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.

AP42 12 2

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

Report 4
Reference 78

Reviewed

# USS CLAIRTON WORKS
# A DIVISION OF USX CORPORATION
# CLAIRTON, PENNSYLVANIA

Report on

# COMPLIANCE DEMONSTRATION
# NO. 13 BATTERY COMBUSTION STACK

AUGUST 1994

# USS CLAIRTON WORKS
# A DIVISION OF USX CORPORATION
# CLAIRTON, PENNSYLVANIA

Report on

# COMPLIANCE DEMONSTRATION
# NO. 13 BATTERY COMBUSTION STACK

AUGUST 1994

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

Project No. IKM-0202

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

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

Clark
Gilson
Cvg Files

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Bureau of Environmental Quality

August 24, 1994

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

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

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

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

Gentlemen:

Subject: #13 Battery Stack Compiance Demonstration
USS Clairton Works

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

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

Very truly yours,

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

GTW/BAC
Enclosure



Steel the recycled material

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## EXECUTIVE SUMMARY

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

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

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

## 1.0 INTRODUCTION

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

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

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

## 2.0 METHODOLOGIES

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

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

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

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

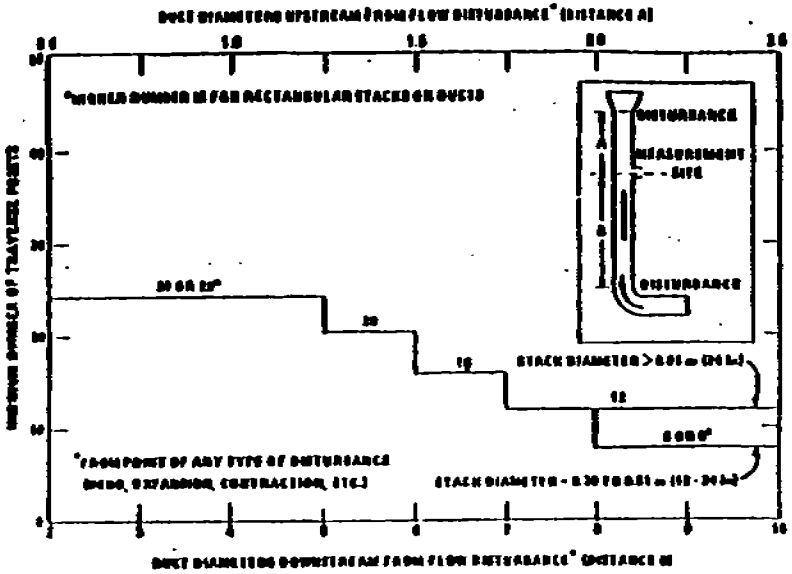
At the beginning and end of each test, gas concentrations of carbon dioxide ($CO_2$), oxygen ($O_2$), and nitrogen ($N_2$ - by difference) were determined with the use of Fyrite apparatus as specified by EPA Method 3. Gas concentrations were used to obtain dry molecular weight of the process gas.

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

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

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

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



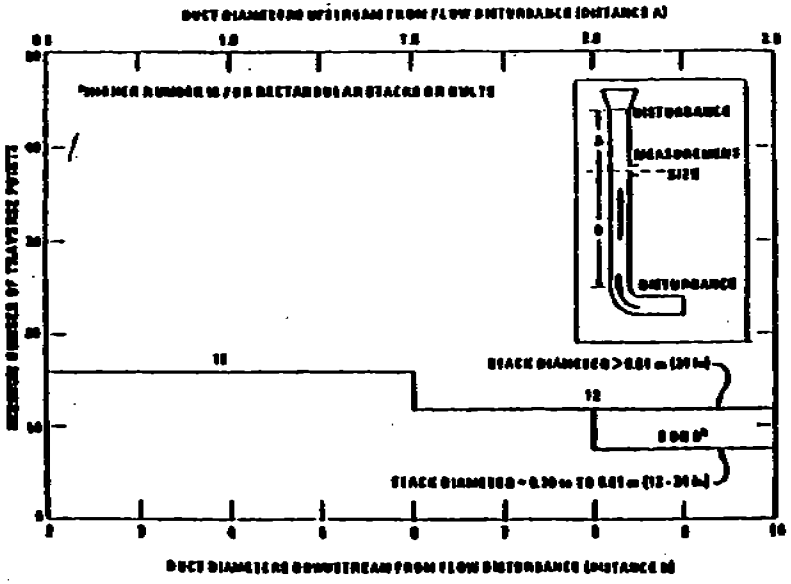




**Table 1-2. Location of Traverse Points in Circular Stacks**

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

| Traverse point number on a diameter | Number of traverse points on a diameter— | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| 1 | 14.6 | 6.7 | 4.4 | 3.2 | 2.6 | 2.1 | 1.8 | 1.6 | 1.4 | 1.3 | 1.1 | 1.1 |
| 2 | 85.4 | 25.0 | 14.6 | 10.5 | 8.3 | 6.7 | 5.7 | 4.9 | 4.4 | 3.9 | 3.6 | 3.2 |
| 3 | | 75.0 | 29.6 | 19.4 | 14.6 | 11.8 | 9.9 | 8.5 | 7.5 | 6.7 | 6.0 | 5.5 |
| 4 | | 93.3 | 70.4 | 32.3 | 22.6 | 17.7 | 14.6 | 12.5 | 10.9 | 9.7 | 8.7 | 7.9 |
| 5 | | | 85.4 | 67.7 | 34.2 | 26.9 | 20.1 | 16.9 | 14.6 | 12.9 | 11.6 | 10.5 |
| 6 | | | 96.6 | 80.6 | 65.8 | 36.6 | 28.9 | 22.9 | 18.8 | 16.5 | 14.6 | 13.2 |
| 7 | | | | 94.5 | 77.4 | 64.4 | 36.6 | 29.3 | 23.6 | 20.4 | 18.0 | 16.1 |
| 8 | | | | 96.8 | 85.4 | 75.0 | 63.4 | 37.5 | 29.6 | 25.0 | 21.9 | 19.4 |
| 9 | | | | | 91.0 | 82.2 | 73.1 | 62.5 | 38.2 | 30.6 | 26.7 | 23.9 |
| 10 | | | | | 97.4 | 88.2 | 79.6 | 71.7 | 61.8 | 38.6 | 31.5 | 27.2 |
| 11 | | | | | | 93.3 | 85.4 | 78.9 | 70.4 | 61.2 | 38.9 | 32.3 |
| 12 | | | | | | 97.9 | 90.1 | 83.1 | 75.4 | 68.4 | 60.7 | 38.9 |
| 13 | | | | | | | 94.3 | 87.5 | 81.2 | 74.0 | 66.8 | 60.2 |
| 14 | | | | | | | 98.2 | 91.5 | 85.4 | 79.6 | 73.8 | 67.7 |
| 15 | | | | | | | | 95.1 | 88.1 | 83.5 | 78.2 | 72.9 |
| 16 | | | | | | | | 98.4 | 92.5 | 87.1 | 82.0 | 77.0 |
| 17 | | | | | | | | | 95.6 | 90.3 | 85.4 | 80.8 |
| 18 | | | | | | | | | 98.6 | 93.3 | 88.4 | 83.9 |
| 19 | | | | | | | | | | 96.1 | 91.3 | 86.8 |
| 20 | | | | | | | | | | 98.7 | 94.0 | 89.8 |
| 21 | | | | | | | | | | | 96.5 | 91.1 |
| 22 | | | | | | | | | | | 98.9 | 94.2 |
| 23 | | | | | | | | | | | | 96.8 |
| 24 | | | | | | | | | | | | 98.9 |

**Table 1-1. Cross-Section Layout for Rectangular Stacks**

| Number of traverse points | Stable layout |
|---|---|
| 8 | 2x2 |
| 12 | 4x3 |
| 16 | 4x4 |
| 20 | 5x4 |
| 25 | 5x5 |
| 30 | 6x5 |
| 36 | 6x6 |
| 42 | 7x6 |
| 49 | 7x7 |

# STACK SAMPLING DATA SHEET



CLIENT USS-CLAIRTON WORKS
TEST UNIT #13 BATTERY STACK
PROJECT NO. JKM - 10242
TEST CREW RPC, TM
BAROMETRIC PRESSURE 29.30

TEST DATE 07-28-94 (THURS)
TEST NO. USS-CLR-BS*13-2
NOZZLE (SIZE,#) 0.490"
STATIC PRESSURE -1.0" H2O
PORT DIRECTION NORTH, EAST

ORIFICE CORRECTION (ΔH@) 1.837
METER CORRECTION (Y) 1.0172
CALIBRATION DATE 06-20-94
PITOT CORRECTION 0.84
CONTROL BOX NO. SIX

HOT/COLD BOX NO. 4
PROBE NO. 10-2
FILTER NO. 1284
STACK DIA. 120"
PORT SIZE 4.0" THREADED NOZZLE

| Traverse Point (inches) | Time | Dry Gas Meter Reading (dcf) | Pitot ΔP (in. H2O) | Orifice ΔH Required (in. H2O) | Orifice ΔH Actual (in. H2O) | Meter Temperature In (°F) | Meter Temperature Out (°F) | Vacuum (in. Hg) | Stack Temp. (°F) | Probe Temp. (°F) | Impinger Temp. (°F) | Hot Box Temp. (°F) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42.7 | 14:47 | 929.707 | 0.04 | 1.16 | 1.16 | 100 | 101 | 3.0 | 501 | ~250°F | <68°F | ~250°F | 5 min./point |
| 30.0 | | | 0.03 | 0.87 | 0.87 | 118 | 100 | 3.0 | 500 | | | | |
| 21.3 | | | 0.04 | 1.16 | 1.16 | 120 | 101 | 3.0 | 504 | | | | |
| 14.2 | | | 0.05 | 1.45 | 1.45 | 121 | 101 | 4.5 | 509 | | | | |
| 8.0 | | | 0.04 | 1.16 | 1.16 | 121 | 101 | 4.0 | 469 | | | | |
| 2.6 | 15:17 | 947.642 | 0.03 | 0.87 | 0.87 | 123 | 100 | 3.0 | 450 | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 42.7 | 15:20 | 947.642 | 0.05 | 1.45 | 1.45 | 110 | 101 | 4.0 | 490 | | | | |
| 30.0 | | | 0.06 | 1.74 | 1.74 | 122 | 100 | 4.5 | 520 | | | | |
| 21.3 | | | 0.05 | 1.45 | 1.45 | 124 | 101 | 4.0 | 529 | | | | |
| 14.2 | | | 0.04 | 1.16 | 1.16 | 123 | 99 | 3.0 | 520 | | | | |
| 8.0 | | | .03 | 0.87 | 0.87 | 123 | 100 | 3.0 | 482 | | | | |
| 2.6 | 15:50 | 966.420 | 0.03 | 0.87 | 0.87 | 124 | 100 | 3.0 | 479 | | | | |
| | | | | | | | | | | | | | |
| Total | Δ=120.0 min | Δ=75.690 dcf | $(\Delta P)_{avg}$ = 0.04 | $(\Delta H)_{avg}$ = 1.27 | | $(T_{m\,in})_{avg}$ = | 106.35 °F | | $(T_{stack})_{avg}$ = 498.17 °F | | | | Estimates: MW= 28.0 %H2O= 14.0 |

SYSTEM LEAK CHECK

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

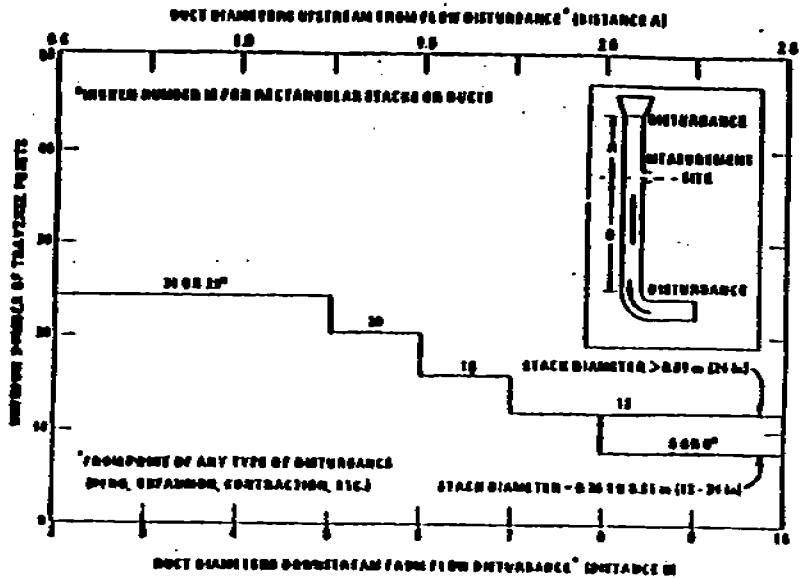
PITOT LEAK CHECK

| | Positive | Negative |
|---|---|---|
| Before | | |
| After | | |

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

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

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



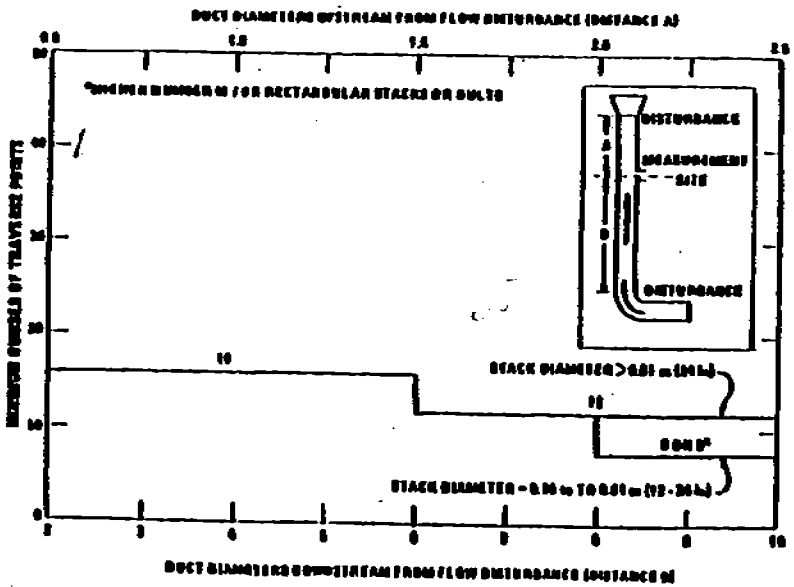




**TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS**

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

| Traverse point number on a diameter | Number of traverse points on a diameter— | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| 1 | 14.6 | 6.7 | 4.4 | 3.2 | 2.6 | 2.1 | 1.8 | 1.6 | 1.4 | 1.3 | 1.1 | 1.1 |
| 2 | 85.4 | 25.0 | 14.6 | 10.5 | 8.2 | 6.7 | 5.7 | 4.9 | 4.4 | 3.9 | 3.6 | 3.2 |
| 3 | | 75.0 | 29.6 | 19.4 | 14.6 | 11.8 | 9.9 | 8.5 | 7.5 | 6.7 | 6.0 | 5.5 |
| 4 | | 93.3 | 70.4 | 32.3 | 22.6 | 17.7 | 14.6 | 12.5 | 10.9 | 9.7 | 8.7 | 7.9 |
| 5 | | | 85.4 | 67.7 | 34.2 | 25.0 | 20.1 | 16.9 | 14.6 | 12.9 | 11.6 | 10.6 |
| 6 | | | 93.3 | 80.6 | 65.8 | 36.6 | 25.0 | 22.0 | 18.9 | 16.5 | 14.6 | 13.2 |
| 7 | | | | 89.6 | 77.4 | 64.4 | 36.6 | 28.3 | 23.6 | 20.4 | 18.0 | 16.0 |
| 8 | | | | 93.3 | 85.4 | 75.0 | 63.4 | 37.5 | 29.6 | 25.0 | 21.8 | 19.4 |
| 9 | | | | | 93.3 | 82.3 | 75.1 | 62.5 | 38.2 | 30.6 | 26.3 | 23.0 |
| 10 | | | | | 97.4 | 89.2 | 79.9 | 71.7 | 61.8 | 38.6 | 31.5 | 27.2 |
| 11 | | | | | | 93.3 | 85.4 | 76.9 | 70.4 | 61.2 | 38.2 | 32.3 |
| 12 | | | | | | 97.9 | 90.1 | 83.1 | 75.4 | 69.4 | 60.7 | 38.9 |
| 13 | | | | | | | 94.3 | 87.5 | 81.2 | 75.0 | 68.5 | 60.2 |
| 14 | | | | | | | 98.2 | 91.5 | 84.4 | 78.6 | 72.8 | 67.7 |
| 15 | | | | | | | | 95.1 | 88.1 | 83.2 | 78.5 | 72.9 |
| 16 | | | | | | | | 98.4 | 92.5 | 87.1 | 83.0 | 77.9 |
| 17 | | | | | | | | | 95.6 | 90.3 | 85.4 | 80.6 |
| 18 | | | | | | | | | 98.6 | 93.3 | 88.4 | 83.9 |
| 19 | | | | | | | | | | 96.1 | 91.3 | 86.9 |
| 20 | | | | | | | | | | 98.7 | 94.0 | 89.6 |
| 21 | | | | | | | | | | | 96.1 | 91.1 |
| 22 | | | | | | | | | | | 98.9 | 94.1 |
| 23 | | | | | | | | | | | | 96.6 |
| 24 | | | | | | | | | | | | 98.9 |

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

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

# STACK SAMPLING DATA SHEET



| | | | | | |
|---|---|---|---|---|---|
| CLIENT USS-CLAIRTON WORKS | TEST DATE 07-28-94 (THURS) | ORIFICE CORRECTION (ΔH@) 1.837 | HOT/COLD BOX NO. 4 |
| TEST UNIT #13 BATTERY STACK | TEST NO. USS-CLR-BS#13-2 | METER CORRECTION (Y) 1.0172 | PROBE NO. 10.2 |
| PROJECT NO. IKA1-0242 | NOZZLE (SIZE,#) 0.490" | CALIBRATION DATE 06-20-94 | FILTER NO. 1284 |
| TEST CREW RPC, TM | STATIC PRESSURE -1.0" H2O | PITOT CORRECTION 0.84 | STACK DIA. 120" |
| BAROMETRIC PRESSURE 27.30 | PORT DIRECTION SOUTH WEST | CONTROL BOX NO. SIX | PORT SIZE 4.0" Thermocouple rows |

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

**SYSTEM LEAK CHECK**

| | Vacuum (in. Hg) | DGM Rate (cfm) |
|---|---|---|
| Before | 5.0 | <0.01cfm |
| After | 7.0 | 0.008cfm |

**PITOT LEAK CHECK**

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

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

| Impinger No. | Impinger Contents | Final | Initial | Difference |
|---|---|---|---|---|
| 1. | 100ml DI H2O | 748.5 | 532.8 | 215.7 |
| 2. | 100ml DI H2O | 603.9 | 553.8 | 50.1 |
| 3. | EMPTY | 459.8 | 450.2 | 9.6 |
| 4. | SILICA GEL | 664.3 | 643.0 | 21.3 |
| 5. | | | | |
| 6. | | | total = | 296.7g |
| 7. | | | | |
| 8. | | | | |

275.4g

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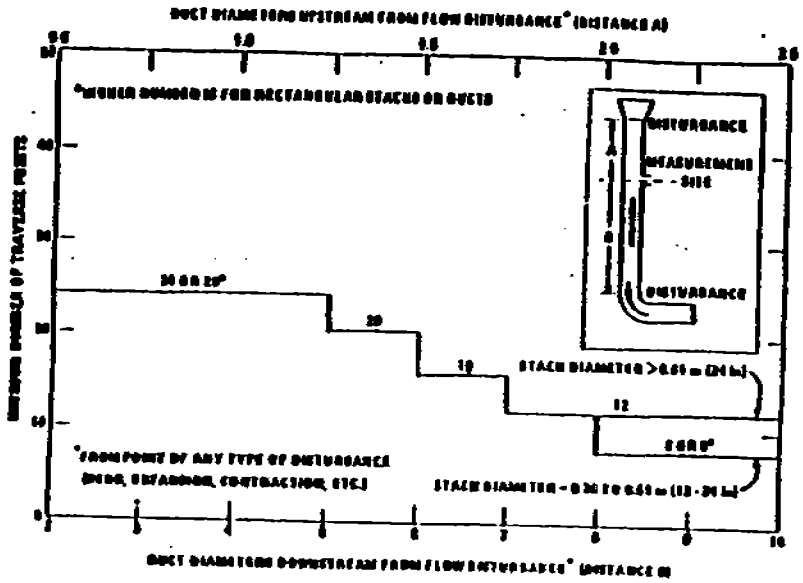
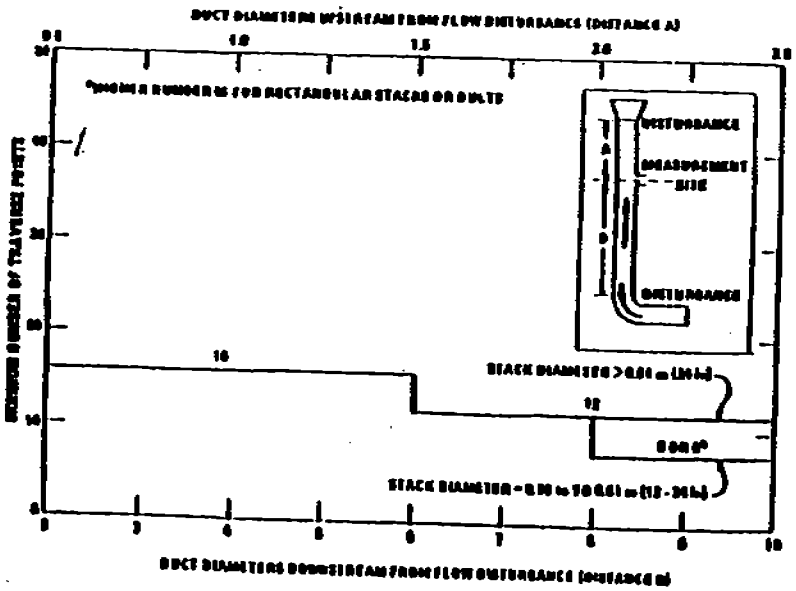
FAX 412/856-0666




## Table 1-2. Location of Traverse Points in Circular Stacks

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

| Traverse point number on a diameter | Number of traverse points on a diameter— | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| 1 | 14.6 | 6.7 | 4.4 | 3.2 | 2.6 | 2.1 | 1.8 | 1.6 | 1.4 | 1.3 | 1.1 | 1.0 |
| 2 | 85.4 | 25.0 | 14.6 | 10.5 | 8.2 | 6.7 | 5.7 | 4.9 | 4.4 | 3.9 | 3.5 | 3.2 |
| 3 | | 75.0 | 29.6 | 19.4 | 14.6 | 11.8 | 9.9 | 8.5 | 7.5 | 6.7 | 6.0 | 5.5 |
| 4 | | 93.3 | 70.4 | 32.3 | 23.6 | 17.7 | 14.6 | 12.5 | 10.9 | 9.7 | 8.7 | 7.9 |
| 5 | | | 85.4 | 67.7 | 34.2 | 26.9 | 20.9 | 18.0 | 14.6 | 12.9 | 11.6 | 10.5 |
| 6 | | | 94.6 | 80.6 | 65.8 | 36.6 | 29.6 | 23.6 | 18.8 | 15.8 | 14.0 | 12.8 |
| 7 | | | | 89.5 | 77.4 | 63.4 | 38.8 | 30.3 | 23.6 | 20.4 | 16.8 | 15.1 |
| 8 | | | | 96.8 | 85.4 | 73.8 | 63.4 | 37.8 | 30.6 | 23.6 | 21.6 | 18.4 |
| 9 | | | | | 91.8 | 82.3 | 73.1 | 62.6 | 36.2 | 30.6 | 26.9 | 23.6 |
| 10 | | | | | 97.4 | 88.2 | 79.6 | 71.7 | 61.8 | 36.6 | 31.8 | 27.3 |
| 11 | | | | | | 93.3 | 85.6 | 78.8 | 70.4 | 61.2 | 36.2 | 31.3 |
| 12 | | | | | | 97.9 | 90.1 | 83.1 | 76.4 | 69.4 | 60.7 | 36.6 |
| 13 | | | | | | | 94.3 | 87.5 | 81.2 | 75.0 | 68.5 | 60.2 |
| 14 | | | | | | | 98.2 | 91.5 | 85.2 | 78.8 | 72.8 | 67.7 |
| 15 | | | | | | | | 95.1 | 88.1 | 83.5 | 76.3 | 72.8 |
| 16 | | | | | | | | 98.4 | 93.5 | 87.1 | 82.8 | 77.6 |
| 17 | | | | | | | | | 96.6 | 90.3 | 85.4 | 80.8 |
| 18 | | | | | | | | | 99.8 | 93.3 | 86.4 | 83.8 |
| 19 | | | | | | | | | | 96.5 | 91.3 | 86.8 |
| 20 | | | | | | | | | | 96.7 | 94.6 | 89.5 |
| 21 | | | | | | | | | | | 98.5 | 96.1 |
| 22 | | | | | | | | | | | 99.3 | 94.6 |
| 23 | | | | | | | | | | | | 98.6 |
| 24 | | | | | | | | | | | | 98.9 |

## Table 1-1. Cross-Section Layout for Rectangular Stacks

| Number of traverse points | Stack layout |
|---|---|
| 8 | 2x2 |
| 12 | 4x3 |
| 16 | 4x4 |
| 20 | 5x4 |
| 25 | 5x5 |
| 30 | 6x5 |
| 36 | 6x6 |
| 42 | 7x6 |
| 49 | 7x7 |

# STACK SAMPLING DATA SHEET



CLIENT USS-CLAIRTON WORKS
TEST UNIT Battery Stack #3
PROJECT NO. IKM-10262
TEST CREW RPC, JM
BAROMETRIC PRESSURE 29.30

TEST DATE 07-28-94 (Thurs)
TEST NO. USS-CLR-BS#3-1
NOZZLE (SIZE,#) 0.490"
STATIC PRESSURE -1.0" H2O
PORT DIRECTION South, West

ORIFICE CORRECTION (ΔH@) 1.837
METER CORRECTION (Y) 1.0172
CALIBRATION DATE 06-20-94
PITOT CORRECTION 0.84
CONTROL BOX NO. SIX

HOT/COLD BOX NO. 1
PROBE NO. 10-2
FILTER NO. 1296
STACK DIA. 120"
PORT SIZE 4.0" Thermo mod

| Traverse Point (inches) | Time | Dry Gas Meter Reading (dcf) | Pitot ΔP (in. H2O) | Orifice ΔH Required (in. H2O) | Orifice ΔH Actual (in. H2O) | Meter Temperature In (°F) | Meter Temperature Out (°F) | Vacuum (in. Hg) | Stack Temp. (°F) | Probe Temp. (°F) | Impinger Temp. (°F) | Hot Box Temp. (°F) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42.7 | 09:32 | 853.225 | 0.05 | 1.40 | 1.40 | 100 | 83 | 4.5 | 499 | ~250°F | <68°F | ~250°F | 5 min./point |
| 30.0 | | | 0.05 | 1.40 | 1.40 | 100 | 83 | 4.5 | 498 | | | | |
| 21.3 | | | 0.04 | 1.12 | 1.12 | 109 | 83 | 4.0 | 509 | | | | |
| 14.2 | | | 0.03 | 0.84 | 0.84 | 109 | 83 | 3.5 | 506 | | | | |
| 8.0 | | | 0.04 | 1.12 | 1.12 | 109 | 83 | 3.0 | 475 | | | | |
| 2.6 | 10:27 | 870.827 | 0.03 | 0.84 | 0.84 | 109 | 84 | 3.0 | 480 | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 42.7 | 12:42 | 870.827 | 0.05 | 1.40 | 1.40 | 80 | 80 | 5.0 | 510 | | | | |
| 30.0 | | | 0.05 | 1.40 | 1.40 | 94 | 80 | 5.0 | 516 | | | | |
| 21.3 | | | 0.06 | 1.68 | 1.68 | 98 | 82 | 5.5 | 500 | | | | |
| 14.2 | | | 0.05 | 1.40 | 1.40 | 100 | 85 | 5.0 | 495 | | | | |
| 8.0 | | | 0.04 | 1.12 | 1.12 | 110 | 88 | 4.5 | 499 | | | | |
| 2.6 | 13:13 | 890.520 | 0.03 | .84 | 0.84 | 110 | 89 | 3.5 | 465 | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Test | Δ=120 | Δ=73.885 | $(\Delta P)_{Ave}$ = | $(\Delta H)_{Ave}$ = | | $(T_{meter})_{Ave}$ = | | | $(T_{stack})_{Ave}$ = | | | | Estimates: |
| Total's | min | dcf | 0.04 | 1.21 | | | 89.58 °F | | 495.88 °F | | | | MW= 28.0 |
| | | | | | | | | | | | | | %H2O= 14.0 |

**SYSTEM LEAK CHECK**

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

**PITOT LEAK CHECK**

| | Positive | Negative |
|---|---|---|
| Before | | |
| After | | |

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

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

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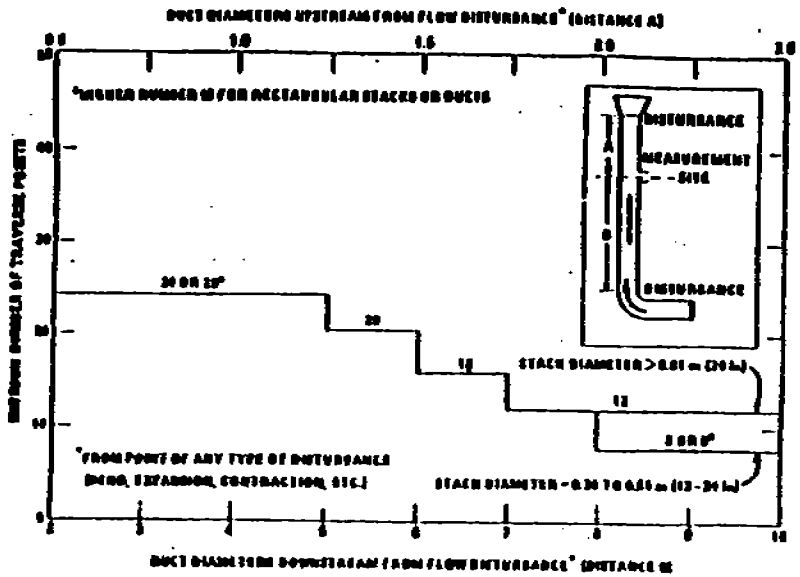


15.5

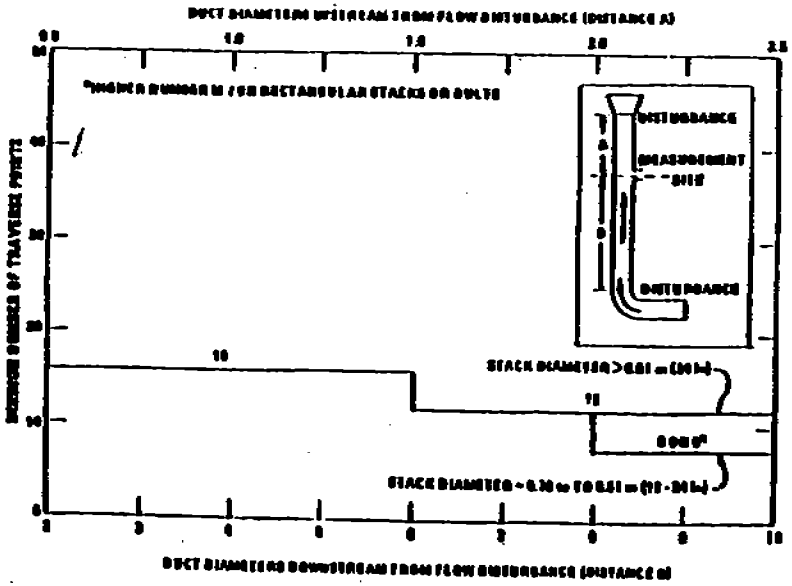


**TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS**

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

| Traverse point number on a diameter | Number of traverse points on a diameter— | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| 1 | 14.6 | 6.7 | 4.4 | 3.2 | 2.6 | 2.1 | 1.8 | 1.6 | 1.4 | 1.3 | 1.1 | 1.1 |
| 2 | 85.4 | 25.0 | 14.6 | 10.5 | 8.2 | 6.7 | 5.7 | 4.9 | 4.4 | 3.9 | 3.5 | 3.2 |
| 3 | | 75.0 | 29.6 | 19.4 | 14.6 | 11.8 | 9.9 | 8.5 | 7.5 | 6.7 | 6.0 | 5.5 |
| 4 | | 93.3 | 70.4 | 32.3 | 22.6 | 17.7 | 14.6 | 12.5 | 10.9 | 9.7 | 8.7 | 7.9 |
| 5 | | | 85.4 | 67.7 | 34.2 | 26.9 | 20.1 | 16.9 | 14.6 | 13.0 | 11.8 | 10.5 |
| 6 | | | 95.6 | 80.6 | 65.8 | 34.6 | 26.9 | 22.0 | 18.5 | 15.5 | 14.0 | 12.3 |
| 7 | | | | 93.5 | 77.4 | 64.4 | 36.6 | 29.3 | 23.9 | 20.6 | 18.0 | 16.1 |
| 8 | | | | 96.8 | 85.4 | 75.0 | 63.4 | 37.5 | 30.6 | 25.9 | 21.9 | 19.4 |
| 9 | | | | | 89.6 | 82.2 | 73.1 | 62.6 | 38.2 | 30.6 | 26.9 | 23.6 |
| 10 | | | | | 97.4 | 88.2 | 78.6 | 71.7 | 61.8 | 38.6 | 31.5 | 27.2 |
| 11 | | | | | | 93.3 | 85.4 | 76.9 | 70.4 | 61.2 | 38.3 | 32.3 |
| 12 | | | | | | 97.9 | 90.1 | 83.1 | 78.4 | 69.4 | 60.7 | 38.6 |
| 13 | | | | | | | 94.3 | 87.5 | 81.2 | 75.0 | 66.9 | 60.2 |
| 14 | | | | | | | 98.2 | 91.5 | 85.4 | 79.6 | 73.6 | 67.7 |
| 15 | | | | | | | | 95.9 | 88.1 | 83.5 | 78.3 | 72.6 |
| 16 | | | | | | | | 98.4 | 92.3 | 87.1 | 82.6 | 77.9 |
| 17 | | | | | | | | | 96.6 | 90.3 | 85.4 | 80.6 |
| 18 | | | | | | | | | 98.8 | 93.3 | 88.4 | 83.9 |
| 19 | | | | | | | | | | 96.1 | 91.3 | 86.6 |
| 20 | | | | | | | | | | 98.1 | 94.0 | 89.6 |
| 21 | | | | | | | | | | | 96.5 | 92.1 |
| 22 | | | | | | | | | | | 98.9 | 94.2 |
| 23 | | | | | | | | | | | | 96.6 |
| 24 | | | | | | | | | | | | 98.9 |

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

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

# STACK SAMPLING DATA SHEET



| | | | |
|---|---|---|---|
| CLIENT USS-CLAIRTON WORKS | TEST DATE 07-28-94 (THURS) | ORIFICE CORRECTION (ΔH@) 1.837 | HOT/COLD BOX NO. 1 |
| TEST UNIT BATTERY STACK #13 | TEST NO. USS-CLR-BS#13-#1 | METER CORRECTION (Y) 1.0172 | PROBE NO. 10-2 |
| PROJECT NO. IKM-02002 | NOZZLE (SIZE,#) 0.490" | CALIBRATION DATE 06-20-94 | FILTER NO. 1296 |
| TEST CREW | STATIC PRESSURE -1.0" H2O | PITOT CORRECTION 0.84 | STACK DIA. 120" |
| BAROMETRIC PRESSURE 29.30 | PORT DIRECTION NORTH, EAST | CONTROL BOX NO. SIX | PORT SIZE 4.0 THREADED PIPE |

| Traverse Point (inches) | Time | Dry Gas Meter Reading (dcf) | Pitot ΔP (in. H2O) | Orifice ΔH Required (in. H2O) | Orifice ΔH Actual (in. H2O) | Meter Temperature In (°F) | Meter Temperature Out (°F) | Vacuum (in. Hg) | Stack Temp. (°F) | Probe Temp. (°F) | Impinger Temp. (°F) | Hot Box Temp. (°F) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42.7 | 08:30 AM | 816.635 | 0.05 | 1.40 | 1.40 | 71 | 71 | 4.5 | 521 | ~250°F | 68°F | ~250°F | 5 min./point |
| 30.0 | | | 0.06 | 1.68 | 1.68 | 86 | 71 | 5.0 | 536 | | | | |
| 21.3 | | | 0.04 | 1.12 | 1.12 | 93 | 73 | 4.0 | 529 | | | | |
| 14.2 | | | 0.05 | 1.40 | 1.40 | 100 | 75 | 4.5 | 490 | | | | |
| 8.0 | | | 0.05 | 1.40 | 1.40 | 100 | 76 | 4.5 | 475 | | | | |
| 2.6 | 09:00 AM | 835.180 | 0.03 | 0.84 | 0.84 | 100 | 76 | 3.5 | 450 | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 42.7 | 09:06 | 835.180 | 0.05 | 1.40 | 1.40 | 84 | 78 | 5.0 | 516 | | | | |
| 30.0 | | | 0.04 | 1.12 | 1.12 | 100 | 78 | 4.5 | 509 | | | | |
| 21.3 | | | 0.04 | 1.12 | 1.12 | 102 | 79 | 4.5 | 508 | | | | |
| 14.2 | | | 0.05 | 1.40 | 1.40 | 105 | 80 | 5.0 | 495 | | | | |
| 8.0 | | | 0.03 | 0.84 | 0.84 | 105 | 81 | 3.8 | 480 | | | | |
| 2.6 | 09:35 AM | 853.225 | 0.03 | 0.84 | 0.84 | 104 | 81 | 3.5 | 450 | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | Estimates: |
| | | | | | | | | | | | | | MW= 28.0 |
| | | | | | | | | | | | | | %H2O= 14.0 |

**SYSTEM LEAK CHECK**

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

**PITOT LEAK CHECK**

| | Positive | Negative |
|---|---|---|
| Before | 0K/15 sec | 0K/15 sec |
| After | 0K/15 sec | 0K/15 sec |

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

| Impinger No. | Impinger Contents | Final | Initial | Difference |
|---|---|---|---|---|
| 1. | 100ml DI H2O | 761.5 | 559.5 | 202.0 |
| 2. | 100 ml DI H2O | 596.4 | 553.3 | 43.1 |
| 3. | EMPTY | 446.2 | 437.4 | 8.8 |
| 4. | Silica gel | 671.5 | 649.4 | 22.1 |
| 5. | | | | |
| 6. | | | Total= | 276.9g |
| 7. | | | | |
| 8. | | | | |

253.9g

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

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

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

# TEST PROTOCOL
# COMPLIANCE DEMONSTRATION
# #13 BATTERY COMBUSTION STACK

## USS CLAIRTON WORKS
## CLAIRTON, PA

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

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

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

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

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

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

# COMPLIANCE DEMONSTRATION
# NO. 13 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

## APPENDIX A

## TEST PROTOCOL, FIELD DATA SHEETS, CALIBRATION RESULTS

ATS
ADVANCED TECHNOLOGY SYSTEMS, INC.

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

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

USS CLAIRTON WORKS
CLAIRTON, PA

TABLE 1

#13 BATTERY COMBUSTION STACK
PARTICULATE MATTER EMISSIONS DATA

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

## 3.0 RESULTS

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

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

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

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

# STACK SAMPLING DATA SHEET



| | | | | | |
|---|---|---|---|---|---|
| CLIENT USS-CLAIRTON WORKS | TEST DATE 07-29-94 (Fri) | ORIFICE CORRECTION (ΔH@) 1.837 | HOT/COLD BOX NO. 4 |
| TEST UNIT #13 BATTERY STACK | TEST NO. USS-CLR-BS#13-3 | METER CORRECTION (Y) 1.0172 | PROBE NO. 10-2 |
| PROJECT NO. IGM-0242 | NOZZLE (SIZE,#) 0.490" | CALIBRATION DATE 06-20-94 | FILTER NO. 1305 |
| TEST CREW RPC TM | STATIC PRESSURE -1.1" H2O | PITOT CORRECTION 0.84 | STACK DIA. 120" |
| BAROMETRIC PRESSURE 29.40 | PORT DIRECTION NORTH, EAST | CONTROL BOX NO. 5iR | PORT SIZE 4.0" THREADED MALE |

| Traverse Point (inches) | Time | Dry Gas Meter Reading (dcf) | Pitot ΔP (in. H2O) | Orifice ΔH Required (in. H2O) | Orifice ΔH Actual (in. H2O) | Meter Temperature In (°F) | Meter Temperature Out (°F) | Vacuum (in. Hg) | Stack Temp. (°F) | Probe Temp. (°F) | Impinger Temp. (°F) | Hot Box Temp. (°F) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42.7 | 07:40 | 966.761 | 0.05 | 1.39 | 1.39 | 68 | 68 | 3.5 | 533 | ~250°F | <68°F | ~250°F | 5min./point |
| 30.0 | | | 0.05 | 1.39 | 1.39 | 82 | 68 | 3.5 | 509 | | | | |
| 21.3 | | | 0.04 | 1.11 | 1.11 | 91 | 70 | 3.0 | 500 | | | | |
| 14.2 | | | 0.04 | 1.11 | 1.11 | 97 | 73 | 3.0 | 489 | | | | |
| 8.0 | | | 0.03 | 0.83 | 0.83 | 100 | 75 | 2.5 | 479 | | | | |
| 2.6 | 08:10 | 984.654 | 0.03 | 0.83 | 0.83 | 99 | 75 | 2.5 | 484 | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 42.7 | 08:13 | 984.654 | 0.04 | 1.11 | 1.11 | 95 | 80 | 3.5 | 511 | | | | |
| 30.0 | | | 0.05 | 1.39 | 1.39 | 105 | 81 | 4.0 | 509 | | | | |
| 21.3 | | | 0.04 | 1.11 | 1.11 | 107 | 82 | 3.5 | 511 | | | | |
| 14.2 | | | 0.03 | 0.83 | 0.83 | 107 | 82 | 3.0 | 494 | | | | |
| 8.0 | | | 0.03 | 0.83 | 0.83 | 108 | 82 | 2.5 | 500 | | | | |
| 2.6 | 08:43 | 1001.677 | 0.03 | 0.83 | 0.83 | 107 | 83 | 2.5 | 450 | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | Estimates: |
| | | | | | | | | | | | | | MW= 28.0 |
| | | | | | | | | | | | | | %H2O= 14.0 |

**SYSTEM LEAK CHECK**

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

**PITOT LEAK CHECK**

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

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

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

263.7 g

ADVANCED TECHNOLOGY SYSTEMS, INC.
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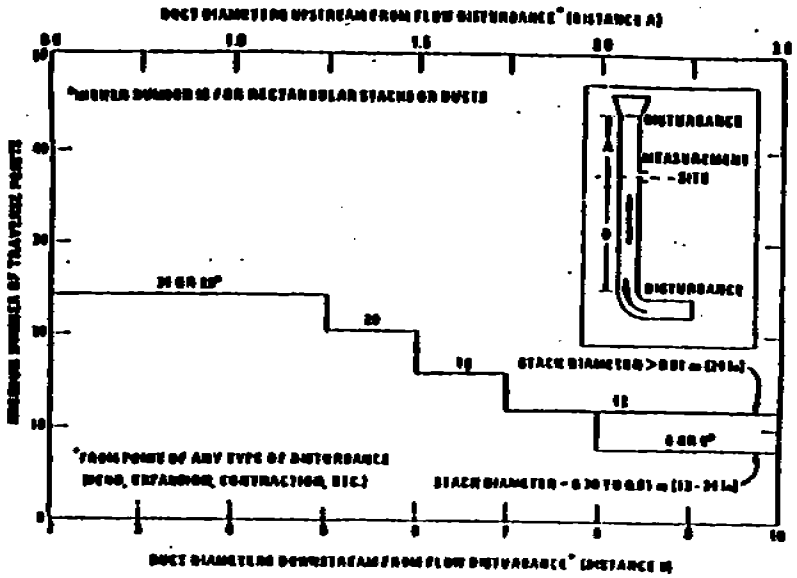
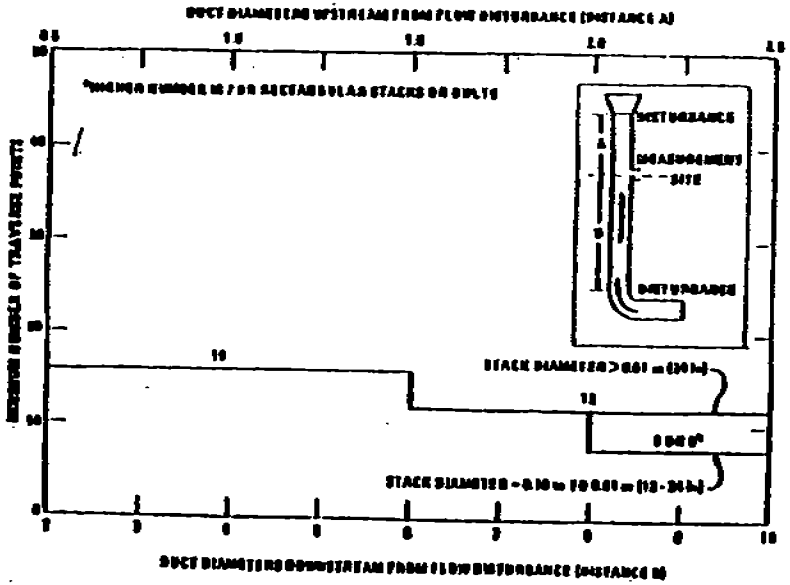



## Table 1-2. Location of Traverse Points in Circular Stacks

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

| Traverse point number on a diameter | Number of traverse points on a diameter— 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 14.6 | 6.7 | 4.4 | 3.2 | 2.6 | 2.1 | 1.8 | 1.6 | 1.4 | 1.3 | 1.1 | 1.0 |
| 2 | 85.4 | 25.0 | 14.6 | 10.5 | 8.2 | 6.7 | 5.7 | 4.9 | 4.4 | 3.9 | 3.5 | 3.2 |
| 3 | — | 75.0 | 29.6 | 19.4 | 14.6 | 11.8 | 9.9 | 8.5 | 7.5 | 6.7 | 6.0 | 5.5 |
| 4 | — | 93.3 | 70.4 | 32.3 | 22.6 | 17.7 | 14.6 | 12.5 | 10.9 | 9.7 | 8.7 | 7.9 |
| 5 | — | — | 85.4 | 67.7 | 34.2 | 26.9 | 20.1 | 16.9 | 14.6 | 13.0 | 11.8 | 10.8 |
| 6 | — | — | 95.6 | 80.6 | 65.8 | 35.6 | 29.6 | 22.6 | 19.6 | 16.5 | 14.6 | 13.3 |
| 7 | — | — | — | 89.5 | 77.4 | 64.4 | 36.6 | 29.3 | 23.6 | 20.4 | 18.0 | 16.1 |
| 8 | — | — | — | 96.8 | 85.4 | 76.6 | 63.4 | 37.5 | 29.8 | 25.0 | 21.8 | 19.4 |
| 9 | — | — | — | — | 91.8 | 82.3 | 73.1 | 62.5 | 38.2 | 30.5 | 26.2 | 23.6 |
| 10 | — | — | — | — | 97.4 | 88.2 | 79.9 | 71.7 | 61.8 | 38.6 | 31.5 | 27.3 |
| 11 | — | — | — | — | — | 93.3 | 85.6 | 78.0 | 70.4 | 61.2 | 38.3 | 32.8 |
| 12 | — | — | — | — | — | 97.8 | 90.1 | 83.1 | 76.4 | 68.4 | 60.7 | 38.8 |
| 13 | — | — | — | — | — | — | 94.2 | 87.5 | 81.2 | 75.0 | 68.5 | 60.2 |
| 14 | — | — | — | — | — | — | 98.2 | 91.5 | 85.4 | 79.6 | 73.8 | 67.7 |
| 15 | — | — | — | — | — | — | — | 95.1 | 88.1 | 83.5 | 78.3 | 72.6 |
| 16 | — | — | — | — | — | — | — | 98.4 | 92.5 | 87.1 | 82.0 | 77.0 |
| 17 | — | — | — | — | — | — | — | — | 95.6 | 90.3 | 85.6 | 80.6 |
| 18 | — | — | — | — | — | — | — | — | 98.6 | 93.3 | 88.4 | 83.8 |
| 19 | — | — | — | — | — | — | — | — | — | 96.1 | 91.3 | 86.8 |
| 20 | — | — | — | — | — | — | — | — | — | 98.7 | 94.0 | 89.5 |
| 21 | — | — | — | — | — | — | — | — | — | — | 96.5 | 92.1 |
| 22 | — | — | — | — | — | — | — | — | — | — | 98.9 | 94.6 |
| 23 | — | — | — | — | — | — | — | — | — | — | — | 96.8 |
| 24 | — | — | — | — | — | — | — | — | — | — | — | 98.9 |




## Table 1-1. Cross-Section Layout for Rectangular Stacks

| Number of traverse points | Matrix layout |
|---|---|
| 8 | 2x4 |
| 12 | 3x4 |
| 16 | 4x4 |
| 20 | 5x4 |
| 25 | 5x5 |
| 30 | 6x5 |
| 36 | 6x6 |
| 42 | 7x6 |
| 49 | 7x7 |

# STACK SAMPLING DATA SHEET



| | | | |
|---|---|---|---|
| CLIENT USS-CLAIRTON WORKS | TEST DATE 07-29-94 (FRI) | ORIFICE CORRECTION (ΔH@) 1.837 | HOT/COLD BOX NO. 4 |
| TEST UNIT Rotary stack #13 | TEST NO. USS-Rotary #13BS-23 | METER CORRECTION (Y) 1.0172 | PROBE NO. 10-[illegible] |
| PROJECT NO. 2411-0292 | NOZZLE (SIZE,#) 0.490" | CALIBRATION DATE 06-20-94 | FILTER NO. 1305 |
| TEST CREW RPC TM | STATIC PRESSURE -1.1" H2O | PITOT CORRECTION 0.84 | STACK DIA. 120" |
| BAROMETRIC PRESSURE 29.40 | PORT DIRECTION SOUTH, WEST | CONTROL BOX NO. 5i8 | PORT SIZE 40" Threaded Nipple |

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

SYSTEM LEAK CHECK

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

PITOT LEAK CHECK

| | Positive | Negative |
|---|---|---|
| Before | | |
| After | | |

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

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

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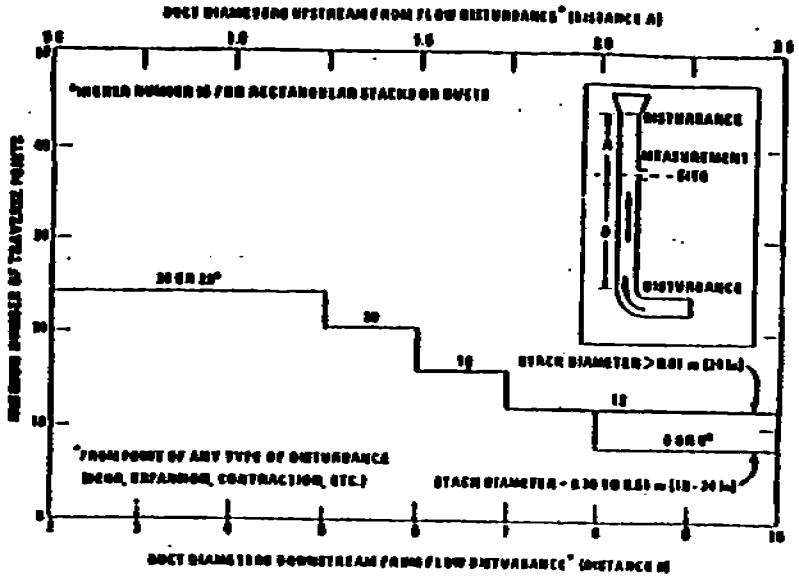
412/856-0662
FAX 412/856-0666



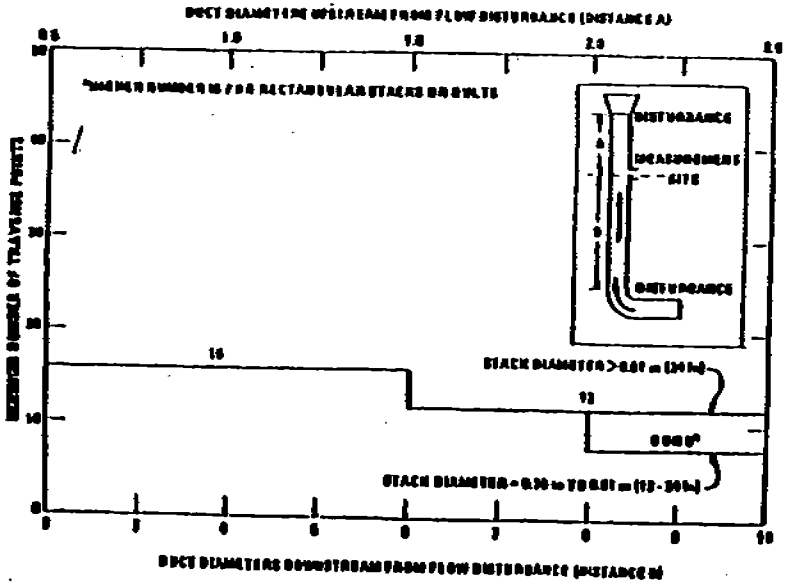




**TABLE 1-2. LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS**

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

| Traverse point number on a diameter | Number of traverse points on a diameter— | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| 1 | 14.6 | 6.7 | 4.4 | 3.2 | 2.6 | 2.1 | 1.8 | 1.6 | 1.4 | 1.3 | 1.1 | 1.1 |
| 2 | 85.4 | 25.0 | 14.6 | 10.5 | 8.2 | 6.7 | 5.7 | 4.9 | 4.4 | 3.9 | 3.5 | 3.2 |
| 3 | | 75.0 | 29.6 | 19.4 | 14.6 | 11.8 | 9.9 | 8.5 | 7.5 | 6.7 | 6.0 | 5.5 |
| 4 | | 93.3 | 70.4 | 32.3 | 22.6 | 17.7 | 14.6 | 12.5 | 10.9 | 9.7 | 8.7 | 7.9 |
| 5 | | | 85.4 | 67.7 | 34.2 | 26.9 | 20.1 | 16.9 | 14.6 | 12.9 | 11.6 | 10.5 |
| 6 | | | 93.6 | 80.6 | 65.8 | 35.6 | 29.9 | 22.6 | 19.6 | 15.5 | 14.0 | 12.7 |
| 7 | | | | 93.5 | 77.4 | 64.4 | 34.8 | 29.3 | 23.9 | 20.4 | 18.0 | 16.0 |
| 8 | | | | 96.8 | 85.4 | 73.6 | 65.4 | 37.3 | 29.6 | 25.0 | 21.9 | 19.4 |
| 9 | | | | | 97.4 | 82.3 | 73.1 | 63.6 | 38.2 | 30.0 | 26.2 | 23.0 |
| 10 | | | | | | 88.2 | 78.6 | 71.7 | 61.8 | 38.6 | 31.5 | 27.2 |
| 11 | | | | | | 93.3 | 85.4 | 78.0 | 70.4 | 61.8 | 38.9 | 32.3 |
| 12 | | | | | | 97.8 | 90.1 | 83.1 | 76.4 | 69.4 | 60.1 | 38.0 |
| 13 | | | | | | | 94.3 | 87.5 | 81.2 | 75.0 | 68.0 | 60.2 |
| 14 | | | | | | | 98.2 | 91.5 | 85.4 | 79.6 | 73.0 | 67.7 |
| 15 | | | | | | | | 95.1 | 88.1 | 83.5 | 76.8 | 73.0 |
| 16 | | | | | | | | 98.4 | 92.5 | 87.1 | 82.6 | 77.6 |
| 17 | | | | | | | | | 95.8 | 90.3 | 85.4 | 80.8 |
| 18 | | | | | | | | | 98.6 | 93.3 | 88.4 | 83.8 |
| 19 | | | | | | | | | | 96.1 | 91.2 | 86.8 |
| 20 | | | | | | | | | | 98.7 | 94.0 | 89.6 |
| 21 | | | | | | | | | | | 96.5 | 92.1 |
| 22 | | | | | | | | | | | 98.9 | 94.6 |
| 23 | | | | | | | | | | | | 96.5 |
| 24 | | | | | | | | | | | | 98.9 |

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

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

## CONTROL BOX CALIBRATION

## THREE POINT CALIBRATION

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

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

## POST TEST

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

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

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

0 to 3.0" H2O RANGE

MAGNEHELIC

| Δ P | MANOMETER |
|---|---|
| 0.50 | 0.50 |
| 1.00 | 1.00 |
| 2.00 | 2.00 |
| 3.00 | 3.00 |

0 to 0.50" H2O RANGE
SLANT TUBE
PRIMARY STANDARD

0 to 5" H2O RANGE

MAGNEHELIC

| Δ H | MANOMETER |
|---|---|
| 4.00 | 4.00 |
| 3.00 | 3.00 |
| 2.00 | 2.00 |
| 1.00 | 1.00 |
| 0.50 | 0.50 |

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

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

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

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

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

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

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

0 to 3.0" H2O RANGE

MAGNEHELIC

| Δ P | MANOMETER |
|---|---|
| 0.50 | 0.50 |
| 1.00 | 1.00 |
| 2.00 | 2.00 |
| 3.00 | 3.00 |

0 to 0.50" H2O RANGE
SLANT TUBE
PRIMARY STANDARD

0 to 5" H2O RANGE

MAGNEHELIC

| Δ H | MANOMETER |
|---|---|
| 4.00 | 4.00 |
| 3.00 | 3.00 |
| 2.00 | 2.00 |
| 1.00 | 1.00 |
| 0.50 | 0.50 |

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

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

PYROMETER CALIBRATION
DATE 04-28-88
OPERATOR AGL

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

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

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

QA ORIFICE AUDIT

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

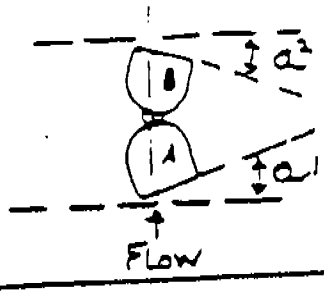
| RUN | 1 | | 2 | | 3 | |
|---|---|---|---|---|---|---|
| INITIAL CF | 110.300 | | 118.300 | | 126.300 | |
| FINAL CF | 117.825 | | 125.828 | | 133.810 | |
| DIFFERENCE | 7.525 | | 7.528 | | 7.510 | |
| | IN | OUT | IN | OUT | IN | OUT |
| TEMP INITIAL | 105 | 100 | 102 | 98 | 102 | 97 |
| TEMP 5 MIN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

# GEOMETRIC PITOT CALIBRATION

Caliper # X6F-59
Precheck
Post Check

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

①

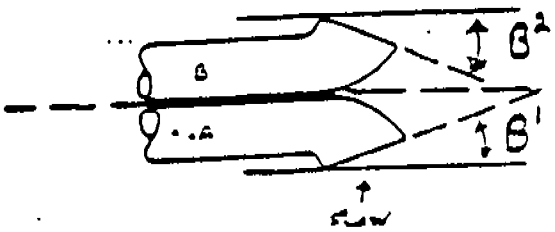



a¹ = 3°
a² = 0°
B¹ = 0°
B² = 1°

a¹, a² = <10°
B¹, B², = <5°

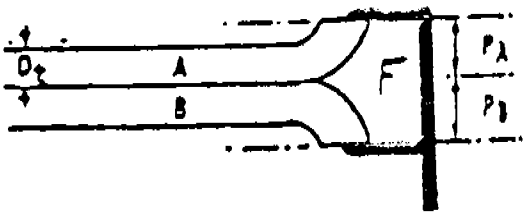
F = .93"

②



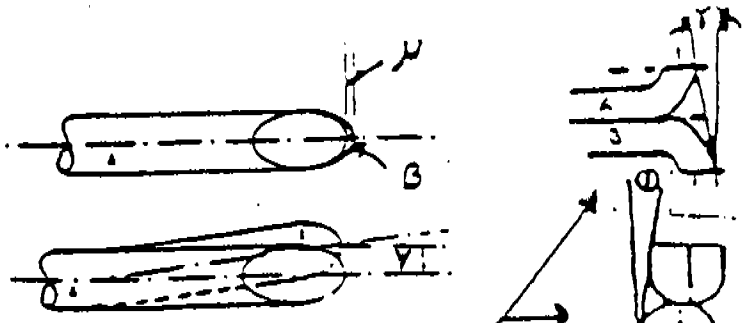

μ = .16 — μ = ≤ 0.1250" (μ = F TAN γ)
V = 0 — V = ≤0.03125" (V = F TAN θ)
W = .194 — W ≥ 0"
X = 0.97 — X ≥ 0.750" (3/4" using 1/2" nozzle)
Y = 5.6 — Y ≥ 3.0"
Z = 3.6 — Z > 2.0"
$D_t$ = .375 — $D_t$ > .1875"

③



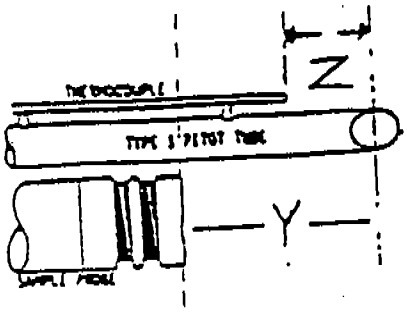

1.05 $D_t$ < d < 1.50 $D_t$
$P_A$ = $P_B$
2.10 $D_t$ < d < 3.00 $D_t$

④

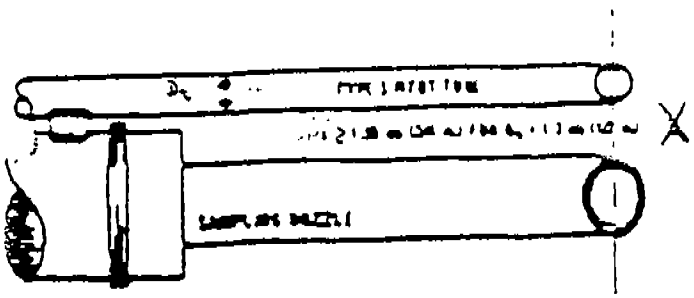



(γ, θ EXPRESSED IN DEGREES)

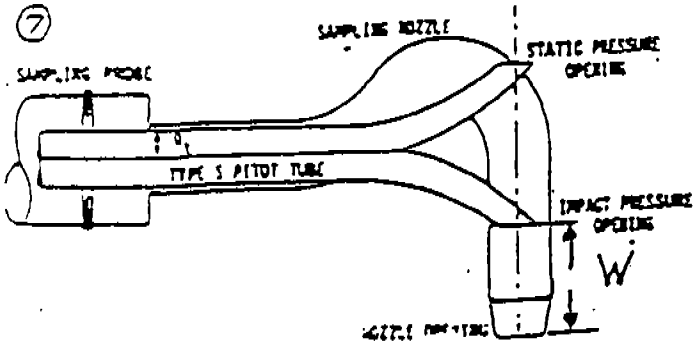
⑥




⑤




⑦

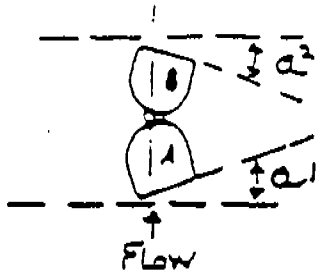


# GEOMETRIC PITOT CALIBRATION

Caliper # YGE - 59
Precheck
Post Check

Probe #: 10-2
Date: 08-05-94
Initials: CR

①

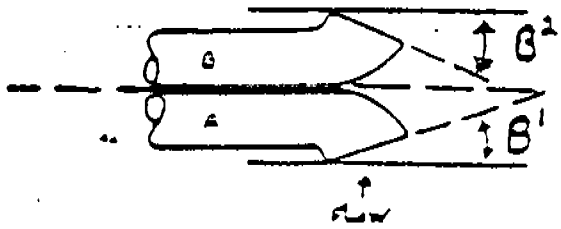



a¹ = 3°
a² = 0°
B¹ = 0°
B² = 1°

a¹, a² = <10°
B¹, B² = <5°

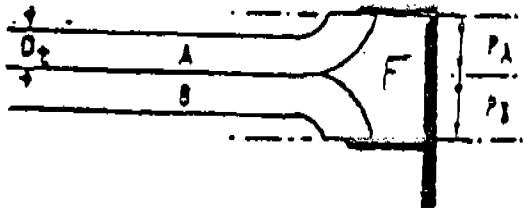
F = .94 "

②




μ = .16 — μ = ≤ 0.1250" (μ = F ...
V = 0 — V = ≤0.03125" (V = F ...
W = .194 — W ≥ 0 "

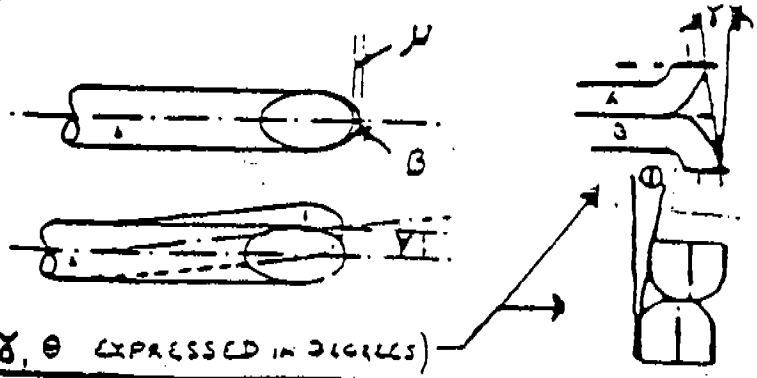
③




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

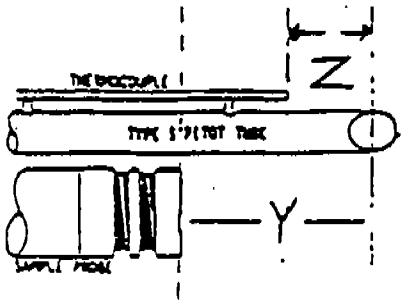
X = 0.97 — X ≥ 0.750" (3/4" using 1/2" nozzle)
Y = 5.6 — Y ≥ 3.0"
Z = 3.8 — Z > 2.0"
D_t = .376 — D_t > .1875"

④

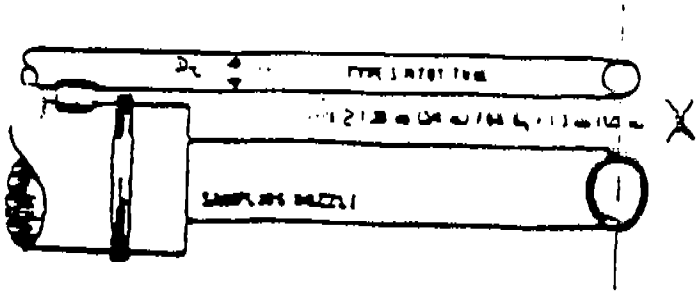



(γ, θ EXPRESSED IN DEGREES)

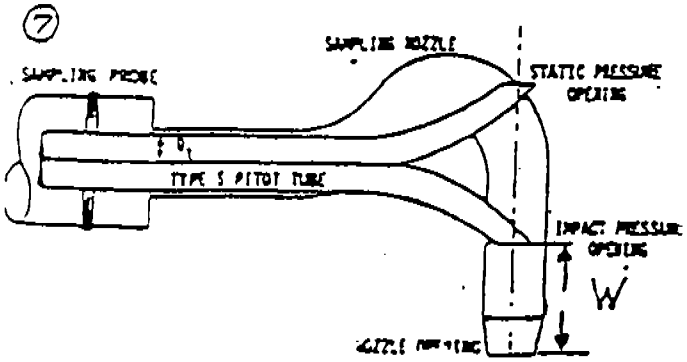
⑥




⑤




⑦



①

VISIBLE EMISSIONS OBSERVATION FORM

# 13 STACK

OBSERVER: R. BRIAN FAJTAK

DATE: 7/28/94

FACILITY: USX/CLAIRTON

OBSERVATION START TIME: 0830

END TIME: 0930

OBSERVATION POINT: 100' South of #19 Batt.

SOURCE:

DISTANCE: ≈ 300'

DIRECTION FROM: S-W

HEIGHT: ≈ 150'

WIND:

SPEED: < 5 mph

DIRECTION: South

TEMPERATURE: 66°F

SKY CONDITION: OVERCAST

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: –

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15%: 240

NO. READINGS 20%: –

NO. READINGS 25 - 55%: –

NO. READINGS 60 - 100%: –

NO. READINGS ≥ 20%: –

GREATEST OPACITY: 0

COMMENTS:

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

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

VISIBLE EMISSIONS OBSERVATION FORM

②

#13 STACK

OBSERVER: R. BRIAN FAJTAK

DATE: 7/28/94

FACILITY: USX/CLAIRTON

OBSERVATION START TIME: 0930

END TIME: 1010

OBSERVATION POINT: 100' south of #19 Batt.

SOURCE:

DISTANCE: ≈ 300'

DIRECTION FROM: S-W

HEIGHT: ≈ 150'

WIND:

SPEED: < 5 mph

DIRECTION: south

TEMPERATURE: 68° F

SKY CONDITION: OVERCAST

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: —

TOTAL # OF READINGS: 162

NO. READINGS 0 - 15%: —

NO. READINGS 20%: —

NO. READINGS 25 - 55%: —

NO. READINGS 60 - 100%: —

NO. READINGS ≥ 20%: —

GREATEST OPACITY: 0

COMMENTS:

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

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

VISIBLE EMISSIONS OBSERVATION FORM

③

#13 STACK

OBSERVER: R. Brian Fajtak

DATE: 7/28/94

FACILITY: USX/Clairton

OBSERVATION START TIME: 1242 hrs

END TIME: 1342 hrs

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

SOURCE:

DISTANCE: ≈300'

DIRECTION FROM: S-W

HEIGHT: ≈150'

WIND:

SPEED: ≈ 5-10 mph

DIRECTION: S

TEMPERATURE: 76°

SKY CONDITION: 80% Cloudy

BACKGROUND: Sky

READING CONDITIONS: Good

COLOR OF EMISSIONS: —

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15% 240

NO. READINGS 20% —

NO. READINGS 25 - 55% —

NO. READINGS 60 - 100% —

NO. READINGS >= 20% —

GREATEST OPACITY: 0

COMMENTS:

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

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

VISIBLE EMISSIONS OBSERVATION FORM

④

#13 STACK

OBSERVER: R. BRIAN FAJTAK

DATE: 7-28-94

FACILITY: USX / CLAIRTON

OBSERVATION START TIME: 1342 Hrs.

END TIME: 1442 Hrs

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

SOURCE:

DISTANCE: ≈300'

DIRECTION FROM: S-W

HEIGHT: ≈100'

WIND:

SPEED: ≈5→10 mph

DIRECTION: South

TEMPERATURE: 78°

SKY CONDITION: 90% Clouds

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: —

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15% 240

NO. READINGS 20% —

NO. READINGS 25 - 55% —

NO. READINGS 60 - 100% —

NO. READINGS ≥ 20% —

GREATEST OPACITY: 0

COMMENTS:

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

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

VISIBLE EMISSIONS OBSERVATION FORM

(5)

# 13 STACK

OBSERVER: R. Brian Fajtak

DATE: 7-28-94

FACILITY: USX/Clairton

OBSERVATION START TIME: 1442 hrs.

END TIME: 1542 hrs

OBSERVATION POINT: ≈ 100' South of 19 Batt.

SOURCE:

DISTANCE: ≈ 300'

DIRECTION FROM: S-W

HEIGHT: ≈ 150'

WIND:

SPEED: ≈ 5-10 mph

DIRECTION: S

TEMPERATURE: 77°

SKY CONDITION: 80% Clouds

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: —

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15% 240

NO. READINGS 20% —

NO. READINGS 25 - 55% —

NO. READINGS 60 - 100% —

NO. READINGS ≥ 20% —

GREATEST OPACITY: 0

COMMENTS:

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

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

# VISIBLE EMISSIONS OBSERVATION FORM

#13 STACK

OBSERVER: R. Brian Fajtak

DATE: 7-28-94

FACILITY: USX/Clairton

OBSERVATION START TIME: 1542 hrs.

END TIME: 1552 hrs

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

SOURCE:

DISTANCE: ≈300'

DIRECTION FROM: S-W

HEIGHT: ≈100'

WIND:

SPEED: ≈5-10 mph

DIRECTION: S

TEMPERATURE: 79°

SKY CONDITION: 80% Clouds

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS:

TOTAL # OF READINGS: 42

NO. READINGS 0 - 15% 42

NO. READINGS 20% –

NO. READINGS 25 - 55% –

NO. READINGS 60 - 100% –

NO. READINGS ≥ 20% –

GREATEST OPACITY: 0

COMMENTS:

| | :00 | :15 | :30 | :45 |
|---|---|---|---|---|
| 00 | 0 | 0 | 0 | 0 |
| 01 | 0 | 0 | 0 | 0 |
| 02 | 0 | 0 | 0 | 0 |
| 03 | 0 | 0 | 0 | 0 |
| 04 | 0 | 0 | 0 | 0 |
| 05 | 0 | 0 | 0 | 0 |
| 06 | 0 | 0 | 0 | 0 |
| 07 | 0 | 0 | 0 | 0 |
| 08 | 0 | 0 | 0 | 0 |
| 09 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | | |
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| | :00 | :15 | :30 | :45 |
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VISIBLE EMISSIONS OBSERVATION FORM

①

OBSERVER: R. Brian Fajtak

DATE: 7/29/94

FACILITY: USX/Clairton

OBSERVATION START TIME: 0740 hrs.

END TIME: 0840 hrs.

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

SOURCE:

DISTANCE: ≈300'

DIRECTION FROM: S-W

HEIGHT: ≈150'

WIND:

SPEED: ≈5-10 mph

DIRECTION: N-E

TEMPERATURE: 65°

SKY CONDITION: 10% clouds

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: —

TOTAL # OF READINGS: 240

NO. READINGS 0 - 15%: 240

NO. READINGS 20%: —

NO. READINGS 25 - 55%: —

NO. READINGS 60 - 100%: —

NO. READINGS ≥ 20%: —

GREATEST OPACITY: 0

COMMENTS:

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

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

VISIBLE EMISSIONS OBSERVATION FORM

(2)

OBSERVER: R. BRIAN FAYTAK

DATE: 7/29/94

FACILITY: USX/Clairton

OBSERVATION START TIME: 0840 Lrs

END TIME: [redacted] 0940 Lrs

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

SOURCE:

DISTANCE: ≈300'

DIRECTION FROM: S-W

HEIGHT: ≈150'

WIND:

SPEED: ≈ 5-10 mph

DIRECTION: N-E

TEMPERATURE: 68°

SKY CONDITION: 25% clouds

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS: Gray/Black

TOTAL # OF READINGS: 240

NO. READINGS 0 - 19%: 240

NO. READINGS 20%: —

NO. READINGS 25 - 55%: —

NO. READINGS 60 - 100%: —

NO. READINGS ≥ 20%: —

GREATEST OPACITY: 5%

COMMENTS:

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

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

③

VISIBLE EMISSIONS OBSERVATION FORM

OBSERVER: R. BRIAN FAJTAK

DATE: 7/29/94

FACILITY: USX/CLAIRTON

OBSERVATION START TIME: 0940

END TIME: 0951

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

SOURCE:
DISTANCE: ≈300'
DIRECTION FROM: S-W
HEIGHT: ≈150'

WIND:
SPEED: ≈5-10 mph
DIRECTION: N-E

TEMPERATURE: 69°

SKY CONDITION: 10% clouds

BACKGROUND: SKY

READING CONDITIONS: GOOD

COLOR OF EMISSIONS:

TOTAL # OF READINGS: 46

NO. READINGS 0 - 15% 46

NO. READINGS 20% –

NO. READINGS 25 - 55% –

NO. READINGS 60 - 100% –

NO. READINGS >= 20% –

GREATEST OPACITY:

COMMENTS:

| | :00 | :15 | :30 | :45 |
|---|---|---|---|---|
| 00 | 0 | 0 | 0 | 0 |
| 01 | 0 | 0 | 0 | 0 |
| 02 | 0 | 0 | 0 | 0 |
| 03 | 0 | 0 | 0 | 0 |
| 04 | 0 | 0 | 0 | 0 |
| 05 | 0 | 0 | 0 | 0 |
| 06 | 0 | 0 | 0 | 0 |
| 07 | 0 | 0 | 0 | 0 |
| 08 | 0 | 0 | 0 | 0 |
| 09 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 |
| 11 | 0 | 0 | | |
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# COMPLIANCE DEMONSTRATION
# NO. 13 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

## APPENDIX B

## PLANT OPERATIONAL DATA

ATS
ADVANCED TECHNOLOGY SYSTEMS, INC.

PUSHING SCHEDULE

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

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

PUSHING SCHEDULE

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

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

# PUSHING SCHEDULE

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

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

14/-A15

A15/14 after B13/13

PUSHING SCHEDULE

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

| Oven | Last Pushed | Earliest | Desired | Latest |
|---|---|---|---|---|
| A15/13 | 18:03 | 2:49pm | 3:00pm | 3:11pm |
| B16/14 | 18:03 | 2:55pm | 3:05pm | 3:16pm |
| A17/13 | 18:03 | 3:00pm | 3:11pm | 3:22pm |
| B18/14 | 18:03 | 3:06pm | 3:17pm | 3:28pm |
| A19/13 | 18:03 | 3:12pm | 3:23pm | 3:34pm |
| B20/14 | 18:03 | 3:18pm | 3:29pm | 3:40pm |
| A21/13 | 18:03 | 3:24pm | 3:35pm | 3:46pm |
| B22/14 | 18:02 | 3:29pm | 3:40pm | 3:51pm |
| A23/13 | 18:03 | 3:35pm | 3:46pm | 3:57pm |
| B24/14 | 18:03 | 3:41pm | 3:52pm | 4:03pm |
| A25/13 | 18:03 | 3:47pm | 3:58pm | 4:09pm |
| B26/14 | 18:03 | 3:53pm | 4:04pm | 4:15pm |
| A27/13 | 18:03 | 3:59pm | 4:10pm | 4:21pm |
| B28/14 | 18:03 | 4:05pm | 4:16pm | 4:27pm |
| A29/13 | 18:02 | 4:10pm | 4:21pm | 4:32pm |
| B30/14 | 18:03 | 4:16pm | 4:27pm | 4:38pm |
| A31/13 | 18:03 | 4:22pm | 4:33pm | 4:44pm |
| A1 /15 | 18:03 | 4:28pm | 4:39pm | 4:50pm |
| B2 /13 | 18:03 | 4:34pm | 4:45pm | 4:56pm |
| A3 /15 | 18:03 | 4:40pm | 4:51pm | 5:02pm |
| B4 /13 | 18:03 | 4:46pm | 4:57pm | 5:08pm |
| A5 /15 | 36:05 | 4:51pm | 5:02pm | 5:13pm |
| B6 /13 | 36:06 | 4:57pm | 5:08pm | 5:19pm |
| A7 /15 | 36:06 | 5:03pm | 5:14pm | [illegible] |
| B8 /13 | 36:06 | 5:09pm | [illegible] | [illegible] |
| A9 /15 | 36:06 | 5:15pm | [illegible] | [illegible] |
| B10/13 | 36:06 | [illegible] | 5:32pm | 5:43pm |
| A11/15 | 36:06 | 5:27pm | 5:38pm | 5:49pm |
| B12/13 | 36:05 | 5:32pm | 5:43pm | 5:54pm |
| A13/15 | 36:06 | 5:38pm | 5:49pm | [illegible] |
| B14/13 | 36:06 | 5:44pm | 5:55pm | 6:06pm |
| A15/15 | 36:06 | 5:50pm | 6:01pm | [illegible] |
| B16/13 | 36:06 | 5:56pm | 6:07pm | [illegible] |
| A17/15 | 36:06 | 6:02pm | 6:13pm | 6:24pm |
| B18/13 | 36:06 | 6:08pm | 6:19pm | 6:30pm |
| A19/15 | 36:05 | 6:13pm | 6:24pm | [illegible] |
| B20/13 | 36:06 | 6:19pm | 6:30pm | 6:41pm |
| A21/15 | 36:06 | 6:25pm | 6:36pm | 6:47pm |
| B22/13 | 36:06 | 6:31pm | 6:42pm | 6:53pm |
| A23/15 | 36:06 | 6:37pm | 6:48pm | 6:59pm |
| B24/13 | 36:06 | 6:43pm | 6:54pm | 7:05pm |
| A25/15 | 36:05 | 6:48pm | 6:59pm | 7:10pm |
| B26/13 | 36:05 | 6:54pm | 7:05pm | 7:16pm |
| A27/15 | 36:05 | 7:00pm | 7:11pm | [illegible] |
| B28/13 | 36:05 | 7:06pm | 7:17pm | [illegible] |
| A29/15 | 36:05 | 7:12pm | [illegible] | [illegible] |
| B30/13 | 36:05 | 7:18pm | 7:29pm | 7:40pm |
| A31/15 | 36:05 | 7:24pm | 7:35pm | 7:46pm |
| A2 /14 | 36:04 | 7:29pm | 7:40pm | [illegible] |
| B2 /15 | 36:04 | 7:35pm | 7:46pm | [illegible] |
| A4 /14 | 36:04 | 7:41pm | 7:52pm | [illegible] |
| B4 /15 | 36:04 | 7:47pm | 7:58pm | [illegible] |
| A6 /14 | 36:04 | [illegible] | 8:04pm | [illegible] |
| B6 /15 | 36:04 | 7:59pm | 8:10pm | [illegible] |
| A8 /14 | 36:04 | 8:05pm | 8:16pm | [illegible] |
| B8 /15 | 36:03 | 8:10pm | [illegible] | [illegible] |
| A10/14 | 36:03 | 8:16pm | 8:27pm | [illegible] |
| B10/15 | 36:03 | 8:22pm | [illegible] | 8:44pm |
| A12/14 | 36:03 | 8:28pm | 8:39pm | 8:50pm |
| B12/15 | 36:03 | 8:34pm | 8:45pm | [illegible] |
| A14/14 | 36:03 | 8:40pm | 8:51pm | 9:02pm |
| B14/15 | 36:03 | 8:46pm | 8:57pm | 9:08pm |
| A16/14 | 36:02 | 8:51pm | 9:02pm | [illegible] |
| B16/15 | 36:02 | 8:57pm | 9:08pm | 9:19pm |
| A18/14 | 36:02 | 9:03pm | 9:14pm | 9:25pm |
| B18/15 | 36:02 | 9:09pm | 9:20pm | 9:31pm |
| A20/14 | 36:02 | 9:15pm | 9:26pm | 9:37pm |
| B20/15 | 36:02 | 9:21pm | 9:32pm | 9:43pm |
| A22/14 | 36:02 | 9:27pm | 9:38pm | 9:49pm |
| B22/15 | 36:01 | 9:32pm | 9:43pm | 9:54pm |
| A24/14 | 36:01 | 9:38pm | 9:49pm | 10:00pm |
| B24/15 | 36:01 | 9:44pm | 9:55pm | 10:06pm |
| A26/14 | 36:01 | 9:50pm | 10:01pm | 10:12pm |
| B26/15 | 36:01 | 9:56pm | 10:07pm | 10:18pm |
| A28/14 | 36:01 | 10:02pm | 10:13pm | 10:24pm |
| B28/15 | 36:01 | 10:08pm | 10:19pm | 10:30pm |
| A30/14 | 36:00 | 10:13pm | 10:24pm | 10:35pm |
| B30/15 | 35:54 | 10:19pm | 10:30pm | 10:41pm |
| A2 /13 | 35:54 | 10:25pm | 10:36pm | 10:47pm |
| B1 /14 | 35:54 | 10:31pm | 10:42pm | 10:53pm |

PUSHING SCHEDULE

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

| Oven | Last Pushed | Earliest | Desired | Latest |
|---|---|---|---|---|
| A4 /13 | 35:54 | 10:37pm | 10:48pm | 10:59pm |
| B3 /14 | 35:54 | 10:43pm | 10:54pm | 11:05pm |

# PUSHING SCHEDULE

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

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


# PUSHING SCHEDULE

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


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

# PUSHING SCHEDULE

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

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

# PUSHING SCHEDULE

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

| Oven | Last Pushed | Earliest | Desired | Latest |
|---|---|---|---|---|
| B14/15 | 10:03 | 2:49pm | 3:00pm | 3:11pm |
| A16/14 | 10:03 | 2:55pm | 3:05pm | 3:16pm |
| B16/15 | 10:03 | 3:00pm | 3:11pm | 3:22pm |
| A18/14 | 10:03 | 3:06pm | 3:17pm | 3:28pm |
| B18/15 | 10:03 | 3:12pm | 3:23pm | 3:34pm |
| A20/14 | 10:03 | 3:18pm | 3:29pm | 3:40pm |
| B20/15 | 10:03 | 3:24pm | 3:35pm | 3:46pm |
| A22/14 | 10:03 | 3:29pm | 3:40pm | 3:51pm |
| B22/15 | 10:03 | 3:35pm | 3:46pm | 3:57pm |
| A24/14 | 10:03 | 3:41pm | 3:52pm | 4:03pm |
| B24/15 | 10:03 | 3:47pm | 3:58pm | 4:09pm |
| A26/14 | 10:03 | 3:53pm | 4:04pm | 4:15pm |
| B26/15 | 10:03 | 3:59pm | 4:10pm | 4:21pm |
| A28/14 | 10:03 | 4:05pm | 4:16pm | 4:27pm |
| B28/15 | 10:02 | 4:10pm | 4:21pm | 4:32pm |
| A30/14 | 10:03 | 4:16pm | 4:27pm | 4:38pm |
| B30/15 | 10:03 | 4:22pm | 4:33pm | 4:44pm |
| A2 /13 | 10:03 | 4:28pm | 4:39pm | 4:50pm |
| B1 /14 | 10:03 | 4:34pm | 4:45pm | 4:56pm |
| A4 /13 | 10:03 | 4:40pm | 4:51pm | 5:02pm |
| B3 /14 | 10:03 | 4:46pm | 4:57pm | 5:08pm |
| A6 /13 | 10:02 | 4:51pm | 5:02pm | 5:13pm |
| B5 /14 | 10:03 | 4:57pm | 5:08pm | 5:19pm |
| A8 /13 | 10:03 | 5:03pm | 5:14pm | 5:25pm |
| B7 /14 | 10:03 | 5:09pm | 5:20pm | 5:31pm |
| A10/13 | 10:03 | 5:15pm | 5:26pm | 5:37pm |
| B9 /14 | 10:03 | 5:21pm | 5:32pm | 5:43pm |
| A12/13 | 10:03 | 5:27pm | 5:38pm | 5:49pm |
| B11/14 | 10:03 | 5:32pm | 5:43pm | 5:54pm |
| A14/13 | 10:03 | 5:38pm | 5:49pm | 6:00pm |
| B13/14 | 10:03 | 5:44pm | 5:55pm | 6:06pm |
| A16/13 | 10:03 | 5:50pm | 6:01pm | 6:12pm |
| B15/14 | 10:03 | 5:56pm | 6:07pm | 6:18pm |
| A18/13 | 10:03 | 6:02pm | 6:13pm | 6:24pm |
| B17/14 | 10:03 | 6:08pm | 6:19pm | 6:30pm |
| A20/13 | 10:03 | 6:13pm | 6:24pm | 6:35pm |
| B19/14 | 10:03 | 6:19pm | 6:30pm | 6:41pm |
| A22/13 | 10:03 | 6:25pm | 6:36pm | 6:47pm |
| B21/14 | 10:03 | 6:31pm | 6:42pm | 6:53pm |
| A24/13 | 10:03 | 6:37pm | 6:48pm | 6:59pm |
| B23/14 | 10:03 | 6:43pm | 6:54pm | 7:05pm |
| A26/13 | 10:02 | 6:48pm | 6:59pm | 7:10pm |
| B25/14 | 10:03 | 6:54pm | 7:05pm | 7:16pm |
| A28/13 | 10:03 | 7:00pm | 7:11pm | 7:22pm |
| B27/14 | 10:03 | 7:06pm | 7:17pm | 7:28pm |
| A30/13 | 10:03 | 7:12pm | 7:23pm | 7:34pm |
| B29/14 | 10:03 | 7:18pm | 7:29pm | 7:40pm |
| B1 /15 | 10:03 | 7:24pm | 7:35pm | 7:46pm |
| A2 /15 | 10:03 | 7:29pm | 7:40pm | 7:51pm |
| B3 /13 | 10:03 | 7:35pm | 7:46pm | 7:57pm |
| A4 /15 | 10:03 | 7:41pm | 7:52pm | 8:03pm |
| B5 /13 | 10:03 | 7:47pm | 7:58pm | 8:09pm |
| A6 /15 | 10:03 | 7:53pm | 8:04pm | 8:15pm |
| B7 /13 | 10:03 | 7:59pm | 8:10pm | 8:21pm |
| A8 /15 | 10:03 | 8:05pm | 8:16pm | 8:27pm |
| B9 /13 | 10:03 | 8:10pm | 8:21pm | 8:32pm |
| A10/15 | 10:03 | 8:16pm | 8:27pm | 8:38pm |
| B11/13 | 10:03 | 8:22pm | 8:33pm | 8:44pm |
| A12/15 | 10:03 | 8:28pm | 8:39pm | 8:50pm |
| B13/13 | 10:03 | 8:34pm | 8:45pm | 8:56pm |
| A14/15 | 10:03 | 8:40pm | 8:51pm | 9:02pm |
| B15/13 | 10:03 | 8:46pm | 8:57pm | 9:08pm |
| A16/15 | 10:03 | 8:51pm | 9:02pm | 9:13pm |
| B17/13 | 10:03 | 8:57pm | 9:08pm | 9:19pm |
| A18/15 | 10:03 | 9:03pm | 9:14pm | 9:25pm |
| B19/13 | 10:03 | 9:07pm | 9:20pm | 9:31pm |
| A20/15 | 10:03 | 9:15pm | 9:26pm | 9:37pm |
| B21/13 | 10:03 | 9:21pm | 9:32pm | 9:43pm |
| A22/15 | 10:03 | 9:27pm | 9:38pm | 9:49pm |
| B23/13 | 10:03 | 9:32pm | 9:43pm | 9:54pm |
| A24/15 | 10:03 | 9:38pm | 9:49pm | 10:00pm |
| B25/13 | 10:03 | 9:44pm | 9:55pm | 10:06pm |
| A26/15 | 10:03 | 9:50pm | 10:01pm | 10:12pm |
| B27/13 | 10:03 | 9:56pm | 10:07pm | 10:18pm |
| A28/15 | 10:03 | 10:02pm | 10:13pm | 10:24pm |
| B29/13 | 10:03 | 10:08pm | 10:19pm | 10:30pm |
| A30/15 | 10:03 | 10:13pm | 10:24pm | 10:35pm |
| A1 /14 | 10:03 | 10:19pm | 10:30pm | 10:41pm |
| B1 /15 | 10:03 | 10:25pm | 10:36pm | 10:47pm |
| A3 /14 | 10:03 | 10:31pm | 10:42pm | 10:53pm |

# PUSHING SCHEDULE

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

| Oven | Last Pushed | Earliest | Desired | Latest |
|---|---|---|---|---|
| B3 /15 | 10:03 | 10:37pm | 10:48pm | 10:59pm |
| A5 /14 | 10:03 | 10:43pm | 10:54pm | 11:05pm |

CC-10295 REV. 1181
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

# PUSHING AND CHARGING REPORT

UNIT NO. 5
12 Hrs. Beginning ~~[illegible] PM~~ 11 AM 7/20/94
Date 7-20-94

BATTERY NO. 13-A

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

BATTERY NO. 13-B

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

BATTERY NO. 14-A

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | | | | | |
| 3 | | | | | |
| 5 | | | | | |
| 7 | | | | | |
| 9 | | | 11 | [illegible] | |
| 11 | | | 11 | [illegible] | |
| 13 | 11 | 31 | 11 | 54 | |
| 15 | · | — | 12 | 05 | PASS-ON |
| 17 | 11 | 45 | 12 | 16 | |
| 19 | 11 | 56 | 12 | 27 | · |
| 21 | 12 | 07 | 12 | [illegible] | |
| 23 | 12 | 18 | 12 | [illegible] | ✓ #1 |
| 25 | 12 | 29 | 12 | 55 | ✓ #1 |
| 27 | 12 | [illegible] | 1 | 06 | ✓ #1 |
| 29 | [illegible] | 51 | 1 | 17 | |
| 31 | 12 | 57 | 1 | 28 | |
| 2 | 7 | 13 | 7 | 44 | |
| 4 | 7 | 24 | 7 | 55 | |
| 6 | 7 | 35 | 8 | 05 | |
| 8 | 7 | 46 | 8 | 17 | |
| 10 | [illegible] | [illegible] | 8 | 29 | |
| 12 | 8 | 07 | 8 | 41 | |
| 14 | 8 | 18 | 8 | 52 | |
| 16 | 8 | 31 | 9 | [illegible] | |
| 18 | 8 | 43 | 9 | 15 | |
| 20 | 8 | 54 | 9 | 27 | |
| 22 | 9 | 05 | 9 | 39 | |
| 24 | 9 | 17 | 9 | 51 | |
| 26 | 9 | 29 | 10 | 02 | |
| 28 | 9 | 41 | 10 | 14 | |
| 30 | 9 | 53 | | | |
| 1 | | | | | |
| 2 | | | | | |

REMARKS: 18 | 16 15 | 15 [illegible] | 26

Condition of Signals

Condition of Pusher

## HOURLY REPORT OF OPERATION

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

Total Ovens Pushed 57

Total Ovens Charged 57

Pusherman

Battery Foreman [illegible]

CC-10285 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

# PUSHING AND CHARGING REPORT

UNIT NO. #5

12 Hrs. Beginning ~~12:00 AM~~ 11 PM 7/27/94

Date 7-28-94

## BATTERY NO. 13-A

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

## BATTERY NO. 13-B

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

## BATTERY NO. 14-A

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

REMARKS: 15/16 28/30 42/10

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 | 12 | 13 | 5 | 5 | 6 | 10 | 10 |
| 1/2 | 6 | 6 | 12 | 12 | 6 | 1 | 2 | 1 | 2 |
| 2/3 | 6 | 6 | 12 | 12 | 8/7 | 6 | 5 | 12 | 11 |
| 3/4 | 6 | 6 | 12 | 12 | 9/8 | 6 | 6 | 11 | 11 |
| 4/5 | 5 | 5 | 11 | 12 | 10/9 | 6 | 6 | 12 | 12 |
| 5/6 | 6 | 7 | 12 | 12 | 11/10 | 6 | 4 | 11 | 9 |
| | 35 | 35 | | | | 30 | 30 | | |

Total Ovens Pushed 65

Total Ovens Charged 65

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. #5
12 Hrs. Beginning ~~12:00 PM~~ 11 AM 7/27/94
Date 7-29-94

**BATTERY NO. 13-A's**

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | | | | | |
| 3 | | | | | |
| 5 | | | | | |
| 7 | | | | | |
| 9 | | | | | |
| 11 | | | | | |
| 13 | | | | | |
| 15 | | | | | |
| 17 | | | | | |
| 19 | | | | | |
| 21 | | | | | |
| 23 | | | | | |
| 25 | | | | | |
| 27 | | | | | |
| 29 | | | | | |
| 31 | | | | | |
| 2 | 4 | 28 | 4 | 46 | |
| 4 | 4 | 38 | 5 | 05 | |
| 6 | 4 | 48 | 5 | 15 | |
| 8 | 4 | 58 | 5 | 25 | |
| 10 | 5 | 07 | 5 | 36 | |
| 12 | 5 | 17 | 5 | 37 | |
| 14 | 5 | 27 | 5 | 43 | |
| 16 | 5 | 34 | 6 | 13 | |
| 18 | 5 | 39 | 6 | 18 | |
| 20 | 5 | 45 | 6 | 33 | |
| 22 | 6 | 15 | 6 | 43 | |
| 24 | 6 | 20 | 6 | 53 | |
| 26 | 6 | 35 | 7 | 03 | |
| 28 | 6 | 45 | 7 | 14 | |
| 30 | 6 | 55 | 7 | 24 | |

**BATTERY NO. 13-B's**

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | 7 | 05 | 7 | 34 | |
| 3 | 7 | 16 | 7 | 44 | |
| 5 | 7 | 26 | 7 | 54 | |
| 7 | 7 | 36 | 8 | 04 | |
| 9 | 7 | 46 | 8 | 15 | |
| 11 | 7 | 56 | 8 | 25 | |
| 13 | 8 | 06 | 8 | 36 | |
| 15 | 8 | 17 | 8 | 48 | |
| 17 | 8 | 27 | 9 | 02 | |
| 19 | 8 | 38 | 9 | 14 | |
| 21 | 8 | 50 | 9 | 26 | |
| 23 | 9 | 04 | 9 | 38 | |
| 25 | 9 | 16 | 9 | 50 | |
| 27 | 9 | 28 | 10 | 02 | |
| 29 | 9 | 40 | 10 | 14 | |
| 31 | | | | | |
| 2 | | | | | |
| 4 | | | | | |
| 6 | | | | | |
| 8 | | | | | |
| 10 | | | | | |
| 12 | | | | | |
| 14 | 11 | 39 | 12 | 08 | |
| 16 | 11 | 49 | 12 | 19 | |
| 18 | 11 | 59 | 12 | 30 | |
| 20 | 12 | 10 | 12 | 41 | |
| 22 | 12 | 21 | 12 | 52 | |
| 24 | 12 | 32 | 1 | 03 | |
| 26 | 12 | 43 | 1 | 14 | |
| 28 | 12 | 54 | 1 | 25 | |
| 30 | 1 | 05 | 1 | 36 | |

**BATTERY NO. 14-A's**

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | 4 | 52 | | | |
| 3 | 10 | 04 | | | |
| 5 | 10 | 16 | | | |
| 7 | | | | | |
| 9 | | | | | |
| 11 | | | | | |
| 13 | | | | | |
| 15 | | | | | |
| 17 | | | | | |
| 19 | | | | | |
| 21 | | | | | |
| 23 | | | | | |
| 25 | | | | | |
| 27 | | | | | |
| 29 | | | | | |
| 31 | | | | | |
| 2 | 1 | 16 | 1 | [illegible] | |
| 4 | [illegible] | [illegible] | 1 | 57 | |
| 6 | 1 | 58 | [illegible] | [illegible] | |
| 8 | [illegible] | 49 | 2 | 20 | |
| 10 | [illegible] | 59 | 3 | 03 | |
| 12 | 2 | 11 | 3 | 13 | |
| 14 | 2 | 22 | 3 | 23 | |
| 16 | 3 | 05 | 3 | 33 | |
| 18 | 3 | 15 | 3 | 43 | |
| 20 | 3 | 25 | 3 | 53 | |
| 22 | 3 | 35 | 4 | 04 | |
| 24 | 3 | 45 | 4 | 14 | |
| 26 | 3 | 55 | 4 | 20 | |
| 28 | 4 | 06 | 4 | 36 | |
| 30 | 4 | 16 | 4 | 36 | |

REMARKS:

| 13-A's | 13-B's | 14-A's |
|---|---|---|
| 15 / 15 | 24 / 24 | 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 | |
|---|---|---|---|---|---|---|---|---|---|
| 11-12 | 3 | 0 | 9 | 6 | 5-6 | 6 | 6 | 11 | 11 |
| 12-1 | 5 | 5 | 9 | 9 | 6-7 | 5 | 5 | 11 | 11 |
| 1-2 | 6 | 6 | 11 | 11 | 7-8 | 6 | 6 | 12 | 12 |
| 2-3 | 2 | 2 | 4 | 4 | 8-9 | 5 | 5 | 10 | 10 |
| 3-4 | 6 | 6 | 12 | 12 | 9-10 | 5 | 5 | 10 | 10 |
| 4-5 | 6 | 6 | 12 | 12 | 10-11 | 2 | 2 | 4 | 4 |
| | 28 | 25 | | | | 29 | 29 | | |

Total Ovens Pushed 57
Total Ovens Charged 54

Pusherman
Battery Foreman

SC-1C295 REV. 1161
03.001.0020

UNITED STATES STEEL CORPORATION
CLAIRTON COKE AND COAL CHEMICAL WORKS

# PUSHING AND CHARGING REPORT

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

BATTERY NO. 13-A

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | 7 | 25 | 7 | 53 | ✓ |
| 3 | 7 | 35 | 8 | 03 | ✓ |
| 5 | 7 | 45 | 8 | 13 | ✓ |
| 7 | 7 | 55 | 8 | 23 | ✓ |
| 9 | 8 | 05 | 8 | 33 | ✓ |
| 11 | 8 | 15 | 8 | 43 | ✓ |
| 13 | 8 | 25 | 8 | 53 | ✓ |
| 15 | 8 | 35 | 9 | 03 | ✓ |
| 17 | 8 | 45 | 9 | 13 | ✓ |
| 19 | 8 | 55 | 9 | 23 | ✓ |
| 21 | 9 | 05 | 9 | 33 | ✓ |
| 23 | 9 | 15 | 9 | 43 | ✓ |
| 25 | 9 | 25 | 9 | 53 | |
| 27 | 9 | 35 | 10 | 03 | |
| 29 | 9 | 45 | 10 | 13 | |
| 11 | 9 | 55 | 10 | 23 | |
| 2 | | | 11 | 10 | |
| 4 | | | 11 | 19 | |
| 6 | 11 | 00 | 11 | 26 | |
| 8 | 11 | 08 | 11 | 36 | |
| 0 | 11 | 17 | 11 | 42 | |
| 2 | 11 | 28 | 11 | 50 | |
| 4 | 11 | 38 | 12 | 00 | |
| 6 | 11 | 48 | 12 | 10 | |
| 8 | 11 | 58 | 12 | 20 | |
| 0 | 12 | 08 | 12 | 30 | |
| 2 | 12 | 18 | 12 | 40 | |
| 4 | 12 | 28 | 12 | 50 | |
| 6 | 12 | 38 | 1 | 00 | |
| 8 | 12 | 48 | 1 | 10 | |
| 0 | 12 | 58 | 1 | 20 | |
| 1 | | | | | |
| 2 | | | | | |

BATTERY NO. 13-B

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | 1 | 08 | 1 | 30 | |
| 3 | 1 | 18 | 1 | 39 | |
| 5 | 1 | 28 | 1 | 48 | |
| 7 | 1 | 37 | 1 | 58 | |
| 9 | 1 | 46 | 2 | 08 | |
| 11 | 1 | 56 | 2 | 17 | |
| 13 | 2 | 06 | 2 | 27 | |
| 15 | 2 | 15 | 2 | 37 | |
| 17 | 2 | 25 | 2 | 47 | |
| 19 | 2 | 35 | 2 | 57 | |
| 21 | 2 | 45 | 3 | 07 | |
| 23 | 2 | 55 | 3 | 17 | |
| 25 | 3 | 05 | 3 | 27 | |
| 27 | 3 | 15 | 3 | 38 | |
| 29 | 3 | 25 | 3 | 48 | |
| 31 | | | | | |
| 2 | 10 | 05 | 10 | 33 | |
| 4 | 10 | 15 | 10 | 38 | |
| 6 | 10 | 25 | 10 | 43 | |
| 8 | 10 | 35 | 10 | 48 | |
| 10 | 10 | 45 | 10 | 53 | |
| 12 | 10 | 55 | 10 | 58 | |
| 14 | | | | | |
| 16 | | | | | |
| 18 | | | | | |
| 20 | | | | | |
| 22 | | | | | |
| 24 | | | | | |
| 26 | | | | | |
| 28 | | | | | |
| 30 | | | | | |
| 1 | | | | | |
| 2 | | | | | |

BATTERY NO. 14-H

| OVEN NO. | TIME PUSHED | | TIME CHARGED | | NOTES |
|---|---|---|---|---|---|
| 1 | 3 | 36 | 3 | 58 | |
| 3 | 3 | 46 | 4 | 09 | |
| 5 | 3 | 56 | 4 | 19 | |
| 7 | 4 | 07 | 4 | 29 | |
| 9 | 4 | 17 | 4 | 37 | |
| 11 | 4 | 27 | 4 | 47 | |
| 13 | 4 | 37 | 5 | 00 | |
| 15 | 4 | [illegible] | 5 | 50 | EMT |
| 17 | 4 | 57 | 5 | 35 | |
| 19 | 5 | 10 | 6 | 03 | |
| 21 | 5 | 30 | 7 | [illegible] | |
| 23 | 5 | 47 | 7 | [illegible] | |
| 25 | 6 | 10 | 7 | [illegible] | |
| 27 | 7 | 00 | 7 | [illegible] | |
| 29 | [illegible] | 10 | 7 | [illegible] | |
| 31 | 7 | 15 | 7 | 43 | ✓ |
| 2 | | | | | |
| 4 | | | | | |
| 6 | | | | | |
| 8 | | | | | |
| 10 | | | | | |
| 12 | | | | | |
| 14 | | | | | |
| 16 | | | | | |
| 18 | | | | | |
| 20 | | | | | |
| 22 | | | | | |
| 24 | | | | | |
| 26 | | | | | |
| 28 | | | | | |
| 30 | | | 11 | 02 | |
| 1 | | | | | |
| 2 | | | | | |

REMARKS: A15/13 CHUCK DOOR NEEDS [illegible] (VERY TIGHT) 17 8"

Condition of Signals 29/31 21/21 Condition of Pusher 16/17

HOURLY REPORT OF OPERATION

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

Total Ovens Pushed 66
Total Ovens Charged 69

Pusherman
Battery Foreman [illegible]

ABB KENT-TAYLOR
DATE
7-22-
13
PM
AM
1
2
3
4
5
6
7
8
9
10
11
12

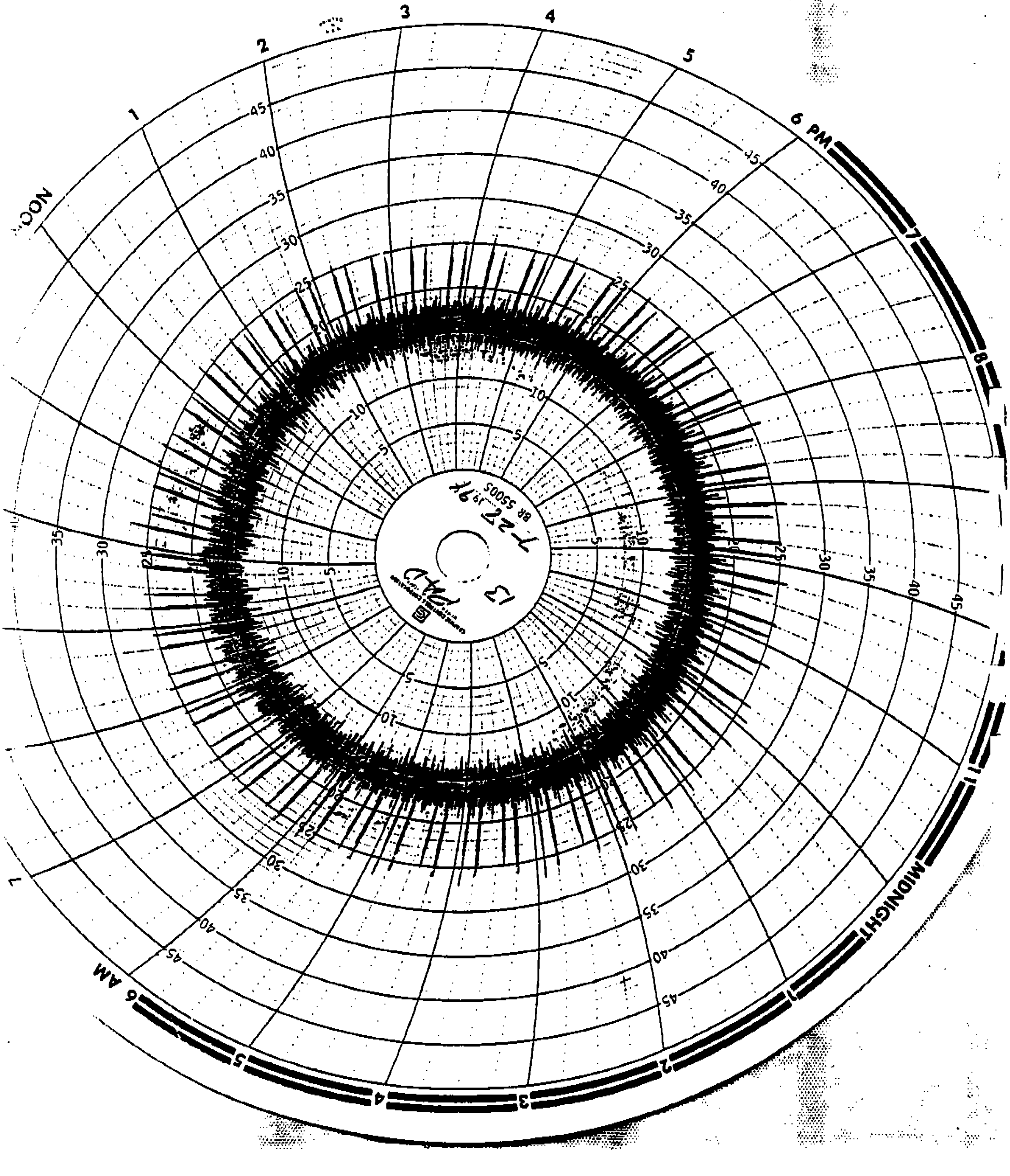
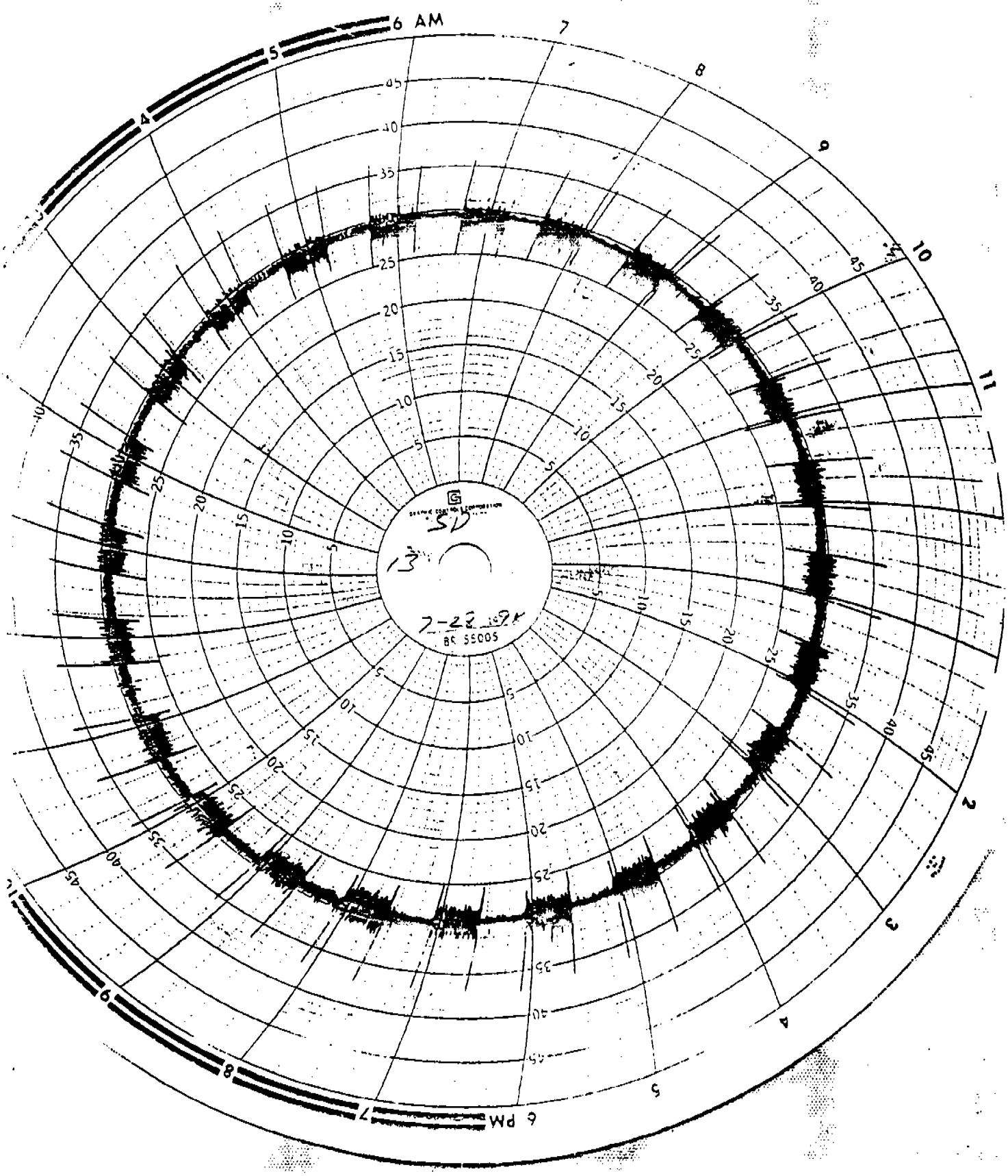

NOON
6 PM
MIDNIGHT
6 AM
BR 55005

ABB KENT-TAYLOR
DATE
0125
6 PM

6 PM
6 AM
12
7-28-94
BR 32008
CS
Grid

NOON
MIDNIGHT
BR 32008


6 AM
7
8
9
10
11
12
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4
5
6
7
8
9
10
11
6 PM
5
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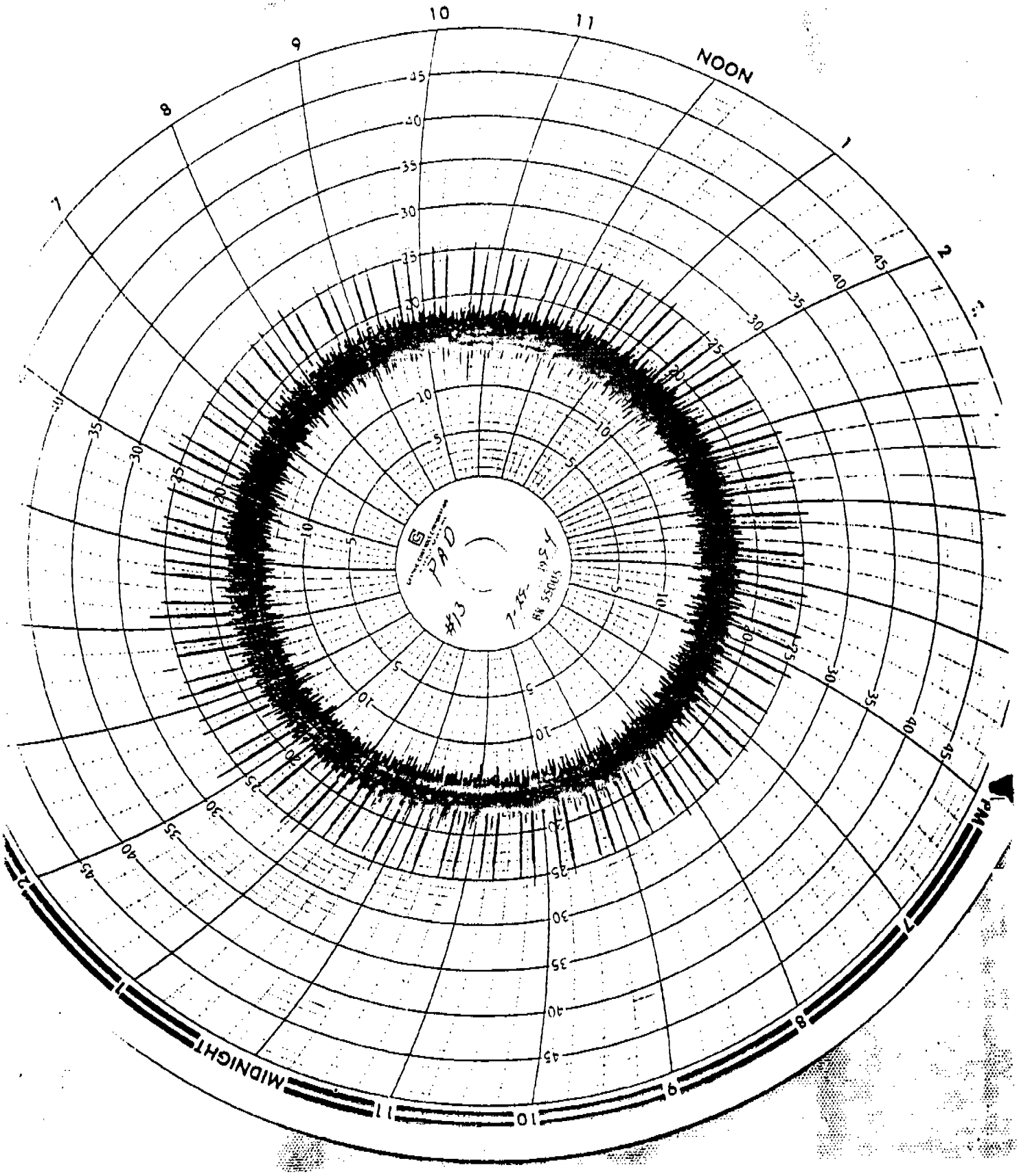
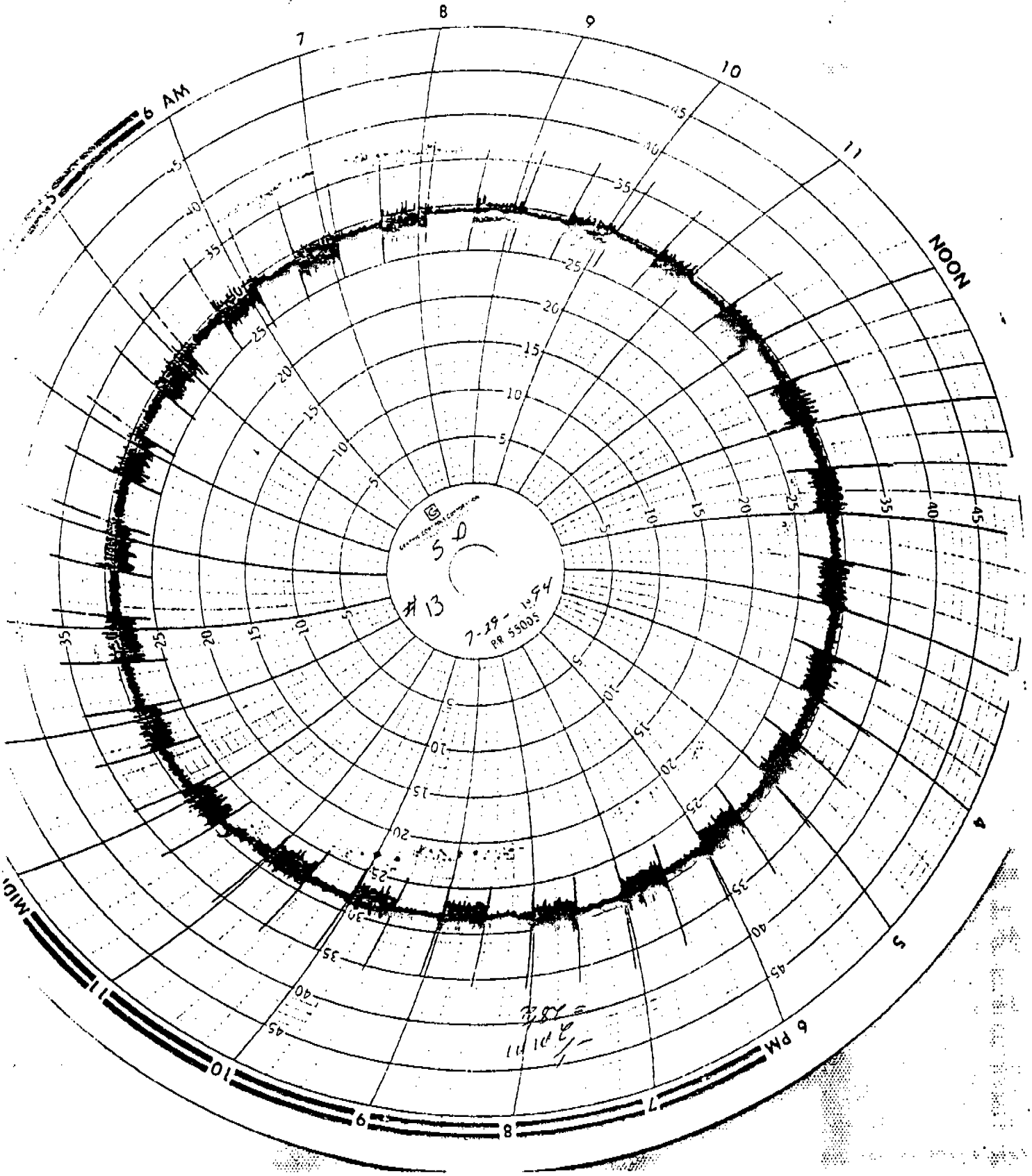
15
20
25
30
35
40
45


NOON
MIDNIGHT
PM
PAD
#13

KENT-TAYLOR
#3
7-29-84

6 AM
7
8
NOON
1
2
3
4
5
6 PM
7
#13
7-29-
BR SECTOR
94

6 PM
MIDNIGHT
6 AM
1
2
3
4
5
6
7
8
9
10
11
12
1
2
3
4
5
6
7
8
9
10
11
12
50
100
150
200
250
300
350


MIDN
11
10
9
8
7
6 PM
5
4
NOON
11
10
9
8
7
6 AM
5
#13
7-29-1964
PR 55005

# COMPLIANCE DEMONSTRATION
# NO. 13 BATTERY COMBUSTION STACK

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

## APPENDIX C

## GRAVIMETRIC AND ANALYTICAL RESULTS, EMISSIONS CALCULATIONS

ATS
ADVANCED TECHNOLOGY SYSTEMS, INC.

ATS
AIR QUALITY ENGINEERING

# ANALYTICAL REPORTING FORM

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

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

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

Analyst's Signature: Patrick J. Hutchison
Date: 8/9/94

Comments

AQE 10/92

STACK SAMPLING CALCULATIONS

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

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

| | | | | |
|---|---|---|---|---|
| A. | Barometric Pressure | 29.30 | in. Hg | |
| B. | Static Pressure | -1.0 | in. H2O | |
| C. | Stack Pressure | 29.23 | in. Hg | [A+(B/13.6)] |
| D. | Average ΔH | 1.21 | in. H2O | |
| E. | Meter Pressure | 29.39 | in. Hg | [A+(D/13.6)] |
| F. | Average ΔP | 0.04 | in. H2O | |
| G. | Pitot Coefficient | 0.84 | | |
| H. | Gas Meter Coefficient | 1.0172 | | |
| I. | Stack Diameter | 120 | in. | |
| J. | Stack Area | 78.54 | $ft^2$ | $(0.00545*I^2)$ |
| K. | Nozzle Diameter | 0.490 | in. | |
| L. | Nozzle Area | 1.31E-03 | $ft^2$ | $(0.00545*K^2)$ |
| M. | Average Stack Temperature | 496 | °F | |
| N. | Average Stack Temperature | 956 | °R | (460+M) |
| O. | Average Meter Temperature | 90 | °F | |
| P. | Average Meter Temperature | 550 | °R | (460+O) |
| Q. | Condensate Volume | 253.9 | mL | |
| R. | Absorbed H2O | 22.1 | mL | |
| S. | Total H2O | 276.0 | mL | (Q+R) |
| T. | Filter Weight | 0.0203 | g | |
| U. | Probe Weight | 0.0341 | g | |
| V. | Impinger Weight | 0.0013 | g | |
| W. | Total Weight | 0.0557 | g | (T+U+V) |
| X. | Metered Gas Volume | 73.885 | dcf | |
| Y. | Corrected Metered Gas Volume | 75.156 | dcf | (X*H) |
| Z. | H2O Gas Volume | 13.822 | cf | (0.00267*S*P/A) |
| AA. | Total Sample Volume | 88.978 | cf | (Y+Z) |
| BB. | Percent H2O | 15.5 | % | (100*Z/AA) |
| CC. | Gas Volume Sampled | 70.923 | dscf | [Y*(528/P)*(E/29.92)] |
| DD. | Grain Loading | 0.0121 | gr/dscf | (15.43*W/CC) |

EE. Average Molecular Weight:

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

Average Molecular Weight 27.61 lb./lb. mol

| | | | | |
|---|---|---|---|---|
| FF. | Average Stack Velocity | 15.6 | fps | {85.49*G*[(F*N)/(C*EE)]^0.5} |
| GG. | Averge Flow Rate | 73700 | acfm | (60*FF*J) |
| HH. | Standard Flow Rate | 39800 | scfm | [GG*(528/N)*(C/29.92)] |
| II. | Sample Time | 7200 | sec | |
| JJ. | Percent Isokinetic | 105.4 | % | {[100*CC*60*J]/[HH*L*II*(1-BB/100)]} |
| KK. | Mass Flow Rate | 3.49 | lb/hr | [DD*HH*(1-BB/100)*60/7000] |

STACK SAMPLING CALCULATIONS

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

TEST DATE: 07-28-94
TEST NUMBER: CLR-BS#13-2

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

EE. Average Molecular Weight:

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

Average Molecular Weight 27.49 lb./lb. mol

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

STACK SAMPLING CALCULATIONS

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

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

| | | | | |
|---|---|---|---|---|
| A. | Barometric Pressure | 29.40 | in. Hg | |
| B. | Static Pressure | -1.1 | in. H2O | |
| C. | Stack Pressure | 29.32 | in. Hg | [A+(B/13.6)] |
| D. | Average Δ H | 1.14 | in. H2O | |
| E. | Meter Pressure | 29.48 | in. Hg | [A+(D/13.6)] |
| F. | Average Δ P | 0.04 | in. H2O | |
| G. | Pitot Coefficient | 0.84 | | |
| H. | Gas Meter Coefficient | 1.0172 | | |
| I. | Stack Diameter | 120 | in. | |
| J. | Stack Area | 78.54 | $ft^2$ | $(0.00545*I^2)$ |
| K. | Nozzle Diameter | 0.490 | in. | |
| L. | Nozzle Area | 1.31E-03 | $ft^2$ | $(0.00545*K^2)$ |
| M. | Average Stack Temperature | 495 | °F | |
| N. | Average Stack Temperature | 955 | °R | (460+M) |
| O. | Average Meter Temperature | 93 | °F | |
| P. | Average Meter Temperature | 553 | °R | (460+O) |
| Q. | Condensate Volume | 263.7 | mL | |
| R. | Absorbed H2O | 18.2 | mL | |
| S. | Total H2O | 281.9 | mL | (Q+R) |
| T. | Filter Weight | 0.0150 | g | |
| U. | Probe Weight | 0.0415 | g | |
| V. | Impinger Weight | 0.0013 | g | |
| W. | Total Weight | 0.0578 | g | (T+U+V) |
| X. | Metered Gas Volume | 72.142 | dcf | |
| Y. | Corrected Metered Gas Volume | 73.383 | dcf | (X*H) |
| Z. | H2O Gas Volume | 14.157 | cf | (0.00267*S*P/A) |
| AA. | Total Sample Volume | 87.540 | cf | (Y+Z) |
| BB. | Percent H2O | 16.2 | % | (100*Z/AA) |
| CC. | Gas Volume Sampled | 69.046 | dscf | [Y*(528/P)*(E/29.92)] |
| DD. | Grain Loading | 0.0129 | gr/dscf | (15.43*W/CC) |

EE. Average Molecular Weight:

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

Average Molecular Weight 27.61 lb./lb. mol

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

# CHAIN OF CUSTODY RECORD

PLANT CODE: IKM0202

PROJECT NAME: CLR

SAMPLERS (Signature):

| STA. NO. | DATE | TIME | COMP. | GRAB | WELL | STATION LOCATION | NUMBER OF CONTAINERS | SO4 by Ion Chromatography | | | | | | | CONDUCTIVITY | pH | REMARKS OR OBSERVATIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7/28/94 | | ✓ | | | CLR-BS#13-1 | 1 | ✓ | | | | | | | | | Total Vol. 50ml |
| | 7/28/94 | | ✓ | | | CLR-BS#13-2 | 1 | ✓ | | | | | | | | | ↓ ↓ |
| | 7/28/94 | | ✓ | | | CLR-BS#13-3 | 1 | ✓ | | | | | | | | | |
| | 8/9/94 | | | ✓ | | CLR-BS#13-SO4-BLK. | 1 | ✓ | | | | | | | | | |

| Relinquished by: (Signature) | Date | Time | Received by: (Signature) | Relinquished by: (Signature) | Date | Time | Received by: (Signature) |
|---|---|---|---|---|---|---|---|
| Patricia A. Stockton | 8/9/94 | | | | | | |
| Relinquished by: (Signature) | Date | Time | Received by: (Signature) | Relinquished by: (Signature) | Date | Time | Received by: (Signature) |
| | | | | | | | |
| Relinquished by: (Signature) | Date | Time | Received for Laboratory by: (Signature) | Date | Time | Ice Chest Temp °C | Ice Chest # / Chain of Custody Tag # |
| | | | | | | | |

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

# RJ Lee *Group*, Inc.

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

RECEIVE

## LABORATORY REPORT

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

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

At

ATS

| Sample Identification | | Sulfate | Volume | Total mg |
|---|---|---|---|---|
| Client | RJ Lee Group | PPM | ml | |
| CLR BS#13-1 | 0134074 | 204 | 50 | 10.2 |
| CLR BS#13-2 | 0134075 | 190 | 50 | 9.50 |
| CLR-BS#13-3 | 0134076 | 426 | 50 | 21.3 |
| CLR BS#13-SO4-BLK | 0134077 | < 1.0 | 50 | < 0.050 |

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

Analyst PL
Date 8-12-94