50-263

RESPONSE TO NRC BULLETIN 87-01

w/ltr 9-9-87 #8803160302

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RECORDS FACILITY BRANCH

UNITED STATES NUCLEAR REGULATORY COMMISSION

NORTHERN STATES POWER COMPANY

MONTICELLO NUCLEAR GENERATING PLANT Docket No. 50-263

RESPONSE TO NRC BULLETIN 87-01

Northern States Power Company, a Minnesota corporation, by this letter dated September 9, 1987 hereby submits information required by NRC Bulletin 87-01 for the Monticello Nuclear Generating Plant.

This letter contains no restricted or other defense information.

NORTHERN STATES POWER COMPANY

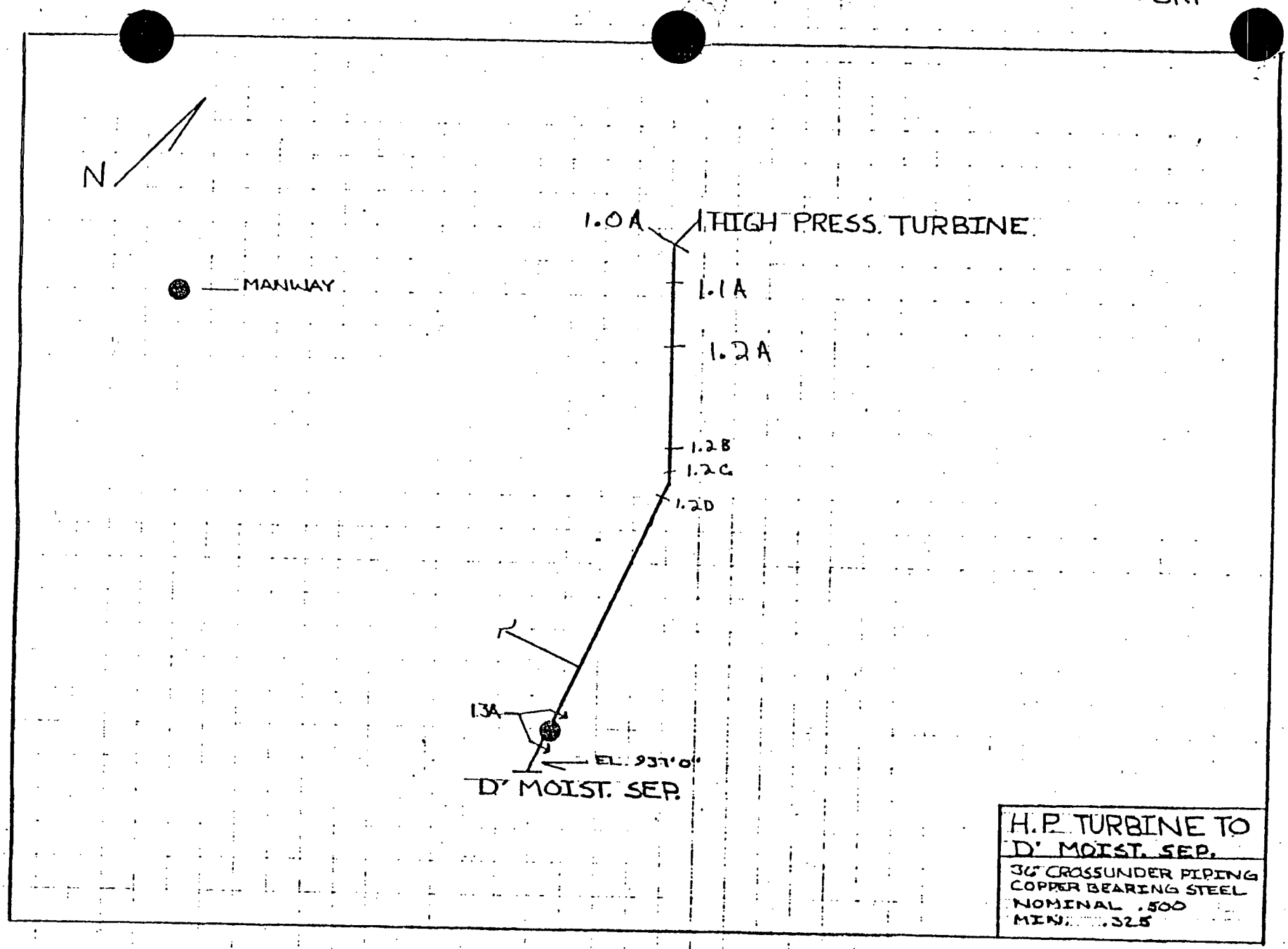
By C E Larson
C E Larson
Vice President, Nuclear Generation

On this 9th day of September, 1987 before me a notary public in and for said County, personally appeared C E Larson, Vice President, Nuclear Generation, and being first duly sworn acknowledged that he is authorized to execute this document on behalf of Northern States Power Company, that he knows the contents thereof and that to the best of his knowledge, information and belief, the statements made in it are true and that it is not interposed for delay.

Judy L. Klapperick

JUDY L. KLAPPERICK
NOTARY PUBLIC—MINNESOTA
ANOKA COUNTY
My Commission Expires Sept. 29, 1991

MONTICELLO THICKNESS MEASUREMENTS AND CHEC CALCULATIONS


N
1.0A
HIGH PRESS. TURBINE
MANWAY
1.1A
1.2A
1.2B
1.2C
1.2D
1.3A
EL. 937'0"
D' MOIST. SEP.
H.P. TURBINE TO
D' MOIST. SEP.
36" CROSSUNDER PIPING
COPPER BEARING STEEL
NOMINAL .500
MIN. .325

ISO-MTS-1

Notes
ISO-MTS-1

Crossover to MS-D

36"

Area	Scaffold Req'd.	Frequency	Loc = (UltraImage file)
1.0A	yes		61
1.1A	yes		60
1.2A	yes		59
1.3A (DS)	yes	"Downstream"	58
1.0A/DS	Yes		61
1.0A1/DS	Yes		65
1.0A2/DS	Yes		65
1.0A3/DS	Yes		65
1.2B IPS	Yes		67
between 1.2B & 1.2C	Yes		Nortec
1.2C DS	Yes		68
1.2D US	Yes	"Upstream"	69
1.3A S.S	Yes		Nortec

1924 Area 1.1A had UT Indications from 310° to 330° Visual Inspection found no Erosion/Corrosion damage.

Thickness Survey

Date 6-21-84
Disc 61

Plant Monticello
Iso # MTS-1
Area 1.0A/05/0-10
Grid Spacing 200
Examiner(s) ASW/OAH
Equipment Used UI III
Calibration Block: Type 3080-83 Serial Number N/A
Transducer: Size ½" dia. Frequency 3.5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.524	.504	.496	.500	.524	.563	.500	.545	.548	.504	.496	.496
2	.504	.512	(.492)	.496	.512	.573	.499	.550	.512	.500	(.492)	(.492)
3	.512	.508	.500	.496	.508	.560	.514	.547	.528	.528	.500	.504
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

Comments:

Thickness Survey

Date 7-3-84

Plant Monticello — Iso # MTS-1

Area 1.0A — Grid Spacing 2"

Examiner(s) OAH - ASW — Equipment Used UI III

Calibration Block: Type 3080-83 — Serial Number N/A

Transducer: Size 1/2" — Frequency 3.5 MHz PC

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1				.556	.568	.563	.507	.540	.570	.563		
2				.528	.570	.568	.524	.542	.568	.542		
3				.535	.546	.564	(.503)	.559	.560	.541		
4				.530	.543	.562	.522	.569	.564	.544		
5				.531	.568				.567	.543		
6				.546	.542				.572	.562		
7				.545	.557					.560		
8				.547								
9				.540								
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

THICKNESS SURVEY REPORT

DATE 5-27-86

DISC# N/A

NT Monticello 1 ISO# MTS-1

EA 10A inner Radius GRID SIZE 4"

AMINERS A Wheeldon, A W Voss EQUIPMENT Nortec 131D

ANSDUCER (SIZE/FREQ.) .25"/5mhz CAL.BLOCK (TYPE/SERIAL NO.) 3080.83

MINAL WALL .500" MIN. WALL .325"

MMENTS SCAN 240° - 120° Done by UT-III

Degree / Grid	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
330																					
300																					
270																					
240																					
210	.524	.535	.526	.526	.520																
180	.520	.518	.498	.478	.493																
150	.521	.539	.520	.523	.524																
120																					
90																					
60																					
30																					
0																					

THICKNESS SURVEY REPORT

DATE 5-9-86

DISC# 61

T MONTICELLO

ISO# MTS-1

1.0 A

GRID SIZE 200

MINERS [illegible signatures]

EQUIPMENT ULTRA IMAGE III

NSDUCER (SIZE/FREQ.) .25" / 10 MHz.

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

TINAL WALL .500"

MIN. WALL .325"

MENTS REF. 0°-120° IS 1½" CCW OF ℄ OF L.S. REF 240°-0° IS 33½" CCW OF ℄ OF L.S.

0° ℄ OF X-DUCER IS 17¼" FROM EDGE OF FLANGE. (REFERENCES REFER TO STARTING POINT OF GRID)

SE INDICATIONS DUE TO LIFT-OFF FROM L.S.

X	Degree / Grid	10	110	120	130	140	150	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
[illegible]	330	.524	.524	.524	.528	.528	.528															
[illegible]	300	.524	.524	.520	.536	.524	.520															
43	270	.536	.536	.536	.540	.532	.528															
	40	.544	.544	.624	—	.548	.540															
	210	—	—	—	—	—	—															
	180	—	—	—	—	—	—															
	150	—	—	—	—	—	—															
172	120	.544	.544	.544	.540	.528	.536															
129	90	.528	.524	.528	.528	.528	.524															
86	60	.520	.520	.520	.520	.524	.524															
	30	.528	.528	.528	.528	.536	.536															
0	0	.540	.536	.540	.544	.544	.540															

LOWEST AREA IS .516"
0°-120° X-77, Y-30

Thickness Survey

Date 7-6-84
Disc 65

Plant Monticello
Iso # MTS-1
Area LOA3 105 10-10"
Grid Spacing 180
Examiner(s) ASW/KLH/NAM
Equipment Used UI-III
Calibration Block: Type 3050-83 Serial Number N/A
Transducer: Size .5" Frequency 3.5 MHz Pc

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.516	.500	.500	.516						.536	.500	.504
2	.516	.504	.516	.532						.528	.516	.504
3	.540	.496	.496	.512						.528	.504	.500
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

Liner radius

Comments:

Thickness Survey

Date 7-6-84
Disc 85

Plant Monticello
Iso # MTS-1
Area 1.0A2 IDS 10-10"
Grid Spacing 180
Examiner(s) ASW/KLH/NAM
Equipment Used UI-III
Calibration Block: Type 2080-83
Serial Number N/A
Transducer: Size .5"
Frequency 3.5 MHz P.C.

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.528	.504	.512	.592						.532	.516	.548
2	.524	.504	(.500)	.516	Inner radius					.556	.524	.516
3	.524	.516	.552	.532						.524	.508	.504
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

Comments:

Thickness Survey

Date 7-6-84
Disc 65

Plant Monticello
Iso # MTS-1
Area LOA1/DS/0-10"
Grid Spacing 180
Examiner(s) ASW/KLH/NAM
Equipment Used UI-III
Calibration Block: Type 3080-83 Serial Number N/A
Transducer: Size .5" Frequency 3.5 mhz P.C

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.528	.516	.508	.558						.540	.528	(.504)
2	.528	.516	.516	.536						.536	.528	.512
3	.532	.508	.512	.532						.536	.518	.508
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

Comments:

Thickness Survey

Date 6-21-84
Disc 60

Plant Monticello
Iso # MTS-1
Area L1A/45/0-10"
Grid Spacing 200
Examiner(s) ASW/DAH/KLH/RL
Equipment Used UI-III
Calibration Block: Type 2080-83
Serial Number N/A
Transducer: Size ½" dia
Frequency 3.5 MHz

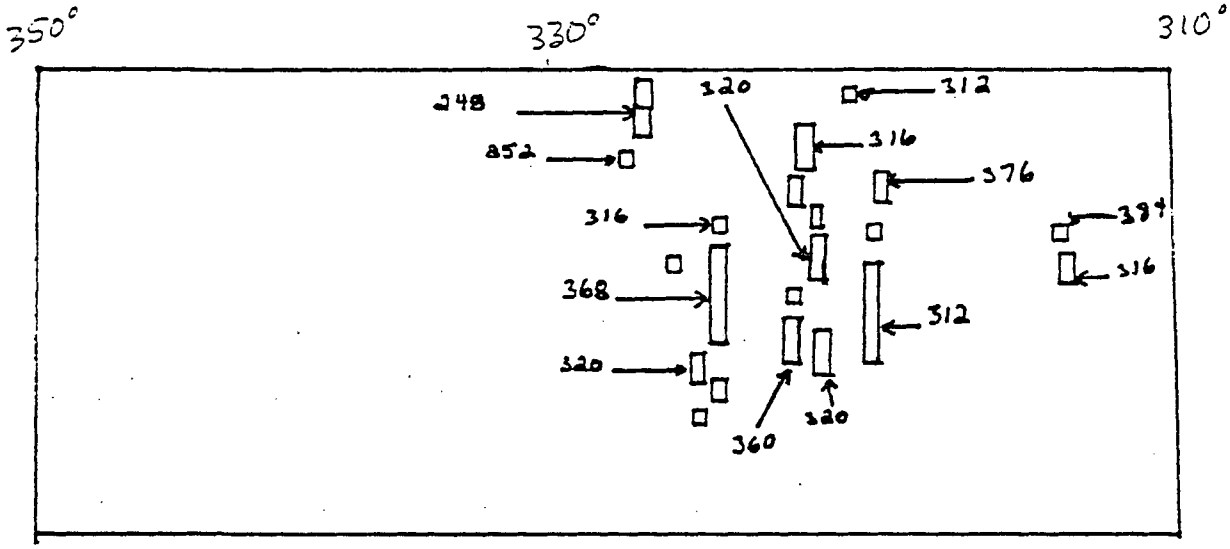
	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.500	.512	.504	.500	.496	.536	.532	(.480)	.492	.500	.532	.504
2	.492	.492	.544	.552	.584	.492	.496	.508	.536	.504	.488	.512
3	.552	.500	.520	.552	.552	.532	.520	.524	.520	.504	.512	.508
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

d.d

Min. reading .480

Comments:

1.1A 270° to 0° MTS.-1 ISO # 60



THICKNESS SURVEY REPORT

DATE 5-8-86

DISC# 60

[redacted] MONTICELLO

ISO# MTS-1

REA 1.1A US

GRID SIZE 200

XAMINERS A.S. WEALOON III / A.W. VOSS II / S.G. HILL II

EQUIPMENT ULTRA IMAGE III

RANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

IOMINAL WALL .500"

MIN. WALL .325"

COMMENTS

X / Degree / Grid	0	[redacted] 30	60	90	120	150	180	[redacted] 210	240	270	300	330
1	0 .516	.516	.516	.516	.524	.516	.536	.516	.524	.516	.524	.686
2	10 .520	.524	.528	.524	.528	.552	.524	.528	.524	.544	.524	.548
3	20 .496	.544	.500	.568	.564	.540	.524	.528	.512	.508	.524	.516
4	30 .532	.532	.544	.536	.576	.548	.552	.544	.552	.552	.500	.528
5	40 .552	.524	.524	.536	.552	.544	.528	.540	.540	.552	.544	.536
6	50 .556	.540	.524	.536	—	—	.536	.540	.508	.548	.544	.528
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												

LOWEST AREA IS .484"
0°-90° X-17, Y-18.

NOTE: (90°-180°) LAMINATION X-87 Y-3
GROOVE IN OD Y-15 & Y-22.

Thickness Survey

Date: 6-20-84
Disc: 59

Plant: Monticello
Iso #: MTS-1
Area: 1.2A105/0-10"
Grid Spacing: 200
Examiner(s): ASW/DAH/QL/KLH
Equipment Used: UI III
Calibration Block: Type 3080-83
Serial Number: N/A
Transducer: Size 1/2"
Frequency: 5MHZ

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.476	.496	.492 DH ~~.528~~	.520	.480	.504	.492	.476	.480	.476	.480	.476
2	.476	.488	.492	.500	.484	.484	.480	.492	.480	.492	.476	.484
3	.492	.504	.512	.508	.496	.504	.480	.480	.496	.476	.472	.472
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

MT-1-3A

Comments:

THICKNESS SURVEY REPORT

DATE 5/9/86

DISC# 59

NT Monticello

ISO# MTS-1

A 1.2A

GRID SIZE 200

MINERS Dan Sells / Steve Alger / Ray Wolf

EQUIPMENT U I III

NSDUCER (SIZE/FREQ.) .25/10MHz.

CAL. BLOCK (TYPE/SERIAL NO.) Step Wedge 3080-8

INAL WALL .5"

MIN. WALL Min. 288 MAX.

MMENTS Delays are off due to 84 P/Educer 86 P/Educer

53 x Coun Ts = 30°

Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
	8	53	106	159	53	106	159	53	106	159	53	106
10	.488	.496	.500	.508	.508	.508	.508	.500	.500	.512	.508	.496
20	.520	.500	.500	.508	.512	.508	.508	.512	.516	.512	.500	.500
30	.496	.496	.500	.512	.508	.508	.508	.508	.508	.512	.512	.496
40	.492	.496	.500	.512	.508	.512	.508	.516	.508	.512	.508	.496
50	.502	.500	.500	.508	.508	.508	.508	.516	.508	.508	.512	.492
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												

Thinnest Spot .488" (File 5) x = 8, y = 10, @ 14°

Thinnest Area File 5 0° – 22°

Thickness Survey

Date 6-25-84
Disc 58

Plant Monticello
Iso # MTS-1
Area 1.3A 10S 10-10" T.S.
Grid Spacing 200
Examiner(s) MSW/RCH/QC
Equipment Used UI-III
Calibration Block: Type 3080-83 Serial Number N/A
Transducer: Size ½" Frequency 3.5 MHz

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0°	.492	.496	.492																
30°	.520	.504	.492																
60°	.536	.492	.496																
90°	.496	.484	.484																
120°	.508	.492	.484																
150°	.500	.504	.496																
180°	.500	.504	.500																
210°	.492	.492	.500																
240°		MAW																	
270°																			
300°		4Y																	
330°	.500	.496	.492																

Comments:

Thickness Survey

Date 06-26-84
Disc NA

Plant Monticello
Area 1.3 A S.S.
Examiner(s) ASW/QL/KLH
Iso # MTS-1
Grid Spacing 4"
Equipment Used Nortec 131-D
Calibration Block: Type 3080-83 Serial Number 269
Transducer: Size .25" Dia Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.519	.513	.517	.519	.547	.530	.527	.524	MAN WAY			.539
2	.522	.520	.520	.518	.517	.522	.523	.522				.521
3	.523	.519	.523	.516	.520	.529	.525	.526				.524
4	.523	.527	.526	.522	.520	547	.525	.523				.485
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

P.D

Comments:

THICKNESS SURVEY REPORT

DATE 5-17-86

DISC# 58

H. MONTICELLO

A 1.3A

MINERS STEVE STANFORD II / A.W. VOSS I / S.G. HALL I

NSDUCER (SIZE/FREQ.) .25" / 10 MHZ.

INAL WALL .500"

ISO# MTS-1

GRID SIZE 200

EQUIPMENT ULTRA IMAGE III

CAL.BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

MIN. WALL .325"

MMENTS MANWAY RESTRICTS SCAN. 240°-330°

ARCSTRIKE SPATTER LONG SEAMS.

X	Degree	1 (0)	2 (10)	3 (20)	4 (30)	5 (40)	6 (50)	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
0	330	.536	.532	.532	.528	.528	.528															
	300	|	|	|	|	|	|															
	270	|	|	|	|	|	|															
13	240	.528	.528	.524	.536	.564	.544															
102	210	.528	.524	.532	.532	.532	.532															
51	180	.528	.520	.532	.548	.536	.536															
150	150	.524	.544	.524	.532	.584	.532															
100	120	.528	.520	.524	.528	.520	.524															
50	90	.532	.520	.520	.520	.520	.524															
168	60	.524	.520	.524	.524	.528	.524															
	30	.528	.524	.528	.524	.528	.524															
56	0	.528	.536	.528	.528	.528	.528															

LOWEST AREA .464

330°-60° 56Y, 33Y

Thickness Survey

Date 7-30-84
Disc 67

Plant MONTICELLO
Iso # MTS-1
Area ~~L2B~~ 1PS 10-10
Grid Spacing 200
Examiner(s) ~~ASW~~ KLH-ASW-JEB
Equipment Used UI III
Calibration Block: Type 3080-83 Serial Number N/A
Transducer: Size 1/2" ϕ Frequency 3.5 MHz P.C.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0°	.532	.552	.544																
30°	.528	.532	.532																
60°	.536	.532	.536																
90°	.532	.532	.544																
120°	.544	.536	.532																
150°	(.480)	.532	.544																
[illegible]	.540	.488	.540																
210°	.536	.524	.532																
240°	.500	.528	.524																
270°	.508	.536	.536																
300°	.540	.544	.544																
330°	.540	.504	.552																

P.P

Comments:

Thickness Survey

Date: 07-31-84

Plant: Monticello (RMC)
Area: IR. between 1.5A and 1.6A
Examiner(s): ASW / KLH
Calibration Block: Type 3080-83 Serial Number 417
Transducer: Size .25" Dia Frequency 5 MHz

Iso # MTS-1
Grid Spacing 4"
Equipment Used #417 NORTEC

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.500	.535	.543								.548	.545
2	.499	.544	.545								.564	.553
3	.498	.535	.544								.566	.549
4	.493	.534	.534								.565	.553
5	.492	.534	.544								.548	.555
6	.496	.536	.546								.546	.551
7	.488	.555	.542								.566	.551
8	.490	.535	.535								.545	.554
9	.486	.537	.540								.545	.563
10			.540									.562
11												
12												
13												
14												
15												
16												
17												
18												
19												

THICKNESS SURVEY REPORT

DATE 5-21-86

DISC# 67

MONTICELLO

ISO# MTS-1

EA 1.5 A DS

GRID SIZE 200

AMINERS STEVE STANFORD II / A.W. VOSS / SG. HALL

EQUIPMENT ULTRA IMAGE III

ANSDUCER (SIZE/FREQ.) .25" / 10 MHZ.

CAL.BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

MINAL WALL .375"

MIN. WALL .325"

MMENTS

LOWEST AREA IS .440"

180°-270° X-8, Y-17

X	Degree \ Grid	1 (0)	2 (10)	3 (20)	4 (30)	5 (40)	6 (50)	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
100	330	.524	.532	.528	.528	.536	.520															
53	300	.536	.512	.516	.528	.544	.500															
150	270	.476	.532	.532	.480	.520	.476															
0	240	.528	.496	.492	.516	.520	.476															
50	2[illegible]	.508	.500	.468	.524	.528	.528															
144	180	.528	.476	.464	.528	.524	.528															
96	150	.528	.508	.504	.496	.528	.536															
48	120	.528	.528	.528	.528	.528	.524															
168	90	.552	.528	.532	.528	.528																
112	60	.528	.528	.528	.528	.528																
36	30	.516	.524	.528	.524	.528																
0	0	.524	.528	.532	.532	.532																

Thickness Survey

Date 07-30-84
Disc 68

Plant Monticello
Area ~~1-2 C 7DS~~ 1-6A RC 10-10
Examiner(s) ASW/KLH/JEB
Calibration Block: Type 3080-83 Serial Number NA
Transducer: Size ½" Dia. Frequency 3.5 mHz P.C.

Iso # MTS-1
Grid Spacing 200
Equipment Used UI-III

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.552	.532	.536	.540	.536	.536	.544	.536	.564	.544	.552	.564
2	.516	.556	.532	.584	.532	.532	.540	.540	.540	.564	.540	.552
3	.560	.540	.536	.556	.528	.532	.556	.556	.568	.564	.540	.544
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Comments:

THICKNESS SURVEY REPORT

DATE 5/16/86

DISC# 68

MONTICELLO

ISO# MTS-1

EA 1.6 A (1.2C) DOWNSTREAM

GRID SIZE 200

AMINERS Dan Gillett Walker I

EQUIPMENT U I III

ANSDUCER (SIZE/FREQ.) .25 10 MHz

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

MINAL WALL .500

MIN. WALL MIN. .300 MAX .824

MMENTS

Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
	4	53	106	160	53	106	160	53	106	151	53	106
1	.476	.512	.508	.508	.504	.504	.524	.516	.528	.528	.540	.564
2	.488	.508	.508	.508	.512	.528	.544	.540	.524	.536	.536	.536
3	.488	.508	.508	.504	.500	.504	.516	.572	.520	.544	.528	.532
4	.488	.508	.504	.512	.516	.552	.528	.508	.520	.536	.532	.532
5	.356	.380	.528	.528	.504	.504	.528	.532	.524	—	.524	.524
6					.536	.528	.400					
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21												

THINNEST AREA 2°-5°

X 2

Y 1

D .468

Thickness Survey

Date 7-30-84
Disc 69

Plant Monticello
Iso # MTS-1
Area L20/US 10-10 (1.TA-R1C)
Grid Spacing 200
Examiner(s) ASW/KLH/JEB
Equipment Used UT-III
Calibration Block: Type 3080-83 Serial Number N/A
Transducer: Size ½" dia Frequency 3.5 mhz P-C

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.620	.528	.528	.628	.572	.556	.536	.532	.536	.544	.560	.516
2	.580	.536	.532	.532	.528	.596	.564	.568	.586	.536	.536	.540
3	.524	.592	.576	.584	.532	.556	.560	.566	.572	.532	.540	.536
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Comments:

THICKNESS SURVEY REPORT

DATE 5-17-86

DISC# 69

MONTICELLO

ISO# HTS-1

REA 1.7 A US

GRID SIZE 200

XAMINERS STEVE STANFORD II / A.W. ROSSI / SCOTT HALL I

EQUIPMENT ULTRA IMAGE III

RANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

CAL. BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

IOMINAL WALL .500"

MIN. WALL .325"

COMMENTS LONG SEAMS & SPATTER

LOWEST AREA .472"
270°-0° X-87 / Y-2

X / Degree / Grid	C	0	30	60	90	120	150	180	210	240	270	300	330
1	0	.774	.524	.528	—	.532	.532	—	.536	.536	.528	.552	.516
2	10	—	.528	.524	.536	.532	.536	.768	.548	.548	.532	.528	.536
3	20	.772	.528	.528	.532	.532	.548	—	.536	.536	.532	.544	.552
4	30	.832	.532	.528	.528	.532	.528	—	.544	.536	.532	.540	.548
5	40	.804	.536	.532	.516	.528	.532	.756	.532	.528	.540	.552	.560
6	50	—	.552	.544	.528	.524	.528	.756	—	.528	.536	.544	.552
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Notes

ISO-MTS-2

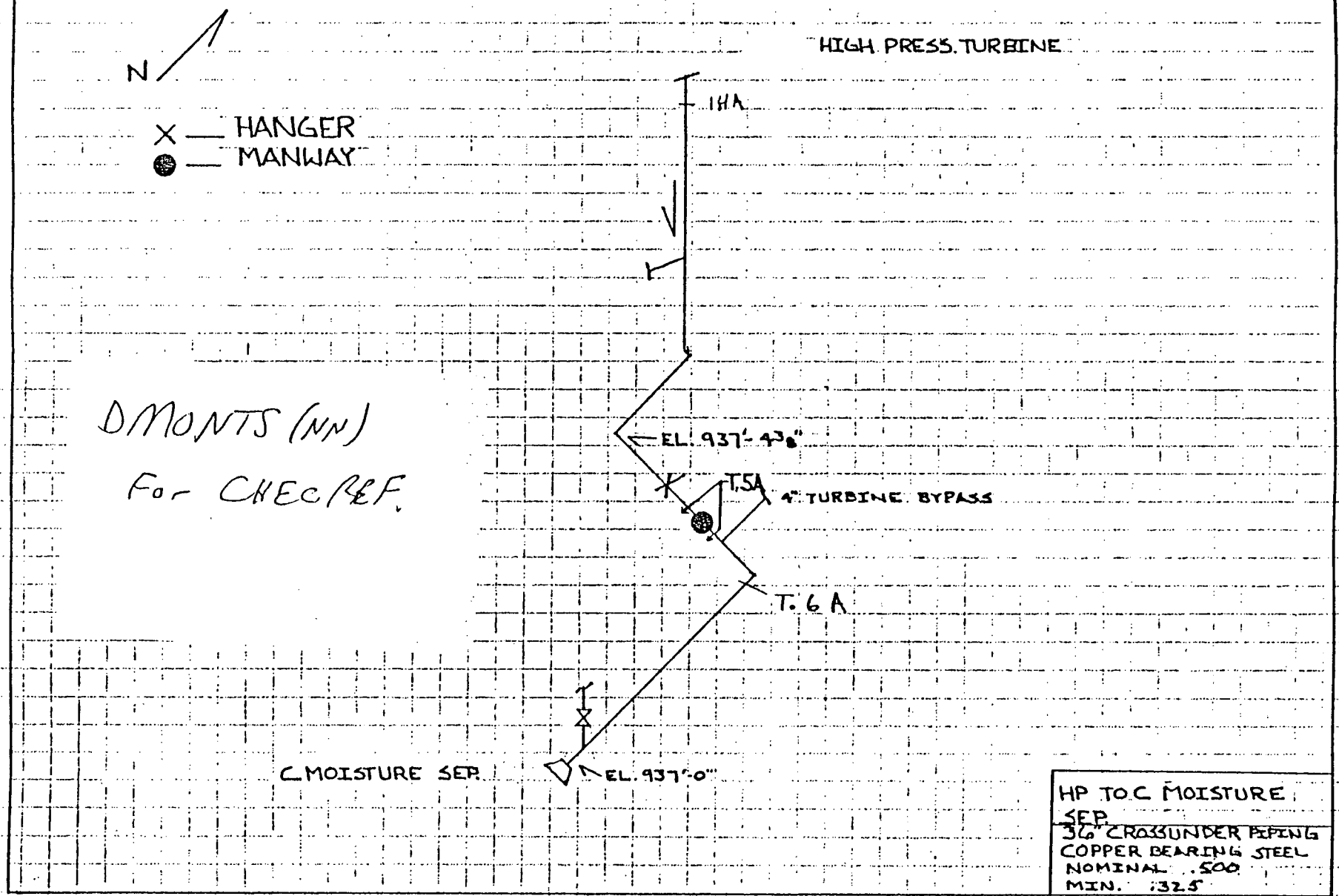
Crossover to MSC

36"

Area	Scaffold Req'd.	Frequency	Disc #
1.4A US	yes		64
T.5A	yes		45
T.6A	yes		46
1.4A DS.	yes		64

FORM 17-3509

SRP



DMONTS (NN)

For CHECK REF.

ISOMTS-2

Thickness Survey

Date 64
Disc 6-28-84

Plant Monticello
Area 1.4A/45/0-10
Examiner(s) OAH/KLH/QL
Calibration Block: Type 3080-83
Transducer: Size 1/2"

Iso # MTS-2
Grid Spacing 180
Equipment Used UT III
Serial Number N/A
Frequency 5MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.652	.680	.672	.668	.668	.672	.688	.664	.668	.692	.668	.668
2	.660	.694	.672	.668	.668	.672	.688	.664	.672	.700	.688	.688
3	.656	.680	.676	.668	.680	.672	.692	.688	.696	.688	.680	.676
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Comments:

Date 6-28-94

Plant Monticello Iso # MTS-2

Area 1.4A / D.S. / 0-10 Grid Spacing 180

Examiner(s) DAH / KLH / QL Equipment Used UI III

Calibration Block: Type 3080-83 Serial Number N/A

Transducer: Size 1/2" Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.660	.684	.676	.736	.672	.680	.672	.664	.668	.668	.668	.680
2	.656	.684	.688	.672	.676	.676	.680	.664	.664	.664	.668	.672
3	(.644)	.692	.680	.676	.664	.664	.672	.660	.660	.680	.672	.692
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did

Date [illegible]

Plant Monticello   Iso # MTS - 2

Area T.6A/US/0-10   Grid Spacing 4"

Examiner(s) ASW-OAH-QL-KLH   Equipment Used 4I-III

Calibration Block: Type Step Block 30808   Serial Number N/A

Transducer: Size 1/2" dia PC   Frequency 5 MHz

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0°	.472"	.468"	.472"																
30°	.484"	.484"	.500"																
60°	.480"	.480"	.484"																
90°	.468"	.460"	.440"																
120°	.476"	.476"	.484"																
[illegible]	.472"	.472"	.472"																
[illegible]0°	.472"	.476"	.468"																
210°	.476"	.468"	.468"																
240°	.468"	.472"	.468"																
270°	.476"	.472"	.480"																
300°	.472"	.464"	.472"																
330°	.472"	.456"	.476"																

THICKNESS SURVEY REPORT

DATE 5/16/86

DISC# 46

Monticello

T.6A Upstream

EXAMINERS [illegible]

TRANSDUCER (SIZE/FREQ.) .25 10mhz

NOMINAL WALL .500

COMMENTS long seam 180-220°

ISO# MTS-2

GRID SIZE 180

EQUIPMENT [illegible]

CAL.BLOCK (TYPE/SERIAL NO.) Stepwedge 3080-83

MIN. WALL

Degree \ Grid	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
330 118	.528	.516	.516	.524	.524	.528						Thinnest Area 10°-20°									
300 59	.524	.520	.516	.520	.528	.520									X 22 Y 56 D .476						
270 175	.528	.528	.520	.544	*.508	.516															
240 118	.528	.524	.524	.520	*.508	.520															
210 59	.544	.532	.528	.528	.548	.528															
180 175	.532	.532	.536	.532	.568	.548															
150 118	.532	.528	.544	.528	.532	.528															
120 59	.532	.520	.528	.560	.524	.536															
90 175	.532	.520	.520	.524	.524	.528															
60 118	.528	.520	.520	.524	.528	.524															
30 59	.528	.524	.524	.520	.524	.520															
0 4	.524	.516	.520	.524	.524	.516															

THICKNESS SURVEY REPORT

DATE 5-16-86

DISC# 46

MONTICELLO

EA T.6A D.S.

AMINERS STEVE STANFORD II / BILLVOSSI / SCOTT HALL I

RANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

OMINAL WALL .500"

OMMENTS Long Seam

ISO# MTS-2

GRID SIZE 180

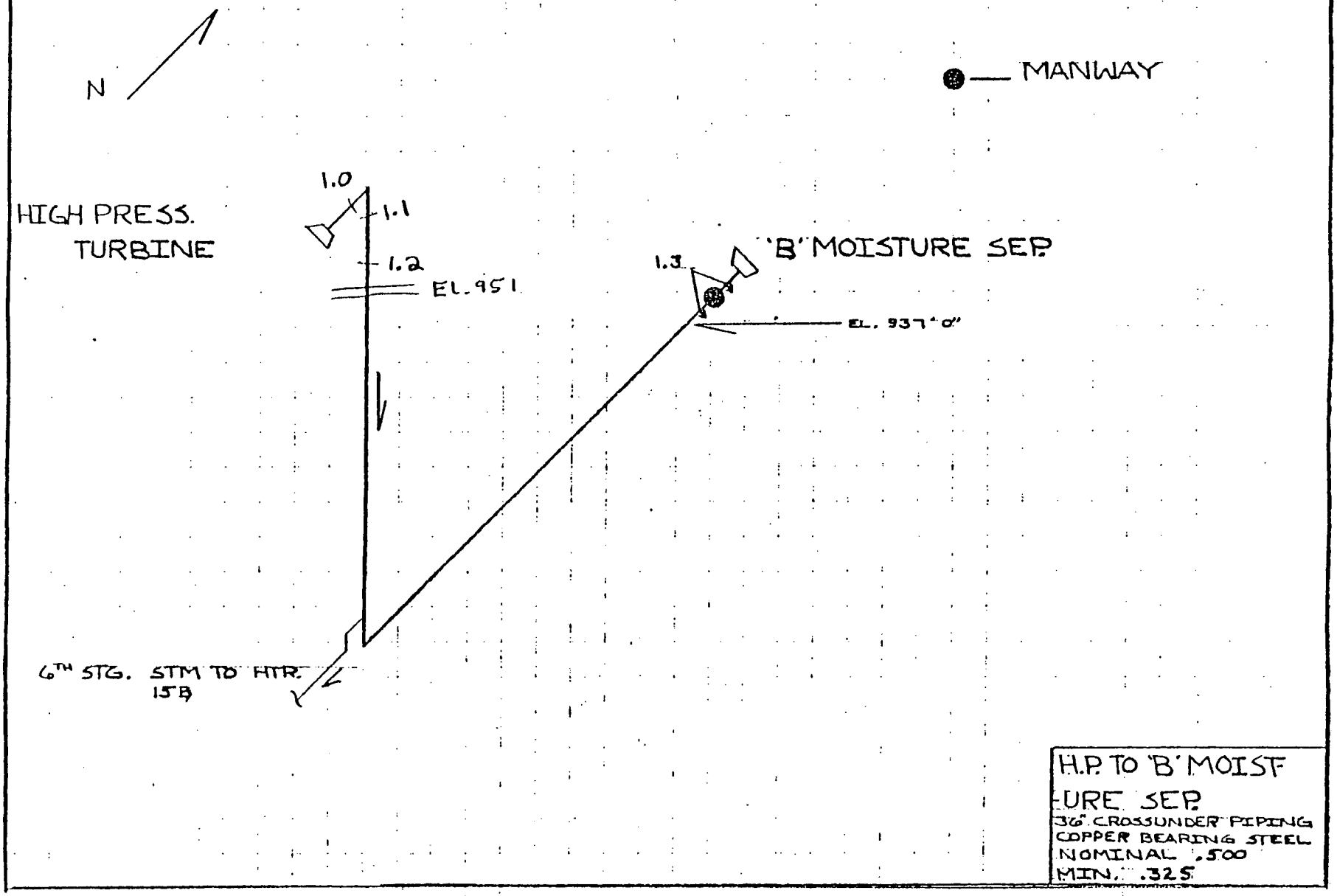
EQUIPMENT ULTRA IMAGE III

CAL.BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

MIN. WALL .325"

LOWEST AREA IS .404"
90°-180° X-29 . Y-53

X	Degree \ Grid	1 (0)	2 (10)	3 (20)	4 (30)	5 (40)	6 (50)	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
56	330	.532	.532	.528	.528	.528	.524															
112	300	.524	.520	.528	.524	.524	.524															
168	270	.524	.520	.524	.524	.524	.524															
[illegible]	240	.532	.536	.528	.520	.524	.520															
1[illegible]	210	.552	.548	.536	.516	.560	.560															
180	180	.536	.552	.544	.548	.560	.568															
118	150	.524	.524	.524	.528	.532	.536															
59	120	.520	.516	.524	.520	.528	.524															
0	90	.524	.524	.524	.528	.516	.532															
118	60	.524	.524	.524	.520	.520	.528															
59	30	.520	.516	.520	.516	.524	.524															
0	0	.520	.524	.524	.520	.516	.520															


N
MANWAY
HIGH PRESS.
TURBINE
1.0
1.1
1.2
EL. 951
1.3
'B' MOISTURE SEP.
EL. 937'-0"
6TH STG. STM TO HTR. 15B
H.P. TO 'B' MOISTURE SEP.
36" CROSSUNDER PIPING
COPPER BEARING STEEL
NOMINAL .500
MIN. .325

ISO-MTS-3

ISO-MTS-3

Crossover to MS-B 36"

Area	Scaffold Req'd.	Frequency	Disc #
1.0	yes		43
1.1	yes		42
1.2	yes		30
1.3 U.S.	yes		47
1.3 D.S.	yes		47

FORM 17-3509

Plant Monticello — Iso # MTS-3

Area 1.0 90° to 270° — Grid Spacing 4"

Examiner(s) D. HALL, Quarede — Equipment Used Nortec #322, U.T. III

Calibration Block: Type 2080-83 — Serial Number 322, NA

Transducer: Size .5" dia. — Frequency 2.25 MHz.

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.500	.504	.496	.517	.536	.509	.488	.521	.543	.527	.496	.492
2	.508	.508	.468	.518	.533	.517	.478	.494	.543	.522	.496	.492
3	.504	.500	.508	.517	.534	.516	.499	.505	.544	.524	.500	.484
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Disc 42

Plant Monticello — Iso # MTS-3

Area 1.1 / US / W-10 — Grid Spacing 180

Examiner(s) A.S.W. / KLM / Q.L. — Equipment Used U.I. III

Calibration Block: Type 3080-83 — Serial Number NA

Transducer: Size 1/2" dia. — Frequency 5MHz.

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.520	.540	.532	.540	.500	.496	.500	.508	.504	.504	.520	.604
2	.524	.524	.536	.528	.580	.608	.608	.536	.536	.528	.532	.536
3	.580	.500	.508	.520	.524	.528	.520	.512	.528	.524	.508	.524
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Comments:

Plant Monticello
Area 1.2/.05/0-10
Examiner(s) ASW/SRF/DAH
Calibration Block: Type 2080-83
Transducer: Size ½" dia.

Iso # MTS-3
Grid Spacing 4"
Equipment Used GI III
Serial Number N/A
Frequency 5.0 mHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.550	.550	.520	.540	.520	.550	.530	.570	.530	.520	.530	.550
2	.550	.490	.550	.550	.530	.470	.520	.520	.520	.540	.570	.550
3	.540	.520	.530	.540	.520	.500	.555	.540	.540	.550	.530	.560
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Date 6-4-84

Plant Monticello — Iso # MTS-3

Area 1.3/05/0-10 — Grid Spacing 4"

Examiner(s) OAH/RL/SRF — Equipment Used UI III

Calibration Block: Type 3080-83 — Serial Number N/A

Transducer: Size ½" dia. P.C. — Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.500	.504	.496	.480	.492	.492	.500	.508	.500	No	.500	.492
2	.496	.500	.500	.468	.484	.496	.492	.476	.500	Scan	.500	.448
3	.504	.492	.484	.484	.492	.492	.480	.496	.504	Taken	.500	.500
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THICKNESS SURVEY REPORT

DATE 5-24-86

DISC# 47

MONTICELLO

1.3 DS

ISO# MTS-3

GRID SIZE 180

EXAMINERS STEVE STANFORD II / A.W. ROSSI / SCOTT HALL I

EQUIPMENT ULTRA IMAGE II

TRANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

NOMINAL WALL .500"

MIN. WALL .325"

COMMENTS NO 240-330 SCAN DUE TO MANWAY

SCAN 7" ℄ OF Y-DYER TO ℄ OF VENT

LOWEST AREA - .440"
@ 338-60° X-36, 4-3

Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
X 0	.512	.520	.520	.516	.504	.520	180 100	87 210	23 240	—	—	.516
℄ 10	.504	.520	.524	.516	.512	.516	.520	.524	.524	—	—	.528
℄ 20	.524	.520	.524	.516	.512	.520	.520	.520	.532	—	—	.528
℄ 30	.528	.524	.520	.524	.516	—	.516	.524	.528	—	—	.540
℄ 40	.528	.528	.520	.520	.540	.520	.528	.520	.516	—	—	.524
℄ 50	.532	.524	.520	.500	.512	.520	.520	.524	.544	—	—	.528
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Date 5-24-84

Plant Monticello
Area 1.3/U.S./0-10
Examiner(s) DAH/AL/SRF
Calibration Block: Type Step Wedge
Transducer: Size ½" RC

Iso # MTS-3
Grid Spacing 4"
Equipment Used UI III
Serial Number N/A
Frequency 5.0 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.448	.452	.472	.460	.472	.468	.480	.428	.472	.472	.422	.426
2	.456	.456	.456	.532	.436	.512	.512	.492	.508	.460	.464	.468
3	.412	.452	.424	.456	.452	.452	.456	.452	.456	.464	.472	.464
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THICKNESS SURVEY REPORT

DATE 5-24-86

DISC# 47

MONTICELLO

1.3 US

ISO# MTS-3

GRID SIZE 200

EXAMINERS STEVE STANFORD II / A.W. VOSS I / S.G. HALL I

EQUIPMENT ULTRA IMAGE III

TRANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

CAL.BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

NOMINAL WALL .500"

MIN. WALL .325"

COMMENTS NO 240-330° SCAN DUE TO WALKWAY

SCAN IS 39 1/2" FROM ℄ OF K-DUCER TO ℄ OF VENT

LOWEST AREA IS .496" 60°-150° X-44, Y-20

X / Degree / Grid	0	12 / 30	168 / 60	63 / 90	126 / 120	189 / 150	45 / 180	210	240	270	300	0 / 330
1 / 0	.496	.516	.516	.512	.512	.520	.516	.528	.520	—	—	.516
2 / 10	.520	.516	.516	.500	.520	.520	.524	.544	.524	—	—	.520
3 / 20	.516	.520	.512	.516	.520	.520	.528	.528	.516	—	—	.524
4 / 30	.512	.520	.520	.500	.512	.516	.532	.524	.532	—	—	.520
5 / 40	.520	.520	.520	.520	.524	.524	.524	.524	.524	—	—	.528
6 / 50	.516	.520	.524	.524	.516	.528	.520	.520	—	—	—	.532
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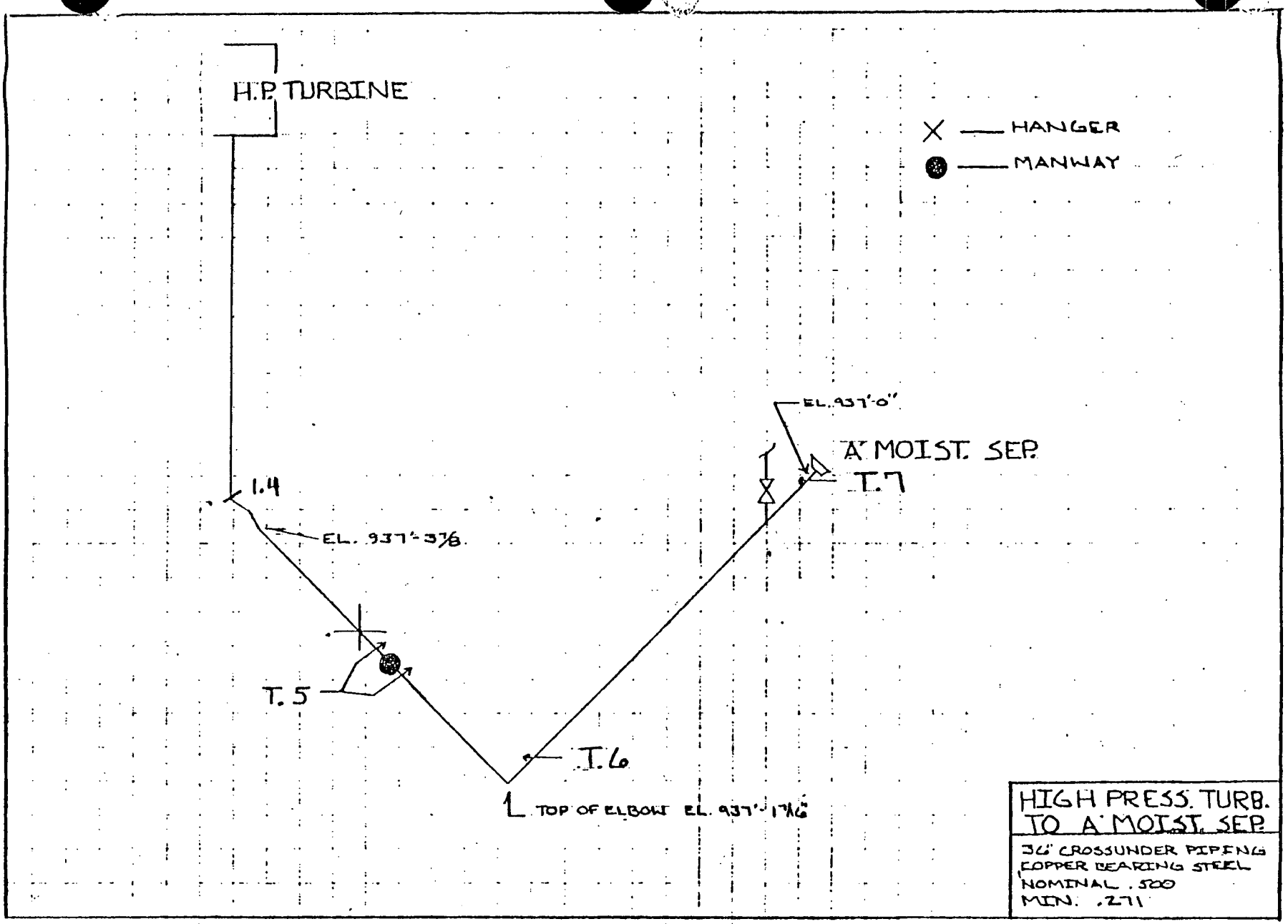
SRF


H.P. TURBINE
HANGER
MANWAY
EL. 937'-0"
A MOIST. SEP.
T.7
1.4
EL. 937'-3⅞"
T. 5
T.6
TOP OF ELBOW EL. 937'-1⅞"
HIGH PRESS. TURB.
TO A MOIST. SEP.
36" CROSSUNDER PIPING
COPPER BEARING STEEL
NOMINAL .500
MIN. .271

ISO - MTS - 4

Notes
ISO-MTS-4

Crossander to MS-A 36"

Area	Scaffold Req'd.	Frequency	Disc #
1.4DS	yes		52
T.5DS	yes		48
T.6	yes		49
T.7	yes		50
1.4US	yes		52
T.5US	yes		48

FORM 17-3803

Date 6-6-84

Plant Monticello
Area 1.4/05/010
Examiner(s) DAH/KLH/SRF
Iso # NTS-4
Grid Spacing 4"
Equipment Used UI III
Calibration Block: Type 3081-83 Serial Number N/A
Transducer: Size 1/2" Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.500	.528	.516	.516	.516	.504	.528	.508	.516	.516	.508	.516
2	.504	.520	.520	.508	.508	.512	.520	.504	.504	.520	.520	.516
3	.496	.548	.576	.588	.520	.560	.572	.520	.516	.520	.512	.508
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Plant Monticello
Area 1.4/45/0-10
Examiner(s) DAH/KLH/SRF
Calibration Block: Type 3080-83
Transducer: Size 1/2"

Date 6-6-84
Iso # MTS-4
Grid Spacing 4"
Equipment Used UI III
Serial Number N/A
Frequency 5 mHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.520	.508	.516	.508	.508	.508	.508	.504	.516	.504	.528	.532
2	.504	.516	.508	.504	.504	.508	.524	.504	.528	.500	.508	.516
3	.496	.524	.508	.500	.504	.504	.504	.500	.528	.500	.520	.524
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Plant Monticello
Area T.S/U.S./0-10
Examiner(s) OAH/SRF/QL
Calibration Block: Type Step Wedge 3080-83 Serial Number N/A
Transducer: Size ½" D.C. Frequency 5 mHz

Date 5-30-84
Iso # N75-4
Grid Spacing 4"
Equipment Used UI III

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.484	.504	.500	.500	.476	.464	.536	.508	.496	.532	.528	.508
2	.504	.540	.492	.484	.500	.456	.508	.544	.536	.548	.556	.504
3	.544	.488	.492	.488	.512	.468	.464	.528	.532	.532	.540	.540
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THICKNESS SURVEY REPORT

DATE 5-13-86

DISC# 48.B

[redacted] MONTICELLO

ISO# MTS-4

AREA T.5 U.S.

GRID SIZE 180

EXAMINERS Stephen W. Stanford A.W. Voss II / Scott Hall II

EQUIPMENT ULTRA IMAGE III

TRANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

CAL.BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

NOMINAL WALL .500"

MIN. WALL .271"

COMMENTS

LOWEST AREA = .500'

90°-180° - X-13, Y-13 AREA

X / Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
0	.512	.512	.516	.520	.516	.524	.520	.516	.524	.524	.524	.520
10	.512	.516	.516	.512	.520	.544	.584	.516	.516	.524	.516	.520
20	.512	.516	.516	.504	.516	.520	.524	.512	.516	.520	.516	.520
30	.512	.512	.512	.504	.512	.512	.516	.512	.516	.516	.520	.516
40	.516	.516	.516	.504	.520	.516	.524	.512	.512	.520	.520	.516
50	.512	.512	.512	.512	.512	.524	—	.512	.512	.520	.516	.520
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Date 5-31-84

Plant Monticello
Area TS/DS/0-10
Examiner(s) DAH/BL/SRF
Calibration Block: Type Std Wedge 3080-83 Serial Number N/A
Transducer: Size 1/2" DC

Iso # MTS-4
Grid Spacing 4"
Equipment Used UI III
Frequency 5 MHz

0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.524	.536	.544	.536	.540	.544	.528	.532	.532	.544	.528	.516	.544	.520
2	.468	.524	.520	.552	.552	.556	.528	.524	.520	.508	.492	.528	.544	.520
3	.560	.544	.544	.560	.544	.536	.548	.520	.528	.508	.528	.520	.544	.520
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THICKNESS SURVEY REPORT

DATE 5-13-86

DISC# 48.A

PL [redacted] MONTICELLO

AR [redacted] T.S D.S.

ISO# MTS-4

GRID SIZE 180

EXAMINERS Ronald W. Stanford II / A.W. Rossi / Scott Hall II

EQUIPMENT ULTRAIMAGE III

TRANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

NOMINAL WALL .500"

MIN. WALL .271"

COMMENTS

LOWEST AREA .476"
270°-0° X-4, Y-57

X / Degree / Grid		63	126	189	55	110	165	[redacted]	4	171	54	108
		30	60	90	120	150	180		240	270	300	330
10	.512	—	—	.516	.516	.528	.520	.524	.532	.540	.516	.516
110	.516	.516	.516	.528	.528	.528	.524	.524	.528	.540	.524	.528
120	.516	.528	.528	.520	.520	.524	.540	.532	.540	.532	.530	.528
130	.500	.528	.520	.552	.524	.528	.556	.520	.528	.524	.528	.532
140	.500	.524	.516	.516	.520	.520	.520	.528	.532	.516	.536	.524
150	.516	.524	.524	.512	.524	.524	.524	.560	.524	.512	.528	.528
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Disc 47

Plant Monticello
Area I.6 - 0-10
Examiner(s) OAH / AL / KLH
Calibration Block: Type 5B Wedge 3080-83 Serial Number N/A
Transducer: Size ½" dia Frequency 5 MHz

Date 5-31-84
Iso # NTS-4
Grid Spacing 4"
Equipment Used UI-III

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.516	.524	.524	.524	.572	.564	.564	.536	.536	.536	.540	.544
2	.444	.496	.508	.532	.604	.432	.504	.532	.560	.560	.540	.536
3	.532	.536	.532	.448	.528	.412	.556	.536	.544	.536	.560	.576
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THICKNESS SURVEY REPORT

DATE 5-13-86

DISC# 49

PLANT MONTICELLO

UNIT T.6

ISO# MTS-4

GRID SIZE 180

EXAMINERS DANSELLS II S.ALGERI R WOLF I

EQUIPMENT U.I. III

TRANSDUCER (SIZE/FREQ.) .25 / 10 MHZ.

CAL.BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

NOMINAL WALL .500"

MIN. WALL .271"

COMMENTS

LOWEST AREA - .452"

90°-180° X-181 Y-36

X Degree / Y Grid	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
1	.512	.528	.524	.532	.524	.524													
2	.508	.524	.524	.512	.516	.528													
3	.508	.516	.512	.516	.516	.524													
4	.512	.508	.516	.516	.516	.516													
5	.516	.524	.524	.524	.524	.524													
6	.516	.528	.524	.532	.524	—													
7	.532	.524	.524	.524	.524	.524													
8	.532	.532	.524	.516	.520	.524													
9	.516	.524	.524	.516	.524	.524													
10	.512	.508	.508	.508	.516	.516													
11	.508	.512	.516	.516	.516	.524													
12	.508	.516	.512	.516	.516	.528													
13	.512	.524	.524	.512	.516	.528													
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Date 6-4-84

Plant Monticello — Iso # MTS-4

Area T.7/0-10 — Grid Spacing 4"

Examiner(s) DAH/SRF/QL — Equipment Used UI III

Calibration Block: Type 3080-83 — Serial Number N/A

Transducer: Size 1/2" dia. RL — Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.572	.580	.588	.560	.524	.548	.552	.532	.576	.504	.508	.520
2	.576	.564	.576	.588	.524	.528	.524	.532	.536	.528	.504	.500
3	.608	.576	.576	.592	.548	.532	.532	.548	.560	.536	.496	.504
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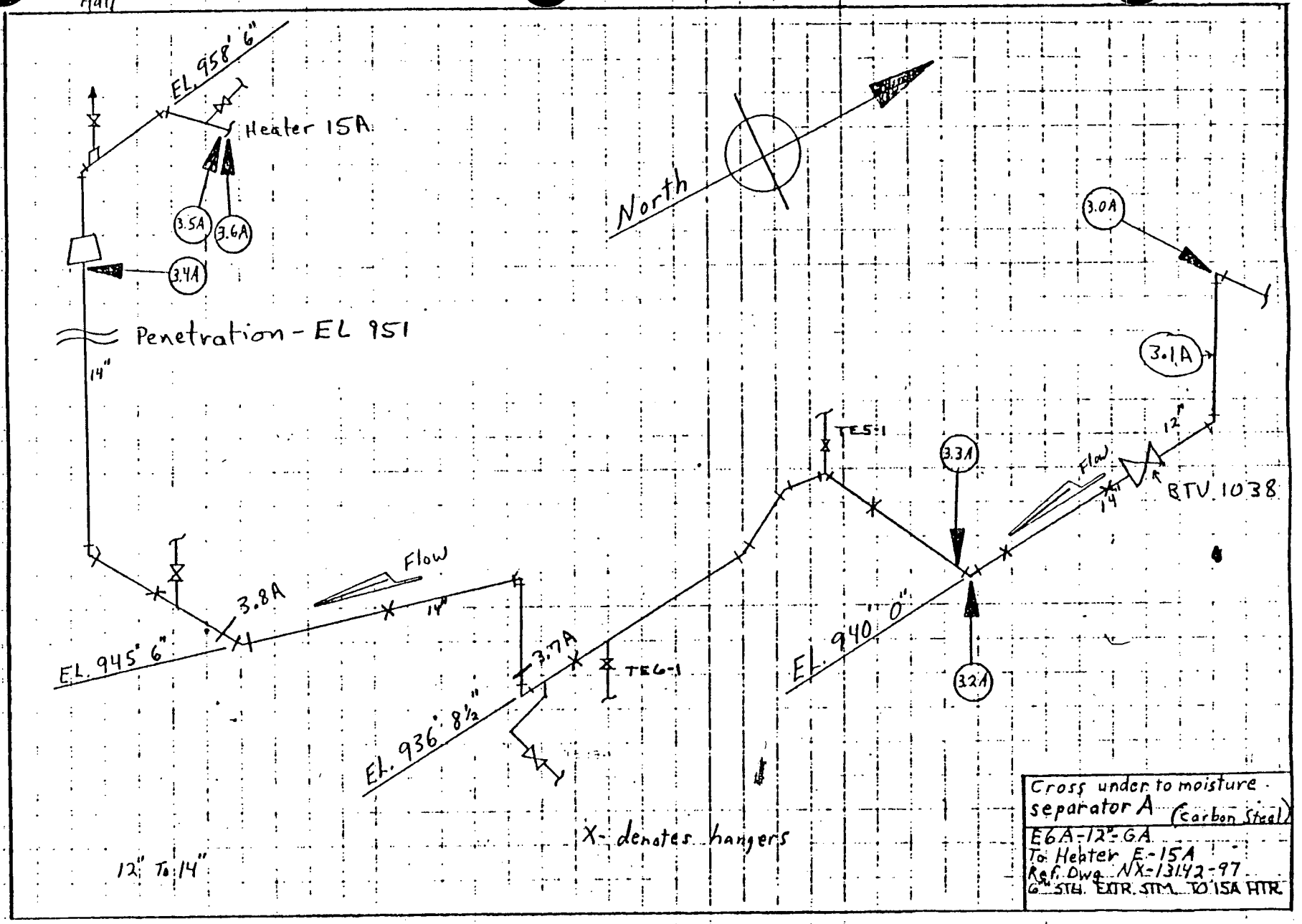
David A. Hall



ISO - MTS - 5

Notes
ISO-MTS-5

Crossunder for MS-A to FWH 1SA 12"

Area	Scaffold Req'd.	Frequency	Disc #
3.0A	yes		Nortec
3.1A	yes		Nortec
3.2A	yes		Nortec
3.3A	yes		Nortec
3.4A	NO		56
3.5A	yes		Nortec
3.6A	Yes		Nortec
3.7A	No		
3.8A	Yes		

Areas 3.7A and 3.8A were added to the program in November 1984

FORM 17-3505

ISO-MTS-5

Date [illegible]

Plant *Monticello* Iso # *MTS-5*

Area *3.0 A Entire Elbow* Grid Spacing *3"*

Examiner(s) *PAH / KLH / R* Equipment Used *Nortec #1310*

Calibration Block: Type *Step Blk. #3080* Serial Number *#322*

Transducer: Size *1/4"* Frequency *5*

	0°	30°	60°	90°	120°	[illegible]	180°	210°	240°	270°	300°	330°
1	409	422	445	436	425	412	428	434	443	449	438	429
2	442	419	410	404	408	399	408	428	431	429	435	456
3	462	438	416	416	399	403	401	421	410	413	440	457
4	451	440	428	411	396	393	388	408	410	411	440	447
5	429	422	419	410	408	399	406	409	422	415	422	431
6	416	404	414	396	422	437	433	438	437	420	439	410
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Plant Monticello Iso # MTS-5 Disc NA

Area 3.1A Grid Spacing 2"

Examiner(s) ASW / QL / KLH Equipment Used Nortec 131-D

Calibration Block: Type 3080-A3 Serial Number 269

Transducer: Size .25" Dia Frequency 5 MHz

Comments:

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.415	.423	.428	.426	.420	.402	.399	.405	.404	.407	.413	.418
2	.443	.438	.442	.431	.414	.392	.403	.399	.409	.425	.418	.429
3	.462	.450	.442	.428	.427	.412	.420	.414	.411	.422	.427	.436
4	.477	.463	.441	.423	.417	.415	.408	.407	.410	.458	.426	.446
5	.488	.461	.450	.422	.416	.410	.403	.399	.406	.418	.422	.456
6	.456	.442	.440	.424	.422	.388	.381	.381	.411	.419	.427	.457
7	.422	.466	.460	.435	.431	.399	.401	.408	.416	.433	.437	.447
8			.464	.458	.433	.418	.391	.400	.430	.442	.437	.444
9				.458	.447	.412	.409	.408	.431	.448	.434	
10				.499	.467	.420	.397	.420	.446	.454		
11					.487	.430	.406	.415	.464			
12						.445	.413	.435				
13						.455	.434	.448				
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Date 6.7.84

Plant MONTICELLO Iso # MT5-5

Area 32A ENTIRE ELBOW Grid Spacing 4"

Examiner(s) DHALL - SFETHERSTONE Equipment Used NORTEC 131-D

Calibration Block: Type 308B3 Serial Number 322

Transducer: Size .25"Ø Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.556	.543	.525	.529	.541	.542	.564	.583	.566	.561	.552	.545
2	.558	.556	.529	.527	.546	.556	.569	.584	.556	.547	.537	.548
3	.554	.556	.538	.536	.554	.557	.549	.570	.560	.536	.542	.548
4	.542	.556	.551	.552	.551	.546	.550	.577	.552	.532	.521	.532
5	.527	.558	.544	.533	.546	.557	.547	.574	.564	.541	.528	.511
6	.504	.530	.542	.537	.550	.558	.543	.578	.564	.532	.497	.516
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Date 6.7.84

Plant MONTICELLO Iso # MTS-5

Area 3.3A Grid Spacing 4"

Examiner(s) D. HALL - S. FETHERSTONE Equipment Used NORTEC 131-D

Calibration Block: Type 308083 Serial Number 323

Transducer: Size .25"Ø Frequency 5MHZ

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.381	.386	.389	.406	.396	.411	.395	.406	.378	.367	.355	.360
2	.378	.377	.373	.379	.377	.386	.388	.385	.384	.389	.387	.385
3	.358	.363	.361	.380	.383	.394	.390	.402	.388	.381	.364	.360
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Thickness Survey

Date [illegible]

Disc 56

Plant Monticello

Iso # MTS-5

Area 3.4A 10S 10-10"

Grid Spacing 100

Examiner(s) ASW/DAH/DL

Equipment Used UT-III

Calibration Block: Type 2080-83 Serial Number N/A

Transducer: Size ½" dia Frequency 3.5 mHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.584	.584	.584	.588	.600	.626	.632	.604	.604	.604	.584	.600
2	.644	.644	.636	.636	.628	.632	.644	.664	.660	.652	.660	.660
3	.660	.652	.652	.660	.656	.796	.692	.680	.680	.664	.676	.680
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Comments:

Date 6-13-84

Plant Monticello — Iso # MTS-5

Area 3.5A — Grid Spacing 2"

Examiner(s) DAH/AL/KLH — Equipment Used Norta 131.0

Calibration Block: Type 3080-83 — Serial Number 322

Transducer: Size 1/4" dia. — Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.511	.518	.512	.509	.499	.494	.484	.500	.510	.513	.514	.507
2	.542	.515	.499	.504	.425	.514	.499	.512	.515	.505	.517	.498
3	.529	.491	.501	.508	.502	.515	.492	.493	.516	.515	.503	.505
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Disc N/A

Plant Monticello
Iso # MTS-5
Area 3.6A on FW HTR vessel
Grid Spacing 4"
Examiner(s) ASW / RL / SRF
Equipment Used NorTec 131 P
Calibration Block: Type 3080-83
Serial Number 322
Transducer: Size .25"
Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	160°	210°	240°	270°	300°	330°
1	.508					.507						
2	.513	.507	.520	.511	.508	.509						
3	.512	.516	.516	.517	.514	.509						
4	.522	.512	.515	.509	.510	.510						
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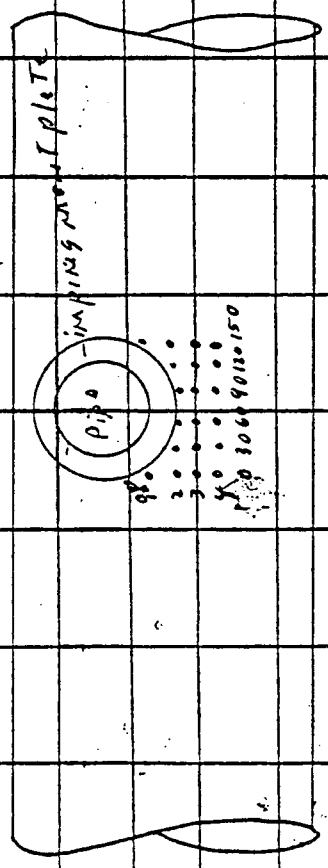

Comments:

THICKNESS SURVEY REPORT

DATE 5-19-86

DISC# 76

UT MONTICELLO

3.7A

ISO# MTS-5

GRID SIZE 180

EXAMINERS STEVE STANFORD II / BILL BOSSI / SCOTT HALLI

EQUIPMENT ULTRA IMAGE III

TRANSDUCER (SIZE/FREQ.) .25/10 MHz.

CAL. BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

NOMINAL WALL

MIN. WALL

COMMENTS

X Degree / Y Grid	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350
1	.400	.396	.400	.412	.396	.400	.392	.388	.368	.392																										
2	.432	.416	.400	.412	.400	.392	.396	.388	.380	.384																										
3	.440	.420	.420	.420	.408	.416	.396	.392	.400	.396																										
4	.432	.436	.420	.420	.412	.412	.412	.400	.412	.400																										
5	.420	.424	.420	.416	.408	.412	.432	.432	.432	.440																										
6	.420	.416	.420	.416	.420	.424	.436	.440	.452	.448																										
7	.408	.408	.412	.412	.408	.408	.412	.408	.412	.416																										
8	.420	.420	.420	.420	.412	.408	.412	.400	.412	.400																										
9	.432	.436	.420	.420	.412	.412	.412	.412	.400	.400																										
10	.440	.420	.420	.420	.408	.416	.396	.392	.400	.396																										
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LOWEST AREA .368"

0°-120° X-3, 4-38

THICKNESS SURVEY REPORT

DATE 5/22/86

DISC# N/A

MONTICELLO

ISO# MTS-5

P[redacted] MTS-3.7A

GRID SIZE SEE COMMENTS

EXAMINERS M.J. LONGSDORF/M.J. Longsdorf II

EQUIPMENT NORTEC 131-D #371

TRANSDUCER (SIZE/FREQ.) ½"Ø 2.25MHz, A30160

CAL.BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

NOMINAL WALL .14" CARBON STEEL

MIN. WALL N/A

COMMENTS 0° AT INNER RADIUS OF ELBOW; 0" AT DOWN STREAM CIRC. WELD.

SCAN STARTS AT 2° DUE TO INSULATION.

Grid \ Degree	30	60	90	120	150	180	240	270	300	330
1' 2"	.530	.531	.536	.567	.575	.567	.555	.568	.546	.520	.526
2' 4"	.545	.550	.543	.569	.575	.568	.558	.570	.535	.522	.532
3' 6"	.563	.555	.545	.564	.578	.561	.557	.565	.545	.535	.552
4' 8"	.570	.555	.550	.559	.565	.564	.554	.564	.539	.542	.554
5' 10"	.573	.550	.548	.550	.569	.570	.575	.555	.538	.545	.557
6' 12"	.572	.558	.547	.555	.557	.560	.557	.564	.548	.545	.564
7' 14"	.577	.555	.536	.554	.554	.566	.555	.569	.564	.556	.565
8' 16"	.567	.554	.530	.545	.557	.563	.572	.580	.564	.544	.555
9' 18"	.565	.552	.530	.546	.567	.575	.575	.576	.555	.575	.545
10' 20"	.566	.556	.540	.545	.580	.580	.565	.570	.560	.530	.544
11' 22"	.563	.560	.544	.549	.565	.568	.557	.569	.555	.531	.532
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MINIMUM WALL = .530

THICKNESS SURVEY REPORT

DATE 5/23/86

DISC# N/A

[redacted] MONTICELLO

ISO# MTS-5

[redacted] MTS-3.8A

GRID SIZE N/A

EXAMINERS M.G. LONGDORF/II

EQUIPMENT NORTEC 131-D #371

TRANSDUCER (SIZE/FREQ.) ½"ø 2.25MHz, A30160

CAL.BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

NOMINAL WALL 14" CARBON STEEL

MIN. WALL N/A

COMMENTS 0° AT INNER RADIUS OF ELBOW; 0" AT DOWN STREAM CIRC. WELD

SCAN BEGINS AT 2" DUE TO INSULATION.

Degree / Grid	30	60	90	120	150	180	[redacted]	240	270	300	330
1 2"	.560	.558	.560	.568	.605	.562	.582	.568	.527	.540	.566
2 4"	.562	.552	.556	.578	.575	.585	.562	.546	.536	.539	.562
3 6"	.567	.560	.561	.587	.575	.577	.560	.555	.536	.539	.558
4 8"	.562	.555	.553	.575	.574	.590	.559	.547	.539	.529	.548
5 10"	.565	.551	.559	.586	.587	.605	.584	.565	.529	.545	.542
6 12"	.557	.553	.561	.599	.599	.610	.572	.549	.522	.511	.522
7 14"	.554	.561	.575	.610	.599	.600	.564	.563	.561	.520	.540
8 16"	.568	.560	.572	.603	.589	.594	.562	.542	.533	.519	.542
9 18"	.550	.552	.565	.601	.584	.593	.568	.550	.542	.524	.535
10 20"	.554	.552	.557	.605	.592	.584	.578	.556	.545	.530	.525
11 22"	.540	.546	.585	.610	.598	.589	.575	.557	.548	.528	.517
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MINIMUM WALL = .511"

THICKNESS SURVEY REPORT

DATE 5/23/86

DISC# N/A

[redacted] MONTICELLO — ISO# MTS-5

[redacted] MTS-3.8A — GRID SIZE N/A

EXAMINERS M.J. Longsdorf M.J. LONGSDORF/II — EQUIPMENT NORTEC 131-D #371

TRANSDUCER (SIZE/FREQ.) ½"ϕ 2.25MHz, A 30160 — CAL.BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

NOMINAL WALL 14" CARBON STEEL — MIN. WALL N/A

COMMENTS 0° AT INNER RADIUS OF ELBOW; 0" AT DOWNSTREAM CIRC. WELD

SCAN BEGINS AT 2" DUE TO INSULATION.

Degree / Grid	30	60	90	120	150	180	[redacted]	240	270	300	330
X 2"	.560	.558	.560	.568	.605	.562	.582	.568	.527	.540	.566
2'4"	.562	.552	.556	.578	.575	.585	.562	.546	.536	.539	.562
3'6"	.567	.560	.561	.587	.575	.577	.560	.555	.536	.539	.558
4'8"	.562	.555	.553	.575	.574	.590	.559	.547	.539	.529	.548
5'10"	.565	.551	.559	.586	.587	.605	.584	.565	.529	.545	.542
6'12"	.550	.553	.561	.599	.599	.610	.572	.549	.522	.511	.522
7'14"	.562	.561	.575	.610	.599	.600	.564	.563	.561	.520	.540
8'16"	.565	.560	.572	.603	.589	.594	.562	.542	.523	.519	.542
9'18"	.565	.552	.565	.601	.584	.593	.568	.550	.542	.524	.535
10'20"	.547	.552	.557	.605	.592	.584	.578	.556	.545	.530	.525
11'22"	.554	.546	.585	.610	.598	.589	.575	.557	.548	.528	.517
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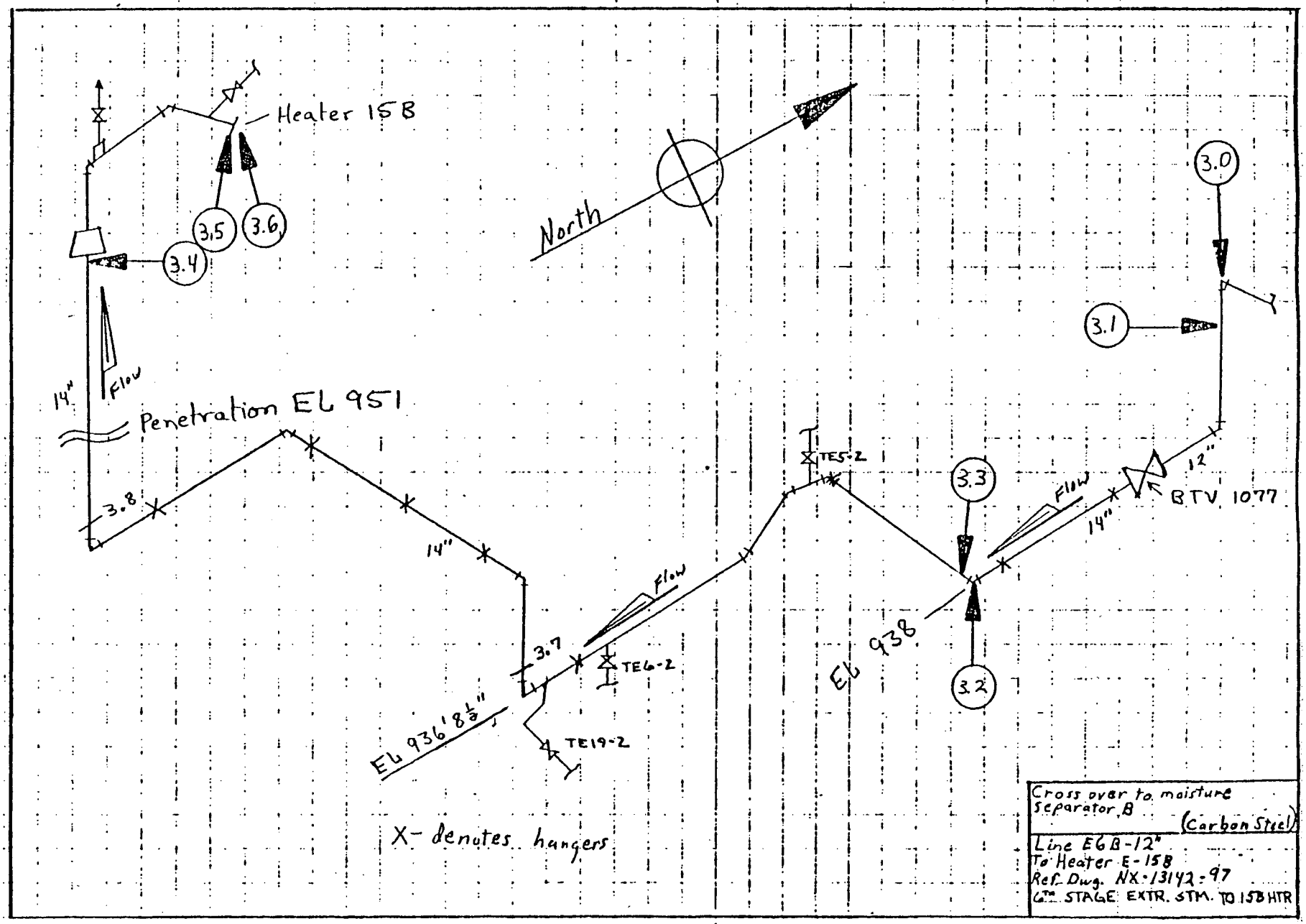
MINIMUM WALL = .511"

Drawn By
David A. Hall



ISO-MTS-6

ISO-MTS-6

Crossover for MS-B To FW-15B 12"

Area	Scaffold Req'd.	Frequency	Disc #
3.0	yes		Nortec
3.1	yes		Nortec
3.2	yes		Nortec
3.3	yes		Nortec
3.4	NO		57
3.5	yes		Nortec
3.6	yes		Nortec
3.7	NO		
3.8	yes		

Areas 3.7 and 3.8 were added in November 1984

ISO-MTS-6

Plant Monticello — Iso # MTS-6 — Date 2-22-07

Area 3.0 — Grid Spacing 3.0"

Examiner(s) PAH / RGA / KLH — Equipment Used Norter - 131 D

Calibration Block: Type 3rd Step Block 3080-83 Serial Number # 322

Transducer: Size ¼" — Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	397	414	421	435	450	425	411	437	446	449	418	418
2	486	437	436	429	419	405	396	397	413	414	433	437
3	467	452	421	412	410	398	385	393	406	414	425	456
4	450	436	426	401	392	377	370	376	395	424	425	437
5	419	421	423	414	410	406	392	396	404	417	425	415
6	370	392	409	417	426	427	417	404	406	401	405	381
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Plant Monticello Iso # MTS-6 Date 4-25-84

Area 3.1 Grid Spacing 3.0"

Examiner(s) DAH / KLH Equipment Used Nortec -131-D

Calibration Block: Type Std Block #3080-83 Serial Number # 322

Transducer: Size .25" Dia Frequency 5 mtz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	366	351	344	338	340	349	359	349	344	348	359	342
2	361	355	353	339	339	356	362	354	353	352	362	347
3	352	359	367	348	335	354	353	349	337	343	364	349
4	368	362	366	352	351	355	358	343	327	338	359	347
5	367	361	367	365	350	350	349	339	321	329	353	352
6	349	369	371	353	344	345	343	328	327	339	345	353
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Date 06-07-84

Plant Monticello Iso # MTS-6

Area 3.2 Entire ELBOW Grid Spacing 4"

Examiner(s) D HALL II/K HALL I Equipment Used Nortec-131-D

Calibration Block: Type 3080-83 Serial Number 322

Transducer: Size .25" Dia Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.567	.554	.554	.585	.572	.592	.543	.530	.496	.495	.524	.553
2	.580	.567	.554	.576	.542	.562	.534	.516	.518	.515	.559	.583
3	.592	.563	.555	.543	.540	.557	.528	.506	.519	.535	.597	.600
4	.588	.569	.562	.544	.558	.592	.533	.524	.533	.543	.584	.602
5	.587	.563	.561	.555	.544	.559	.535	.515	.518	.532	.594	.596
6	.584	.511	.550	.556	.537	.547	.538	.536	.526	.538	.574	.595
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Date 6.7.84

Plant MONTICELLO — Iso # MTS-6

Area 3.3 — Grid Spacing 4"

Examiner(s) D. HALL - K. HALL — Equipment Used NORTEC 131-D

Calibration Block: Type 308083 — Serial Number 322

Transducer: Size .25"Ø — Frequency 5MHz.

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.422	.412	.390	.389	.372	.380	.371	.381	.406	.418	.419	.432
2	.380	.279	.389	.400	.406	.404	.406	.409	.408	.408	.499	.345
3	.398	.405	.413	.406	.401	.398	.402	.384	.399	.387	.385	.386
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THICKNESS SURVEY REPORT

DATE 5/19/86

DISC# 73

T MONTICELLO

ISO# MTS-6

3.3 DOWNSTREAM

GRID SIZE 100

EXAMINERS DAN SELLS II & ALAN I

EQUIPMENT U I III

TRANSDUCER (SIZE/FREQ.) .25" 10MHZ.

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

NOMINAL WALL .500

MIN. WALL MIN. .283 MAX .599

COMMENTS NO EXAM 240°–270° DUE TO ADJACENT PIPE

Degree / Grid	4	30 45°	60 90	90 135°	120 180	150 30	180 60	210 90	240 120	270 46	300 92	330 120
1	.404	.408	.416	.420	.424	.424	.440	.420	.416	.384	.396	.408
2	.408	.396	.404	.412	.408	.420	.428	.408	.416	.396	.408	.392
3	.384	.392	.396	.404	.412	.408	.424	.408	.416	.388	.396	.382
4	.396	.396	.388	.388	.396	.396	.408	.408	.408	.404	.408	.404
5	.392	.384	.388	.388	.388	.396	.404	.396	.408	.404	.408	.404
6	.404	.392	.392	.392	.388	.388	.384	.384	.396	.412	.424	.416
7	.412	.396	.392	.388	.388	.392	.400	.392	.388	.392	.412	.408
8	.412	.412	.408	.396	.388	.396	.388	.376	.384	.392	.416	.416
9	.448	.412	.408	.404	.404	.396	.372	—	—	—	.408	.420
10	.368	.428	.420	.416	.420	—	—	—	—	.392	.416	.432
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THINNEST FIVE

240°–270°

X 28

Y 99

D 360

Thickness Survey

Date 6-15-84
Disc 57

Plant Monticello
Area 3.4 IDS 10-10"
Examiner(s) ASW/GL/DAH
Iso # MTS-6
Grid Spacing 100
Equipment Used UI-2
Calibration Block: Type 3080-83
Serial Number N/A
Transducer: Size ½" dia
Frequency 3.5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.572	.560	.572	.584	.568	.560	.572	.560	.560	.580	.560	.580
2	.628	.640	.656	.656	.632	.640	.640	.640	.628	.608	.612	.604
3	.652	.660	.652	.656	.660	.652	.688	.648	.636	.640	.628	.628
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Comments:

Date 6-13-84

Plant Monticello
Area 3.5
Examiner(s) DAH/AL/KLH
Iso # MTS-6
Grid Spacing 2"
Equipment Used Nortec 131-D
Calibration Block; Type 3080-83 Serial Number 322
Transducer: Size 1/4" dia. Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.491	.522	.512	.526	.501	.485	.484	.467	.472	.499	.499	.507
2	.479	.511	.502	.503	.501	.504	.424	.500	.488	.477	.480	.518
3	.505	.520	.511	.507	.505	.488	.482	.498	.479	.488	.504	.517
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19												

Date 6-19-84

Disc N/A

Plant Monticello

Iso # MTS-6

Area 3.6 ON FWH15B on Vessel

Grid Spacing 4"

Examiner(s) HSW / QL / SRF

Equipment Used NonTec 131 D

Calibration Block: Type 3080-83 Serial Number 322

Transducer: Size .125" dia Frequency 5 mhz

	0°	30°	60°	90°	120°	150°	160°	210°	240°	270°	300°	330°
1	.524						.530					
2	.508	.526	.505	.515	.525	.530	.512					
3	.503	.505	.515	.509	.506	.510	.519					
4	.503	.505	.526	.503	.529	.518	.530					
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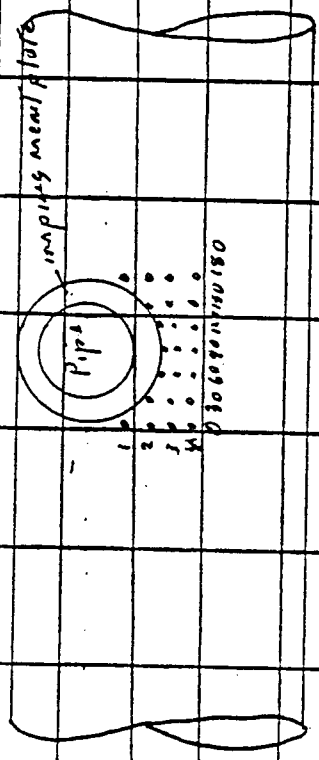

Comments:

THICKNESS SURVEY REPORT

DATE 5/19/86
DISC# 74

T Monitcello — ISO# MTS-6
3.7 Upstream — GRID SIZE 100
…INERS [signatures] — EQUIPMENT U I III
TRANSDUCER (SIZE/FREQ.) .25 10 mhz — CAL.BLOCK (TYPE/SERIAL NO.) Stepwedge 30808
NOMINAL WALL .500 — MIN. WALL Min .283 Max .599
COMMENTS Weld Splatter 240°-360°

Grid \ Degree	4	30 / 45	60 / 90	90 / 135	120 / 180	150 / 45	180 / 90	210 / 135	240 / 180	270 / 45	300 / 90	330 / 135
1	.396	.404	.412	.408	.396	.384	.388	.380	.376	.380	.396	.380
2	.388	.396	.416	.440	.408	.404	.396	.392	.384	.380	.376	.376
3	.392	.404	.412	.416	.412	.404	.392	.384	.372	.388	.380	.380
4	.380	.380	.392	.412	.412	.408	.408	.408	.384	.384	.380	.360
5	.376	.384	.392	.412	.420	.420	.416	.404	.384	.380	.368	.364
6	.376	.368	.384	.396	.396	.408	.412	.408	.392	.380	.384	.368
7	.364	.356	.372	.388	.400	.408	.416	.416	.408	.392	.388	.380
8	.384	.384	.384	.400	.404	.396	.408	.412	.404	.396	.404	.392
9	.384	.376	.368	.376	.376	.384	.408	.416	.416	.404	.416	.404
10	.380	.360	.360	.368	.376	.376	.404	.432	.420	.432	.432	.404
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Thinnest 30-120°
X 100
Y 91
D .343

THICKNESS SURVEY REPORT

DATE 5/22/86

DISC# N/A

MONTICELLO

MTS-3.7

ISO# MTS-16

EXAMINERS M.J. Longabaugh / M.J. LONGSDORF II

GRID SIZE SEE COMMENTS

TRANSDUCER (SIZE/FREQ.) ½", 2.25 MHz, A30160

EQUIPMENT NORTEC 131-D #371

NOMINAL WALL 14" CARBON STEEL

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

MIN. WALL N/A

COMMENTS 0° AT INNER RADIUS OF ELBO; 0" AT DOWN STREAM CIRC. WELD.
SCAN STARTS AT 2" DUE TO INSULATION.

Degree / Grid	30	60	90	120	150	180	210	240	270	300	330
2"	.495	.512	.531	.537	.556	.545	.563	.560	.523	.584	.484
4"	.497	.520	.532	.539	.562	.540	.565	.555	.516	.499	.485
6"	.501	.515	.537	.554	.575	.555	.554	.535	.502	.487	.493
8"	.575	.529	.540	.555	.580	.545	.540	.524	.493	.485	.500
10"	.527	.530	.538	.548	.567	.547	.535	.530	.504	.495	.514
12"	.526	.526	.538	.547	.563	.548	.537	.514	.501	.496	.510
14"	.520	.529	.550	.544	.555	.545	.545	.545	.545	.485	.550
16"	.529	.540	.554	.546	.552	.530	.540	.542	.496	.483	.510
18"	.530	.535	.554	.537	.546	.532	.544	.550	.511	.498	.515
20"	.528	.532	.536	.540	.556	.547	.535	.552	.512	.500	.518
22"	.553	.548	.542	.540	.557	.553	.536	.534	.505	.498	.509
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MINIMUM WALL = .483"

THICKNESS SURVEY REPORT

DATE 5/19/86
DISC# 75

[illegible]T Monticello
3.7 Downstream
EXAMINERS [illegible signature]
TRANSDUCER (SIZE/FREQ.) .25 10mhz
NOMINAL WALL .500
COMMENTS 200° - 360° Rough Surface (chipped paint) Threshold raised to 50% due to this condition

ISO# MTS-6
GRID SIZE 100
EQUIPMENT U I III
CAL.BLOCK (TYPE/SERIAL NO.) Stepwedge 3080-83
MIN. WALL Min .271 Max .587

Degree		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
330	135	.408	.424	.416	.404	.396	.388	—	.388	.384	.388											
300	90	.412	.420	.424	.416	—	.396	.400	.388	—	—											
270	45	.416	.412	.424	.416	.416	.408	.396	.404	.384	.388											
240	180	.392	.408	.412	.420	—	.420	.416	.400	.396	.400											
2[illegible]	135	.388	.400	.396	.420	.420	.420	.440	.412	.404	.436											
180	90	.392	.400	.396	.412	.412	.416	.424	.420	.424	.424											
150	45	.380	.380	.392	.392	.392	.408	.420	.416	.420	.436											
120	180	.380	.380	.380	.388	.388	.392	.404	.408	.428	.416											
90	135	.392	.384	.388	.384	.384	.388	.396	.396	.412	.410											
60	90	.392	.384	.380	.380	.372	.326	.376	.380	.396	.396											
30	45	.400	.392	.400	.380	.380	.388	.380	.380	.388	.388											
[illegible]	4	.412	.408	.412	.392	.404	.388	.368	.388	.396	.392											
Degree / Grid		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Thinnest Field
270-90°
X 98
Y 52
D .356

THICKNESS SURVEY REPORT

DATE 5-20-86

DISC# 77

T MONTICELLO

3.8 (0"-18")

ISO# MTS-6

GRID SIZE 190

INERS STEVE STANFORD II / A.W. VOSS / S.G. HALL

EQUIPMENT ULTRA IMAGE III

TRANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

CAL.BLOCK (TYPE/SERIAL NO.) STEWEDGE 3080-83

NOMINAL WALL .375"

MIN. WALL

COMMENTS 18" ARM

Grid / Degrees	X 0	22 30	44 60	66 90	88 120	24 150	48 180	72 210	0 240	23 270	46 300	69 330
1 0	.434	.392	.368	.356	.354	.360	.352	.356	.414	.408	.414	.390
2 10	.390	.374	.370	.362	.344	.348	.336	.360	.384	.384	.390	.412
3 20	.390	.388	.374	.354	.350	.348	.352	.360	.388	.374	.386	.392
4 30	.388	.390	.404	.374	.356	.356	.352	.388	.424	.392	.412	.414
5 40	.388	.386	.380	.368	.356	.344	.340	.352	.392	.370	.396	.398
6 50	.382	.394	.381	.364	.360	.352	.348	.348	.386	.362	.376	.392
7 60	.382	.388	.384	.380	.358	.352	.356	.356	.404	.360	.384	.390
8 70	.386	.396	.390	.396	.368	.352	.348	.356	.390	.374	.372	.382
9 80	.394	.394	.390	.384	.368	.360	.356	.344	.410	.394	.370	.382
10 90	.386	.392	.386	.380	.372	.360	.372	.352	.374	.392	.372	.384
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LOWEST AREA IS .340"
120°-240° X-47, Y-54

THICKNESS SURVEY REPORT

DATE 5/22/86

DISC# N/A

MONTICELLO

MTS-3.8

ISO# MTS-6

GRID SIZE N/A

EXAMINERS M.J. Longsdorf / M.J. LONGSDORF/II

EQUIPMENT NORTEC 131-D #371

TRANSDUCER (SIZE/FREQ.) ½" ϕ 2.25 MHz, A30160

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-B3

NOMINAL WALL .14" CARBON STEEL

MIN. WALL N/A

COMMENTS 0° AT INNER RADIUS OF ELBOW; 0" AT DOWN STREAM CIRC. WELD.
SCAN BEGINS AT 2" DUE TO INSULATION

Degree / Grid	30	60	90	120	150	180	210	240	270	300	330
1' 2"	.550	.500	.492	.535	.525	.542	.565	.540	.555	.495	.512
2' 4"	.546	.505	.520	.545	.532	.555	.566	.536	.513	.492	.570
3' 6"	.566	.560	.515	.538	.520	.553	.544	.529	.565	.496	.518
4' 8"	.560	.515	.512	.535	.515	.535	.550	.530	.528	.508	.526
5' 10"	.585	.534	.510	.534	.525	.525	.536	.554	.528	.517	.510
6' 12"	.590	.550	.517	.530	.515	.533	.528	.538	.518	.508	.513
7' 14"	.575	.535	.515	.522	.504	.525	.540	.518	.528	.519	.540
8' 16"	.565	.525	.510	.520	.505	.514	.520	.522	.532	.522	.536
9' 18"	.572	.540	.508	.525	.520	.503	.537	.523	.535	.522	.533
10' 20"	.572	.555	.505	.510	.516	.525	.542	.527	.520	.528	.544
11' 22"	.535	.545	.514	.517	.520	.520	.547	.527	.529	.533	.542
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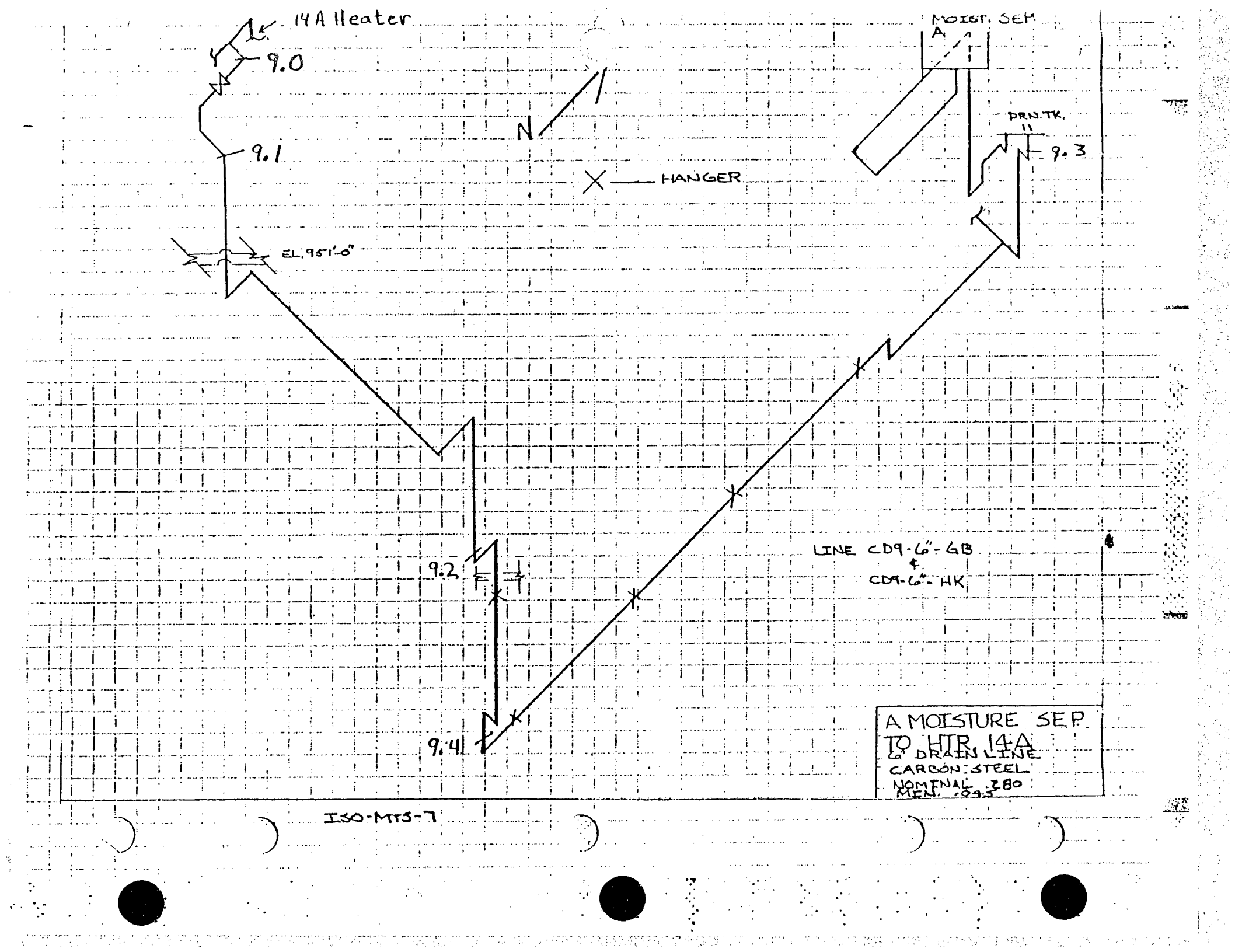
MINIMUM WALL = .492"


14A Heater
9.0
9.1
N
HANGER
MOIST. SEP. A
DRN. TK.
9.3
EL. 951'-0"
9.2
9.4
LINE CD9-6"-GB
&
CD9-6"-HK
A MOISTURE SEP. TO HTR 14A
6" DRAIN LINE
CARBON STEEL
NOMINAL .280
MIN. .193
ISO-MTS-7

Notes.
ISO-MTS-7

MS-A To FWH 14A 6"

Area	Scaffold Req'd.	Frequency	Disc #
9.0	yes		Nortec
9.1	yes		Nortec
9.2	No		Nortec
9.3	NO		Nortec
9.4	NO		

Area 9.4 was added in November 1984

Thickness Survey

Date 06-12-84
Disc N/A

Plant Monticello
Iso # MTJ-7
Area 9.0 Entire Elbow
Grid Spacing 2"
Examiner(s) ASW / KLH
Equipment Used Nortec 131-D
Calibration Block: Type 3080-83
Serial Number 322
Transducer: Size .25" Dia
Frequency 5 MHz

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
330°	.325	.334	.354	.346	.354	.324													
300°	.352	.369	.337	.361	.353														
270°	.334	.344	.338	.358															
240°	.320	.330	.327	.327	.319														
210°	.320	.317	.315	.316	.318	.315													
180°	.326	.312	.306	.301	.305	.312	.316	.339											
150°	.320	.312	.326	.323	.299	.296	.317	.301											
120°	.315	.304	.316	.308	.302	.308	.318	.309											
90°	.309	.294	.303	.273	.294	.299	.319	.324											
60°	.325	.317	.314	.299	.278	.304	.319	.326											
30°	.320	.339	.329	.322	.322	.300	.305	.308											
0°	.318	.309	.309	.332	.329	.329	.309	.312											

Ave = .3192
Min = .278
S.D. = .01764
S.D.' = .0175

An engineering judgement of toriginal ~ .350

Comments:

Thickness Survey

Date 06-12-84
Disc N/A

Plant Monticello
Iso # MTS-7
Area 9.1 Entire Elbow
Grid Spacing 2"
Examiner(s) ASW / KLH
Equipment Used Nortec 131-D
Calibration Block: Type 3080-83 Serial Number 322
Transducer: Size .25" Dia Frequency 5mHz

	0°	30°	60°	90°	120°	150°	Tdv	210°	240°	270°	300°	330°
1	.295	.296	.316	.339	.353	.359	.359	.360	.336	.342	.326	.320
2	.289	.294	.316	.341	.353	.364	.366	.362	.335	.315	.304	.301
3	.315	.295	.344	.344	.350	.342	.365	.369	.330	.311	.302	.322
4	.294	.325	.341	.341	.351	.366	.362	.367	.326	.307	.321	.291
5	.294	.333	.314	.337	.350	.358	.354	.350	.322	.303	.317	.288
6	.323	.335	.313	.338	.352	.348	.364	.356	.321	.301	.316	.287
7	.323	.312	.337	.341	.345	.350	.356	.348	.320	.298	.291	.295
8	.325	.340	.316	.347	.344	.344	.349	.342	.324	.321	.299	.322
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

Comments:

Thickness Survey

Date 6-1-84

Plant Monticello
Iso # MTS-7
Area 9.2 (Entire Elbow)
Grid Spacing 2"
Examiner(s) DAH/QL
Equipment Used Nortec 131-D
Calibration Block: Type 3080-83 Serial Number 322
Transducer: Size 1/4" dia. Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.295	.291	.311	.312	.304	.299	.290	.288	.298	.292	.293	.298
2	.309	.315	.317	.313	.288	.287	.288	.278	.284	.289	.304	.308
3	.329	.319	.314	.308	.296	.279	.276	.271	.282	.282	.301	.318
4	.329	.320	.313	.310	.295	.283	.269	.271	.281	.292	.306	.312
5	.314	.308	.321	.318	.297	.289	.288	.274	.297	.296	.307	.308
6	.292	.286	.314	.314	.303	.294	.303	.294	.298	.300	.299	.298
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

Date 5-24-84

Plant Monticello — Iso # MTS-7

Area 9.3 Entire Elbow — Grid Spacing 2"

Examiner(s) D. HALL, G. Loredo — Equipment Used Nortec-131-D

Calibration Block: Type 2080-83 — Serial Number 322

Transducer: Size .25" dia. — Frequency 5 MHZ.

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.272	.290	.278	.267	.272	.281	.273	.282	.277	.276	.266	.261
2	.299	.304	.290	.276	.271	.223	.265	.271	.265	.272	.270	.285
3	.301	.308	.295	.276	.273	.264	.250	.249	.259	.259	.265	.284
4	.309	.306	.298	.289	.277	.277	.253	.260	.262	.263	.266	.280
5	.279	.295	.303	.304	.291	.283	.268	.261	.268	.271	.265	.272
6	.260	.279	.296	.307	.275	.278	.283	.275	.273	.294	.261	.258
7												
8												
9	-	-	-	-	-	-	-					
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

THICKNESS SURVEY REPORT

DATE 5/22/86

DISC# N/A

[redacted] MONTICELLO

ISO# MTS-7

EA MTS-9.4

GRID SIZE N/A

AMINERS M.J. Longsdorf M.S. LONGSDORF/II

EQUIPMENT NORTEC 131-D # 371

ANSDUCER (SIZE/FREQ.) 1/2" d, 2.25MHz, A30160

CAL. BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

MINAL WALL 6" CARBON STEEL

MIN. WALL N/A

OMMENTS 0° AT INNER RADIUS OF ELBOW; 0" AT DOWN STREAM CIRC. WELD

Degree / Grid	30	60	90	120	150	180	[redacted]	240	270	300	330
0"	.38	.38	.38	.36	.36	.36	.36	.36	.36	.38	.38
2"	.38	.38	.38	.36	.36	.34	.36	.36	.36	.38	.38
4"	.38	.38	.38	.34	.34	.34	.34	.34	.36	.36	.38
6"	.38	.38	.36	.35	.35	.35	.35	.35	.36	.38	.38
8"	.38	.38	.36	.35	.35	.35	.35	.35	.36	.38	.38
6											
7											
8											
9											
10											
11											
12											
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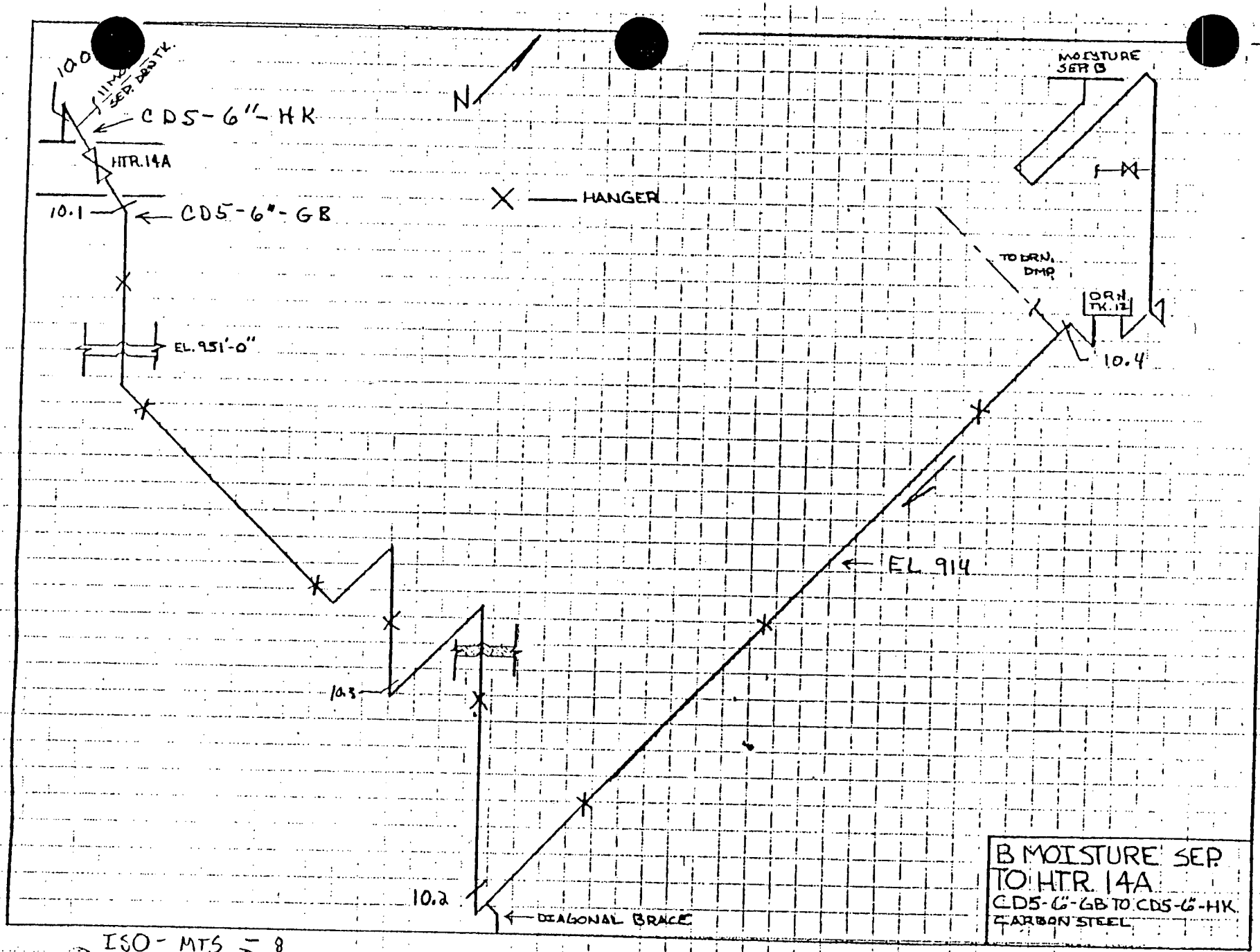
14											
15											
16											
17											
18											
19											
20											
21											

MINIMUM WALL = .34"


100
MOISTURE SEP. DRN. TK.
CD5-6"-HK
HTR. 14A
10.1
CD5-6"-GB
N
HANGER
MOISTURE SEP B
TO DRN. DMP.
DRN. TK. 12
10.4
EL. 951'-0"
EL 914
10.3
10.2
DIAGONAL BRACE
B MOISTURE SEP. TO HTR. 14A
CD5-6"-GB TO CD5-6"-HK
CARBON STEEL

ISO-MTS - 8

Notes
ISO-MTS-?

MS-B to FWH 14A 6"

Area	Scaffold Req'd.	Frequency	Disc #
10.0	yes		Nortec
10.1	yes		Nortec
10.3	No		Nortec
10.4	NO		Nortec
10.2	NO		

Area 10.2 was added in November 1994

Thickness Survey

Date 6-12-84
Disc N/A

Plant Monticello
Area 10.0 Entire Elbow
Examiner(s) ASW / KLH
Calibration Block: Type 3080-83 Serial Number 322
Transducer: Size .25" dia Frequency 5 MHz

Iso # MTS-8
Grid Spacing 2"
Equipment Used NorTec 131D

	0°	30°	60°	90°	120°	150	180	210°	240°	270°	300°	330°
1	.301	.296	.303	.313	.324	.310	.332	.312	.284	.307	.302	.299
2	.292	.306	.294	.303	.307	.336	.351	.335	.313	.303	.288	.294
3	.285	.281	.313	.300	.315	.336	.360	.338	.300	.302	.288	.288
4	.277	.245	.312	.304	.317	.340	.352	.345	.297	.300	.286	.273
5	.267	.292	.287	.297	.315	.341	.354	.345	.307	.297	.282	.264
6	.270	.271	.290	.297	.305	.331	.339	.339	.298	.294	.288	.274
7	.286	.282	.286	.303	.308	.324	.324	.319	.294	.298	.290	.284
8	.291	.287	.291	.301	.302				.291	.301	.292	.288
9	.298	.297	.300	.304						.307	.301	.300
10												
11			Ave = .304 "Reject" all > .325"									
12												
13				S.D. = .0209								
14												
15				S.D. = .0206								
16												
17												
18												
19												

Comments:

Thickness Survey

Date 6-12-84
Disc N/A

Plant Monticello
Area 10.1 Entire Elbow
Examiner(s) ASW IKLH
Calibration Block: Type 2080-83
Transducer: Size .25" Dia.

Iso # MTS-8
Grid Spacing 2"
Equipment Used Nortec 1310
Serial Number 322
Frequency 5mHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.267	.304	.295	.298	.340	.338	.320	.314	.319	.294	.293	.301
2	.257	.276	.311	.296	.308	.335	.340	.327	.318	.303	.290	.308
3	.259	.270	.286	.289	.308	.348	.350	.341	.318	.301	.285	.302
4	.259	.292	.284	.284	.304	.336	.354	.344	.344	.296	.289	.304
5	.259	.272	.286	.284	.310	.327	.337	.334	.338	.303	.300	.303
6	.269	.273	.284	.293	.299	.322	.311	.313	.316	.312	.302	.290
7	.271	.281	.284	.316						.312	.313	.317
8	.284	.310	.334	.324						.315	.318	.296
9	.214	.283										.323
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

Comments:

THICKNESS SURVEY REPORT

DATE 5/22/86

DISC# N/A

PLANT MONTICELLO

ISO# MTS-B

AREA MTS-10.2

GRID SIZE N/A

EXAMINERS M.J. Longsdorf / M.J. LONGSDORF, II

EQUIPMENT NORTEC 131-D #371

TRANSDUCER (SIZE/FREQ.) ½" ø, 2.25 MHz, A30160

CAL. BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

NOMINAL WALL 6" CARBON STEEL

MIN. WALL N/A

COMMENTS 0° AT INNER RADIUS OF ELBOW; 0" AT DOWN STREAM CIRC. WELD

Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
1' 0"	.38	.38	.38	.38	.38	.40	.42	.42	.42	.40	.38	.38
2' 2"	.38	.38	.38	.38	.37	.37	.38	.40	.40	.40	.40	.38
3' 4"	.40	.40	.38	.36	.38	.38	.38	.38	.40	.40	.40	.40
4' 6"	.40	.40	.36	.36	.38	.38	.38	.38	.38	.38	.40	.40
5' 8"	.40	.40	.38	.38	.38	.38	.36	.38	.38	.38	.40	.40
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8												
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14												
15												
16												
17												
18												
19												
20												
21												

MINIMUM WALL = .36"

...ness Survey

Date 6-1-84

Plant Monticello
Iso # MTS-8
Area 10.3 Entire Elbow
Grid Spacing 2"
Examiner(s) DAH / QL
Equipment Used Nortec 131-D
Calibration Block: Type 3080-83 Serial Number 322
Transducer: Size ½" 1/4" dia Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.290	.293	.291	.285	.302	.299	.290	.284	.309	.300	.288	.301
2	.311	.309	.299	.284	.293	.294	.291	.279	.298	.304	.290	.313
3	.323	.318	.297	.296	.297	.294	.284	.268	.291	.293	.283	.326
4	.335	.323	.300	.304	.306	.304	.288	.265	.289	.290	.278	.326
5	.323	.316	.311	.314	.312	.307	.298	.270	.297	.298	.283	.300
6	.293	.307	.317	.315	.323	.313	.312	.289	.299	.297	.279	.300
7												
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17												
18												
19												

Date 5-24-84

Plant Monticello — Iso # MTS-8

Area 10.4 Entire Elbow — Grid Spacing 2"

Examiner(s) D. HALL, Q. Loredo — Equipment Used Nortec-131-D

Calibration Block: Type 2090-83 — Serial Number 322

Transducer: Size .25" dia — Frequency 5 MHZ

	0°	30°	60°	90°	120°	180°	0°	210°	240°	270°	300°	330°
1	.305	.268	.289	.289	.277	.261	.273	.284	.289	.281	.298	.254
2	.295	.260	.272	.283	.269	.260	.275	.274	.287	.292	.272	.273
3	.273	.258	.276	.282	.271	.272	.278	.280	.289	.285	.288	.271
4	.270	.271	.274	.280	.279	.272	.279	.281	.285	.291	.280	.268
5	.280	.277	.265	.282	.274	.270	.280	.282	.284	.281	.278	.273
6	.275	.262	.267	.289	.271	.268	.279	.271	.270	.280	.276	.273
7												
8												
9	-	-	-	-	-	-	-					
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 2:32
NORTHERN STATES POWER COMPANY

INPUT FILE NAME cmonts8

OUTPUT FILE NAME a:cmonts8.ou2

BOUNDING LEVEL = 90 %

NUMBER OF CASES = 1

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 2:32
NORTHERN STATES POWER COMPANY

MONTICELLO THICKNESS SUR.# 08

CASE = 1 NCHEM = 1 TOTAL TIME = 110000. NSEG = 1

ICHEM	FMULT	PH	OXY	HOURS
0	100.000	7.000	2000.0	110000.

NCOMP = 17 DESIGN PRESS.= 202. DESIGN TEMP.= 383.

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 2:32
NORTHERN STATES POWER COMPANY

MONTICELLO THICKNESS SUR.# 08

GEO (SECOND LINE)	MAT	COMP. NAME	DIA	THICK	TEMP	FLOW
		CR	CU	MO	SIGMA	
4	0	8.0E	6.	.280	383.	-4.500
	8.0000	.5000	1.0000	30000.		
8	5	8.0V1	6.	.280	383.	-4.500
9	5	8.0P1	6.	.280	383.	-4.500
1	5	8.1E2	6.	.280	383.	-4.500
9	5	8.1P2	6.	.280	383.	-4.500
2	5	8.1E3	6.	.280	383.	-4.500
9	5	8.1P3	6.	.280	383.	-4.500
2	5	8.1E4	6.	.280	383.	-4.500
9	5	8.1P4	6.	.280	383.	-4.500
2	5	8.3E1	6.	.280	383.	-4.500
9	5	8.3P1	6.	.280	383.	-4.500
2	5	8.3E2	6.	.280	383.	-4.500
9	5	8.3P2	6.	.280	383.	-4.500
2	5	8.2E1	6.	.280	383.	-4.500
9	5	8.2P1	6.	.280	383.	-4.500
2	5	8.4E1	6.	.280	383.	-4.500
2	5	8.1E1	6.	.280	383.	-4.500

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 2:32
NORTHERN STATES POWER COMPANY

MONTICELLO THICKNESS SUR.# 08

PASS 2 DATA
NUMBER OF INSPECTIONS = 17

NUMBER	COMP	MEASURED THICKNESS
1	8.0E	.280
2	8.0V1	.280
3	8.0P1	.280
4	8.1E2	.280
5	8.1P2	.280
6	8.1E3	.280
7	8.1P3	.280
8	8.1E4	.280
9	8.1P4	.280
10	8.3E1	.280
11	8.3P1	.280
12	8.3E2	.280
13	8.3P2	.280
14	8.2E1	.280
15	8.2P1	.280
16	8.4E1	.280
17	8.1E1	.280

MONTICELLO THICKNESS SUR.# 08

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED AVERAGE EROSION RATE (MM/YR)
8.0V1	.00
8.1E3	.00
8.1E4	.00
8.3E1	.00
8.3E2	.00
8.2E1	.00
8.4E1	.00
8.1E1	.00
8.1E2	.00
8.0P1	.00
8.1P2	.00
8.1P3	.00
8.1P4	.00
8.3P1	.00
8.3P2	.00
8.2P1	.00
8.0E	.00

NOTE:
THE AVERAGE EROSION RATE FOR EACH COMPONENT IS CALCULATED USING THE MAXIMUM TOTAL TIME FOR THE PROBLEM

MONTICELLO THICKNESS SUR.# 08

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED HOURS TO REACH MINIMUM WALL THICKNESS
8.0V1	6586771.
8.1E3	11051290.
8.1E4	11051290.
8.3E1	11051290.
8.3E2	11051290.
8.2E1	11051290.
8.4E1	11051290.
8.1E1	11051290.
8.1E2	22212570.
8.0P1	33373850.
8.1P2	33373850.
8.1P3	33373850.
8.1P4	33373850.
8.3P1	33373850.
8.3P2	33373850.
8.2P1	33373850.
8.0E	1433682000.

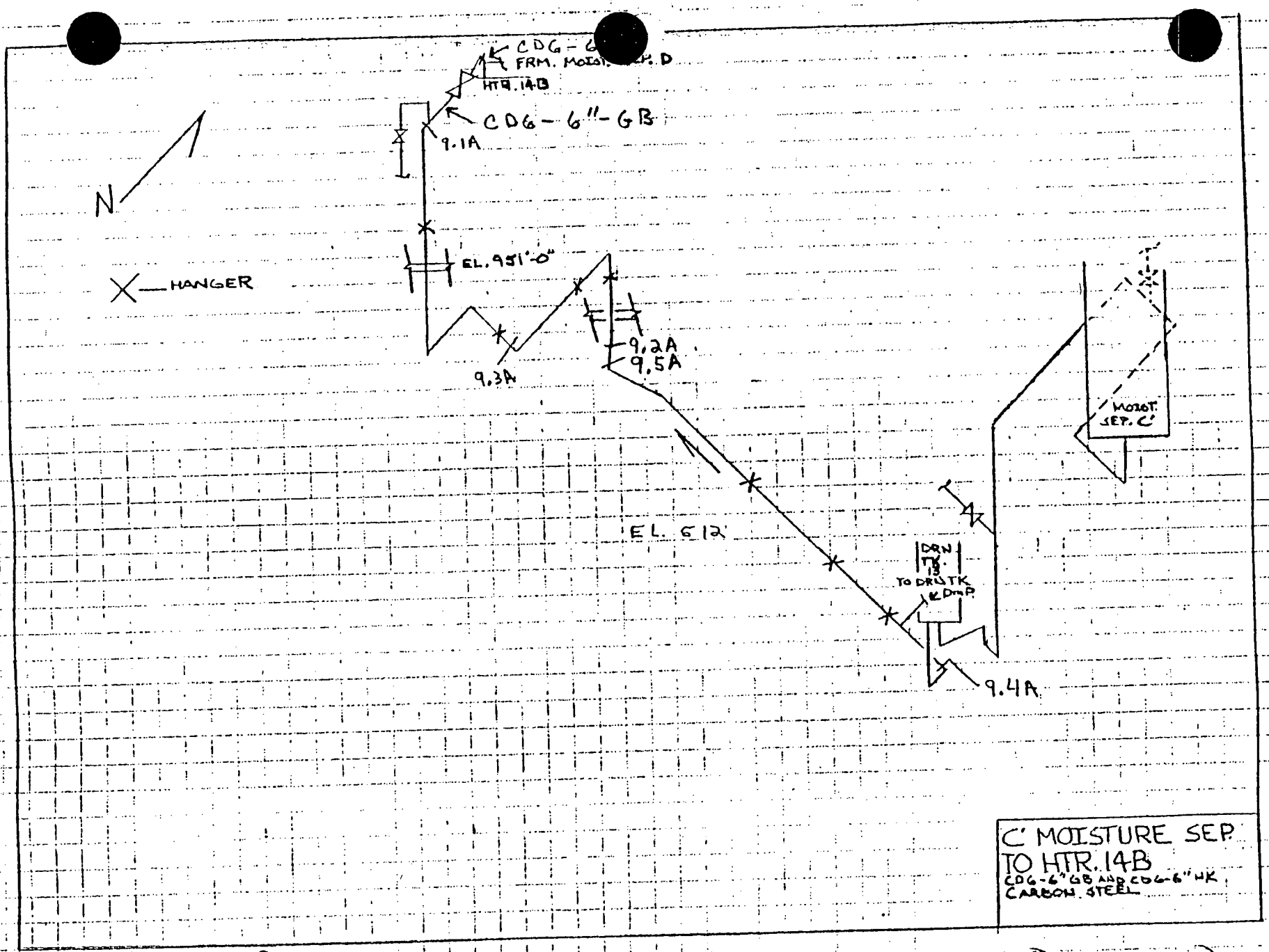
WARNING:
THE DESIGN MINIMUM WALL THICKNESS USED IN PREDICTING TOTAL HOURS IS BASED ON DESIGN PRESSURE ONLY. UTILITIES MUST PERFORM PLANT SPECIFIC ENGINEERING EVALUATIONS THAT INCLUDE ALL LOADS TO PREDICT TOTAL HOURS BEFORE A FAILURE WOULD OCCUR.

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 2:32
NORTHERN STATES POWER COMPANY

MONTICELLO THICKNESS SUR.# 08

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED THICKNESS (INCH)	PREDICTED WEAR (INCH)	LATEST EROSION RATE (MM/YEAR)	MINIMUM WALL THICKNESS (INCH)
8.0E	.280	.000	.00	.022
8.0V1	.276	.004	.00	.044
8.0P1	.279	.000	.00	.044
8.1E2	.279	.001	.00	.044
8.1P2	.279	.000	.00	.044
8.1E3	.278	.002	.00	.044
8.1P3	.279	.000	.00	.044
8.1E4	.278	.002	.00	.044
8.1P4	.279	.000	.00	.044
8.3E1	.278	.002	.00	.044
8.3P1	.279	.000	.00	.044
8.3E2	.278	.002	.00	.044
8.3P2	.279	.000	.00	.044
8.2E1	.278	.002	.00	.044
8.2P1	.279	.000	.00	.044
8.4E1	.278	.002	.00	.044
8.1E1	.278	.002	.00	.044



C' MOISTURE SEP.
TO HTR. 14B
CDG-6" GB AND CDG-6" HK
CARBON STEEL

ISO-MTS-9

Notes
ISO-MTS-9

MS-C to FUJH 143 6"

Area	Scaffold Req'd.	Frequency	Disc #
9.1A	NO		Nortec
9.3A	NO		Nortec
9.4A	NO		Nortec
9.2A	NO		
9.5A	NO		

Areas 9.2A and 9.5A were added in November 1994

Thickness Survey

Date 6-12-84
Disc N/A

Plant Monticello
Area 9.1A Entire Elbow
Examiner(s) ASW/KLH
Calibration Block: Type 3080-83
Transducer: Size .25" dia

Iso # MTS-8 9
Grid Spacing 2"
Equipment Used Nortec 131 D
Serial Number 322
Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	TEU	210°	240°	270°	300°	330°
1	.284	.277	.300	.315	.377	.355	.342	.327	.320	.307	.309	.276
2	.258	.283	.300	.318	.338	.353	.334	.324	.322	.314	.298	.300
3	.259	.297	.299	.324	.343	.367	.336	.322	.324	.314	.295	.272
4	.258	.271	.326	.316	.341	.345	.356	.338	.323	.335	.297	.267
5	.268	.278	.301	.320	.337				.320	.328	.294	.277
6	.274	.288	.310	.318						.311	.298	.288
7												
8												
9												
10												
11												
12												
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15												
16												
17												
18												
19												

Comments:

THICKNESS SURVEY REPORT

DATE 5/16/86
DISC# N/A

PLANT MONTICELLO
ISO# MTS-9
AREA MTS-9-2A
GRID SIZE N/A
EXAMINERS M.J. Longshore (signature) M.J. LONGSHORE
EQUIPMENT NORTEC 131-D # 409
TRANSDUCER (SIZE/FREQ.) 1/2", 2.25 MHz, A30160
CAL.BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83
NOMINAL WALL 6" CARBON STEEL
MIN. WALL N/A
COMMENTS 0° AT INNER RADIUS OF LOWER ELBOW. 0" AT CIRC. WELD.
LIMITATION AT 270° DUE TO ADJACENT PIPE.

MINIMUM WALL = .32"

Degree \ Grid	0"	2"	4"	6"	8"	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
330	.32	.33	.33	.33	.33																
300	.32	.33	.33	.32	.33																
270	\	\	\	\	\																
240	.32	.33	.33	.33	.33																
210	.32	.33	.33	.33	.33																
180	.32	.34	.34	.34	.33																
150	.32	.34	.34	.34	.34																
120	.32	.34	.34	.34	.34																
90	.32	.34	.34	.34	.34																
60	.32	.33	.34	.33	.34																
30	.32	.33	.33	.32	.33																
0	.32	.33	.33	.33	.33																

Thickness Survey

Date 6-26-84
Disc N/A

Plant Monticello
Area 9.3A
Examiner(s) ASW/Q.L./KLH
Calibration Block: Type 3080-83 Serial Number 269
Transducer: Size .25" dia. Frequency 5 MHz.

Iso # M.T.S. - 9
Grid Spacing 2"
Equipment Used Nortec-131-D

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.299	.303	.317	.298	.306	.313	.311	.317	.316	.320	.310	311
2	.265	.297	.333	.343	.334	.346	.316	.309	.303	.282	.315	.300
3	.283	.300	.346	.349	.347	.348	.312	.304	.299	.283	.290	.295
4	.276	.305	.329	.314	.326	.324	.308	.302	.288	.277	.283	.285
5	.281	.309	.322		.329	.318	.304	.301	.281	.266	.271	.281
6	.287	.314				.309	.303	.291	.279	.258	.273	.279
7	.289						.302	.290	.288	.264	.281	287
8								.295	.285	.271	.315	.296
9										.278		
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

Comments:

Thickness Survey

Date 5-24-84

Plant Monticello Iso # MTS-9

Area 9.4A Entire Elbow Grid Spacing 2"

Examiner(s) D. Hall, Q. Laredo Equipment Used Nortec-131-D

Calibration Block: Type 3080-83 Serial Number 322

Transducer: Size .25" dia. Frequency 5 MHz.

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.306	.303	.299	.302	.267	.246	.247	.262	.277	.315	.315	.304
2	.300	.289	.292	.296	.270	.260	.254	.269	.289	.312	.322	.297
3	.289	.283	.292	.290	.285	.276	.281	.280	.280	.303	.318	.288
4	.280	.282	.297	.305	.302	.291	.272	.267	.262	.273	.280	.275
5	.276	.289	.307	.317	.304	.280	.260	.247	.234	.269	.283	.270
6	.292	.295	.306	.309	.278	.259	.244	.238	.234	.279	.302	.279
7												
8												
9	-	-	---	---	-	-	-	.				
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19												

THICKNESS SURVEY REPORT

DATE 5/16/86

DISC# N/A

PLANT MONTICELLO

ISO# MTS-9

AREA MTS-9.4A

GRID SIZE N/A

EXAMINERS M. A. Longsdorf

EQUIPMENT NORTEC 131-D #409

TRANSDUCER (SIZE/FREQ.) ½" 2.25MHz A30160

CAL. BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

NOMINAL WALL 6" CARBON STEEL

MIN. WALL N/A

COMMENTS 0° AT INNER RADIUS OF ELBOW; 0" AT DOWN STREAM CIRC. WELD

MINIMUM WALL = .31"

Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
X 0"	.37	.37	.37	.36	.34	.32	.32	.32	.34	.36	.37	.37
2"	.36	.37	.36	.36	.34	.32	.32	.32	.34	.36	.36	.36
3 4"	.36	.36	.36	.36	.36	.35	.34	.34	.34	.34	.35	.35
4 6"	.36	.36	.36	.38	.37	.35	.34	.32	.32	.32	.34	.34
5 8"	.38	.37	.37	.38	.36	.33	.32	.32	.31	.32	.34	.36
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												

THICKNESS SURVEY REPORT

DATE 5/16/86

DISC# N/A

PLANT MONTICELLO

AREA MTS-9-5A

EXAMINERS M. J. Longsdore

TRANSDUCER (SIZE/FREQ.) ½" 2.25MHz. A30160

NOMINAL WALL 6" CARBON STEEL

ISO# MTS-9

GRID SIZE N/A

EQUIPMENT NORTEC 131-D # 409

CAL. BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-63

MIN. WALL N/A

COMMENTS 0° AT INNER RADIUS OF ELBOW; 0" AT DOWN STREAM CIRC. WELD. LIMITATION AT 270°, 6"-8" DUE TO ADJACENT PIPE

Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
0"	.36	.36	.36	.36	.36	.34	.34	.34	.36	.36	.36	.36
2"	.36	.36	.36	.36	.36	.36	.34	.34	.32	.34	.36	.36
4"	.36	.36	.36	.38	.38	.36	.36	.36	.34	.32	.34	.34
6"	.36	.36	.36	.38	.38	.36	.36	.36	.34			.34
8"	.36	.36	.38	.38	.38	.36	.36	.36	.36			.36
6												
7												
8												
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12												
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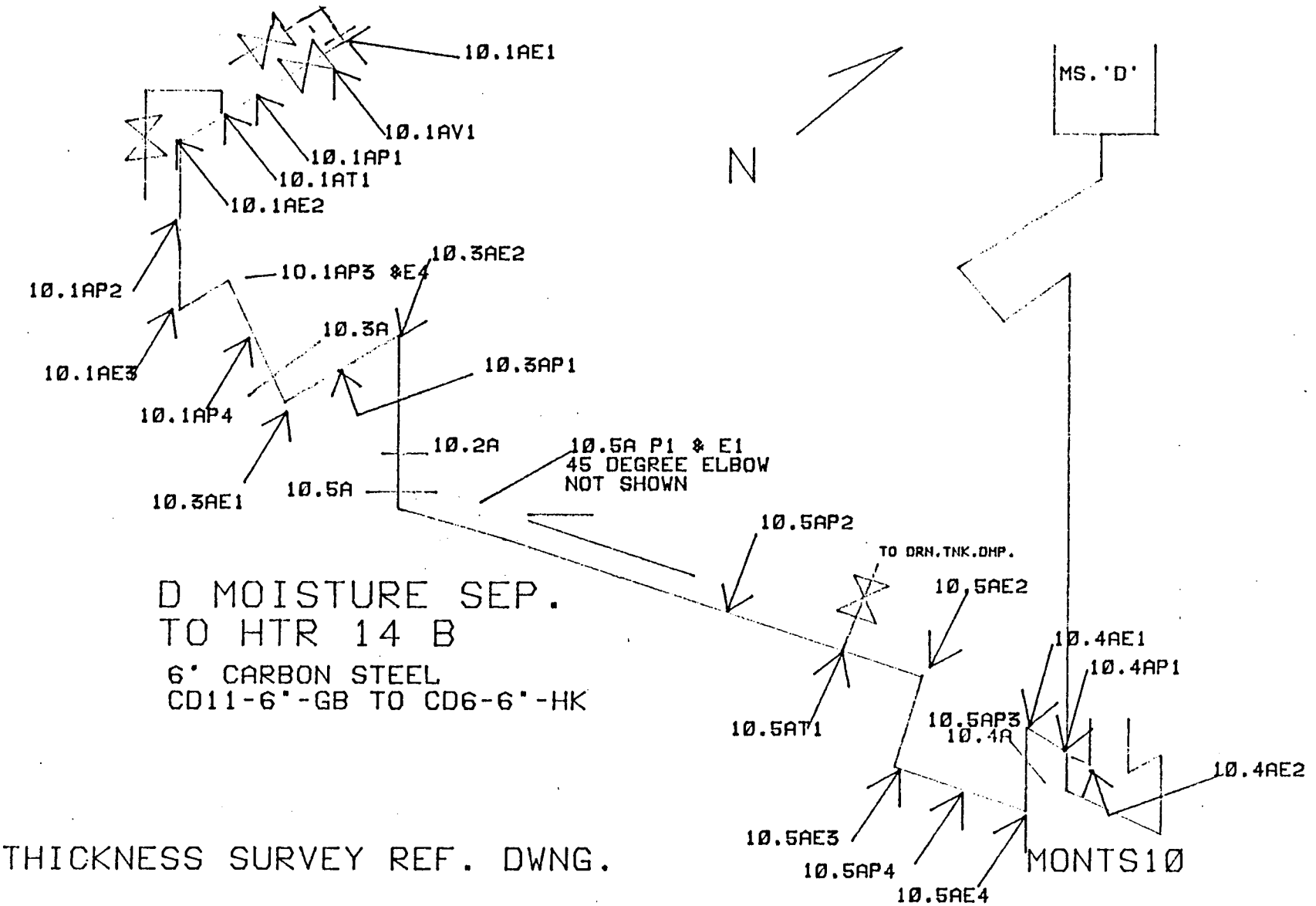
19												
20												
21												

MINIMUM WALL = .32"



THICKNESS SURVEY REF. DWNG.

Notes

ISO-MTS-10

MS-D to FWH 14B 6"

Area	Scaffold Req'd. (Frequency)	Disc #
10.0A	yes	Nortec
10.1A	yes	Nortec
10.3A	NO	Nortec
10.4A	No	Nortec
10.2A	No	
10.5A	No	

Areas 10.2A and 10.5A were added in November 1994

Thickness Survey

Date 06-12-84
Disc NA

Plant Monticello
Area 10.0 A Entire Elbow
Examiner(s) ASW / KLH
Calibration Block: Type 3080-83 Serial Number 322
Transducer: Size .25" Dia Frequency 5 MHz
Iso # MTS-10
Grid Spacing 2"
Equipment Used Nortec 131-D

	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.354	.328	.311	.335	.347	.324	.333	.359	.338	.345	.300	.334
2	.329	.320	.325	.304	.314	.317	.355	.341	.346	.337	.325	.342
3	.343	.336	.298	.294	.311	.336	.354	.340	.367	.355	.354	.340
4	.347	.310	.297	.288	.298	.316	.349	.340	.358	.363	.361	.339
5	.330	.313	.298	.313	.299	.320	.325	.338	.377	.361	.365	.332
6	.331	.341	.305	.298	.304	.325	.352	.334	.360	.348	.355	.352
7	.350	.326	.306	.305	.313	.334	.335	.335	.330	.352	.335	.350
8		.337	.324	.313	.320	.350	.352					
9			.328	.332	.339							
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

Comments:

Thickness Survey

Date 06-12-84
Disc N/A

Plant Monticello
Area 10.1A Entire Elbow
Examiner(s) ASW / KLH
Iso # MTS-10
Grid Spacing 2"
Equipment Used Nortec 131-D
Calibration Block: Type 3080-83 Serial Number 322
Transducer: Size .25" Dia Frequency 5 mHz.

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.330	.323	.324	.332	.333	.337	.331	.321	.338	.328	.327	.320
2	.321	.314	.310	.318	.326	.328	.328	.322	.338	.342	.350	.323
3	.321	.314	.300	.309	.317	.323	.323	.329	.345	.352	.353	.332
4	.312	.309	.315	.303	.312	.318	.320	.328	.339	.350	.345	.331
5	.312	.303	.296	.297	.305	.320	.322	.330	.337	.338	.337	.333
6	.321	.305	.301	.298	.304	.319	.328	.328	.330	.324	.329	.327
7	.345	.305	.307	.306	.313	.321	.328	.327	.320	.312	.337	.318
8		.316	.312	.317	.318	.328	.329					
9			.327	.326	.331							
10												
11												
12												
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14												
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16												
17												
18												
19												

Comments:

THICKNESS SURVEY REPORT

DATE 5/11/96

DISC# N/A

PLANT MONTICELLO

ISO# MTS-10

AREA MTS-10,2A

GRID SIZE N/A

EXAMINERS M. L. LENTSDORF

EQUIPMENT NORTEC 131-D #409

TRANSDUCER (SIZE/FREQ.) ½" 2.25 MHz, A30160

CAL. BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

NOMINAL WALL 6" CARBON STEEL

MIN. WALL N/A

COMMENTS 0° AT INNER RADIUS OF LOWER ELBOW; 0" AT CIRC. WELD.

LIMITATION AT 120° DUE TO ADJACENT PIPE.

Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
X 0"	.31	.31	.31	.32		.32	.34	.34	.34	.34	.32	.32
2"	.32	.32	.32	.33		.34	.34	.34	.34	.34	.32	.32
3'4"	.31	.31	.32	.33		.34	.34	.34	.34	.34	.32	.32
4'6"	.32	.32	.32	.34		.34	.34	.34	.34	.34	.32	.32
8'8"	.32	.32	.32	.34		.34	.34	.34	.34	.32	.32	.32
6												
7												
8												
9												
10												
11												
12												
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14												
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16												
17												
18												
19												
20												
21												

MINIMUM WALL = .31"

Thickness Survey

Date 6-26-84
Disc N/A

Plant Monticello
Area 10.3A ENtire Elbow
Examiner(s) ASW/KLH/Q.L.
Iso # M.T.S-10
Grid Spacing 2"
Equipment Used Nortec-131-D
Calibration Block: Type 3080-83 Serial Number 269
Transducer: Size .25" dia. Frequency 5 MHz.

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.315	.305	.305	.295 ø	.314	.314	.325	.332	.296	.312	.315	.318
2	.310	.313	.327	.331	.323	.316	.313	.307	.287	.299	.301	.304
3	.304	.318	.339	.345	.325	.321	.309	.290	.282	.288	.287	.298
4	.304	.307	.331	.335	.320	.325	.308	.282	.273	.282	.286	.297
5	.308	.311	.319	.308	.313	.316	.301	.296	.266	.282	.295	.300
6	.306	.311				.312	.306	.301	.272	.283	.300	.300
7							.311	.304	.277	.290	.309	.309
8									.287	.303		
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

Comments:

Thickness Survey

Date 5-24-84

Plant Monticello — Iso # MTS-10

Area 10.4A Entire Elbow — Grid Spacing 2"

Examiner(s) D. HALL, Q. Loredo — Equipment Used Nortec-131-D

Calibration Block: Type 3030-83 — Serial Number 322

Transducer: Size .25" dia. — Frequency 5 MHz.

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.330	.285	.275	.293	.284	.272	.293	.296	.292	.299	.305	.304
2	.329	.305	.290	.294	.275	.254	.269	.294	.273	.294	.306	.319
3	.331	.312	.295	.284	.270	.241	.253	.261	.220	.282	.305	.326
4	.336	.317	.294	.292	.272	.251	.257	.274	.227	.287	.302	.320
5	.320	.315	.299	.299	.283	.260	.262	.277	.278	.293	.306	.313
6	.302	.299	.287	.287	.299	.279	.274	.302	.300	.321	.298	.302
7												
8												
9	-	-	-	-	-	-	-	-				
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

THICKNESS SURVEY REPORT

DATE 5/16/86

DISC# N/A

PLANT MONTICELLO

ISO# MTS-10

AREA MTS-10.4A

GRID SIZE N/A

EXAMINERS M.J. Longsdorf

EQUIPMENT NORTEC 131-D ⇌ 409

TRANSDUCER (SIZE/FREQ.) ½" 2.25MHz, A30160

CAL.BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

NOMINAL WALL 6" CARBON STEEL

MIN. WALL N/A

COMMENTS 0° AT INNER RADIUS OF ELBOW; 0" AT DOWN STREAM CIRC. WELD.

Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
X 0"	.36	.36	.36	.36	.36	.36	.34	.36	.36	.36	.36	.36
2"	.36	.36	.36	.36	.36	.34	.34	.36	.36	.36	.36	.36
3' 4"	.36	.36	.36	.36	.34	.33	.32	.33	.35	.36	.36	.36
4' 6"	.36	.36	.36	.36	.35	.34	.33	.34	.35	.36	.36	.36
5' 8"	.36	.36	.36	.36	.36	.36	.36	.36	.36	.36	.36	.36
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

MINIMUM WALL = .32"

THICKNESS SURVEY REPORT

DATE 5/16/86

DISC# N/A

PLANT MONTICELLO | ISO# MTS - 10

AREA MTS - 10.5A | GRID SIZE N/A

EXAMINERS M. J. [illegible] / M. D. LANSDOWNE | EQUIPMENT NORTEC 131-D #409

TRANSDUCER (SIZE/FREQ.) 1/2" 2.25 MHz A30160 | CAL.BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

NOMINAL WALL 6" CARBON STEEL | MIN. WALL N/A

COMMENTS 0° AT INNER RADIUS OF ELBOW; 0" AT DOWN STREAM CIRC. WELD
LIMITATION AT 8" AND 120° DUE TO ADJACENT PIPE.

Degree \ Grid	0"	2"	4"	6"	8"	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
330	.36	.34	.36	.36	.36							MINIMUM WALL = .32"								
300	.36	.36	.36	.36	.36															
270	.34	.36	.34	.34	.36															
240	.36	.35	.34	.34	.34															
210	.36	.34	.33	.33	.34															
180	.35	.32	.32	.32	.34															
150	.34	.34	.33	.33	.34															
120	.36	.35	.34	.34																
90	.36	.36	.34	.34	.36															
60	.36	.36	.36	.36	.36															
30	.36	.36	.36	.36	.36															
0	.37	.36	.36	.36	.36															

INPUT FILE NAME cmonts10

OUTPUT FILE NAME a:cmonts10.ou2

BOUNDING LEVEL = 90 %

NUMBER OF CASES = 1

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 3:19
NORTHERN STATES POWER COMPANY

MONTICELLO THICKNESS SUR.#10

CASE = 1 NCHEM = 1 TOTAL TIME = 110000. NSEG = 2

ICHEM	FMULT	PH	OXY	HOURS
0	100.000	7.100	1000.0	110000.

NCOMP = 21 DESIGN PRESS.= 202. DESIGN TEMP.= 383.

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 3:19
NORTHERN STATES POWER COMPANY

MONTICELLO THICKNESS SUR.#10

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED AVERAGE EROSION RATE (MM/YR)
10.1AE1	.00
10.0E1	.00
10.4AE1	.00
10.4AE2	.00
10.1AV1	.00
10.1AT1	.00
10.1AE2	.00
10.1AE3	.00
10.1AE4	.00
10.3AE1	.00
10.3AE2	.00
10.5AE1	.00
10.5AE2	.00
10.5AE3	.00
10.5AE4	.00
10.5AT1	.00
10.5AE1	.00
10.0AP1	.00
10.1AP1	.00
10.1AP1	.00
10.1AP2	.00
10.1AP3	.00
10.1AP4	.00
10.3AP1	.00
10.2AP1	.00
10.5AP1	.00
10.5AP2	.00
10.5AP3	.00
10.5AP4	.00
10.4AP0	.00
10.4AP1	.00

NOTE:
THE AVERAGE EROSION RATE FOR EACH COMPONENT IS CALCULATED USING THE MAXIMUM TOTAL TIME FOR THE PROBLEM

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 3:19
NORTHERN STATES POWER COMPANY

MONTICELLO THICKNESS SUR.#10

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED HOURS TO REACH MINIMUM WALL THICKNESS
10.1AE1	5470643.
10.0E1	5470643.
10.4AE1	5470643.
10.4AE2	5470643.
10.1AV1	6586771.
10.1AT1	6586771.
10.1AE2	11051290.
10.1AE3	11051290.
10.1AE4	11051290.
10.3AE1	11051290.
10.3AE2	11051290.
10.5AE1	11051290.
10.5AE2	11051290.
10.5AE3	11051290.
10.5AE4	11051290.
10.5AT1	16631930.
10.5AE1	22212570.
10.0AP1	33373850.
10.1AP1	33373850.
10.1AP1	33373850.
10.1AP2	33373850.
10.1AP3	33373850.
10.1AP4	33373850.
10.3AP1	33373850.
10.2AP1	33373850.
10.5AP1	33373850.
10.5AP2	33373850.
10.5AP3	33373850.
10.5AP4	33373850.
10.4AP0	33373850.
10.4AP1	33373850.

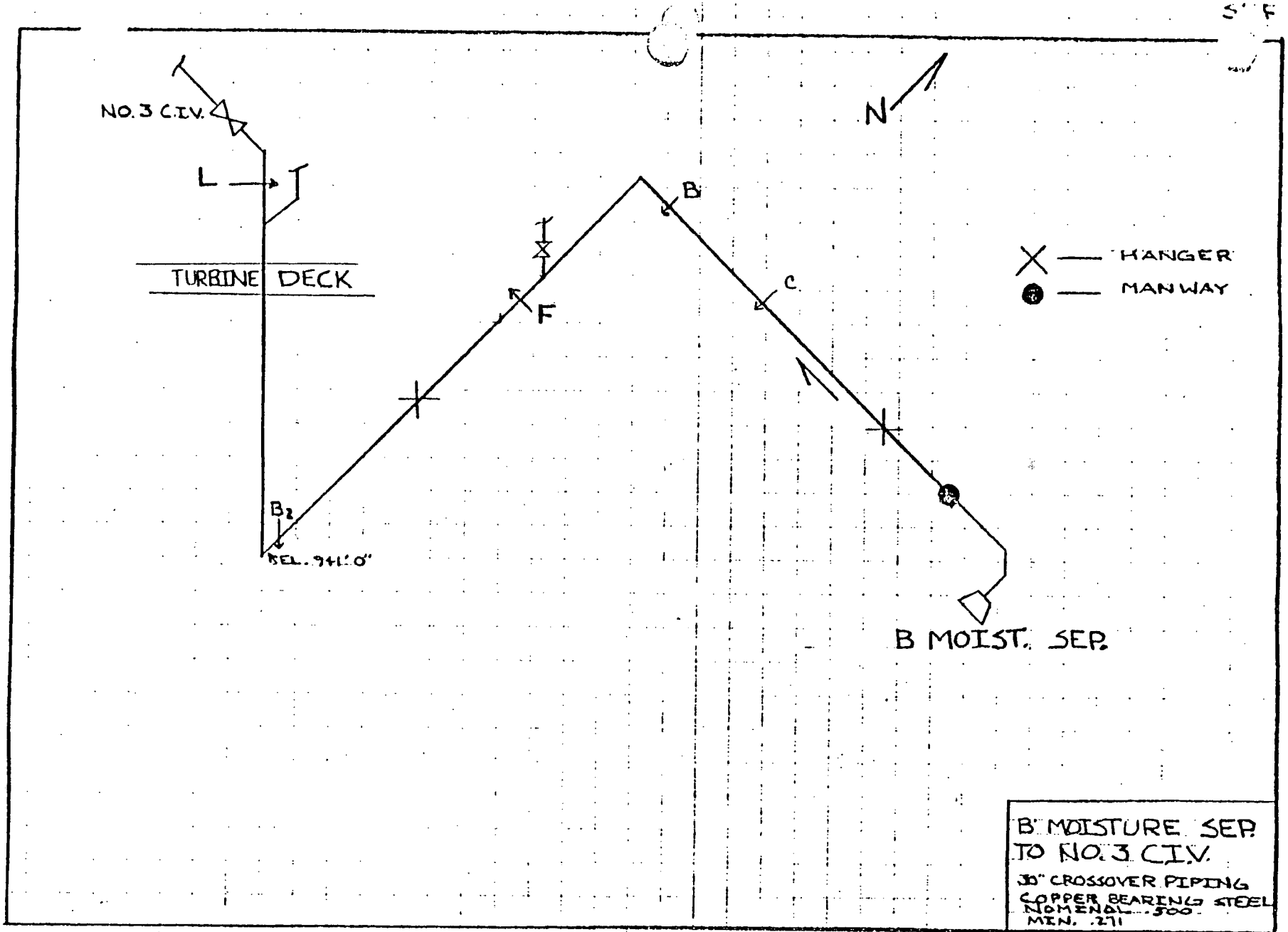
WARNING:
THE DESIGN MINIMUM WALL THICKNESS USED IN PREDICTING TOTAL HOURS IS BASED ON DESIGN PRESSURE ONLY. UTILITIES MUST PERFORM PLANT SPECIFIC ENGINEERING EVALUATIONS THAT INCLUDE ALL LOADS TO PREDICT TOTAL HOURS BEFORE A FAILURE WOULD OCCUR.

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 3:19
NORTHERN STATES POWER COMPANY

MONTICELLO THICKNESS SUR.#10

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED THICKNESS (INCH)	PREDICTED WEAR (INCH)	LATEST EROSION RATE (MM/YEAR)	MINIMUM WALL THICKNESS (INCH)
10.1AE1	.275	.005	.00	.044
10.0AP1	.279	.000	.00	.044
10.0E1	.275	.005	.00	.044
10.1AP1	.279	.000	.00	.044
10.1AV1	.276	.004	.00	.044
10.1AP1	.279	.000	.00	.044
10.1AT1	.276	.004	.00	.044
10.1AE2	.278	.002	.00	.044
10.1AP2	.279	.000	.00	.044
10.1AE3	.278	.002	.00	.044
10.1AP3	.279	.000	.00	.044
10.1AE4	.278	.002	.00	.044
10.1AP4	.279	.000	.00	.044
10.3AE1	.278	.002	.00	.044
10.3AP1	.279	.000	.00	.044
10.3AE2	.278	.002	.00	.044
10.2AP1	.279	.000	.00	.044
10.5AE1	.278	.002	.00	.044
10.5AP1	.279	.000	.00	.044
10.5AE1	.279	.001	.00	.044
10.5AP2	.279	.000	.00	.044
10.5AT1	.278	.002	.00	.044
10.5AE2	.278	.002	.00	.044
10.5AE3	.278	.002	.00	.044
10.5AP3	.279	.000	.00	.044
10.5AP4	.279	.000	.00	.044
10.5AE4	.278	.002	.00	.044
10.4AP0	.279	.000	.00	.044
10.4AE1	.275	.005	.00	.044
10.4AP1	.279	.000	.00	.044
10.4AE2	.275	.005	.00	.044


NO. 3 C.I.V.
L
TURBINE DECK
B
F
C
B2
EL. 941'-0"
N
HANGER
MANWAY
B MOIST. SEP.
B MOISTURE SEP. TO NO. 3 C.I.V.
30" CROSSOVER PIPING
COPPER BEARING STEEL
NOMINAL .500
MIN. .271

ISO-MTS-11

Notes
ISO-MTS-11

MS-B to LPA 20"

Area	Scaffold Req'd.	Frequency	Disc #
B	yes		32
F	yes		34
L	NO		28
E.J	yes		33
C	yes		35

1984 Weld repair was done in several areas between B-2 and F. See plant report for details.

Plant Monticello — Date 4-26-84

Area L — Iso # MTS-11

Examiner(s) ASW/DAH/KLH — Grid Spacing 4"

Calibration Block: Type 3080-83 Serial Number N/A — Equipment Used U.I. III

Transducer: Size ½" Dia — Frequency 5MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	1.200	1.180	1.140	1.150	1.250	1.050	1.000	1.050	1.030	1.010	1.010	1.060
2	1.190	1.240	1.200	1.170	1.240	1.040	1.000	1.040	1.010	1.040	.950	1.080
3	W	E	L	D								↑
4	.570	.570	.570	.590	.570	.580	.560	.560	.550	.560	.570	.560
5	.550	.570	.540	.570	.590	.580	.570	.570	.540	.560	.540	.570
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U.S.

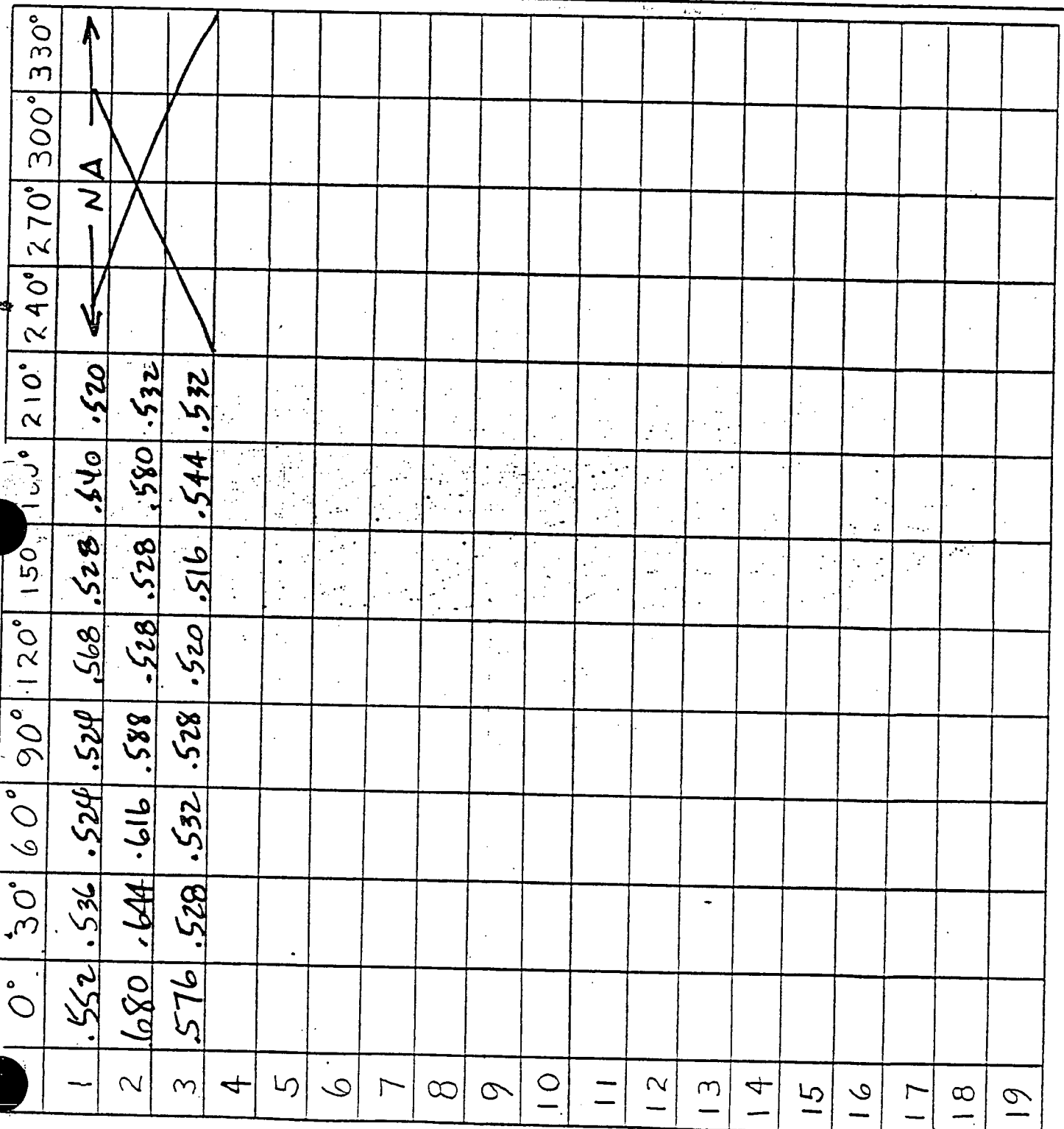
D.S.

Thickness Survey

Date 7-17-84
Disc # 33

Plant MONTICELLO
Area B2/DS/POST WELD.
Examiner(s) ASW/KLH/NAM
Calibration Block: Type _____ Serial Number NA
Transducer: Size 1/2" ∅ Frequency 3.5 MHZ PC

Iso # MTS-11
Grid Spacing 200
Equipment Used UI TII



	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.552	.536	.524	.524	.568	.528	.540	.520				
2	.680	.644	.616	.588	.528	.528	.580	.532				
3	.576	.528	.532	.528	.520	.516	.544	.532				
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Comments:

THICKNESS SURVEY REPORT

DATE 5-12-86

DISC# 33.B

PLANT MONTICELLO

ISO# MTS-11

AREA B.2 DS

GRID SIZE 200

EXAMINERS [illegible]

EQUIPMENT ULTRA IMAGE III

TRANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

NOMINAL WALL .500"

MIN. WALL .271"

COMMENTS REF.-TRACK SET D.S. 6" FROM WELD ℄.

NO READINGS ALONG Y-10 AXIS DUE TO WELD/LIFT-OFF & NOISE. NOTE: ADDITIONAL SCANS ON

HANGER LIMITED ACCESS ON 0°-90° SCAN. DISK 33.B.

LOWEST AREA - .404"

180°-270° - X-54, Y-13

X / Degree / Y / Grid	0	46	92	138	55	110	165	49	8	0	54	108
	0	30	60	90	120	150	180	210	240	270	300	330
1 0	.524	.528	.524	.516	.524	.516	—	.516	.528	.524	.520	.516
2 10	.636	—	—	—	—	.464	—	—	—	.632	.608	.616
3 20	.532	.532	.528	.532	.532	.532	.600	.524	.524	.524	.524	.528
4 30	.516	.528	.532	.532	.536	.536	.520	.520	.524	.524	.528	.528
5 40	—	.532	.532	—	.532	.532	.528	—	—	.524	.528	.532
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Thickness Survey

Date 7-18-84
Disc #33

Plant MONTICELLO
Area B2/US/POSTWELD
Examiner(s) ASW/KLH/NAM
Calibration Block: Type 3080-83 Serial Number NA
Transducer: Size 1/2" Ø Frequency 3.5 MHZ PC

Iso # MTS-11
Grid Spacing 200
Equipment Used U I III

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
330°																			
300°	NA																		
270°																			
240°	.540	.496	.512																
210°	.488	.504	.512																
180°	.488	.536	.508																
150	.532	.508	.516																
120°	.508	.512	.540																
90°																			
60°	N/A																		
30°																			
0°																			

Comments:

Disc. # 22 Date 05-08-84

Plant Monticello Iso # MTS-11

Area B-2 RVS (up stream of hanger) Grid Spacing 4"

Examiner(s) DAH/SRF/KLH Equipment Used U.I. III

Calibration Block: Type 3088-83 Serial Number N/A

Transducer: Size ½" Dia. Frequency 5 mHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.480	.480	.500	.480	.500	.500	.530	.500	.500	.500	.488	.504
2	.490	.480	.480	.480	.490	.490	.510	.492	.500	.496	.492	.488
3	.480	.480	.500	.480	.490	.490	.520	.500	.496	.568	.500	.500
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THICKNESS SURVEY REPORT

DATE 5-10-86

DISC# 33.A&B

PLANT MONTICELLO

AREA B.2 U.S.

EXAMINERS [illegible]

TRANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

NOMINAL WALL .500"

ISO# MTS-11

GRID SIZE 200

EQUIPMENT ULTRA IMAGE III

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

MIN. WALL .271"

COMMENTS REF. POINT - TRANSDUCER ℄ 6½" UPSTREAM OF BRACKET (HANGER).

UNSCANNED AREAS DUE TO BOLTS.

LOWEST AREA IS .428"

180°-270° X-11, Y-51

X Degree / Y Grid	0	44 30	88 60	132 90	44 120	88 150	132 180	44 210	88 240	132 270	44 300	88 330
0	.508	.504	.504	—	.516	.524	.508	.508	.512	.516	.508	.508
10	—	.504	.504	—	.524	.520	.508	.508	.508	.520	.516	.516
20	.504	.504	.504	.504	.504	.516	.500	.512	.516	.520	.508	.508
30	.504	.512	.504	.504	.528	.528	.528	.520	.512	.512	.512	.508
40	.504	.504	.508	.504	.520	.536	.532	.508	.520	.516	.512	.508
50	.504	.504	.508	.504	.528	.536	.520	.536	.520	.516	.508	.508
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Disc. # 33 Date 05-09-84

Plant Monticello Iso # MTS - 11

Area B-2 Grid Spacing 4"

Examiner(s) DAH/QL/KLH/SRF Equipment Used U.I. III

Calibration Block: Type 3080-83 Serial Number N/A

Transducer: Size ½" Dia Frequency 5 mHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.640	.580	.570	.560	.560	.560	.560	.590	.540	.540	.580	.590
2	.580	.580	.580	.550	.560	.550	.560	.540	.540	.550	.580	.570
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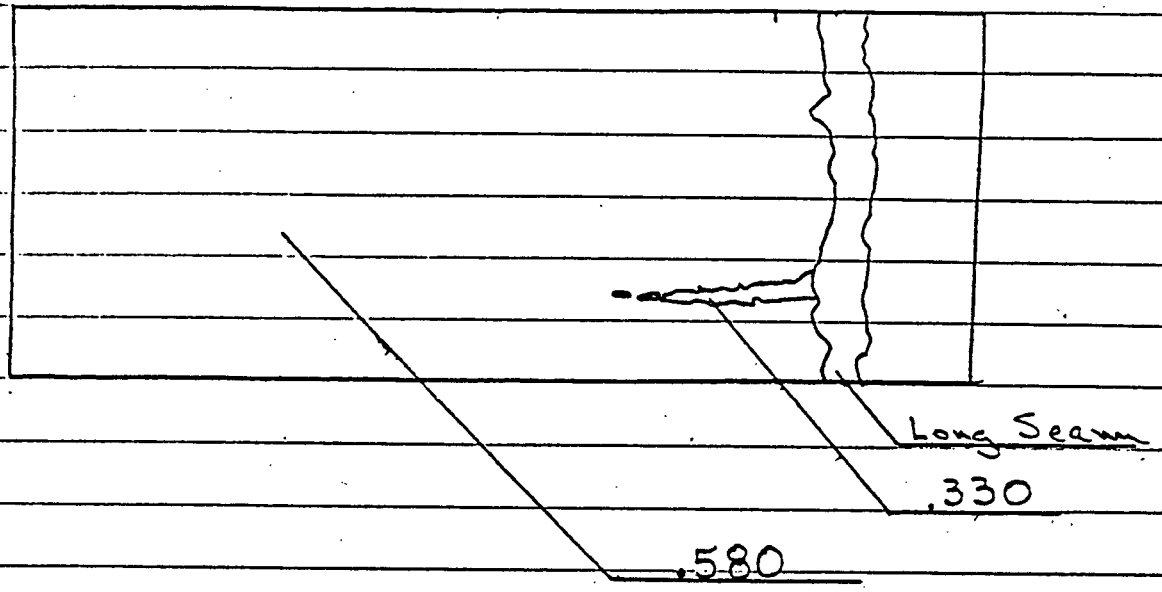
B-2 Disc# 33

Iso# MTS-11/05-9-84



Disc. # 34

Date 05-11-84

Plant Monticello

Iso # MTS-11

Area F

Grid Spacing 4"

Examiner(s) DAH/QL

Equipment Used U.I. III

Calibration Block: Type 3080-83 Serial Number N/A

Transducer: Size ½" Dia Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.500	.508	.512	.524	.500	.520	.508	.504	.512	.500	.492	.492
2	.500	.508	.508	.516	.492	.492	.504	.512	.488	.500	.492	.492
3	.504	.500	.500	.504	.496	.492	.500	.496	.500	.500	.496	.496
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THICKNESS SURVEY REPORT

DATE 5/10/86

DISC# 34

PLANT MONTICELLO

ISO# MTS-11

AREA "F"

GRID SIZE 200

EXAMINERS DAN SELLS/STEVE ALGER/RAY WOLF

EQUIPMENT UI III

TRANSDUCER (SIZE/FREQ.) .25" 10 MHZ.

CAL. BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

NOMINAL WALL .5"

MIN. WALL MIN=.360 MAX .910

COMMENTS DELAYS ARE OFF due to P/C in 84, P/E 10MHZ. 86

Degree / Grid	← File 9 0 4	30 44	→ 60 88	← File 10 90 4	120 44	→ 150 88	← File 12 180 4	210 44	→ 240 88	← File 11 270 4	300 44	→ 330 88
1	.520	.520	.512	.516	.512	.512	.512	.428	.424	.512	.520	.512
2	.512	.512	.520	.520	.524	.520	.552	.524	.520	.516	.516	.520
3	.512	.512	.520	.512	.512	.508	.484	.512	.522	.520	.520	.512
4	.512	.520	.520	.524	.520	.524	.496	.520	.520	.520	.520	.520
5	.520	.520	.524	.524	.524	.556	.528	.524	.524	.520	.524	.520
6							← File 13		→			
7							.512	.532	.520			
8							.508	.520	.520			
9							.512	.500	.516			
10							.512	.520	.500			
11							.512	.512	.432			
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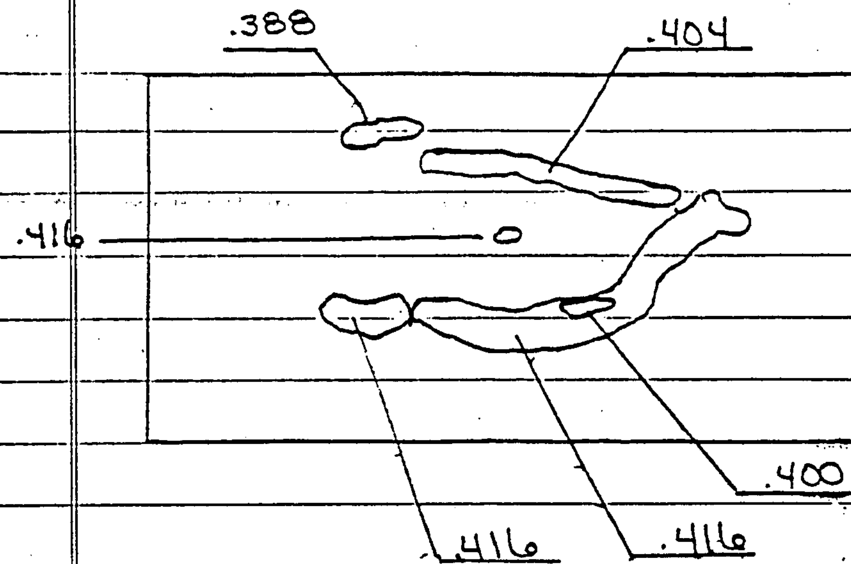
THINNEST AREA (File 13)
X = 38
Y = 28
D .396

AREA (File 12)
202° — 256°
THIN WALL

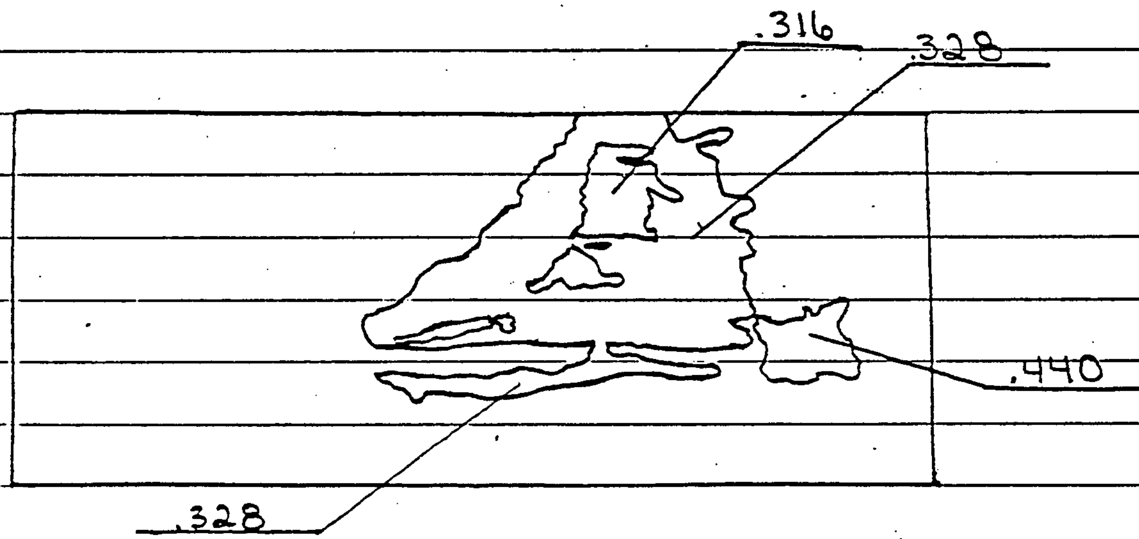
Area F 180°-270°

Iso MTS-11 05-11-84



6" GEN. Area 730 BY VENT

Iso MTS-11 05-15-84



Iso MTS-1L
Disc. # 34

AREA F 7:30 BY VENT

GENERAL AREA POST WELD

.536	.512	.508	.508	.500
.508	.516	.496	.508	.496
.508	.504	.500	.496	.504
.496	.504	.512	.532	.504

Page ___ of ___
Report # _____

Thickness Survey

Date 7-18-84
Disc #32

Plant MONTICELLO
Area B- POSTWELD.
Examiner(s) _____
Calibration Block: Type _____
Transducer: Size .5 DIA

Iso # MTS-11
Grid Spacing _____
Equipment Used UE III
Serial Number NA
Frequency 3.5 MHz PC

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
330°																			
300°																			
270°	NA																		
240°																			
210°																			
180°	.508	.536	.572																
150°	.512	.508	.528																
120°	.484	.508	.508																
90°	.508	.500	.492																
60°	.592	.488	.484																
30°																			
0°	NA																		

Comments:

Misc. # 02 Date 5-~~25~~-84

Plant Monticello Iso # MTS-11

Area B Grid Spacing 4"

Examiner(s) DAH | QL | KLH Equipment Used U.I. III

Calibration Block: Type 3080-83 Serial Number N/A

Transducer: Size ½" Dia Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.520	.540	550	.540	.530	.530	.530	.530	.530	.530	.530	.520
2	.530	.540	.540	.560	.550	.540	.530	.540	.540	.470	.530	.540
3	.510	.530	.550	.540	.550	.570	.560	.550	.570	.510	.540	.530
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THICKNESS SURVEY REPORT

DATE 5-14-86

DISC# 32

PLANT MONTICELLO

ISO# MTS-11

AREA B

GRID SIZE 150

EXAMINERS STEVE STANFORD II / A.W. NOSS / S.G. HALL

EQUIPMENT ULTRA IMAGE III

TRANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

CAL. BLOCK (TYPE/SERIAL NO.) STEWEDGE 3080-83

NOMINAL WALL .500"

MIN. WALL .271"

COMMENTS LIMITATIONS DUE TO SPATTER, NUTS & L.S. ALSO ROUGH SURFACES CONTRIBUTE TO NOISE SIGNALS.

* REF. 10 3/4" FROM ℄ OF X-DUCER TO ℄ OF WELD D.S.

LOWEST AREA - .408"
210°-270° X-36, Y-61

X Degree / Y Grid	0	30	60	90	120	150	180	210	240	270	300	330
10		.504	.520	.528	—	.524	.520	.516	.512	—	—	.516
110		.508	.508	—	—	.524	.508	.508	.508	—	.520	.528
120		.524	.544	—	—	—	—	.508	.508	—	.508	.516
130		.528	.528	.524	—	.508	.516	.512	.508	—	.516	.524
140		.504	.504	.528	—	.520	.508	.500	.504	.516	.508	.520
150		.504	.508	.524	—	.516	.508	.500	.508	.524	.524	.524
160		.516	.508	.528	—	.532	.512	.516	.508	.508	—	.520
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DISC. #35 Date 05-11-84

Plant Monticello Iso # MTS-11

Area C Grid Spacing 4"

Examiner(s) DAH / KLH / QL Equipment Used U.I. III

Calibration Block: Type 3080-83 Serial Number N/A

Transducer: Size ½" Dia Frequency 5mHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1							.496	.496	.484	.484	.496	.484
2	←	W	A	L	L	→	.500	.492	.496	.496	.492	.476
3							.508	.504	.496	.484	.496	.496
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THICKNESS SURVEY REPORT

DATE 5-9-86

DISC# 34

PLANT MONTICELLO

ISO# MTS-11

AREA 7:30 BY VENT

GRID SIZE 80

EXAMINERS [illegible]

EQUIPMENT ULTRA IMAGE III

TRANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

NOMINAL WALL .500"

MIN. WALL .271"

COMMENTS IMAGE GRID REF. 7 3/4" U.S. FROM NEAREST WELD & 34 1/4" CCW FROM 0°

SPATTER LIMITATION IN AREA OF X-85, Y-31

LOWEST AREA IS .472"
X-30, Y-21

X Degree / Y Grid	0 ϕ	20 30	40 60	60 90	80 120	90 150	180	210	240	270	300	330
1 0	.520	.500	.504	.512	.512	.520						
2 10	.528	.496	.504	.500	.504	.512						
3 20	.52	.492	.508	.496	.588	.520						
4 30	.512	.504	.504	.512	.520	.532						
5 40	.520	.504	.504	.520	.516	.528						
6 45	.520	.508	.500	.532	.508	.524						
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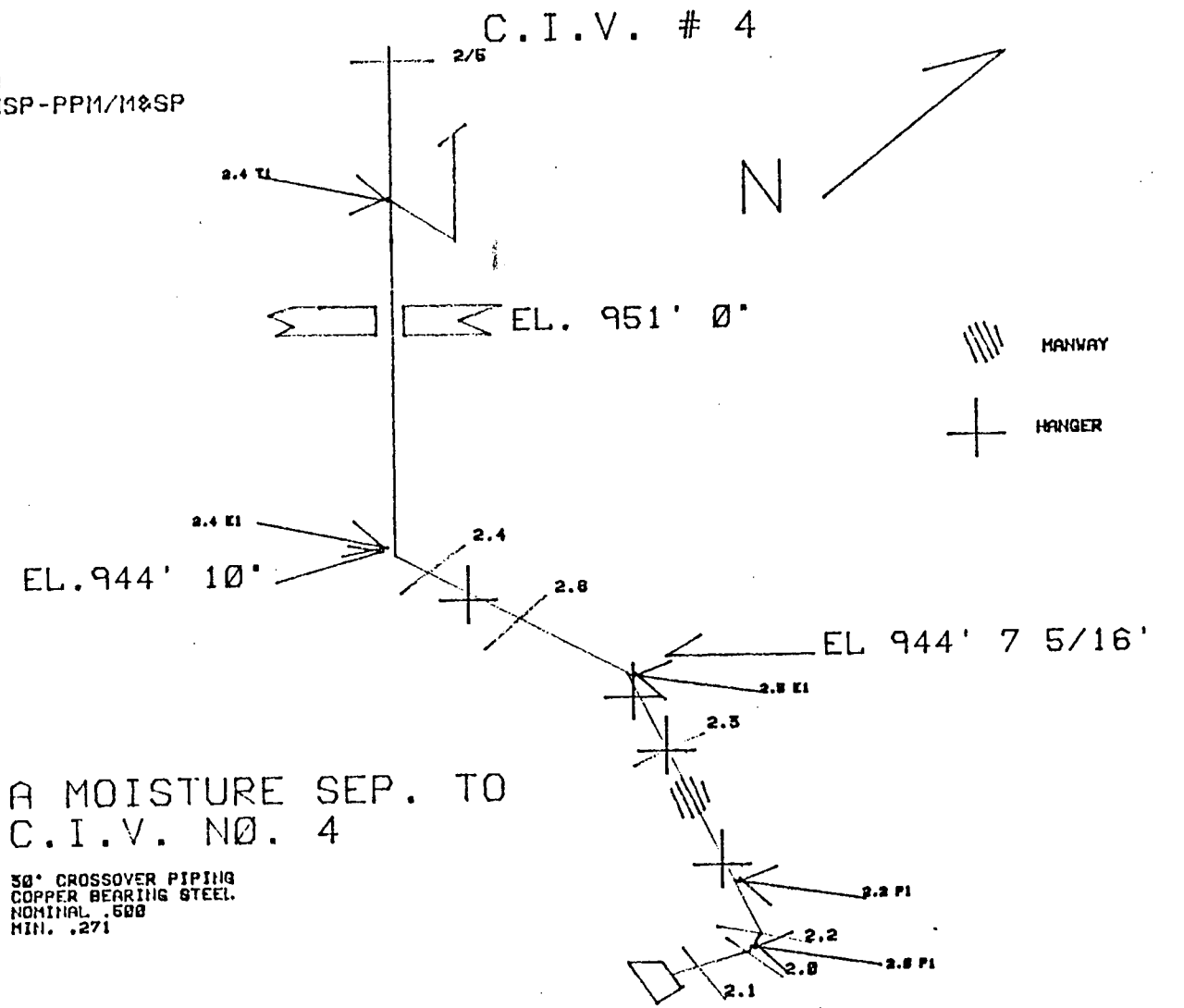
8/28/87
MARK HUGO
SR.ENG. NSP-PPM/M&SP
MPLS,MN



50' CROSSOVER PIPING
COPPER BEARING STEEL.
NOMINAL .500
MIN. .271

THICKNESS SURVEY REF. DWNG.

MONTS12

Notes

ISO-MTS-12

MS-A to ZP-B 20'

Area	Scaffold Reqd.	Frequency	Disc #
2.0	yes		54
2.1	yes		55
2.2	yes		53
2.3	yes		72
2.4	yes		70
2.5	NO		27
2.6	yes		71

Thickness Survey

Date 10-2-97
Disc 54

Plant Monticello
Iso # MTS-12
Area 2.0/US/10"-10"
Grid Spacing 180
Examiner(s) ASW/SRF/KLH
Equipment Used UT-III
Calibration Block: Type 3080-83 Serial Number N/A
Transducer: Size ½" P.C Frequency 5 mHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.500	.524	.504	.516	*	.504	.504	.508	.488	.496	.508	.504
2	.500	.500	.496	.504	*	.508	.504	.504	.516	.484	.528	.504
3	.446	.460	.500	.504	*	*	.504	.508	.480	.476	.528	.504
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19												

Comments: *Limited scan 90° To 180° due To 4" pipe
2 small welds at 90°

Thickness Survey

Date 8/11-01

Disc 55

Plant Monticello

Iso # MTS-12

Area 2.1/05/110"-0"

Grid Spacing 180

Examiner(s) ASW/KLH/SRF

Equipment Used UT-III

Calibration Block: Type 3080-83 Serial Number N/A

Transducer: Size ½" P-C Frequency 5 MHz

Node #	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.524	.524	.496	.500	.504	.496	.516	.520	.516	.528	.544	.536
2	.520	.524	.512	.496	.504	.504	.524	.520	.508	.528	.520	.520
3	.532	.524	.500	.492	.516	.508	.504	.504	.524	.528	.504	.508
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Comments:

Date 6-8-84

Plant Monticello — Iso # MTS-12

Area 2.2 — Grid Spacing 180

Examiner(s) ASW/RLH/SRF — Equipment Used UI-III

Calibration Block: Type 3090-83 — Serial Number N14

Transducer: Size ½" P-C — Frequency 5 mHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.520	.516	.504	.508	.500	.496	.488	.492	.476	.480	.496	.492
2	.500	.528	.496	.504	.520	.496	.496	.516	.500	.504	.496	.480
3	.500	.508	.500	.500	.520	.528	.492	.520	.504	.500	.496	.494
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Date [illegible]
Disc 72

Plant Monticello
Area 2.3 105 10-10
Examiner(s) ASW/KLH/JEB
Calibration Block: Type 3080-83
Transducer: Size ½" dia

Iso # MTS-12
Grid Spacing 180
Equipment Used UI-III
Serial Number N/A
Frequency 3.5 mhz P-C

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.532	.524						.544	.540	.536	.528	.528
2	.524	.524		W	A	L		.528	.528	.524	.524	.528
3	.532	.524			L			.532	.528	.528	.528	.524
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Comments:

Thickness Survey

Date 8-2-87
Disc 70

Plant Monticello
Iso # MTS-12
Area 2.4 / 10S / 10-10
Grid Spacing 180
Examiner(s) ASW / KLH / JEB
Equipment Used UI-III
Calibration Block: Type 3080-83
Serial Number N/A
Transducer: Size ½" dia
Frequency 3.5 mhz P-C

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.520	.520	.572	.516	.520	.520	.520	.508	.524	.524	.520	.516
2	.520	.528	.520	.516	.520	.516	.520	.516	.516	.512	.520	.512
3	.500	.524	.524	.516	.524	.536	.520	.508	.520	.516	.520	.524
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Comments:

Disc #27

Plant Monticello — Date 4-25-84

Area 2.5 — Iso # MTS-HCC/2

Examiner(s) ASW/DAH/SRF — Grid Spacing 4"

Calibration Block: Type 3080-83 — Equipment Used U.I. III

Transducer: Size ½" Dia — Serial Number N/A

Frequency 5MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	1.170	1.140	1.180	1.150	1.150	1.020	1.040	1.020	1.020	1.010	1.000	1.040
2	1.160	1.030	1.150	1.160	1.170	1.030	1.030	1.000	1.030	1.000	1.020	1.020
3	W	E	L	D	W	E	L	D	W	E	L	D
4	.560	.550	.560	.550	.590	.550	.600	.540	.550	.570	.570	.570
5	.600	.560	.540	.580	.590	.590	.560	.590	.600	.560	.600	.610
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Thickness Survey

Date 8-2-84
Disc 71

Plant Monticello
Iso # MTS-12
Area 2.6/US/0-10
Grid Spacing 180
Examiner(s) ASW/KLH/JEB
Equipment Used UI-III
Calibration Block: Type 3080-83 Serial Number N/A
Transducer: Size ½" dia Frequency 3.5 MHz P-C

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.492	.508	.508	.512	.492	.528	.528	.532	.532	.524	.544	.524
2	.496	.508	.516	.536	.508	.528	.528	.528	.528	.528	.524	.524
3	.488	.492	.508	.488	.488	.540	.528	.536	.528	.528	.524	.528
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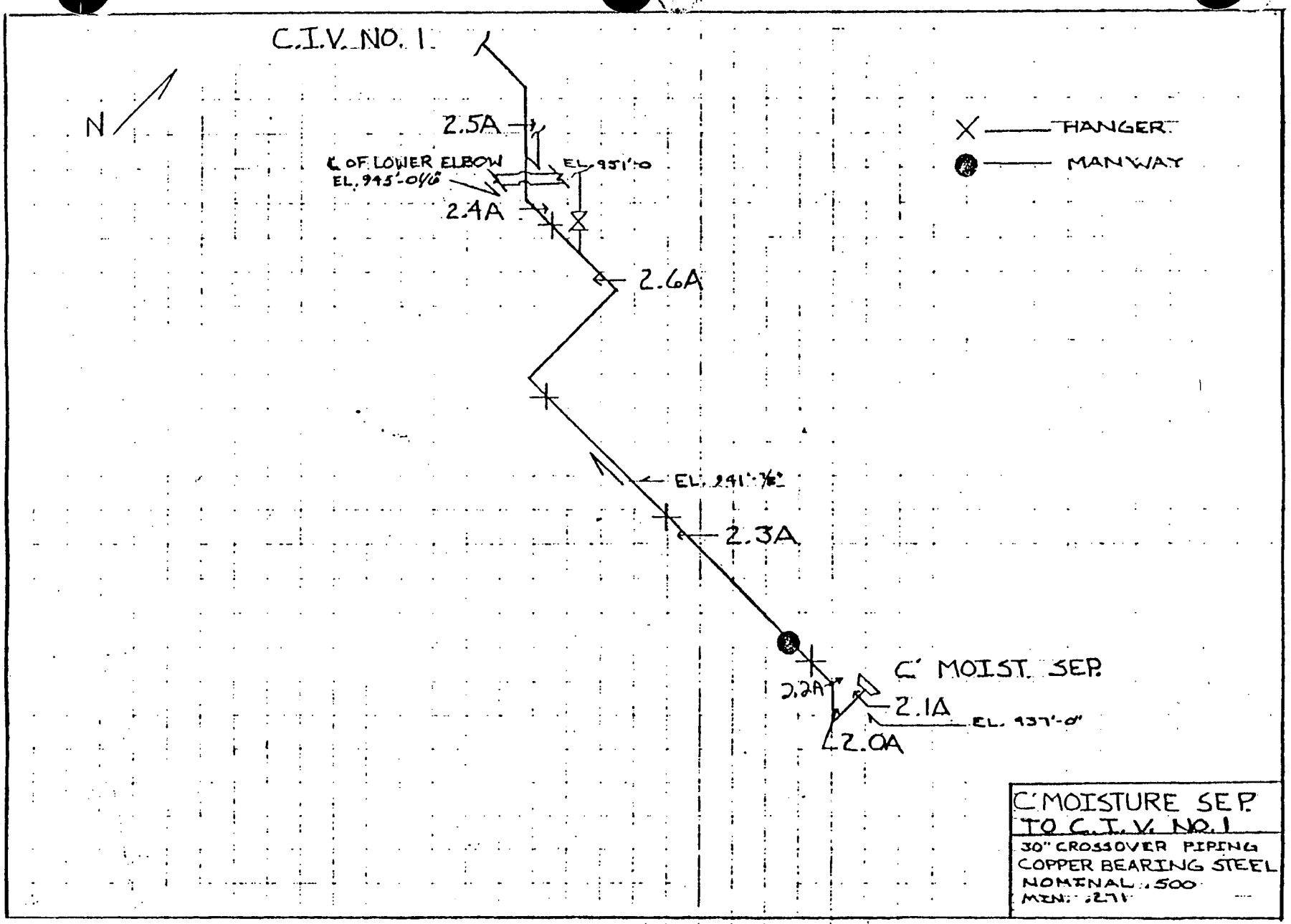
Comments:


C.I.V. NO. 1
N
2.5A
℄ OF LOWER ELBOW
EL. 945'-0⅛"
EL. 951'-0
2.4A
2.6A
EL. 941'-7½"
2.3A
C' MOIST. SEP.
2.2A
2.1A
EL. 937'-0"
2.0A
HANGER
MANWAY
C' MOISTURE SEP.
TO C.I.V. NO. 1
30" CROSSOVER PIPING
COPPER BEARING STEEL
NOMINAL .500
MIN: .271

ISO-MTS-13

Notes

ISO-MTS-13

MS-C to LPB 30"

Area	Scaffold Req'd.	Frequency	Disc #
2.0A	yes		41
2.1A	yes		Nortec
2.2A	yes		Nortec
2.3A	NO		39
2.4A	yes		38
2.5A	NO		29
2.6A	Yes		31

FORM 17-3509

Date [illegible]

Disc 41

Plant MONTICELLO — Iso # MTS-13

Area 2.0A 0° TO 180° — Grid Spacing 4"

Examiner(s) D HALL, K HALL, Q LOREDO — Equipment Used NORTEL 131D & U I III

Calibration Block: Type STEP BLOCK — Serial Number 322

Transducer: Size 1/2" dia — Frequency 2.25 MHZ

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
330°	.504	.500	.516																
300°	.508	.504	.492																
270°	.468	.508	.572																
240°	.520	.496	.508																
210°	.528	.508	.508																
180°	.538	.540	.537																
150°	.538	.542	.537																
120°	.535	.520	.523																
90°	.513	.514	.528																
60°	.529	.525	.532																
30°	.548	.545	.542																
0°	.540	.538	.535																

Comments:

Plant MONTICELLO
Area 2.1A 0° TO 330°
Examiner(s) D. HALL, Q. LOREDO
Calibration Block: Type 3080-B3
Transducer: Size .5" dia

Date [illegible]
Disc N/A
Iso # MTS-13
Grid Spacing 4"
Equipment Used NORTEC 131 D & UI III
Serial Number 322 / NA
Frequency 2.25 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.521	.534	.529	.535	.539	.529	.538	.533	.534	.532	.539	.534
2	.542	.529	.534	.541	.535	.528	.531	.526	.532	.528	.528	.535
3	.541	.524	.536	.545	.532	.531	.528	.526	.530	.524	.528	.535
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Comments:

Date 5-21-84
Disc 44

Plant Monticello
Area 2.2A 90° to 270° Top of Elbow
Examiner(s) D HALL, Q Loredo
Calibration Block: Type 3080-83
Transducer: Size .5" Dia.

Iso # MTS-13
Grid Spacing 4"
Equipment Used Nortec 131-D, U.I
Serial Number 322, NA
Frequency 2.25 mHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.508	.520	.508	.546	.559	.551	.509	.556	.553	.549	.526	.532
2	.508	.524	.504	.545	.548	.548	.528	.554	.551	.543	.532	.512
3	.540	.508	.528	.542	.542	.541	.532	.552	.546	.542	.512	.536
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Comments:

Date 5-15-84

Plant Monticello
Area 2.3A / DS / 0-10
Examiner(s) ASW / SRF / QL
Iso # (Disc. 39) MTS-13
Grid Spacing 4"
Equipment Used UT III
Calibration Block: Type 3080-B3 Serial Number N/A
Transducer: Size ½" dia Frequency 5MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.504	~~.480~~	.488	.508	.476	.476	.492	.492	.432	.492	.446	.492
2	.492	.508	.476	.496	.480	.500	.480	.504	.496	.496	.492	.496
3	.504	.508	.508	.500	.488	.472	.472	.504	.496	.472	.444	.472
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Date 5-15-84

Plant Monticello

Iso # (Disc. 38) MTS-13

Area ~~[illegible]~~ 2.4A/05/0-10

Grid Spacing 4"

Examiner(s) DAH/QL/KLH

Equipment Used UI III

Calibration Block: Type 3080-83

Serial Number N/A

Transducer: Size 1/2" dia.

Frequency 5 MHZ

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.512	.580	.528	.528	.532	.528	.508	.540	.560	.504	.536	.584
2	.532	.552	.532	.524	.520	.520	.536	.520	.532	.532	.540	.548
3	.524	.532	.536	.532	.524	.51	.524	.512	.512	.528	[illegible]	.548
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THICKNESS SURVEY REPORT

DATE 5-14-86

DISC# 38

PLANT MONTICELLO

ISO# MTS-13

AREA 2.4 A U.S. 0°-10°

GRID SIZE 180

EXAMINERS STEVE STANFORD II / A.W. VOSS / S.G. HALL

EQUIPMENT ULTRA IMAGE III

TRANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

NOMINAL WALL .500"

MIN. WALL .271"

COMMENTS

LOWEST AREA - .340" (0°-90°)
X-49, Y-7
GENERAL LOW AREA X-40 TO X-58
Y-0 TO Y-50

X Degree / Y Grid	0 0	55 30	110 60	165 90	49 120	98 150	0 180	50 210	00 240	150 270	47 300	94 330
0	.520	.512	.520	.516	.516	.516	.520	.524	.524	.512	.520	.516
10	.520	.516	.516	.516	.516	.512	.516	.524	.520	.516	.532	.516
20	.520	.520	.520	.516	.532	.524	.524	.528	.516	.516	.524	.516
30	.520	.404	.524	.516	.512	.516	.516	.524	.528	.516	.532	.488
40	.520	.520	.520	.484	.512	.520	.520	.528	.520	.516	.520	.520
50	.512	.524	.520	.516	.520	.524	.516	.524	.520	.512	.532	.552
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20												
21												

Plant Monticello
Area 2.5-A
Examiner(s) ASW/DAH/KLH
Calibration Block: Type 3080-83 Serial Number N/A
Transducer: Size ½" Dia Frequency 5 mHz

Date 4-26-84
Iso # MTS #ac 13
Grid Spacing 4"
Equipment Used U. I. III

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	1.160	1.070	1.040	1.030	1.040	1.040	1.040	1.090	1.170	1.140	1.150	1.170
2	1.170	1.040	1.020	1.030	1.040	1.050	1.030	1.070	1.190	1.180	1.150	1.150
3	W	E	L	D	W	E	L	D	W	E	L	D
4	.540	.540	.550	.600	.550	.560	.590	.570	.540	.550	.590	.570
5	.560	.540	.540	.590	.590	.590	.570	.600	.590	.600	.590	.560
6												
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US

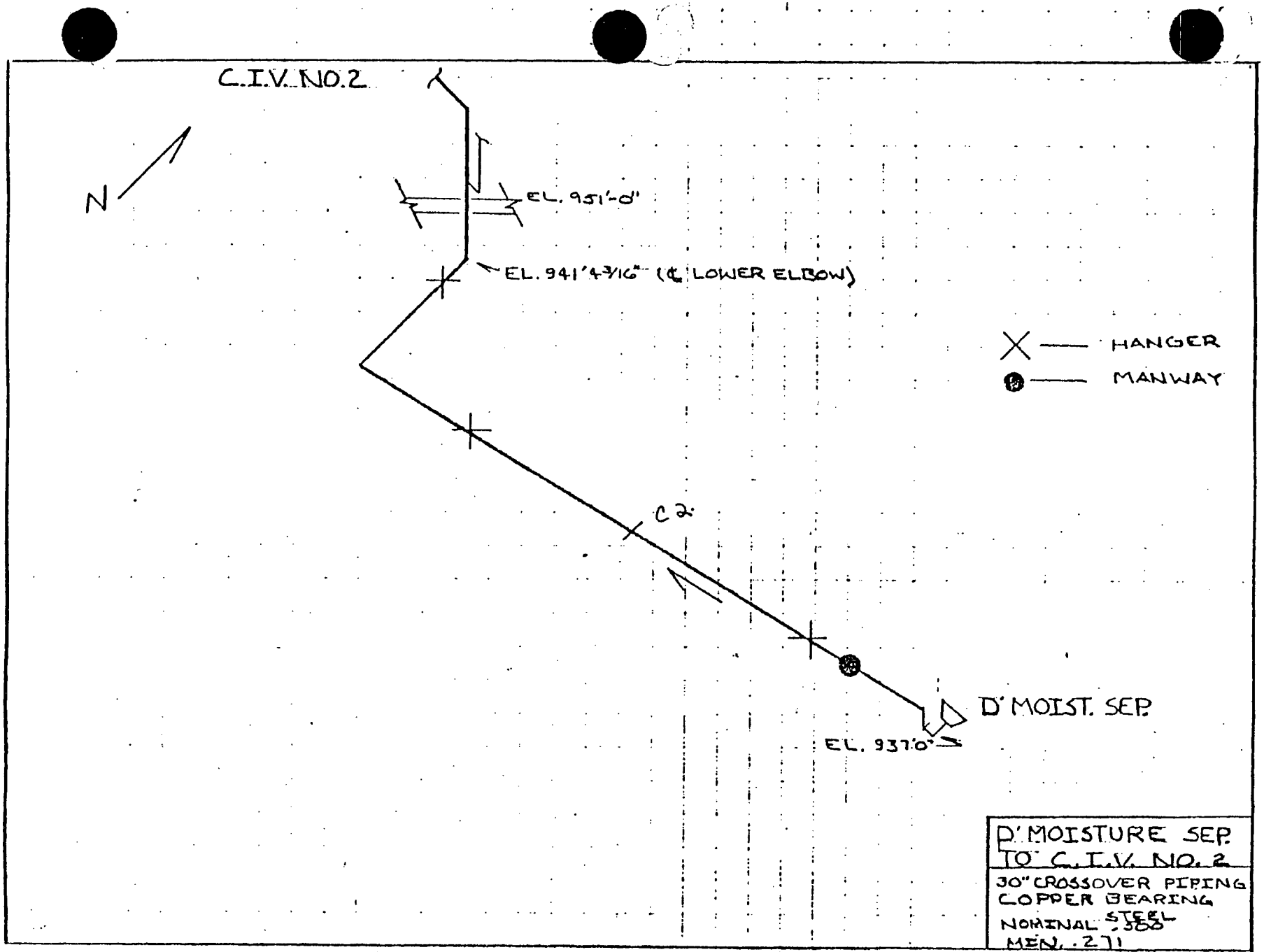
DS

Date 5-4-84

Plant Monticello
Area ~~1~~ 26A /DS./0-10
Examiner(s) DAH / KLH
Calibration Block: Type 3080-83
Transducer: Size ½"

Iso # ~~DISC~~.#31 MTS-13
Grid Spacing 4"
Equipment Used UI III
Serial Number N/A
Frequency 5MHZ

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0°	.540	.530	.550																
30°	.540	.540	.540																
60°	.550	.540	.530																
90°	.550	.540	.550																
120°	.490	.530	.530																
150°	.500	.550	.530																
180°	.530	.530	.530																
210°	.540	.550	.570																
240°	.540	.550	.550																
270°	.550	.570	.550																
300°	.530	.530	.550																
330°	.530	.530	.520																


C.I.V. NO.2
N
EL. 951'-0"
EL. 941'-4 7/16" (℄ LOWER ELBOW)
HANGER
MANWAY
C 2
D' MOIST. SEP.
EL. 937'-0"
D' MOISTURE SEP. TO C.I.V. NO. 2
30" CROSSOVER PIPING
COPPER BEARING
NOMINAL STEEL
WEN. .271

ISO-MTS-14

Notes

ISO-MTC-14

MS-B to LP-A 30'

Area	Scaffold Req'd.	Frequency	Disc #
C-2	NO		40

Date 5-16-84

Plant Monticello Iso # (Disc #40) MTS-14

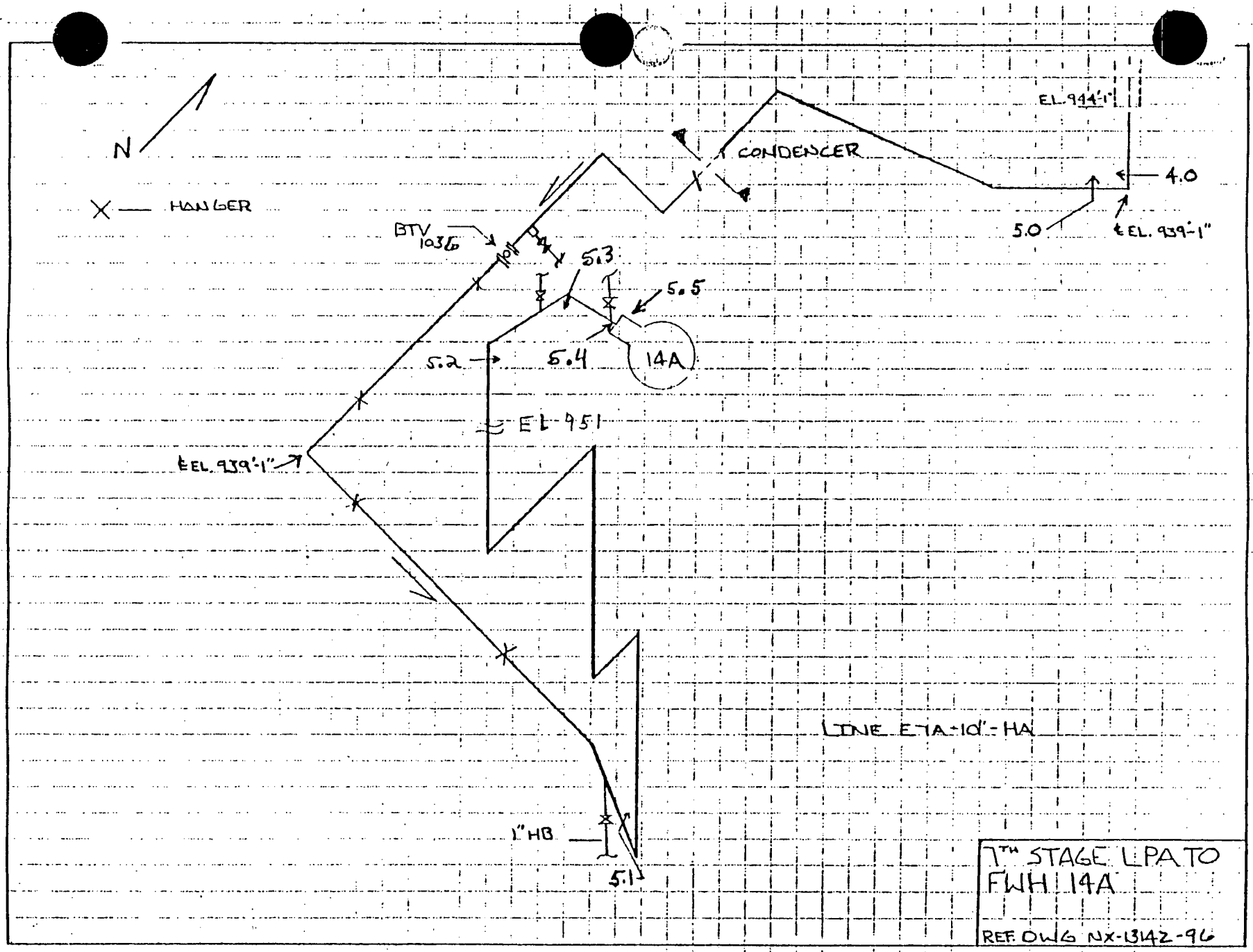
Area C2/DS/0-10 Grid Spacing 4"

Examiner(s) AWS/SRF/KLH/QL Equipment Used 4I III

Calibration Block: Type 3080-P3 Serial Number N/A

Transducer: Size 1/2" dia. Frequency 5 MHz

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
330°	.488	.484	.464																
300°	.492	.484	.492																
270°	.476	.480	.476																
240°	.476	.476	.480																
210°	.460	.440	.480																
180°	.492	.480	.492																
150°	.492	.496	.500																
120°	.492	.492	.480																
90°	.484	.492	.484																
60°	.480	.492	.480																
30°	.492	.484	.492																
0°	.484	.484	.480																


N
X — HANGER
CONDENCER
EL. 944'-1"
4.0
5.0
℄ EL. 939'-1"
BTV 1036
5.3
5.5
5.2
5.4
14A
EL 951
℄ EL. 939'-1"
LINE E-1A-10"-HA
1" HB
5.1
7TH STAGE LPA TO FWH 14A
REF. DWG NX-1342-96

ISO-MTS-15

Notes

ISO-MTS-15

7th Stage LPA to FWSH 10A

Area	Scaffold Req'd.	Frequency	Disc #
4.0	NO		Nortec
5.0	NO		Nortec
5.1	NO		Nova 100-D
5.2	yes		62
5.3	yes		Nortec
5.4	yes		Nortec
5.5	yes		Nortec

Thickness Survey

Date 7-14-87
Disc N/A

Plant Monticello
Iso # MTS-15
Area 4.0 Entire Elbow
Grid Spacing 2"
Examiner(s) ASW/ALH
Equipment Used Nortec 1310
Calibration Block: Type 3080.83 Serial Number 287
Transducer: Size .25" Dia Frequency 5 mHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.347	.349	.330	.351	.373	.381	.393	.367	.361	.356	.374	.366
2	.354	.362	.345	.355	.374	.380	.396	.376	.383	.377	.383	.373
3	.315	.358	.342	.401	.389	.392	.392	.379	.369	.372	.376	.366
4	.319	.351	.329	.354	.383	.391	.399	.380	.368	.373	.374	.369
5	.327	.342	.327	.354	.384	.393	.397	.384	.373	.368	.367	.364
6		.345	.335	.343	.376	.392	.396	.386	.375	.372	.368	.363
7			.329	.345	.370	.390	.385	.387	.381	.382	.372	.368
8				.348	.376	.381	.401	.385	.374	.382	.380	
9					.377	.374	.388	.381	.380	.370	.372	
10					.380	.385	.390	.383	.371	.364	.368	
11					.381	.395	.400	.390	.366			
12								.382	.373			
13									.377			
14												
15												
16												
17												
18												
19												

Comments:

Thickness Survey

Date 07-19-84
Disc N/A

Plant Monticello
Iso # MTS-15
Area 5.0 Entire Elbow
Grid Spacing 2"
Examiner(s) ASW KLH
Equipment Used Nortec 131-D
Calibration Block: Type 3080-83 Serial Number 287
Transducer: Size .25" Dia Frequency 5 mhz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.431	.440	.439	.429	.406	.404	.377	.358	.352	.376	.411	.420
2	.441	.437	.434	.420	.399	.400	.375	.361	.358	.381	.416	.423
3	.425	.432	.436	.422	.397	.394	.376	.355	.360	.385	.415	.417
4	.424	.430				.399	.366	.356	.361	.386	.404	.414
5								.352	.359	.384	.390	
6									.353	.368		
7												
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17												
18												
19												

Comments:

Thickness Survey

Plant Monticello — Iso # MTS-15 — Date 7-3-84

Area S.I. Entire Elbow — Grid Spacing 2" — Disc N/A

Examiner(s) ASW / DAH — Equipment Used Nova 100-D

Calibration Block: Type 3080-83 — Serial Number 109

Transducer: Size .5" dia — Frequency 5mhz PC

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.341	.366	.376	.363	.378	.377	.394	.373	.369	.336	.332	.346
2	.353	.362	.367	.361	.370	.378	.390	.377	.369	.342	.335	.356
3	.351	.368	.370	.358	.373	.373	.385	.373	.370	.341	.339	353
4	.362	.371	.379	.369	.369	.365	.382	.374	.369	.340	.337	.352
5	.352	.378	.380	.371	.370	.368	.379	.368	.365	.338	.330	.349
6	.367	.372	.380	.373	.385	.366	.378	.371	.360	.336	.341	.349
7	.369	.371	.368	.363	.370	.368	.371	.369	.352	.338	.332	.365
8	.384	.381	.366	.354	.361	.370	.378	.366	.357	.342	.344	.388
9		.385	.372	.356	348	.369	.384	.376	.366	.352	.352	.389
10			.399	.368	.351	.365	.382	.377	.370	.357	.355	
11				.366	.344	.352	.381	.378	.379	.362		
12					.348	.347	.371	.374	.380	.373		
13						.340	.367	.379	.377			
14						.341	.366	.368	.384			
15						.343	.357	.366	.369			
16												
17												
18												
19												

Comments:

Thickness Survey

Date 6-25-84
Disc 62

Plant Monticello
Iso # MTS-15
Area 5.2 IDS 10-10"
Grid Spacing 100
Examiner(s) ASW/KLH/QL
Equipment Used UI-III
Calibration Block: Type 3080-83 Serial Number M14
Transducer: Size ½" Frequency 3.5 mHz

	0°	30°	60°	90°	120°	150°	160°	210°	240°	270°	300°	330°
1	.380	.356	.368	.360	.356	.372	.408	.368	.364	.340	.344	.340
2	.360	.360	.344	.360	.368	.356	.372	.364	.368	.356	.344	.344
3	.356	.360	.360	.356	.372	.364	.392	.396	.368	.346	.356	.344
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16												
17												
18												
19												

Comments:

Thickness Survey

Date 06/26/84
Disc NA

Plant Monticello
Iso # MTS-15
Area 5.3 Entire ELBOW
Grid Spacing 2"
Examiner(s) ASW/QL/KLH
Equipment Used Nortec 131-D
Calibration Block: Type 3080-83 Serial Number 269
Transducer: Size .25" Dia Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	160°	210°	240°	270°	300°	330°
1	.430	.427	.436	.440	.431	.421	.415	.406	.421	.444	.435	.434
2	.443	.422	.426	.434	.421	.426	.420	.412	.426	.441	.437	.433
3	.436	.427	.415	.431	.419	.428	.423	.424	.433	.448	.442	.435
4	.432	.425	.408	.433	.426			.433	.431	.447	.444	.433
5	.434	.423	.417	.447						.441	.444	.436
6	.449	.431	.433								.444	.441
7	.442	.437									.433	.440
8	.453	.434										.437
9												
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17												
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19												

Comments:

Thickness Survey

Date 06-26-84
Disc NA

Plant Monticello
Area 5.4 Entire Nozzle
Examiner(s) ASW/QL/KLH
Iso # MTS-15
Grid Spacing 2"
Equipment Used Nortec-131-D
Calibration Block: Type 3080-83 Serial Number 269
Transducer: Size .25" Dia Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	160°	210°	240°	270°	300°	330°
1	.318	.263	.421	.487	.486	.496	.493	.512	.527	.487	.492	.461
2	.306	.365	.453	.487	.490	.506	.508	.523	.541	.515	.545	.551
3	.504	.433	.428	.486	.485	.500	.521	.533	.535	.526	.544	.551
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Comments:

THICKNESS SURVEY REPORT

DATE 5/16/86

DISC# N/A

PLANT MONTICELLO

ISO# MTS-15

AREA MTS-5.4

GRID SIZE N/A

EXAMINERS M.J. LONGSDORF

EQUIPMENT NORTEC 131-D # 409

TRANSDUCER (SIZE/FREQ.) 1/2", 2.25 MHz, A30160

CAL. BLOCK (TYPE/SERIAL NO.) ROMPAS # LMT052

NOMINAL WALL N/A

MIN. WALL N/A

COMMENTS 0° AT INSIDE RADIUS OF ELBOW; 0" AT DOWN STREAM CIRC. WELD. RADIUS APPEARS THICKER DUE TO GAP UNDER TRANSDUCER.

Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
0"	.34	.32	.30	.29	.29	.29	.28	.29	.29	.29	.30	.32
1"	.32	.30	.29	.29	.28	.26	.25	.26	.28	.29	.30	.30
2"	.34	.31	.30	.29	.28	.24	.23	.25	.28	.28	.29	.29
3"	.34	.32	.30	.28	.27	.26	.27	.28	.28	.29	.30	.32
4"	.34	.32	.29	.28	.28	.28	.27	.28	.29	.29	.30	.32
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20												
21												

* MINIMUM WALL = .23"

* CALIBRATION ON ROMPAS SIDE DRILLED HOLE @ .3" AND .7" @ 3 DIV AND 7 DIV

Thickness Survey

Date 06-26-8384
Disc NA

Plant Monticello
Iso # MTS-15
Area 5.5 on FWH-14A
Grid Spacing 2"
Examiner(s) ASW/QL/KLH
Equipment Used Nortec 131-D
Calibration Block: Type 3080-83 Serial Number 269
Transducer: Size .25" Dia Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	160°	210°	240°	270°	300°	330°
1	.471						.474					
2	.460	.463				.464	.464					
3	.461	.460	.464	.468	.468	.462	.460					
4	.457	.461	.461	.465	.461	.463	.464					
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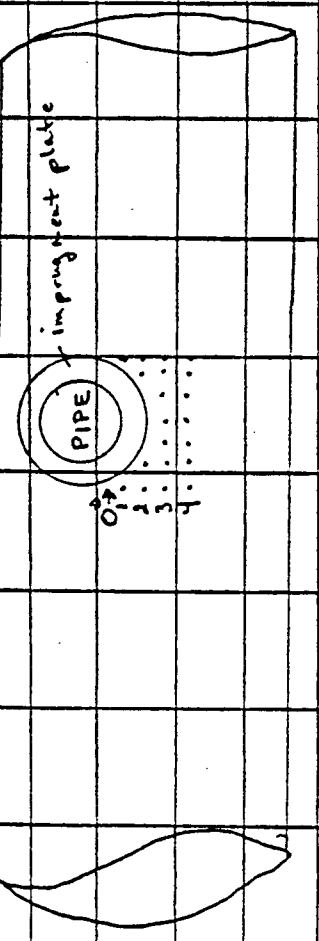

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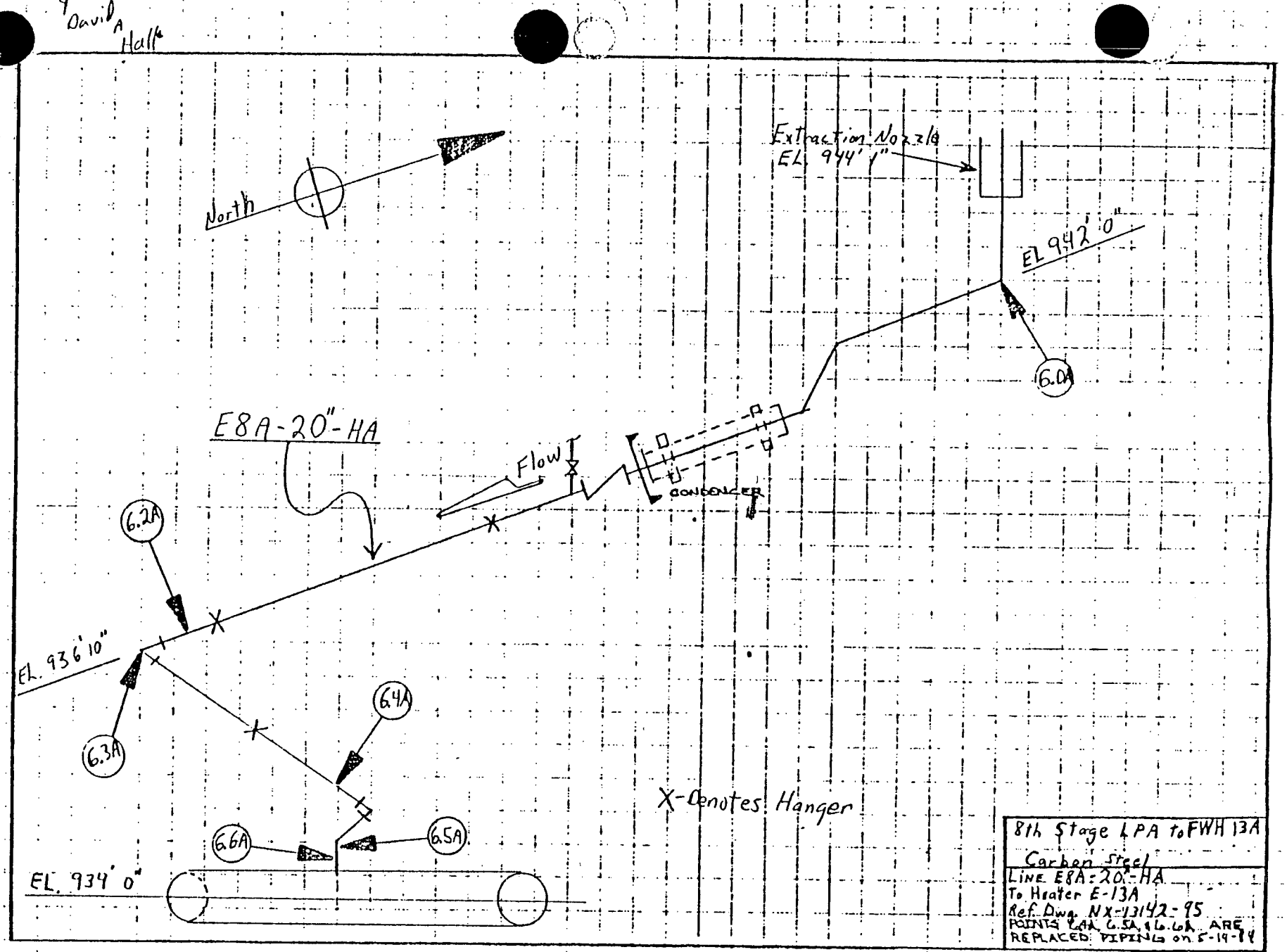
David A Hall
North
Extraction Nozzle
EL 944' 1"
EL 942' 0"
6.0A
E8A-20"-HA
Flow
CONDENSER
6.2A
EL. 936' 10"
6.4A
6.3A
X-denotes Hanger
6.6A
6.5A
EL. 934' 0"
8th Stage LPA to FWH 13A
Carbon Steel
LINE E8A-20"-HA
To Heater E-13A
Ref. Dwg. NX-13142-95
POINTS 6.2A, 6.5A & 6.6A ARE
REPLACED PIPING on 5-19-94

ISO-MTS-16

ISO-MTS-16

2nd Stage LP-A to FWH 13A

Area	Scaffold Req'd.	Frequency	Disc #
6.5A	NO		Nortec
6.2A	yes		666
6.3A	yes		Nortec
6.4A	yes		Nortec
6.5A	yes		Nortec
6.6A	yes		Nortec

Plant Monticello
Area 6.0A Entire Elbow
Examiner(s) ASW / ALH
Calibration Block: Type 3080-83
Transducer: Size ¼" dia

Date [illegible]
Disc N/A
Iso # MTS-16
Grid Spacing 4"
Equipment Used Nortec 1310
Serial Number 287
Frequency 5 mhz

	0°:	30°	60°	90°	120°	150°	160°	210°	240°	270°	300°	330°
1	.410	.411	.447	.434	.439	.413	.408	.440	.421	.439	.426	.392
2	.436	.439	.445	.437	.446	.408	.397	.424	.423	.422	.446	.423
3	.476	.454	.452	.448	.451	.396	.402	.429	.455	.439	.454	.455
4	.457	.458	.449	.449	.454	.443	.401	.444	.454	.442	.452	.433
5			.469	.451	.449	.449	.387	.410	.443	.434	.457	
6				.438	.441	.421	.391	.408	.446	.433		
7				.458	.433	.395	.393	.394	.437	.423		
8				.431	.426	.386	.374	.396	.430			
9					.412	.389	.396	.392	.421			
10						.412		.406				
11								.410				
12												
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18												
19												

Comments:

Thickness Survey

Date 7-18-84
Disc 66

Plant Monticello
Area 6-2A
Examiner(s) ASW/KLH/NAM
Calibration Block: Type 3080-83
Transducer: Size ½" dia

Iso # MTS-16
Grid Spacing 200
Equipment Used UI-II
Serial Number N/A
Frequency 3.5 mhz P-C

	0°	30°	60°	90°	120°	150°	160°	210°	240°	270°	300°	330°
1	.404	.388	.360	.340	.312	.384	.344	.380	.360	.388	.424	.396
2	.376	.400	.392	.364	.380	.352	.356	.312	.364	.404	.408	.388
3	.392	.388	.356	.320	.360	.332	.340	.368	.376	.392	.404	.392
4												
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Comments:

Plant Monticello Iso # MTS-16 Date 07-19-84

Area 6.3A Entire Elbow Grid Spacing 4"

Examiner(s) ASW KLH Equipment Used Nortec

Calibration Block: Type 3080-83 Serial Number 287

Transducer: Size .25" Dia Frequency 5 mHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.434	.446	.450	.462	.454	.446	.444	.438	.457	.463	.500	.447
2	.429	.450	.445	.450	.442	.439	.450	.436	.448	.471	.466	.445
3	.431	.444	.447	.454	.452	.442	.443	.431	.440	.463	.462	.442
4	.431	.444	.460	.461	.458	.447	.441	.431	.440	.464	.468	.444
5	.433	.446	.465	.458	.453	.444	.437	.437	.431	.456	.469	.454
6	.440	.448	.452	.445	.451	.438	.435	.426	.437	.472	.470	.461
7	.438	.452	.446	.463	.449	.429	.437	.425	.445	.470	.475	.467
8	.438	.447	.452	.459	.439	.428	.426	.425	.451	.462	.475	.469
9	.432	.430	.432	.448	.429	.427	.434	.433	.450		.464	.458
10	.423	.445	.429	.437	.434	.431	.438	.433				.443
11	.416	.430	.424	.437	.443	.432	.438					
12			.421	.427								
13				.428								
14				.434								
15												
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17												
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19												

Thickness Survey

Thickness Survey

Date 07-19-84

Plant Monticello — Iso # MTS-16

Area 6.4A Entire Elbow — Grid Spacing 4"

Examiner(s) ASW KLH — Equipment Used Nortec 131-D

Calibration Block: Type 3080-83 — Serial Number 287

Transducer: Size ¼" Dia — Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.562	.538	.579	.602	.593	.605	.570	.549	.550	.499	.511	.533
2	.566	.559	.590	.609	.595	.618	.588	.564	.543	.495	.485	.530
3	.573	.577	.633	.632	.634	.623	.602	.559	.531	.504	.470	.540
4	.574	.575	.638	.644	.634	.636	.617	.562	.545	.527	.504	.532
5	.562	.555	.612	.644	.633	.626	.610	.570	.562	.538	.515	.542
6	.542	.547	.596	.658	.652	.615	.610	.550	.550	.549	.511	.525
7	.546	.552	.568	.614	.613	.591	.595	.582	.576	.544	.522	.524
8	.556	.568	.576	.592	.602	.572	.582	.587	.566	.555	.537	.532
9	.553	.583	—	—	.573	—	.579	.582	.573	.576	.546	.538
10	.552						.584	.580	.589	.577	.540	.533
11	.555							.560	.562	.584	.540	.529
12	.557							.561	.568	.562	.539	.552
13								.576	.533	.557	.536	
14												
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17												
18												
19												

THICKNESS SURVEY REPORT

DATE 5/23/86

DISC# N/A

PLANT MONTICELLO

AREA MTS - 6.4A

EXAMINERS M.J. Longbore / M.J. LONGBORE / II

TRANSDUCER (SIZE/FREQ.) 1/2" ϕ 2.25MHz, A30160

NOMINAL WALL 20" CARBON STEEL

ISO# MTS-16

GRID SIZE N/A

EQUIPMENT NORTEC 131-D #371

CAL. BLOCK (TYPE/SERIAL NO.) STEP WEDGE 3080-83

MIN. WALL N/A

COMMENTS 0° AT T.O.C. TO AGREE WITH FORMER INSPECTION.
0" AT DOWN STREAM CIRC. WELD AT INNER RADIUS OF ELBOW

Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
3"	.566	.589	.584	.600	.594	.592	.579	.550	.490	.486	.505	.524
6"	.570	.592	.646	.615	.650	.626	.592	.556	.539	.484	.480	.526
9"	.575	.576	.638	.636	.632	.622	.590	.556	.536	.533	.467	.537
12"	.563	.610	.678	.661	.628	.633	.613	.564	.545	.522	.510	.522
15"	.546	.562	.656	.652	.640	.627	.605	.572	.556	.531	.513	.539
18"	.587	.547	.639	.691	.637	.610	.607	.584	.550	.552	.511	.522
21"	.543	.550	.637	.660	.613	.596	.593	.552	.571	.545	.514	.520
24"	.556	.555	.616	.618	.649	.622	.598	.588	.573	.581	.543	.532
27"	.554	.580	.596	.622	.603	.598	.574	.586	.573	.576	.542	.535
30"	.557	.560	.610	.600	.596	.577	.580	.592	.592	.580	.543	.532
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20												
21												

Low spot
.461

Thickness Survey

Date 6-18-84

Plant Monticello — Iso # MTS-16

Area 6.5A Entire Elbow — Grid Spacing 4"

Examiner(s) ASW/QL — Equipment Used Nortec 131 D

Calibration Block: Type 3080-83 — Serial Number 322

Transducer: Size .25" dia — Frequency 5 mhz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.469	.431	.437	.452	.444	.478	.444	.448	.433	.419	.447	.463
2	.468	.433	.428	.452	.434	.473	.441	.450	.434	.453	.441	.460
3	.465	.438	.450	.436	.434	.473	.452	.448	.434	.481	.429	.457
4	.470	.465	.466	.437	.430	.472	.462	.448	.430	.473	.428	.433
5	.466	.464	.477	.432						.440	.420	.453
6	.475	.464									.422	.452
7												
8												
9	—	—	—	—	—	—	—	—				
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19												

Thickness Survey

Date 6-18-84

Plant Monticello
Area 6.6A ON FWH 13A
Examiner(s) ASW / QC
Calibration Block: Type 3080-83
Transducer: Size .25"

Iso # MTS-16
Grid Spacing 4"
Equipment Used NorTec 131 D
Serial Number 322
Frequency 5 mHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.545											
2	.523	.520	.524	.530	.533	.538						
3	.530	.516	.523	.524	.529	.535						
4	.535	.510	.518	.524	.528	.526						
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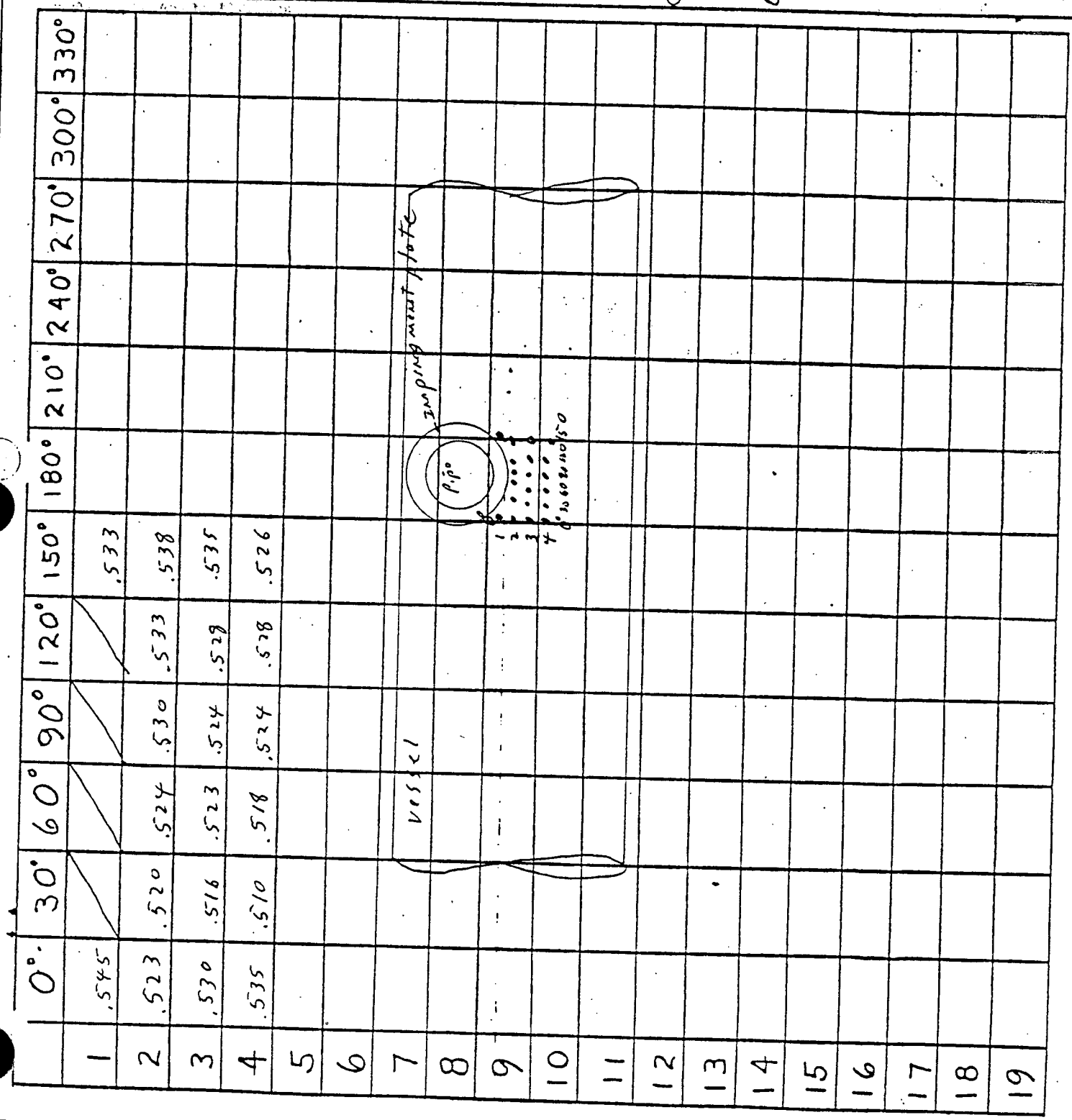
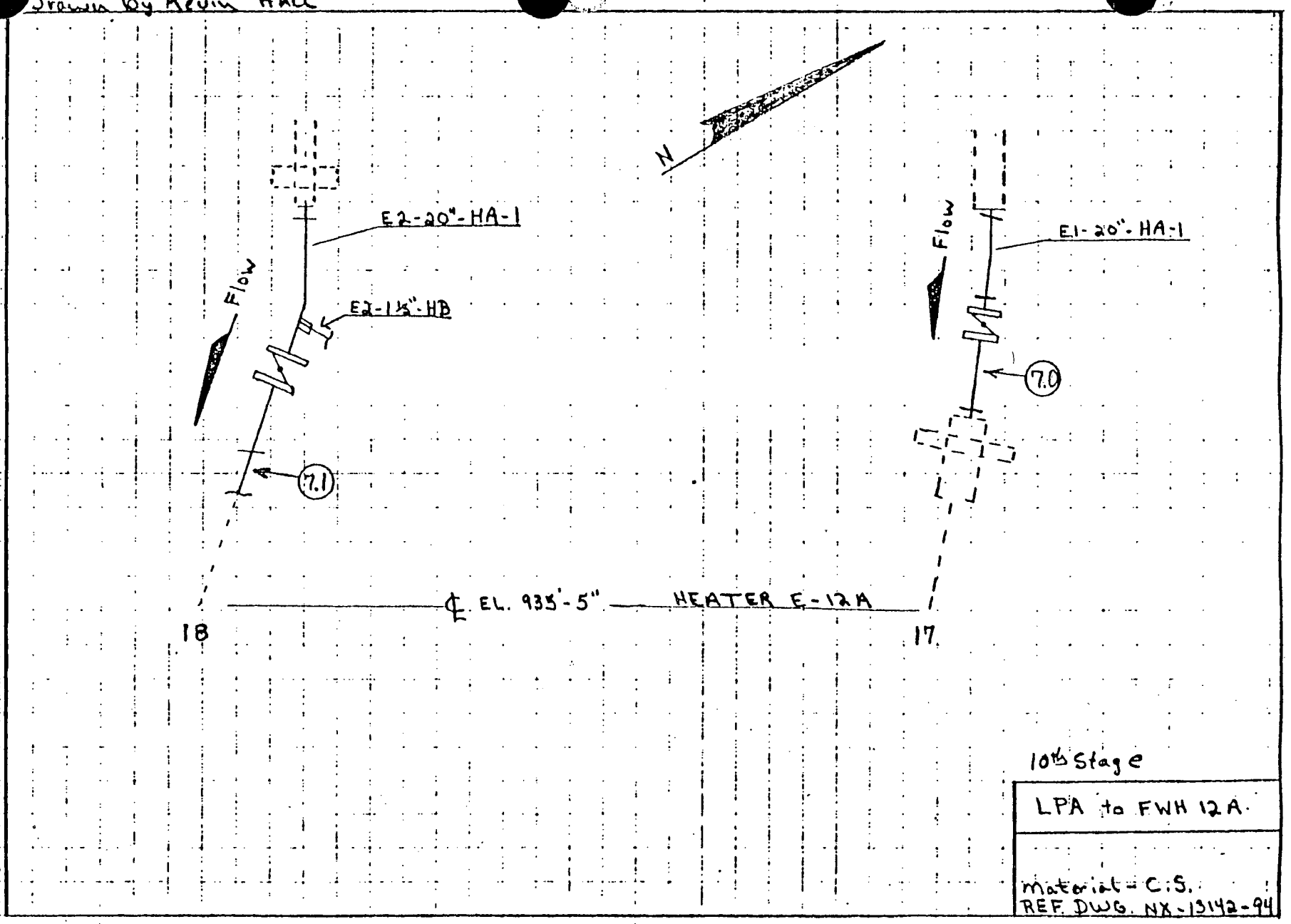


Drawn by Kevin Hall



10th Stage

LPA to FWH 12A

Material - C.S.
REF. DWG. NX-13142-94

ISO-MTS-17 + 18

Notes

I50-MTC-17

10½ Stage LP-A Co FWH 12A - Inboard

Area	Scaffold Req'd.	Frequency	Disc #
7.0	NO		Nortec

Thickness Survey

Date 7-19-84
Disc N/A

Plant Monticello
Area 7.0
Examiner(s) ASW / KLH
Iso # MTS-17
Grid Spacing 4"
Equipment Used NorTec 131D
Calibration Block: Type 3080-83 Serial Number 287
Transducer: Size ¼" dia Frequency 5mHz

	0°	30°	60°	90°	120°	150°	160°	210°	240°	270°	300°	330°
1	.382	.376	.377	.385	.390	.392	.394	.406	.414	.403	.396	.392
2	.377	.369	.372	.377	.385	.390	.394	.400	.407	.407	.392	.388
3	.380	.368	.370	.380	.385	.388	.391	.396	.407	.402	.392	.382
4	.389	.383	.382	.393	.403	.403	.402	.400	.411	.406	.387	.387
5	.378	.385	.382	.391	.405	.401	.398	.398	.400	.401	.385	.380
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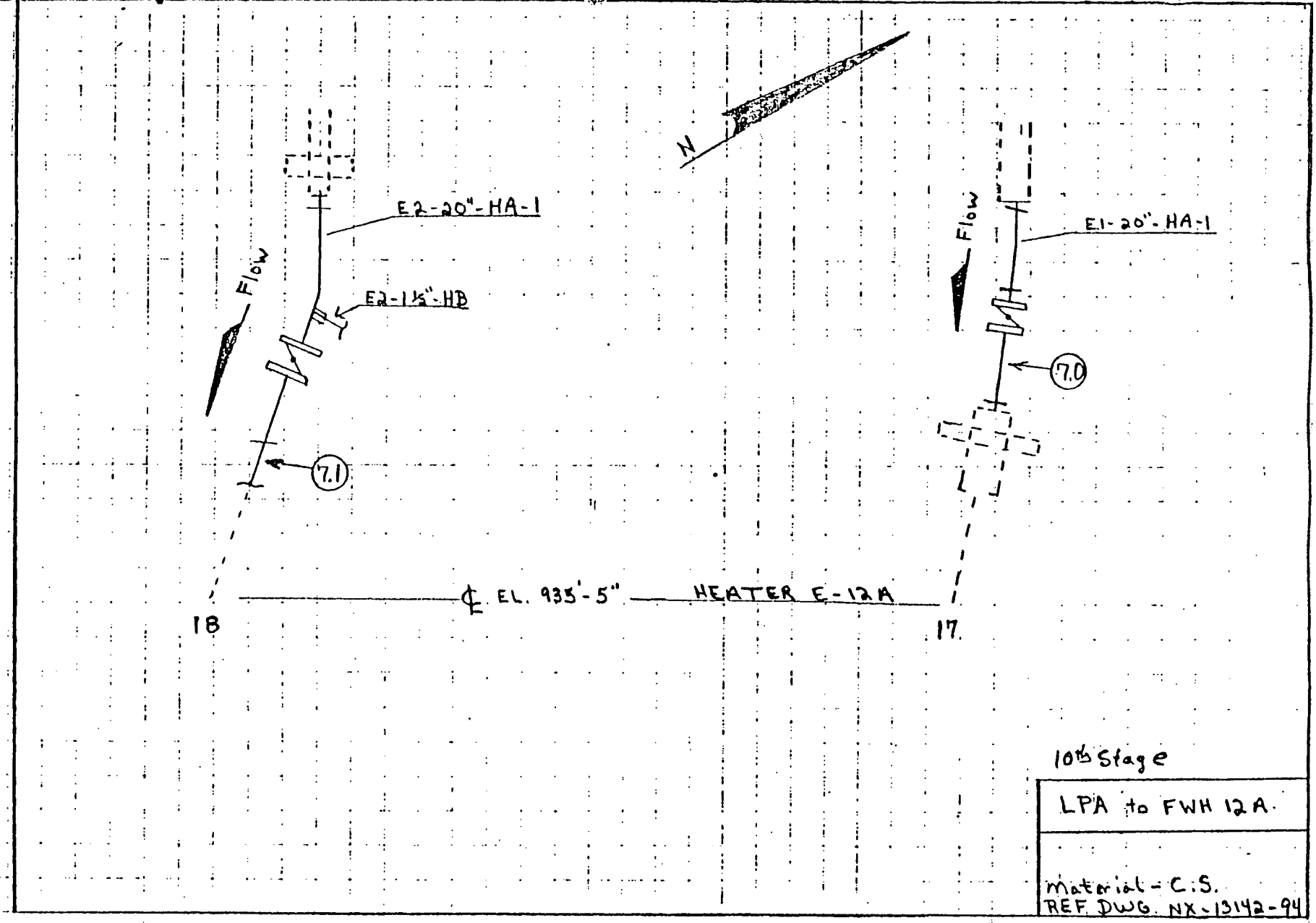
Comments:

Drawn by Kevin Hall



10th Stage

LP'A to FWH 12A.

Material - C.S.
REF DWG. NX-13142-94

ISO-MTS-17 + 18

Notes

ISO-N-S-12

10th stage LPA to FWH 12A Outboard

Area | Scaffold Req'd. | Frequency | Disc #

7.1 | NO | Nortec

Thickness Survey

Date 2-19-84
Disc NIA

Plant Monticello
Area 7.1
Examiner(s) ASW / KLH

Iso # MTS-18
Grid Spacing 4"
Equipment Used NorTec 131D

Calibration Block: Type 2080-83 Serial Number 287
Transducer: Size ½" dia Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	210°	240°	270°	300°	330°
1	.388	.385	.379	.387	.374	.393	.340	.348	.357	.360	.372
2	.385	.390	.381	.364	.375	.361	.338	.347	.357	.366	.368
3	.382	.388	.379	.376	.370	.368	.332	.344	.388	.361	.362
4	.375	.392	.391	.379	.374	.387	.342	.343	.382	.375	.357
5	.371	.388	.390	.390	.382	.382	.368	.356	.384	.355	.365
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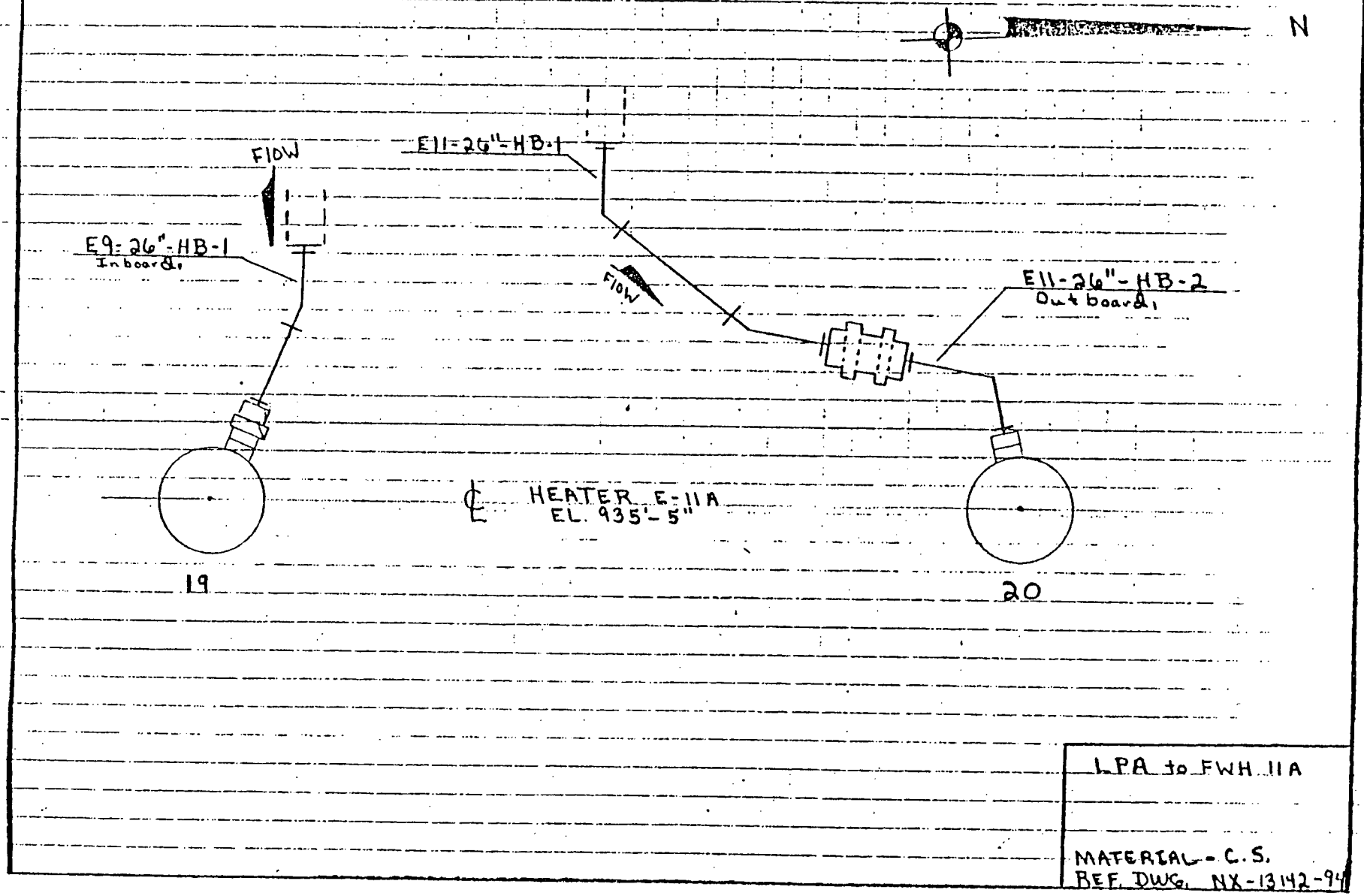
Comments:

Drawn by Keiva Hall



LPA to FWH 11A

MATERIAL - C.S.
REF. DWG. NX-13142-94

ISO-MTS- 19 +20

NOTES

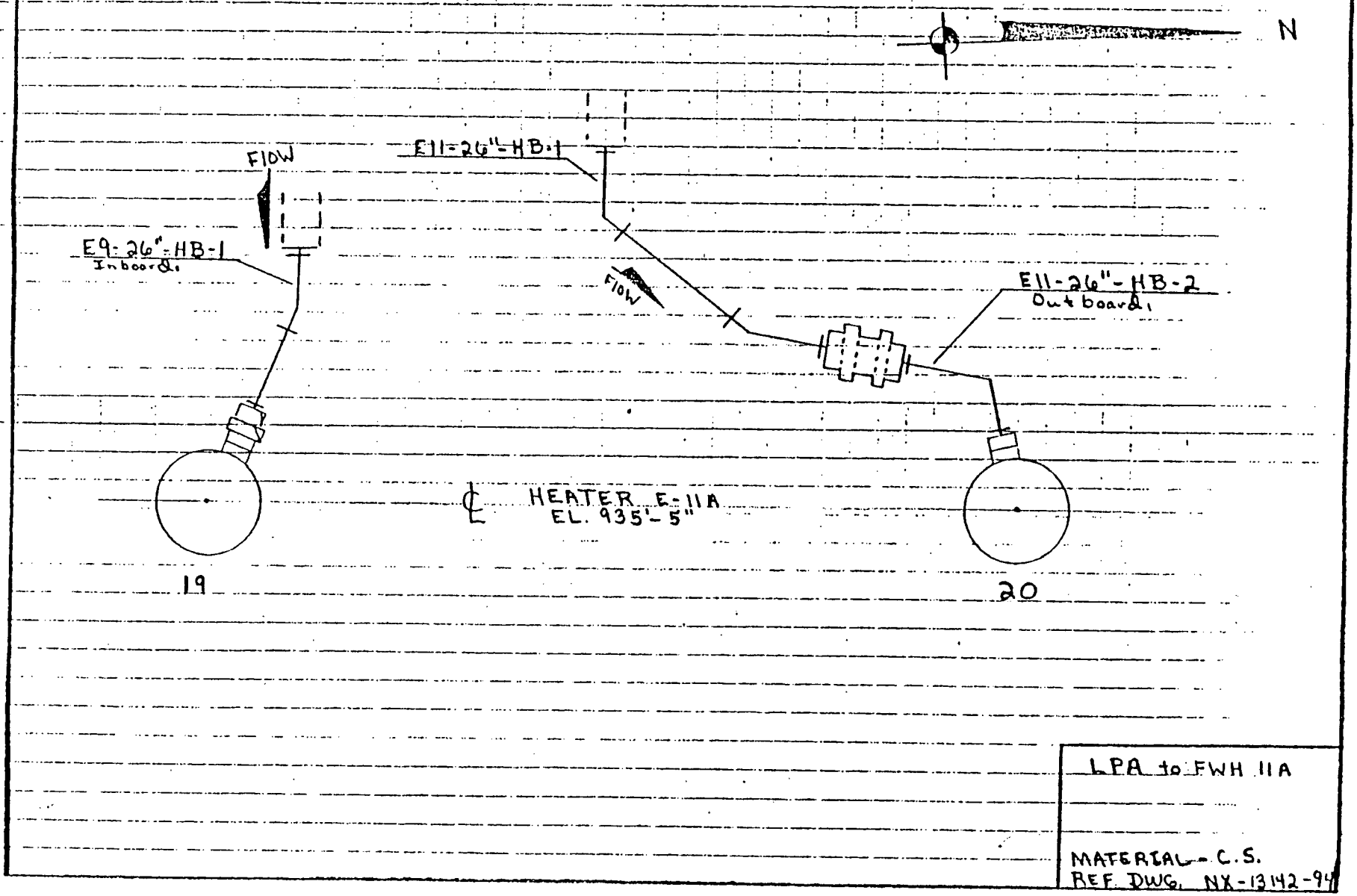
ESO-MTS-19

12th Stage LPA to FWH 11A Inboard -1 26"

Area | Scaffold Req'd | Frequency

No spot Assigned

Drawn by Kevin Hall



LPA to FWH 11A

MATERIAL - C.S.
REF. DWG. NX-13142-94

ISO-MTS- 19 +20

NOTES

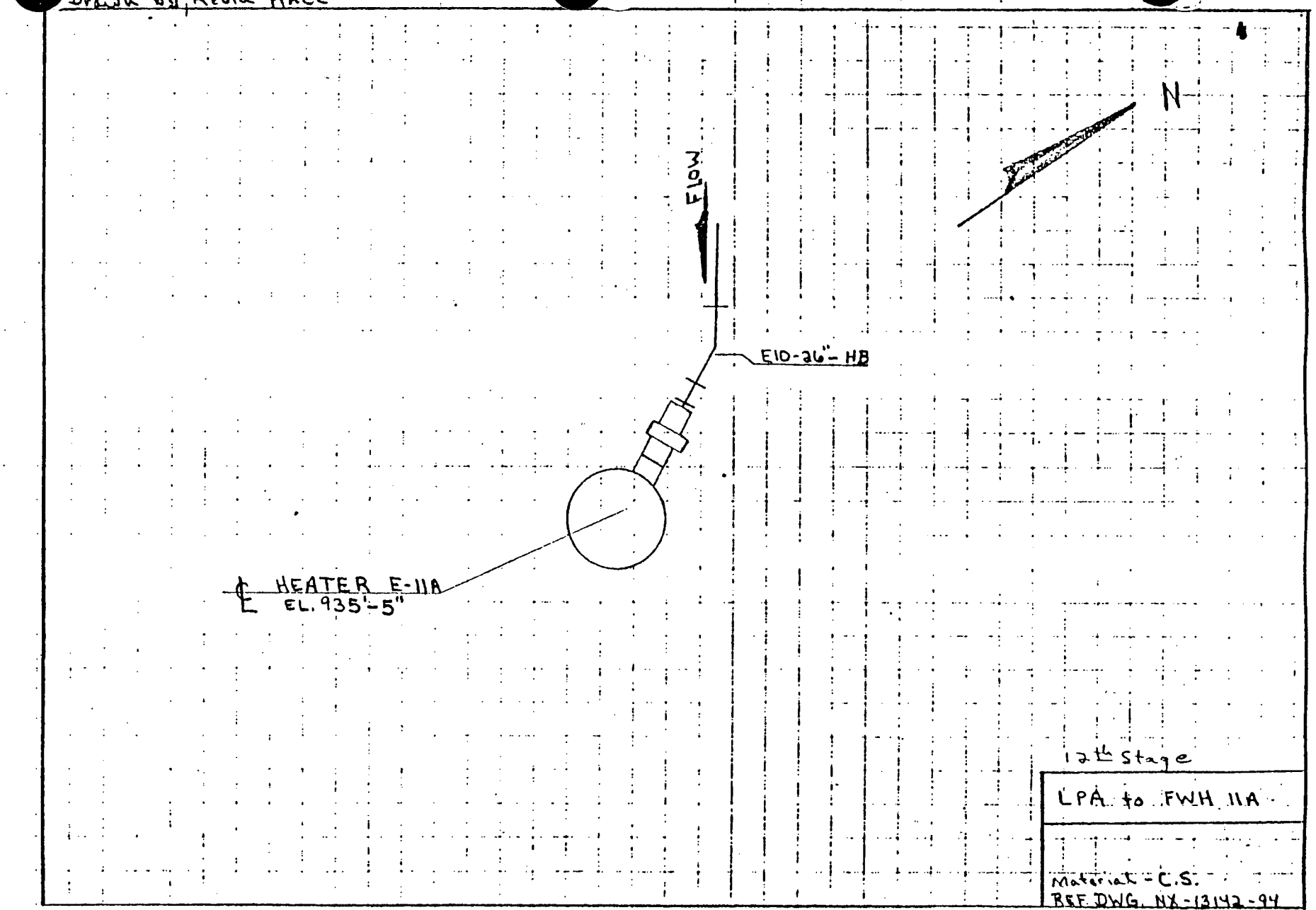
ISO-MTS-20

12th stage LPA to FWH 11A outboard - 1 26"

Area | Scaffold Reqd. | Frequency

No Area Assigned

Drawn by: Kevin Hall



12th Stage

LPA to FWH 11A

Material - C.S.
REF DWG. NX-13142-94

ESO-MTS- 21

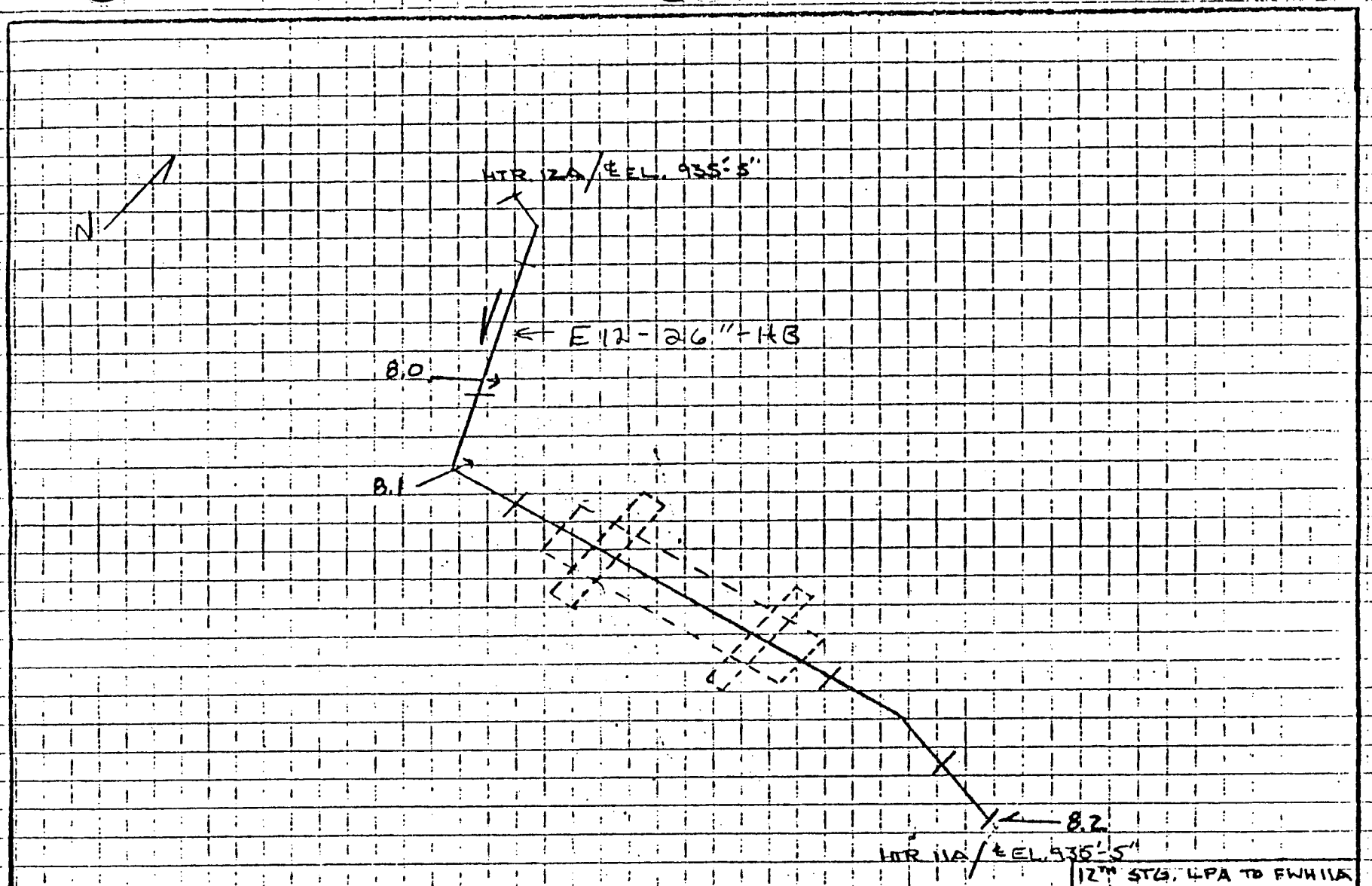
Notes

ISO-MTS-21

12th Stage LPA to FWH 11A Inboard-2 26"

Area | Scaffold Req'd. | Frequency

NO AREA ASSIGNED


N
HTR. 12A / ℄ EL. 935'-5"
← E 12-26"-HB
8.0
8.1
8.2
HTR 11A / ℄ EL. 935'-5"
12TH STG. LPA TO FWH 11A
26" OUTBOARD
LINE E-12-26"-HB
REF. DWG. NK-13142-94

ISO-MTS-22

Notes
ISO-MTS-22

12th Stage LPA to FUSH IIA Outboard-2 24"

Area	Scaffold Req'd.	Frequency	Disc #
8.0	NO		Nortec
8.1	NO		Nortec
8.2	NO		Nortec

Thickness Survey

Date 07-20-07
Disc NA

Plant Monticello
Iso # MT 5-22
Area 8.0 Entire Elbow
Grid Spacing 4"
Examiner(s) ASW KLH
Equipment Used Nortec 131-D
Calibration Block: Type 3080-83 Serial Number 287
Transducer: Size .25 mm2 Frequency 5 mHz

	0°	30°	60°	90°	120°	150°	180	210°	240°	270°	300°	330°
1	408	432	415	420	423	412	411	421	428	421	424	420
2	412	422	422	387	423	399	420	422	420	428	423	424
3	395	424	420	414	404	421	407	427	419	421	424	423
4			423	416	396	395	417	404	422	420	420	
5					401	396	419	419	399			
6						402	418	408				
7												
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Comments:

Thickness Survey

Plant Monticello — Iso # MTS-22 — Date 07-20-07

Area 8.1 Entire Elbow — Grid Spacing 4" — Disc N/A

Examiner(s) ASW KLH — Equipment Used Nortec - 131-D

Calibration Block: Type 2080-B3 — Serial Number 287

Transducer: Size .25" Dia — Frequency 5 mhz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.421	.390	.381	.429	.420	.414	.312	.394	.407	.389	.379	.380
2	.421	.418	.423	.418	.423	.385	.383	.388	.417	.409	.413	.398
3	.396	.402	.402	.426	.425	.406	.414	.397	.419	.389	.381	.383
4	.377	.372	.401	.417	.422	.416	.336	.402	.411	.385	.371	.367
5	.375	.418	.395	.415	.423	.413	.415	.418	.406	.401	.384	.368
6	.382	.380	.394	.417	.423	.415	.401	.421	.409	.378	.381	.385
7	.380	.403	.402	.404	.408	.421	.404	.417	.397	.399	.387	.392
8	.401	.378	.370	.423	.372	.372	.349	.400	.418	.416	.392	.379
9	.387	.374	.418	.370	.414	.381	.422	.419	.411	.392	.351	.391
10	.391	.380	.375	.392	.421	.403	.420	.395	.419	.421	.370	.384
11		.388	.385	.398	.419	.370	.420	.393	.403	.422	.402	.425
12			.416	.391	.422	.454	.412	.404	.422	.349	.423	.413
13			.377	.396	.381	.423	.414	.418	.421	.401	.417	
14				.388	.401	.458	.419	.414	.426	.433	.416	
15				.373	.407	.421	.420	.417	.401	.427		
16				.382	.420	.421	.422	.420	.435	.395		
17					.419	.422	.421	.420	.418			
18					.414		.437					
19												

Comments:

Thickness Survey

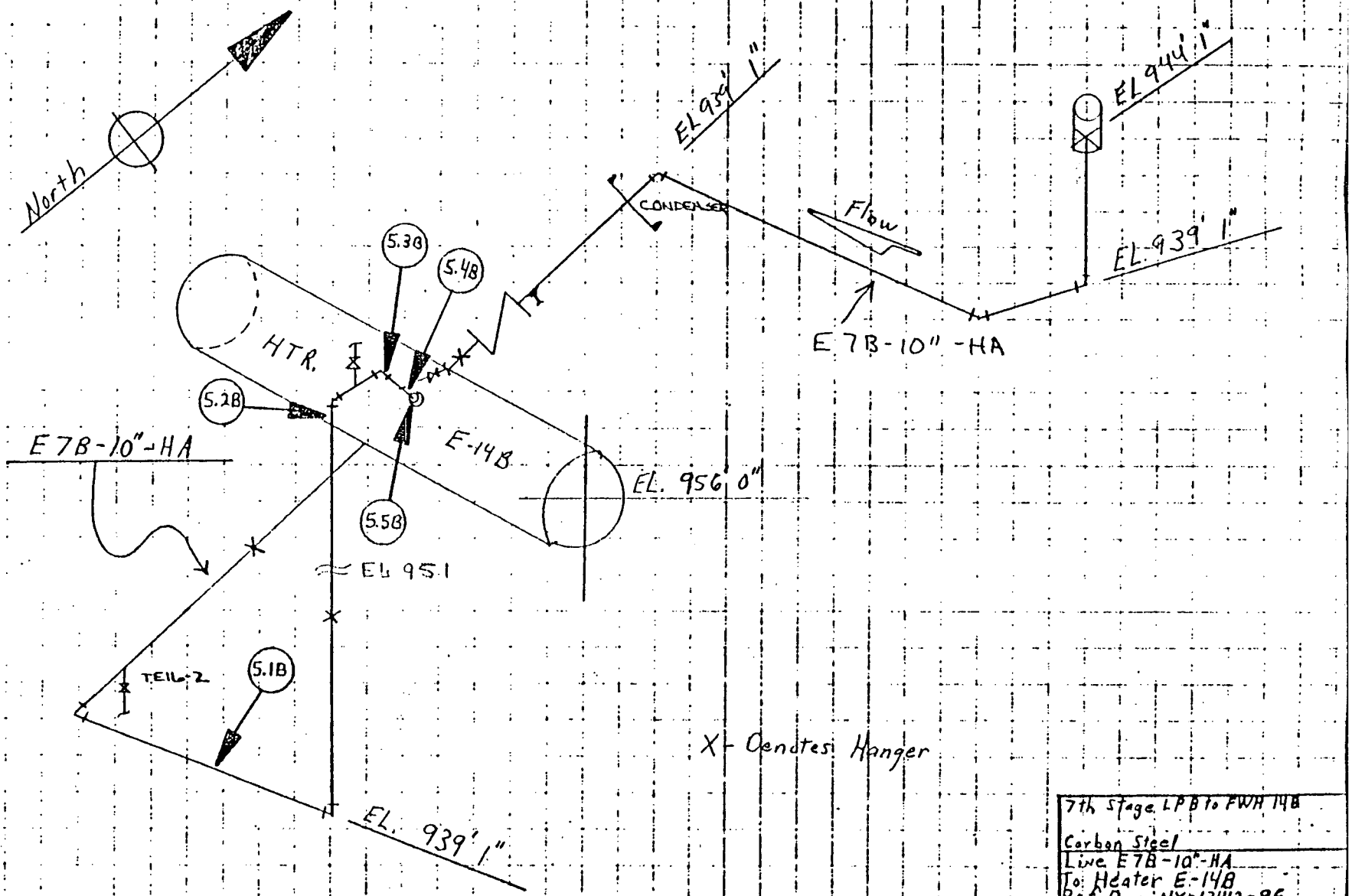
Date 7-20-84
Disc N/A

Plant Monticello
Iso # MTS-22
Area 8.2 Entire Elbow
Grid Spacing 4"
Examiner(s) ASW / KLH
Equipment Used NorTec 131 D
Calibration Block: Type 3080-83 Serial Number 287
Transducer: Size ½" Frequency 5 Mhz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.403	.357	.390	.389	.388	.388	.362	.413	.389	.389	.388	.394
2	.459	.394	.374	.387	.397	.391	.363	.393	.390	.392	.389	.400
3	.399	.396	.364	.419	.409	.394	.360	.392	.428	.391	.386	.385
4	.406	.400	.354	.396	.400	.386	.400	.393	.394	.404	.387	.400
5	.400	.420	.352	.396	.398	.379		.402	.416	.400	.386	.402
6	.401	.400	.384	.394	.398				.385	.380	.371	.404
7	.412	.361	.353	.412	.401					.392	.386	.429
8	.423	.387	.345								.366	.401
9	.402	.417	.340								.402	.432
10	.425	.388	.337									.397
11	.442											.398
12	.383											
13	.462											
14												
15												
16												
17												
18												
19												

Comments:

Drawn by David A. Hall



7th Stage LP B to FWH 14B

Carbon Steel
Line E7B-10"-HA
To: Heater E-14B
Ref. Dwg. NX-13142-96

ISO-MTS-23

NOTES

ISO-MTS-23

7th Stage LDB To 14B 10"

Area	Scaffold Req'd.	Frequency	Disc #
5.1B	NO		Nova 10C-3
5.2B	yes		63
5.3B	yes		Nortec
5.4B	yes		Nortec
5.5B	yes		Nortec

Thickness Survey

Date 2-3-84
Disc N/A

Plant Monticello
Area S.1 B Entire Elbow
Examiner(s) ASW / DAH
Calibration Block: Type 3080-83
Transducer: Size .5" dia

Iso # MTS-23
Grid Spacing 2"
Equipment Used Nova 100-D
Serial Number 109
Frequency 5mhz PC

	0°	30°	60°	90°	120°	150°	160°	210°	240°	270°	300°	330°
1	.355	.335	.330	.353	.378	.396	.393	.368	.372	.371	.370	.348
2	.349	.339	.325	.348	.372	.394	.392	.371	.374	.381	.372	.351
3	.376	.343	.325	.343	.373	.398	.386	.373	.385	.387	.373	.370
4	.364	.341	.332	.363	.364	.397	.388	.373	.393	.389	.383	.363
5	.347	.335	.347	.347	.361	.392	.379	.376	.389	.390	.388	.353
6	.332	.336	.346	.359	.362	.389	.376	.372	.374	.391	.390	.346
7	.337	.308	.336	.363	.369	.385	.376	.370	.389	.385	.383	.343
8			.331	.373	.376	.391	.373	.370	.376	.388	.372	
9			.326	.372	.398	.395	.372	.378	.380	.378	.363	
10			.315	.360	.396	.403	.372	.391	.390	.380	.371	
11				.347	.400	.413	.381	.394	.385	.381		
12					.413	.420	.401	.383	.397	.393		
13					.403	.427	.405	.397	.400			
14						.416	.403	.401				
15							.412					
16												
17												
18												
19												

Comments:

Thickness Survey

Date 6-25-84
Disc 63

Plant Monticello
Iso # MTS-23
Area S-2B/DS/0-10"
Grid Spacing 80
Examiner(s) ASW/KLH/QL
Equipment Used UT-III
Calibration Block: Type 3080-83 Serial Number N/A
Transducer: Size ½" Dia. Frequency 3.5 mHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.392	.372	.376	.360	.344	.344	.348	.360	.356	.360	.356	.364
2	.356	.356	.348	.332	.348	.368	.360	.356	.360	.360	.352	.344
3	.344	.356	.340	.356	.360	.364	.356	.356	.360	.340	.340	.340
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Comments:

Thickness Survey

Date 6-26-84
Disc N/A

Plant Monticello
Iso # MTS-23
Area 5.3 B Entire Elbow
Grid Spacing 2"
Examiner(s) ASW/QL/KLH
Equipment Used NonTec 1310
Calibration Block: Type 3080-83 Serial Number 264
Transducer: Size .25" dia Frequency 5 mhz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.393	.406	.403	.410	.385	.381	.395	.404	.402	.394	.388	.398
2	.399	.412	.437	.397	.385	.379	.385	.424	.422	.391	.390	.406
3	.409	.411	.398	.387	.370	.373	.389	.393	.439	.397	.392	.420
4	.398	.404	.408	.377					.392	.390	.386	.422
5	.387	.388	.341	.382								.395
6	.377	.385	.385									.395
7												
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17												
18												
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Comments:

Thickness Survey

Date 06-26-84
Disc NA

Plant Monticello
Area 5.4 B Entire Nozzel
Examiner(s) ASW/QL/KLH
Iso # MTS-23
Grid Spacing 2"
Equipment Used Nortec-131-D
Calibration Block: Type 3080-83 Serial Number 269
Transducer: Size .25" Dia Frequency 5 mHz

	0°	30°	60°	90°	120°	150°	160°	210°	240°	270°	300°	330°
1	.377	.462	.444	.468	.482	.502	.502	.524	.500	.475	.504	.408
2	.375	.378	.425	.377	.409	.755	.460	.420	.446	.506	.513	.429
3	.429	.458	.464	.437	.414	.370	.374	.434	.466	.425	.505	.462
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Comments:

Thickness Survey

Date 06-26-84
Disc NA

Plant Monticello Iso # MTS-23
Area 5.5B FWH-14B on Vessel Grid Spacing 2"
Examiner(s) ASW / QL / KLH Equipment Used Nortec - 131-D
Calibration Block: Type 3080-83 Serial Number 269
Transducer: Size .25" Dia Frequency 5mHz

	0°	30°	60°	90°	120°	150°	160°	210°	240°	270°	300°	330°
1	.497						.493					
2	.488	.490				.490	.481					
3	.484	.483	.487	.493	.492	.490	.483					
4	.481	.484	.488	.491	.491	.491	.484					
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18												
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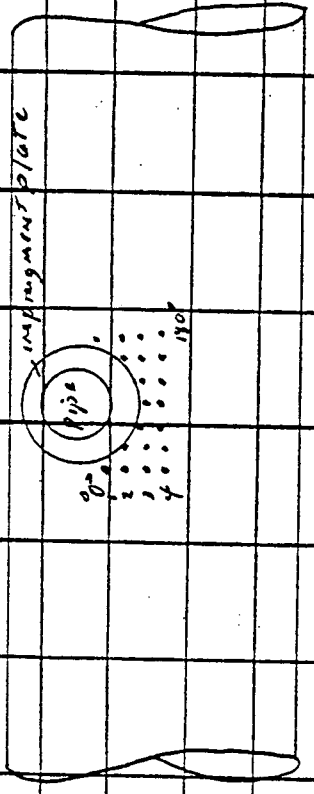
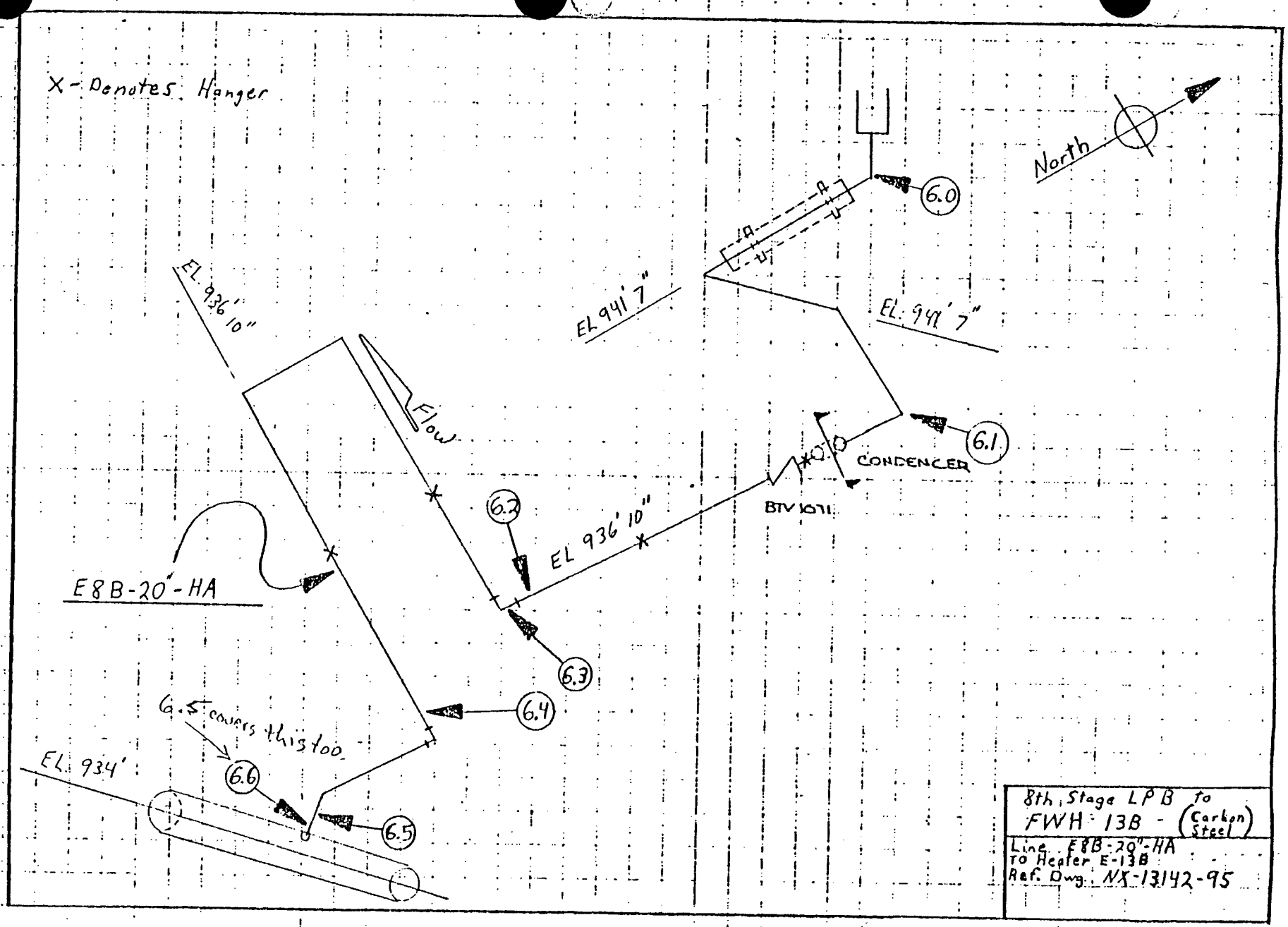


Comments:

Drawn by David A. Hall



ISO-MTS-24

ICD-MTE-24

8th Stage LP2 to FWH 13B

Area	Scaffold Req'd.	Frequency	Disc #
6.0	No		Nortec
6.1	NO		Nortec
6.2	yes		36
6.3	yes		Nortec
6.4	yes		37
6.5	yes		Nortec
6.6	yes		Nortec

Survey

Date 1-24-84

Disc N/A

Plant Monticello

Iso # MTS- 24

Area 6.0 Entire Elbow

Grid Spacing 4"

Examiner(s) ASW/KLH/JEB

Equipment Used Nortec 131D

Calibration Block: Type 3080-83

Serial Number 417

Transducer: Size 1/4" dia

Frequency 5 mhz

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
330°	.514	.505	.477	.437	.468														
300°	.488	.492	.507	.473	.472	.488													
270°	.423	.463	.499	.495	.442	.426	.450	.451	.467										
240°	.434	.444	.444	.426	.461	.403	.401	.385	.400										
210°	.422	.412	.426	.441	.436	.444	.425	.423	.463	.429									
1[illegible]	.445	.462	.440	.462	.464	.461	.427	.428											
15[illegible]	.462	.463	.443	.442	.446	.451	.460	.450	.463	.443									
120°	.450	.458	.445	.445	.477	.471	.473	.466	.460										
90°	.454	.441	.467	.468	.474	.442	.443												
60°	.494	.473	.494	.455	.477														
30°	.495	.440	.476	.464	.461														
0°	.490	.499	.499	.499	.451														

Comments:

Plant Monticello Iso # 24 Date 01-20-84

Area 6.1 Grid Spacing 4" Disc NA

Examiner(s) ASW JEB KLH Equipment Used Nortec 131-D

Calibration Block: Type 3080-83 Serial Number 417

Transducer: Size .25" Dia Freqency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.371	.402	.391	.385	.404	.416	.437	.427	.410	.385	.388	.371
2	.387	.398	.403	.386	.407	.413	.430	.439	.417	.374	.377	.367
3	.405	.402	.404	.412	.424	.429	.441	.436	.397	.376	.377	.384
4	.394	.403	.424	.404	.419	.424	.425	.423	.400	.368	.388	.380
5	.386	.408	.418	.416	.423	.419	.415	.420	.389	.383	.398	.393
6	.406	.399	.424	.413	.411	.414	.420	.410	.402	.382	.394	.389
7	.397	.441	.398	.397	.412	.395	.410	.412	.405	.376	.400	.391
8	.400	.430	.413	.400	.395	.411	.414	.418	.409	.385	.397	.389
9		.398	.395	.388	.410	.403	.417	.408	.412	.379	.400	.384
10			.397	.400	.401	.416	.404	.417	.404	.381		.395
11			.399	.422	.412	.420	.447	.418	.415	.385		
12					.405	.426	.415	.417	.405			
13					.423	.418	.432	.433	.402			
14						.414	.429	.425	.403			
15						.419	.427	.427	.398			
16						.431	.446	.430				
17							.457					
18												
19												

Comments:

...kness Survey

Date 5-12-84
Disc 36

Plant Monticello
Area 6.2/US/0-10
Examiner(s) DAH/QL/KLH
Iso # MTS-24
Grid Spacing 4"
Equipment Used UI III
Calibration Block: Type 3080-83 Serial Number NA
Transducer: Size .5" Dia Frequency 5 MHz

	0°	30°	60°	90°	120°	150	180°	210°	240°	270°	300°	330°
1	.360	.376	.384	.380	.388	.404	.388	.380	.380	.372	.384	.360
2	.368	.320	.384	.380	.312	.396	.288	.380	.372	.376	.380	.360
3	.372	.320	.400	.380	.376	.388	.388	.380	.368	.396	.360	.376
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Comments:

THICKNESS SURVEY REPORT

DATE 5-20-86

DISC# 36

PLANT MONTICELLO

ISO# MTS-24

AREA 6.2

GRID SIZE 200

EXAMINERS STEVE STANFORD II / BRUCE S I / SCOTT HALL I

EQUIPMENT ULTRA IMAGE III

TRANSDUCER (SIZE/FREQ.) .25" / 10 MHZ.

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

NOMINAL WALL .375"

MIN. WALL

COMMENTS POOR CONTACT DUE TO PAINTED SURFACE

Y Degree / Grid	0	31	62	93	124	155	180	30	60	90	120	150
	0	30	60	90	120	150	180	210	240	270	300	330
0	.360	.364	.368	.376	.384	.392	.376	.372	.384	.380	.376	.364
10	.360	.372	.368	.380	.396	.392	.396	.376	.400	.388	.376	.368
20	.356	.368	.364	.376	.392	.388	.376	.384	.384	.388	.364	.368
30	.356	.364	.364	.380	.380	.388	.388	.380	.388	.368	.380	.364
40	.356	.384	.388	.392	.384	.384	.388	.368	.380	.384	.380	.360
50	.352	.364	.368	.380	.388	.388	.376	.372	.380	.376	.384	.352
60	.352	.368	.376	.376	.384	.380	.388	.316	.380	.376	.380	.368
70	.352	.364	.376	.376	.380	.392	—	.384	.380	.388	.380	.368
80	.356	.360	.380	.376	.376	.384	.380	.388	.376	.364	.360	.356
90	.360	.372	.384	.380	.368	.392	.376	—	—	—	—	—
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21												

Plant Monticello — Iso # — Date 5-16-84

Area 6.3 Entire Elbow — Grid Spacing 4" — Disc N/A

Examiner(s) D. Hall & Laredo — Equipment Used Nortec 131D

Calibration Block: Type 3080-83 — Serial Number 322

Transducer: Size .5" dia — Frequency 2.25mHz

Comments:

	0°	30°	60°	90°	120°	150	180°	210°	240°	270°	300°	330°
1	.406	.416	.422	.410	.422	.426	.427	.431	.444	.432	.412	.403
2	.405	.424	.433	.427	.427	.433	.432	.430	.443	.419	.400	.405
3	.412	.415	.435	.438	.421	.428	.438	.440	.442	.428	.412	.412
4	.423	.424	.440	.431	.419	.432	.425	.432	.434	.418	.405	.413
5	.409	.430	.437	.427	.406	.429	.432	.428	.433	.426	.415	.407
6	.405	.420	.436	.426	.412	.417	.413	.438	.438	.423	.410	.413
7	.396	.414	.428	.415	.405	.415	.426	.434	.451	.432	.418	.405
8	.395	.407	.416	.416	.431	.417	.420	.442	.454	.428	.408	.407
9	.390	.408	.427	.422	.408	.418	.439	.453	.452	.427	.397	.388
10	.408	.423	.413	.419	.414	.424	.438	.451	.447	.424	.402	.411
11	.398	.420	.431	.414	.416	.405	.431	.453	.446	.424	.401	.400
12	.404	.428	.402	.393	.391	.403	.421	.438	.449	.434	.433	.424
13												
14												
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16												
17												
18												
19												

Thickness Survey

Date 5-12-84
Disc 37

Plant Monticello
Area 6.4/US/0-10"
Examiner(s) DAH/QL/RLH
Iso # MTS-24
Grid Spacing 200
Equipment Used UI-III
Calibration Block: Type 3080.83 Serial Number N/A
Transducer: Size .5" dia Frequency 5mhz

	0°	30°	60°	90°	120°	150°	160°	210°	240°	270°	300°	330°
1	.628	.620	.612	.600	.606	.600	.604	.620	.644	.644	.652	.640
2	.628	.620	.612	.604	.600	.600	.600	.616	.632	.644	.644	.632
3	.632	.624	.620	.604	.620	.546	.604	.616	.628	.636	.648	.644
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19												

Comments:

Thickness Survey

Date 5-16-84
Disc NA

Plant MONTICELLO
Area 6.5, 6.6 ENTIRE ELBOW
Examiner(s) D.HALL - Q.LOREDO
Calibration Block: Type S.W. 3080-83 Serial Number 322
Transducer: Size .5"Ø Frequency 2.25 MZ

Iso # MTS24
Grid Spacing 4"
Equipment Used NORTEC 131-D

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.446	.426	.398	.391	.411	.436	.429	.422	.385	.424	.431	.437
2	.448	.428	.394	.386	.406	.442	.440	.409	.396	.415	.434	.439
3	.461	.448	.406	.382	.426	.455	.446	.420	.424	.410	.436	.454
4	.456	.450	.401	.401	.402	.456	.448	.427	.400	.405	.436	.454
5	.469	.442	.385	.404	.415	.449	.423	.435	.404	.404	.437	.465
6	.443	.436	.398	.422	.418	.443	.415	.416	.406	.386	.426	.460
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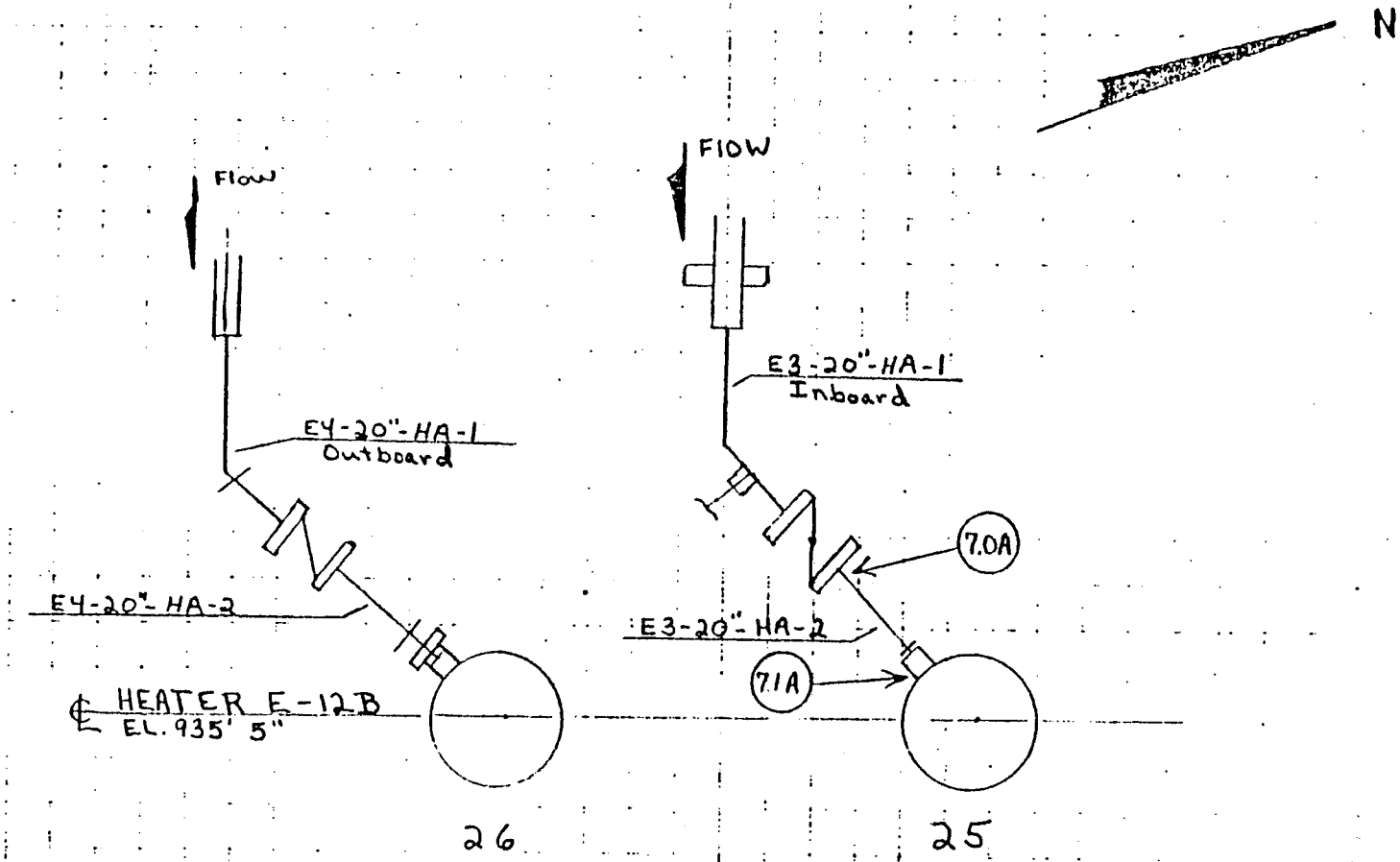
Comments:

D by Kevin HALL



10th stage

LPB To FWH 12B

MATERIAL - C.S.
REF. DWG. NX-13142-94

ISO - MTS - 25 + 26

ISO-MTS-25

10th stage LP B to FWH 12B Inboard 20'

Area	Scaffold Req'd.	Frequency	Disc #
7.0R	NO		Nortec
7.1A	NO		Nortec

Thickness Survey

Date 7-24-84
Disc N/A

Plant Monticello
Area 7.0A
Examiner(s) ASW/KLH/JEP
Iso # MTS-25
Grid Spacing 4"
Equipment Used NorTec 131D
Calibration Block: Type 3080-83 Serial Number 417
Transducer: Size ¼" dia Frequency 5 mhz.

	0°	30°	60°	90°	120°	150	180	210°	240°	270°	300°	330°
1	.389	.393	.408	.405	.374	.375	.344	.354	.344	.371	.364	.370
2	.384	.393	.398	.411	.365	.368	.344	.345	.349	.351	.361	.371
3	.378	.398	.400	.395	.371	.375	.398	.345	.354	.350	.360	.372
4	.376	.390	.407	.394	.403	.369	.362	.353	.351	.348	.361	.386
5	.374	.386	.395	.391	.387	.362	.364	.347	.342	.344	.355	.377
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

Comments:

Survey

Date 7-24-84
Disc N/A

Plant Monticello
Area 7.1 A
Examiner(s) ASW/KLH/JEB

Iso # MTS-25
Grid Spacing 3"
Equipment Used Nortec 131D
Calibration Block: Type 3080-83 Serial Number 417
Transducer: Size .25" dia Frequency 5mhz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.512	.524	.542	.475	.527	.452	.480	.548	.518	.536	.512	.518
2	.558	.559	.567	.546	.562	.544	.562	.537	.548	.550	.526	.556
3	.606	.562	.562	.542	.471	.468	.519	.442	.571	.562	.539	.550
4												
5												
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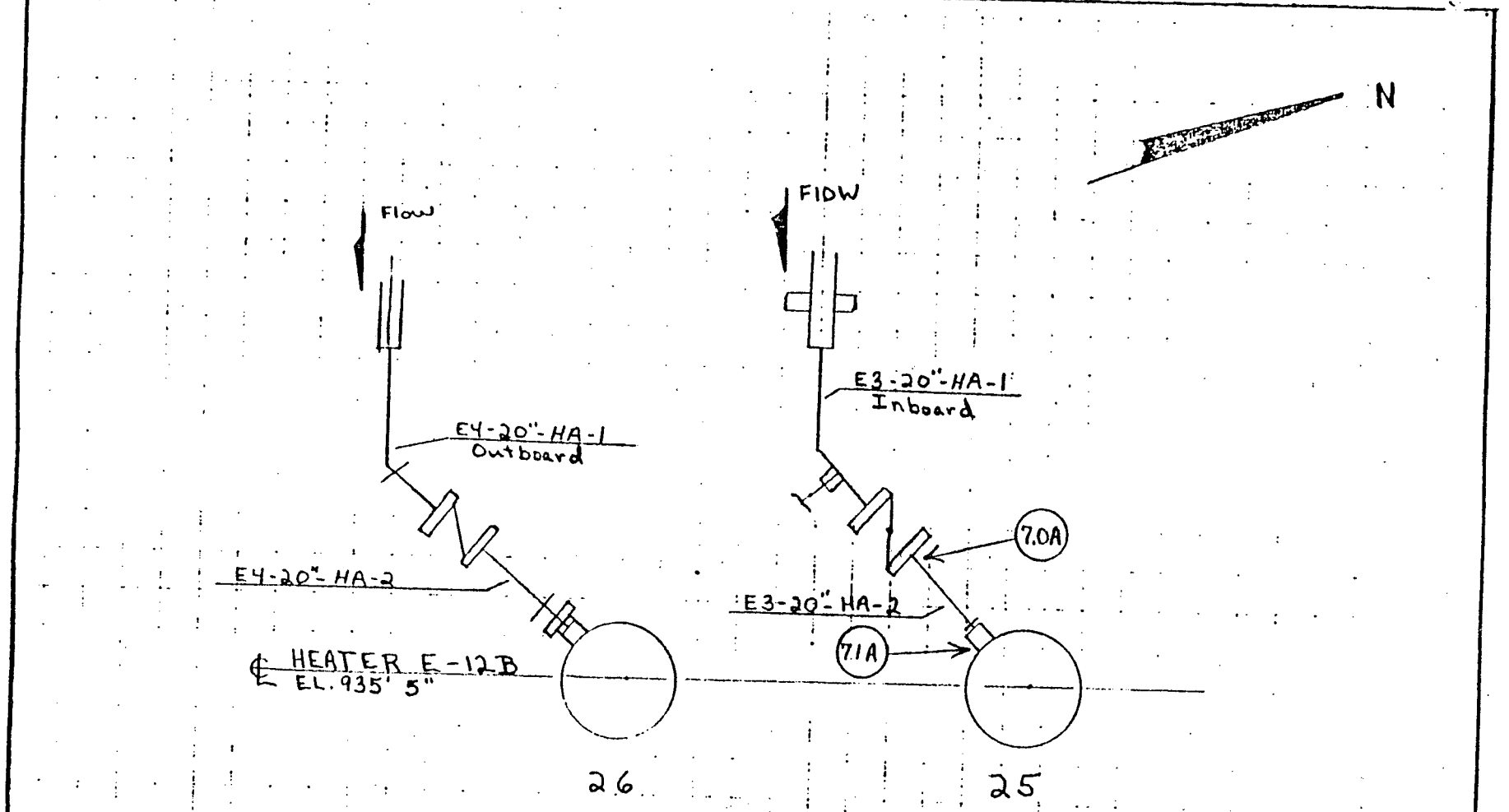
17												
18												
19												

Comments:

D[illegible] by Kevin HALL



LPB To FWH 12B

MATERIAL - C.S.
REF. DWG. NX-13142-94

ISO-MTS-25 +26

Notes

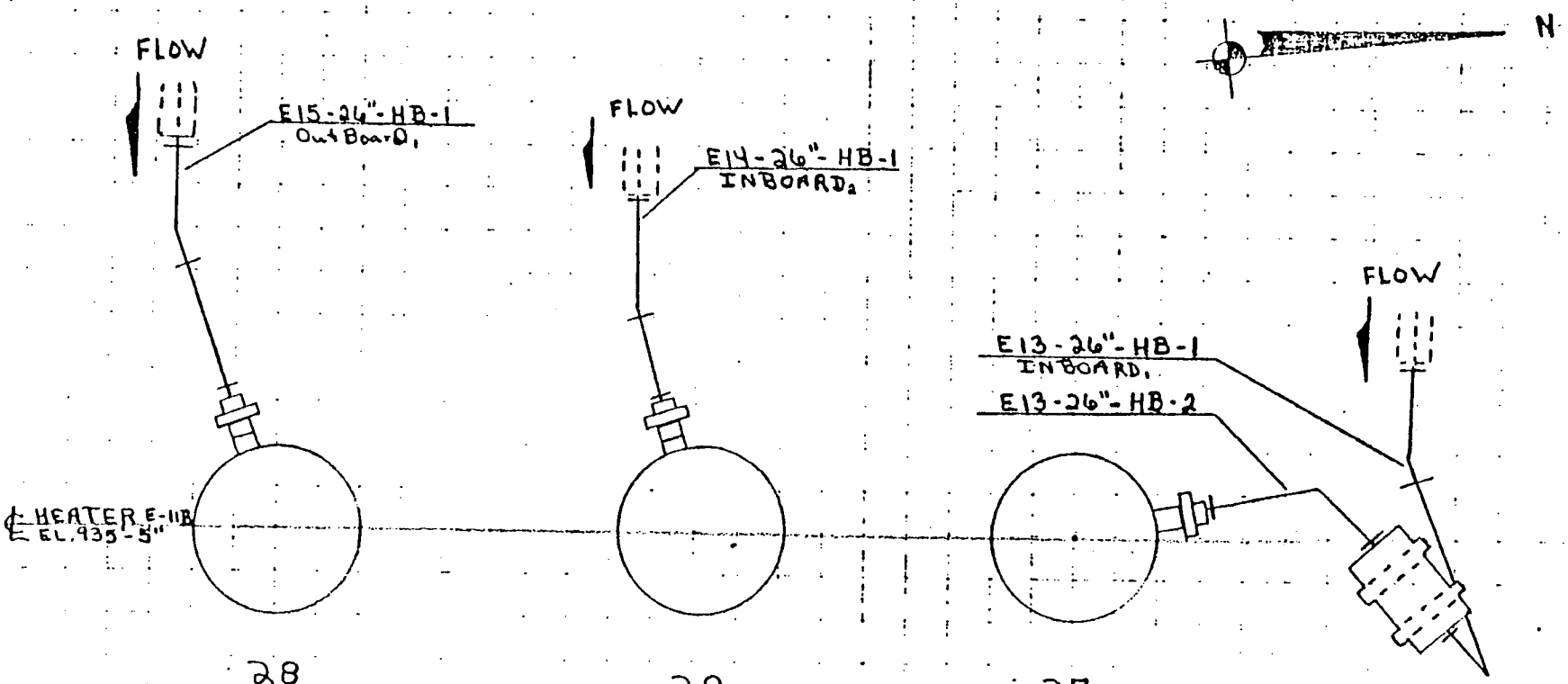
ISO-MTG-26

10th Stage LP-B to FWH 12B Outboard 20'

Area Scaffold Req'd. | Frequency

No Area Assigned

Dr[redacted]y Kevin Hall



LPB to FWH 11B
MATERIAL - C.S. REF DWG. NX-13142-94

ISO - MTS - 27, 28, + 29

NOTES

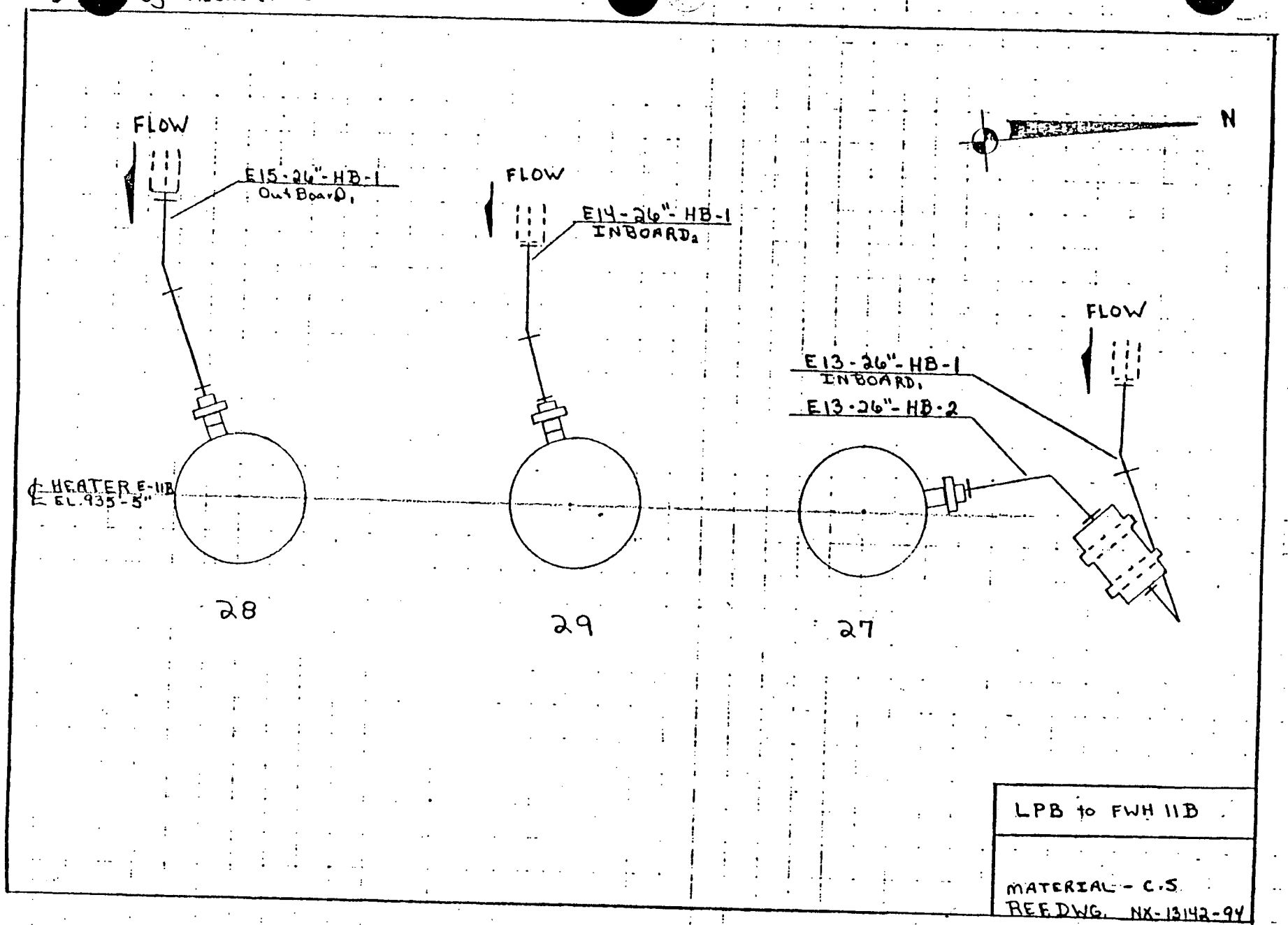
I 50 - MTC - 27

12th Stage LP-5 to FW4 11B Inboard 1 26"

Area Scaffold Req'd. | Frequency

No Area Designated

Dr[redacted] oy Kevin Hall



ISO - MTS - 27, 28, + 29

Notes

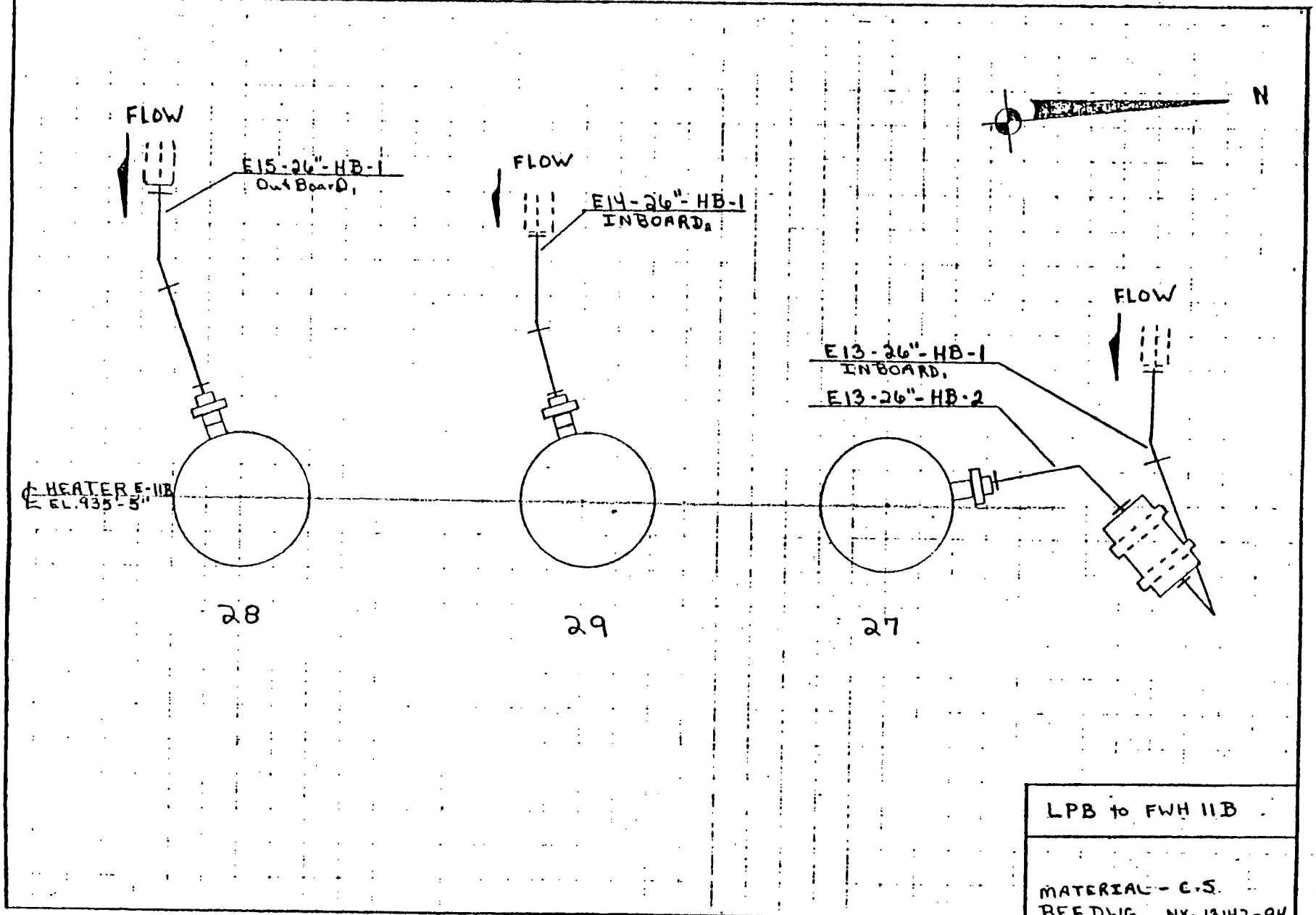
IED-MTE-27

12th Stage LPB to FWH 11B Outboard 1 26"

Area | Scaffold Req'd. | Frequency

No Area Assigned

Drawn by Kevin Hall



LPB to FWH 11B
MATERIAL - C.S. REF DWG. NX-13142-94

ISO - MTS - 27, 28, + 29

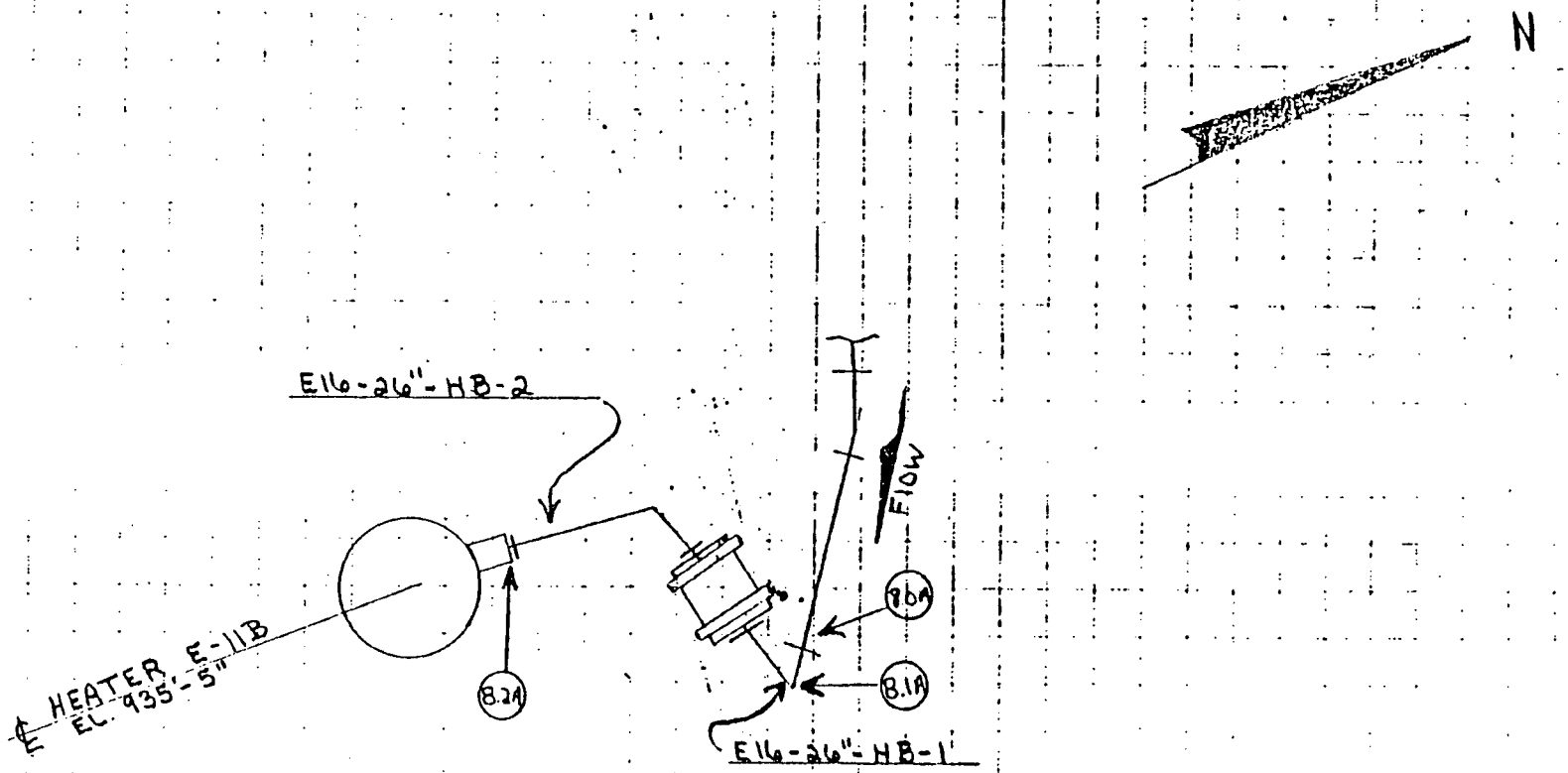
NOTES
ECO-NTS-24

12th Stage LPB to FWH 11B Inboard 2 ~26"

Area Scaffold Req'd. | Frequency

Not assigned

Drawn by Kevin Hall



12th Stage

LPB to FWH 11B OUTBoard

MATERIAL-C.S.
REF. DWG. NY-13142-94

ISO-MTS-30

NOTES

ESD-MTS-3D

1½ Stage LPB to FWH 11B Outboard - 2 — 26"

Area	Scaffold Req'd.	Frequency	Disc #
8.0A	NO		Nortec
8.1A	NO		Nortec
8.2A	NO		Nortec

Wall Survey

Date 07-25-84
Disc NA

Plant Monticello
Area 8.0A Entire Elbow
Examiner(s) ASW, JEB, KLH
Iso # 30
Grid Spacing 4"
Equipment Used Nortec 131-D
Calibration Block: Type 3080-83 Serial Number 417
Transducer: Size .25" Dia Frequency 5 MHz

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.412	.422	.415	.432	.428	.422	.436	.414	.434	.396	.434	.438
2	.354	.397	.382	.434	.438	.419	.433	.402	.406	.397	.401	.418
3	.363	.403	.434	.432	.437	.436	.437	.407	.395	.380	.436	.404
4			.440	.438	.427	.419	.438	.419	.380	.422	.434	.410
5					.422	.431	.434	.436	.377	.416	.412	
6							.428	.409	.361			
7								.435				
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

Comments:

Plant Monticello Iso # 30 Date 07-25-84

Area 8.1A Grid Spacing 4" Disc NA

Examiner(s) ASW, JEB, KLH Equipment Used Nortec 131-D

Calibration Block: Type 3080-83 Serial Number 417

Transducer: Size .25" Dia Frequency 5 mHz

Witness Survey

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.398	.430	.440	.415	.434	.423	.442	.456	.438	.448	.443	.457
2	.415	.432	.433	.451	.430	.444	.467	.432	.440	.480	.443	.448
3	.416	.446	.440	.448	.428	.424	.463	.466	.442	.447	.440	.450
4	.398	.435	.448	.427	.459	.421	.458	.438	.454	.445	.448	.478
5	.395	.427	.451	.432	.430	.458	.460	.468	.430	.457	.479	.446
6	.403	.441	.445	.432	.443	.455	.461	.440	.436	.443	.447	.444
7	.400	.437	.444	.426	.445	.429	.483	.439	.453	.455	.449	.443
8	.425	.447	.436	.429	.441	.448	.460	.442	.426	.449	.441	.450
9	.419	.438	.459	.428	.427	.431	.442	.430	.451	.447	.445	.444
10	.422	.440	.473	.428	.430	.438	.463	.438	.436	.448	.447	.451
11			.437	.428	.428	.445	.445	.444	.458	.446	.435	
12				.428	.425	.453	.472	.449	.439	.435	.433	
13				.429	.447	.456	.463	.445	.424	.442		
14				.442	.433	.460	.442	.445	.428	.464		
15				.446		.464	.439	.444	.441			
16				.446		.447	.448	.440	.437			
17							.460	.447	.422			
18							.441					
19							.448					

Comments:

Thickness Survey,

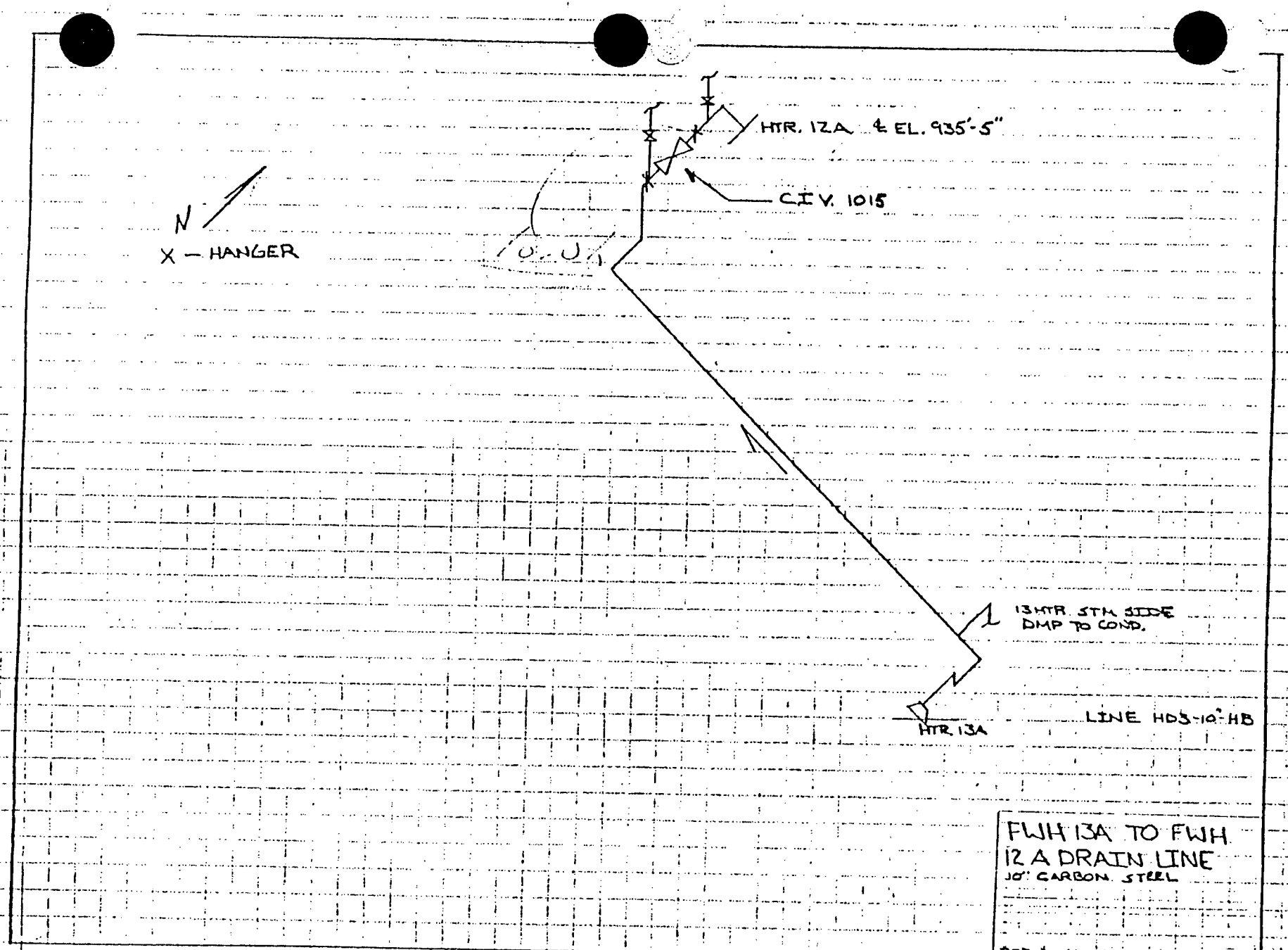
Date 7-24-84
Disc. N/A

Plant Monticello
Area 8.2A Entire Elbow
Examiner(s) ASW/ALH/JEB
Calibration Block: Type 3080-83 Serial Number 417
Transducer: Size ¼" dia Frequency 5 mHz

Iso # MTS-30
Grid Spacing 4"
Equipment Used NoorTec 131 D

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
1	.406	.400	.392	.415	.404	.411	.373	.422	.405	.402	.408	.427
2	.432	.406	.397	.394	.402	.426	.355	.439	.421	.403	.401	.386
3	.379	.393	.419	.381	.400	.404	.374	.423	.416	.404	.354	.398
4	.413	.400	.371	.391	.418	.398	.402	.410	.419	.413	.410	.400
5	.437	.400	.434	.422	.399	.414	.401	.435	.377	.390	.399	.413
6	.378	.424	.372	.424	.405					.400	.399	.398
7	.395	.417	.351	.396	.415					.337	.395	.363
8	.426	.393	.338	.372						.347	.400	.344
9	.407	.409	.387	.400								
10	.377											
11												
12												
13												
14												
15												
16												
17												
18												
19												

Comments:


HTR. 12A @ EL. 935'-5"
CIV. 1015
N
X — HANGER
13 HTR. 5TH SIDE DMP TO COND.
HTR 13A
LINE HD3-10"-HB
FWH 13A TO FWH 12A DRAIN LINE
10" CARBON STEEL
REF. DWG. NX-12192-119
ISO-MTS-31

Notes

ISO-MTS-31

FWH 13A to FWH 12A Drain 10"

Area | Scaffold Req'd. | Frequency

ISO # Assigned

INPUT FILE NAME cmonts31

OUTPUT FILE NAME a:cmonts31.ou2

BOUNDING LEVEL = 90 %

NUMBER OF CASES = 1

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 4: 7
NORTHERN STATES POWER COMPANY

MONTICELLO THICKNESS SUR. #31

CASE = 1 NCHEM = 1 TOTAL TIME = 110000. NSEG = 1

ICHEM	FMULT	PH	OXY	HOURS
0	100.000	7.100	1000.0	110000.

NCOMP = 16 DESIGN PRESS.= 23. DESIGN TEMP.= 241.

MONTICELLO THICKNESS SUR. #31

GEO (SECOND LINE)	MAT	COMP. NAME	DIA	THICK	TEMP	FLOW
		CR	CU	MO	SIGMA	
9	5	31 P1	10.	.365	241.	-8.000
4	5	31 E1	10.	.365	241.	-8.000
9	5	31 P2	10.	.365	241.	-8.000
4	5	31 E2	10.	.365	241.	-8.000
14	5	31 T1	10.	.365	241.	-8.000
9	5	31 P3	10.	.365	241.	-8.000
2	5	31 E3	10.	.365	241.	-8.000
9	5	31 P4	10.	.365	241.	-8.000
2	5	31 E4	10.	.365	241.	-8.000
9	5	31 P5	10.	.365	241.	-8.000
4	5	31 E5	10.	.365	241.	-8.000
9	5	31 P6	10.	.365	241.	-8.000
9	5	16.0A	10.	.365	241.	-8.000
4	5	31 E6	10.	.365	241.	-8.000
9	5	31 P8	10.	.365	241.	-8.000
8	5	31 V1	10.	.365	241.	-8.000

MONTICELLO THICKNESS SUR. #31

PASS 2 DATA
NUMBER OF INSPECTIONS = 16

NUMBER	COMP	MEASURED THICKNESS
1	31 P1	.365
2	31 E1	.365
3	31 P2	.365
4	31 E2	.365
5	31 T1	.365
6	31 P3	.365
7	31 E3	.365
8	31 P4	.365
9	31 E4	.365
10	31 P5	.365
11	31 E5	.365
12	31 P6	.365
13	16.0A	.365
14	31 E6	.365
15	31 P8	.365
16	31 V1	.365

MONTICELLO THICKNESS SUR. #31

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED AVERAGE EROSION RATE (MM/YR)
31 E1	.01
31 E2	.01
31 E5	.01
31 E6	.01
31 T1	.01
31 V1	.01
31 E3	.00
31 E4	.00
31 P1	.00
31 P2	.00
31 P3	.00
31 P4	.00
31 P5	.00
31 P6	.00
16.0A	.00
31 P8	.00

NOTE:
THE AVERAGE EROSION RATE FOR EACH COMPONENT IS CALCULATED USING THE MAXIMUM TOTAL TIME FOR THE PROBLEM

MONTICELLO THICKNESS SUR. #31

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED HOURS TO REACH MINIMUM WALL THICKNESS
31 E1	5629689.
31 E2	5629689.
31 E5	5629689.
31 E6	5629689.
31 T1	6777627.
31 V1	6777627.
31 E3	11369380.
31 E4	11369380.
31 P1	34328140.
31 P2	34328140.
31 P3	34328140.
31 P4	34328140.
31 P5	34328140.
31 P6	34328140.
16.0A	34328140.
31 P8	34328140.

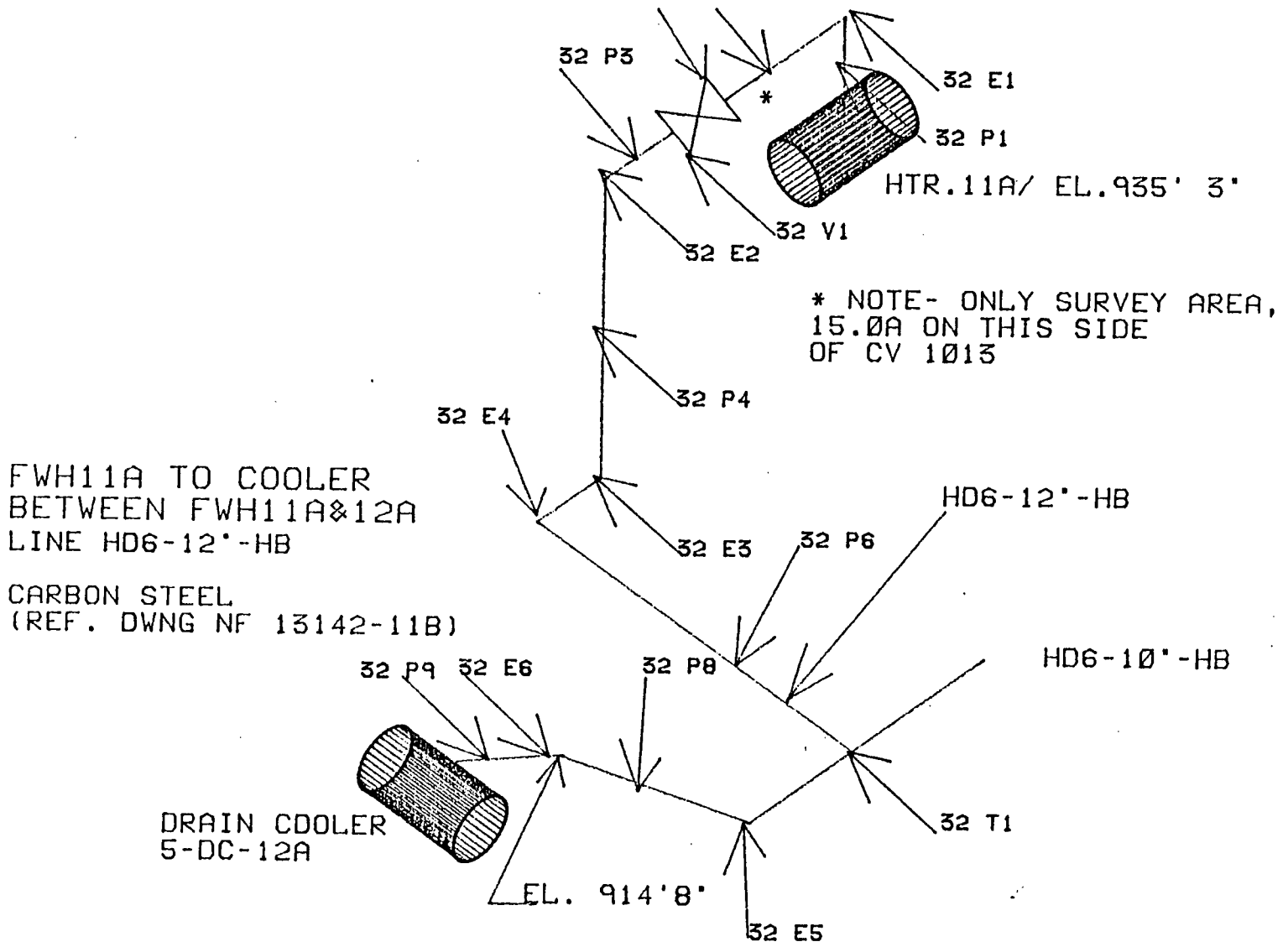
WARNING:
THE DESIGN MINIMUM WALL THICKNESS USED IN PREDICTING TOTAL HOURS IS BASED ON DESIGN PRESSURE ONLY. UTILITIES MUST PERFORM PLANT SPECIFIC ENGINEERING EVALUATIONS THAT INCLUDE ALL LOADS TO PREDICT TOTAL HOURS BEFORE A FAILURE WOULD OCCUR.

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 4: 7
NORTHERN STATES POWER COMPANY

MONTICELLO THICKNESS SUR. #31

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED THICKNESS (INCH)	PREDICTED WEAR (INCH)	LATEST EROSION RATE (MM/YEAR)	MINIMUM WALL THICKNESS (INCH)
31 P1	.364	.001	.00	.008
31 E1	.358	.007	.01	.008
31 P2	.364	.001	.00	.008
31 E2	.358	.007	.01	.008
31 T1	.359	.006	.01	.008
31 P3	.364	.001	.00	.008
31 E3	.362	.003	.00	.008
31 P4	.364	.001	.00	.008
31 E4	.362	.003	.00	.008
31 P5	.364	.001	.00	.008
31 E5	.358	.007	.01	.008
31 P6	.364	.001	.00	.008
16.0A	.364	.001	.00	.008
31 E6	.358	.007	.01	.008
31 P8	.364	.001	.00	.008
31 V1	.359	.006	.01	.008



THICKNESS SURVEY REF. DWNG.

MONTS32

NOTES

ISO-MTS-32

FWH 11A & Cooler between FWH 11A + 12A 12"

Area | Scaffold Req'd. | Frequency

No Assigned

INPUT FILE NAME cmonts32

OUTPUT FILE NAME a:cmonts32.ou2

BOUNDING LEVEL = 90 %

NUMBER OF CASES = 1

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 4:52
NORTHERN STATES POWER COMPANY

MONTICELLO THICKNESS SUR.# 32

CASE = 1 NCHEM = 1 TOTAL TIME = 110000. NSEG = 1

ICHEM	FMULT	PH	OXY	HOURS
0	100.000	7.100	1000.0	110000.

NCOMP = 16 DESIGN PRESS.= 8. DESIGN TEMP.= 178.

MONTICELLO THICKNESS SUR.# 32

GEO (SECOND LINE)	MAT	COMP. NAME CR	DIA CU	THICK MO	TEMP SIGMA	FLOW
9	5	32 P1	12.	.375	178.	-6.000
4	5	32 E1	12.	.375	178.	-6.000
8	5	32 V1	12.	.375	178.	-6.000
9	5	32 P3	12.	.375	178.	-6.000
4	5	32 E2	12.	.375	178.	-6.000
9	5	32 P4	12.	.375	178.	-6.000
2	5	32 E3	12.	.375	178.	-6.000
4	5	32 E4	12.	.375	178.	-6.000
9	5	32 P6	12.	.375	178.	-6.000
13	5	32 T1	12.	.375	178.	-6.000
1	5	32 E5	12.	.375	178.	-6.000
9	5	32 P8	12.	.375	178.	-6.000
1	5	32 E6	12.	.375	178.	-6.000
9	5	32 P9	12.	.375	178.	-6.000
9	5	15.0A	12.	.375	178.	-6.000
9	5	32 P7	12.	.375	178.	-6.000

MONTICELLO THICKNESS SUR.# 32

PASS 2 DATA
NUMBER OF INSPECTIONS = 16

NUMBER	COMP	MEASURED THICKNESS
1	32 P1	.375
2	32 E1	.375
3	32 V1	.375
4	32 P3	.375
5	32 E2	.375
6	32 P4	.375
7	32 E3	.375
8	32 E4	.375
9	32 P6	.375
10	32 T1	.375
11	32 E5	.375
12	32 P8	.375
13	32 E6	.375
14	32 P9	.375
15	15.0A	.375
16	32 P7	.375

MONTICELLO THICKNESS SUR.# 32

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED AVERAGE EROSION RATE (MM/YR)
32 E1	.00
32 E2	.00
32 E4	.00
32 V1	.00
32 T1	.00
32 E3	.00
32 E5	.00
32 E6	.00
32 P1	.00
32 P3	.00
32 P4	.00
32 P6	.00
32 P8	.00
32 P9	.00
15.0A	.00
32 P7	.00

NOTE:
THE AVERAGE EROSION RATE FOR EACH COMPONENT IS CALCULATED USING THE MAXIMUM TOTAL TIME FOR THE PROBLEM

MONTICELLO THICKNESS SUR.# 32

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED HOURS TO REACH MINIMUM WALL THICKNESS
32 E1	11687080.
32 E2	11687080.
32 E4	11687080.
32 V1	14046500.
32 T1	14046500.
32 E3	23484160.
32 E5	47078320.
32 E6	47078320.
32 P1	70672490.
32 P3	70672490.
32 P4	70672490.
32 P6	70672490.
32 P8	70672490.
32 P9	70672490.
15.0A	70672490.
32 P7	70672490.

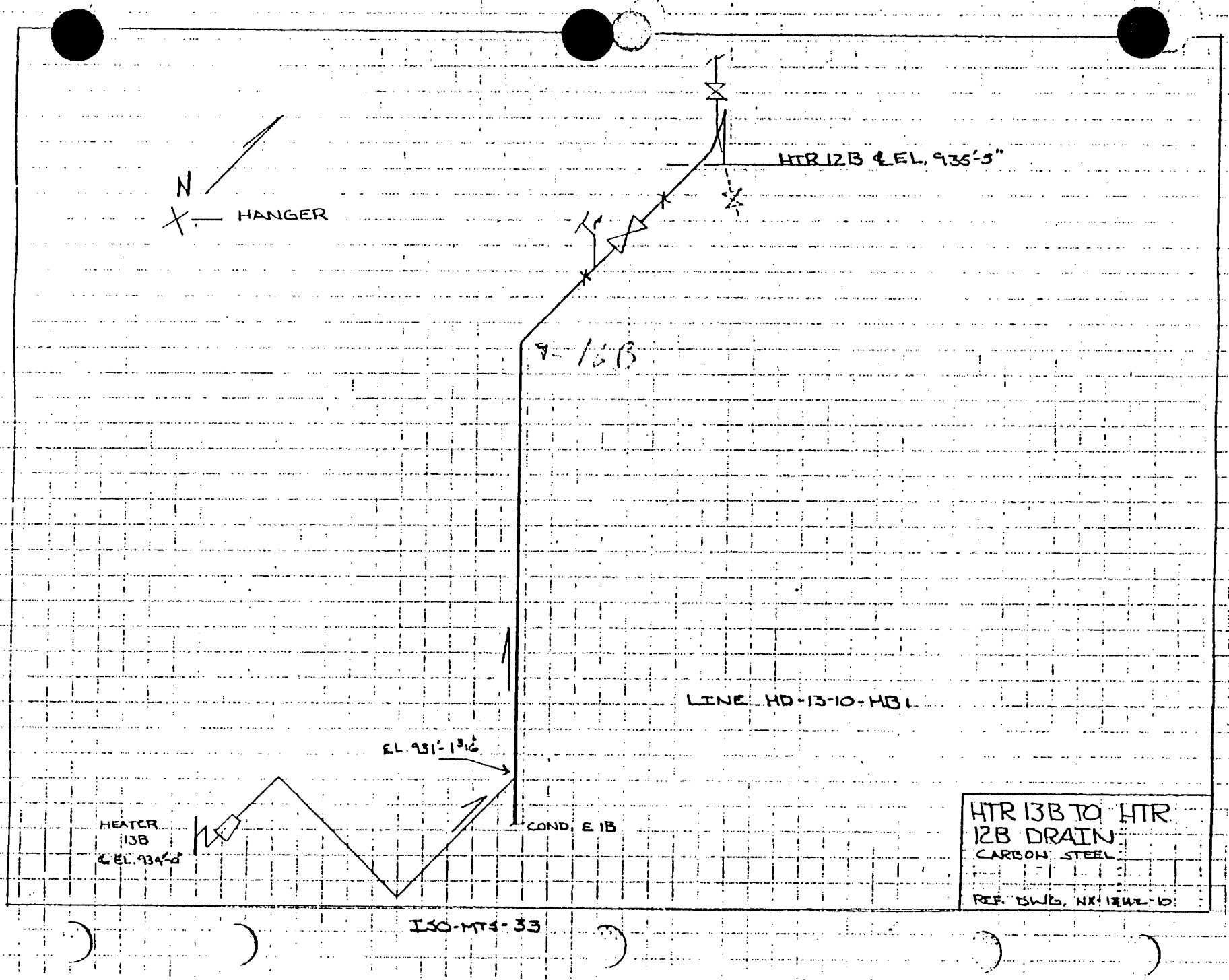
WARNING:
HE DESIGN MINIMUM WALL THICKNESS USED IN PREDICTING TOTAL HOURS IS BASED ON IGN PRESSURE ONLY. UTILITIES MUST PERFORM PLANT SPECIFIC ENGINEERING EVALUATIONS THAT INCLUDE ALL LOADS TO PREDICT TOTAL HOURS BEFORE A FAILURE WOULD OCCUR.

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 4:52
NORTHERN STATES POWER COMPANY

MONTICELLO THICKNESS SUR.# 32

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED THICKNESS (INCH)	PREDICTED WEAR (INCH)	LATEST EROSION RATE (MM/YEAR)	MINIMUM WALL THICKNESS (INCH)
32 P1	.374	.000	.00	.003
32 E1	.372	.003	.00	.003
32 V1	.372	.003	.00	.003
32 P3	.374	.000	.00	.003
32 E2	.372	.003	.00	.003
32 P4	.374	.000	.00	.003
32 E3	.373	.002	.00	.003
32 E4	.372	.003	.00	.003
32 P6	.374	.000	.00	.003
32 T1	.372	.003	.00	.003
32 E5	.374	.000	.00	.003
32 P8	.374	.000	.00	.003
32 E6	.374	.000	.00	.003
32 P9	.374	.000	.00	.003
15.0A	.374	.000	.00	.003
32 P7	.374	.000	.00	.003


N
HANGER
HTR 12B ℄ EL. 935'-5"
9-1/8
LINE HD-13-10-HB1
EL 931'-1 3/16"
HEATER 13B ℄ EL. 934'-6"
COND. E 1B
HTR 13B TO HTR 12B DRAIN
CARBON STEEL
REF. DWG. NX-12112-0
ISO-MTS-33

Notes
ISO-MTS-33

FWH 12B to FWH 12B Drain 10"

Area Scaffold Req'd. | Frequency

No # Assigned

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 5:44
NORTHERN STATES POWER COMPANY

INPUT FILE NAME cmonts33

OUTPUT FILE NAME a:cmonts33.ou2

BOUNDING LEVEL = 90 %

NUMBER OF CASES = 1

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 5:44
NORTHERN STATES POWER COMPANY

MONTICELLO THICKNESS SUR. #33

CASE = 1 NCHEM = 1 TOTAL TIME = 110000. NSEG = 1

ICHEM	FMULT	PH	OXY	HOURS
0	100.000	7.100	1000.0	110000.

NCOMP = 19 DESIGN PRESS.= 8. DESIGN TEMP.= 241.

MONTICELLO THICKNESS SUR. #33

GEO (SECOND	MAT LINE)	COMP. CR	NAME	DIA CU	THICK MO	TEMP SIGMA	FLOW
9	5	33	P1	10.	.365	241.	-8.000
4	5	33	E1	10.	.365	241.	-8.000
9	5	33	P2	10.	.365	241.	-8.000
4	5	33	E2	10.	.365	241.	-8.000
9	5	33	P3	10.	.365	241.	-8.000
2	5	33	E3	10.	.365	241.	-8.000
9	5	33	P4	10.	.365	241.	-8.000
2	5	33	E4	10.	.365	241.	-8.000
9	5	33	P5	10.	.365	241.	-8.000
14	5	33	T1	10.	.365	241.	-8.000
9	5	33	P6	10.	.365	241.	-8.000
4	5		16B	10.	.365	241.	-8.000
14	5	33	T2	10.	.365	241.	-8.000
8	5	33	V1	10.	.365	241.	-8.000
9	5	33	P7	10.	.365	241.	-8.000
1	5	33	E5	10.	.365	241.	-8.000
9	5	33	P8	10.	.365	241.	-8.000
2	5	33	E6	10.	.365	241.	-8.000
9	5	33	P9	10.	.365	241.	-8.000

MONTICELLO THICKNESS SUR. #33

PASS 2 DATA
NUMBER OF INSPECTIONS = 19

NUMBER	COMP	MEASURED THICKNESS
1	33 P1	.365
2	33 E1	.365
3	33 P2	.365
4	33 E2	.365
5	33 P3	.365
6	33 E3	.365
7	33 P4	.365
8	33 E4	.365
9	33 P5	.365
10	33 T1	.365
11	33 P6	.365
12	16B	.365
13	33 T2	.365
14	33 V1	.365
15	33 P7	.365
16	33 E5	.365
17	33 P8	.365
18	33 E6	.365
19	33 P9	.365

MONTICELLO THICKNESS SUR. #33

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED AVERAGE EROSION RATE (MM/YR)
33 E1	.01
33 E2	.01
16B	.01
33 T1	.01
33 T2	.01
33 V1	.01
33 E3	.00
33 E4	.00
33 E6	.00
33 E5	.00
33 P1	.00
33 P2	.00
33 P3	.00
33 P4	.00
33 P5	.00
33 P6	.00
33 P7	.00
33 P8	.00
33 P9	.00

NOTE:
THE AVERAGE EROSION RATE FOR EACH COMPONENT IS CALCULATED USING THE MAXIMUM TOTAL TIME FOR THE PROBLEM

MONTICELLO THICKNESS SUR. #33

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED HOURS TO REACH MINIMUM WALL THICKNESS
33 E1	5716092.
33 E2	5716092.
16B	5716092.
33 T1	6881310.
33 T2	6881310.
33 V1	6881310.
33 E3	11542180.
33 E4	11542180.
33 E6	11542180.
33 E5	23194370.
33 P1	34846550.
33 P2	34846550.
33 P3	34846550.
33 P4	34846550.
33 P5	34846550.
33 P6	34846550.
33 P7	34846550.
33 P8	34846550.
33 P9	34846550.

WARNING:
THE DESIGN MINIMUM WALL THICKNESS USED IN PREDICTING TOTAL HOURS IS BASED ON DESIGN PRESSURE ONLY. UTILITIES MUST PERFORM PLANT SPECIFIC ENGINEERING EVALUATIONS THAT INCLUDE ALL LOADS TO PREDICT TOTAL HOURS BEFORE A FAILURE WOULD OCCUR.

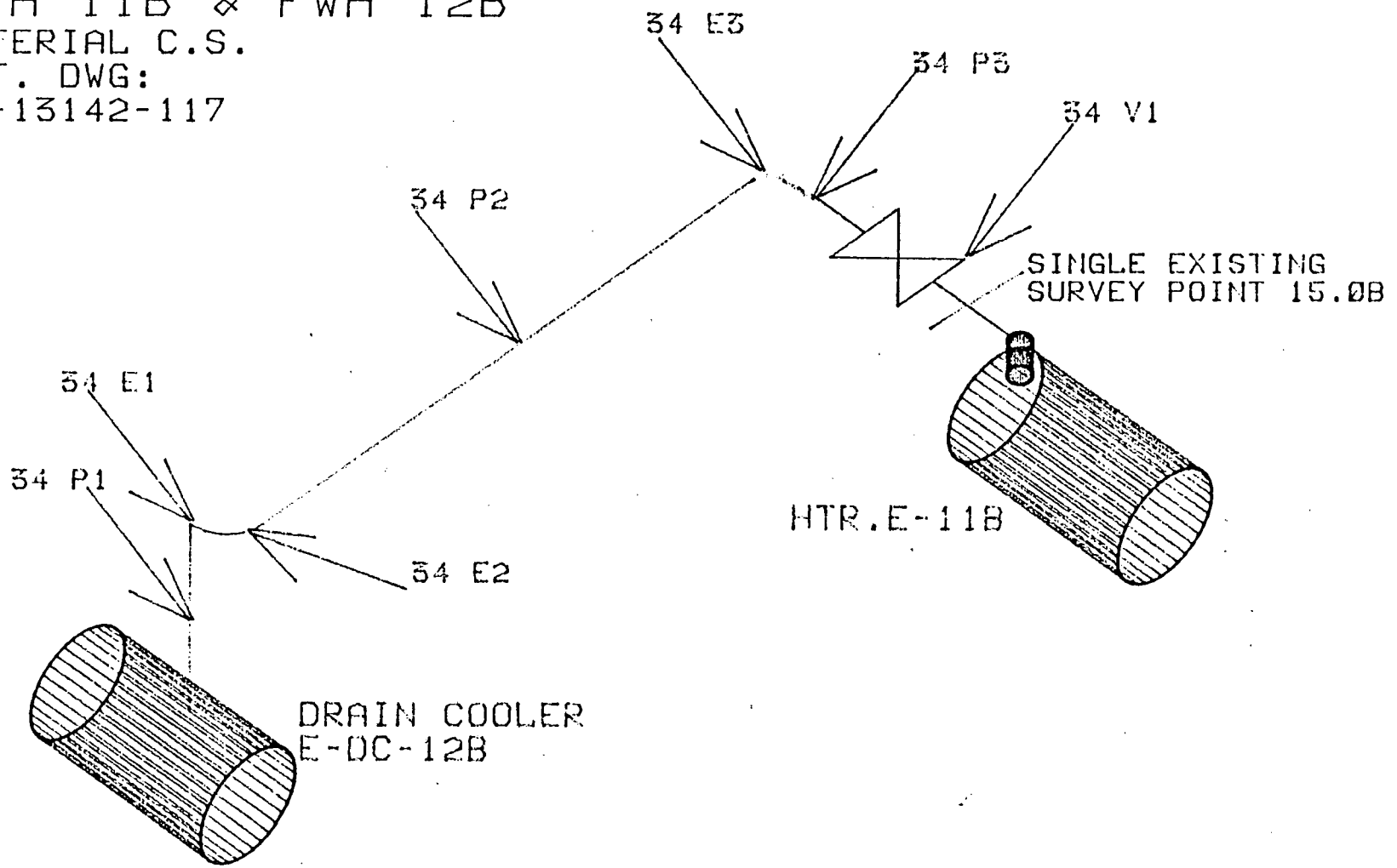
EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18: 5:44
NORTHERN STATES POWER COMPANY

MONTICELLO THICKNESS SUR. #33

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED THICKNESS (INCH)	PREDICTED WEAR (INCH)	LATEST EROSION RATE (MM/YEAR)	MINIMUM WALL THICKNESS (INCH)
33 P1	.364	.001	.00	.003
33 E1	.358	.007	.01	.003
33 P2	.364	.001	.00	.003
33 E2	.358	.007	.01	.003
33 P3	.364	.001	.00	.003
33 E3	.362	.003	.00	.003
33 P4	.364	.001	.00	.003
33 E4	.362	.003	.00	.003
33 P5	.364	.001	.00	.003
33 T1	.359	.006	.01	.003
33 P6	.364	.001	.00	.003
16B	.358	.007	.01	.003
33 T2	.359	.006	.01	.003
33 V1	.359	.006	.01	.003
33 P7	.364	.001	.00	.003
33 E5	.363	.002	.00	.003
33 P8	.364	.001	.00	.003
33 E6	.362	.003	.00	.003
33 P9	.364	.001	.00	.003

FWH 11 B TO COOLER
FWH 11B & FWH 12B
MATERIAL C.S.
REF. DWG:
NX-13142-117



THICKNESS SURVEY REF. DWNG. MONTS34

Notes
ECO-MTS-34

FWH 11B & Cooler between FWH 11B to FWH 12B 12"

Area — Scaffold Req'd. | Frequency

ISO # Assigned

INPUT FILE NAME cmonts34

OUTPUT FILE NAME a:cmonts34.ou2

BOUNDING LEVEL = 90 %

NUMBER OF CASES = 1

MONTICELLO THICKNESS SUR. #34

CASE = 1 NCHEM = 1 TOTAL TIME = 110000. NSEG = 1

ICHEM	FMULT	PH	OXY	HOURS
0	100.000	7.000	1000.0	110000.

NCOMP = 10 DESIGN PRESS.= 8. DESIGN TEMP.= 178.

MONTICELLO THICKNESS SUR. #34

GEO (SECOND	MAT LINE)	COMP. NAME CR	DIA CU	THICK MO	TEMP SIGMA	FLOW
9	5	15.0B	12.	.375	178.	-6.000
8	5	34 V1	12.	.375	178.	-6.000
9	5	34 P3	12.	.375	178.	-6.000
2	5	34 E3	12.	.375	178.	-6.000
9	5	34 P2	12.	.375	178.	-6.000
4	5	34 E1	12.	.375	178.	-6.000
4	5	34 E2	12.	.375	178.	-6.000
9	5	34 P1	12.	.375	178.	-6.000
9	5	34FILL	12.	.375	178.	-6.000
9	5	34FILL2	12.	.375	178.	-6.000

MONTICELLO THICKNESS SUR. #34

PASS 2 DATA
NUMBER OF INSPECTIONS = 10

NUMBER	COMP	MEASURED THICKNESS
1	15.0B	.375
2	34 V1	.375
3	34 P3	.375
4	34 E3	.375
5	34 P2	.375
6	34 E1	.375
7	34 E2	.375
8	34 P1	.375
9	34FILL	.375
10	34FILL2	.375

MONTICELLO THICKNESS SUR. #34

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED AVERAGE EROSION RATE (MM/YR)
34 E1	.00
34 E2	.00
34 V1	.00
34 E3	.00
15.0B	.00
34 P3	.00
34 P2	.00
34 P1	.00
34FILL	.00
34FILL2	.00

NOTE:
THE AVERAGE EROSION RATE FOR EACH COMPONENT IS CALCULATED USING THE MAXIMUM TOTAL TIME FOR THE PROBLEM

MONTICELLO THICKNESS SUR. #34

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED HOURS TO REACH MINIMUM WALL THICKNESS
34 E1	11687080.
34 E2	11687080.
34 V1	14046500.
34 E3	23484160.
15.0B	70672490.
34 P3	70672490.
34 P2	70672490.
34 P1	70672490.
34FILL	70672490.
34FILL2	70672490.

WARNING:
THE DESIGN MINIMUM WALL THICKNESS USED IN PREDICTING TOTAL HOURS IS BASED ON DESIGN PRESSURE ONLY. UTILITIES MUST PERFORM PLANT SPECIFIC ENGINEERING EVALUATIONS THAT INCLUDE ALL LOADS TO PREDICT TOTAL HOURS BEFORE A FAILURE WOULD OCCUR.

MONTICELLO THICKNESS SUR. #34

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED THICKNESS (INCH)	PREDICTED WEAR (INCH)	LATEST EROSION RATE (MM/YEAR)	MINIMUM WALL THICKNESS (INCH)
15.0B	.374	.000	.00	.003
34 V1	.372	.003	.00	.003
34 P3	.374	.000	.00	.003
34 E3	.373	.002	.00	.003
34 P2	.374	.000	.00	.003
34 E1	.372	.003	.00	.003
34 E2	.372	.003	.00	.003
34 P1	.374	.000	.00	.003
34FILL	.374	.000	.00	.003
34FILL2	.374	.000	.00	.003

THICKNESS SURVEY REPORT

DATE 5-22-86

DISC# 78

PLANT MONTICELLO

ISO# MTS-35

AREA 11.A1

GRID SIZE 200

EXAMINERS STEVE STANFORD II / BILL BOSS I / SCOTT HALL I

EQUIPMENT ULTRA IMAGE III

TRANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

NOMINAL WALL .937"

MIN. WALL

COMMENTS

X Degree / Y Grid	162 0	27 30	54 60	81 90	108 120	135 150	0 180	27 210	54 240	81 270	108 300	135 330
1 0	.960	.930	.920	.920	.890	.890	.890	.880	.910	.910	.920	.930
2 10	.920	.930	.920	.910	.890	.910	.890	.890	.910	.910	.920	.920
3 20	.940	.940	.920	.920	.910	.910	.890	.890	.890	.920	.920	.920
4 30	.940	.930	.920	.910	.910	.910	.890	.890	.910	.920	.920	.940
5 40	.940	.930	.920	.920	.920	.910	.890	.910	.910	.910	.920	.950
6 50	.940	.920	.910	.910	.890	.890	.890	.900	.890	.910	.910	.920
7 60	.930	.930	.910	.920	.890	.910	.910	.910	.890	.910	.890	.920
8 70	.930	.930	.940	.930	.920	.940	.920	.920	.910	.930	.910	.930
9 80	.940	.960	—	.920	.940	.870	.890	—	—	.890	.910	.930
10 90	.930	—	—	—	—	—	.910	.890	.890	.910	.910	.920
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LOWEST AREA - .870
@ 180° - X-166, Y-8

THICKNESS SURVEY REPORT

DATE 5-27-86

DISC# 81

PLANT MONTICELLO

ISO# MTS-35

AREA 11.A2

GRID SIZE 200

EXAMINERS STEVE STANFORD II / A.W. VOSSI / S.G. HALL I

EQUIPMENT ULTRA IMAGE III

TRANSDUCER (SIZE/FREQ.) .25" / 10 MHz.

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

NOMINAL WALL 1.037"

MIN. WALL

COMMENTS

X Degree / Y Grid	0	30	60	90	120	150	180	210	240	270	300	330
1 0	1.040	1.040	1.020	1.000	1.000	1.010	1.020	1.040	1.040	1.070	1.070	1.060
2 10	1.060	1.040	1.030	1.020	1.010	1.010	1.020	1.040	1.080	1.070	1.070	1.060
3 20	1.080	1.060	1.020	1.020	1.010	1.010	1.030	1.030	1.060	1.070	1.070	1.070
4 30	1.070	1.020	1.030	1.000	1.000	1.010	1.030	1.030	1.060	1.090	1.080	1.070
5 40	1.070	1.030	1.020	1.000	1.010	1.010	1.030	1.040	1.070	1.080	1.080	1.080
6 50	1.070	1.030	1.010	.990	.990	1.000	1.030	1.020	1.070	1.080	1.090	1.080
7 60	1.070	1.030	1.010	1.030	1.000	1.000	1.030	1.030	1.060	1.080	1.080	1.070
8 70	1.060	1.030	1.020	1.020	1.000	1.010	1.030	1.030	1.060	1.080	1.080	1.080
9 80	1.080	1.040	1.020	1.010	1.000	1.000	1.030	1.040	1.060	1.070	1.090	1.070
10 90	1.070	1.040	1.020	1.010	1.000	1.020	1.020	1.030	1.040	1.060	1.040	1.070
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LOWEST AREA .970"
0-180° X-125, Y-46

THICKNESS SURVEY REPORT

DATE 5-23-86

DISC# 80

PLANT MONTICELLO

ISO# MTS-35

AREA 11.C1

GRID SIZE 200

EXAMINERS STEVE STANFORD II / BILL JOSSI / SCOTT HALL

EQUIPMENT ULTRA IMAGE III

TRANSDUCER (SIZE/FREQ.) .25" / 10 MHZ.

CAL. BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

NOMINAL WALL 1.037

MIN. WALL

COMMENTS

X Degree / Y Grid	0 0	29 30	58 60	87 90	116 120	145 150	174 180	30 210	60 240	90 270	120 300	150 330
1 0	1.080	1.080	1.050	1.070	1.060	1.060	1.060	1.040	1.070	1.090	1.090	1.090
2 10	1.090	1.080	1.090	1.070	1.070	1.060	1.060	1.070	1.080	1.110	1.110	1.110
3 20	1.090	1.110	1.080	1.080	1.070	1.070	1.030	1.060	1.070	1.080	1.090	1.090
4 30	1.110	1.090	1.080	1.070	1.060	1.040	1.050	1.030	1.060	1.080	1.090	1.110
5 40	1.090	1.080	1.070	1.070	1.050	1.050	1.050	1.060	1.080	1.090	1.110	1.090
6 50	1.090	1.090	1.080	1.080	1.060	1.050	1.040	1.050	1.070	1.080	1.110	1.110
7 60	1.090	1.080	1.080	1.060	1.050	1.050	1.040	1.060	1.070	1.080	1.090	1.110
8 70	1.090	1.080	1.050	1.060	1.050	1.050	1.050	1.060	1.070	1.080	1.110	1.110
9 80	1.090	1.080	1.070	1.060	1.050	1.050	1.050	1.060	1.080	1.090	1.110	1.090
10 90	1.080	1.060	1.060	1.040	1.040	1.050	1.050	1.070	1.090	1.110	1.110	1.090
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LOWEST AREA - 1.060"
X-70, Y-75

THICKNESS SURVEY REPORT

DATE 5-22-86

DISC# 78

NT MONTICELLO

ISO# MTS-35

AREA 11. D1 0-18"

GRID SIZE 200

EXAMINERS STEVE STANFORD II / A.W. JOSS / S.G. HALL

EQUIPMENT ULTRA IMAGE III

TRANSDUCER (SIZE/FREQ.) .25"/10 MHz.

CAL.BLOCK (TYPE/SERIAL NO.) STEPWEDGE 3080-83

NOMINAL WALL 1.037

MIN. WALL

COMMENTS

X / Degree / Y / Grid	0	30	60	90	120	150	180	210	240	270	300	330
1	0	1.040	1.020	1.040	1.040	1.040	1.010	1.050	1.060	1.010	1.050	1.040
2	10	1.020	1.010	1.040	1.050	1.040	1.050	1.010	1.060	1.060	1.060	1.040
3	20	1.050	1.040	1.030	1.040	1.020	1.060	1.060	1.010	1.060	1.080	1.050
4	30	1.050	1.050	1.030	1.100	1.040	1.050	1.050	1.060	1.060	1.040	1.040
5	40	1.050	1.040	1.030	1.020	1.060	1.080	1.060	1.060	960	1.070	1.030
6	50	—	1.010	—	—	—	.930	—	—	—	.850	—
7	60	.960	.960	.960	1.000	1.010	1.020	—	—	—	.990	.990
8	70	.960	.960	.980	.930	1.010	1.020	1.040	1.020	1.050	1.000	.980
9	80	.980	.960	.980	1.010	1.020	1.050	1.040	1.020	900	1.000	.980
10	90	.980	.990	.990	1.010	1.020	1.020	1.060	1.010	1.000	.980	.950
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LOWEST AREA - .950"
180°-0° X-160, Y-76

THICKNESS SURVEY REPORT

DATE 5-29-86

DISC# N/A

PLANT Monticello

ISO# MTS-36

AREA 12.1

GRID SIZE 2"

EXAMINERS A Wheildon / A Wiess / S Hull

EQUIPMENT Nortec 1310

TRANSDUCER (SIZE/FREQ.) .25"/5mhz

CAL. BLOCK (TYPE/SERIAL NO.) 3080-83

NOMINAL WALL

MIN. WALL

COMMENTS 0° T.O.C. Lowest area .545"

Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
1	.643	.638	.618	.605	.604	.596	.610	.640	.650	.635	.612	.608
2	.633	.642	.613	.612	.610	.587	.626	.668	.645	.650	.635	.637
3	.634	.642	.640	.612	.605	.586	.615	.656	.643	.668	.655	.616
4	.639	.635	.624	.580	.585	.596	.625	.655	.652	.686	.664	.647
5	.630	.626	.634	.586	.593	.605	.610	.635	.658	.682	.682	.638
6	.575	.644	.620	.585	.605	.628	.610	.608	.592	.585	.620	.625
7	.625	.630	.602	.600	.622	.602	.618	.594	.586	.585	.597	.604
8	.587	.636	.626	.624	.619	.605	.608	.588	.555	.550	.551	.600
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THICKNESS SURVEY REPORT

DATE 5-29-86

DISC# N/A

PLANT Monticello

ISO# MTS-36

AREA 12.2

GRID SIZE 2"

EXAMINERS A Wheeldon / A Wood / S Hull

EQUIPMENT NonTec 131D

TRANSDUCER (SIZE/FREQ.) .25"/5mHz

CAL. BLOCK (TYPE/SERIAL NO.) 3090-83

NOMINAL WALL

MIN. WALL

COMMENTS 0°-T.D.C. Lowest area .594

Grid \ Degree	0	30	60	90	120	150	180	210	240	270	300	330
1	.635	.629	.648	.615	.623	.621	.594	.652	.644	.631	.608	.630
2	.624	.630	.635	.612	.626	.622	.610	.609	.680	.641	.615	.634
3	.622	.619	.624	.602	.625	.627	.612	.617	.621	.636	.623	.629
4	.618	.612	.617	.606	.630	.642	.623	.626	.645	.640	.617	.625
5	.604	.613	.618	.604	.633	.629	.626	.622	.637	.638	.612	.622
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THICKNESS SURVEY REPORT

DATE 5-30-86

DISC# N/A

N[redacted] Monticello

ISO# MTS-36

A 2.3

GRID SIZE 2"

MINERS A. Whaldon / A.W. Voss

EQUIPMENT Nortec 1310

NSDUCER (SIZE/FREQ.) .25"/5mHz

CAL.BLOCK (TYPE/SERIAL NO.) 3080-83

MINAL WALL

MIN. WALL

MMENTS 0°-T.D.C. Lowest area .513" readings on line 6 due to counterbore of weld

Degree / Grid	30	60	90	120	150	180	210	240	270	300	330
1	.592	.584	.550	.532	.516	.518	.542	.554	.572	.590	.594
2	.594	.584	.549	.526	.516	.517	.545	.559	.567	.583	.587
3	.590	.584	.550	.523	.514	.518	.539	.555	.564	.584	.587
4	.587	.579	.550	.522	.516	.513	.538	.558	.562	.583	.583
5	.591	.580	.544	.520	.520	.520	.540	.560	.564	.590	.581
6	.378	.376	.385	.474	.506	.369	.429	.459	.390	.420	.420
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THICKNESS SURVEY REPORT

DATE 5-30-86

DISC# N/A

T Monticello

ISO# MTS-37

A 13.1

GRID SIZE 2"

EXAMINERS A Wheeldon / A W Voss

EQUIPMENT NorTec 131D

TRANSDUCER (SIZE/FREQ.) .25" / 5mHz

CAL. BLOCK (TYPE/SERIAL NO.) 3080-83

NOMINAL WALL

MIN. WALL

COMMENTS 0° - T.O.C. Lowest Reading .370

Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
1	.447	.401	.427	.432	.425	.435	.455	.467	.476	.455	.435	.443
2	.464	.414	.445	.432	.428	.432	.401	.459	.460	.460	.430	.439
3	.488	.426	.450	.445	.423	.384	.431	.393	.452	.460	.457	.455
4	.487	.440	.442	.442	.421	.380	.371	.434	.443	.457	.446	.441
5	.490	.428	.450	.438	.427	.370	.407	.429	.443	.464	.439	.439
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THICKNESS SURVEY REPORT

DATE 5-30-86

DISC# N/A

P[redacted] Monticello

ISO# MTS-37

AREA 13.2

GRID SIZE 2"

EXAMINERS A Wheildon / A W Voss

EQUIPMENT NorTec 131D

TRANSDUCER (SIZE/FREQ.) .25" / 5MHz

CAL. BLOCK (TYPE/SERIAL NO.) 3080.83

NOMINAL WALL

MIN. WALL

COMMENTS 0° - inner radius Lowest area .342"

Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
1	.387	.400	.432	.496	.447	.469	.511	.439	.441	.403	.354	.369
2	.377	.380	.434	.492	.474	.483	.510	.465	.446	.436	.342	.343
3	.375	.368	.418	.493	.487	.485	.524	.473	.455	.412	.367	.342
4	.364	.366	.415	.442	.482	.491	.513	.474	.456	.402	.377	.346
5	.430	.390	.466	.456	.477	.530	.510	.455	.452	.446	.416	.394
6												
7												
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21												

THICKNESS SURVEY REPORT

DATE 5-30-86

DISC# N/A

T Montcello

13.3

ISO# MTS-37

GRID SIZE 2"

EXAMINERS A Wheeldon / A W Voss

EQUIPMENT NorTec 131 D

TRANSDUCER (SIZE/FREQ.) .25"/5mHz

CAL.BLOCK (TYPE/SERIAL NO.) 3080-83

NOMINAL WALL

MIN. WALL

COMMENTS 0° - T.D.C. Lowest area .393"

Degree / Grid	30	60	90	120	150	180	210	240	270	300	330
1	.447	.431	.427	.456	.463	.469	.470	.494	.446	.445	.434	.456	.496
2	.446	.417	.398	.411	.424	.467	.470	.492	.491	.467	.447	.452	.456
3	.446	.405	.390	.402	.403	.460	.478	.492	.466	.454	.452	.465	
4													
5													
6													
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17													
18													
19													
20													
21													

THICKNESS SURVEY REPORT

DATE 5-29-86

DISC# N/A

[redacted] Monticello

ISO# MTS-38

14.1

GRID SIZE 2"

EXAMINERS A W Voss / S Hall / A Wheeldon

EQUIPMENT Nortec 1310

TRANSDUCER (SIZE/FREQ.) .25"/5mhz

CAL.BLOCK (TYPE/SERIAL NO.) 3080-93

NOMINAL WALL

MIN. WALL

COMMENTS 0° T.O.C. Lowest area .368

Degree / Grid	0	30	60	90	120	150	180	210	240	270	300	330
1	.565	.658	.666	.666	.660	.662	.628	.610	.590	.591	.606	.617
2	.656	.636	.626	.657	.617	.638	.625	.610	.590	.592	.630	.630
3	.646	.634	.625	.630	.621	.624	.627	.622	.620	.620	.630	.629
4	.455	.405	.396	.413	.469	.465	.463	.556	.525	.550	.476	.476
5	.465	.429	.418	.392	.374	.386	.406	.428	.432	.450	.463	.478
6	.450	.425	.406	.389	.369	.389	.405	.422	.425	.445	.453	.466
7	.445	.428	.413	.410	.416	.425	.435	.435	.440	.460	.445	.444
8	.442	.430	.425	.414	.422	.422	.422	.418	.416	.440	.423	.435
9	.442	.424	.422	.412	.417	.418	.426	.430	.428	.449	.434	.445
10												
11												
12												
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14												
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16												
17												
18												
19												
20												
21												

Internal Correspondence

Date January 10, 1985

From Randy Coleman

Location Midland Square -3

To Dan Couch

Location Monticello

Subject: TURBINE PIPING THICKNESS SURVEY

Dear Dan,

I have enclosed a copy of the Monticello Turbine Piping Thickness Survey Report and a Thickness Survey Log Book. If you have any questions, please let me know.

Sincerely,

Randy J Coleman
Material & Special Process Engineer

wmh

GENERAL

This report covers the turbine piping wall thickness survey done on Monticello Nuclear Generating Plant Unit I from April 25 through August 2, 1984. The Inspection was done by personnel from Lambert, McGill, and Thomas Inc (LMT) of Santa Clara, California under the supervision of Randy Coleman from Production Plant Maintenance Department. The site coordinator was Dan Couch from the Monticello Plant.

The inspection was conducted as a baseline for an ongoing turbine piping wall thickness study at the Monticello plant. The data points were chosen by plant personnel. Isometric diagrams showing the pipe layout and location of data aquisition areas were sketched by personnel from LMT.

Data was gathered using a Nortec 131-D Digital Ultrascope or the General Dynamics Ultra Image III. The Nortec 131-D is a conventional manually operated ultrascope with a digital readout. The next two paragraphs describe the Ultra Image III and some of its capabilities.

The Ultra Image III is an ultrasonic imaging inspection system whose functions are monitored and controlled by a microprocessor. Information on administrative records, scanner set-up, calibration parameters, and ultrasonic instrument control settings is stored in the microprocessor header memory in preparation for taking data. The thickness data is gathered over a pre-determined area in accordance with information in the header and is stored in a data memory. The header and data memory may then be analyzed and stored on magnetic floppy disks as permanent records.

The Ultra Image III is capable of presenting data in various forms. Analysis may be performed on general areas or on given points because the thickness and signal amplitude data stored in the memory are arranged in grid form with X and Y coordinates. The coordinates correspond to specific points of the area examined. Multiple presentation format permits the analyst to display a plan view with an infinite number of thickness ranges given in percent of nominal wall thickness. In addition to the plan view, cross sections of the inspection area may be viewed.

Data taken while using the Nortec instrument was put directly on report forms. Data taken using the Ultra Image system was stored on floppy disks and later transcribed to report forms. The completed report forms are in the Monticello Thickness Survey log book. Information stored on floppy disks will be retained by Production Plant Maintenance Department.

The results of this baseline inspection have been organized and put into a Monticello Thickness Survey Log Book. The book is divided into sections based on thickness survey isometric diagrams. Sections are labeled with the appropriate isometric diagram number. They contain a copy of the isometric, copies of the thickness survey reports and a note page for comments. The reasons for organizing the log book in this fashion is that as reports are received from subsequent inspections the log book may be conveniently updated by dividing it into subsections containing reports on specific areas.

RESULTS

The results of the inspection can be summarized by stating that the crossunder piping shows signs of tiger stripping and areas of severe erosion/corrosion. The extraction and drain piping areas tested show no sign of severe localized erosion/corrosion.

The worst areas of erosion/corrosion were discovered when a maintenance worker crawled through the crossunder line between B moisture separator and #3 CIV to retrieve a part that had been accidently dropped into the line. He noticed that the horizontal run between B2 and F on ISO-MTS-11 had numerous spots that appeared to have one fourth inch wall loss. In addition to this the pipe to elbow weld at area B had wall loss upstream of the weld and the general area around C had tiger stripping.

The suspect areas were scanned with the Ultra Image III. The results were that some areas were at or below the 0.271" minimum wall thickness. The areas that required weld repair and reinspection are at B2, F and B. Area C was not repaired because the tiger striped areas had minimum thickness readings greater than 0.450 inches. Repair work was handled by the plant.

One additional noteworthy area on crossunder piping was area 1.1A on ISO-MTS-1. Scan data on the Ultra Image III shows thin areas between 310° and 330°. The thin spots could not be found when a visual examination inside the pipe was performed. The spots are apparently laminations in the pipe.

Visual examination of the remainder of the crossunder piping that was accessable revealed areas of tiger stripping but no severely eroded areas.

Selected areas of the extraction and drain piping as stated earlier in this report, were examined and the results were favorable. None of the areas tested showed severe erosion/corrosion damage like that in the crossunder piping. However, the areas in Table 1 show major thickness variations over the data acquisition areas. These suspect areas should be examined during the next refueling outage.

TABLE 1

ISO	AREA
MTS-4	T.5
MTS-4	T.6
MTS-9	9.4A
MTS-10	10.4A
MTS-15	5.4
MTS-16	6.4A
MTS-24	6.2

On September 5, 1984 a seminar entitled Erosion/Corrosion of Turbine Piping Systems was given by Electric Power Research Institute at the J.A. Jones Applied Research Center in Charlotte, North Carolina. Don Pedersen from the Monticello plant and Randy Coleman from Production Plant Maintenance Department attended the seminar. The material presented in the seminar was focused on current research of the erosion/corrosion problem and how to develop a plant specific program to monitor it. Table 2 contains a list of data acquisition areas that should be added to the current Monticello Thickness Survey Program if the monitoring program EPRI suggested is to be followed.

TABLE 2

ISO#	AREA#
MTS-5	3.7A
MTS-5	3.8A
MTS-6	3.7
MTS-6	3.8
MTS-7	9.4
MTS-8	10.2
MTS-9	9.2A
MTS-9	9.5A
MTS-10	10.2A
MTS-10	10.5A

Recommendations

1. The weld repaired areas of the crossunder piping should be reinspected during the next refueling outage.

2. The areas listed in Table 1 should be reinspected during the next refueling outage.

3. The interior surface of the crossunder piping should be given a visual examination during the next refueling outage.

4. The data acquisition areas listed in Table 2 should be added to the thickness survey program and baseline inspection should be done on them during the next refueling outage.

Document Name:
RJC112884WMH01

Requestor's ID:
OPR4

Author's Name:
RANDY COLEMAN

Document Comments:
MONTICELLO THICKNESS SURVEY REPORT

1-e-94

GENERAL

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TABLE 1

ISO	AREA
MTS-4	T.5
MTS-4	T.6
MTS-9	9.4A
MTS-10	10.4A
MTS-15	5.4
MTS-16	6.4A
MTS-24	6.2

On September 5, 1984 a seminar entitled Erosion/Corrosion of Turbine Piping Systems was given by Electric Power Research Institute at the J.A. Jones Applied Research Center in Charlotte, North Carolina. Don Pedersen from the Monticello plant and Randy Coleman from Production Plant Maintenance Department attended the seminar. The material presented in the seminar was focused on current research of the erosion/corrosion problem and how to develop a plant specific program to monitor it. Table 2 contains a list of data acquisition areas that should be added to the current Monticello Thickness Survey Program if the monitoring program EPRI suggested is to be followed.

TABLE 2

ISO#	AREA#
MTS-5	3.7A
MTS-5	3.8A
MTS-6	3.7
MTS-6	3.8
MTS-7	9.4
MTS-8	10.2
MTS-9	9.2A
MTS-9	9.5A
MTS-10	10.2A
MTS-10	10.5A

Recommendations

1. The weld repaired areas of the crossunder piping should be reinspected during the next refueling outage.

2. The areas listed in Table 1 should be reinspected during the next refueling outage.

3. The interior surface of the crossunder piping should be given a visual examination during the next refueling outage.

4. The data acquisition areas listed in Table 2 should be added to the thickness survey program and baseline inspection should be done on them during the next refueling outage.

1-10-87

Monticello Feedwater Piping Wall Thickness Survey Summary

Inspection Point No.	Description and Line No.	Nominal Wall Thickness in.	Max Wall Loss in.
A1	#11 RFP Recirc branch flow tee, FW3-8-DE	0.594	.014
A2	Elbow downstream of CV 6-12A, FW28-14-DE	0.938	.078 (in the counterbore area)
A3	Elbow after branch tee A FW line to CV 6-13 FW2-6-DE	0.562	.005
A4	Branch Tee downstream of CV 6-13, FW2-6-DE	0.562	.044
A5	Elbow downstream of A4 FW2-6-DE	0.562	.040
A6	Elbow on #12 RFP Suction C4B-16-GB	0.375	.025
B1	Elbow Upstream of SPE C2-24-G8	0.500	.005
B2	Mixing tee where A & B condensate loops mix downstream of SJAEs, C2-24-G8	0.500	.020
B3	Mixing tee of B loop inner and after SJAE condensers, C2B-16-GB	0.375	-.007
C1	B loop FW cleanup line branch flow tee, FW10-8-DE	0.594	.024
D1	Elbow downstream of CV 1095A, C5-10-GB	0.365	.024
D2	Branch tee upstream of CV 1095A, C5-6-G8	0.280	.007
D3	Branch flow tee to 11B drain cooler, C4B-16-GB	0.375	-.021

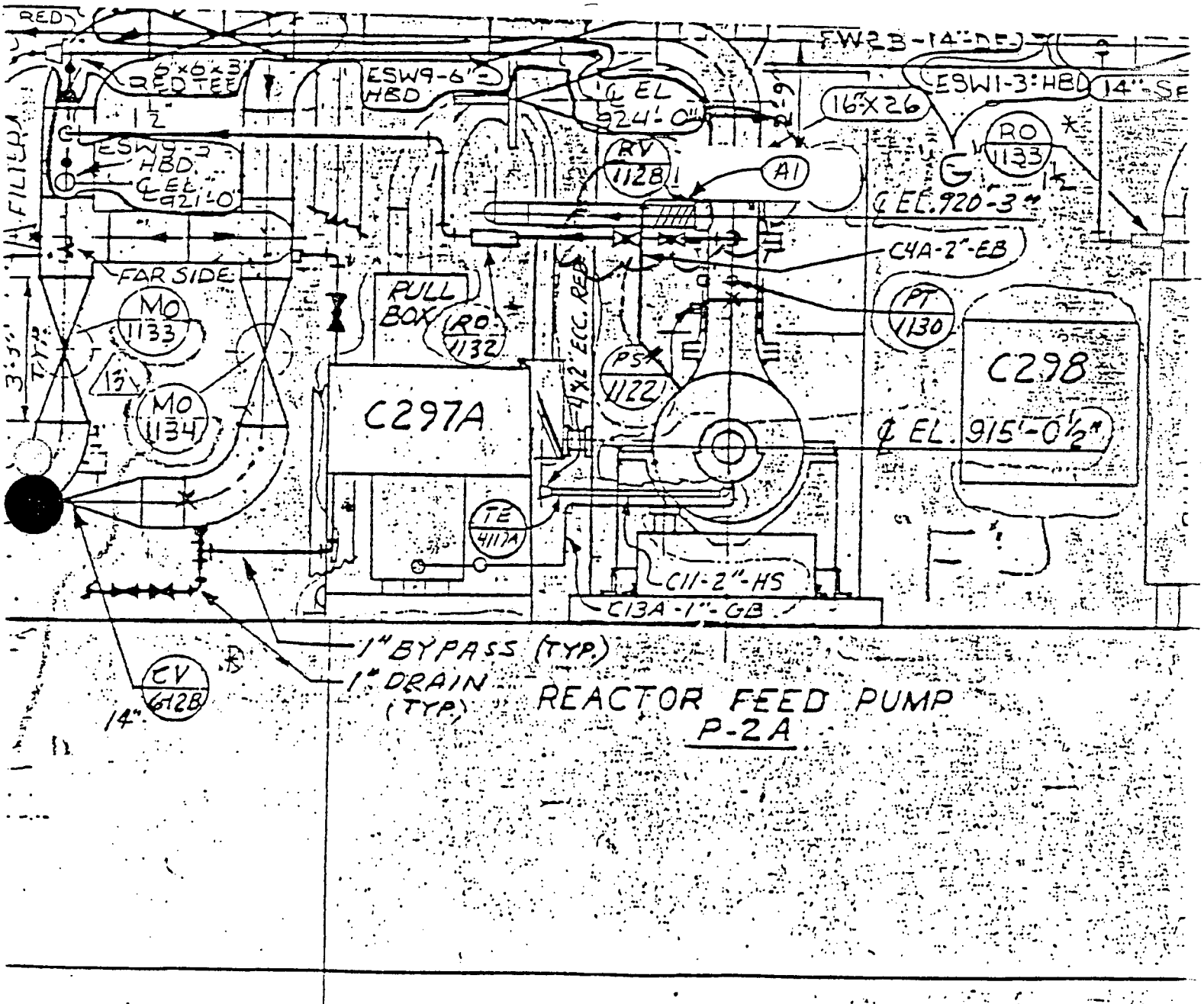
Negative wall loss indicates that the thinnest area measured is that much greater than the nominal wall thickness.
All wall loss is less than manufacturers tolerance (12.5%)

Future Plans

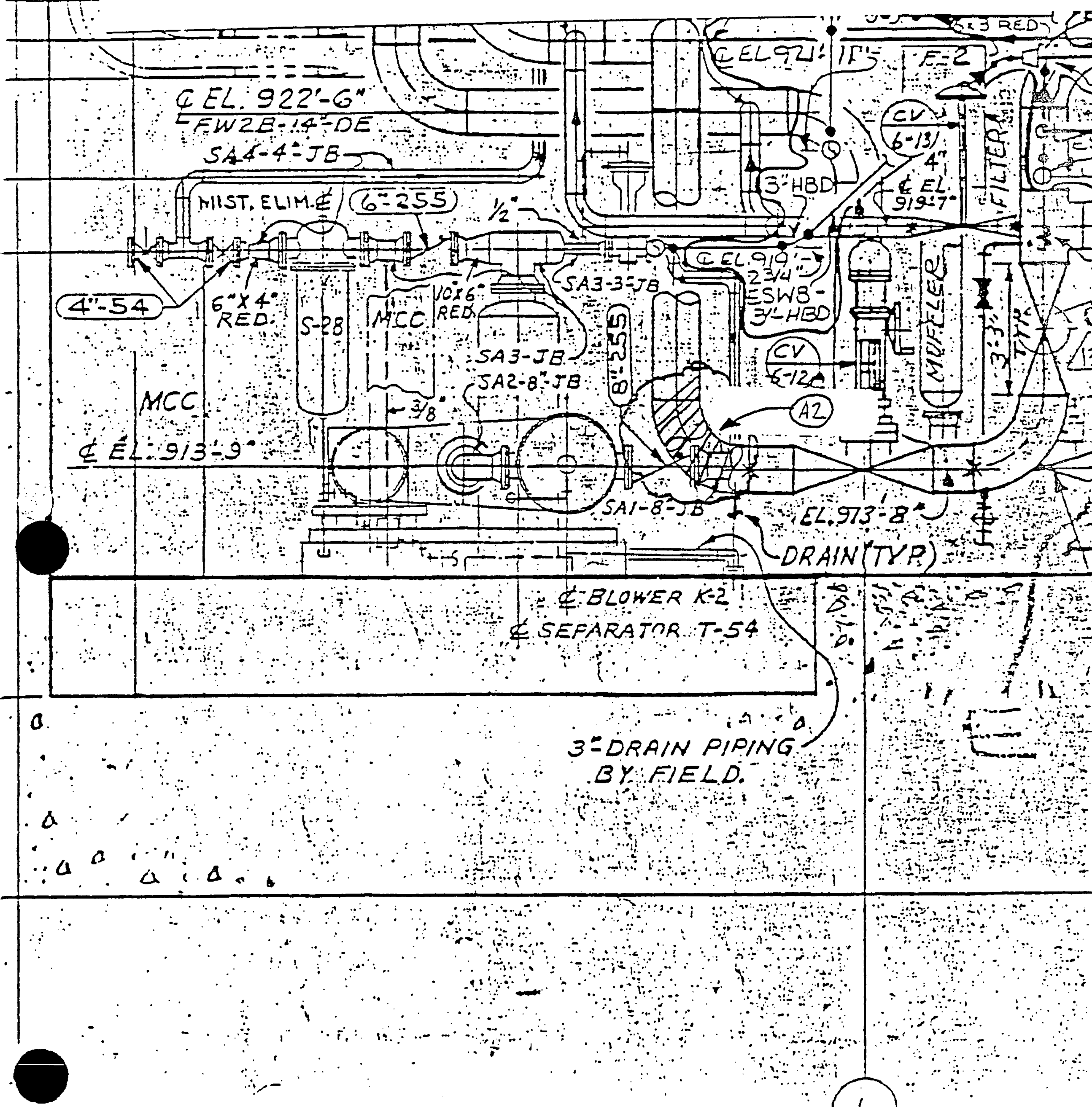
1. During 1987 outage inspect one RFP recirc line downstream of the recirculation valve.

2. During 1987 outage inspect the branch flow tee on the B feedwater riser inside the drywell.

With the above results evaluate if future inspections are warranted.

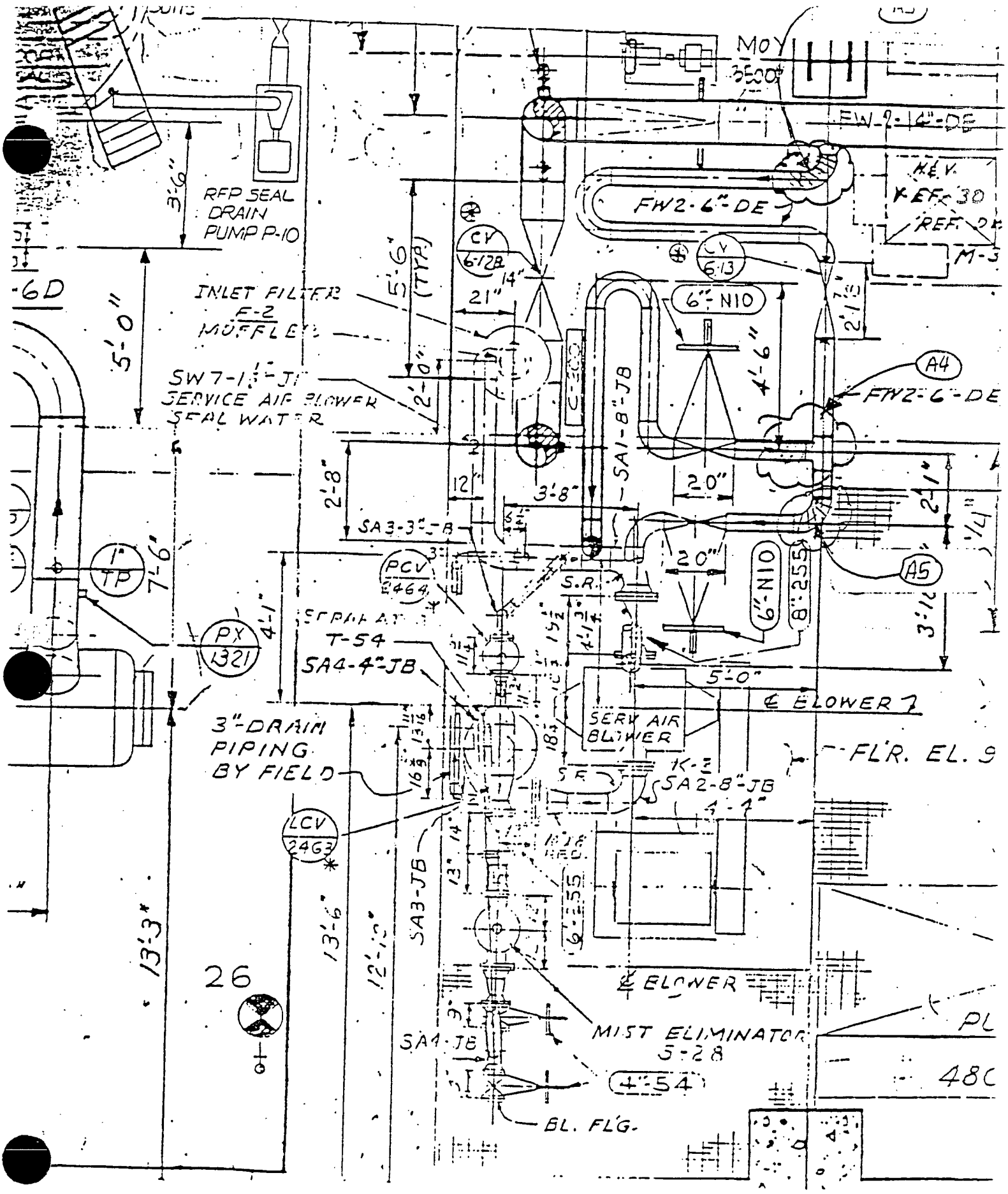

RED
8"x6"x3" RED TEE
1½"
ESW9-6"-HBD
ESW9-3"-HBD
℄ EL 921'-0"
FAR SIDE
MO 1133
MO 1134
3'-3" TYP.
FILLER
RULL BOX
RO 1132
C297A
TE 4117A
RV 1128
A1
℄ EL 924'-0"
4"x2" ECC. RED.
PS 1122
ESW2B-14"-DF
16"X26
ESW1-3"-HBD
14"-SE
RO 1133
℄ EL. 920'-3"
C4A-2"-EB
PT 1130
C298
℄ EL. 915'-0½"
C11-2"-HS
C13A-1"-GB
1" BYPASS (TYP.)
1" DRAIN (TYP.)
CV 6128
14"
REACTOR FEED PUMP
P-2A

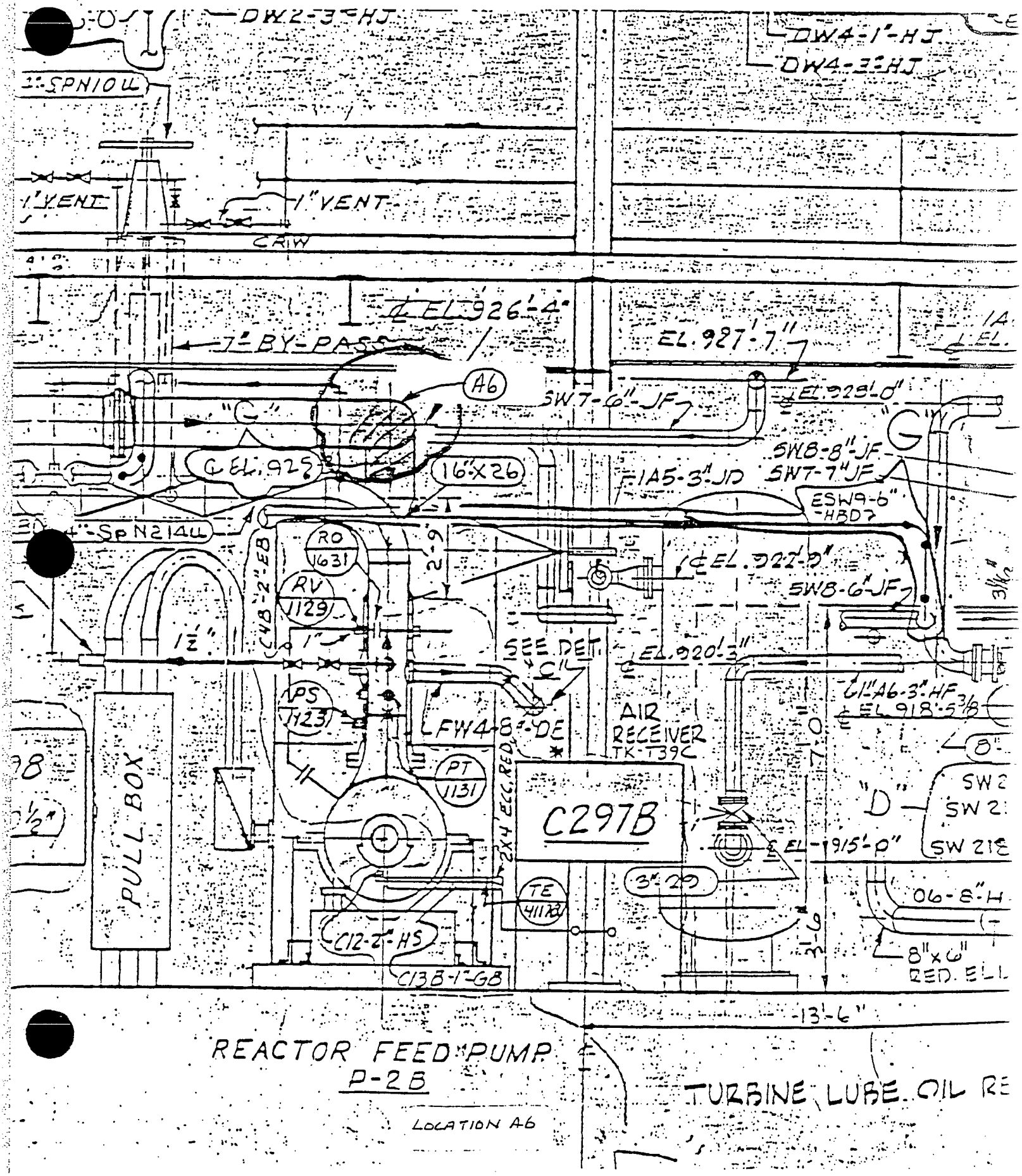
LOCATION A-1



℄ EL. 922'-6"
FW2B-14"-DE
SA4-4"-JB
MIST. ELIM. ℄
6"-255
1/2"
4"-54
6"X4" RED.
10X6" RED.
S-28
MCC
SA3-3"-JB
SA3-JB
SA2-8"-JB
8"-255
3/8"
℄ EL. 913'-9"
SA1-8"-JB
EL. 913'-8"
DRAIN (TYP.)
A2
CV 6-12
CV 6-13
4"
℄ EL. 919'-7"
3"HBD
ESW8-3/4"HBD
F-2
FILTER
MUFFLER
3'-3" TYP.
℄ BLOWER K-2
℄ SEPARATOR T-54
3"-DRAIN PIPING BY FIELD.

LOCATION A2

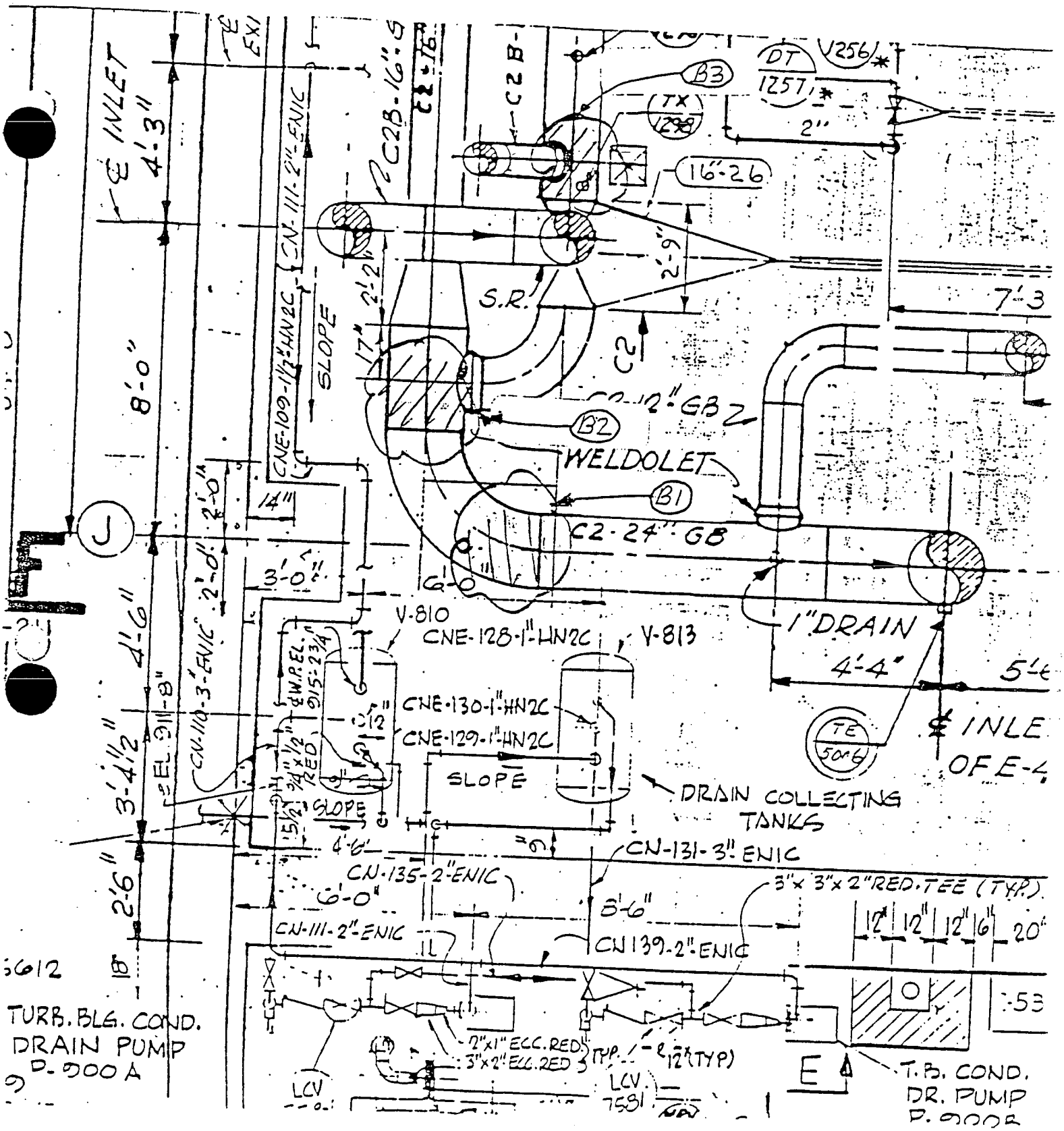

RFP SEAL DRAIN PUMP P-10
3'-6"
5'-0"
INLET FILTER F-2
SW 7-1½"-JI
SERVICE AIR BLOWER SEAL WATER
5'-6" (TYP.)
CV 6-128
CV 6-13
14"
21"
2'-0"
FW2-6"-DE
6"-N10
4'-6"
A4
FW2-6"-DE
SA1-8"-JB
2'-8"
12"
3'-8"
SA3-3"-B
20"
2'-1"
A5
PCV 2464
S.R.
8"-255
6"-N10
1" TP
7'-6"
PX 1321
4'-1"
T-54
SA4-4"-JB
5'-0"
℄ BLOWER
SERV AIR BLOWER
FL'R. EL. 9
3"-DRAIN PIPING BY FIELD
LCV 2463
SA2-8"-JB
4'-4"
SA3-JB
13'-3"
13'-6"
12'-1½"
26
℄ BLOWER
MIST ELIMINATOR
5-28
SA4-JB
+54
BL. FLG.
LOCATIONS
A3, A4, A5



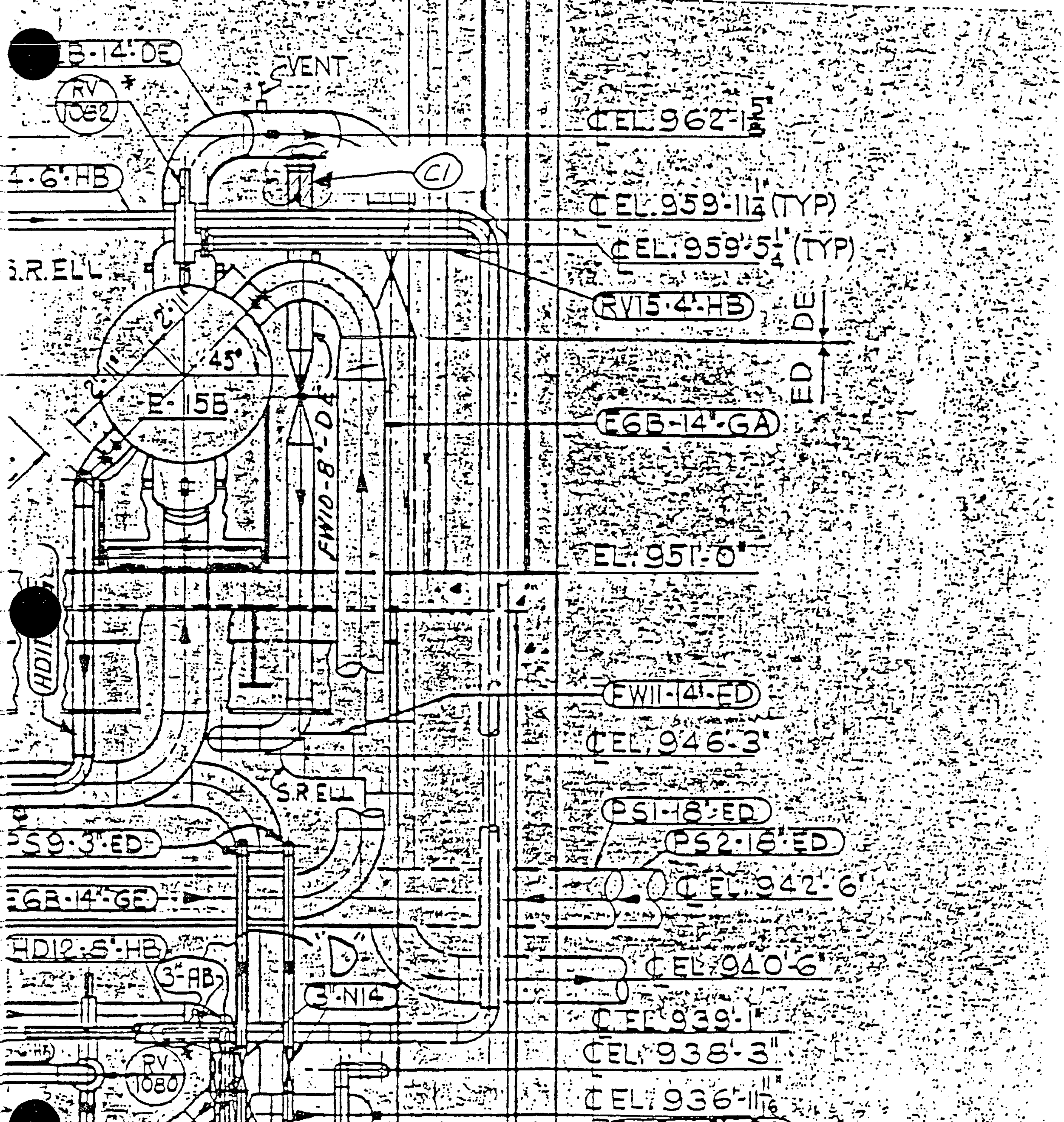
REACTOR FEED PUMP
P-2B

LOCATION A6

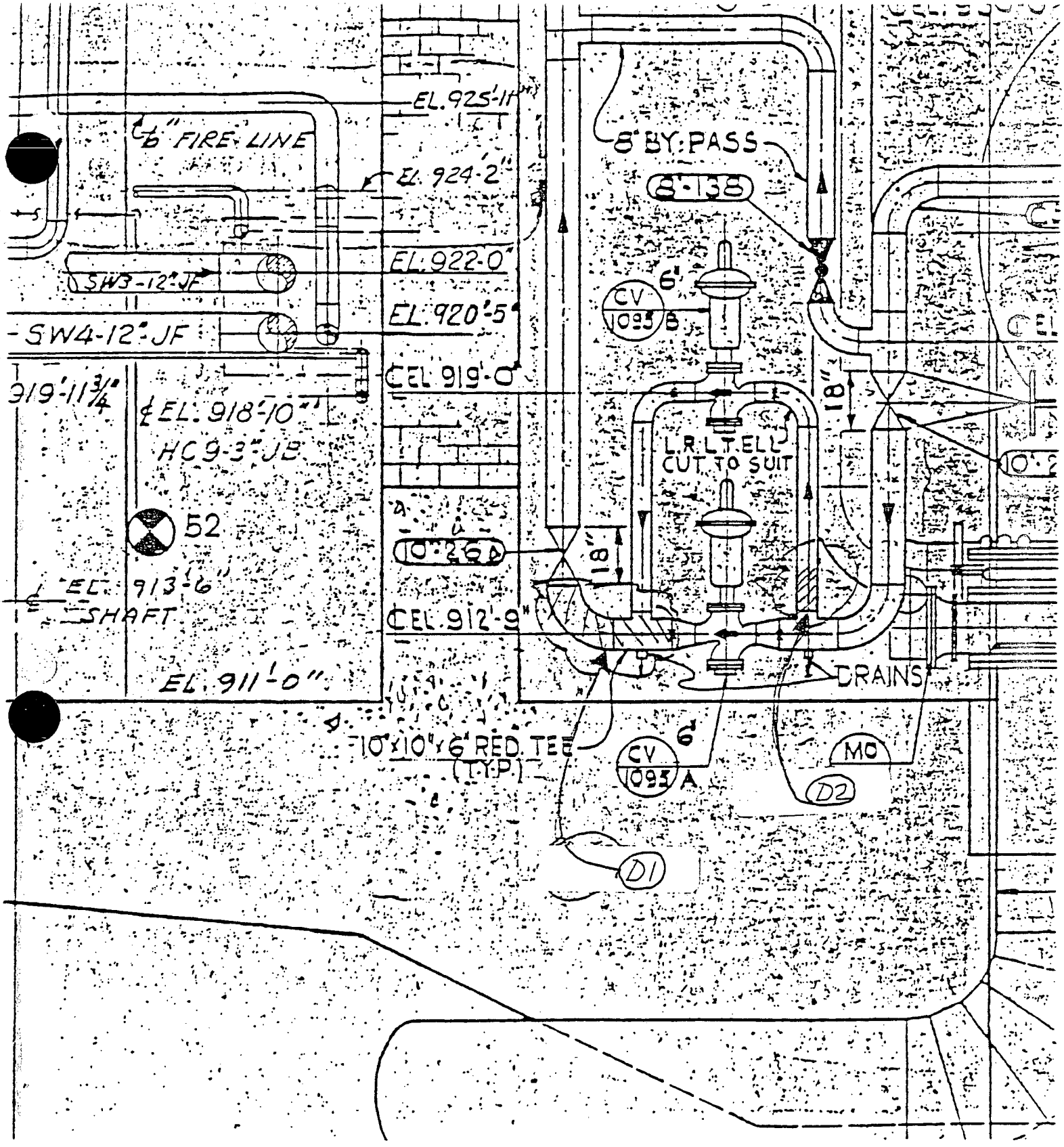
TURBINE LUBE OIL RE



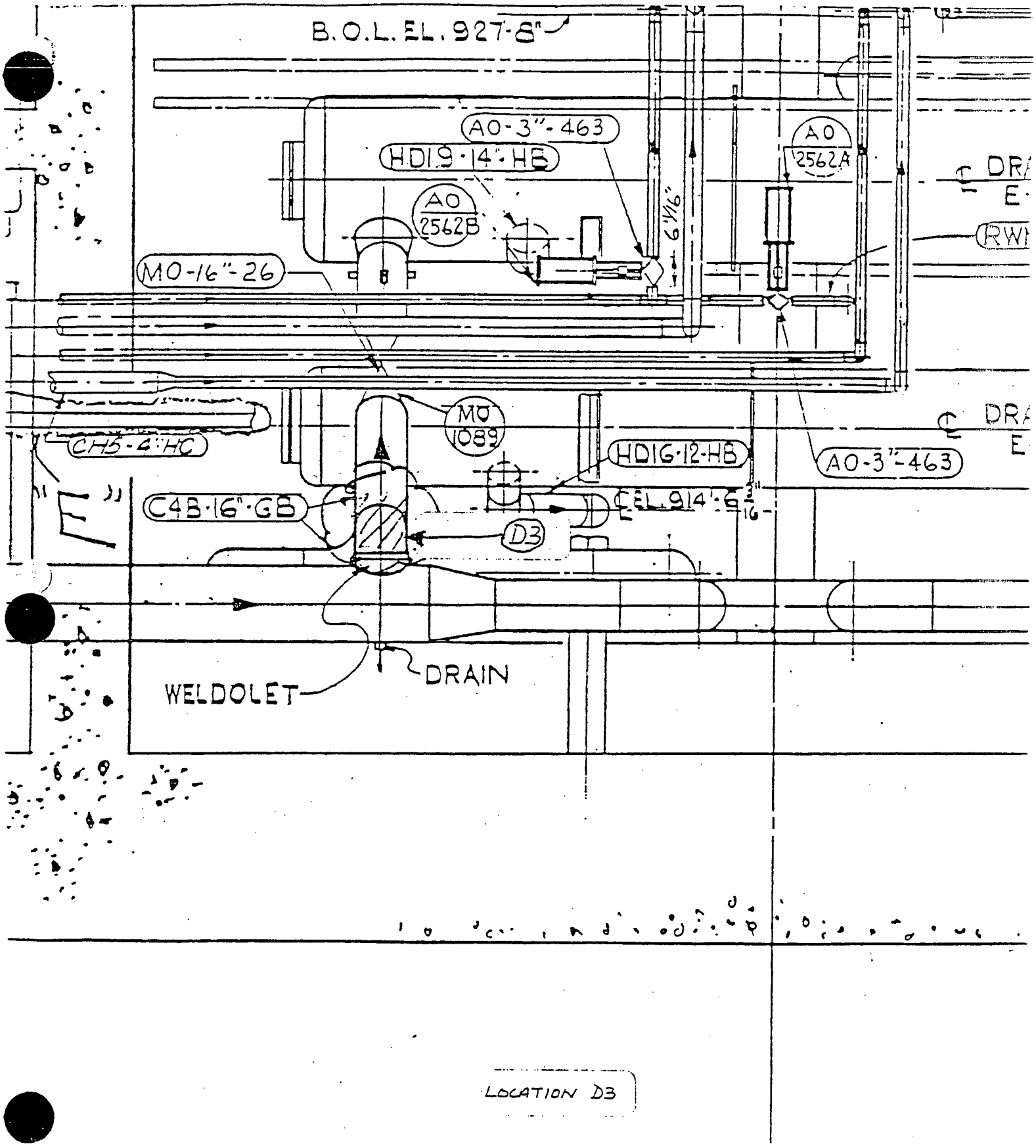
LOCATIONS
B1, B2, B3


B-14"-DE
VENT
RV 1082
C1
4-6"-HB
℄ EL. 962'-1 1/2"
℄ EL. 959'-11 1/4" (TYP)
℄ EL. 959'-5 1/4" (TYP)
S.R. ELL
RV15-4"-HB
DE
ED
45°
2'-11"
E-15B
FW10-8"-DE
E6B-14"-GA
EL. 951'-0"
HD11
FW11-14"-ED
℄ EL. 946'-3"
S.R. ELL
PS1-18"-ED
PS2-18"-ED
PS9-3"-ED
℄ EL. 942'-6"
E6B-14"-GE
HD12-5"-HB
"D"
3"-AB
℄ EL. 940'-6"
3"-N14
℄ EL. 939'-1"
℄ EL. 938'-3"
RV 1080
℄ EL. 936'-11 1/16"
C43-16"-GB
45°
45°
SA4-4"-JB

LOCATION C1



LOCATIONS
D1, D2


B.O.L. EL. 927'-8"
AO-3"-463
HD19-14"-HB
AO
2562B
AO
2562A
6 1/16"
MO-16"-26
MO
1089
CH5-4"-HC
HD16-12-HB
AO-3"-463
EL. 914'-6 3/16"
C4B-16"-GB
D3
WELDOLET
DRAIN

LOCATION D3

INPUT FILE NAME cmonts2p

OUTPUT FILE NAME a:cmonts2p.ou2

BOUNDING LEVEL = 90 %

NUMBER OF CASES = 1

A Comparison of Observed Results in 2 Phase Flow Systems versus CHEC predictions:

AREA:	OBSERVED RATE: (mils/year)	PREDICTED RATE: (mils/year)
1.0A	16	98
1.0A Inner Radius	21	98
5.4(ISO 15)	95	17
6.4(ISO 16)	0	0
6.2(ISO 24)	0	0
B.2(ISO 11)	14	24
B(ISO 11)	24	24
* 10.0A	4.7	2

* Note: 10.0A is water solid, and is the only water solid area repeated to date in the 84' and '86 exams.

EPRI'S CHEC COMPUTER PROGRAM - VERSION 1 - 9/ 8/1987 18:17:41
NORTHERN STATES POWER COMPANY

MONTICELLO TWO PHASE WORK

CASE = 1 NCHEM = 1 TOTAL TIME = 17520. NSEG = 5

ICHEM	FMULT	PH	OXY	HOURS
0	100.000	7.000	8.0	17520.

NCOMP = 2 DESIGN PRESS.= 197. DESIGN TEMP.= 380.

MONTICELLO TWO PHASE WORK

GEO (SECOND	MAT LINE)	COMP. NAME CR	DIA CU	THICK MO	TEMP SIGMA	FLOW
4	7	1.0A	-36.	.549	380.	.168
4	7	1.0A IR	-36.	.535	380.	.168

NCOMP = 1 DESIGN PRESS.= 111. DESIGN TEMP.= 341.

MONTICELLO TWO PHASE WORK

GEO (SECOND LINE)	MAT	COMP. NAME	DIA	THICK	TEMP	FLOW
		CR	CU	MO	SIGMA	
8	25	5.4	10.	.480	341.	.070

NCOMP = 2 DESIGN PRESS.= 66. DESIGN TEMP.= 313.

MONTICELLO TWO PHASE WORK

GEO (SECOND LINE)	MAT	COMP. NAME	DIA	THICK	TEMP	FLOW
		CR	CU	MO	SIGMA	
9	25	6.2	20.	.372	313.	.004
2	25	6.2	20.	.372	313.	.004

NCOMP = 3 DESIGN PRESS.= 191. DESIGN TEMP.= 378.

MONTICELLO TWO PHASE WORK

GEO (SECOND LINE)	MAT	COMP. NAME	DIA	THICK	TEMP	FLOW
		CR	CU	MO	SIGMA	
9	7	B.2	-30.	.553	378.	.168
9	7	F	-30.	.501	378.	.168
9	7	B	-30.	.538	378.	.168

NCOMP = 2 DESIGN PRESS.= 100. DESIGN TEMP.= 383.

MONTICELLO TWO PHASE WORK

GEO (SECOND LINE)	MAT	COMP. NAME	DIA	THICK	TEMP	FLOW
		CR	CU	MO	SIGMA	
9	0	10.0A	6.	.333	383.	-4.500
	12.0000	.5000	1.0000	36000.		
2	0	10.0A	6.	.333	383.	-4.500
	12.0000	.5000	1.0000	36000.		

MONTICELLO TWO PHASE WORK

PASS 2 DATA
NUMBER OF INSPECTIONS = 10

NUMBER	COMP	MEASURED THICKNESS
1	1.0A	.533
2	1.0A IR	.515
3	5.4	.291
4	6.2	.372
5	6.2	.372
6	B.2	.538
7	F	.501
8	B	.513
9	10.0A	.329
10	10.0A	.329

MONTICELLO TWO PHASE WORK

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED AVERAGE EROSION RATE (MM/YR)
1.0A	1.25
1.0A IR	1.25
B.2	.31
B	.31
F	.31
5.4	.22
10.0A	.02
10.0A	.00
6.2	.00
6.2	.00

NOTE:
THE AVERAGE EROSION RATE FOR EACH COMPONENT IS CALCULATED USING THE MAXIMUM TOTAL TIME FOR THE PROBLEM

MONTICELLO TWO PHASE WORK

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED HOURS TO REACH MINIMUM WALL THICKNESS
1.0A IR	25469.
1.0A	27980.
F	173546.
B	198969.
B.2	209691.
5.4	433883.
10.0A	2957942.
10.0A	8908866.
6.2	29843160.
6.2	89564540.

WARNING:
THE DESIGN MINIMUM WALL THICKNESS USED IN PREDICTING TOTAL HOURS IS BASED ON DESIGN PRESSURE ONLY. UTILITIES MUST PERFORM PLANT SPECIFIC ENGINEERING EVALUATIONS THAT INCLUDE ALL LOADS TO PREDICT TOTAL HOURS BEFORE A FAILURE WOULD OCCUR.

MONTICELLO TWO PHASE WORK

PASS 2 RESULTS AT 90% BOUNDING LEVEL

COMPONENT	PREDICTED THICKNESS (INCH)	PREDICTED WEAR (INCH)	LATEST EROSION RATE (MM/YEAR)	MINIMUM WALL THICKNESS (INCH)
1.0A	.451	.099	1.25	.294
1.0A IR	.437	.098	1.25	.294
5.4	.463	.017	.22	.040
6.2	.372	.000	.00	.044
6.2	.371	.000	.00	.044
B.2	.529	.024	.31	.237
F	.477	.024	.31	.237
B	.513	.024	.31	.237
10.0A	.333	.000	.00	.009
10.0A	.331	.002	.02	.009

Internal Correspondence

NSP

Date January 10, 1985

From Randy Coleman

Location Midland Square -3

To Dan Couch

Location Monticello

Subject: TURBINE PIPING THICKNESS SURVEY

Dear Dan,

I have enclosed a copy of the Monticello Turbine Piping Thickness Survey Report and a Thickness Survey Log Book. If you have any questions, please let me know.

Sincerely,

Randy J Coleman
Material & Special Process Engineer

wmh

GENERAL

This report covers the turbine piping wall thickness survey done on Monticello Nuclear Generating Plant Unit I from April 25 through August 2, 1984. The Inspection was done by personnel from Lambert, McGill, and Thomas Inc (LMT) of Santa Clara, California under the supervision of Randy Coleman from Production Plant Maintenance Department. The site coordinator was Dan Couch from the Monticello Plant.

The inspection was conducted as a baseline for an ongoing turbine piping wall thickness study at the Monticello plant. The data points were chosen by plant personnel. Isometric diagrams showing the pipe layout and location of data aquisition areas were sketched by personnel from LMT.

Data was gathered using a Nortec 131-D Digital Ultrascope or the General Dynamics Ultra Image III. The Nortec 131-D is a conventional manually operated ultrascope with a digital readout. The next two paragraphs describe the Ultra Image III and some of its capabilities.

The Ultra Image III is an ultrasonic imaging inspection system whose functions are monitored and controlled by a microprocessor. Information on administrative records, scanner set-up, calibration parameters, and ultrasonic instrument control settings is stored in the microprocessor header memory in preparation for taking data. The thickness data is gathered over a pre-determined area in accordance with information in the header and is stored in a data memory. The header and data memory may then be analyzed and stored on magnetic floppy disks as permanent records.

The Ultra Image III is capable of presenting data in various forms. Analysis may be performed on general areas or on given points because the thickness and signal amplitude data stored in the memory are arranged in grid form with X and Y coordinates. The coordinates correspond to specific points of the area examined. Multiple presentation format permits the analyst to display a plan view with an infinite number of thickness ranges given in percent of nominal wall thickness. In addition to the plan view, cross sections of the inspection area may be viewed.

Data taken while using the Nortec instrument was put directly on report forms. Data taken using the Ultra Image system was stored on floppy disks and later transcribed to report forms. The completed report forms are in the Monticello Thickness Survey log book. Information stored on floppy disks will be retained by Production Plant Maintenance Department.

The results of this baseline inspection have been organized and put into a Monticello Thickness Survey Log Book. The book is divided into sections based on thickness survey isometric diagrams. Sections are labeled with the appropriate isometric diagram number. They contain a copy of the isometric, copies of the thickness survey reports and a note page for comments. The reasons for organizing the log book in this fashion is that as reports are received from subsequent inspections the log book may be conveniently updated by dividing it into subsections containing reports on specific areas.

RESULTS

The results of the inspection can be summarized by stating that the crossunder piping shows signs of tiger stripping and areas of severe erosion/corrosion. The extraction and drain piping areas tested show no sign of severe localized erosion/corrosion.

The worst areas of erosion/corrosion were discovered when a maintenance worker crawled through the crossunder line between B moisture separator and #3 CIV to retrieve a part that had been accidently dropped into the line. He noticed that the horizontal run between B2 and F on ISO-MTS-11 had numerous spots that appeared to have one fourth inch wall loss. In addition to this the pipe to elbow weld at area B had wall loss upstream of the weld and the general area around C had tiger stripping.

The suspect areas were scanned with the Ultra Image III. The results were that some areas were at or below the 0.271" minimum wall thickness. The areas that required weld repair and reinspection are at B2, F and B. Area C was not repaired because the tiger striped areas had minimum thickness readings greater than 0.450 inches. Repair work was handled by the plant.

One additional noteworthy area on crossunder piping was area 1.1A on ISO-MTS-1. Scan data on the Ultra Image III shows thin areas between 310° and 330°. The thin spots could not be found when a visual examination inside the pipe was performed. The spots are apparently laminations in the pipe.

Visual examination of the remainder of the crossunder piping that was accessable revealed areas of tiger stripping but no severely eroded areas.

Selected areas of the extraction and drain piping as stated earlier in this report, were examined and the results were favorable. None of the areas tested showed severe erosion/corrosion damage like that in the crossunder piping. However, the areas in Table 1 show major thickness variations over the data acquisition areas. These suspect areas should be examined during the next refueling outage.

TABLE 1

ISO	AREA
MTS-4	T.5
MTS-4	T.6
MTS-9	9.4A
MTS-10	10.4A
MTS-15	5.4
MTS-16	6.4A
MTS-24	6.2

On September 5, 1984 a seminar entitled Erosion/Corrosion of Turbine Piping Systems was given by Electric Power Research Institute at the J.A. Jones Applied Research Center in Charlotte, North Carolina. Don Pedersen from the Monticello plant and Randy Coleman from Production Plant Maintenance Department attended the seminar. The material presented in the seminar was focused on current research of the erosion/corrosion problem and how to develop a plant specific program to monitor it. Table 2 contains a list of data acquisition areas that should be added to the current Monticello Thickness Survey Program if the monitoring program EPRI suggested is to be followed.

TABLE 2

ISO#	AREA#
MTS-5	3.7A
MTS-5	3.8A
MTS-6	3.7
MTS-6	3.8
MTS-7	9.4
MTS-8	10.2
MTS-9	9.2A
MTS-9	9.5A
MTS-10	10.2A
MTS-10	10.5A

Recommendations

1. The weld repaired areas of the crossunder piping should be reinspected during the next refueling outage.

2. The areas listed in Table 1 should be reinspected during the next refueling outage.

3. The interior surface of the crossunder piping should be given a visual examination during the next refueling outage.

4. The data acquisition areas listed in Table 2 should be added to the thickness survey program and baseline inspection should be done on them during the next refueling outage.

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MONTICELLO THICKNESS SURVEY REPORT

1-9-24

Internal Correspondence

NSP

	Mark Hugo	Date	9-9-87
From	Dan Couch	Location	Int'l Ctr 3
To		Location	Monticello

Subject: TURBINE PIPING THICKNESS SURVEY

Dear Dan,

I have enclosed a copy of the Monticello Thickness Survey Report covering the work done in May of 1986. If you have any questions, please let me know.

Sincerely,

Mark Hugo
Interim PPM/M&SP Engineer assigned
to the Thickness Survey

Authored by:

Zane Johnson
Engineering Intern

FORM 17-3467

MONTICELLO THICKNESS SURVEY REPORT (5/86)

I. General Information

The thickness survey is organized into sections based on isometric diagrams and further subdivided into areas where actual thickness measurements are made.

The inspection was carried out by personnel from Lambert, MacGill and Thomas, Inc. of Santa Clara, California, under the supervision of Randy Coleman of Production Plant Maintenance.

The thickness measurements were made using either of two instruments; the Nortec 131-D unit or the Ultra Image III system. In the case of the Nortec Unit, the area of interest was laid out in a grid pattern and thickness readings were recorded at the intersection points. The Ultra Image system, however, records and stores on diskettes a "contour map" of the area, not just discrete points. The system divides the scan area into a 100x200 point map which may, at a later time, be reviewed and thickness values transcribed to paper for various coordinate positions. More information on these units may be found in the Appendix.

II. RESULTS

From the results of the 1984 inspection it was recommended that the following areas, shown in Table 1, be rechecked in the 1986 inspection. The values shown for "5/86 min." and "6/84 min." are taken directly from the field data sheets and represent the single thinnest reading taken in that area at that time. All measurements are in inches.

It would appear from the 1986 results that the only area of concern is Area 5.4 of MTS-15. This area has been found to have an overall thickness change (i.e. the average of all data points taken) of .189". While the remaining average thickness of .291" is well above the required minimum wall calculated on a hoop-stress basis, the measured existing wall thickness is well below the nominal wall minus 12.6% manufacturing tolerance. Production Plant Maintenance, Materials and Special Processes Engineers will resurvey this area in 1987.

On September 5, 1984 a seminar entitled Erosion/Corrosion of Turbine Piping Systems was given by EPRI. Don Pedersen of the Monticello plant and Randy Coleman of Production Plant Maintenance attended. Table

2 contains a list of areas that were added as a result of the EPRI recommendations.

Table 1

Iso #	Area	5/86 min.	6/84 min.	Nom./Min. wall
MTS-4	T.5,us	.500	.456	.500/.325
	T.5,ds	.476	.468	.500/.325
	T.6	.452	.412	.500/.325
MTS-9	9.4A	.310	.234	.280/ ?
MTS-10	10.4A	.320	.241	.280/ ?
MTS-15	5.4	.230	.263	.365/ ?
MTS-16	6.4A	.467	.470	.375/ ?
MTS-24	6.2	.352	.288	.375/ ?

Table 2

Iso #	Area	5/86 min.	Nom./Min. wall
MTS-5	3.7A,UI	.368	.375/ ?
	3.7A,N	.530	.375/ ?
	3.8A	.511	.375/ ?
MTS-6	3.7	.483	.375/ ?
	3.7,us	.348	.500/.283
	3.7,ds	.356	.500/.271
	3.8,UI	.340	.375/ ?
	3.8,N	.492	.375/ ?
MTS-7	9.4	.340	.280/.045
MTS-8	10.2	.360	.280/ ?
MTS-9	9.2A	.320	.280/ ?
	9.5A	.320	.280/ ?
MTS-10	10.2A	.310	.280/ ?
	10.5A	.320	.280/ ?

III. CONCLUSION

Aside from Area 5.4 of MTS-15, there were no areas found to be below the manufacturing tolerance of 12.6%.

IV. Appendix

A) Nortec 131-D:

This instrument is a portable ultrasonic inspection unit fitted with a standard CRT display and a digital display for thickness measurements. Information on accuracy and repeatability of these units in general may be found in the EPRI report entitled Nondestructive Examination of Ferritic Piping for Erosion/Corrosion, April 1987.

B) Ultra Image III:

The Ultra Image III is an ultrasonic inspection system whose functions are monitored and controlled by a microprocessor. Information on administrative records, scanner setup, calibration parameters and ultrasonic control settings is stored in the microprocessor header memory in preparation for taking data. The thickness data is gathered over a predetermined area in accordance with information in the header and is stored in memory. The header and data memory may then be stored on magnetic floppy disks as permanent records.

The UI-III is capable of presenting data in various forms. Analysis may be performed on general areas or on given points because the thickness and signal amplitude data stored in memory are arranged in grid form with X and Y coordinates corresponding to specific points on the examination area. The multiple presentation format permits the analyst to display a plan view with an infinite number of thickness ranges in percent of nominal wall thickness using colors on the screen. Four and eight color displays are available. In addition to the plan view, cross-sections of the inspection area may be viewed.

One major advantage of the UI-III is that it may be used to collect data on a given area and store that data on a floppy disc. The data may then be compared to data collected during previous inspections of that area. However, there are limitations in the data comparison techniques available. The one that has the most effect on the Prairie Island and Monticello Thickness Surveys is the apparent increase of pipe wall thickness that may occur when the data is transcribed directly to data sheets. The situation occurs when two sets of data are gathered on a specific area but the inspection starting points are different. In other words, the data collected for coordinates X=1, Y=1 on the current inspection will not represent the same position on the pipe as the coordinates X=1, Y=1 for a previous inspection unless the transducer starting and scanning positions are identical for both inspections. Position variations as small as 0.020 inches can be the cause of such discrepancies. The technicians that gather the data try to inspect the exact areas covered

in the previous inspection but placement of the transducer and the scanner belt are best effort jobs.

The actual data analysis is more complicated than comparing readings from the X and Y positions ofa grid of data to that of the previous inspection. When the data is presented on the UI-III, large areas of erosion may be evaluated by using the erosion pattern edges and center to estimate the amount that one set of data must be offset to match the other set of data. Comparison of the data may then be completed. For small areas of localized thinning, the thin areas may be picked out and analyzed separately. In areas where gross erosion has occurred between inspections, determining the amount of offset may be a best effort job.