Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

57

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

Orig → WLC
cy letter → EJT, WGG

October 25, 1993

AHF 10/26

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: Compliance Demonstration
Clairton Battery Stack #2

I have enclosed with this letter the mass emission report on #2 Battery Combustion Stack. The compliance demonstration was conducted at USS Clairton Works, Clairton, PA, a division of USX Corporation, on August 25-26, 1993.

For questions regarding this report, please contact William C. Graeser at (412) 233-1467.

Very truly yours,

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

GTW/BAC
Enclosure

Steel the recycled material

U. S. Steel
Clairton Works
400 State Street
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G. T. Weber, Jr.
General Manager
USS Clairton Works

GTW/BAC
Enclosure

Steel
the recycled material

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

Report on
COMPLIANCE DEMONSTRATION
NO. 2 BATTERY COMBUSTION STACK
USS CLAIRTON WORKS

OCTOBER 1993

Prepared By: Chester Environmental
3000 Tech Center Drive
Monroeville, Pennsylvania 15146

Project No.: 600725-01

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APPENDIX B PLANT OPERATIONAL DATA
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EXECUTIVE SUMMARY

On August 25 and 26, 1993, a compliance test program was conducted for USS Clairton Works, Clairton, PA, on the #2 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 0.0175 grains per dry standard cubic feet (gr/dscf) and 5.3 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 #2 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 August 25 and 26, 1993, a compliance test program was conducted for USS Clairton Works, Clairton, PA, on the #2 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).

The test program required two days to complete the field work activities due to a delay in the operation of the Battery #2. Since no ovens in Battery #2 were pushed or charged from approximately 1200 to 1600 on August 25 1993, no emissions testing was completed during this time period. The third test run was conducted on the following day, August 26, 1993.

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 (CO_2), oxygen (O_2), and nitrogen (N_2, 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 0.0175 grains per dry standard cubic feet (gr/dscf) and 5.3 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 #2 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 (^{O}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 108.4 percent, 107.2 percent, and 107.1 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.

TABLE 1

USS CLAIRTON WORKS
CLAIRTON, PA

#2 BATTERY COMBUSTION STACK
PARTICULATE MATTER EMISSIONS DATA

		Run 1	Run 2	Run 3	Average
Test Number		CLR-BS2-1	CLR-BS2-2	CLR-BS2-3	
Test Date		8-25-93	8-25-93	8-26-93	
Mass Emissions Rate and Concentration					
Particulate Matter	(lb/hr)	7.0	3.0	5.9	5.3
	(gr/dscf)	0.0230	0.0103	0.0193	0.0175
Stack Conditions					
Flow Rate	(acfm)	78900	75300	78900	77700
	(scfm)	41500	39600	41500	40867
	(dscfm)	35400	33779	35524	34901
Temperature	(°F)	526	528	529	528
Moisture Content	(%)	14.7	14.7	14.4	14.6
Sampling Conditions					
Test times		0925 to 0955	1607 to 1637	1109 to 1139	
		1000 to 1030	1642 to 1712	1143 to 1213	
		1035 to 1105	1718 to 1748	1218 to 1248	
		1112 to 1142	1753 to 1823	1252 to 1322	
Sampling Time	(minutes)	120	120	120	
Sample Volume	(dscf)	64.978	61.197	64.280	
Isokinetics	(%)	108.4	107.2	107.1	

COMPLIANCE DEMONSTRATION
NO. 2 BATTERY COMBUSTION STACK
USS CLAIRTON WORKS

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX A

TEST PROTOCOL, FIELD DATA SHEETS, CALIBRATION RESULTS

CHESTER
ENVIRONMENTAL

TEST PROTOCOL
COMPLIANCE DEMONSTRATION OF
#2 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 CO_2, O_2, and N_2 (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 Pollution Control, field data sheets for the particulate matter sampling and visible emissions determinations, emissions calculations, and gravimetric results for each test.

STACK SAMPLING DATA SHEET

CLIENT USS Clairton Works | TEST DATE 8-25-93 (Wed) | ORIFICE CORRECTION (ΔH@) 1.802 | HOT/COLD BOX NO. 2
TEST UNIT #2 Battery Stack | TEST NO. CLR-#285-PM-1 | METER CORRECTION (Y) 0.9619 | PROBE NO. 10-2
PROJECT NO. 6000725-61 | NOZZLE (SIZE,#) 0.428 | CALIBRATION DATE 5-17-93 | FILTER NO. 1082
TEST CREW MC | STATIC PRESSURE -1.0" H_2O | PITOT CORRECTION 0.84 | STACK DIA. 114"
BAROMETRIC PRESSURE 29.50 | PORT DIRECTION #4 #3 | CONTROL BOX NO. 7 | PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	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
40.6	09:25	796.892	.060	1.04	1.04	95	85	4.0	522	250	<68	250	5 min./point
28.5			.070	1.22	1.22	102	85	4.5	540				
20.2			.070	1.22	1.22	105	85	4.5	546				
13.5			.050	.87	.87	110	86	4.0	550				
7.6			.040	.70	.70	110	86	4.0	529				
2.4	09:55	815.638	.050	.87	.87	115	88	4.0	504				
40.6	10:00	815.638	.050	.87	.87	100	88	4.0	558				
28.5			.060	1.04	1.04	120	92	4.0	569				
20.2			.060	1.04	1.04	120	92	4.0	529				
13.5			.060	1.04	1.04	122	95	4.5	521				
7.6		-	.050	.87	.87	122	95	4.0	528				
2.4	10:30	833.935	.050	.87	.87	122	95	4.0	500				
													Estimates:
													MW= ~~28.0~~ 27.63
													%H2O= 11

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	0.005
After	6.5	<0.01 CFM

PITOT LEAK CHECK

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

GAS	1	2
CO2	5.0	
O2	12.5	
CO	0	
N2	82.5	

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100mL DI. H_2O	666.1	479.3	183.8
2.	100mL DI. H_2O	574.6	545.2	29.4
3.	Empty	438.4	435.2	3.2
4.	Silica Gel	545.5	525.0	20.5
5.				
6.	Actual			236.9g total
7.	Moisture = 14.8%			
8.				

216.4g

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT: USS Clairton Works
TEST UNIT: #2 Battery Stack
PROJECT NO.: 600725-01
TEST CREW: RPC
BAROMETRIC PRESSURE: 29.50

TEST DATE: 8-25-97
TEST NO.: CLR-2BS-PM-1
NOZZLE (SIZE,#): 0.428
STATIC PRESSURE: -1.0" H2O
PORT DIRECTION: #2, #1

ORIFICE CORRECTION (ΔH@): 1.82
METER CORRECTION (Y): 0.9619
CALIBRATION DATE: 5-17-93
PITOT CORRECTION: 0.84
CONTROL BOX NO.: 7

HOT/COLD BOX NO.: 2
PROBE NO.: 10-3
FILTER NO.: 1082
STACK DIA.: 114"
PORT SIZE: 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	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
40.6	10:35	833.935	.050	.87	.87	111	100	4.0	521	250	<68	250	5 min./point
28.5			.060	1.04	1.04	123	102	4.0	520				
#2 20.2			.060	1.04	1.021	121	103	4.0	519				
13.5			.060	1.04	1.04	122	100	4.0	540				
7.6			.050	.87	.87	122	100	4.0	507				
2.4	11:05	851.329	.040	.69	.69	122	101	3.5	500				
40.6	11:12	851.329	.070	1.21	1.21	120	105	5.5	521				
28.5			.070	1.21	1.21	120	105	5.5	520				
#1 20.2			.050	.86	.86	128	105	4.0	545				
13.5			.050	.86	.86	128	105	4.5	531				
7.6			.050	.86	.86	128	103	4.5	505				
2.4	11:42	869.750	.040	.69	.69	126	102	4.0	500				
Test Totals	Δ = 120 min	Δ = 72.858 dcf	$(\Delta P)_{AVG}$ = 0.055	$(\Delta H)_{AVG}$ = 1.05		$(T_{meter})_{AVG}$ = 106°F			$(T_{stack})_{AVG}$ = 526°F				Estimates:

velocity = [illegible] ft/sec 18.5

Tso. = [illegible] 108.3% [illegible]

MW = ~~28.0~~ 27.63
%H2O = 11

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS CLAIRTON WORKS | TEST DATE 8-25-93 (Wed.) | ORIFICE CORRECTION (ΔH@) 1.892 | HOT/COLD BOX NO. 4
TEST UNIT #2 BATTERY STACK | TEST NO. CLR-2BS-PM-2 | METER CORRECTION (Y) 0.9619 | PROBE NO. 10-2
PROJECT NO. 600725-01 | NOZZLE (SIZE,#) 0.428 | CALIBRATION DATE 5-17-93 | FILTER NO. 1081
TEST CREW RPS | STATIC PRESSURE -1.0 "H2O | PITOT CORRECTION 0.84 | STACK DIA. 114"
BAROMETRIC PRESSURE 29.50 | PORT DIRECTION #1,4 | CONTROL BOX NO. 7 | PORT SIZE 4"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	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
40.6	16:07	870.681	.06	1.04	1.04	100	100	2.0	516	~250°	~68°	~250°	5 min./point
28.5			.06	1.04	1.04	112	99	2.0	509				
20.2			.06	1.04	1.04	118	99	2.0	531				
13.5			.05	.87	.87	120	100	2.0	541				
7.6			.05	.87	.87	120	100	2.0	541				
2.4	16:37	888.815	.05	.87	.87	120	102	2.0	500				
40.6	16:42	888.815	.07	1.21	1.21	116	100	3.0	531				
28.5			.07	1.21	1.21	126	104	3.0	540				
20.2			.05	.87	.87	128	104	3.0	512				
13.5			.06	1.04	1.04	130	105	3.0	519				
7.6			.06	1.04	1.04	130	105	3.0	522				
2.4	17:12	908.311	.06	1.04	1.04	130	105	3.0	539				
													Estimates:
													MW= ~~28.0~~ 27.64
													%H2O= 11

#1 (first 5 rows) ↑ ↓ | #4 (next 6 rows) ↑ ↓

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	20.01CFM
After	6.5	20.01CFM

PITOT LEAK CHECK

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

GAS	1	2
CO2	5.0	5.0
O2	12.5	12.5
CO	0	0
N2	82.5	82.5

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100ml H2O	738.2	557.4	180.8
2.	100ml H2O	500.7	476.4	24.3
3.	DRI	458.1	455.9	2.2
4.	Si Gel	681.4	665.6	15.8
5.				
6.	Actual			223.19 total
7.	Moisture = 14.7%			
8.				

207.3g

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS - CLAIRTON WORKS | TEST DATE 8-25-93 (Wed.) | ORIFICE CORRECTION (Δ H@) 1.802 | HOT/COLD BOX NO. 4

TEST UNIT #2 BATTERY STACK | TEST NO. CLR-265-PM-2 | METER CORRECTION (Y) 0.9619 | PROBE NO. 10-2

PROJECT NO. 600725-01 | NOZZLE (SIZE,#) 0.428 | CALIBRATION DATE 5-17-93 | FILTER NO. 1081

TEST CREW RPC | STATIC PRESSURE -1.0 "H2O | PITOT CORRECTION 0.84 | STACK DIA. 114"

BAROMETRIC PRESSURE 29.50 | PORT DIRECTION #3,2 | CONTROL BOX NO. 4 | PORT SIZE 4.0"

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot Δ P (in. H2O)	Orifice Δ H Required (in. H20)	Orifice Δ H Actual (in. H20)	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
40.6	17:18	908.311	.06	1.04	1.04	118	106	2.5	516	~250°F	<68°F (ice)	~250°F	5 min./point
28.5			.06	1.04	1.04	140	111	3.0	530				
20.2			.06	1.04	1.04	142	111	3.0	535				
13.5			.05	.87	.87	147	115	2.5	541				
7.6			.03	.52	.52	1418	118	2.0	544				
2.4	17:48	925.289	.03	.52	.52	150	120	2.0	496				
40.6	17:53	925.289	.05	.87	.87	141	120	2.5	531				
28.5			.05	.87	.87	152	124	2.5	533				
20.2			.06	1.04	1.04	158	128	3.0	553				
13.5			.04	.69	.69	160	129	2.0	569				
7.6			.03	.52	.52	160	130	1.5	526				
2.4	18:23	941.760	.03	.52	.52	160	136	1.5	497				
Test Totals	Δ= 120 min	Δ= 71.079 dcf	(ΔP)AVG = 0.050	(ΔH)AVG = 0.90		(Tmeter)AVG = 123°F			(TStack)AVG = 528°F				
						Velocity = 17.7 ft/sec			= 530. = 107.2 %				Estimates: MW= 27.64 %H2O= 4

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS CLAIRTON WORKS	TEST DATE 8-26-93 (THUR)	ORIFICE CORRECTION (ΔH@) 1.802	HOT/COLD BOX NO. 2
TEST UNIT #2 BATTERY STACK	TEST NO. CLR-2BS-PM#3	METER CORRECTION (Y) 0.9819	PROBE NO. 10-2
PROJECT NO. 600725-01	NOZZLE (SIZE,#) 0.428	CALIBRATION DATE 05-17-93	FILTER NO. 1085
TEST CREW RPC	STATIC PRESSURE -1.10 "H2O	PITOT CORRECTION 0.84	STACK DIA. 114
BAROMETRIC PRESSURE 29.52	PORT DIRECTION #3, 2	CONTROL BOX NO. SIERRA	PORT SIZE 4

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	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
↑ 40.6	11:09	942.083	.06	1.04	1.04	100	100	3.5	517	~250	<68°F ICE ADD	~250	5 min./point
#3 28.5			.06	1.04	1.04	120	100	3.5	515				
20.3			.06	1.024	1.024	130	108	3.5	521				
13.5			.06	1.024	1.04	140	111	3.5	521				
7.6			.06	1.024	1.04	142	111	3.5	506				
↓ 2.4	11:39	960.490	.05	.87	.87	146	113	3.0	529				
↑ 40.6	11:43	960.490	.06	1.04	1.04	140	112	4.0	527				
28.5			.06	1.04	1.04	150	120	4.0	521				
#2 20.3			.05	.87	.87	152	121	3.5	539				
13.5			.06	1.04	1.04	156	123	4.0	546				
7.6			.05	.87	.87	158	124	4.0	521				
↓ 2.4	12:13	978.860	.05	.87	.87	158	123	4.0	501				
													Estimates:
													MW= ~~28.0~~ ~~27.99~~
													%H2O= 11 27.67

SYSTEM LEAK CHECK

	Vacuum (in. Hg)	DGM Rate (cfm)
Before	5.0	<0.01 cfm
After	6.5	<0.01 cfm

PITOT LEAK CHECK

	Positive	Negative
Before	OK/1536	OK/1536
After	OK/1536	OK/1530

GAS	1	2
CO2	5.0	5.0
O2	12.5	12.5
CO	0	0
N2	82.5	82.5

FYRITE CHECK 11:25
O_2 = 20.5

Impinger No.	Impinger Contents	Final	Initial	Difference
1.	100 ml DI H_2O	664.4	483.6	180.8
2.	100 ml DI H_2O	566.7	540.0	26.7
3.	EMPTY	442.0	438.2	3.8
4.	SILICA GEL	597.2	579.0	18.2
5.				
6.	Actual			229.5g
7.	Moisture = 14.4 %			total
8.				

211.3g

CHESTER ENVIRONMENTAL

STACK SAMPLING DATA SHEET

CLIENT USS - CLAIRTON Works
TEST UNIT #2 BATTERY STACK
PROJECT NO. 600725-01
TEST CREW RPC
BAROMETRIC PRESSURE 29.52

TEST DATE 8-26-93 (Thurs)
TEST NO. CLR-2BS-PM-3
NOZZLE (SIZE,#) 0.428
STATIC PRESSURE -1.10 "H2O
PORT DIRECTION #4, 1

ORIFICE CORRECTION (ΔH@) 1.802
METER CORRECTION (Y) .9619
CALIBRATION DATE 05-17-93
PITOT CORRECTION 0.84
CONTROL BOX NO. SEVEN

HOT/COLD BOX NO. 2
PROBE NO. 10-2
FILTER NO. 1083
STACK DIA. 114"
PORT SIZE 4

Traverse Point (inches)	Time	Dry Gas Meter Reading (dcf)	Pitot ΔP (in. H2O)	Orifice ΔH Required (in. H20)	Orifice ΔH Actual (in. H20)	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
40.6	12:18	978.860	.07	1.21	1.21	138	120	5.0	561	~250°	<68°	~250°	5 min./point
28.5			.07	1.21	1.21	152	126	5.0	549				
20.2			.08	1.21	1.21	156	126	5.0	561				
13.5			.05	.87	.87	156	126	3.5	520				
7.6			.05	.87	.87	155	124	3.5	519				
2.4	12:48	998.805	.05	.87	.87	155	122	3.5	510				
40.6	12:52	998.805	.07	1.23	1.23	130	110	5.0	555				
28.5			.07	1.23	1.23	131	111	5.0	543				
20.2			.05	.88	.88	131	111	4.0	516				
13.5			.05	.88	.88	130	110	4.0	525				
7.6			.05	.88	.88	132	109	4.0	511				
2.4	13:22	1017.333	.05	.88	.88	132	109	4.0	506				
Test Totals	Δ = 120 min	Δ = 75.250 dcf	$(\Delta P)_{AVG}$ = 0.055	$(\Delta H)_{AVG}$ =	1.00	$(T_{meter})_{AVG}$ = 128°F			$(T_{stack})_{AVG}$ = 529°F				Estimates: 27.67 MW= ~~28.0~~ ~~27.99~~ %H2O= N
						velocity = 18.5 ft/sec			Tso. = 107.1%				

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

	Positive	Negative
Before		
After		

GAS	1	2
CO2		
O2		
CO		
N2		

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

CHESTER ENVIRONMENTAL

VISIBLE EMISSIONS OBSERVATIONS FORM

#2 STACK TEST

OBSERVER: DENNE

DATE: 8-25-93

FACILITY: USX CLAIRTON

OBSERVATION: START TIME: 10:15

END TIME: 11:15

OBSERVATION POINT: ETS TRAILER AREA

SOURCE: #2 STACK

DISTANCE: 800'

DIRECTION FROM: NW

HEIGHT: 200'

WIND:

SPEED: 6 MPH

DIRECTION: → NORTH

TEMPERATURE: 82 °F

SKY CONDITION: PTLY CLDY

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% —

No. READINGS >= 60% —

GREATEST OPACITY: —

CREW: C FOREMAN: HARRIS

COMMENTS: — 20 %

15	0	—	—	—	—	45	30	—	—	—	—
	1	—	—	—	—		31	—	—	—	—
	2	—	—	—	—		32	—	—	—	—
	3	—	—	—	—		33	—	—	—	—
	4	—	—	—	—		34	—	—	—	—
20	5	—	—	—	—		35	—	—	—	—
	6	—	—	—	—		36	—	—	—	—
	7	—	—	—	—		37	—	—	—	—
	8	—	—	—	—		38	—	—	—	—
	9	—	—	—	—		39	—	—	—	—
25	10	—	—	—	—	55	40	—	—	—	—
	11	—	—	—	—		41	—	—	—	—
	12	—	—	—	—		42	—	—	—	—
	13	—	—	—	—		43	—	—	—	—
	14	—	—	—	—		44	—	—	—	—
30	15	—	—	—	—	1100	45	—	—	—	—
	16	—	—	—	—		46	—	—	—	—
	17	—	—	—	—		47	—	—	—	—
	18	—	—	—	—		48	—	—	—	—
	19	—	—	—	—		49	—	—	—	—
35	20	—	—	—	—	05	50	—	—	—	—
	21	—	—	—	—		51	—	—	—	—
	22	—	—	—	—		52	—	—	—	—
	23	—	—	—	—		53	—	—	—	—
	24	—	—	—	—		54	—	—	—	—
40	25	—	—	—	—	10	55	—	—	—	—
	26	—	—	—	—		56	—	—	—	—
	27	—	—	—	—		57	—	—	—	—
	28	—	—	—	—		58	—	—	—	—
	29	—	—	—	—		59	—	—	—	—

RUN #1 2ND HR.

VISIBLE EMISSIONS OBSERVATIONS FORM

#2 STACK TEST

OBSERVER: Denne

DATE: 8-25-93

FACILITY: USX CLAIRTON

OBSERVATION: START TIME: 16:05

END TIME: 17:05

OBSERVATION POINT:

ETS TRAILER AREA

SOURCE: #2 STACK

DISTANCE: 800'

DIRECTION FROM: NW

HEIGHT: 200'

WIND:

SPEED: 7 MPH

DIRECTION: → WEST

TEMPERATURE: 94°F

SKY CONDITION: PTLY CLOUDY

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: BLACK

TOTAL No. OF READINGS: 240

No. READINGS >= 20% 0

No. READINGS >= 60% 0

GREATEST OPACITY: 10%

CREW: D FOREMAN: WARGO

COMMENTS: - 30%

START 16:05

	0	–	–	–	–	35	30	–	–	–	–
	1	–	–	–	–		31	–	–	–	–
	2	–	–	–	–		32	–	–	–	–
	3	–	–	–	–		33	–	–	–	–
	4	–	–	–	–		34	–	–	–	–
10	5	–	–	–	–	40	35	–	–	–	–
	6	–	–	5	5		36	–	–	–	–
	7	10	5	–	–		37	–	–	–	–
	8	–	–	–	–		38	–	–	–	–
	9	–	–	–	–		39	–	–	–	–
15	10	–	–	–	–	45	40	–	–	–	–
	11	–	–	–	–		41	–	–	–	–
	12	–	–	–	–		42	–	–	–	–
	13	–	–	–	–		43	–	–	–	–
	14	–	–	–	–		44	–	–	–	–
20	15	–	–	–	–	50	45	–	–	–	–
	16	–	–	–	–		46	–	–	–	–
	17	–	–	–	–		47	–	–	–	–
	18	–	–	–	–		48	–	–	–	–
	19	–	–	–	–		49	–	–	–	–
25	20	–	–	–	–	55	50	–	–	–	–
	21	–	–	–	–		51	–	–	–	–
	22	–	–	–	–		52	–	–	–	–
	23	–	–	–	–		53	–	–	–	–
	24	–	–	–	–		54	–	–	–	–
30	25	–	–	–	–	00	55	–	–	–	–
	26	–	–	–	–		56	–	–	–	–
	27	–	–	–	–		57	–	–	–	–
	28	–	–	–	–		58	–	–	–	–
	29	–	–	–	–		59	–	–	–	–

RUN #2 1ST HR.

START TEST 16:05 2ND RUN

VISIBLE EMISSIONS OBSERVATIONS FORM

#2 STACK TEST

OBSERVER: Donne

DATE: 5-26-93

FACILITY: USX CLAIRTON

OBSERVATION: START TIME: 11:05

END TIME: 12:05

OBSERVATION POINT: Ext Trailer Area

SOURCE: #2 STACK

DISTANCE: 500'

DIRECTION FROM: NW

HEIGHT: 200'

WIND:

SPEED: 5 MPH

DIRECTION: →SE

TEMPERATURE: 57 °F

SKY CONDITION: PTLY CLDY

BACKGROUND: SKY

READING CONDITIONS: FAIR

COLOR OF EMISSION: —

TOTAL No. OF READINGS: 240

No. READINGS >= 20% —

No. READINGS >= 60% —

GREATEST OPACITY: —

CREW: C FOREMAN: HARRIS

COMMENTS: — :8 2

START 3RD RUN

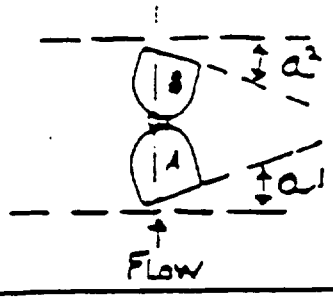
11:05	0	—	—	—	—
	1	—	—	—	—
	2	—	—	—	—
	3	—	—	—	—
	4	—	—	—	—
10	5	—	—	—	—
	6	—	—	—	—
	7	—	—	—	—
	8	—	—	—	—
	9	—	—	—	—
15	10	—	—	—	—
	11	—	—	—	—
	12	—	—	—	—
	13	—	—	—	—
	14	—	—	—	—
20	15	—	—	—	—
	16	—	—	—	—
	17	—	—	—	—
	18	—	—	—	—
	19	—	—	—	—
25	20	—	—	—	—
	21	—	—	—	—
	22	—	—	—	—
	23	—	—	—	—
	24	—	—	—	—
30	25	—	—	—	—
	26	—	—	—	—
	27	—	—	—	—
	28	—	—	—	—
	29	—	—	—	—
35	30	—	—	—	—
	31	—	—	—	—
	32	—	—	—	—
	33	—	—	—	—
	34	—	—	—	—
40	35	—	—	—	—
	36	—	—	—	—
	37	—	—	—	—
	38	—	—	—	—
	39	—	—	—	—
45	40	—	—	—	—
	41	—	—	—	—
	42	—	—	—	—
	43	—	—	—	—
	44	—	—	—	—
50	45	—	—	—	—
	46	—	—	—	—
	47	—	—	—	—
	48	—	—	—	—
	49	—	—	—	—
55	50	—	—	—	—
	51	—	—	—	—
	52	—	—	—	—
	53	—	—	—	—
	54	—	—	—	—
00	55	—	—	—	—
	56	—	—	—	—
	57	—	—	—	—
	58	—	—	—	—
	59	—	—	—	—

3RD RUN. 1st HR.

GEOMETRIC PITOT CALIBRATION

Caliper # XEF-59
Precheck
Post Check

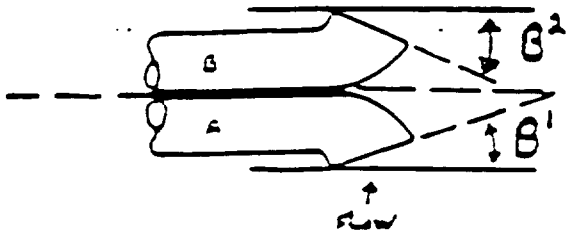
Probe #: 10-2
Date: 07-13-93
Initials: LPC

① 

a^1 = 3.0
a^2 = 0
$a^1, a^2 = <10°$

B^1 = 0
B^2 = 1.0
$B^1, B^2 = <5°$

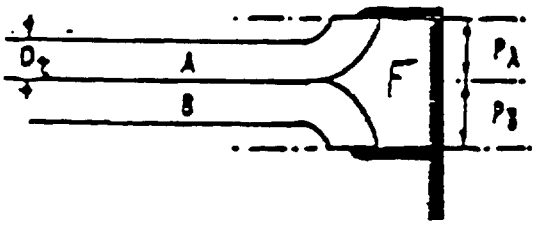
F = .930"

② 

μ = .16
μ = ≤ 0.1250" ($\mu = F \tan \gamma$)

V = 0
V = ≤0.03125" ($V = F \tan \theta$)

W = .194
W ≥ 0"

③ 

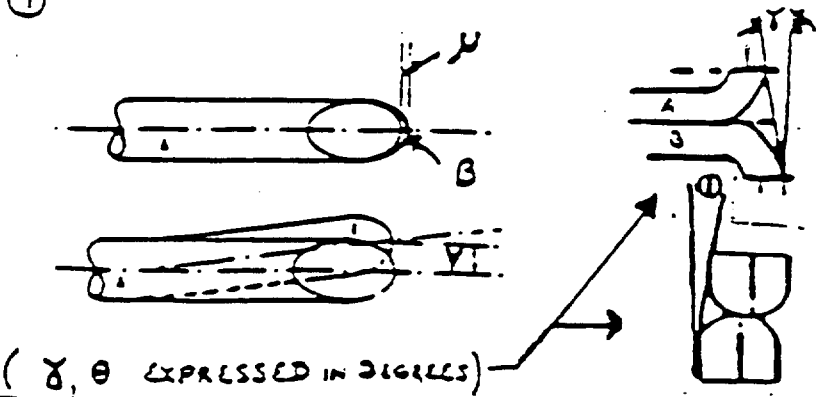
$1.05\ D_t < A < 1.50\ D_t$
$P_A = P_B$
$2.10\ D_t < A < 3.00\ D_t$

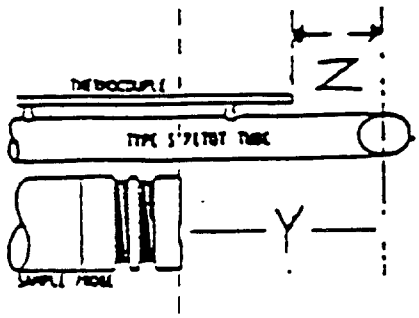
X = .97
X ≥ 0.750"
(3/4" using 1/2" nozzle)

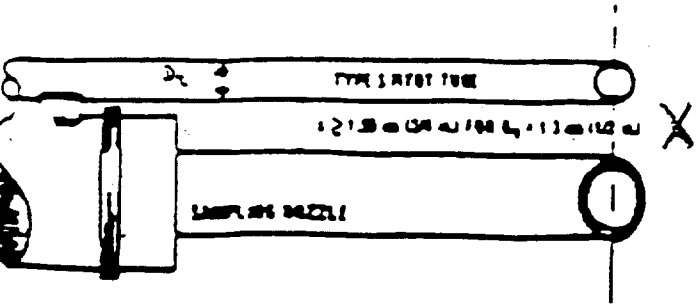
Y = 5.600
Y ≥ 3.0"

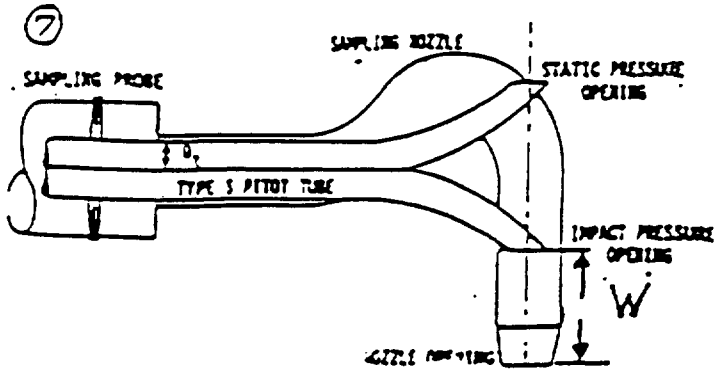
Z = 3.6
Z > 2.0"

D_t = .375
D_t > .1875"

④ 

⑥ 

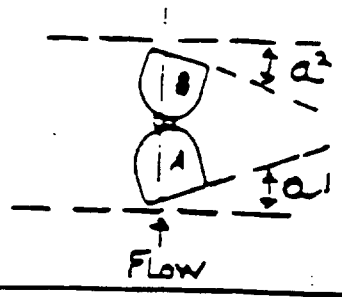
⑤ 

⑦ 

GEOMETRIC PITOT CALIBRATION

Caliper # XEF-59
Precheck
Post Check

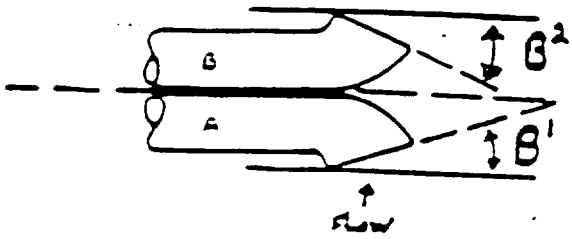
Probe #: 10-2
Date: 10-11-93
Initials: TJM

① 

a^1 = 5.0°
a^2 = 1.0°
$a^1, a^2 = <10°$

B^1 = 2.0°
B^2 = 2.0°
$B^1, B^2, = <5°$

F = 0.880"

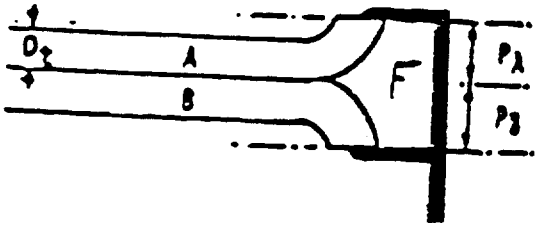
② 

μ = 0.0153 — $\mu = \leq 0.1250"$ ($\mu = F \tan \gamma$)

V = 0 — $V = \leq 0.03125"$ ($V = F \tan \theta$)

W = 0.267 — $W \geq 0"$

X = 1.030 — $X \geq 0.750"$ (3/4" using 1/2" nozzle)

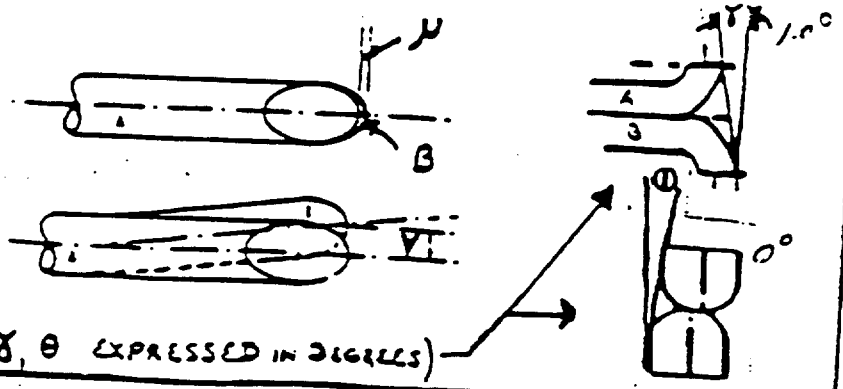
③ 

$1.05\ D_t \leq A \leq 1.50\ D_t$
$P_A = P_B$
$2.10\ D_t \leq A \leq 3.00\ D_t$

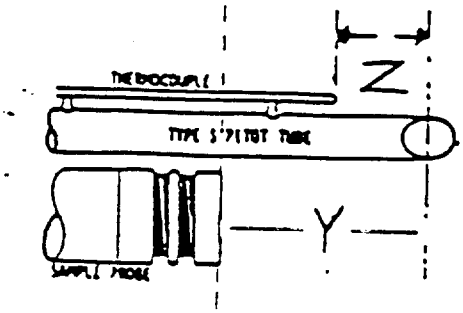
Y = 5.465 — $Y \geq 3.0"$

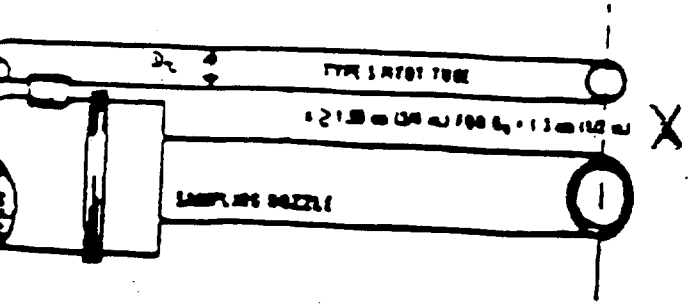
Z = 4.872 — $Z > 2.0"$

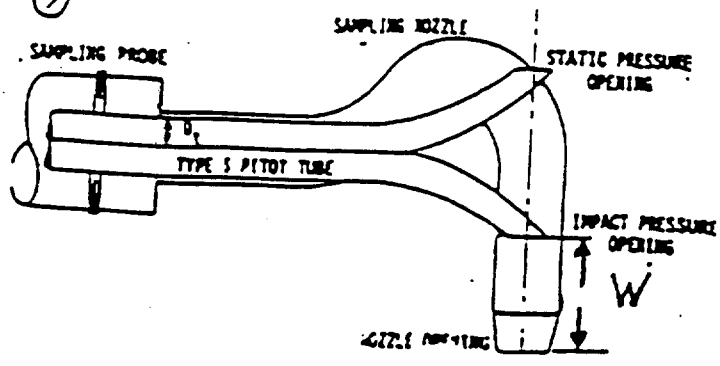
D_t = .373 — $D_t > .1875"$

④ 

(γ, θ EXPRESSED IN DEGREES)

⑥ 

⑤ 

⑦ 

COMPLIANCE DEMONSTRATION
NO. 2 BATTERY COMBUSTION STACK
USS CLAIRTON WORKS

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX B

PLANT OPERATIONAL DATA

CHESTER
ENVIRONMENTAL

CC-10295 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 1
12 Hrs. Beginning 12:00 A M
Date 8-25-93

BATTERY NO. A-3

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	9	06	9	03	
3	9	18	9	[illegible]	
5	9	30	9	26	
7	9	38	9	42	
9	9	45	9	55	
11	9	58	10	05	
13	10	25	10	28	
15	10	35	10	38	
17	10	46	10	48	
19	11	00	11	04	
21	11	10	11	12	HR PB
23	11	20	11	22	
25	11	27	11	29	
27	11	35	[illegible]	[illegible]	
29	11	50	11	52	
31	11	59			
2					
4					
6			12	17	
8	12	07	[illegible]	[illegible]	
10	12	16	[illegible]	[illegible]	
12	12	26	12	55	
14	[illegible]	37	[illegible]	[illegible]	
16	1	46	1	27	
18	1	05	1	37	
20	1	22	1	46	PB
22	1	33	1	[illegible]	HR PB
24	1	43	2	00	
26	1	53	2	10	
28	2	07	2	31	PB
30	2	17	2	37	PB
1					
2					

BATTERY NO. B-3

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	2	34	2	51	HR-PB
3	2	45	3	09	
5	3	07	3	18	
7	3	24	3	32	
9	3	35	3	41	
11	3	45	3	51	
13	3	56	4	33	
15	4	31	4	44	
17	4	42	4	55	
19	4	53	5	05	
21	5	03	5	16	
23	5	14	5	27	
25	5	25	5	38	
27	5	36	5	48	
29	5	46	5	54	
31	5	57	6	05	
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
1					
2	6	07	6	16	

BATTERY NO. A-2

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11					
13					
15					
17					
19					
21					
23					
25					
27					
29					
31					
2	6	14	6	23	
4	6	25	6	34	
6	6	37	6	42	
8	6	47	6	53	
10	6	56	7	03	
12	7	07	7	13	
14	7	17	7	23	
16	7	29	7	36	
18	7	43	7	47	
20	7	51	8	06	
22	8	12	8	08	
24	8	20	8	18	
26	8	30	8	28	
28	8	40	8	42	
30	8	50	8	52	
1					
2					

REMARKS: 28/28 17/17 15/15 6C 6C

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	5	4	
1-2	5	5	
2-3	4	5	
3-4	5	5	
4-5	3	3	
5-6	6	6	
	28	28	

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
6-7	6	6	
7-8	5	5	
8-9	5	6	
9-10	6	5	
10-11	3	4	
11-12	7	6	
	32	32	

Total Ovens Pushed 60
Total Ovens Charged 60

Pusherman

Battery Foreman

1-2	5	5		7-8	5	5	
2-3	4	5		8-9	5	6	
3-4	5	5		9-10	6	5	
4-5	3						
	6						

Total Ovens Pushed 60

Total Ovens Charged 60

Pushman

Battery Foreman

OVEN NO.	PUSHED	CHARGED	NOTES
B 1	9 15	9 29	
3	9 27	9 37	
5	9 59	10 04	
7	10 06	10 12	
9	10 14	10 18	
11	10 20	10 29	
13	10 31	10 40	
15	10 42	10 53	
17	10 55	11 04	
19	11 06	11 15	
21	11 17	11 33	
23			PAS-UP
25	11 35	11 43	
27	11 45	11 53	
29	11 55	11 59	
31			
B 2	27		
4	28		
6		2 06	
8	12 08	12 19	
10	12 20	12 30	
12	12 32	12 41	
14	12 43	1 —	
16	1 02	1 12	
18	1 14	1 24	
20	1 26	1 35	
22	1 37	1 47	
24	1 49	2 02	
26	2 04	2 12	
28	2 14	2 22	
30	2 24	2 28	
C/1	2 30	2 40	
C/2			

OVEN NO.	PUSHED	CHARGED	NOTES
A 1	2 42	3 15	
3	3 —	3 27	
5	3 17	3 39	RB
7	3 29	3 51	
9	3 41	3 57	
11	3 53	4 32	
13			
15	4 34	4 43	
17	4 45	4 55	
19	4 57	5 04	
21	5 06	5 16	KO PB
23	5 19	5 28	
25	5 30	5 40	
27	5 42	5 52	
29	5 54	6 03	
31	6 05	6 19	
B 2			
4			
6		16	
8		16	
10			
12			
14			
16			
18			
20	12 49	2 36	
22			
24			
26			
28			
30			

OVEN NO.	PUSHED	CHARGED	NOTES
B 1			
3			
5			
7			
9			
11			
13			
15			
17			
19			
21			
23			
25		16	
27		16	59
29			60
31			
B 2	6 20	6 25	
4	6 30	6 35	
6	6 40	6 45	
8	6 50	7 —	
10	7 02	7 10	
12	7 12	7 22	PB
14	7 24	7 33	KO RB
16	7 35	7 45	
18	7 50	8 04	
20	8 06	8 15	PB
22	8 17	8 25	
24	8 27	8 35	
26	8 37	8 46	
28	8 48	8 56	RB
30	8 58	9 02	
C/1	9 04	9 19	
C/2			

REMARKS:

12-8 { KO-II, PB-IIII } 8-4 { KO-, PB-II }

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	5	4	
1-2	5	5	
2-3	5	6	
3-4	5	5	
4-5	3	3	
5-6	5	5	
	28	28	

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
6-7	5	5	
7-8	5	5	
8-9	6	6	
9-10	4	4	
10-11	6	6	
11-12	5	6	
	31	32	

Total Ovens Pushed 59

Total Ovens Charged 60

Pusherman

Battery Foreman

CC-10295 REV. 1161
05.001.0020

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 8-25-93

BATTERY NO. A-3

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11					
13					
15					
17					
19					
21					
23					
25					
27					
29					
31			12	05	
2	6	53	7	03	
4	7	06	7	15	
6	7	17	7	26	D.B
8	7	28	7	36	P.B
10	7	38	7	46	
12	7	48	7	56	
14	7	58	8	—	
16	8	41	8	51	
18	8	53	9	01	P.B
20	9	03	9	11	
22	9	13	9	21	
24	9	23	9	31	
26	9	33	9	41	
28	9	43	9	51	P.B
30	9	53	10	02	
1					
2					

BATTERY NO. B-3

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	10	12	10	21	
3	10	23	10	31	
5	10	33	10	41	
7	10	43	10	51	
9	10	53	11	—	
11	11	02	11	10	P.B
13	11	12	11	20	
15	11	22	11	30	
17	11	32	11	40	
19					
21					
23					
25					
27					
29					
31					
2)	12	47	12	49	
4	12	58	12	58	
6	1	10	1	12	
8	1	20	1	22	
10	1	30	1	32	
12	1	40	1	42	
14	1	50	1	52	
16	2	00	2	02	
18	2	10	2	12	
20	2	22	2	24	
22	2	28	2	30	
24	2	40	2	42	
26	2	50	2	52	
28	3	00	3	02	
30	3	12	3	14	
C1	3	20	3	22	
2					

BATTERY NO. A-2

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	2	30	3	32	
3	3	40	3	42	
5	4	05	4	13	
7	4	15	4	22	
9	4	26	4	32	
11	4	36	4	50	KO P.B
13	4	52	5	02	
15	5	04	5	13	
17	5	15	5	23	
18	5	25	5	33	
21	5	35	5	58	
23	5	48	6	04	
25	6	02	6	11	
27	6	13	6	23	
29	6	26	6	33	
31	6	35	6	44	
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
1					
2					

REMARKS: 15/16 — 25/25 — 16/16 — 56 — 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	3		6-7	5	5	
1-2	5	5		7-8	6	7	
2-3	6	6		8-9	2	1	
3-4	5	5		9-10	6	6	
4-5	5	4		10-11	5	5	
5-6	5	5		11-12	4	5	
	28	28			28	29	

Total Ovens Pushed 56
Total Ovens Charged 57
Pusherman
Battery Foreman

CC-10295 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 1
12 Hrs. Beginning 12:00 PM
Date 8-25-93

BATTERY NO. B-2

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1			
3			
5			
7			
9			
11			
13			
15			
17			
19			
21			
23	10 02		
25			
27			
29			
31	12 38	12 52	—
2	1 02	1 12	—
4	1 10	1 [illegible]	—
6	1 24	1 [illegible]	—
8	1 31	1 38	—
10	1 44	1 [illegible]	—
12	1 [illegible]	1 [illegible]	—
14	[illegible]	[illegible]	—
16	8 45	8 45	—
18	8 56	8 [illegible]	—
20	9 10	9 [illegible]	—
22	9 [illegible]	[illegible]	—
24	[illegible]	[illegible]	—
26	[illegible]	[illegible]	—
28	[illegible]	[illegible]	—
30	[illegible]	[illegible]	—
C/1	10 08	10 [illegible]	—
C/2	12 44	1 [illegible]	—

BATTERY NO. A-1

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	10 18	10 22	—
3	10 28	10 32	—
5	10 38	10 42	—
7	10 48	10 52	—
9	10 58	11 02	—
11	11 08	11 12	—
13	11 20	11 24	—
15	11 32	11 36	—
17	11 44	11 48	—
19			
21			
23			
25			
27			
29			
31			
2	12 53	1 03	—
4	1 05	1 14	—
6	1 16	1 25	—
8	1 27	1 35	—
10	1 37	1 46	—
12	1 48	1 56	—
14	1 58	2 06	— PB
16	2 08	2 17	—
18	2 19	2 34	—
20			PASS-UP
22	2 36	2 45	PB —
24	2 47	2 56	PB —
26	2 58	3 08	—
28	3 10	3 26	—
30	3 28	3 36	—
C/1			
C/2			

BATTERY NO. B-1

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	3 38	3 46	—
3	3 48	3 52	—
5	4 10	4 12	—
7	4 22	4 24	—
9	4 34	4 36	PB, KO
11	4 46	4 48	PB, KO
13	4 58	5 02	PB —
15	5 12	5 16	—
17	5 22	5 26	—
19	5 32	5 39	—
21	5 42	5 48	—
23	5 58	6 02	—
25	6 08	6 12	—
27	6 20	6 24	—
29	6 32	6 36	—
31	6 44	6 48	—
2			
4			
6			
8			
10			
12			
14			
16			
18			
20			
22			
24			
26			
28			
30			
C/1			
C/2	6 50	6 54	—

REMARKS:

TO -	17	23	17		59
PB - III	18	23	17		58

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	3	1	
1-2	6	7	
2-3	5	5	
3-4	4	5	
4-5	5	4	
5-6	5	5	
	28	27	

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
6-7	5	6	
7-8	6	6	
9-9	3	3	
9-10	6	5	
10-11	7	6	
11-12	4	5	
	31	31	

Total Ovens Pushed 59
Total Ovens Charged 58

Pusherman

Battery Foreman

CC-10295 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 1
12 Hrs. Beginning 12:00 A M
Date 8-26-93

BATTERY NO. A-3

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	4	44	4	48	
3	4	56	4	59	
5	5	08	5	12	
7	5	19	5	23	
9	5	30	5	34	
11	5	42	5	45	PB
13	5	56	5	59	
15	6	08	6	12	
17	6	19	6	23	
19	6	29	6	33	
21	6	40	6	43	PB
23	6	51	6	54	PB
25	6	58	7	02	
27	7	09	7	13	PB
29	7	20	7	24	
31	7	31	7	35	
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
1					
2					

BATTERY NO. B-3

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11					
13					
15					
17					
(19)	12	05	12	07	
21	12	17	12	19	
23	12	29	12	32	
25	12	40	12	43	
27	12	51	12	53	
29	1	02	1	06	
31	1	13	1	17	
2	8	05	8	07	
4	8	15	8	17	
6	8	25	8	27	P.B.
8	8	35	8	37	
10	8	45	8	47	PB
12	9	05	9	07	PB
14	9	15	9	17	
16	9	28	9	30	
18	9	40	9	42	
20	9	50	9	52	
22	10	00	10	02	H P PB
24	10	10	10	12	HP PB
26	10	24	10	26	H.P PB
28	10	35	10	37	
30	10	45	10	47	
C1	10	55	10	57	
C2	1	23	1	26	

BATTERY NO. A-2

OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	11	10	11	08	
3	11	48	11	50	
5	11	54	11	56	
7	11	59			
9					
11					
13					
15					
17					
18					
21					
23					
25					
27					
29					
31					
2	1	20	1	31	
4	1	39	1	42	
6	1	49	1	53	
8	2	—	2	05	
10	2	16	2	20	
12	2	27	2	30	
14	2	38	2	42	PR
16	2	49	2	53	
18	3	00	3	04	
20	3	10	3	15	
22	3	20	3	25	
24	3	30	3	35	
26	3	41	3	46	
28	3	51	3	56	
30	4	35	4	40	
1					
2					

REMARKS:

16/16 24/24 19/18

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	5	5	
1-2	6	6	
2-3	5	5	
3-4	6	6	
4-5	3	3	
5-6	5	5	
	30	30	

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

Total Ovens Pushed 59
Total Ovens Charged 58

Pusherman

Battery Foreman

CC-10295 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

PUSHING AND CHARGING REPORT

UNIT NO. 1
12 Hrs. Beginning 12:00 AM
Date 8-26-93

BATTERY NO. [illegible]

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	4 52	4 54	
3	5 03	5 05	
5	5 13	5 15	
7	5 23	5 25	
9	5 33	5 35	
11	5 43	5 45	
13	5 53	5 55	
15	6 04	6 06	
17	6 16	6 18	
19	6 28	6 30	
21	6 40	6 42	
23		2 53	
25	7 05	7 07	
27	7 17	7 19	
29	7 29	7 31	
31	7 41	7 43	
2			2
4			4
6			6
8			8
10		16/17	10
12			12
14			14
16			16
18			18
20			
22			21
24			23
26			25
28			27
30			30
C/1			
C/2	7 50	7 52	

BATTERY NO. A-1

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1			32
3			34
5			36
7			38
9		22/22	40
11			42
13			49
15			
17			
19	12 07	12 10	
21	12 20	12 22	
23	12 32	12 34	
25	12 44	12 46	
27	12 56	12 58	
29	1 07	1 09	
31	1 19	1 17	
2	8 13	8 21	
4	8 23	8 32	2
6	8 34	8 43	4
8	8 45	9 —	6
10	9 02	9 10	8
12	9 12	9 23	PB
14	9 25	9 34	KO PB
16	9 36	9 46	PB
18	9 48	10 06	
20	2 15	2 18	
22	10 08	10 16	PB
24	10 18	10 27	PB
26	10 29	10 40	PB
28	10 42	11 —	PB
30	11 02	11 14	PB
C/1			
C/2			

BATTERY NO. B-1

OVEN NO.	TIME PUSHED	TIME CHARGED	NOTES
1	11 16	11 21	
3	11 23	11 31	
5	11 29	11 35	PB
7	11 37	11 41	KO
9			
11			
13			
15			
17			
19		20/20	
21			
23			58 P
25			59 P
27			
29			
31			
2	1 31	1 33	
4	1 43	1 45	
6	1 55	1 57	
8	2 06	2 08	
10	2 24	2 26	PB
12	2 36	2 38	
14	2 47	2 49	KO PB
16	2 54	2 58	PB
18	3 05	3 07	
20	3 15	3 17	PB
22	3 25	3 27	
24	3 35	3 37	
26	3 45	3 47	
28	3 55	3 57	
30	4 32	4 34	
C/1	4 42	4 44	
C/2			

REMARKS:

12-8 { KO-1 / PB-1111 } 8-4 { KO-1 / PB-1111 } KO A/M on 1 B/1

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		6-7	4	4	
1-2	5	5		7-8	5	5	
2-3	5	5		8-9	4	3	
3-4	6	6		9-10	5	5	
4-5	3	3		10-11	4	4	
5-6	6	6		11-12	5	6	
	30	32			27	27	

Total Ovens Pushed 58
Total Ovens Charged 59

Pusherman

Battery Foreman

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

UNIT NO.
12 Hrs. Beginning 12:00 PM
Date 8-26-93

BATTERY NO. B-2						BATTERY NO. A-1						BATTERY NO. B-1					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES	OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES	OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1						1	6	48	7	16		1					
3						3	6	49	7	28		3					
5						5	7	04	7	40		5					
7						7	7	19	7	54		7					
9						9	7	30	8	33		9	12	41	1	11	KO-PB
11						11	7	32	8	48		11	12	51	1	21	PB
13						13	7	56	9	02		13	1	02	1	31	KO-PB
15						15	8	35	9	14		15	1	13	1	41	PB
17						17	8	50	9	26		17	1	23	1	51	
19						19	9	04	9	36		19	1	33	2	02	PB
21						21	9	16	9	50		21	1	43	2	13	
23						23	9	28	10	03		23	1	53	2	23	PB
25						25	9	38	10	16		25	2	04	2	34	
27						27	9	52	10	32		27	2	15	2	40	
29						29	10	05	10	42		29	2	25	2	57	
31						31	10	14	10	52		31	2	36	3	08	
2	2	53	3	22		2						2	10	34	11	02	
4	3	04	3	32		4						4	10	44	11	14	
6	3	14	3	42		6						6	10	54	11	24	
8	3	24	3	53		8						8	11	04	11	34	
10	3	34	4	06		10						10	11	16	11	44	
12	3	44	4	18		12						12	11	26			
14	3	55	4	22		14						14	11	36			
16	4	08	4	44		16						16	11	46			
18	4	20	4	56		18						18					
20	4	24	5	08		20						20					
22	4	46	5	20		22						22					
24	4	58	5	32		24						24					
26	5	10	5	26		26						26					
28	5	22	5	54		28						28					
30	5	44	5	59		30						30					
C 1	5	38	6	05		1						1					
2						2						C/2	2	42	3	18	

REMARKS: KO-11

16/16 PB-HT 1 16/16 21/18

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	—		6-7	2	4	
1-2	6	5		7-8	5	4	
2-3	6	6		8-9	2	2	
3-4	6	6		9-10	5	5	
4-5	5	5		10-11	5	5	
5-6	4	6		11-12	5	5	
	29	28			24	22	

Total Ovens Pushed 53
Total Ovens Charged 50

Pusherman

Battery Foreman [signature]

CC-10295 REV. 1161
03.041-8020

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 8-26-93

BATTERY NO. A-3					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7					
9					
11					
13					
15					
17					
19					
21					
23					
25					
27					
29					
31					
2	2	45	3	20	PB KO
4	2	55	3	29	
6	3	07	3	39	
8	3	15	3	52	
10	3	27	3	58	
12	3	35	4	10	PB
14	3	50	4	28	PB
16	3	56	4	38	PB KO
18	4	19	4	48	K.O.P.B
20	4	30	5	—	K.O.P.B
22	4	41	5	13	K.O.P.B
24	4	51	5	23	K.O.P.B
26	5	02	5	37	KO
28	5	15	5	47	
30	5	25	5	57	
1					
2					

BATTERY NO. B-3					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1	5	42	6	07	
3	6	53	7	30	
5	7	04	7	40	
7	7	23	7	50	
9	7	33	8	37	
11	7	43	8	45	
13	7	53	9	05	
15	8	35	9	15	P.B
17	8	47	9	25	
19	9	03	9	35	
21	9	13	9	45	
23	9	23	9	55	
25	9	33	10	09	
27	9	43	10	22	
29	9	53	10	30	
31	10	07	10	39	
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
1					
C-2	10	20	10	49	

BATTERY NO. A-2					
OVEN NO.	TIME PUSHED		TIME CHARGED		NOTES
1					
3					
5					
7			12	01	
9	12	32	12	24	
11	12	45	12	47	
13	12	55	12	57	
15	1	05	1	07	
17	1	15	1	17	
18	1	25	1	27	
21	1	35	1	38	
23	1	45	2	12	HP. PB
25	2	00	2	32	
27	2	07	2	47	
29	2	18	2	57	
31	2	30	3	09	
2	10	27	10	59	
4	10	37	11	06	
6	10	47	11	16	
8	10	57	11	26	
10	11	08	11	36	
12	11	18	11	46	
14	11	28			
16	11	38			
18	11	48			
20					
22					
24					
26					
28					
30					
1					
2					

REMARKS:

Condition of Signals

Condition of Pusher

HOURLY REPORT OF OPERATION

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
12-1	3	4	
1-2	5	4	
2-3	6	4	
3-4	6	6	
4-5	4	4	
5-6	4	6	
	28	27	

TIME	OVENS PUSHED	OVENS CHARGED	OVENS SCHEDULED
6-7	1	1	
7-8	5	3	
8-9	2	2	
9-10	6	6	
10-11	6	6	
11-12	5	5	
	25	23	

Total Ovens Pushed 53
Total Ovens Charged 51

Pusherman

Battery Foreman

Wednesday, August 25, 1993 Turn 2
Batteries: 1-3_2

Seq #	Oven		Last Pushed		Earliest		Desired		Latest
1	B20 /2		19:41		10:00am		10:00am		3:12pm
2	B14/3		19:41		10:06am		10:06am		3:18pm
3	B22/2		19:41		10:12am		10:12am		3:24pm
4	B16/3		19:41		10:18am		10:18am		3:30pm
5	B24/2		19:41		10:24am		10:24am		3:36pm
6	B18/3		19:41		10:30am		10:30am		3:42pm
7	B26/2		19:41		10:36am		10:36am		3:48pm
8	B20/3		19:41		10:42am		10:42am		3:54pm
9	B28/2		19:41		10:48am		10:48am		4:00pm
10	B22/3		19:41		10:54am		10:54am		4:06pm
11	B30/2		19:41		11:00am		11:00am		4:12pm
12	B24/3		19:41		11:06am		11:06am		4:18pm
13	B32/2		19:41		11:12am		11:12am		4:24pm
14	B26/3		19:41		11:18am		11:18am		4:30pm
15	B34/2		19:41		11:24am		11:24am		4:36pm
16	B28/3		19:41		11:30am		11:30am		4:42pm
17	B36/2		19:41		11:36am		11:36am		4:48pm
18	B30/3		19:41		11:42am		11:42am		4:54pm
19	B38/2		19:41		11:48am		11:48am		5:00pm
20	B32/3		19:41		11:54am		11:54am		5:06pm
21	B40/2		19:41		12:00pm		12:00pm		5:12pm
22	B34/3		19:41		12:06pm		12:06pm		5:18pm
23	B42/2		19:41		12:12pm		12:12pm		5:24pm
24	B36/3		19:41		12:18pm		12:18pm		5:30pm
25	B44/2		19:41		12:24pm		12:24pm		5:36pm
26	B38/3		19:41		12:30pm		12:30pm		5:42pm
27	B46/2		19:41		12:36pm		12:36pm		5:48pm
28	B40/3		19:41		12:42pm		12:42pm		5:54pm
29	B48/2		19:41		12:48pm		12:48pm		6:00pm
30	B42/3		19:41		12:54pm		12:54pm		6:06pm
31	B50/2		19:41		1:00pm		1:00pm		6:12pm
32	B44/3		19:41		1:06pm		1:06pm		6:18pm
33	B52/2		19:41		1:12pm		1:12pm		6:24pm
34	B46/3		19:41		1:18pm		1:18pm		6:30pm
35	B54/2		19:41		1:24pm		1:24pm		6:36pm
36	B48/3		19:41		1:30pm		1:30pm		6:42pm
37	B56/2		19:41		1:36pm		1:36pm		6:48pm
38	B50/3		19:41		1:42pm		1:42pm		6:54pm
39	B58/2		19:41		1:48pm		1:48pm		7:00pm
40	B52/3		19:41		1:54pm		1:54pm		7:06pm
41	B60/2		19:41		2:00pm		2:00pm		7:12pm
42	B54/3		19:41		2:06pm		2:06pm		7:18pm
43	B62/2		19:41		2:12pm		2:12pm		7:24pm
44	B56/3		19:41		2:18pm		2:18pm		7:30pm
45	B64/2		19:41		2:24pm		2:24pm		7:36pm
46	B58/3		19:41		2:30pm		2:30pm		7:42pm
47	B66/2		19:41		2:36pm		2:36pm		7:48pm
48	B60/3		19:41		2:42pm		2:42pm		7:54pm
49	B68/2		19:41		2:48pm		2:48pm		8:00pm
50	B62/3		19:41		2:54pm		2:54pm		8:06pm
51	B70/2		19:41		3:00pm		3:00pm		8:12pm
52	B64/3		19:41		3:06pm		3:06pm		8:18pm
53	B72/2		19:41		3:12pm		3:12pm		8:24pm
54	B66/3		19:41		3:18pm		3:18pm		8:30pm
55	B74/2		19:41		3:24pm		3:24pm		8:36pm
56	B68/3		19:41		3:30pm		3:30pm		8:42pm
57	B76/2		19:41		3:36pm		3:36pm		8:48pm
58	B70/3		19:41		3:42pm		3:42pm		8:54pm
59	B78/2		19:41		3:48pm		3:48pm		9:00pm
60	B72/3		19:41		3:54pm		3:54pm		9:06pm
61	B80/2		19:41		4:00pm		4:00pm		9:12pm
62	B74/3		19:41		4:06pm		4:06pm		9:18pm
63	B82/2		19:41		4:12pm		4:12pm		9:24pm
64	B76/3		19:41		4:18pm		4:18pm		9:30pm
65	B84/2		19:41		4:24pm		4:24pm		9:36pm
66	B78/3		19:41		4:30pm		4:30pm		9:42pm
67	B86/2		19:41		4:36pm		4:36pm		9:48pm
68	B80/3		19:41		4:42pm		4:42pm		9:54pm
69	B88/2		19:41		4:48pm		4:48pm		10:00pm
70	B82/3		19:41		4:54pm		4:54pm		10:06pm
71	B90/2		19:41		5:00pm		5:00pm		10:12pm
72	B84/3		19:41		5:06pm		5:06pm		10:18pm
73	B92/2		19:41		5:12pm		5:12pm		10:24pm
74	B86/3		19:41		5:18pm		5:18pm		10:30pm
75	B94/2		19:41		5:24pm		5:24pm		10:36pm
76	B88/3		19:41		5:30pm		5:30pm		10:42pm
77	B96/2		19:41		5:36pm		5:36pm		10:48pm
78	B90/3		19:41		5:42pm		5:42pm		10:54pm
79	B98/2		19:41		5:48pm		5:48pm		11:00pm
80	B92/3		19:41		5:54pm		5:54pm		11:06pm
81	B100/2		19:41		6:00pm		6:00pm		11:12pm
82	B94/3		19:41		6:06pm		6:06pm		11:18pm
83	B102/2		19:41		6:12pm		6:12pm		11:24pm
84	B96/3		19:41		6:18pm		6:18pm		11:30pm
85	B104/2		19:41		6:24pm		6:24pm		11:36pm
86	B98/3		19:41		6:30pm		6:30pm		11:42pm
87	B106/2		19:41		6:36pm		6:36pm		11:48pm
88	B100/3		19:41		6:42pm		6:42pm		11:54pm
89	B108/2		19:41		6:48pm		6:48pm		12:00am
90	B102/3		19:41		6:54pm		6:54pm		12:06am
91	B110/2		19:41		7:00pm		7:00pm		12:12am
92	B104/3		19:41		7:06pm		7:06pm		12:18am
93	B112/2		19:41		7:12pm		7:12pm		12:24am
94	B106/3		19:41		7:18pm		7:18pm		12:30am
95	B114/2		19:41		7:24pm		7:24pm		12:36am
96	B108/3		19:41		7:30pm		7:30pm		12:42am
97	B116/2		19:41		7:36pm		7:36pm		12:48am
98	B110/3		19:41		7:42pm		7:42pm		12:54am
99	B118/2		19:41		7:48pm		7:48pm		1:00am
100	B112/3		19:41		7:54pm		7:54pm		1:06am
101	B120/2		19:41		8:00pm		8:00pm		1:12am
102	B114/3		19:41		8:06pm		8:06pm		1:18am
103	B122/2		19:41		8:12pm		8:12pm		1:24am
104	B116/3		19:41		8:18pm		8:18pm		1:30am
105	B124/2		19:41		8:24pm		8:24pm		1:36am
106	B118/3		19:41		8:30pm		8:30pm		1:42am
107	B126/2		19:41		8:36pm		8:36pm		1:48am
108	B120/3		19:41		8:42pm		8:42pm		1:54am
109	B128/2		19:41		8:48pm		8:48pm		2:00am
110	B122/3		19:41		8:54pm		8:54pm		2:06am
111	B130/2		19:41		9:00pm		9:00pm		2:12am
112	B124/3		19:41		9:06pm		9:06pm		2:18am
113	B132/2		19:41		9:12pm		9:12pm		2:24am
114	B126/3		19:41		9:18pm		9:18pm		2:30am
115	B134/2		19:41		9:24pm		9:24pm		2:36am
116	B128/3		19:41		9:30pm		9:30pm		2:42am
117	B136/2		19:41		9:36pm		9:36pm		2:48am
118	B130/3		19:41		9:42pm		9:42pm		2:54am
119	B138/2		19:41		9:48pm		9:48pm		3:00am
120	B132/3		19:41		9:54pm		9:54pm		3:06am
121	B140/2		19:41		10:00pm		10:00pm		3:12am
122	B134/3		19:41		10:06pm		10:06pm		3:18am
123	B142/2		19:41		10:12pm		10:12pm		3:24am
124	B136/3		19:41		10:18pm		10:18pm		3:30am
125	B144/2		19:41		10:24pm		10:24pm		3:36am
126	B138/3		19:41		10:30pm		10:30pm		3:42am
127	B146/2		19:41		10:36pm		10:36pm		3:48am
128	B140/3		19:41		10:42pm		10:42pm		3:54am
129	B148/2		19:41		10:48pm		10:48pm		4:00am
130	B142/3		19:41		10:54pm		10:54pm		4:06am
131	B150/2		19:41		11:00pm		11:00pm		4:12am
132	B144/3		19:41		11:06pm		11:06pm		4:18am
133	B152/2		19:41		11:12pm		11:12pm		4:24am
134	B146/3		19:41		11:18pm		11:18pm		4:30am
135	B154/2		19:41		11:24pm		11:24pm		4:36am
136	B148/3		19:41		11:30pm		11:30pm		4:42am
137	B156/2		19:41		11:36pm		11:36pm		4:48am
138	B150/3		19:41		11:42pm		11:42pm		4:54am
139	B158/2		19:41		11:48pm		11:48pm		5:00am
140	B152/3		19:41		11:54pm		11:54pm		5:06am
141	B160/2		19:41		12:00am		12:00am		5:12am
142	B154/3		19:41		12:06am		12:06am		5:18am
143	B162/2		19:41		12:12am		12:12am		5:24am
144	B156/3		19:41		12:18am		12:18am		5:30am
145	B164/2		19:41		12:24am		12:24am		5:36am
146	B158/3		19:41		12:30am		12:30am		5:42am
147	B166/2		19:41		12:36am		12:36am		5:48am
148	B160/3		19:41		12:42am		12:42am		5:54am
149	B168/2		19:41		12:48am		12:48am		6:00am
150	B162/3		19:41		12:54am		12:54am		6:06am
151	B170/2		19:41		1:00am		1:00am		6:12am
152	B164/3		19:41		1:06am		1:06am		6:18am
153	B172/2		19:41		1:12am		1:12am		6:24am
154	B166/3		19:41		1:18am		1:18am		6:30am
155	B174/2		19:41		1:24am		1:24am		6:36am
156	B168/3		19:41		1:30am		1:30am		6:42am
157	B176/2		19:41		1:36am		1:36am		6:48am
158	B170/3		19:41		1:42am		1:42am		6:54am
159	B178/2		19:41		1:48am		1:48am		7:00am
160	B172/3		19:41		1:54am		1:54am		7:06am
161	B180/2		19:41		2:00am		2:00am		7:12am
162	B174/3		19:41		2:06am		2:06am		7:18am
163	B182/2		19:41		2:12am		2:12am		7:24am
164	B176/3		19:41		2:18am		2:18am		7:30am
165	B184/2		19:41		2:24am		2:24am		7:36am
166	B178/3		19:41		2:30am		2:30am		7:42am
167	B186/2		19:41		2:36am		2:36am		7:48am
168	B180/3		19:41		2:42am		2:42am		7:54am
169	B188/2		19:41		2:48am		2:48am		8:00am
170	B182/3		19:41		2:54am		2:54am		8:06am
171	B190/2		19:41		3:00am		3:00am		8:12am
172	B184/3		19:41		3:06am		3:06am		8:18am
173	B192/2		19:41		3:12am		3:12am		8:24am
174	B186/3		19:41		3:18am		3:18am		8:30am
175	B194/2		19:41		3:24am		3:24am		8:36am
176	B188/3		19:41		3:30am		3:30am		8:42am
177	B196/2		19:41		3:36am		3:36am		8:48am
178	B190/3		19:41		3:42am		3:42am		8:54am
179	B198/2		19:41		3:48am		3:48am		9:00am
180	B192/3		19:41		3:54am		3:54am		9:06am
181	B200/2		19:41		4:00am		4:00am		9:12am
182	B194/3		19:41		4:06am		4:06am		9:18am
183	B202/2		19:41		4:12am		4:12am		9:24am
184	B196/3		19:41		4:18am		4:18am		9:30am
185	B204/2		19:41		4:24am		4:24am		9:36am
186	B198/3		19:41		4:30am		4:30am		9:42am
187	B206/2		19:41		4:36am		4:36am		9:48am
188	B200/3		19:41		4:42am		4:42am		9:54am
189	B208/2		19:41		4:48am		4:48am		10:00am
190	B202/3		19:41		4:54am		4:54am		10:06am
191	B210/2		19:41		5:00am		5:00am		10:12am
192	B204/3		19:41		5:06am		5:06am		10:18am
193	B212/2		19:41		5:12am		5:12am		10:24am
194	B206/3		19:41		5:18am		5:18am		10:30am
195	B214/2		19:41		5:24am		5:24am		10:36am
196	B208/3		19:41		5:30am		5:30am		10:42am
197	B216/2		19:41		5:36am		5:36am		10:48am
198	B210/3		19:41		5:42am		5:42am		10:54am
199	B218/2		19:41		5:48am		5:48am		11:00am
200	B212/3		19:41		5:54am		5:54am		11:06am
201	B220/2		19:41		6:00am		6:00am		11:12am
202	B214/3		19:41		6:06am		6:06am		11:18am
203	B222/2		19:41		6:12am		6:12am		11:24am
204	B216/3		19:41		6:18am		6:18am		11:30am
205	B224/2		19:41		6:24am		6:24am		11:36am
206	B218/3		19:41		6:30am		6:30am		11:42am
207	B226/2		19:41		6:36am		6:36am		11:48am
208	B220/3		19:41		6:42am		6:42am		11:54am
209	B228/2		19:41		6:48am		6:48am		12:00pm
210	B222/3		19:41		6:54am		6:54am		12:06pm
211	B230/2		19:41		7:00am		7:00am		12:12pm
212	B224/3		19:41		7:06am		7:06am		12:18pm
213	B232/2		19:41		7:12am		7:12am		12:24pm
214	B226/3		19:41		7:18am		7:18am		12:30pm
215	B234/2		19:41		7:24am		7:24am		12:36pm
216	B228/3		19:41		7:30am		7:30am		12:42pm
217	B236/2		19:41		7:36am		7:36am		12:48pm
218	B230/3		19:41		7:42am		7:42am		12:54pm
219	B238/2		19:41		7:48am		7:48am		1:00pm
220	B232/3		19:41		7:54am		7:54am		1:06pm
221	B240/2		19:41		8:00am		8:00am		1:12pm
222	B234/3		19:41		8:06am		8:06am		1:18pm
223	B242/2		19:41		8:12am		8:12am		1:24pm
224	B236/3		19:41		8:18am		8:18am		1:30pm
225	B244/2		19:41		8:24am		8:24am		1:36pm
226	B238/3		19:41		8:30am		8:30am		1:42pm
227	B246/2		19:41		8:36am		8:36am		1:48pm
228	B240/3		19:41		8:42am		8:42am		1:54pm
229	B248/2		19:41		8:48am		8:48am		2:00pm
230	B242/3		19:41		8:54am		8:54am		2:06pm
231	B250/2		19:41		9:00am		9:00am		2:12pm
232	B244/3		19:41		9:06am		9:06am		2:18pm
233	B252/2		19:41		9:12am		9:12am		2:24pm
234	B246/3		19:41		9:18am		9:18am		2:30pm
235	B254/2		19:41		9:24am		9:24am		2:36pm
236	B248/3		19:41		9:30am		9:30am		2:42pm
237	B256/2		19:41		9:36am		9:36am		2:48pm
238	B250/3		19:41		9:42am		9:42am		2:54pm
239	B258/2		19:41		9:48am		9:48am		3:00pm
240	B252/3		19:41		9:54am		9:54am		3:06pm
241	B260/2		19:41		10:00am		10:00am		3:12pm
242	B254/3		19:41		10:06am		10:06am		3:18pm
243	B262/2		19:41		10:12am		10:12am		3:24pm
244	B256/3		19:41		10:18am		10:18am		3:30pm
245	B264/2		19:41		10:24am		10:24am		3:36pm
246	B258/3		19:41		10:30am		10:30am		3:42pm
247	B266/2		19:41		10:36am		10:36am		3:48pm
248	B260/3		19:41		10:42am		10:42am		3:54pm
249	B268/2		19:41		10:48am		10:48am		4:00pm
250	B262/3		19:41		10:54am		10:54am		4:06pm
251	B270/2		19:41		11:00am		11:00am		4:12pm
252	B264/3		19:41		11:06am		11:06am		4:18pm
253	B272/2		19:41		11:12am		11:12am		4:24pm
254	B266/3		19:41		11:18am		11:18am		4:30pm
255	B274/2		19:41		11:24am		11:24am		4:36pm
256	B268/3		19:41		11:30am		11:30am		4:42pm
257	B276/2		19:41		11:36am		11:36am		4:48pm
258	B270/3		19:41		11:42am		11:42am		4:54pm
259	B278/2		19:41		11:48am		11:48am		5:00pm
260	B272/3		19:41		11:54am		11:54am		5:06pm
261	B280/2		19:41		12:00pm		12:00pm		5:12pm
262	B274/3		19:41		12:06pm		12:06pm		5:18pm
263	B282/2		19:41		12:12pm		12:12pm		5:24pm
264	B276/3		19:41		12:18pm		12:18pm		5:30pm
265	B284/2		19:41		12:24pm		12:24pm		5:36pm
266	B278/3		19:41		12:30pm		12:30pm		5:42pm
267	B286/2		19:41		12:36pm		12:36pm		5:48pm
268	B280/3		19:41		12:42pm		12:42pm		5:54pm
269	B288/2		19:41		12:48pm		12:48pm		6:00pm
270	B282/3		19:41		12:54pm		12:54pm		6:06pm
271	B290/2		19:41		1:00pm		1:00pm		6:12pm
272	B284/3		19:41		1:06pm		1:06pm		6:18pm
273	B292/2		19:41		1:12pm		1:12pm		6:24pm
274	B286/3		19:41		1:18pm		1:18pm		6:30pm
275	B294/2		19:41		1:24pm		1:24pm		6:36pm
276	B288/3		19:41		1:30pm		1:30pm		6:42pm
277	B296/2		19:41		1:36pm		1:36pm		6:48pm
278	B290/3		19:41		1:42pm		1:42pm		6:54pm
279	B298/2		19:41		1:48pm		1:48pm		7:00pm
280	B292/3		19:41		1:54pm		1:54pm		7:06pm
281	B300/2		19:41		2:00pm		2:00pm		7:12pm
282	B294/3		19:41		2:06pm		2:06pm		7:18pm
283	B302/2		19:41		2:12pm		2:12pm		7:24pm
284	B296/3		19:41		2:18pm		2:18pm		7:30pm
285	B304/2		19:41		2:24pm		2:24pm		7:36pm
286	B298/3		19:41		2:30pm		2:30pm		7:42pm
287	B306/2		19:41		2:36pm		2:36pm		7:48pm
288	B300/3		19:41		2:42pm		2:42pm		7:54pm
289	B308/2		19:41		2:48pm		2:48pm		8:00pm
290	B302/3		19:41		2:54pm		2:54pm		8:06pm
291	B310/2		19:41		3:00pm		3:00pm		8:12pm
292	B304/3		19:41		3:06pm		3:06pm		8:18pm
293	B312/2		19:41		3:12pm		3:12pm		8:24pm
294	B306/3		19:41		3:18pm		3:18pm		8:30pm
295	B314/2		19:41		3:24pm		3:24pm		8:36pm
296	B308/3		19:41		3:30pm		3:30pm		8:42pm
297	B316/2		19:41		3:36pm		3:36pm		8:48pm
298	B310/3		19:41		3:42pm		3:42pm		8:54pm
299	B318/2		19:41		3:48pm		3:48pm		9:00pm
300	B312/3		19:41		3:54pm		3:54pm		9:06pm
301	B320/2		19:41		4:00pm		4:00pm		9:12pm
302	B314/3		19:41		4:06pm		4:06pm		9:18pm
303	B322/2		19:41		4:12pm		4:12pm		9:24pm
304	B316/3		19:41		4:18pm		4:18pm		9:30pm
305	B324/2		19:41		4:24pm		4:24pm		9:36pm
306	B318/3		19:41		4:30pm		4:30pm		9:42pm
307	B326/2		19:41		4:36pm		4:36pm		9:48pm
308	B320/3		19:41		4:42pm		4:42pm		9:54pm
309	B328/2		19:41		4:48pm		4:48pm		10:00pm
310	B322/3		19:41		4:54pm		4:54pm		10:06pm
311	B330/2		19:41		5:00pm		5:00pm		10:12pm
312	B324/3		19:41		5:06pm		5:06pm		10:18pm
313	B332/2		19:41		5:12pm		5:12pm		10:24pm
314	B326/3		19:41		5:18pm		5:18pm		10:30pm
315	B334/2		19:41		5:24pm		5:24pm		10:36pm
316	B328/3		19:41		5:30pm		5:30pm		10:42pm
317	B336/2		19:41		5:36pm		5:36pm		10:48pm
318	B330/3		19:41		5:42pm		5:42pm		10:54pm
319	B338/2		19:41		5:48pm		5:48pm		11:00pm
320	B332/3		19:41		5:54pm		5:54pm		11:06pm
321	B340/2		19:41		6:00pm		6:00pm		11:12pm
322	B334/3		19:41		6:06pm		6:06pm		11:18pm
323	B342/2		19:41		6:12pm		6:12pm		11:24pm
324	B336/3		19:41		6:18pm		6:18pm		11:30pm
325	B344/2		19:41		6:24pm		6:24pm		11:36pm
326	B338/3		19:41		6:30pm		6:30pm		11:42pm
327	B346/2		19:41		6:36pm		6:36pm		11:48pm
328	B340/3		19:41		6:42pm		6:42pm		11:54pm
329	B348/2		19:41		6:48pm		6:48pm		12:00am
330	B342/3		19:41		6:54pm		6:54pm		12:06am
331	B350/2		19:41		7:00pm		7:00pm		12:12am
332	B344/3		19:41		7:06pm		7:06pm		12:18am
333	B352/2		19:41		7:12pm		7:12pm		12:24am
334	B346/3		19:41		7:18pm		7:18pm		12:30am
335	B354/2		19:41		7:24pm		7:24pm		12:36am
336	B348/3		19:41		7:30pm		7:30pm		12:42am
337	B356/2		19:41		7:36pm		7:36pm		12:48am
338	B350/3		19:41		7:42pm		7:42pm		12:54am
339	B358/2		19:41		7:48pm		7:48pm		1:00am
340	B352/3		19:41		7:54pm		7:54pm		1:06am
341	B360/2		19:41		8:00pm		8:00pm		1:12am
342	B354/3		19:41		8:06pm		8:06pm		1:18am
343	B362/2		19:41		8:12pm		8:12pm		1:24am
344	B356/3		19:41		8:18pm		8:18pm		1:30am
345	B364/2		19:41		8:24pm		8:24pm		1:36am
346	B358/3		19:41		8:30pm		8:30pm		1:42am
347	B366/2		19:41		8:36pm		8:36pm		1:48am
348	B360/3		19:41		8:42pm		8:42pm		1:54am
349	B368/2		19:41		8:48pm		8:48pm		2:00am
350	B362/3		19:41		8:54pm		8:54pm		2:06am
351	B370/2		19:41		9:00pm		9:00pm		2:12am
352	B364/3		19:41		9:06pm		9:06pm		2:18am
353	B372/2		19:41		9:12pm		9:12pm		2:24am
354	B366/3		19:41		9:18pm		9:18pm		2:30am
355	B374/2		19:41		9:24pm		9:24pm		2:36am
356	B368/3		19:41		9:30pm		9:30pm		2:42am
357	B376/2		19:41		9:36pm		9:36pm		2:48am
358	B370/3		19:41		9:42pm		9:42pm		2:54am
359	B378/2		19:41		9:48pm		9:48pm		3:00am
360	B372/3		19:41		9:54pm		9:54pm		3:06am
361	B380/2		19:41		10:00pm		10:00pm		3:12am
362	B374/3		19:41		10:06pm		10:06pm		3:18am
363	B382/2		19:41		10:12pm		10:12pm		3:24am
364	B376/3		19:41		10:18pm		10:18pm		3:30am
365	B384/2		19:41		10:24pm		10:24pm		3:36am
366	B378/3		19:41		10:30pm		10:30pm		3:42am
367	B386/2		19:41		10:36pm		10:36pm		3:48am
368	B380/3		19:41		10:42pm		10:42pm		3:54am
369	B388/2		19:41		10:48pm		10:48pm		4:00am
370	B382/3		19:41		10:54pm		10:54pm		4:06am
371	B390/2		19:41		11:00pm		11:00pm		4:12am
372	B384/3		19:41		11:06pm		11:06pm		4:18am
373	B392/2		19:41		11:12pm		11:12pm		4:24am
374	B386/3		19:41		11:18pm		11:18pm		4:30am
375	B394/2		19:41		11:24pm		11:24pm		4:36am
376	B388/3		19:41		11:30pm		11:30pm		4:42am
377	B396/2		19:41		11:36pm		11:36pm		4:48am
378	B390/3		19:41		11:42pm		11:42pm		4:54am
379	B398/2		19:41		11:48pm		11:48pm		5:00am
380	B392/3		19:41		11:54pm		11:54pm		5:06am
381	B400/2

Thursday, August 26 1993 Turn 3
Batteries: 1-3_2

Seq #	Over	Last Pushed	Earliest	Desired	Latest
1	A1 /1	43:34	3:30pm	4:00pm	4:10pm
2	B1 /2	43:35	3:36pm	4:06pm	4:16pm
3	A2 /1	43:34	3:42pm	4:12pm	4:22pm
4	B2 /2	43:35	3:48pm	4:18pm	4:28pm
5	A3 /1	43:34	3:54pm	4:24pm	4:34pm
6	B3 /2	43:35	4:00pm	4:30pm	4:40pm
7	A4 /1	43:34	4:06pm	4:36pm	4:46pm
8	B4 /2	43:35	4:12pm	4:42pm	4:52pm
9	A5 /1	43:34	4:18pm	4:48pm	4:58pm
10	B5 /2	43:35	4:24pm	4:54pm	5:04pm
11	A6 /1	43:34	4:30pm	5:00pm	5:10pm
12	B6 /2	43:35	4:36pm	5:06pm	5:16pm
13	A7 /1	43:34	4:42pm	5:12pm	5:22pm
14	B7 /2	43:35	4:48pm	5:18pm	5:28pm
15	A8 /1	43:34	4:54pm	5:24pm	5:34pm
16	B8 /2	43:35	5:00pm	5:30pm	5:40pm
17	A9 /1	43:34	5:06pm	5:36pm	5:46pm
18	B9 /2	43:35	5:12pm	5:42pm	5:52pm
19	A10/1	43:34	5:18pm	5:48pm	5:58pm
20	B10/2	43:35	5:24pm	5:54pm	6:04pm
21	A11/1	43:34	5:30pm	6:00pm	6:10pm
22	B11/2	43:35	5:36pm	6:06pm	6:16pm
23	A12/1	43:34	5:42pm	6:12pm	6:22pm
24	B12/2	43:35	5:48pm	6:18pm	6:28pm
25	A13/1	43:34	5:54pm	6:24pm	6:34pm
26	B13/2	43:35	6:00pm	6:30pm	6:40pm
27	A14/1	43:34	6:06pm	6:36pm	6:46pm
28	B14/2	43:35	6:12pm	6:42pm	6:52pm
29	A15/1	43:34	6:18pm	6:48pm	6:58pm
30	B15/2	43:35	6:24pm	6:54pm	7:04pm
31	A16/1	43:34	6:30pm	7:00pm	7:10pm
32	B16/2	43:35	6:36pm	7:06pm	7:16pm
33	A17/1	43:34	6:42pm	7:12pm	7:22pm
34	B17/2	43:35	6:48pm	7:18pm	7:28pm
35	A18/1	43:34	6:54pm	7:24pm	7:34pm
36	B18/2	43:35	7:00pm	7:30pm	7:40pm
37	A19/1	43:34	7:06pm	7:36pm	7:46pm
38	B19/2	43:35	7:12pm	7:42pm	7:52pm
39	A20/1	43:34	7:18pm	7:48pm	7:58pm
40	B20/2	43:35	7:24pm	7:54pm	8:04pm
41	A21/1	43:34	7:30pm	8:00pm	8:10pm
42	B21/2	43:35	7:36pm	8:06pm	8:16pm
43	A22/1	43:34	7:42pm	8:12pm	8:22pm
44	B22/2	43:35	7:48pm	8:18pm	8:28pm
45	A23/1	43:34	7:54pm	8:24pm	8:34pm
46	B23/2	43:35	8:00pm	8:30pm	8:40pm
47	A24/1	43:34	8:06pm	8:36pm	8:46pm
48	B24/2	43:35	8:12pm	8:42pm	8:52pm
49	A25/1	43:34	8:18pm	8:48pm	8:58pm
50	B25/2	43:35	8:24pm	8:54pm	9:04pm
51	A26/1	43:34	8:30pm	9:00pm	9:10pm
52	B26/2	43:35	8:36pm	9:06pm	9:16pm
53	A27/1	43:34	8:42pm	9:12pm	9:22pm
54	B27/2	43:35	8:48pm	9:18pm	9:28pm
55	A28/1	43:34	8:54pm	9:24pm	9:34pm
56	B28/2	43:35	9:00pm	9:30pm	9:40pm
57	A29/1	43:34	9:06pm	9:36pm	9:46pm
58	B29/2	43:35	9:12pm	9:42pm	9:52pm
59	A30/1	43:34	9:18pm	9:48pm	9:58pm
60	B30/2	43:35	9:24pm	9:54pm	10:04pm
61	B23/2	63:11	9:30pm	10:00pm	10:10pm
62	C1 /2	43:35	9:36pm	10:06pm	10:16pm
63	B1 /3	43:35	9:42pm	10:12pm	10:22pm
64	A1 /1	43:34	9:48pm	10:18pm	10:28pm
65	B2 /3	43:34	9:54pm	10:24pm	10:34pm
66	A2 /1	43:34	10:00pm	10:30pm	10:40pm
67	B3 /2	43:35	10:06pm	10:36pm	10:46pm
68	A3 /1	43:34	10:12pm	10:42pm	10:52pm
69	B4 /2	43:35	10:18pm	10:48pm	10:58pm
70	A4 /1	43:34	10:24pm	10:54pm	11:04pm
71	B5 /2	43:35	10:30pm	11:00pm	11:10pm
72	A5 /1	43:34	10:36pm	11:06pm	11:16pm
73	B6 /2	43:35	10:42pm	11:12pm	11:22pm
74	A6 /1	43:34	10:48pm	11:18pm	11:28pm
75	B7 /2	43:35	10:54pm	11:24pm	11:34pm
76	A7 /1	43:34	11:00pm	11:30pm	11:40pm
77	B8 /2	43:35	11:06pm	11:36pm	11:46pm
78	A8 /1	43:34	11:12pm	11:42pm	11:52pm
79	B9 /2	43:35	11:18pm	11:48pm	11:58pm
80	A9 /1	43:34	11:24pm	11:54pm	12:04am
81	B10/2	43:35	11:30pm	12:00am	12:10am
82	A10/1	43:34	11:36pm	12:06am	12:16am
83	B11/2	43:35	11:42pm	12:12am	12:22am
84	A11/1	43:34	11:48pm	12:18am	12:28am
85	B12/2	43:35	11:54pm	12:24am	12:34am
86	A12/1	43:34	12:00am	12:30am	12:40am
87	B13/2	43:35	12:06am	12:36am	12:46am
88	A13/1	43:34	12:12am	12:42am	12:52am
89	B14/2	43:35	12:18am	12:48am	12:58am
90	A14/1	43:34	12:24am	12:54am	1:04am
91	B15/2	43:35	12:30am	1:00am	1:10am
92	A15/1	43:34	12:36am	1:06am	1:16am
93	B16/2	43:35	12:42am	1:12am	1:22am
94	A16/1	43:34	12:48am	1:18am	1:28am
95	B17/2	43:35	12:54am	1:24am	1:34am
96	A17/1	43:34	1:00am	1:30am	1:40am
97	B18/2	43:35	1:06am	1:36am	1:46am
98	A18/1	43:34	1:12am	1:42am	1:52am
99	B19/2	43:35	1:18am	1:48am	1:58am
100	A19/1	43:34	1:24am	1:54am	2:04am
101	B20/2	43:35	1:30am	2:00am	2:10am
102	A20/1	43:34	1:36am	2:06am	2:16am
103	B21/2	43:35	1:42am	2:12am	2:22am
104	A21/1	43:34	1:48am	2:18am	2:28am
105	B22/2	43:35	1:54am	2:24am	2:34am
106	A22/1	43:34	2:00am	2:30am	2:40am
107	B23/2	43:35	2:06am	2:36am	2:46am
108	A23/1	43:34	2:12am	2:42am	2:52am
109	B24/2	43:35	2:18am	2:48am	2:58am
110	A24/1	43:34	2:24am	2:54am	3:04am
111	B25/2	43:35	2:30am	3:00am	3:10am
112	A25/1	43:34	2:36am	3:06am	3:16am
113	B26/2	43:35	2:42am	3:12am	3:22am
114	A26/1	43:34	2:48am	3:18am	3:28am
115	B27/2	43:35	2:54am	3:24am	3:34am
116	A27/1	43:34	3:00am	3:30am	3:40am
117	B28/2	43:35	3:06am	3:36am	3:46am
118	A28/1	43:34	3:12am	3:42am	3:52am
119	B29/2	43:35	3:18am	3:48am	3:58am
120	A29/1	43:34	3:24am	3:54am	4:04am
121	B30/2	43:35	3:30am	4:00am	4:10am
122	A30/1	43:34	3:36am	4:06am	4:16am

+B23/2 ~~+~~ B30/2

Wednesday, August 25, 1993 Turn 1
Batteries: 1-3_2

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1	A1/2	19:40	11:50am	11:00am	11:10am
2	B1/1	19:40	11:56am	11:06am	11:16am
3	A3/2	19:41	12:02pm	11:12am	11:22am
4	B3/1	19:41	12:08pm	11:18am	11:28am
5	A5/2	19:42	12:14pm	11:24am	11:34am
6	B5/1	19:42	12:20pm	11:30am	11:40am
7	A7/2	19:43	12:26pm	11:36am	11:46am
8	B7/1	19:43	12:32pm	11:42am	11:52am
9	A9/2	19:44	12:38pm	11:48am	11:58am
10	B9/1	19:44	12:44pm	11:54am	12:04pm
11	A11/2	19:45	12:50pm	12:00pm	12:10pm
12	B11/1	19:45	12:56pm	12:06pm	12:16pm
13	A13/2	19:46	1:02pm	12:12pm	12:22pm
14	B13/1	19:46	1:08pm	12:18pm	12:28pm
15	A15/2	19:47	1:14pm	12:24pm	12:34pm
16	B15/1	19:47	1:20pm	12:30pm	12:40pm
17	A17/2	19:48	1:26pm	12:36pm	12:46pm
18	B17/1	19:48	1:32pm	12:42pm	12:52pm
19	A19/2	19:49	1:38pm	12:48pm	12:58pm
20	B19/1	19:49	1:44pm	12:54pm	1:04pm
21	A21/2	19:50	1:50pm	1:00pm	1:10pm
22	B21/1	19:50	1:56pm	1:06pm	1:16pm
23	A23/2	19:51	2:02pm	1:12pm	1:22pm
24	B23/1	19:51	2:08pm	1:18pm	1:28pm
25	A25/2	19:52	2:14pm	1:24pm	1:34pm
26	B25/1	19:52	2:20pm	1:30pm	1:40pm
27	A27/2	19:53	2:26pm	1:36pm	1:46pm
28	B27/1	19:53	2:32pm	1:42pm	1:52pm
29	A29/2	19:54	2:38pm	1:48pm	1:58pm
30	B29/1	19:54	2:44pm	1:54pm	2:04pm
31	A31/2	19:55	2:50pm	2:00pm	2:10pm
32	B31/1	19:55	2:56pm	2:06pm	2:16pm
33	C1 /2	19:56	3:02pm	2:12pm	2:22pm
34	A1 /2	19:36	2:15am	2:25am	2:35am
35	B1 /1	19:36	2:21am	2:31am	2:41am
36	A1 /1	19:36	2:27am	2:37am	2:47am
37	B3 /2	19:39	2:34am	2:44am	2:54am
38	A3 /2	19:39	2:40am	2:50am	3:00am
39	B5 /2	19:39	2:46am	2:56am	3:06am
40	A5 /1	19:39	2:52am	3:02am	3:12am
41	B7 /2	19:39	2:58am	3:08am	3:18am
42	A7 /1	19:39	3:04am	3:14am	3:24am
43	B9 /2	19:39	3:10am	3:20am	3:30am
44	A9 /1	19:39	3:16am	3:26am	3:36am
45	B11/3	19:38	3:22am	3:32am	3:42am
46	A11/1	19:38	3:28am	3:38am	3:48am
47	B13/3	19:32	3:34am	3:44am	3:54am
48	A13/1	19:32	3:40am	3:50am	4:00am
49	B15/3	19:26	3:46am	3:56am	4:06am
50	A15/1	19:27	3:53am	4:03am	4:13am
51	B17/3	19:26	3:59am	4:09am	4:19am
52	A17/1	19:26	4:05am	4:15am	4:25am
53	B19/3	19:25	4:11am	4:21am	4:31am
54	A19/1	19:26	4:17am	4:27am	4:37am
55	B21/3	19:26	4:23am	4:33am	4:43am
56	A21/1	19:26	4:29am	4:39am	4:49am
57	B23/3	19:25	4:35am	4:45am	4:55am
58	A23/1	19:25	4:41am	4:51am	5:01am
59	B25/3	19:25	4:47am	4:57am	5:07am
60	A25/1	19:25	4:53am	5:03am	5:13am
61	B27/3	19:25	4:59am	5:09am	5:19am
62	A27/1	19:25	5:05am	5:15am	5:25am
63	B29/3	19:26	5:12am	5:22am	5:32am
64	A29/1	19:25	5:18am	5:28am	5:38am
65	B31/3	19:25	5:24am	5:34am	5:44am
66	A31/1	19:25	5:30am	5:40am	5:50am
67	C2 /3	19:25	5:36am	5:46am	5:56am
68	A2 /2	19:25	5:42am	5:52am	6:02am
69	B2 /1	19:25	5:48am	5:58am	6:08am
70	A4 /2	19:24	5:54am	6:04am	6:14am
71	B4 /1	19:24	6:00am	6:10am	6:20am
72	A6 /2	19:24	6:06am	6:16am	6:26am
73	B6 /1	19:24	6:12am	6:22am	6:32am
74	A8 /2	19:24	6:18am	6:28am	6:38am
75	B8 /1	19:24	6:24am	6:34am	6:44am
76	A10/2	19:25	6:31am	6:41am	6:51am
77	B10/1	19:31	6:37am	6:47am	6:57am
78	A12/2	19:30	6:43am	6:53am	7:03am
79	B12/1	19:30	6:49am	6:59am	7:09am
80	A14/2	19:30	6:55am	7:05am	7:15am
81	B14/1	22:59	7:01am	7:11am	7:21am
82	A16/2	19:36	7:07am	7:17am	7:27am
83	B16/1	19:36	7:13am	7:23am	7:33am
84	A18/2	19:36	7:19am	7:29am	7:39am
85	B18/1	19:35	7:25am	7:35am	7:45am
86	A20/2	19:35	7:31am	7:41am	7:51am
87	B20/1	19:35	7:37am	7:47am	7:57am
88	A22/2	19:35	7:43am	7:53am	8:03am

Thursday, August 26, 1993 Turn 2
Batteries: 1-3_2

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
13	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
15	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
18	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
19	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
22	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
23	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
26	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
27	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
28	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
29	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
31	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
32	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
33	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
34	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
36	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
37	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
38	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
40	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
41	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
42	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
43	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
44	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
45	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
46	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
47	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
48	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
49	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
51	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
52	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
53	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
54	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
55	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
56	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
57	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
58	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
59	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
60	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
61	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
62	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
63	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
64	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
65	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
66	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
67	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
68	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
69	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
70	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
71	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
72	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
73	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
74	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
75	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
76	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
77	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
78	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1-420

Friday, August 27, 1993 Turn 3

Batteries: 1-3_2

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1			7:30pm		
2					
3					
4					
5					
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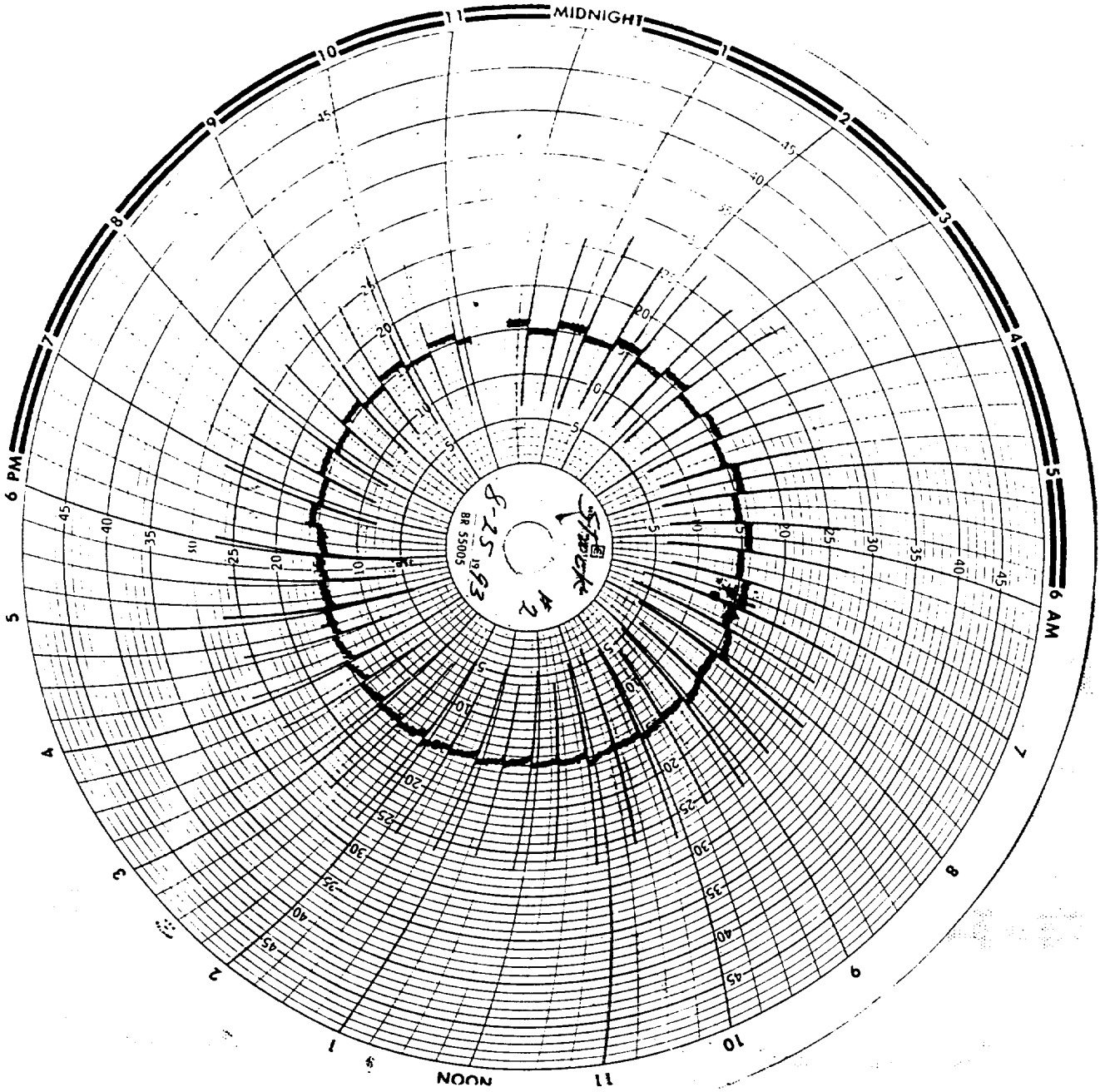
77					
78					
79					

Thursday, August 26, 1993 Turn 1
Batteries: 1-3_2

Seq #	Oven	Last Pushed	Earliest	Desired	Latest
1	[illegible]	[illegible]	[illegible]	12:00am	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
13	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
15	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
18	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
19	[illegible]	[illegible]	[illegible]	1:49am	[illegible]
20	[illegible]	[illegible]	[illegible]	1:55am	[illegible]
21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
22	[illegible]	[illegible]	[illegible]	2:07am	[illegible]
23	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
24	[illegible]	[illegible]	2:09am	2:19am	[illegible]
25	A10/2	19:44	2:15am	2:25am	[illegible]
26	B10/1	19:44	2:21am	2:31am	2:41am
27	A12/2	19:44	2:27am	2:37am	2:47am
28	B12/1	19:45	2:34am	2:44am	2:54am
29	A14/2	19:45	2:40am	2:50am	3:00am
30	B14/1	19:45	2:46am	2:56am	3:06am
31	A16/2	19:45	2:52am	3:02am	3:12am
32	B16/1	19:45	2:58am	3:08am	3:18am
33	A18/2	19:45	3:04am	3:14am	3:24am
34	B18/1	19:45	3:10am	3:20am	3:30am
35	A20/2	19:45	3:16am	3:26am	3:36am
36	B20/1	19:32	3:22am	3:32am	3:42am
37	A22/2	19:32	3:28am	3:38am	3:48am
38	B22/1	19:32	3:34am	3:44am	3:54am
39	A24/2	19:32	3:40am	3:50am	4:00am
40	B24/1	19:32	3:46am	3:56am	4:06am
41	A26/2	19:33	3:53am	4:03am	4:13am
42	B26/1	19:33	3:59am	4:09am	4:19am
43	A28/2	19:32	4:05am	4:15am	4:25am
44	B28/1	19:32	4:11am	4:21am	4:31am
45	A30/2	19:32	4:17am	4:27am	4:37am
46	B30/1	19:32	4:23am	4:33am	4:43am
47	C1 /1	19:32	4:29am	4:39am	4:49am
48	A1 /3	19:32	4:35am	4:45am	4:55am
49	B1 /2	19:31	4:41am	4:51am	5:01am
50	A3 /3	19:31	4:47am	4:57am	5:07am
51	B3 /2	19:31	4:53am	5:03am	5:13am
52	A5 /3	19:31	4:59am	5:09am	5:19am
53	B5 /2	19:31	5:05am	5:15am	5:25am
54	A7 /3	19:32	5:12am	5:22am	5:32am
55	B7 /2	19:32	5:18am	5:28am	5:38am
56	A9 /3	19:31	5:24am	5:34am	5:44am
57	B9 /2	19:31	5:30am	5:40am	5:50am
58	A11/3	19:31	5:36am	5:46am	5:56am
59	B11/2	19:31	5:42am	5:52am	6:02am
60	A13/3	19:31	5:48am	5:58am	6:08am
61	B13/2	19:31	5:54am	6:04am	6:14am
62	A15/3	19:30	6:00am	6:10am	6:20am
63	B15/2	19:30	6:06am	6:16am	6:26am
64	A17/3	19:30	6:12am	6:22am	6:32am
65	B17/2	19:30	6:18am	6:28am	6:38am
66	A19/3	19:30	6:24am	6:34am	6:44am
67	B19/2	19:31	6:31am	6:41am	6:51am
68	A21/3	19:31	6:37am	6:47am	6:57am
69	B21/2	19:30	6:43am	6:53am	7:03am
70	A23/3	19:30	6:49am	6:59am	7:09am
71	A25/3	19:30	6:55am	7:05am	7:15am
72	B25/2	19:30	7:01am	7:11am	7:21am
73	A27/3	19:30	7:07am	7:17am	7:27am
74	B27/2	19:30	7:13am	7:23am	7:33am
75	A29/3	19:29	7:19am	7:29am	7:39am
76	B29/2	19:29	7:25am	7:35am	7:45am
77	A31/3	19:29	7:31am	7:41am	7:51am
78	B31/2	19:29	7:37am	7:47am	7:57am
79	C2 /2	19:29	7:43am	7:53am	8:03am

+A20-1 w B8-1 — B23-2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6 PM
BR 55005
8-25-93
#2

MIDNIGHT
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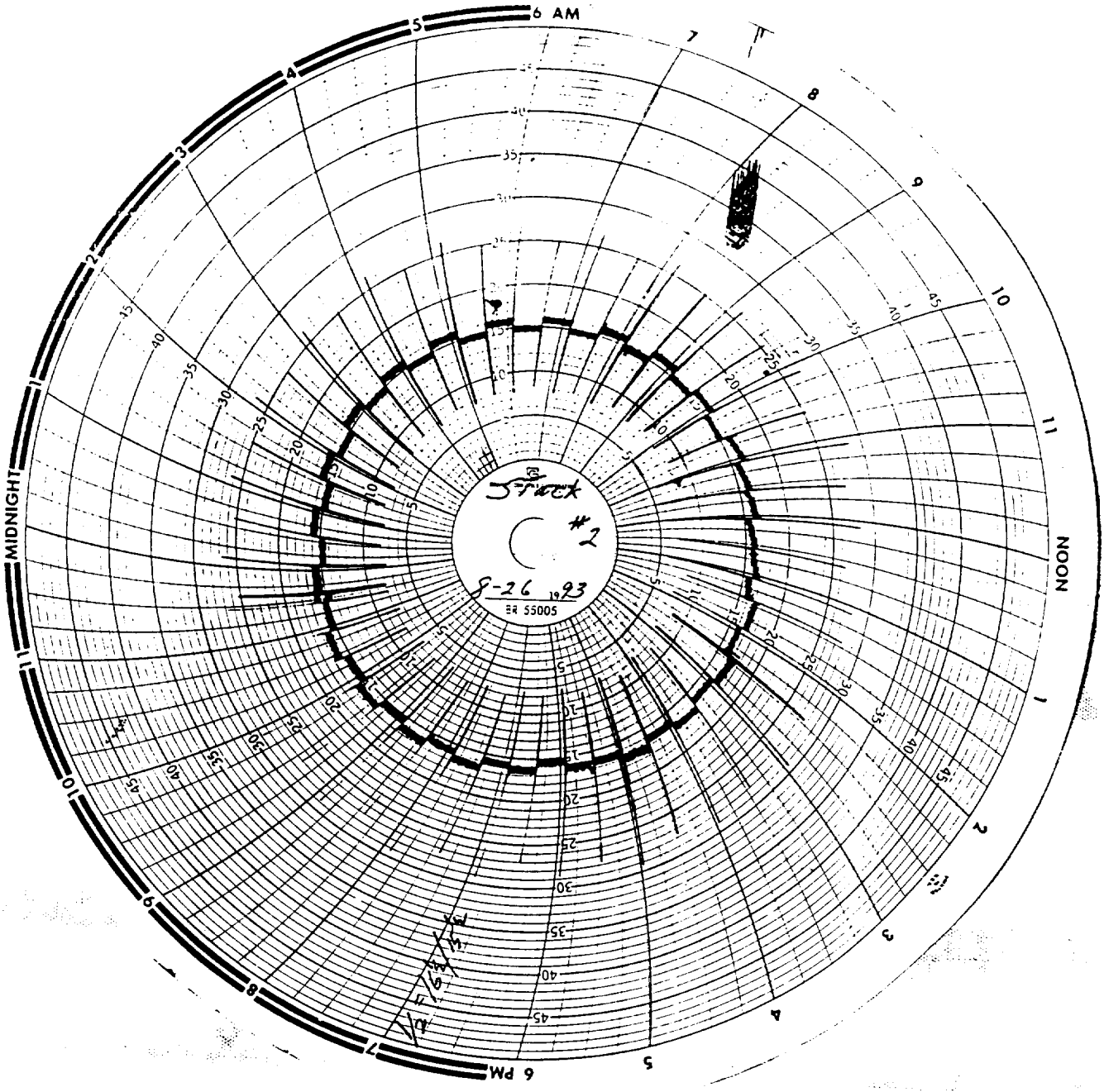
6 PM
GP #2
8-25 19 93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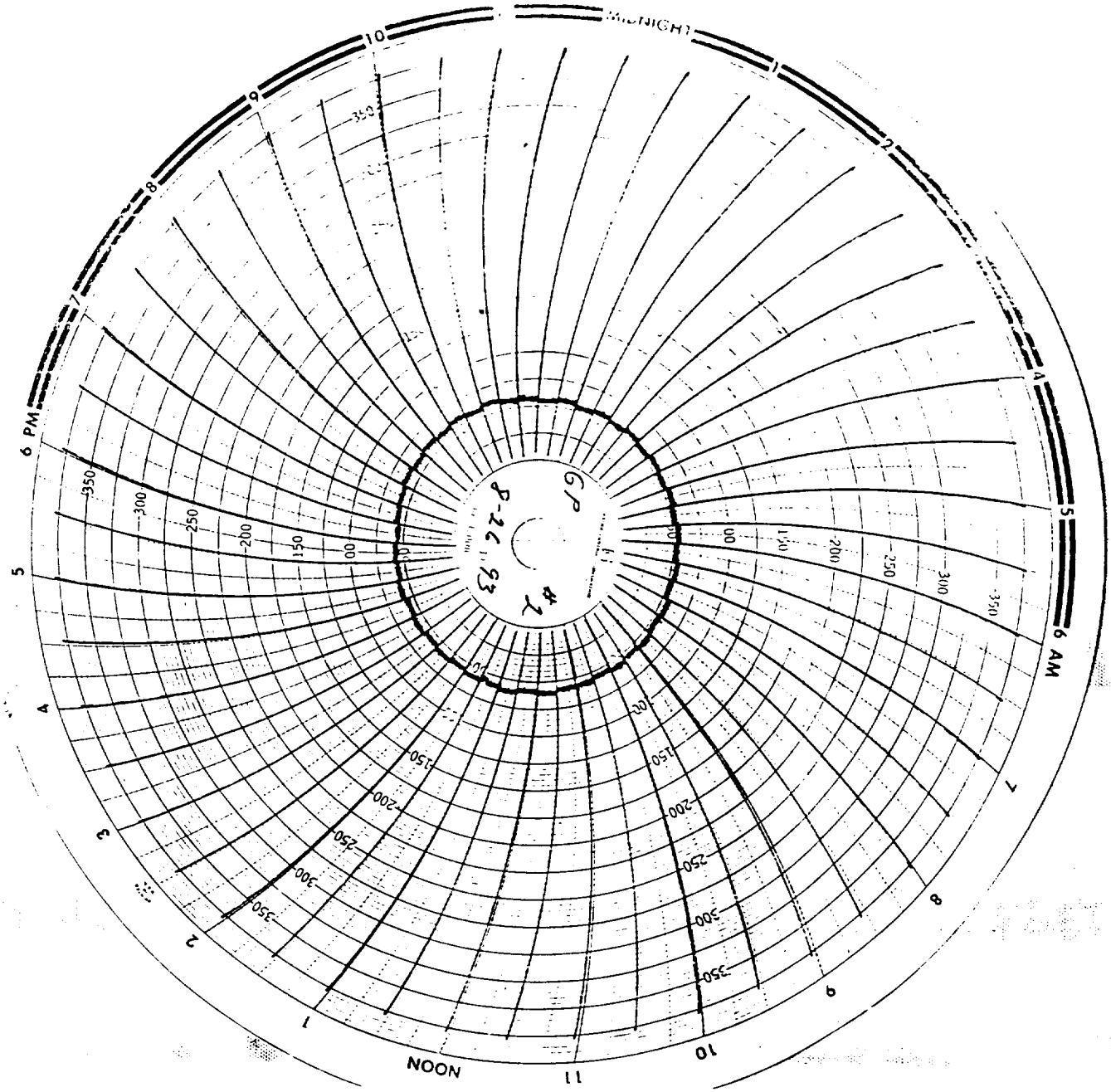
#2
8-26 1993
ER 55005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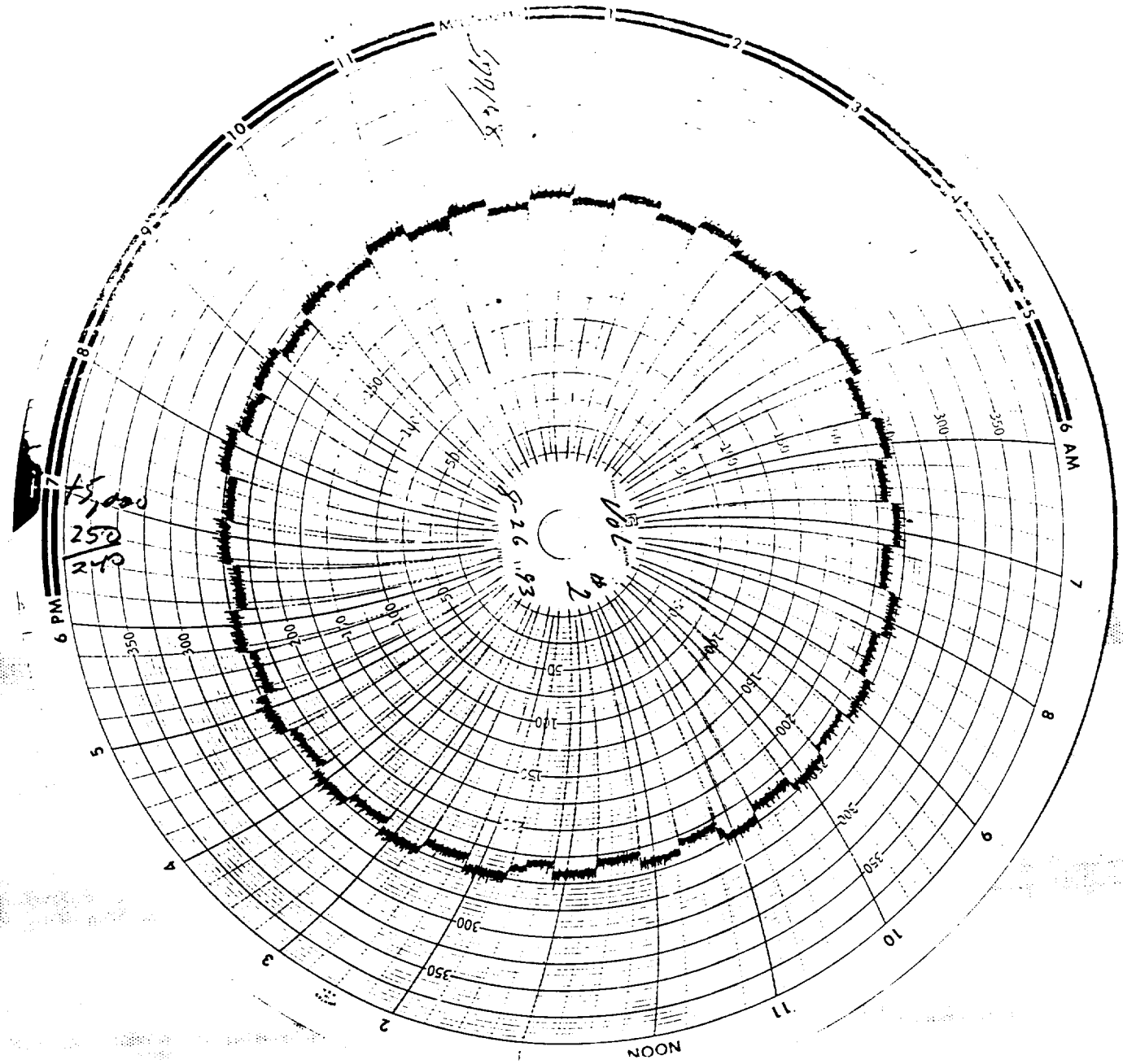
8-26-93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7
8
9
10
11
NOON
2
3
4
5
6 PM
50
100
150
200
250
300
350

COMPLIANCE DEMONSTRATION
NO. 2 BATTERY COMBUSTION STACK
USS CLAIRTON WORKS

USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

APPENDIX C
GRAVIMETRIC RESULTS, EMISSIONS CALCULATIONS

CHESTER
ENVIRONMENTAL

KEYSTONE ENVIRONMENTAL RESOURCES, INC.
AIR QUALITY ENGINEERING

ANALYTICAL REPORTING FORM

CLIENT USS Clairton Works
PLANT LOCATION #2 Battery Combustion Stack
PROJECT NUMBER 600725.01
UNIT TESTED

TEST DATE 8/25/93 & 8/26/93
DATE RECEIVED 8/26/93
DATE ANALYZED 9/7/93
ANALYTICAL METHOD EPA Method 5

Test Number	Component	Cyclone Weight Units ( )	Filter Weight Units (g)	Insoluble Portion of Front Half Units ( )	0.22μ Filter Insoluble Portion of Back Half Units ( )	Soluble Portion of Back Half Units ( )	Soluble Portion of Front Half Units (g)	Chloroform/ Ethyl Ether Extract Units ( )
CLR-2BS-PM-1	Particulate		0.0281				0.0699	
CLR-2BS-PM-2	"		0.0165				0.0252	
CLR-2BS-PM-3	"		0.0364				0.0453	
CLR-2BS-PM-BLK	"						0.0011	

Extraction Method
Solvent

Analyst's Signature John P. Slumskock
Date 9/9/93

Comments

AQE 3/92

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 8-25-93

TEST SITE #2 Battery Combustion Stack TEST NUMBER CL-R-2BS-PM-1

A.	Barometric Pressure	29.50	in. Hg	
B.	Static Pressure	-1.0	in. H2O	
C.	Stack Pressure	29.43	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.05	in. H2O	
E.	Meter Pressure	29.58	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	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.428	in.	
L.	Nozzle Area	9.99×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	526	°F	
N.	Average Stack Temperature	986	°R	(460+M)
O.	Average Meter Temperature	106	°F	
P.	Average Meter Temperature	563	°R	(460+O)
Q.	Condensate Volume	216.4	mL	
R.	Absorbed H2O	20.5	mL	
S.	Total H2O	236.9	mL	(Q+R)
T.	Filter Weight	0.0281	g	
U.	Probe Weight	0.0688	g	
V.	Impinger Weight	—	g	
W.	Total Weight	0.0969	g	(T+U+V)
X.	Metered Gas Volume	72.858	dcf	
Y.	Corrected Metered Gas Volume	70.082	dcf	(X*H)
Z.	H2O Gas Volume	12.072	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	82.154	cf	(Y+Z)
BB.	Percent H2O	14.7	%	(100*Z/AA)
CC.	Gas Volume Sampled	64.978	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0230	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.147		18	2.646
CO2	0.050	0.853	44	1.877
CO	∅	↓	28	∅
O2	0.125		32	3.412
N2	0.825	↓	28	19.704

Average Molecular Weight 27.64 lb./lb. mol

FF.	Average Stack Velocity	18.5	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	78900	acfm	(60*FF*J)
HH	Standard Flow Rate	41500	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	108.4	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	7.0	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 8-25-93
TEST SITE #2 Battery Combustion Stack TEST NUMBER CLR-2BS-PM-2

A.	Barometric Pressure	29.50	in. Hg	
B.	Static Pressure	-1.0	in. H2O	
C.	Stack Pressure	29.43	in. Hg	[A+(B/13.6)]
D.	Average ΔH	0.90	in. H2O	
E.	Meter Pressure	29.57	in. Hg	[A+(D/13.6)]
F.	Average ΔP	0.050	in. H2O	
G.	Pitot Coefficient	0.84		
H.	Gas Meter Coefficient	0.9619		
I.	Stack Diameter	114	in.	
J.	Stack Area	70.88	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.428	in.	
L.	Nozzle Area	9.99×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	528	°F	
N.	Average Stack Temperature	988	°R	(460+M)
O.	Average Meter Temperature	123	°F	
P.	Average Meter Temperature	583	°R	(460+O)
Q.	Condensate Volume	207.3	mL	
R.	Absorbed H2O	15.8	mL	
S.	Total H2O	223.1	mL	(Q+R)
T.	Filter Weight	0.0165	g	
U.	Probe Weight	0.0243	g	
V.	Impinger Weight	—	g	
W.	Total Weight	0.0408	g	(T+U+V)
X.	Metered Gas Volume	71.079	dcf	
Y.	Corrected Metered Gas Volume	68.371	dcf	(X*H)
Z.	H2O Gas Volume	11.772	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	80.143	cf	(Y+Z)
BB.	Percent H2O	14.7	%	(100*Z/AA)
CC.	Gas Volume Sampled	61.197	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0103	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.147		18	2.646
CO2	0.050	0.853	44	1.877
CO	Ø	↓	28	Ø
O2	0.125		32	3.412
N2	0.825		28	19.704

Average Molecular Weight 27.64 lb./lb. mol

FF.	Average Stack Velocity	17.7	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	75300	acfm	(60*FF*J)
HH	Standard Flow Rate	39600	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	107.2	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	3.0	lb/hr	[DD*HH*(1-BB/100)*60/7000]

CHESTER ENVIRONMENTAL

STACK SAMPLING CALCULATIONS

CLIENT USS Clairton Works TEST DATE 8-26-93

TEST SITE #2 Battery Combustion Stack TEST NUMBER CLR-2BS-PM1-3

A.	Barometric Pressure	29.52	in. Hg	
B.	Static Pressure	-1.1	in. H2O	
C.	Stack Pressure	29.44	in. Hg	[A+(B/13.6)]
D.	Average ΔH	1.00	in. H2O	
E.	Meter Pressure	29.59	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	ft^2	$(0.00545*I^2)$
K.	Nozzle Diameter	0.428	in.	
L.	Nozzle Area	9.99×10^{-4}	ft^2	$(0.00545*K^2)$
M.	Average Stack Temperature	529	°F	
N.	Average Stack Temperature	989	°R	(460+M)
O.	Average Meter Temperature	128	°F	
P.	Average Meter Temperature	588	°R	(460+O)
Q.	Condensate Volume	211.3	mL	
R.	Absorbed H2O	18.2	mL	
S.	Total H2O	229.5	mL	(Q+R)
T.	Filter Weight	0.0364	g	
U.	Probe Weight	0.0442	g	
V.	Impinger Weight	—	g	
W.	Total Weight	0.0806	g	(T+U+V)
X.	Metered Gas Volume	75.250	dcf	
Y.	Corrected Metered Gas Volume	72.383	dcf	(X*H)
Z.	H2O Gas Volume	12.205	cf	(0.00267*S*P/A)
AA.	Total Sample Volume	84.588	cf	(Y+Z)
BB.	Percent H2O	14.4	%	(100*Z/AA)
CC.	Gas Volume Sampled	64.280	dscf	[Y*(528/P)*(E/29.92)]
DD	Grain Loading	0.0193	gr/dscf	(15.43*W/CC)

EE. Average Molecular Weight:

Component	% Volume ÷100	* (1-BB/100)	* Molecular Weight	= Weight/Mol
H2O	0.144		18	2.592
CO2	0.050	0.856	44	1.883
CO	0	↓	28	0
O2	0.125		32	3.424
N2	0.825	↓	28	19.774

Average Molecular Weight 27.67 lb./lb. mol

FF.	Average Stack Velocity	186	fps	{85.49*G*[(F*N)/(C*EE)]^0.5}
GG.	Averge Flow Rate	78900	acfm	(60*FF*J)
HH	Standard Flow Rate	41500	scfm	[GG*(528/N)*(C/29.92)]
II.	Sample Time	7200	sec	
JJ.	Percent Isokinetic	107.1	%	{[100*CC*60*J] / [HH*L*II*(1-BB/100)]}
KK.	Mass Flow Rate	5.9	lb/hr	[DD*HH*(1-BB/100)*60/7000]

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