.00%			******************	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
To	tal Beams:	9	То	tal Percent:	744.64%		To	tal Beams:	7	To	al Percent:	427.69%
	<b></b>	Tota	Weld Meta	Coverage:	82.74%	***************************************			Tota	Base Metal	Coverage:	61.10%
	***************************************		<u> </u>	<del></del>	Com	bined Cove	erage				4.4.010.0	
***************************************				Coverage			1	Total				
				Percent	×	Volume	+	Volume	=	Result	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
, geograe con ou arcelon charles		1	Weld Metal:	82.74%		520.96	1	1953.60		22.06%		
			Base Metal:	61.10%		1432.64		1953.60		44.81%		
······································		***************************************		<u> </u>			<u>T</u>	otal Exam C	overage =	66.87%	- Marie - Constant of State of	

**CCNPP** 

Component ID: 4 - 404 LTP No.: 004050

4 – 404 NDE Repo

NDE Report No.: CC04-1U-014 Summary No.: 004050 MO No.: 1200300701

Exam Area: Base Metal / 33" Exam Angle: 45° / 60° Scale: 50%

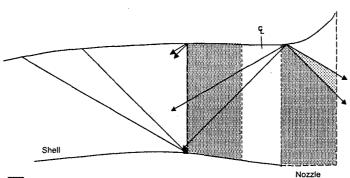
Page 9 of 11

Diameter: On Head Thickness: 4.40" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)

Coverage Sketch No: 8



Coverage by at least 2 sound beams for 33" = 572.88 in<sup>3</sup>.

Coverage by 1 sound beam only for 33" = 26.4 in<sup>3</sup>.

Total: 572.88 + (26.4 / 2) = 586.08 in<sup>3</sup>.

,	Weld Metal	: Volume =	520.96	Cubic Inch	es			Base Metal	: Volume =	1432.64	Cubic Inch	es
			Coverage	Beam	Percent of				•	Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Cub. In.)	Total	520.96		Beam No.	Angle	Sketch	(Cub. In.)	Total	1432.64
4	45°↑	1	232.30	492.90	94.61%		1+2	45°/60°11	8	586.08	1272.83	88.85%
' i	40	2	260.60	492.90	94.0176		1 1 7 2	45 /00 11	9	686.75	1272.03	88.85%
2	45°1	3	106.60	106.60	20.46%	444	3	45°←	10	716.32	716.32	50.00%
3	60%	4	232.30	520.00	400.000/		4	45°→	10	716.32	716.32	50.00%
٠, ١	60°↑	5	288.66	520.96	100.00%	VA.00.000.00.00.00	5	60°←	10	716.32	716.32	50.00%
4	60°L	6	154.00	154.00	29.56%		6	60°→	10	716.32	716.32	50.00%
5	45°←	7	520.96	520.96	100.00%		7	0° WRV	10	716.32	716.32	50.00%
6	45°→	7	520.96	520.96	100.00%	i	<u> </u>					
7	60°←	7	520.96	520.96	100.00%							
8	60°→	7	520.96	520.96	100.00%						***************************************	AMARIA MARIA MARIA MARIA MARIA MARIA
9	0° WRV	7	520.96	520.96	100.00%							
То	tal Beams:	9	То	tal Percent:	744.64%		To	tal Beams:	7	То	tal Percent:	427.69%
		Total	Weld Meta	Coverage:	82.74%	****************			Tota	Base Meta	Coverage:	61.10%
					Com	bined Cov	erage	<u> </u>	<u> </u>			·*************************************
	***************************************			Coverage			1	Total				
				Percent	X	Volume	Ť	Volume	=	Result		
		V	Veld Metal:	82.74%		520.96		1953.60		22.06%		
		E	Base Metal:	61.10%		1432.64		1953.60		44.81%		
		******************************	······		***************************************	· · · · · · · · · · · · · · · · · · ·	·	tal Exam C	`overage =	66.87%	***************************************	

**CCNPP** 

Component ID: 4 - 404

LTP No.: 004050

Coverage Sketch No: 9 Exam Area: Base Metal / 41"

Exam Angle: 45° / 60° NDE Report No.: CC04-1U-014

**Summary No.:** 004050 MO No.: 1200300701

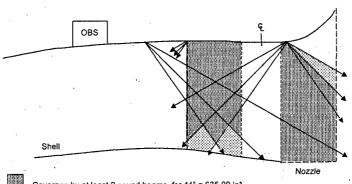
Scale: 50%

Page 10 of 11

Diameter: On Head Thickness: 4.40" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



Coverage by at least 2 sound beams for 41" = 635.09 in3.

Coverage by 1 sound beam only for 41" = 103.32 in<sup>3</sup>.

Total:  $635.09 + (103.32 / 2) = 686.75 \text{ in}^3$ .

	Weld Metal	: Volume =	520.96	Cubic Inch	ies	***************************************		Base Meta	l: Volume =	1432.64	Cubic Incl	ies
			Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Cub. In.)	Total∖	520.96		Beam No.	Angle	Sketch	(Cub. In.)	Total	1432.64
-1	45°↑	1	232.30	492.90	94.61%		1+2	45°/60°†1	- 8	586.08	1272.83	88.85%
. 1	45	2	260.60	492.90	94.01%		1. ' * 4		9	686.75	12/2.03	88.85%
2	45°↓	3	106.60	106.60	20.46%		3	45°←	10	716.32	716.32	50.00%
3	60°↑	4	232.30	520.96	100.00%		4	45°→	10	716.32	716.32	50.00%
3	60.1	5	288.66	520.96	100.00%		5	60°←	10	716.32	716.32	50.00%
4	60°↓	6	154.00	154.00	29.56%		6	.60°→	10	716.32	716.32	50.00%
5	45°←	7	520.96	520.96	100.00%		7	0° WRV	10	716.32	716.32	50.00%
6	45°→	7	520.96	520.96	100.00%							
7	60°←	7	520.96	520.96	100.00%		1					
8	60°→	7	520.96	520.96	100.00%							
9	0° WRV	7	520.96	520.96	100.00%					······································		
Ţ	otal Beams:	9	То	tal Percent:	744.64%		T	otal Beams:	7	То	tal Percent:	427.69%
		Tota	l Weld Metal	Coverage:	82.74%				Tota	Base Meta	Coverage:	61.10%
					Com	bined Cov	erage	i·	1			
COMPANIES OF THE SECOND	<u> </u>		1	Coverage			1	Total				
	Ž			Percent	X	Volume	+	Volume	=	Result		
A 12 11 iu au an an an an an			Weld Metal:	82.74%		520.96		1953.60		22.06%	***************************************	·
			Base Metal:	61.10%		1432.64		1953.60	<u> </u>	44.81%		
	{ 	······································					Ī	otal Exam	Coverage =	66.87%		·····
								٠				

**CCNPP** 

1.1

Component ID: 4 - 404 LTP No.: 004050

Coverage Sketch No: 10
Exam Area: Base Metal / 74"
Exam Angle: 45° / 60° / 0° WRV

NDE Report No.: CC04-1U-014 Summary No.: 004050 MO No.: 1200300701

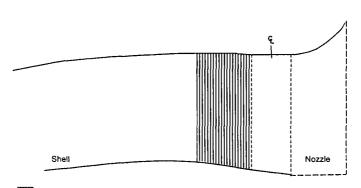
Scale: 50%

Page 11 of 11

Diameter: On Head Thickness: 4.40"
Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° ↔ / 60° ↔ / 0° WRV Coverage for 74" = 716.32 in³

	Weld Metal	: Volume =	520.96	Cubic Inch	ies			Base Meta	l: Volume =	1432.64	Cubic Incl	es
			Coverage	Beam	Percent of				*****	Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Cub. In.)	Tota!	520.96		Beam No.	Angle	Sketch	(Cub. In.)	Total	1432.64
4	45°↑	1	232.30	492.90	94.61%		1+2	45°/60°↑1	8	586.08	1272.83	88.85%
' '	45	2	260.60	492.90	94.01%		1		9	686.75	1212.03	88.85%
2	45°↓	3	106.60	106.60	20.46%		3_	45°←	10	716.32	716.32	50.00%
3	60°↑	4	232.30	520.96	100.00%		4	45°→	10	716.32	716.32	50.00%
3	00 (	5	288.66	520.96	100.00%	******	5	60°←	10	716.32	716.32	50.00%
4	60°1	6	154.00	154.00	29.56%		6	60°→	10	716.32	716.32	50.00%
5	45°←	7	520.96	520.96	100.00%		7	0° WRV	10	716.32	716.32	50.00%
6	45°→	7	520.96	520.96	100.00%	· · · · · · · · · · · · · · · · · · ·						
7	60°←	7	520.96	520.96	100.00%							
8	60°→	7	520.96	520.96	100.00%							
9	0° WRV	7	520.96	520.96	100.00%	Y.C				******************		, A. S
To	otal Beams:	9	То	tal Percent:	744.64%		Тс	tal Beams:	7	То	tal Percent:	427.69%
		Tota	   Weld Metal	Coverage:	82.74%				Tota	Base Meta	Coverage:	61.10%
					Com	bined Cove	erage		<u> </u>		The state of the s	······································
	***************************************			Coverage				Total	·			
			1	Percent	X	Volume	+	Volume	=	Result		
en er er er er eg a eg a eg en er en		7	Veid Metal:	82.74%		520.96	1	1953.60		22.06%	\$ A	
		E	Base Metal:	61.10%		1432.64		1953.60		44.81%		
		Market Service Control of the Contro	<u></u>				T	otal Exam (	Coverage =	66.87%	water to a common	

#### Responses to Request for Additional Information Summary No.: 004100 Comp ID: 4-405 Page 1 of 9

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

#### Response:

PZR Surge Nozzle to Upper Head / Due to nozzle configuration, coverage of nozzle side base metal and weld was limited. The pressurizer nozzle-to-vessel head welds are accessible only from the head side based on the nozzle curvature. The scanning surface of the nozzle is essentially perpendicular to the head surface which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The nondestructive examination (NDE) techniques and procedures used incorporated examination techniques qualified under Article 4 of Section V of the ASME Code as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

#### Response:

 $\{ ^{\prime\prime}\}_{\lambda}$ 

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

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2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

See attached sketches derived from examination data on file at CCNPP for cross sectional coverage plots and calculations.

**CCNPP** 

Component ID: 4 - 405

LTP No.: 004100

NDE Report No.: 2000BU028

Coverage Sketch No: 1 Exam Area: Weld Metal 360°

Exam Angle: 45°

**Summary No.:** 004100

MO No.: 1199904203

**Scale:** 50%

Diameter: On Head

Thickness: 4.40" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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· .. id

. South

(Sketch Resized for Relief Request)

Shell Nozzle

45°† Coverage = 419.16 in³ of 420 in³ exam area ≈ 99.80%

			Cove	rage Dimen	sions						Beam D	irections		
				1		1		Result			}	}		A
		Length	X	Width	×	Thickness	=	(Cub. In.)		ard Nozzle:	1	1		
E	xam Area:	51.85		6.3		4.5		1470.00		om Nozzle:	Į.			
٧	Veld Metal:	51.85		1.8		4.5		420.00		Clockwise:	<b>←</b>	•		
В	ase Metal:	51.85		4.5		4.5	,,	1050.00	Counter	Clockwise:				
						1		1	1					
		Weld Metal	: Volume =		Cubic Incl	105			Base Metai	Volume =	1050.00	Cubic Incl	nes	
		1		Coverage	Beam	Percent of			<b>!</b>		Coverage	Beam	Percent of	
	Beam No.	Angle	Sketch	(Cub. In.)	Total	420.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1050.00	
	1	45°↑	1	419.16	419,16	99.80%		1+2	45°/60°11	7	907.09	907.09	86.39%	
Ţ	2	45°↓	2	66.37	66.37	15.80%			1				86.39%	
	3	60°↑	3	418.44	418,44	99.63%	· · · · · · · · · · · · · · · · · · ·	3	45°←	8	525	525	50.00%	
· Animicono	4	60°↓	4	35.00	35.00	8.33%		4	45°→	8	525	525	50.00%	
Ī	5	45°←	5	390.83	390.83	93.05%		5	60°⊷	8	525	525	50.00%	
	6	45°-→	5	390.83	390.83	93.05%		6	60°→	8	525	525	50.00%	
aranconumu	7	60°←	5	390.83	390.83	93.05%	-,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	7	0° WRV	8	525	525	50.00%	*************
	8	60°→	5	390.83	390.83	93.05%								
	9	0° WRV	6	420.00	420.00	100.00%			1	M	***************************************	<b>*</b>		
	Same of the same o			0		į						) [. [		
	**************	i						**************	<b></b>		e Varantiitiin tarkoonii kassa kassa ka	} &::::::::::::::::::::::::::::::::::::		
	To	otal Beams:	9	To	tal Percent:	695.78%		To To	otal Beams:	7	То	tal Percent:	422.78%	
		ļ		ļ.,		1			ļ			<u> </u>		
L		<del> </del>	iota	Weld Metal	Coverage:	77.31%				1018	Base Meta	Coverage:	60.40%	
	***************************************	l		<u>'</u>		Com	bined Cove	erage	<u> </u>	•				
	***************************************	<u> </u>			Coverage	1			Total			20 7 7 70 70 70 70 70 70 70 70 70 70 70 7	<u> </u>	***************************************
manua mili			***************************************		Percent	Х	Volume	+	Volume	=	Result	the same control	1	
				Neld Metal:	77.31%		420.00	ļ	1470.00		22.09%		1	
		1		Base Metal:		1	1050.00	1	1470.00		43.14%	.,	1	
				5	) quagraga	1			1			]	]	
		1		-		1		1	otal Exam C	overage =	65.23%			

**CCNPP** 

Component ID: 4 - 405

LTP No.: 004100

Coverage Sketch No: 2 Exam Area: Weld Metal 360°

Exam Angle: 45°

NDE Report No.: 2000BU028

**Summary No.:** 004100

Scale: 50%

MO No.: 1199904203

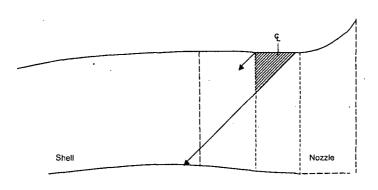
Diameter: On Head Thickness: 4.40" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 3 of 9

::

(Sketch Resized for Relief Request)



45°1 Coverage = 66.37 in of 420 in exam area = 15.80%

		0010	rage Dimen	210112						Deaill D	irections		
				}	1		Result						
	Length	× ×	Width	X	Thickness	=	(Cub. ln.)	Tow	ard Nozzle:	1			
Exam Area:	51.85	***********	6.3		4.5		1470.00		om Nozzle:	1			*******
Weld Metal:	51.85		1.8		4.5		420.00		Clockwise:	<b>←</b>			
Base Metal:	51.85		4.5	***************************************	4.5		1050.00	Counter	Clockwise:	<del></del>			
	Weld Metal	Volume #	420.00	Cubic Incl	108	······································		Base Metal:	Volume ≃	1050.00	Cubic Inch	les.	<del> </del>
	TTOTA INCION		Coverage	Beam	Percent of	connection control to the				Coverage	Beam	Percent of	
Beam No.	Angle	Sketch	(Cub. In.)	Total	420.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1050.00	***********
1	45°↑	1	419.16	419.16	99.80%							86.39%	
<del>2</del>	45°1	<del></del>	66.37	66.37	15.80%		1+2	45°/60°†↓	7	907.09	907.09	86.39%	1011147,
3	60°†	3	418.44	418.44	99.63%	***************************************	3	45°←	8	525	525	50.00%	
4	60°	4	35.00	35.00	8.33%	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	4	45°→	8	525	525	50.00%	000000
5	45°⊷	5	390.83	390.83	93.05%		5	60°←	8	525	525	50.00%	1
6	45°→	5	390.83	390.83	93.05%		6	60°→	8	525	525	50.00%	1
7	60°←	5	390.83	390.83	93.05%		7	0° WRV	8	525	525	50.00%	
8	60°→	5	390.83	390.83	93.05%						1		·····
9	0° WRV	6	420.00	420.00	100.00%			<b>********</b>		an an annue an an an an an an			
Te	otal Beams:	9	To	tal Percent:	695.78%		To	otal Beams:	7	To	tal Percent:	422.78%	^ ~ · · · · · · · · · ·
		Total	Weld Meta	Coverage:	77.31%				Total	Base Meta	l Coverage:	60.40%	
					Com	bined Cove	erage	<u>                                       </u>			į		ļ
				Coverage				Total					·····
······································	W	************	****	Percent	x	Volume	+	Volume		Result			*******
		······	Veld Metal:	77.31%	4	420.00	1	1470.00		22.09%	,,		
			Base Metal:			1050.00		1470.00		43.14%	**************************************		ļ
		***********	pro-pro-pro-pro-pro-pro-pro-pro-pro-pro-		<b></b>		Тт	otal Exam C	overage =	65.23%			ļ

**CCNPP** 

Component ID: 4 - 405 LTP No.: 004100

Summary No.: 004100

Coverage Sketch No: 3 Exam Area: Weld Metal 360° Exam Angle: 60°

NDE Report No.: 2000BU028

MO No.: 1199904203

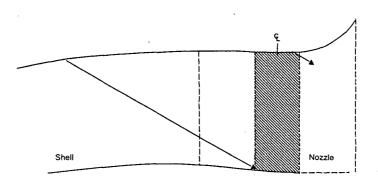
Scale: 50%

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Diameter: On Head Thickness: 4.40" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless SteelCASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



60°↑ Coverage = 418.44 in³ of 420 in³ exam area = 99.63%

Length		rage Dimen										
Length						Result					1	,
	X	Width	X	Thickness		(Cub. In.)	Tow	ard Nozzle:	1		i	~~~~
51.85		6.3		4.5		1470.00		om Nozzle:				. ******
51.85		1.8		4.5		420.00		Clockwise:	←-		1	
51.85		4.5		4.5		1050.00	Counter	Clockwise:				
Weld Metal	: Volume ≃	420.00	Cubic Inch	es		<del></del>	Base Metal	: Volume =	1050.00	Cubic Inch	105	·······
1			Beam	Percent of			1			Beam	Percent of	
Angle	Sketch				.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Beam No.	Angle	Sketch				
	1	419.16		99.80%							86.39%	
	2	66.37	66.37	15.80%		1+2	45 /60 1	7	907.09	907.09	86.39%	
60°†	3	418.44	418.44	99.63%	~ *************************************	3	45°⊷	8	525	525	50.00%	*******
60°1	4	35.00	35.00	8.33%		4	45°→	8	525	525	50.00%	
45°←	5	390.83	390.83	93.05%		5	60°←	8	525	525	50.00%	
45°→	5	390.83	390.83	93.05%		6	60°→	8	525	525	50.00%	
60°←	5	390.83	390.83	93.05%		7	0° WRV	8	525	525	50.00%	
60°→	5	390.83	390,83	93.05%	ACCRECATE PROPERTY AND ADDRESS OF A							
0° WRV	6	420.00	420.00	100.00%						**************************************	¢*************************************	
											ļ	
Total Beams	ā	To	al Percent	F 605 78%		Ta	tal Beams	7	To	al Percent	422 78%	
1		†					1			1		************
	Tota	l Weld Metal	Coverage:	77.31%				Total	Base Meta	Coverage:	60.40%	
		1		Com	bined Cove	erage						,
			Coverage				Total					
				X		+		=			Ĭ	
		Weld Metal:	77.31%		420.00		1470.00		22.09%			
		Base Metal:	60.40%		1050.00		1470.00		43.14%			,
		<b>!</b>		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		<u> </u>	otal Exam C	overage =	65.23%			···········
	S1.85   Weld Meta	S1.85   Weld Metal: Volume =   No.	S1.85	S1.85	S1.85	S1.85	S1.85	S1.85	S1.85	S1.85		

**CCNPP** 

. 1.1

Component ID: 4 - 405

LTP No.: 004100 **Summary No.:** 004100

Coverage Sketch No: 4 Exam Area: Weld Metal 360°

Exam Angle: 60°

NDE Report No.: 2000BU028

MO No.: 1199904203

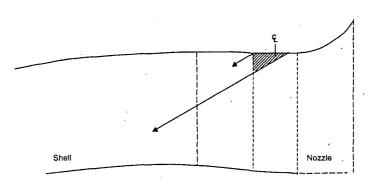
Scale: 50%

Diameter: On Head Thickness: 4.40" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless SteelCASS = Cast Stainless Steel

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(Sketch Resized for Relief Request)



60° L Coverage = 35 in of 420 in exam area = 8.33%

		Cove	rage Dimen	sions				J		Beam D	irections		
1			[		1		Result						
	Length	×	Width	X	Thickness		(Cub. In.)		ard Nozzie:	1		i	7
Exam Area			6.3		4.5		1470.00		om Nozzle:	1,			
Weld Metal	51.85		1.8		4.5		420.00		Clockwise:	-			1
Base Metal	51.85		4.5		4.5		1050.00	Counter	Clockwise:	<b>→</b>			1
	Weld Metal	: Volume =	420.00	Cubic Incl	106		<del></del>	Base Metal	Volume =	1050.00	Cubic Incl	108	<del> </del>
~~~	;	. volunte -	Coverage	Beam	Percent of		·	:	. voidina -	Coverage	Beam	Percent of	
Beam No	Angle	Sketch	(Cub. In.)	Total	420.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1050.00	
Dealit No	45°↑	JABICII 1	419.16	419.16	99.80%		Boani No.	1	OKOTON	· · · · · · · · · · · · · · · · · · ·		86.39%	
	45°1	2	66.37	66.37	15.80%		1+2	45°/60°↑↓	7	907.09	907.09	86.39%	
	60°1	3	418.44	418.44	99.63%		3	45°←	8	525	525	50.00%	*******
	60°1	. 4	35.00	35.00	8.33%		<del>                                     </del>	45°	8	525	525	50.00%	+
5	45°←	5	390.83	390.83	93.05%		5 .	60°←	8	525	525	50.00%	ł
- 6	45°→	5	390.83	390.83	93.05%		<u> </u>	60°-→	- 8	525	525	50.00%	<b></b>
	60°←	5	390.83	390.83	93.05%		7	0° WRV	- 8	525	525	50.00%	
<del></del>	60°→	5	390.83	390.83	93.05%		<del>- ′</del>	1 0 VVIV	°_	323	323	30.00%	
	0° WRV	6	420.00	420.00	100.00%			·•	· ^ · · · · · · · · · · · · · · · · · ·		<b></b>		
	1 0 VVICV		420.00	420.00	100.00%			<b></b>					
								<b>_</b>					ļ
*****	fotal Beams:	9	To	tal Percent:	695.78%		To	otal Beams:	7	To	tal Percent:	422.78%	
	1	Tota	I Weld Meta	Coverage:	77.31%	.,.,		<u> </u>	Total	Base Meta	l Coverage:	60,40%	
					Com	bined Cove	rage						ļ
~~~	·†····	<del></del>		Coverage		DIII 0 0 0 1 0	1	Total			***************************************	************	·
	***************************************			Percent	X	Volume		Volume		Result	**********	*****	*******
			Veld Metal:	77.31%	į	420.00	<b></b>	1470.00		22.09%			ļ
			Base Metal:			1050.00		1470.00		43.14%			<u> </u>
	<u> </u>				<b></b>			otal Exam C	AVAFAGA .	65.23%			ļ
			•		·	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<u></u>	Oldi Exam (	Overage =	U3.43 %		Ļ	į

**CCNPP** 

Component ID: 4 - 404

LTP No.: 004100

Coverage Sketch No: 5

Exam Area: Weld Metal 360° Exam Angle: 45° / 60°

NDE Report No.: 2000BU028

**Summary No.:** 004100 MO No.: 1199904203

**Scale:** 50%

Diameter: On Head

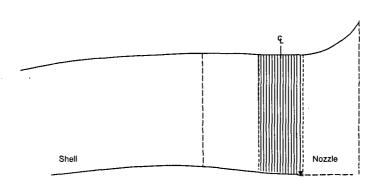
Thickness: 4.40" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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. . . . . . a. (3.9)

(Sketch Resized for Relief Request)



45° ↔ / 60° ↔ Coverage = 390.83 in of 420 in exam area ≈ 93.05%

			Cove	rage Dimen	sions						Beam D	rections		
						ł		Result					,	
		Length	X	Width	×	Thickness	=	(Cub. In.)		ard Nozzle:				
	Exam Area:	51.85		6.3		4.5		1470.00		om Nozzle:				
	Weld Metal:	51.85		1,8		4.5		420.00		Clockwise:	<del></del>			
	Base Metal:	51.85		4.5		4.5		1050.00	Counter	Clockwise:	<b>→</b>			
						f								
		Weld Metal	: Volume =		Cubic Inch				Base Metal	Volume ≃		Cubic Inch		roughtennoon.
	3			Coverage	Beam	Percent of					Coverage	Beam	Percent of	
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Beam No.	Angle	Sketch	(Cub. In.)	Total	420.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1050.00	
	1.	45*↑	1	419.16	419.16	99.80%		1+2	45°/60°11	7	907.09	907,09	86.39%	
	2	45°1	2	66.37	66.37	15.80%		L_''*					86.39%	
***************************************	3	60°↑	3	418.44	418.44	99.63%		. 3	45°←	8	525	525	50.00%	
	4	- 60°↓	4	35.00	35.00	8.33%		4	45°-→	8	525	525	50.00%	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	5	45°	5	390.83	390.83	93.05%		5	60°⊷-	8	525	525	50.00%	
	6	45°-→	5	390.83	390.83	93.05%		6	60°-→	8	525	525	50.00%	
	7	60°←	5	390.83	390.83	93.05%		7	0° WRV	8	525	525	50.00%	
······································	8	60°→	5	390.83	390.83	93.05%								
	9	0° WRV	6	420.00	420.00	100.00%								
											,			
······································		tal Beams:	9	To	tal Percent:	695.78%	~~**************	To	tal Beams:	7	To	tal Percent:	422.78%	************
		***************************************					and a second							
			Tota	Weld Metal	Coverage:	77.31%				Total	Base Meta	Coverage:	60.40%	l
						Com	bined Cove	rage	——					
***************************************					Coverage				Total			22,002.02.00.00.02.00.00.00.00.00.00.00.00.		
was recovered			***************************************		Percent	×	Volume	+	Volume	=	Result			,
			1	Veld Metal:	77.31%		420.00	I	1470.00		22.09%		i	
		**************************************		ase Metal:	60.40%		1050.00		1470.00		43.14%			
			***********		~····			π	otal Exam C	overage =	65.23%			
****		·							LACITOR C			***************************************	<b></b>	

**CCNPP** 

Component ID: 4 - 405

LTP No.: 004100

Coverage Sketch No: 6 Exam Area: Weld Metal 360°

Exam Angle: 0° WRV

NDE Report No.: 2000BU028

Summary No.: 004100 MO No.: 1199904203

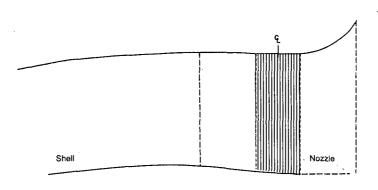
Scale: 50%

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Diameter: On Head Thickness: 4.40" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



0° WRV Coverage = 420 in³ of 420 in³ exam area ≈ 100%

			Cove	rage Dimen	sions						Beam D	irections		
		i .			1		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Result				1		1
······································	*************	Length	×	Width	) X	Thickness	=	(Cub. In.)	Tow	ard Nozzie:	1	·	1	
Exam	Area:	51.85		6.3		4.5	,	1470.00	Away fr	om Nozzle:	1		T	
Weld	Metal:	51.85		1.8	•	4.5		420.00		Clockwise:	<del></del>			
Base	Metal:	51.85		4.5		4.5		1050.00	Counter	Clockwise:	<b>→</b>			1
				100.00				<u> </u>	Base Metal		1050.00			ļ
		Weld Metal	: Volume =		Cubic Incl				Base Metai	: volume =		Cubic Incl		
L_				Coverage	Beam	Percent of	·				Coverage	Beam	Percent of	ļ
Bea	m No.	Angle	Sketch	(Cub. In.)	Total	420.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1050.00	<u></u>
	1	45°↑	1	419.16	419.16	99.80%		1+2	45°/60°†1	7	907.09	907.09	86.39%	J
	2	45°1	2	66.37	66.37	15.80%				· ·	307.03		86.39%	
	3	60°↑	3	418.44	418.44	99.63%	***************************************	3	45*←	8	525	525	50.00%	
	4	60°1	4	35.00	35.00	8.33%		4	45°→	8	525	525	50.00%	
	5	45°⊷	5	390.83	390.83	93.05%		5	60°←	8	525	525	50.00%	
	6	45°→	5	390.83	390.83	93.05%		6	60°→	- 8	525	525	50.00%	1
	7	60°←	5	390.83	390.83	93.05%		7	0° WRV	8	525	525	50.00%	1
	8	60°-→	5	390.83	390.83	93.05%								*********
	9	0° WRV	6	420.00	420.00	100.00%	~~~~~ <del>~~~~</del>	Andrewson and the second second	(	-6401a640000000000		) restriction as a restriction of the second	author o minimum.	
							.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
	To	otal Beams:	9	To	tal Percent:	695.78%		To	otal Beams:	7	То	tal Percent:	422.78%	
					Ĭ									
<u>L</u>			Tota	Weld Meta	Coverage:	77.31%			<u> </u>	Iota	Base Meta	Coverage:	60.40%	ļ
					<u>}                                    </u>	Com	bined Cove	erage						ļ
	***************************************				Coverage	4		T	Total				Accessor and a constant	**********
	********	***************************************	***************************************	AND THE PROPERTY OF	Percent	` X	Volume	*····	Volume	···········	Result		h	1.00
			······	Veld Metal:	77.31%	ļ	420.00	<u> </u>	1470.00		22.09%			ļ
				Base Metal:		<u>.</u>	1050.00	<u> </u>	1470.00		43.14%		<b></b>	<u> </u>
			atronica provide standard	poly you has a poly and the deliberation of the second second second second second second second second second				Т.	otal Exam C	overage =	65.23%			ļ
~~~		·							, LAUIT C		20.2076	******		ļ

**CCNPP** 

Component ID: 4 - 405

LTP No.: 004100

Coverage Sketch No: 7 Exam Area: Base Metal 360° Exam Angle: 45° / 60°

NDE Report No.: 2000BU028 Summary No.: 004100

MO No.: 1199904203 **Scale:** 50%

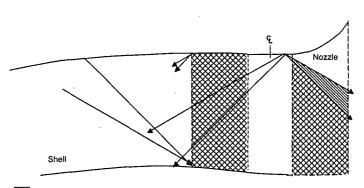
Diameter: On Head

Thickness: 4.40" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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(Sketch Resized for Relief Request)



Coverage by at least 2 sound beams = 875.01 in of 1050 in exam area = 83.33%.

Coverage by 1 sound beam only = 64.16 in<sup>3</sup> of 1050 in<sup>3</sup> exam area = 6.11%.

Total:  $875.01 + (64.16 / 2) = 907.09 \text{ in}^3 \text{ of } 1050 \text{ in}^3 \text{ exam area} = 86.39\%.$ 

		Cove	rage Dimen	sions						Beam D	irections		
i	j		į				Result		!		1	Ï	
***************************************	Length	X	Width	X	Thickness	=	(Cub. In.)		ard Nozzle:	1			~~~~
Exam Are			6.3		4.5		1470.00		om Nozzie:	1	<u> </u>		-manue
Weld Me			1.8	}	4.5		420.00		Clockwise:	<b>←</b>	1		
Base Me	tal: 51.85		4.5		4.5		1050.00	Counter	Cłockwise:				******
				-	1			1					****
	Weld Metal	: Volume =		Cubic Incl		400		Base Metal	: Volume =		Cubic Incl		
			Coverage	Beam	Percent of	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				Coverage	Beam	Percent of	
Beam N		Sketch	(Cub. In.)	Total	420.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1050.00	
1	45°↑	1	419.16	419.16	99.80%		1+2	45°/60°†1	7	907.09	907.09	86.39%	
2	45°↓	2	66.37	66.37	15.80%				,			86.39%	
3	60°↑	3	418.44	418.44	99.63%		3	45°←	8	525	525	50.00%	
4	60°L	4	35.00	35.00	8.33%		4	45°	8	525	525	50.00%	
5	45°←	5	390.83	390.83	93.05%		5	60•⊷	8	525	525	50.00%	
6	45°	5	390.83	390.83	93.05%		6	60°→	8	525	525	50.00%	
7	60°•~	5	390.83	390.83	93.05%		7	0° WRV	- 8	525	525	50.00%	
8	60°→	5	390.83	390.83	93.05%			1			1		~~~~
9	0° WRV	6	420.00	420.00	100.00%								
	Total Beams:	9	То	tal Percent:	695.78%	., ,	To	tal Beams:	7	To	tal Percent:	422.78%	Contract
		Tota	Weld Meta	Coverage:	77.31%				Total	Base Meta	Coverage:	60.40%	
					Com	bined Cov	erage				1		·,
				Coverage			L	Total			l	1	
1				Percent	X	Volume	+	Volume	=	Result			
i	\$	1	Weld Metal:	77.31%		420.00	}	1470.00		22.09%			
			Base Metal:	60.40%		1050.00		1470.00		43.14%			
		***************************************	***************************************	! 	1	***********************	T	otal Exam C	overage =	65.23%	*************	ļ	******
enen		~			·			1			3 0000000000000000000000000000000000000	÷	*****

**CCNPP** 

Component ID: 4 - 405

LTP No.: 004100

Coverage Sketch No: 8

Exam Area: Base Metal 360°
Exam Angle: 45° / 60° / 0° WRV

NDE Report No.: 2000BU028

Summary No.: 004100 MO No.: 1199904203

Scale: 50%

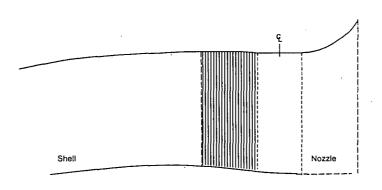
motor: On Hood

Page 9 of 9

Diameter: On Head Thickness: 4.40" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° → / 60° → / 0° WRV Coverage = 525 in³ of 1050 in³ exam area = 50%

		Cove	erage Dimer	nsions				1		Beam D	irections		
	1		Ĭ	ş		yı pırısıyızını iyi i <b>nini</b>	Result		,				,
***************************************	Lengt		Width	X	Thickness	=	(Cub. In.)		ard Nozzle:	1	<u> </u>		
Exam A	rea: 51.85		6.3		4.5		1470.00		om Nozzle:	1			
Weld Me	etal: 51.85	1	1.8	***************************************	4.5		420.00		Clockwise:	← .	<u> </u>		
Base Me	etal: 51.85		4.5		4.5		1050.00	Counter	Clockwise:	<b>→</b>			
	Wold Me	tal: Volume =	420.00	Cubic Incl	108		1	Base Metal	Volume =	1050.00	Cubic Incl	105	
******	1	Tall Volume -	Coverage	Beam	Percent of			Duec mote	70,0,0	Coverage	Beam	Percent of	······
Beam	No.   Angle	Sketch	(Cub. In.)	Total	420.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1050.00	
1	45°↑	1	419.16	419.16	99.80%			· · · · · · · · · · · · · · · · · · ·				86.39%	
<u>,</u>	45°1	2	66.37	66.37	15.80%		1 + 2	45°/60°1\$	7	907.09	907.09	86.39%	
3	60*1	<del>- 3</del> -	418.44	418.44	99.63%	~~~~	3	45°⊷	8	525	525	50.00%	
4	60°	4	35.00	35.00	8.33%		4	45°→	8	525	525	50.00%	
5	45°⊷	5	390.83	390.83	93.05%		5	60°←	8	525	525	50.00%	
6	45°	5	390.83	390.83	93.05%		6	60°→	8	525	525	50.00%	
<del></del>	60°⊷	<del>- 5</del> -	390.83	390.83	93.05%		7	0° WRV	8	525	525	50.00%	
8	60°	5	390.83	390.83	93.05%								v
9	0° WR	V 6	420.00	420.00	100.00%			}·····			\$		
			ļ							••••••••••	*		
	Total Bean	is: 9	i To	tal Percent:	695.78%		To	otal Beams:	7	То	tal Percent:	422.78%	
		Tota	i al Weld Meta	I Coverage:	77.31%				Tota	Base Meta	Coverage:	60.40%	
			1	1	1	bined Cov		1			} 		
	····	····		Coverage	Com	Dinea Cov	BIAGE	Total			***************************************		****
·····		****	******************	Percent	X	Volume	+	Volume	=	Result	*********		
			: Weld Metal:	77.31%	<u> </u>	420.00		1470.00		22.09%	ł		
			Base Metal:	60.40%		1050.00		1470.00		43.14%			
			ļ	ļ	ļ		<del> </del>	otal Exam C	overage =	65,23%		ļ	
*****	~~~	wen		\$	·			1			***************************************	**	

#### Responses to Request for Additional Information Summary No.: 004150 Comp ID: 16-405A Page 1 of 9

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

#### Response:

Safety & Relief "A" Nozzle to PZR Upper Head / Due to nozzle configuration coverage of nozzle side base metal and weld was limited. The nozzle enters the vessel at an angle thereby also limiting coverage attainable from the vessel side of the weld. The pressurizer nozzle-to-vessel head welds are accessible only from the head side based on the nozzle curvature. The scanning surface of the nozzle is essentially perpendicular to the head surface which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The nondestructive examination (NDE) techniques and procedures used incorporated examination techniques qualified under Article 4 of Section V of the ASME Code as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

#### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

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2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

See attached sketches derived from examination data on file at CCNPP for cross sectional coverage plots and calculationsr

**CCNPP** 

Component ID: 16-405A

**LTP No.:** 004150

NDE Report No.: CC06-1U-065

Coverage Sketch No: 1

Exam Area: Weld Metal 360°

Exam Angle: 45°

**Summary No.:** 004150 MO No.: 1200500749

**Scale:** 50%

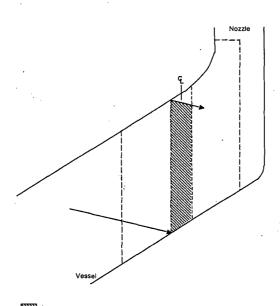
Diameter: 96" Thickness: 5.00"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 9

(Sketch Resized for Relief Request)



45°† Coverage = 4.25 in² of 4.59 in² area = 92.59%

		Cove	rage Dimen	sions				(		Beam Di	rections		
							Result						
	Length	X	Width	×	Thickness	=	(Squ. In.)	Tow	ard Nozzle:	1			
Exam Area:	23		5.6		See Sketch		26.85		om Nozzle:	1			
Weld Metal:	23		1	}	See Sketch		4.59		Clockwise:	←		i	
Base Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>		]	
					1		1	1					
	Weld Metal	: Volume =		Square Inc				Base Metal	Volume =		Square Inc		
			Coverage	Beam	Percent of					Coverage	Beam	Percent of	
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	
1	45°↑	1	4.25	4.25	92.59%		1+2	45°/60°11	6	18.48	18.48	83.02%	
2	45°į	2	0.00	0.00	0.00%		172	45 /60 It		10.40	10.40	83.02%	1
3	60°t	3	4.34	4.34	94.55%	//// <b>////</b>	3	45°←	7	10.53	10.53	47.30%	
4	60°i	4	0.00	0.00	0.00%		4	45°→	7	10.53	10.53	47.30%	
5	45°4	5	1.38	1.38	30.07%	.,	5	60°←	7	10.53	10.53	47.30%	
6	45°-→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%	
7	60'←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%	,
8	60°→	5	1.38	1.38	30.07%								<b> </b> ~~~
9	0° WRV	5	1.38	1.38	30.07%		***************************************		anno de la compania		Paris and an arrange with	\$ A. O'THE CO. TO STATE OF STA	^^~~
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	L												
	tal Beams:	9	To	tal Percent:	337.47%	//		otal Beams:	7	To	tal Percent:	402.56%	
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		Tota	Weld Meta	Coverage:	37.50%				Tota	Base Meta	Coverage:	57.51%	
					لسيسل			<u> </u>					
	l				Com	bined Cov	erage						ļ
			.,,	Coverage	i		<b></b>	Total Volume		······································	1777		
				Percent	, x	Volume	ļ <u>T</u>	1		Result			
	<u></u>		Veld Metal:	37.50%	ļ	4.59		26.85		6.41%		ļ	ļ
	ļ		Base Metal:	57.51%	ļ	22.26	ļ	26.85	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	47.68%			ļ
	{	I			{		1	otal Exam C		54.09%		i	

**CCNPP** 

Component ID: 16-405A

LTP No.: 004150

NDE Report No.: CC06-1U-065

Coverage Sketch No: 2 Exam Area: Weld Metal 360°

Exam Angle: 45°

Summary No.: 004150 MO No.: 1200500749

Scale: 50%

Diameter: 96" Thickness: 5.00"

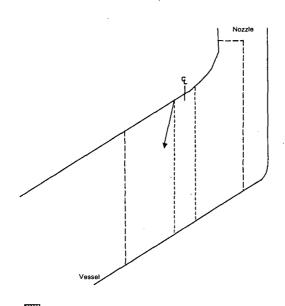
Material: CC/S CC/S = Clad Carbon Steel

S/S = Stainless Steel CASS = Cast Stainless Steel

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(Sketch Resized for Relief Request)



45°↓ Coverage = 0 in² of 4.59 in² area = 0%

		Cove	rage Dimen	sions				1		Beam D	rections	
	1	<b>*************************</b>	•		T		Result	***************************************			1	1
7	Length	X	Width	X	Thickness	=	(Squ. In.)	Tow	ard Nozzle:	1	<u> </u>	1
Exam Area:	23	and an	5.6	**************	See Sketch	000 - 00000 00 00 00 PROPO - F- P	26.85	Away fr	om Nozzle:	`\	}	
Weld Metal:	23	<b></b>	1		See Sketch		4.59		Clockwise:	-	(	
Base Metal	23		4.6		See Sketch		22.26	Counter	Clockwise:		5	
<del> </del>	Weld Metal	: Volume ≃	4.59	Square inc	hes	***************************************	<del></del>	Base Metal	: Volume =	22.26	Square Inc	hes
-	1	1	Coverage	Beam	Percent of		<u> </u>			Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26
1	45°†	1	4.25	4.25	92.59%						10.10	83.02%
2	45	2	0.00	0.00	0.00%		1+2	45°/60°†↓	6	18.48	18.48	83.02%
3	60°1	3	4.34	4.34	94.55%		3	45°←	7	10.53	10.53	47.30%
4	60°1	4	0.00	0.00	0.00%		4	45°→	7	10.53	10.53	47.30%
5	45°←	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%
6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%
7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%
8	60°→	5	1.38	1.38	30.07%							
9	0° WRV	5	1.38	1.38	30.07%							
	1	<u></u>										ļ
			<u> </u>							***************************************		ļ
-	otal Beams:	9	To	tal Percent:	337.47%	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	To	otal Beams:	7	То	tal Percent:	402.56%
	<u>}</u>	Tota	Weld Meta	Coverage:	37.50%				Tota	Base Meta	l Coverage:	57.51%
	<u> </u>	<del></del>	<del></del>	Causes	Com	bined Cov	erage	Total				ļ
		en ma unita entita en	i di i reniumentennis i	Coverage Percent	x	Volume	+	Volume	~~~~~	Result	vas. a sermanana	
	ļ	ł	: Weld Metal:	37.50%	ļ	4.59	ļ	26.85		6.41%		<b> </b>
			Base Metal:	57.51%	į	22.26	1	26.85		47.68%		İ
			\$			***************************************					00111001101100	
	1	l	1		1		<u> T</u>	otal Exam C	overage =	54.09%	l	

**CCNPP** 

Component ID: 16-405A

LTP No.: 004150

Coverage Sketch No: 3 Exam Area: Weld Metal 360°

Exam Angle: 60°

NDE Report No.: CC06-1U-065 Summary No.: 004150

MO No.: 1200500749

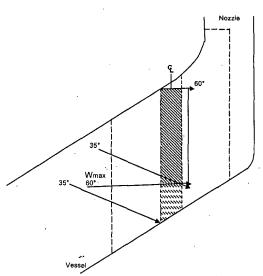
Scale: 50%

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Diameter: 96"
Thickness: 5.00"
Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



Note: At 180° the 60°↑ exam was limited by the head to shell transition. A supplemental 35°↑ was used to obtain additional coverage

60°↑ Coverage @ 180°, Wmax limited by head to shell transition. = 3.23 in²

g oo | Coverage @ 100 ; Timbe milited by head to anon narioment.

35°† Coverage @ 180° = 1.11 in²

Total Coverage 3.23 + 1.11 = 4.34 in<sup>2</sup>. 4.34 in<sup>2</sup> of 4.59 in<sup>2</sup> area = 94.55%

		Cove	rage Dimen	isions				í		Beam D	irections	
	1			\$			Result				š	
************	Length	X	Width	X	Thickness	=	(Squ. In.)	Tow	ard Nozzle:	1	Green germannen andere B	**************************************
Exam Area:	23		5.6	\$ a	See Sketch		26.85	Away fr	om Nozzie:	1	900 11 11 10 11 11 11 10 10 10 10 10 10 1	1
Weld Metal:	23		1	 }	See Sketch		4.59		Clockwise:	<b>—</b>	3	
Base Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>	<b>)</b>	
	Weld Metal	: Volume =	4.59	Square Inc	ches	***************************************		Base Metal	Volume =	22.26	Square Inc	hes
	1	-	Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26
1	45°t	1	4.25	4.25	92.59%			.50.000				83.02%
2	45°	2	0.00	0.00	0.00%	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	1+2	45°/60°†↓	6	18.48	18.48	83.02%
3	60°↑	3	4.34	4.34	94.55%		3	45°⊷	7	10.53	10.53	47.30%
4	60°	4	0.00	0.00	0.00%		4	45°→	7	10.53	10.53	47.30%
5	45°←	5	1.38	1.38	30.07%		5	60°	7	10.53	10.53	47.30%
6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%
····· <del>7</del>	60°←	5	1.38	1.38	30.07%	**************************************	7	0° WRV	7	10.53	10.53	47.30%
8	60°→	5	1.38	1.38	30.07%	:*::::::::::::::::::::::::::::::::::::						
9	0° WRV	5	1.38	1.38	30.07%		A CONTRACTOR OF THE PARTY OF TH		v.o	MANAGE AT THE TOTAL PROPERTY AND ADDRESS OF THE PARTY AND ADDRESS OF TH		***************************************
									,,,,,	·,,		
T	otal Beams:	9	To	tal Percent:	337.47%		To	tal Beams:	7	To	tal Percent:	402.56%
	1	***************************************	**********	1	*************************				********		***************************************	***********
		Tota	Weld Meta	Coverage:	37.50%				Total	Base Meta	Coverage:	57.51%
			·	·	Com	bined Cov	erage					ļ
				Coverage				Total				l
	1			Percent	X	Volume	+	Volume	=	Result		
		1	Veld Metal:	37.50%		4.59		26.85		6.41%	I	
			Base Metal:	57.51%		22.26		26.85		47.68%		
		****************		<u>.</u>	ļ		· · · · · · · · · · · · · · · · · · ·	otal Exam C	overage =	54.09%		

**CCNPP** 

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Component ID: 16-405A

LTP No.: 004150

Coverage Sketch No: 4 Exam Area: Weld Metal 360°

Exam Angle: 60°

NDE Report No.: CC06-1U-065

**Summary No.:** 004150 MO No.: 1200500749

**Scale:** 50%

Diameter: 96"

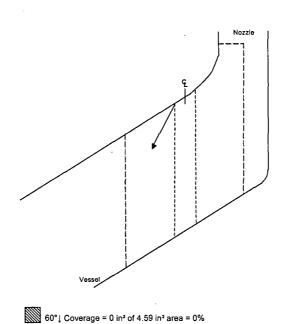
Thickness: 5.00"

Material: CC/S CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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(Sketch Resized for Relief Request)



		Cove	rage Dimen	sions						Beam D	irections	
	1		The Table of the Control of the Cont	<u>}</u>			Result					I
***************************************	Length	×	Width	×	Thickness		(Squ. In.)	Towa	ard Nozzle:	T	**************************************	***************************************
Exam Area:	23	•	5.6		See Sketch		26.85	Away fro	om Nozzie:	1		
Weld Metal:	23		1	i	See Sketch		4.59		Clockwise:	←-		-
Base Metal:	23		4.6	•	See Sketch		22.26	Counter	Clockwise:	<del></del>		
	Weld Metal	: Volume =	4.59	Square Inc	hes	***************************************		Base Metal:	Volume =	22.26	Square Inc	hes
	1	1	Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26
1	45°↑	1	4.25	4.25	92.59%		1.0	4500000			40.40	83.02%
2	45°1	2	0.00	0.00	0.00%		1+2	45°/60°†↓	6	18.48	18.48	83.02%
3	60°↑	3	4.34	4.34	94.55%	****	3	45°	7	10.53	10.53	47.30%
4	60°1	4 .	0.00	0.00	0.00%	. A p Ann of the constitution	4	45°→	7	10.53	10.53	47.30%
5	45°←-	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%
6	45°→	5	1.38	1.38	30.07%		6	60°-→	7	10.53	10.53	47.30%
7	60°⊷	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%
8	60°→	5	1.38	1.38	30.07%							
9	0° WRV	5	1.38	1.38	30.07%							
				}							r	
T	tal Beams:	9	To	tal Percent:	337.47%	······································	To	otal Beams:	7	To	tal Percent:	402.56%
		Tota	Weld Meta	Coverage:	37.50%		.,,		Tota	Base Meta	l Coverage:	57.51%
					Com	bined Cove	erage					<u> </u>
*		a.m.n	·~	Coverage	¥	Võlume		Total Volume	//////////////////////////////////////	Result		
	<b></b>		: Neld Metal:	37.50%	ļ	4.59		26.85		6.41%		ļ
			Base Metal:	57.51%		22.26	l	26.85		47.68%		
									***************************************			
	[				1		<u> </u>	otai Exam C	overage =	54.09%		

**CCNPP** 

Component ID: 16-405A

NDE Report No.: CC06-1U-065 **Summary No.:** 004150

LTP No.: 004150

Coverage Sketch No: 5

MO No.: 1200500749 Scale: 50%

Exam Angle: 45° / 60° / 0°

Exam Area: Weld Metal 360°

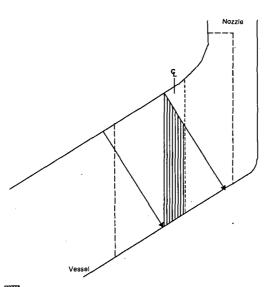
Diameter: 96"

Thickness: 5.00" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 6 of 9

(Sketch Resized for Relief Request)



45° ↔ / 60° ↔ / 0° Coverage = 3.83 in² of 4.59 in² exam area = 83.33%

NOTE: This sketch shows coverage @ 180° which was the most favorable location for these exams. Moving from 180° to 0° the coverage was gradually reduced to the point where 0% coverage was obtained at 0°.

Actual coverage for these exams = 1.38 in² = 30.07%

			Cove	rage Dimen	sions						Beam D	irections		
							,,	Result					i i	
	1	Length	X	Width	X	Thickness	=	(Squ. In.)	Tow	ard Nozzle:	ſ			******
-1 mg   - 50 pp par   -200 a	Exam Area:	23		5.6		See Sketch		26.85	Away fro	om Nozzle:	Į.			
*****************	Weld Metal:	23		1		See Sketch		4.59		Clockwise:				
	Base Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>			
***************************************	<del> </del>	Weld Metal	: Volume =	4.59	Square Inc	hes	varavana orteneriae	·	Base Metal	Volume ≂	22.26	Square Inc	ches	····
·^~~~~~~				Coverage	Beam	Percent of					Coverage	Beam	Percent of	
	Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	•••••
***************************************	1	45°t	1	4.25	4.25	92.59%							83.02%	,
***************************************	2	45°1	2	0.00	0.00	0.00%		1+2	45°/60°†↓	6	18.48	18.48	83.02%	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
**********	3	60°↑	3	4.34	4.34	94.55%		3	45*	7	10.53	10.53	47.30%	
· · · · · · · · · · · · · · · · · · ·	4	60°1	4	0.00	0.00	0.00%	A	4	45°-→	7	10.53	10.53	47.30%	
	5	45°←	5	1,38	1.38	30.07%		5	60°←	7	10,53	10.53	47.30%	
	6	45°→	5	1.38	1.38	30.07%	***************************************	6	60°→	7	10.53	10.53	47.30%	
***************************************	7	60°	5	1.38	1.38	30.07%	,	7	0° WRV	7	10.53	10.53	47.30%	
************	8	60"→	5	1.38	1.38	30.07%	·						1	
	9	0° WRV	5	1.38	1.38	30.07%				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				
							.,,,				•••••			
•	To	tal Beams:	9	То	tal Percent:	337.47%		To	ital Beams:	7	То	tal Percent:	402.56%	*******
***************************************								1						
···			Tota	Weld Meta	Coverage:	37.50%				Total	Base Meta	Coverage:	57.51%	
	1					Com	bined Cov	erage	·					
					Coverage			1	Total					.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
					Percent	X	Volume	+	Volume	=	Result			
***************************************	i .		,	Veld Metal:	37.50%	Į.	4.59		26.85		6.41%			
			E	Base Metal:	57.51%		22.26		26.85	······································	47.68%		I	
********						l		· T	otal Exam C	overage =	54.09%	************	<b></b>	
The section of the section			oraccopport (	an an areas				7					*****************	*******

**CCNPP** 

Component ID: 16-405A

LTP No.: 004150 Coverage Sketch No: 6

Exam Area: Base Metal 360° Exam Angle: 45° /60°

NDE Report No.: CC06-1U-065

Summary No.: 004150 MO No.: 1200500749

**Scale:** 50%

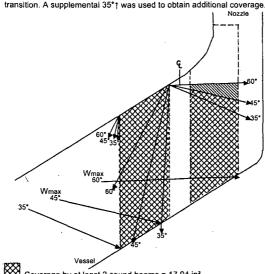
Page 7 of 9

Diameter: 96" Thickness: 5.00" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)

Note: At 180° the 45° ↑ & 60° ↑ exams were limited by the head to shell transition. A supplemental 35°† was used to obtain additional coverage.



Coverage by at least 2 sound beams ≈ 17.94 in².

Coverage by 1 sound beam only = 1.07 in<sup>2</sup>. Total:  $17.94 + (1.07 / 2) \approx 18.48 \text{ in}^2$ . 18.48 of 22.26 = 83.02%

		Cove	age Dimen	sions				ł		Beam D	irections		
i i							Result				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Ì	
	Length	×	Width	×	Thickness	=	(Squ. In.)	Tow	ard Nozzie:	î		Ī	
Exam Area:			5.6		See Sketch		26.85		om Nozzle:				
Weld Metal:			1	}	See Sketch		4.59		Clockwise:	<b>-</b>	Ì	1	
Base Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:		,		
	Weld Metal	· Volume =	4 59	Square Inc	hes	~~~~~~~~~~~		Base Metal	Volume ≈	22.26	Square Inc	hes	
		- 10141110	Coverage	Beam	Percent of	**********				Coverage	Beam	Percent of	~~~~
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	
1	45°1	1	4.25	4.25	92.59%							83.02%	
····· 2	45°1	2	0.00	0.00	0.00%		1+2	45°/60°†↓	6	18.48	18.48	83.02%	
3	60°†	3	4.34	4.34	94.55%	~~~~~~~~~	3	45°⊷	7	10.53	10.53	47.30%	~~~~
	60°	4	0.00	0.00	0.00%		4	45°→	7	10.53	10.53	47.30%	
5	45°⊷	- 5	1,38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%	
6	45°→	- 5	1.38	1.38	30.07%	,	6	60°→	<del>-                                    </del>	10.53	10.53	47.30%	
<del>7</del>	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%	
······ <del>8</del>	60°→	5	1.38	1.38	30.07%	····	<del></del>				10.00	1110070	*******
9	0° WRV	5	1,38	1.38	30.07%	construent construents	**********			an and a part of the second of	····	· · · · · · · · · · · · · · · · · · ·	-
T	otal Beams:	9	To	tai Percent:	337.47%		Te	tal Beams:	7	То	tal Percent:	402.56%	
		Total	Weld Meta	l Coverage:	37.50%				Total	Base Meta	l Coverage:	57.51%	
	ļ			2	Com	bined Cove	enage						
				Coverage	00111	511100 001	1	Total			~~~~	<b>!</b>	
		A A		Percent	x	Volume	***************************************	Volume	·····	Result	***************		
	1		Veld Metal:	37.50%	ļ	4.59	ļ	26.85		6.41%	<b>!</b> ```	ļ	
			ase Metal:			22.26		26.85		47.68%			
			····	: 			T	otal Exam C	overage =	54.09%	· Orania managaran		
		******************************	************	****	<u> </u>		†	!		·····	***************************************	******************	~~~

**CCNPP** 

Component ID: 16-405A

LTP No.: 004150

Coverage Sketch No: 7

Exam Area: Base Metal 360° Exam Angle: 45° / 60° / 0° WRV NDE:Report No.: CC06-1U-065

Summary No.: 004150

MO No.: 1200500749 Scale: 50%

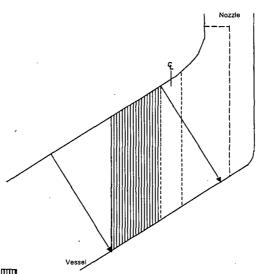
Diameter: 96"

Page 8 of 9

Thickness: 5.00" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° ↔ / 60° ↔ / 0° WRV Coverage = 10.53 in° of 22.26 in° exam area = 47.30%

NOTE: This sketch shows coverage @ 180° which was the most favorable location for these exams. Moving from 180° to 0° the coverage of the nozzle side base metal was gradually reduced to the point where 0% coverage was obtained at 0°. No coverage credit was taken for the nozzle side base material

	Coverage Dimensions									Beam Directions					
								Result							
· v	***************************************	Length	×	Width	×	Thickness	=	(Squ. In.)	Tow	ard Nozzle:	Ī				
	Exam Area:	23		5.6 1	See Sketch See Sketch			26.85 4.59	Away from Nozzie: Clockwise:		1				
· · · · · · · · · · · · · · · · · · ·	Weld Metal:	23									<b>←</b>				
E	Base Metal:	23		4.6		See Sketch		22.26	Counter Clockwise:				İ		
***************************************	<u> </u>	Weld Metal	· Volume =	4 50	Square Inc	hog	***************************************		Base Metal:	Volume =	22.26	Square Inc	hos	*********	
		TTEIG MELA	. 40141116 -	Coverage	Beam	Percent of		·	Dage Inclui	10101110 -	Coverage	·Beam	Percent of	Misson contribe	
	Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26		
	Seall No.	45°↑	1	4.25	4.25	92.59%							83.02%	***************************************	
	2 .	45°L		0.00	0.00	0.00%		1+2	45°/60°†↓	6	18.48	18.48	83.02%		
************	3	60°t	3	4.34	4.34	94.55%		3	45°←	7	10.53	10.53	47.30%	·····	
	4	60°1	4	0.00	0.00	0.00%	***************************************	4	45°→	7	10.53	10.53	47.30%	*****	
	5	45°+-	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%		
	6	45°→	- 5	1.38	1.38	30.07%		6	60°	7	10.53	10.53	47.30%		
	7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%		
··········	8	60°→	5	1.38	1.38	30.07%	·						· · · · · · · · · · · · · · · · · · ·	ATALOGUE CONTRACTOR	
	9	0° WRV	5	1.38	1.38	30.07%					4000. 000 000 000 0000 0000.				
														·· ····· ······	
	Ti	i otal Beams:	9	То	tal Percent:	337.47%		Т	tal Beams:	7	To	al Percent:	402.56%	~~~~	
			Total Weld Metal Coverage:			37.50%			Total Base Metal		I Coverage: 57.51%				
						Com	bined Cov	erage					ļ		
~		<b></b>		Coverage				ilog de rei age		Total		****************		*********	
	£	÷			Percent	×	Volume	·	Volume		Result	###		er income	
				Weld Metal:		ļi	4.59		26.85		6.41%	***************************************	h	***************************************	
				Base Metal:			22.26		26.85	······································	47.68%		<u> </u>		
	ļ	}	e e e dele e e e delegación de electron de			<u> </u>		т	otal Exam C	overage =	54.09%		ļ	· www.	
	<b></b>	~		h		}	····		L. LAUTI O		<u> </u>		ļ		

**CCNPP** 

Component ID: 16-405A

LTP No.: 004150

Coverage Sketch No: Exam Area Exam Area: AFGLBCKDHJE

Exam Angle: NA

NDE Report No.: CC06-1U-065 **Summary No.:** 004150

MO No.: 1200500749

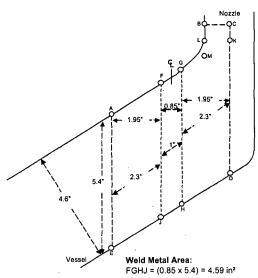
**Scale:** 50%

Page 9 of 9

Diameter: 96" Thickness: 5.00" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



- Base Metal Area:

   Vessel Side = AFJE = (1.95 x 5.4) = 10.53 in²

   Nozzle Side = GKDH + GLM + LKM + LBCK

   (1.95 x 5.4) + (1 x 0.6)/2 + (1 x 0.6)/2 + (1 x 0.6) = 11.73 in²

   Total Base Metal Area = 10.53 + 11.73 = 22.26 in²

Total Exam Area: 4.59 + 22.26 = 26.85 in<sup>2</sup>

		Cove	rage Dimen	sions						Beam D	irections		
	1						Result	1		}	•	1	
***************************************	Length	X	Width	X	Thickness		(Squ. In.)		ard Nozzle:				<u> </u>
Exam Area:	23		5.6		See Sketch		26.85	Away fr	om Nozzle:	Ţ			
Weld Metal:	23		1		See Sketch		4.59		Clockwise:	<b>├</b>			
Base Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>			
	Weld Metal	· Volume E	4 50	Square Inc	hos	***************************************	<del></del>	Base Metal	· Volume =	22.26	Square Inc	hes	İ
	Weid Hield	· voidine -	Coverage	Beam	Percent of			i mota		Coverage	Beam	Percent of	IN A POLITY OF
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	· · · · · · · · · · · · · · · · · · ·
1	45°1	1	4.25	4.25	92.59%							83.02%	
····· 2	45°1	2	0.00	0.00	0.00%	,	1+2	45°/60°†↓	6	18.48	18.48	83.02%	
3	60°†	3	4.34	4.34	94.55%	CONTROL OF THE PARTY OF THE PARTY	3	45°⊷	7	10.53	10.53	47.30%	
4	60°	4 ·	0.00	0.00	0.00%		4	45°→	7	10.53	10.53	47.30%	,
5	45°⊷	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%	
6	45°→	5	1,38	1.38	30.07%		6	60°-→	7	10.53	10.53	47.30%	
7	60*⊷	5	1.38	1.38	30.07%	i	7	0° WRV	7	10.53	10.53	47.30%	w
8	60°→	5	1.38	1.38	30.07%					}			]
9	0° WRV	5	1.38	1.38	30.07%					}			
		· · · · · · · · · · · · · · · · · · ·											
T	otal Beams:	9	То	tal Percent:	337.47%		T	otal Beams:	7	· To	tal Percent:	402.56%	
		Tota	Weld Metal	Coverage:	37.50%				Tota	l Base Meta	Coverage:	57.51%	
	<b>!</b>				Com	bined Cove	erage	·	<u>'                                      </u>				
	ļ			Coverage Percent		Võlume		Total Volume		Result			·
	ļ		Veld Metal:	37.50%	X	4.59	<del> </del>	26.85		6.41%		ļ	ļ
	įi		veid Metai: Base Metai:			22.26	ļ	26.85		47.68%	·*····		
	1		oost Metal:	J1.31%	ļ	22.20	ł	20.00	<b></b>	71.00/6			ļ
		******************			h		T	otal Exam C	overage =	54.09%	***************************************		
*****				, 000 a 100 a		**********	************	T		fr	***************************************	· · · · · · · · · · · · · · · · · · ·	1

## Responses to Request for Additional Information Summary No.: 004200 Comp ID: 16-405B Page 1 of 9

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

Safety & Relief "B" Nozzle to PZR Upper Head / Due to nozzle configuration coverage of nozzle side base metal and weld was limited. The nozzle enters the vessel at an angle thereby also limiting coverage attainable from the vessel side of the weld. The pressurizer nozzle-to-vessel head welds are accessible only from the head side based on the nozzle curvature. The scanning surface of the nozzle is essentially perpendicular to the head surface which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The nondestructive examination (NDE) techniques and procedures used incorporated examination techniques qualified under Article 4 of Section V of the ASME Code as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

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2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

See attached sketches derived from examination data on file at CCNPP for cross sectional coverage plots and calculations.

5

**CCNPP** 

Component ID: 16-405B

LTP No.: 004200 Coverage Sketch No: 1

Exam Area: Weld Metal 360°

Exam Angle: 45°

NDE Report No.: CC06-1U-066

Summary No.: 004200

MO No.: 1200500749

Scale: 50%

Page 2 of 9

Diameter: 96" Thickness: 5.00" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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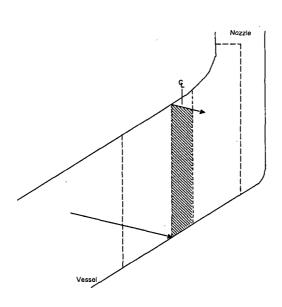
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und. 11:

(Sketch Resized for Relief Request)



45°† Coverage = 4.25 in² of 4.59 in² area = 92.59%

		Cove	rage Dimen	sions						Beam D	irections	
	1			1		,	Result					
····	Length	X	Width	X	Thickness		(Squ. In.)	Tow	ard Nozzie:	1	ijan anderen over regeneratien e	***************************************
Exam Area:	23		5.6	f	See Sketch		26.85	Away fr	om Nozzle:	<u> </u>		
Weld Metal	23	·,	1		See Sketch		4.59		Clockwise:			<b> </b>
Base Metal	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>		
1	Í		<del>                                     </del>		1							
	Weld Metal	: Volume =	4.59	Square Inc	hes			Base Metal	: Volume =	22.26	Square Inc	ches
	1		Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26
1	45°↑	1	4.25	4.25	92.59%		4.2	451/60141	-	10.40	10.40	83.02%
2	45°1	2	0.00	0.00	0.00%		1 + 2	45°/60°†↓	6	18.48	18.48	83.02%
3	60°↑	3	4.34	4,34	94.55%	*************	3	45°←	7	10.53	10.53	47.30%
4	60°1	4	0.00	0.00	0.00%		4	45°-→	7	10.53	10.53	47.30%
5	45°←	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%
6	45°-→	5	1.38	1.38	30.07%	`,,.,	6	60°→	7	10.53	10.53	47.30%
7	60°⊷	5	1,38	1.38	30.07%	\$1113511111 EQUITATE STATE	7	0° WRV	7	10.53	10.53	47.30%
8	60°→	5	1.38	1.38	30.07%							
9	0° WRV	5	1.38	1.38	30.07%			\$	TOTAL COM BOTH OF STREET	600 600 chr. 2 . 600 6		1
	1						1					1
			i				, , , , , , , , , , , , , , , , , , , ,					
1	otal Beams:	9	То	tal Percent:	337.47%		To	otal Beams:	7	To	tal Percent:	402.56%
					1							
		Tota	l Weld Meta	Coverage:	37.50%			{	Tota	Base Meta	Coverage:	57.51%
			<u> </u>				<u> </u>					1
andromen com so as as a	)				Com	bined Cove	erage					
		AN- PAR- AL	: •	Coverage			······································	Total	A Lawrence Comment			
		l	İ	Percent	X	Volume	+	Volume	=	Result		L
	1		Weld Metal:	37.50%		4.59	<u> </u>	26.85		6.41%		<b></b>
			Base Metal:	57.51%		22.26		26.85		47.68%		
	ļ		ļ		ļ		<b></b>	otal Exam C		54.09%	******************************	ļ
		-		**********			<u> </u>	Otal Exam C	- age	54,09%		

**CCNPP** 

Component ID: 16-405B

LTP No.: 004200

Summary No.: 004200 MO No.: 1200500749

Exam Area: Weld Metal 360° Exam Angle: 45°

NDE Report No.: CC06-1U-066

Scale: 50%

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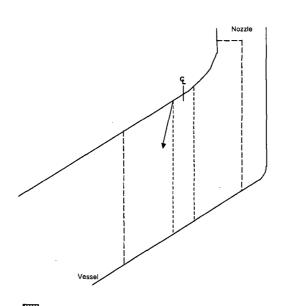
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Diameter: 96" Thickness: 5.00" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)

Coverage Sketch No: 2



45°1 Coverage = 0 in² of 4.59 in² area = 0%

		Cove	rage Dimen	sions						Beam Di	rections		
	]	-		[			Result					1	
	Length	X	Width	X	Thickness	=	(Squ. In.)	Tow	ard Nozzle:	1			
Exam Area:	23		5.6	<u> </u>	See Sketch	***************	26.85	Away fr	om Nozzle:	1		******	
Weld Metal:	23	Ì	1	j	See Sketch		4.59		Clockwise:				1
Base Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:			İ	
					ļ		1						
****	Weld Metal	: Volume ≖		Square Inc				Base Metal	Volume =		Square Inc		
	1	<u></u>	Coverage	Beam	Percent of			<u> </u>		Coverage	Beam	Percent of	J
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	ļ
1	45°↑	1	4.25	4.25	92.59%		1+2	45°/60°†1	6	18.48	18.48	83.02%	J
2	45°↓	2	0.00	0.00	0.00%		''*	45 700 11	۰	10.40	10.40	83.02%	1
3	60°↑	3	4.34	4.34	94.55%		3	45° ←-	7	10,53	10.53	47.30%	1^
4	60°L	4	0.00	0.00	0.00%		4	45°→	7	10.53	10.53	47.30%	I
5	45°←	5	1.38	1.38	30.07%	***************************************	5	60°←	7	10.53	10.53	47.30%	1
6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%	1
7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%	1
8	60°→	5	1.38	1.38	30.07%	***************************************							1****
9	0° WRV	5	1.38	1.38	30.07%							1	
			Į										ļ
								<b></b>				<u> </u>	
	otal Beams:	9	То	tal Percent:	7 337.47%		To	otal Beams:	7	To	tal Percent:	402.56%	ļ
	j	Tota	Weld Meta	Coverage:	37.50%				Total	Base Meta	Coverage	57.51%	
<del></del>	<del>                                     </del>	1011	i iii	·	07.5070			<del></del>	10.0	Date meta	- covorago.	07.0.70	J
					Com	bined Cove	erage						Ĺ
			1	Coverage	1		Ĭ	Total					I
Ī			I	Percent	X	Volume	+	Volume	=	Result			
			Weld Metal:	37.50%		4.59	[	26.85		6.41%			1
			Base Metal:	57.51%		22.26	<b></b>	26.85		47.68%			ļ
	ļ		ļ				<u> </u>	otal Exam C		FA 000/			ļ
							<u> </u>	otal Exam C	overage =	54.09%	*****	·	i

**CCNPP** 

Component ID: 16-405B

LTP No.: 004200

Coverage Sketch No: 3 Exam Area: Weld Metal 360°

Exam Angle: 60°

NDE Report No.: CC06-1U-066

Summary No.: 004200 MO No.: 1200500749

Scale: 50%

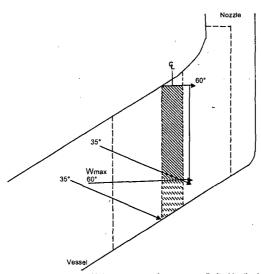
Diameter: 96"

Thickness: 5.00" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless SteelCASS = Cast Stainless Steel

Page 4 of 9

(Sketch Resized for Relief Request)



Note: At 180° the 60°† exam was limited by the head to shell transition. A supplemental 35°† was used to obtain additional coverage

60°↑ Coverage @ 180°, Wmax limited by head to shell transition. = 3.23 in²

35°↑ Coverage @ 180° = 1.11 in²

Total Coverage 3.23 + 1.11 = 4.34 in<sup>2</sup>. 4.34 in<sup>2</sup> of 4.59 in<sup>2</sup> area = 94.55%

			Cove	rage Dimen	sions						Beam Di	rections		
		1 (		]		1		Result				······		
	************	Length	× ×	Width	X	Thickness		(Squ. In.)	Tow	ard Nozzle:	1	000 000 pg 4 0 0 pc 000000		
Ē	xam Area:	23		5.6		See Sketch		26.85	Away fr	om Nozzle:	1		-	
٧	Veld Metal:	23		1		See Sketch	***************************************	4.59	***************************************	Clockwise:	←			
В	ase Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>			
		Weld Metal	Volume =	4.59	Square Inc	hes			Base Metal	: Volume =	22.26	Square Inc	hes	·/········
		1 1		Coverage	Beam	Percent of		·			Coverage	Beam	Percent of	
h	Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	
	1	45°↑	1	4.25	4.25	92.59%		<del></del>					83.02%	
	2	45°	2	0.00	0.00	0.00%		1+2	45°/60°†↓	6	18.48	18.48	83.02%	
	2	60°†	3	4.34	4.34	94.55%	**************	3	45°⊷	7	10.53	10.53	47.30%	·······
	4	60°	4	0.00	0.00	0.00%	************	4	45°→	7	10.53	10.53	47.30%	
·	5	45°←	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%	
·····	6	45°~→	5	1.38	1.38	30.07%	.,,,,,	6	60°→	7	10.53	10.53	47.30%	
	7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%	
	8	60°→	5	1.38	1.38	30.07%	~~~~~~~~~~							www.v.
	9	0° WRV	5	1.38	1.38	30.07%		to discount of the contract of the	an a company of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract o	****	**************************************		1	
						-								
	To	otal Beams:	9	То	tal Percent:	337.47%	****	To	ital Beams:	7	Tol	al Percent:	402.56%	
			Tota	Weld Meta	l Coverage:	37.50%				Total	Base Metal	Coverage:	57.51%	
		ļ			<u> </u>	Com	bined Cov	nrage.					<b> </b>  -	
	******	····			Coverage	2011	DITIOG COV	trage	Total			***************************************	***********	**********
	************				Percent	x	Volume	+ +	Volume	=	Result	*************	}	
		ļ		Neld Metal:		1	4.59		26.85		6.41%	***************************************	ļ	
·····				Base Metal:		ţ	22.26		26.85		47.68%	······································		
					\$ \$ \$						E4 5587			
		ļ				Į.,		1 1	tal Exam C	overage =	54.09%	**************************************		****

**CCNPP** 

Best

Component ID: 16-405B

LTP No.: 004200

Coverage Sketch No: 4
Exam Area: Weld Metal 360°

Exam Angle: 60°

NDE Report No.: CC06-1U-066

Summary No.: 004200 MO No.: 1200500749

**Scale:** 50%

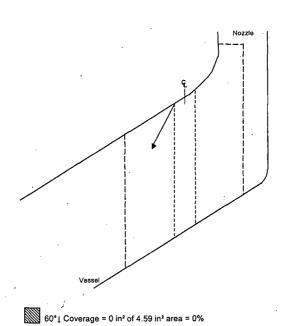
Diameter: 96"

Thickness: 5.00" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 5 of 9

(Sketch Resized for Relief Request)



		Cove	rage Dimen	sions						Beam Di	rections		
	1			T	· · · · · · · · · · · · · · · · · · ·		Result			1	monumentaria com		1
200	Length	X	Width	x	Thickness	=	(Squ. In.)	Tow	ard Nozzle:	7	***************************************		****
Exam Area:	23	arrest to pay a garage processor	5.6		See Sketch		26.85	Away fr	om Nozzle:	1	***************************************		1
Weld Metal:	23		1		See Sketch		4.59	.,	Clockwise:	( <del>-</del>		<u> </u>	T
Base Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>			1
	Weld Metal	: Volume ≃	4.59	Square Inc	hes		<del></del>	Base Metal	Volume =	. 22.26	Square Inc	ches	i
	i I		Coverage	Beam	Percent of					Coverage	. Beam	Percent of	1
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	****
1	45°↑	1	4.25	4.25	92.59%		4.0	454/00004			40.40	83.02%	1
2	45°1	2	0.00	0.00	0.00%		1+2	45°/60°11	6	18.48	18.48	83.02%	1
3	60°†	3	4.34	4.34	94.55%	***************************************	3	45°←	7	10.53	10.53	47.30%	1
4	60°L	4	0.00	0.00	0.00%		4	45*→	7	10.53	10.53	47.30%	1~~
5	45°⊷	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%	1
6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%	1
. 7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%	1
8	60°→	5	1.38	1.38	30.07%	***************************************							1***
9	0° WRV.	5	1.38	1.38	30.07%					<u> </u>			
													ļ
To To	otal Beams:	9	То	tal Percent:	337.47%		To	otal Beams:	7	To	tal Percent:	402.56%	
		Tota	l Weld Meta	Coverage:	37.50%				Tota	l Base Metal	Coverage:	57.51%	
	,,,			1	1			i		í			
					Com	bined Cov	erage						ļ
		*****		Coverage Percent	X	Volume	<b></b>	Total Volume	······································	Result			
!	ļ		Veld Metal:	37.50%	·	4.59	·	26.85		6.41%			-
	<b></b>		Base Metal:	57.51%	j	22.26	ļ	26.85		47.68%		ļ	ł
	ļ		Jase Melal.	31.3176				20.00		71.00/0			
					i	***************************************	T.	otal Exam C	overage =	54.09%			****

**CCNPP** 

Component ID: 16-405B

LTP No.: 004200

NDE Report No.: CC06-1U-066 **Summary No.:** 004200

MO No.: 1200500749

Exam Area: Weld Metal 360° Exam Angle: 45° / 60° / 0°

**Scale:** 50%

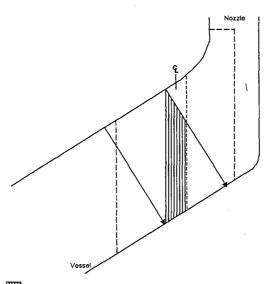
Page 6 of 9

Diameter: 96" Thickness: 5.00" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)

Coverage Sketch No: 5



45° ↔ / 60° ↔ / 0° Coverage = 3.83 in² of 4.59 in² exam area = 83.33%

NOTE: This sketch shows coverage @ 180° which was the most favorable location for these exams. Moving from 180° to 0° the coverage was gradually reduced to the point where 0% coverage was obtained at 0°.

Actual coverage for these exams = 1.38 in² = 30.07%

			Cove	rage Dimen	sions						Beam D	rections		
		1						Result					ľ	
*****		Length	×	Width	X	Thickness	=	(Squ. In.)		ard Nozzle:			Ĭ	
A 11 Op 11 A AO 11 109	Exam Area:	23	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	5.6		See Sketch		26.85	Away fro	om Nozzle:	1			
	Weld Metal:	23		1	,	See Sketch		4.59		Clockwise:	-		[	
	Base Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>			
***************************************	<del>                                     </del>	Weld Metal	: Volume ≃	4.59	Square Inc	hes	***********		Base Metal	Volume =	22.26	Square Inc	hes	*************
***********	·	1		Coverage	Beam	Percent of					Coverage	Beam	Percent of	
***************************************	Beam No.	Angle	Sketch	(Sau. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
***************************************	1	45°1	1	4.25	4.25	92.59%		1.0				10.10	83.02%	
***********	2	45°1	2	0.00	0.00	0.00%		1+2	45°/60°†↓	6	18.48	18.48	83.02%	
*************	3	60°↑	3	4.34	4.34	94.55%	,,	3	45°⊷	7	10.53	10.53	47.30%	~~~~
*******	4	60°1	4	0.00	0.00	0.00%		4	45°→	7	10.53	10.53	47.30%	*******
	5	45*←	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%	
	6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%	
	7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%	
****	8	60°→	5	1.38	1.38	30.07%	· · · · · · · · · · · · · · · · · · ·							
	9	0° WRV	5	1.38	1.38	30.07%								
										,				
	T	otal Beams:	9	To	tal Percent:	337.47%	····	To	tal Beams:	7	To	tal Percent:	402.56%	
***************************************			Tota	l Weld Meta	Coverage:	37.50%				Total	Base Meta	Coverage:	57.51%	
								1						
***************************************		<u> </u>				Com	bined Cov	erage					<b> </b>	
· · · · · · · · · · · · · · · · · · ·			A. A. & CONTROL A A A.		Coverage Percent	×	Volume	+	Total Volume		Result			*********
***************************************	· · · · · · · · · · · · · · · · · · ·	ļ		Neld Metal:	37.50%		4.59	1	26.85		6.41%		i i	
				Base Metal:	57.51%		22.26		26.85		47.68%			
	·			h		<u> </u>		<del> </del>	otal Exam C	overage =	54.09%		<b></b>	A
~~~~		·····			·····	į	***************************************	·					<u> </u>	

**CCNPP** 

Component ID: 16-405B LTP No.: 004200

NDE Report No.: CC06-1U-066 Summary No.: 004200

Coverage Sketch No: 6

Exam Area: Base Metal 360° Exam Angle: 45° / 60°

MO No.: 1200500749

**Scale:** 50%

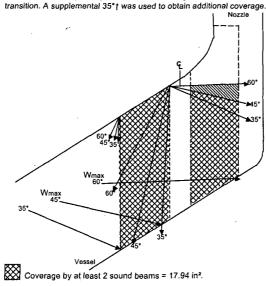
Page 7 of 9

Diameter: 96" Thickness: 5.00" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request) ·

Note: At 180° the 45°  $\uparrow$  & 60°  $\uparrow$  exams were limited by the head to shell transition. A supplemental 35°† was used to obtain additional coverage



Coverage by 1 sound beam only = 1.07 in2.

Total:  $17.94 + (1.07 / 2) = 18.48 \text{ in}^2$ . 18.48 of 22.26 = 83.02%

		Cove	rage Dimen	sions				i		Beam D	irections		
			I	]			Result		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	***************************************	<b>*</b>		[
	Length	X	Width	X	Thickness	=	(Squ. In.)	Tow	ard Nozzle:	T T	T	Account to the second s	•~~~
Exam Area	23		5.6		See Sketch	ways to a real experience	26.85	Away fr	om Nozzie:	1	1		
Weld Metal			1	<b>4</b>	See Sketch		4.59		Clockwise:	<del></del>	3		
Base Metal.	23		4.6	1	See Sketch		22.26	Counter	Clockwise:	>			
	1		4.50					Base Metal	. V-1	22.26	Square Inc		! 
	Weld Metal	: volume =		Square Inc				base metal	volume =				
	<u> </u>		Coverage	Beam	Percent of					Coverage	Beam	Percent of	ļ
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	ļ
1	45°↑	1	4.25	4.25	92.59%		1+2	45°/60°11	6	18.48	18.48	83.02%	
2	45°1	2	0.00	0.00	0.00%	*****************						83.02%	
3	60°↑	3	4.34	4.34	94.55%	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	3	45°←		10.53	10.53	47.30%	
4	60°	4	0.00	0.00	0.00%		4	45°→	7	10.53	10.53	47.30%	
5	45°←	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%	l
6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%	ļ
7	60•←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%	l
8	60°→	5	1.38	1.38	30.07%								]
9	0° WRV	5	1.38	1.38	30.07%	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
											į		
	otal Beams:	9	To	tal Percent	337.47%	-2	To	tal Beams:	7	To	tal Percent:	402.56%	
	1			1	1					*********			-00000
		Tota	l Weld Meta	Coverage:	37.50%				Tota	Base Meta	Coverage:	57.51%	
	1			<u> </u>	Com	bined Cov	erage	l			İ	<b></b>	ļ
	1			Coverage			1	Total			***************************************	***************************************	
***************************************	**********			Percent	×	Volume	+	Volume		Result	6 Francisco como o ceru	•	manin
	1		Neld Metal:	37.50%	1	4.59	1	26.85		6.41%			i
			Base Metal:	57.51%		22.26	·	26.85		47.68%	***************************************	•	
		***************************************		} }	ļ		<del></del>	otal Exam C	overage =	54.09%			ļ
	÷	a 60 a0 a0 a0 a0 a0 a0 a0 a0 a0 a0 a0 a0 a0		}~	£	*********				······.	****** ***********	- and made and a second or	

**CCNPP** 

Component ID: 16-405B

LTP No.: 004200

Coverage Sketch No: 7

Fyam Area: Base Metal 3

Exam Area: Base Metal 360°
Exam Angle: 45° / 60° / 0° WRV

NDE Report No.: CC06-1U-066

Summary No.: 004200

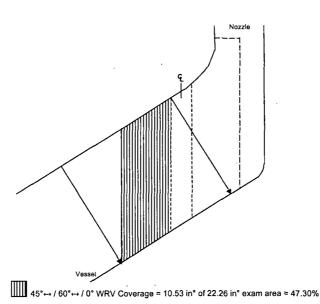
MO No.: 1200500749 Scale: 50% Diameter: 96"

Thickness: 5.00" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel . CASS = Cast Stainless Steel

Page 8 of 9

(Sketch Resized for Relief Request)



NOTE: This sketch shows coverage @ 180° which was the most favorable location for these exams. Moving from 180° to 0° the coverage of the nozzle side base metal was gradually reduced to the point where 0% coverage was obtained at 0°.

No coverage credit was taken for the nozzle side base material.

											irections		
**********						,	Result				1		
	Length	×	Width	X	Thickness	=	(Squ. In.)	Towa	ard Nozzle:	†	•		**************************************
m Area:	23		5.6		See Sketch		26.85	Away fro	om Nozzle:	ļ	******	i .	
d Metal:	23		1	***************************************	See Sketch		4.59		Clockwise:	<del></del>	1	1	
e Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	→			
					1						<u> </u>		
	Neld Metal	: Volume =				A convenience de convenience		Base Metal:	Volume =				or end promorting Arthur
								1 1					]
am No.		Sketch					Beam No.	Angle	Sketch	(Squ. In.)	Total		<u> </u>
1		1	4.25				1+2	45°/60°±1	6	18 48	18 48		
2	45°↓	2	0.00	0.00	0.00%		1						]
3	60°†	3	4.34	4.34	94.55%		3						
4	60°t	4	0.00	0.00					7				
5	45°←	5	1.38	1.38	30.07%		5	60°←	_7	10.53	10.53	47.30%	
6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%	
7	60*⊷	5	1.38	1.38	30.07%	,020,000,000	7 .	0° WRV	7	10.53	10.53	47.30%	
8	60°→	5	1.38	1.38	30.07%			1			1		
9	0° WRV	5	1.38	1.38	30.07%								
Το	tal Beams:	9	To	al Percent:	337.47%	************	To	tal Beams:	7	To	tal Percent:	402.56%	
		Tota	Weld Metal	Coverage:	37.50%				Total	Base Meta	Coverage:	57.51%	
						bined Cove	rage						
		amama				Volume	+		·····	Result			
			Veld Metal:	37.50%		4.59	ļ	26.85	***************************************	6.41%			
			ase Metal:	57.51%		22.26		26.85		47.68%		ļ	
	. 4. 11. 7. 11						<u> </u>	otal Exam C	overage =	54.09%		ļ	
	sam No. 1 2 3 4 5 6 6 7 8 8 9	e Metal: 23  Weld Metal  aam No. Angle 1 45°1 2 45°1 3 60°1 4 60°1 5 45°- 7 60°- 8 60°- 9 0° WRV	e Metal: 23    Weld Metal: Volume =	Weld Metal: Volume =   4.59   Coverage	Weld Metal: Volume	Weld Metal: Volume	Weld Metal: Volume =	## Metal: 23	## Weld Metal: Volume =	Weld Metal: Volume =   4.59   Square Inches   Base Metal: Volume =   Coverage   Beam   Percent of	## Weld Metal: Volume =	Weld Metal: Volume =   4.59   Square Inches   Base Metal: Volume =   22.26   Square Inches   Coverage   Beam   Percent of	Weld Metal: Volume =   4.59   Square Inches   Base Metal: Volume =   22.26   Square Inches   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Beam   Percent of   Coverage   Coverage   Coverage   Coverage   Coverage   Coverage   Coverage   Coverage   Percent   X

**CCNPP** 

Component ID: 16-405B

LTP No.: 004200 Coverage Sketch No: Exam Area

> Exam Area: AFGLBCKDHJE Exam Angle: NA

NDE Report No.: CC06-1U-066

**Summary No.:** 004200 MO No.: 1200500749

**Scale:** 50%

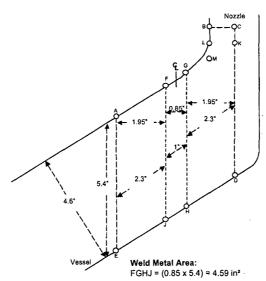
Diameter: 96"

Thickness: 5.00" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 9 of 9

(Sketch Resized for Relief Request)



### Base Metal Area:

- Vessel Side = AFJÉ = (1.95 x 5.4) = 10.53 in²
  Nozzle Side = GKDH + GLM + LKM + LBCK
  = (1.95 x 5.4) + (1 x 0.6)/2 + (1 x 0.6)/2 + (1 x 0.6) = 11.73 in²
  Total Base Metal Area = 10.53 + 11.73 = 22.26 in²

Total Exam Area: 4.59 + 22.26 = 26.85 in<sup>2</sup>

		Cove	rage Dimer	sions						Beam Di	rections	
			***************************************				Result					
war and a second contract of the second	Length	X	Width	X	Thickness	=	(Squ. In.)	Tow	ard Nozzie:	1	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	***********
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Weld Metal:			1	\$	See Sketch		4.59	l	Clockwise:	<b>←</b>		
Base Metal:	23	***************************************	4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>		
					1							
	Weld Metal	: Volume =		Square Inc				Base Metal:	Volume ≈		Square Inc	
			Coverage	Beam	Percent of			<u>!</u> :		Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26
1	45°↑	-1	4.25	4.25	92.59%		1+2	45°/60°11	6	18.48	18.48	83.02%
2	45°1	2	0.00	0.00	0.00%		1 172	. '*	3	10.40	10.40	83.02%
3	60°†	3	4.34	4.34	94.55%	***************************************	3	45°←	7	10.53	10.53	47.30%
4	60°↓	4	0.00	0.00	0.00%		4	45°→	7	10.53	10.53	47.30%
5	45°←	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%
6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%
7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%
8	50°→	5	1.38	1.38	30.07%							
9	0° WRV	5	1.38	1.38	30.07%							
		••••••••••••		<b>}</b>	<b></b>							
		·····										
	otal Beams:	9	То	tal Percent:	337.47%		To	otal Beams:	7	To	tal Percent:	402.56%
		Tota	Weld Meta	l Coverage:	37.50%				Tota	Base Meta	Coverage:	57.51%
				<u> </u>	C	bined Cove	1	لــــــــــــــــــــــــــــــــــــــ				ļ
<b></b>	<u> </u>			Coverage	Com	DITIEG COVE	orage .	Total				<u> </u>
		***********		Percent	X	Volume	<u> </u>	Volume		Result	School and a second	40,0000.40.00.00.00
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	}	E	Base Metal:	57.51%		22.26		26.85		47.68%		
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	Į	···					<u> </u>	Clar EXam C	OARINGE E	34.09%	*********	h

## Responses to Request for Additional Information Summary No.: 100805 Comp ID: SG-11-W5 Page 1 of 8

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

SG Inlet Nozzle to Primary Head Nozzle / Machined transition on nozzle extension limited base metal coverage. The steam generator nozzle-to-vessel head welds are accessible only from the head side based on the designed nozzle configuration. The proximity of the nozzle radius prevented full examination coverage from the nozzle side. Scanning was performed from the nozzle; however, the ultrasonic waves did not cover the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The NDE techniques and procedures used incorporated examination techniques qualified under Article 4 of Section V of the ASME Code as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

## Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

a.l

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

See attached sketches derived from examination data on file at CCNPP for cross sectional coverage plots and calculations.

**CCNPP** 

a News

Component ID: SG-11-W5

LTP No.: 100805

NDE Report No.: CC06-1U-041 **Summary No.:** 100805

Coverage Sketch No: 1

Exam Area: Weld Metal 360° Exam Angle: 45°

MO No.: 1200500777 Scale: 50%

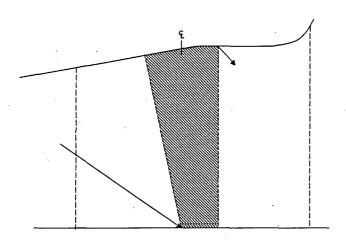
Diameter: 42" Thickness: 7.30"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 8

(Sketch Resized for Relief Request)



45° † Coverage = 14 in² of 14 in² exam area = 100%.

			Cove	rage Dimen	sions	-			1		Beam Di	rections		
								Result					1	
*******		Length	X	Width	×	Thickness	=	(Squ. In.)	Tow	ard Nozzle:	1			
	Exam Area:	na		9.5		See Sketch		69.00	Away fr	om Nozzle:	Į.			
	Weld Metal:	na		1.9		7.4		14.00		Clockwise:	←		1	
	Base Metal:	na		7.4		See Sketch		55.00	Counter	Clockwise:				
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	Beam No.	Angle	Sketch	(Squ. In.)	Total	14.00		Beam No.	Angle	Sketch	(Squ. In.)	Total	55.00	Į
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***************************************	2	45°1	2	7.96	7.96	56.86%		1+2	45°/60°†↓	6	53.58	53.58	97.42%	
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	5	45°⊷	5	14.00	14.00	100.00%		5	60°←	7	41	41	74.55%	
	6	45°→	5	14.00	14.00	100.00%		6	60°	7	41	41	74.55%	İ
	7	60°⊷	5	14.00	14.00	100.00%		7	0° WRV	7	41	41	74.55%	
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	9	0° WRV	5	14.00	14.00	100.00%								
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	To	tal Beams:	9	То	tal Percent:	830.86%		To	tal Beams:	7	To	tal Percent:	567.56%	
			Tota	Weld Meta	Coverage:	92.32%				Total	Base Metal	Coverage:	81.08%	
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······································					Coverage				Total					
					Percent	X	Volume	+	Volume	=	Result			
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				Base Metal:	81.08%		55.00	<b></b>	69.00		64.63%			
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**CCNPP** 

Component ID: SG-11-W5

LTP No.: 100805

Coverage Sketch No: 2 Exam Area: Weld Metal 360°

Exam Angle: 45°

NDE Report No.: CC06-1U-041

**Summary No.:** 100805

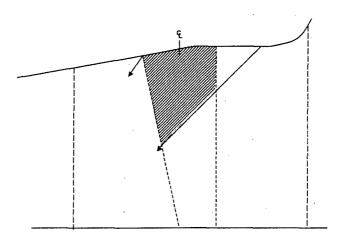
MO No.: 1200500777 **Scale:** 50%

Page 3 of 8

Diameter: 42" Thickness: 7.30" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° 1 Coverage = 7.96 in² of 14 in² exam area = 56.86%.

		Cove	rage Dimer	sions						Beam D	irections		
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Base Metal:	па		7.4		See Sketch		55.00	Counter	Clockwise:	<b>→</b>			
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Beam No.	Angle	Sketch	(Squ. In.)	Total	14.00		Beam No.	Angle	Sketch	(Squ. In.)	Total	55.00	
1	45°↑	1	14.00	14.00	100.00%							97.42%	
- 2	45°	2	7.96	7.96	56.86%		1 + 2	45°/60°†1	6	53.58	53.58	97.42%	
<del></del>	60°t	3	14.00	14.00	100.00%	~~~	3	45°	7	41	41	74.55%	******
4	60°	4	10.36	10.36	74.00%		4	45°→	7	41	41	74.55%	
5	45°←	5	14.00	14.00	100.00%		5	60°←	7	41	41	74.55%	
6	45°→	5	14.00	14.00	100.00%		6	60°→	7	41	41	74.55%	
7	60°←	5	14.00	14.00	100.00%		7	0° WRV	7	41	41	74.55%	.0.0
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		Tota	I Weld Meta	Coverage:	92.32%				Total	Base Meta	:   Coverage:	81.08%	
					Com	bined Cove	erage	Total					
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CCNPP

Component ID: SG-11-W5

LTP No.: 100805

Coverage Sketch No: 3 Exam Area: Weld Metal 360°

Exam Angle: 60°

NDE Report No.: CC06-1U-041

**Summary No.:** 100805 MO No.: 1200500777

Scale: 50%

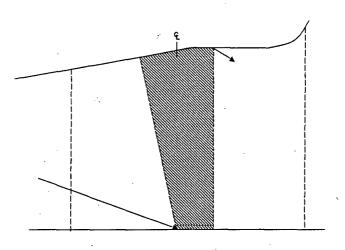
Diameter: 42"

Thickness: 7.30" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 4 of 8

(Sketch Resized for Relief Request)



60° † Coverage = 14 in² of 14 in² exam area = 100%.

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	97.42%	53.58	53.58	6	45°/60°11	1+2		100.00%	14.00	14.00	1	45°↑	1
	97,42%	33.36	33.56			172	l	56.86%	7.96	7.96	2	45°1	2
	74.55%	41	41	7	45°⊷	3		100.00%	14.00	14.00	3	60°1	3
	74.55%	41	41	7	45°	4		74.00%	10.36	10.36	4	60°1	4
	74.55%	41	41	7	60°←	. 5		100.00%	14.00	14.00	5	45°←	5
	74.55%	41	41	. 7	60°→	6	T	100.00%	14.00	14.00	5	45°→	6
	74.55%	41	41	7	0° WRV	7	,	100.00%	14.00	14.00	5	60°⊷	7
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*************	<u> </u>		Result	*	Volume	+	Volume	X	Percent		]		
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			64.63%		69.00		55.00		81.08%	Base Metal:	E		
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			83.36%	overage =	otal Exam C	<u>T</u>	1		,				

**CCNPP** 

Component ID: SG-11-W5

LTP No.: 100805

Coverage Sketch No: 4

Exam Area: Weld Metal 360°

Exam Angle: 60°

NDE Report No.: CC06-1U-041

Summary No.: 100805 MO No.: 1200500777

Scale: 50%

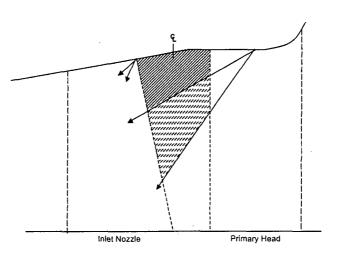
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 $_{i,j}[\cdot S_{i}$ 

Diameter: 42"
Thickness: 7.30"
Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



60° ↓ Coverage ≈ 4.65 in².

Supplemental 35°↓ Coverage = 5.72 in²

Total:  $(4.65 + 5.72) = 10.36 \text{ in}^2 \text{ of } 14 \text{ in}^2 \text{ exam area} = 74\%$ 

		Cove	rage Dimen	slons				1		Beam D	rections		
		,,,	······································	}		,	Result						Ţ
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Length	X	Width	×	Thickness	=	(Squ. in.)	Tow	ard Nozzie:	1		an ann an an an an an an an an an an an	*******
Exam Area	na	***************************************	9.5		See Sketch		69.00	Away fr	om Nozzle:	1	y	**************************************	
Weld Metal	na		1.9		7.4		14,00		Clockwise:	<b>←</b>			
Base Metal	na		7.4	·····	See Sketch		55.00	Counter	Clockwise:				1
				-			1						1
F	Weld Metal	: Volume =	14.00	Square Inc	hes	. ,		Base Metal	Volume =	55.00	Square Inc	ches	] ~~~~
			Coverage	Beam	Percent of			[		Coverage	Beam	Percent of	1
Beam No.	Angle	Sketch	(Squ. In.)	Total	14.00		Beam No.	Angle	Sketch	(Squ. In.)	Total	55.00	1
1	45°↑	1	14.00	14.00	100.00%	,	1+2	45°/60°11	6	53.58	53.58	97.42%	1
2	45°1	2	7.96	7.96	56.86%		1 1 7 2	42 100 11-		33.56	55.56	97.42%	1
3	60°1	3	14.00	14.00	100,00%		3	45*⊷	7	41	41	74.55%	1****
4	60°L	4	10.36	10.36	74.00%	A	4	45°→	7	41	41	74.55%	1
5	45°←	5	14.00	14.00	100.00%	,,	5	60°←	7	41	41	74.55%	1
6	45°→	5	14.00	14.00	100.00%		6	60°→	7	41	41	74.55%	1
7	60°←	5	14.00	14.00	100.00%	***************************************	7	0° WRV	7	41	41	74.55%	1
8	60°→	5	14.00	14.00	100.00%								1
9	0° WRV	5	14.00	14.00	100.00%			1					1~~~
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7	otal Beams:	9	To	tal Percent:	830.86%		To	otal Beams:	7	To	tal Percent:	567.56%	
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	1	Tota	Weld Meta	l Coverage:	92.32%				Total	Base Meta	Coverage:	81.08%	I
1							1						<u> </u>
	<u> </u>				Com	bined Cove	erage						ļ
	<b></b>			Coverage			L	Total	**************************************		· congression with the sample of		į
			<u></u>	Percent	X	Volume	<u> </u>	Volume	=	Result			ļ
	. L		Neld Metal:	92.32%		14.00	<u> </u>	69.00		18,73%		ļ	ļ
			Base Metal:	81.08%		55.00		69.00		64.63%			ļ
	nomination with the second	-mara-marahananana			Enreen communication	w	L	L					ļ.,
	1	l	i	[			<u> </u>	otal Exam C	overage =	83.36%		1	1

**CCNPP** 

Component ID: SG-11-W5

LTP No.: 100805

Coverage Sketch No: 5 Exam Area: Weld Metal 360° Exam Angle: 45° / 60° / 0° WRV NDE Report No.: CC06-1U-041

Summary No.: 100805 MO No.: 1200500777

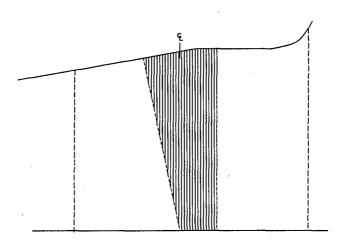
Scale: 50%

Page 6 of 8

Diameter: 42" Thickness: 7.30" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° ↔ / 60° ↔ / 0° WRV Coverage = 14 in² of 14 in² exam area = 100%.

		Cove	rage Dimen	sions						Beam D	irections		
				1		divinous divi	Result					I	
	Length	×	Width		Thickness	=	(Squ. In.)	Tow	ard Nozzle:	1	<u> </u>	Ĭ	
Exam Area:	na	71-6-14-1-C	9.5	***************************************	See Sketch		69.00	Away fr	om Nozzle:	1	T		, ,
Weld Metal:	na		1.9		7.4		14.00		Clockwise:	<b>←</b> -		7 · · · · · · · · · · · · · · · · · · ·	
Base Metal:	na		7,4		See Sketch		55.00	Counter	Clockwise:	<b>→</b>			
						-	<u> </u>						
	Weld Metal	: Volume ≈		Square Inc		n eesterman on 0.000		Base Metal	: Volume =		Square Inc		
	!		Coverage	Beam	Percent of					Coverage	Beam	Percent of	
Beam No.	Angle	Sketch	(Squ. In.)	Total	14.00		Beam No.	Angle	Sketch	(Squ. In.)	Total	55.00	]
1	45°†	1	14.00	14.00	100.00%		1+2	45°/60°11	6	53.58	53.58	97.42%	l
2	45°!	2	7.96	7.96	56.86%		L '			35.50	33.30	97.42%	
3_	60°†	3	14.00	14.00	100.00%		3	45°←	7	41	41	74.55%	J
4	60°1	4	10.36	10.36	74.00%		4	45°→	7	41	41	74.55%	
5	45°⊷	5	14.00	14.00	100.00%		5	60°←	7	41	41	74.55%	1
6	45°→	5	14.00	14.00	100.00%		6	60°→	7	41	41	74.55%	1
7	60°←	5	14.00	14.00	100.00%		7	0° WRV	7	41	41	74.55%	
8	60°→	5	14.00	14.00	100.00%	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
9	0° WRV	5	14.00	14.00	100.00%	en erestonos o u romania		1			3,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1		
								Į			8		
		***************************************						ļ			<u></u>		ļ
			***************************************	<u>.</u>		·····		l			<u> </u>	ļ <u></u>	
To	tal Beams;	9	То	tal Percent:	830.86%		T(	otal Beams:	7	To	tal Percent:	567.56%	
		Total	Weld Meta	Coverage:	92.32%				Tota	Base Meta	Coverage:	81.08%	
				J	Com	bined Cov	erage	1			ļ	ļ	
	~	-		Coverage			1	Total			·		·
		.,.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		Percent	X	Volume	+	Volume	=	Result	300 H (600 0 H (100 00)	\$ 00	
		١	Veld Metal:	92.32%		14.00		69.00	· · · · · · · · · · · · · · · · · · ·	18.73%		i .	
	<b>,</b> ,	E	Base Metal:	81.08%		55.00		69.00		64.63%			
					ļ		† <del>-</del>	otal Exam (	overage =	83.36%	ļ	<u>.</u>	ļ
					[		I	otal Exam C	overage =	83.36%			

**CCNPP** 

Component ID: SG-11-W5

LTP No.: 100805 Coverage Sketch No: 6

Exam Area: Base Metal 360° Exam Angle: 45° / 60° / 

 NDE Report No.:
 CC06-1U-041

 Summary No.:
 100805

 MO No.:
 1200500777

.Scale: 50%

Diameter: 42"

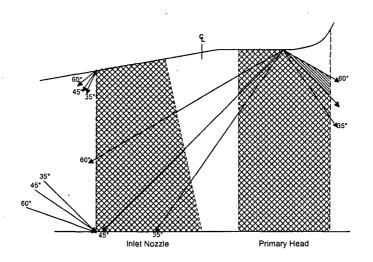
Thickness: 7.30" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 7 of 8

3.8

(Sketch Resized for Relief Request)



Coverage by at least 2 sound beams = 53.20 in².

Coverage by 1 sound beam only = 0.76 in².

Total:  $53.20 + (0.76 / 2) = 53.58 \text{ in}^2 \text{ of } 55 \text{ in}^2 \text{ exam area} = 97.42\%$ .

		Cove	rage Dimer	isions						Beam D	irections	
			<u>-</u>		1		Result	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
	Length	×	Width	X	Thickness	= -	(Squ. In.)	Tow	ard Nozzle:	1		
Exam Are	a: na	man a manananana	9.5	.}	See Sketch		69.00	Away fr	om Nozzle:	<b>↓</b>		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Weld Meta	al: na		1.9	}	7.4		14.00	1	Clockwise:	←		]
Base Meta	al: na		7.4		See Sketch		55.00	Counter	Clockwise:	→		
	Weld Metal	· Valuma =	14.00	Square Inc	.h.a.		·	Base Metal	· Volume =	55.00	Square Inc	han .
	vveid Metai	. volume =						Dase Metal	, volume =	Coverage	Beam	Percent of
	; - 1 A - 1 - 1	Charle	Coverage	Beam	Percent of		Barn No.	Angle	Cleaten			
Beam N		Sketch	(Squ. In.)	Total .	14.00		Beam No.	Angle	Sketch	(Squ. In.)	Total	55.00
<del></del>	45°†	1 2	14.00	14.00	100.00%		1+2	45°/60°11	6	53.58	53.58	97.42%
2	45°1		7.96	7.96	56.86%		<u> </u>	450	7	<del></del>	l 44	97.42%
3	60°†	3	14.00	14.00	100.00%		3	45°← 45°→	7	41	41	74.55%
4_	60°	4	10.36	10.36	74.00%		4			41	41	74.55%
5	45*⊷	5	14.00	14.00	100.00%		5	60°←	7	41	41	74.55%
6	45°→	5	14.00	14.00	100.00%		6	60°→	7	41	41	74.55%
77	60°←	5	14.00	14.00	100.00%		7	0° WRV	<sup></sup> 7	41	41	74.55%
8	60°→	5	14.00	14.00	100.00%			1			<u></u>	
9	0° WRV	5	14.00	14.00	100.00%						ļ	
											<u> </u>	
	Total Beams:	9	To	i tal Percent:	830.86%		To	tal Beams:	7	То	tal Percent:	567.56%
han		to contract the contract of th		1	1						T	
		Tota	Weld Meta	Coverage:	92.32%				Total	Base Meta	l Coverage:	81.08%
			·	<u> </u>	Com	bined Cov	erage			<del></del>	<b>İ</b>	
				Coverage	1		1	Total				
				Percent	X	Volume	+	Volume	=	Result		1
		,	Veld Metal:	92.32%	1	14.00	-	69.00		18.73%	1	
		E	Base Metal:	81.08%		55.00		69.00		64.63%		
		things a shape a second		<b> </b>			+т	otal Exam C	overage =	83.36%		<b></b>
		******************		*	*************		1	1			***************************************	**************************************

**CCNPP** 

Component ID: SG-11-W5

LTP No.: 100805

Coverage Sketch No: 7

Exam Area: Base Metal 360°
Exam Angle: 45° / 60° / 0° WRV

NDE Report No.: CC06-1U-041

Summary No.: 100805

MO No.: 1200500777

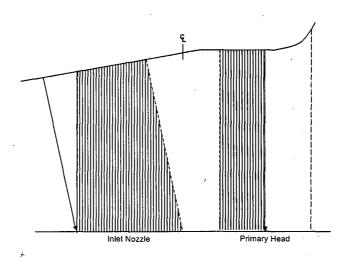
Scale: 50%

Page 8 of 8

Diameter: 42"
Thickness: 7.30"
Material: CC/S

Material: CC/S
CC/S = Clad Carbon Steel
S/S = Stainless Steel
CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° ↔ / 60° ↔ / 0° WRV Coverage = 41 in² of 55 in² exam area = 74.55%.

			Cove	rage Dimen	sions				Beam Directions					
	-					[		Result						
		Length	X	Width	X	Thickness	=	(Squ. In.)		ard Nozzle:	Ť			
Exam		na		9.5		See Sketch		69.00		om Nozzle:	Ţ	•		
Weld f		na		1.9		7.4		14.00		Clockwise:				
Base I	Metal:	na		7.4		See Sketch		55.00	Counter	Clockwise:	<b>→</b>			
			<u> </u>	<u></u>		1	***************							
		Weld Metal	: Volume ≠		Square inc				Base Metal	: Volume =		Square Inc		
				Coverage	Beam	Percent of					Coverage	Beam	Percent of	l
Bear	m No.	Angle	Sketch	(Sgu. In.)	Total	14.00		Beam No.	Angle	Sketch	(Sgu. In.)	Total	55.00	ļ
	1	45°†	1	14.00	14.00	100.00%		1+2	45°/60°11	6	53.58	53.58	97.42%	
	2	45° ļ	2	7.96	7.96	56.86%			1		30.00		97.42%	
	3	60°T	3	14.00	14.00	100.00%		3	45 ←	7	41	41	74.55%	
	4	60°↓	4	10.36	10.36	74.00%	,,,,,	4	45°→	7	41	41	74.55%	
	5	45°←	5	14.00	14.00	100.00%		5	60°←	7	41	41	74.55%	
	6	45°-→	5	14.00	14.00	100.00%		6	60*→	7	41	41	74.55%	}
	7	60°←	5	14.00	14.00	100.00%		7	0° WRV	7	41	41	74.55%	
	8	60°→	5	14.00	14.00	100.00%								
	9	0° WRV	5	14.00	14.00	100.00%	AND DESCRIPTION OF THE PARTY OF							
									<b>.</b>					
	To	ital Beams:	9	To	tal Percent:	830.86%		To	otal Beams:	7	То	tal Percent:	567.56%	************
			Tota	l Weld Metal	Coverage:	92.32%				Tota	Base Meta	Coverage:	81.08%	
				!		Com	bined Cov	erage						
	contract				Coverage	ļ		4	Total					
				L	Percent	X	Volume	+	Volume		Result		Į	
				Neld Metal:	92.32%	ļ	14.00	. <b>j</b>	69.00		18.73%			
				Base Metal:	81.08%	į	55.00	.	69.00		64.63%			
								I	otal Exam C	overage =	83.36%			
		A., arearered a record	Leader - Control Control Control Control	*****	·	**************************************	***************	T	1			***************************************		*********

## Responses to Request for Additional Information Summary No.: 100955 Comp ID: SG-11-W6 Page 1 of 7

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

SG Outlet Nozzle to Primary Head Nozzle / Machined transition on nozzle extension limited base metal coverage. The steam generator nozzle-to-vessel head welds are accessible only from the head side based on the designed nozzle configuration. The proximity of the nozzle radius prevented full examination coverage from the nozzle side. Scanning was performed from the nozzle; however, the ultrasonic waves did not cover the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The NDE techniques and procedures used incorporated examination techniques qualified under Article 4 of Section V of the ASME Code as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

See attached sketches derived from examination data on file at CCNPP for cross sectional coverage plots and calculations.

**CCNPP** 

Component ID: SG - 11 - Weld 6 LTP No.: 100955

NDE Report No.: CC10-1U-064

M.O. No.:

**Scale:** 50%

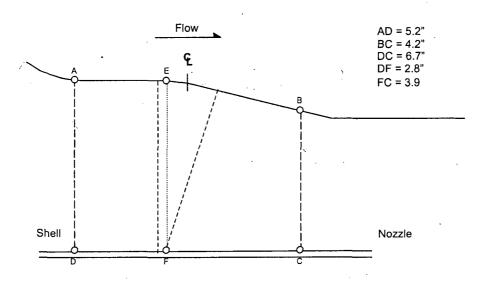
Sketch: Exam Area

Diameter: 30" Thickness: 5" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless SteelCASS = Cast Stainless Steel

Page 2 of 7

(Sketch Resized for Relief Request)



### Exam Area

- ABCD
- AEFD + EBCF  $(2.8 \times 5.2) + 3.9((5.2 + 4.2)/2) = 32.89 \text{ in}^2$

Coverage Sketch	Angle	Sound Direction	Coverage
1	45°	With Flow	60.47%
2	45°	Against Flow	62.22%
3	60°	With Flow	22.04%
4	60°	Against Flow	28.28%
5	45°	CW	99.03%
5	45°	CCW	99.03%
5	60°	CW	99.03%
5	60°	CCW	99.03%
5	0°	WRV	99.03%
		TOTAL	668.16
668.16 / 9 3	Sound B	eams = 74.24	
Ac	hieved	74.24% Covera	ıge

**CCNPP** 

Component ID: SG - 11 - Weld 6

LTP No.: 100955

NDE Report No.: CC10-1U-064

M.O. No.:

Coverage Sketch No: 1 Exam: 35° / 45° (With Flow) **Scale:** 50%

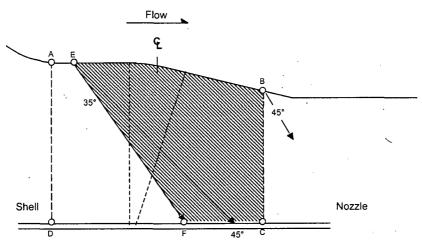
Diameter: 30"

Thickness: 5" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 3 of 7

(Sketch Resized for Relief Request)



NOTE: The 45° exam was supplemented with a 35° exam due to the 14° OD taper.

Exam Area
• ABCD = 32.89 in<sup>2</sup>

### With Flow

- Examined ABCD AEFD 32.89 (5.2(0.7 + 4.3)/2) = 19.94 in<sup>2</sup> 19.94 / 32.89 = 60.47%

Coverage Sketch	Angle	Sound Direction	Coverage
1	45°	With Flow	60.47%
2	45°	Against Flow	62.22%
3	60°	With Flow	22.04%
4	60°	Against Flow	28.28%
5	45°	CW	99.03%
5	45°	CCW	99.03%
5	60°	CW.	99.03%
5	60°	CCW	99.03%
5	0°	WRV	99.03%
		TOTAL	668.16
668.16 / 9 3	Sound B	eams = 74.24	
Ac	hleved	 74.24% Covera	ige

**CCNPP** 

**Component ID:** SG – 11 – Weld 6

Exam: 35° / 45°

LTP No.: 100955

NDE Report No.: CC10-1U-064

M.O. No.:

**Scale:** 50% (Against Flow)

Diameter: 30" Thickness: 5"

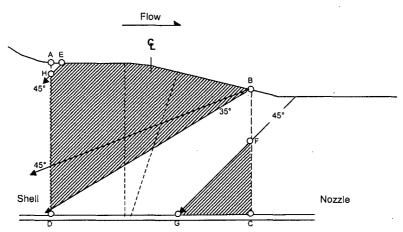
Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless SteelCASS = Cast Stainless Steel

Page 4 of 7

(Sketch Resized for Relief Request)

Coverage Sketch No: 2



NOTE: The 45° exam was supplemented with a 35° exam due to the 14° OD taper.

ABCD = 32.89 in<sup>2</sup>

## **Against Flow**

- Examined ABD AEH + FCG (6.7 x 5.2)/2 (0.4 x 0.4)/2 + (2.5 x 2.5)/2 = 20.47 in<sup>2</sup> 20.47 / 32.89 = 62.22%

Coverage Sketch	Angle	Sound Direction	Coverage
1	45°	With Flow	60.47%
2	45°	Against Flow	62.22%
3	60°	With Flow	22.04%
4.	60°	Against Flow	28.28%
5 .	45°	CW	99.03%
5	45°	CCW	99.03%
5	60°	CW	99.03%
5	60°	CCW	99.03%
5	0°	WRV	99.03%
		TOTAL	668.16
668.16 / 9	Sound B	eams = 74.24	
Ac	hieved :	74.24% Covera	lge:

**CCNPP** 

**Component ID:** SG – 11 – Weld 6

NDE Report No.: CC10-1U-064

**Scale:** 50%

Diameter: 30" Thickness: 5"

LTP No.: 100955 Coverage Sketch No: 3

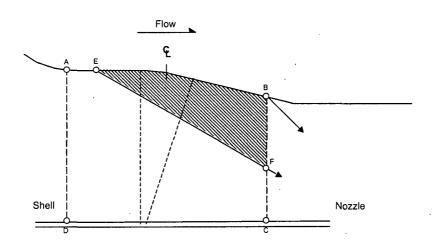
M.O. No.:

Material: CC/S

Exam: 60° (With Flow) CC/S = Clad Carbon Steel S/S = Stainless SteelCASS = Cast Stainless Steel

Page 5 of 7

(Sketch Resized for Relief Request)



Exam Area
• ABCD = 32.89 in²

## With Flow

- Examined EBF (5.8 x 2.5)/2 = 7.25 in<sup>2</sup> 7.25 / 32.89 = <u>22.04%</u>

Coverage		Sound							
Sketch	Angle	Direction	Coverage						
1	45°	With Flow	60.47%						
2.	45°	Against Flow	62.22%						
3	60°	With Flow	22.04%						
4	60°	Against Flow	28.28%						
5	45°	CW	99.03%						
5	45°	CCW	99.03%						
5	60°	CW	99.03%						
5	60°	CCW	99.03%						
5	O°	WRV	99.03%						
		TOTAL	668.16						
668.16 / 9	Sound B	eams = 74.24							
AC	Achieved 74.24% Coverage								

**CCNPP** 

**Component ID:** SG – 11 – Weld 6

LTP No.: 00955

Coverage Sketch No: 4 Exam: 60°

(Against Flow)

NDE Report No.: CC10-1U-064

M.O. No.:

**Scale:** 50%

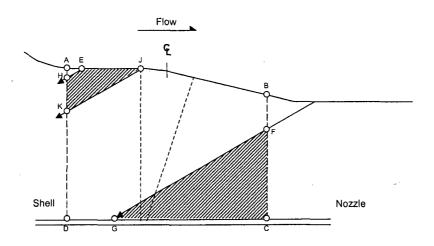
Diameter: 30" Thickness: 5"
Material: CC/S

CC/S = Clad Carbon Steel

S/S = Stainless Steel CASS = Cast Stainless Steel

Page 6 of 7

(Sketch Resized for Relief Request)



ABCD = 32.89 in<sup>2</sup>

- Against Flow
   AJK AEH + FCG
   (2.5 x 1.5)/2 (0.5 x 0.3)/2 + (3 x 5)/2 = 9.30 in<sup>2</sup>
   9.30 / 32.89 = 28.28%

Coverage	A	Sound	^
Sketch	Angle	Direction	Coverage
1	.45°	With Flow	60.47%
2	45°	Against Flow	62.22%
3	60°	With Flow	22.04%
4	60°	Against Flow	28.28%
5	45°	CW	99.03%
5	45°	CCW	99.03%
5	60°	CW	99.03%
5	60°	CCW	99.03%
5	0°	WRV	99.03%
		TOTAL	668.16
668.16/9	Sound B	eams = 74.24	
Ac	hieved :	74.24% Covera	ıqe

**CCNPP** 

**Component ID:** SG – 11 – Weld 6

LTP No.: 100955

Coverage Sketch No: 5

Exam: 45° & 60° & 0° WRV

NDE Report No.: CC10-1U-064

M.O. No.:

**Scale:** 50%

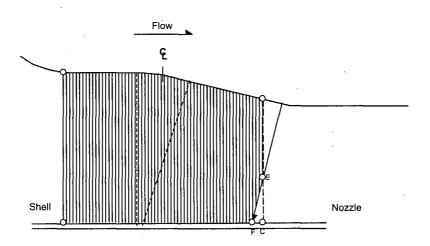
Diameter: 30" Thickness: 5"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 7 of 7

(Sketch Resized for Relief Request)



ABCD = 32.89 in<sup>2</sup>

- Examined ABCD ECF 32.89 (1.6 x 0.4)/2 = 32.57 in<sup>2</sup>
- 32.57 / 32.89 = <u>99.03%</u>

Coverage Sketch	Angle	Sound Direction	Coverage
1	45°	With Flow	60.47%
2	45°	Against Flow	62.22%
3	60°	With Flow	22.04%
4	60°	Against Flow	28.28%
5	45°	CW	99.03%
5	45°	CCW	99.03%
5	60°	CW	99.03%
5	60°	CCW	99.03%
5	0,	WRV	99.03%
		TOTAL	668.16
668.16 / 9 3	Sound B	eams = 74.24	
Ac	hieved '	74.24% Covera	lge

## Responses to Request for Additional Information Summary No.: 103205 Comp ID: SG-11-W7 Page 1 of 7

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

SG Outlet Nozzle to Primary Head Nozzle / Machined transition on nozzle extension limited base metal coverage. The steam generator nozzle-to-vessel head welds are accessible only from the head side based on the designed nozzle configuration. The proximity of the nozzle radius prevented full examination coverage from the nozzle side. Scanning was performed from the nozzle; however, the ultrasonic waves did not cover the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The NDE techniques and procedures used incorporated examination techniques qualified under Article 4 of Section V of the ASME Code as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

## Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

## Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

See attached sketches derived from examination data on file at CCNPP for cross sectional coverage plots and calculations.

**CCNPP** 

Component ID: SG - 11 - Weld 7

LTP No.: 103205

Coverage Sketch No: 1

Exam: 35° / 45°

(With Flow)

NDE Report No.: CC-1U-065

M.O. No.: C120090648

**Scale: 50%** 

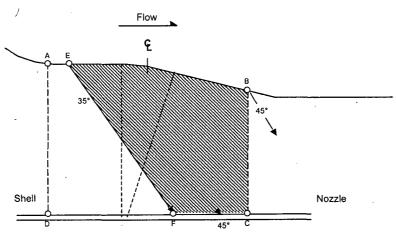
Diameter: 30"

Thickness: 5" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 7

(Sketch Resized for Relief Request)



NOTE: The 45° exam was supplemented with a 35° exam due to the 14° OD taper.

Exam Area
 ABCD = 32.89 in²

### With Flow

- Examined ABCD AEFD 32.89 (5.2(0.7 + 4.3)/2) = 19.94 in<sup>2</sup> 19.94 / 32.89 = 60.47%

Coverage		Sound	
Sketch	Angle	Direction	Coverage
1 .	45°	With Flow	60.47%
2	45°	Against Flow	62.22%
3	60°	With Flow	22.04%
4	60°	Against Flow	28.28%
5	45°	CW	99.03%
. 5	45°	CCW	99:03%
5	60°	CW.	99.03%
5	60°	CCW	99.03%
5	0°	WRV	99.03%
		TOTAL	668.16
668.16 / 9	Sound B	eams = 74.24	
Ac	hieved '	74.24% Covera	nge

**CCNPP** 

Component ID: SG - 11 - Weld 7

LTP No.: 103205

Coverage Sketch No: 2 Exam: 35° / 45°

(Against Flow)

NDE Report No.: CC-1U-065

M.O. No.: C120090648

Scale: 50%

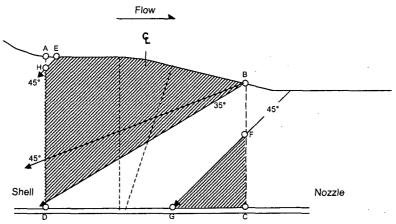
Diameter: 30" Thickness: 5"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 3 of 7

(Sketch Resized for Relief Request)



NOTE: The 45° exam was supplemented with a 35° exam due to the 14° OD taper.

ABCD = 32.89 in<sup>2</sup>

## **Against Flow**

- Examined ABD AEH + FCG (6.7 x 5.2)/2 (0.4 x 0.4)/2 + (2.5 x 2.5)/2 = 20.47 in<sup>2</sup> 20.47 / 32.89 = <u>62.22%</u>

Coverage Sketch	Angle	Sound Direction	Coverage
.1	45°	With Flow	60.47%
2	45°	Against Flow	62.22%
3	60°	With Flow	22.04%
4	60°	Against Flow	28.28%
5	45°	CW	99.03%
5	45°	CCW	99.03%
5	60°	CW	99.03%
5	60°	CCW	99.03%
5	0°	WRV	99.03%
		TOTAL	668.16
668.16 / 9 3	Sound B	eams = 74.24	
Ac	hleved	74.24% Covera	ige

**CCNPP** 

Component ID: SG - 11 - Weld 7

**LTP No.:** 103205

NDE Report No.: CC-1U-065

M.O. No.: C120090648

Coverage Sketch No: 3 Exam: 60° (With Flow)

**Scale:** 50%

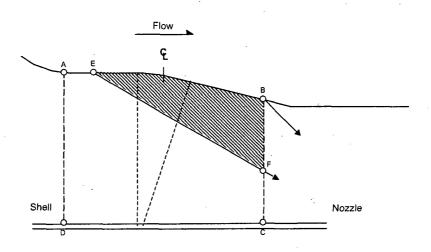
Diameter: 30" Thickness: 5"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 4 of 7

(Sketch Resized for Relief Request)



Exam Area
• ABCD = 32.89 in²

- Examined EBF (5.8 x 2.5)/2 = 7.25 in<sup>2</sup> 7.25 / 32.89 = <u>22.04%</u>

Coverage Sketch	Anala	Sound Direction	Calcaraaa
OVACCII	Angle		Coverage
1	45°	With Flow	60.47%
2	45°	Against Flow	62.22%
3	60°	With Flow	22.04%
4	60°	Against Flow	28.28%
5	45°	CW	99.03%
5	45°	CCW	99.03%
5	60°	CW	99.03%
5	60°	CCW	99.03%
5	0°	WRV	99.03%
		TOTAL	668.16
668.16 / 9 3	Sound B	eams = 74.24	
Ac	hleved	74.24% Covera	ige

**CCNPP** 

**Component ID:** SG – 11 – Weld 7

**LTP No.:** 103205

NDE Report No.: CC-1U-065

Diameter: 30" Thickness: 5" Material: CC/S

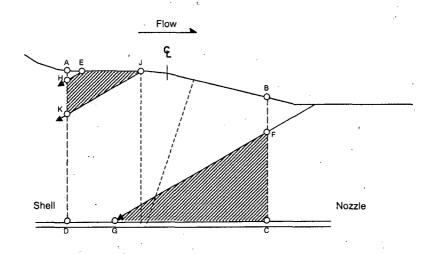
Coverage Sketch No: 4

Exam: 60° (Against Flow) M.O. No.: C120090648 **Scale:** 50%

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 5 of 7

(Sketch Resized for Relief Request)



### Exam Area

ABCD = 32.89 in<sup>2</sup>

Coverage		Sound	
Sketch	Angle	Direction	Coverage
1	45°	With Flow	60.47%
2	45°	Against Flow	62.22%
3	60°	With Flow	22.04%
4	60°	Against Flow	28.28%
5	45°	CW	99.03%
5	45°	CCW	99.03%
5	60°	CW	99.03%
5	60°	CCW	99.03%
5	0°	: WRV:	99.03%
		TOTAL	668.16
668.16 / 9	Sound B	eams = 74.24	
Ac	hleved	74.24% Covera	ige .

**CCNPP** 

Component ID: SG - 11 - Weld 7

LTP No.: 103205

Coverage Sketch No: 5

Exam: 45° & 60° & 0° WRV

**NDE Report No.:** CC-1U-065

M.O. No.: C120090648

**Scale:** 50%

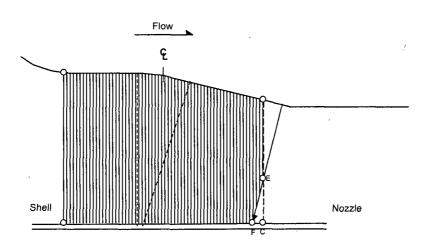
Diameter: 30" Thickness: 5"

Material: CC/S CC/S = Clad Carbon Steel

S/S = Stainless SteelCASS = Cast Stainless Steel

Page 6 of 7

(Sketch Resized for Relief Request)



Exam Area • ABCD = 32.89 in²

## With Flow

- Examined ABCD ECF 32.89 (1.6 x 0.4)/2 = 32.57 in<sup>2</sup>
- 32.57 / 32.89 = <u>99.03%</u>

Coverage Sketch	Angle	Sound Direction	Coverage
1	45°	With Flow	60.47%
2	45°	Against Flow	62.22%
3	60°	With Flow	22.04%
4	60°	Against Flow	28.28%
5	45°	CW	99.03%
5	45°	. CCW	99.03%
5	60°	CW	99.03%
5	60°	CCW	99.03%
5	0°	WRV	99.03%
		TOTAL	668.16
668.16 / 9	Sound B	eams = 74.24	
Ac	hleved	74.24% Covera	ıge

**CCNPP** 

Component ID: SG - 11 - Weld 7

LTP No.: 103205

NDE Report No.: CC-1U-065

M.O. No.: C120090648

**Scale:** 50%

Sketch: Exam Area

Diameter: 30" Thickness: 5"

Material: CC/S

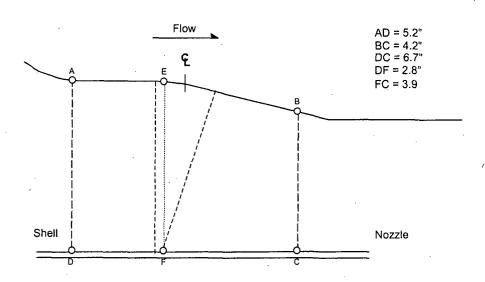
CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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(Sketch Resized for Relief Request)



Coverage		Sound	
Sketch	Angle	Direction	Coverage
1	45°	With Flow	60.47%
2	45°	Against Flow	62.22%
3	60°	With Flow	22.04%
. 4	60°	Against Flow	28.28%
. 5	45°	CW	99.03%
5	45°	CCW	99.03%
5	60°	CW	99.03%
5	60°	CCW	99.03%
5	0°	WRV	99.03%
		TOTAL	668.16
668.16 / 9 3	Sound B	eams = 74.24	
Ac	hieved i	74.24% Covera	ge

## Responses to Request for Additional Information Summary No.: 106055 Comp ID: SG-12-W5 Page 1 of 8

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

SG Inlet Nozzle to Primary Head Nozzle / Machined transition on nozzle extension limited base metal coverage. The steam generator nozzle-to-vessel head welds are accessible only from the head side based on the designed nozzle configuration. The proximity of the nozzle radius prevented full examination coverage from the nozzle side. Scanning was performed from the nozzle; however, the ultrasonic waves did not cover the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The NDE techniques and procedures used incorporated examination techniques qualified under Article 4 of Section V of the ASME Code as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

## Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

See attached sketches derived from examination data on file at CCNPP for cross sectional coverage plots and calculations.

**CCNPP** 

Component ID: SG-12-W5

LTP No.: 106055

NDE Report No.: CC06-1U-046

Coverage Sketch No: 1

Exam Area: Weld Metal 360°

Exam Angle: 45°

**Summary No.:** 106055

MO No.: 1200500776 **Scale:** 50%

Diameter: 42"

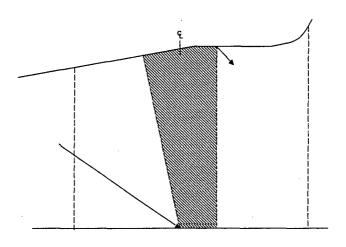
Thickness: 7.30" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 8

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(Sketch Resized for Relief Request)



45° † Coverage = 14 in² of 14 in² exam area = 100%.

			Cove	rage Dimen	sions				Beam Directions					
			,		1	1		Result				Ĺ		
		Length	×	Width	×	Thickness	=	(Squ. In.)		ard Nozzie:	1	I .		
	Exam Area:	na		9.5		See Sketch	***************************************	69.00		om Nozzle:	Ţ.	T		
٧	Neld Metal:	na		1.9		7.4		14.00	1	Clockwise:	<b>←</b>			
E	Base Metal:	na		7,4		See Sketch		55.00	Counter	Clockwise:	>			
		Weld Metal	· Maluma =	14.00	Square Inc	hoo	***************************************		Base Metal	: Volume =	55.00	Square Inc	hoe	
	<del></del> ;	Weld Metal	. Volume =	Coverage	Beam	Percent of			Lase Motal	Volume -	Coverage	Beam	Percent of	
	Beam No.	A = = ( =	Sketch		Total	14.00		Beam No.	Angle	Sketch		Total	55.00	
,,,,,,	Beam No.	Angle 45°†	Sketch	(Squ. In.)				Bealli No.	Angle	SKEICH	(Squ. In.)	iotai	97.42%	
	1		1	14.00	14.00	100.00%		1+2	45°/60°11	6	53.58	53.58		ļ
encoreco.	2	45°↓	2	7.96	7.96	56.86%		3	45°←	7			97.42%	·****
	3	60°↑	3	14.00	14.00	100.00%				<del>'</del>	41	41	74.55%	
	. 4	60°↓	4	10.36	10.36	74.00%		4	45°→		41	41	74.55%	
	5	45°⊷	5	14.00	14.00	100.00%		5	60°⊷	7	41	41	74.55%	
	6	45°→	5	14.00	14.00	100.00%		6	60°→		41	41	74.55%	
	<u> 7 .</u>	60°⊷	5	14.00	14.00	100.00%		7	0° WRV	7	41	41	74.55%	
	8	60°→	5	14.00	14.00	100.00%			I		Manager and the state of the state of	k Lota manananan		
	9	0° WRV	5	14.00	14.00	100.00%								
						1						<u> </u>		
	To	ital Beams:	9	То	tal Percent:	830.86%		To	otal Beams:	7	То	tal Percent:	567.56%	
			Tota	i I Weld Meta	Coverage:	92.32%				Total	Base Meta	i I Coverage:	81.08%	
400.00						Com	bined Cove	erage	<u> </u>		<u> </u>	1		
·····	***************************************				Coverage	1	D	1	Total			*****************	***************************************	
				*************	Percent	X	Volume	+	Volume	·····	Result	***************************************		*********
		.,,,,,,,,		Veld Metal:	92.32%	ţ	14.00	ļ	69.00		18.73%		1	
				Base Metal:		\$	55.00	<b>!</b>	69.00	····	64.63%		\$	
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			va moreau		·······	<del>}</del>		)	otal Exam C	overage E	83.36%		ļ	
	· · · · · · · · · · · · · · · · · · ·					fra		ļ4		J.J.UNU -		***************************************		

**CCNPP** 

Component ID: SG-12-W5

LTP No.: 106055

Coverage Sketch No: 2 Exam Area: Weld Metal 360°

Exam Angle: 45°

NDE Report No.: CC06-1U-046

**Summary No.:** 106055 MO No.: 1200500776

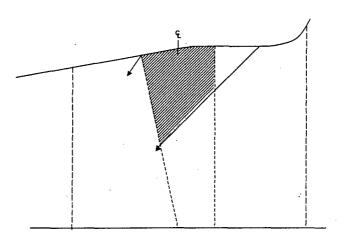
**Scale: 50%** 

Page 3 of 8

Diameter: 42" Thickness: 7.30" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° | Coverage = 7.96 in² of 14 in² exam area = 56.86%.

		Cove	rage Dimen	sions				Beam Directions						
		1		:	-		Result							
Annual Contraction of the Contraction	Length	**************************************	Width	X	Thickness		(Squ. In.)	Towa	ard Nozzle:	Ť	2			
Exam Are	a: na		9.5	Parent of the Contract	See Sketch	poph courters wheel disease	69.00	Away fro	om Nozzle:	1	}	4,	Ì	
Weld Met	al: na		1.9	<u> </u>	7.4		14.00		Clockwise:				[	
Base Met	al: na	3	7.4	} }	See Sketch	,	55.00	Counter	Clockwise:	>		P		
	<del></del>			}	i		1							
	Weld Meta	l: Volume =	14.00	Square Inc	ches			Base Metal:	Volume =	55.00	Square Inc	hes	]	
	1	1.	Coverage	Beam	Percent of			1		Coverage	Beam	Percent of	1	
Beam N	o. Angle	Sketch	(Squ. In.)	Total	14.00		Beam No.	Angle	Sketch	(Squ. In.)	Total	55.00		
1	45°↑	1	14.00	14.00	100.00%		1+2	45°/60°†1	6	53.58	53.58	97.42%		
2	45°1	2	7.96	7.96	56.86%		1 172	43 700 11	Ų	33.50	33.36	97.42%		
3	60°↑	3	14.00	14.00	100.00%		3	45°⊷	7	41	41	74.55%	1	
4	60°↓	4	10.36	10.36	74.00%		4	45°→	7	41	41	74.55%		
5	45'	5	14.00	14.00	100.00%	(10) 10 10 10 10 10 10 10 10 10 10 10 10 10	5	60'←	7	41	41	74.55%		
- 6	45°→	5	14.00	14.00	100.00%		6	60°-→	7	41	41	74.55%		
7	60°←	5	14.00	14.00	100.00%		7	0° WRV	7	41	41	74.55%		
. 8	60°→	5	14.00	14.00	100.00%									
9	0° WRV	5	14.00	14.00	100.00%			1						
				-	1			1						
					4					•		i		
	1	İ						1						
	Total Beams:	9	То	tal Percent:	830.86%		To	otal Beams:	7	To	tal Percent:	567.56%		
		Tota	l Weld Meta	1 Coverage:	92.32%	44404.0410.000		<u> </u>	Total	l Base Meta	Coverage:	81.08%	<b>.</b>	
			<u> </u>	1	<u> </u>		<u> </u>	1						
· · · · · · · · · · · · · · · · · · ·					Com	bined Cove	erage							
				Coverage		and to be a factories		Total	<u>.</u>		33.33	{ \$000000000000000000000000000000000000		
		1	<u> </u>	Percent	; X	Volume	· •	Volume		Result				
			Weld Metal:	92.32%	\$	14.00		69.00		18.73%		ļ	i	
			Base Metal:	81.08%	1	55.00		69.00	D.W	64.63%			ļ	
								otal Exam C		83.36%	**************************************	C-8-1001-1-1		
			•	J	de como o constituir de la constituir de			Otal Exam C	Overage =	03.30%	000 001 110 10 10 10 10 10 10 10 10 10 1	in the second second second second	ļ.,.,	

**CCNPP** 

Component ID: SG-12-W5

LTP No.: 106055

Coverage Sketch No: 3 Exam Area: Weld Metal 360°

Exam Angle: 60°

NDE Report No.: CC06-1U-046

**Summary No.:** 106055 MO No.: 1200500776

**Scale:** 50%

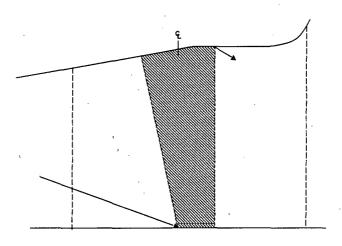
Diameter: 42"

Thickness: 7.30" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 4 of 8

(Sketch Resized for Relief Request)



60° ↑ Coverage = 14 in² of 14 in² exam area = 100%.

			Cove	rage Dimer	sions						Beam Di	rections		
		}	<b>*</b>			}		Result						
***********		Length	X :	Width	X	Thickness	=	(Squ. In.)	Tow	ard Nozzie:	1		T.	V-34- N- 2 No
	Exam Area:	na		9.5		See Sketch		69.00	Away fr	om Nozzle:	1			
.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Weld Metal:	na	1	1.9		7.4		14.00		Clockwise:	←			
	Base Metal:	na		7.4		See Sketch		55.00	Counter	Clockwise:	<b>→</b>			
		Weld Metal	: Volume =	14.00	Square Inc	hes		<del></del>	Base Metal	: Volume =	55.00	Square Inc	hes	***********
**********		1		Coverage	Beam	Percent of					Coverage	Beam	Percent of	***********
	Beam No.	Angle	Sketch	(Squ. In.)	Total	14.00	-	Beam No.	Angle	Sketch	(Squ. In.)	Total	55.00	
****	1	45°t	1	14.00	14.00	100.00%							97.42%	.,,
	2	45°1	2	7.96	7.96	56.86%		1+2	45°/60°†↓	6	53.58	53.58	97.42%	
	3	60°1	3	14.00	14.00	100.00%		3	45°⊷	7	41	41	74.55%	
	4	60°	4	10.36	10.36	74.00%	***************************************	4	45°→	7	41	41	74.55%	
	5	45*	5	14.00	14.00	100.00%		5	60°←	7	41	41	74.55%	
	6	45°→	5	14.00	14.00	100.00%		6	60°→	7	41	41	74.55%	
	7	60°←	5	14.00	14.00	100.00%	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	7	0° WRV	7	41	41	74.55%	
	8	60°→	5	14.00	14.00	100.00%							1	~~~~~
	9	0° WRV	5	14.00	14.00	100.00%			***************************************			Transama arabanta da ar	A A A A A A A A A A A A A A A A A A A	
				,						¢				***************************************
	To	tal Beams:	9	То	tal Percent:	830.86%		To	tal Beams:	7	To	al Percent:	567.56%	******
						#								**********
	<u> </u>	<u></u>	Tota	Weld Meta	Coverage:	92.32%		<u> </u>	<u> </u>	Fota	Base Meta	Coverage:	81.08%	
			<del></del>		·	Com	bined Cov	erage				***************************************	ļ	
	†·····				Coverage	1		1	Total			*******************	***************************************	
			***************************************		Percent	X	Volume	+	Volume	=	Result	300 cm marrows and	1	
	1			Veld Metal:	92.32%		14.00		69.00		18.73%	***************************************	T	
			E	Base Metal:	81.08%		55.00		69.00		64.63%			
				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					l otal Exam C	overage =	83.36%	***************************************	ļ	
						h			Auiii C				h	

**CCNPP** 

Component ID: \$G-12-W5

LTP No.: 106055

Coverage Sketch No: 4
Exam Area: Weld Metal 360°

Exam Angle: 60°

NDE Report No.: CC06-1U-046

Summary No.: 106055

MO No.: 1200500776

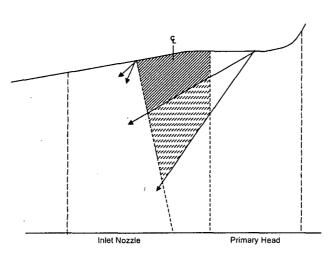
**Scale:** 50%

Page 5 of 8

Diameter: 42"
Thickness: 7.30"
Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



60°

60° ↓ Coverage = 4.65 in².

1111

Supplemental 35°↓ Coverage = 5.72 in²

Total:  $(4.65 + 5.72) = 10.36 \text{ in}^2 \text{ of } 14 \text{ in}^2 \text{ exam area} = 74\%$ 

		Cove	rage Dimer	isions				Beam Directions					
	***************************************			1	1		Result	1				I.	
	Lengt	n x	Width	X	Thickness	=	(Squ. In.)	Tow	ard Nozzle:	1	<u> </u>		
Exam A	rea: na	******************	9.5	<u> </u>	See Sketch		69.00	Away fr	om Nozzle:	1		******	•
Weld Me	tal: na	***************************************	1.9	1	7.4		14.00		Clockwise:	<del></del>		£	
Base Me	etal: na		7.4		See Sketch		55.00	Counter	Clockwise:	<b>→</b>			
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	AAGIO MI	tai: voiume =						Dase metal	: volume =	Coverage	Beam	Percent of	
	N		Coverage	Beam	Percent of		Daniel Ma		Charle				
Beam			(Squ. In.)	Total	14.00		Beam No.	Angle	Sketch	(Squ. In.)	Total	55.00	
<u>-</u> -	45°↑	1 1	14.00	14.00	100.00%		1+2	45*/60*11	6	53.58	53.58	97.42%	*******
2	45°1	2 3	7.96	7.96	56.86% 100.00%		3	45°←	<del>,</del>	41	41	97.42% 74.55%	········
	60°	- 3			74.00%		4	45°→	<del></del>	41	41		
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5			14.00	14.00	100.00%								
. 6	45°→		14.00	14.00	100.00%		6 7	60°→		41	41	74.55%	
	60°←	5	14.00	14.00	100.00%	*******		0° WRV		41	41	74.55%	
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9	0° WR	V 5	14.00	14.00	100.00%		.,	<u> </u>					
······································	Total Bean	ns: 9	To	tal Percent:	830.86%	~	To	otal Beams:	7	То	tal Percent:	567.56%	
***************************************	1				***************************************								
		Tota	Weld Meta	Coverage:	92.32%			1	Tota	Base Meta	Coverage:	81.08%	
			<del></del>		Com	bined Cov	erage	<u>'                                      </u>					
		****		Coverage				Total					
.,				Percent	X	Volume	+	Volume		Result			
			Weld Metal:	92.32%		14.00		69.00	!	18.73%			
			Base Metal:	81.08%		55.00		69.00		64.63%			
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		****		france a management	·		·	1				·	

**CCNPP** 

11.15

Component ID: SG-12-W5

LTP No.: 106055

Coverage Sketch No: 5

Exam Area: Weld Metal 360°
Exam Angle: 45° / 60° / 0° WRV

**NDE Report No.:** CC06-1U-046 **Summary No.:** 106055

MO No.: 1200500776

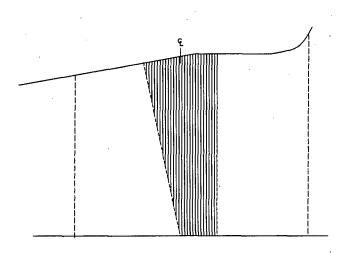
Scale: 50%

Page 6 of 8

Diameter: 42"
Thickness: 7.30"
Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° ↔ / 60° ↔ / 0° WRV Coverage = 14 in² of 14 in² exam area = 100%.

		Cove	rage Dimen	sions				·		Beam D	irections		
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construction of the section of the s	Length	X	Width	X	Thickness		(Squ. In.)	Tow	ard Nozzle:	1	•		
Exam Area:	na		9.5	\$1000000 A. C. C.	See Sketch	Service Management of the Service of	69.00	Away fr	om Nozzle:	1	1		
Weld Metal:	na		1.9	į	7.4		14.00		Clockwise:	-	§		
Base Metal:	na		7,4	}	See Sketch		55.00	Counter	Clockwise:	-	<u> </u>		1
<u> </u>	Weld Metal	· Volume =	14.00	Square Inc	hoe			Base Metal	Volume =	55.00	Square Inc	hes	
	TTOIG MICE	. Volume -	Coverage	Beam	Percent of	~~~~~		Base meta,	· voidino	Coverage	Beam	Percent of	A
Beam No.	Angle	Sketch	(Squ. In.)	Total	14.00		Beam No.	Angle	Sketch	(Squ. In.)	Total	55.00	ļ
Deall No.	45°↑	1	14.00	14.00	100.00%							97.42%	····
2	45°	2	7.96	7.96	56.86%		1+2	45°/60°†↓	6	53.58	53.58	97.42%	ł
3	60°t	3	14.00	14.00	100.00%		3	45°←	7	41	41	74.55%	V-00 00000
<del></del>	60°	4	10.36	10.36	74.00%	America contrata	4	45°→	<del>-                                    </del>	41	41	74.55%	
	45°←	5	14.00	14.00	100.00%		5	60°←-	<del></del>	41	41	74.55%	
6	45°-→	5	14.00	14.00	100.00%		6	60°→	<del></del>	41	41	74.55%	
	60°←	5	14.00	14.00	100.00%		7	0° WRV	<del></del>	41	41	74.55%	
<u>8</u>	60°~-	5	14.00	14.00	100.00%					<del></del>	<del> </del>	3070	
9	0° WRV	5	14.00	14.00	100.00%	· · · · · · · · · · · · · · · · · · ·	***************************************	an, announce - m - m - an		Make and an entering of the		·	
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	ļ		• · · · · · · · · · · · · · · · · · · ·		<u> </u>					***************************************			
Ti	otal Beams:	9	То	tal Percent:	830.86%		To	tal Beams:	7	То	tal Percent:	567.56%	
		Total	Weld Meta	Coverage:	92.32%	<b></b>			Total	Base Meta	l Coverage:	81.08%	
					Com	bined Cove	erage						ļ
	L			Coverage	ļ		· •	Total		Result			
	ļ		L	Percent	X	Volume	ļ <del></del>	Volume	=			ļ	ļ
	<u>}</u>		Neld Metal:	92.32%	ļ	14.00		69.00		18.73%		Į	į
	į	E	Base Metal:	81.08%	į	55.00		69.00		64.63%			ļ
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	L			[	1		I I	otal Exam C	overage =	83.36%	I		<u> </u>

**CCNPP** 

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Component ID: SG-12-W5

LTP No.: 106055

Coverage Sketch No: 6

Exam Area: Base Metal 360° Exam Angle: 45° / 60°

NDE Report No.: CC06-1U-046 **Summary No.:** 106055

MO No.: 1200500776

Scale: 50%

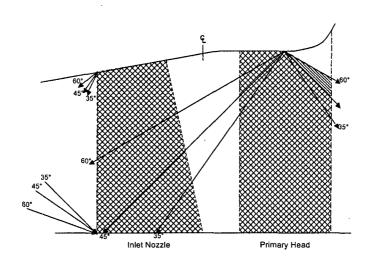
Page 7 of 8

of K

Diameter: 42" Thickness: 7.30" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



Coverage by at least 2 sound beams = 53.20 in<sup>2</sup>.

Coverage by 1 sound beam only = 0.76 in².

Total:  $53.20 + (0.76 / 2) = 53.58 \text{ in}^2 \text{ of } 55 \text{ in}^2 \text{ exam area} = 97.42\%$ .

		Cove	rage Dimen	sions	. <u>-</u>			Beam Directions					
	1				1		Result						
	Length	X	Width	X	Thickness	=	(Squ. In.)	Tow	ard Nozzle:	1			
Exam Area:	na	A CONTRACTOR OF THE PARTY OF TH	9.5		See Sketch		69.00	Away fr	om Nozzle:	1			*******
Weld Metal:	na		1.9		7.4	***************************************	14.00	STATE OF THE PARTY	Clockwise:	<b>-</b>			1
Base Metal:	na		7.4	}	See Sketch		55.00		Clockwise:			1	
	100-1-1 M-4-1	No.	44.00					D M-4-1	. 37-1	FF 00	0	<u> </u>	
	Weld Metal	: volume =		Square Inc				Base Metal	volume =		Square Inc		
	1		Coverage	Beam	Percent of		<u> </u>			Coverage	Beam	Percent of	(
Beam No.		Sketch	(Squ. In.)	Total	14.00		Beam No.	Angle	Sketch	(Squ. In.)	Total	55.00	Į
	45°↑	1	14.00	14.00	100.00%		1+2	45°/60°11	6	53.58	53.58	97.42%	Į
2	45°1	2	7.96	7.96	56.86%							97.42%	******
3	60°†	3	14.00	14.00	100.00%	a gaganga dan matakish isi	3	45°←	7	41	41	74.55%	
4	60°1	4	10.36	10.36	74.00%	,	4	45°→	7	41	41	74.55%	Į
5	45°←	5	14.00	14.00	100.00%		5	60°←	7	41	41	74.55%	J
6	45°→	_5	14.00	14.00	100.00%		6	60°→	7	41	41	74.55%	ar a classes to
7	60°←	5	14.00	14.00	100.00%		7	0° WRV	7	41	41	74.55%	l
8	60°→	5	14.00	14.00	100.00%								1
9	0° WRV	5	14.00	14.00	100.00%								
			,			••••							
т	otal Beams:	9	To	tal Percent:	830.86%		То	tal Beams:	7	То	tai Percent:	567.56%	
		Total	Weld Meta	Coverage:	92.32%				Tota	Base Meta	Coverage:	81.08%	ļ
	ļ				0	bined Cov		ì					
	. <del> </del>			Coverage	Coni	Dilled COV	araya .	Total					·····
	ļ	Addres and Autority and Autorities and		Percent	x	Volume	+	Volume	**********	Result			
			Veld Metal:	92.32%		14.00		69.00		18.73%			ļ
			Base Metal:	81.08%		55.00	1	69.00		64.63%			Ì
				**********								~~~	
		*a			L		<u> </u>	otal Exam C	overage =	83.36%	***********	ļ	

**CCNPP** 

Component ID: SG-12-W5

LTP No.: 106055

Coverage Sketch No: 7

Fyam Area: Base Metal 360°

Exam Area: Base Metal 360°
Exam Angle: 45° / 60° / 0° WRV

NDE Report No.: CC06-1U-046

Summary No.: 106055

MO No.: 1200500776

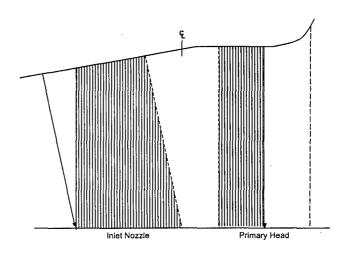
Scale: 50%

Page 8 of 8

Diameter: 42"
Thickness: 7.30"
Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° ↔ / 60° ↔ / 0° WRV Coverage = 41 in² of 55 in² exam area = 74.55%.

		Cove	rage Dimer	sions						Beam D	rections	
				T			Result					1
	Length	х	Width	X X	Thickness	=	(Squ. In.)	Tow	ard Nozzle:	1	***************************************	1
Exam Area	i: na	***************************************	9.5	\$1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	See Sketch	and accept on the circle on the	69,00	Away fr	om Nozzle:	1	1911.000.000.000.000.00	
Weld Meta	l: na	i	1.9	ļ	7.4		14.00		Clockwise:	-		
Base Meta	I: na		7.4	}	See Sketch		55.00	Counter	Clockwise:	-		11
	Weld Metal	: Volume ≃		Square Inc				Base Metal	: Volume ≃		Square Inc	
			Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No	. Angle	Sketch	(Squ. In.)	Total	14.00		Beam No.	Angle	Sketch	(Squ. In.)	Total	55.00
1	45°↑	1	14.00	14.00	100.00%		1+2	45°/60°11	6	53.58	53.58	97.42%
2	45°↓	2	7.96	7.96	56.86%		, , ,	42 100 11	"	55.55	33.30	97.42%
3	60°†	3	14.00	14.00	100.00%		3	45°←	7	41	41	74.55%
4	60°!	4	10.36	10.36	74.00%		4	45°→	7	41	41	74.55%
5	45°←	5	14.00	14.00	100.00%		5	60°←	7	41	41	74.55%
6	45°→	5	14.00	14.00	100.00%		6	60°→	7	41	41	74.55%
7	60°↔-	5	14.00	14.00	100.00%		7	0° WRV	7	41	41	74.55%
8	60°→	5	14.00	14.00	100.00%							
9	0° WRV	5	14.00	14.00	100.00%							
					1		I					
								<u> </u>				
	Total Beams:	9	To	tal Percent:	830.86%	and the second second	To	tal Beams:	7	То	tal Percent:	567.56%
		Tota	Weld Meta	Coverage:	92.32%				Tota	Base Meta	Coverage:	81.08%
	+	1012	TTOIC WIELD	i Covarago.	32.32.70		<del></del>	,			. Coverage.	01.0070
	***************************************				Com	bined Cov	erage					
				Coverage	1			Total				
	1			Percent	X	Võlume	+	Volume	=	Result		1
		١	Weld Metal:	92.32%		14.00		69.00		18.73%		
			Base Metal:	81.08%		55.00		69.00		64.63%		
				<u> </u>	J			otal Exam C		83.36%		ļ
				Lange	1		<u> </u>	otal Exam C	.overage =	83.30%	****	. L

### Responses to Request for Additional Information Summary No.: 114900 Comp ID: 12-SI-1010-7 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each Relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Pipe to Valve / Taper on Valve prevented any axial or circumferential scanning from Valve side of the weld. See attached sketches derived from examination data on file at CCNPP

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

Component ID: 12-SI-1010-7

LTP No.: 114900

NDE Report No.: CC06-1U-080 Coverage Sketch No: 1 of 1

**Summary No.:** 114900 MO No.: 1200500777

Exam Area: Inner Exam Angle: 45° / 60° Scale: 100%

Diameter: 12"

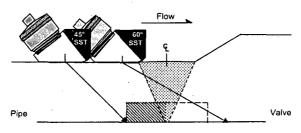
Thickness: 1.20" Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

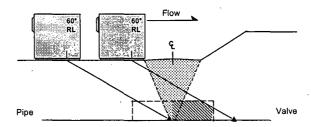
Page 2 of 2

12

(Sketch Resized for Relief Request)



Exam Coverage = 50% as per single sided access rules.



Far side of weld examined to the extent possible with RL probe. No coverage credit taken.

## Responses to Request for Additional Information Summary No.: 102650 Comp ID: 10/12-SI-1009 Page 1 of 4

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Angled branch connection 12" Pipe to 30" Pipe / Weld location prevented any scanning from 12" pipe side. The ultrasonic examination of the above pipe weld was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper). For this weld obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the weld received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

#### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

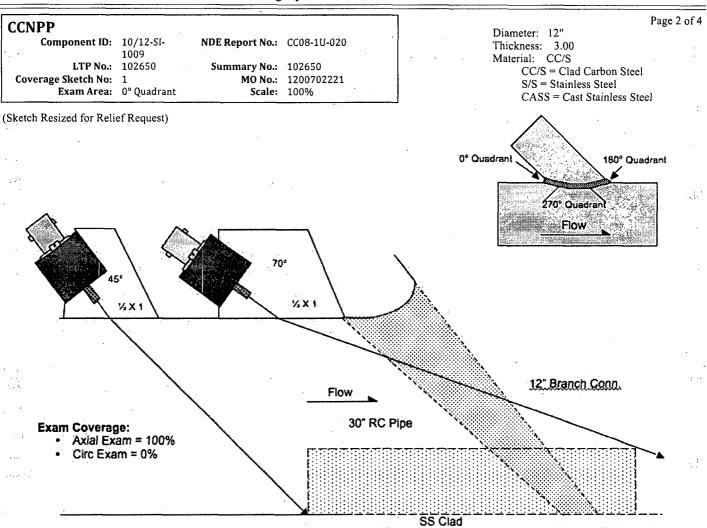
2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

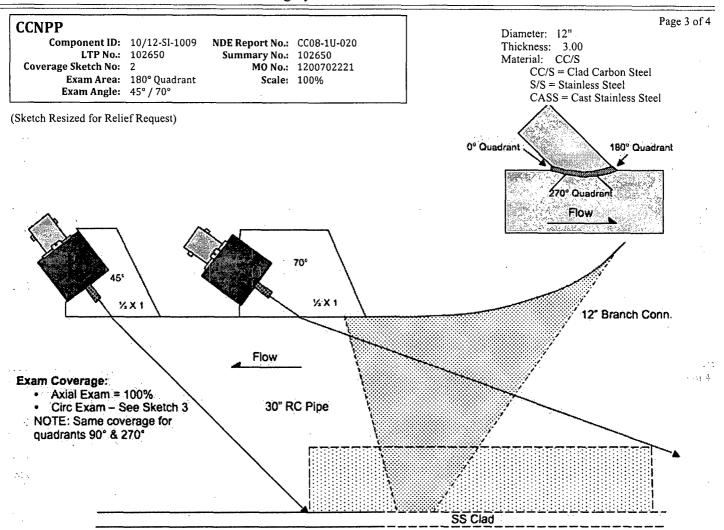
Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

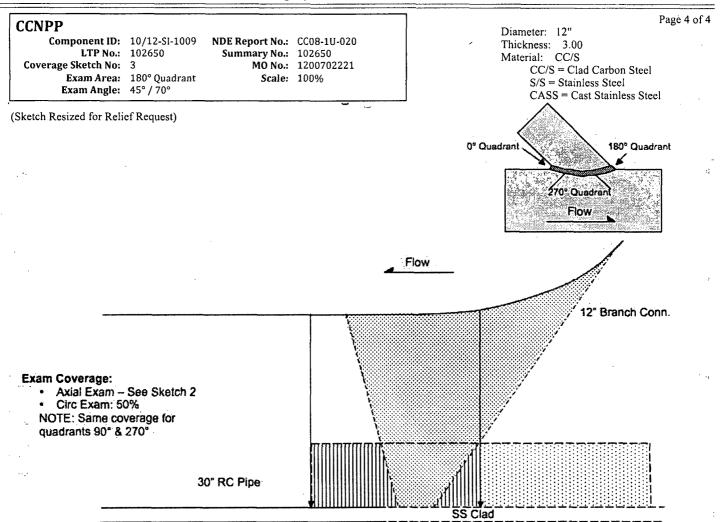
#### Response:



Quadrant	Axial	Circ
0	100%	0%
90°	100%	50%
180°	100%	50%
270°	100%	50%
Total:	400%	150%
Total 7 4:	100%	37.5%



Quadrant	Axial	Circ
0*	100%	0%
90°	100%	50%
180°	100%	50%
270°	100%	50%
Total:	400%	150%
Total / 4:	100%	37.5%



Quadrant	Axial	Circ
0*	100%	0%
90°	100%	50%
180°	100%	50%
270°	100%	50%
Total:	400%	150%
Total / 4:	100%	37.5%

# Responses to Request for Additional Information Summary No.: 115950 Comp ID: 12-SI-1011-12 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

#### Response:

Pipe to Safe End / No Code coverage was credited for scanning performed from Cast Stainless Steel Safe End side of weld. The ultrasonic examination of the above pipe weld was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper). For this weld obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the weld received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

#### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response

**CCNPP** 

**Component ID:** 12-SI-1011-12 LTP No.: 115950

NDE Report No.: CC08-1U-034

Coverage Sketch No: 1 of 1 Exam Area: Inner **Summary No.:** 115950 MO No.: 1200702210

Exam Angle: 60°

Scale: 100%

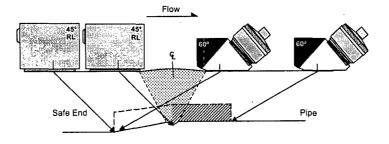
Page 2 of 2

:::1

Diameter: 12" Thickness: 1.125"
Material: CASS TO S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



Exam Coverage = 50% as per single sided access rules.

No coverage credit taken for 45° RL exam from Safe End side.

# Responses to Request for Additional Information Summary No.: 123700 Comp ID: 4-SR-1006-4 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Pipe to Tee / Scanning from Tee side of weld limited due to proximity of transition on Tee to the weld. The ultrasonic examination of the above pipe weld was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper). For this weld obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the weld received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

#### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Responses

See attached sketches derived from examination data on file at CCNPP for cross sectional coverage plots and calculations.

ijι.

**CCNPP** 

Component ID: 4-SR-1006-4

LTP No.: 123700 Coverage Sketch No: 1 of 1

Exam Area: Inner Exam Angle: 45°/60°/ NDE Report No.: CC06-1U-043 Summary No.: 123700

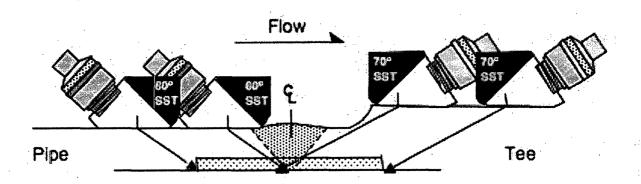
MO No.: 1200500749 Scale: 100% Diameter: 4.0" Thickness: 0.44"

Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 2

(Sketch Resized for Relief Request)



# **Angles Measured in Component:**

- Nominal 60° = 54°
- Nominal 70° = 62°

### Scan Limitation:

- Axial exam from Tee side obstructed for 4" of 14:25" by Tee configuration.
- Circ exam from Tee side obstructed for 360° by Tee configuration.

#### Coverage Calc:

- Axial scan pipe side = 14.25" of 14.25" = 100%.
- Axial scan tee side = 10.25" of 14.25" = 72%.
- Circ scan pipe side = 14.25° of 14.25" = 100%.
- Circ scan tee side = 0" of 14.25" = 0%.
- Total: (100 + 72 + 100 + 0) / 4 = 68%.

# **ENCLOSURE 2**

**Relief Request ISI-25 for CCNPP Unit 1 Class 2 Components** 

# Responses to Request for Additional Information Summary No.: 252000 Comp ID: SCHE-11-1 Page 1 of 4

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Channel Barrel-to-Flange / Close proximity of Flange transition to the weld limits attaining full coverage from the flange side of weld. The ultrasonic interrogation of the channel shell to flange weld could only be partially obtained from flange side due to the component configuration and close proximity of the weld to the flange transition. The nondestructive examination (NDE) techniques and procedures used incorporated similar examination techniques qualified under Appendix III of the ASME Section XI Code, as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

Component ID: SCHE-11-1

LTP No.: 252000

NDE Report No.: 2000BU011 **Summary No.: 252000** 

Coverage Sketch No: 1 Exam Area: 360° (147.5")
Exam Angle / Direction: 45° Ax Upst MO No.: 1199904472 Scale: 100%

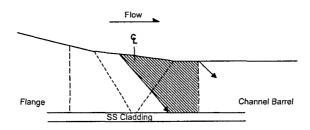
Diameter: 45" Thickness: 1.25"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 4

(Sketch Resized for Relief Request)



45° Axial Coverage from Upstream side = 43%

**CCNPP** 

Component ID: SCHE-11-1

onent ID: SCHE-11-1 N LTP No.: 252000

Coverage Sketch No: 2 Exam Area: 360° (147.5")

Exam Area: 360° (147.5")
Exam Angle / Direction: 45° / 60° Ax Dnst

NDE Report No.: 2000BU011

Summary No.: 252000 MO No.: 1199904472

Scale: 100%

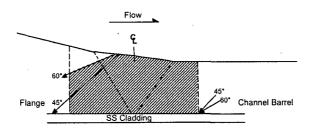
Diameter: 45"
Thickness: 1.25"
Material: CC/S

CC/S = Clad Carbon Steel

S/S = Stainless Steel
CASS = Cast Stainless Steel

Page 3 of 4

(Sketch Resized for Relief Request)



45° / 60° Axial Coverage from Downstream side = 94%

**CCNPP** 

Component ID: SCHE-11-1

LTP No.: 252000

Coverage Sketch No: 3

Exam Area: 360° (147.5")
Exam Angle / Direction: 45° CW / CCW

NDE Report No.: 2000BU011

**Summary No.:** 252000 MO No.: 1199904472

Scale: 100%

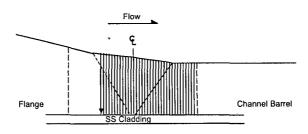
Diameter: 45" Thickness: 1.25"

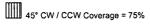
Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 4 of 4

(Sketch Resized for Relief Request)





Covera	ge Calc
Exam	Coverag
Ax Upst	43%
Ax Dnst	94%
CW	75%
CCW	75%
Total:	287%
Total / 4:	71.8%

# Responses to Request for Additional Information Summary No.: 252350 Comp ID: SCHE-12-2 Page 1 of 3

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Channel Barrel-to-Flange / Close proximity of Flange transition to the weld limits attaining full coverage from the flange side of weld. The ultrasonic interrogation of the channel shell to flange weld could only be partially obtained from flange side due to the component configuration and close proximity of the weld to the flange transition. The nondestructive examination (NDE) techniques and procedures used incorporated similar examination techniques qualified under Appendix III of the ASME Section XI Code, as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

Component ID: SCHE-12-2

LTP No.: 252350

NDE Report No.: CC08-1U-005 **Summary No.:** 252350

MO No.: 1200702218

Exam Area: 360° (141.37") Exam Angle / Direction: 45° Ax Upst

**Scale:** 100%

Diameter: 45" Thickness: 1.25"

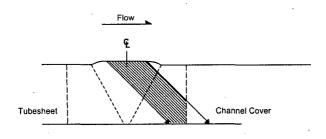
Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 3

(Sketch Resized for Relief Request)

Coverage Sketch No: 1



45° Axial Coverage from Upstream side = 33.3%

**CCNPP** 

Component ID: SCHE-12-2

LTP No.: 252350

Coverage Sketch No: 2

Exam Area: 360° (141.37")
Exam Angle / Direction: 45° / 70° Ax Dnst

NDE Report No.: CC08-1U-005

Summary No.: 252350 MO No.: 1200702218

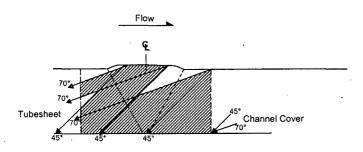
**Scale: 100%** 

Page 3 of 3

Diameter: 45" Thickness: 1.25" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° / 70° Axial Coverage from Downstream side = 85%

Coverage Calc Exam Coverage Ax Upst 85% 100% Ax Dnst

CW CCW 100%

Total: Total / 4: 318.3% <u>79.6%</u>

# Responses to Request for Additional Information Summary No.: 252100 Comp ID: SCHE-11-N1 Page 1 of 3

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Inlet Nozzle to Shell / Due to nozzle configuration coverage of the nozzle side base metal and weld was limited. The nozzle-to-shell weld is primarily accessible from the shell side based on the component configuration. The nozzle scanning surface is essentially perpendicular to the shell which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The NDE techniques and procedures used incorporated similar examination techniques qualified under Appendix III of the ASME Section XI Code, as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

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Component ID: SCHE-11-N1

LTP No.: 252100

Coverage Sketch No: 2 Exam Area: 360° Exam Angle / Direction: 45° CW / CCW NDE Report No.: 2000BU010 Summary No.: 252100

MO No.: 1199904472

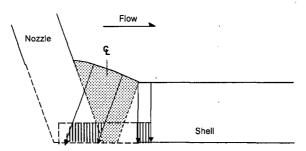
Scale: 100%

Page 2 of 3

Diameter: 10" Thickness: 1.125" Material: S/S to CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



Exam Area:  $(1.75 \times 0.4) \approx 0.70 \text{ in}^2$ Examined:  $(0.63 \times 0.4) + (0.25 \times 0.4) = 0.35 \text{ in}^2 = 50\%$ 

45° / 60° CW / CCW Coverage = 50%

Covérage Calc Coverage Exam 0% 80% Ax Upst CW 50% CCW 50%

180% Total: Total / 4: 45%

**CCNPP** 

Component ID: SCHE-11-N1

LTP No.: 252100

Coverage Sketch No: 1 Exam Area: 360°

Exam Angle / Direction: 45° / 60° Ax Dnst

NDE Report No.: 2000BU010

**Summary No.: 252100** MO No.: 1199904472

Scale: 100%

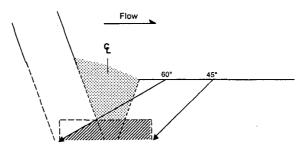
Diameter: 10"

Thickness: 1.125"
Material: S/S to CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 3 of 3

(Sketch Resized for Relief Request)



Exam Area:  $(1.75 \times 0.4) = 0.70 \text{ in}^2$ Examined:  $0.70 - (0.7 \times 0.4)/2 = 0.56 \text{ in}^2 = 80\%$ 



45° / 60° Axial Coverage from Downstream side = 80%

45° / 70° Axial Coverage from Upstream side = 0%

# Responses to Request for Additional Information Summary No.: 252450 Comp ID: SCHE-12-N2 Page 1 of 3

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Outlet Nozzle to Shell / Due to nozzle configuration coverage of the nozzle side base metal and weld was limited. The nozzle-to-shell weld is primarily accessible from the shell side based on the component configuration. The nozzle scanning surface is essentially perpendicular to the shell which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The NDE techniques and procedures used incorporated similar examination techniques qualified under Appendix III of the ASME Section XI Code, as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

Component ID: SCHE-12-N2

LTP No.: 252450

Coverage Sketch No: 1

Exam Area: 360° (40")
Exam Angle / Direction: 45° / 70° Ax Upst

NDE Report No.: CC08-1U-003\* **Summary No.:** 252450

Scale: 100%

MO No.: 1200702218

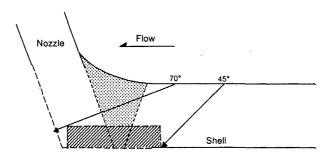
Diameter: 10"

Thickness: 1.125" Material: S/S to CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 3

(Sketch Resized for Relief Request)



45° / 70° Axial Coverage from Upstream side = 100%

45° / 70° Axial Coverage from Downstream side = 0%

**CCNPP** 

Component ID: SCHE-12-N2 LTP No.: 252450 Coverage Sketch No: 2

NDE Report No.: CC08-1U-003

**Summary No.: 252450** 

Exam Area: 360° (40")
Exam Angle / Direction: 45° CW / CCW

MO No.: 1200702218

Scale: 100%

Diameter: 10" Thickness: 1.125"

Material: S/S to CC/S
CC/S = Clad Carbon Steel

S/S = Stainless Steel CASS = Cast Stainless Steel

Page 3 of 3

(Sketch Resized for Relief Request)

Nozzle

45° CW / CCW Coverage = 53.8%

Coverage Calc Exam Ax Upst Ax Dnst CW CCW Coverage 100% 0% 53.8%

Total: Total / 4: 207.6%

# Responses to Request for Additional Information Summary No.: 417150 Comp ID: 12-SC-1215-18 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Pipe to Tee / Coverage limited by intrados of adjacent Tee-connection. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Resnance

**CCNPP** 

**Component ID:** 12-SC-1215-18 **LTP No.:** 417150

Coverage Sketch No: NA
Exam Area: Lower
Exam Angle: 70°

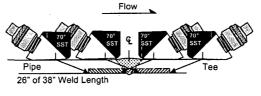
NDE Report No.: CC08-1U-007 Summary No.: 417150

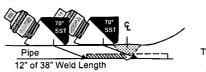
MO No.: 1200702220 Scale: 100% Page 2 of 2

Diameter: 12"
Thickness: 0.33"
Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)





Tee @ Intrados

Coverage Calc

Exam Coverage
Ax Upst 100%
Ax Dnst 68%
Circ Upst 100%
Circ Dnst 68%

Total: 336% Total / 4: **84%** 

# Responses to Request for Additional Information Summary No.: 307150 Comp ID: 14-SI-1201-1 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Valve to Elbow / Due to taper on valve body no coverage was attainable from valve side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

#### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

od

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

Coverage Sketch No: NA

 Component ID:
 14-SI-1201-1
 NDE Report No.:
 CC06-1U-009

 LTP No.:
 307150
 Summary No.:
 307150

Exam Area: Lower Exam Angle: 45° / 70° MO No.: 1200500727

Scale: 100%

Diameter: 14"

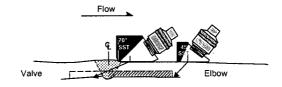
Thickness: 0.25" Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

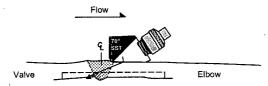
Page 2 of 2

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(Sketch Resized for Relief Request)



Exam Coverage = 50% as per single sided access rules.



Best effort exam on far side of weld - no coverage credit taken.

# Responses to Request for Additional Information Summary No.: 310050 Comp ID: 12-SI-1214-3 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

#### Response:

Pipe to Tee / No Code coverage was credited for scanning performed from Cast Stainless Steel Side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

**Component ID:** 12"-SI-1214-3 LTP No.: 310050

NDE Report No.: CC06-1U-005 **Summary No.:** 310050

Coverage Sketch No: NA Exam Area: Lower

Exam Angle: 45° / 70°

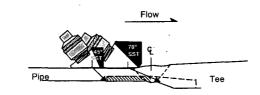
MO No.: 1200500736 Scale: 100%

Page 2 of 2

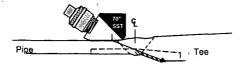
Diameter: 12" Thickness: 0.28" Material: S/S to CASS

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



Exam Coverage = 50% as per single sided access rules.



Best effort exam on far side of weld - no coverage credit taken.

## Responses to Request for Additional Information Summary No.: 310200 Comp ID: 12-SI-1214-5 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Pipe to Tee / No Code coverage was credited for scanning performed from Cast Stainless Steel Side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

#### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

Component ID: 12"-SI-1214-5 LTP No.: 310200

-SI-1214-5 NDE Report No.: CC06-1U-006

Coverage Sketch No: NA
Exam Area: Lower
Exam Angle: 45° / 70°

Summary No.: 310200 MO No.: 1200500736

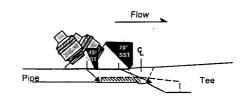
Scale: 100%

Page 2 of 2

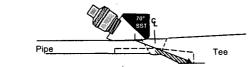
Diameter: 12"
Thickness: 0.28"
Material: S/S to CASS

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



Exam Coverage = 50% as per single sided access rules.



Best effort exam on far side of weld - no coverage credit taken.

## Responses to Request for Additional Information Summary No.: 310650 Comp ID: 12-SI-1214-12 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

Elbow to Valve / Due to taper on valve body no coverage was attainable from valve side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

## Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

## Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

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2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

**CCNPP** 

**Component ID:** 12-SI-1214-12 LTP No.: 310650

NDE Report No.: 20021BU002

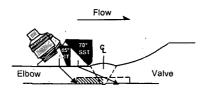
Coverage Sketch No: NA Exam Area: Lower Exam Angle: 45° / 70° **Summary No.:** 310650 MO No.: 1200100734

**Scale: 100%** 

Page 2 of 2

Diameter: 12" Thickness: 0.25" Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel



Exam Coverage = 50% as per single sided access rules.



Best effort exam on far side of weld - no coverage credit taken.

## Responses to Request for Additional Information Summary No.: 312250 Comp ID: 12-SI-1216-1 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

Tee to Pipe / Coverage limited by close proximity of intrados of Tee. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

## Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

## Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Responses

**CCNPP** 

**Component ID:** 12"-SI-1216-1

LTP No.: 312250

**Summary No.:** 312250

Coverage Sketch No: NA Exam Area: Lower Exam Angle: 45° / 70° NDE Report No.: 2004BU003

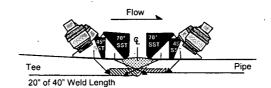
MO No.: 1200300696 **Scale: 100%** 

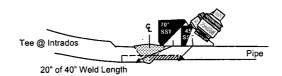
Page 2 of 2

Diameter: 12" Thickness: 0.25" Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)





Coverage Calc Exam Coverage Exam Ax Upst 100% 50% 100% Ax Dnst Circ Upst Circ Dnst

Total: 300% 75% Total / 4:

## Responses to Request for Additional Information Summary No.: 336200 Comp ID: 4-SI-1206-7 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

Valve to Pipe / Due to taper on valve body no coverage was attainable from valve side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical described barriers prohibiting access for placement of source, film, image quality indicator, etc.

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2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

## Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

CCNPP

Component ID: 4-SI-1206-7 LTP No.: 336200

NDE Report No.: 96-UT-1-14 **Summary No.: 336200** MO No.: 1199502020

**Scale:** 100%

Exam Area: Lower

Exam Angle: 45° / 70°

Diameter: 4" Thickness: 0.38"

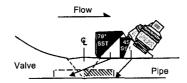
Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 2

(Sketch Resized for Relief Request)

Coverage Sketch No: NA



Exam Coverage = 50% as per single sided access rules.

## Responses to Request for Additional Information Summary No.: 338850 Comp ID: 4-SI-1209-1 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

Branch to Elbow / Due to taper on Branch Connection (nozzle) no coverage was attainable from Branch side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

**CCNPP** 

Component ID: 4-SI-1209-1

LTP No.: 338850

NDE Report No.: 2004BU005 **Summary No.:** 338850

Coverage Sketch No: NA

MO No.: 1200300689

Exam Area: Lower Exam Angle: 45°/70°

Scale: 100%

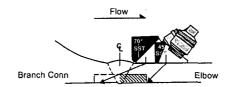
Diameter: 4" Thickness: 0.38"

Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 2

(Sketch Resized for Relief Request)



Exam Coverage = 50% as per single sided access rules.

## Responses to Request for Additional Information Summary No.: 416050 Comp ID: 12-SC-1213-1 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

Valve to Tee / Due to taper on valve body no coverage was attainable from valve side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

## Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

## Response:

**CCNPP** 

**Component ID: 12-SC-1213-1** LTP No.: 416050

NDE Report No.: CC08-1U-004 **Summary No.:** 416050

Coverage Sketch No: NA Exam Area: Lower Exam Angle: 70°

MO No.: 1200702211

Scale: 100%

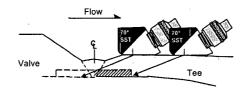
Diameter: 10" Thickness: 0.33"

Material: S/S

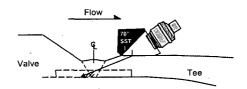
CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 2

(Sketch Resized for Relief Request)



Exam Coverage = 50% as per single sided access rules.



Best effort exam on far side of weld - no coverage credit taken.

## Responses to Request for Additional Information Summary No.: 417200 Comp ID: 10-SC-1214-1 Page 1 of 5

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

Tee to Pipe / Integral attachments on pipe side of weld in close proximity to weld obstructed transducer. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

## Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

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2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

## Response:

**CCNPP** 

Component ID: 10-SC-1214-1 LTP No.: 417200

NDE Report No.: 2004BU012 **Summary No.:** 417200

Coverage Sketch No: 1 Exam Area: Ax Upst Exam Angle: 45° / 70° MO No.: 1200300695

**Scale:** 100%

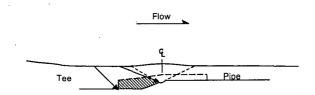
Diameter: 10"

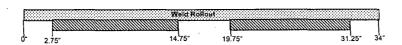
Thickness: 0.25" Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 5

(Sketch Resized for Relief Request)







Axial Exam Upstream = 63%

#### Calculation:

- Upstream exam box = (0.85 x 0.20) = 0.170 in²
- Examined 0.155 in<sup>2</sup> = 91%
- 91% (23.5" of 34" weld length) = 63%

**CCNPP** 

Component ID: 10-SC-1214-1 LTP No.: 417200

1214-1 NDE Report No.: 2004BU012 0 Summary No.: 417200

Coverage Sketch No: 2
Exam Area: Ax Dnst
Exam Angle: 45° / 70°

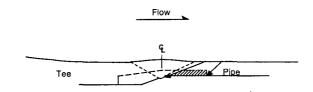
MO No.: 1200300695 Scale: 100% Diameter: 10"
Thickness: 0.25"

Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 3 of 5

(Sketch Resized for Relief Request)







Axial Exam Downstream = 46%

#### Calculation:

- Upstream exam box = (0.85 x 0.09) = 0.077 in²
- Examined 0.059 in<sup>2</sup> = 77%
- 77% (20.5" of 34" weld length) = 46%

**CCNPP** 

Component ID: 10-SC-1214-1 LTP No.: 417200

NDE Report No.: 2004BU012 Summary No.: 417200

Coverage Sketch No: 3 Exam Area: Circ Upst MO No.: 1200300695 Scale: 100%

Exam Angle: 45°

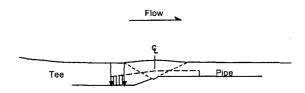
Diameter: 10" Thickness: 0.25"

Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 4 of 5

(Sketch Resized for Relief Request)





Circ Exam Upstream = 26%

#### Calculation:

- Upstream exam box = (0.85 x 0.20) = 0.170 in²
- Examined 0.063 in<sup>2</sup> = 37%
- 37% (23.5" of 34" weld length) = 26%

**CCNPP** 

Component ID: 10-SC-1214-1

NDE Report No.: 2004BU012

Coverage Sketch No: 4

LTP No.: 417200

**Summary No.: 417200** 

Exam Area: Circ Dnst Exam Angle: 45°

Scale: 100%

MO No.: 1200300695

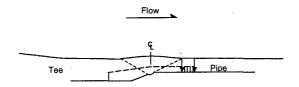
Diameter: 10" Thickness: 0.25"

Material: S/S

CC/S = Clad Carbon SteelS/S = Stainless Steel CASS = Cast Stainless Steel

Page 5 of 5

(Sketch Resized for Relief Request)







Circ Exam Downstream = 18%

#### Calculation:

- Upstream exam box = (0.85 x 0.09) = 0.077 in<sup>2</sup> Examined 0.023 in<sup>2</sup> = 30%
- 30% (20.5" of 34" weld length) = 18%

#### Coverage Calc

Exam Coverage 63% 46% Ax Upst Ax Dnst Circ Upst 26% Circ Dnst 18%

Total: Total / 4: 38%

# **ENCLOSURE 3**

Relief Request ISI-26 for CCNPP Unit 2 Class 1 Components

## Responses to Request for Additional Information Summary No.: 103080 Comp ID: 4-404 Page 1 of 8

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

PZR Surge Nozzle to Lower Head / Due to nozzle configuration coverage of nozzle side base metal and weld was limited. The pressure nozzle-to-vessel head welds are accessible only from the head side based on the nozzle curvature. The scanning surface of the nozzle is essentially perpendicular to the head surface which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The nondestructive examination (NDE) techniques and procedures used incorporated examination techniques qualified under Article 4 of Section V of the ASME Code as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

## Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

## Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

**CCNPP** 

Component ID: 4 ~ 404 LTP No.: 103080 NDE Report No.: 2001BU012 Summary No.: 103080

Coverage Sketch No: 1
Exam Area: Weld Metal

MO No.: 2200002409

Exam Angle: 45°

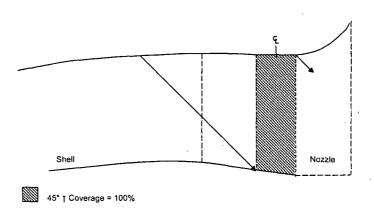
**Scale:** 50%

Diameter: On Head Thickness: 4.4"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 8



		Cove	rage Dimen	sions				l		Beam Di	rections		
				ž	4		Result				- VIII	1	
	Length	X	Width	X	Thickness	=	(Cub. In.)	Tow	ard Nozzle:	1			*****
Exam Area:	65.5		6.15	Service an experience construction	4.6	***************************************	1853	Away fr	om Nozzie:	Ţ		ģ. a 200 a	
Weld Metal:	65.5		1.55		4.6		467		Clockwise:	<b>←</b>			ļ
Base Metal:	65.5		4.6		4.6		1386	Counter	Clockwise:	<b>-</b> →			
							i					1	
	Weld Metal	: Volume =		Cubic Incl				Base Metal	Volume =		Cubic Inch		]
			Coverage	Beam	Percent of					Coverage	Beam	Percent of	
Beam No.	Angle	Sketch	(Cub. In.)	Total	467.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1386.00	
1	45°↑	1			100.00%		1	45°↑	6		-	71.00%	
2	45*↓	2			23.00%		2	60°†	7			80.00%	
3	f*00	3			100.00%	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	3	45°←	8			50.00%	, w., a., a.
4	60°1	4			13.00%	**************	4	45'→	8			50.00%	
5	45°←	5			100.00%		5	60°←	- 8			50.00%	
6	45°→	5			100.00%		6	60°→	8			50.00%	1
7	60°⊷	5			100.00%		7	0° WRV	8			50.00%	
8	60°→	5			100.00%							i	
9	0° WRV	5			100.00%						PRES 11-061-11-11-11-11-11-11-11-11-11-11-11-11-1		
										}		1	
													l
	<b></b>	*************		: h.,		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						ļ
	otal Beams:	9	To	tal Percent:	736.00%	.,	TC	tal Beams:	7	To	tal Percent:	401.00%	
		Tota	l Weld Meta	Coverage:	81.78%				Total	Base Metal	Coverage:	57.29%	
		1012	i TTOIG WIGIE	Coverage.	1 01.7078				10.00	Dugo Moto	Covolago.	1 01.2570	
į				·	Com	bined Cove	erage						
				Coverage			3	Total					Ī
				Percent	X	Volume	+	Volume	=	Result			
			Weld Metal:	81.78%	1	467.00	1	1853.00		20.61%		į	
			Base Metal:	57.29%	[	1386.00		1853.00		42.85%		,	:
		****			<b></b>		ļ <u>.</u>		,,				į
		l	1	}			<u>Te</u>	otal Exam C	overage =	63.46%		I	1

**CCNPP** 

Component ID: 4 - 404

LTP No.: 103080

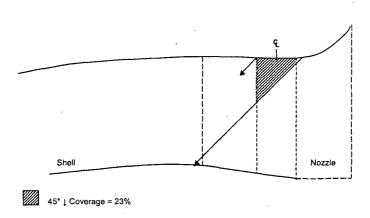
NDE Report No.: 2001BU012 Summary No.: 103080

Coverage Sketch No: 2 Exam Area: Weld Metal Exam Angle: 45° MO No.: 2200002409 **Scale:** 50%

Diameter: On Head Thickness: 4.4" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 3 of 8



		Cove	rage Dimen	sions						Beam D	irections	
		I		T	{		Result					
**	Length	X	Width	X	Thickness	=	(Cub. In.)	Tow	ard Nozzle:	1	**************************************	
Exam Area:	65.5	A COMMERCIA COMMERCIA	6.15		4.6		1853	Away fr	om Nozzle:	1	\$41446411111111111111111111111111111111	
Weld Metal:	65.5		1.55		4.6	 	467		Clockwise:	←		
Base Metal:	65.5		4.6		4.6		1386	Counter	Clockwise:	→.		
	Weld Metal	: Volume =	467.00	Cubic Inch	nes	İ	<del> </del>	Base Metal	: Volume =	1386.00	Cubic Incl	105
	1		Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Cub. In.)	Total	467.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1386.00
1	45°†	1			100.00%		1	45°↑	6			71.00%
2	45°1	2			23.00%	Diministrative Contract	2	60°↑	7			80.00%
3	60°†	3			100.00%	·	3	45°⊷	8			50.00%.
4	60°L	4			13.00%		4	45°→	8			50.00%
5	45°⊷	5			100.00%		5	60°←	8			50.00%
6	45°→	5			100.00%		6	60°→	8			50.00%
7	60°←	5			100.00%		7	0° WRV	8			50.00%
- 8	60°→	5			100.00%							
9	0° WRV	5			100.00%							
				<u> </u>	<b></b>							
T	otal Beams:	9	To	tal Percent:	736.00%		To	tal Beams:	7	То	tal Percent:	401.00%
		Tota	Weld Meta	Coverage:	81.78%				Total	Base Meta	Coverage:	57.29%
						bined Cove	1770					
				Coverage	Com	DINEG COVE	alage .	Total				<b></b>
-0.00	<u> </u>	******		Percent	†x	Volume	+	Volume		Result		
	·		Veld Metal:	81.78%	1	467.00	1	1853.00		20.61%	J	1
	1		Base Metal:			1386.00		1853.00		42.85%	***************************************	ģ
				ļ	ļ	i 	ļ				·*····································	
					i	<u> </u>	<u> To</u>	otal Exam C	overage =	63.46%		

**CCNPP** 

Component ID: 4-404

LTP No.: 103080

Coverage Sketch No: 3

Exam Area: Weld Metal Exam Angle: 60°

NDE Report No.: 2001BU012

Summary No.: 103080 MO No.: 2200002409

Scale: 50%

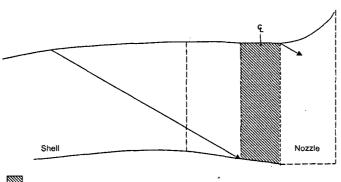
Diameter: On Head Thickness: 4.4"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 4 of 8

(Sketch Resized for Relief Request)



60° † Coverage = 100%

		Cove	rage Dimen	sions						Beam Di	rections	
	1				Ţ.		Result					
	Length	X	Width	X	Thickness	=	(Cub. In.)	Tow	ard Nozzle:	1		
Exam Area:	65.5	***************************************	6.15		4.6		1853	Away fr	om Nozzie:	1		1
Weld Metal:	65.5		1.55		4.6		467		Clockwise:	-		
Base Metal:	65.5		4.6		4.6		1386	Counter	Cłockwise:	<b>→</b>		
	Weld Metal	: Volume =	467.00	Cubic Incl	105		<del> </del>	Base Metal	: Volume =	1386.00	Cubic Incl	105
~	1		Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Cub. In.)	Total	467.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1386.00
	45°1	1	· · · · · · ·		100.00%		1	45°†	6			71.00%
2	45°1	2			23.00%		2	60°↑	7			80.00%
3	60°↑	3			100.00%		3	45°⊷	8			50.00%
4	60°1	4			13.00%		4	45°→	8			50.00%
5	45°⊷	5			100.00%		5	60°←	8			50.00%
6	45°→	5			100.00%		6	60°→	8			50.00%
7	60°←	5			100.00%		7	0° WRV	8			50.00%
8	60°→	5			100.00%	***************************************						
9	0° WRV	5			100.00%							
												<u></u>
Te	otal Beams:	9	То	tal Percent:	736.00%	·, , , ,	To	otal Beams:	7	To	tal Percent:	401.00%
		Tota	   Weld Metal	Coverage:	81.78%				Total	Base Metal	Coverage:	57.29%
i	ļ				Com	bined Cov	erage	*****				
		regarden er en en en en en en en en en en en en en		Coverage Percent	ļ	Volume	ļ	Total Volume		Result		
	ļ	],			X		ļ <u>T</u>					
	ļ		Neld Metal:		ļ	467.00		1853.00		20.61%		<b></b>
	ļ		Base Metal:	57.29%		1386.00	ļ	1853.00		42.85%		
	ł	261110000110011100111	l	***************************************	<del>†</del>	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Ť.	otal Exam C	overage =	63.46%		

CCNPP

Component ID: 4 - 404 LTP No.: 103080 NDE Report No.: 2001BU012

Coverage Sketch No: 4 Exam Area: Weld Metal

Exam Angle: 60°

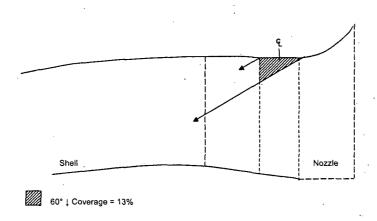
Summary No.: 103080

MO No.: 2200002409 **Scale:** 50%

Diameter: On Head Thickness: 4.4" Material: CC/S

> CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 5 of 8



		Cove	rage Dimen	sions						Beam Di	rections	
			i	}	1	1	Result					
***************************************	Length	X	Width	X	Thickness	=	(Cub. In.)	Tow	ard Nozzle:	1	*****************	
Exam Area:	65.5	MA-SOUTH STATE OF STA	6.15		4,6		1853	Away fr	om Nozzle:	1	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Weld Metal:	65.5		1.55		4.6	ļ	467		Clockwise:		*******************************	
Base Metal:	65.5		4.6		4.6		1386	Counter	Clockwise:	→ .		
								1				
	Weld Metal	: Volume =		Cubic Incl				Base Metal	Volume =		Cubic Incl	
			Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Cub. In.)	Total	467.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1386.00
	45°†	1			100.00%		1	45°↑	6			71.00%
2	_45°↓	2			23.00%	********	2	60°↑	7		-	80.00%
3	60°↑	3			100.00%		3	45°←	8		·	50.00%
4	60°↓	4 .			13.00%		4	45°→	8			50.00%
5	45° ←-	5 .		<u> </u>	100.00%	<u> </u>	5	60°←	8			50.00%
6	45°→	5			100.00%		6	60°→	. 8			50.00%
7	60°←	5			100.00%		7	0° WRV	8			50.00%
8	60°→	5	i		100.00%		[					
9	0° WRV	5			100.00%							
			-									
									***************************************			
	tal Beams:	9	To	tal Percent:	736.00%		To	otal Bearns:	7	To	tal Percent:	401.00%
		Tota	l Weld Meta	Coverage:	81.78%				Tota	Base Metal	Coverage:	57.29%
					1							
					Com	bined Cov	erage					
· James and the state of			y on our or or or or or or or or or or or or or	Coverage	<b></b>	La., ,,		Total	m money conversion		Superior Succession	
				Percent	X	Volume	+	Volume		Result		L
			Neld Metal:	81.78%	ļ	467.00		1853.00		20.61% -		į
			Base Metal:	57.29%	l	1386.00	ļ	1853.00		42.85%		ļ
				} 	ļ		7	otal Exam C	overage s	63.46%		ļ
	***************************************			5 	i karmummon on on mu	i Augustamanta	i	Otal Lixaiii C	Overage -	23,40 76	Amanuaara ar awa	

**CCNPP** 

Component ID: 4-404 LTP No.: 103080 Coverage Sketch No: 5 NDE Report No.: 2001BU012 Summary No.: 103080 MO No.: 2200002409

Scale: 50%

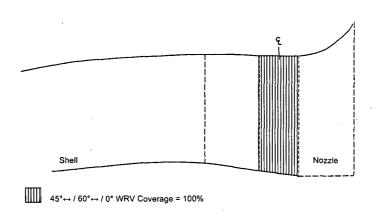
Exam Area: Weld Metal
Exam Angle: 45° / 60° / 0° WRV

Diameter: On Head Thickness: 4.4" Material: CC/S

CC/S = Clad Carbon Steel

S/S = Stainless Steel CASS = Cast Stainless Steel

Page 6 of 8



			Cover	rage Dimen	sions				ľ		Beam Di	rections		
Ī				,,, ,	<u> </u>			Result						
	1	Length	X	Width	X	Thickness	=	(Cub. In.)		vard Nozzle:				
Exam	Area:	65.5		6.15		4.6		1853	Away f	rom Nozzle:				
Weld I	Metal:	65.5		1.55		4.6		467		Clockwise:				
Base I	Metal:	65.5		4.6	3	4.6		1386	Counte	r Clockwise:	<b>→</b>			
·····		Wold Motal	: Volume =	467.00	Cubic Inch	108	······································	<del></del>	Rase Meta	i: Volume =	1386.00	Cubic Inch	108	
<del>}</del> -		ridio metal	. volume -	Coverage	Beam	Percent of			i Daso mora	i. votamo -	Coverage	Beam	Percent of	
Bear	m No. I	Angle	Sketch	(Cub. In.)	Total	467.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1386.00	
0001	1 10.	45°↑	1	(000.111.)	TOTAL	100.00%		1	45°↑	6	(Oub. Will	10.01	71.00%	
	<del>;</del>	45°	2			23.00%		2	60°↑	7			80.00%	
	3	60°1	3			100.00%	************	3	45°←	8			50.00%	
	4	60°	4			13.00%		4	45°→	8			50.00%	room com
	<del>}</del>	45°←	5	<del></del>	<del></del>	100.00%		5	60°←	8		·	50.00%	
	<u> </u>	45°-→	5		····	100.00%		6	60°→	8			50.00%	
<del> </del>	<del>}  </del>	60°⊷	5	· · · · · ·	<del> </del>	100.00%		7	0° WRV	8			50.00%	
	i I	60°→	5		· · · · · · · · · · · · · · · · · · ·	100.00%	***************************************	<del> </del>					- 50.0070	*****
	<del>§ -</del> 1	0° WRV	5			100.00%	g.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			d	*****************			
		0			·	100.0070				<b>†</b>			<u> </u>	
	To	tal Beams:	9	То	tal Percent:	736.00%		To	tal Beams:	7	To	tal Percent:	401.00%	
			Total	Weld Meta	Coverage:	81.78%				Tota	Base Metal	Coverage:	57.29%	
	-		1		1					1				
						Com	bined Cove	erage				~~~~~~~~~		
		eto eta unta un tra eta eta un			Coverage				Total				<u> </u>	arra ra ra
					Percent	X	Volume	+	Volume		Result			
				Veld Metal:	81.78%		467.00		1853.00	.ļ	20.61%		ļļ.	
			E	Base Metal:	57.29%		1386.00	į	1853.00	. <b></b>	42.85%		ļ	
					; ; ;	10-10-10-1		To	otal Exam	Coverage =	63.46%	***************************************		
,	·····	anger dan i i stra di in propo e stro	************			*********		······································		· · · · · · · · · · · · · · · · · · ·		ATT. 1 MO. 1 MATERIAL TO 11 O.	\$1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	*******

**CCNPP** 

Component ID: 4 - 404

LTP No.: 103080

Coverage Sketch No: 6

Exam Area: Base Metal Exam Angle: 45°

NDE Report No.: 2001BU012

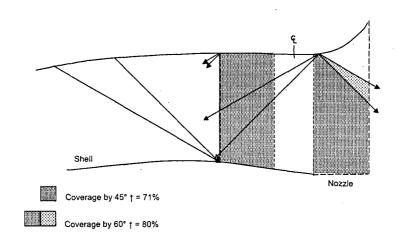
**Summary No.:** 103080 MO No.: 2200002409

**Scale:** 50%

Diameter: On Head Thickness: 4.4" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 7 of 8



		Cove	rage Dimen	sions				1		Beam Di	rections		
			1		1	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Result						
~~~	Length	×	Width	×	Thickness	=	(Cub. In.)	Tow	ard Nozzle:	Î			·
Exam Area	65.5		6.15	THE RESERVE AND ADDRESS OF	4.6	A IS FORE CONTRACTOR COMM	1853	. Away fr	om Nozzie:	1			rice and
Weld Metal	65.5		1.55		4.6		467		Clockwise:	<del></del>			•
Base Metal	65.5		4.6		4.6		1386	Counter	Clockwise:	<b>→</b>			
········	Weld Metal	: Volume ≈	467.00	Cubic Incl	nes			Base Metal	: Volume =	1386,00	Cubic Incl	nes	America
	1		Coverage	Beam	Percent of			1		Coverage	Beam	Percent of	********
Beam No	Angle	Sketch	(Cub. In.)	Total	467.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1386.00	
1	45°1	1			100.00%		1	45°↑	6	3000000		71.00%	• • • • • • • • • • • • • • • • • • • •
2	45°	2	<b></b>		23.00%		2	60°†	7			80.00%	
3	60°†	3 .			100.00%		3	45°←	8			50.00%	*******
4	60°	4			13.00%		4	45°→	8			50.00%	
5	45°⊷	5			100.00%		5	60°←	8			50.00%	***************************************
6	45°→	5			100.00%		6	60°→	8			50.00%	····
7	60°←	5			100.00%	··········	7	0° WRV	8			50.00%	
8	60°→	5			100.00%	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		1				1 10.00.0	********
9	0° WRV	5			100.00%	~~,~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		<b></b>		************	***		
								ļ		····			
	<del> </del>		<u> </u>					<b></b>					
	otal Beams:	9	То	tal Percent:	736.00%		To	otal Beams:	7	To	tal Percent:	401.00%	
		Tota	i I Weld Meta	Coverage:	81.78%			ł	Total	Base Meta	Coverage:	57.29%	
	<u> </u>		!		Com	bined Cov	erage	<u> </u>		<u> </u>			
····	· [		1	Coverage	1 00111		1	Total			***************************************	·	,,,,,,,
	**	C		Percent	* ×	Volume	·	Volume	***************************************	Result	***************************************		amir.
	·		Neld Metal:	81.78%	<b>†</b>	467.00	1	1853.00		20.61%			
			Base Metal:	57.29%	· · · · · ·	1386.00		1853.00		42.85%		1	
					ģ					02.4007			~~~~
			I		<b></b>		<u> </u>	otal Exam C	overage =	63.46%	***************************************	Ļ	

**CCNPP** 

Component ID: 4 - 404 LTP No.: 103080 Coverage Sketch No: 7

EXAM Area: Base Metal

NDE Report No.: 2001BU012 Summary No.: 103080

MO No.: 2200002409 Scale: 50% Diameter: On Head

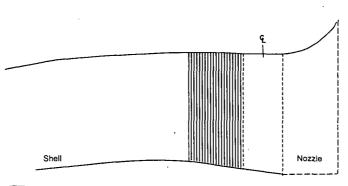
Thickness: 4.4" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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(Sketch Resized for Relief Request)

Exam Angle: 45° / 60° / 0° WRV



45° ↔ / 60° ↔ / 0° WRV Coverage = 50%

		Cove	rage Dimen	sions						Beam D	rections		
		and the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of th		,			Result					İ	
·····	Length	×	Width	×	Thickness	=	(Cub. In.)		ard Nozzle:				
Exam Area:	65.5		6.15		4.6		1853		om Nozzle:	1			
Weld Metal:	65.5		1.55		4.6		467		Clockwise:				
Base Metal:	65.5		4.6		4.6		1386	Counter	Clockwise:	<b>→</b>			
	Weld Metal	: Volume =	467.00	Cubic Inch	les	OCAN SAN SANOON, A PROCESSOR AND	<u></u>	Base Metal	: Volume ≃	1386.00	Cubic Inch	105	<u> </u>
			Coverage	Beam	Percent of			1		Coverage	Beam	Percent of	***************************************
Beam No.	Angle	Sketch	(Cub. In.)	Total	467.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1386.00	
1	45°t	1			100.00%		1	45°↑	6			71.00%	1
2	45°1	2			23.00%	111111111111111111111111111111111111111	2	60°↑	7			80.00%	1
3	60°†	3			100.00%	20, 1 100. 1 201.00000000000000000000000000	3	45°⊷	8			50.00%	724447000000
4	60°1	4			13.00%		4	45°→	8			50.00%	1
5	45°←	5			100.00%		5	60°⊷	8			50.00%	1
6	45°	5			100.00%		6	60°→	8			50.00%	1
7	60*←	5			100.00%		7	0° WRV	8			50.00%	
8	60°→	5			100.00%								
9	0° WRV	5			100.00%								
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	ļ		Base Metal:	57.29%		1386.00		1853.00		42.85%			
	<b></b>					A.11.7. A.1.170. A.A.1800	1	otal Exam (	Coverage =	63.46%		<b></b>	<u>                                     </u>

## Responses to Request for Additional Information Summary No.: 103090 Comp ID: 4-405 Page 1 of 8

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

PZR Spray Nozzle to Upper Head / Due to nozzle configuration coverage of nozzle side base metal and weld was limited. The pressure nozzle-to-vessel head welds are accessible only from the head side based on the nozzle curvature. The scanning surface of the nozzle is essentially perpendicular to the head surface which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The nondestructive examination (NDE) techniques and procedures used incorporated examination techniques qualified under Article 4 of Section V of the ASME Code as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

## Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

## Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

.:d+

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

**CCNPP** 

Component ID: 4 - 405 LTP No.: 103090

4 - 405 NDE Report 103090 Summary

Coverage Sketch No: 1
Exam Area: Weld Metal 360°

Exam Angle: 45°

NDE Report No.: 2001BU020 Summary No.: 103090

MO No.: 2200002409

Scale: 50%

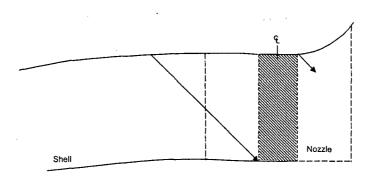
Diameter: On Head Thickness: 4.4"

Thickness: 4.4"
Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 8

(Sketch Resized for Relief Request)



45°† Coverage = 380 in³ of 380 in³ exam area = 100%

		Cove	rage Dimen	sions				l		Beam D	irections		
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2	45°1	2	65.50	65.50	17.24%		1+2	45°/60°†↓	6	950.10	950.10	90.14%	
3	60°†	3	380.00	380.00	100.00%	********	3	45°⊷	7	625.01	625.01	59.30%	·····
4	60°1	4	39.50	39.50	10.39%		4	45°→	7	625.01	625.01	59.30%	
5	45°⊷	5	380.00	380.00	100.00%		5	60*←	7	625.01	625.01	59.30%	1
6	45°	5	380.00	380.00	100.00%		6	60°→	7	625.01	625.01	59.30%	1
7	60°←	5	380.00	380.00	100.00%		7	0° WRV	7	625.01	625.01	59.30%	1
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**CCNPP** 

Component ID: 4 ~ 405

LTP No.: 103090 Summary No.: 103090

Coverage Sketch No: 2 Exam Area: Weld Metal 360°

Exam Angle: 45°

NDE Report No.: 2001BU020

MO No.: 2200002409

**Scale:** 50%

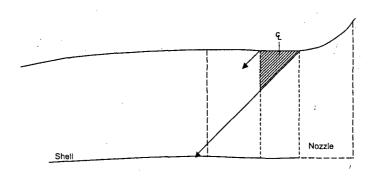
Diameter: On Head

Thickness: 4.4" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 3 of 8

(Sketch Resized for Relief Request)



45°↓ Coverage = 65.5 in³ of 380 in³ exam area = 17.24%

		Cove	rage Dimen	sions		•				Beam Di	rections		
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4	60"	4	39.50	39.50	10.39%		4	45°→	7	625.01	625.01	59.30%	1
- 5	45'←	5	380.00	380.00	100.00%		5	60°←	7	625.01	625.01	59.30%	!
6	45*	5	380.00	380.00	100.00%		6	60°→	7	625.01	625.01	59.30%	1
7	60*	5	380.00	380.00	100.00%		7	0° WRV	7	625.01	625.01	59.30%	
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**CCNPP** 

Component ID: 4-405

LTP No.: 103090

Summary No.: 103090

Coverage Sketch No: 3

Exam Area: Weld Metal 360°

Exam Angle: 60°

NDE Report No.: 2001BU020

MO No.: 2200002409

Scale: 50%

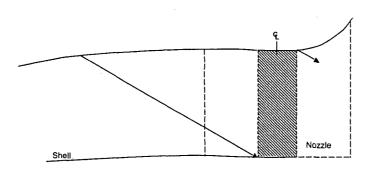
Diameter: On Head Thickness: 4.4"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 4 of 8

(Sketch Resized for Relief Request)



60°† Coverage = 380 in³ of 380 in³ exam area = 100%

		Cove	rage Dimen	sions				i		Beam Di	rections	
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**CCNPP** 

Component ID: 4 - 405

LTP No.: 103090

NDE Report No.: 2001BU020 Summary No.: 103090

Coverage Sketch No: 4

Exam Area: Weld Metal 360° Exam Angle: 60°

MO No.: 2200002409

Scale: 50%

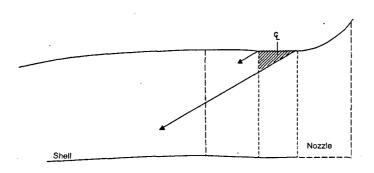
Diameter: On Head

Thickness: 4.4" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 5 of 8

(Sketch Resized for Relief Request)



60°! Coverage = 39.5 in³ of 380 in³ exam area = 10.39%

		Cave	rage Dimen	sions				l		Beam D	irections		or construence of
					į.		Result						
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Base Metal:	57		4.3		4.3		1054.00	Counter	Clockwise:	<b>→</b>			
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		~			<u> </u>	den monte menten	<u> </u>	otal Exam C	overage =	71.49%	****		

**CCNPP** 

Component ID: 4 - 405

LTP No.: 103090

Coverage Sketch No: 5

Exam Area: Weld Metal 360° Exam Angle: 45° / 60° / 0° WRV

NDE Report No.: 2001BU020 Summary No.: 103090

MO No.: 2200002409

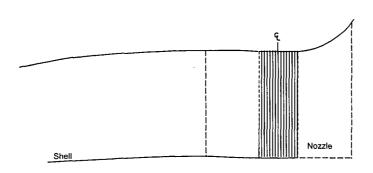
Scale: 50%

Page 6 of 8

Diameter: On Head Thickness: 4.4" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° ↔ / 60° ↔ / 0° WRV · Coverage = 380 in³ of 380 in³ exam area = 100%

		Cove	rage Dimen	sions						Beam Di	rections		
							Result					i	
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Base Metal:	57		4.3		4.3		1054.00	Counter	Clockwise:	<b>→</b>			į
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	Weld Metal	: Volume ≠		Cubic Inch			<u> </u>	Base Metal:	Volume =		Cubic Inch		
			Coverage	Beam	Percent of					Coverage	Beam	Percent of	
Beam No.	Angle	Sketch	(Cub. In.)	Total	380.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1054.00	ļ
	45°↑	1	380.00	380.00	100.00%		1+2	45°/60°11	6	950.10	950.10	90.14%	
2	45*1	2	65.50	65.50	17.24%							90.14%	]
3	60°†	3	380.00	380.00	100.00%		3	45°⊷	7	625.01	625.01	59.30%	
4	60°1	4	39.50	39.50	10.39%		4	45°	7	625.01	625.01	59.30%	
5	45°←	5	380.00	380.00	100.00%		5	60*⊷	7	625.01	625.01	59.30%	]
6	45°→	5	380.00	380.00	100.00%		6	60°→	7	625.01	625.01	59.30%	
7	60°←	5	380.00	380.00	100.00%	J. 1007101-7110-111111	7	0° WRV	7	625.01	625.01	59.30%	
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		Tota	Weld Meta	Coverage:	80.85%				Tota	Base Meta	Coverage:	68.11%	]
	<b>}</b>			!	Com	bined Cove	rage	<u> </u>				ļ	ļ
····	<del> </del>		-	Coverage	1			Total					å
*******		**************		Percent	×	Volume	+	Volume		Result	A		Marin
	1	······	Neld Metal:	80.85%	{	380.00		1434.00	,	21.42%		ſ	
		<u> </u>	Base Metal:	68.11%	• · · · · · · · · · · · · · · · · · · ·	1054.00		1434.00	•••••	50.06%		†	
						********				74 400/			ļ
	Į ,		i toronomentario	ir Dan ein eine eine neuen aus eine eine eine eine eine eine eine ein	\$ 		<u> 1</u>	otal Exam C	overage =	71.49%		951501060007	

**CCNPP** 

Component ID: 4-405

LTP No.: 103090

NDE Report No.: 2001BU020

Coverage Sketch No: 6 Exam Area: Base Metal 360°

Exam Angle: 45° / 60° Summary No.: 103090

MO No.: 2200002409 **Scale:** 50%

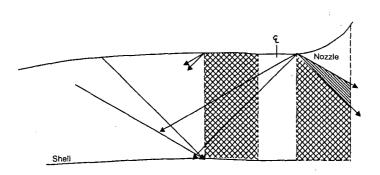
Diameter: On Head Thickness: 4.4"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 7 of 8

(Sketch Resized for Relief Request)



Coverage by at least 2 sound beams = 922.26 in<sup>3</sup> of 1054 in<sup>3</sup> exam area = 87.50%.

Coverage by 1 sound beam only = 55.68 in<sup>3</sup> of 1054 in<sup>3</sup> exam area = 5.28%.

Total:  $922.26 + (55.68 / 2) = 950.10 \text{ in}^3 \text{ of } 1054 \text{ in}^3 \text{ exam area} = 90.14\%.$ 

			Cove	rage Dimen	sions						Beam D	rections		
								Result	1					
••••••		Length	×	Width	X	Thickness	=	(Cub. ln.)		ard Nozzie:	1			
····	Exam Area:	57		5.85		4.3		1434.00		om Nozzle:	Ţ			
	Weld Metal:			1.55		4.3		380.00		Clockwise:				
	Base Metal:	57		4.3		4.3		1054.00	Counter	Clockwise:	<b>→</b>			
	· <del> </del>	Weld Metal	· Volume =	380.00	Cubic Inch	00	· · · · · · · · · · · · · · · · · · ·	<del></del>	Base Metal	· Volume =	1054 00	Cubic Incl	108	
	· <del> </del>	FICIU INCLAI	. voiding -	Coverage	Beam	Percent of	***************************************	<del></del>	I I I I I I I I I I I I I I I I I I I	· · · · · · · · · · · · · · · · · · ·	Coverage	Beam	Percent of	
	Beam No.	Angle	Sketch	(Cub. In.)	Total	380.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1054.00	
	1	45°↑	1	380.00	380.00	100.00%							90.14%	
	2	45°	2	65.50	65.50	17.24%	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	1+2	45°/60°†↓	6	950.10	950.10	90.14%	
*************	3	60°1	3	380.00	380.00	100.00%	***************************************	3	45°⊷-	7	625.01	625.01	59 30%	***********
	4	60°	4	39.50	39.50	10.39%	and committees where offer	4	45°-→	7	625.01	625.01	59.30%	*********
	5	45°⊷	5	380.00	380.00	100.00%		5	60°←	7	625.01	625.01	59.30%	
	6	45°→	5	380.00	380.00	100.00%		6	60°→	7	625.01	625.01	59.30%	
	7	60°↔	5	380.00	380.00	100.00%		7	0° WRV	7	625.01	625.01	59.30%	
	8	60°→	5	380.00	380.00	100.00%								***********
	9	0° WRV	5	380.00	380.00	100.00%					, , , , , , , , , , , , , , , , , , , ,	1		- Annual Control
										,,,,,,,				
			w.v						<u> </u>					
	T	otal Beams:	9	To	tal Percent:	727.63%		T	otal Beams:	7	То	tal Percent:	476.78%	
			Tota	I Weld Meta	Coverage:	80.85%	.,,		<u> </u>	Tota	Base Meta	l Coverage:	68.11%	
				<u> </u>		Com	bined Cov	07200	1			<b>.</b>	ļ	·*************************************
	<del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>	<b></b>		<del></del>	Coverage	Com	Diried COV	i	Total				***************************************	
	*********			*******************	Percent	X	Volume	+	Volume	50-1, <b></b>	Result			
*******				Weld Metal:			380.00	·	1434.00		21.42%			
	1			Base Metal:	68.11%		1054.00		1434.00		50.06%			
······································	ļ					ļ		T	otal Exam C	overage =	71,49%		<u> </u>	
······································				·		!m		· · · · · · · · · · · · · · · · · · ·	1			***************************************	\$	~~~~~

**CCNPP** 

Component ID: 4 - 405

LTP No.: 103090 Coverage Sketch No: 7

> Exam Area: Base Metal 360° Exam Angle: 45° / 60° / 0° WRV

NDE Report No.: 2001BU020

**Summary No.:** 103090 **MO No.:** 2200002409

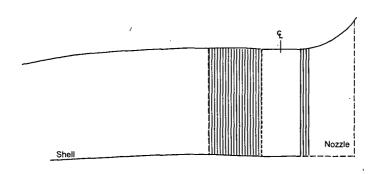
Scale: 50%

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Diameter: On Head Thickness: 4.4" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° ↔ / 60° ↔ / 0° WRV Coverage = 625.01 in of 1054 in exam area = 59.30%

			Cove	rage Dimen	Beam Directions									
			1	1				Result					1	
***************************************	***************************************	Length	×	Width	×	Thickness	=	(Cub. In.)	Tow	ard Nozzle:	1			
	Exam Area:	57		5.85	30	4.3		1434.00	Away fr	om Nozzle:	Į.		1	
	Weld Metal:	57		1.55		4.3		380.00		Clockwise:	<b>←</b> -			
	Base Metal:	57		4.3		4.3		1054.00	Counter	Clockwise:				
	<u>L</u>					1			<u>.                                    </u>				)	
		Weld Metal	: Volume ≃		Cubic Incl				Base Metal	: Volume =		Cubic Incl		
				Coverage	Beam	Percent of		<u></u>	<u> </u>		Coverage	Beam	Percent of	
	Beam No.	Angle	Sketch	(Cub. In.)	Total	380.00		Beam No.	Angle	Sketch	(Cub. In.)	Total	1054.00	
		45°†	1	380.00	380.00	100.00%		1+2	45°/60°11	6	950.10	950.10	90.14%	
·····	2	45°1	2	65.50	65.50	17.24%			L		_		90.14%	
m. mm chhairm	3	60°↑	3	380.00	380.00	100.00%	pp. cycle accomplication in the	3	45°←	7	625.01.	625.01	59.30%	
	4	60°↓	4	39.50	39.50	10.39%		4	45°→	7	625.01	625.01	59.30%	
	5	45*←	5	380.00	380.00	100.00%		_ 5	60°←	7	625.01	625.01	59.30%	
	6	45°→	5	380.00	380.00	100.00%		6	60°→	7	625.01	625.01	59.30%	
	7	60°←	5	380.00	380.00	100.00%		7	0° WRV	7	625.01	625.01	59.30%	
	8	_60°	5	380.00	380.00	100.00%			L				L	
	9	0° WRV	5	380.00	380.00	100.00%	.,,,,,							
				ļ		<b></b>			ļ					**************
				ļ	}				ļ			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	ļ	
	To	tal Beams:	9	То	tal Percent:	727.63%		To	otal Beams:	7	To	tal Percent:	476.78%	
	<u>L</u>		Tota	l Weld Meta	Coverage:	80.85%				lota	Base Meta	Coverage:	68.11%	
14.48			<u></u>	<u>!</u>		Com	bined Cove	erage						
***************************************	~^~~~~~~	*********		i	Coverage			T	Total			***************************************		
· · · · · · · · · · · · · · · · · · ·					Percent	X	Volume	+	Volume	=	Result		i	
		·		Weld Metal;	80.85%		380.00		1434.00		21.42%		ļ	
	i			Base Metal:	68.11%		1054.00		1434.00		50.06%			
								<b></b>	atal Evar- 1		74 400/		ļ	
						<b></b>		<u> </u>	otal Exam C	overage =	/1.49%	*>**********		

## Responses to Request for Additional Information Summary No.: 103100 Comp ID: 16-405A Page 1 of 9

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

Safety & Relief "A" Nozzle to Upper Head / Due to nozzle configuration coverage of nozzle side base metal and weld was limited. The nozzle enters the vessel at an angle thereby also limiting coverage attainable from the vessel side of the weld. The pressure nozzle-to-vessel head welds are accessible only from the head side based on the nozzle curvature. The scanning surface of the nozzle is essentially perpendicular to the head surface which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The nondestructive examination (NDE) techniques and procedures used incorporated examination techniques qualified under Article 4 of Section V of the ASME Code as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

**CCNPP** 

Component ID: 16-405A

LTP No.: 103100

Summary No.: 103100

Coverage Sketch No: 1 Exam Area: Weld Metal 360°

Exam Angle: 45°

NDE Report No.: 2003BU041

MO No.: 2200201399

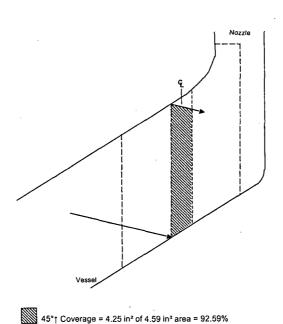
Scale: 50%

Diameter: 96" Thickness: 5.0"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 9



		Cove	rage Dimen	1		Beam D	irections					
T		***************************************		1	}		Result				·····	
	Length	X	Width	X	Thickness	=	(Squ. In.)	Tow	ard Nozzie:	1	************	
Exam Area:	23		5.6		See Sketch		26.85	Away f	om Nozzle:	1	***************************************	į
Weld Metal:	23		1	}	See Sketch		4.59		Clockwise:	<del></del>		
Base Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>-</b>		
<del> </del>	Weld Metal	: Volume =	4,59	Square Inc	hes		<del> </del>	Base Meta	: Volume =	22.26	Square Inc	thes
	-		Coverage	Beam	Percent of			ī		Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26
1	45°†	1	4.25	4.25	92.59%		-	151000			40.00	81.22%
2	45°1	2	0.00	0.00	0.00%		1+2	45°/60°↑↓	6	18.08	18.08	81.22%
3	60°↑	3	4.06	4.06	88.45%		3	45°←	7	10.53	10.53	47.30%
4	60°L	4	0.00	0.00	0.00%	- co co person de consciención con	4	45°	7	10.53	10.53	47.30%
5	45°←	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%
6	45°→	5	1,38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%
7	60°	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%
8	60°→	5	1.38	1.38	30.07%	~~~~						
9	0° WRV	5	1.38	1.38	30.07%	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		1				
				***************************************				ļ	<u> </u>	······································		
TO	tal Beams:	9	10	tal Percent:	331.37%			otal Beams:			tal Percent:	398.97%
		Tota	Weld Meta	Coverage:	36.82%				Total	Base Meta	Coverage:	57.00%
					Com	bined Cov	erage	1	<u> </u>			
				Coverage				Total				
1				Percent	, x	Volume	+	Volume	=	Result		
			Veld Metal:	36.82%	1	4.59	1	26.85	L	6.29%	<b>.</b>	ļ
			Base Metal:	57.00%	ļ	22.26	ļ	26.85		47.25%		I
			erek era erasik ala (m. /ferro)		<u></u>		т	otal Exam (	Coverage =	53.55%		ļ

**CCNPP** 

Component ID: 16-405A

LTP No.: 103100

NDE Report No.: 2003BU041 Summary No.: 103100

Coverage Sketch No: 2
Exam Area: Weld Metal 360°

Exam Angle: 45°

MO No.: 2200201399

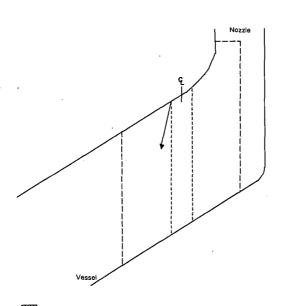
Scale: 50%

Page 3 of 9

Diameter: 96"
Thickness: 5.0" ·
Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45°1 Coverage = 0 in² of 4.59 in² area = 0%

		Cove	rage Dimen	sions	Beam Directions								
	,	**		, , , , , , , , , , , , , , , , , , ,	-		Result				3		
	Length	X	Width	X	Thickness	=	(Squ. In.)	Tow	ard Nozzie:	1			
Exam Area:	23	*********	5.6		See Sketch		26.85	Away fre	om Nozzie:		\$,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	1	
Weld Metal:	23		1		See Sketch		4.59		Clockwise:	-	¥		
Base Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	>			
	Weld Metal	: Volume n	4.60	Square Inc	abac .			Base Metal:	Volume =	22.26	Sguare Inc	hoe	
·····	Weld Metal	; volume =	Coverage	Beam	Percent of	**************************************	<del></del>	Dase metal.	Votutile -	Coverage	Beam	Percent of	
Beam No.	Amelo	Sketch		Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	
Beam No.	Angle 45°↑	Sketch	(Squ. In.)	4.25	92.59%		Beant NO.	Arigie	SKelch	(340.111.)	TULAI	81.22%	
		1	4.25				1+2	45°/60°†↓	6	18.08	18.08		
2	45°↓	2	0.00	0.00	0.00%			45°←		10.52	10.53	81.22%	
3	60°†	3	4.06	4.06	88.45%		3		<del></del>	10.53		47.30%	************
4	60°1	4	0.00	0.00	0.00%			45°→ 60°←		10.53	10.53	47.30%	
5	45°←	5	1.38	1.38	30.07%		5			10.53	10.53	47.30%	.,
6	45°→	5	1.38	1.38	30.07%		6 7	60°→	<u> </u>	10.53	10.53	47.30%	
7	60°←	5	1.38	1.38	30.07%		/	0° WRV		10.53	10.53	47.30%	
8	60°→	5	1:38	1.38	30.07%	name on compa		1			<u> </u>		
9	0° WRV	5	1.38	1.38	30.07%			ļ			<u>.</u>		
							.,	<b> </b>			}		
								<b> </b>			<u> </u>	<u> </u>	
To	tal Beams:	9	To	tal Percent:	331.37%		To	otal Beams:	7	То	tal Percent:	398.97%	
		Tota	I Weld Metal	Coverage	36.82%				Total	Base Meta	l Coverage:	57.00%	
		1012	1 11010 111010	Corolago.	00.52.76			í .		1		011111	
						bined Cove	erage						
				Coverage		ma, i, i , normenem		Total					<u> </u>
			1	Percent	X	Votume	+	Volume	2	Result		<u> </u>	(
			Weld Metal:	36.82%		4.59	1	26.85		6.29%		L	
			Base Metal:	57.00%	<b></b>	22.26		26.85	,	47.25%			
	MARIN 1001 100 1000 1000 1000 1000 1000 100			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<u> </u>			otal Exam C	overage P	53.55%	\$41.0 (1014101100000000000000000000000000000	100 C 111 1 101 101 101 101 101 101 101	
							3	U.U AUIII U	0,0,2Hn -	<u>22,00 /g</u>		·	100 (01/00/2000 to 00

**CCNPP** 

Component ID: 16-405A

LTP No.: 103100

Coverage Sketch No: 3 Exam Area: Weld Metal 360°

Exam Angle: 60°

NDE Report No.: 2003BU041

Summary No.: 103100 MO No.: 2200201399

Scale: 50%

Diameter: 96"

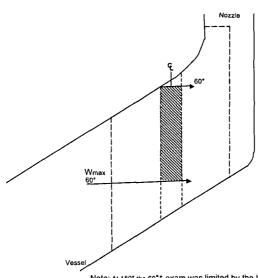
Thickness: 5.0" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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. ( )

(Sketch Resized for Relief Request)



Note: At 180° the 60°↑ exam was limited by the head to shell transition.

60°† Coverage @ 180° quadrant, Wmax limited by head to shell transition. = 3.23 in²

Coverage in remaining 3 quadrants = 4.34 in² Average = (3.23 + 4.34 + 4.34 + 4.34) / 4 = 4.06 in² 4.06 in² of 4.59 in² exam area = 88.45%

			Cove	rage Dimen	sions				1		Beam Di	irections		
	***** G	T			Ĭ		***************************************	Result						
		Length	X	Width	X	Thickness	=	(Squ. In.)		ard Nozzie:				
Exam		23		5.6		See Sketch	······································	26.85		om Nozzle:				
Weld	Metal:			1		See Sketch		4.59		Clockwise:				
Base	Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>			
		Weld Metal	· Volume =	4.59	Square Inc	hes		<del></del>	Base Metal	: Volume =	22.26	Square Inc	hes	
		TTCIG INCIAL	· voianio -	Coverage	Beam	Percent of			1	10,0,0	Coverage	Beam	Percent of	
Bea	m No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	
	1	45°↑	1	4.25	4.25	92.59%							81.22%	
<del></del>	2	45°1	2	0.00	0.00	0.00%		1+2	45°/60°†↓	6	18.08	18.08	81,22%	
	3	60°t	3	4.06	4.06	88.45%		3	45*←	7	10.53	10.53	47.30%	~~~
	<u> </u>	60.1	4	0.00	0.00	0.00%		1 4	45°→	7	10.53	10.53	47.30%	
	5	45°←	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%	
	6	45*→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%	
	7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%	
	8	60°→	5	1.38	1.38	30.07%	*****************	·	1					******
	9	0° WRV	5	1.38	1.38	30.07%				m				~~~~
					· · · · · · · · · · · · · · · · · · ·						,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	.,		
	To	otal Beams:	9	То	tal Percent:	331.37%		To	tal Beams:	7	To	tal Percent:	398.97%	V0780.608
	****************		Tota	Weld Meta	Coverage:	36.82%				Total	Base Meta	Coverage:	57.00%	
						Com	bined Cov	erage				İ		
					Coverage				Total					
				1	Percent	X	Volume	+	Volume	=	Result			
			Į.	Neld Metal:	36.82%	1	4.59	1	26.85		6.29%	ł		
				Base Metal:	57.00%		22.26		26.85		47.25%			
						ļ	A	<u> </u>	otal Exam C	overage =	53.55%			
	********	å				<b>1</b>		· · · · · · · · · · · · · · · · · · ·	1			A		

**CCNPP** 

Component ID: 16-405A

LTP No.: 103100

Coverage Sketch No: 4 Exam Area: Weld Metal 360°

Exam Angle: 60°

NDE Report No.: 2003BU041

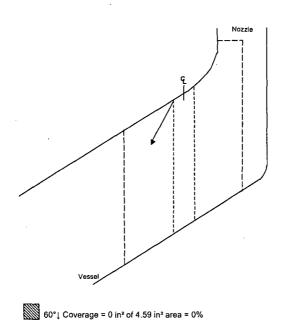
Summary No.: 103100 MO No.: 2200201399

**Scale:** 50%

Diameter: 96" Thickness: 5.0"

Material: CC/S CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 5 of 9



		Cove	rage Dimen	sions				i		Beam D	irections	
	1		I	3			Result		Maccon 100 111 111 111 111 111 111 111 111 11	1		i
***************************************	Length	X	Width	X X	Thickness	÷	(Squ. In.)	Tow	ard Nozzle:	Ĩ Ť		
Exam Area:	23	*************	5.6	\$	See Sketch		26.85	Away fr	om Nozzle:	1		
Weld Metal:	23		1 1	)	See Sketch		4.59		Clockwise:	<b>←</b>		
Base Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	-		
<del></del>	Weld Metal	: Volume =	4.59	Square Inc	hes			Base Metal	Volume =	22.26	Square Inc	hes
			Coverage	Beam	Percent of	240000000000000000000000000000000000000		1		Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26
1	45°↑	1	4.25	4.25	92.59%		1+2	45°/60°11	6	18.08	18.08	81.22%
2	45°1	2	0.00	0.00	0.00%							81.22%
3	60°†	3	4.06	4.06	88.45%		3	45°←	7	10.53	10.53	47.30%
4	60°↓	4	0.00	0.00	0.00%	Condesion of the condesion of the	4	45°→	7	10.53	10.53	47.30%
5	45°←	5	1.38	1.38	30.07%		5	60*←	7	10.53	10.53	47.30%
6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%
7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%
8	60°→	5	1.38	1.38	30.07%							
9	0° WRV	5	1.38	1.38	30.07%	-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1						
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~ r	otal beams.	<b>—</b>		lai Fercent.	331.3776	A.,	***************************************	Jiai Deams.			iai r diceiii.	330.57 /6
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	}		<u></u>		Com	bined Cove	erage					
	I		j	Coverage	1			Total				İ.,
T			i	Percent	X	Volume	+	Volume	=	Result	l	
	1.		Weld Metal:	36.82%	L	4.59		26.85		6.29%	l	
	:		Base Metal:	57.00%		22.26	ļ	26.85		47.25%		
		***********			ļ		T	otal Exam C	overage =	53.55%	6	

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**CCNPP** 

Component ID: 16-405A

LTP No.: 103100

Coverage Sketch No: 5

Exam Area: Weld Metal 360° Exam Angle: 45° / 60° / 0°

NDE Report No.: 2003BU041

Summary No.: 103100

MO No.: 2200201399

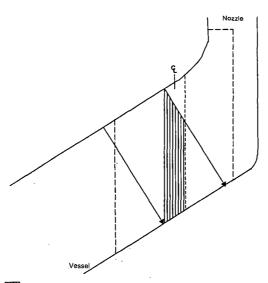
Scale: 50%

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Diameter: 96" Thickness: 5.0" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° ↔ / 60° ↔ / 0° Coverage = 3.83 in² of 4.59 in² exam area = 83.33%

NOTE: This sketch shows coverage @ 180° which was the most favorable location for these exams. Moving from 180° to 0° the coverage was gradually reduced to the point where 0% coverage was obtained at 0°.

Actual coverage for these exams = 1.38 in<sup>2</sup> = 30.07%

			Cove	rage Dimen	sions						Beam D	irections		
		1		: :	]			Result					1	
	********	Length	X	Width	×	Thickness		(Squ. In.)	Tow	ard Nozzle:	†	<u> </u>		
Ë	xam Area:	23		5.6	\$1a.a.m.n.n	See Sketch		26.85	Away fr	om Nozzie:	1			1. 0.00 ,
V	Veld Metal:	23		1	• · · · · · · · · · · · · · · · · · · ·	See Sketch	,	4.59		Clockwise:	<del></del>	*	]	
В	ase Metal:	23		4.6	3	See Sketch		22.26	Counter	Clockwise:	<b>→</b>			
		Weld Metal	. Volume *	4.60	Square Inc	then I	·		Base Metal	· Volumo =	22.26	Square Inc	chag	**********
		vvoiu metai	. volume -	Coverage	Beam	Percent of	> 1.0.2 (0000000000000000000000000000000000		Daso motal	, volume -	Coverage	Beam	Percent of	
	Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	,
	Beam No.	45°t	SKEICH	4.25	4.25	92.59%				SKEICH			81.22%	
	- '2	45°1	2	0.00	0.00	0.00%		1+2	45°/60°†1	6	18.08	18.08	81.22%	
		60°;	3	4.06	4.06	88.45%	·	3	45°	. 7	10.53	10.53	47.30%	
	4	60°1	4	0.00	0.00	0.00%		4	45°→	<del></del>	10.53	10.53	47.30%	
	5	45°+−	5	1.38	1.38	30.07%		5	60*	7	10.53	10.53	47.30%	
	6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%	
	<del>- 7 -</del>	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47,30%	
	- B	60°→	5	1.38	1.38	30.07%	V/************************************							OSCOROSO PAULO
	9	0° WRV	5	1.38	1.38	30.07%				***************************************	**************************************	<b>6</b>	Takanana a sakaka sasaha	-00% 00.00 - 000g
							,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
······································	T	otal Beams:	9	To	tal Percent:	331.37%		Ti	otal Beams:	7	То	tal Percent:	398.97%	
			Tota	Weld Meta	Coverage:	36.82%				Tota	Base Meta	Coverage:	57.00%	
		<u> </u>		<u> </u>	<u>[</u>	Com	bined Cov	erage				Ì		
	00-600-60000-cm-60	·*····································	anumérico amerom		Coverage Percent	x	Volume	<b></b>	Total Volume		Result			A
		<u> </u>		Veld Metal:	36.82%	1	4.59	1	26.85		6.29%			
	,		E	Base Metal;	57.00%		22.26	ļ	26.85		47.25%			
		ł			<b></b>	ļ	······························	T	otal Exam C	overage =	53.55%	***************************************		enen meret, un.
	a. a	**********************		Phononical Advantages		1		1						

**CCNPP** 

Component ID: 16-405A

LTP No.: 103100 Summary No.: 103100 Coverage Sketch No: 6

Exam Area: Base Metal 360° Exam Angle: 45° / 60°

NDE Report No.: 2003BU041

MO No.: 2200201399 **Scale:** 50%

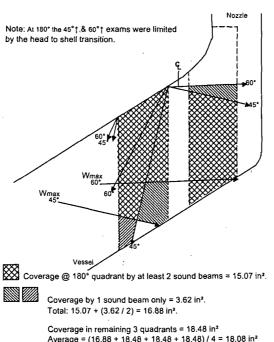
Diameter: 96" Thickness: 5.0"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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(Sketch Resized for Relief Request)



Coverage in remaining 3 quadrants = 18.48 in² Average = (16.88 + 18.48 + 18.48 + 18.48) / 4 = 18.08 in² 18.08 in² of 22.26 in² exam area = 81.22%

		Cove	rage Dimen	sions				ļ		Beam D	irections		
				1			Result	1				1	
	Length	X	Width	X	Thickness	=	(Squ. In.)		ard Nozzie:	1			
Exam Area:	23		5.6		See Sketch		26.85		om Nozzie:	<b>1</b>	[		1
Weld Metal:	23		1		See Sketch		4.59		Clockwise:				
Base Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>			
	Weld Metal	Volume =	4.59	Square Inc	hes		<u> </u>	Base Metal	: Volume =	22.26	Square Inc	hes	********
			Coverage	Beam	Percent of	Leave consens on the transfer		1		Coverage	Beam	Percent of	3
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	
1	45°↑	1	4.25	4.25	92.59%		4.2	450/6004	6	18.00	10.00	. 81.22%	
2	45°1	2	0.00	0.00	0.00%		1+2	45°/60°†↓	l °	18.08	- 18.08	81.22%	
3	60°↑	3	4.06	4.06	88.45%	36.430. 6.66.600.600	3	45°←	7	10.53	10.53	47.30%	7
4	60°L	4	0.00	0.00	0.00%	A	4	45°→	7	10.53	10.53	47.30%	
5	45°⊷	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%	]
6	45°-→	5	1.38	1.38	30.07%		6_	60°→	7	10.53	10.53	47.30%	]
7	60*⊷	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%	}
8	60°→	5	1.38	1.38	30.07%								1
9	0' WRV	5	1.38	1.38	30.07%								
					1							<u> </u>	
To	otal Beams:	9	То	tal Percent:	<b>7</b> 331.37%		To	tal Beams:	7	To	tal Percent:	398.97%	*******
		Tota	Weld Meta	Coverage:	36.82%			ļ	Total	Base Meta	l Coverage:	57.00%	
	· ·												
					Com	bined Cove	erage						ļ
		*********		Coverage Percent	- x	Volume		Total Volume	=	Result	22 mm/hit 1,000 / 12 mm 1 1 1 1		<b></b>
		······································	Neld Metal:		l	4.59	}	26.85		6.29%		†	†********
			Base Metal:			22.26		26.85		47.25%			
				<u></u>	1		т.	otal Exam (	overage =	53.55%			

**CCNPP** 

Component ID: 16-405A

LTP No.: 103100 Coverage Sketch No: 7

Exam Area: Base Metal 360°
Exam Angle: 45° / 60° / 0° WRV

NDE Report No.: 2003BU041 Summary No.: 103100

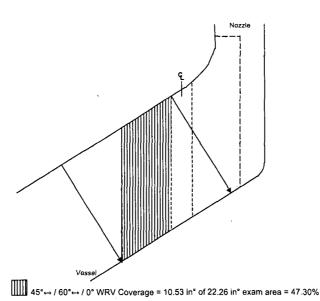
MO No.: 2200201399 Scale: 50% Diameter: 96" Thickness: 5.0"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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(Sketch Resized for Relief Request)



NOTE: This sketch shows coverage @  $180^\circ$  which was the most favorable location for these exams. Moving from  $180^\circ$  to  $0^\circ$  the coverage of the nozzle side base metal was gradually reduced to the point where 0% coverage was obtained at  $0^\circ$ .

No coverage credit was taken for the nozzle side base material.

			Cove	rage Dimen	sions						Beam Di	rections		
								Result						
		Length	×	Width	×	Thickness	=	(Squ. In.)		ard Nozzle:		Ĺ		
Exa	ım Area:	23		5.6		See Sketch		26.85		om Nozzle:				
Wel	d Metal:	23		1		See Sketch		4.59		Clockwise:				
Bas	e Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	<del></del>			
		Weld Metal	Volume ≈	4.59	Square Inc	hes	00: COLUMN: ************************************		Base Metal	Volume =	22.26	Square Inc	hes	w
· · · · · · · · · · · · · · · · · · ·				Coverage	Beam	Percent of	AND THE PROPERTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY O				Coverage	Beam	Percent of	mane
Ве	am No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	
	1	45°↑	1	4.25	4.25	92.59%					· · · · · · · · · · · · · · · · · · ·	40.00	81.22%	•••••
	2	45°	2	0.00	0.00	0.00%	oundament and other	1+2	45°/60°†↓	6	18.08	18.08	81.22%	******
	3	60°†	3	4.06	4.06	88.45%	~~~	3	45°←	7	10.53	10.53	47.30%	Manage
	4	60°	4	0.00	0.00	0.00%	- payon, edulativista in estati sin	4	45°→	7	10.53	10.53	47.30%	
	5	45°⊷	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%	
	6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%	
	7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%	~~
	8	60°→	5	1.38	1.38	30.07%	***************************************					-		New york
	9	0° WRV	5	1.38	1.38	30.07%		***************************************		***************************************				****
						<u> </u>								
	To	otal Beams:	9	To	tal Percent:	331.37%		To	tal Beams:	7	Τo	tal Percent:	398.97%	Proposition
			_ Total	l Weld Meta	l Coverage:	36.82%				Total	Base Meta	Coverage:	57.00%	
		<b>-</b>				Comi	bined Cove	erage						
		Market Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contract Contr			Coverage				Total					· · · · · · · · · · · · · · · · · · ·
					Percent	******************	Volume	+	Volume		Result			-Me one
	••••••			Neld Metal:	36.82%		4.59		26.85		6.29%			
			E	Base Metal:	57.00%		22.26		26.85		47.25%			
						<u> </u>		Ţ	otal Exam C	overage =	53.55%			~
			Advisor Commence			*	***************************************	1	1		.,	***************************************		

**CCNPP** 

Component ID: 16-405A

LTP No.: 103100 Coverage Sketch No: Exam Area

Exam Area: AFGLBCKDHJE Exam Angle: NA

NDE Report No.: 2003BU041

Summary No.: 103100 MO No.: 2200201399

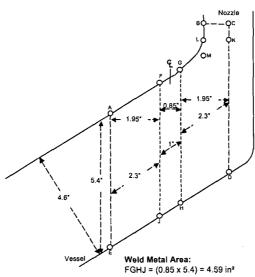
Scale: 50%

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Diameter: 96" Thickness: 5.0" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



#### Base Metal Area:

- Vessel Side = AFJE = (1.95 x 5.4) = 10.53 in²
  Nozzle Side = GKDH + GLM + LKM + LBCK
  = (1.95 x 5.4) + (1 x 0.6)/2 + (1 x 0.6)/2 + (1 x 0.6) = 11.73 in²
  Total Base Metal Area = 10.53 + 11.73 = 22.26 in²

#### Total Exam Area: 4.59 + 22.26 = 26.85 in<sup>2</sup>

			Cove	rage Dimen	sions						Beam D	rections		
					}	1		Result					1	I
		Length	X	Width	×	Thickness	=	(Squ. In.)		ard Nozzle:	1			1.
Êxa	m Area:	23		5.6		See Sketch	rute tioniiiinnee	26.85	Away fr	om Nozzie:	1		I	
We	ld Metal:	23	***************************************	1		See Sketch		4.59		Clockwise:	-			
Bas	se Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:			•	<u> </u>
		Weld Metal:	. Values a	4.60	Square Inc			<u> </u>	Base Metal	. Valuma =	22.26	Square Inc	hoa	
		vyelu metal.	Apinine -	Coverage	Beam	Percent of	A	·}	Dase metal	, volume 4	Coverage	Beam	Percent of	
	eam No.	A12	Sketch		Total	4.59		Beam No.	Angle	Sketch		Total	22.26	
<u>B</u>	eam No.	Angle	Sketch	(Squ. In.)				Beam No.	Angle	Sketter	(Squ. In.)	Iotal		
	2	45°† 45°i	2	4.25 0.00	4.25 0.00	92.59%		1+2	45°/60°1	6	18.08	18.08	81.22% 81.22%	
	3	60°1	3	4.06	4.06	88.45%		3	45°⊷	7	10.53	10.53	47.30%	
	4							4	45°→	<del>'</del>	10.53	10.53	47.30%	
	7	60°↓	4	0.00	0.00	0.00%		5	45°→ 60°←	<del>'</del>				
	5	45°	5	1.38	1.38	30.07%					10.53	10.53	47.30%	
	6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%	
	7	60°←	5	1.38	1.38	30.07%			0° WRV		10.53	10.53	47.30%	
	8	60°→	5	1.38	1.38	30.07%								
	9	0° WRV	5	1.38	1.38	30.07%								
	To	otal Beams:	9	То	tal Percent:	331.37%		To	ital Beams:	7	То	tal Percent:	398.97%	~~~~
			······································				.,,							
			Tota	l Weld Meta	Coverage:	36.82%		· <b> </b>		lotal	Base Meta	Coverage:	57.00%	ļ
						Com	bined Cov	erage						
				L	Coverage				Total					
					Percent	X	Volume	+	Volume	=	Result			
			١	Neld Metal:	36.82%		4.59	1	26.85		6.29%			
				Base Metal:	57.00%	I	22.26		26.85		47.25%			
			6 p 6 mg 6 m . 6			1		To	otal Exam C	overage =	53.55%			
	.,	*****************			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	***************************************		daman nanana.						· · · · · · · · · · · · · · · · · · ·

### Responses to Request for Additional Information Summary No.: 103110 Comp ID: 16-405B Page 1 of 9

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Safety & Relief "B" Nozzle to Upper Head / Due to nozzle configuration coverage of nozzle side base metal and weld was limited. The nozzle enters the vessel at an angle thereby also limiting coverage attainable from the vessel side of the weld. The pressure nozzle-to-vessel head welds are accessible only from the head side based on the nozzle curvature. The scanning surface of the nozzle is essentially perpendicular to the head surface which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The nondestructive examination (NDE) techniques and procedures used incorporated examination techniques qualified under Article 4 of Section V of the ASME Code as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

#### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

Component ID: 16-405B LTP No.: 103110

NDE Report No.: CC07-IU-031 **Summary No.:** 103110

Coverage Sketch No: 1

Exam Area: Weld Metal 360°

Exam Angle: 45°

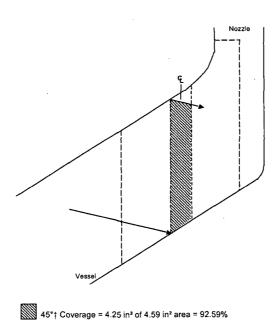
**Scale:** 50%

MO No.: 2200600733

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Diameter: 96" Thickness: 5.0" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel



		Cove	rage Dimen	sions						Beam Di	rections	
	T	/ · · · · · · · · · · · · · · · · · · ·	<del></del>		1		Result					
	Length	X	Width	X	Thickness	=	(Squ. in.)	Tow	ard Nozzle:	Ť ************************************	***************	******************
Exam Area:	23		5.6		See Sketch		26.85	Away fr	om Nozzle;	Ţ		\$
Weld Metal:	23		1 1		See Sketch		4.59		Clockwise:	<b>←</b>	***************************************	
Base Metal:	23		4.6		See Sketch	***************************************	22.26	Counter	Clockwise:	<b>→</b>	***************************************	
	Weld Metal	: Volume =		Square Inc				Base Metal	: Volume ≈		Square Inc	
			Coverage	Beam	Percent of	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			30 1 1	Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. ln.)	Total	22.26
<u>l 1</u>	45°↑	1	4.25	4.25	92.59%		1+2	45°/60°11	6	18.08	18.08	81.22%
2	45°↓	2	0.00	0.00	0.00%	~~~~						81.22%
3	60*↑	3	4.06	4.06	88.45%		3	45°←	7	10.53	10.53	47.30%
4	60°	4	0.00	0.00	0.00%	.,	4	45°-→	7	10.53	10.53	47.30%
5	45°←	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%
6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%
7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%
8	60°→	5	1.38	1.38	30.07%			L	en communication in the all			
9	0° WRV	5	1.38	1.38	30.07%							
Ti	otal Beams:	9	To	tal Percent:	<b>7</b> 331 37%	***************************************	To	otal Beams:	7	To	tal Percent:	398.97%
	1	**************************************	1						*****		***************************************	
		Tota	Weld Meta	Coverage:	36.82%				Total	Base Metal	Coverage:	57.00%
	ļ			<u>'</u>	Com	bined Cov	erage					<u> </u>
	1			Coverage	1			Total				
	1			Percent	X	Volume	+	Volume	=	Result		Ī
	1	,	Weld Metal:	36.82%		4.59	1	26.85		6.29%		
			Base Metal:	57.00%	Name at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same at the same a	22.26		26.85		47.25%		
		Factor (1000)	] 				Т.	otal Exam C	overage =	53.55%	Oraca apadomento massono de se	
m. francour.	*********						\$				been some and an entire or on the	•

CCNPP

Component ID: 16-405B

LTP No.: 103110

**Summary No.:** 103110

Coverage Sketch No: 2 Exam Area: Weld Metal 360°

Exam Angle: 45°

NDE Report No.: CC07-IU-031

MÓ No.: 2200600733

**Scale:** 50%

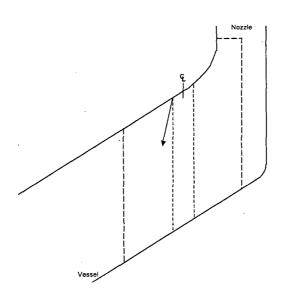
Diameter: 96"

Thickness: 5.0" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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(Sketch Resized for Relief Request)



45°1 Coverage = 0 in² of 4.59 in² area = 0%

		Cove	rage Dimen	sions						Beam Di	rections	
1	1		<del></del>				Result			3		
	Length	X	Width	X	Thickness		(Squ. In.)	Tow	ard Nozzle:	1	***************************************	Anno va novembro como
Exam Area:	23	******	5.6		See Sketch		26.85	Away fr	om Nozzle:	1	A TOWNSON - STANSON - CO.	a constitution for any department
Weld Metal:	23		1		See Sketch		4.59		Clockwise:	<b>←</b>		
Base Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	>		
<del> </del>	Weld Metal	: Volume =	4.59	Square Inc	hes		<del> </del>	Base Metal:	: Volume ≈	22.26	Square Inc	hes
	1		Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59	***************************************	Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26
1	45°†	-1	4.25	4.25	92.59%			4504000			10.00	81.22%
2	45°1	2	0.00	0.00	0.00%		1+2	45°/60°†‡	6	18.08	18.08	81.22%
3	60°†	3	4.06	4.06	88.45%	******************	3	45°⊷	7	10.53	10.53	47.30%
4	60*1	4	0.00	0.00	0.00%	C 20009 40 200000000	_ 4	45°→	7	10.53	10.53	47.30%
5	45°	5	1.38	1.38	30.07%		5	60°⊷	7	10.53	10.53	47.30%
6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%
7	60°⊷	5	1.38	1.38	30.07%	- marketing men reserve	7	0° WRV	7	10.53	10.53	47.30%
8	60°→	5	1.38	1.38	30.07%	*****						J .
9	0° WRV	5	1.38	1.38	30.07%						······································	
		·			<u> </u>	.,,						
T	otal Beams:	9	То	tal Percent:	331.37%		To	otal Beams:	7	То	tal Percent:	398.97%
		Tota	Weld Metal	Coverage:	36.82%		ļ		Tota	Base Meta	Coverage:	57.00%
					Com	bined Cov	27200					
·				Coverage	Com	Dilled COV		Total				
·	<b></b>		***************************************	Percent	x	Volume	<u></u>	Volume		Result	11%	<b>.</b>
ļ	<u> </u>		Veld Metal:	36.82%	Į	4.59	ł	26.85		6.29%		ļ
· •	ł		Base Metal:		<b></b>	22.26	<b>†</b>	26.85		47.25%	,	<b>}</b>
ļ			Jaso Welai.	37.00%	<b></b>		<b></b>	20.00		77.2370		
· ·	·		<b>/**</b> /** <sub>1</sub> .,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				Т-	otal Exam C	overage =	53.55%	***************************************	1

**CCNPP** 

Component ID: 16-405B

LTP No.: 103110

NDE Report No.: CC07-IU-031

Coverage Sketch No: 3 Exam Area: Weld Metal 360°

Exam Angle: 60°

Summary No.: 103110 MO No.: 2200600733

**Scale: 50%** 

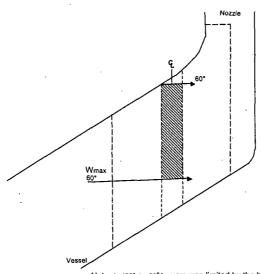
Diameter: 96" Thickness: 5.0"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 4 of 9

(Sketch Resized for Relief Request)



Note: At 180° the 60°† exam was limited by the head to shell transition.

60°↑ Coverage @ 180° quadrant, Wmax limited by head to shell transition. = 3.23 in²

Coverage in remaining 3 quadrants = 4.34 in<sup>2</sup> Average = (3.23 + 4.34 + 4.34 + 4.34) / 4 = 4.06 in<sup>2</sup> 4.06 in<sup>2</sup> of 4.59 in<sup>2</sup> exam area = 88.45%

			Cove	rage Dimen	sions				l		Beam D	irections		
				· · · · · · · · · · · · · · · · · · ·				Result	-:					1
	*********	Length	X	Width	×	Thickness	=	(Squ. In.)	Towa	ard Nozzle:	t			
Exan	n Area:	23	A-11-4001-4-6VA-/-VIII-/-	5.6		See Sketch		26.85	Away fro	om Nozzle:	ļ		1	
Weld	Metal:	23		1		See Sketch		4.59		Clockwise:	<b>←</b>			T
Base	Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>			
		Weld Metal:	Volume =	4.59	Square Inc	bes	************	<del>                                     </del>	Base Metal:	Volume =	22.26	Square Inc	hes	
~u~~~~		1		Coverage	Beam	Percent of	************				Coverage	Beam	Percent of	
Bes	am No.	Angle	Sketch	(Squ. in.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	
	1	45°t	1	4.25	4.25	92.59%							81,22%	
	2	45°1	2	0.00	0.00	0.00%		1+2	45°/60°†↓	6	18.08	18.08	81.22%	
	3	60°1	3	4.06	4.06	88.45%		3	45°←	7	10.53	10.53	47.30%	***************************************
**********	4	60°1	4	0.00	0.00	0.00%		4	45°→	7	10.53	10.53	47.30%	
	5	45°←	5	1.38	1.38	30.07%	,	5	60°←	7	10.53	10.53	47.30%	
	6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%	
	7	60°⊷	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%	
	8	60°→	5	1.38	1.38	30.07%	***************************************						1	1
	9	0° WRV	5	1.38	1.38	30.07%			1	*************	PART COLUMN TO THE PROPERTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF			
	Ti	tal Beams:	9	То	tal Percent:	331.37%		To	otal Beams;	7	To	tal Percent:	398.97%	
			Tota	Weld Metal	Coverage:	36.82%				. Total	Base Meta	Coverage:	57.00%	
					Causana	Com	bined Cov	erage	Total			mananan mananan		ļ
	**********				Coverage	**************************************	Volume	+	Volume		Result	A-M		
				Neld Metal:			4.59	1	26.85	***	6.29%	**********	ļ	
				Base Metal:	57.00%		22.26		26.85		47.25%			ļ
					***************************************			+	otal Exam C	Overage E	53.55%	a Professional de la companya de la companya de la companya de la companya de la companya de la companya de la		
	*****			L				4	CLAI EXAMI C	Overage -	23.5576		į	ŧ

**CCNPP** 

Component ID: 16-405B

LTP No.: 103110

Coverage Sketch No: 4 Exam Area: Weld Metal 360° Exam Angle: 60°

NDE Report No.: CC07-IU-031

**Summary No.:** 103110 MO No.: 2200600733

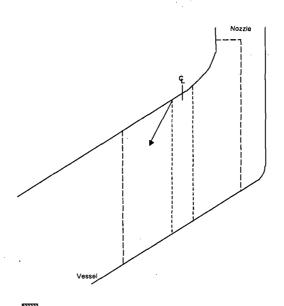
Scale: 50%

Diameter: 96" Thickness: 5.0"

Material: CC/S CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

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(Sketch Resized for Relief Request)



60°1 Coverage = 0 in² of 4.59 in² area = 0%

		Cove	rage Dimen	sions						Beam D	irections	
	1	\$		Ĭ	1		Result				ş	1
manifestation and the second	Length	X	Width	× ×	Thickness		(Squ. (n.)	Tow	ard Nozzle:	1	<u> </u>	
Exam Area:	23		5.6	·	See Sketch		26.85	Away fr	om Nozzle:	1	}	ederroman a particular de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la constitución de la con
Weld Metal:	23	j	1	\$	See Sketch		4.59		Clockwise:	<b>←</b>	•	
Base Metal	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>	<b>D</b>	
		1			1	~~~~						
	Weld Metal	: Volume =		Square Inc			<u> </u>	Base Metal:	Volume =		Square Inc	
	1		Coverage	Beam	Percent of					Coverage	Beam	Percent of
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26
1	45°↑	1	4.25	4.25	92.59%		1+2	45°/60°↑1	6	18.08	18.08	81.22%
2	45°↓	2	0.00	0.00	0.00%			1				81.22%
3	60°↑	3	4.06	4.06	88.45%		3	45°←	7	10.53	10.53	47.30%
4	60°L	4	0.00	0.00	0.00%		4	45°→	7	10.53	10.53	47.30%
5	45°←-	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%
6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%
7	60°⊷	5	1.38	1.38	30.07%	OLI III (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIII) (OIIIIII) (OIIIII) (OIIIIII) (OIIIIII) (OIIIIII) (OIIIIIII) (OIIIIII) (OIIIIII) (OIIIIII) (OIIIIIII) (OIIIIII) (OIIIIIII) (OIIIIIIIIII	7	0° WRV	7	10.53	10.53	47.30%
8	60°→	5	1.38	1.38	30.07%							
9	0° WRV	5	1.38	1.38	30.07%							
	1				1							
			} } \$**********************************								ţ	
	otal Beams:	0	To	tal Darcant	331.37%	***************************************	Te	tal Beams:	7	To	tal Percent	398.97%
	otal Deama.	ļ		iai r eicein.	331.37 /6			/ Doding.			tarr orconit.	000.0770
		Tota	Weld Meta	Coverage:	36.82%				Total	Base Meta	Coverage:	57.00%
	ļ		i		Com	bined Cove	erage				İ	<b> </b>
	<del></del>			Coverage		Dirica Corr	i	Total			~~~~~~~~~	<b></b>
···				Percent	X	Võlume	+	Volume	···^	Result		*************
	<u> </u>	J	: Neid Metal:	36.82%	ļ	4.59	<b></b>	26.85		6.29%		
			Base Metal:	57.00%	5	22.26		26.85		47.25%		
	<u> </u>				ļ		ļ					
	.1	l	<u> </u>	į	1		<u> </u>	otal Exam C	overage =	<u>53.55%</u>	l	L

**CCNPP** 

Component ID: 16-405B

LTP No.: 103110

Exam Area: Weld Metal 360° Exam Angle: 45° / 60° / 0° NDE Report No.: CC07-IU-031 Summary No.: 103110

MO No.: 2200600733

Scale: 50%

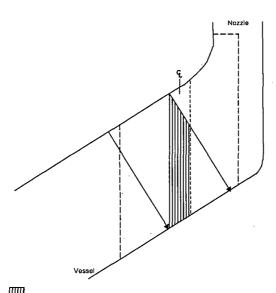
Page 6 of 9

Diameter: 96" Thickness: 5.0" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)

Coverage Sketch No: 5



45° ↔ / 60° ↔ / 0° Coverage = 3.83 in² of 4.59 in² exam area = 83.33%

NOTE: This sketch shows coverage @  $180^\circ$  which was the most favorable location for these exams. Moving from  $180^\circ$  to  $0^\circ$  the coverage was gradually reduced to the point where 0% coverage was obtained at  $0^\circ$ .

Actual coverage for these exams = 1.38 in<sup>2</sup> = 30.07%

			Cove	rage Dimen	sions						Beam Di	rections	
						1		Result					
••••••	······································	Length	X	Width	X	Thickness		(Squ. In.)	Tow	ard Nozzle:	<b>*</b>	,, <del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>	*****
Ex	am Area:	23	**************	5.6		See Sketch	۵.۰۰	26.85	Away fr	om Nozzle:	1	2	*****************
We	eld Metal:	23		1	•	See Sketch	,	4.59		Clockwise:	<del></del>		l
Ва	se Metal:	. 23		4.6		See Sketch		22.26	Counter	Clockwise:			
		1						1					
		Weld Metal:	Volume ≠		Square Inc				Base Metal	: Volume ≃		Square Inc	
				Coverage	Beam	Percent of					Coverage	Beam	Percent of
<u>  E</u>	Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26
	1	45°↑	11	4.25	4.25	92.59%		1+2	45°/60°†1	6	18.08	18.08	81.22%
	2	45°1	2	0.00	0.00	0.00%	*****************************						81.22%
	3	60°↑	3	4.06	4.06	88.45%		3	45°←	7	10.53	10.53	47.30%
	4	60°↓	4	0.00	0.00	0.00%		4	45°	. 7	10.53	10.53	47.30%
	5	45° ←	5	1.38	1.38	30.07%		5	60°+~	7	10.53	10.53	47.30%
	6	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%
	7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%
	8	60°→	5	1.38	1.38	30.07%							
	9	0° WRV	5	1.38	1.38	30.07%							
						1							
	Ti	otal Beams:	9	To	tal Percent:	331.37%	~····	To	tal Beams:	7	То	tal Percent;	398.97%
Ļ			Tota	Weld Meta	Coverage:	36.82%				Total	Base Meta	Coverage:	57.00%
						Com	bined Cov	erage					
					Coverage Percent	X	Volume		Total Volume	************	Result		
			······································	Veld Metal:		1	4.59	†	26.85		6.29%		<u> </u>
				Base Metal:	57.00%		22.26		26.85		47.25%		
		***************************************		A.038020				Т.	otal Exam C	overage =	53.55%		
						ļ			July L Kaill C	,01010HB -	33.33 /6		h

**CCNPP** 

Component ID: 16-405B

LTP No.: 103110 Coverage Sketch No: 6

Exam Area: Base Metal 360° Exam Angle: 45° / 60°

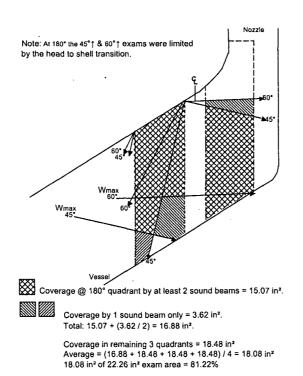
NDE Report No.: CC07-IU-031 Summary No.: 103110

MO No.: 2200600733 Scale: 50%

Diameter: 96" Thickness: 5.0" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 7 of 9



		Cove	rage Dimer	sions						Beam D	irections		
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Exam Area:	23		5.6	}	See Sketch		26.85	Away fr	om Nozzle:	1			
Weld Metal:	23		1	• · · · · · · · · · · · · · · · · · · ·	See Sketch		4.59		Clockwise:	<b>←</b>			
Base Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>			
					}								
	Weld Metal	: Volume =		Square inc				Base Metal:	Volume =		Square Inc		
			Coverage	Beam	Percent of			1		Coverage	Beam	Percent of	
Beam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	
	45°↑	11	4.25	4.25	92.59%		1 + 2	45°/60°11	6	18.08	18.08	81.22%	ļ
2	45°↓	2	0.00	0.00	0.00%							81.22%	
3	60°†	3	4.06	4.06	88.45%		3	45°⊷	7	10.53	10.53	47.30%	
4	60°t	4	0.00	0.00	0.00%		4	45°→	7	10.53	10.53	47.30%	İ
5	45°←	5	1.38	1.38	30.07%		5	60°←		10.53	10.53	47.30%	İ
6	45° →	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%	
7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%	
8	60*→	5	1.38	1.38	30.07%	AH AH - 603 A C - 603 - 6		ļi	· · · · · · · · · · · · · · · · · · ·		<b>.</b>		
9	0° WRV	5	1.38	1.38	30.07%								
						······································							
т	otal Beams:	9	To	tal Percent:	331.37%		To	otal Beams:	7	То	tal Percent:	398.97%	w
		Tota	i I Weld Meta	l Coverage:	36.82%			ļ	Tota	Base Meta	Coverage	57.00%	ļ
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					Com	bined Cove	rage					ľ	
***************************************	***************************************			Coverage				Total					
	************		fores and an arrangement	Percent	X	Volume	***************************************	Volume		Result	*****************		
••••	1		Weld Metal:	36.82%	4	4.59		26.85	,,	6.29%	[		[
			Base Metal:	57.00%		22.26		26.85		47.25%		j	
	ļ		L						,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				ļ
en con con con con con con con con con co	J		l		1		<u></u>	otal Exam C	overage =	53.55%	VI	L	ļ

**CCNPP** 

Component ID: 16-405B

LTP No.: 103110 Coverage Sketch No: 7

Exam Area: Base Metal 360° Exam Angle: 45° / 60° / 0° WRV NDE Report No.: CC07-IU-031 **Summary No.: 103110** 

MO No.: 2200600733

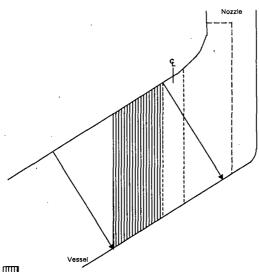
**Scale:** 50%

Page 8 of 9

Diameter: 96" Thickness: 5.0" Material: CC/S

CC/S = Clad Carbon Steel · S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° ↔ / 60° ↔ / 0° WRV Coverage = 10.53 in° of 22.26 in° exam area = 47.30%

NOTE; This sketch shows coverage @ 180° which was the most favorable location for these exams. Moving from 180° to 0° the coverage of the nozzle side base metal was gradually reduced to the point where 0% coverage was obtained at 0°. No coverage credit was taken for the nozzle side base material

			Cove	rage Dimen	sions						Beam D	rections		
							;	Result	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				ĭ i	*****
		Length	×	Width	×	Thickness	- E	(Squ. In.)	Tow	ard Nozzie:	1		T	
Exam	Area:	23	***************************************	5.6	[	See Sketch		26.85	Away fr	om Nozzle:	1			
Weld N	Metal:	23	······	1		See Sketch	***************************************	4.59		Clockwise:	←			
Base I	Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:	<b>→</b>			
	<del> '</del>	Weld Metal:	Volume =		Square Inc				Base Metal	Volume =		Square Inc		
				Coverage	Beam	Percent of					Coverage	Beam	Percent of	
Bear	m No. [	_Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. (n.)	Total	22.26	
L	1 1	45°†	1	4.25	4.25	92.59%		1+2	45°/60°†1	6	18.08	18.08	81.22%	
	2	45°↓	2	0.00	0.00	0.00%							81.22%	····
	3	60°↑	3	4.06	4.06	88.45%		3	45°←	7	10.53	10.53	47.30%	*****
	4	60°↓	4	0.00	0.00	0.00%		4	45°-→	7	10.53	10.53	47.30%	
	5	45°⊷	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%	
	6 _ [	45°→	5	1.38	1.38	30.07%		6	60°→	7	10.53	10.53	47.30%	
7	7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%	
	8	60°	5	1.38	1.38	30.07%						-		
	9	0° WRV	5	1.38	1.38	30.07%								
	То	tal Beams:	9	То	tal Percent:	331.37%		To	otal Beams:	7	То	tal Percent:	398.97%	
			Tota	Weld Meta	Coverage:	36.82%				Tota	Base Meta	Coverage:	57.00%	
						Com	oined Cov	erage				***************************************		
			***************************************		Coverage Percent	×	Volume	+	Total Volume	z	Result	·····		
			١	Weld Metal:	36.82%		4.59	1	26.85		6.29%		L	
				Base Metal:	57.00%		22.26	ļ	26.85		47.25%			
		~~~,	***************************************	.,	7s				otal Exam C	overage =	53.55%	·	ļ	
man, minaanaa		en transcentration of	·		\$-a-a-maia-a-a-man	\$		j				· /	******	

**CCNPP** 

Component ID: 16-405B

LTP No.: 103110 Coverage Sketch No: Exam Area

NDE Report No.: CC07-IU-031 **Summary No.:** 103110 MO No.: 2200600733 **Scale:** 50%

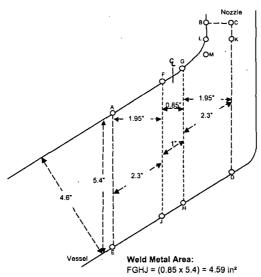
Exam Area: AFGLBCKDHJE Exam Angle: NA

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Diameter: 96" Thickness: 5.0" Material: CC/S

> CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



#### Base Metal Area:

- Metal Area: Vessel Side = AFJE = (1.95 x 5.4) = 10.53 in<sup>2</sup> Nozzle Side = GKDH + GLM + LKM + LBCK = (1.95 x 5.4) + (1 x 0.6)/2 + (1 x 0.6)/2 + (1 x 0.6) = 11.73 in<sup>2</sup> Total Base Metal Area = 10.53 + 11.73 = 22.26 in<sup>2</sup>

### Total Exam Area: 4.59 + 22.26 = 26.85 in<sup>2</sup>

			Cove	age Dimer	sions						Beam D	rections		
					Ì			Result						1
		Length	X	Width	×	Thickness	=	(Squ. In.)	Tow	ard Nozzle:	1			
Ex	am Area:	23		5.6	}	See Sketch		26.85	Away fr	om Nozzie:	1			-
We	eld Metal:	23		1		See Sketch		4.59		Clockwise:	<b>←</b>		· · · · · · · · · · · · · · · · · · ·	
Ва	se Metal:	23		4.6		See Sketch		22.26	Counter	Clockwise:				
<del>!</del>		Weld Metal	· Volume =	4 50	Square Inc	hoe		-	Base Metal	Volume =	22.26	Square Inc	chae	ļ
<del>[-</del> -		TICIU INGLAL	voiume -	Coverage	Beam	Percent of		<del> </del>	Daşe metal	Volume -	Coverage	Beam	Percent of	
	eam No.	Angle	Sketch	(Squ. In.)	Total	4.59		Beam No.	Angle	Sketch	(Squ. In.)	Total	22.26	
<u> </u>	eaill No.	45°1	SKEICH	4.25	4.25	92.59%		Beall No.	Aligie	SKELCII	(Squ. III.)	iotai	81.22%	
	2	45	2	0.00	0.00	0.00%		1+2	45°/60°†↓	6	18.08	18.08	81.22%	
	3	60°1	- 3	4.06	4.06	88.45%		1 3	45°←	7	10.53	10.53	47.30%	
	4	60°	4	0.00	0.00	0.00%	***************************************	4	45°-→	7	10.53	10.53	47.30%	^***
····	5	45°	5	1.38	1.38	30.07%		5	60°←	7	10.53	10.53	47.30%	
	- 6	45°→	5	1.38	1.38	30.07%		6	60°→	<del></del>	10.53	10.53	47.30%	i
	7	60°←	5	1.38	1.38	30.07%		7	0° WRV	7	10.53	10.53	47.30%	
	- 8	60°-→	5	1.38	1.38	30.07%	·						1	
	9	0° WRV	5	1.38	1.38	30.07%				***********			****	
	To	tal Beams:	9	То	tal Percent:	331.37%		To	otal Beams:	7	То	tal Percent:	398.97%	
			Total	Weld Meta	Coverage:	36.82%				Total	Base Meta	Coverage:	57.00%	
		1	-		-									
								bined Coverage						ļ
			.,,	************************	Coverage	X	Võlume	ļ	Total Volume		Result	*************	ļ	ļ
				Veld Metal:	36.82%	<b>^</b>	4.59	ļ	26.85	-	6.29%		ļ	ļ.,
				sase Metal:			22.26	·	26.85		47.25%			
				ruse Ivieldi.	31.00%	<u> </u>		·}	20.00		71.23/0		·	ļ
		······		- Armania i encora		\$		T	otal Exam C	overage =	53.55%			
minmint.		***************************************		**************************************	• • • • • • • • • • • • • • • • • • •			9				344.000.000.000		i mm.r.

## Responses to Request for Additional Information Summary No.: 109360 Comp ID: 30-RC-21A-10/2-CV-2005 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Pipe to Branch Connection / Coverage of weld from Branch (nozzle) Penetration side of weld limited due to configuration. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

**CCNPP** 

Component ID: 30-RC-21A-10/2-CV-2005

LTP No.: 109360

Coverage Sketch No: NA

Exam Area: Lower T /  $\frac{1}{2}$  " From Toe Exam Angle:  $45^{\circ}$  /  $60^{\circ}$ 

NDE Report No.: CC07-IU-030

Summary No.: 109360 MO No.: 2200600729

Scale: 100%

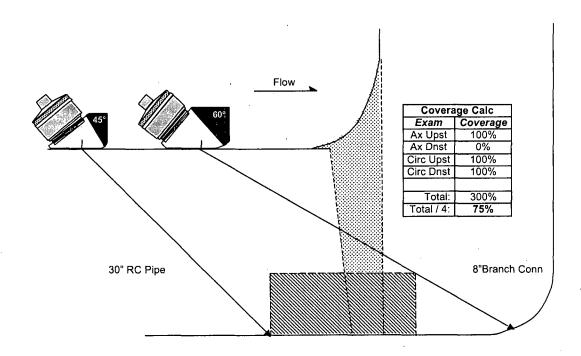
Diameter: 8"
Thickness: 3.0"

Material: CC/S CC/S = Clad Ca

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 2

 $\mathcal{M}A$ 



Coverage Calc				
Exam	Coverage			
Ax Upst	100%			
Ax Dnst	0%			
Circ Upst	100%			
Circ Dnst	100%			
Total:	300%			
Total / 4:	75%			

### Responses to Request for Additional Information Summary No.: 136020 Comp ID: 4-PS-2003-2 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Tee to Pipe / Adjacent weld in close proximity on pipe side limited coverage to Tee side which was also limited by obstruction by a penetration in close proximity to the weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

. 4

**CCNPP** 

Component ID: 4-PS-2003-2 LTP No.: 136020 Coverage Sketch No: NA

NDE Report No.: CC70-IU-045 **Summary No.: 136020** MO No.: 2200600733

Scale: 100%

Diameter: 4"

Thickness: 0.44" Material: S/S

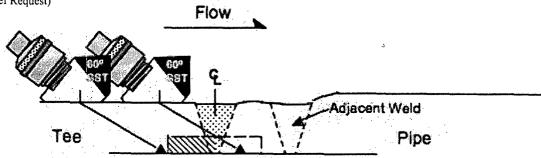
CC/S = Clad Carbon Steel S/S = Stainless SteelCASS = Cast Stainless Steel

Page 2 of 2

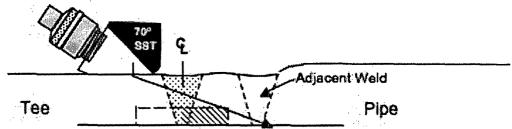
(Sketch Resized for Relief Request)

Exam Area: Lower

Exam Angle: 60° / 70°



- Exam Coverage = 50% per single sided access rules.
- This sketch represents 7.5" of 15" Weld Length. Remainder of weld obstructed by branch of Tee.
- Upstream Coverage = 50% Ax / 50% Circ.



Far side of weld examined per single sided access rules. No coverage credit taken.

Coverage Calc				
Exam	Coverage			
Ax Upst	50%			
Ax Dnst	0%			
Circ Upst	50%			
Circ Dnst	100%			
Total:	200%			
Total / 4:	50%			

## Responses to Request for Additional Information Summary No.: 136040 Comp ID: 4-PS-2003-4 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Tee to Pipe / Due to geometry no coverage was attainable on Tee side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

#### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

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2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

Component ID: 4-PS-2003-4

LTP No.: 136040

NDE Report No.: CC07-IU-050 Summary No.: 136040

Exam Area: Lower T Exam Angle: 60° / 70°

MO No.: 2200600733 **Scale: 100%** 

Diameter: 4"

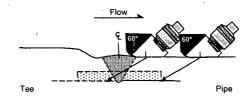
Thickness: 0.44" Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

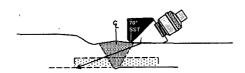
Page 2 of 2

(Sketch Resized for Relief Request)

Coverage Sketch No: NA



Exam Coverage = 50% per single sided access rules.



Far side of weld examined per single sided access rules. No coverage credit taken.

### Responses to Request for Additional Information Summary No.: 138470 Comp ID: 3-PS-2002-27 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Valve to Pipe / Due to taper on valve body no coverage was attainable from valve side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

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2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

**CCNPP** 

Component ID: 3-PS-2002-27

LTP No.: 138470

NDE Report No.: CC07-IU-051

Coverage Sketch No: NA

Summary No.: 138470

Exam Area: Lower T Exam Angle: 60° / 70° MO No.: 2200600733

Scale: 100%

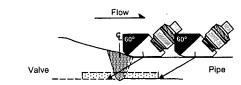
Page 2 of 2

Diameter: 3" Thickness: 0.41"

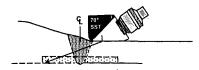
Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



Exam Coverage = 50% per single sided access rules.



Far side of weld examined per single sided access rules. No coverage credit taken.

### Responses to Request for Additional Information Summary No.: 143030 Comp ID: 2.5-SR-2003-4 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Elbow to Pipe / Adjacent weld in close proximity to examined weld limited coverage which was also limited at Intrados of Elbow being in close proximity to the weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

#### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

Component ID: 2.5-SR-2003-4 Coverage Sketch No: NA

LTP No.: 143030

NDE Report No.: 2003BU032

**Summary No.: 143030** MO No.: 2200201399

**Scale: 100%** 

Diameter: 2.5" Thickness: 0.38"

Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless SteelCASS = Cast Stainless Steel

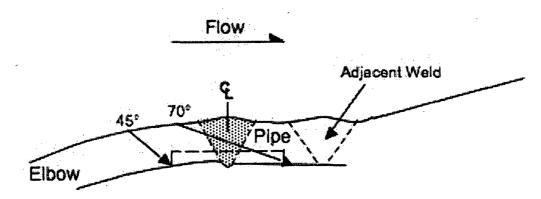
Page 2 of 2

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(Sketch Resized for Relief Request)

Exam Area: Lower T

Exam Angle: 45° / 70°



- Exam Coverage = 50% per single sided access rules.
- Axial exam obstructed by intrados from 3.5" to 6".
- Examined 6.625" of 9.125" = 72.6%

Coverage Calc				
Exam	Coverage			
Ax Upst	72.6%			
Ax Dnst	0%			
Circ Upst	100%			
Circ Dnst	0%			
Total:	172.6%			
Total / 4:	43%			

### Responses to Request for Additional Information Summary No.: 116180 Comp ID: 12-SI-2010-12 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Elbow to Safe End / No Code coverage was credited for scanning performed from Cast Stainless Steel Safe End side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

#### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

**Component ID:** 12-SI-2010-12 LTP No.: 116180

NDE Report No.: CC09-IU-020 Summary No.: 116180

MO No.: 2200800092

Coverage Sketch No: NA Exam Area: Lower T

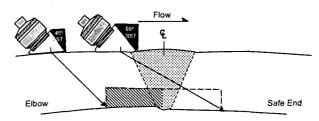
**Scale:** 100% Exam Angle: 45° / 60° / 70°

Diameter: 12"

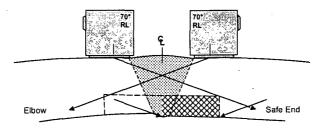
Thickness: 1.13" Material: S/S to CASS

CC/S = Clad Carbon Steel S/S = Stainless SteelCASS = Cast Stainless Steel

Page 2 of 2



Exam Coverage = 50% per single sided access rules.



Far side of weld examined per single sided access rules. No coverage credit taken.

## Responses to Request for Additional Information Summary No.: 117110 Comp ID: 12-SI-2011-12 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Elbow to Safe End / No Code coverage was credited for scanning performed from Cast Stainless Steel Safe End side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

Component ID: 12-SI-2011-12

NDE Report No.: CC09-IU-018

Coverage Sketch No: NA

LTP No.: 117110

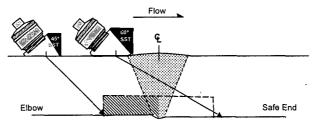
**Summary No.: 117110** 

Exam Area: Lower T Exam Angle: 45° / 60° / 70° MO No.: 2200800093 **Scale: 100%** 

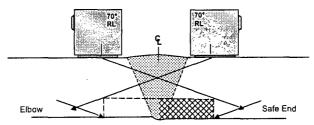
Page 2 of 2

Diameter: 12" Thickness: 1.13"
Material: S/S to CASS

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel



Exam Coverage = 50% per single sided access rules.



Far side of weld examined per single sided access rules. No coverage credit taken.

### Responses to Request for Additional Information Summary No.: 118110 Comp ID: 12-SI-2012-12 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Pipe to Safe End / No Code coverage was credited for scanning performed from Cast Stainless Steel Safe End side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

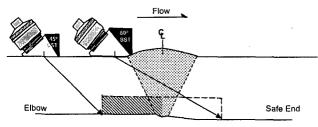
Component ID: 12-SI-2012-12 LTP No.: 118110 NDE Report No.: CC09-IU-019 Summary No.: 118110

Coverage Sketch No: NA
Exam Area: Lower T
Exam Angle: 45°/60°/70°

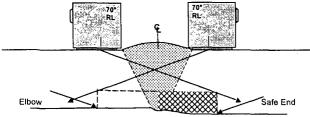
MO No.: 2200800093 Scale: 100% Page 2 of 2

Diameter: 12"
Thickness: 1.16"
Material: S/S to CASS

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel



Exam Coverage = 50% per single sided access rules.



Far side of weld examined per single sided access rules. No coverage credit taken.

## Responses to Request for Additional Information Summary No.: 139000 Comp ID: 4-SR-2001-1 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Tee to Pipe / No examination could be performed from Tee side of weld due to Weld crown configuration. This also limited coverage from the pipe side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

#### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

Component ID: 4-SR-2001-1

NDE Report No.: 2003BU023

Coverage Sketch No: NA

LTP No.: 139000 Summary No.: 139000

MO No.: 2200201399

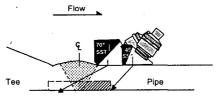
Exam Area: Lower T Exam Angle: 45° / 70° Scale: 100%

Diameter: 4"
Thickness: 0.50"

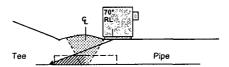
Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 2



Exam Coverage = 50% per single sided access rules.



Far side of weld examined per single sided access rules. No coverage credit taken.

### Responses to Request for Additional Information Summary No.: 141010 Comp ID: 4-SR-2005-2 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Safe-end to Elbow / Due to geometry no coverage was attainable on Safe End side of weld due to taper and lift-off at weld toe also limited coverage from elbow side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

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**CCNPP** 

Component ID: 4-SR-2005-2 LTP No.: 141010

**Summary No.:** 141010

Coverage Sketch No: NA Exam Area: Lower T Exam Angle: 45° / 70°

NDE Report No.: 2003BU038

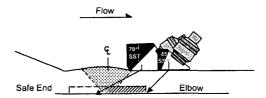
MO No.: 2200201399 Scale: 100%

Page 2 of 2 Diameter: 4"

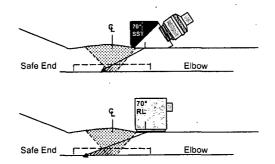
Thickness: 0.41" Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless SteelCASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



Exam Coverage = 50% per single sided access rules.



Far side of weld examined per single sided access rules. No coverage credit taken.

# **ENCLOSURE 4**

Relief Request ISI-27 for CCNPP Unit 2 Class 2 Components

### Responses to Request for Additional Information Summary No.: 201650 Comp ID: SCHE-22-1 Page 1 of 4

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

### Response:

Channel Barrel-to-Flange / Close proximity of Flange transition to the weld limits attaining full coverage from the flange side of weld. The ultrasonic interrogation of the channel shell to flange weld could only be partially obtained from flange side due to the component configuration and close proximity of the weld to the flange transition. The nondestructive examination (NDE) techniques and procedures used incorporated similar examination techniques qualified under Appendix III of the ASME Section XI Code, as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

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2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

#### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

#### Response:

**CCNPP** 

Component ID: SCHE-22-1

LTP No.: 201650

Coverage Sketch No: 1

Exam Area: Ax Upst. (360°) Exam Angle: 45° / 70°

NDE Report No.: 2003BU006 Summary No.: 201650

MÓ No.: 2200201386 Scale: 100%

Diameter: 45" Thickness: 1.25" Material: CC/S

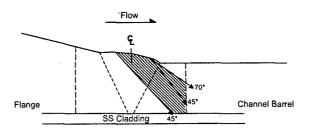
CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 4

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(Sketch Resized for Relief Request)



45° / 70°Axial Coverage from Upstream side = 0.76 in² of 2.44 in² exam area = 31.2%

**CCNPP** 

Component ID: SCHE-22-1

LTP No.: 201650 Coverage Sketch No: 2

Exam Area: Ax Dnst (360°) Exam Angle: 45° / 70°

NDE Report No.: 2003BU006 **Summary No.:** 201650

MO No.: 2200201386 Scale: 100%

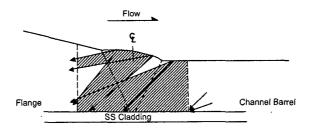
Diameter: 45" Thickness: 1.25"

Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless SteelCASS = Cast Stainless Steel

Page 3 of 4

(Sketch Resized for Relief Request)



45° / 70°Axial Coverage from Upstream side = 2.16 in² of 2.44 in² exam area = 88.5%

**CCNPP** 

Component ID: SCHE-22-1

LTP No.: 201650

Coverage Sketch No: 3

Exam Area: Circ (360°) Exam Angle: 45°

NDE Report No.: 2003BU006

**Summary No.:** 201650

MO No.: 2200201386

Scale: 100%

Diameter: 45"

Thickness: 1.25" Material: CC/S

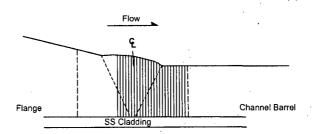
CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 4 of 4

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(Sketch Resized for Relief Request)



45° Circ Coverage CW / CCW = 1.5 in² of 2.44 in² exam area = 61.5%

- - (31.2 + 88.5) / 2 = 59.85%

#### Circ Coverage

61.5%

Total Coverage
• (59.85 + 61.5) / 2 = 61%

# Responses to Request for Additional Information Summary No.: 201700 Comp ID: SCHE-22-2 Page 1 of 3

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

Channel Barrel-to-Flange / Close proximity of Flange transition to the weld limits attaining full coverage from the flange side of weld. The ultrasonic interrogation of the channel shell to flange weld could only be partially obtained from flange side due to the component configuration and close proximity of the weld to the flange transition. The nondestructive examination (NDE) techniques and procedures used incorporated similar examination techniques qualified under Appendix III of the ASME Section XI Code, as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

# Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

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2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

## Response:

**CCNPP** 

Component ID: SCHE-22-2

LTP No.: 201700

Coverage Sketch No: 1

Exam Area: 360° Exam Angle: 45°/60° Ax Upst

NDE Report No.: CC05-IU-003

**Summary No.: 201700** MO No.: 2200400808

Scale: 100%

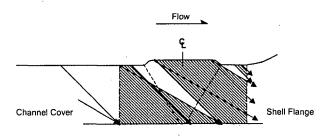
Page 2 of 3 Diameter: 45"

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Thickness: 1.25" Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



45° / 60°Axial Coverage from Upstream side = 2.56 in² of 3.0 in² exam area = 85.3%

**CCNPP** 

Component ID: SCHE-22-2

LTP No.: 201700

Coverage Sketch No: 2

Exam Area: Ax Dnst. (360°) Exam Angle: 45° / 60° NDE Report No.: CC05-IU-003 Summary No.: 201700

MO No.: 2200400808 Scale: 100% Diameter: 45" Thickness: 1.25"

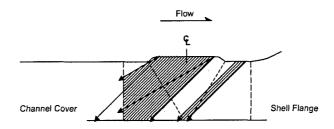
Material: CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 3 of 3

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(Sketch Resized for Relief Request)



45° / 60°Axial Coverage from Upstream side = 1.35 in² of 3.0 in² exam area = 45%

# Responses to Request for Additional Information Summary No.: 201400 Comp ID: SCHE-21-N1 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

Inlet Nozzle to Shell / Due to nozzle configuration coverage of the nozzle side base metal and weld was limited. The nozzle-to-shell weld is primarily accessible from the shell side based on the component configuration. The nozzle scanning surface is essentially perpendicular to the shell which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The NDE techniques and procedures used incorporated similar examination techniques qualified under Appendix III of the ASME Section XI Code, as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

## Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

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2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

# Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

## Response:

**CCNPP** 

Component ID: SCHE-21-N1

LTP No.: 201400

Coverage Sketch No: 1 Exam Area: 360°

Exam Angle / Direction: 45° / 70° Ax Upst

NDE Report No.: 2001BU006

**Summary No.: 201400** 

MO No.: 2200002397

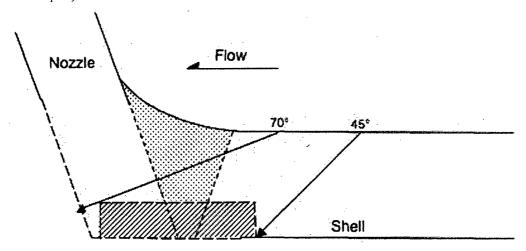
**Scale: 100%** 

Page 2 of 2 Diameter: 10"

Thickness: 1.125" Material: S/S to CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)



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45° / 70° Axial Coverage from Upstream side = 100%

45° / 70° Axial Coverage from Downstream side = 0%

Coverage Calc	
Exam	Coverage
Ax Upst	100%
Ax Dnst	0%
CW	50%
CCW	50%
Total:	200%
Total / 4:	<u>50%</u>

# Responses to Request for Additional Information Summary No.: 201500 Comp ID: SCHE-21-N2 Page 1 of 3

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

Outlet Nozzle to Shell / Due to nozzle configuration coverage of the nozzle side base metal and weld was limited. The nozzle-to-shell weld is primarily accessible from the shell side based on the component configuration. The nozzle scanning surface is essentially perpendicular to the shell which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. The NDE techniques and procedures used incorporated similar examination techniques qualified under Appendix III of the ASME Section XI Code, as supplemented by Table I-2000-1. See attached sketches derived from examination data on file at CCNPP.

2.1.1 b) As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

# Response:

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This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

## Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

## Response:

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**CCNPP** 

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Component ID: SCHE-21-N2

LTP No.: 201500

Coverage Sketch No: 1

Exam Area: 360° (40")
Exam Angle / Direction: 45° / 70° Ax Upst

NDE Report No.: CC09-1U-005 Summary No.: 201500

MO No.: 2200800083

Scale: 100%

Page 2 of 3

Diameter: 10"
Thickness: 1.125"
Material: S/S to CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)

Nozzle Flow
70° 45°
Shell

45° / 70° Axial Coverage from Upstream side = 100%

45° / 70° Axial Coverage from Downstream side = 0%

**CCNPP** 

Component ID: SCHE-21-N2

LTP No.: 201500

Coverage Sketch No: 2 Exam Area: 360° Exam Angle / Direction: 45° CW / CCW NDE Report No.: CC09-1U-005

Summary No.: 201500 MO No.: 2200800083

Scale: 100%

Page 3 of 3 Diameter: 10"

Thickness: 1.125" Material: S/S to CC/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

(Sketch Resized for Relief Request)

Flow

45° CW / CCW Coverage = 52.5%

Coverage Calc Exam Ax Upst Ax Dnst Coverage 100% 0% CCM 52.5% 52.5%

205% 51.3% Total: Total / 4:

# Responses to Request for Additional Information Summary No.: 215100 Comp ID: 10-SI-2002-3 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

# Response:

Pipe to Valve / Due to taper on valve body no coverage was attainable from valve side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

## Response:

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This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan with tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

## Response:

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See attached sketches derived from examination data on file at CCNPP for cross sectional coverage plots and calculations.

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**CCNPP** 

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Component ID: 10-SI-2002-3

LTP No.: 215100

**Summary No.: 215100** 

Coverage Sketch No: NA

Exam Area: Lower T Exam Angle: 45° / 70°

NDE Report No.: CC04-IU-044

MO No.: 2200400809

Scale: 100%

Diameter: 10"

Thickness: ,0.25" Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel 11:

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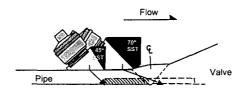
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Page 2 of 2

(Sketch Resized for Relief Request)



Exam Coverage = 50% as per single sided access rules.

Exam obstructed for 4" due to Branch Connection In close proximity to weld.

Adjusted Coverage = 50% (29.5" of 33.5" weld length) = 44%.

# Responses to Request for Additional Information Summary No.: 215550 Comp ID: 10-SI-2003-2 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

Flange to Expander/ Close proximity of Flange transition to the weld limits attaining coverage from the flange side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

## Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

### Response:

**CCNPP** 

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Component ID: 10-SI-2003-2

NDE Report No.: CC05-IU-001 LTP No.: 215550 Summary No.: 215550

Coverage Sketch No: NA Exam Area: Lower T

Exam Angle: 45° / 70°

MO No.: 2200400808

**Scale: 100%** 

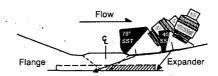
Diameter: 10" Thickness: 0.38"

Material: S/S

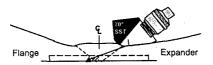
CC/S = Clad Carbon Steel S/S = Stainless SteelCASS = Cast Stainless Steel

Page 2 of 2

(Sketch Resized for Relief Request)



Exam Coverage = 50% as per single sided access rules.



Far side of weld examined as per single sided access rules - No coverage credit taken.

# Responses to Request for Additional Information Summary No.: 225750 Comp ID: 6-SI-2004A-19 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

# Response:

Elbow to Reducer / Access to bottom of weld obstructed by immovable structural member (I-beam). The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under-Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

## Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

## Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

## Response:

**CCNPP** 

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Component ID: 6-SI-2004A-19

LTP No.: 225750

NDE Report No.: CC07-IU-004

Coverage Sketch No: NA

Exam Area: Lower T Exam Angle: 60°

Summary No.: 225750 .

MO No.: 2200600723 Scale: 100%

Diameter: 6" Thickness: 0.43"

Material: S/S

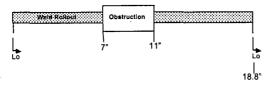
CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

Page 2 of 2

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(Sketch Resized for Relief Request)

Reducer



Exam Coverage = 100% for 14.8" of 18.8" weld length = 78.7%

# Responses to Request for Additional Information Summary No.: 230650 Comp ID: 6-SI-2017-11 Page 1 of 2

The NRC requested Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) to provide detailed and specific information to support the bases for limited examination in all requests for relief submitted on June 30, 2010, and therefore, demonstrate impracticality. The questions for each relief request are as follows:

2.1.1 a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences affecting NDE techniques.

## Response:

Elbow to Pipe / Integral welded attachment (saddle) adjacent to weld prevented access to the lower 180 degrees of weld on pipe side of weld. The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration (weld location relative to scanning surface, curvature/taper) and/or immovable penetrations and/or attachments. For these welds obtaining full coverage from both sides of the weld was not attainable since one side of the weld was not optimally oriented for scanning of the weld and adjacent base metal based on the surface angle of the component; therefore, the welds received a single-sided examination or partial two-sided examination resulting in less than 90% coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporated examination techniques qualified under Appendix VIII of the ASME Section XI Code. See attached sketches derived from examination data on file at CCNPP.

As applicable, describe NDE equipment (ultrasonic scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

## Response:

This was a manual UT examination. Limitations are as detailed on the attached sketches. No alternative examinations are planned for the welds during the current inspection interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

2.1.1 c) Fully clarify the wave mode(s) and insonification angles used for all ultrasonic examinations.

### Response:

Wave modality used included longitudinal and shear. Insonification angles were as indicated on the scan tables on the attached sketches.

2.1.1 d) Provide cross-sectional coverage plots to describe ASME Code volumes and transducer angles used during the examination.

## Response:

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**CCNPP** 

Component ID: 6-SI-2017-11

LTP No.: 230650

Coverage Sketch No: NA Exam Area: Lower T Exam Angle: 60° / 70°

NDE Report No.: CC07-IU-001 Summary No.: 230650

MO No.: 2200600726 **Scale:** 100%

Diameter: 6"

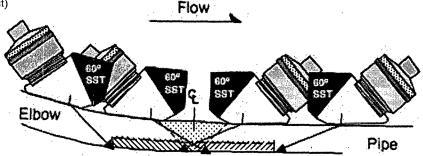
Thickness: 0.30" Material: S/S

CC/S = Clad Carbon Steel S/S = Stainless Steel CASS = Cast Stainless Steel

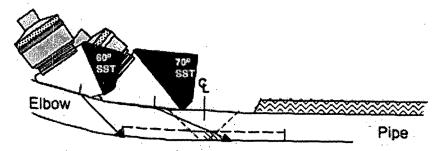
Page 2 of 2

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(Sketch Resized for Relief Request)



Exam Coverage = 100% for 180° of weld length.



Exam Coverage = 50% for 180° of weld length, due to integral attachment on pipe side. Far side of weld examined in this area as per single sided access rules - No coverage credit taken.

Coverage Calc	
Exam	Coverage
Ax Upst	100%
Ax Dnst	50%
Circ CW	75%
Circ CCW	75%
Total:	300%
Total / 4:	75%