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AP-42 Section	12.2
Reference	
Report Sect.	4
Reference	83

reviewed
AS

**USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA**

Report on

**COMPLIANCE DEMONSTRATION
NO. 1 BATTERY COMBUSTION STACK
USS CLAIRTON WORKS**

NOVEMBER 1993

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Project No.: 600726-01

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
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APPENDICES

APPENDIX A	TEST PROTOCOL, FIELD DATA SHEETS, CALIBRATION RESULTS
APPENDIX B	PLANT OPERATIONAL DATA
APPENDIX C	GRAVIMETRIC RESULTS, EMISSIONS CALCULATIONS

EXECUTIVE SUMMARY

On September 29 and 30, 1993, a compliance test program was conducted for USS Clairton Works, Clairton, PA, on the #1 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 Amended Mon Valley Consent Decree, Paragraph V.A.(6) and Appendix 4.A.

The results of the testing showed an average particulate matter concentration and emission rate of 0.0081 grains per dry standard cubic feet (gr/dscf) and 2.6 pounds per hour (lb/hr), respectively. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), the allowable particulate matter concentration for #1 Battery Combustion Stack is 0.030 gr/dscf. Thus, the average particulate matter concentration in the stack gas is less than the allowable concentration.

The opacity of the exhaust gas during any of the three tests was less than or equal to 10 percent. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), 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."

1.0 INTRODUCTION

On September 29 and 30, 1993, a compliance test program was conducted for USS Clairton Works, Clairton, PA, on the #1 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 Amended Mon Valley Consent Decree, Paragraph V.A.(6) and Appendix 4.A.

Testing was performed by Chester Environmental. All test procedures were witnessed by Phil Lawrence from the Allegheny County Health Department Bureau of Environmental Quality (BEQ).

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. Three two-hour tests were executed during normal, maximum operation and production of the battery.

The process exhausts through a 114 inch inside 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 traverse point was sampled for 5 minutes, thus bringing the total sampling time to 120 minutes for each test run.

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 (CO₂), oxygen (O₂), and nitrogen (N₂, by difference) were determined with the use of a Bacharach "Fyrite" apparatus as specified by EPA Method 3. Gas concentrations were used to obtain molecular weight of the process gas on a dry basis.

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 were maintained. Clean up of the sampling train included an acetone rinse of the front-half components of the sample train. Front-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 was prepared in the same manner as the test sample rinses. The blank residue weight was subtracted from the test sample residue weights. After blank correction, the acetone rinse residue weights and sample train 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.

3.0 RESULTS

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

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 BEQ can be found in Appendix A.

Copies of the field data sheets can be found in Appendix A. The gravimetric results and the emissions calculations for each test can be found in Appendix C.

The test results have been summarized in Table 1. The results of the testing showed an average particulate matter concentration and emission rate of 0.0081 grains per dry standard cubic feet (gr/dscf) and 2.6 pounds per hour (lb/hr), respectively. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), the allowable particulate matter concentration for #1 Battery Combustion Stack is 0.030 gr/dscf. Thus, the average particulate matter concentration in the stack gas is 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) and standard cubic feet per minute (scfm), moisture content of the stack gas (percent by volume), stack gas temperature ($^{\circ}\text{F}$), gas volume sampled for each test in units of dry standard cubic feet (dscf), and the isokinetics value for each test. The gas volume sampled for each 120 minute test was greater than 50 dry standard cubic feet. 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. Isokinetic values for the three test runs were 104.9 percent, 109.2 percent, and 103.4 percent; therefore, all values were within the acceptable range. Actual test sampling times have also been included in Table 1.

Copies of the field data sheets for the visible emissions readings can be found in Appendix A. As promulgated by the Amended Mon Valley Consent Decree, Paragraph V.A.(6), 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." The opacity of the exhaust gas during any of the three tests was less than or equal to 10 percent.

USS CLAIRTON WORKS
CLAIRTON, PA

TABLE 1

#1 BATTERY COMBUSTION STACK
PARTICULATE MATTER EMISSIONS DATA

Test Number		Run 1	Run 2	Run 3	Average
Test Date		CLR-1BS-1	CLR-1BS-2	CLR-1BS-3	
		9-29-93	9-30-93	9-30-93	
<u>Mass Emissions Rate and Concentration</u>					
Particulate Matter	(lb/hr)	2.8	3.5	1.5	2.6
	(gr/dscf)	0.0087	0.0111	0.0046	0.0081
<u>Stack Conditions</u>					
Flow Rate	(acfm)	77900	78000	81400	79100
	(scfm)	41500	41800	43300	42200
	(dscfm)	37100	36600	38800	37500
Temperature	(°F)	515	511	518	515
Moisture Content	(%)	10.5	12.5	10.3	11.1
<u>Sampling Conditions</u>					
Test times		1335	0835	1127	
		to 1405	to 0905	to 1157	
		1410	0913	1226	
		to 1440	to 0943	to 1256	
		1451	0947	1303	
		to 1521	to 1017	to 1333	
		1534	1020	1340	
		to 1604	to 1050	to 1410	
Sampling Time	(minutes)	120	120	120	
Sample Volume	(dscf)	65.869	67.573	67.987	
Isokinetics	(%)	104.9	109.2	103.4	

**COMPLIANCE DEMONSTRATION
NO. 1 BATTERY COMBUSTION STACK
USS CLAIRTON WORKS**

**USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA**

**APPENDIX A
TEST PROTOCOL, FIELD DATA SHEETS, CALIBRATION
RESULTS**

**TEST PROTOCOL
COMPLIANCE DEMONSTRATION
#1 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 (40 CFR, Part 60, Appendix A) and Sections 139.11 and 139.12 of the Pennsylvania Department of Environmental Resources (PA DER) Source Testing Manual. 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 114 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. Static pressure of the exhaust gas stream will be measured with the same pitot tube.

At the beginning and end of each test, gas concentrations of CO₂, O₂, and N₂ (by difference) will be determined with the use of a Bacharach "Fyrite" apparatus as specified by EPA Method 3. Gas concentrations will be used to obtain molecular weight of the process gas on a dry basis.

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 an acetone rinse of the front-half components of the sample train. Front-half acetone rinses will be evaporated to dryness, desiccated, and weighed to a constant weight. Sample train glass fiber 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 milligram. One acetone blank will be prepared in the same manner as the test sample rinses. The blank residue weight will be subtracted from the test sample residue weights. After blank correction, front-half acetone rinse residue weights and sample train filter weights will be used to determine total particulate matter catch. Clean up and analytical procedures will follow the methodology of EPA Method 5.

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.

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 Bureau of Air Quality, field data sheets for the particulate matter sampling and visible emissions determinations, emissions calculations, and gravimetric results for each test.

STACK SAMPLING DATA SHEET

Page 1 of 2

CLIENT USG Carbon Works

TEST DATE 7-29-93 (Wk. 1)

ORIFICE CORRECTION (ΔH@) 1.8022

IIT/COLD BOX NO. 37

TEST UNIT #1 B-Henry Stack

TEST NO. 622-185-PM-1

METER CORRECTION (V) 0.9619

PROBE NO. 10-1

PROJECT NO. 600726-01

NOZZLE (SIZE, #) 0.423"

CALIBRATION DATE 5-17-93

FILTER NO. 10-46

TEST CREW R/P JC JPS

STATIC PRESSURE -1.2" H₂O

PITOT CORRECTION 0.84

STACK DIA. 11.4"

BAROMETRIC PRESSURE 29.50

PORT DIRECTION A

CONTROL BOX NO. 7

PORT SIZE 4"

Traverse Point (Inches)	Time	Dry Gas Meter Reading (dcl)	Pitot ΔP (in. H ₂ O)	Orifice ΔH		Meter Temperature		Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	IICl Dia Temp. (°F)	Comments
				Required (in. H ₂ O)	Actual (in. H ₂ O)	In (°F)	Out (°F)						
40.6	13:35	272.945	.07	1.15	1.15	62	62	4.0	499	250	468	260	5 min./point
28.5			.07	1.15	1.15	81	63	4.0	535				
20.2			.06	.99	.99	88	64	3.0	544	250	383	260	
13.5			.06	.99	.99	90	65	3.0	552				
7.6			.05	.82	.82	92	66	3.0	534	250	39	265	
2.4	14:05	291.035	.04	.66	.66	94	66	3.0	499				
40.6	14:10	291.035	.07	1.15	1.15	78	66	4.0	483	245	39	255	
28.5			.06	.99	.99	84	70	3.5	498				
20.2			.06	.99	.99	92	71	3.5	497	250	40	250	
13.5			.06	.99	.99	93	71	3.5	500				
7.6			.05	.82	.82	100	72	3.5	499	250	40	250	
2.4	14:40	308.915	.05	.82	.82	100	72	3.0	497				Estimates: MW = 28.3 % H ₂ O = 12

PITOT LEAK CHECK

	Before	After	Positive	Negative
GAS	0.0	0.0	0.0	0.0
CO ₂	0.0	0.0	0.0	0.0
O ₂	0.0	0.0	0.0	0.0
CO	0.0	0.0	0.0	0.0
N ₂	0.0	0.0	0.0	0.0

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	20.01 cfm
After	5.5	20.01 cfm

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 mL D.I. H ₂ O	670.1	543.5	126.6
2.	100 mL D.I. H ₂ O	559.9	538.8	21.1
3.	Empty	442.8	440.1	2.7
4.	5.1 mL GDL	666.6	453.3	133.3
5.				
6.	Actual		Total =	163.7
7.	Moisture = 10.5%			
8.				



⇒ MW = 27.99

150.49

STACK SAMPLING DATA SHEET

CLIENT USS Claiton Works TEST DATE 7-27-93 (Wed.) ORIFICE CORRECTION (ΔH) 1.8012 IOT/COLD BOX NO. 3, 7
 TEST UNIT #1 Bethany Stack TEST NO. C12-185-174-1 METER CORRECTION (V) 0.9619 PROBE NO. 10-1
 PROJECT NO. 114 NOZZLE (SIZE, IN) 0.423 CALIBRATION DATE 5-17-93 FILTER NO. 1046
 TEST CREW 1 STATIC PRESSURE -12" H₂O PITOT CORRECTION 0.84 STACK DIA. 174"
 BAROMETRIC PRESSURE 29.50 PORT DIRECTION 82° D C CONTROL BOX NO. 7 PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (cf)	Pilot A/P (in. H ₂ O)	Orifice ΔH Required (in. H ₂ O)	Actual (in. H ₂ O)	Meter Temperature In (°F)	Out (°F)	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
40.6	14:51	308.915	.065	1.07	1.07	90	70	4.0	561	~250	<28	~250	5 min./point
28.5			.07	1.15	1.15	96	72	4.0	565	250	43	255	
20.2			.07	1.15	1.15	98	73	4.0	489	250	44	260	
13.5			.05	.82	.82	100	73	3.0	488	250			
7.6			.05	.82	.82	100	73	3.0	490				
2.4	15:21	327.135	.05	.82	.82	100	73	3.0					
40.6	15:34	327.135	.07	1.15	1.15	80	70	4.5	514	245	45	255	
28.5			.06	.99	.99	99	72	3.5	530	245	44	250	
20.2			.06	.99	.99	100	74	3.5	544	245			
13.5			.05	.82	.82	101	74	3.0	506	250	44	250	
7.6			.04	.66	.66	101	74	3.0	491				
2.4	16:04	343.910	.041	.66	.66	101	74	3.0	490				
Test A =		A =	(AP) =	(A-H) =	(A-H) =	(T) =	(T) =		(Stack) =				Estimates: MW = 28.3 %H ₂ O = 12.0
Total				0.948	0.948				514				
Total				0.053	0.053								

IS = 104.9%

Velocity = 18.3 ft/sec

Initial

Final

Difference

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

Positive	Negative
Before	
After	
GAS	1
CO ₂	2
O ₂	
CO	
N ₂	

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

STACK SAMPLING DATA SHEET

Page 1 of 3

CLIENT USS CHESTER TEST DATE 07-30-95 ORIFICE CORRECTION (ΔH) 0.00 IIT/COLD BOX NO. 7-5
 TEST UNIT # 1 BATS-24 STICK TEST NO. 60726-01 METER CORRECTION (V) 0.9619 PROBE NO. 10-1
 PROJECT NO. 60726-01 NOZZLE (SIZE) 1/2" NPT CALIBRATION DATE 05-12-93 FILTER NO. 1086
 TEST CREW 60726-01 STATIC PRESSURE 12.12 PITOT CORRECTION 0.04 STACK DIA. 114
 BAROMETRIC PRESSURE 29.60 PORT DIRECTION DC CONTROL BOX NO. 36100 PORT SIZE 20"

Traverse Point (inches)	Time	Dry Gas Meter Reading (scf)	Pilot ΔP (in. H2O)	Orifice ΔH		Meter Temperature		Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
				Required (in. H2O)	Actual (in. H2O)	In (°F)	Out (°F)						
40.6	08:35	344.875	07	1.15	1.15	48	48	4.0	489	250	468	250	5 min./point
28.5			07	1.15	1.15	68	48	4.0	535				
20.2			07	1.15	1.15	74	50	4.0	543	240	38	245	
13.5			06	.99	.99	79	52	3.5	552				
7.6			.04	.66	.66	80	53	3.0	570	245	36	245	
2.4	09:05	363.120	.04	.66	.66	80	53	3.0	497				
40.6	09:13	363.120	07	1.15	1.15	70	60	4.0	479	245	39	245	
28.5			.06	.99	.99	82	59	3.0	483				
20.2			.06	.99	.99	84	59	3.0	489	250	39	245	
13.5			.05	.82	.82	86	60	3.0	494				
7.6			.05	.82	.82	86	60	3.0	489	250	40	250	
2.4	09:43	380.950	.05	.82	.82	85	60	3.0	508				

Estimates:
 MW = 28.3
 %H2O = 12

PITOT LEAK CHECK

Before	After	Positive	Negative
1.15	1.15	1.15	0.00
0.99	0.99	0.99	0.00
0.82	0.82	0.82	0.00
0.66	0.66	0.66	0.00
0.66	0.66	0.66	0.00

SYSTEM LEAK CHECK

Before	After	Vacuum (in. Hg)	DGM Rate (cfm)
5.0	5.0	5.0	0.0125
5.0	5.0	5.0	0.0125

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100ml AT H ₂ O	710.6	552.5	158.1
2.	100ml AT H ₂ O	585.0	556.6	28.4
3.	empty	429.7	425.3	4.4
4.	200ml H ₂ O	672.7	659.3	13.4
5.				
6.				
7.	Aspirator			
8.	Moisture = 12.5%			



CHESTER ENVIRONMENTAL

⇒ MW = 27.77

190.9g

STACK SAMPLING DATA SHEET

Page 1 of 2

CLIENT U.S. CLARIFICATION WORKS TEST DATE 09-20-93 (11/13) ORIFICE CORRECTION (ΔH) @ 1.80 2 HOT/COLD BOX NO. 1
 TEST UNIT #1 BATTERY STACKS TEST NO. CL2-165-PH-3 METER CORRECTION (Y) 0.96 9 PROBE NO. 10-1
 PROJECT NO. 650726-01 NOZZLE (SIZE) 0.428" CALIBRATION DATE 05-12-92 FILTER NO. 1047
 TEST CREW 629 STATIC PRESSURE -12" H₂O PITOT CORRECTION 0.84 STACK DIA. 114
 BAROMETRIC PRESSURE 29.60 FORT DIRECTION AB CONTROL BOX NO. 5600 PORT SIZE 40

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcm)	Pilot ΔP (in. H ₂ O)	Orifice ΔH	Meter Temperature	Vacuum (in. Hg)	Stack Temp. (°F)	Probe Temp. (°F)	Impinger Temp. (°F)	Hot Box Temp. (°F)	Comments
40.6	11:27	416.320	0.07	1.15	62	3.5	490	280	468	225	5 min./point
28.5			0.07	1.15	82	3.5	489				
20.2			0.06	0.99	86	3.0	523	245	38	250	
13.5			0.07	1.15	88	3.5	534				
7.6			0.05	0.82	90	3.0	534	250	38	250	
2.4	11:57	434.800	0.05	0.82	90	3.0	531				
40.6	12:26	434.800	0.07	1.15	70	3.0	512	255	38	260	16 min. stack flow
28.5			0.08	1.32	86	4.0	496				16 min. stack flow
20.2			0.07	1.15	90	3.0	526	250	38	255	16 min. stack flow
13.5			0.06	0.98	90	3.0	521				16 min. stack flow
7.6			0.06	0.98	90	3.0	537	350	37	255	
2.4	12:56	453.400	0.06	0.98	92	3.0	546				
											Estimates: MW = 28.3
											% H ₂ O = 12.0

PITOT LEAK CHECK

Before	After	Positive	Negative
0.15 sec	0.15 sec	0.15 sec	0.15 sec
0.15 sec	0.15 sec	0.15 sec	0.15 sec

CO ₂	O ₂	CO	N ₂
40.0	13.0	0	83.0
40.0	13.0	0	83.0

SYSTEM LEAK CHECK

Vacuum (in. Hg)	DGM Rate (cfm)
5.0	50.01 cfm
5.0	50.01 cfm

Impinger Contents

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 mL DE H ₂ O	593.7	478.3	115.4
2.	100 mL DE H ₂ O	569.1	539.2	29.9
3.	Empty	450.0	414.9	35.1
4.	Silica gel	680.7	666.0	14.7
5.				
6.	Aspirated			
7.	Aspirated = 10.370			
8.				

⇒ MW = 28.01



VISIBLE EMISSIONS OBSERVATION FORM

*1 Battery Stack Test
Day 1 Page 1

SERVER: Robert J. Cox

DATE: 9/29/93 Wednesday

ACTIVITY: USX-Clairton Works

OBSERVATION START TIME: 13:30 pm

END TIME: 14:30 pm

OBSERVATION POINT:

W. of Oak Ridge Paper Mill

SOURCE: *1 Battery Stack

DISTANCE: @ 600'

DIRECTION FROM: NW

HEIGHT: @ 200'

WIND:

SPEED: 9 mph

DIRECTION: NW

TEMPERATURE: 55°F

SKY CONDITION: Mostly Cloudy

BACKGROUND: Sky

READING CONDITIONS: Good

COLOR OF EMISSIONS: black

TOTAL # OF READINGS: 240

NO. READINGS 0 - 1% 240

NO. READINGS 20% 0

NO. READINGS 25 - 50% 0

NO. READINGS 60 - 100% 0

NO. READINGS > 20% 0

GREATEST OPACITY: 10%

COMMENTS:

13:30

	: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	5	5	5
05	5	5	5	5
06	0	0	0	0
07	0	0	0	0
08	0	5	5	5
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

14:00

	: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	5	5	10
49	10	10	5	5
50	0	5	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

10

20

VISIBLE EMISSIONS OBSERVATION FORM

#1 Battery Stack Test
Day 1 Page 3

RESERVER: Robert Y. Gou

DATE: 9/29/93 Wednesday

FACILITY: USX-Clinton Works

OBSERVATION START TIME: 15:30 pm

END TIME: 16:05 pm

OBSERVATION POINT:

N.W. of Ali Pipe Shop along roadway

SOURCE: #1 Battery Stack

DISTANCE: @ 600'

DIRECTION FROM: N.W.

HEIGHT: @ 200'

WIND:

SPEED: 9 mph

DIRECTION: West

TEMPERATURE: 53°F

SKY CONDITION: Mostly Cloudy

BACKGROUND: Sky

READING CONDITIONS: Good

COLOR OF EMISSIONS: NA

TOTAL # OF READINGS: 140

NO. READINGS 0 - 1% 140

NO. READINGS 2% 0

NO. READINGS 25 - 5% 0

NO. READINGS 50 - 10% 0

NO. READINGS > 20% 0

GREATEST OPACITY: 0 %

COMMENTS:

End Test 16:05 pm

Test 1: 9/29/93 - 13:30 pm - 14:05 pm

	: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

16:00

16:05
END

	: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				
36				
37				
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40				
41				
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57				
58				
59				

VISIBLE EMISSIONS OBSERVATIONS FORM

/ STACK

OBSERVER: Rat Malone

DATE: 9-30-93

FACILITY: USS - Clinton

OBSERVATION: START TIME: 9:35
END TIME: 10:35

OBSERVATION POINT:
Maple Ave. Lot

SOURCE: #1 STACK

DISTANCE: ~850 ft.

DIRECTION FROM: SW

HEIGHT: ~200 ft.

WIND:

SPEED: 12 mph

DIRECTION: NW

TEMPERATURE: 45°

SKY CONDITION: Broken Clouds

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: —

TOTAL NO. OF READINGS: 240

NO. READINGS $\geq$ 20%: —

NO. READINGS $\geq$ 60%: —

GREATEST OPACITY: 0%

CREW: B FOREMAN: ZALUC

COMMENTS: —

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	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

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 OBSERVATIONS FORM

1 STACK

OBSERVER: Pat Malone

DATE: 9-30-93

FACILITY: USS - Clinton

OBSERVATION: START TIME: 10:35

END TIME: 11:09

OBSERVATION POINT:

Maple Ave Lot

SOURCE: #1 Stack

DISTANCE: ~850 ft.

DIRECTION FROM: SW

HEIGHT: ~200 ft.

WIND:

SPEED: 9 mph

DIRECTION: North

TEMPERATURE: 46°

SKY CONDITION: Scattered Clouds

BACKGROUND: Sky

READING CONDITIONS: Fine

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 136

No. READINGS $\geq$ 20% —

No. READINGS $\geq$ 60% —

GREATEST OPACITY: 0%

CREW: B FOREMAN ZACUT

COMMENTS: —

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	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

30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34				
35				
36				
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59				

VISIBLE EMISSIONS OBSERVATIONS FORM

1 STACK

OBSERVER: Pat Malone

DATE: 9-30-93

FACILITY: USS - Claiborne

OBSERVATION: START TIME: 11:25

END TIME: 12:25

OBSERVATION POINT:

Maple Ave lot

SOURCE: #1 STACK

DISTANCE: ~ 850 ft.

DIRECTION FROM: SW

HEIGHT: ~ 200 ft.

WIND:

SPEED: 9 mph

DIRECTION: North

TEMPERATURE: 46°

SKY CONDITION: Scattered Clouds

BACKGROUND: Sky

READING CONDITIONS: Fair

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS $\geq$ 20% —

No. READINGS $\geq$ 60% —

GREATEST OPACITY: 0%

CREW: B FOREMAN: ZACW

COMMENTS: —

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	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

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

PRE-TEST MAGNEHELIC CALIBRATION

BOX# 7

DATE 05-17-93

OPERATOR RPC

0 to 10" H2O RANGE

MAGNEHELIC	ΔP	MANOMETER
	0.50	0.50
	1.00	1.00
	2.00	2.00
	4.00	4.00
	6.00	6.00
	8.00	8.00

0 to 0.50" H2O RANGE

MAGNEHELIC	ΔP	MANOMETER
	0.50	---
	0.40	---
	0.30	---
	0.20	---
	0.10	---

0 to 3" H2O RANGE

MAGNEHELIC	ΔH	MANOMETER
	3.00	3.00
	2.00	2.00
	1.00	1.00
	0.50	0.50

Calibration not necessary.
Primary standard on control box.

PRE-TEST LEAK CHECK

DATE 05-17-93

OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	38.650	38.878	0.228	10.000	-0.003
WET	0.000	0.202	0.202		

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 05-17-93

OPERATOR RPC

VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	41.0
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	299.0
8.31	400	399.0
10.57	500	498.0

POST-TEST MAGNEHELIC CALIBRATION

BOX# 7

DATE 10-22-93

OPERATOR RPC

0 to 10" H2O RANGE

MAGNEHELIC	ΔP	MANOMETER
	0.50	0.50
	1.00	1.00
	2.00	2.00
	4.00	4.00
	6.00	6.00
	8.00	8.00

0 to 0.50" H2O RANGE

MAGNEHELIC	ΔP	MANOMETER
	0.50	---
	0.40	---
	0.30	---
	0.20	---
	0.10	---

0 to 3" H2O RANGE

MAGNEHELIC	ΔH	MANOMETER
	3.00	3.00
	2.00	2.00
	1.00	1.00
	0.50	0.50

Calibration not necessary.
Primary standard on control box.

POST-TEST LEAK CHECK

DATE 10-22-93

OPERATOR RPC

	START CF	STOP CF	VOLUME CF	TIME (min)	LEAK RATE
DRY	338.001	338.200	0.199	10.000	-0.0004
WET	0.000	0.195	0.195		

PYROMETER CALIBRATION

DATE 04-28-88

OPERATOR AGL

POST-TEST PYROMETER CHECK

DATE 10-22-93

OPERATOR RPC

VOLTAGE INPUT (mV)	ARGE TEMP (°F)	TEMP READING (°F)	VOLTAGE INPUT (mV)	TARGET TEMP (°F)	TEMP READING (°F)
0.18	40	40.0	0.18	40	40.0
0.40	50	50.0	0.40	50	50.0
0.84	70	70.0	0.84	70	70.0
1.29	90	90.0	1.29	90	90.0
1.74	110	110.0	1.74	110	110.0
2.66	150	150.0	2.66	150	150.0
3.82	200	200.0	3.82	200	200.0
6.09	300	301.0	6.09	300	300.0
8.31	400	400.0	8.31	400	400.0
10.57	500	500.0	10.57	500	502.0

QA ORIFICE AUDIT

ORIFICE BAPC-3 DATE 11-22-93 B.P. 29.20
 OPERATOR RPC BOX # 7

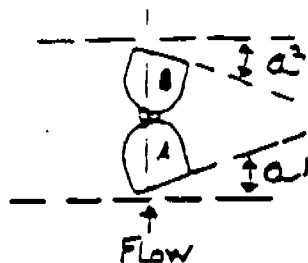
RUN	1	2	3
INITIAL CF	445.800	453.700	461.600
FINAL CF	453.420	461.370	469.224
DIFFERENCE	7.620	7.670	7.624
TEMP INITIAL	IN 80 OUT 70	IN 81 OUT 71	IN 82 OUT 73
TEMP 5 MIN	80	82	83
TEMP 10 MIN	81	82	84
TEMP 15 MIN	81	82	84
TEMP AVG	75.5	77.125	78.875
	TEMP R 535.5	TEMP R 537.125	TEMP R 538.875
TIME (MIN.)	15.00	15.00	15.00
ORIFICE	IN WATE 0.70 IN HG 0.05	IN WATER 0.70 IN HG 0.05	IN WATER 0.70 IN HG 0.05
METER PRESSURE	29.25	29.25	29.25
AMBIENT TEMP.	°F 75.0 °C 23.9	°F 75.0 °C 23.9	°F 75.0 °C 23.9
VACUUM IN HG	21.0	21.0	21.0
DGM CAL Y	0.9619	0.9619	0.9619
STD CF	7.092	7.117	7.052
STD CUBIC METERS	0.2009	0.2016	0.1997

GEOMETRIC PITOT CALIBRATION

Caliper # XFS-59
 Precheck _____
 Post Check _____

Probe #: 10-1
 Date: 8-12-93
 Initials: [Signature]

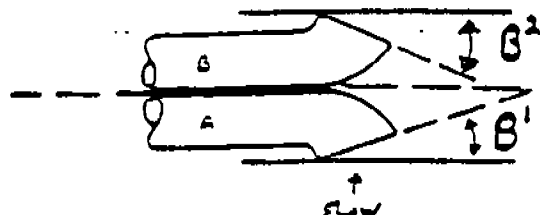
①



$a^1 = 0$
 $a^2 = 0.5^\circ$
 $B^1 = 1.5^\circ$
 $B^2 = 1.0^\circ$
 $F = 0.980$

$a^1, a^2 = < 10^\circ$
 $B^1, B^2 = < 5^\circ$

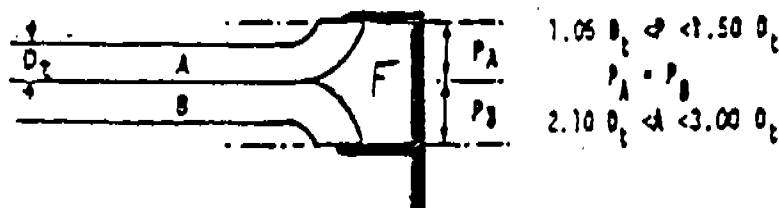
②



$\mu = 0.0175$
 $V = 0.026$
 $W = 0.237$

$\mu \leq 0.1250^\circ (\mu = F \tan \theta)$
 $V \leq 0.03125^\circ (V = F \tan \theta)$
 $W \geq 0$

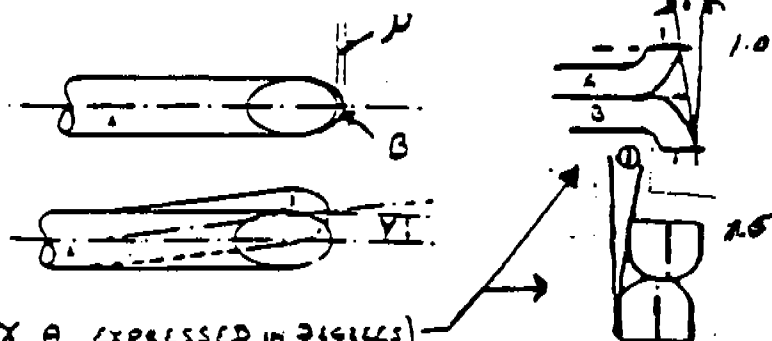
③



$Y = 6.000$
 $Z = 2.500$
 $D_t = 0.374$

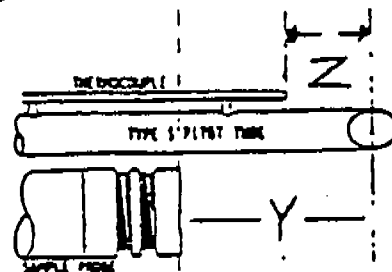
$Y \geq 3.0^\circ$
 $Z \geq 2.0^\circ$
 $D_t \geq .1875$

④

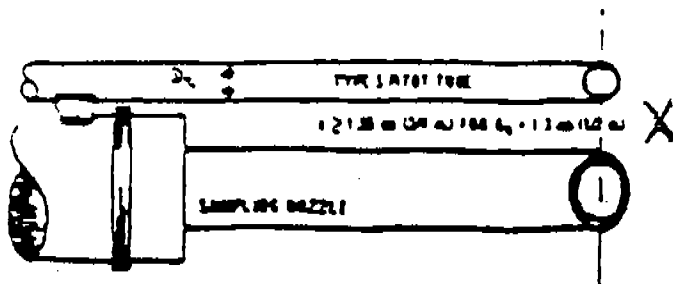


(θ, θ EXPRESSED IN DEGREES)

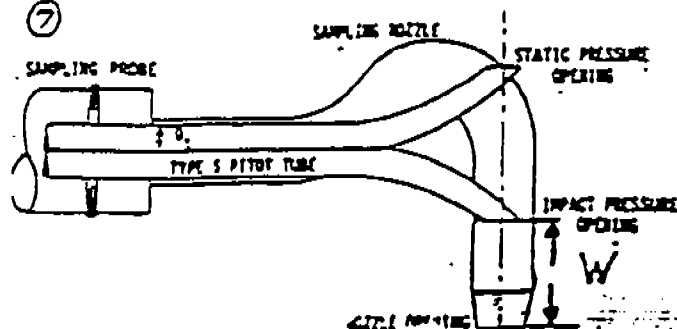
⑤



⑥



⑦

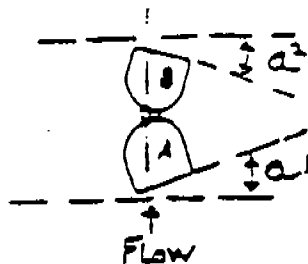


GEOMETRIC PITOT CALIBRATION

Caliper # XEF-59
Precheck _____
Post Check _____

Probe #: 10-1
Date: 10-11-93
Initials: gm

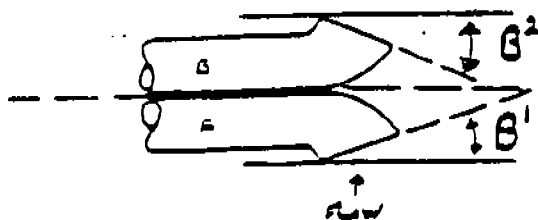
①



$$\begin{aligned} \alpha^1 &= 1.0^\circ \\ \alpha^2 &= 3.0^\circ \\ B^1 &= 1.0^\circ \\ B^2 &= 2.0^\circ \\ F &= 0.975'' \end{aligned}$$

$\alpha^1, \alpha^2 = < 10^\circ$
 $B^1, B^2 = < 5^\circ$

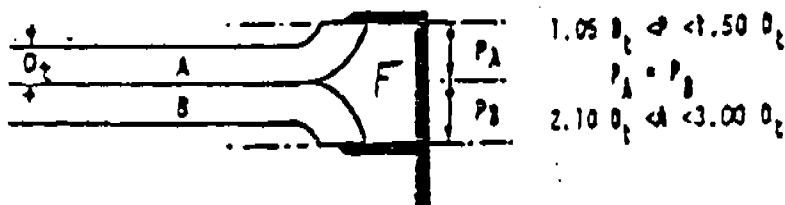
②



$$\begin{aligned} \mu &= 0.340 \\ V &= 0 \\ W &= 0.278 \end{aligned}$$

$\mu \leq 0.1250^\circ (\mu = F \tan \gamma)$
 $V \leq 0.03125^\circ (V = F \tan \theta)$
 $W \geq 0''$

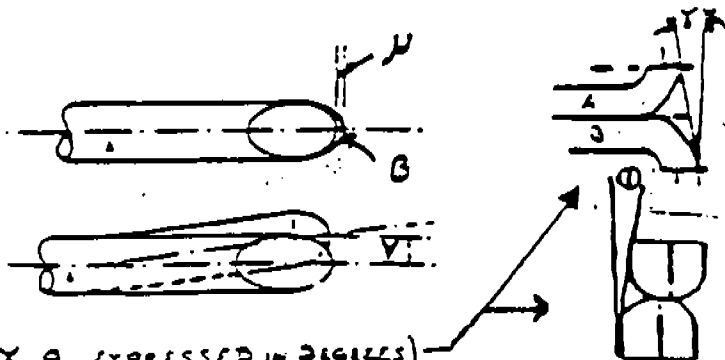
③



$$\begin{aligned} Y &= 6.000 \\ Z &= 3.264 \\ D_1 &= 0.374 \end{aligned}$$

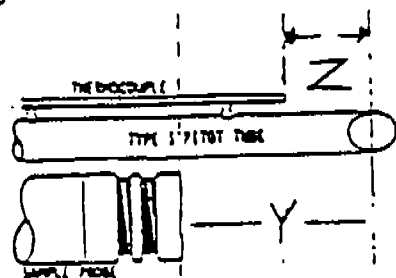
$Y \geq 3.0''$
 $Z > 2.0''$
 $D_1 > .1875''$

④

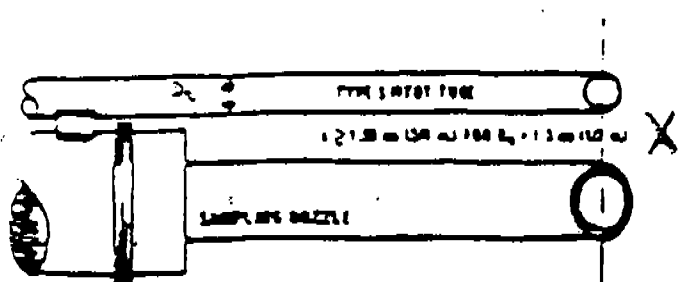


(γ, θ EXPRESSED IN DEGREES)

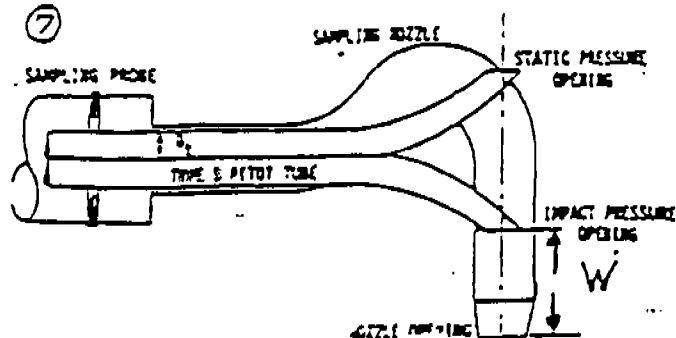
⑤



⑥



⑦



**COMPLIANCE DEMONSTRATION
NO. 1 BATTERY COMBUSTION STACK
USS CLAIRTON WORKS**

**USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA**

**APPENDIX B
PLANT OPERATIONAL DATA**

CO-10725 Rev. 1161
23 101, 1010

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 1

12 hrs. Beginning 12:00 P.M.

Date 9-29-72

BATTERY NO. <u>B-2</u>				BATTERY NO. <u>A-1</u>				BATTERY NO. <u>C-1</u>			
OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	7:10	7:39		1	1:30	1:33		1			
3	7:20	7:50		3	1:43	1:46		3			
5	7:30	8:09		5	1:54	1:59		5			
7	7:41	8:35		7	2:04	2:07		7			
9	7:52	8:50		9	2:15	2:18		9			
11	8:01	9:00		11	2:26	2:30		11			
13	8:11	9:11		13	2:37	2:41		13			
15	8:22	9:22		15	2:42	2:50		15			
17	8:33	9:33		17	2:57	2:59		17			
19	8:43	9:43		19	3:10	3:13		19			
21	8:53	9:53		21	3:20	3:23		21			
23	9:05	10:04		23	3:30	3:33		23			
25	9:15	10:15		25	3:40	3:43		25			
27	9:25	10:20		27	3:50	3:53		27			
29	10:06	10:35		29	4:04	4:12		29			
(31)	10:17	X X	WAKE	31	4:14	4:22		31			
2				2	10:37	11:06		2	4:30	4:38	
4				4	10:48	11:11		4	4:40	4:48	
6				6	10:58	11:23		6	4:50	4:57	
8				8	11:08	11:11		8	5:00	5:07	
10				10	11:13	11:23		10	5:10	5:18	
12				12	11:25	11:28		12	5:20	5:28	
14				14				14	5:30	5:38	
16				16				16	5:40	5:48	
18				18				18	5:50	5:59	
20		12:38		20				20	6:01	6:09	
22		12:51		22				22	6:11	6:19	
24		12:58		24				24	6:21	6:29	
26	12:35	1:33		26				26	6:31	6:39	
28				28				28	6:41	6:49	
30	12:48	1:46		30				30	6:51	6:55	
5/1	12:55	1:50						5/1	6:57	7:08	
5/2	10:22	10:57						2			

REMARKS:

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	3	3		5-7	7	6	
1-2	3	6		7-8	5	3	
2-3	6	6		8-9	3	3	
3-4	5	5		9-10	6	6	
4-5	5	5		10-11	6	5	
5-6	6	6		11-12	3	5	
	28	31			30	29	

Total Ovens Pushed 58

Total Ovens Charged 60

Pusherman

Battery Foreman

741

CC-10295 REV 1161
01 001 0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 1

12 Hrs. Beginning 12:00 PM

Date 6-20-73

BATTERY NO. 12-3				BATTERY NO. 13-3				BATTERY NO. 14-3			
OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1		48		1	55	2		1			
3		39		3	25	2		3			
5	25	8 38		5	12	2		5			
7	25	8 43		7	2	50		7			
9		58		9	2	10		9			
11		0 10		11	2	20		11			
13	21	80	PR	13	2	20		13			
15		32		15	2	40		15			
17	26	42	PR	17	2	15		17			
19	28	9 52		19	2	05		19			
21	2	10 04		21	3	15		21			
23	4	14		23	3	25		23			
25	4	28		25	3	25		25			
27	4	40		27	7	45		27			
29	4	44		29	3	51		29			
31	4	11		31	4	10		31			
2				2	10	26		2	4	5	57
4				4	15	38		4	4	25	57
6				6	15	42		6	4	45	57
8				8	15	03		8	4	55	57
10				10	5	2		10	5	65	57
12				12	11	20		12	5	15	57
14				14				14	5	25	57
16				16				16	5	35	57
18				18				18	5	45	57
20		2 05		20				20	5	55	57
22		1 12		22				22	6	02	57
24				24				24	6	12	57
26	1	23		26				26	6	22	57
28	1	27		28				28	6	32	57
30	1	31		30				30	6	42	57
1				1				1			
2				2	11	28	4 47	2			

REMARKS:

11/22 22/20 11/15 41 42
15 15 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
12-1	5	5		6-1	5	5	
1-2	6	6		7-8	6	6	
2-3	6	6		8-9	6	6	
3-4	6	6		9-10	5	5	
4-5	6	5		10-11	5	5	
5-6	6	6		11-12	2	4	
	30	29			26	28	

Total Ovens Pushed 56
Total Ovens Charged 57

Pusherman
Battery foreman

94w

CO-10722 Rev. 1161
33 301 0510

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 1

12 Hrs. Beginning 12:00 P.M.

Date 2-1-58

BATTERY NO. <u>1</u>				BATTERY NO. <u>2</u>				BATTERY NO. <u>3</u>			
OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1				1				1			
3				3				3			
5				5				5			
7				7				7			
9	12:00	12:10		9				9	12:05	12:15	
11	12:10	12:20		11				11	12:15	12:25	
13	12:20	12:30		13				13	12:25	12:35	
15	12:30	12:40		15				15	12:35	12:45	
17	12:40	12:50		17				17	12:45	12:55	
19	12:50	1:00		19				19	12:55	1:05	
21	1:00	1:10		21				21	1:05	1:15	
23	1:10	1:20		23				23	1:15	1:25	
25	1:20	1:30		25				25	1:25	1:35	
27	1:30	1:40		27				27	1:35	1:45	
29	1:40	1:50		29				29	1:45	1:55	
31	1:50	2:00		31				31	1:55	2:05	
2	9:55	10:05		2	2:10	2:20		2			
4	10:05	10:15		4	2:20	2:30		4			
6	10:15	10:25		6	2:30	2:40		6			
8	10:25	10:35		8	2:40	2:50		8			
10	10:35	10:45		10	2:50	3:00		10			
12	10:45	10:55		12	3:00	3:10		12			
14	10:55	11:05		14	3:10	3:20		14			
16	11:05	11:15		16	3:20	3:30		16			
18	11:15	11:25		18	3:30	3:40		18			
20	11:25	11:35		20	3:40	3:50		20			
22	11:35	11:45		22	3:50	4:00		22			
24	11:45	11:55		24	4:00	4:10		24			
26				26	4:10	4:20		26			
28				28	4:20	4:30		28			
30				30	4:30	4:40		30			
1				1				1			
2	12:00	12:10		2				2	12:05	12:15	

REMARKS:

25/26 15/15 17/17 40/41
Condition of Signals Condition of Pusher 17/17 57/58

DETAILED REPORT OF OPERATION

TIME	Ovens Pushed	Ovens Charged	Ovens Scheduled	TIME	Ovens Pushed	Ovens Charged	Ovens Scheduled	
12-1	1	1		6-7	5	6		
1-2	2	2		7-8	3	3		Total Ovens Pushed 57
2-3	3	3		8-9	4	4		Total Ovens Charged 58
3-4	4	4		9-10	2	2		
4-5	5	5		10-11	5	4		Pusherman
5-6	6	6		11-12	6	4		Battery Foreman <u>RAH</u>
	32	35			25	23		

10-12285 4/1 1161
03 001.0026

UNITED STATES STEEL CORPORATION
CLAIRTON CORE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 1

12 Hrs. Beginning 12:00 A.M.

Date 9-29-92

BATTERY NO. <u>A-3</u>				BATTERY NO. <u>B-3</u>				BATTERY NO. <u>A-2</u>			
OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1				1				1	5 21	5 49	
3				3				3	5 51	6 01	
5		5 09		5				5	5 41	6 11	
7		12 20		7				7	5 51	6 21	
9		12 30		9				9	6 03	6 31	
11	12 07	12 40		11				11	6 13	6 41	
13	12 48	12 50		13				13	6 30	7 -	
15	12 28	1 -		15				15	6 48	7 10	
17	12 38	1 10		17				17	6 50	7 20	
19	12 48	1 20		19				19	7 03	7 30	
21	12 58	1 30		21				21	7 13	7 40	
23	1 08	1 40		23				23	7 23	7 52	
25	1 18	1 50		25				25	7 33	8 02	
27	1 28	2 -		27				27	8 -5	8 14	
29	1 38	2 10		29				29	8 15	8 45	
31	1 48	2 20		31				31	5 15	6 00	
2	1 30	2 40		2	2 03	2 42		2			
4	2 10	2 28		4	2 13	2 52		4			
6	2 40	3 22		6	2 30	3 02 AB		6			
8	2 18	3 42		8	2 40	3 12		8			
10	2 12	3 00		10	2 50	3 22		10			
12	10 40	11 17		12	3 -	3 32		12			
14	10 55	11 27		14	3 10	3 42		14			
16	11 25	11 58		16	3 20	3 52		16			
18	11 35	12 07		18	3 30	4 03		18			
20	11 45	12 17		20	3 40	4 13		20			
22	11 55	12 27		22	3 50	4 23		22			
24	12 05	12 37		24	4 05	4 38		24			
26				26	4 15	4 48		26			
28				28	4 25	5 00		28			
30				30	4 35	5 10		30			
1				1	4 45	5 20		1			
2				2	4 55	5 30		2			

REMARKS: 23/10 16/16 16/16 35 16 55

Condition of Signals _____ Condition of Pusher _____

HOURLY REPORT OF OPERATION							
TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	6	6		6-7	5	5	
1-2	5	5		7-8	4	4	
2-3	5	5		8-9	3	4	
3-4	6	6		9-10	4	3	
4-5	3	3		10-11	3	3	
5-6	6	6		11-12	5	5	
	31	31			24	24	

Total Ovens Pushed 55
Total Ovens Charged 55
Pusherman _____
Battery Foreman JAN

CO-10295 REV 1/61
 23 OCT 1962

UNITED STATES STEEL CORPORATION
 CLAYTON CORE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 1

12 Hrs. Beginning 12:00 AM

Date G-30-93

BATTERY NO. <u>B-2</u>				BATTERY NO. <u>A-1</u>				BATTERY NO. <u>B-1</u>			
OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1				1	9 40	9 43	✓	1	1 50	1 50	✓
3				3	9 50	8 54	✓	3	2 08	2 10	✓
5				5	9 04	9 07		5	2 18	2 20	✓
7				7	9 15	9 18		7	2 35	2 30	✓
9				9	9 20	9 23		9	10 35	10 38	✓
11				11	9 47	9 51		11	2 50	3 03	✓
13				13	10 10	10 13		13	3 10	3 12	✓
15				15	10 20	10 23		15	3 20	3 22	✓
17				17	10 45	10 48		17	3 30	3 32	✓
19				19	10 53	10 58		19	3 46	3 48	✓
21				21	11 10	11 13		21	3 50	3 51	✓
23				23	11 22	11 25		23	4 32	4 34	✓
25				25	11 35	11 38		25	4 44	4 46	✓
27				27	11 48	11 51		27	4 53	4 55	✓
29				29	11 56	11 59		29	5 06	5 08	✓
31		2 05	✓	31				31	5 16	5 18	✓
2	5 35	6 07	✓	2				2			
4	5 45	6 23	✓	4				4			
6	5 55	6 34	✓	6				6			
8	6 09	6 44	✓	8				8			
10	6 25	6 56	✓	10				10			
12	6 36	7 08	✓	12				12			
14	6 46	7 18	✓	14	12 10	12 12	✓	14			
16	6 58	7 28	✓	16	12 22	12 24	✓	16			
18	7 10	7 38	✓	18	12 32	12 34	✓	18			
20	7 20	7 48	✓	20	12 42	12 44	✓	20			
22	7 30	8 02	✓	22	12 50	12 54	✓	22			
24	7 40	8 08	✓	24	1 04	1 06	✓	24			
26	7 50	8 10	✓	26	1 18	1 20	✓	26			
28	8 46	8 50	✓	28	1 30	1 32	✓	28			
30	8 14	8 17	✓	30	1 48	1 50	✓	30			
32	8 25	8 29	✓	32				32			
34				34				34	5 01	5 02	✓
36				36				36			
38				38				38			
40				40				40			
42				42				42			
44				44				44			
46				46				46			
48				48				48			
50				50				50			
52				52				52			
54				54				54			
56				56				56			
58				58				58			
60				60				60			
62				62				62			
64				64				64			
66				66				66			
68				68				68			
70				70				70			
72				72				72			
74				74				74			
76				76				76			
78				78				78			
80				80				80			
82				82				82			
84				84				84			
86				86				86			
88				88				88			
90				90				90			
92				92				92			
94				94				94			
96				96				96			
98				98				98			
100				100				100			

REMARKS: <u>16/</u>	<u>24/</u>	<u>17/</u>	<u>57</u>
<u>17</u>	<u>24</u>	<u>17</u>	<u>58</u>

Condition of Signals				Condition of Pusher			
HOURLY REPORT OF OPERATION							
TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
1-1	5	5		9-7	5	6	
1-2	5	5		1-8	5	5	
2-3	5	5		8-9	4	7	
3-4	5	5		9-10	4	4	
4-5	3	3		10-11	5	5	
5-6	6	3		11-12	5	5	
29	26			28	32		

Total Ovens Pushed	57
Total Ovens Charged	58
Pusherman	
Battery Foreman	<i>[Signature]</i>

UNITED STATES STEEL CORPORATION
CLAIRTON CORE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 1

12 Hrs. Beginning 12:00 A.M.

Date 12/15/55

BATTERY NO. 1				BATTERY NO. 2				BATTERY NO. 3			
OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1				1	7 30	7 27		1	1 52	2 31	
3				3	7 45	7 32		3	2 1	2 38	
5				5	7 55	7 42		5	2 12	2 45	
7				7	7 10	7 15		7	2 27	3 1	
9				9				9	2 42	3 10	
11				11				11	2 52	3 20	
13				13	7 25	7 25		13	3 02	3 30	
15				15	7 30	7 52		15	3 12	3 40	
17				17	10 35	11 10		17	3 22	3 50	
19				19	10 50	11 12		19	3 32	4 34	
21				21	11 05	11 22		21	3 42	4 44	
23				23	11 15	11 32		23	3 52	4 54	
25				25	11 30	11 55		25	4 06	5 08	
27				27	11 40			27	4 46	5 30	
29				29	11 50			29	4 56	5 43	
31				31				31	5 10	5 53	
2	5 27	6 04		2				2			
4	5 40	6 15		4				4			
6	5 50	6 28		6				6			
8	6 02	6 38		8		12 06		8			
10	6 13	6 48		10	6 19			10			
12	6 30	6 54		12		12 27		12			
14	6 40	7 14		14	12 04	12 38		14			
16	6 50	7 24		16	12 16	12 59		16			
18	7 02	7 34		18	12 25	1 07		18			
20	7 12	7 44		20	12 36	1 14		20			
22	7 22	7 55		22	12 45	1 32		22			
24	7 32	8 05		24	12 57	1 40		24			
26	7 42	8 13		26	1 09	1 49		26			
28	8 00	8 31		28	1 24	1 58		28			
30	8 10	8 41		30	1 34	2 10		30			
1				1	1 42	2 22		1			
2				2				2			

REMARKS: 15/ 24/ 16/ 55
15/ 23/ 16/ 54

Condition of Signals Condition of Posner

HOURLY REPORT OF OPERATION							
TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED	TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	6	4		8-7	6	6	
1-2	5	6		7-8	5	4	
2-3	5	5		6-8	5	4	
3-4	6	6		9-10	3	4	
4-5	3	3		10-11	2	3	
5-6	4	4		11-12	5	5	
	29	28			26	26	

Total Ovens Pushed 55
Total Ovens Charged 54
Pusherman
Battery Foreman

CC-10295 REV 1161
23.001.0023

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 1

12 Hrs. Beginning 12:00 PM

Date 9-29-92

BATTERY NO. 15-2				BATTERY NO. 17-1				BATTERY NO. 19-1			
OVER NO.	TIME PUSHED	TIME CHARGED	NOTES	OVER NO.	TIME PUSHED	TIME CHARGED	NOTES	OVER NO.	TIME PUSHED	TIME CHARGED	NOTES
1	4:05	4:35	1					1	10:04	10:32	13
3	4:15	4:45	3					3	10:14	10:42	15
5	4:27	4:56	5					5	10:24	10:52	17
7	4:37	5:06	7					7	10:34	11:02	19
9	4:47	5:16	9					9	X	X	10:5-11
11	4:58	5:27	11					11	10:44	11:12	
13	5:08	5:37	13					13	10:54	11:22	
15	5:18	5:47	15					15	11:04	11:32	
17	5:29	5:58	17					17	11:14		
19	5:39	6:09	19					19	11:24		
21	5:50	6:19	21					21			
23	6:00	6:29	23					23			
25	6:11	6:40	25					25			
27	6:21	6:50	27					27			
29	6:31	7:01	29					29			
31	9:43	X	X					31			
				12	12:45	12:48					
				14	6:52	7:22	32	2	1:05	1:08	
				16	7:03	7:31	35	4	1:16	1:19	
				18	7:14	7:37	37	6	1:27	1:30	
				20	7:24	7:48	39	8	1:40	1:43	
				22	7:29	8:28	40	10	1:50	1:53	
				24	7:39	8:38	42	12	2:01	2:05	
				26	7:50	8:48	44	14	2:11	2:14	
				28	8:30	8:58	46	16	2:24	2:28	
				30	8:40	9:08	48	18	2:35	2:39	
				32	8:50	9:21	50	20	2:48	2:51	
				34	9:00	9:31	52	22	2:57	2:59	
				36	9:10	9:52	54	24	3:10	3:15	
				38	9:23	10:01	56	26	3:20	3:23	
				40	9:33	10:12	58	28	3:30	3:34	
				42	9:54	10:22	61	30	3:40	4:19	
								32	3:48	4:31	

REMARKS:

Condition of Signals: Condition of Pusher:

HOURLY REPORT OF OPERATION							
TIME	Ovens Pushed	Ovens Charged	Ovens Scheduled	TIME	Ovens Pushed	Ovens Charged	Ovens Scheduled
12-1	1	1		6-7	6	5	
1-2	5	5		7-8	6	6	
2-3	6	6		8-9	3	4	
3-4	5	5		9-10	6	4	
4-5	6	6		10-11	6	6	
5-6	6	6		11-12	2	2	
	28	26			29	27	

Total Ovens Pushed 57
Total Ovens Charged 58
Pusherman
Battery Foreman

UNITED STATES STEEL CORPORATION
CLAIRTON CORE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 1

12 Hrs. Beginning 12:00 --M

Date 2-2-57

BATTERY NO. 1				BATTERY NO. 2				BATTERY NO. 3			
OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES	OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	4 15	4 34		1				1	9 56	10 22	
2	4 10	4 44		2				2	10 08	10 40	
3	4 21	4 56		3				3	10 18	10 48	
4	4 32	5 06		4				4	10 30	10 54	
5	4 42	5 16		5				5	10 38	11 07	
6	4 53	5 26		6				6	10 46	11 17	
7	5 04	5 37		7				7	10 52	11 27	
8	5 14	5 47		8				8	11 05		
9	5 25	6 07		9				9	11 15		
10	5 35	6 17		10				10	11 25		
11	5 45	6 37		11				11			
12	5 55	6 37		12				12			
13	6 05	6 38		13				13			
14	6 15	6 48		14				14			
15	6 25	6 58		15				15			
16	6 36	7 10		16				16			
17				17	12 40	1 05		17			
18				18	6 46	7 22		18	1 05	1 42	
19				19	6 56	7 37		19	1 15	1 47	
20				20	7 08	7 47		20	1 20	1 57	
21				21	7 20	7 57		21	1 30		
22				22				22	1 45	2 10	
23				23				23	1 55		
24				24				24	2 05	2 37	
25				25				25	2 15	2 47	
26				26				26	2 25	2 57	
27				27				27	2 35	3 07	
28				28				28	2 45	3 18	
29				29				29	2 55	3 30	
30				30				30	3 05	3 40	
31				31				31	3 15	3 50	
32				32				32	3 25	3 58	
33				33				33	3 35	4 12	
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99				99				99			
100				100				100			

REMARKS: 16/ 17/ 25/ 58
11/2 11/19 22/ 57

Condition of Signals Condition of Pusher

HOURLY REPORT OF OPERATION

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

Total Ovens Pushed 58
Total Ovens Charged 57

Pusherman
Battery Foreman

Supplies: 1-1-2

19:24	7:44am	7:54am	8:04am
19:24	7:38am	7:48am	7:58am
19:24	7:32am	7:42am	7:52am
19:24	7:26am	7:36am	7:46am
19:24	7:20am	7:30am	7:40am
19:24	7:14am	7:24am	7:34am
19:24	7:08am	7:18am	7:28am
19:24	7:02am	7:12am	7:22am
19:24	6:56am	7:06am	7:16am
19:24	6:50am	7:00am	7:10am
19:24	6:44am	6:54am	7:04am
19:24	6:38am	6:48am	6:58am
19:24	6:32am	6:42am	6:52am
19:24	6:26am	6:36am	6:46am
19:24	6:20am	6:30am	6:40am
19:24	6:14am	6:24am	6:34am
19:24	6:08am	6:18am	6:28am
19:24	6:02am	6:12am	6:22am
19:24	5:56am	6:06am	6:16am
19:24	5:50am	6:00am	6:10am
19:24	5:44am	5:54am	6:04am
19:24	5:38am	5:48am	5:58am
19:24	5:32am	5:42am	5:52am
19:24	5:26am	5:36am	5:46am
19:24	5:20am	5:30am	5:40am
19:24	5:14am	5:24am	5:34am
19:24	5:08am	5:18am	5:28am
19:24	5:02am	5:12am	5:22am
19:24	4:56am	5:06am	5:16am
19:24	4:50am	5:00am	5:10am
19:24	4:44am	4:54am	5:04am
19:24	4:38am	4:48am	4:58am
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19:24	4:14am	4:24am	4:34am
19:24	4:08am	4:18am	4:28am
19:24	4:02am	4:12am	4:22am
19:24	3:56am	4:06am	4:16am
19:24	3:50am	4:00am	4:10am
19:24	3:44am	3:54am	4:04am
19:24	3:38am	3:48am	3:58am
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19:24	3:14am	3:24am	3:34am
19:24	3:08am	3:18am	3:28am
19:24	3:02am	3:12am	3:22am
19:24	2:56am	3:06am	3:16am
19:24	2:50am	3:00am	3:10am
19:24	2:44am	2:54am	3:04am
19:24	2:38am	2:48am	2:58am
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19:24	1:02am	1:12am	1:22am
19:24	12:56am	1:06am	1:16am
19:24	12:50am	1:00am	1:10am
19:24	12:44am	12:54am	1:04am
19:24	12:38am	12:48am	12:58am
19:24	12:32am	12:42am	12:52am
19:24	12:26am	12:36am	12:46am
19:24	12:20am	12:30am	12:40am
19:24	12:14am	12:24am	12:34am
19:24	12:08am	12:18am	12:28am
19:24	12:02am	12:12am	12:22am
19:24	11:56am	12:06am	12:16am
19:24	11:50am	12:00am	12:10am
19:24	11:44am	11:54am	12:04am
19:24	11:38am	11:48am	11:58am
19:24	11:32am	11:42am	11:52am
19:24	11:26am	11:36am	11:46am
19:24	11:20am	11:30am	11:40am
19:24	11:14am	11:24am	11:34am
19:24	11:08am	11:18am	11:28am
19:24	11:02am	11:12am	11:22am
19:24	10:56am	11:06am	11:16am
19:24	10:50am	11	

2/-B31

+ B2S/2 after A4/1

Batteries: 1-3 ?

Page	Open	Last Passed	Earliest	Desired	Latest
70			7:55am	8:00am	8:00am
71			8:00am	8:05am	8:05am
72			8:05am	8:10am	8:10am
73			8:10am	8:15am	8:15am
74			8:15am	8:20am	8:20am
75			8:20am	8:25am	8:25am
76			8:25am	8:30am	8:30am
77			8:30am	8:35am	8:35am
78			8:35am	8:40am	8:40am
79			8:40am	8:45am	8:45am
80			8:45am	8:50am	8:50am
81			8:50am	8:55am	8:55am
82			8:55am	9:00am	9:00am
83			9:00am	9:05am	9:05am
84			9:05am	9:10am	9:10am
85			9:10am	9:15am	9:15am
86			9:15am	9:20am	9:20am
87			9:20am	9:25am	9:25am
88			9:25am	9:30am	9:30am
89			9:30am	9:35am	9:35am
90			9:35am	9:40am	9:40am
91			9:40am	9:45am	9:45am
92			9:45am	9:50am	9:50am
93			9:50am	9:55am	9:55am
94			9:55am	10:00am	10:00am
95			10:00am	10:05am	10:05am
96			10:05am	10:10am	10:10am
97			10:10am	10:15am	10:15am
98			10:15am	10:20am	10:20am
99			10:20am	10:25am	10:25am
100			10:25am	10:30am	10:30am
101			10:30am	10:35am	10:35am
102			10:35am	10:40am	10:40am
103			10:40am	10:45am	10:45am
104			10:45am	10:50am	10:50am
105			10:50am	10:55am	10:55am
106			10:55am	11:00am	11:00am
107			11:00am	11:02am	11:02am
108			11:05am	11:08am	11:08am
109			11:04am	11:14am	11:14am
110			11:10am	11:20am	11:20am
111			11:16am	11:26am	11:26am
112			11:22am	11:32am	11:32am
113			11:28am	11:38am	11:38am
114			11:34am	11:44am	11:44am
115			11:40am	11:50am	11:50am
116			11:46am	11:56am	11:56am
117			11:52am	12:03am	12:03am
118			11:58am	12:07am	12:07am
119			12:03am	12:13am	12:13am
120			12:09am	12:19am	12:19am
121			12:15am	12:25am	12:25am
122			12:21am	12:31am	12:31am
123			12:27am	12:37am	12:37am
124			12:33am	12:43am	12:43am
125			12:39am	12:49am	12:49am
126			12:45am	12:55am	12:55am
127			12:51am	1:01am	1:01am
128			12:57am	1:07am	1:07am
129			1:03am	1:13am	1:13am
130			1:09am	1:19am	1:19am
131			1:15am	1:25am	1:25am
132			1:21am	1:31am	1:31am
133			1:27am	1:37am	1:37am
134			1:33am	1:43am	1:43am
135			1:39am	1:49am	1:49am
136			1:45am	1:55am	1:55am
137			1:51am	2:01am	2:01am
138			1:57am	2:07am	2:07am
139			2:03am	2:13am	2:13am
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141			2:15am	2:25am	2:25am
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144			2:33am	2:43am	2:43am
145			2:39am	2:49am	2:49am
146			2:45am	2:55am	2:55am
147			2:51am	3:01am	3:01am
148			2:57am	3:07am	3:07am
149			3:03am	3:13am	3:13am
150			3:09am	3:19am	3:19am
151			3:15am	3:25am	3:25am
152			3:21am	3:31am	3:31am
153			3:27am	3:37am	3:37am
154			3:33am	3:43am	3:43am
155			3:39am	3:49am	3:49am
156			3:45am	3:55am	3:55am
157			3:51am	4:01am	4:01am
158			3:57am	4:07am	4:07am
159			4:03am	4:13am	4:13am
160			4:09am	4:19am	4:19am
161			4:15am	4:25am	4:25am
162			4:21am	4:31am	4:31am
163			4:27am	4:37am	4:37am
164			4:33am	4:43am	4:43am
165			4:39am	4:49am	4:49am
166			4:45am	4:55am	4:55am
167			4:51am	5:01am	5:01am
168			4:57am	5:07am	5:07am
169			5:03am	5:13am	5:13am
170			5:09am	5:19am	5:19am
171			5:15am	5:25am	5:25am
172			5:21am	5:31am	5:31am
173			5:27am	5:37am	5:37am
174			5:33am	5:43am	5:43am
175			5:39am	5:49am	5:49am
176			5:45am	5:55am	5:55am
177			5:51am	6:01am	6:01am
178			5:57am	6:07am	6:07am
179			6:03am	6:13am	6:13am
180			6:09am	6:19am	6:19am
181			6:15am	6:25am	6:25am
182			6:21am	6:31am	6:31am
183			6:27am	6:37am	6:37am
184			6:33am	6:43am	6:43am
185			6:39am	6:49am	6:49am
186			6:45am	6:55am	6:55am
187			6:51am	7:01am	7:01am
188			6:57am	7:07am	7:07am
189			7:03am	7:13am	7:13am
190			7:09am	7:19am	7:19am
191			7:15am	7:25am	7:25am
192			7:21am	7:31am	7:31am
193			7:27am	7:37am	7:37am
194			7:33am	7:43am	7:43am
195			7:39am	7:49am	7:49am
196			7:45am	7:55am	7:55am
197			7:51am	8:01am	8:01am
198			7:57am	8:07am	8:07am
199			8:03am	8:13am	8:13am
200			8:09am	8:19am	8:19am

- B28/2

Wednesday, September 19, 1990
 Batteries: 1-1

Dep #	Over	Last Pushed	Earliest	Desired	Latest
1					
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- B $\frac{10}{3}$ Banded

Thursday, September 20, 1990 Turn 1
Batteries: 1-10

Box #	Crew	Last Furnace	Earliest	Desired	Latest
1					
2					
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V-B9

B₂₅/2 after A₉/2

B₁₀/3 after B₁₀/2

Thursday, September 10, 1971

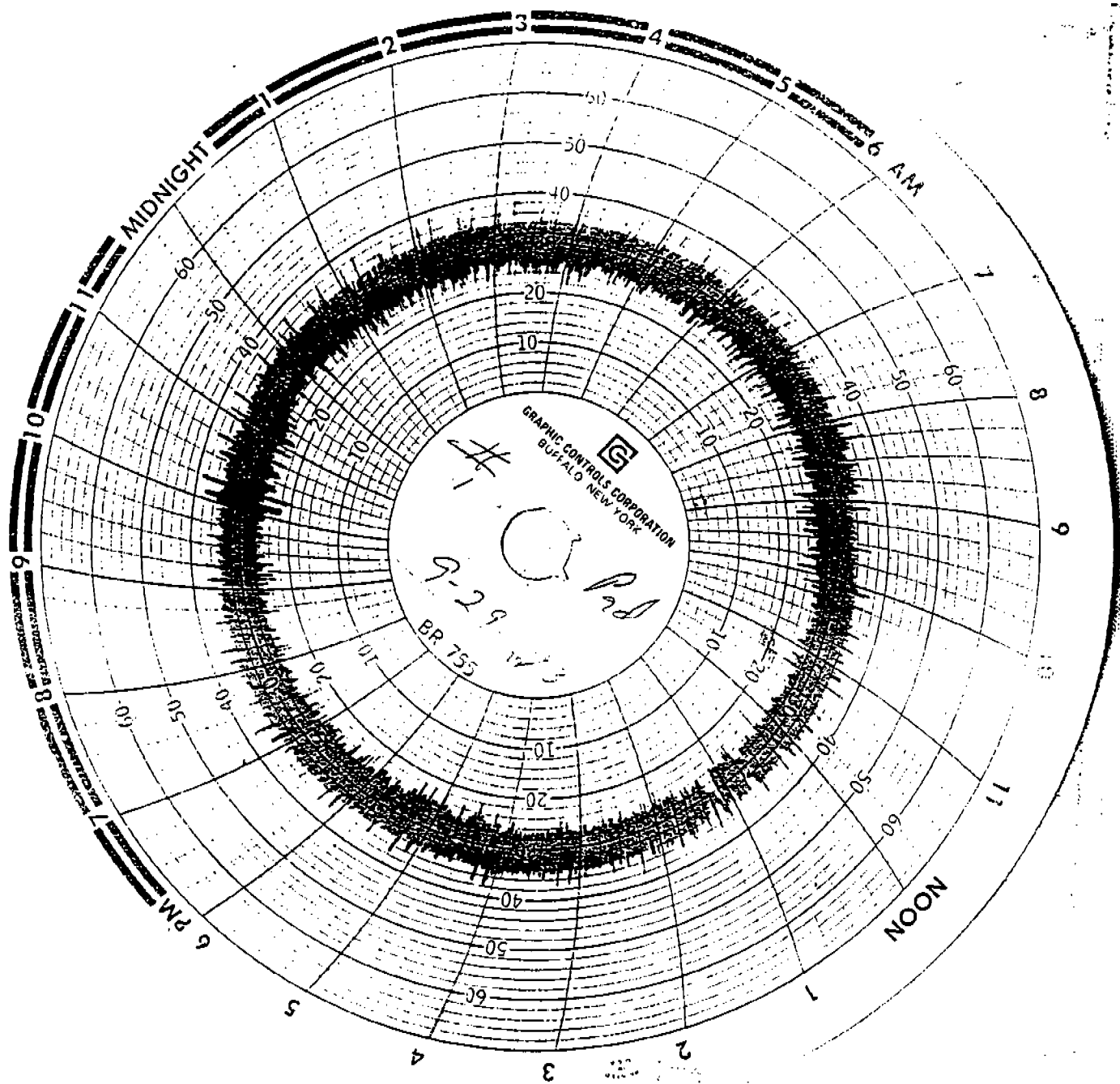
Batteries: 1-10

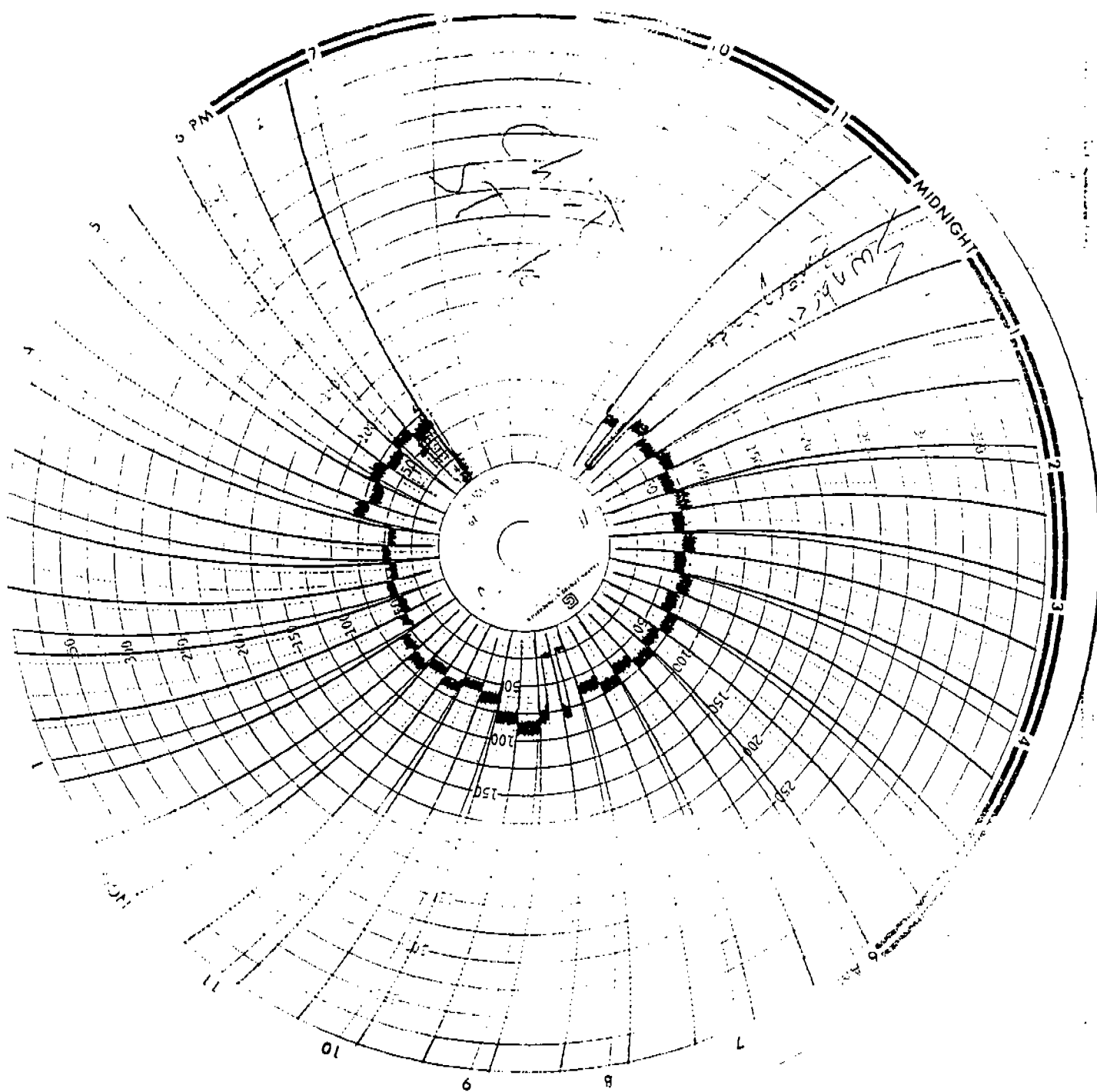
Sec	Oven	Last Pushed	Earliest	Seated	Latest
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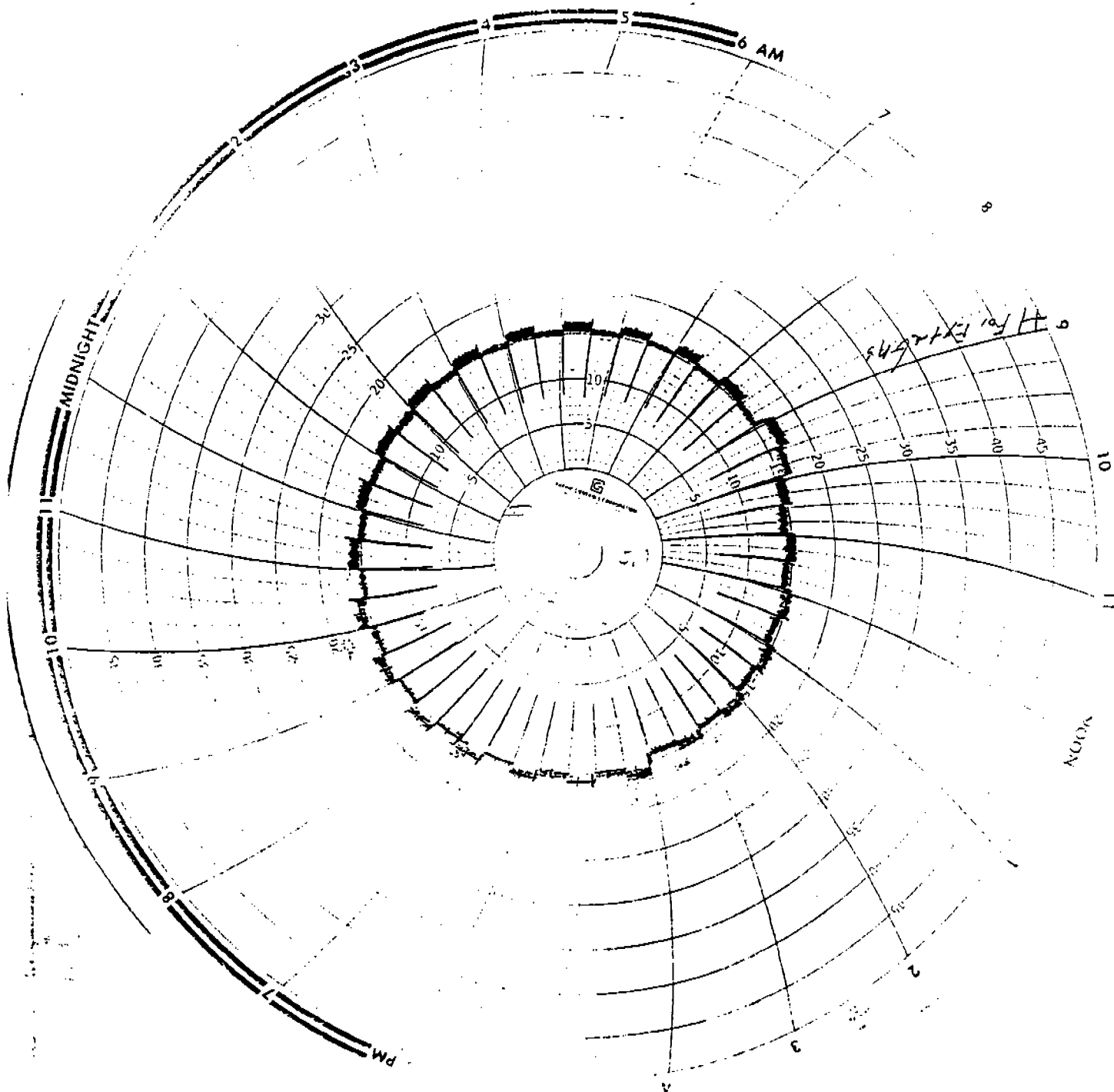
- B28/2 - B28/3 - B11/3
+ B9/1 "A7/1

Thursday, September 30, 1992 Run 1
 Batteries: 1-3

Sec	Over	Last Pushed	Earliest	Desired	Latest
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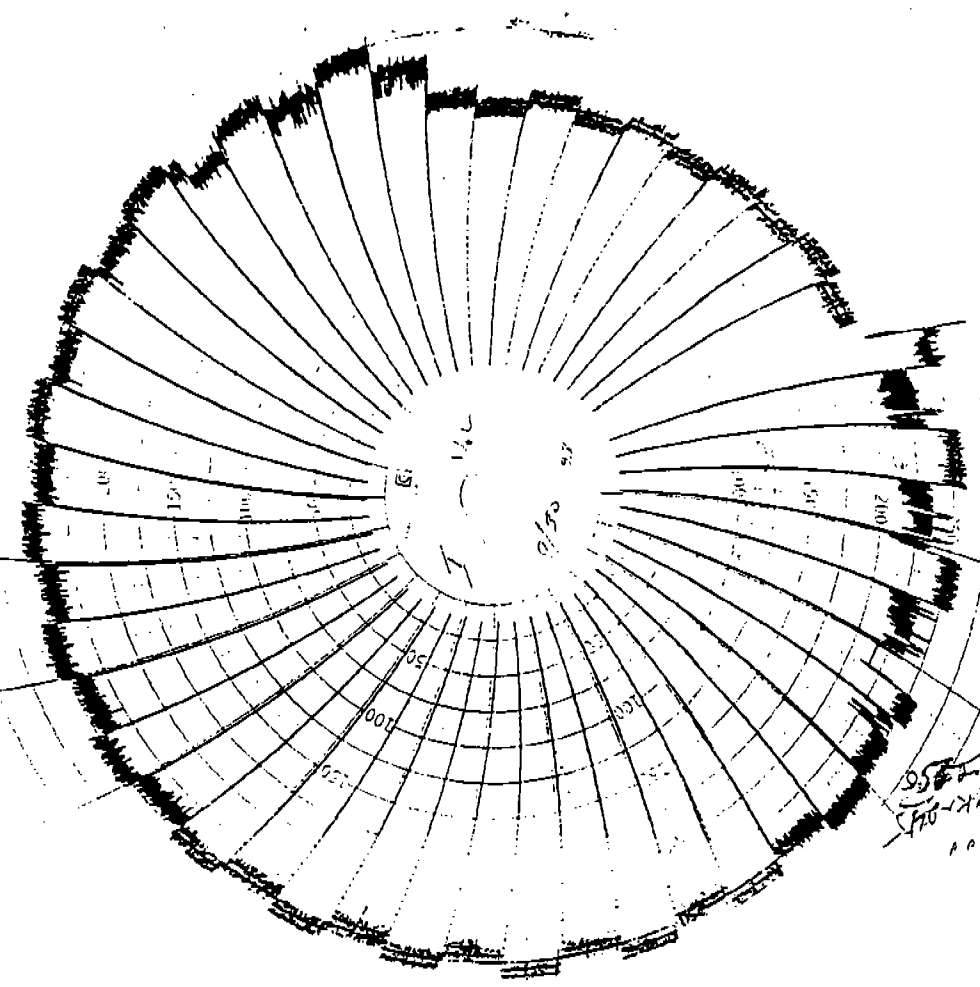
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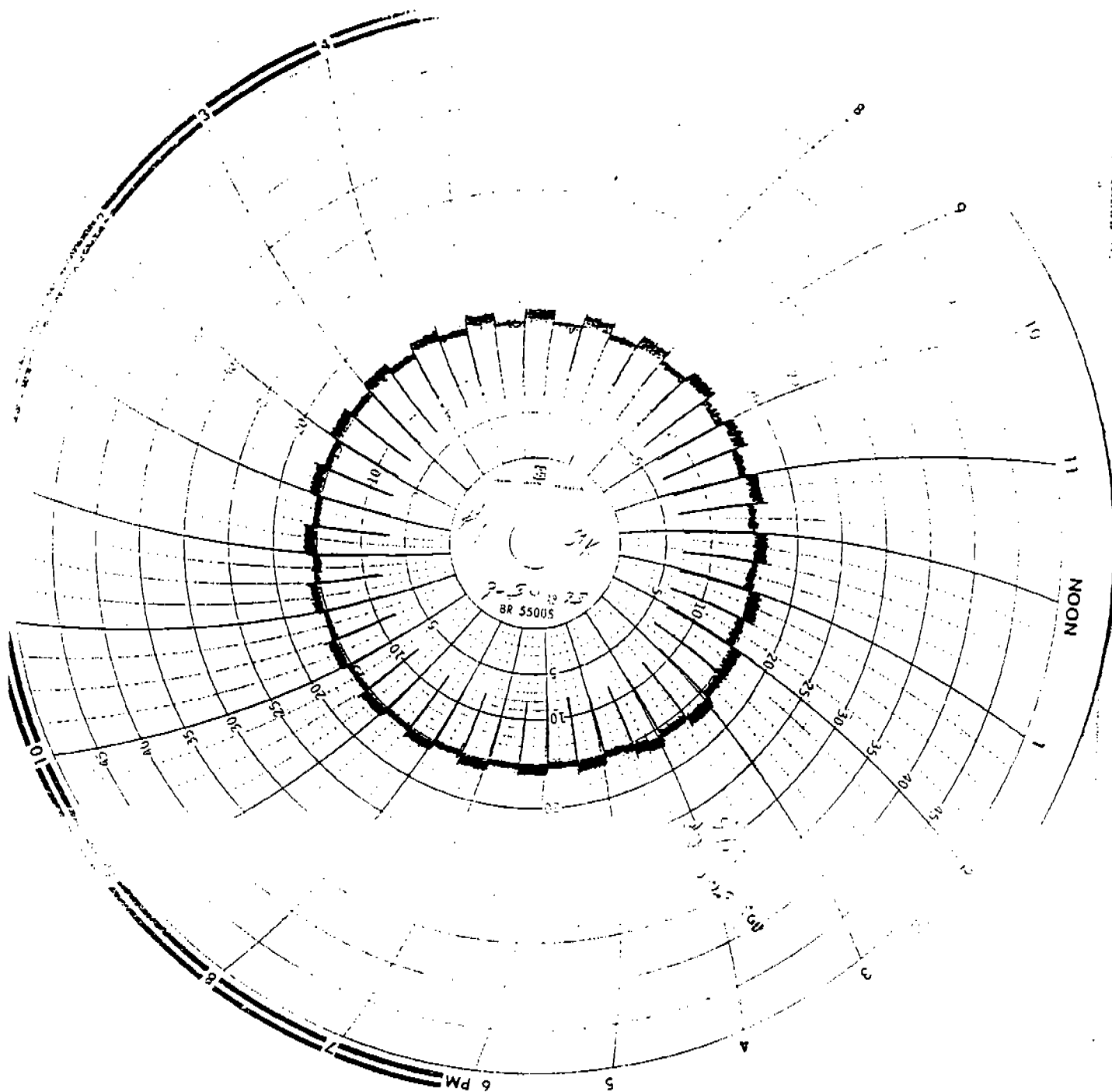
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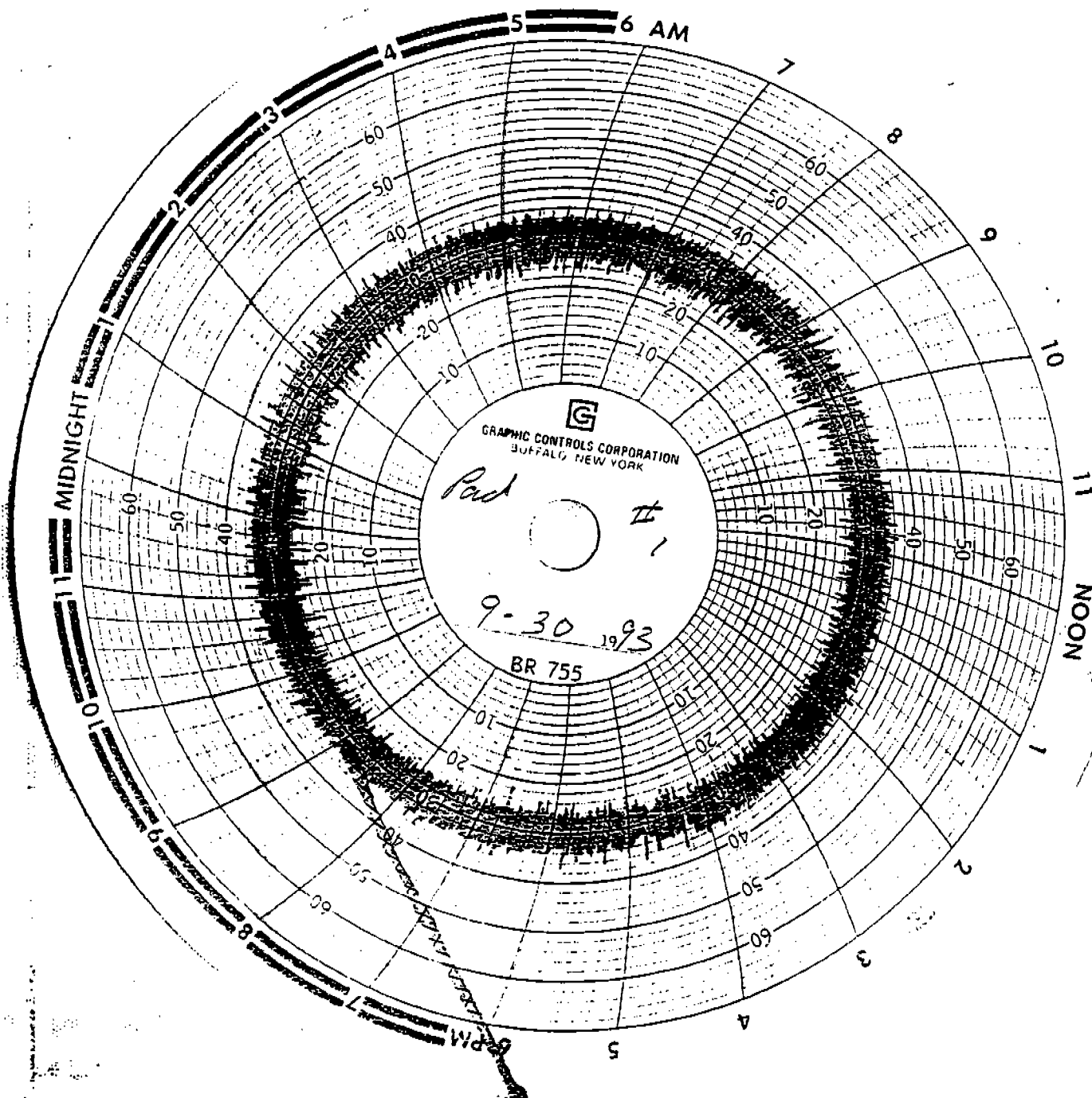
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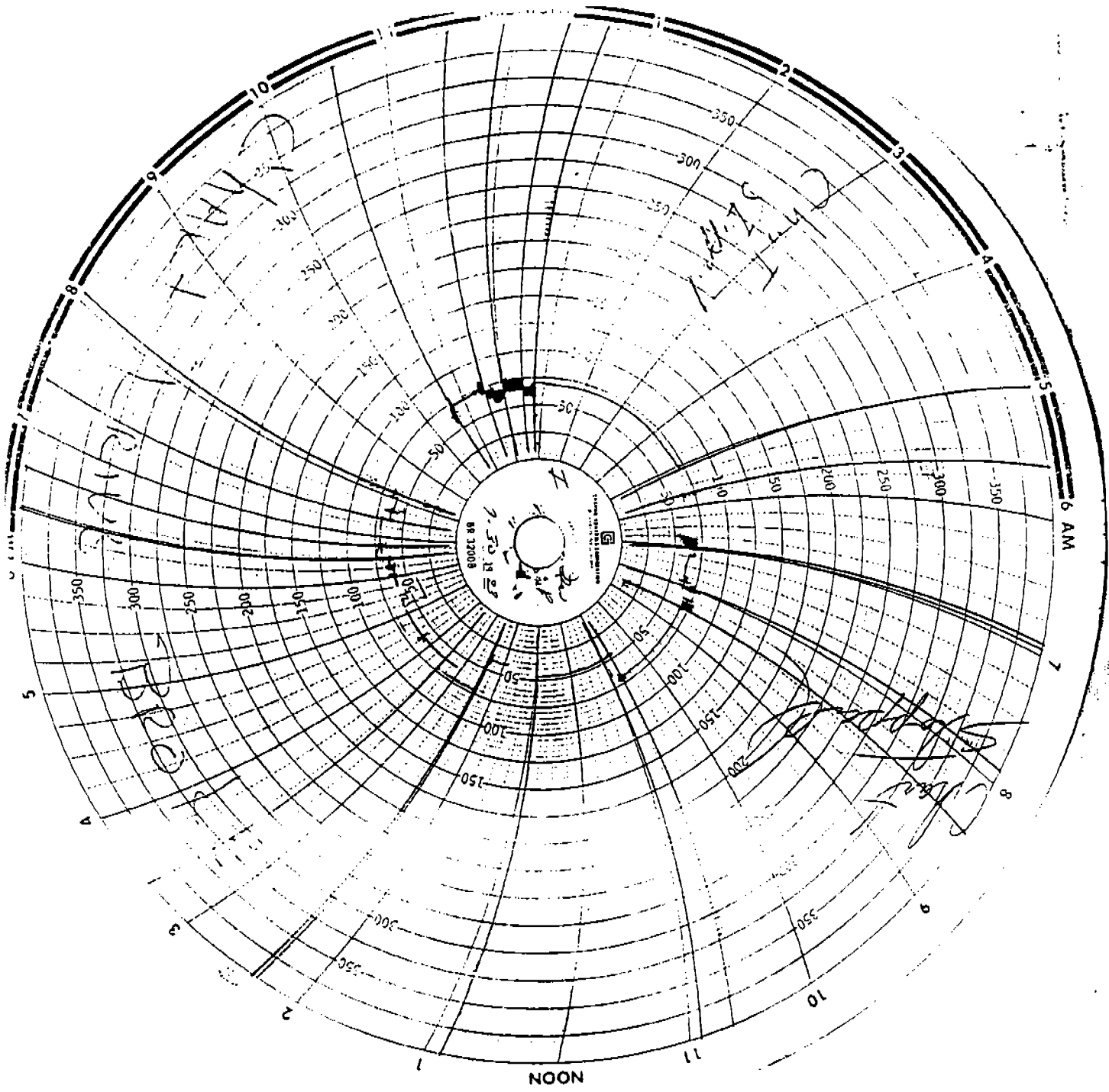
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**COMPLIANCE DEMONSTRATION
NO. 1 BATTERY COMBUSTION STACK
USS CLAIRTON WORKS**

**USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA**

**APPENDIX C
GRAVIMETRIC RESULTS, EMISSIONS CALCULATIONS**

STACK SAMPLING CALCULATIONS

CLIENT UES Clayton Works
TEST SITE # 1 Battery Stack

TEST DATE 9-27-93

TEST NUMBER CLR-135-PM-1

A. Barometric Pressure	<u>29.50</u>	in. Hg	
B. Static Pressure	<u>-1.2</u>	in. H2O	
C. Stack Pressure	<u>29.41</u>	in. Hg	[A+(B/13.6)]
D. Average ΔH	<u>0.94</u>	in. H2O	
E. Meter Pressure	<u>29.57</u>	in. Hg	[A+(D/13.6)]
F. Average ΔP	<u>0.055</u>	in. H2O	
G. Pitot Coefficient	<u>0.84</u>		
H. Gas Meter Coefficient	<u>0.9619</u>		
I. Stack Diameter	<u>11.4</u>	in.	
J. Stack Area	<u>70.88</u>	ft ²	(0.00545*I ²)
K. Nozzle Diameter	<u>0.428</u>	in.	
L. Nozzle Area	<u>9.99 x 10⁻⁴</u>	ft ²	(0.00545*K ²)
M. Average Stack Temperature	<u>515</u>	°F	
N. Average Stack Temperature	<u>975</u>	°R	(460+M)
O. Average Meter Temperature	<u>81</u>	°F	
P. Average Meter Temperature	<u>541</u>	°R	(460+O)
Q. Condensate Volume	<u>150.4</u>	mL	
R. Absorbed H2O	<u>13.3</u>	mL	
S. Total H2O	<u>163.7</u>	mL	(Q+R)
T. Filter Weight	<u>0.0089</u>	g	
U. Probe Weight	<u>0.0281</u>	g	
V. Impinger Weight		g	
W. Total Weight	<u>0.0370</u>	g	(T+U+V)
X. Metered Gas Volume	<u>70.995</u>	dcf	
Y. Corrected Metered Gas Volume	<u>68.290</u>	dcf	(X*H)
Z. H2O Gas Volume	<u>8.016</u>	cf	(0.00267*S*P/A)
AA. Total Sample Volume	<u>76.306</u>	cf	(Y+Z)
BB. Percent H2O	<u>10.5</u>	%	(100*Z/AA)
CC. Gas Volume Sampled	<u>65.869</u>	dscf	[Y*(528/P)*(E/29.92)]
DD. Grain Loading	<u>0.0087</u>	gr/dscf	(15.43*W/CC)
EE. Average Molecular Weight:			

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	<u>0.105</u>		18	<u>1.890</u>
CO2	<u>0.04</u>	<u>0.895</u>	44	<u>1.575</u>
CO	<u>0</u>		28	<u>0</u>
O2	<u>0.13</u>		32	<u>3.723</u>
N2	<u>0.83</u>		28	<u>20.800</u>

Average Molecular Weight 27.99 lb./lb. mol

FF. Average Stack Velocity	<u>18.3</u>	fps	{85.49*G*[(F*N)/(C*EE)] ^{0.5} }
GG. Average Flow Rate	<u>77900</u>	acfm	(60*FF*J)
HH. Standard Flow Rate	<u>41500</u>	scfm	[GG*(528/N)*(C/29.92)]
II. Sample Time	<u>7200</u>	sec	
JJ. Percent Isokinetic	<u>104.9</u>	%	{[100*CC*60*J] / [HH*L*π*(1-BB/100)]}
KK. Mass Flow Rate	<u>2.8</u>	lb/hr	[DD*HH*(1-BB/100)*60/7000]

STACK SAMPLING CALCULATIONS

CLIENT USS Clayton Works
TEST SITE #1 Battery Stack

TEST DATE 9-30-93
TEST NUMBER C-42-185-PM-2

A. Barometric Pressure 29.60 in. Hg
B. Static Pressure -1.2 in. H2O
C. Stack Pressure 29.51 in. Hg [A+(B/13.6)]
D. Average ΔH 0.93 in. H2O
E. Meter Pressure 29.67 in. Hg [A+(D/13.6)]
F. Average ΔP 0.055 in. H2O
G. Pitot Coefficient 0.84
H. Gas Meter Coefficient 0.9619
I. Stack Diameter 114 in.
J. Stack Area 70.88 ft² (0.00545*I²)
K. Nozzle Diameter 0.428 in.
L. Nozzle Area 9.99 x 10⁻⁴ ft² (0.00545*K²)
M. Average Stack Temperature 511 °F
N. Average Stack Temperature 971 °R (460+M)
O. Average Meter Temperature 69 °F
P. Average Meter Temperature 529 °R (460+O)
Q. Condensate Volume 190.9 mL
R. Absorbed H2O 13.4 mL
S. Total H2O 204.3 mL (Q+R)
T. Filter Weight 0.0110 g
U. Probe Weight 0.0377 g
V. Impinger Weight 0.0487 g (T+U+V)
W. Total Weight 70.975 dcf
X. Metered Gas Volume 68.271 dcf (X*H)
Y. Corrected Metered Gas Volume 9.749 cf (0.00267*S*P/A)
Z. H2O Gas Volume 78.020 cf (Y+Z)
AA. Total Sample Volume 12.5 % (100*Z/AA)
BB. Percent H2O 67.573 dscf [Y*(528/P)*(E/29.92)]
CC. Gas Volume Sampled 0.0111 gr/dscf (15.43*W/CC)
DD Grain Loading
EE. Average Molecular Weight:

Component	% Volume ÷100	*(1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.125		18	2.250
CO2	0.04	0.875	44	1.540
CO	0		28	0
O2	0.13		32	3.640
N2	0.83	↓	28	20.335

Average Molecular Weight 27.77 lb./lb. mol

FF. Average Stack Velocity 18.3 fps (85.49*G*[(F*N)/(C*EE)]^{0.5})
GG. Average Flow Rate 78000 acfm (60*FF*I)
HH Standard Flow Rate 41800 scfm [GG*(528/N)*(C/29.92)]
II. Sample Time 7200 sec
JJ. Percent Isokinetic 109.2 % [(100*CC*60*J) / [HH*L*II*(1-BB/100)]]
KK. Mass Flow Rate 3.5 lb/hr [DD*HH*(1-BB/100)*60/7000]

STACK SAMPLING CALCULATIONS

CLIENT USS Clinton Works

TEST DATE 9-30-93

TEST SITE #1 Barkley Stack

TEST NUMBER CLR-1BS-PV-3

A. Barometric Pressure 29.60 in. Hg
 B. Static Pressure -1.2 in. H2O
 C. Stack Pressure 29.51 in. Hg [A+(B/13.6)]
 D. Average Δ H 1.00 in. H2O
 E. Meter Pressure 29.67 in. Hg [A+(D/13.6)]
 F. Average Δ P 0.060 in. H2O
 G. Pitot Coefficient 0.84
 H. Gas Meter Coefficient 0.969
 I. Stack Diameter 114 in.
 J. Stack Area 70.88 ft² (0.00545*I²)
 K. Nozzle Diameter 0.428 in.
 L. Nozzle Area 9.99 x 10⁻⁴ ft² (0.00545*K²)
 M. Average Stack Temperature 518 °F
 N. Average Stack Temperature 978 °R (460+M)
 O. Average Meter Temperature 75 °F
 P. Average Meter Temperature 535 °R (460+O)
 Q. Condensate Volume 150.4 mL
 R. Absorbed H2O 14.7 mL
 S. Total H2O 165.1 mL (Q+R)
 T. Filter Weight 0.0057 g
 U. Probe Weight 0.0147 g
 V. Impinger Weight g
 W. Total Weight 0.0204 g (T+U+V)
 X. Metered Gas Volume 72.221 dcf
 Y. Corrected Metered Gas Volume 69.469 dcf (X*H)
 Z. H2O Gas Volume 7.967 cf (0.00267*S*P/A)
 AA. Total Sample Volume 77.436 cf (Y+Z)
 BB. Percent H2O 10.3 % (100*Z/AA)
 CC. Gas Volume Sampled 67.987 dscf [Y*(528/P)*(E/29.92)]
 DD Grain Loading 0.0046 gr/dscf (15.43*W/CC)
 EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.103		18	1.854
CO2	0.04	0.897	44	1.579
CO	0		28	0
O2	0.13		32	3.732
N2	0.83	✓	28	20.846

Average Molecular Weight 28.01 lb./lb. mol

FF. Average Stack Velocity 9.1 fps {85.49*G*[(F*N)/(C*EE)]^{0.5}}
 GG. Average Flow Rate 81400 acfm (60*FF*I)
 HH Standard Flow Rate 43300 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 1.5 lb/hr [DD*HH*(1-BB/100)*60/7000]