Entergy

Entergy Nuclear Northeast
Entergy Nuclear Operations, Inc.
Vermont Yankee
P.O. Box 0500
185 Old Ferry Road
Brattleboro, VT 05302-0500
Tel 802 257 5271

May 11, 2005
BVY 05-37

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

Subject: **Vermont Yankee Nuclear Power Station**
License No. DPR-28 (Docket No. 50-271)
Relief Request B-5, Response to Request for Additional Information

By letter dated October 1, 2003[1], Vermont Yankee Nuclear Power Station (VY) submitted Relief Request B-5. Relief Request B-5 proposed relief for identified weld examinations from the Third Interval where the required "essentially 100%" examination coverage was impractical due to physical obstructions and limitations imposed by design, geometry, and materials of construction of the subject components.

On January 19, 2005[2], The NRC submitted a Request for Additional Information regarding RI-01. Accordingly, the following Attachments provide the response to the request for additional information.

There are no commitments contained within this letter.

Please feel free to contact me at (802) 258-4236, if there are any questions regarding this subject.

Sincerely,

James M. DeVincentis
Manager, Licensing
Vermont Yankee Nuclear Power Station

Attachments (16)

cc: USNRC Region 1 Administrator (w/o attachments)
USNRC Resident Inspector - VY (w/o attachments)
USNRC Project Manager - VY
Vermont Department of Public Service

[1] Reference VY Letter to USNRC, BVY 03-89, "Supplement 2 to Fourth-Interval Inservice Inspection (ISI) Program Plan – Submittal of Relief Request RI-01," dated October 1, 2003.
[2] Reference USNRC Letter to VY, NVY 05-05, "Request for Additional Information - Relief Request B-5 (TAC No. MC0959)," dated January 19, 2005.

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ATTACHMENT 1 TO BVY 05-37

Relief Request B-5, Response to Request for Additional Information
Restatement of Questions and General Response to Questions

ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

On January 19, 2005[3], The NRC submitted a Request for Additional Information regarding Relief Request B-5. The Staff questions are restated below:

Question 1:

Provide a technical basis for each component listed in Table RR-B-5 describing in detail the examination limitation, and discuss whether other [supplemental] examinations may be used to increase or supplement the limited examinations. The technical basis should include a cross-sectional sketch of the weld indicating ultrasonic coverage(s) and details of the weld and base metal materials. The technical basis should confirm, where applicable, that the examinations that were performed were qualified under Appendix VIII of Section XI.

Question 2:

Indicate what degradation mechanism(s) is most likely to occur in this weld and a basis for whether the achieved examination coverage could reasonably be expected to detect this degradation.

Response to Questions:

The questions above are requesting various related pieces of information. To summarize and explain the responses, please see below:

Description of Examination Limitation

The description of each limitation is described in Table 1 which follows.

Use of Supplemental Examinations

The use of supplemental examinations to enhance the inspection results is discussed in Notes 3, 8 and 9 of Table 1.

Provide Cross-Sectional Coverage Sketches

Coverage sketches, in addition to coverage calculations are provided on the sketches.

Provide Details of the Weld and Base Materials Involved

The base materials for the subject areas are identified on the coverage sketches. Weld materials are identified on the sketches where dissimilar metals are joined.

Confirm, where applicable, that examinations were performed per Appendix VIII of Section XI
Table 1, Note 1 identifies the components which were examined per ASME Section V, Articles 4 & 5 and USNRC Reg. Guide 1.150. It is noted that additional non-code scanning angles or techniques would have

[3] Reference USNRC Letter to VY, NVY 05-05, "Request for Additional Information - Relief Request B-5 (TAC No. MC0959)," dated January 19, 2005.

provided little or no relevant additional data. Performance of such examinations would have significantly increased radiation dose with little or no enhancement in safety.

Indicate Most Likely Degradation Mechanism

The most likely degradation mechanisms are discussed in Notes 3, 8 and 9 in Table 1 below.

Achieved Coverage will Detect Degradation Mechanism

Statement of acceptable coverage to detect degradation mechanism is discussed in Notes 3, 8 and 9 in Table 1 below.

TABLE 1

COMPONENTS WITH LESS THAN "ESSENTIALLY 100%" COVERAGE

Section XI Category & Item No.	Component System & Number	Component Description	Examination Limitation	Exam & Coverage Percent	Notes
B-D B3.90	RPV N1A	Vessel-to-Nozzle (Recirculation)	Weld proximity to nozzle blend radius limits scanning to one side	UT 50.4%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N1B	Vessel-to-Nozzle (Recirculation)	Weld proximity to nozzle blend radius limits scanning to one side	UT 50.4%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N2A	Nozzle-to-Vessel (Recirculation)	Weld proximity to nozzle blend radius limits scanning to one side	UT 51.6%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N2B	Nozzle-to-Vessel (Recirculation)	Weld proximity to nozzle blend radius limits scanning to one side	UT 51.6%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N2C	Nozzle-to-Vessel (Recirculation)	Weld proximity to nozzle blend radius limits scanning to one side	UT 51.6%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N2D	Nozzle-to-Vessel (Recirculation)	Weld proximity to nozzle blend radius limits scanning to one side	UT 51.6%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N2E	Nozzle-to-Vessel (Recirculation)	Weld proximity to nozzle blend radius limits scanning to one side	UT 51.6%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N2F	Nozzle-to-Vessel (Recirculation)	Weld proximity to nozzle blend radius limits scanning to one side	UT 51.6%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N2G	Nozzle-to-Vessel (Recirculation)	Weld proximity to nozzle blend radius limits scanning to one side	UT 51.6%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N2H	Nozzle-to-Vessel (Recirculation)	Weld proximity to nozzle blend radius limits scanning to one side	UT 51.6%	See notes 1, 2, 3 & 4

B-D B3.90	RPV N2J	Nozzle-to-Vessel (Recirculation)	Weld proximity to nozzle blend radius limits scanning to one side	UT 51.6%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N2K	Nozzle-to-Vessel (Recirculation)	Weld proximity to nozzle blend radius limits scanning to one side	UT 51.6%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N3A	Vessel-to-Nozzle (Main Steam)	Weld proximity to nozzle blend radius limits scanning to one side	UT 51.6%	See notes 1, 2, 3, 4 & 5
B-D B3.90	RPV N3B	Vessel-to-Nozzle (Main Steam)	Weld proximity to nozzle blend radius limits scanning to one side	UT 51.6%	See notes 1, 2, 3, 4 & 5
B-D B3.90	RPV N3C	Vessel-to-Nozzle (Main Steam)	Weld proximity to nozzle blend radius limits scanning to one side	UT 51.6%	See notes 1, 2, 3, 4 & 5
B-D B3.90	RPV N3D	Vessel-to-Nozzle (Main Steam)	Weld proximity to nozzle blend radius limits scanning to one side	UT 51.6%	See notes 1, 2, 3, 4 & 5
B-D B3.90	RPV N4A	Nozzle-to-Vessel (Feed Water)	Weld proximity to nozzle blend radius limits scanning to one side	UT 63.3%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N4B	Nozzle-to-Vessel (Feed Water)	Weld proximity to nozzle blend radius limits scanning to one side	UT 63.3%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N4C	Nozzle-to-Vessel (Feed Water)	Weld proximity to nozzle blend radius limits scanning to one side	UT 63.3%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N4D	Nozzle-to-Vessel (Feed Water)	Weld proximity to nozzle blend radius limits scanning to one side	UT 63.3%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N5A	Nozzle-to-Vessel (Core Spray)	Weld proximity to nozzle blend radius limits scanning to one side	UT 67.1%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N5B	Nozzle-to-Vessel (Core Spray)	Weld proximity to nozzle blend radius limits scanning to one side	UT 67.1%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N6A	Nozzle-to-Vessel (Head Spray)	Weld proximity to nozzle blend radius limits scanning to one side	UT 52.5%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N6B	Nozzle-to-Vessel (Head Spray)	Weld proximity to nozzle blend radius limits scanning to one side	UT 52.5%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N7	Vessel-to-Nozzle (Head Vent)	Weld proximity to nozzle blend radius limits scanning to one side	UT 49.1%	See notes 1, 2 & 3
B-D B3.90	RPV N8A	Vessel-to-Nozzle (Jet Pump Instr.)	Weld proximity to nozzle blend radius limits scanning to one side	UT 65.9%	See notes 1, 2, 3 & 4
B-D B3.90	RPV N8B	Vessel-to-Nozzle (Jet Pump Instr.)	Weld proximity to nozzle blend radius limits scanning to one side	UT 65.9%	See notes 1, 2, 3 & 4

B-D B3.90	RPV N9	Vessel-to-Nozzle (CRD – Capped)	Weld proximity to nozzle blend radius limits scanning to one side	UT 61.6%	See notes 1, 2 & 3
B-D B3.90	RPV N10	Nozzle-to-Vessel (SLC)	Weld proximity to nozzle blend radius limits scanning to one side. Additional partial limitation due to RPV Support Skirt	UT 42.8%	See notes 1, 2 & 3
B-D B3.100	RPV N10-IR	Nozzle Inner Radius (SLC)	Support skirt	UT 88.3%	See notes 1, 2 & 3
B-F B5.10	RPV N6A-SE	Nozzle-to-Safe-end (Head Spray)	Flange bolting & surface depression	UT 58%	See note 2, 9 & 10
B-F B5.10	RPV N6B-SE	Nozzle-to-Safe-end (Head Spray)	Flange bolting	UT 89.9%	See note 2, 9 & 10
B-H B8.10	RPV SUPPORT SKIRT	Bottom Head-to-Support Skirt	OD of weld inaccessible due to biological shield wall and insulation	PT 50%	See note 6, 8 & 10
B-J B9.11	Core Spray CS4B-MF5	Valve-to-Pipe	Pipe to valve configuration (one-sided exam)	UT 38.6%	See note 7, 9 & 10
B-J B9.11	RHR RH28-12	Pipe-to-Valve	Pipe to valve configuration (one-sided exam)	UT 82.5%	See note 2, 9 & 10
B-J B9.11	RHR RH29-10	Valve-to-Elbow	Elbow to valve configuration (one-sided exam) & branch connection obstruction	UT 82.1%	See note 2, 8 & 10
B-J B9.11	RHR RH32-8	Valve-to-Pipe	Pipe to valve configuration (one-sided exam) & OD surface configuration	UT 73.8%	See note 2, 8 & 10
B-K B10.10	Recirc RR-89,90	8 Lug Welds	Pipe clamp on bottom of shear lugs	PT 77.8%	See note 8 & 10
B-O B14.10	CRD 02-27HF	CRD Housing-to-Flange	Two 1" diameter support rods	UT 85.2%	See note 2, 9 & 10
B-O B14.10	CRD 02-27SH	CRD Housing-to-Flange	Two 1" diameter support rods	UT 85.2%	See note 2, 9 & 10
B-O B14.10	CRD 26-03HF	CRD Housing-to-Flange	Two 1" diameter support rods	UT 85.2%	See note 2, 9 & 10
B-O B14.10	CRD 34-39HF	CRD Housing-to-Flange	Two 1" diameter support rods	UT 85.2%	See note 2, 9 & 10
C-A C1.10	RHR A-HTEX10-4	RHR Heat Exch. Shell-to-Flange	Flange geometry & 12 welded attachments	UT 80.2%	See note 2, 9 & 10
C-C C3.10	RHR A-RHR-CC-4	RHR Heat Exch. Welded Support	Limited access between shell and floor	MT 80.1%	See note 8 & 10
C-F-2 C5.51	Condensate CT27-S30	Pipe-to-Valve	Valve configuration	UT 84.5%	See note 2, 7, 8 & 10
C-F-2 C5.51	Feedwater FW-17-S5	Valve-to-Pipe	Valve configuration (one-sided exam)	UT 79.8%	See note 2, 7, 8 & 10
C-F-2 C5.51	RHR RH3D-S206	Valve-to-Pipe	Weld OD profile configuration (limited circumferential scan)	UT 79.0%	See note 2, 7, 8 & 10

C-F-2 Augmented	RCIC RC3-S15	Pipe-to-Valve (0.280" thick)	Valve configuration	UT 80.5%	See note 2, 7, 8 & 10
NUREG 0313	RWCU CU54-16	Pipe-to-Flange (Class 3)	Flange configuration	UT 57.3%	See note 2, 7, 9 & 10

NOTES

1. This examination was performed in accordance the requirements of ASME Section V, Articles 4 & 5 and USNRC Reg. Guide 1.150. Additional non-code scanning angles or techniques would have provided little or no relevant additional data. Performance of such examinations would have significantly increased radiation dose with little or no enhancement in safety.
2. A copy of the examination report with cross-sectional sketches and coverage calculations are attached. Sketches have been modified to include identification of component materials.
3. Flaws within the examination area would most likely have initiated from existing fabrication related discontinuities. No discontinuities of reportable size have been recorded for this component during construction or baseline examinations. This area is subjected to minimal residual and operational stress. To date, for the industry, no cracking has been reported in this area. The NDT critical flaw size for the Vermont Yankee RPV is ¼ t (approximately 1.3"). Vermont Yankee believes that the examinations that were performed on this area would have detected a flaw of this size.
4. Examination limitations identical for all components in this Item Number. Coverage calculations performed for one, apply to all items in the Category
5. Coverage for the N3A, B, C & D nozzle to vessel welds are identical to N2A-K. See plots for N2A-K.
6. Access to ID surface only.
7. Appendix VIII examination
8. Flaws within the examination area would most likely have initiated from service induced fatigue or corrosion. No discontinuities of reportable size have been recorded for this component during construction or baseline examinations. Vermont Yankee believes that the examinations that were performed on this area would have detected service induced flaws in the accessible areas.
9. Flaws within the examination area would most likely have initiated from service induced fatigue or IGSCC. No discontinuities of reportable size have been recorded for this component during construction or baseline examinations. Vermont Yankee believes that the examinations that were performed on this area would have detected service induced flaws in the accessible areas.
10. Additional non-code scanning angles or techniques would have provided little or no relevant additional data. Performance of such examinations would have provided little or no enhancement in safety.

ATTACHMENT 2 TO BVY 05-37

Relief Request B-5, Response to Request for Additional Information
Coverage Sketches – N1A & N1B Nozzle to Vessel

ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

YANKEE

NUCLEAR SERVICES DIVISION
INSERVICE INSPECTION

PROCEDURE YA-UT-1
REVISION 9
PAGE 11 of 12

YA-UT-2-0036

SUPPLEMENTAL DATA SHEET

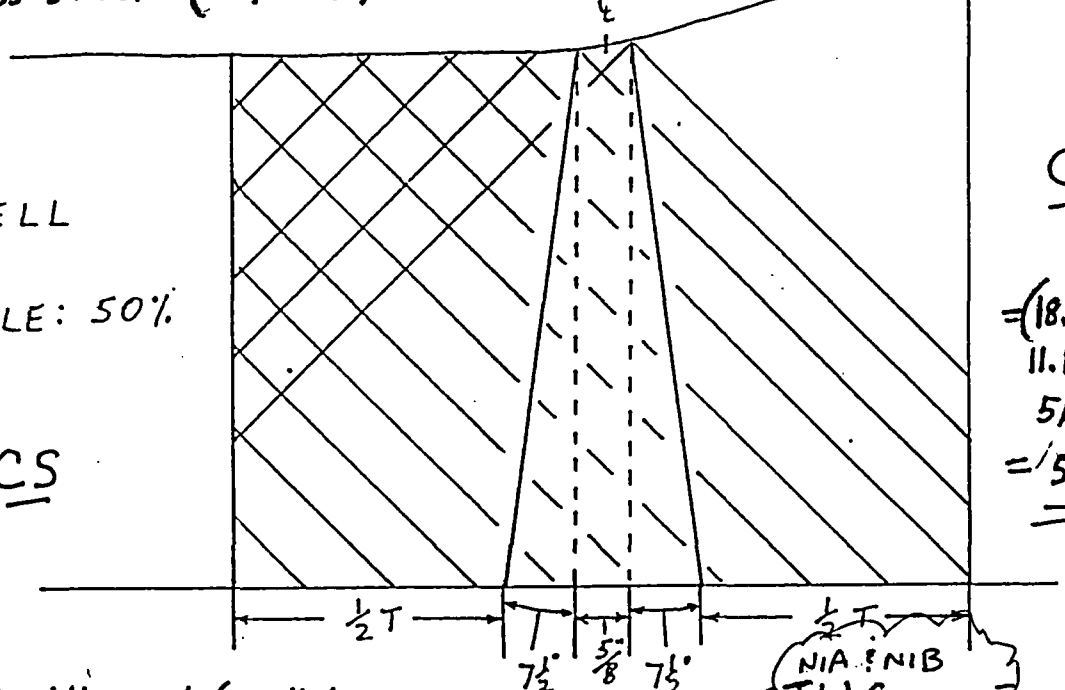
PLANT: VY OUTAGE: RF-21 DRAWING: ISI-RPV-103 REV.: 3
SYSTEM: RPV COMPONENT/WELD NO.: N1A NZ TO VESSEL EN: N/A
LOCATION: DW 279

Examination Details/Sketch: 45° COVERAGE

WELD DIMENSIONS TAKEN FROM N1 NOZZLE
DESIGN DWG: 5920-238 R4.

Cross-Section = $(7\frac{3}{4} \times 5\frac{1}{2}) + \frac{1}{2}(3\frac{3}{4} \times 1\frac{1}{2}) = 45.4''\,in^2$

Thermocouple interference is negligible.



% 45° Axial US = $\frac{1}{2}(4 \times 4\frac{1}{4})/45.4 = 18.7\%$
% 45° Axial DS = $[(5\frac{1}{2} \times 7\frac{3}{4}) - \frac{1}{2}(3\frac{1}{2} \times 3\frac{1}{2})]/45.4 = 80.4\%$
% 45° Circ CW = $(4\frac{1}{4} \times 5\frac{1}{2})/45.4 = 51.5\%$
% 45° Circ CCW = $(4\frac{1}{4} \times 5\frac{1}{2})/45.4 = 51.5\%$
% 0° = $(4\frac{1}{4} \times 5\frac{1}{2})/45.4 = 51.5\%$

N1A & N1B Total Coverage = (% 45° Axial US + % 45° Axial DS + % 45° Circ CW + % 45° Circ CCW + % 60° Axial US + % 60° Axial DS + % 60° Circ CW + % 60° Circ CCW + % 0°)/9

$= (18.7 + 80.4 + 51.5 + 51.5 + 11.1 + 86.2 + 51.5 + 51.5 + 51.5)/9$
$= 50.4\%$

EXAMINER Simon Crothers Dean Howard LEVEL II DATE 11-10-99
COG. ENG./EXAM AGENCY N/A DATE N/A
ISI COORDINATOR (If ASME XI Exam) [signature] DATE 11.11.99
QA (Optional) N/A DATE N/A
ANII (Optional) [signature] DATE 11.30.99

YANKEE	NUCLEAR SERVICES DIVISION INSERVICE INSPECTION	PROCEDURE YA-UT-1 REVISION 9 PAGE 11 of 12 YA-UT-2-0036

SUPPLEMENTAL DATA SHEET

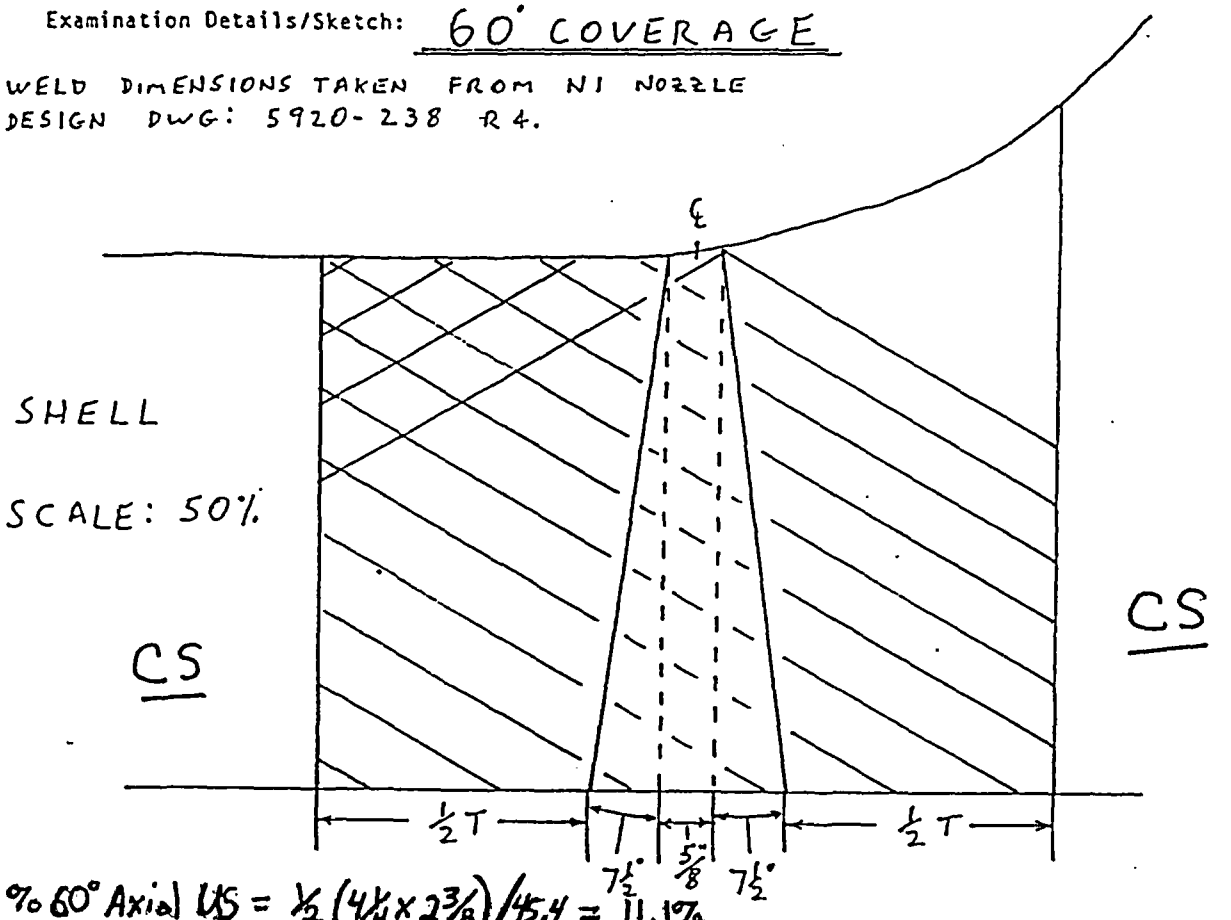
PLANT: VY OUTAGE: RF-21 DRAWING: 151-RPV-103 REV.: 3

SYSTEM: RPV COMPONENT/WELD NO.: N1A N2 TO VESSEL EN: N/A

LOCATION: DW 279

Examination Details/Sketch: 60° COVERAGE

WELD DIMENSIONS TAKEN FROM N1 NOZZLE DESIGN DWG: 5920-238 R4.



% 60° Axial US = ½(4¼ × 2⅜)/45.4 = 11.1%

% 60° Axial DS = [(5½ × 7¾) − ½(3½ × 2)]/45.4 = 86.2%

% 60° Circ CW = (4¼ × 5½)/45.4 = 51.5%

% 60° Circ CCW = (4¼ × 5½)/45.4 = 51.5%

EXAMINER Simon Crothers Dean Howard LEVEL II DATE 11-10-99

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 11.11.99

QA (Optional) N/A DATE N/A

ANII (Optional) [signature] DATE 11-30-99

YANKEE	NUCLEAR SERVICES DIVISION INSERVICE INSPECTION	PROCEDURE YA-UT-1 REVISION 9 PAGE 11 of 12 YA-UT-2-0035

SUPPLEMENTAL DATA SHEET

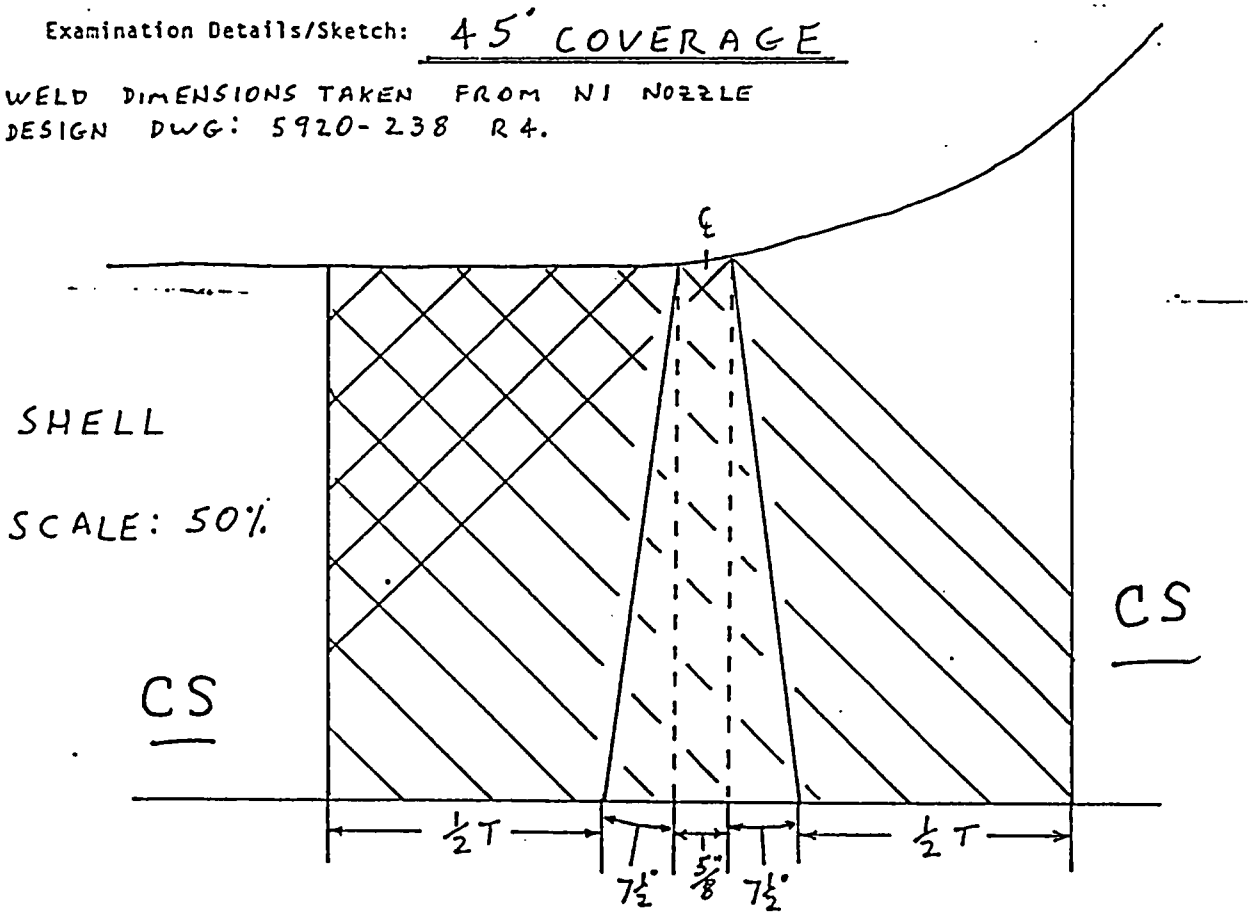
PLANT: VY OUTAGE: RF-21 DRAWING: ISI-RPV-103 REV.: 3

SYSTEM: RPV COMPONENT/WELD NO.: N1B N2 TO VESSEL EN: N/A

LOCATION: DW 279

Examination Details/Sketch: 45° COVERAGE

WELD DIMENSIONS TAKEN FROM N1 NOZZLE DESIGN DWG: 5920-238 R4.



EXAMINER Simon Crothers / Dean Howard LEVEL II DATE 11-10-99

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) SHP Young DATE 11.11.99

QA (Optional) N/A DATE N/A

ANII (Optional) W. Hyatt DATE 11-30-99

R65\9

FORM 3

NUCLEAR SERVICES DIVISION INSERVICE INSPECTION	PROCEDURE REVISION PAGE	YA-UT-1 9 11 of 12

YA-UT-2-0035

SUPPLEMENTAL DATA SHEET

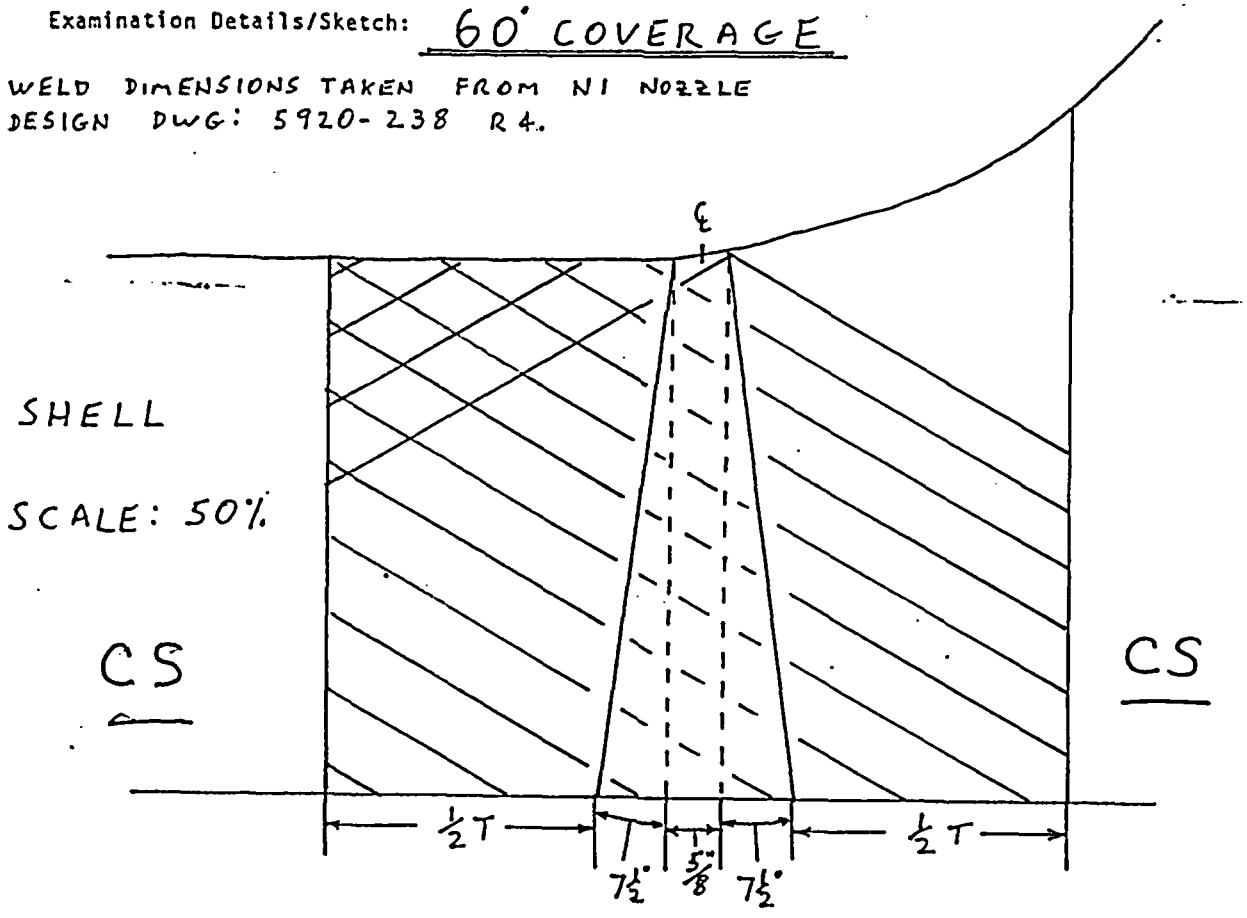
PLANT: VY OUTAGE: RF-21 DRAWING: 151-RPV-103 REV.: 3

SYSTEM: RPV COMPONENT/WELD NO.: N1B N2 TO VESSEL EH: N/A

LOCATION: DW 279

Examination Details/Sketch: 60° COVERAGE

WELD DIMENSIONS TAKEN FROM N1 NOZZLE DESIGN DWG: 5920-238 R4.



EXAMINER Simon Crothers Dean Howard LEVEL II DATE 11-10-99

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 11.11.99

QA (Optional) N/A DATE N/A

ANII (Optional) [signature] DATE 11.30.99

R65\9

FORM 3

ATTACHMENT 3 TO BVY 05-37

Relief Request B-5, Response to Request for Additional Information
Coverage Sketches – Nozzles N2A, B, C, D, E, F, G, H, J & K

ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

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MAD
3-23-95

VERMONT YANKEE

CRV COVERAGE PLOT 0°

TYPICAL FOR: N2A, N2B, N2C, N2D+N2E, N2F, N2G, N2H, N2J + N2K

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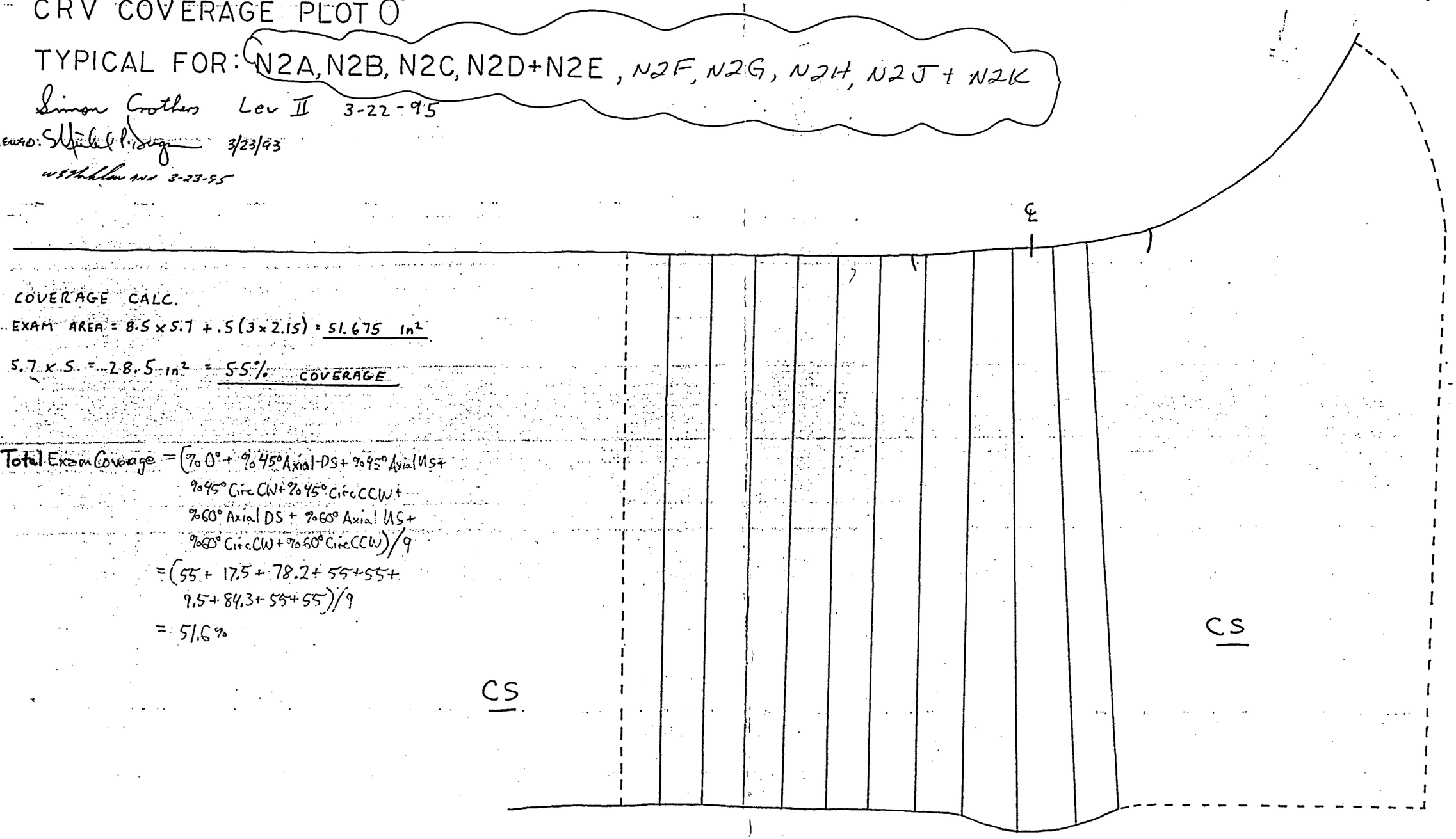


COVERAGE CALC.

EXAM AREA = 8.5 x 5.7 + .5 (3 x 2.15) = 51.675 in²

5.7 x 5 = 28.5 in² = 55% COVERAGE

Total Exam Coverage = (% 0° + % 45° Axial DS + % 45° Axial US + % 45° Circ CW + % 45° Circ CCW + % 60° Axial DS + % 60° Axial US + % 60° Circ CW + % 60° Circ CCW)/9

= (55 + 17.5 + 78.2 + 55 + 55 + 9.5 + 84.3 + 55 + 55)/9

= 51.6%

VERMONT YANKEE

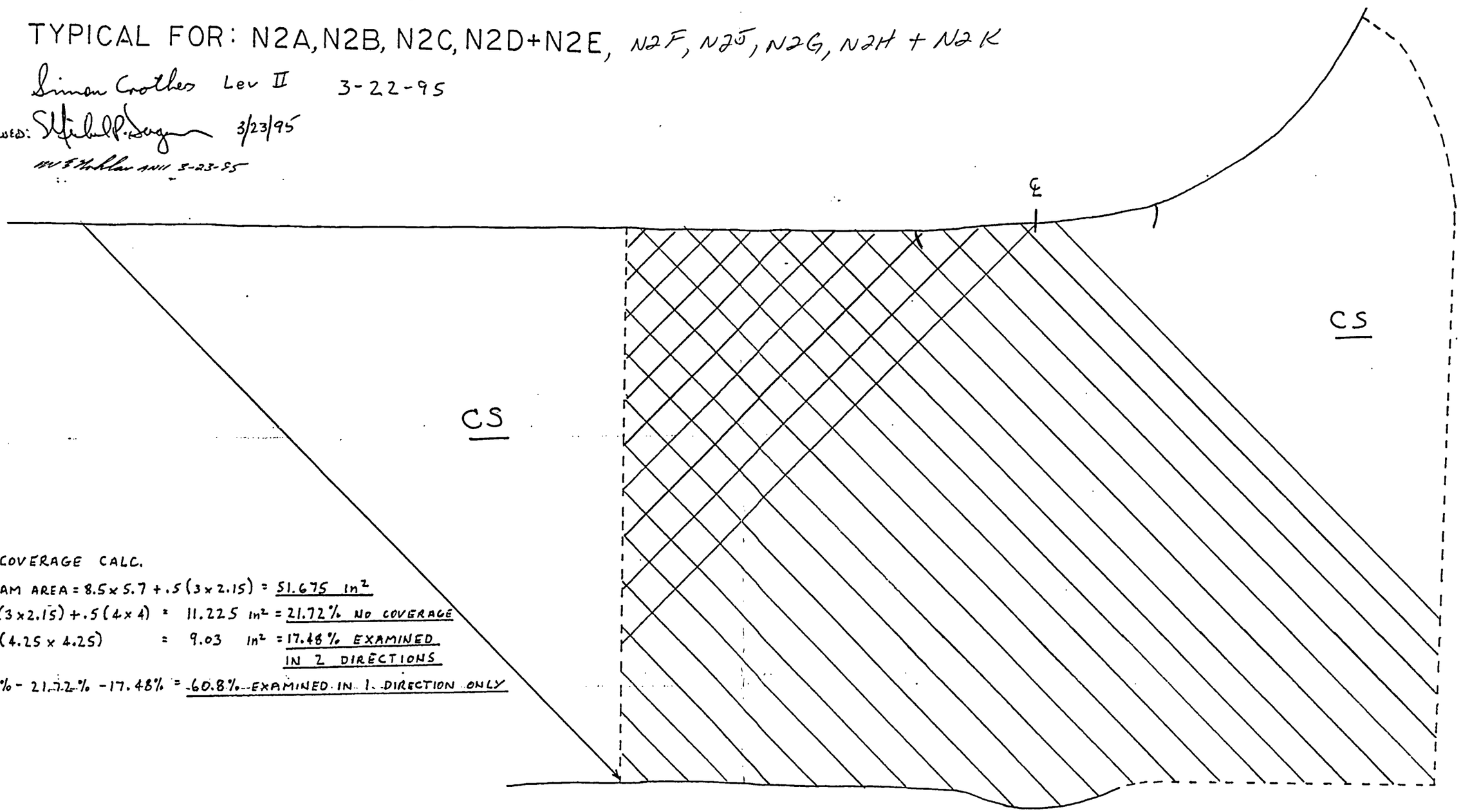
CRV COVERAGE PLOT 45°

TYPICAL FOR: N2A, N2B, N2C, N2D + N2E, N2F, N2J, N2G, N2H + N2K

Simon Crothers Lev II 3-22-95

REVIEWED: [signature] 3/23/95

[signature] 3-23-95



COVERAGE CALC.

EXAM AREA = 8.5 x 5.7 + .5 (3 x 2.15) = 51.675 in^2

.5 (3 x 2.15) + .5 (4 x 4) = 11.225 in^2 = 21.72% NO COVERAGE

.5 (4.25 x 4.25) = 9.03 in^2 = 17.48% EXAMINED IN 2 DIRECTIONS

100% - 21.72% - 17.48% = 60.8% EXAMINED IN 1 DIRECTION ONLY

VERMONT YANKEE

CRV COVERAGE PLOT 60°

TYPICAL FOR: N2A, N2B, N2C, N2D + N2E, N2F, N2G, N2H, N2J + N2K

Simon Crothers Lev II 3-22-95

REVIEWED: [signature] 3/23/95

[signature] 3-23-95

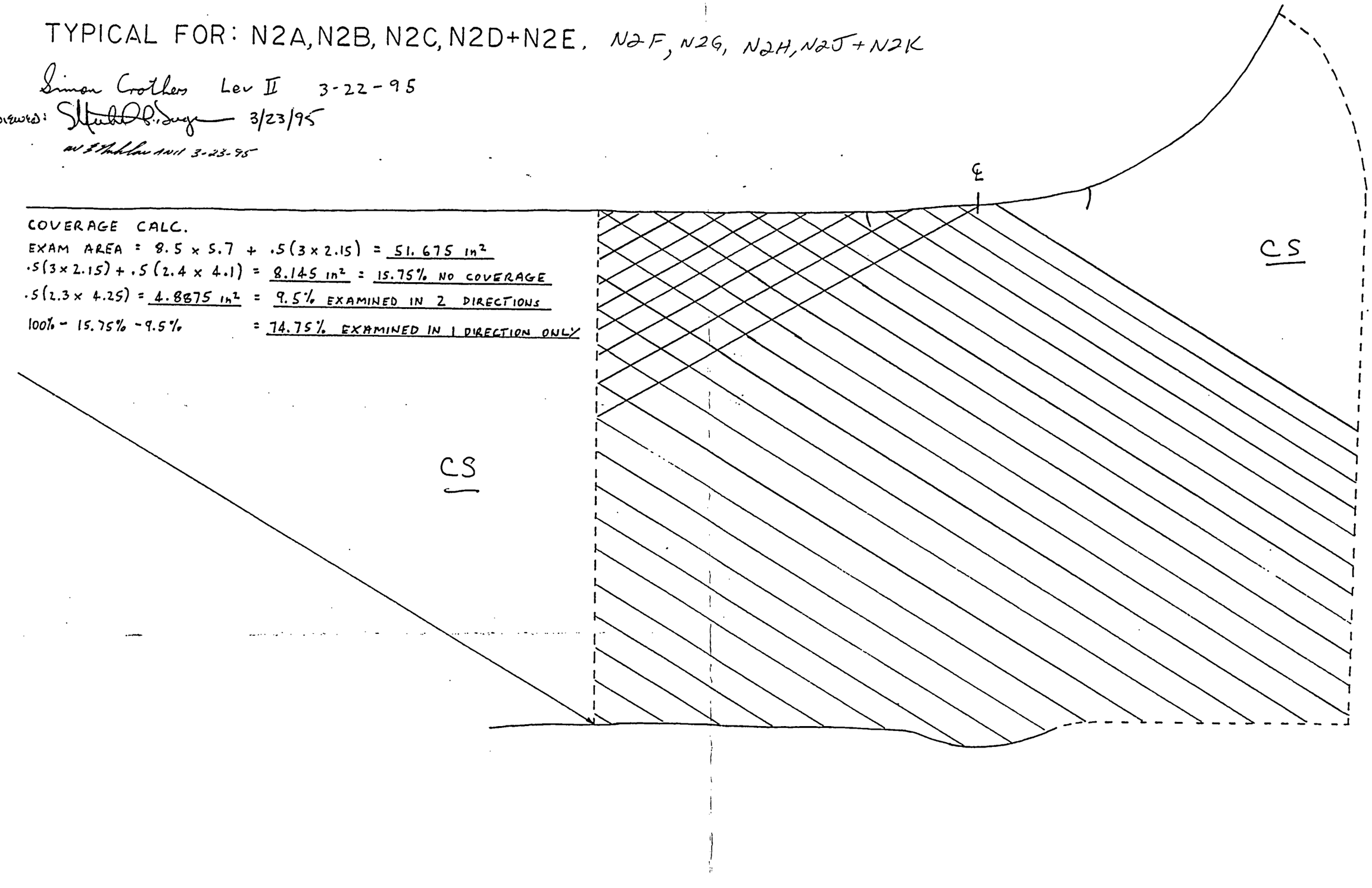
COVERAGE CALC.

EXAM AREA = 8.5 × 5.7 + .5(3 × 2.15) = 51.675 in²

.5(3 × 2.15) + .5(2.4 × 4.1) = 8.145 in² = 15.75% NO COVERAGE

.5(2.3 × 4.25) = 4.8875 in² = 9.5% EXAMINED IN 2 DIRECTIONS

100% − 15.75% − 9.5% = 74.75% EXAMINED IN 1 DIRECTION ONLY



ATTACHMENT 4 TO BVY 05-37

Relief Request B-5, Response to Request for Additional Information
Coverage Sketches – Nozzles N4A, B, C & D, N5A & B

ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

Cross-section = $(8\frac{7}{8} \times 5\frac{1}{2}) + \frac{1}{2}(2\frac{1}{4} \times 1) = 49.9\ in^2$

% 45° Axial US = $(8\frac{7}{8} \times 5\frac{1}{2}) - \frac{1}{2}(2\frac{1}{2} \times 2\frac{1}{2})/49.9 = 91.6\%$

% 45° Axial DS = $\frac{1}{2}(5 \times 5\frac{1}{2})/49.9 = 25.1\%$

% 60° Axial US = $(8\frac{7}{8} \times 5\frac{1}{2}) - \frac{1}{2}(2\frac{1}{2} \times 1\frac{3}{8})/49.9 = 94.4\%$

% 60° Axial DS = $\frac{1}{2}(5 \times 2\frac{7}{8})/49.9 = 14.4\%$

% 45° Circ CW+CCW = % 60 Circ CW+CCW = % 0° = $(6\frac{1}{4} \times 5\frac{1}{2})/49.9 = 68.9\%$

Total Coverage = (% 45° Axial US + % 45° Axial DS + % 60° Axial US + % 60° Axial DS + % 45° Circ CW + % 45° Circ CCW + % 60° Circ CW + % 60° Circ CCW + % 0°)/9

= (91.6 + 25.1 + 94.4 + 14.4 + 68.9 + 68.9 + 68.9 + 68.9 + 68.9)/9

= 63.3%

Coverage for: N4A, B, C & D

UT-2-026 PG 6

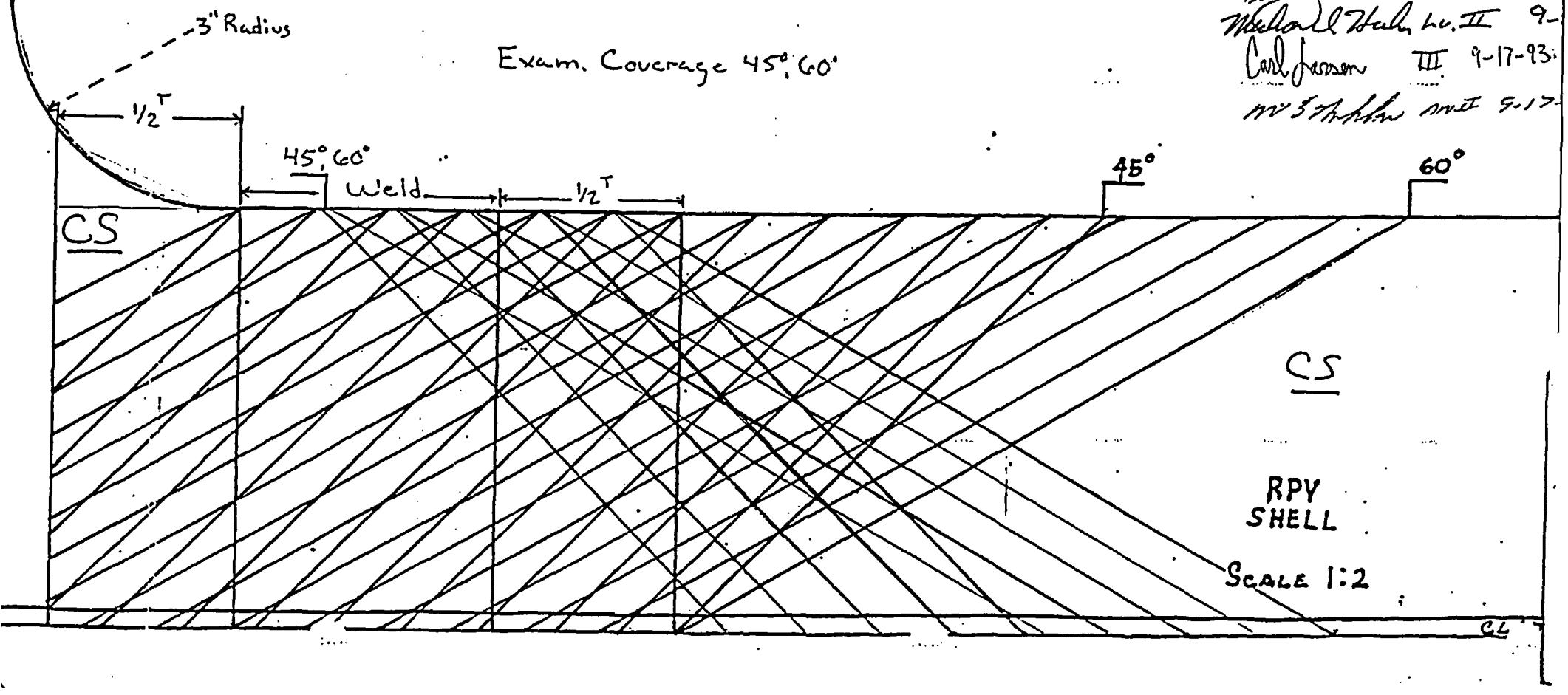
Vermont Yankee 1993

Component: 108-05-8039/N4A

Flow

Tim Oddson Lv. II 9-
Michael Walk Lv. II 9-
Carl Jensen III 9-17-93
[illegible] Lv II 9-17-

Exam. Coverage 45°, 60°



N5A & N5B

~~NOZZLE TO~~ VESSEL WELD.

REQUIRED BASE MATERIAL = A-B-G-H AND C-D-E-F = 38.10"²

REQUIRED WELD MATERIAL = B-C-F-G = 8.49"²

Required Coverage = 46.6 in.²

UT LIII 10-22-02

DIMENSIONS FROM CB&I DRAWING # 5920-69

% 45° Axial US = (8×5½) − ½(1¾ × 1¾)/46.6 = 91.1%

% 45° Axial DS = (5½ × 1) + ½(5½ × 5)/46.6 = 41.3%

% 60° Axial US = (8×5½) − ½(1¾ × 1)/46.6 = 92.5%

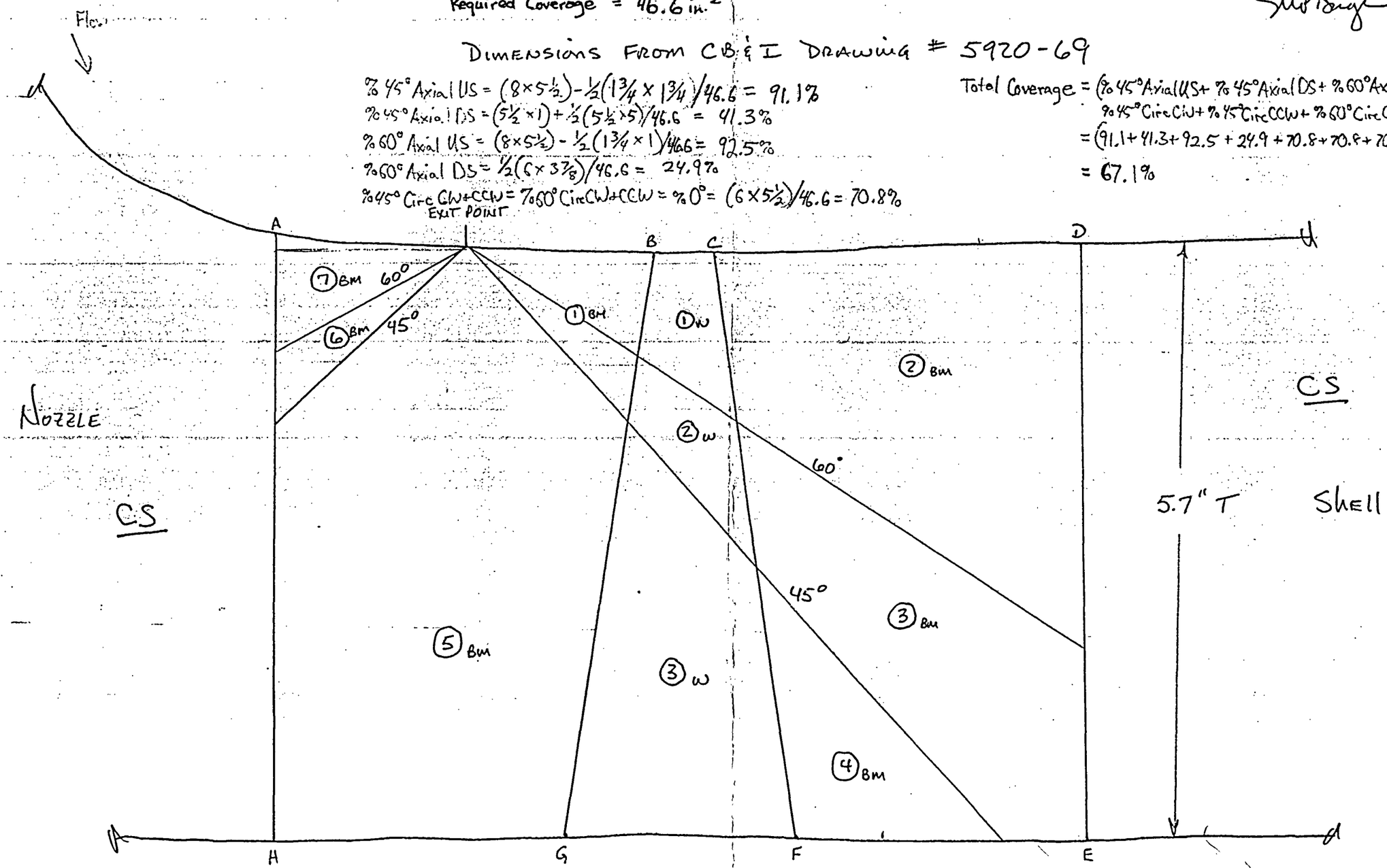
% 60° Axial DS = ½(6 × 3⅜)/46.6 = 24.9%

% 45° Circ CW + CCW = % 60° Circ CW + CCW = % 0° = (6 × 5½)/46.6 = 70.8%

Total Coverage = (% 45° Axial US + % 45° Axial DS + % 60° Axial US + % 60° Axial DS + % 45° Circ CW + % 45° Circ CCW + % 60° Circ CW + % 60° Circ CCW + % 0°)/9

= (91.1 + 41.3 + 92.5 + 24.9 + 70.8 + 70.8 + 70.8 + 70.8 + 70.8)/9

= 67.1%



ATTACHMENT 5 TO BVY 05-37

Relief Request B-5, Response to Request for Additional Information
Coverage Sketches – Nozzles N6A & B

ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

8061-02-006

N6A & 6B NOZZLE TO VESSEL WELD

COVERAGE PLOT

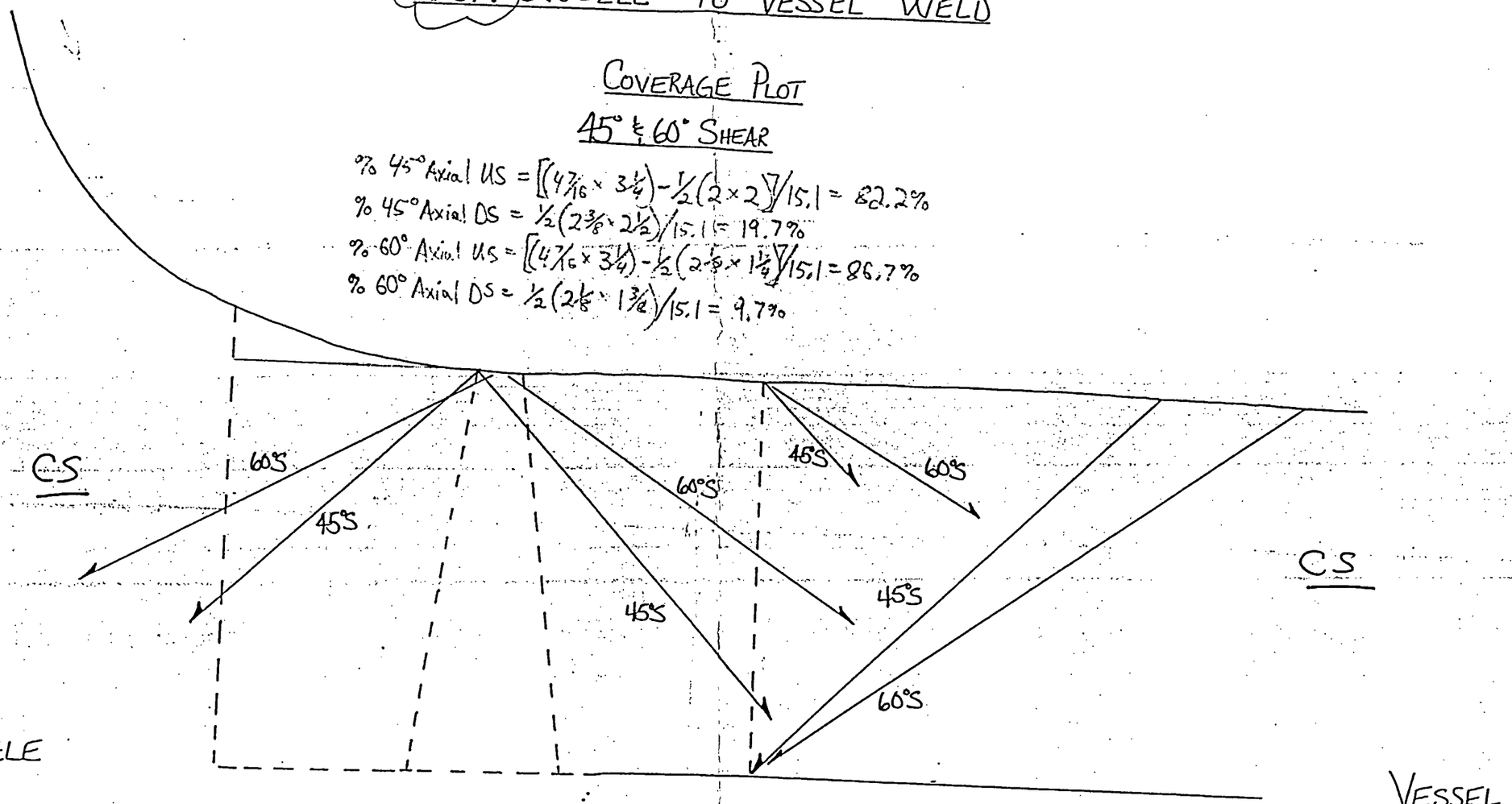
45° & 60° SHEAR

% 45° Axial US = [(4 7/16 × 3 1/4) − 1/2(2 × 2)]/15.1 = 82.2%

% 45° Axial DS = 1/2(2 3/8 × 2 1/2)/15.1 = 19.7%

% 60° Axial US = [(4 7/16 × 3 1/4) − 1/2(2 1/8 × 1 1/4)]/15.1 = 86.7%

% 60° Axial DS = 1/2(2 1/8 × 1 3/8)/15.1 = 9.7%



NOTE: THIS EXAMINATION WAS LIMITED DUE TO THE NOZZLE

EXAMINER: David K Tucker DATE: 12 Oct 02

EXAMINER: Angela L. Tucker DATE: 10-12-02

N6A/6B VESSEL TO NOZZLE WELD

Required Coverage = ~~12.42 + 2.69~~ = 15.1 in²

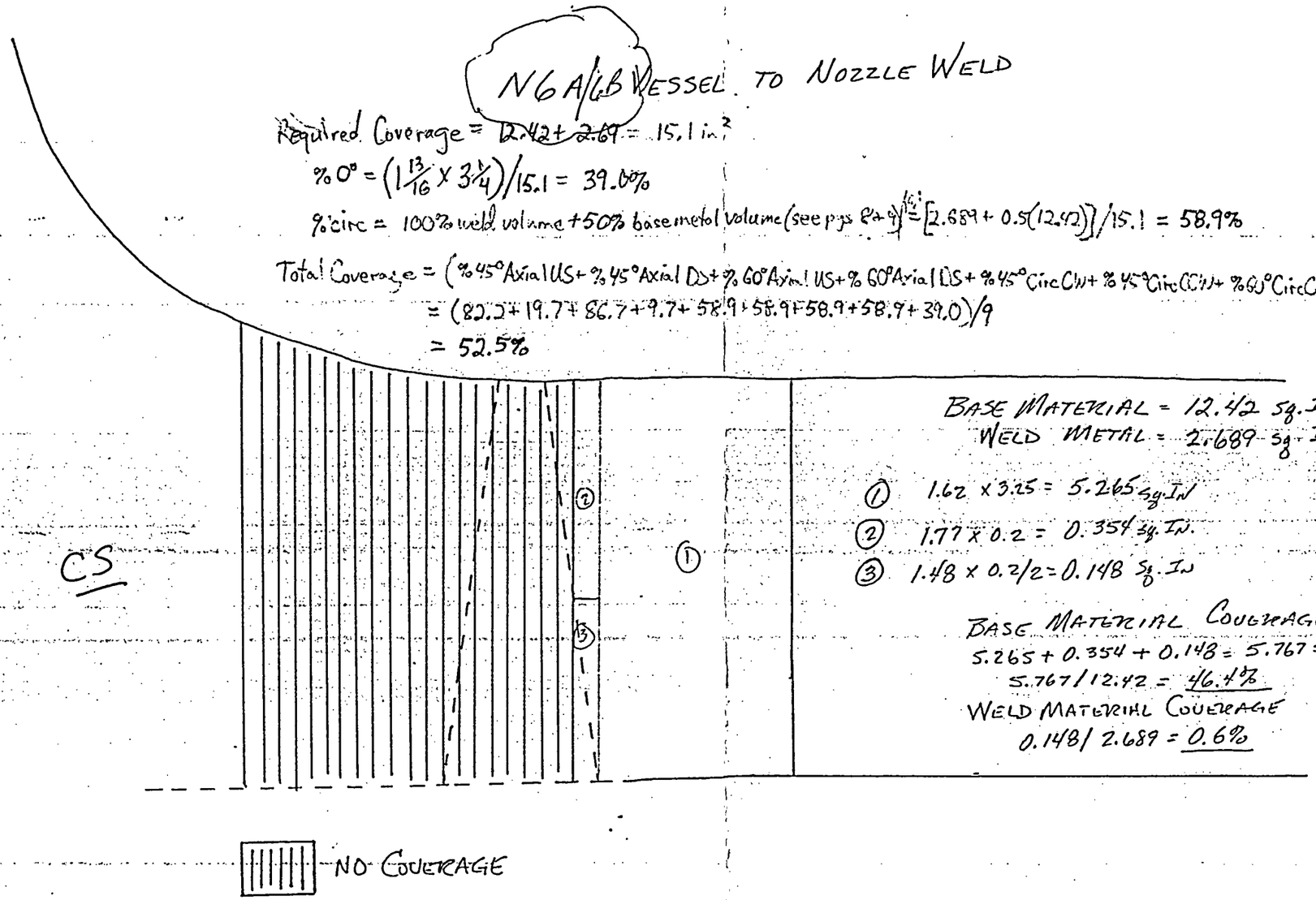
$\%0° = (1\frac{13}{16} \times 3\frac{1}{4})/15.1 = 39.0\%$

%circ = 100% weld volume + 50% base metal volume (see pgs 8+9) = [2.689 + 0.5(12.42)]/15.1 = 58.9%

Total Coverage = (%45° Axial US + %45° Axial DS + %60° Axial US + %60° Axial DS + %45° Circ CW + %45° Circ CCW + %60° Circ CW + %60° Circ CCW + %0°)/9

= (82.2 + 19.7 + 86.7 + 9.7 + 58.9 + 58.9 + 58.9 + 58.9 + 39.0)/9

= 52.5%



BASE MATERIAL = 12.42 sq. IN
WELD METAL = 2.689 sq. IN

① 1.62 × 3.25 = 5.265 sq. IN
② 1.77 × 0.2 = 0.354 sq. IN.
③ 1.48 × 0.2/2 = 0.148 sq. IN

BASE MATERIAL COVERAGE
5.265 + 0.354 + 0.148 = 5.767 sq. IN.
5.767/12.42 = 46.4%

WELD MATERIAL COVERAGE
0.148/2.689 = 0.6%

[signature] 10-12-02

ATTACHMENT 6 TO BVY 05-37

Relief Request B-5, Response to Request for Additional Information
Coverage Sketches – N7 Nozzle to Vessel

ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

N7 VESSEL TO NOZZLE WELD

Required Coverage = 10.83 + 2.5 = 13.3 in.^{3}

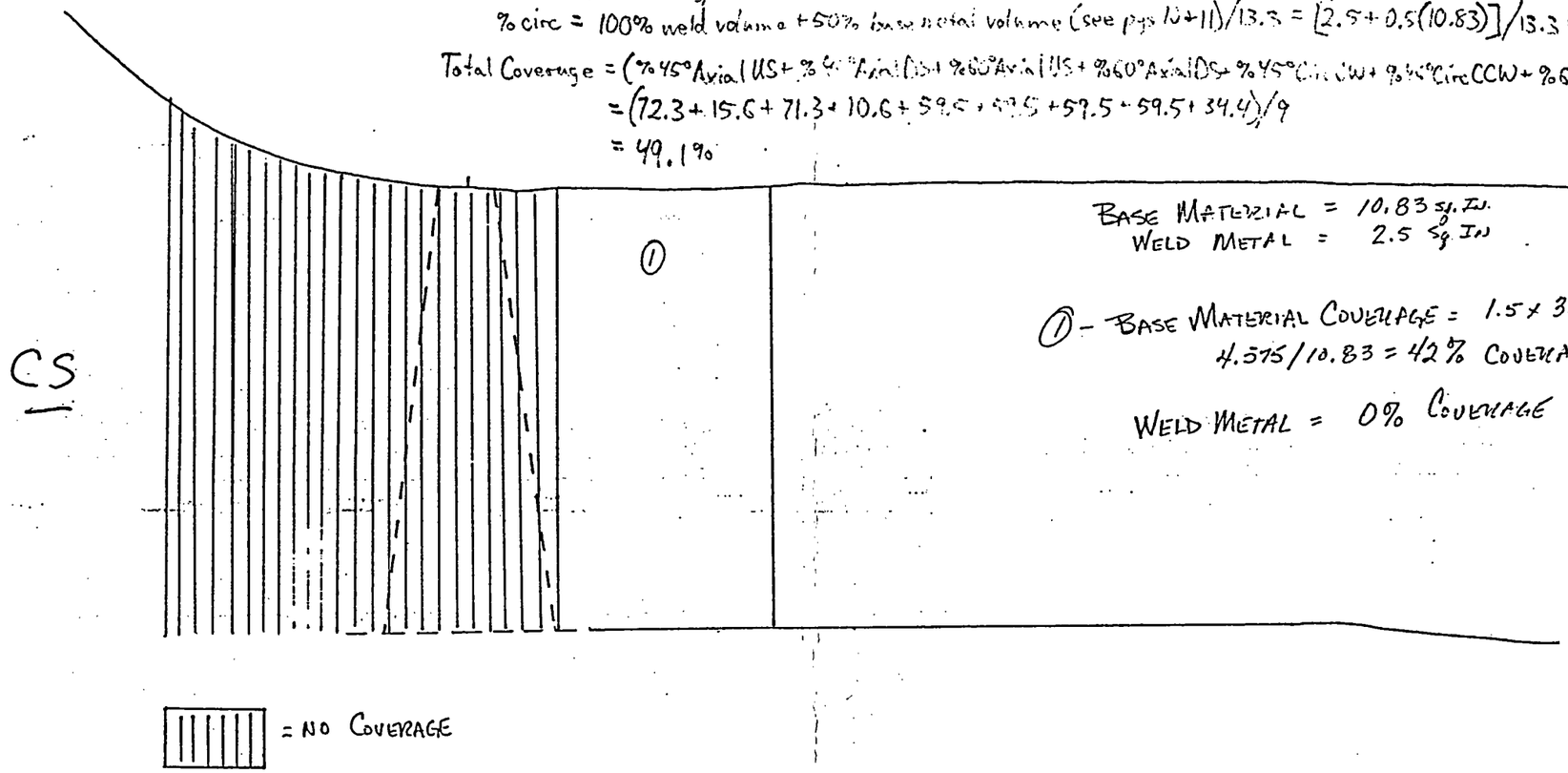
% 0° = (1.05 × 3.05)/13.3 = 34.4%

% circ = 100% weld volume + 50% base metal volume (see pgs 10+11)/13.3 = [2.5 + 0.5(10.83)]/13.3 = 59.5%

Total Coverage = (% 45° Axial US + % 45° Axial DS + % 60° Axial US + % 60° Axial DS + % 45° Circ CW + % 45° Circ CCW + % 60° Circ CW + % 60° Circ CCW + % 0°)/9

= (72.3 + 15.6 + 71.3 + 10.6 + 59.5 + 59.5 + 59.5 + 59.5 + 34.4)/9

= 49.1%



BASE MATERIAL = 10.83 sq. In.
WELD METAL = 2.5 sq. In

① - BASE MATERIAL COVERAGE = 1.5 × 3.05 = 4.575 sq. In
4.575/10.83 = 42% COVERAGE

WELD METAL = 0% COVERAGE

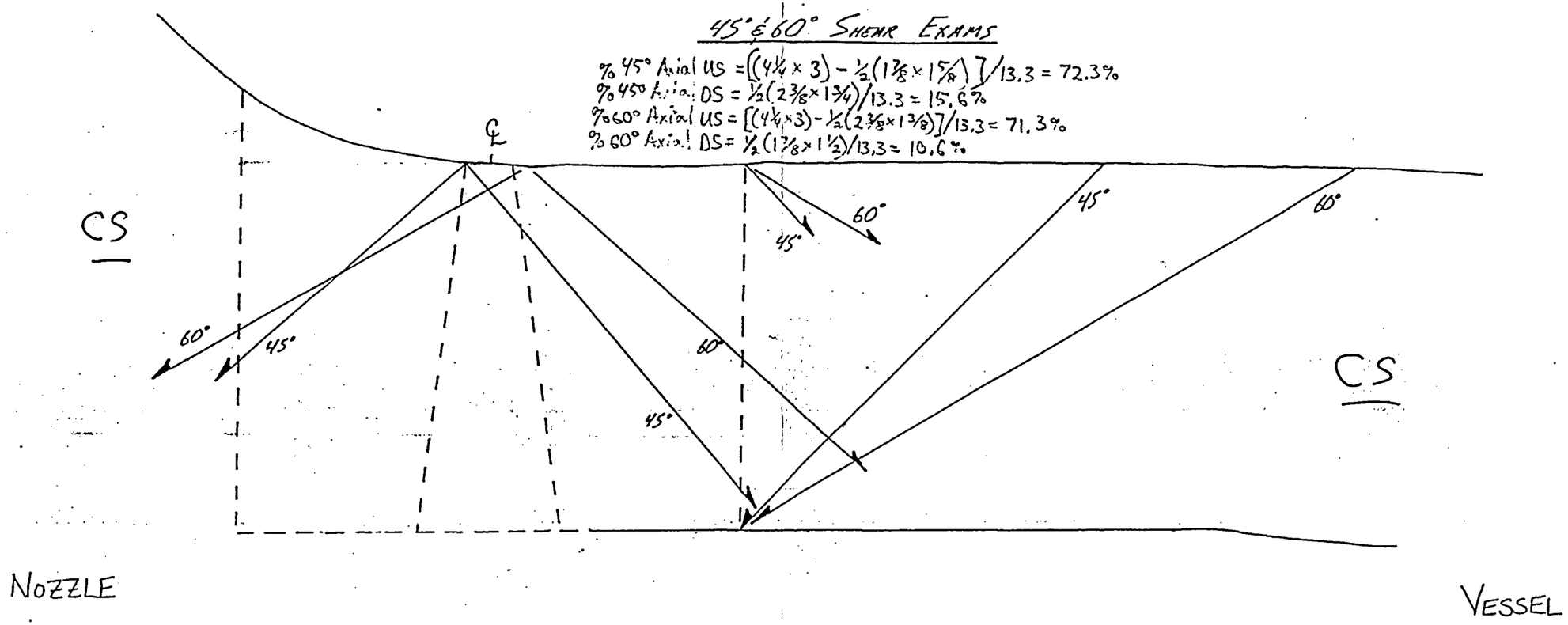
Benjamin Sark 10-12-02

N7 NOZZLE TO VESSEL WELD

COVERAGE PLOT

45° & 60° SHEAR EXAMS

% 45° Axial US = [(4¼ × 3) − ½(1⅞ × 1⅝)]/13.3 = 72.3%
% 45° Axial DS = ½(2⅜ × 1¾)/13.3 = 15.6%
% 60° Axial US = [(4¼ × 3) − ½(2⅜ × 1⅜)]/13.3 = 71.3%
% 60° Axial DS = ½(1⅞ × 1½)/13.3 = 10.6%



NOTE: THIS EXAMINATION WAS LIMITED DUE TO THE NOZZLE CONFIGURATION.

EXAMINER: Angela L. Tucker DATE: 10-12-02
EXAMINER: David K. Tucker DATE: 12 Oct 02

ATTACHMENT 8 TO BVY 05-37

Relief Request B-5, Response to Request for Additional Information
Coverage Sketches – Nozzles N8A & B

ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

YANKEE	NUCLEAR SERVICES DIVISION INSERVICE INSPECTION	PROCEDURE YA-UT-1 REVISION 9 PAGE 11 of 12

YA-UT-9-0032

SUPPLEMENTAL DATA SHEET

PLANT: VY OUTAGE: RF-21 DRAWING: 5920-245 REV.: —

SYSTEM: RPV COMPONENT/WELD NO.: N8A, N8B NOZZLE TO VESSEL EH: N/A

LOCATION: DW 266'

Examination Details/Sketch:

Required Coverage = $(8\frac{1}{2} \times 5\frac{1}{2}) + \frac{1}{2}(1\frac{1}{2} \times 1) = 47.5 in^2$

EXAM COVERAGE 45° + 60°

% 45° Axial US = $[(8\frac{1}{2} \times 5\frac{1}{2}) - \frac{1}{2}(2\frac{1}{2} \times 2\frac{1}{2})]/47.5 = 91.8\%$

% 45° Axial DS = $[\frac{1}{2}(5\frac{1}{2} \times 5\frac{1}{2}) + (\frac{1}{2} \times 5\frac{1}{2})]/47.5 = 37.6\%$

% 60° Axial US = $[(8\frac{1}{2} \times 5\frac{1}{2}) - \frac{1}{2}(2\frac{1}{2} \times 1\frac{1}{2})]/47.5 = 94.5\%$

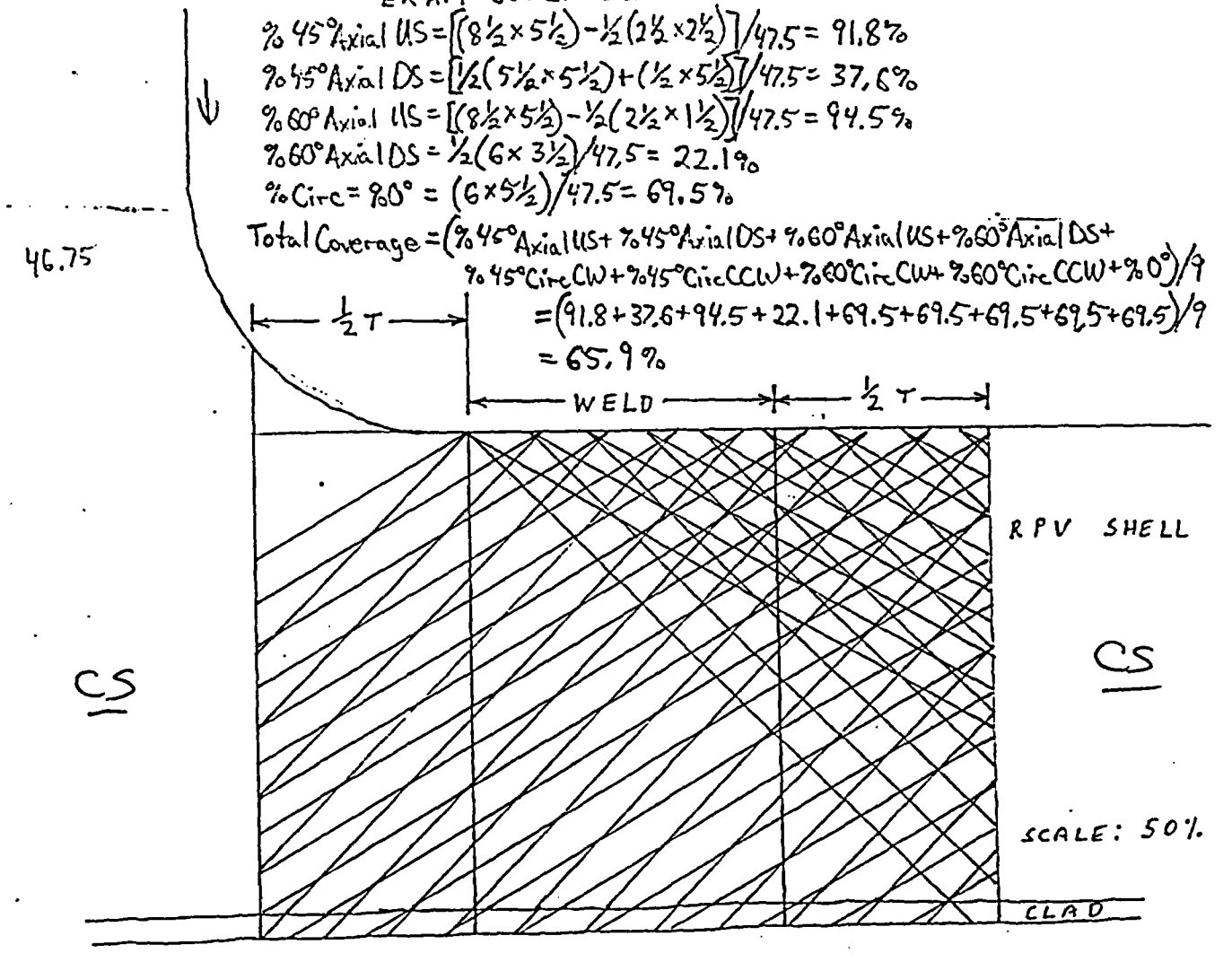
% 60° Axial DS = $\frac{1}{2}(6 \times 3\frac{1}{2})/47.5 = 22.1\%$

% Circ = 90° = $(6 \times 5\frac{1}{2})/47.5 = 69.5\%$

Total Coverage = (% 45° Axial US + % 45° Axial DS + % 60° Axial US + % 60° Axial DS + % 45° Circ CW + % 45° Circ CCW + % 60° Circ CW + % 60° Circ CCW + % 0°)/9

= (91.8 + 37.6 + 94.5 + 22.1 + 69.5 + 69.5 + 69.5 + 69.5 + 69.5)/9

= 65.9%



EXAMINER Simon Crothers LEVEL II DATE 11-6-99

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 11-8-99

QA (Optional) N/A DATE N/A

ANII (Optional) [signature] DATE 11-30-99

ATTACHMENT 7 TO BVY 05-37

Relief Request B-5, Response to Request for Additional Information
Coverage Sketches – N9 Nozzles

ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

Weld # N9, Nozzle to Vessel Weld Coverage

Obstruction: Nozzle blend configuration

Base Material: 68.73% complete

Weld Material: 55% complete

Dimensions for coverage calculation taken from Chicago Bridge and Iron Drawing # 5920-246

Total Coverage = (%45°Axial US + %45°Axial DS + %60°Axial US + %60°Axial DS + %45°Circ CW + %45°Circ CCW + %60°Circ CW + %Circ CCW + %0°)/9

= (87.2 + 34.2 + 90.2 + 20.6 + 64.4 + 64.4 + 64.4 + 64.4 + 64.4)/9

= 61.6%

Reviewer: [signature] Level: III Date: 12-22-02

N9

NOZZLE TO VESSEL WELD

8061-02-003

(BM) REQUIRED BASE MATERIAL = A-B-G-D AND C-D-E-F = 39.51"^{2}

(W) REQUIRED WELD MATERIAL = B-C-F-G = 8.785"^{2}

Required Coverage = 39.51 + 8.785 = 48.3 in^2

UT LIII 10-22-02

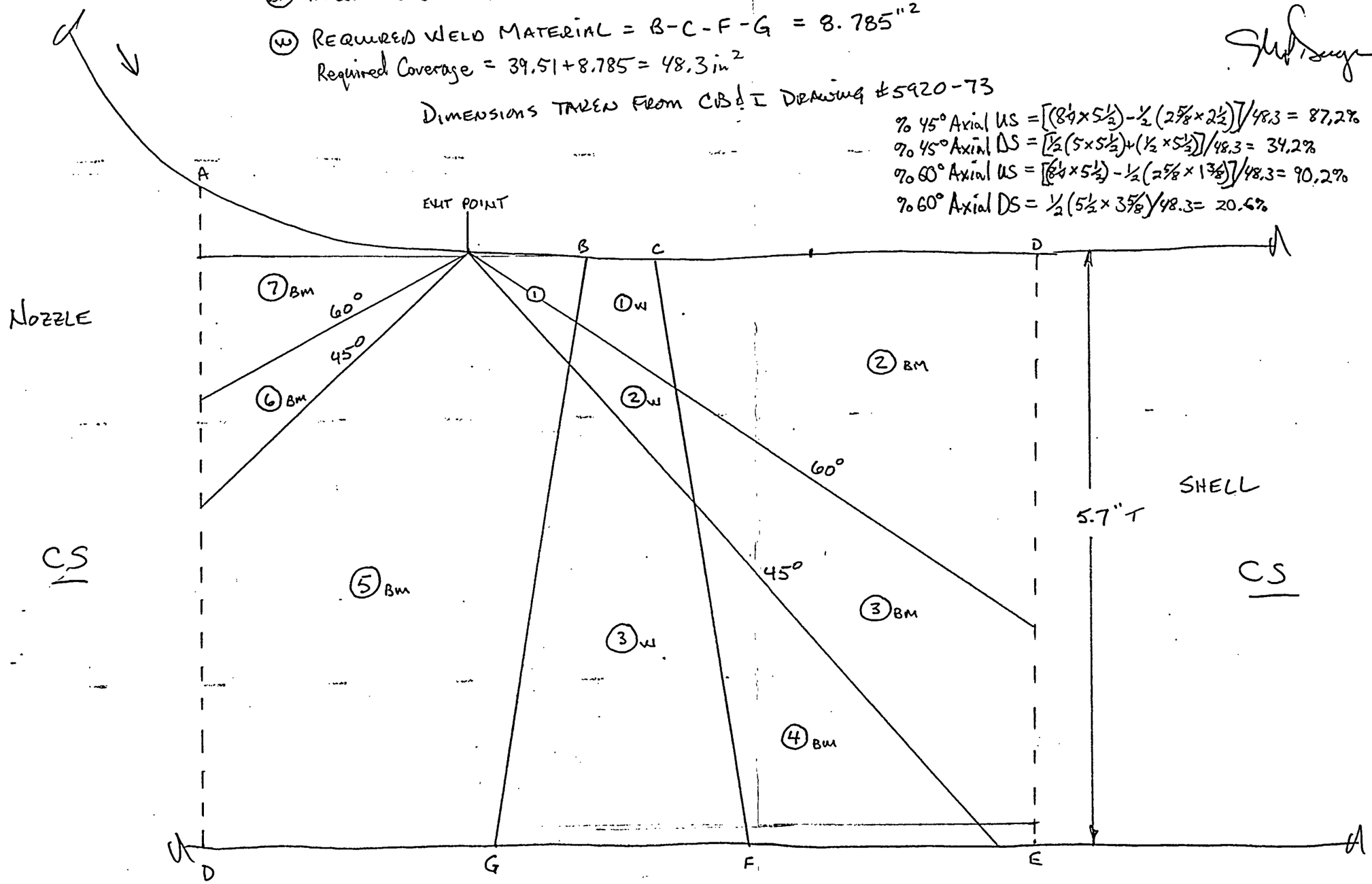
DIMENSIONS TAKEN FROM CB&I DRAWING #5920-73

% 45° Axial US = [(8¼ × 5½) − ½ (2⅝ × 2½)]/48.3 = 87.2%

% 45° Axial DS = [½ (5 × 5½) + (½ × 5½)]/48.3 = 34.2%

% 60° Axial US = [(8¼ × 5½) − ½ (2⅝ × 1⅜)]/48.3 = 90.2%

% 60° Axial DS = ½ (5½ × 3⅝)/48.3 = 20.6%



N9

NOZZLE TO VESSEL WELD

CIRCUMFERENTIAL SCAN

[signature] UT LIII 10-22-02

WELD AREA COMPLETE = 100%

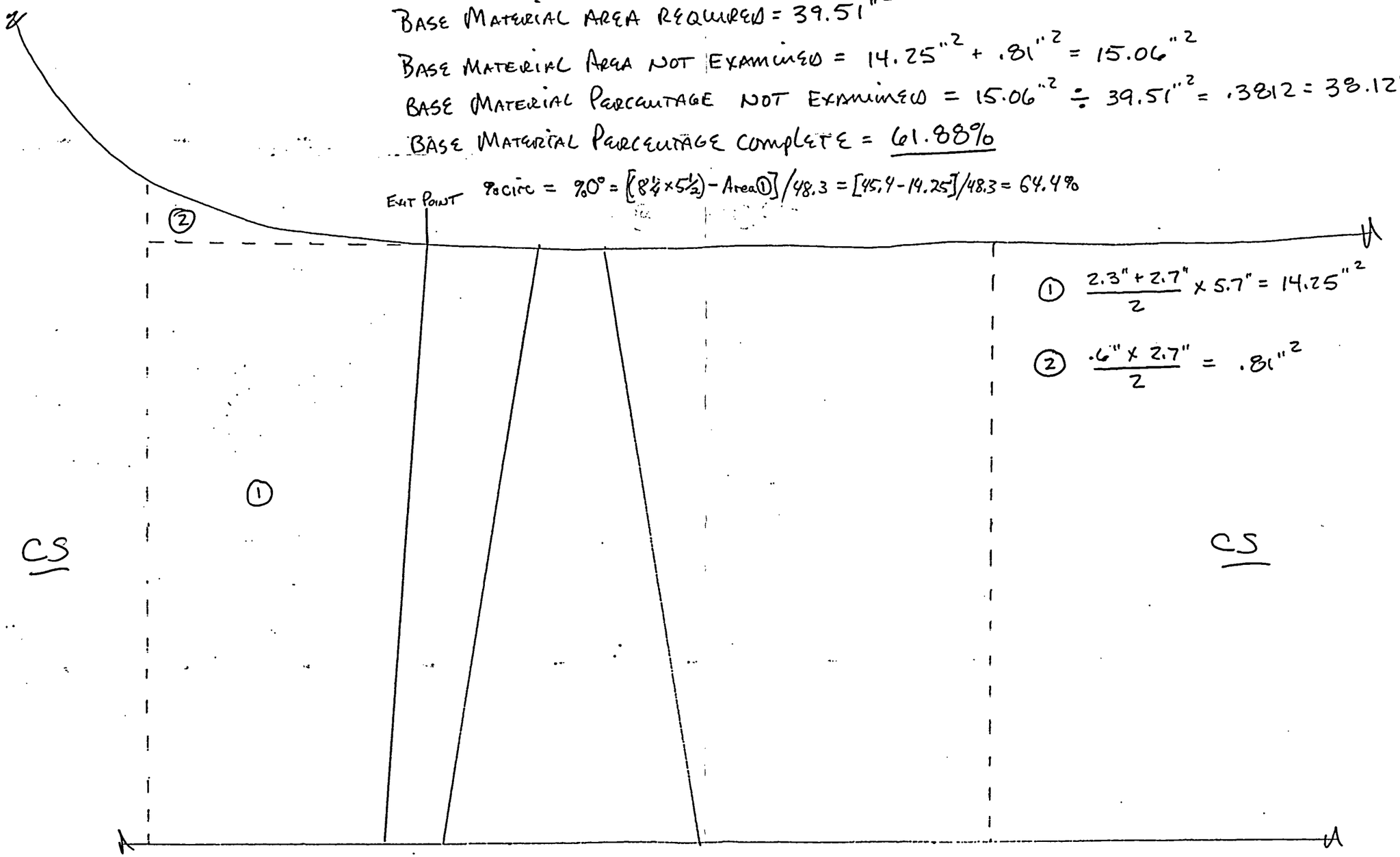
BASE MATERIAL AREA REQUIRED = 39.51"²

BASE MATERIAL AREA NOT EXAMINED = 14.25"² + .81"² = 15.06"²

BASE MATERIAL PERCENTAGE NOT EXAMINED = 15.06"² ÷ 39.51"² = .3812 = 38.12%

BASE MATERIAL PERCENTAGE COMPLETE = 61.88%

%circ = %0° = [(8¼ × 5½) − Area①]/48.3 = [45.4 − 14.25]/48.3 = 64.4%



① $\frac{2.3" + 2.7"}{2} \times 5.7" = 14.25"^2$

② $\frac{.6" \times 2.7"}{2} = .81"^2$

ATTACHMENT 9 TO BVY 05-37

Relief Request B-5, Response to Request for Additional Information
Coverage Sketches – Nozzle N10

ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

YANKEE	NUCLEAR SERVICES DIVISION INSERVICE INSPECTION	PROCEDURE REVISION PAGE	YA-UT-1 9 11 of 12

SUPPLEMENTAL DATA SHEET

YA-UT-2-0037

PLANT: VY OUTAGE: RF-21 ~~DRAWING: ISI-RPV-103~~ REV.: 3

SYSTEM: RPV COMPONENT/WELD NO.: N10 NZ TO SHELL EH: N/A

LOCATION: DW 269'

Examination Details/Sketch: 45° COVERAGE

Total Coverage = (%45° Axial US + %45° Axial DS + %60° Axial US + %60° Axial DS + %45° Circ CW + %45° Circ CCW + %60° Circ CW + %60° Circ CCW + %0°)/9

= (74.0 + 13.5 + 78.6 + 7.7 + 42.3 + 42.3 + 42.3 + 42.3 + 42.3)/9

= 42.8%

WELD DIMENSIONS FROM N10 NZ. DESIGN DWG. 5920-358 R3.

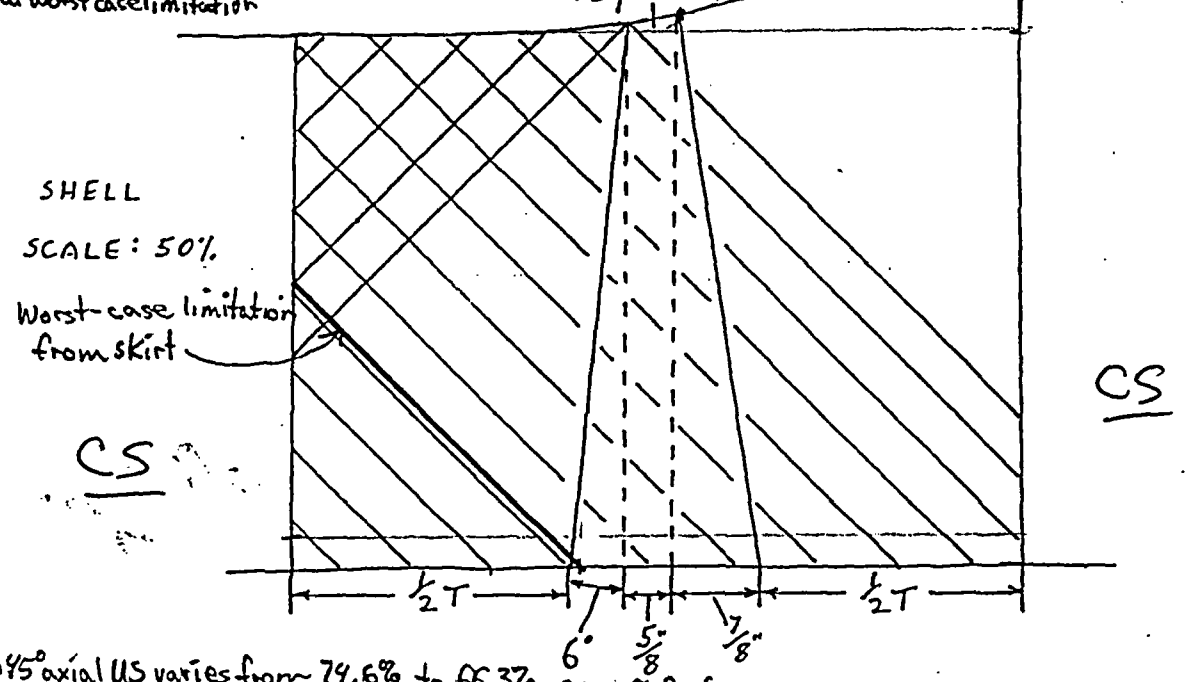
Required Exam Volume = $(7\frac{5}{8} \times 5\frac{1}{2}) + \frac{1}{2}(3\frac{3}{4} \times 1\frac{7}{8})$

= 45.5 in²

%45° axial US = $[(7\frac{5}{8} \times 5\frac{1}{2}) - \frac{1}{2}(4 \times 4)]/45.5$ = 74.6%

%45° axial DS = $\frac{1}{2}(3\frac{1}{2} \times 3\frac{1}{2})/45.5$ = 13.5%

% 45° axial US = $[(7\frac{5}{8} \times 5\frac{1}{2}) - \frac{1}{2}(4 \times 4) - \frac{1}{2}(2\frac{3}{4} \times 2\frac{3}{4})]/45.5$ = 66.3%
at worst case limitation



%45° axial US varies from 74.6% to 66.3% over 50° of arc.

The average of 74.6% & 66.3% is a conservative approximation = 70.5% for $\frac{50}{360}$ & 74.6% for $\frac{310}{360}$

Interpolating, corrected %45° axial US = $(74.6 - 70.5)(\frac{310}{360}) + 70.5$ = 74.0%

EXAMINER	Simon Crothers Dean Howard	LEVEL II	DATE 11-9-99
COG. ENG./EXAM AGENCY	N/A		DATE N/A
ISI COORDINATOR (If ASME XI Exam)	[signature]		DATE 11-18-99
QA (Optional)	N/A		DATE N/A
ANII (Optional)	[signature]		DATE 11-30-99

YANKEE

NUCLEAR SERVICES DIVISION
INSERVICE INSPECTION

PROCEDURE YA-UT-1
REVISION 9
PAGE 11 of 12

SUPPLEMENTAL DATA SHEET

YA-UT-2-0037

PLANT: VY OUTAGE: RF-21 DRAWING: ISI-RPV-103 REV.: 3
SYSTEM: RPV COMPONENT/WELD NO.: N10 NZ TO SHELL EN: N/A
LOCATION: DW 269'

Examination Details/Sketch: 60° COVERAGE

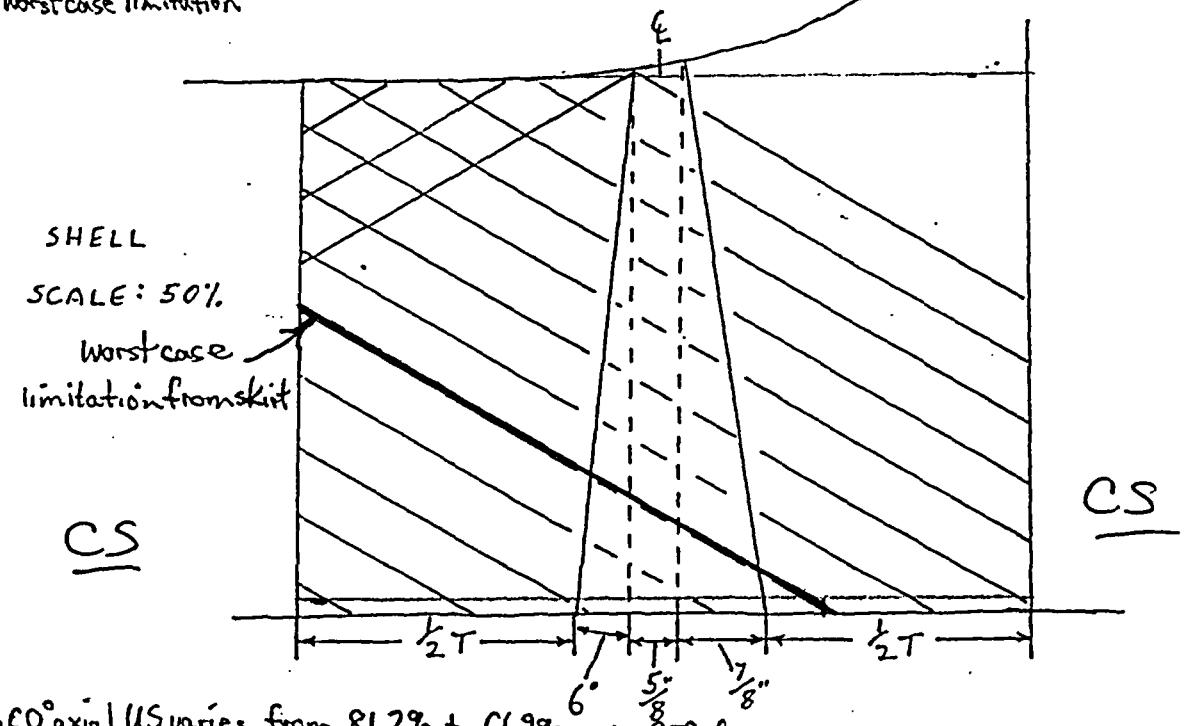
WELD DIMENSIONS FROM
N10 NZ. DESIGN DWG. 5920-358 R3.

% Circ = %0° = (3½ × 5½)/45.5
= 42.3%

% 60° axial US = [(7⅝ × 5½) − ½(4 × 2⅜)]/45.5 = 81.2%

% 60° axial DS = ½(3½ × 2)/45.5 = 7.7%

% 60° axial US = [(7⅝ × 5½) − ½(4 × 2⅜) − ½(5⅝ × 3¼)]/45.5 = 61.9%
at worst case limitation



%60° axial US varies from 81.2% to 61.9% over 95° of arc
The average of 81.2% + 61.9% is a conservative approximation = 71.5% for 95/360 + 81.2% for 265/360
Interpolating, corrected %60 axial US = (81.2 − 71.5)(265/360) + 71.5 = 78.6%

EXAMINER Simon Crothers Dean Howard LEVEL II DATE 11-9-99
COG. ENG./EXAM AGENCY N/A DATE N/A
ISI COORDINATOR (If ASME XI Exam) [signature] DATE 11-18-99
QA (Optional) N/A DATE N/A
ANII (Optional) [signature] DATE 11-30-99

R65\9

FORM 3

YANKEE	NUCLEAR SERVICES DIVISION INSERVICE INSPECTION	PROCEDURE YA-UT-1 REVISION 9 PAGE 11 of 12 YA-UT-2-0038

SUPPLEMENTAL DATA SHEET

PLANT: V Y OUTAGE: RF-21 ~~DRAWING: 151-RPV-103~~ REV.: 3

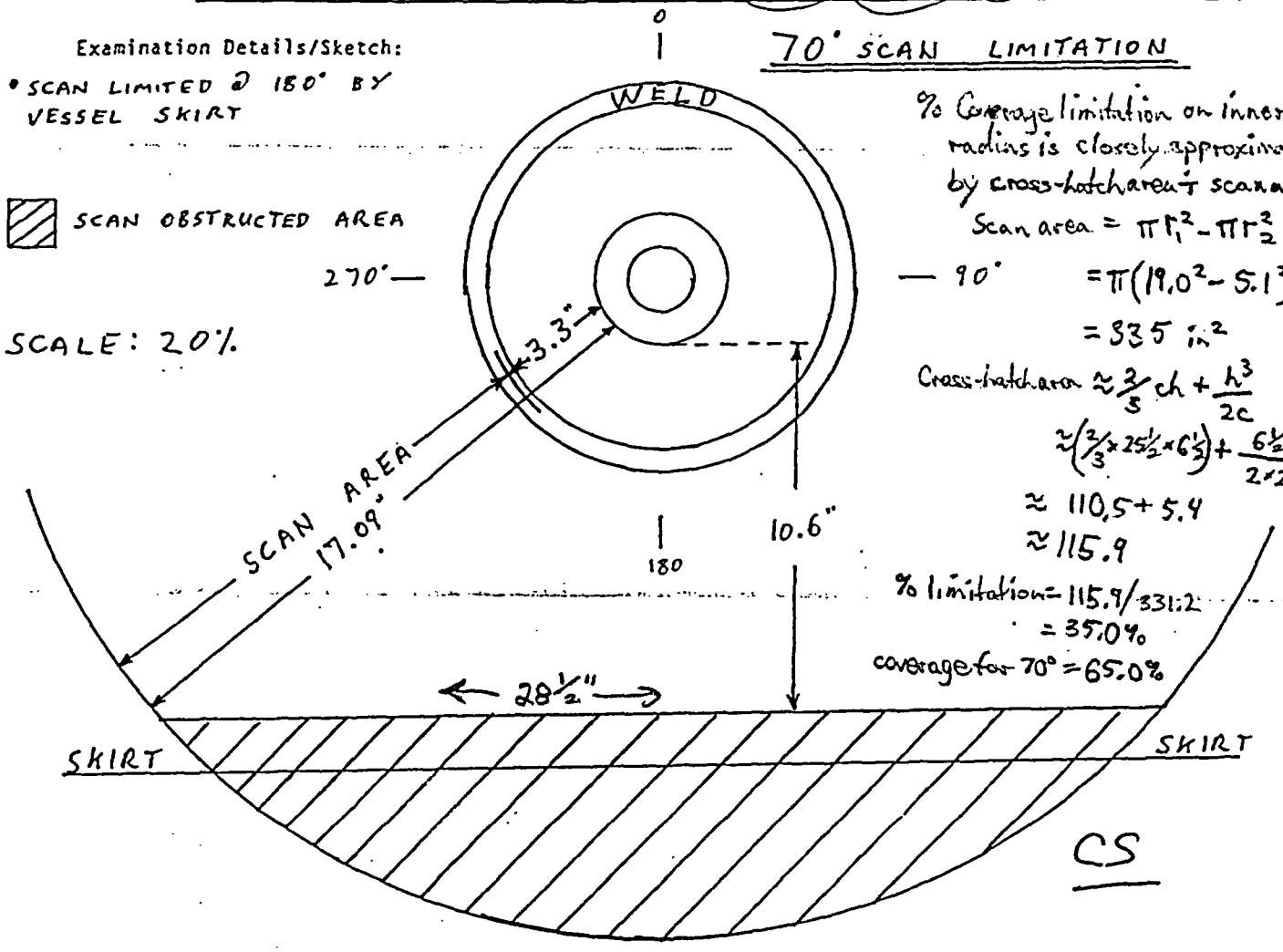
SYSTEM: R P V COMPONENT/WELD NO.: N10 INNER RADIUS EH: N/A

LOCATION: DW 269°

Examination Details/Sketch:

• SCAN LIMITED @ 180° BY VESSEL SKIRT

70° SCAN LIMITATION



SCAN OBSTRUCTED AREA

SCALE: 20%

% Coverage limitation on inner radius is closely approximated by cross-hatch area ÷ scan area.

Scan area $= \pi r_1^2 - \pi r_2^2$

$= \pi(19.0^2 - 5.1^2)$

$= 335 \text{ in}^2$

Cross-hatch area $\approx \frac{2}{3}ch + \frac{h^3}{2c}$

$\approx \left(\frac{2}{3} \times 25\frac{1}{2} \times 6\frac{1}{2}\right) + \frac{6\frac{1}{2}^3}{2 \times 25\frac{1}{2}}$

$\approx 110.5 + 5.4$

≈ 115.9

% limitation $= 115.9/331.2$

$= 35.0\%$

coverage for 70° $= 65.0\%$

Total coverage $= (\%\,50°CW + \%\,50°CCW + \%\,70°CW + \%\,70°CCW + \%\,\%\,70°/11°CW + \%\,70°/11°CCW)/6$

$= (100\% + 100\% + 65\% + 65\% + 100\% + 100\%)/6 = 88.3\%$

EXAMINER	Simon Crothers Dean Howard	LEVEL II	DATE 11-9-99
COG. ENG./EXAM AGENCY	N/A		DATE N/A
ISI COORDINATOR (If ASME XI Exam)	[signature]		DATE 11-18-99
QA (Optional)	N/A		DATE N/A
ANII (Optional)	[signature]		DATE 11-18-99

ATTACHMENT 10 TO BVY 05-37

Relief Request B-5, Response to Request for Additional Information
Coverage Sketches – Nozzles N6A & B

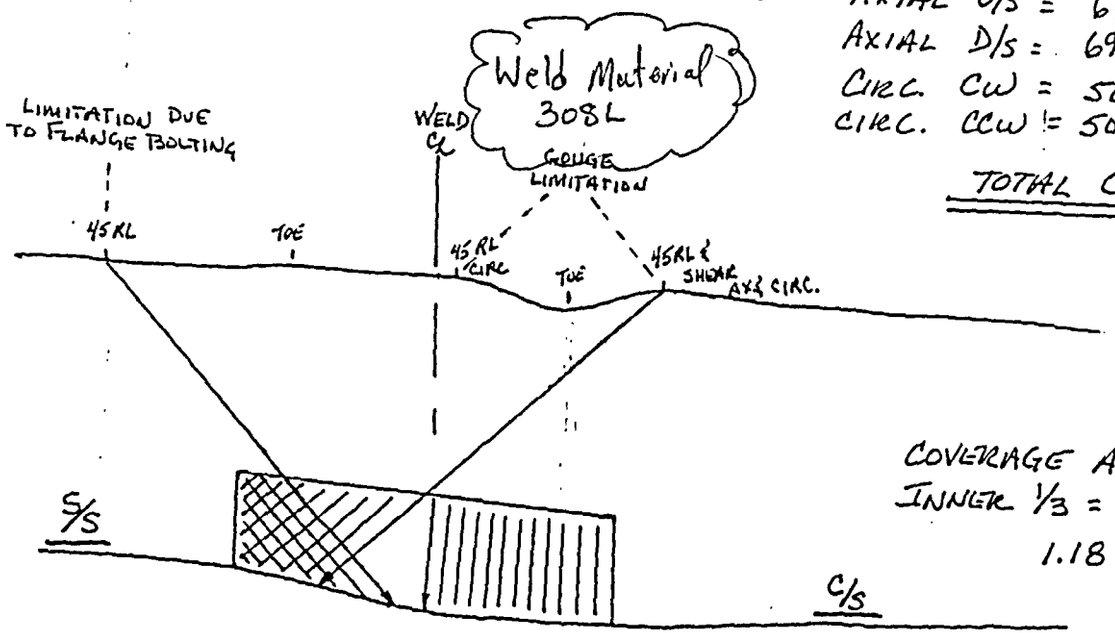
ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

N6A-5E

WORK ORDER # 01-004585-016
DATE: 10-12-02
DATA Sheet E058-02-WS pg 2 of 2

COVERAGE = AXIAL U/S = 64%
AXIAL D/S = 69%
CIRC. CW = 50%
CIRC. CCW = 50%

TOTAL COVERAGE = 58%



COVERAGE AREA
INNER 1/3 = 2.05 x 0.575
1.18 sq. IN.

NO COVERAGE AXIAL DIRECTION

NO COVERAGE CIRC. DIRECTION

CIRC. DIRECTION - NO COVERAGE
CLOCKWISE & COUNTER CLOCKWISE = 50%
0.6 x 1.0 = 0.6 sq. IN.

AXIAL DIRECTION - NO COVERAGE
TRANSDUCER LOCATION <
- U/S SIDE - 0.75 x 0.55/2 0.45 x 0.5 = 0.43 sq. IN.
- D/S SIDE - 0.9 x 0.53/2 0.25 x 0.5 = 0.36 sq. IN.

U/S SIDE = 36%
D/S SIDE = 31%

BENJAMIN SANDEN

10-12-02

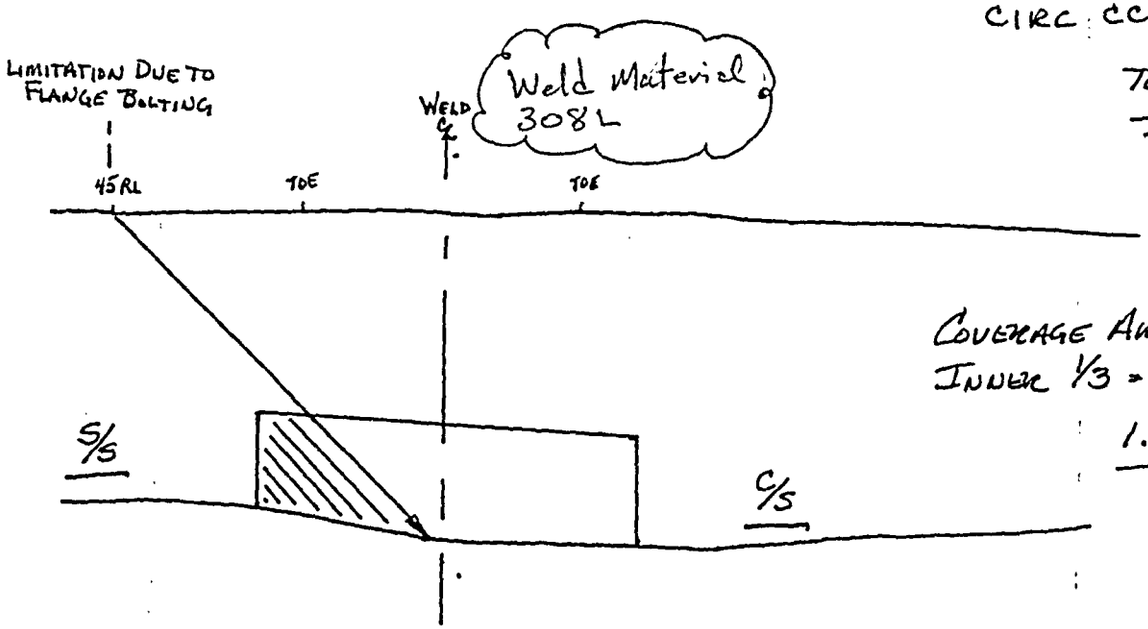
REVIEWER: 10.17.02

WORK ORDER # 01-004585-021
DATE: 10-14-02
DATA SHEET # 805E-02-007 Pg 2 of 2

N6B-SE

COVERAGE = AXIAL U/S = 100%
AXIAL D/S = 59.4%
CIRC CW = 100%
CIRC CCW = 100%

TOTAL COVERAGE = ~~90%~~ 89.9%



COVERAGE AREA
INNER 1/3 = 2.05 X 0.575
1.18 SQ. IN.

NO COVERAGE AXIAL DIRECTION

AXIAL DIRECTION - NO COVERAGE
TRANSDUCER LOCATION
D/S SIDE 0.27 X 0.55 0.7 X 0.95/2 = 0.48
D/S SIDE 0.48 / 1.18 = 40.6%

BENJAMIN SANDEN [signature] 10-14-02
REVIEWER: [signature] 10.17.02
[illegible] [illegible] 10-21-02

ATTACHMENT 11 TO BVY 05-37

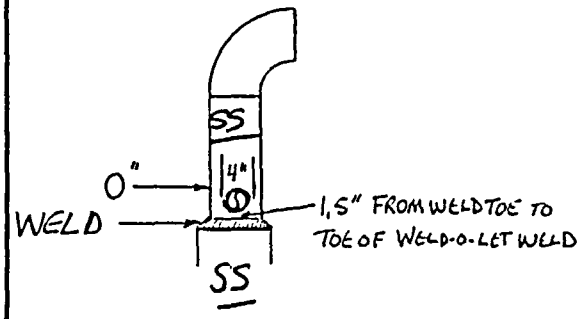
Relief Request B-5, Response to Request for Additional Information
Coverage Sketches – Weld No. CS4B-MF5

ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

Ultrasonic Examination Supplemental Report Sheet

Component ID: CS4B-MFS System: CS Data Sheet No: 8055-01-006

Work Order No: 00-003204-000 Procedure No: NE-8055 Rev: 0 Page 4 of 4



1. TOTAL CIRCUMFERENCE WELD LENGTH = 17.5"
2. WELD OBSTRUCTION (FROM 5.5" to 9.5") = 4.0"
3. PERCENT OBSTRUCTED (4.0" ÷ 17.5") = 11.43%
4. TOTAL OBTAINABLE COVERAGE FOR SINGLE SIDED WELD EXAM = 50.00%
5. TOTAL COVERAGE DS SCAN (50.00% - 11.43%) = 38.57%
6. TOTAL COVERAGE US SCAN (50.00% - 11.43%) = 38.57%
7. TOTAL COVERAGE CW SCAN (50.00% - 11.43%) = 38.57%
8. TOTAL COVERAGE CCW SCAN (50.00% - 11.43%) = 38.57%
9. TOTAL COVERAGE, ALL DIRECTIONS (154.28 ÷ 4) = 38.57%

Examiner: DENNIS P. STRICKLAND Level: II Date: 5-09-01

Examiner: DAVID MILES Level: II Date: 5-09-01

Reviewer: Date: 5-12-01

Reviewer: N/A Date: N/A

ANII: Date: 5-12-01

ATTACHMENT 12 TO BVY 05-37

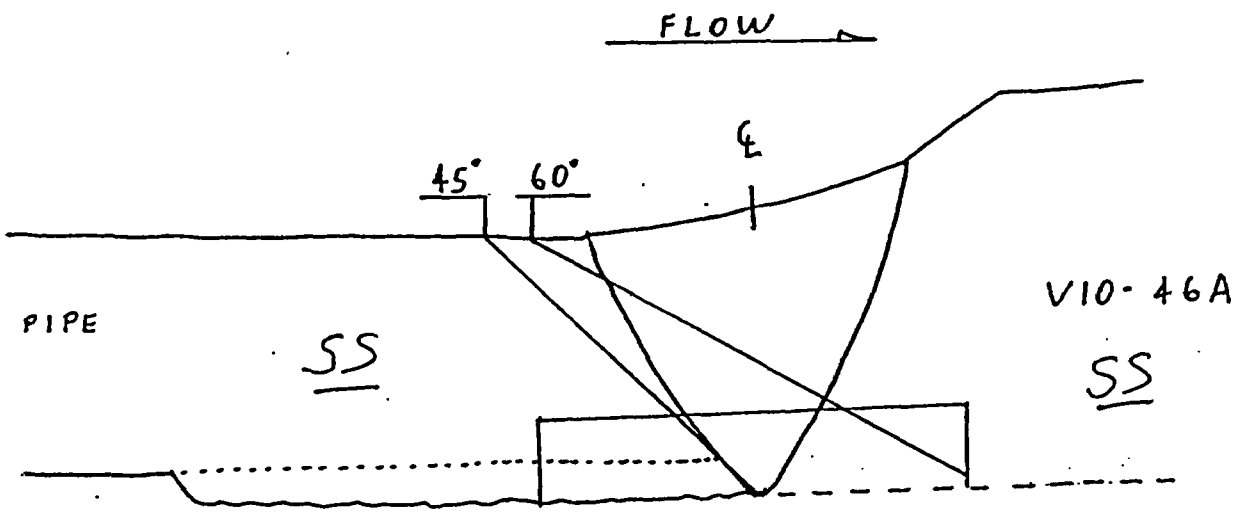
Relief Request B-5, Response to Request for Additional Information
Coverage Sketches – Welds No. RH28-12, RH 29-10 & RH 32-8

ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

SUPPLEMENTAL DATA SHEET ISI- RHR PART II sheet 1/5

PLANT: VY OUTAGE: 1995 DRAWING: REV.: 0
SYSTEM: RHR COMPONENT/WELD NO.: RH28-12 EN: N/A
LOCATION: DW 266°

Examination Details/Sketch: CRV COVERAGE PLOT.



COVERAGE CALC.

EXAM AREA = 0.45 x 2.25 = 1.01 in²

.5(.35 x .65) = 0.11 in² = 11.26% OF CRV NOT COVERED

100% - 11.26% = 88.74% COVERAGE WITH 60° IN ONE DIRECTION

(.45 x .7) + .5(.45 x .45) = 0.42 in² = 41.21% COVERAGE WITH 45° IN ONE DIRECTION

Total coverage = (Axial 45° % + Axial 60° % + Circ CW % + Circ CCW %)/4 = (41.21+88.74+100+100)/4 = 82.5%

EXAMINER Simon Crothers / [illegible] LEVEL II DATE 3-29-95
COG. ENG./EXAM AGENCY N/A DATE N/A
ISI COORDINATOR (If ASME XI Exam) [illegible] DATE 3-30-95
QA (Optional) DATE
ANII (Optional) [illegible] DATE 4-1-95

YANKEE	NUCLEAR SERVICES DIVISION INSERVICE INSPECTION	PROCEDURE REVISION PAGE

YA+UT-2-34
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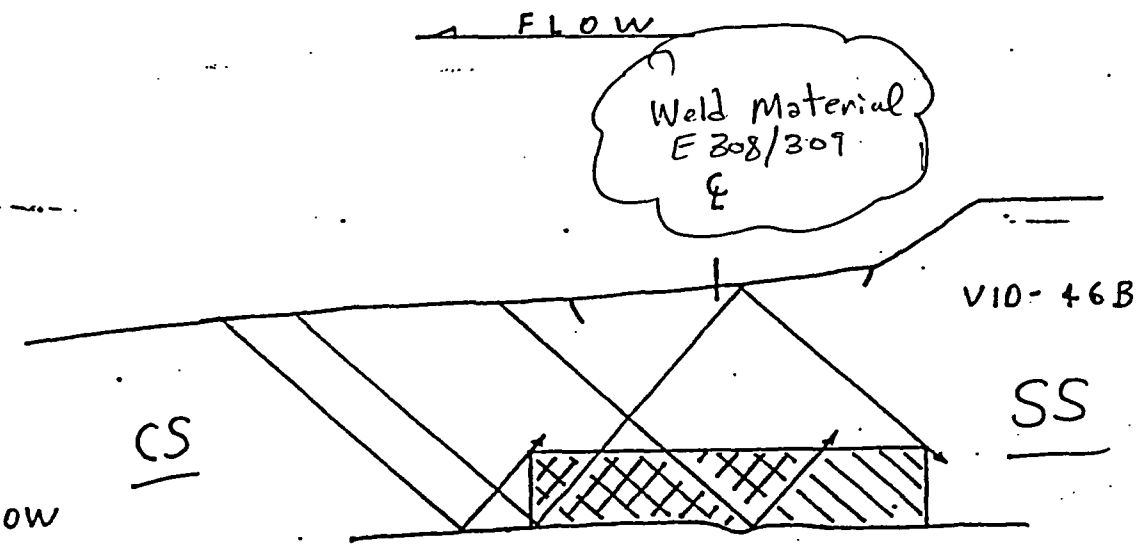
SUPPLEMENTAL DATA SHEET

PLANT: VY OUTAGE: SPRING '95 DRAWING: 154-5920-9287 REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: RH-29-10 EN: N/A

LOCATION: DW 266'

Examination Details/Sketch: 45° SHEAR · CRV COVERAGE PLOT



EXAM AREA = 2.08 x 0.4 = 0.83 in²

1.15 x 0.4 + .5(0.4 x 0.4) = 0.54 in² = 65% COVERAGE IN TWO DIRECTIONS

35% COVERAGE IN ONE DIRECTION

EXAMINED 90% OF WELD LENGTH - SEE ATTACHED SKETCH FOR OBSTRUCTION OF 10% OF WELD LENGTH.

Total coverage = 90% (Axial 3rd leg % + Axial 2nd leg % + Circ CW % + Circ CCW %)/4 = .9(100+65+100+100)/4 = 82.1%

EXAMINER Simon Crothers / [illegible] LEVEL II DATE 4-3-95

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [illegible] DATE 4.4.95

QA (Optional) DATE

ANII (Optional) [illegible] DATE 4-5-95

R65\9

FORM 3

YANKEE	NUCLEAR SERVICES DIVISION INSERVICE INSPECTION	PROCEDURE REVISION PAGE

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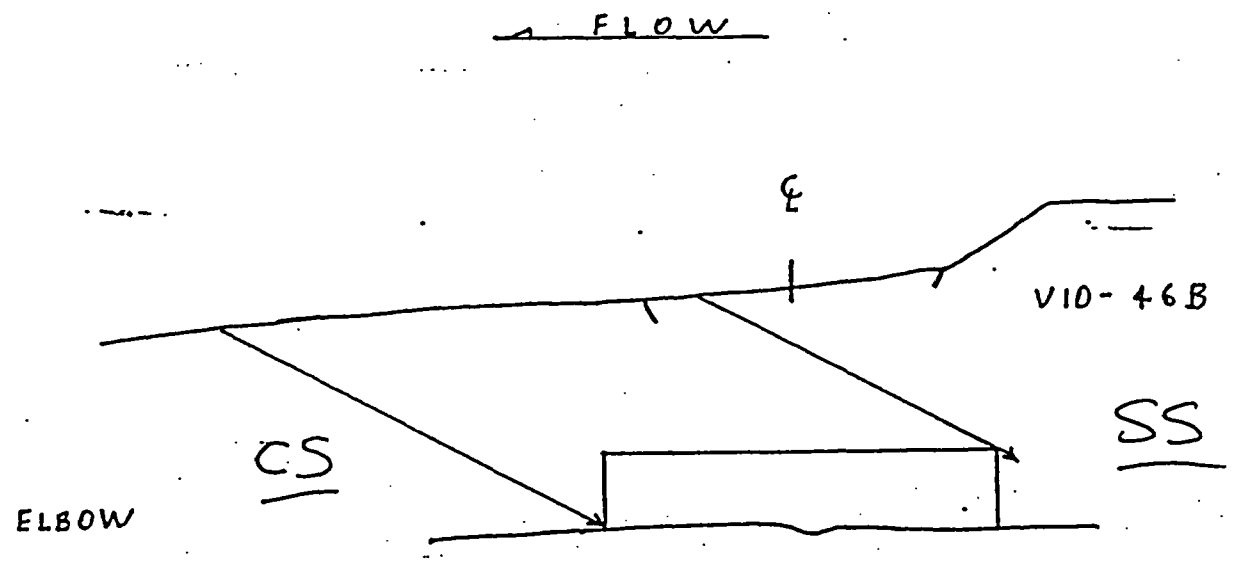
SUPPLEMENTAL DATA SHEET

PLANT: VY OUTAGE: SPRING '95 DRAWING: ISI-5920-9287 REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: RH-29-10 EN: N/A

LOCATION: D.W 266'

Examination Details/Sketch: 60° RL COVERAGE PLOT



ACHIEVED 100% CRV COVERAGE IN ONE DIRECTION FOR 90% OF WELD LENGTH - SEE ATTACHED SKETCH FOR OBSTRUCTION OF 10% OF WELD LENGTH.

EXAMINER Simon Crothers / [signature] LEVEL II DATE 4-3-95

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 4-4-95

QA (Optional) DATE

ANII (Optional) [signature] DATE 4-5-95

R65\9

FORM 3

YANKEE	NUCLEAR SERVICES DIVISION INSERVICE INSPECTION	PROCEDURE REVISION PAGE

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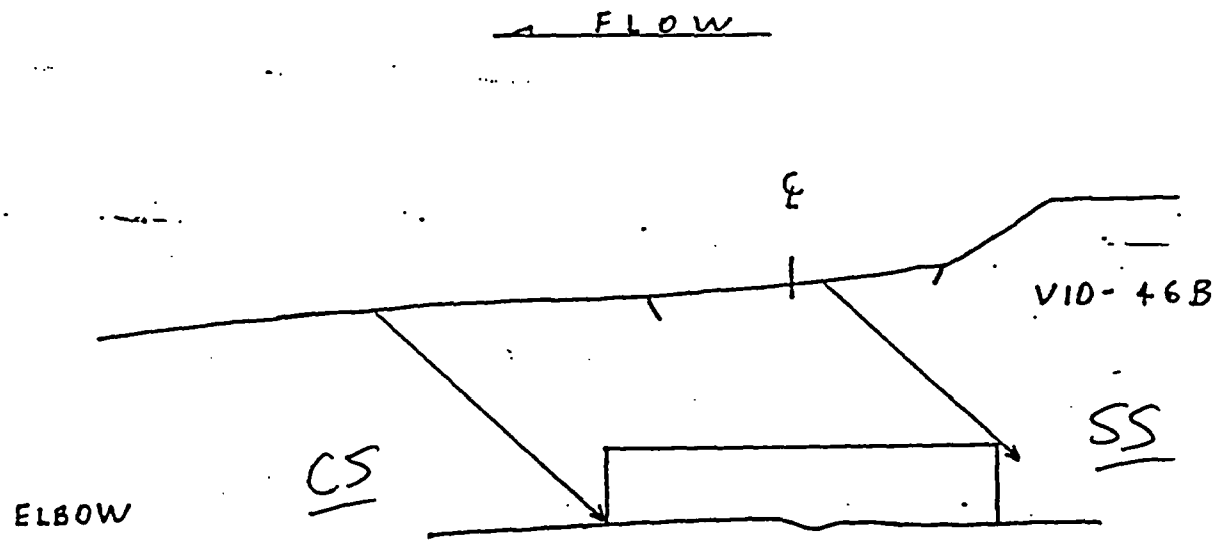
SUPPLEMENTAL DATA SHEET

PLANT: VY OUTAGE: SPRING '95 DRAWING: ISI-5920-9287 REV.: 0
SYSTEM: RHR COMPONENT/WELD NO.: RH-29-10 EN: N/A
LOCATION: DW 266'

Examination Details/Sketch: 45° RL COVERAGE PLOT



ACHIEVED 100% CRV COVERAGE IN ONE DIRECTION FOR 90% OF WELD LENGTH — SEE ATTACHED SKETCH FOR OBSTRUCTION OF 10% OF WELD LENGTH.

EXAMINER Simon Crothers / for [signature] LEVEL II DATE 4-3-95
COG. ENG./EXAM AGENCY N/A DATE N/A
ISI COORDINATOR (IF ASME XI Exam) [signature] DATE 4-4-95
QA (Optional) DATE
ANII (Optional) [signature] DATE 4-5-95

R65\9

FORM 3

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YANKEE	NUCLEAR SERVICES DIVISION INSERVICE INSPECTION	PROCEDURE REVISION PAGE

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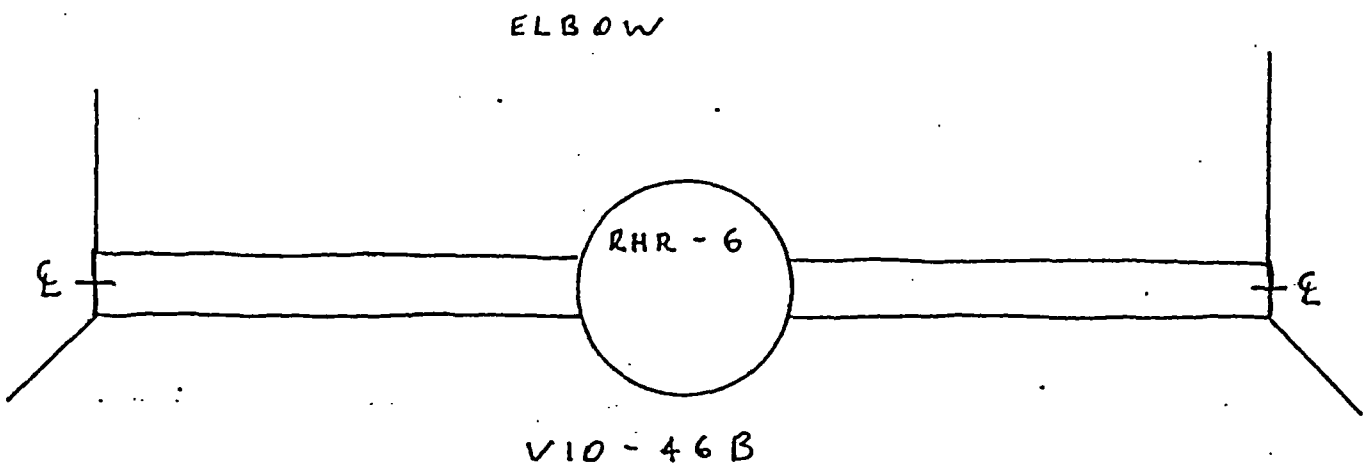
SUPPLEMENTAL DATA SHEET

PLANT: VY OUTAGE: SPRING '95 DRAWING: 151-5920-9287 REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: RH-29-10 EN: N/A

LOCATION: DW 266'

Examination Details/Sketch: SCAN OBSTRUCTION. 180° FROM TDC.



WELD LENGTH = 75.4"
OBSTRUCTION = 7.4" = 10% OF WELD LENGTH.

EXAMINER Simon Crothers / for Beth LEVEL II DATE 4-3-95

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 4-4-95

QA (Optional) DATE

ANII (Optional) [signature] DATE 4-5-95

R65\9

FORM 3

YANKEE	NUCLEAR SERVICES DIVISION INSERVICE INSPECTION	PROCEDURE REVISION PAGE

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SUPPLEMENTAL DATA SHEET ISI-5920-6622 SH 1/3

PLANT: VY OUTAGE: SPRING, '95 DRAWING: REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: RH-32-8 EN: N/A

LOCATION: DW 266°

Examination Details/Sketch: CRV COVERAGE SUMMARY.

45°

- 33.5% COVERAGE x 62.5% WELD LENGTH (SKETCH "A")
  + 13.6% COVERAGE x 12.5% WELD LENGTH (SKETCH "B")
  = 22.6% COVERAGE IN TWO DIRECTIONS
- 30% COVERAGE x 62.5% WELD LENGTH (SKETCH "A")
  + 19.5% COVERAGE x 25% WELD LENGTH (SKETCH "A")
  + 42.6% COVERAGE x 12.5% WELD LENGTH (SKETCH "B")
  = 29% COVERAGE IN ONLY ONE DIRECTION + 22.6% = 51.6% coverage in at least one direction

60°

- 73.6% COVERAGE x 50% WELD LENGTH (SKETCH "C")
  + 32.5% COVERAGE x 25% WELD LENGTH (SKETCH "D")
  = 44.9% COVERAGE IN TWO DIRECTIONS
- 24.6% COVERAGE x 50% WELD LENGTH (SKETCH "C")
  + 55% COVERAGE x 25% WELD LENGTH (SKETCH "D")
  = 26% COVERAGE IN ONLY ONE DIRECTION + 44.9% = 70.9% coverage in at least one direction

Total Coverage = {[(Axial 45° 2 dir + Axial 45° 1 dir) + (Axial 60° 2 dir + Axial 60° 1 dir)]/2 + Circ CW + Circ CCW}/4
= {[(22.6 + 51.6 + 44.9 + 70.9)/2 + 100 + 100]/4 = 73.8%

EXAMINER Simon Crothers / [signature] LEVEL II DATE 4-8-95

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 4-10-95

QA (Optional) DATE

ANII (Optional) [signature] DATE 4-10-95

R65\9

FORM 3

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SUPPLEMENTAL DATA SHEET 151-5920-6622 SH 1/3

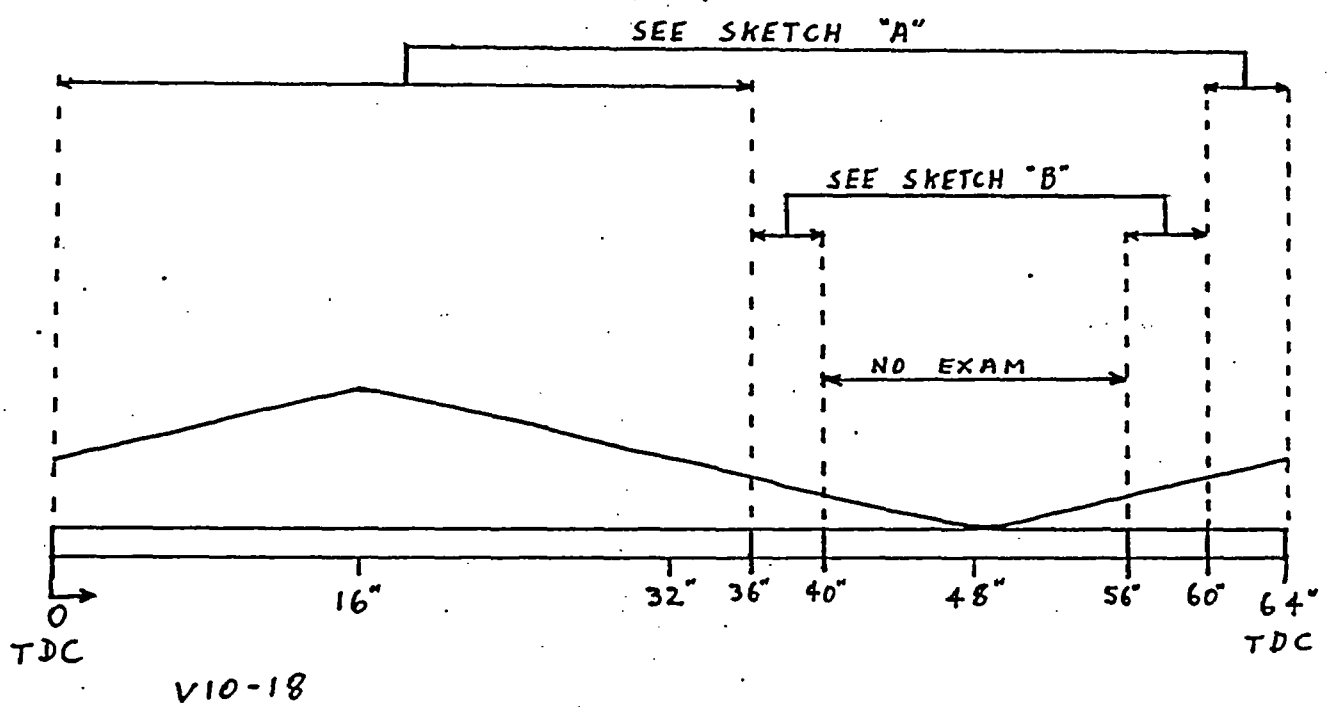
PLANT: VY OUTAGE: SPRING '95 DRAWING: _____ REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: RH-32-8 EN: N/A

LOCATION: DW 266'

Examination Details/Sketch:

ROLL-OUT SUPPLEMENT TO 45° SHEAR SKETCHES "A" + "B"



EXAMINER [signature] LEVEL II DATE 4-8-95

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 4-10-95

QA (Optional) _____ DATE _____

ANII (Optional) [signature] DATE 4-10-95

R65\9

FORM 3

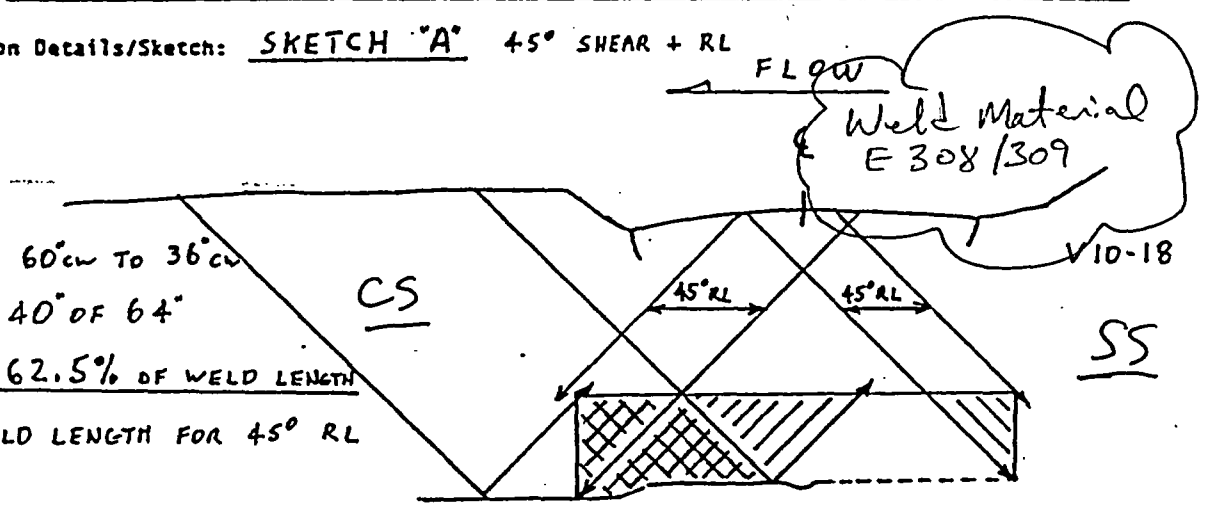
SUPPLEMENTAL DATA SHEET

PLANT: VY OUTAGE: SPRING-95 DRAWING: ISI-5920-6622 Sh. 1/3 REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: RH-32-8 EN: N/A

LOCATION: DW 266'

Examination Details/Sketch: SKETCH "A" 45° SHEAR + RL



AREA COVERED: 60"cw TO 36"cw
= 40" OF 64"
= 62.5% OF WELD LENGTH

NOTE: 100% WELD LENGTH FOR 45° RL

COVERAGE CALC.

EXAM AREA = 2.3 x .45 = 1.04 in²

(.55 x .45) + .5(.45 x .45) = .35 in² = 33.5% COVERAGE IN TWO DIRECTIONS

.5 [(.65 x .65) + (.45 x .45)] = .31 in² = 30% COVERAGE IN ONE DIRECTION
(SHEAR: .65 x .65; RL: .45 x .45)

NOTE: FROM 40"cw TO 56"cw EXAMINED WITH 45°RL ONLY, ON WELD CROWN ONLY.
40" TO 56" = 16" OF 64" = 25% OF WELD LENGTH
COVERAGE CALC: .45 x .45 = .2 in² = 19.5% COVERAGE IN ONE DIRECTION

EXAMINER Simon Crothers / [signature] LEVEL II DATE 4-8-95
COG. ENG./EXAM AGENCY N/A DATE N/A
ISI COORDINATOR (If ASME XI Exam) [signature] DATE 4-10-95
QA (Optional) DATE
ANII (Optional) [signature] DATE 4-10-95

R65\9

FORM 3

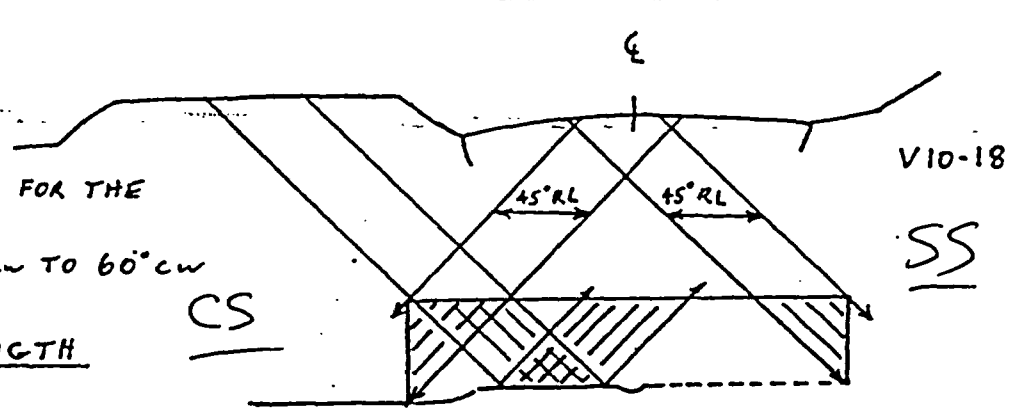
SUPPLEMENTAL DATA SHEET

PLANT: VY OUTAGE: SPRING-95 DRAWING: 151-5920-6622 Sh. 1/3 REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: RH-32-8 EN: N/A

LOCATION: DW 266'

Examination Details/Sketch: SKETCH "B" 45° SHEAR + RL



AVERAGE CROSS-SECTION FOR THE FOLLOWING AREAS:
36"cw TO 40"cw + 56"cw TO 60"cw
= 8" OF 64"
= 12.5% OF WELD LENGTH

COVERAGE CALC

EXAM AREA = 2.3 x .45 = 1.04 in²

$.5[(.35 \times .35)_{SHEAR/RL} + (.4 \times .4)_{SHEAR}] = .14\ in^2$ = 13.6% COVERAGE IN TWO DIRECTIONS

$.5[(.35 \times .35)_{RL} + (.4 \times .4)_{SHEAR} + (.45 \times .45)_{RL}] + (.4 \times .25)_{SHEAR} + (.4 \times .25)_{SHEAR} = .44\ in^2$

= 42.6% COVERAGE IN ONE DIRECTION

EXAMINER Simon Crothers / for [signature] LEVEL II DATE 4-8-95

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 4-10-95

QA (Optional) DATE

ANII (Optional) [signature] DATE 4-10-95

R65\9

FORM 3

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NUCLEAR SERVICES DIVISION
INSERVICE INSPECTION
PROCEDURE
REVISION
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SUPPLEMENTAL DATA SHEET ISI-5920-6622 sh 1/3

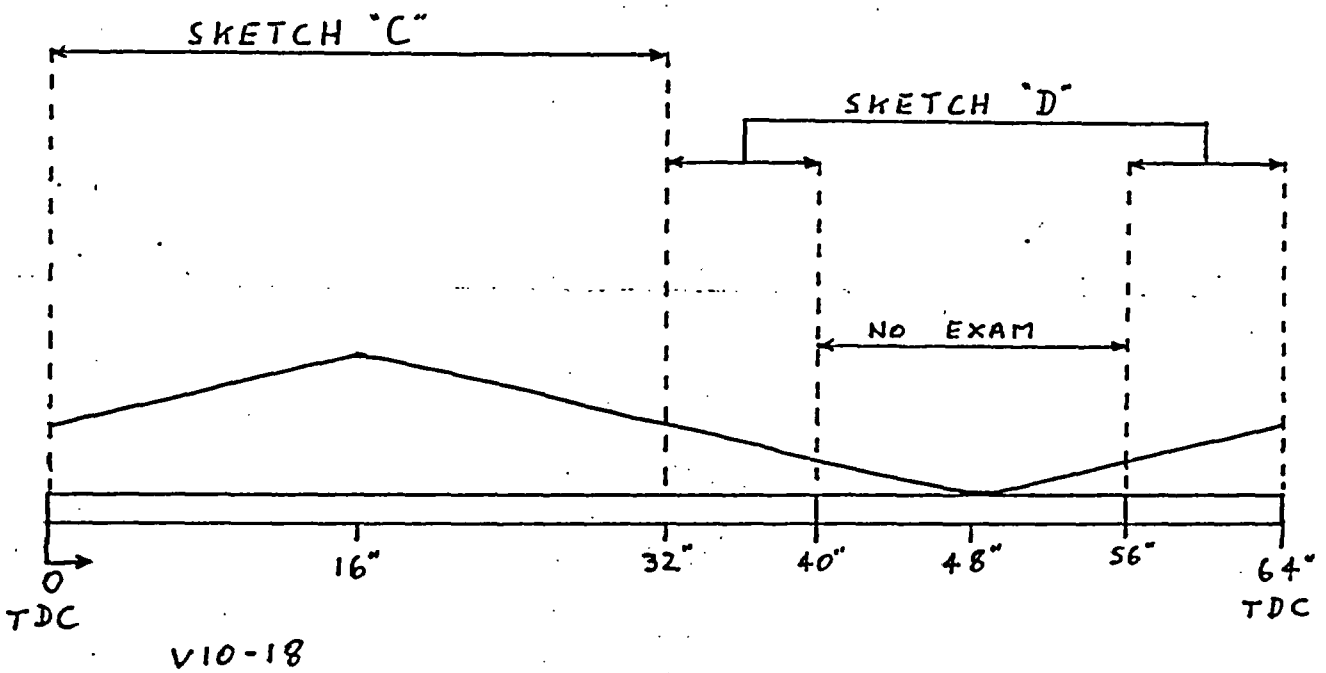
PLANT: VY OUTAGE: SPRING '95 DRAWING: _____ REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: RH-32-8 EN: N/A

LOCATION: DW 266'

Examination Details/Sketch:

ROLL-OUT SUPPLEMENT TO 60° SHEAR SKETCHES "C" + "D"



EXAMINER Simon Crothers / [signature] LEVEL II DATE 4-8-95

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 4-10-95

OA (Optional) _____ DATE _____

ANII (Optional) [signature] DATE 4-10-95

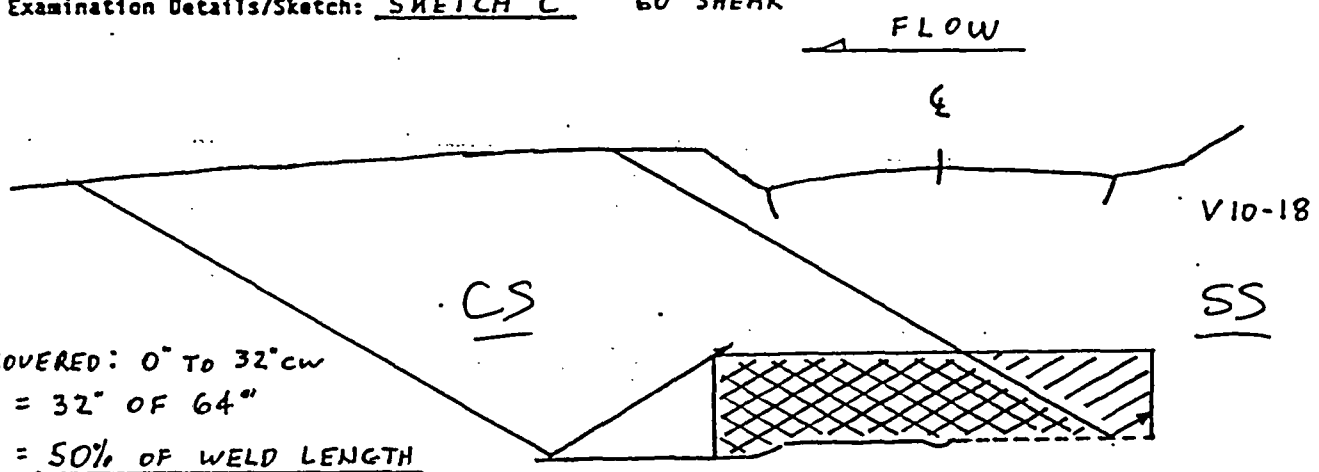
R65\9

FORM 3

SUPPLEMENTAL DATA SHEET

PLANT: VY OUTAGE: SPRING-95 DRAWING: 151-5920-6622 Sh. 1/3 REV.: 0
SYSTEM: RHR COMPONENT/WELD NO.: RH-32-8 EN: N/A
LOCATION: DW 266'

Examination Details/Sketch: SKETCH "C" 60° SHEAR



AREA COVERED: 0° TO 32° CW
= 32" OF 64"
= 50% OF WELD LENGTH

COVERAGE CALC EXAM AREA = 2.3 x .45 = 1.04 in²

.5(.8 x .45) + (1.3 x .45) = .77 in² = 73.6% COVERAGE IN TWO DIRECTIONS

.5 [(.8 x .45) + (.15 x .2)] + (.2 x .3) = .26 in² = 24.6% COVERAGE IN ONE DIRECTION

EXAMINER Simon Crothers / for Butler LEVEL II DATE 4-8-95
COG. ENG./EXAM AGENCY N/A DATE N/A
ISI COORDINATOR (If ASME XI Exam) [signature] DATE 4-10-95
QA (Optional) DATE
ANII (Optional) [signature] DATE 4-10-95

R65\9

FORM 3

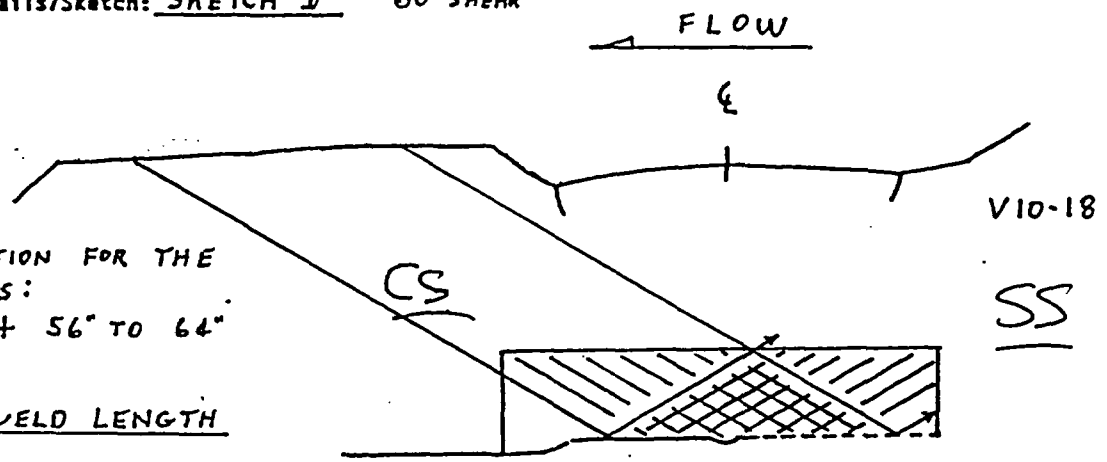
SUPPLEMENTAL DATA SHEET

PLANT: VY OUTAGE: SPRING-95 DRAWING: ISI-5920-6622 Sh. 1/3 REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: RH-32-8 EN: N/A

LOCATION: DW 266'

Examination Details/Sketch: SKETCH "D" 60° SHEAR



AVERAGE CROSS-SECTION FOR THE FOLLOWING AREAS:
32"cw TO 40"cw + 56" TO 64"
= 16" OF 64"
= 25% OF WELD LENGTH

COVERAGE CALC

EXAM AREA = 2.3 x .45 = 1.04 in²

.5 (1.5 x .45) = .34 in² = 32.5% COVERAGE IN TWO DIRECTIONS

.5 [(1.5 x .45) - (.1 x .2) + (.45 x .75) + (.15 x .2)] + (.2 x .3) = .57 in²

= 55% COVERAGE IN ONE DIRECTION

EXAMINER Simon Crothers / [signature] LEVEL II DATE 4-8-95

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 4.10.95

QA (Optional) DATE

ANII (Optional) [signature] DATE 4-10-95

R65\9

FORM 3

NUCLEAR SERVICES DIVISION INSERVICE INSPECTION	PROCEDURE REVISION PAGE	YA-UT-2-51 12 of 14

SUPPLEMENTAL DATA SHEET 151-5920-6622 sh 1/3

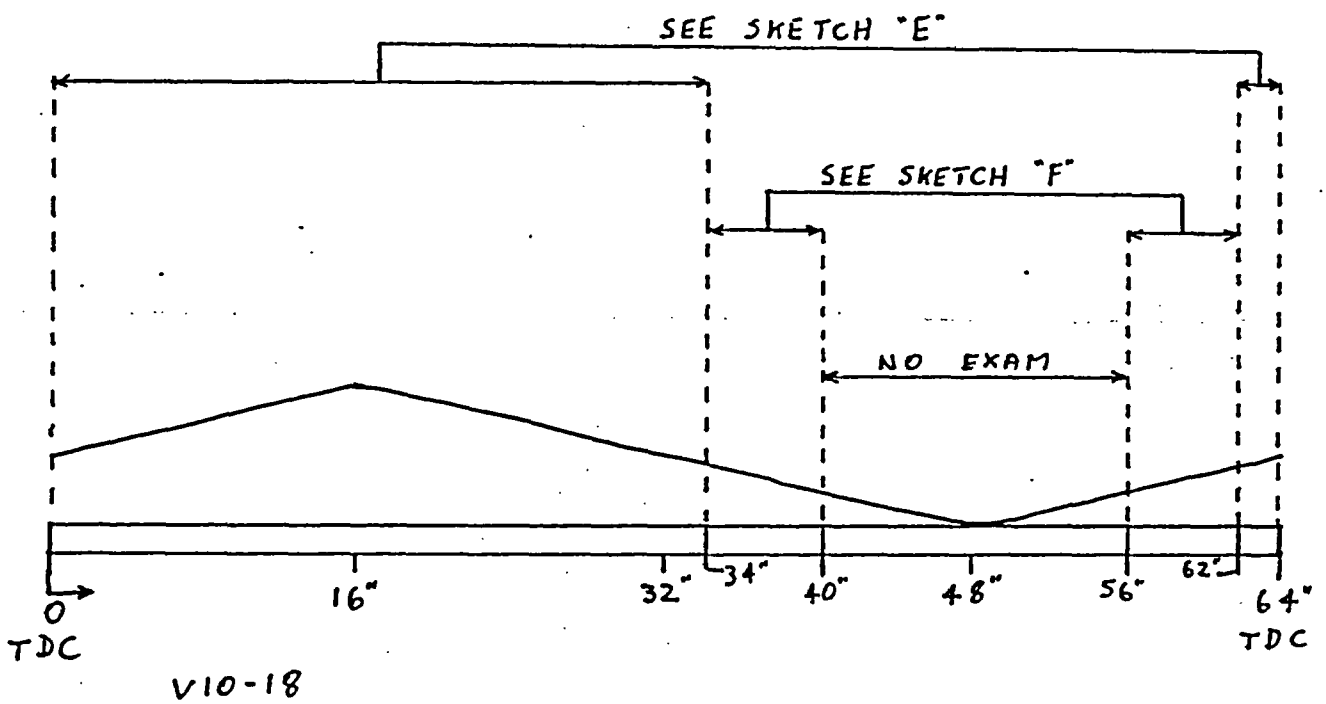
PLANT: VY OUTAGE: SPRING '95 DRAWING: _____ REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: RH-32-8 EN: N/A

LOCATION: DW 266'

Examination Details/Sketch:

ROLL-OUT SUPPLEMENT TO 60° RL SKETCHES "E" + "F"



EXAMINER Simon Crothers / for Butler LEVEL II DATE 4-8-95

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 4-10-95

QA (Optional) _____ DATE _____

ANII (Optional) [signature] DATE 4-10-95

R65\9

FORM 3

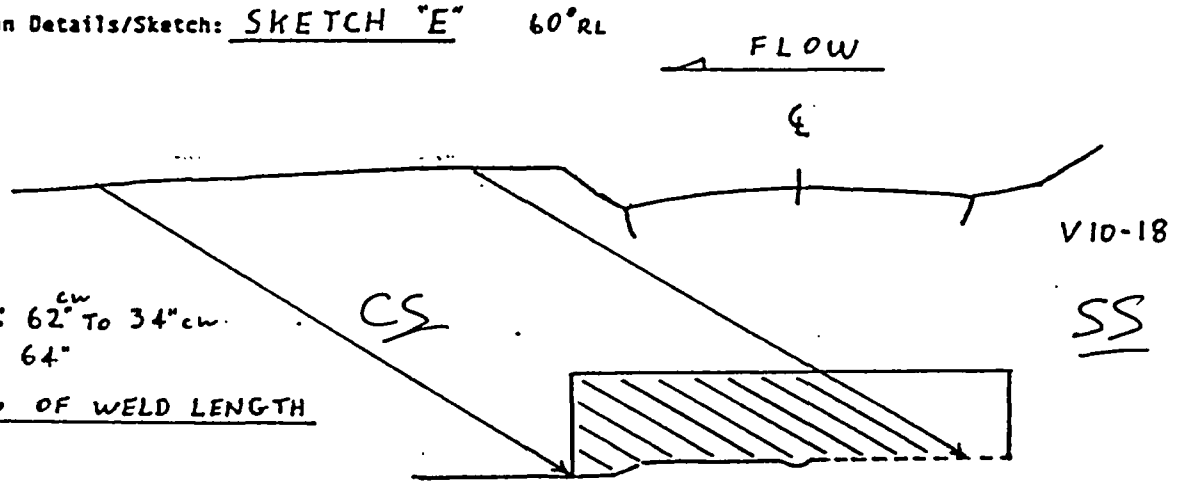
SUPPLEMENTAL DATA SHEET

PLANT: VY OUTAGE: SPRING-95 DRAWING: ISI-5920-6622 Sh. 1/3 REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: RH-32-8 EN: N/A

LOCATION: DW 266'

Examination Details/Sketch: SKETCH "E" 60° RL



AREA COVERED: 62" cw TO 34" cw
= 36" OF 64"
= 56.25% OF WELD LENGTH

COVERAGE CALC

EXAM AREA = 2.3 x .45 = 1.04 in²

(1.3 x .45) + .5 (.45 x .75) = .75 in² = 72.5% COVERAGE IN ONE DIRECTION

NOTE: THIS AREA HAS ALREADY BEEN COVERED WITH 60° SHEAR.

EXAMINER Simon Crothers / [signature] LEVEL II DATE 4-8-95

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 4.10.95

QA (Optional) DATE

ANII (Optional) [signature] DATE 4-10-95

R65\9

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YANKEE

NUCLEAR SERVICES DIVISION
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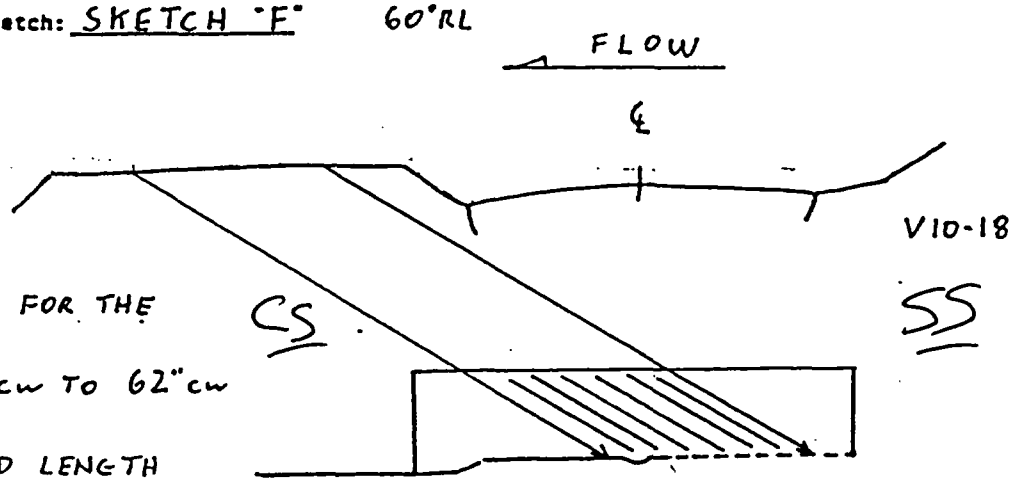
SUPPLEMENTAL DATA SHEET

PLANT: VY OUTAGE: SPRING-95 DRAWING: ISI-5920-6622 Sh. 1/3 REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: RH-32-8 EN: N/A

LOCATION: DW 266'

Examination Details/Sketch: SKETCH "F" 60°RL



AVERAGE CROSS-SECTION FOR THE FOLLOWING AREAS:

34"cw TO 40"cw + 56"cw TO 62"cw
= 12" OF 64"
= 18.75% OF WELD LENGTH

COVERAGE CALC

EXAM AREA = 2.3 x .45 = 1.04 in²

1.1 x .45 = .5 in² = 47.6% COVERAGE IN ONE DIRECTION

NOTE: THIS AREA HAS ALREADY BEEN COVERED WITH 60° SHEAR.

EXAMINER Simon Crothers / [signature] LEVEL II DATE 4-8-95

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 4-10-95

QA (Optional) DATE

ANII (Optional) [signature] DATE 4-10-95

R65\9

FORM 3

111

ATTACHMENT 13 TO BVY 05-37

Relief Request B-5, Response to Request for Additional Information
Coverage Sketches – 8 lug welds / hanger #RR-89, 90

ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

YA-PE-1-13
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LIQUID PENETRANT EXAMINATION REPORT

PLANT VERMONT YANKEE OUTAGE ENL 1996 DRAWING KI-5920-6802 SH. 2/6 REV. 0

SYSTEM RECIRC LOOP B COMPONENT/WELD NO. 8 LUG WELDS/HANGER RR-89,90 EN N/A

LOCATION DRYWELL 260'

EXAMINATION DETAILS PROCESS: Solvent Removable Color Contrast

Temperature verified between 60°F and 125°F ☑ Yes ☐ No

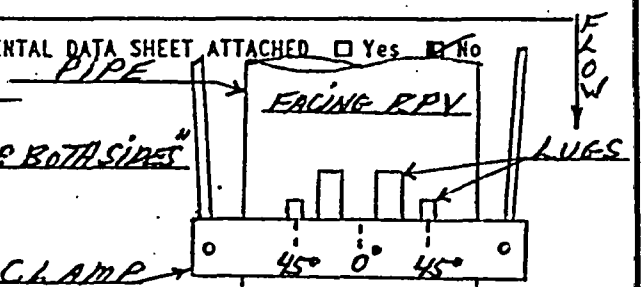
Material: STAINLESS STEEL Thermometer S/N 123586

Surface Condition: ☐ As-Welded ☑ Ground ☐ Machined ☐ Other

MATERIALS:	Manufacturer	Designation	Batch No.
Precleaner:	MAGNAFLUX	SKC-S	94K01K
Penetrant:	MAGNAFLUX	SKL-CP	94J05K
Remover:	MAGNAFLUX	SKC-S	94K01K
Developer:	MAGNAFLUX	SKD-S2	93K06K
Post-Cleaner:	MAGNAFLUX	SKC-S	94K01K

EXAMINATION/DETAILS/SKETCH SUPPLEMENTAL DATA SHEET ATTACHED ☐ Yes ☑ No

EXAMINED 8 LUG WELDS WITH CLAMP IN PLACE, EXAMINED BOTH SIDE WELDS AND TOP WELD ON EACH LUG. LUG DIMENSIONS = 4-5"X2½" AND 4-2"X1½".



coverage % = (2.5+1.5)/(5+5+2.5+2+2+1.5) = 77.8%

ACCEPTANCE CRITERIA

ASME XI ☑ ASME III NX-5000 ☐ ASME III NX-2500 ☐ ANSI B31.1 ☐

Other N/A

INDICATION RECORD:

Ind. No.	Size	Location	Accept	Reject	Comments
NO RECORDABLE INDICATIONS			☑	☐	ROUNDED
			☐	☐	INDICATIONS UP
			☐	☐	TO 3/32" ON TOP
			☐	☐	CORNERS OF
			☐	☐	WELDS
			☐	☐	

EXAMINER [signature] Level: II / II Date: 9-11-96

Cog. Eng./Exam Agency N/A Date: N/A

ISI Coordinator (if ASME XI Exam) [signature] Date: 9-11-96

QA (Optional) N/A Date: N/A

ANII (Optional) [signature] Date: 9-12-96

FORM 1

186

186-03-6344

ATTACHMENT 14 TO BVY 05-37

Relief Request B-5, Response to Request for Additional Information
Coverage Sketches – CRD welds 34-39HF, 26-03HF, 02-27SH & 02-27HF

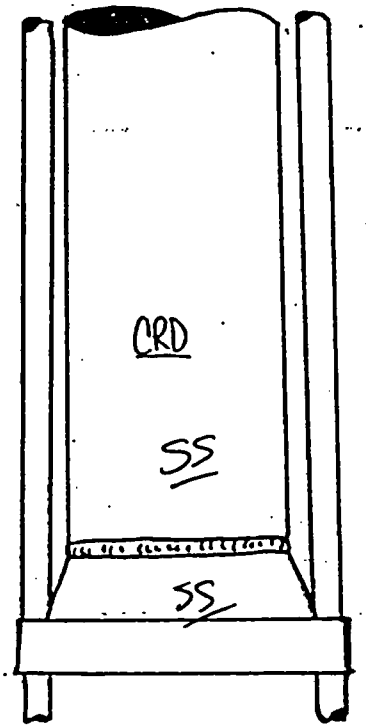
ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

SUPPLEMENTAL DATA SHEET

YA-UT-2-52 Page 3 of

PLANT: Vermont Yankee OUTAGE: 1996 DRAWING: 151-RPV-104 REV.: 0
SYSTEM: CRD COMPONENT/WELD NO.: CIRC WELD HOUSING TO FLANGE 34-39HF EN: N/A
LOCATION: DRYWELL 252' (under RPV Vessel)

Examination Details/Sketch:



Two (2) 1" Rods located @ 180° from each other around CRD obstruct both perpendicular and parallel scans in those areas.

5'3/16" ϕ pipe = 18.26" circumference

Perpendicular scan obstructed for 2" around circumference.

$\frac{2''}{18.26''} = \frac{x}{100\%}$ = 10.95% incomplete
89.05% complete

Parallel Scan obstructed for 3.4" around circumference in both directions.

$\frac{3.4''}{18.26''} = \frac{x}{100\%}$ = 18.62% incomplete
81.38% complete

EXAMINER Janet K Miles / Edgar W. Fallon LEVEL II/II DATE 9/24/96
COG. ENG./EXAM AGENCY N/A DATE N/A
ISI COORDINATOR (If ASME XI Exam) [signature] DATE 9-25-96
QA (Optional) N/A DATE N/A
AHII (Optional) [signature] DATE 9-26-96

Applies to:
34-39HF
26-03HF
02-27SH
02-27HF

Total Exam Coverage = 89.05 + 81.38 / 2 = 85.2%

R6519

ATTACHMENT 15 TO BVY 05-37

Relief Request B-5, Response to Request for Additional Information
Coverage Sketches – HTEX 10-4

ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

EVALUATION REPORT YA-UT-2-813 ~~9412~~

PLANT: VY OUTAGE: SPRING 98 DRAWING: ISI-RPV-104 REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: HTEX 10-4 EN: N/A

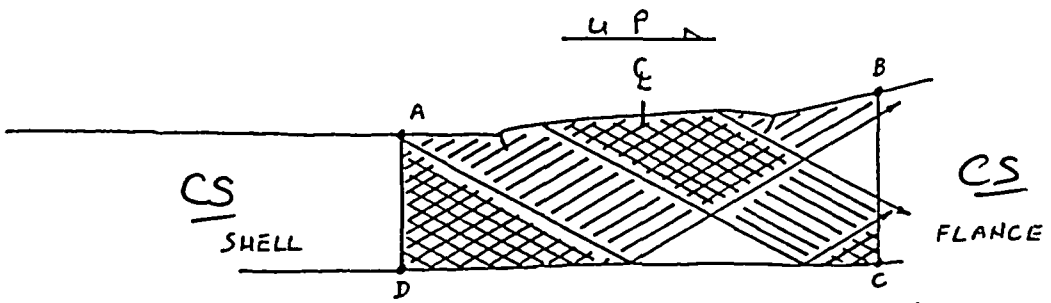
LOCATION: RB LNECR

Reference (Applicable Code Paragraphs)

• SKETCH "A" (AXIAL) • WELD LENGTH = 143" • WCW = 1.4"

• EXAM AREA (A-B-C-D) = 2.4" x 0.8" = 1.92 in²

NOTE: THIS SKETCH REPRESENTS 139.4" OF 143" OF WELD LENGTH



TWO DIRECTIONAL COVERAGE: .5 [(.7x1.2) + (.5x.9) + (.5x.5) + (.25x.4)] = .82 in²

(.82 in² OF 1.92 in²) x (139.4" OF 143" LENGTH) = 41.63%

ONE DIRECTIONAL COVERAGE: .5(.2x.7) + (.4x1.0) + .5(.25x.8) + (.5x.48) = .81 in²

50% (.81 in² OF 1.92 in²) x (139.4" OF 143" LENGTH) = 20.56%

SKETCH A : 41.63% + 20.56% = 62.19% AXIAL CRV

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 3-20-98

QA (Optional) N/A DATE N/A

ANII (Optional) [signature] DATE 4-3-98

YANKEE
NUCLEAR SERVICES DIVISION
INSERVICE INSPECTION

PROCEDURE YA-UT-1
REVISION 9
PAGE 12 of 12

8 4 10

EVALUATION REPORT

YA-UT-2-~~8~~ 13 ~~10 4 13~~

PLANT: VY OUTAGE: SPRING 98 DRAWING: ISI-RPV-104 REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: HTEX 10-4 EN: N/A

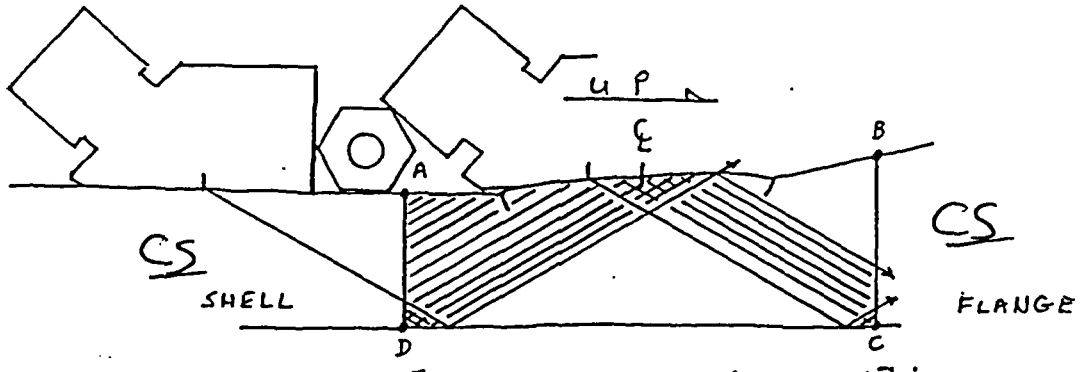
LOCATION: RB LNECR

Reference (Applicable Code Paragraphs)

• SKETCH "B" (AXIAL) • WELD LENGTH = 143" • WCW = 1.4"

• EXAM AREA (A-B-C-D) = 2.4" × 0.8" = 1.92 in²

NOTE: THIS SKETCH REPRESENTS 3.6" OF 143" OF WELD LENGTH. (12 NUTS @ 0.3" WIDE)



TWO DIRECTIONAL COVERAGE: .5[(.15×.25) + (.2×.65) + (.1×.2)] = .094 in²

(.094 in² OF 1.92 in²) × (3.6" OF 143" LENGTH) = 0.12 %

ONE DIRECTIONAL COVERAGE: .5(.5 × 1.0) + (.25 × 1.2) + (.35 × 1.1) = 0.935 in²

50% (.935 in² OF 1.92 in²) × (3.6" OF 143" LENGTH) = 0.61%

SKETCH B : 0.12% + 0.61% = 0.73% AXIAL CRV

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 3-20-98

QA (Optional) N/A DATE N/A

ANII (Optional) [signature] DATE 4-3-98

R65\9

FORM 4

9 of 10

EVALUATION REPORT YA-UT-2-813 #4 of 12

PLANT: VY OUTAGE: SPRING 98 DRAWING: 151-RPV-104 REV.: 0

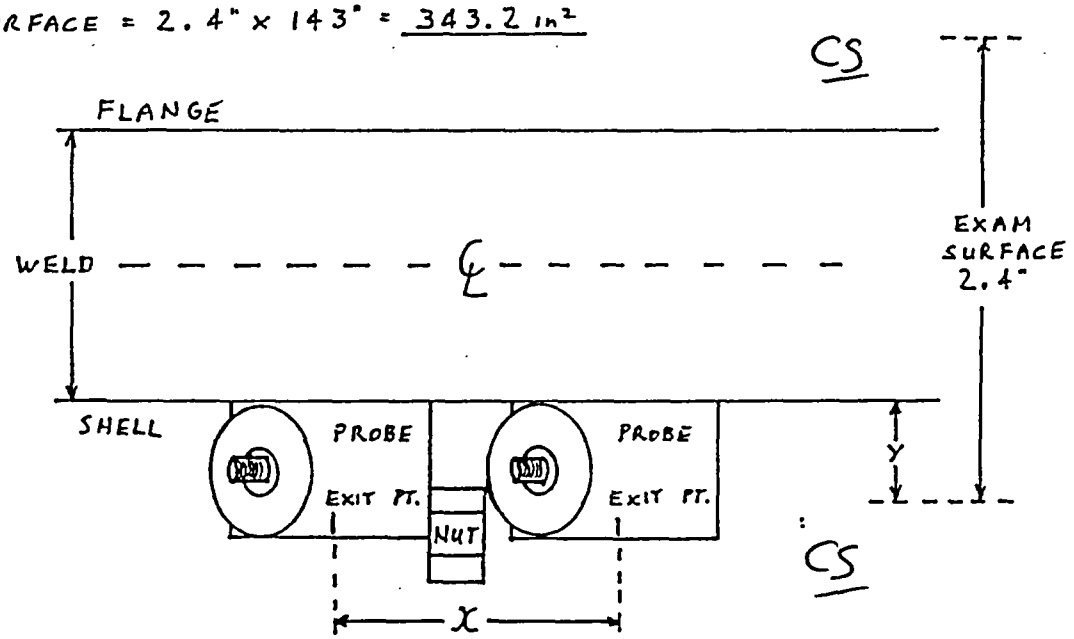
SYSTEM: RHR COMPONENT/WELD NO.: HTEX 10-4 EN: N/A

LOCATION: RB LNECR

Reference (Applicable Code Paragraphs)

• SKETCH "C" (CIRC) • WELD LENGTH = 143" • WCW = 1.4"

• EXAM SURFACE = 2.4" x 143" = 343.2 in²



SURFACE AREA OBSTRUCTED = X x Y x No. OF NUTS
= 1.5 x .5 x 12 = 9 in²

SKETCH C: (343.2 in² − 9 in²) ÷ (343.2 in²) = 97.38% CIRC CRV

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 3-20-98

QA (Optional) N/A DATE N/A

ANII (Optional) [signature] DATE 4-3-98

R65\9

YANKEE	NUCLEAR SERVICES DIVISION INSERVICE INSPECTION	PROCEDURE YA-UT-1 REVISION 9 PAGE 12 of 12 10 4 10

EVALUATION REPORT YA-UT-2-~~8~~13 ~~12~~ 4 12

PLANT: VY OUTAGE: SPRING '98 DRAWING: 151-RPV-104 REV.: 0

SYSTEM: RHR COMPONENT/WELD NO.: HTEX 10-4 EN: N/A

LOCATION: RB LNECR

Reference (Applicable Code Paragraphs)

COVERAGE SUMMARY

SKETCH "A": AXIAL COVERAGE = 62.19%

SKETCH "B" AXIAL COVERAGE = 0.73%

TOTAL (A') = 62.92%

SKETCH "C" CIRC COVERAGE = 97.38%

TOTAL CRV = (A'+C)/2 = (62.92% + 97.38%)/2 = 80.15%

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 3-20-98

QA (Optional) N/A DATE N/A

ANII (Optional) [signature] DATE 4-3-98

R65\9

FORM 4

ATTACHMENT 16 TO BVY 05-37

Relief Request B-5, Response to Request for Additional Information
Coverage Sketches: A-RHR-CC-4, CT27-S30, FW17-S5, RH3DS206, RC3-S15 & CU54-16

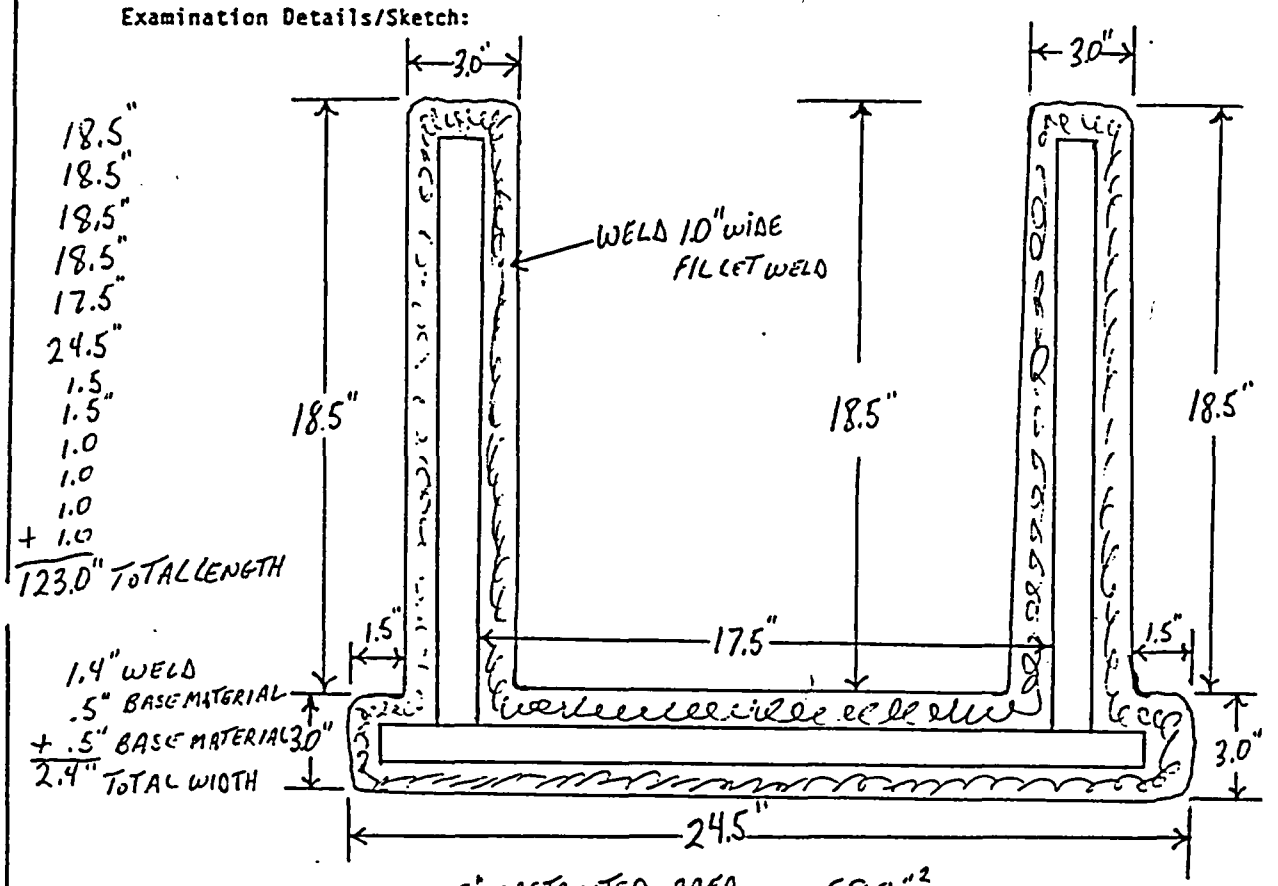
ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

DATA SHT. # OL-MP-1-9 Pg 2 of 2

SUPPLEMENTAL DATA SHEET

PLANT: V.Y. OUTAGE: N/A DRAWING: 151-RPV-104 REV.: 0
SYSTEM: RHR HEAT EXCHANGER COMPONENT/WELD NO.: A-RHR-CC-4 EN: N/A
LOCATION: NE CORNER Room

Examination Details/Sketch:



123.0"
x 2.4"
295.2"

24.5" OBSTRUCTED AREA
x 2.4"
58.8

58.8"²
+295.2"²
.1992 = 19.92% INCOMPLETE

Total Coverage = 80.1%

EXAMINER Janet K Miles / David Miles LEVEL II / II DATE 5/24/96
COG. ENG. EXAM AGENCY N/A DATE N/A
ISI COORDINATOR (If ASME XI Exam) [signature] DATE 5-30-96
QA (Optional) N/A DATE N/A
ANII (Optional) DATE

R65\9

FORM 3

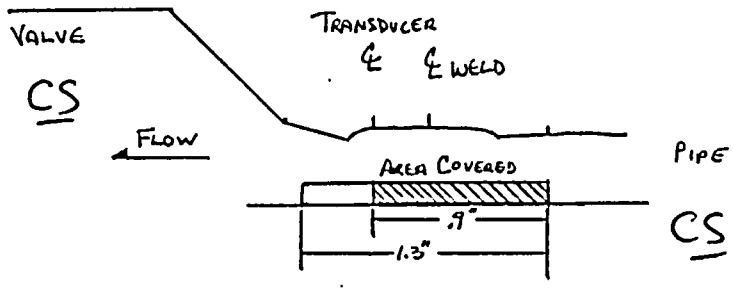
Ultrasonic Examination Supplemental Report Sheet

Component ID: CT27-S30 System: CS Data Sheet No: 8054-01-009

Work Order No: 00-003142-000 Procedure No: NE 8054 Rev: 0 Page 3 of 3

ASME Section XI coverage is the inner 1/3 T and 1/4" from each weld toe (see NE 8054, Fig. 1). Procedure NE 8054 required coverage is the inner 1/3 T and 1/2" from each weld toe. For the purpose of calculated coverage, the ASME code coverage requirement volume was used. The examination was limited due to the pipe to valve configuration allowing examination from the pipe side only.

A 1 1/2 Vee examination was performed perpendicular to the weld from the pipe side in order to obtain complete coverage in the axial direction.



Width of the area to be examined is 1.3".
Width of the area covered during the examination was 0.9".
0.9" ÷ 1.3" = 69% Circumferential coverage.
69% + 69% + 100% + 100% = 338% (percent coverage of examination in four directions).
338% ÷ 4 = 84.5% Coverage of the required code volume.

Examiner: Dennis P. Strickland Level: II Date: 4-11-01

Examiner: Dale Murdock Level: III Date: 4/11/01

Reviewer: Date: 4.16.01

Reviewer: N/A Date: N/A

ANII: Date: IV-17-01

Ultrasonic Examination Supplemental Report Sheet

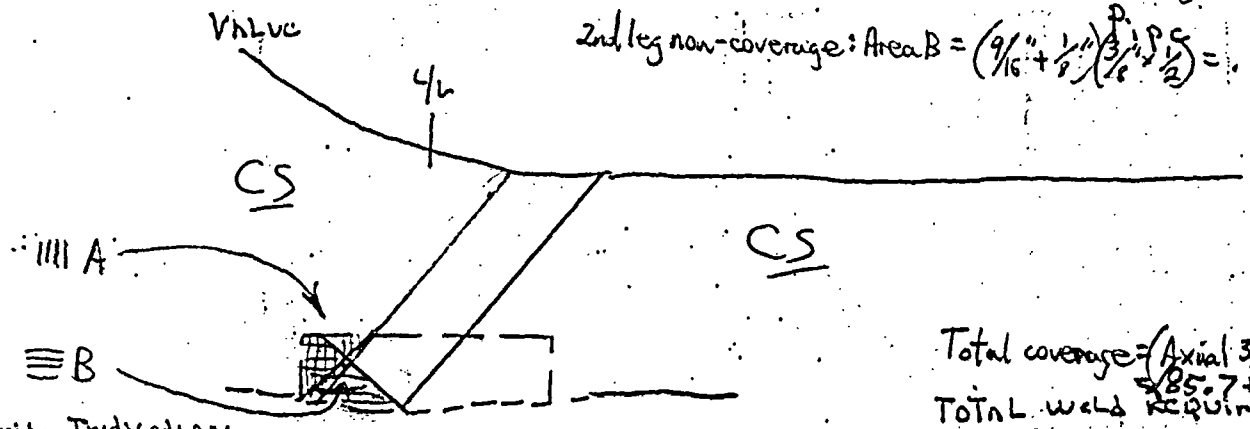
Component ID: FW17-S5 System: F.W. Data Sheet No: 8054-01-028

Work Order No: 00-003095-000 Procedure No: NE 8054 Rev: 0 Page 2 of 2

Required volume cross-section = .492 in²

3rd leg non-coverage: Area A = $(\frac{3}{8}'' \times \frac{3}{8}'')\frac{1}{2}$ = .070 in² .070/.492 = 14.3% coverage = 85.7%

2nd leg non-coverage: Area B = $(\frac{9}{16}'' + \frac{1}{8}'')(\frac{3}{8}'' \times \frac{1}{2})$ = .129 in² .129/.492 = 26.2% coverage = 73.8%



Note: Geometric Indication Recorded in 1996 was verified but not Recorded.

Total coverage = (Axial 3rd leg % + Axial 2nd leg %)2 = (85.7 + 73.8)/2 = 79.8%

Total weld required volume coverage = ~~38%~~ 79.8% for all directions.

Scanned from Pipe Side only. Due to valve configuration.

Examiner: N/A. B/ Level: II Date: 5/10/01

Examiner: N/A Level: N/A Date: N/A

Reviewer: [signature] Date: 5.12.01

Reviewer: N/A Date: N/A

ANII: [signature] Date: 5-12-01

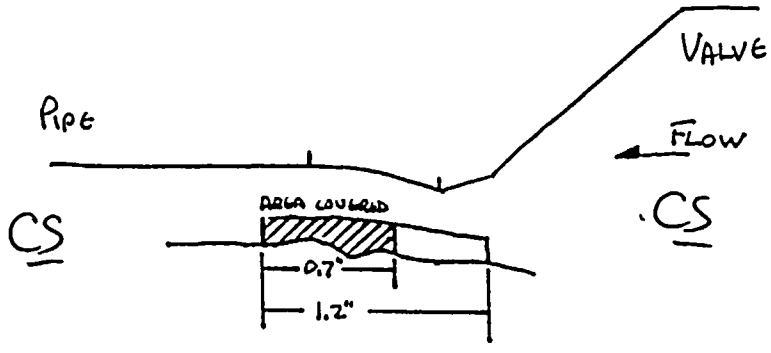
Ultrasonic Examination Supplemental Report Sheet

Component ID: RH3D-S206 System: RHR Data Sheet No: 8054-01-015

Work Order No: 00-003173-000 Procedure No: NE 8054 Rev: 0 Page 2 of 2

ASME SECTION XI COVERAGE IS THE INNER 1/3T AND 1/4" FROM EACH WELD TOE (SEE NE 8054, FIG 1). PROCEDURE NE 8054 REQUIRED COVERAGE IS THE INNER 1/3T AND 1/2" FROM EACH WELD TOE. FOR THE PURPOSE OF CALCULATED COVERAGE, THE ASME CODE COVERAGE REQUIREMENT VOLUME WAS USED. THE EXAMINATION WAS LIMITED DUE TO THE VALVE TO PIPE CONFIGURATION ALLOWING EXAMINATION FROM THE PIPE SIDE ONLY.

A 1 1/2 VEE EXAMINATION WAS PERFORMED PERPENDICULAR TO THE WELD FROM THE PIPE SIDE IN ORDER TO OBTAIN COMPLETE COVERAGE IN THE AXIAL DIRECTION.



WIDTH OF THE AREA TO BE EXAMINED IS 1.2"

WIDTH OF THE AREA COVERED DURING THE EXAMINATION WAS 0.7"

0.7" ÷ 1.2" = 58% CIRCUMFERENTIAL COVERAGE

58% + 58% + 100% + 100% = 316% (PERCENT COVERAGE OF EXAMINATION IN FOUR DIRECTIONS)

316% ÷ 4 = 79% COVERAGE OF THE REQUIRED CODE VOLUME

Examiner: Dennis P. Strickland Level: II Date: 4-18-01

Examiner: N/A Level: N/A Date: N/A

Reviewer: [signature] Date: 4-20-01

Reviewer: N/A Date: N/A

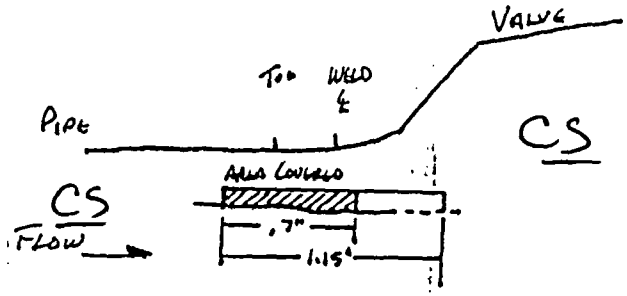
ANII: [signature] Date: 4-20-01

Ultrasonic Examination Supplemental Report Sheet

Component ID: RC3-S15 System: RCIC Data Sheet No: 8054.01.011

Work Order No: 01-001328-000 Procedure No: NE 8054 Rev: 0 Page 2 of 2

ASME SECTION XI COVERAGE IS THE INNER 1/3 T AND 1/4" FROM EACH WELD TOE (SEE NE 8054, FIG 1). PROCEDURE NE 8054 REQUIRED COVERAGE IS THE INNER 1/3 T AND 1/2" FROM EACH WELD TOE. FOR THE PURPOSE OF CALCULATED COVERAGE, THE ASME CODE COVERAGE REQUIREMENT VOLUME WAS USED. THE EXAMINATION WAS LIMITED DUE TO THE PIPE TO VALVE CONFIGURATION ALLOWING EXAMINATION FROM THE PIPE SIDE ONLY.



WIDTH OF THE AREA TO BE EXAMINED IS 1.15"
WIDTH OF THE AREA COVERED DURING THE EXAMINATION WAS 0.7"
0.7" ÷ 1.15 = 61% CIRCUMFERENTIAL COVERAGE
61% + 61% + 100% + 100% = 322% (PERCENT COVERAGE OF EXAMINATION IN FOUR DIRECTIONS.)
322% ÷ 4 = 80.5% COVERAGE OF THE REQUIRED CODE VOLUME.

Examiner: Dennis P. Strickland DENNIS P. STRICKLAND Level: III Date: 4-17-01

Examiner: N/A Level: N/A Date: N/A

Reviewer: [signature] Date: 04-20-01

Reviewer: N/A Date: N/A

ANII: [signature] Date: 4-20-01

YANKEE	NUCLEAR SERVICES DIVISION INSERVICE INSPECTION	PROCEDURE REVISION PAGE	YA-UT-1 9 11 of 12

YA-UT-2-0027

SUPPLEMENTAL DATA SHEET

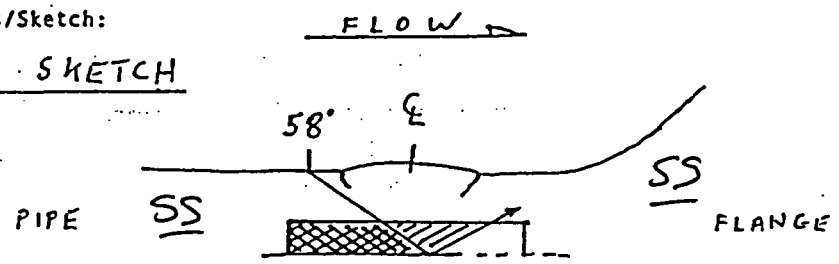
PLANT: VY OUTAGE: RF-21 DRAWING: WM-70105-300 REV.: 2

SYSTEM: RWCU COMPONENT/WELD NO. CU54-16 EH: N/A

LOCATION: RB 252'

Examination Details/Sketch:

CRV COVERAGE SKETCH



EXAM AREA = 1.2" x .16" = 0.192 in²

- TWO DIRECTIONAL COVERAGE = .5 x .16 + .5(.16x.25) = 0.100 in²
- .100 OF .192 = 52 %
- ONE DIRECTIONAL COVERAGE = .5(.16 x .6) = 0.048 in²
- .048 OF .192 = 25 %
- AXIAL COVERAGE = 52% + 25%/2 = 64.5%

Total Coverage = (Axial Coverage + Circ Coverage)/2
= (64.5% + 50%)/2
= 57.3%

EXAMINER Simon Crothers LEVEL II DATE 11-2-99

COG. ENG./EXAM AGENCY N/A DATE N/A

ISI COORDINATOR (If ASME XI Exam) [signature] DATE 11.4.99

QA (Optional) N/A DATE N/A

ANII (Optional) [signature] DATE 11/4/99