AP42 Section:	12.2
Reference:	78
Title:	Compliance Demonstration No. 13 Battery Combustion Stack, USS Clairton Works, Clairton, PA, Advance Technology Systems, Inc., Monroeville, PA, August 1994.

AP42 12.2

AP-42 Section 12.2
Reference
Report Sect. 4
Reference 78

Input
Reference 78

Reviewed

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

Report on

COMPLIANCE DEMONSTRATION
NO. 13 BATTERY COMBUSTION STACK

AUGUST 1994

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

Report on

COMPLIANCE DEMONSTRATION
NO. 13 BATTERY COMBUSTION STACK

AUGUST 1994

Prepared By
Advanced Technology Systems, Inc.
3000 Tech Center Drive
Monroeville, Pennsylvania 15146

Project No. IKM-0202

AP-42 Section 12.2
Reference
Report Sect. 4
Reference 78

U. S. Steel
Clairton Works
400 State Street
Clairton, PA 15025-1855

RECEIVED
AUG 30 1994
DEPUTY DIRECTOR'S OFFICE
Bureau of Environmental Quality

August 24, 1994

Director
Bureau of Air Quality Control
Department of Environmental Resources
P.O. Box 2063
Harrisburg, PA 17120

Deputy Director
Allegheny County Health Department
Department of Air Quality
301 Thirty-ninth Street
Pittsburgh, PA 15201

U.S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, PA 19017

Office of Chief Counsel
Western Region
Department of Environmental Resources
400 Waterfront Drive
Pittsburgh, PA 15222-4745

Gentlemen:

Subject: #13 Battery Stack Compiance Demonstration
USS Clairton Works

I am enclosing with this letter the mass emission report on #13 Battery Combustion Stack. The compliance demonstration was conducted at USS Clairton Works, a division of USX Corporation, on July 28-29, 1994.

For questions regarding these reports please call William C. Graeser at (412) 233-1467

Very truly yours,

G. T. Weber, Jr.
General Manager
USS Clairton Works

GTW/BAC
Enclosure

TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY iii

1.0 INTRODUCTION 1

2.0 METHODOLOGIES 2

3.0 RESULTS 4

LIST OF TABLES

Table 1 Particulate Matter Emissions Data 6

APPENDICES

APPENDIX A TEST PROTOCOL, FIELD DATA SHEETS, CALIBRATION RESULTS

APPENDIX B PLANT OPERATIONAL DATA

APPENDIX C GRAVIMETRIC AND ANALYTICAL RESULTS, EMISSIONS CALCULATIONS

EXECUTIVE SUMMARY

On July 28 and 29, 1994, a compliance test program was conducted for USS Clairton Works, Clairton, Pennsylvania, on the #13 Battery Combustion Stack. The purpose of the testing was to determine the (1) concentration and mass emission rate of particulate matter, and (2) presence and extent of visible emissions from the stack as required by the Second Consent Decree (Civil Action Nos. 79-709, 91-329), Chapter V (Compliance Requirements - Clairton Works), Section F (Combustion Stacks), Specific Items 2 through 4.

The results of the testing showed an average particulate matter concentration and emission rate of 0.0120 grains per dry standard cubic foot (gr/dscf) and 3.43 pounds per hour (lb/hr), respectively. As promulgated by the Second Consent Decree, Chapter V, Section F.2.a, the allowable particulate matter concentration for #13 Battery Combustion Stack is 0.015 gr/dscf (a Lowest Achievable Emission Rate [LAER] standard). Thus, the particulate matter emissions from the stack are less than the allowable concentration.

During the test periods, the greatest three-minute average opacity was less than 5 percent. The maximum opacity observed was 5 percent. As promulgated by the Second Consent Decree, Chapter V, Sections F.2.b and F.3, the visible emissions shall not equal or exceed 20 percent opacity for a period or periods aggregating in excess of 3 minutes in any 60-minute period and shall never equal or exceed 60 percent opacity. Thus, the observed opacities were less than the allowable values.

1.0 INTRODUCTION

On July 28 and 29, 1994, a compliance test program was conducted for USS Clairton Works, Clairton, Pennsylvania, on the #13 Battery Combustion Stack. The purpose of the testing was to determine the (1) concentration and mass emission rate of particulate matter, and (2) presence and extent of visible emissions from the stack as required by the Second Consent Decree (Civil Action Nos. 79-709, 91-329), Chapter V (Compliance Requirements - Clairton Works), Section F (Combustion Stacks), Specific Items 2 through 4.

Testing was performed by Messrs. Richard Casselberry and Thomas Morgan of Advanced Technology Systems, Inc. (previously the Monroeville, Pennsylvania-based Air Emissions Measurement Group of Chester Environmental) and Mr. Brian Fajtak of Environmental Technical Services under the direction of Mr. Bernie Clark of Chester Environmental. All test procedures were witnessed by Mr. Phil Lawrence of the Allegheny County Health Department - Department of Air Quality (DAQ).

The test program required two days to complete the field work activities due to a delay in the operation of the Battery #13. Since no ovens in Battery #13 were pushed or charged from approximately 1000 to 1245 on July 28, 1994, no emissions testing was completed during this time period. Once normal operations of the battery resumed (about 1245), emissions testing was resumed. Since there was an insufficient amount of daylight remaining after the completion of the second test run, the third test run was conducted on the following day, July 29, 1994.

2.0 METHODOLOGIES

The compliance test program was conducted in accordance with the emissions measurement test protocol, which can be found in Appendix A.

Particulate matter sampling was performed in accordance with EPA Stationary Source Sampling Methods 1 through 5, Sections 139.11 and 139.12 of the Pennsylvania Department of Environmental Resources (PA DER) Source Testing Manual, and Appendix A of the Amended Installation Permit for USS Clairton Works Nos. 13, 14, and 15 Batteries. Three two-hour tests were executed during normal operating conditions. Greater than 50 dry standard cubic feet of sample gas was collected during each test run.

The process exhausts through a 120 inch diameter stack. A total of 24 traverse points (12 per diameter) were sampled; the traverse points were calculated in accordance with EPA Method 1. Sampling was conducted through four equally spaced ports, with six traverse points sampled per port. Each point was sampled for 5 minutes, thus bringing the total sampling time to 120 minutes.

In accordance with EPA Method 2, velocities and volumetric flow rates of the exhaust gas were determined using a calibrated S type pitot tube. Positive and negative pitot lines were leak-checked at the beginning and end of each test run. Gas velocity differential pressures along with stack gas temperatures were recorded at each sampling point.

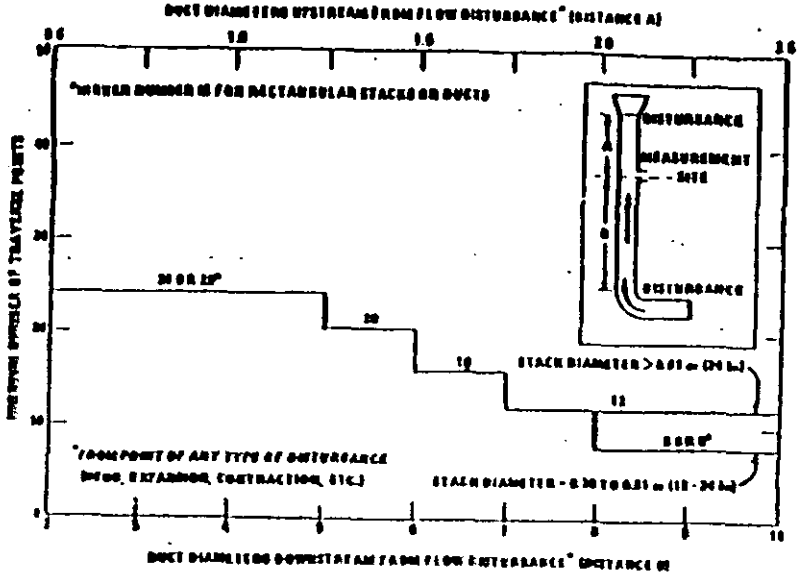
At the beginning and end of each test, gas concentrations of carbon dioxide (CO_2), oxygen (O_2), and nitrogen (N_2 - by difference) were determined with the use of Fyrite apparatus as specified by EPA Method 3. Gas concentrations were used to obtain dry molecular weight of the process gas.

Percent moisture content, by volume, of the exhaust gas was determined by measuring the weight gain of the four sample train impingers in accordance with EPA Method 4.

As specified by EPA Method 5, each sample train was assembled as required by the method, leak-checked on site at the beginning and end of each test run, and operated such that isokinetic conditions are maintained. Clean up of the sampling train will include a

water rinse followed by an acetone rinse of both the front-half and back-half components of the sample train, as per PA DER particulate matter test methods. The water soluble and water insoluble portions of the front-half of the sampling train were determined as a total; that is, the water rinse was not filtered to determine soluble and insoluble portions. Front-half acetone and water rinses were evaporated to dryness, desiccated, and weighed to a constant weight. The water soluble and water insoluble portions of the back-half were determined separately in accordance with Section 139.12 of the PA DER Source Testing Manual. The back-half water rinses and first three impinger solutions were combined and then filtered under suction through a preweighed 0.22 micrometer membrane filter. The filter used to capture the insoluble material was dried, desiccated, and weighed to a constant weight. After filtration, the soluble back-half water was extracted with chloroform and ethyl ether. The extracts were evaporated to dryness, desiccated, and weighed to a constant weight. The filtrate, or remaining water from the extraction process, was evaporated to dryness, desiccated, and weighed to a constant weight. Following the gravimetric analyses for the filtrate residue, the residue was resolubilized and the solution submitted for sulfate analysis via ion chromatography. Back-half acetone rinses were evaporated to dryness, desiccated, and weighed to a constant weight. Sample train filters were desiccated for 24 hours, and particulate matter weight was determined gravimetrically. Rinse residue weights and filter weights were measured to the nearest 0.1 mg. One acetone blank and one deionized distilled water blank were prepared in the same manner as the test sample rinses. The blank residue weights were subtracted from the test sample residue weights. After blank correction, front-half water and acetone rinse residue weights, sample train filter weights, and back-half water insoluble filter weights were used to determine total particulate matter catch.

All visible emissions determinations were performed in accordance with EPA Stationary Source Sampling Method 9. Visible emission readings were recorded for the duration of each particulate matter test.



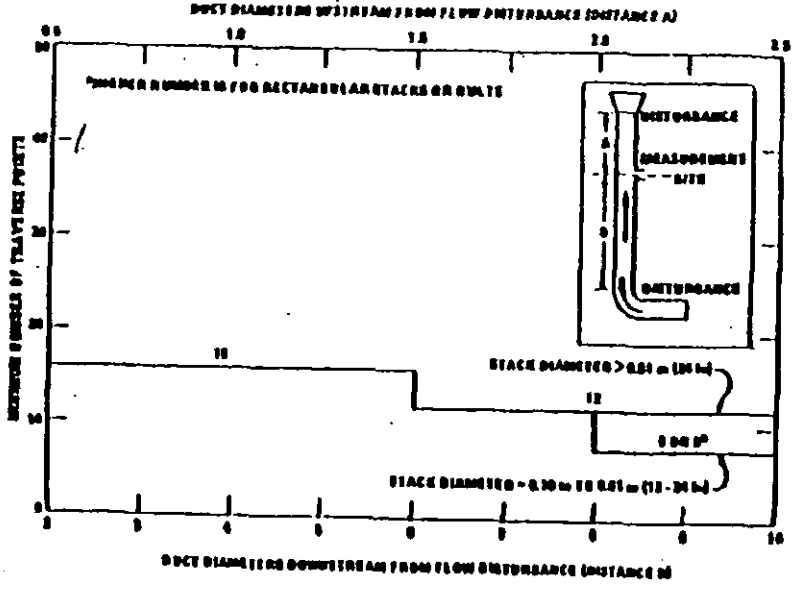


TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS

(Percent of stack diameter from inside wall to traverse point)

Traverse point number on a diameter	Number of traverse points on a diameter											
	2	4	6	8	10	12	14	16	18	20	22	24
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6	1.4	1.3	1.1	1.1
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	5.0	4.4	3.9	3.5	3.2
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5	7.5	6.7	6.0	5.5
4		93.3	70.4	32.3	22.6	17.7	14.6	12.5	10.9	9.7	8.7	7.9
5			85.4	67.7	34.2	25.0	20.1	16.9	14.6	12.9	11.6	10.5
6			96.8	80.6	65.8	35.6	26.9	22.9	19.8	17.5	15.7	14.2
7				89.5	77.4	64.4	38.8	29.3	23.9	20.4	18.0	16.1
8				96.8	85.4	75.0	63.0	37.5	29.6	25.0	21.9	19.4
9					91.0	82.3	73.1	62.5	36.2	30.6	26.9	23.9
10					97.4	88.2	79.9	71.7	63.8	36.6	31.5	27.8
11						93.3	85.4	78.9	70.4	63.2	36.2	32.3
12						97.9	90.1	83.1	76.4	69.4	63.1	36.6
13							94.2	87.5	81.2	75.0	68.8	63.2
14							98.2	91.5	85.4	78.8	73.6	67.7
15								95.1	88.1	83.5	78.2	73.0
16								98.4	92.5	87.1	82.0	77.0
17									95.6	90.3	85.4	80.6
18									98.6	93.3	88.4	83.9
19										96.1	91.2	86.8
20										98.7	94.0	89.8
21											96.8	92.1
22											98.9	94.5
23												96.9
24												98.9

TABLE 1-1. CROSS-SECTION LAYOUT FOR RECTANGULAR STACKS

Number of traverse points	Matrix layout
8	3x3
12	4x3
16	4x4
20	5x4
25	5x5
30	6x5
36	6x6
42	7x6
49	7x7

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS | TEST DATE 07-28-94 (THURS) | ORIFICE CORRECTION (ΔH@) 1.837 | HOT/COLD BOX NO. 4
TEST UNIT #13 BATTERY STACK | TEST NO. USS-CLR-BS#13-2 | METER CORRECTION (Y) 1.0172 | PROBE NO. D-2
PROJECT NO. JIGM1 - 0242 | NOZZLE (SIZE,in) 0.490" | CALIBRATION DATE 06-20-94 | FILTER NO. 1284
TEST CREW RBC TM | STATIC PRESSURE -1.0" H_2O | PITOT CORRECTION 0.84 | STACK DIA. 120"
BAROMETRIC PRESSURE 29.30 | PORT DIRECTION NORTH EAST | CONTROL BOX NO. SIX | PORT SIZE 4.0" THREADED NIPPLE

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
42.7	14:47	929.707	0.04	1.16	1.16	100	101	3.0	501	~250°F	<68°F	~250°F	5 min./point
30.0			0.03	0.87	0.87	118	100	3.0	500				
21.3			0.04	1.16	1.16	120	101	3.0	504				
14.2			0.05	1.45	1.45	121	101	4.5	509				
8.0			0.04	1.16	1.16	121	101	4.0	469				
2.6	15:17	947.642	0.03	0.87	0.87	123	100	3.0	450				
42.7	15:20	947.642	0.05	1.45	1.45	110	101	4.0	490				
30.0			0.06	1.74	1.74	122	100	4.5	520				
21.3			0.05	1.45	1.45	124	101	4.0	529				
14.2			0.04	1.16	1.16	123	99	3.0	520				
8.0			.03	0.87	0.87	123	100	3.0	482				
2.6	15:50	966.420	0.03	0.87	0.87	124	100	3.0	479				
Test totals	Δ=120 min	Δ=75.690 dcf	(ΔP)Avg = 0.04	(ΔH)Avg = 1.27			(Tm)Avg = 106.35 °F		(Ts)Avg = 498.17 °F				Estimates: MW= 28.0 %H2O= 14.0

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before		
After		

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2	6.6	6.0
O2	10.5	10.5
CO	~~0.0~~	~~0.0~~
N2	83.5	83.5

Impinger No.	Impinger Contents	Final	Initial	Difference
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

ADVANCED TECHNOLOGY SYSTEMS, INC.
339 Haymaker Road Suite 201
Monroeville, PA 15146
412/856-0662
FAX 412/856-0666

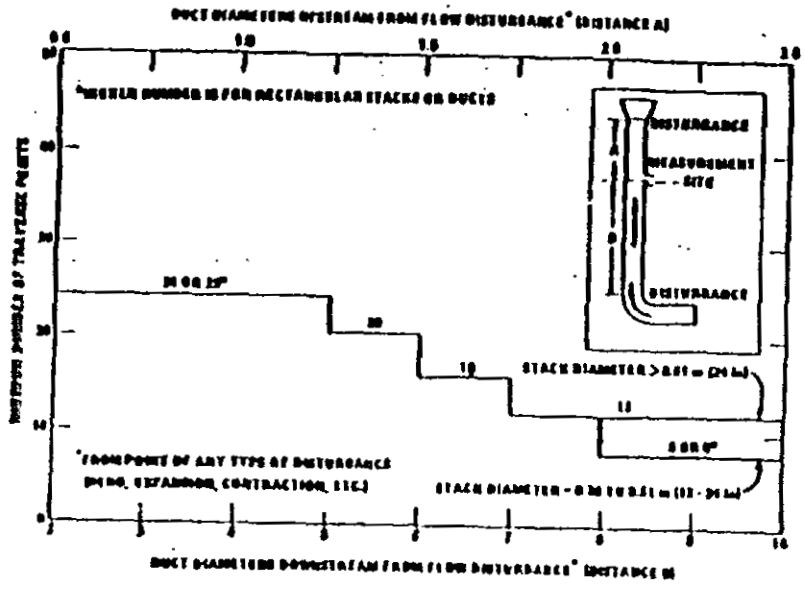


TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS

(Percent of stack diameter from inside wall to traverse point)

Traverse point number on a diameter	Number of traverse points on a diameter											
	2	4	6	8	10	12	14	16	18	20	22	24
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6	1.4	1.3	1.1	1.1
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9	4.4	3.9	3.5	3.2
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5	7.5	6.7	6.0	5.5
4		93.3	70.4	32.3	23.6	17.7	14.6	12.5	10.9	9.7	8.7	7.9
5			85.4	67.7	34.2	25.0	20.1	16.9	14.6	12.9	11.6	10.5
6			95.6	80.6	65.8	34.3	26.9	22.6	19.6	17.3	15.5	14.0
7				96.8	77.4	65.7	34.2	28.3	23.9	20.8	18.4	16.6
8				98.4	89.5	75.0	65.8	37.5	29.9	25.0	21.9	19.4
9					97.4	82.3	73.1	62.5	36.2	30.6	26.2	23.0
10						88.2	79.9	71.7	63.9	36.8	31.5	27.6
11						93.3	85.4	78.8	70.4	63.2	36.2	32.3
12						97.9	90.1	83.1	76.4	69.4	60.2	36.9
13							94.3	87.5	81.2	75.0	68.5	60.2
14							98.2	91.5	85.4	78.8	73.8	63.7
15								95.1	88.1	83.8	79.1	73.8
16								98.4	92.5	87.1	83.8	77.6
17									95.6	90.3	86.4	80.9
18									98.6	93.3	88.5	83.9
19										96.1	91.3	86.8
20										98.7	94.0	89.5
21											96.5	91.9
22											98.9	94.0
23												96.1
24												98.8

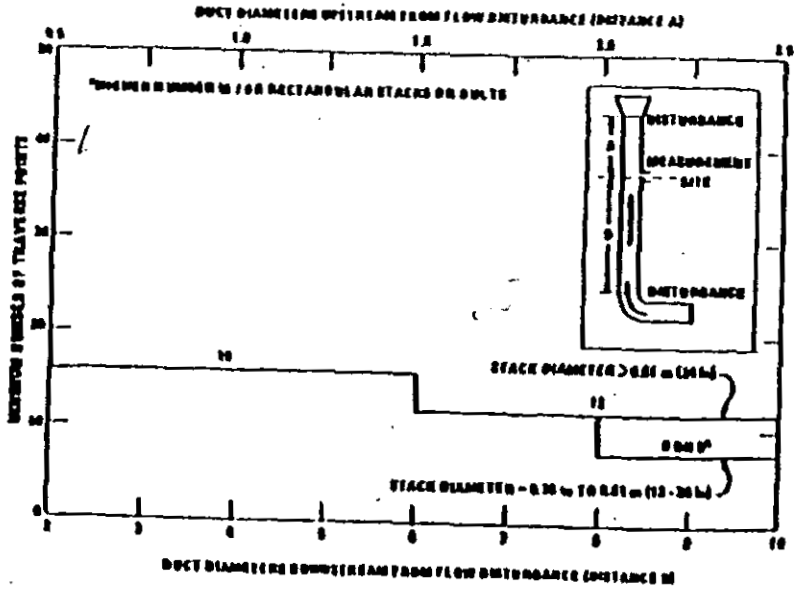


TABLE 1-1. CROSS-SECTION LAYOUT FOR RECTANGULAR STACKS

Number of traverse points	Matrix layout
8	3x3
12	4x3
16	4x4
20	5x4
25	5x5
30	6x5
36	6x6
42	7x6
49	7x7

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS | TEST DATE 07-28-94 (THURS) | ORIFICE CORRECTION (ΔH@) 1.837 | HOT/COLD BOX NO. 4
TEST UNIT #13 BATTERY STACK | TEST NO. USS-CLR-BS#13-2 | METER CORRECTION (Y) 1.0172 | PROBE NO. 10-2
PROJECT NO. 1241-02142 | NOZZLE (SIZE,#) 0.490 " | CALIBRATION DATE 06-20-94 | FILTER NO. 1284
TEST CREW RPC, TM | STATIC PRESSURE -1.0 "H2O | PITOT CORRECTION 0.84 | STACK DIA. 120"
BAROMETRIC PRESSURE 22.30 | PORT DIRECTION SOUTH WEST | CONTROL BOX NO. SIX | PORT SIZE 4.0" Thermocouple Probe

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
42.7	13:40	890.730	0.05	1.44	1.44	88	88	5.0	509	~250°F	68°	~250°F	5 min./point
30.0			0.06	1.73	1.73	104	87	5.0	489				
21.3			0.06	1.73	1.73	105	88	5.0	499				
14.2			0.06	1.74	1.74	110	90	5.0	505				
8.0			0.04	1.16	1.16	112	92	3.5	498				
2.6	14:10	911.200	0.04	1.16	1.16	115	95	3.0	500				
42.7	14:14	911.200	0.04	1.16	1.16	110	95	3.0	509				
30.0			0.04	1.16	1.16	115	96	3.0	520				
21.3			0.04	1.16	1.16	118	97	3.0	519				
14.2			0.05	1.45	1.45	119	98	4.0	506				
8.0			0.05	1.45	1.45	120	98	4.0	500				
2.6	14:44	929.707	0.03	0.87	0.87	121	100	3.0	450				
													Estimates:
													MW= 28.0
													%H2O= 14.0

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.010 CFM
After	7.0	0.008 CFM

PITOT LEAK CHECK

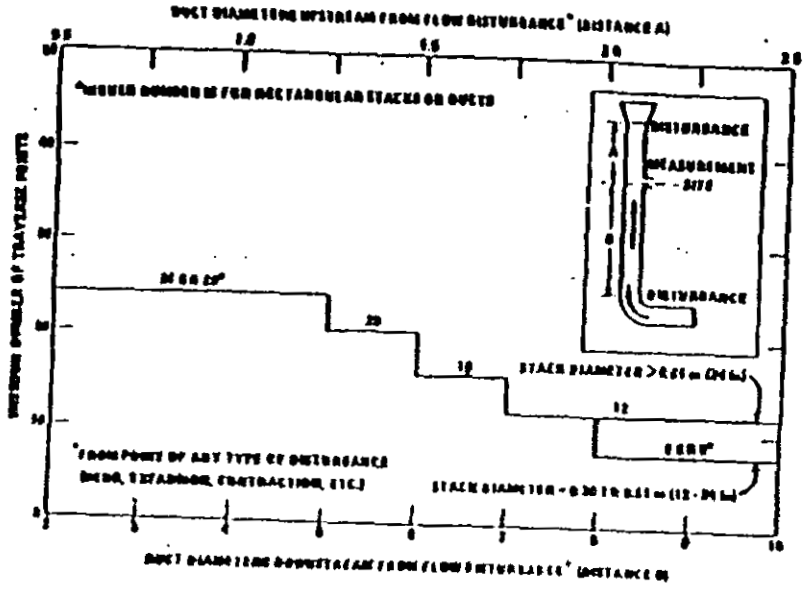
	Positive	Negative
Before	0"/15 sec	0"/15 sec
After	0"/15 sec	0"/15 sec

GAS	1	2
CO2	6.0	6.0
O2	10.5	10.5
CO	0	0
N2	83.5	83.5

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 ml DI H2O	748.5	532.8	215.7
2.	100 ml DI H2O	603.9	553.8	50.1
3.	EMPTY	459.8	450.2	9.6
4.	Silica Gel	464.3	443.0	21.3
5.				
6.			Total =	296.7g
7.				
8.				

275.4g

ADVANCED TECHNOLOGY SYSTEMS, INC.
339 Haymaker Road Suite 201
Monroeville, PA 15146
412/856-0662
FAX 412/856-0666



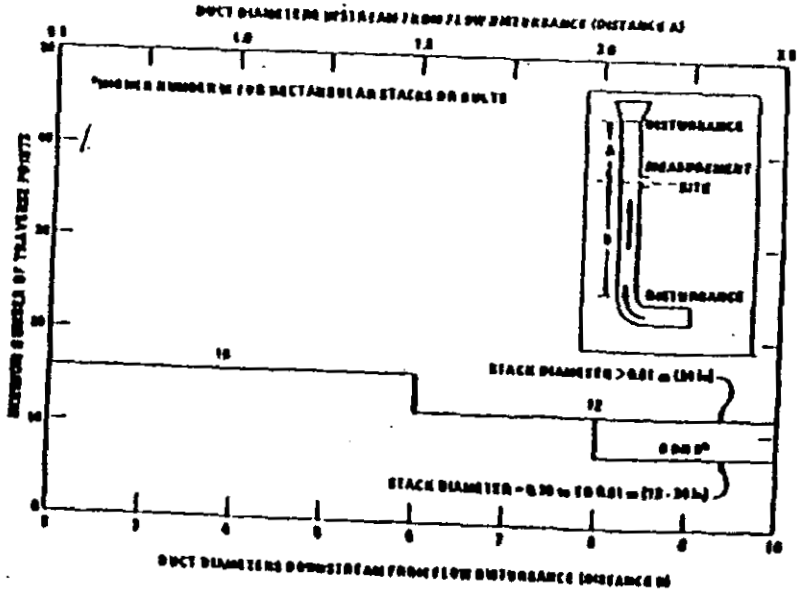


TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS

(Percent of stack diameter from inside wall to traverse point)

Traverse point number on a diameter	Number of traverse points on a diameter											
	2	4	6	8	10	12	14	16	18	20	22	24
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6	1.4	1.3	1.1	1.1
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9	4.4	3.9	3.5	3.2
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5	7.5	6.7	6.0	5.5
4		93.3	70.4	32.3	23.6	17.7	14.6	12.5	10.9	9.7	8.7	7.9
5			85.4	67.7	34.2	25.0	20.1	16.9	14.6	13.0	11.7	10.5
6			96.6	80.6	65.8	35.6	26.9	22.6	19.6	17.3	15.6	14.2
7				89.5	77.4	64.4	34.8	29.2	25.2	22.6	20.4	18.7
8				96.8	85.4	75.0	65.2	37.5	32.6	28.9	26.0	23.7
9					91.8	82.3	73.1	62.5	39.3	34.7	31.3	28.6
10					97.4	88.2	79.8	71.4	61.4	39.3	35.4	32.3
11						93.3	85.1	78.0	67.5	60.7	39.3	35.9
12						97.9	90.1	83.1	73.1	65.3	60.7	39.3
13							94.2	87.5	81.5	73.1	65.3	60.7
14							98.2	91.5	85.1	76.4	69.1	64.1
15								95.1	88.4	79.3	73.0	67.7
16								98.4	91.5	82.1	76.4	71.0
17									94.3	85.1	79.3	74.0
18									96.9	87.5	82.1	77.0
19										90.0	85.1	80.0
20										92.1	87.5	83.0
21										93.9	90.0	85.9
22										95.7	92.1	88.0
23										97.4	93.9	90.0
24										98.7	95.7	91.8

TABLE 1-1. CROSS-SECTION LAYOUT FOR RECTANGULAR STACKS

Number of traverse points	Stack is divided into
9	3 × 3
12	4 × 3
16	4 × 4
20	5 × 4
25	5 × 5
30	6 × 5
36	6 × 6
42	7 × 6
49	7 × 7

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS | TEST DATE 07-28-94 (GRAVES) | ORIFICE CORRECTION (ΔH@) 1.837 | HOT/COLD BOX NO. 1
TEST UNIT BATTERY STACK #3 | TEST NO. USS-CLR-BS #13-1 | METER CORRECTION (Y) 1.0132 | PROBE NO. 10-2
PROJECT NO. IKM-KR462 | NOZZLE (SIZE,#) 0.490" | CALIBRATION DATE 06-20-94 | FILTER NO. 1296
TEST CREW RAC, TM | STATIC PRESSURE -1.0" H2O | PITOT CORRECTION 0.84 | STACK DIA. 120"
BAROMETRIC PRESSURE 29.30 | PORT DIRECTION SOUTH, WEST | CONTROL BOX NO. SIX | PORT SIZE 40" Thermo mpb

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pilot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
42.7	09 32	853.225	0.05	1.40	1.40	100	83	4.5	499	~250°F	<68°F	~250°F	5 min./point
30.0			0.05	1.40	1.40	100	83	4.8	498				
21.3			0.04	1.12	1.12	109	83	4.0	509				
14.2			0.03	0.84	0.84	109	83	3.5	506				
8.0			0.04	1.12	1.12	109	83	3.0	475				
2.6	10 42	870.827	0.03	0.84	0.84	109	84	3.0	480				
42.7	12 42	870.827	0.05	1.40	1.40	80	80	5.0	510				
30.0			0.05	1.40	1.40	94	80	5.0	516				
21.3			0.06	1.68	1.68	98	82	5.5	500				
14.2			0.05	1.40	1.40	100	85	5.0	495				
8.0			0.04	1.12	1.12	110	88	4.5	499				
2.6	13 13	890.520	0.03	.84	0.84	110	89	3.5	465				
Test	Δ=120	Δ=73.885	(ΔP)ave =	(ΔH)ave =		(Tmeter)Avg =			(Tstack)Avg =				Estimates:
Totals	min	dcf	0.04	1.21			89.58 °F		495.88 °F				MW= 28.0
													%H2O= 14.0

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before		
After		

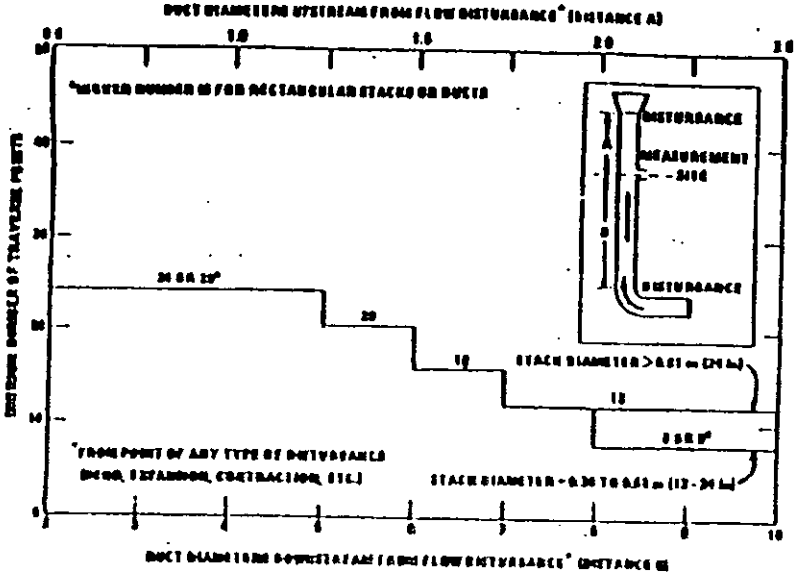
PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2	6.0	6.0
O2	10.5	10.5
CO	0	0
N2	83.5	83.5

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL DI H2O			
2.	100mL DI H2O			
3.	Empty			
4.	Silica Gel			
5.				
6.				
7.				
8.				

ADVANCED TECHNOLOGY SYSTEMS, INC.
339 Haymaker Road Suite 201
Monroeville, PA 15146
412/856-0662
FAX 412/856-0666



15.5

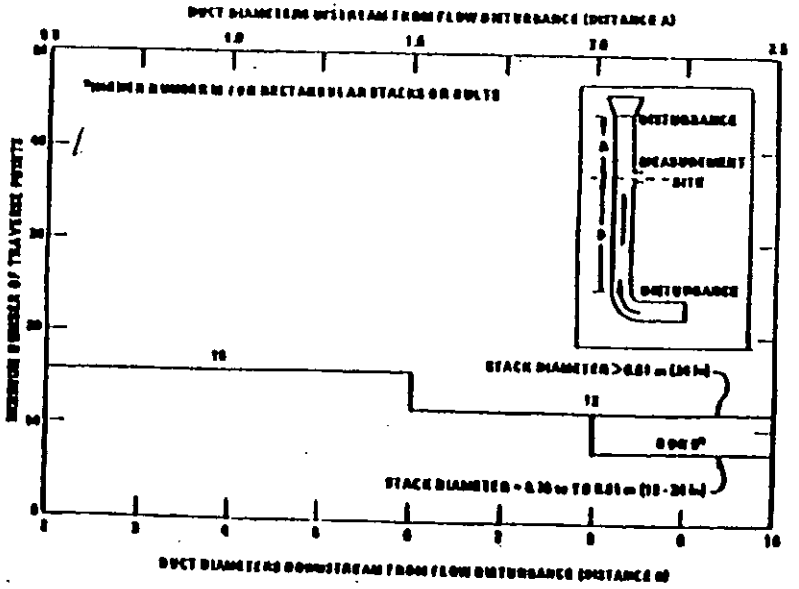


TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS

(Percent of stack diameter from inside wall to traverse point)

Traverse point number on a diameter	Number of traverse points on a diameter											
	2	4	6	8	10	12	14	16	18	20	22	24
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6	1.4	1.3	1.1	1.1
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9	4.4	3.9	3.5	3.2
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5	7.5	6.7	6.0	5.5
4		93.3	70.4	32.3	22.6	17.7	14.6	12.5	10.9	9.7	8.7	7.9
5			85.4	67.7	34.2	25.0	20.1	16.9	14.6	12.9	11.6	10.5
6			96.8	80.6	65.8	35.6	29.0	22.9	18.5	16.5	14.9	13.5
7				89.5	77.4	64.4	34.0	29.3	25.0	20.6	18.8	17.1
8				96.8	85.4	78.0	65.4	37.5	29.8	25.0	21.9	19.4
9					91.8	82.3	73.1	62.5	39.8	30.6	26.1	23.6
10					97.4	88.2	79.6	71.7	61.8	34.6	31.5	27.2
11						93.3	85.4	78.0	70.4	61.8	36.9	32.3
12						97.8	90.1	83.1	76.4	66.4	60.7	36.9
13							94.2	87.5	81.2	75.0	66.5	60.2
14							98.2	91.5	85.4	78.6	72.0	67.7
15								95.1	88.1	82.5	78.2	72.8
16								98.4	90.5	87.1	83.4	77.6
17									91.9	90.3	85.4	80.6
18									93.3	93.3	86.4	83.0
19										96.1	91.3	86.0
20										98.7	94.0	88.6
21											96.5	90.1
22											98.8	94.0
23												96.4
24												98.9

TABLE 1-1. CROSS-SECTION LAYOUT FOR RECTANGULAR STACKS

Number of traverse points	Matrix layout
8	3×3
12	4×3
16	4×4
20	5×4
25	5×5
30	6×5
36	6×6
42	7×6
49	7×7

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS	TEST DATE 07-28-94 (THURS)	ORIFICE CORRECTION (ΔH@) 1.837	HOT/COLD BOX NO. 1
TEST UNIT BATTERY STACK #13	TEST NO. USS-CLR-BS#13-#1	METER CORRECTION (Y) 1.0172	PROBE NO. 10-2
PROJECT NO. IKM1 - 02802	NOZZLE (SIZE,in) 0.490"	CALIBRATION DATE 06-20-94	FILTER NO. 1296
TEST CREW	STATIC PRESSURE -1.0 "H2O	PITOT CORRECTION 0.84	STACK DIA. 120"
BAROMETRIC PRESSURE 29.30	PORT DIRECTION NORTH, EAST	CONTROL BOX NO. SIX	PORT SIZE 4.0 THROUGH WALL

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
42.7	08:30 PM	816.635	0.05	1.40	1.40	71	71	4.5	521	~250°F	68°F	~250°F	5 min./point
30.0			0.06	1.68	1.68	86	71	5.0	536				
21.3			0.04	1.12	1.12	93	73	4.0	529				
14.2			0.05	1.40	1.40	100	75	4.5	480				
8.0			0.05	1.40	1.40	100	76	4.5	475				
2.6	09:00 PM	835.180	0.03	0.84	0.84	100	76	3.5	450				
42.7	09:06	835.180	0.05	1.40	1.40	84	78	5.0	516				
30.0			0.04	1.12	1.12	100	78	4.5	509				
21.3			0.04	1.12	1.12	102	79	4.5	508				
14.2			0.05	1.40	1.40	105	80	5.0	495				
8.0			0.03	0.84	0.84	105	81	3.8	480				
2.6	09:36 PM	853.225	0.03	0.84	0.84	104	81	3.5	450				
													Estimates:
													MW= 28.0
													%H2O= 14.0

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.01 CFM
After	8.0	0.01 CFM

PITOT LEAK CHECK

	Positive	Negative
Before	OK/15 sec	OK/15 sec
After	OK/15 sec	OK/15 sec

GAS	1	2
CO2	6.0	6.0
O2	10.5	10.5
CO	0	0
N2	83.5	83.5

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100ml DI H2O	761.5	559.5	202.0
2.	100 ml DI H2O	596.4	553.3	43.1
3.	EMPTY	446.2	437.4	8.8
4.	SILICA GEL	671.5	649.4	22.1
5.				
6.			TOTAL=	276.0g
7.				
8.				

253.9g

ADVANCED TECHNOLOGY SYSTEMS, INC.
339 Haymaker Road Suite 201
Monroeville, PA 15146
412/856-0662
FAX 412/856-0666

A report summarizing the compliance test program will be submitted within 60 days following completion of field work. The report will describe test methodologies utilized and present a textual and tabular summary of the emissions results and related sampling information. Copies of operational data will be included in the report to verify that all testing was performed during periods of normal plant operation. Also incorporated into the report will be copies of the pre-test calibration results, post-test calibration results, the results of an audit conducted with a critical orifice provided by the Allegheny County Health Department - Department of Air Quality, field data sheets for the particulate matter sampling and visible emissions determinations, emissions calculations sheets, and analytical results for each test.

water rinse followed by an acetone rinse of both the front-half and back-half components of the sample train, as per PA DER particulate matter test methods. The water soluble and water insoluble portions of the front-half of the sampling train will be determined as a total; that is, the water rinse will not be filtered to determine soluble and insoluble portions. Front-half acetone and water rinses will be evaporated to dryness, desiccated, and weighed to a constant weight. The water soluble and water insoluble portions of the back-half will be determined separately in accordance with Section 139.12 of the PA DER Source Testing Manual. The back-half water rinses and first three impinger solutions will be combined and then filtered under suction through a preweighed 0.22 micrometer membrane filter. The filter used to capture the insoluble material will be dried, desiccated, and weighed to a constant weight. After filtration, the soluble back-half water will be extracted with chloroform and ethyl ether. The extracts will be evaporated to dryness, desiccated, and weighed to a constant weight. The filtrate, or remaining water from the extraction process, will be evaporated to dryness, desiccated, and weighed to a constant weight. Following the gravimetric analyses for the filtrate residue, the residue will be resolubilized and the solution submitted for sulfate analysis via ion chromatography. Back-half acetone rinses will be evaporated to dryness, desiccated, and weighed to a constant weight. Sample train filters will be desiccated for 24 hours, and particulate matter weight will be determined gravimetrically. Rinse residue weights and filter weights will be measured to the nearest 0.1 mg. One acetone blank and one deionized distilled water blank will be prepared in the same manner as the test sample rinses. The blank residue weights will be subtracted from the test sample residue weights. After blank correction, front-half water and acetone rinse residue weights, sample train filter weights, and back-half water insoluble filter weights will be used to determine total particulate matter catch.

All visible emissions determinations will be performed in accordance with EPA Stationary Source Sampling Method 9. Visible emission readings will be recorded for the duration of each particulate matter test.

TEST PROTOCOL
COMPLIANCE DEMONSTRATION
#13 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
CLAIRTON, PA

Particulate matter sampling will be performed in accordance with EPA Stationary Source Sampling Methods 1 through 5, Sections 139.11 and 139.12 of the Pennsylvania Department of Environmental Resources (PA DER) Source Testing Manual, and Appendix A of the Amended Installation Permit for USS Clairton Works Nos. 13, 14, and 15 Batteries. Three two-hour tests will be executed during normal operating conditions. Greater than 50 dry standard cubic feet of sample gas will be collected during each test run.

The process exhausts through a 120 inch diameter stack. A total of 24 traverse points (12 per diameter) will be sampled; the traverse points will be calculated in accordance with EPA Method 1. Sampling will be conducted through four equally spaced ports, with six traverse points sampled per port. Each point will be sampled for 5 minutes, thus bringing the total sampling time to 120 minutes.

In accordance with EPA Method 2, velocities and volumetric flow rates of the exhaust gas will be determined using a calibrated S type pitot tube. Positive and negative pitot lines will be leak-checked at the beginning and end of each test run. Gas velocity differential pressures along with stack gas temperatures will be recorded at each sampling point.

At the beginning and end of each test, gas concentrations of CO_2, O_2, and N_2 (by difference) will be determined with the use of a Fyrite apparatus as specified by EPA Method 3. Gas concentrations will be used to obtain molecular weight of the process gas.

Percent moisture content, by volume, of the exhaust gas will determined by measuring the weight gain of the four sample train impingers in accordance with EPA Method 4.

As specified by EPA Method 5, each sample train will be assembled as required by the method, leak-checked on site at the beginning and end of each test run, and operated such that isokinetic conditions are maintained. Clean up of the sampling train will include a

COMPLIANCE DEMONSTRATION
NO. 13 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

APPENDIX A

TEST PROTOCOL, FIELD DATA SHEETS, CALIBRATION RESULTS

ATS
ADVANCED TECHNOLOGY SYSTEMS, INC.

All testing was performed during periods of normal plant operation. Copies of the plant operational data can be found in Appendix B.

The gravimetric and analytical results (including the results of the sulfate analyses of the back-half filtrate from the sample trains) and the emissions calculations for each test can be found in Appendix C.

USS CLAIRTON WORKS
CLAIRTON, PA

TABLE 1

#13 BATTERY COMBUSTION STACK
PARTICULATE MATTER EMISSIONS DATA

		Run 1	Run 2	Run 3	Average
Test Number		CLR-BS#13-1	CLR-BS#13-2	CLR-BS#13-3	
Test Date		07-28-94	07-28-94	07-29-94	
Mass Emissions Rate and Concentration					
Particulate Matter	(lb/hr)	3.49	3.11	3.69	3.43
	(gr/dscf)	0.0121	0.0109	0.0129	0.0120
Stack Conditions					
Flow Rate	(acfm)	73700	73900	73500	73700
	(scfm)	39800	39800	39800	39800
	(dscfm)	33600	33200	33400	33400
Temperature	(°F)	496	498	495	496
Moisture Content	(%)	15.5	16.6	16.2	16.1
Sampling Conditions					
Test times		0830 to 0900	1340 to 1410	0740 to 0810	
		0906 to 0936	1414 to 1444	0813 to 0843	
		0939 to 1009	1447 to 1517	0846 to 0916	
		1242 to 1312	1520 to 1550	0919 to 0949	
Sampling Time	(minutes)	120	120	120	
Sample Volume	(dscf)	70.923	70.515	69.046	
Isokinetics	(%)	105.4	106.2	103.4	

3.0 RESULTS

The test results have been summarized in Table 1. The results of the testing showed an average particulate matter concentration and emission rate of 0.0120 grains per dry standard cubic foot (gr/dscf) and 3.43 pounds per hour (lb/hr), respectively. As promulgated by the Second Consent Decree, Chapter V, Section F.2.a, the allowable particulate matter concentration for #13 Battery Combustion Stack is 0.015 gr/dscf (a Lowest Achievable Emission Rate [LAER] standard). Thus, the particulate matter emissions from the stack are less than the allowable concentration.

Table 1 also lists other pertinent stack and sampling parameters which include stack gas flow rate in units of actual cubic feet per minute (acfm), standard cubic feet per minute (scfm), and dry standard cubic feet per minute (dscfm), stack gas temperature (^{O}F), moisture content of the stack gas (percent by volume), gas volume sampled for each test in units of dry standard cubic feet (dscf), and the isokinetics value for each test. The isokinetics value is equal to the ratio of the average linear gas velocity sampled through the probe nozzle to the average stack gas velocity. An isokinetics value between 90 percent and 110 percent is considered acceptable. All isokinetic values were within the acceptable range of values. The gas volume sampled for each 120 minute test was greater than 50 dry standard cubic feet. Actual test sampling times have also been included in Table 1.

Copies of all field data sheets, including the visible emissions readings, can be found in Appendix A. As promulgated by the Second Consent Decree, Chapter V, Sections F.2.b and F.3, the visible emissions shall not equal or exceed 20 percent opacity for a period or periods aggregating in excess of 3 minutes in any 60-minute period and shall never equal or exceed 60 percent opacity. During the test periods, the greatest three-minute average opacity was less than 5 percent. The maximum opacity observed was 5 percent. Thus, the observed opacities were less than the allowable values.

All sampling equipment was calibrated and operated in accordance with EPA Stationary Source Sampling Methods 1 through 5. Copies of the pre-test calibration results, post-test calibration results, and the results of an audit conducted with a critical orifice provided by the Allegheny County Health Department DAQ can be found in Appendix A.

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS | TEST DATE 07-29-94 (Fri) | ORIFICE CORRECTION (ΔH@) 1.837 | HOT/COLD BOX NO. 4
TEST UNIT #13 BATTERY STACK | TEST NO. USS-CLR-BS#13-3 | METER CORRECTION (Y) 1.012 | PROBE NO. 10-2
PROJECT NO. 1GUN-B2462 | NOZZLE (SIZE,#) 0.490" | CALIBRATION DATE 06-20-94 | FILTER NO. 1305
TEST CREW RPC TM | STATIC PRESSURE -1.1" H2O | PITOT CORRECTION 0.84 | STACK DIA. 120"
BAROMETRIC PRESSURE 29.40 | PORT DIRECTION NORTH, EAST | CONTROL BOX NO. SIR | PORT SIZE 4.0" THREADED MALE

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
42.7	07 40 m	966.761	0.05	1.39	1.39	68	68	3.5	533	~250°F	<68°F	~250°F	5min./point
30.0			0.05	1.39	1.39	82	68	3.5	509				
21.3			0.04	1.11	1.11	91	70	3.0	500				
14.2			0.04	1.11	1.11	97	73	3.0	489				
8.0			0.03	0.83	0.83	100	75	2.5	479				
2.6	08 10 m	984.654	0.03	0.83	0.83	99	75	2.5	484				
42.7	08 43 m	984.654	0.04	1.11	1.11	95	80	3.5	511				
30.0			0.05	1.39	1.39	105	81	4.0	509				
21.3			0.04	1.11	1.11	107	82	3.5	511				
14.2			0.03	0.83	0.83	107	82	3.0	494				
8.0			0.03	0.83	0.83	108	82	2.5	500				
2.6	08 43 m	1001.677	0.03	0.83	0.83	107	83	2.5	450				
													Estimates:
													MW= 28.0
													%H2O= 14.0

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.012 CFM
After	5.0	<0.01 CFM

PITOT LEAK CHECK

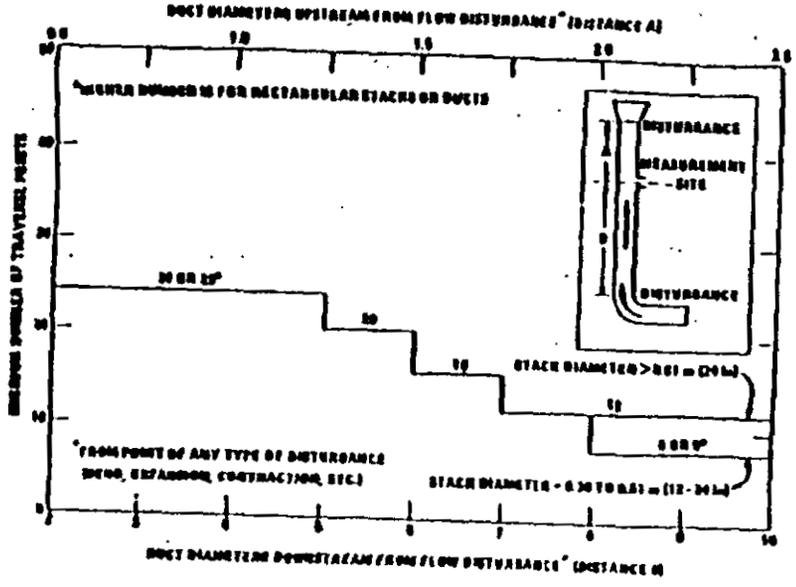
	Positive	Negative
Before	OK/NO LEAK	OK/NO LEAK
After	OK/NO LEAK	OK/NO LEAK

GAS	1	2
CO2	6.5	6.5
O2	10.5	10.5
CO	0	0
N2	83.0	83.0

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 ml DI H2O	743.7	534.1	209.6
2.	100 ml DI H2O	603.8	555.8	48.0
3.	Empty	457.3	451.2	6.1
4.	Silica gel	660.8	642.2	18.2
5.				
6.			Total =	281.9g
7.				
8.				

263.7g

ADVANCED TECHNOLOGY SYSTEMS, INC.
339 Haymaker Road Suite 201
Monroeville, PA 15146
412/856-0662
FAX 412/856-0666



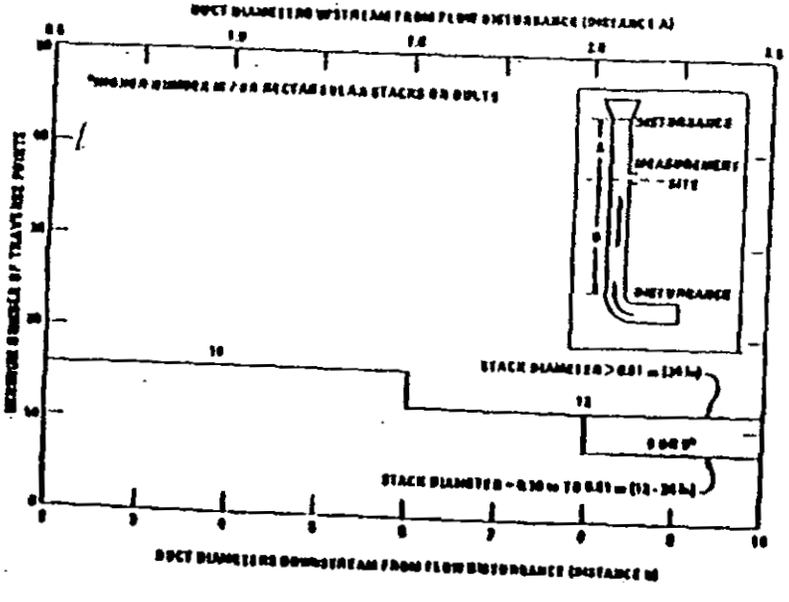


TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS

(Percent of stack diameter from inside wall to traverse point)

Traverse point number on a diameter	Number of traverse points on a diameter											
	2	4	6	8	10	12	14	16	18	20	22	24
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6	1.4	1.3	1.1	1.0
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9	4.4	3.9	3.5	3.2
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5	7.5	6.7	6.0	5.5
4		93.3	70.4	32.3	22.6	17.7	14.6	12.5	10.9	9.7	8.7	7.9
5			85.4	67.7	34.2	25.0	20.1	16.9	14.8	13.1	11.8	10.8
6			96.8	80.6	65.8	35.6	29.0	22.6	20.3	17.9	16.1	14.5
7				89.5	77.4	64.4	34.2	27.5	25.0	22.6	20.4	18.5
8				96.8	85.4	73.8	65.8	37.5	29.6	27.4	25.0	23.1
9					89.8	82.3	71.2	62.5	34.2	32.3	29.6	27.4
10					97.4	88.2	78.0	71.7	65.8	37.5	34.2	31.5
11						93.3	85.4	78.0	70.4	67.7	38.8	36.3
12						97.9	90.1	83.1	76.4	70.4	65.8	40.7
13							94.2	87.5	81.2	75.0	69.4	65.5
14							98.2	91.5	85.4	79.6	73.5	68.5
15								95.5	88.1	83.5	77.6	72.0
16								98.4	92.6	87.1	81.6	76.0
17									95.6	90.3	85.4	79.5
18									98.8	93.3	88.4	83.1
19										96.1	91.3	86.5
20										98.7	94.0	89.5
21											96.5	92.5
22											98.8	95.5
23												98.2
24												98.9

TABLE 1-1. CROSS-SECTION LAYOUT FOR RECTANGULAR STACKS

Number of traverse points	Matrix layout
9	3x3
12	4x3
16	4x4
20	5x4
25	5x5
30	6x5
36	6x6
42	7x6
49	7x7

STACK SAMPLING DATA SHEET

CLIENT USS-CLAIRTON WORKS	TEST DATE 07-29-94 (FRI)	ORIFICE CORRECTION (ΔH@) 1.837	HOT/COLD BOX NO. 4
TEST UNIT Rumsey Stack #13	TEST NO. USS-CTN #13BS-23	METER CORRECTION (Y) 1.0172	PROBE NO. 10-2
PROJECT NO. 7411-0292	NOZZLE (SIZE,in) .490"	CALIBRATION DATE 06-20-94	FILTER NO. 1305
TEST CREW RPC TA	STATIC PRESSURE -1.1" H_2O	PITOT CORRECTION 0.84	STACK DIA. 120"
BAROMETRIC PRESSURE 29.40	PORT DIRECTION SOUTH, WEST	CONTROL BOX NO. SIR	PORT SIZE 40" DIAMETER NOZ

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pilot ΔP (in. H2O)	Orifice ΔH Required (in. H2O)	Orifice ΔH Actual (in. H2O)	Meter Temperature In (°F)	Meter Temperature Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
42.7	08:46	1001.677	0.05	1.41	1.41	95	86	3.0	525	~250F	<68F	~250F	5 min./point
30.0			0.06	1.70	1.70	99	86	4.0	493				
21.3			0.06	1.70	1.70	110	86	4.0	495				
14.2			0.04	1.41	1.41	112	87	3.0	501				
8.0			0.03	0.85	0.85	112	88	2.0	481				
2.6	09:16	1020.960	0.03	0.85	085	112	89	2.0	479				
42.7	09:19	1020.960	0.05	1.41	1.41	97	89	3.5	511				
30.0			0.05	1.41	1.41	105	90	3.5	515				
21.3			0.05	1.41	141	116	92	3.5	516				
14.2			0.03	0.85	0.85	116	93	2.5	500				
8.0			0.03	0.85	0.85	116	93	2.5	465				
2.6	09:49	1038.903	0.03	0.85	0.85	116	93	2.5	460				
Test	Δ=120	Δ=72.142	$(\Delta P)_{Avg}$ =	$(\Delta H/\Delta H_{@})_{Avg}$ =		$(T_{meter})_{Avg}$ =			$(T_{stack})_{Avg}$ =				Estimates:
Totals	min.	dcf											MW= 28.0
			(.04)	(1.14)			(92.98)		(495)	°F			%H2O= 14.0

q=

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before		
After		

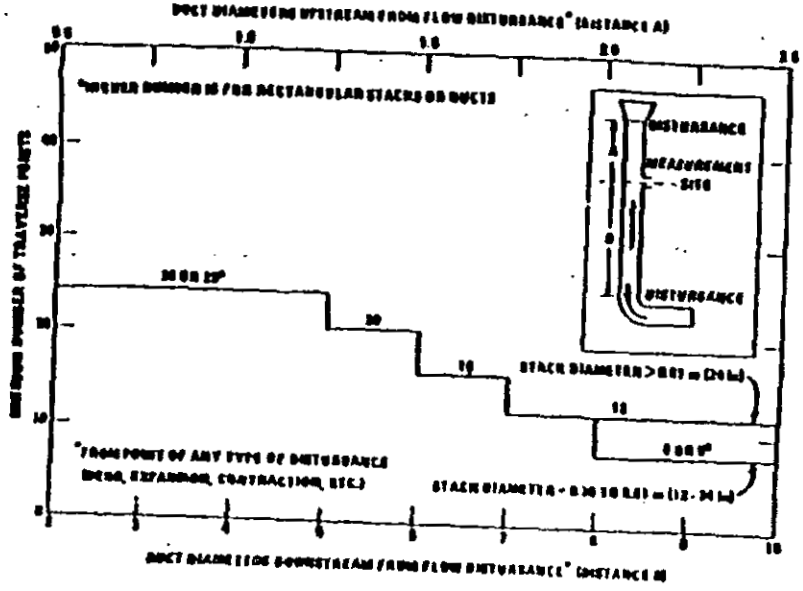
PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2	6.5	6.5
O2	10.5	10.5
CO	<1.0	0
N2	83.0	83.0

Impinger No.	Impinger Contents	Final	Initial	Difference
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

ADVANCED TECHNOLOGY SYSTEMS, INC.
339 Haymaker Road Suite 201
Monroeville, PA 15146
412/856-0662
FAX 412/856-0666



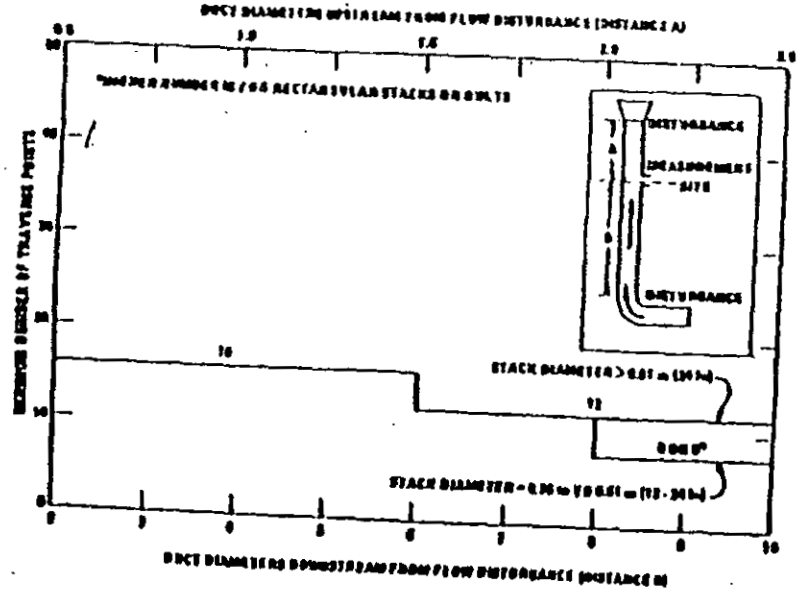


TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS

[Percent of stack diameter from inside wall to traverse point]

Traverse point number on a diameter	Number of traverse points on a diameter											
	2	4	6	8	10	12	14	16	18	20	22	24
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6	1.4	1.3	1.1	1.0
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9	4.4	3.9	3.5	3.2
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5	7.5	6.7	6.0	5.5
4		93.3	70.4	32.3	22.6	17.7	14.9	12.9	11.3	10.0	9.1	8.3
5			85.4	67.7	34.2	25.0	20.1	17.7	15.8	14.2	12.9	11.8
6			96.6	85.6	65.8	35.6	29.6	25.5	22.6	20.3	18.5	16.9
7				94.5	77.4	64.4	36.6	32.3	29.0	26.2	23.9	22.0
8				98.0	85.4	75.0	63.4	40.3	37.5	34.2	31.5	29.0
9					91.8	82.3	73.1	67.7	62.5	59.8	38.2	35.6
10					97.4	88.2	79.9	71.7	71.7	65.8	61.8	58.4
11						93.3	85.4	78.0	78.0	71.4	68.5	65.1
12						97.9	90.1	83.5	83.5	76.4	73.8	71.0
13							94.3	87.5	87.5	81.2	78.0	75.0
14							98.2	91.9	91.9	85.6	82.6	79.6
15								95.5	95.5	88.1	85.5	82.9
16								98.4	98.4	90.5	87.9	85.4
17										92.7	90.3	87.8
18										94.8	92.5	90.2
19										96.7	94.6	92.5
20										98.4	96.5	94.5
21											98.2	96.3
22											99.7	98.0
23												99.5
24												99.8

TABLE 1-1. CROSS-SECTION LAYOUT FOR RECTANGULAR STACKS

Number of traverse points	Matrix layout
9	3×3
12	4×3
16	4×4
20	5×4
25	5×5
30	6×5
36	6×6
42	7×6
49	7×7

CONTROL BOX CALIBRATION

THREE POINT CALIBRATION

BOX # 6 BP 28.95 In. Hg
DATE 06-20-94 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER	ORIFICE
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	COEFFICIENT Y	COEFFICIENT ΔH@
START			0.000	28.95				0.50	350.100		
HALF		81.0			98.0	89.0	93.5				
STOP	12.75		5.000						355.151		
CALCULATION	12.75	541.0	5.013	28.95			553.5	28.99	5.051	1.0140	1.873
START			0.000	28.95				1.00	355.600		
HALF		81.0			105.0	90.0	97.5				
STOP	8.95		5.000						360.700		
CALCULATION	8.95	541.0	5.013	28.95			557.5	29.02	5.100	1.0103	1.833
START			0.000	28.95				2.00	361.200		
HALF		81.0			110.0	92.0	101.0				
STOP	6.30		5.000						366.234		
CALCULATION	6.30	541.0	5.013	28.95			561.0	29.10	5.034	1.0273	1.805
AVERAGE										1.0172	1.837

POST TEST

BOX # 6 BP 29.00 In. Hg
DATE 08-03-94 OPERATOR RPC

	WET TEST METER				DRY TEST METER					METER	ORIFICE
	TIME (min)	TEMP TW	VOLUME VM	PRESSURE PW	TEMP IN TI	TEMP OUT TO	TEMP AVG TA	ORIFICE PD	VOLUME VD	COEFFICIENT Y	COEFFICIENT ΔH@
START			0.000	29.00				1.25	63.000		
HALF		72.0			98.0	82.0	90.0				
STOP	7.90		5.000						68.309		
CALCULATION	7.90	532.0	5.013	29.00			550.0	29.09	5.309	0.9730	1.747
START			0.000	29.00				1.25	68.500		
HALF		72.0			105.0	84.0	94.5				
STOP	7.95		5.000						73.541		
CALCULATION	7.95	532.0	5.013	29.00			554.5	29.09	5.041	1.0331	1.754
START			0.000	29.00				1.25	74.000		
HALF		72.0			111.0	87.0	99.0				
STOP	7.98		5.000						79.073		
CALCULATION	7.98	532.0	5.013	29.00			559.0	29.09	5.073	1.0349	1.753
AVERAGE										1.0137	1.751
DIFFERENCE										0.3%	4.9%

PRE-TEST MAGNEHELIC CALIBRATION
BOX# 6
DATE 06-09-94
OPERATOR RPC

0 to 3.0" H2O RANGE

MAGNEHELIC

Δ P	MANOMETER
0.50	0.50
1.00	1.00
2.00	2.00
3.00	3.00

0 to 0.50" H2O RANGE
SLANT TUBE
PRIMARY STANDARD

0 to 5" H2O RANGE

MAGNEHELIC

ΔH	MANOMETER
4.00	4.00
3.00	3.00
2.00	2.00
1.00	1.00
0.50	0.50

PRE-TEST LEAK CHECK
DATE 06-20-94
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	394.400	394.619	0.219	10.000	0.000
WET	0.000	0.222	0.222		

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

VOLTAGE INPUT (mV)	ARGE TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	301.0
8.31	400	400.0
10.57	500	500.0

PRE-TEST PYROMETER CHECK
DATE 06-09-94
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	301.0
8.31	400	402.0
10.57	500	502.0

POST-TEST MAGNEHELIC CALIBRATION
BOX# 6
DATE 08-03-94
OPERATOR RPC

0 to 3.0" H2O RANGE

MAGNEHELIC

△ P	MANOMETER
0.50	0.50
1.00	1.00
2.00	2.00
3.00	3.00

0 to 0.50" H2O RANGE
SLANT TUBE
PRIMARY STANDARD

0 to 5" H2O RANGE

MAGNEHELIC

△ H	MANOMETER
4.00	4.00
3.00	3.00
2.00	2.00
1.00	1.00
0.50	0.50

POST-TEST LEAK CHECK
DATE 08-03-94
OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	62.400	62.590	0.190	10.000	0.0000
WET	0.000	0.190	0.190		

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

VOLTAGE INPUT (mV)	ARGE TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	301.0
8.31	400	400.0
10.57	500	500.0

POST-TEST PYROMETER CHECK
DATE 08-03-94
OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0
0.40	50	50.0
0.84	70	70.0
1.29	90	90.0
1.74	110	110.0
2.66	150	150.0
3.82	200	200.0
6.09	300	302.0
8.31	400	402.0
10.57	500	502.0

QA ORIFICE AUDIT

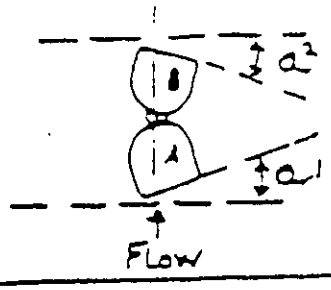
ORIFICE BAPC-3 DATE 06-09-94 B.P. 29.00
OPERATOR RPC BOX # 6

RUN	1		2		3	
INITIAL CF	110.300		118.300		126.300	
FINAL CF	117.825		125.828		133.810	
DIFFERENCE	7.525		7.528		7.510	
	IN	OUT	IN	OUT	IN	OUT
TEMP INITIAL	105	100	102	98	102	97
TEMP 5 MIN	102	99	101	97	102	97
TEMP 10 MIN	102	98	102	97	103	98
TEMP 15 MIN	102	98	102	97	103	98
		TEMP R		TEMP R		TEMP R
TEMP AVG	100.75	560.75	99.5	559.5	100	560
TIME (MIN.)	15.00		15.00		15.00	
	IN WATE	IN HG	IN WATER	IN HG	IN WATER	IN HG
ORIFICE	0.75	0.06	0.75	0.06	0.75	0.06
METER PRESSURE		29.06		29.06		29.06
	°F	°C	°F	°C	°F	°C
AMBIENT TEMP.	78.0	25.6	78.0	25.6	78.0	25.6
VACUUM IN HG	21.0		21.0		21.0	
DGM CAL Y	1.0128		1.0128		1.0128	
STD CF	6.995		7.014		6.991	
STD CUBIC METERS	0.1981		0.1986		0.1980	

GEOMETRIC PITOT CALIBRATION

Caliper # X6F :59
Precheck
Post Check

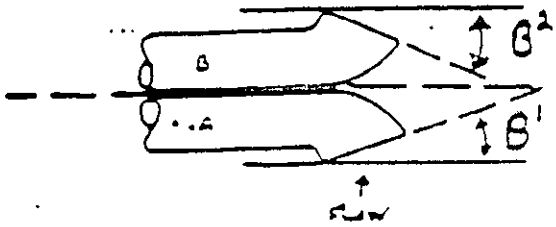
Probe #: 10.2
Date: 6-10-94
Initials: RPC

① 

a² = 3°
a¹ = 0°
a¹, a² = <10°

B¹ = 0°
B² = 1°
B¹, B² = <5°

F = .93"

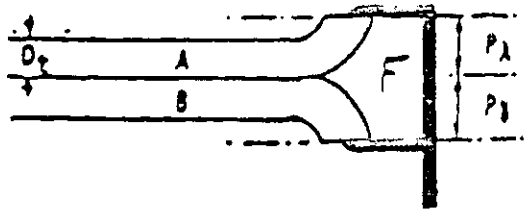
② 

μ = 16
β = ≤ 0.1250" (β = F TAN γ)

V = 0
V = ≤0.03125" (V = F TAN θ)

W = .194
W ≥ 0"

X = 0.97
X ≥ 0.750"
(3/4" using 1/2" nozzle)

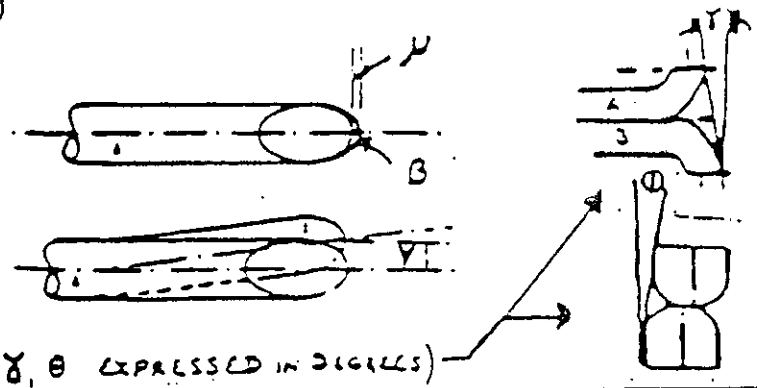
③ 

1.05 D_t < P_A < 1.50 D_t
P_A = P_B
2.10 D_t < P_B < 3.00 D_t

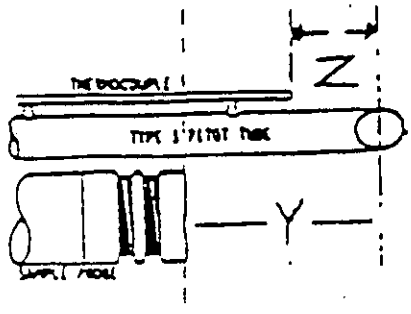
Y = 5.6
Y ≥ 3.0"

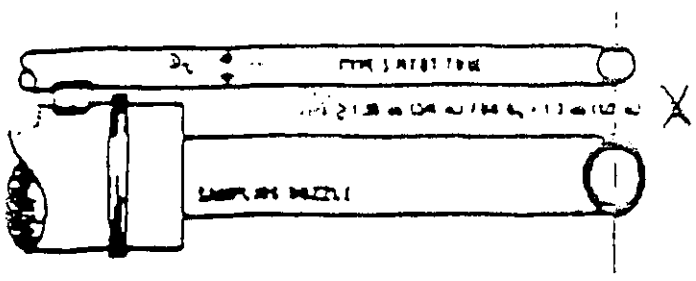
Z = 3.6
Z > 2.0"

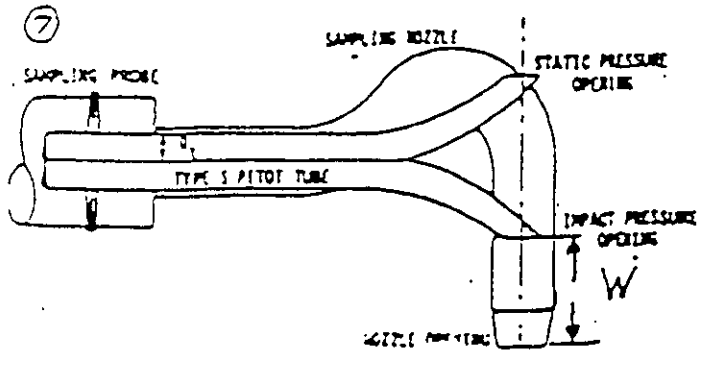
D_t = .375
D_t > .1875"

④ 

(γ, θ EXPRESSED IN DEGREES)

⑥ 

⑤ 

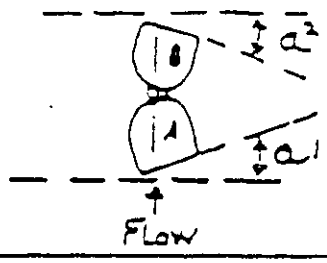
⑦ 

GEOMETRIC PITOT CALIBRATION

Caliper # Vee - 59
Precheck
Post Check

Probe #: 10.2
Date: 08-03-94
Initials: CR

①

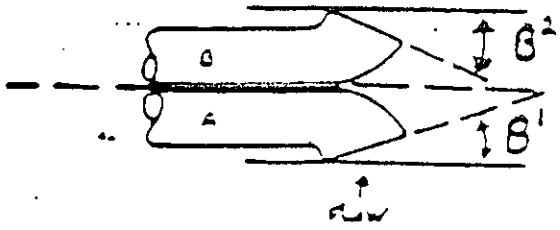


a¹ = 3°
a² = 0°
a¹, a² = <10°

B¹ = 0°
B² = 1°
B¹, B² = <5°

F = .94 "

②

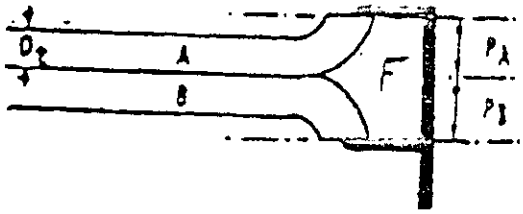


μ = .16
μ = ≤ 0.1250" (μ = F Tan

V = 0
V = ≤0.03125" (V = F Tan

W = .194
W ≥ 0 "

③



1.05 D_t ≤ A <1.50 D_t
P_A = P_B
2.10 D_t ≤ A ≤3.00 D_t

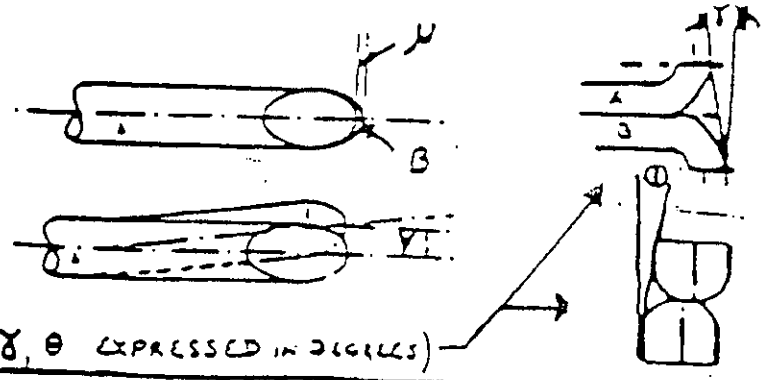
X = 0.97
X ≥ 0.750"
(3/4" using 1/2" nozzle)

Y = 5.6
Y ≥ 3.0"

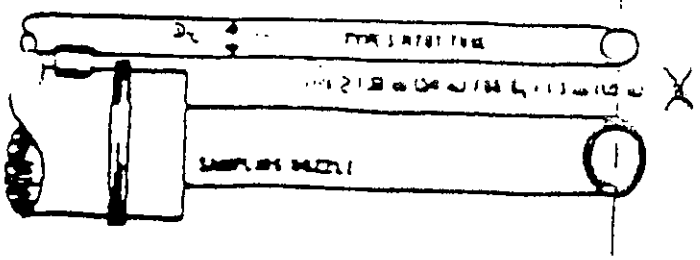
Z = 3.8
Z > 2.0"

D_t = .376
D_t > .1875"

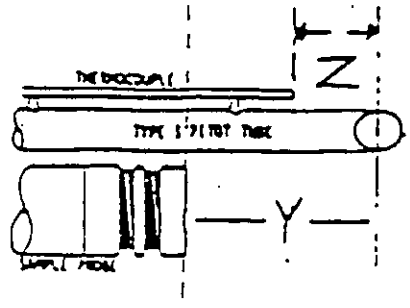
④



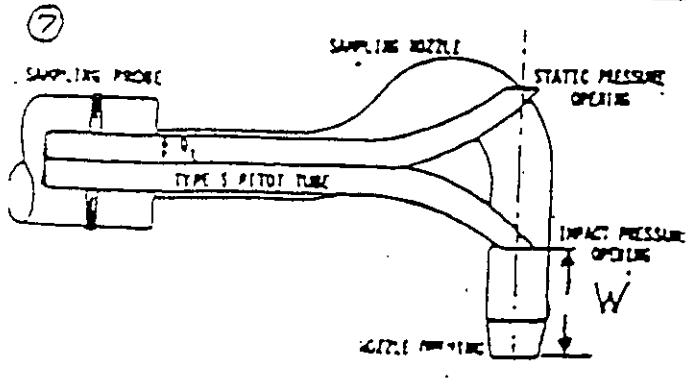
⑤



⑥



⑦



VISIBLE EMISSIONS OBSERVATION FORM

①

13 STACK

OBSERVER: R. BRIAN FAJTAK

DATE: 7/28/94

FACILITY: USX/CLAIRTON

OBSERVATION START TIME: 0836

END TIME: 0930

OBSERVATION POINT: 100' South of #19 Batt.

SOURCE:

DISTANCE: ≈ 300'

DIRECTION FROM: S-W

HEIGHT: ≈ 150'

WIND:

SPEED: < 5 mph

DIRECTION: South

TEMPERATURE: 66°F

SKY CONDITION: OVERCAST

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: —

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15%: 240

NO. READINGS 20%: —

NO. READINGS 25 - 55%: —

NO. READINGS 60 - 100%: —

NO. READINGS >= 20%: —

GREATEST OPACITY: 0

COMMENTS:

	:00	:15	:30	:45
00	0	0	0	0
01	0	0	0	0
02	0	0	0	0
03	0	0	0	0
04	0	0	0	0
05	0	0	0	0
06	0	0	0	0
07	0	0	0	0
08	0	0	0	0
09	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

	:00	:15	:30	:45
30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATION FORM

(2)

#13 STACK

OBSERVER: R. BRIAN FAJAK

DATE: 7/28/94

FACILITY: USX/CLAIRTON

OBSERVATION START TIME: 0930

END TIME: 1010

OBSERVATION POINT: 100' south of #19 Bath

SOURCE:

DISTANCE: ≈ 300'

DIRECTION FROM: S-W

HEIGHT: ≈ 150'

WIND:

SPEED: < 5 mph

DIRECTION: south

TEMPERATURE: 68° F

SKY CONDITION: OVERCAST

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: —

TOTAL # OF READINGS: 162

NO. READINGS 0 - 15% —

NO. READINGS 20% —

NO. READINGS 25 - 55% —

NO. READINGS 60 - 100% —

NO. READINGS >= 20% —

GREATEST OPACITY: 0

COMMENTS:

	:00	:15	:30	:45
00	0	0	0	0
01	0	0	0	0
02	0	0	0	0
03	0	0	0	0
04	0	0	0	0
05	0	0	0	0
06	0	0	0	0
07	0	0	0	0
08	0	0	0	0
09	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

	:00	:15	:30	:45
30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0		
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				

VISIBLE EMISSIONS OBSERVATION FORM

(3)

#13 STACK

OBSERVER: R. Brian Fajtak

DATE: 7/28/94

FACILITY: USX/Clairton

OBSERVATION START TIME: 1242 hrs

END TIME: 1342 hrs

OBSERVATION POINT: ≈40' South of #19 Batt.

SOURCE:

DISTANCE: ≈300'

DIRECTION FROM: S-W

HEIGHT: ≈150'

WIND:

SPEED: ≈ 5-10 mph

DIRECTION: S

TEMPERATURE: 76°

SKY CONDITION: 80% cloudy

BACKGROUND: SKY

READING CONDITIONS: Good

COLOR OF EMISSIONS: —

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15% 240

NO. READINGS 20% —

NO. READINGS 25 - 55% —

NO. READINGS 60 - 100% —

NO. READINGS >= 20% —

GREATEST OPACITY: 0

COMMENTS:

	:00	:15	:30	:45
00	0	0	0	0
01	0	0	0	0
02	0	0	0	0
03	0	0	0	0
04	0	0	0	0
05	0	0	0	0
06	0	0	0	0
07	0	0	0	0
08	0	0	0	0
09	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

	:00	:15	:30	:45
30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATION FORM

④

#13 STACK

OBSERVER: R. BRIAN FAJTAK

DATE: 7-28-94

FACILITY: USX / CLAIRTON

OBSERVATION START TIME: 1342 Hrs.

END TIME: 1442 Hrs

OBSERVATION POINT: ≈100' South of #19 Batt.

SOURCE:

DISTANCE: ≈300'

DIRECTION FROM: S-W

HEIGHT: ≈100'

WIND:

SPEED: ≈5→10 mph

DIRECTION: South

TEMPERATURE: 78°

SKY CONDITION: 90% Clouds

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: —

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15%: 240

NO. READINGS 20%: —

NO. READINGS 25 - 55%: —

NO. READINGS 60 - 100%: —

NO. READINGS >= 20%: —

GREATEST OPACITY: 0

COMMENTS:

	:00	:15	:30	:45
00	0	0	0	0
01	0	0	0	0
02	0	0	0	0
03	0	0	0	0
04	0	0	0	0
05	0	0	0	0
06	0	0	0	0
07	0	0	0	0
08	0	0	0	0
09	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

	:00	:15	:30	:45
30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58				
59				

VISIBLE EMISSIONS OBSERVATION FORM

(5)

#13 STACK

OBSERVER: R. Brian Faytak

DATE: 7-28-94

FACILITY: USX/Clairton

OBSERVATION START TIME: 1442 hrs.

END TIME: 1542 hrs

OBSERVATION POINT: ≈100' South of 19 Batt.

SOURCE:

DISTANCE: ≈300'

DIRECTION FROM: S-W

HEIGHT: ≈150'

WIND:

SPEED: ≈5-10 mph

DIRECTION: S

TEMPERATURE: 77°

SKY CONDITION: 80% Cloudy

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: —

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15%: 240

NO. READINGS 20%: —

NO. READINGS 25 - 55%: —

NO. READINGS 60 - 100%: —

NO. READINGS ≥ 20%: —

GREATEST OPACITY: 0

COMMENTS:

	:00	:15	:30	:45
00	0	0	0	0
01	0	0	0	0
02	0	0	0	0
03	0	0	0	0
04	0	0	0	0
05	0	0	0	0
06	0	0	0	0
07	0	0	0	0
08	0	0	0	0
09	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

	:00	:15	:30	:45
30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATION FORM

#13 STACK

OBSERVER: R. BRIAN FAYTAK

DATE: 7-28-94

FACILITY: USX/CLAIRTON

OBSERVATION START TIME: 1542 hrs.

END TIME: 1552 hrs

OBSERVATION POINT: ≈100' south of #19 Bath.

SOURCE:

DISTANCE: ≈300'

DIRECTION FROM: S-W

HEIGHT: ≈100'

WIND:

SPEED: ≈5-10 mph

DIRECTION: S

TEMPERATURE: 79°

SKY CONDITION: 80% clouds

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: _____

TOTAL # OF READINGS: 42

NO. READINGS 0 - 15%: 42

NO. READINGS 20%: —

NO. READINGS 25 - 55%: —

NO. READINGS 60 - 100%: —

NO. READINGS ≥ 20%: —

GREATEST OPACITY: 0

COMMENTS:

	:00	:15	:30	:45
00	0	0	0	0
01	0	0	0	0
02	0	0	0	0
03	0	0	0	0
04	0	0	0	0
05	0	0	0	0
06	0	0	0	0
07	0	0	0	0
08	0	0	0	0
09	0	0	0	0
10	0	0		
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				

	:00	:15	:30	:45
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				

VISIBLE EMISSIONS OBSERVATION FORM

①

OBSERVER: R. Brian Fajtak

DATE: 7/29/94

FACILITY: USX/Clairton

OBSERVATION START TIME: 0740 hrs.

END TIME: 0840 hrs.

OBSERVATION POINT:
≈100' south of #19 BAH.

SOURCE:

DISTANCE: ≈ 300'

DIRECTION FROM: S-W

HEIGHT: ≈ 150'

WIND:

SPEED: ≈ 5-10 mph

DIRECTION: N-E

TEMPERATURE: 65°

SKY CONDITION: 10% clouds

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: —

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15%: 240

NO. READINGS 20%: —

NO. READINGS 25 - 55%: —

NO. READINGS 60 - 100%: —

NO. READINGS ≥ 20%: —

GREATEST OPACITY: 0

COMMENTS:

	:00	:15	:30	:45
00	0	0	0	0
01	0	0	0	0
02	0	0	0	0
03	0	0	0	0
04	0	0	0	0
05	0	0	0	0
06	0	0	0	0
07	0	0	0	0
08	0	0	0	0
09	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

	:00	:15	:30	:45
30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

VISIBLE EMISSIONS OBSERVATION FORM

(2)

OBSERVER: R. BRIAN FAYHAL

DATE: 7/29/94

FACILITY: USX/Clairton

OBSERVATION START TIME: 0840 Hrs

END TIME: [redacted] 0940 Hrs

OBSERVATION POINT: ≈100' south of #19 Batt.

SOURCE:

DISTANCE: ≈300'

DIRECTION FROM: S-W

HEIGHT: ≈150'

WIND:

SPEED: ≈ 5-10 mph

DIRECTION: N-E

TEMPERATURE: 68

SKY CONDITION: 25% clouds

BACKGROUND: SKY

READING CONDITIONS: Good

COLOR OF EMISSIONS: Grey/Black

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15%: 240

NO. READINGS 20%: —

NO. READINGS 25 - 55%: —

NO. READINGS 60 - 100%: —

NO. READINGS .>= 20%: —

GREATEST OPACITY: 5%

COMMENTS:

	:00	:15	:30	:45
00	0	0	0	0
01	0	0	0	0
02	0	0	0	0
03	0	0	0	0
04	0	0	0	0
05	0	0	0	0
06	0	0	0	0
07	0	0	0	0
08	0	0	0	0
09	0	0	0	5
10	5	5	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0

	:00	:15	:30	:45
30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	0	0	0	0
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0

(3)

VISIBLE EMISSIONS OBSERVATION FORM

OBSERVER: R. BRIAN FAYTAK

DATE: 7/29/94

FACILITY: USX/CLAIRTON

OBSERVATION START TIME: 0940

END TIME: 0951

OBSERVATION POINT:
≈100' south of #19 BATT.

SOURCE:

DISTANCE: ≈300'

DIRECTION FROM: S-W

HEIGHT: ≈150'

WIND:

SPEED: ≈5-10 mph

DIRECTION: N-E

TEMPERATURE: 69°

SKY CONDITION: 10% clouds

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: —

TOTAL # OF READINGS: 46

NO. READINGS 0 - 15%: 46

NO. READINGS 20%: —

NO. READINGS 25 - 55%: —

NO. READINGS 60 - 100%: —

NO. READINGS >= 20%: —

GREATEST OPACITY: —

COMMENTS:

	:00	:15	:30	:45
00	0	0	0	0
01	0	0	0	0
02	0	0	0	0
03	0	0	0	0
04	0	0	0	0
05	0	0	0	0
06	0	0	0	0
07	0	0	0	0
08	0	0	0	0
09	0	0	0	0
10	0	0	0	0
11	0	0		
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				

	:00	:15	:30	:45
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				

COMPLIANCE DEMONSTRATION
NO. 13 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

APPENDIX B

PLANT OPERATIONAL DATA

ATS
ADVANCED TECHNOLOGY SYSTEMS, INC.

PUSHING SCHEDULE

Thursday, July 28, 1994 Turn 1
Batteries: 13-15_2

#	Oven	Last Pushed	Earliest	Desired	Latest
	A5 /15	######	12:49pm	11:02pm	11:11pm
	B6 /13	######	10:55pm	11:05pm	11:16pm
	A7 /15	######	11:00pm	11:11pm	11:22pm
	B8 /13	######	11:05pm	11:17pm	11:29pm
	A9 /15	######	11:12pm	11:23pm	11:34pm
	B10/13	######	11:18pm	11:29pm	11:40pm
	A11/15	######	11:24pm	11:35pm	11:46pm
	B12/13	######	11:29pm	11:40pm	11:51pm
	A13/15	######	11:35pm	11:46pm	11:57pm
	B14/13	######	11:41pm	11:52pm	12:03am
	A15/15	######	11:47pm	11:56pm	12:09am
	B16/13	######	11:53pm	12:04am	12:15am
	A17/15	######	11:59pm	12:10am	12:21am
	B18/13	######	12:05am	12:15am	12:27am
	A19/15	######	12:10am	12:21am	12:33am
	B20/13	######	12:16am	12:27am	12:38am
	A21/15	######	12:22am	12:33am	12:44am
	B22/13	######	12:28am	12:39am	12:50am
	A23/15	######	12:34am	12:45am	12:56am
	B24/13	######	12:40am	12:51am	1:02am
	A25/15	######	12:46am	12:57am	1:08am
	B26/13	######	12:51am	1:02am	1:13am
	A27/15	######	12:57am	1:08am	1:19am
	B28/13	######	1:03am	1:14am	1:25am
	A29/15	######	1:09am	1:20am	1:31am
	B30/13	######	1:15am	1:26am	1:37am
	A31/15	######	1:21am	1:32am	1:43am
	A2 /14	######	1:27am	1:38am	1:49am
	B2 /15	######	1:32am	1:43am	1:54am
	A4 /14	######	1:38am	1:49am	2:00am
	B4 /15	######	1:44am	1:55am	2:06am
	A6 /14	######	1:50am	2:01am	2:12am
	B6 /15	######	1:56am	2:07am	2:18am
	A8 /14	######	2:02am	2:13am	2:24am
	B8 /15	######	2:08am	2:19am	2:30am
	A10/14	######	2:13am	2:24am	2:35am
	B10/15	######	2:19am	2:30am	2:41am
	A12/14	######	2:25am	2:36am	2:47am
	B12/15	######	2:31am	2:42am	2:53am
	A14/14	######	2:37am	2:48am	2:59am
	B14/15	######	2:43am	2:54am	3:05am
	A16/14	######	2:48am	2:59am	3:10am
	B16/15	######	2:54am	3:05am	3:16am
	A18/14	######	3:00am	3:11am	3:22am
	B18/15	######	3:06am	3:17am	3:28am
	A20/14	######	3:12am	3:23am	3:34am
	B20/15	######	3:18am	3:29am	3:40am
	A22/14	######	3:24am	3:35am	3:46am
	B22/15	######	3:29am	3:40am	3:51am
	A24/14	######	3:35am	3:46am	3:57am
	B24/15	######	3:41am	3:52am	4:03am
	A26/14	######	3:47am	3:58am	4:09am
	B26/15	######	3:52am	4:04am	4:15am
	A28/14	######	3:57am	4:10am	4:21am
	B28/15	######	4:05am	4:16am	4:27am
	A30/14	######	4:10am	4:21am	4:32am
	B30/15	######	4:16am	4:27am	4:38am
	A2 /13	######	4:22am	4:33am	4:44am
	B1 /14	######	4:28am	4:39am	4:50am
	A4 /13	######	4:34am	4:45am	4:56am
	B3 /14	######	4:40am	4:51am	5:02am
	A6 /13	######	4:46am	4:57am	5:08am
	B5 /14	######	4:51am	5:02am	5:13am
	A8 /13	######	4:57am	5:09am	5:20am
	B7 /14	######	5:03am	5:14am	5:25am
	A10/13	######	5:07am	5:20am	5:31am
	B9 /14	######	5:15am	5:26am	5:37am
	A12/13	######	5:21am	5:32am	5:43am
	B11/14	######	5:27am	5:38am	5:49am
	A14/13	######	5:33am	5:43am	5:54am
	B13/14	######	5:39am	5:49am	6:00am
	A16/13	######	5:44am	5:55am	6:06am
	B15/14	######	5:50am	6:01am	6:12am
	A18/13	######	5:56am	6:07am	6:18am
	B17/14	######	6:02am	6:13am	6:24am
	A20/13	######	6:08am	6:19am	6:30am
	B19/14	######	6:13am	6:24am	6:35am
	A22/13	######	6:19am	6:30am	6:41am
	B21/14	######	6:25am	6:36am	6:47am
	A24/13	######	6:31am	6:42am	6:53am

PUSHING SCHEDULE

Thursday, July 28, 1994 Turn 1
Batteries: 13-15_2

#	Oven	Last Pushed	Earliest	Desired	Latest
	B23/14	######	6:37am	6:48am	6:59am
	A26/13	######	6:43am	6:54am	7:05am

PUSHING SCHEDULE

Thursday, July 28, 1994 Turn 2
Batteries: 13-15_2

#	Oven	Last Pushed	Earliest	Desired	Latest
	B25/14	17:48	6:45am	7:00am	7:15am
	A28/13	17:48	6:51am	7:06am	7:21am
	B27/14	17:48	6:57am	7:12am	7:27am
	A30/13	17:48	7:03am	7:18am	7:33am
	B29/14	17:48	7:09am	7:24am	7:39am
	B1 /13	17:48	7:15am	7:30am	7:45am
	A2 /15	17:48	7:21am	7:36am	7:51am
	B3 /13	17:48	7:27am	7:42am	7:57am
	A4 /15	17:48	7:33am	7:48am	8:03am
	B5 /13	17:48	7:39am	7:54am	8:09am
	A6 /15	17:48	7:45am	8:00am	8:15am
	B7 /13	17:48	7:51am	8:06am	8:21am
	A8 /15	17:48	7:57am	8:12am	8:27am
	B9 /13	17:48	8:03am	8:18am	8:33am
	A10/15	17:48	8:09am	8:24am	8:39am
	B11/13	17:48	8:15am	8:30am	8:45am
	A12/15	17:48	8:21am	8:36am	8:51am
	B13/13	17:48	8:27am	8:42am	8:57am
	A15/14	17:54	8:33am	8:48am	9:03am
	A14/15	17:54	8:39am	8:54am	9:09am
	B15/13	17:55	8:45am	9:00am	9:15am
	A16/15	17:55	8:51am	9:06am	9:21am
	B17/13	17:55	8:57am	9:12am	9:27am
	A18/15	17:55	9:03am	9:18am	9:33am
	B19/13	17:55	9:09am	9:24am	9:39am
	A20/15	17:55	9:15am	9:30am	9:45am
	B21/13	17:56	9:21am	9:36am	9:51am
	A22/15	17:56	9:27am	9:42am	9:57am
	B23/13	17:56	9:33am	9:48am	10:03am
	A24/15	17:56	9:39am	9:54am	10:09am
	B25/13	17:56	9:45am	10:00am	10:15am
	A26/15	17:56	9:51am	10:06am	10:21am
	B27/13	17:56	9:57am	10:12am	10:27am
	A28/13	17:57	10:03am	10:18am	10:33am
	B29/13	17:57	10:09am	10:24am	10:39am
	A30/15	17:57	10:15am	10:30am	10:45am
	A1 /14	17:57	10:21am	10:36am	10:51am
	B1 /15	17:57	10:27am	10:42am	10:57am
	A3 /14	17:57	10:33am	10:48am	11:03am
	B3 /15	17:57	10:39am	10:54am	11:09am
	A5 /14	17:58	10:45am	11:00am	11:15am
	B5 /15	17:58	10:51am	11:06am	11:21am
	A7 /14	17:58	10:57am	11:12am	11:27am
	B7 /15	17:58	11:03am	11:18am	11:33am
	A9 /14	17:58	11:09am	11:24am	11:39am
	B9 /15	17:58	11:15am	11:30am	11:45am
	A11/14	17:58	11:21am	11:36am	11:51am
	B11/15	17:59	11:27am	11:42am	11:57am
	A13/14	17:59	11:33am	11:48am	12:03pm
	B13/15	17:59	11:39am	11:54am	12:09pm
	B15/15	17:59	11:45am	12:00pm	12:15pm
	A17/14	17:59	11:51am	12:06pm	12:21pm
	B17/15	17:59	11:57am	12:12pm	12:27pm
	A19/14	17:59	12:03pm	12:18pm	12:33pm
	B19/15	18:00	12:09pm	12:24pm	12:39pm
	A21/14	18:00	12:15pm	12:30pm	12:45pm
	B21/15	18:00	12:21pm	12:36pm	12:51pm
	A23/14	18:00	12:27pm	12:42pm	12:57pm
	B23/15	18:00	12:33pm	12:48pm	1:03pm
	A25/14	18:00	12:39pm	12:54pm	1:09pm
	B25/15	18:01	12:45pm	1:00pm	1:15pm
	A27/14	18:01	12:51pm	1:06pm	1:21pm
	B27/15	18:01	12:57pm	1:12pm	1:27pm
	A29/14	18:01	1:03pm	1:18pm	1:33pm
	B29/15	18:01	1:09pm	1:24pm	1:39pm
	A31/14	18:01	1:15pm	1:30pm	1:45pm
	A1 /13	18:01	1:21pm	1:36pm	1:51pm
	B2 /14	18:02	1:27pm	1:42pm	1:57pm
	A3 /13	18:02	1:33pm	1:48pm	2:03pm
	B4 /14	18:02	1:39pm	1:54pm	2:09pm
	A5 /13	18:02	1:45pm	2:00pm	2:15pm
	B6 /14	18:02	1:51pm	2:06pm	2:21pm
	A7 /13	18:02	1:57pm	2:12pm	2:27pm
	B8 /14	18:02	2:03pm	2:18pm	2:33pm
	A9 /13	18:03	2:09pm	2:24pm	2:39pm
	B10/14	18:03	2:15pm	2:30pm	2:45pm
	A11/13	18:03	2:21pm	2:36pm	2:51pm
	B12/14	18:03	2:27pm	2:42pm	2:57pm
	A13/13	18:03	2:33pm	2:48pm	3:03pm
	B14/14	18:03	2:39pm	2:54pm	3:09pm

14/-A15

A15/14 after B13/13

PUSHING SCHEDULE

Thursday, July 28, 1994 Turn 3
Batteries: 13-15_2

#	Oven	Last Pushed	Earliest	Desired	Latest
	A15/13	18:03	2:49pm	3:00pm	3:11pm
	B16/14	18:03	2:53pm	3:05pm	3:16pm
	A17/13	18:03	3:00pm	3:11pm	3:22pm
	B18/14	18:03	3:06pm	3:17pm	3:26pm
	A19/13	18:03	3:12pm	3:23pm	3:34pm
	B20/14	18:03	3:18pm	3:29pm	3:40pm
	A21/13	18:03	3:24pm	3:35pm	3:46pm
	B22/14	18:02	3:29pm	3:40pm	3:51pm
	A23/13	18:03	3:35pm	3:46pm	3:57pm
	B24/14	18:03	3:41pm	3:52pm	4:03pm
	A25/13	18:03	3:47pm	3:58pm	4:09pm
	B26/14	18:03	3:53pm	4:04pm	4:15pm
	A27/13	18:03	3:59pm	4:10pm	4:21pm
	B28/14	18:03	4:05pm	4:16pm	4:27pm
	A29/13	18:02	4:10pm	4:21pm	4:32pm
	B30/14	18:03	4:16pm	4:27pm	4:38pm
	A31/13	18:03	4:22pm	4:33pm	4:44pm
	A1 /15	18:03	4:28pm	4:39pm	4:50pm
	B2 /13	18:03	4:34pm	4:45pm	4:56pm
	A3 /15	18:03	4:40pm	4:51pm	5:02pm
	B4 /13	18:03	4:46pm	4:57pm	5:08pm
	A5 /15	36:05	4:51pm	5:02pm	5:13pm
	B6 /13	36:06	4:57pm	5:08pm	5:19pm
	A7 /15	36:06	5:03pm	5:14pm	5:25pm
	B8 /15	36:06	5:09pm	5:20pm	5:31pm
	A9 /15	36:06	5:15pm	5:26pm	5:37pm
	B10/15	36:05	5:22pm	5:32pm	5:43pm
	A11/15	36:05	5:27pm	5:38pm	5:49pm
	B12/15	36:05	5:33pm	5:43pm	5:54pm
	C13/15	36:06	5:38pm	5:49pm	6:00pm
	B14/15	36:06	5:44pm	5:55pm	6:06pm
	A15/15	36:06	5:50pm	6:01pm	6:12pm
	B16/13	36:06	5:56pm	6:07pm	6:18pm
	A17/15	36:06	6:02pm	6:13pm	6:24pm
	B18/13	36:06	6:08pm	6:19pm	6:30pm
	A19/15	36:05	6:13pm	6:24pm	6:35pm
	B20/13	36:06	6:19pm	6:30pm	6:41pm
	A21/15	36:06	6:25pm	6:36pm	6:47pm
	B22/13	36:06	6:31pm	6:42pm	6:53pm
	A23/15	36:06	6:37pm	6:48pm	6:59pm
	B24/13	36:06	6:43pm	6:54pm	7:05pm
	A25/15	36:05	6:48pm	6:59pm	7:10pm
	B26/13	36:05	6:54pm	7:05pm	7:16pm
	A27/15	36:05	7:00pm	7:11pm	7:22pm
	B28/13	36:05	7:06pm	7:17pm	7:28pm
	A29/15	36:05	7:12pm	7:23pm	7:34pm
	B30/13	36:05	7:18pm	7:29pm	7:40pm
	A31/15	36:05	7:24pm	7:35pm	7:46pm
	A2 /14	36:04	7:29pm	7:40pm	7:51pm
	B2 /15	36:04	7:35pm	7:46pm	7:57pm
	A4 /14	36:04	7:41pm	7:52pm	8:03pm
	B4 /15	36:04	7:47pm	7:58pm	8:09pm
	A6 /14	36:04	7:53pm	8:04pm	8:15pm
	B6 /15	36:04	7:59pm	8:10pm	8:21pm
	A8 /14	36:04	8:05pm	8:16pm	8:27pm
	B8 /15	36:03	8:10pm	8:21pm	8:32pm
	A10/14	36:03	8:16pm	8:27pm	8:38pm
	B10/15	36:03	8:22pm	8:33pm	8:44pm
	A12/14	36:03	8:28pm	8:39pm	8:50pm
	B12/15	36:03	8:34pm	8:45pm	8:56pm
	A14/14	36:03	8:40pm	8:51pm	9:02pm
	B14/15	36:03	8:46pm	8:57pm	9:08pm
	A16/14	36:02	8:51pm	9:02pm	9:13pm
	B16/15	36:02	8:57pm	9:08pm	9:19pm
	A18/14	36:02	9:03pm	9:14pm	9:25pm
	B18/15	36:02	9:09pm	9:20pm	9:31pm
	A20/14	36:02	9:15pm	9:26pm	9:37pm
	B20/15	36:02	9:21pm	9:32pm	9:43pm
	A22/14	36:02	9:27pm	9:38pm	9:49pm
	B22/15	36:01	9:32pm	9:43pm	9:54pm
	A24/14	36:01	9:38pm	9:49pm	10:00pm
	B24/15	36:01	9:44pm	9:55pm	10:06pm
	A26/14	36:01	9:50pm	10:01pm	10:12pm
	B26/15	36:01	9:56pm	10:07pm	10:18pm
	A28/14	36:01	10:02pm	10:13pm	10:24pm
	B28/15	36:01	10:08pm	10:19pm	10:30pm
	A30/14	36:00	10:13pm	10:24pm	10:35pm
	B30/15	35:54	10:19pm	10:30pm	10:41pm
	A2 /13	35:54	10:25pm	10:36pm	10:47pm
	B1 /14	35:54	10:31pm	10:42pm	10:53pm

PUSHING SCHEDULE

Thursday, July 28, 1994 Turn 3
Batteries: 13-15_2

Oven	Last Pushed	Earliest	Desired	Latest
A4 /13	35:54	10:37pm	10:46pm	10:59pm
B3 /14	35:54	10:43pm	10:54pm	11:05pm

PUSHING SCHEDULE

Friday, July 29, 1994 Turn 1
Batteries: 13-15_2

Oven	Last Pushed	Earliest	Desired	Latest
A6 /13	15:54	10:49pm	11:08pm	11:11pm
B5 /14	15:53	10:55pm	11:05pm	11:16pm
A8 /13	15:53	11:00pm	11:11pm	11:22pm
B7 /14	15:53	11:06pm	11:17pm	11:28pm
A10/13	15:53	11:12pm	11:23pm	11:34pm
B9 /14	15:53	11:18pm	11:29pm	11:40pm
A12/13	15:53	11:24pm	11:35pm	11:46pm
B11/14	15:52	11:29pm	11:40pm	11:51pm
A14/13	15:52	11:35pm	11:46pm	11:57pm
B13/14	15:52	11:41pm	11:52pm	12:03am
A16/13	15:52	11:47pm	11:58pm	12:09am
B15/14	15:52	11:53pm	12:04am	12:15am
A18/13	15:52	11:59pm	12:10am	12:21am
B17/14	15:52	12:05am	12:16am	12:27am
A20/13	15:51	12:10am	12:21am	12:32am
B19/14	15:51	12:16am	12:27am	12:38am
A22/13	15:51	12:22am	12:33am	12:44am
B21/14	15:51	12:28am	12:39am	12:50am
A24/13	15:51	12:34am	12:45am	12:56am
B23/14	15:51	12:40am	12:51am	1:02am
A26/13	15:51	12:46am	12:57am	1:08am
B25/14	18:02	12:51am	1:02am	1:13am
A28/13	18:02	12:57am	1:08am	1:19am
B27/14	18:02	1:03am	1:14am	1:25am
A30/13	18:02	1:09am	1:20am	1:31am
B29/14	18:02	1:15am	1:26am	1:37am
B1 /13	18:02	1:21am	1:32am	1:43am
A2 /15	18:02	1:27am	1:38am	1:49am
B3 /13	18:01	1:33am	1:43am	1:54am
A4 /15	18:01	1:38am	1:48am	2:00am
B5 /13	18:01	1:44am	1:55am	2:06am
A6 /15	18:01	1:50am	2:01am	2:12am
B7 /13	18:01	1:56am	2:07am	2:18am
A8 /15	16:01	2:02am	2:13am	2:24am
B9 /13	18:01	2:08am	2:19am	2:30am
A10/15	18:00	2:13am	2:24am	2:35am
B11/13	15:00	2:19am	2:30am	2:41am
A12/15	18:00	2:25am	2:36am	2:47am
B13/13	18:00	2:31am	2:42am	2:53am
A14/15	17:54	2:37am	2:48am	2:59am
B15/13	17:54	2:43am	2:54am	3:05am
A16/15	17:53	2:48am	2:55am	3:10am
B17/13	17:53	2:54am	3:05am	3:16am
A18/15	17:53	3:00am	3:11am	3:22am
B19/13	17:53	3:06am	3:17am	3:28am
A20/15	17:53	3:12am	3:23am	3:34am
B21/13	17:53	3:18am	3:29am	3:40am
A22/15	17:53	3:24am	3:35am	3:46am
B23/13	17:52	3:29am	3:40am	3:51am
A24/15	17:52	3:35am	3:46am	3:57am
B25/13	17:52	3:41am	3:52am	4:03am
A26/15	17:52	3:47am	3:58am	4:09am
B27/13	17:52	3:53am	4:04am	4:15am
A28/15	17:52	3:59am	4:10am	4:21am
B29/13	17:52	4:05am	4:16am	4:27am
A30/15	17:51	4:10am	4:21am	4:32am
A1 /14	17:51	4:16am	4:27am	4:38am
B1 /15	17:51	4:22am	4:33am	4:44am
A3 /14	17:51	4:28am	4:39am	4:50am
B3 /15	17:51	4:34am	4:45am	4:56am
A5 /14	17:51	4:40am	4:51am	5:02am
B5 /15	17:51	4:46am	4:57am	5:08am
A7 /14	17:50	4:51am	5:02am	5:13am
B7 /15	17:50	4:57am	5:08am	5:19am
A9 /14	17:50	5:03am	5:14am	5:25am
B9 /15	17:50	5:09am	5:20am	5:31am
A11/14	17:50	5:15am	5:26am	5:37am
B11/15	17:50	5:21am	5:32am	5:43am
A13/14	17:50	5:27am	5:38am	5:49am
B13/15	17:49	5:32am	5:43am	5:54am
A15/14	21:01	5:38am	5:49am	6:00am
B15/15	17:55	5:44am	5:55am	6:06am
A17/14	17:55	5:50am	6:01am	6:12am
B17/15	17:55	5:56am	6:07am	6:18am
A19/14	17:55	6:02am	6:13am	6:24am
B19/15	17:55	6:08am	6:19am	6:30am
A21/14	17:54	6:13am	6:24am	6:35am
B21/15	17:54	6:19am	6:30am	6:41am
A23/14	17:54	6:25am	6:36am	6:47am
B23/15	17:54	6:31am	6:42am	6:53am

PUSHING SCHEDULE

Friday, July 29, 1994 Turn 1
Batteries: 13-15_2

#	Oven	Last Pushed	Earliest	Desired	Latest
	A25/14	17:54	6:37am	6:48am	6:59am
	B25/15	17:54	6:43am	6:54am	7:05am

PUSHING SCHEDULE

Friday, July 29, 1994 Turn 2
Batteries: 13-15_2

Oven	Last Pushed	Earliest	Desired	Latest
A27/14	17:54	6:45am	7:00am	7:15am
B27/15	17:54	6:51am	7:06am	7:21am
A29/14	17:54	6:57am	7:12am	7:27am
B29/15	17:54	7:03am	7:18am	7:33am
A31/14	17:54	7:09am	7:24am	7:39am
A1 /13	17:54	7:15am	7:30am	7:45am
B2 /14	17:54	7:21am	7:36am	7:51am
A3 /13	17:54	7:27am	7:42am	7:57am
B4 /14	17:54	7:33am	7:48am	8:03am
A5 /13	17:54	7:39am	7:54am	8:09am
B6 /14	17:54	7:45am	8:00am	8:15am
A7 /13	17:54	7:51am	8:06am	8:21am
B8 /14	17:54	7:57am	8:12am	8:27am
A9 /13	17:54	8:03am	8:18am	8:33am
B10/14	17:54	8:09am	8:24am	8:39am
A11/13	17:54	8:15am	8:30am	8:45am
B12/14	17:54	8:21am	8:36am	8:51am
A13/13	17:54	8:27am	8:42am	8:57am
B14/14	17:54	8:33am	8:48am	9:03am
A15/13	17:54	8:39am	8:54am	9:09am
B16/14	17:55	8:45am	9:00am	9:15am
A17/13	17:55	8:51am	9:06am	9:21am
B18/14	17:55	8:57am	9:12am	9:27am
A19/13	17:55	9:03am	9:18am	9:33am
B20/14	17:55	9:09am	9:24am	9:39am
A21/13	17:55	9:15am	9:30am	9:45am
B22/14	17:56	9:21am	9:36am	9:51am
A23/13	17:56	9:27am	9:42am	9:57am
B24/14	17:56	9:33am	9:48am	10:03am
A25/13	17:56	9:39am	9:54am	10:09am
B26/14	17:56	9:45am	10:00am	10:15am
A27/13	17:56	9:51am	10:06am	10:21am
B28/14	17:56	9:57am	10:12am	10:27am
A29/13	17:57	10:03am	10:18am	10:33am
B30/14	17:57	10:09am	10:24am	10:39am
A31/13	17:57	10:15am	10:30am	10:45am
A1 /15	17:57	10:21am	10:36am	10:51am
B2 /13	17:57	10:27am	10:42am	10:57am
A3 /15	17:57	10:33am	10:48am	11:03am
B4 /13	17:57	10:39am	10:54am	11:09am
A5 /15	17:58	10:45am	11:00am	11:15am
B6 /13	17:58	10:51am	11:06am	11:21am
A7 /15	17:58	10:57am	11:12am	11:27am
B8 /13	17:58	11:03am	11:18am	11:33am
A9 /15	17:58	11:09am	11:24am	11:39am
B10/13	17:58	11:15am	11:30am	11:45am
A11/15	17:58	11:21am	11:36am	11:51am
B12/13	17:59	11:27am	11:42am	11:57am
A13/15	17:59	11:33am	11:48am	12:03pm
B14/13	17:59	11:39am	11:54am	12:09pm
A15/15	17:59	11:45am	12:00pm	12:15pm
B16/13	17:59	11:51am	12:06pm	12:21pm
A17/15	17:59	11:57am	12:12pm	12:27pm
B18/13	17:59	12:03pm	12:18pm	12:33pm
A19/15	18:00	12:09pm	12:24pm	12:39pm
B20/13	18:00	12:15pm	12:30pm	12:45pm
A21/15	18:00	12:21pm	12:36pm	12:51pm
B22/13	18:00	12:27pm	12:42pm	12:57pm
A23/15	18:00	12:33pm	12:48pm	1:03pm
B24/13	18:00	12:39pm	12:54pm	1:09pm
A25/15	18:01	12:45pm	1:00pm	1:15pm
B26/13	18:01	12:51pm	1:06pm	1:21pm
A27/15	18:01	12:57pm	1:12pm	1:27pm
B28/13	18:01	1:03pm	1:18pm	1:33pm
A29/15	18:01	1:09pm	1:24pm	1:39pm
B30/13	18:01	1:15pm	1:30pm	1:45pm
A31/15	18:01	1:21pm	1:36pm	1:51pm
A2 /14	18:02	1:27pm	1:42pm	1:57pm
B2 /15	18:02	1:33pm	1:48pm	2:03pm
A4 /14	18:02	1:39pm	1:54pm	2:09pm
B4 /15	18:02	1:45pm	2:00pm	2:15pm
A6 /14	18:02	1:51pm	2:06pm	2:21pm
B6 /15	18:02	1:57pm	2:12pm	2:27pm
A8 /14	18:02	2:03pm	2:18pm	2:33pm
B8 /15	18:03	2:09pm	2:24pm	2:39pm
A10/14	18:03	2:15pm	2:30pm	2:45pm
B10/15	18:03	2:21pm	2:36pm	2:51pm
A12/14	18:03	2:27pm	2:42pm	2:57pm
B12/15	18:03	2:33pm	2:48pm	3:03pm
A14/14	18:03	2:39pm	2:54pm	3:09pm

PUSHING SCHEDULE

Friday, July 29, 1994 Turn 3
Batteries: 13-15_2

Oven	Last Pushed	Earliest	Desired	Latest
B14/15	18:03	3:49pa	3:08pa	3:11pa
A16/14	18:03	3:55pa	3:09pa	3:16pa
B16/15	18:03	3:08pa	3:11pa	3:19pa
A18/14	18:03	3:06pa	3:17pa	3:26pa
B18/15	18:03	3:12pa	3:23pa	3:34pa
A20/14	18:03	3:18pa	3:29pa	3:40pa
B20/15	18:03	3:24pa	3:35pa	3:46pa
A22/14	18:02	3:29pa	3:40pa	3:51pa
B22/15	18:03	3:35pa	3:46pa	3:57pa
A24/14	18:03	3:41pa	3:52pa	4:03pa
B24/15	18:03	3:47pa	3:58pa	4:09pa
A26/14	18:03	3:53pa	4:04pa	4:15pa
B26/15	18:03	3:59pa	4:10pa	4:21pa
A28/14	18:03	4:05pa	4:16pa	4:27pa
B28/15	18:02	4:10pa	4:21pa	4:32pa
A30/14	18:03	4:16pa	4:27pa	4:38pa
B30/15	18:03	4:22pa	4:33pa	4:44pa
A2 /13	18:03	4:28pa	4:39pa	4:50pa
B1 /14	18:03	4:34pa	4:45pa	4:56pa
A4 /13	18:03	4:40pa	4:51pa	5:02pa
B3 /14	18:03	4:46pa	4:57pa	5:08pa
A6 /13	18:02	4:51pa	5:02pa	5:13pa
B5 /14	18:03	4:57pa	5:08pa	5:19pa
A8 /13	18:03	5:03pa	5:14pa	5:25pa
B7 /14	18:03	5:09pa	5:19pa	5:31pa
A10/13	18:03	5:15pa	5:25pa	5:37pa
B9 /14	18:03	5:21pa	5:30pa	5:43pa
A12/13	18:03	5:27pa	5:36pa	5:49pa
B11/14	18:03	5:33pa	5:42pa	5:54pa
A14/13	18:03	5:39pa	5:49pa	6:00pa
B13/14	18:03	5:44pa	5:55pa	6:06pa
A16/13	18:03	5:50pa	6:01pa	6:12pa
B15/14	18:03	5:56pa	6:07pa	6:18pa
A18/13	18:03	6:02pa	6:13pa	6:24pa
B17/14	18:03	6:08pa	6:19pa	6:30pa
A20/13	18:03	6:13pa	6:24pa	6:35pa
B19/14	19:03	6:17pa	6:28pa	6:41pa
A22/13	18:03	6:25pa	6:36pa	6:47pa
B21/14	18:03	6:31pa	6:42pa	6:53pa
A24/13	18:03	6:37pa	6:48pa	6:59pa
B23/14	18:03	6:43pa	6:54pa	7:05pa
A26/13	18:03	6:49pa	6:59pa	7:12pa
B25/14	18:03	6:54pa	7:05pa	7:18pa
A28/13	18:03	7:00pa	7:11pa	7:24pa
B27/14	18:03	7:06pa	7:17pa	7:30pa
A30/13	18:03	7:12pa	7:23pa	7:36pa
B29/14	18:03	7:19pa	7:29pa	7:42pa
B1 /13	18:02	7:24pa	7:34pa	7:48pa
A2 /15	19:02	7:29pa	7:40pa	7:54pa
B3 /13	18:03	7:35pa	7:46pa	7:57pa
A4 /15	18:03	7:41pa	7:52pa	8:03pa
B5 /13	18:03	7:47pa	7:58pa	8:09pa
A6 /15	18:03	7:53pa	8:04pa	8:15pa
B7 /13	18:03	7:59pa	8:10pa	8:21pa
A8 /15	18:03	8:05pa	8:15pa	8:27pa
B9 /13	18:03	8:10pa	8:21pa	8:33pa
A10/15	18:03	8:16pa	8:27pa	8:39pa
B11/13	18:03	8:22pa	8:33pa	8:44pa
A12/15	18:03	8:28pa	8:39pa	8:50pa
B13/13	18:03	8:34pa	8:45pa	8:56pa
A14/15	18:03	8:40pa	8:51pa	9:02pa
B15/13	18:03	8:46pa	8:57pa	9:08pa
A16/15	18:03	8:51pa	9:02pa	9:13pa
B17/13	18:03	8:57pa	9:08pa	9:19pa
A18/15	18:03	9:03pa	9:14pa	9:25pa
B19/13	18:03	9:09pa	9:20pa	9:31pa
A20/15	16:03	9:15pa	9:26pa	9:37pa
B21/13	16:03	9:21pa	9:32pa	9:43pa
A22/15	16:03	9:27pa	9:38pa	9:49pa
B23/13	18:03	9:32pa	9:43pa	9:54pa
A24/15	18:03	9:38pa	9:49pa	10:00pa
B25/13	16:03	9:44pa	9:55pa	10:06pa
A26/15	18:03	9:50pa	10:01pa	10:12pa
B27/13	16:03	9:56pa	10:07pa	10:18pa
A28/15	16:03	10:02pa	10:13pa	10:24pa
B29/13	18:03	10:08pa	10:19pa	10:30pa
A30/15	16:03	10:13pa	10:24pa	10:35pa
A1 /14	18:03	10:19pa	10:30pa	10:41pa
B1 /15	16:03	10:25pa	10:36pa	10:47pa
A3 /14	18:03	10:31pa	10:42pa	10:53pa

PUSHING SCHEDULE

Friday, July 29, 1994 Turn 3
Batteries: 13-15_2

Oven	Last Pushed	Earliest	Desired	Latest
B3 /15	13:03	10:37pa	10:48pa	10:59pa
A5 /14	18:03	10:43pa	10:54pa	11:05pa

CC-10295 REV. 1181
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 5
12 Hrs. Beginning ~~Midnight~~ 11 AM 7/20/94
Date 7-28-94

BATTERY NO. 13-A					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	1	08	1	39	
3	1	19	1	50	✓
5	1	30	2	01	✓
7	1	41	2	13	
9	1	52	2	18	✓
11	2	03	2	24	✓
13	2	15	2	30	✓
15	3	00	3	19	
17	3	11	3	29	
19	3	21	3	39	✓
21	3	31	3	49	✓
23	3	41	4	00	
25	3	51	4	11	
27	4	02	4	21	
29	4	13	4	32	
31	4	23	4	43	
2	10	04			
4	10	16			
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
1					
2					

BATTERY NO. 13-13					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11					
13					
15					
17					
19					
21					
23					
25					
27					
29					
31					
2	4	34	5	04	
4	4	45	5	14	
6	4	56	5	24	
8	5	06	5	34	
10	5	16	5	44	
12	5	26	5	56	
14	5	36	6	06	
16	5	46	6	17	
18	5	58	6	28	
20	6	08	6	39	
22	6	19	6	50	
24	6	30	7	00	
26	6	41	7	11	
28	6	52	7	22	
30	7	02	7	33	
1					
2					

BATTERY NO. 14-A					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9			[illegible]	[illegible]	
11			[illegible]	[illegible]	
13	11	31	11	58	
15	[illegible]	---	[illegible]	[illegible]	[illegible]
17	11	45	12	16	
19	11	56	12	27	
21	12	07	[illegible]	[illegible]	
23	12	18	[illegible]	[illegible]	✓ B1
25	12	29	12	55	✓ B1
27	[illegible]	50	1	06	✓ B1
29	[illegible]	51	1	17	
31	12	52	1	28	
2	7	13	7	44	
4	7	24	7	55	
6	7	35	8	05	
8	7	46	8	17	
10	[illegible]	[illegible]	8	28	
12	8	07	8	41	
14	8	[illegible]	8	52	
16	8	31	[illegible]	[illegible]	
18	[illegible]	43	[illegible]	15	
20	[illegible]	54	[illegible]	27	
22	9	05	[illegible]	39	
24	9	17	9	51	
26	9	29	10	02	
28	9	41	10	14	
30	9	53			
1					
2					

REMARKS:

18 | 16 15 | 15 1 | 26

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED		TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	
11-12	3	3	8	8	5-6	6	6	12	12
12-1	6	6	11	11	6-7	5	5	11	11
1-2	5	5	10	10	7-8	6	6	11	11
2-3	2	5	5	9	8-9	5	5	10	10
3-4	6	4	12	10	9-10	5	5	10	10
4-5	6	5	12	11	10-11	2	2	4	4
	28	28				29	29		

Total Ovens Pushed 57
Total Ovens Charged 57

Pusherman

Battery Foreman

CC-10263 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. #5
12 Hrs. Beginning ~~12:00 AM~~ 11 PM 7/27/94
Date 7-27-94

BATTERY NO. 13-A

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11					
13					
15					
17					
19					
21					
23					
25					
27					
29					
31			11	04	
2	3	55	4	22	
4	4	04	4	32	
6	4	14	4	42	
8	4	24	4	52	
10	4	34	5	03	
12	4	44	5	14	
14	4	54	5	25	
16	5	05	5	40	
18	5	16	5	52	
20	5	30	6	07	
22	5	42	6	10	
24	5	54	6	15	
26	6	06	6	20	
28	7	05	7	13	
30	7	15	7	23	
1					
2					

BATTERY NO. 13-B

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	7	25	7	33	
3	7	35	7	43	
5	7	45	7	53	
7	7	55	8	03	
9	8	05	8	13	
11	8	15	8	23	
13	8	25	8	28	
15	8	40	8	48	✓#1
17	8	50	8	58	✓#1
19	9	00	9	08	✓#1
21	9	10	9	18	✓#1
23	9	20	9	28	✓#1
25	9	30	9	38	
27	9	40	9	48	✓#1
29	9	50	9	58	✓#1
31					
2			11	14	
4			11	24	
6	11	06	11	34	
8	11	16	11	44	
10	11	26	11	54	
12	11	36	12	04	
14	11	46	12	14	
16	11	56	12	24	
18	12	06	12	34	
20	12	16	12	44	
22	12	26	12	54	
24	12	36	1	05	
26	12	46	1	15	
28	12	56	1	25	
30	1	07	1	35	
1					
2					

BATTERY NO. 14-A

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	10	00	10	08	
3	[illegible]		[illegible]		✓
5	[illegible]		[illegible]		
7	10	30	10	38	
9	10	40			
11	10	50			
13					
15	11	30			
17					
19					
21					
23					
25					
27					
29					
31					
3	1	17	1	45	
4	1	27	1	56	
6	1	37	2	06	
8	1	47	2	16	
10	1	58	2	[illegible]	
12	2	08	2	36	
14	2	18	2	46	
16	2	28	2	56	
18	2	38	3	07	
20	2	48	3	17	
22	2	58	3	27	
24	3	08	3	37	
26	3	19	3	[illegible]	
28	3	29	4	02	
30	3	39	4	12	
1					
2					

REMARKS: 15 / 16 28 / 30 2 / 2 1 / 0

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	
12/1	6	6	12	13
1/2	6	6	12	12
3/3	6	6	12	12
3/4	6	6	12	12
4/3	5	5	11	12
5/4	6	7	12	12
	35	35		

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	
5/5	5	6	10	10
6/6	1	2	1	2
6-7	6	5	12	11
7-8	6	6	11	11
8-9	6	6	12	12
10/10	6	4	11	9
	30	30		

Total Ovens Pushed 35
Total Ovens Charged 35

Pusherman

Battery Foreman

CC-10285 REV. 1181
03.001.0020
UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. #5
12 Hrs. Beginning ~~6:00 P.M.~~ 11 AM 7/27/94
Date 7-29-94

BATTERY NO. 13-A's						BATTERY NO. 13-B's						BATTERY NO. 14-A's					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES	OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES	OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1						1	7	05	7	34		1	9	52			
3						3	7	16	7	44		3	10	04			
5						5	7	26	7	54		5	10	16			
7						7	7	36	8	04		7					
9						9	7	46	8	15		9					
11						11	7	56	8	25		11					
13						13	8	06	8	36		13					
15						15	8	17	8	48		15					
17						17	8	27	9	02		17					
19						19	8	38	9	14		19					
21						21	8	50	9	26		21					
23						23	9	04	9	38		23					
25						25	9	16	9	50		25					
27						27	9	28	10	02		27					
29						29	9	40	10	14		29					
31						31	X		X		X	31					
2	4	28	4	46		2						2	1	16	1	[illegible]	
4	4	38	5	05		4						4	[illegible]		1	57	
6	4	48	5	15		6						6	1	38	[illegible]	[illegible]	
8	4	58	5	25		8						8	[illegible]	49	2	20	
10	5	07	5	36		10						10	[illegible]	59	3	03	
12	5	17	5	37		12						12	2	11	3	13	
14	5	27	5	43		14	11	39	12	08		14	2	23	3	23	
16	5	34	6	13		16	11	49	12	19		16	3	05	3	33	
18	5	39	6	18		18	11	59	12	30		18	3	15	3	43	
20	5	45	6	33		20	12	10	12	41		20	3	25	3	53	
22	6	15	6	43		22	12	21	12	53		22	3	35	4	04	
24	6	20	6	53		24	12	33	1	03		24	3	45	4	14	
26	6	35	7	03		26	12	43	1	14		26	3	55	4	20	
28	6	45	7	14		28	12	54	1	25		28	4	06	4	16	
30	6	55	7	24		30	1	05	1	36		30	4	16	4	36	
X		X		X		X		X		X		X					
X	X		X			X	X		X			X					

REMARKS:

15	15	24	24	16	15

Condition of Signals | Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED		TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	
11-12	3	0	9	6	5-6	6	6	11	11
12-1	5	5	9	9	6-7	5	5	11	11
1-2	6	6	11	11	7-8	6	6	12	12
2-3	2	2	4	4	8-9	5	5	10	10
3-4	6	6	12	12	9-10	5	5	10	10
4-5	6	6	12	12	10-11	2	2	4	4
	28	25				29	29		

Total Ovens Pushed 57
Total Ovens Charged 54
Pusherman
Battery Foreman

QC-IC285 REV. 1161
03.801.0020
UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. #5
12 Hrs. Beginning ~~7:00 am~~ 11 pm 7/28/94
Date 7-29-94

BATTERY NO. 13-A						BATTERY NO. 13-B						BATTERY NO. 14-A					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES	OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES	OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	7	25	7	53	✓	1	1	08	1	30		1	3	36	3	58	
3	7	35	8	03	✓	3	1	18	1	39		3	3	46	4	09	
5	7	45	8	13	✓	5	1	28	1	48		5	3	56	4	19	
7	7	55	8	23	✓	7	1	37	1	58		7	4	07	4	29	
9	8	05	8	33	✓	9	1	46	2	08		9	4	17	4	37	
11	8	15	8	43	✓	11	1	56	2	17		11	4	27	4	47	
13	8	25	8	53	✓	13	2	06	2	27		13	4	37	5	00	
15	8	35	9	03	✓	15	2	15	2	37		15	4	[illegible]	5	50	SHUT
17	8	45	9	13	✓	17	2	25	2	47		17	4	57	5	35	
19	8	55	9	23	✓	19	2	35	2	57		19	5	10	6	03	
21	9	05	9	33	✓	21	2	45	3	07		21	5	30	7	[illegible]	
23	9	15	9	43	✓	23	2	55	3	17		23	5	47	7	[illegible]	
25	9	25	9	53		25	3	05	3	27		25	6	10	7	[illegible]	
27	9	35	10	03		27	3	15	3	38		27	7	00	7	[illegible]	
29	9	45	10	13		29	3	25	3	48		29	[illegible]	10	7	53	
31	9	55	10	23		31						31	7	15	7	43	✓
2			11	10		2	10	05	10	37		2					
4			11	19		4	10	15	10	58		4					
6	11	00	11	26		6	10	25	10	47		6					
8	11	08	11	36		8	10	35	10	48		8					
10	11	17	11	42		10	10	45	10	53		10					
12	11	28	11	50		12	10	55	10	58		12					
14	11	38	12	00		14						14					
16	11	48	12	10		16						16					
18	11	58	12	20		18						18					
20	12	08	12	30		20						20					
22	12	18	12	40		22						22					
24	12	28	12	50		24						24					
26	12	38	1	00		26						26					
28	12	48	1	10		28						28					
30	12	58	1	20		30						30			11	02	
1						1						1					
2						2						2					

REMARKS: A15/13 CHUCK DOOR NEEDS OILED. DOOR VERY TIGHT. 7:18 AM

Condition of Signals 29/31

21/21 Condition of Pusher

16/17

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
11	7	7		5	3	2	
12	6	6		6	1	1	
1	6	7		7	7	7	
2	6	6		8	6	7	
3	6	6		9	6	6	
4	6	5		10	6	9	
	37	37			29	32	

Total Ovens Pushed 66
Total Ovens Charged 69

Pusherman

Battery Foreman [illegible]

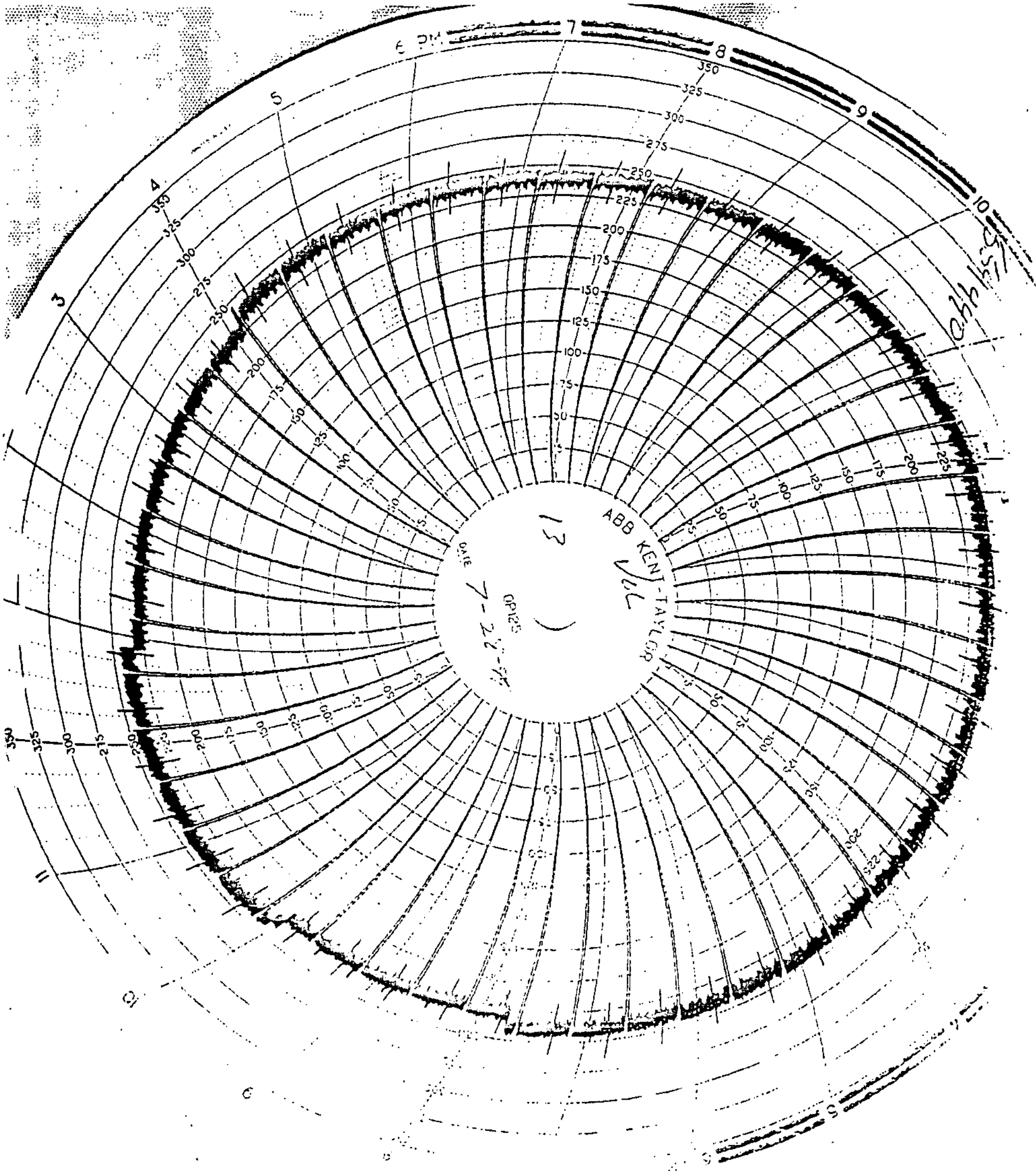
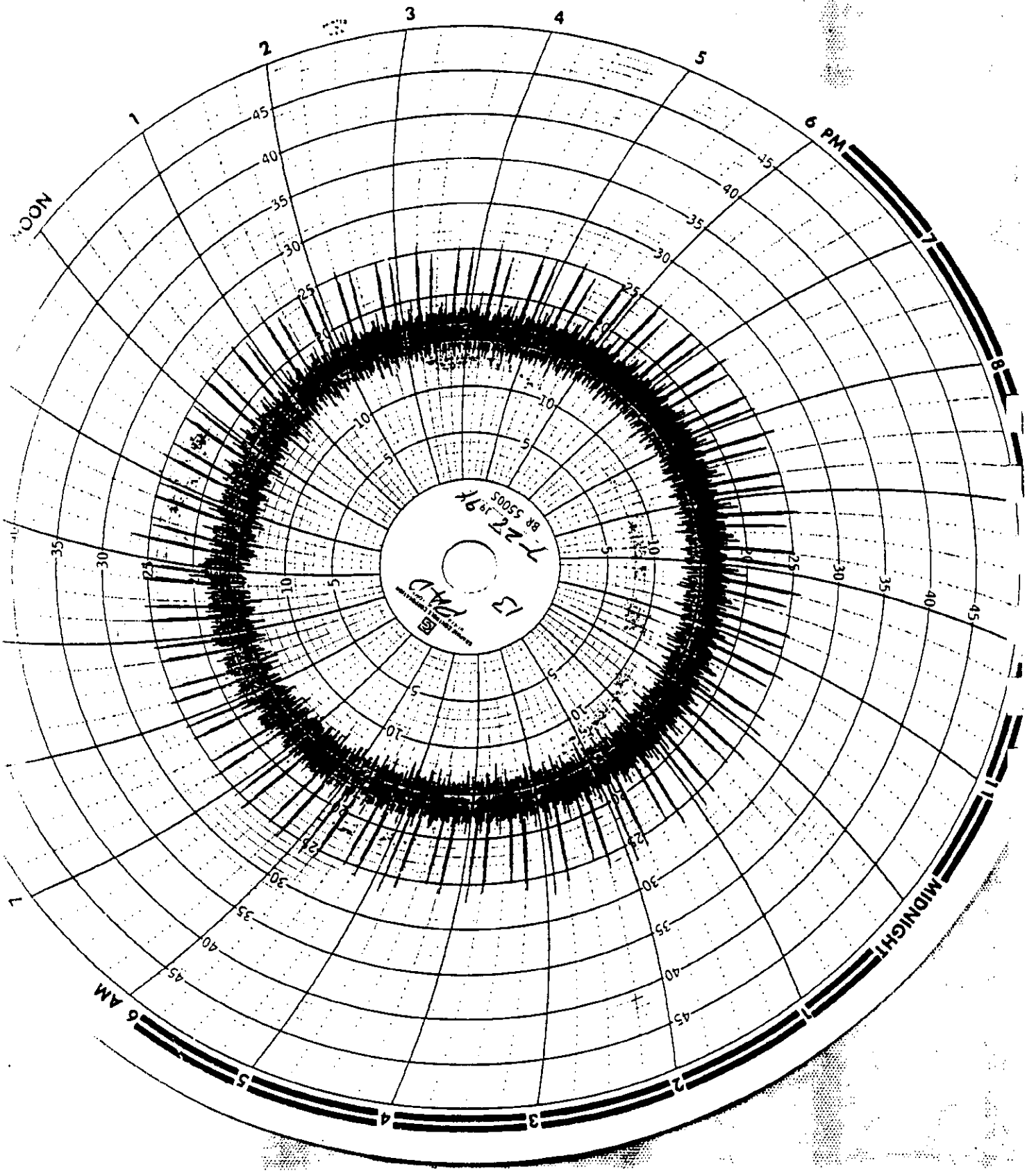


ABB KENT-TAYLOR
DATE
CP125
6 PM


NOON
1
2
3
4
5
6 PM
7
8
MIDNIGHT
1
2
3
4
5
6 AM
7
45
40
35
30
25
20
10
5

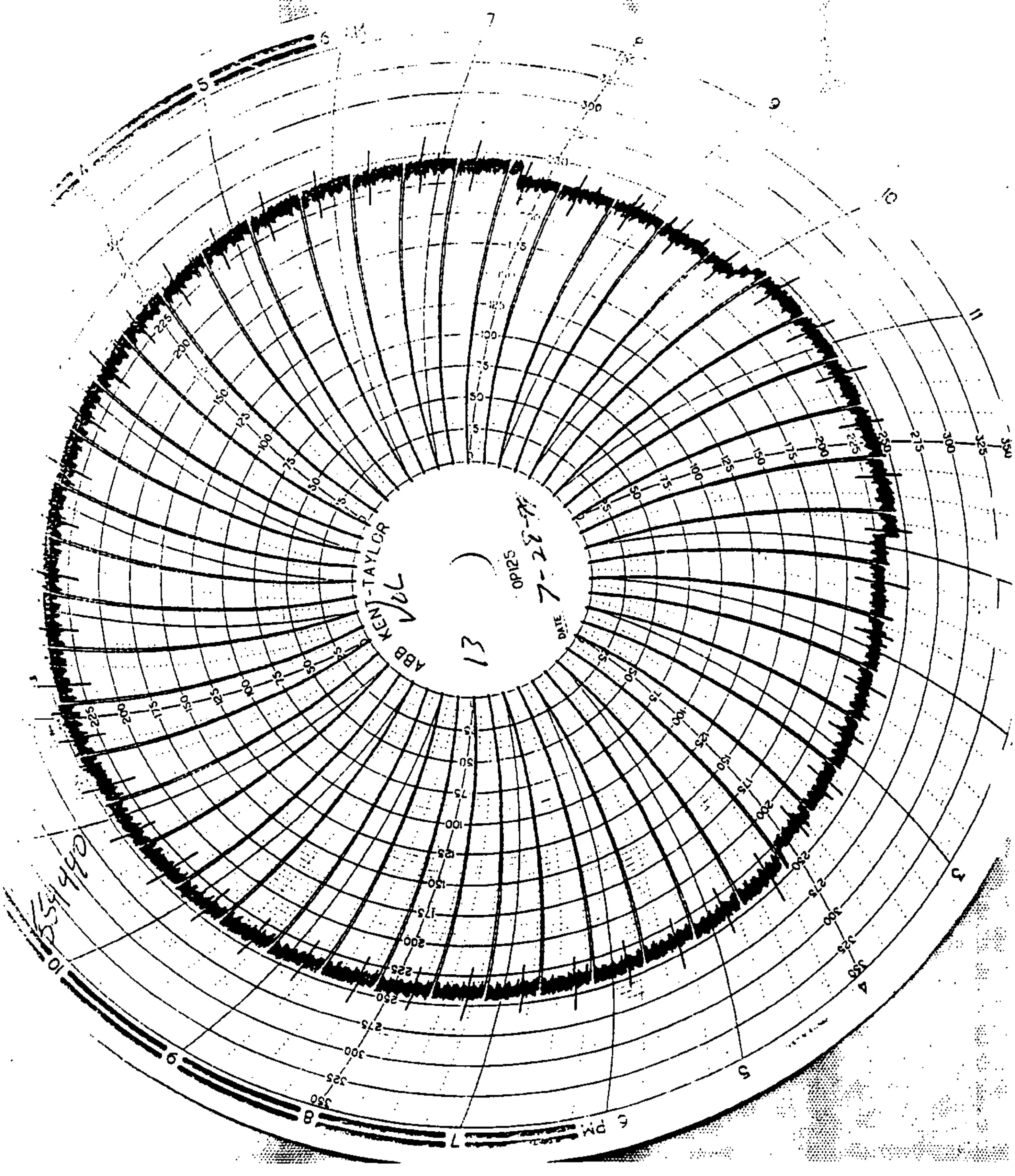
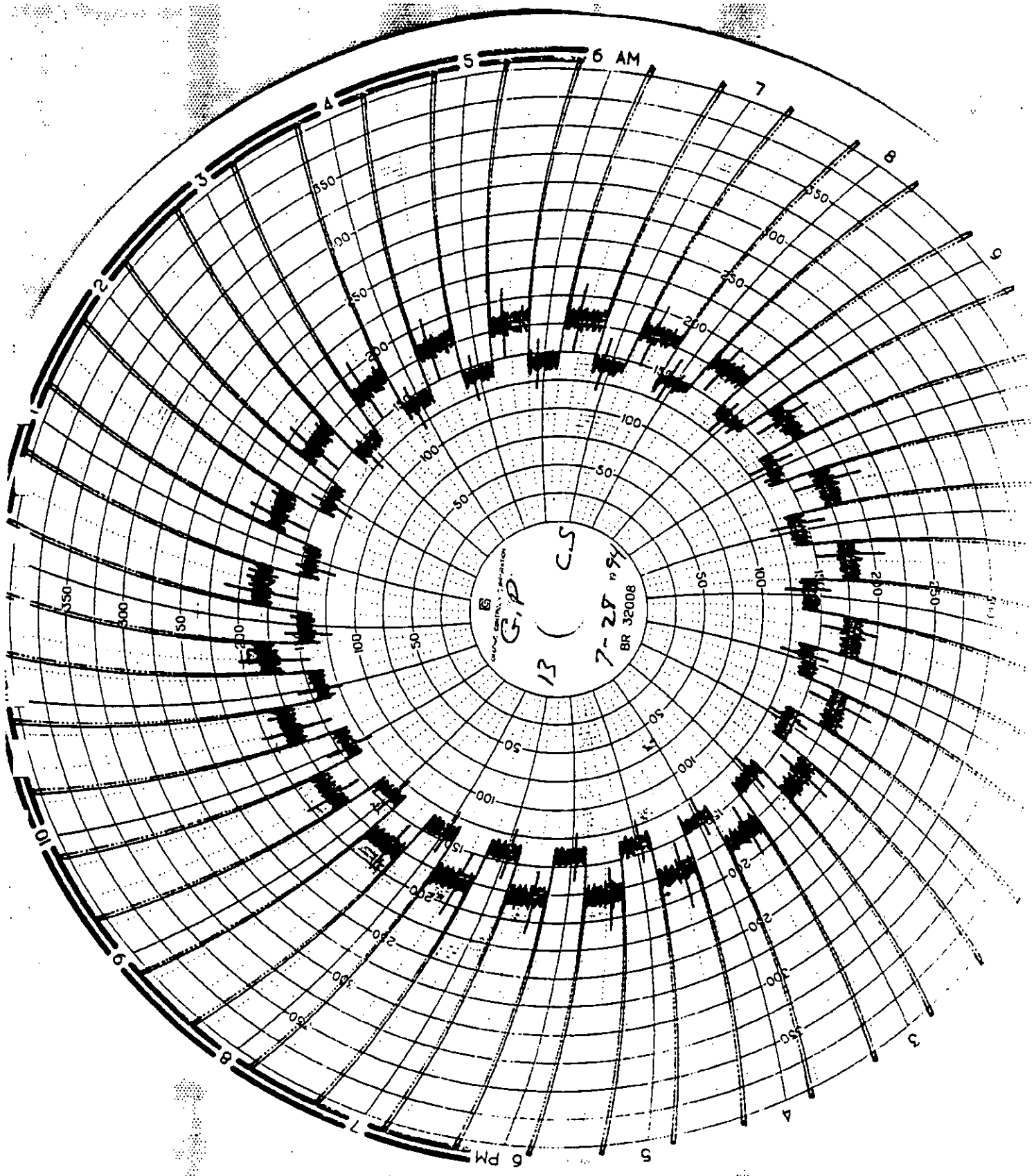
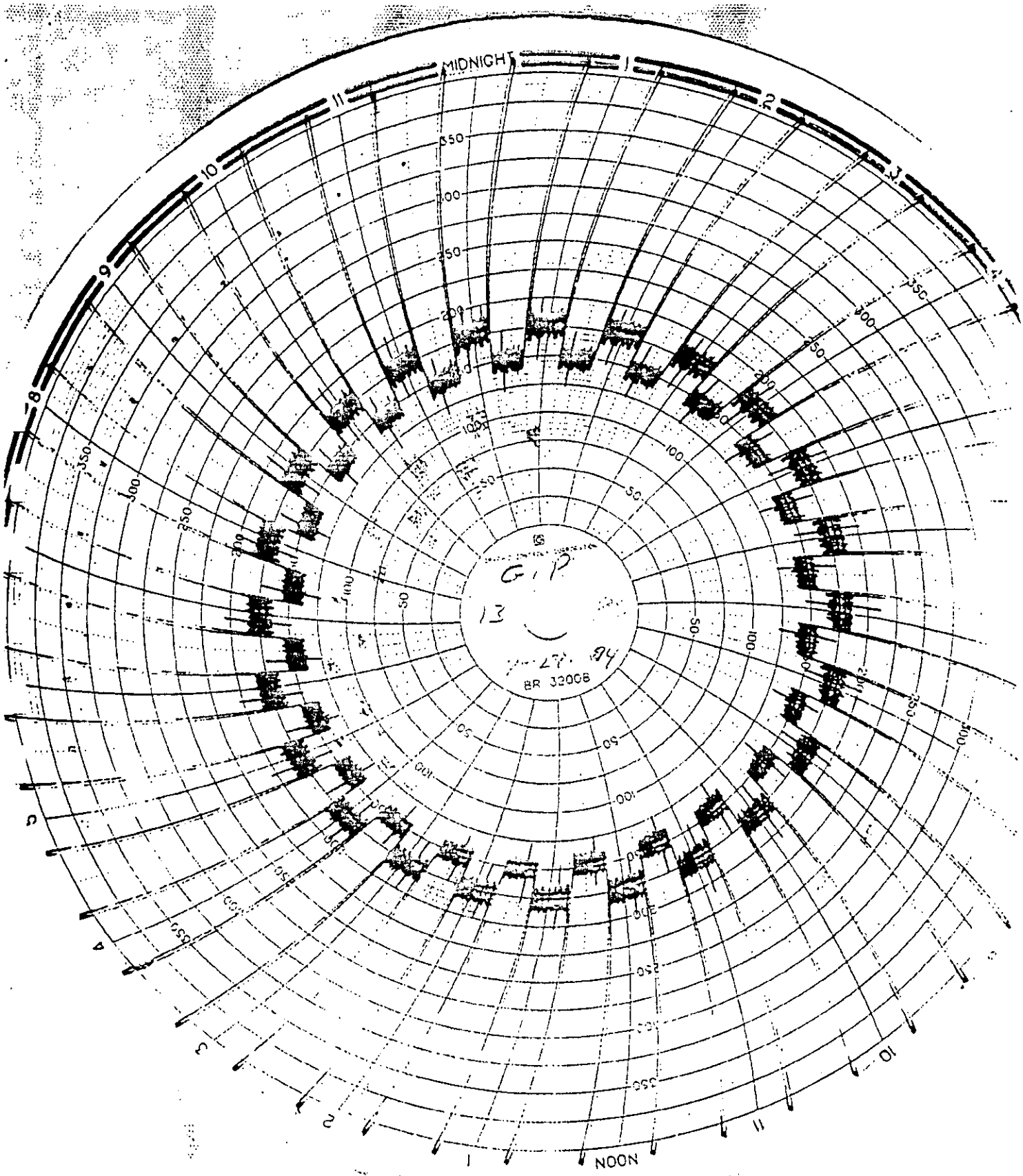
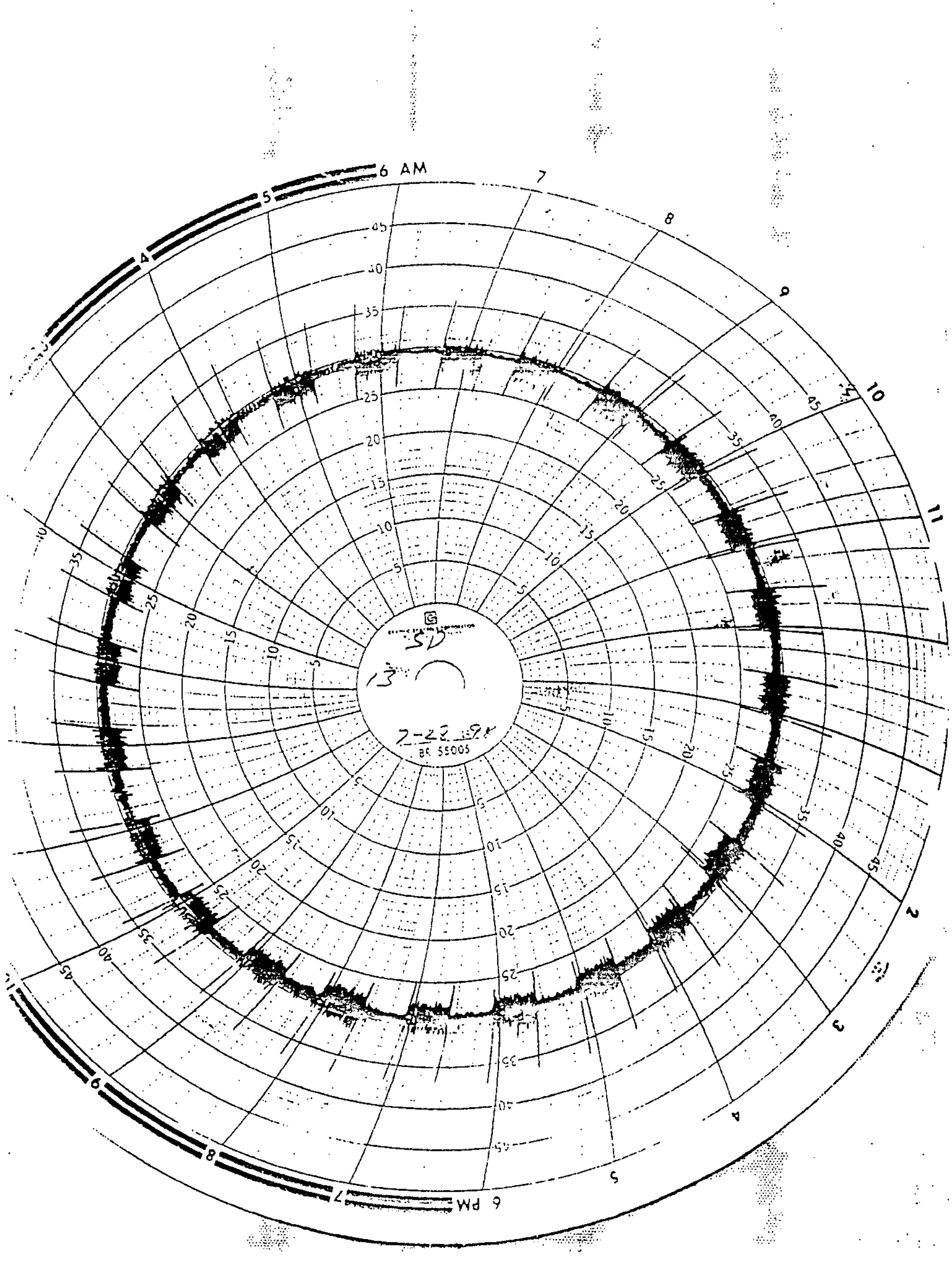
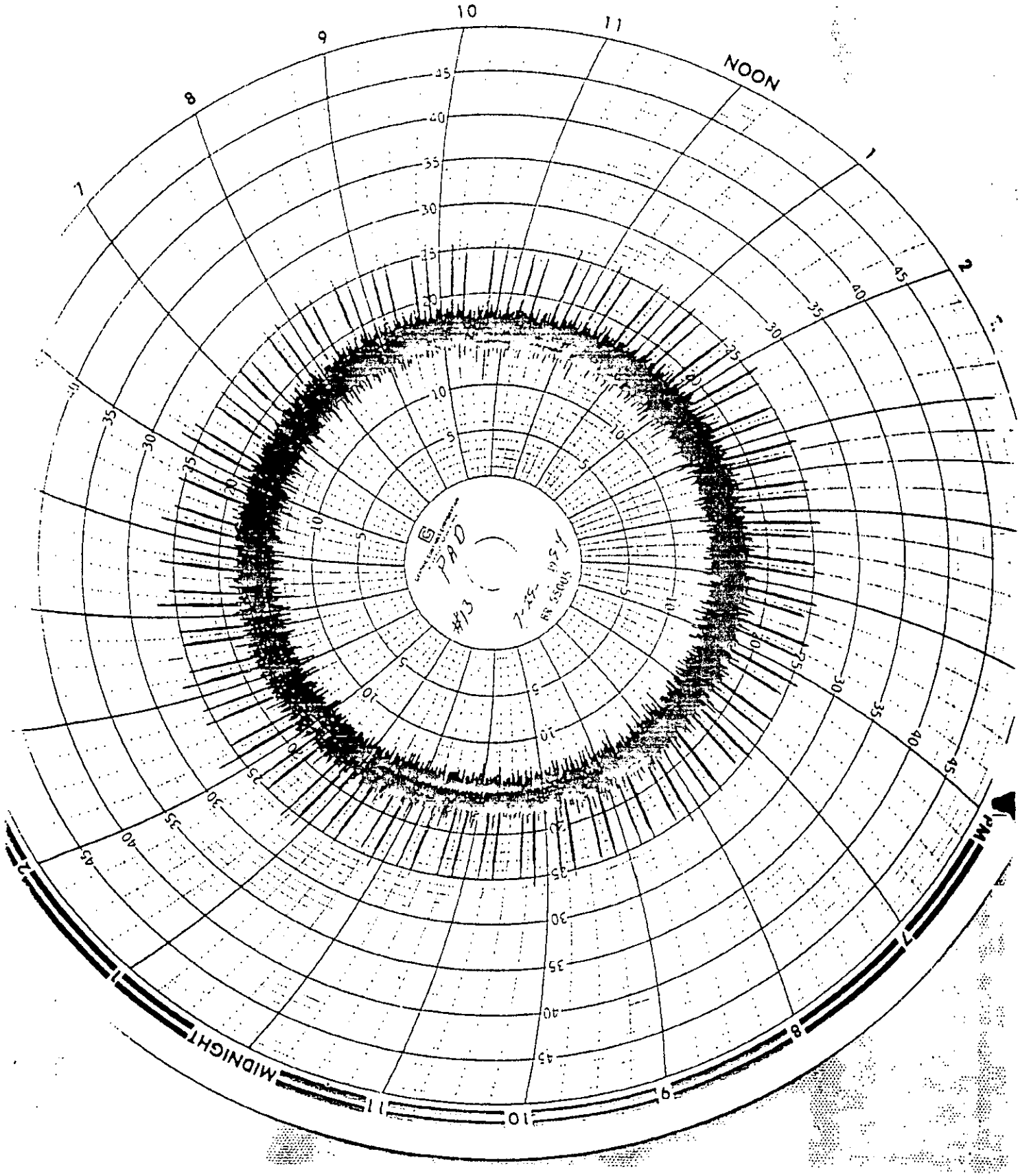


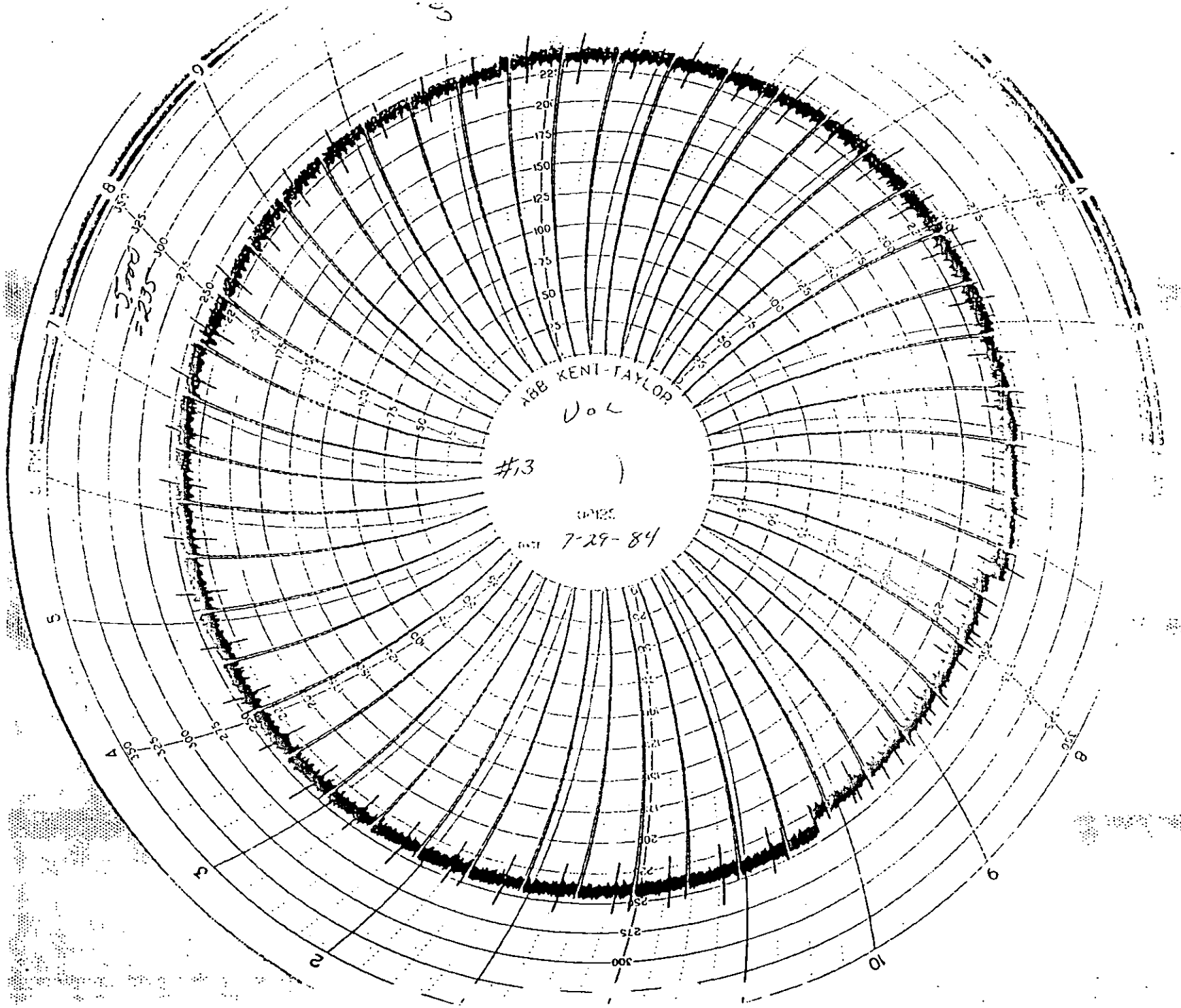
ABB KENT-TAYLOR
OP125
DATE
6 PM

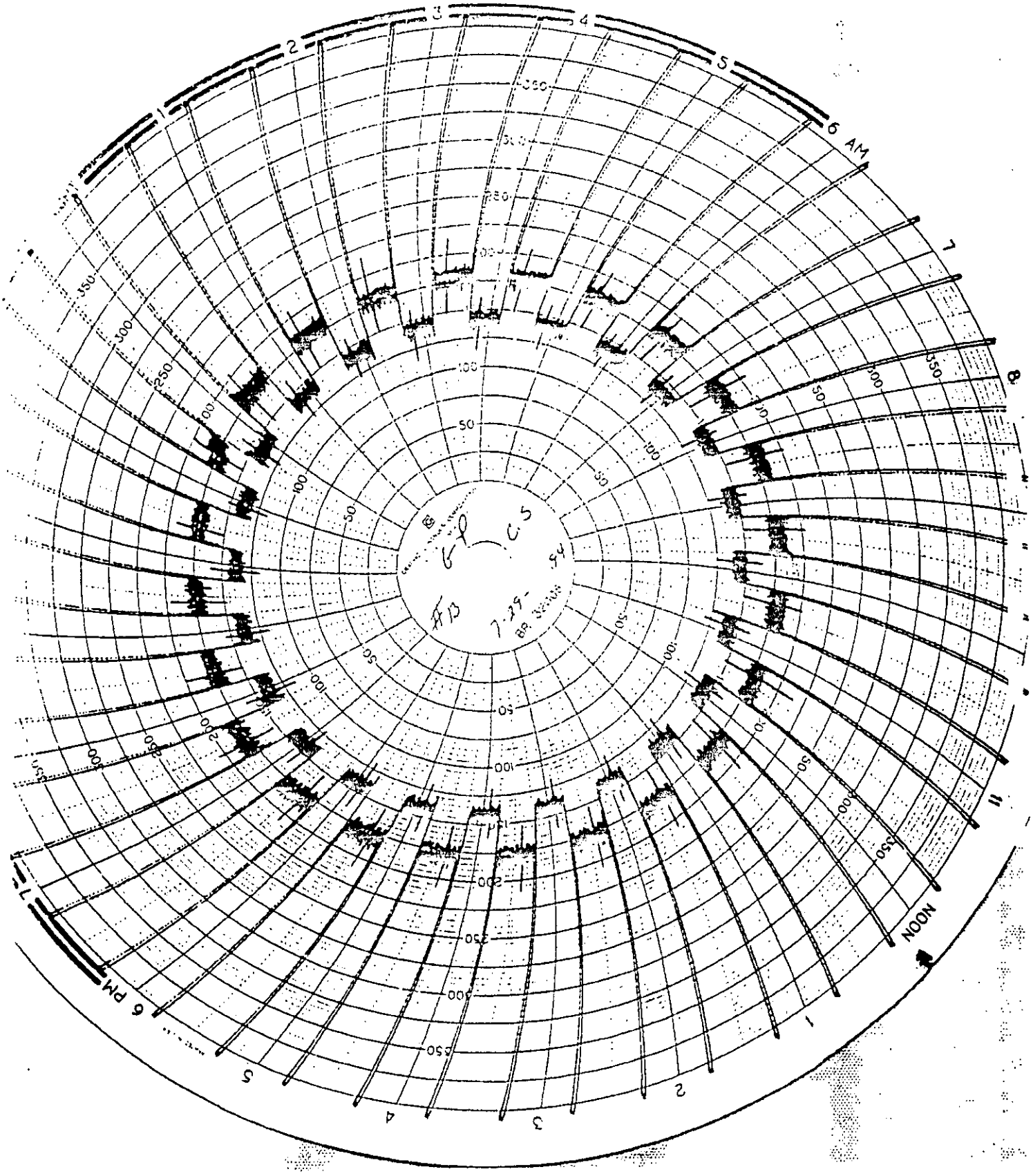

6 AM
6 PM
7- 28
BR 32008

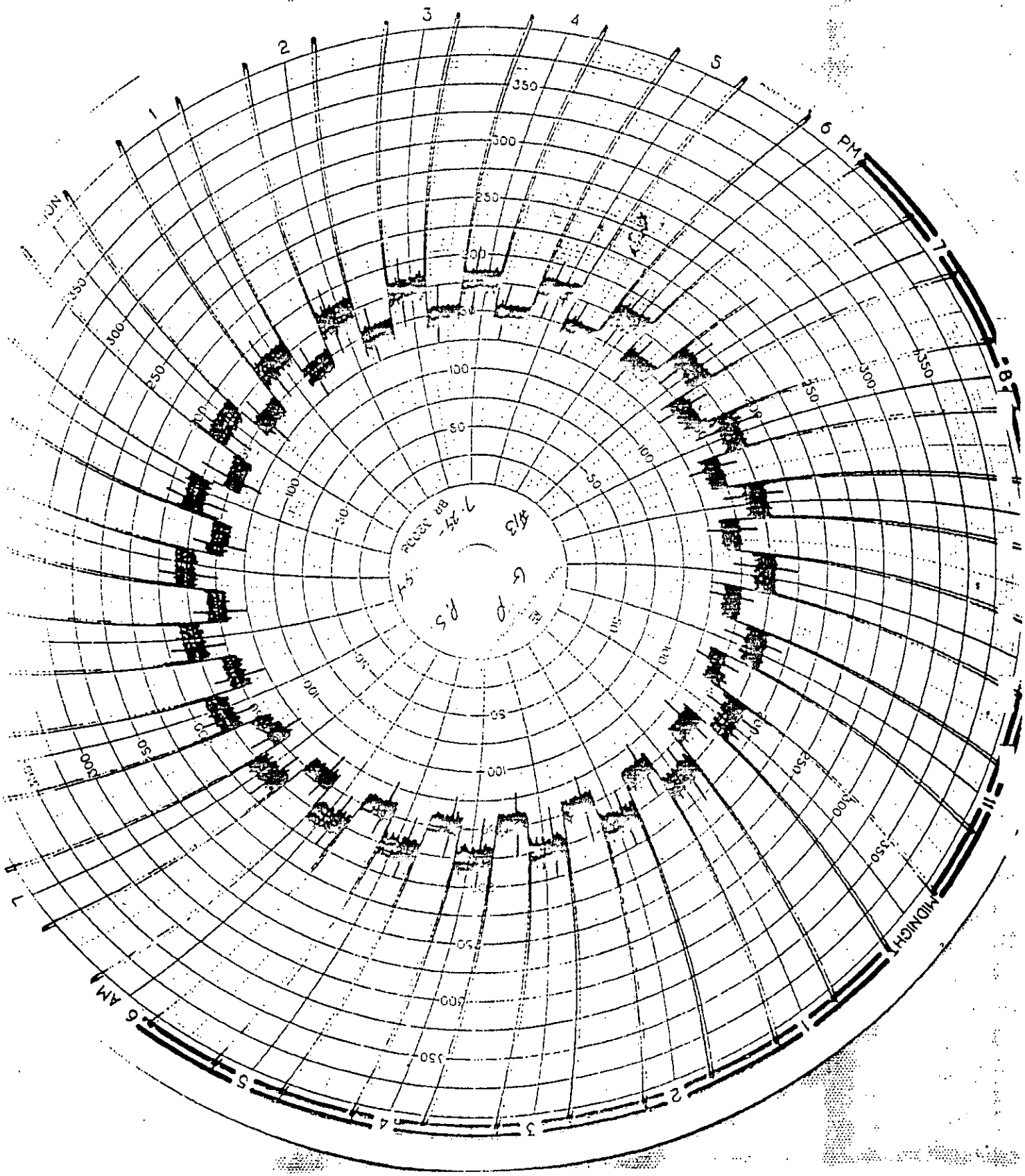

MIDNIGHT
NOON
GIP
13
BR 33008

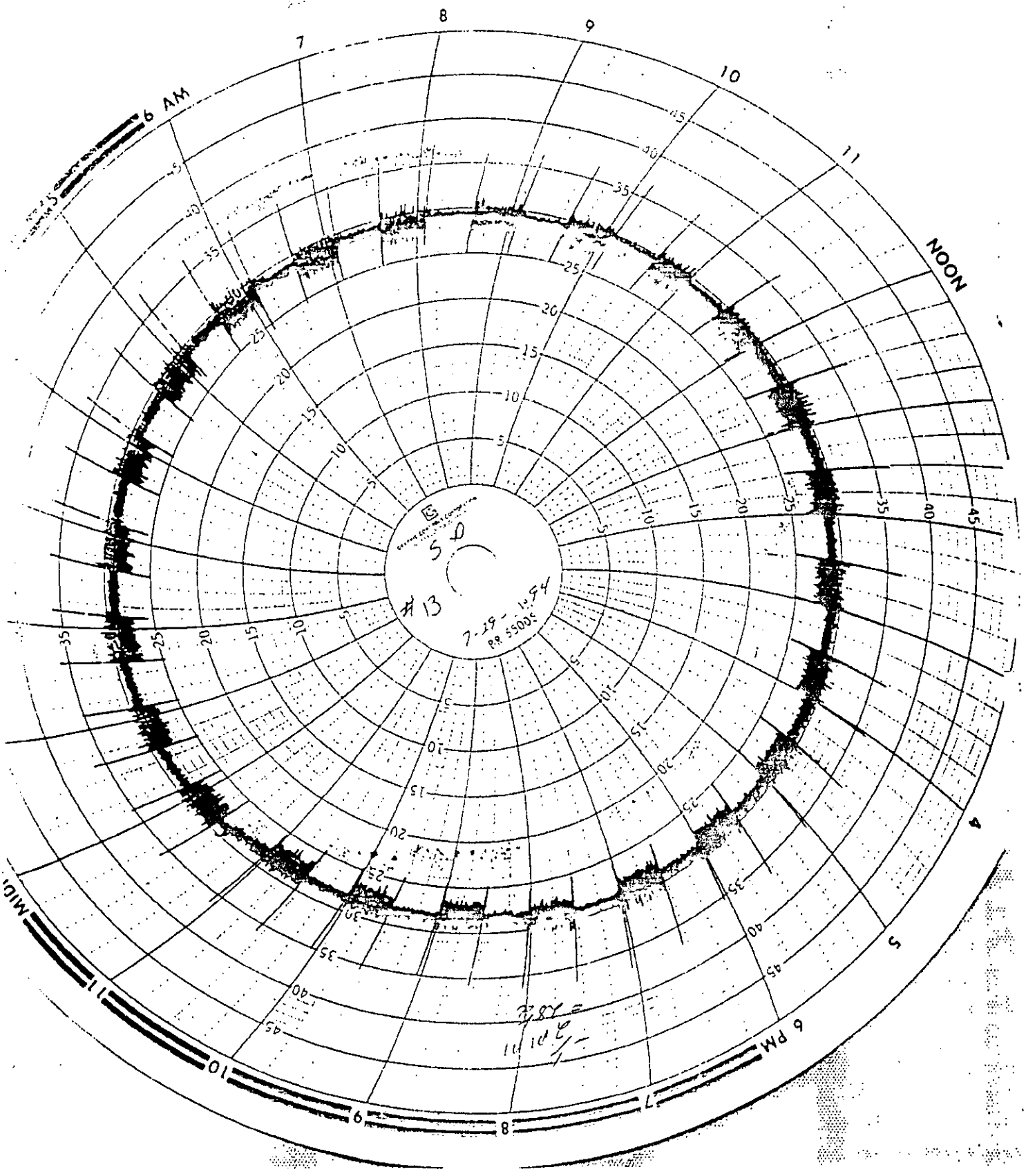

6 AM
6 PM
BS 55005
2-22-91
13
15


NOON
MIDNIGHT
PM
PAD
#13


ASB KENT-TAYLOR
Vol
#13
7-29-84


6 AM
NOON
6 PM
1
2
3
4
5
7
8
11
50
100
150
200
250
300
350
400
500
550


1
2
3
4
5
6 PM
7
8
MIDNIGHT
1
2
3
4
5
6 AM
7
NOON
50
100
150
200
250
300
350
400
450
500
550


6 AM
NOON
6 PM
MIDN
7
8
9
10
11
12
1
2
3
4
5
6
7
8
9
10
11
5
10
15
20
25
30
35
40
45
SD
#13
7-29- 1:54
PR 55005

COMPLIANCE DEMONSTRATION
NO. 13 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

APPENDIX C

GRAVIMETRIC AND ANALYTICAL RESULTS, EMISSIONS CALCULATIONS

ATS
ADVANCED TECHNOLOGY SYSTEMS, INC.

ATS
AIR QUALITY ENGINEERING

ANALYTICAL REPORTING FORM

CLIENT USS - Clairton Works
PLANT LOCATION Clairton, PA
PROJECT NUMBER EKM 0202
UNIT TESTED #13 Battery Stack

TEST DATE 7/28 & 7/29/94
DATE RECEIVED 7/28 & 7/29/94
DATE ANALYZED 7/29/94
ANALYTICAL METHOD Gravimetric Method

Test Number	Filter ID Number	Component	Chloroform/ Ethyl Ether Extract Units (grams)	Filter Weight Units (grams)	Soluble Portion of Front Half H2O Rinse Units (grams)	Soluble Portion of Front Half Acetone Rinse Units (grams)	Soluble Portion of Back Half H2O Rinse Units (grams)	Soluble Portion of Back Half Acetone Rinse Units (grams)	0.22µm Filter Insoluble Portion of Back Half H2O Rinse Units (grams)
CLR-BS#13-1	1296	Particulate	0.0018	0.0203	0.0244	0.0097	0.0143	0.0025	0.0013
CLR-BS#13-2	1284	Particulate	0.0020	0.0178	0.0217	0.0093	0.0150	0.0004	0.0011
CLR-BS#13-3	1305	Particulate	0.0020	0.0150	0.0310	0.0105	0.0294	0.0018	0.0013
CLR-BS#13-BLK	1312	Particulate	0.0002	0.0003	0.0006	0.0002			

Analyst's Signature Patricia J. Hamilton
Date 8/9/94

Comments

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS — TEST DATE: 07-28-94

TEST SITE #13 BATTERY COMBUSTION STACK — TEST NUMBER: CLR-BS#13-1

A.	Barometric Pressure	29.30	in. Hg	
B.	Static Pressure	-1.0	in. H2O	
C.	Stack Pressure	29.23	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.21	in. H2O	
E.	Meter Pressure	29.39	in. Hg	[A+(D/13.6)]
F.	Average ΔP '	0.04	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0172		
I.	Stack Diameter	120	in.	
J.	Stack Area	78.54	ft²	(0.00545*I²)
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft²	(0.00545*K²)
M.	Average Stack Temperature	496	°F	
N.	Average Stack Temperature	956	°R	(460+M)
O.	Average Meter Temperature	90	°F	
P.	Average Meter Temperature	550	°R	(460+O)
Q.	Condensate Volume	253.9	mL	
R.	Absorbed H2O	22.1	mL	
S.	Total H2O	276.0	mL	(Q+R)
T.	Filter Weight	0.0203	g	
U.	Probe Weight	0.0341	g	
V.	Impinger Weight	0.0013	g	
W.	Total Weight	0.0557	g	(T+U+V)
X.	Metered Gas Volume	73.885	dcf	
Y.	Corrected Metered Gas Volume	75.156	dcf	(X*H)
Z.	H2O Gas Volume	13.822	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	88.978	cf	(Y+Z)
BB.	Percent H2O	15.5	%	(100*Z/AA)
CC.	Gas Volume Sampled	70.923	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0121	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.155		18	2.796
CO2	0.060	0.845	44	2.230
CO	0.000	0.845	28	0.000
O2	0.105	0.845	32	2.838
N2	0.835	0.845	28	19.748

Average Molecular Weight: 27.61 lb./lb. mol

FF.	Average Stack Velocity	15.6	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	73700	acfm	(60*FF*J)
HH.	Standard Flow Rate	39300	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	105.4	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	3.49	lb/hr	[DD*HH*(1-BB/100)*60/7000]

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS — TEST DATE: 07-28-94

TEST SITE #13 BATTERY COMBUSTION STACK — TEST NUMBER: CLR-BS#13-2

A.	Barometric Pressure	29.30	in. Hg	
B.	Static Pressure	-1.0	in. H2O	
C.	Stack Pressure	29.23	in. Hg	[A+(B/13.6)]
D.	Average ∆ H	1.27	in. H2O	
E.	Meter Pressure	29.39	in. Hg	[A+(D/13.6)]
F.	Average ∆ P	0.04	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0172		
I.	Stack Diameter	120	in.	
J.	Stack Area	78.54	ft²	(0.00545*I²)
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft²	(0.00545*K²)
M.	Average Stack Temperature	498	°F	
N.	Average Stack Temperature	958	°R	(460+M)
O.	Average Meter Temperature	106	°F	
P.	Average Meter Temperature	566	°R	(460+O)
Q.	Condensate Volume	275.4	mL	
R.	Absorbed H2O	21.3	mL	
S.	Total H2O	296.7	mL	(Q+R)
T.	Filter Weight	0.0178	g	
U.	Probe Weight	0.0310	g	
V.	Impinger Weight	0.0011	g	
W.	Total Weight	0.0499	g	(T+U+V)
X.	Metered Gas Volume	75.690	dcf	
Y.	Corrected Metered Gas Volume	76.992	dcf	(X*H)
Z.	H2O Gas Volume	15.312	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	92.304	cf	(Y+Z)
BB.	Percent H2O	16.6	%	(100*Z/AA)
CC.	Gas Volume Sampled	70.515	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0109	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.166		18	2.986
CO2	0.060	0.834	44	2.202
CO	0.000	0.834	28	0.000
O2	0.105	0.834	32	2.803
N2	0.835	0.834	28	19.501
Average Molecular Weight				27.49 lb./lb. mol

FF.	Average Stack Velocity	15.7	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	73900	acfm	(60*FF*J)
HH.	Standard Flow Rate	39800	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	106.2	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	3.11	lb/hr	[DD*HH*(1-BB/100)*60/7000]

STACK SAMPLING CALCULATIONS

CLIENT: USS CLAIRTON WORKS
TEST SITE #13 BATTERY COMBUSTION STACK

TEST DATE: 07-29-94
TEST NUMBER: CLR-BS#13-3

A.	Barometric Pressure	29.40	in. Hg	
B.	Static Pressure	-1.1	in. H2O	
C.	Stack Pressure	29.32	in. Hg	[A+(B/13.6)]
D.	Average ∆ H	1.14	in. H2O	
E.	Meter Pressure	29.48	in. Hg	[A+(D/13.6)]
F.	Average ∆ P	0.04	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	1.0172		
I.	Stack Diameter	120	in.	
J.	Stack Area	78.54	ft²	(0.00545*I²)
K.	Nozzle Diameter	0.490	in.	
L.	Nozzle Area	1.31E-03	ft²	(0.00545*K²)
M.	Average Stack Temperature	495	°F	
N.	Average Stack Temperature	955	°R	(460+M)
O.	Average Meter Temperature	93	°F	
P.	Average Meter Temperature	553	°R	(460+O)
Q.	Condensate Volume	263.7	mL	
R.	Absorbed H2O	18.2	mL	
S.	Total H2O	281.9	mL	(Q+R)
T.	Filter Weight	0.0150	g	
U.	Probe Weight	0.0415	g	
V.	Impinger Weight	0.0013	g	
W.	Total Weight	0.0578	g	(T+U+V)
X.	Metered Gas Volume	72.142	dcf	
Y.	Corrected Metered Gas Volume	73.383	dcf	(X*H)
Z.	H2O Gas Volume	14.157	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	87.540	cf	(Y+Z)
BB.	Percent H2O	16.2	%	(100*Z/AA)
CC.	Gas Volume Sampled	69.046	dscf	[Y*(528/P)*(E/29.92)]
DD.	Grain Loading	0.0129	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Mol. Weight	= Weight/Mol
H2O	0.162		18	2.911
CO2	0.065	0.838	44	2.397
CO	0.000	0.838	28	0.000
O2	0.105	0.838	32	2.817
N2	0.830	0.838	28	19.482

Average Molecular Weight: 27.61 lb./lb. mol

FF.	Average Stack Velocity	15.6	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	73500	acfm	(60*FF*J)
HH.	Standard Flow Rate	39800	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	103.4	%	{[100*CC*60*J]/[HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	3.69	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHAIN OF CUSTODY RECORD

PLANT CODE	PROJECT NAME
IKM0202	CLR

SAMPLERS *(Signature)*

STA. NO.	DATE	TIME	COMP.	GRAB	WELL	STATION LOCATION	NUMBER OF CONTAINERS	SO_4 by Ion Chromatograph	CONDUCTIVITY	pH	REMARKS OR OBSERVATIONS
	7/28/94		✓			CLR-BS#13-1	1	✓			Total Vol. 50ml
	7/28/94		✓			CLR-BS#13-2	1	✓			
	7/29/94		✓			CLR-BS#13-3	1	✓			
	8/9/94			✓		CLR-BS#13-SO_4-BLK.	1	✓			

Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*
[signature]	8/9/94						
Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date	Time	Received for Laboratory by: *(Signature)*	Date	Time	Ice Chest Temp °C	Ice Chest # / Chain of Custody Tag #

DISTRIBUTION: Original accompanies shipment; Copy to Coordinator Field Files.

RJ Lee *Group*, Inc.

350 Hochberg Road Monroeville, PA 15146
Phone (412) 325-1776 Fax (412) 733-1799

RECEIVED

LABORATORY REPORT

Advanced Technology Systems, Inc.
339 Haymaker Road, Suite 201
Monroeville, PA 15146
Attention: Patrick Stockton
(412) 856 0662
Analysis: Determination of Sulfate in Solution
Method: Ion Chromotography

RJ Lee Group Job No.: INH408743
Samples Received: 10-Aug-94
Report Date: 12-Aug-94
Client Project: NA
Purchase Order No.: 29182

Ai.

ATS

Sample Identification		Sulfate	Volume	Total mg
Client	RJ Lee Group	PPM	ml	
CLR-BS#13-1	0134074	204	50	10.2
CLR BS#13-2	0134075	190	50	9.50
CLR-BS#13-3	0134076	426	50	21.3
CLR-BS#13-SOL-BLK	0134077	< 1.0	50	< 0.050

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, RJ Lee Group will store the samples for a period of thirty (30) days before discarding. A shipping and handling fee will be assessed for the return of any samples.

Analyst _____

Date 8-12-94