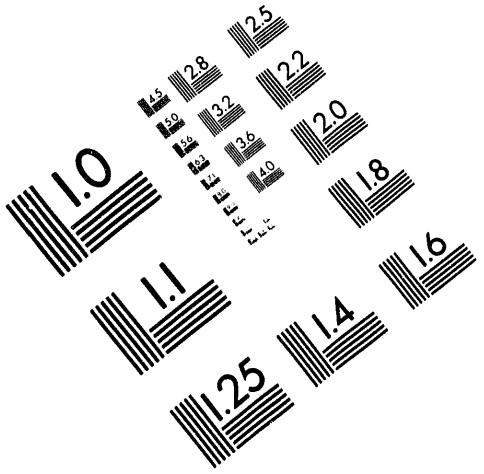
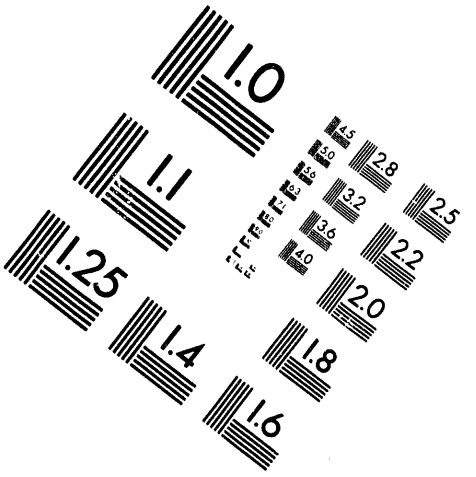


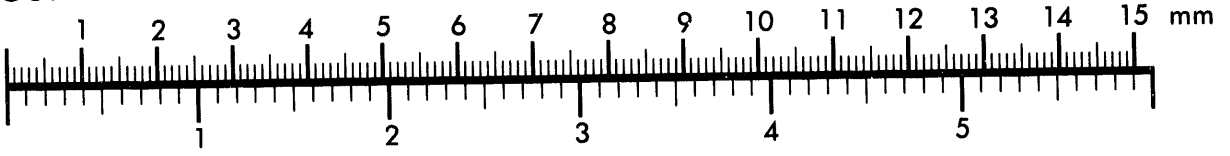
Association for Information and Image Management

1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910

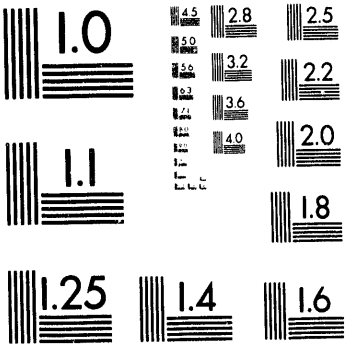
301/587-8202

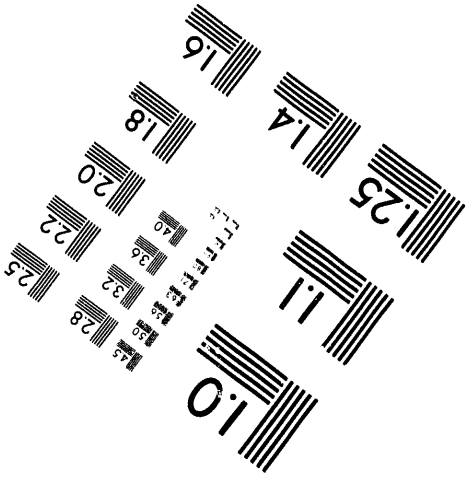


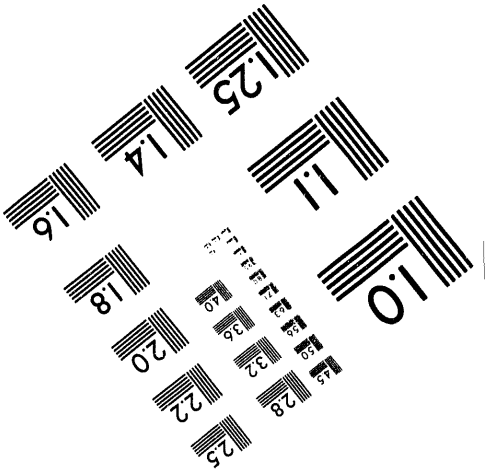
Centimeter



Inches







MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

1 of 9

DOE/PC/89659--T16-App.-Bk.1

APPENDIX NO. 1

Small Boiler Simulator Description

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

MASTER

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

Appendix A

SMALL BOILER SIMULATOR (SBS)

SMALL BOILER SIMULATOR (SBS)

Based on the industry need for a pilot-scale cyclone boiler simulator, Babcock & Wilcox (B&W) designed, fabricated, and installed such a facility at its Alliance Research Center (ARC) in 1985. The project involved conversion of an existing pulverized coal-fired facility to be cyclone-firing capable. Additionally, convective section tube banks were installed in the upper furnace in order to simulate a typical boiler convection pass. The small boiler simulator (SBS) is designed to simulate most fireside aspects of full-size utility boilers such as combustion and flue gas emissions characteristics, fireside deposition, etc.

Simulation Criteria

Prior to the design of the pilot-scale cyclone boiler simulator, the various cyclone boiler types were reviewed in order to identify the inherent cyclone boiler design characteristics which are applicable to the majority of these boilers. The cyclone boiler characteristics that were reviewed include NO_x emissions, furnace exit gas temperature (FEGT), carbon loss, and total furnace residence time. Previous pilot-scale cyclone-fired furnace experience identified the following concerns:

- Operability of a small cyclone furnace (e.g., continuous slag tapping capability).

- The optimum cyclone(s) configuration for the pilot-scale unit was debated. Commercial cyclone boiler systems can include front-wall fired, opposed-wall fired, and single or multiple cyclone elevations. In addition, there are different cyclone burner and cyclone furnace designs presently in operation.

- Compatibility of NO_x levels, carbon burnout, cyclone ash carryover to the convection pass, cyclone temperature, furnace residence time, and FEGT. Due to the various sizes/types/fuels burned, commercial cyclone units operate within a large range of combustion and pollutant conditions.

Originally, an opposed-wall fired, cyclone design was proposed, based on the large number of cyclone utility boilers falling into this design category. Using this as the design basis for the pilot-scale unit would involve having two 3-million Btu/hr cyclones. A review of past experience revealed that the smallest cyclone ever designed/operated was 10-million Btu/hr. Based on this and coupled with concerns about fabrication and slag tap operation (due to size), it was decided to proceed with designing a single 6-million Btu/hr cyclone to accommodate the SBS facility.

Pilot-Scale Furnace Design Criteria

The design of the pilot-scale cyclone-fired furnace offers many challenges to the designer. A design criteria is required in order to obtain experimental results that can be directly scaled-up to commercial cyclone boilers. Pertinent parameters were identified and incorporated in the pilot furnace design. These parameters are as follows:

- Cyclone exit conditions: coal burn-out, gaseous species concentrations, and flue gas temperatures.

- Flue gas time/temperature history within the furnace/convective surface regions.

Cyclone Exit Conditions. One concern of designing a 6-million Btu/hr size cyclone is that a high amount of combustion heat is transferred through the cyclone barrel water-cooled walls. Thus, the cyclone exit temperature and slag tapping capability of the cyclone could be affected. To ensure slag tapping capabilities, one approach is to overheat the combustion air to compensate for the extra heat loss. In addition, coal particle size can be reduced from the typical utility cyclone size coal (crushed) in order to intensify the combustion process. An additional concern is to simulate the cyclone collection efficiency, or percent of the fuel burned in the molten slag layer versus in-suspension. This is a function of cyclone design parameters such as cyclone barrel diameter, air velocities, and coal particle size. Therefore, the following design parameters had to be considered simultaneously to satisfy the above-stated potential operational problems:

- Cyclone design parameters

  - Combustion air velocities
  - Surface-to-volume ratio

- Average cyclone gas residence time

- Available cyclone heat per unit cooling area

- Combustion air temperature

- Coal particle size

The cyclone furnace was then designed by geometrically scaling down a single-wall-fired utility cyclone unit to 6-million Btu/hr. Air velocities to the cyclone were considered the major parameter and, thus, they were scaled one-to-one with the commercial cyclone unit. Average coal particle size was reduced to approximately duplicate the commercial unit's centrifugal force and, consequently, the cyclone collection efficiencies. The reduced particle size also increased the combustion intensity. Finally, to simulate the available heat per unit surface area, the design temperature of the combustion air for the 6-million Btu/hr cyclone was higher than for normal utility cyclone operation.

Flue Gas Time/Temperature History. The various cyclone boiler design types were reviewed in order to predict furnace gas residence times. Based upon

this review, a range of residence times was generated in order to bracket the general cyclone boiler population. Generally, the study showed that single-wall-fired cyclone units contain furnace residence times on the lower side of the general population range. Although this is true, the majority of single-wall fired units do have sufficient residence time available for the reburning technology. Thus, the SBS cyclone design criteria was to simulate the geometry of B&W's commercially operated, single-wall-fired cyclone boiler type. In addition, the SBS furnace was insulated in order to achieve a comparable flue gas time/temperature relationship to actual field operating experience.

Pilot-Scale Furnace Facility Description

B&W's 6-million Btu/hr small boiler simulator (Figure 1) was utilized to perform the pilot-scale cyclone reburning tests. The SBS is fired by a single, scaled-down version of B&W's cyclone furnace. Coarse pulverized coal (44% through 200 mesh), carried by primary air, enters tangentially into the burner. (Pulverized coal had to be utilized in the SBS instead of crushed coal in order to obtain complete combustion in this small cyclone.) Preheated combustion air at 700°F enters tangentially into the cyclone furnace. The larger coal particles are captured and burn in the molten slag layer formed within the cyclone furnace, while the finer particles burn in suspension. The mineral matter melts, exits the cyclone furnace from the tap at the cyclone throat, and is dropped into a water-filled slag tank. Only 15 - 20% of the ash leaves the cyclone with the flue gases and enters the main furnace.

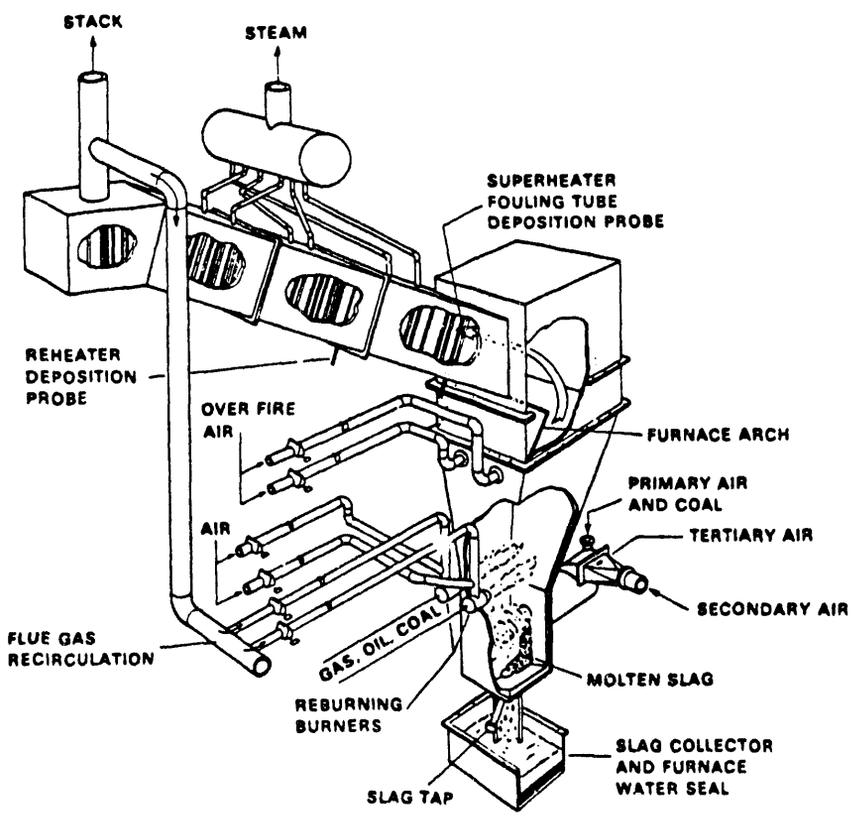


Figure 1 Small Boiler Simulator (SBS) Facility

The furnace is water-cooled and simulates the geometry of B&W's single-cyclone, front-wall fired cyclone boilers. It consists of four separate water-cooled sections. The SBS facility has been operating for a total of 8 years, with the last 6 years being operated in the cyclone configuration. This cyclone facility has been proven to simulate typical full-scale cyclone units via furnace/convective pass gas temperature profiles and residence times, NO_x levels, cyclone slagging potential, ash retention within the resulting slag, unburned carbon, and fly ash particle size. A summary of these comparisons is shown in Table 1.

Table 1

COMPARISON OF BASELINE CONDITIONS FOR SBS FACILITY AND COMMERCIAL UNITS

	SBS	Typical Cyclone-Fired Boilers
Cyclone Temperature	>3000°F	>3000°F
Residence Time	1.4 sec at full load	0.7 - 2 sec
Furnace Exit Gas Temperature	2265°F	2200° - 2350°F
NO_x Level	900 - 1200 ppm	600 - 1400 ppm
Ash Retention	80 - 85%	60 - 90%
Unburned Carbon	<1% in ash	1 - 20%
Ash Particle Size (MMD; Bahco)	6 - 8 microns	6 - 11 microns

The inside surface of the furnace is insulated to yield an FEGT of 2265°F at the design heat input rate of 6-million Btu/hr. A water-cooled tube bank simulates the flue gas time/temperature history inherent in full-scale cyclone convective passes. The tube bank consists of four separate sections for simulating a secondary superheater, reheater, primary superheater, and economizer. Each section consists of a water-cooled jacket and tubes to quench the flue gases. All four sections are connected to a common atmospheric drum. This use of convective tubes to cool the gas, in conjunction with the cyclone furnace, makes this a unique facility among pilot-scale combustors.

Two reburning burners were installed on the SBS furnace rear wall, above the cyclone burner/barrel. The facility is capable of firing natural gas, oil, or coal at the reburning burner region. The multi-fuel reburning burners were designed to accommodate the required velocities for furnace penetration and also to allow for enough flexibility for varying mixing characteristics. Each burner consists of essentially two zones: an outer zone housing a set of spin vanes and an inner zone contains the reburn fuel injector. Air and flue gas recirculation (FGR) flow can be introduced through the outer zone. Figure 2 is a photograph of the actual reburn burners location and associated air/gas recirculation/fuel piping.

OFA ports are available on both the front and rear walls of the SBS at three elevations, with each elevation containing two ports. Locating the OFA ports at different elevations assists in assessing the effects of residence time on fuel burnout and NO_x reduction. Rear OFA ports were used in this project to simulate a reburning system.

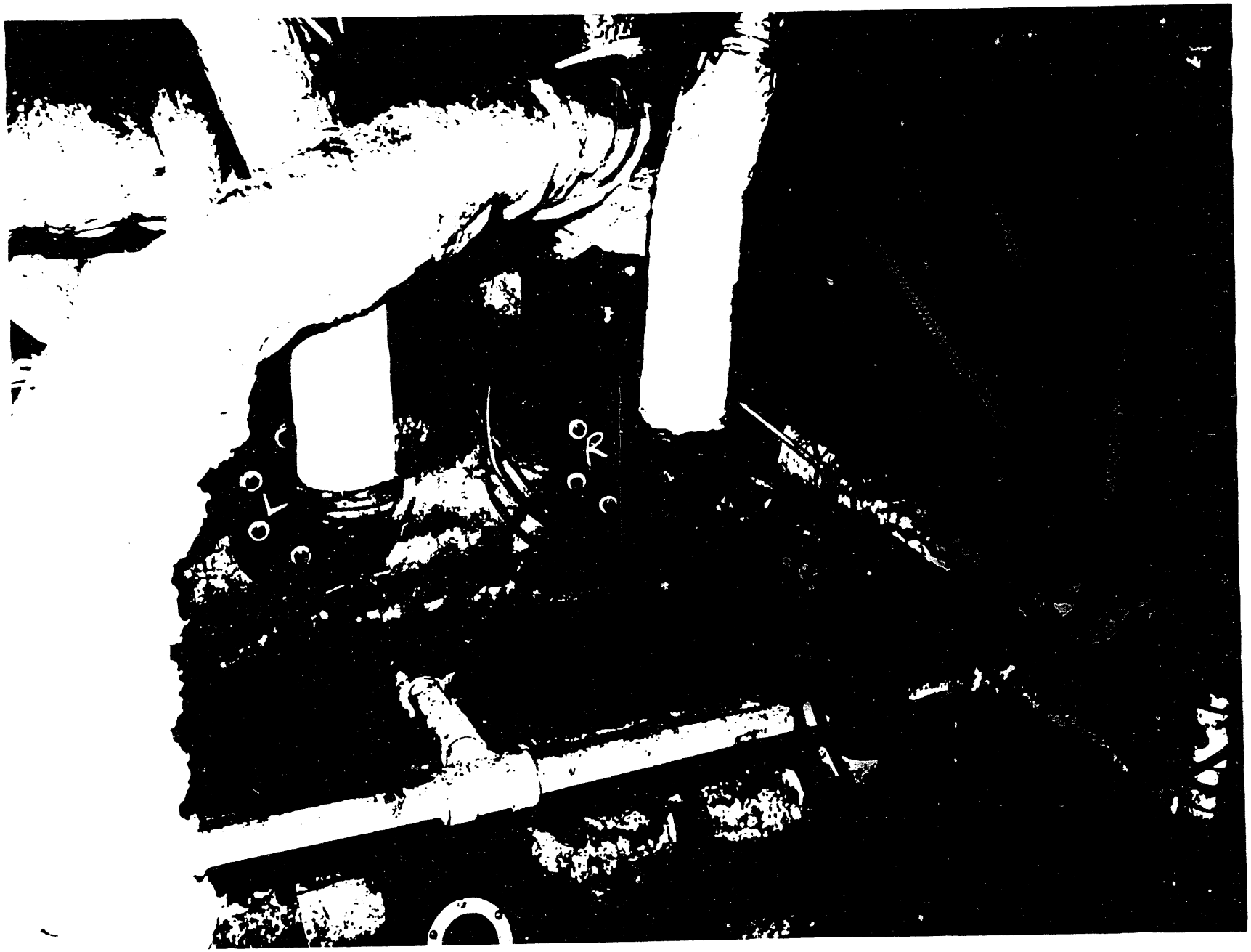


Figure 2 SBS Reburning Burners and Associated Piping Location

The SBS furnace and convective pass sections are equipped with numerous observation ports at different elevations to allow for complete evaluation of the process under investigation. Utilizing the viewports for in-furnace probing assists in determining temperatures and gas/solids composition.

Two air-cooled ash deposition probes are available in the convective section (simulating secondary superheater and reheater tubes) in order to allow for fouling (deposition) studies to be performed. These probes are equipped with thermocouples for measuring metal wall and inlet/outlet air temperatures. The probe metal temperature is maintained at a typical boiler tube temperature in order to assure meaningful ash deposition results. The effect of ash deposition on heat transfer is determined by energy balance calculations for each probe. In addition, a simulated commercial sootblower is available to determine the required sootblower pressure necessary to remove the deposits and restore maximum heat flux potential. In this project, only the superheater probe was used.

APPENDIX NO. 2

Statement of Work by Task and Subtask

1.0 Phase I: Design and Permitting

All activities which were part of design of the reburn system were included in Phase I. Research and development activities as well as engineering design were performed in Phase I.

1.1 Task 1 Project Management and Reporting

This task provided for overall project coordination, leadership, guidance, reporting, and supervision for Phase I of the Coal Reburning project. Additionally, this task included a single point contact within B&W for DOE on the Coal Reburning project for reporting and resolution of technical and cost issues. While B&W, EPRI, Wisconsin Power & Light, DOE, and the State of Illinois were all participating on the project, the responsibilities for the above issues rested with the B&W Project Manager. B&W was responsible for the overall management of the project and for coordination of the activities throughout all tasks with all project participants.

1.2 Task 2 Review of Reburning Technology and Pilot-Scale Cyclone Boiler

For the reburning technology, B&W reviewed recently available information in order to further evaluate the major process variables and their potential side effects. An evaluation of this data along with data from the pilot-scale tests further defined the feasibility of the application of reburning to cyclone boilers.

Pilot-scale tests were performed using B&W's six million Btu/hr capacity, cyclone-equipped Small Boiler Simulator. The objective of this subtask was to examine and predict the effectiveness of reburning for NO_x reduction and to assess the associated side effects (fireside corrosion, ash deposition on superheater tube bank, impact on ESP performance, FEGT, and unburned combustibles) while simulating WP&L's Nelson Dewey Unit No. 2 typical operating conditions. The results from these tests were compared with previous pilot-scale cyclone study results.

Pilot-scale baseline testing followed by reburning testing with selected coals was performed in the SBS. The specific objectives were as follows:

- Evaluate process performance with Lamar coal (demonstration host site coal) and a high sulfur Illinois coal
- Obtain data on NO_x reduction potential and predict process performance at full scale
- Study the effect of flue gas recirculation (FGR) added at the reburn burners on reburning technology

- Identify changes in unburned combustibles and particulate loading at the stack

- Assess the impact of the reburning technology on electrostatic precipitator (ESP) performance

- Evaluate the effect of the reburn technology on furnace exit gas temperature (FEGT)

- Identify changes in superheater tube bank heat flux

- Determine the effect of high sulfur/medium sulfur coal on fireside corrosion

The evaluation of this test work was primarily based on the comparison of this study with the previous cyclone reburning study (EPRI/GRI Pilot-Scale Testing Project described under previous work).

As part of the pilot study, the mathematical model for predicting flow and mixing for the SBS equipped with reburn was validated by comparing its results with actual test data. The model was then available for application to the full scale demonstration design.

1.3 Task 3 Physical Numerical Flow Modeling

Using information derived from Pilot Scale testing, B&W developed the preliminary design of a reburning system for the host site boiler at WP&L's Nelson Dewey Station. This design included equipment locations, fuel/air flow rates, and operating stoichiometries, and was used as initial configurations for the physical flow and numerical flow models.

Physical Flow Modeling

Physical flow model studies were performed at the Alliance Research Center (ARC) to characterize the expected mixing between the combustion gas and the injected reburn fuel/OFA for the retrofit of Nelson Dewey No. 2 with reburning burners and dual-air zone OFA ports. The objectives of this subtask were to:

- Evaluate the mixing between combustion flue gas and the injected reburn fuel and air and, also, the mixing of the reburn zone gases with the overfire air

- Determine the best locations and spin directions for the reburning burners and overfire air ports

This work was carried out in a 1/12 scale, three-dimensional model of the WP&L Nelson Dewey Station Unit No. 2 furnace. The model was constructed of transparent plexiglass and was designed and fabricated to allow for flexible variation in reburning burners and overfire air port arrangements.

Baseline flow tests were made to determine the existing flow patterns in the furnace and to establish a basis for reburning burner and OFA port placement. Baseline furnace gas velocity measurements were taken at Nelson Dewey Unit No. 2 for comparison. After verifying that the model and field results agreed, model tests were made to separately characterize and optimize the mixing of the reburning burner gases and overfire air with the furnace combustion gases.

Reburn testing began with an initial arrangement of the reburning burners and continued by varying the arrangement as determined necessary to achieve adequate mixing. Results included furnace flow patterns and temperature profiles. Temperature measurement traverses were performed at the 681 ft. elevation in the model furnace to determine degree of mixing of the combustion gases with air/coal from the reburning burners. Wool tuft probes were also used to evaluate jet penetration and mixing. The following variables were investigated: burner spin direction, spin angle, number of burners, and burner-to-burner spacing. The OFA ports were subsequently installed and mixing with the reburn zone flow was investigated. Temperature measurements were made at the 700 ft. elevation to investigate degree of mixing by determining homogeneity of gas temperature as was done for burners alone. The test results were then examined to determine the final reburning burner and overfire air port arrangements for use at WP&L, Unit 2.

Numerical Flow Modeling

The objective of this work was to benchmark three-dimensional FORCE™ cyclone furnace predictions for the full-scale unit by comparing them to data obtained from the hot and cold velocity traversing at Nelson Dewey Unit No. 2 and also the physical flow model tests described above.

Qualitative agreement between numerical predictions and cold flow modeling predictions was obtained. It was this model which served as the main tool in analyzing/ optimizing numerous reburning system arrangements quickly and cost effectively. Simulation of different reburn arrangements was carried out using the mathematical model in the analysis to determine the required number of burners and OFA ports, as well as location. The result was a recommendation to use four

reburn burners and four OFA ports in the reburn system for Nelson Dewey.

1.4 Task 4 Baseline Characterization Tests

Data required to characterize the boiler's pre-retrofit operating conditions were obtained through a series of baseline tests. The objective of these tests was to characterize the boiler operating parameters, efficiency, and emissions characteristics under a variety of load and power demand conditions.

Baseline testing was conducted from the last week of April through the first week of June 1990, prior to installation of the reburning system. These tests provided the benchmark data to which the subsequent reburning results could be compared. The host utility coal at that time, which was a bituminous, medium sulfur coal from Lamar, Indiana, was used for the majority of the baseline tests. The tests while firing the Lamar coal were performed at three load conditions, 100, 75 and 50%, and at different excess air/flue gas recirculation levels. The objectives of baseline characterization testing were to identify normal or typical conditions for boiler operations, emissions characteristics, ESP performance, and changes in these parameters when excess air and flue gas recirculation rates were varied.

Data on boiler operating conditions and emissions as a function of boiler load and excess air levels were regularly collected by the data acquisition system. This information included:

- Superheater steam temperature and pressure
- Steam drum temperature and pressure
- Feedwater temperature and pressure
- Recirculation or tempering gas flow (if any)
- Gas and air temperatures entering and leaving the air heater
- Economizer outlet gas temperatures
- Gas and air differential pressure across the airheater
- Feedwater flow
- Steam flow
- Secondary air temperature
- Generator output
- FD fan amperage and voltage
- Operating conditions and continuous gas samples for O_2, CO_2, CO, NO_x, and Opacity were taken for all tests

Also, physical measurement of the FEGT at each of the various test conditions was conducted, as well as in-furnace probing for O_2, CO, NO_x, H_2S, and temperatures at optimum conditions. Sample extraction from the furnace was performed using High Velocity Thermocouple (HVT) probes. Gaseous emission data (NO_x, O_2, CO, CO_2, SO_2) were

collected by the Acurex test crew at the precipitator outlet using the EPA certified continuous Emissions Monitoring System. B&W's economizer gas outlet grid was also available to cross check Acurex's gaseous emissions data (NO_x, O_2, CO, CO_2).

The in-furnace probing was performed at four different furnace elevations: 1) cyclone exit, 2) reburn burner elevation, 3) reburn zone area, and 4) furnace exit. During cold flow conditions (FD fans only), an anemometer grid system was used to measure velocity profiles. During hot conditions (coal/oil firing), water-cooled probes were used to measure temperatures, gaseous species, or gas velocity profiles.

Acurex was responsible for collecting additional data via EPA methods at the precipitator inlet and outlet which allowed precipitator performance analysis to be carried out. These data characterized particulate loading, particulate sizing, trace metal concentrations, volatile/non-volatile organics, unburned carbon and electrical resistivity of the ash at the precipitator inlet and outlet.

Qualitative agreement between the numerical modeling predictions of furnace flow patterns and full-scale measured velocity distribution was obtained, further validating the modeling tools.

1.5 Task 5 Design of Reburning System and Development of Test Plan

The mixing characteristics and residence time data obtained from the physical flow model tests and the mathematical model activity provided information input to the system design. Using this information, B&W with the help of Sargent & Lundy for balance of plant requirements, performed a detailed engineering design for the reburning system retrofit that met all required design and construction codes. This included:

(1) Engineering calculations for the final determination of the proper size, capacity, performance requirements, and mounting location of all items of equipment; the dimensions and configuration of all building enclosures, foundations, structural work, piping, ductwork, insulation, and electrical work; and the requirements for instrumentation and controls.

(2) Preparation of detailed drawings showing dimensions and configuration and noting all special construction features of mechanical equipment.

(3) Specifications covering all materials and equipment to be used and all construction work to be performed

in providing the completed plant. These included building enclosures, foundations, steelwork, ductwork, piping, electrical work, and instrumentation.

(4) Preparation of description outlining procedure(s) required to operate the plant to meet the performance requirements of the process design.

Burner/Overfire Air (OFA) Port Design

B&W "S-Type" burner and dual air zone OFA port designs were used in the reburning system. Once the number of burners/OFA ports required was determined, detailing of the actual components was carried out. This included burner/OFA port throat sizes, coal nozzle size, coal impeller/swirler design, secondary air inlet design, burner supports, burner lighter, burner/lighter flame safety system considerations, and seal air requirements.

Pulverizer System Design

A B&W MPS 67 pulverizer was required to provide pulverized coal to the reburning burners. The pulverizer design/operation allows sufficient flexibility to accommodate variation of the resulting coal fineness. This parameter was considered to be critical during optimization of the coal reburn system with respect to NO_x versus unburned carbon.

Based upon the reburn burner requirements, the pulverizer size and operating characteristics were determined in order to accommodate coal/primary air flow rates, flexible coal fineness capability and turn down requirements.

The technical documentation and specifications for the pulverizer auxiliary equipment and the coal handling/storage requirements were developed. Auxiliary equipment included such items as the pyrite removal system, pulverizer tire maintenance/replacement system, seal air and lubricating systems, inerting system, primary air fan, gearbox, motors, etc. Coal handling/storage requirements included designing a system to modify the existing coal conveyor to accommodate feeding coal to a new coal silo and to install a 150 ton coal silo, piping/low coal alarm system between the silo and feeder, and a new gravimetric feeder.

Flue/Duct/Coal Piping Design

General arrangement drawings identifying the layout of the cyclone coal reburning system at Nelson Dewey No. 2 were prepared. The drawings showed the overall reburn system from the new coal handling system to the new boiler penetrations for the burners/OFA ports. This included flue/duct/coal piping locations.

These systems were sized to accommodate the worst case anticipated flow rates in each of the gas recirculation/air/fuel streams. Once these drawings were complete, system pressures were calculated along with identification of the number and location of dampers/monitoring equipment needed to control and measure flows. The flue system included transporting FGR from the existing FGR fan to the reburning burners secondary air zone. The duct work included the reburning burners secondary air system, OFA port system, primary/tempering air for the pulverizer system and miscellaneous seal air systems. The coal piping involved the piping from the pulverizer to each of the reburn burners.

Controls/Electrical Design

Because the reburning technology is dependent upon accurately controlling the air/fuel ratio at various boiler elevations, one of the major design subtasks was the design of the control system. The state-of-the-art Bailey Network 90® Microprocessor System was proposed to control the reburn system. In addition, because the reburn system included various new equipment (e.g. pulverizer, primary air fan, seal air blower, damper drives) which required power, the electrical system at Nelson Dewey needed to be upgraded with the engineering help of Sargent & Lundy.

Finalized control/electrical packages allowing engineering design for all the equipment and subsystems were developed. The packages included the following:

(a) Final B&W/Sargent & Lundy/Bailey Control drawings of the control/electrical system upgrades
(b) Materials/equipment specifications
(c) Control operating philosophy manuals

Pulverizer Enclosure/Structural Steel

The objective of this activity was to prepare the drawings/specifications required for the new pulverizer system enclosure and any structural steel modifications. Sargent & Lundy designed the enclosure structural steel and conveyor system modifications for inclusion in a general mechanical/structural bid specification.

Test Plan Development

B&W prepared a detailed test plan structured to enable demonstration of the operating capabilities of a retrofitted reburning system at normal boiler operating conditions. Based on results from pilot scale tests and numerical modeling, the test plan encompassed the parameters required to demonstrate the effect of reburning with the minimum impact on boiler operations. The test plan provided for parametric tests to define the optimum

reburning parameters for the specific applications and for long-term performance tests needed to demonstrate the reliability of the reburning system.

A quality assurance/quality control (QA/QC) plan was also developed to accompany the test plan. Acurex, using its in-house QA/QC personnel, prepared a plan for the emissions portion of field testing.

1.6 Task 6 Environmental Assessment and Permitting

The work to be performed under this task was related to permitting activities, the majority of which entailed environmental considerations.

An environmental monitoring plan was developed to describe B&W's monitoring tasks and the rationale for the scope of any type of monitoring proposed. It defined the scope of monitoring to be performed during each phase of the project, as appropriate, including a list of substances to be monitored, the general locations where measurements and monitoring would take place, and the general types of sampling techniques, including frequency and duration, of such sampling.

Permits

Permits and operating licenses as required were obtained by the host site utility, Wisconsin Power & Light, to facilitate installation of the cyclone coal reburning technology and to conduct the NO_x control testing.

While no special permits were identified as being necessary for this project, the objective of this subtask involved the preparation and development of information to support applications and procedures for securing all National, State, and Local environmental permits and licenses required for construction and operation of the reburning demonstration. These procedures included meetings with the permitting agencies.

2.0 Phase II - Procurement, Fabrication, Installation and Start-Up

In an effort to prevent schedule delays due to long-lead-time item procurement, Phase II was divided into Phase IIA and IIB. Phase IIA allowed such items to be ordered under budget period 1 to avoid construction delays.

2.1 Phase IIA - Long Lead-Time Item Procurement

2.1.1 Task 1 Management & Reporting

The management activities including resolution of technical and cost issues, reporting and coordination of activities in Phase IIA were performed under this task.

2.1.2 Task 2 Procurement of Long-Lead-Time Items

The objective of this task was to initialize procurement activities for equipment requiring an extraordinary lead time, relative to the construction schedule. This was carried out to assure equipment deliveries within the schedule requirements of construction.

Long-lead-time items included:

(1) OFA port boiler tube panels for modification of the furnace walls during installation activities

(2) Modified reburn burner boiler tube panel revisions

(3) MPS-67 pulverizer fabrication as well as purchase of:

- Primary air fan
- Drive motor
- Gear drive

(4) Network 90° control system upgrade components and associated equipment

(5) Foundation construction

Foundation construction is dependent on ground conditions. The project schedule originally called for foundation construction in March 1991. However, WP&L advised that ground conditions at the plant are unsuitable at that time for excavation and subsequent concrete work due to ground water levels during the spring thaw. Pushing the foundation work to later in the year jeopardized the schedule for heavy construction because of concrete curing requirements. Therefore, the decision was made to complete the bulk of the concrete work in November/December 1990 when ground conditions were more suitable, as part of long- lead-time procurement activities.

Substructure installation entailed pulverizer and enclosure oundation installation. A large mass of concrete is required by the pulverizer to dampen vibration.

2.2 Phase IIB - Procurement, Construction, and Start-Up

This phase entailed the remaining procurement activities as well as installation and start-up.

2.2.1 Task 1 Project Management and Reporting

All management and reporting activities as well as cost monitoring that apply to all tasks collectively in Phase IIB were performed under this task.

2.2.2 Task 2 Procurement and Fabrication of the Reburning System

A number of long-lead-time items already were ordered as a result of Phase IIA Long-Lead-Time Item Procurement Activities. The items are:

1. MPS Pulverizer gear drive
2. MPS Pulverizer drive motor
3. MPS-67 Pulverizer
4. MPS inching drive
5. Primary air fan
6. Primary air fan motor
7. Gravimetric feeder and associated components
8. 480 volt motor control center
9. 4160/480 volt step down transformer
10. Data acquisition system
11. Bailey Network 90® control system upgrade
12. Substructure installation

Remaining items for procurement and fabrication to be carried out in Phase IIB were:

1. Coal reburning burners
2. OFA ports and NO_x registers
3. Coal piping and valving
4. Ductwork and piping
5. Air flow monitors
6. Dampers and damper drives
7. Pulverizer and primary air fan seal air system
8. Pulverizer lube oil system
9. Pulverizer rotating classifier hydraulic drive and hydraulic tire pressure loading system
10. Burner lighter control system
11. Various instrumentation requirements (thermocouples, etc.)
12. Asbestos removal

These items as well as miscellaneous small items were procured and fabricated as needed to maintain overall project schedule.

2.2.3 Task 3 Installation and Start-up

Installation was categorized into a total of three separate construction activities beyond Phase IIA substructure work. These were for:

(1) Asbestos removal - Nelson Dewey Unit No. 2 is insulated extensively with asbestos. Consequently, any retrofit activity entails removal of asbestos prior to mechanical work performance. A separate contractor was chosen to perform this work prior to arrival of a general contractor on site. Scope of asbestos removal covered most of the rear wall of the boiler and areas where penetrations into existing ductwork and the air heater were to be made.

(2) General mechanical/structural work - This work included mechanical installation of the reburn system. The scope for the general contractor was installation of the following major items:

   (a) Coal handling modifications and coal silo for the reburn system
   (b) An MPS-67 Pulverizer with auxiliary equipment
   (c) Primary, secondary and OFA as well as gas recirculation ductwork
   (d) Four reburn burners and a lighter control package
   (e) Four dual air zone OFA ports
   (f) Four 12 inch coal pipes with shut off valves
   (g) Tube wall panels for the reburn burners and OFA port penetrations into the boiler
   (h) Pulverizer enclosure building

(3) Electrical specification - This work consisted of installation of electrical wiring and connecting instrumentation and control systems within the reburn system and between the reburn system and the existing plant. Connection of the Network 90® Control System upgrade occurred as part of this activity.

General mechanical installation was carried out in two phases: 1) Spring outage work, taking advantage of an early boiler outage and 2) actual reburn installation.

Spring Outage Work

Spring outage activities took place over a two week scheduled outage for normal boiler maintenance in March 1991. This outage was offered to the project as additional time to do preliminary construction work, freeing up time in the fall outage for reburn system installation. These activities included the following,

all of which could not be performed while the boiler was in operation:

1. High pressure service water tie-in
2. Station air tie-in
3. Instrument air tie-in
4. Slag tank penetration for the pyrite sluicing system
5. Relocation of piping and valves in the path of the reburn ductwork
6. Existing ductwork modifications for reburn system requirements
7. 4160 volt breaker installation
8. Panel board modifications for reburn instrument installation
9. Asbestos insulation removal

The major item in this list was asbestos removal. By carrying out removal in March 1991 and temporarily replacing the insulation with fiberglass block (without final mastic application), a major bottleneck in the fall outage was eliminated.

Reburn Installation

The bulk of the reburn system installation occurred in June through October 1991. Construction work from June through mid-September consisted of the following activities:

1. Mobilization and set up on the site
2. Erection of structural steel for the pulverizer enclosure
3. Fabrication of the coal silo
4. Removal of existing building siding where applicable/installation of new building siding
5. Erection of the primary air fan
6. Erection of the pulverizer and accessories
7. Installation of the coal piping and hangers up to the burner area
8. Installation of the coal silo
9. Installation of the gravimetric feeder
10. Installation of primary, secondary and OFA ducts to a point up-steam of where burners and OFA ports would be installed
11. Installation of miscellaneous piping
12. Installation of stairs, platforms and doorways
13. Installation of miscellaneous equipment electrical wire pull and terminations
14. Installation of building lighting
15. Installation of air monitors, dampers and damper drives
16. Insulation of ductwork and piping

These activities could be carried out with the boiler in operation. The boiler was scheduled to shut down on September 16, 1991. The remaining work requiring a boiler

outage was performed from that date through the end of October 1991, in a six week outage. This work consisted of:

1. Relocate the tripper conveyor head pulley and install belt extension via vulcanized joints
2. Cut and remove existing boiler tubes at burner and OFA port locations (eight total locations)
3. Install new boiler tubes at burner and OFA port locations (eight locations)
4. Install four burners with associated lighters and piping
5. Install four NO_x ports
6. Install boiler casing and refractory
7. Tie-in air and flue gas recirculation ductwork to burners
8. Tie-in coal piping to burners
9. Tie-in OFA ductwork to OFA ports
10. Complete insulation work
11. Complete electrical installation
12. Demobilize

Ultrasonic test (UT) data were collected during the outage to establish a UT baseline. Tube thicknesses were measured throughout selected locations within the furnace envelope to provide baseline information for assessing potential corrosion effects of reburning.

Equipment Start-Up/Shakedown

This task consisted primarily of inspection and general checkout of all equipment installed as part of the cyclone coal reburning system.

Prior to start-up and after installation of the cyclone coal reburning system equipment, a detailed inspection was conducted to ascertain that all equipment was installed per the design specifications, that all field tolerances were adhered to, that no interferences exist, and that all moving parts operate properly. Adjustable S-type burner, OFA port and pulverizer components were set at predetermined positions in preparation for start-up. Electrical components installed as part of the retrofit were checked at this time to insure operability. B&W field service personnel conducted the inspection of all equipment installed as part of the overall cyclone coal reburning system.

3.0 Phase III - Operation and Disposition

3.1 Task 1 Project Management and Reporting

All management and reporting activities and cost monitoring that apply to all tasks collectively in Phase III were carried out under this task.

3.2 Task 2 Parametric Optimization Tests of Reburn System

Coal reburning tests were performed to evaluate the effect of the key parameters on the NO_x reduction and potential side effects. The major parameters investigated were:

- Mixing optimization was explored by changing the dispersion/penetration of the reburning fuel via burner hardware adjustments and flue gas recirculation. The OFA ports were adjusted to optimize penetration and side-to-side mixing. The reburning burner hardware was first optimized followed by OFA adjustment under optimum burner conditions.

- Stoichiometry in the reburning zone was varied while maintaining cyclone furnace stoichiometry above 10% excess air to minimize potential cyclone corrosion problems.

- Performance testing at three loads under optimum operating conditions was carried out once these conditions were determined via parametric optimization testing.

The effects of reburning on particle mass loading and flyash particle size (entering and exiting the ESP), carbon utilization, *insitu* resistivity and H_2O were evaluated during testing in addition to continuous monitoring of outlet gases.

Initial parametric optimization testing was performed by B&W alone to determine range of operating parameters for the system. This sequence consisted of approximately 50 tests and was termed the "T" series. This series is discussed under Section 7.0, Coal Reburning Technical Impacts.

Once the system range of operation was determined, Acurex was brought on site to verify gaseous emission data. Specific parametric optimization tests were rerun with Acurex continuous emissions monitoring (CEM) capability engaged to verify results. Tests on particulate loading at the precipitator inlet and outlet were also preformed by Acurex. This group of optimization tests are termed the "A" series as discussed in Section 7.0.

Prior to long-term testing initiation, a series of performance tests at three loads and optimum conditions was carried out. These are termed the "P" series and are discussed in Section 7.0.

3.3 Task 3 Long-Term Performance Test

During the long-term performance tests, the boiler was operated under the authority of Wisconsin Power & Light dispatch control. Optimum reburning conditions determined during the parametric tests were programmed into the control system over the load range to reproduce desired conditions during long-term operation.

The duration of the long-term test was four months. This period of time, coupled with five months of parametric tests, provides a total test duration of nine months.

At the end of long-term performance operation another series of performance tests ("F" series) were carried out with both B&W and Acurex on site. This occurred at the end of September 1992. These test results, when compared with performance tests taken at the end of parametric optimization would provide an indication of long-term effects of reburn operating, if any exist. This information is also discussed in Section 7.0.

Hazardous Air Pollutant Testing (HAP)

As an addition to the scope of the project and in support of DOE's efforts to develop and promote commercialization of Clean Coal technologies, Hazardous Air Pollutant (HAP) testing was undertaken at the reburn demonstration site in early November 1992. Trace elements, acid gases and organic substances were tested in the coal feed, slag, ESP inlet, ESP outlet, and ESP bottom ash streams both with and without reburn in operation. Results of this testing are discussed in Section 7.3.3 HAP Testing Results.

Western Fuel Testing

Driven by SO_2 emission reduction requirements in Wisconsin, WP&L was required as of January 1, 1993 to comply with an SO_2 emission limit of 1.2 $lb/10^6$ Btu. Compliance philosophy was to fuel switch to Western coal. Interest in system performance on this second coal resulted in an addition to the scope of the original demonstration. Accordingly, parametric optimization testing as well as performance testing, a condensed version of the T, P, and F series tests, were undertaken from November 16 through December 11, 1992. The results are discussed in Section 7.0 Coal Reburning Technical Impacts.

3.4 Task 4 Performance, Economic and Application Studies

The results of the Small Boiler Simulator (Phase I) pilot-plant tests and field tests were analyzed. The NO_x emissions from the baseline condition were analyzed for the effects of: boiler load' overall excess air; chemical

characteristics of fuel such as volatile matter, sulfur, and fuel nitrogen content; boiler/cyclone geometries (heat release per unit of surface area/volume of the furnace); and combustion air temperature.

The reburning system parameters such as FGR, reburning burner load, reburning zone stoichiometry/residence time/temperature, and boiler geometry were analyzed to develop trends of NO_x emissions and reburning zone conditions.

The long-term performance data was evaluated to determine the effect of reburning on overall boiler performance, and continuous gaseous emissions were characterized.

Based on the results of the general application information developed throughout the program, B&W developed base case preliminary designs of reburning systems applied to a generic boiler design typified by the host site boiler used in this program. These cases were for a 110 MW and 605 MW_e unit. Capital and operating costs associated with each case study were developed and the EPRI *TAG*™ Technical Assessment Guide analysis was performed for each case.

The cost estimates were compared to determine the relative cost effectiveness of coal reburning application as a function of unit size. For each case study, a sensitivity analyses was performed to determine the relative impact of various performance, design, operating and economic variables on the costs of NO_x control.

3.5 Task 5 Final Report

The project final report was prepared under this task.

3.6 Task 6 Disposition

With the completion of testing at the Nelson Dewey plant, the reburning burners, pulverizer and associated equipment remain in place for commercial operation. Title to the material supplied and installed during the cyclone boiler coal reburning retrofit was transferred to Wisconsin Power & Light. Further operation and maintenance of the reburning burners will be the responsibility of the host site utility operating company.

APPENDIX NO. 3

Evaluation of Reburning for NO_x Control from Lignite-Fired Cyclone Boilers

EVALUATION OF REBURNING FOR NO_x CONTROL FROM LIGNITE-FIRED CYCLONE BOILERS

Final Report — August 1992 through April 1993

Babcock & Wilcox Report RDD:93:47313-005-001:01

May 1993

Prepared by

Hamid Farzan

Babcock & Wilcox — Research and Development Division
1562 Beeson Street
Alliance, Ohio 44601-2196

Submitted by

Babcock & Wilcox — Contract Research Division
1562 Beeson Street
Alliance, Ohio 44601-2196

Prepared for

Basin Electric Power Cooperative
1717 East Interstate Avenue
Bismarck, North Dakota 58501-0564

BEPC Contract No.: 217872
B&W Contract No.: CRD 3457

CUSTOMER FEEDBACK QUESTIONNAIRE

Please help us do a better job for you.

Report Title: Evaluation of Reburning for NO_x Control From Lignite-Fired Cyclone Boilers

Report No.: RDD:93:47313-005-001:01

Customer feedback on our work is important to us. We would like to have your comments concerning this report. Your cooperation in completing this form and returning it to the address shown will assist us in improving our service to you.

Do the contents of this report meet your needs? ☐ Yes Not Entirely, because _____

_____

_____

Did you receive this report when we promised it? ☐ Yes ☐ No

Comment: _____

_____

How could we have made this report more useful to you? _____

_____

_____

_____

Thank you.

Name: _____ Date: _____

Organization: _____

Please fold and return this form to address shown on the reverse side.

EXECUTIVE SUMMARY

INTRODUCTION

Standard low-NO_x combustion modification technologies are not applicable for cyclone-equipped boilers operation. The emerging reburning technology offers cyclone boiler owners a promising alternative to expensive flue gas cleanup techniques for NO_x emission reduction. Reburning involves the injection of a supplemental fuel (natural gas, oil, or coal) into the main furnace in order to produce locally reducing conditions which convert NO_x produced in the main combustion zone to molecular nitrogen, thereby reducing overall NO_x emissions.

After obtaining encouraging results from engineering feasibility and pilot-scale proof-of-concept (POC) studies[1][2], Babcock & Wilcox (B&W) is presently completing a U.S. Department of Energy (DOE) Clean Coal II project to demonstrate the cyclone coal reburning technology on a commercial utility boiler. The host site for the demonstration is the Wisconsin Power & Light's (WP&L's) 110-MW_e Nelson Dewey Station Unit No. 2.

There are presently over 100 operating, cyclone-equipped utility boilers representing approximately 14% of pre-New Source Performance Standards (NSPS) coal-fired generating capacity (over 26,000 MW_e). However, these units contribute approximately 21% of the NO_x emitted since their inherently turbulent, high-temperature combustion process is conducive to NO_x formation. Although the majority of cyclone units are 20 - 30 years of age, utilities plan to operate many of these units for at least an additional 10 - 20 years. These units (located primarily in the Midwest) have been targeted for the second phase of the federal acid rain legislation scheduled to go into effect in 1995. In some instances, Title I —Ozone Non-Attainment will accelerate the timetable for compliance. The cyclone boilers that use lignite located in the Dakotas represent 2000 MW_e generating capacity.

Despite many years of B&W research on coal reburning, no pilot- or full-scale lignite-fired reburning evaluation had been undertaken prior to this project. The main characteristics of North Dakota lignite — high moisture content, low Btu, and low fixed carbon/volatile matter (FC/VM) ratios — are unique and required pilot-scale evaluation prior to full-scale cyclone reburning application. Therefore, this pilot-scale testing was performed to evaluate the applicability of reburning technology to reduce NO_x emissions from cyclone-equipped utility boilers which use North Dakota lignite as a primary fuel. The performance goals for the lignite reburning program were:

- Greater than 50% reduction in NO_x, as referenced to the uncontrolled (baseline) conditions at full-load

- No significant impact on cyclone furnace operation, boiler efficiency, fireside corrosion, and deposition

Fly ash was isokinetically sampled from the stack of the SBS during baseline and reburning conditions and analyzed for unburned combustibles. Unburned carbon (UBC) of the fly ash was always below 1%. Also, CO emissions remained low (less than 40 ppm) throughout the various test conditions. Thus, based upon this data, no UBC or CO emission problems are anticipated during full-scale reburning application.

Furnace exit gas temperature (FEGT) was measured (nine points at three elevations) with a high-velocity thermocouple (HVT) water-cooled probe. FEGT was approximately 1800 - 1850F for the full-load baseline condition. With reburning in service, FEGT changed by less than ±50F during the pilot-scale North Dakota lignite tests. When FGR was added into the reburn burners, FEGT decreased from baseline by less than 50F. Since lignite-fired cyclone boilers are using gas tempering to quench the FEGT, the effect of reburning on FEGT should not adversely impact boiler performance.

Fireside deposition was studied during two 32-hour baseline and reburning tests using a superheater deposition probe. Each test contained four sootblowing cycles. Baseline fly ash concentrations at the stack showed that approximately 50% of the coal ash was leaving the boiler and this level did not change with reburning. Presumably, better cyclone slagging characteristics during reburning operation was the reason that no increase in fly ash levels were observed. The superheater probe deposit thickness was also similar in both tests. Heat flux dropped from approximately 14,500 to 10,000 Btu/hr/ft^2 during an approximate 8-hour period for both baseline and reburning conditions. The maximum heat flux was recoverable with soot blowing operation. In order to regain the maximum heat flux for either the baseline or reburning cases, the same sootblowing pressure was required. This was supported by the chemical analysis of the deposits on the superheater probe which were similar between baseline and reburning tests.

The in-furnace probing data with the North Dakota lignite show that only up to 160 ppm H_2S concentration was observed in the reburn zone and thus the majority of the sulfur component remained as SO_2. In addition, most of the higher H_2S levels were observed at the middle of the boiler and lower H_2S levels near the walls. If these results can be duplicated at the full-scale, increased fireside corrosion should not be a consequence of the reburning technology.

COMMERCIALIZATION AND ECONOMICS

A separate economic evaluation was not performed in this report. But due to the importance of economics, a summary of the DOE Clean Coal II Cyclone Reburning Project Economics is presented here. The reburning technology is considered to be commercially available through Babcock & Wilcox. B&W is presently completing a successful 110-MW_e demonstration at WP&L's Nelson Dewey Unit No. 2. Although it is desirable to perform larger demonstrations (e.g., 600 MW_e) prior to commercialization, B&W is confident that similar NO_x emission reductions can be achieved in larger boilers. The evaluation of potential side-effects of the technology are yet to be determined in larger boilers.

Table 1 shows the costs of the reburning technology for two boiler generating capacities. The costs presented in this table are site-specific and each reburning application will require a final review.

Currently, the Dakotas have approximately 2000 MW_e of cyclone boilers in operation using lignite. The majority of these units are not using any NO_x control technology because they are exempt from NO_x regulation until 1995. In 1995, these units may be forced to choose a NO_x control technology to comply with federal legislation (Phase II CAA). Since cyclones cannot use standard low-NO_x burner technology,

- The cyclone furnace must operate under an oxidizing environment to minimize possible corrosion in the cyclone.

- Mixing between reburn fuel/air and cyclone gases is a key factor on the performance of the reburn system. Mixing performance of the SBS and Nelson Dewey Unit No. 2 should be considered as a minimum criteria in design of full-scale retrofits.

- Utilize the SBS stoichiometries and average residence times in the design of the full-scale retrofit as a starting point. Physical and/or numerical modeling is recommended to assess/improve the mixing performance if required.

REFERENCES

1. G. J. Maringo, et al., "Feasibility of Reburning for Cyclone Boiler NO_x Control," 1987 EPA/EPRI Joint Symposium on Stationary Combustion NO_x Control, New Orleans, Louisiana, March 23-27, 1987.

2. H. Farzan, et al., "Pilot Evaluation of Reburning for Cyclone Boiler NO_x Control," in the Proceedings of EPRI/EPA Joint Symposium on Stationary NO_x Control," San Francisco, California, March 6-9, 1989.

CONTENTS

Section		Page
1	INTRODUCTION	1
	Objectives	1
	Cyclone and Reburning Process Description	2
	Project Methodology	4
2	EXPERIMENTAL FACILITY	5
	Small Boiler Simulator (SBS)	5
	Instrumentation	11
3	RESULTS	13
	Introduction	13
	Western Subbituminous Coal Evaluation	13
	North Dakota Lignite Evaluation	17
4	CONCLUSIONS	31
5	RECOMMENDATIONS	33
6	REFERENCES	35

Appendices

A SMALL BOILER SIMULATOR (SBS)

B LIGNITE-FIRED CYCLONE BOILER OPERATIONAL CONDITIONS

C PARTICLE SIZE DISTRIBUTION OF DECKER COAL AND NORTH DAKOTA LIGNITE

D PARAMETRIC LIGNITE REBURNING EVALUATION RESULTS

E IN-FURNACE PROBING DATA

ILLUSTRATIONS

Figure		Page
1-1	Cyclone furnace	2
1-2	Reburning technology	3
2-1	6-million Btu/hr small boiler simulator (SBS) facility	6
2-2	Gas sampling and analysis system	12
3-1	SBS baseline NO_x levels with Decker coal at 5-million Btu/hr	14
3-2	SBS baseline NO_x levels with Decker coal at different firing rates	14
3-3	SBS reburning NO_x levels with Decker coal at 5-million Btu/hr	16
3-4	SBS reburning NO_x levels with Decker coal at different firing rates	16
3-5	SBS NO_x levels with North Dakota lignite at 5-million Btu/hr	18
3-6	Effect of FGR on SBS NO_x levels with North Dakota lignite	18
3-7	SBS NO_x levels with North Dakota lignite at different loads	19
3-8	SBS NO_x reduction with North Dakota lignite at different loads	19
3-9	Heat flux of the superheater probe during the baseline test	24
3-10	Heat flux of the superheater probe during the reburning test	24
3-11	Center of the superheater deposition probe during the baseline and reburning tests	25
3-12	SBS NO_x levels with North Dakota lignite, western subbituminouis coal, and eastern bituminous coal	27
3-13	Comparison of the SBS and Nelson Dewey NO_x levels with the eastern bituminous coal	29
3-14	Comparison of the SBS and Nelson Dewey NO_x levels with the western subbituminous coal	29

TABLES

Table		Page
2-1	Comparison of baseline conditions for the SBS facility and commercial units	5
2-2	Decker coal proximate and ultimate analyses	7
2-3	Decker coal fly ash analysis	8
2-4	North Dakota lignite proximate and ultimate analyses	8
2-5	North Dakota lignite fly ash analysis	9
2-6	North Dakota lignite ash fusion temperatures	9
2-7	North Dakota lignite Hardgrove grindability index (HGI)	9
2-8	Variation of North Dakota fuel properties during test	10
2-9	SBS gas analyzers	12
3-1	H_2S concentrations in reburn zone	21
3-2	Chemical analysis of ash during the baseline test	26
3-3	Chemical analysis of ash during the reburning test	26

Section 1

INTRODUCTION

There are presently 105 operating, cyclone-equipped utility boilers representing approximately 14% of pre-New Source Performance Standards (NSPS) coal-fired generating capacity (over 26,000 MW_e). However, these units contribute approximately 21% of the NO_x emitted, since their inherently turbulent, high-temperature combustion process is conducive to NO_x formation. Although the majority of cyclone units are 20 - 30 years of age, utilities plan to operate many of these units for at least an additional 10 - 20 years. Although cyclone boilers are exempt from Phase I NO_x emission control requirement under Title IV of the federal Clean Air Act Amendment (CAAA) of 1990, future federal and state regulations could target these boilers for NO_x emission control.

Cyclone-equipped boilers have a unique configuration which prevents application of standard low-NO_x burner technology; that is, the combustion occurs within a water-cooled horizontal cylinder attached to the outside of the furnace. Furthermore, other conventional NO_x reduction techniques, such as two-stage combustion, cannot be applied to the full extent due to associated cyclone operational concerns (cyclone corrosion and slagging). The use of selected catalytic reduction or selected non-catalytic reduction (SCR/SNCR) technologies offers promise of controlling NO_x from these units, but at high capital and/or operating costs. Reburning is, therefore, a promising alternative NO_x reduction approach for cyclone-equipped units at more reasonable capital and operating costs.

Reburning technology involves injection of a second fuel into the main furnace (above the cyclone region) to produce a secondary combustion zone where a reducing atmosphere exists. These local chemical reducing conditions convert NO_x to molecular nitrogen, thus destroying a portion of the NO_x produced in the primary cyclone combustion zone. Since reburning can be applied to the cyclone while it is operating under normal oxidizing conditions, this technology merits development for ultimate commercialization.

Babcock and Wilcox (B&W) has been evaluating the reburning technology for NO_x control from cyclone boilers[1,2,3]. Prior to this pilot-scale study, the entire data base consisted of medium- and high-sulfur eastern bituminous coals in a pilot-scale cyclone. In addition, the U.S. Department of Energy (DOE) under its Clean Coal II solicitation is currently sponsoring B&W to perform a 100-MW_e demonstration of coal reburning using a medium-sulfur bituminous coal and a low-sulfur subbituminous western coal. The characteristics of North Dakota lignite — high moisture content, low Btu, and low fixed carbon/volatile matter (FC/VM) ratios — are unique and required pilot-scale evaluation prior to full-scale reburning retrofit to cyclone boilers.

OBJECTIVES

The purpose of this pilot-scale study was to evaluate cyclone reburning technology using lignite and to

from a tap at the cyclone throat, and is dropped into a water-filled slag tank. The flue gases and remaining ash leave the cyclone and enter the main furnace. No commercially-demonstrated combustion modifications have significantly reduced NO_x emissions without adversely effecting cyclone operation. Past tests with combustion air staging achieved 15 - 30% reductions. Cyclone tube corrosion concerns due to the resulting reducing conditions were not fully addressed because of the short duration of these tests. Further investigation of staging for cyclone NO_x control was halted due to utility corrosion concern. Additionally, since no mandatory federal/state NO_x emission regulation was enforced, no alternative technologies were pursued.

The recent emergence of the reburning technology offers a promising alternative to conventional combustion controls and SCR systems. The reburning process employs multiple combustion zones in the furnace, as shown in Figure 1-2. The main combustion zone is operated at a reduced stoichiometry and has the majority of the fuel input (70 - 85% heat input). The majority of investigations on natural gas-/oil-/coal-fired units have shown that the main combustion zone of the furnace should be operated at a stoichiometry of less than 1.0. This operating criterion is impractical for cyclone units due to the potential for highly corrosive conditions, since most cyclones burn high-sulfur, high-iron content bituminous coals. To avoid this situation and its potentially catastrophic consequences, the cyclone main combustion zone was determined to be operated at a stoichiometry of no less than 1.1 (2% excess O_2 at the stack).

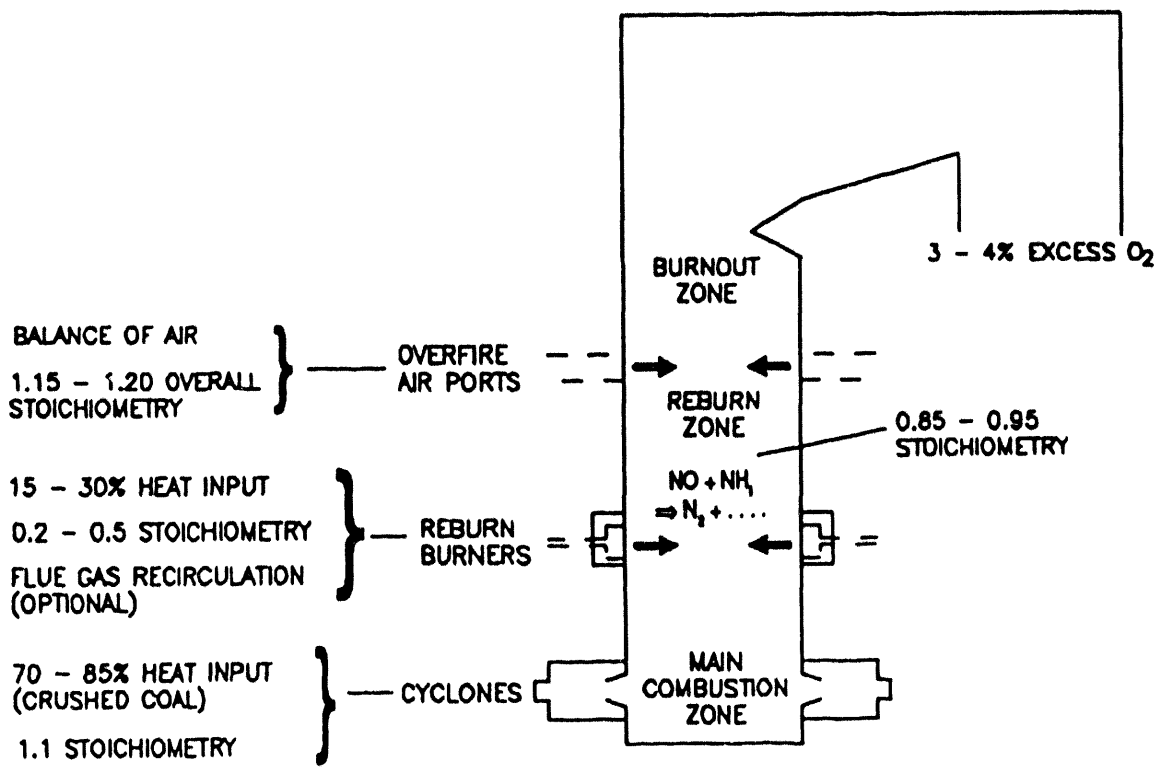


Figure 1-2 Reburning technology

Section 2

EXPERIMENTAL FACILITY

SMALL BOILER SIMULATOR (SBS)

Babcock & Wilcox's 6-million Btu/hr small boiler simulator (SBS) was utilized to perform the pilot-scale study (Figure 2-1). This facility is described in detail in Appendix A. A short description of the facility pertinent to this project is presented here.

The SBS is fired by a single, scaled-down version of B&W's cyclone furnace. Coarse pulverized coal (44% through 200 mesh), carried by primary air, enters tangentially into the burner. Pulverized coal has to be utilized in the SBS instead of crushed coal to obtain complete combustion in this small cyclone. Preheated combustion air at 600 to 800F enters tangentially into the cyclone furnace.

The water-cooled furnace simulates the geometry of B&W's single-cyclone, front-wall fired cyclone boilers. The inside surface of the furnace is insulated to yield a furnace exit gas temperature (FEGT) of 2250F at the design heat input rate of 6-million Btu/hr. This facility simulates furnace/convective pass gas temperature profiles and residence times, NO_x levels, cyclone slagging potential, ash retention within the resulting slag, unburned carbon, and fly ash particle size of typical full-scale cyclone units. A comparison of baseline conditions of these units with the full-scale cyclone boilers is shown in Table 2-1.

Two reburn burners were installed on the SBS furnace rear wall above the cyclone furnace. Each burner consists of two zones with the outer zone housing a set of spin vanes while the inner zone contains the reburn fuel injector. Air and flue gas recirculation (FGR) can be introduced through the outer zone. Overfire air (OFA) ports are located on both the front and rear walls of the SBS at three elevations with each elevation containing two ports.

Table 2-1

COMPARISON OF BASELINE CONDITIONS FOR THE SBS FACILITY AND COMMERCIAL UNITS

	SBS	Typical Cyclone-Boilers
Cyclone Temperature	>3000F	3000F
Residence Time	1.4 seconds at full load	0.7 - 2 seconds
Furnace Exit Gas Temperature	2265F	2200 - 2350F
NO_x Level	900 - 1200 ppm	600 - 1400 ppm
Ash Retention	60 - 80%	60 - 80%
Unburned Carbon	<1% in ash	1 - 20%
Ash Particle Size (MMD; Bahco)	6 - 8 microns	6 - 11 microns

Fuel Analysis

Two coals were tested. They were Decker — a western subbituminous coal that is being fired at the Nelson Dewey Station — and a representative lignite from North Dakota. The same coals were ground (Appendix C shows the size distributions) and utilized as the reburn fuels during the coal reburning tests.

The Decker coal proximate and ultimate analyses are shown in Table 2-2. The coal ash analysis is shown in Table 2-3. Decker coal is high in moisture and low on fixed carbon/volatile matter (FC/VM) ratio (1.13) which is typical of western coals. Fuel nitrogen and sulfur content are very low. But fly ash content of 3.6% is not typical of coals fired in cyclone boilers.

North Dakota lignite analyses are shown in Tables 2-4 through 2-7. As received analysis shows 36% moisture, 6% ash, and 7159 Btu/hr which is a little higher Btu than typical North Dakota lignite but very close. To ensure that lignite properties remain constant during the tests, Btu, ash, and moisture content were checked periodically. Heating value dropped from 12,411 to 12,203 Btu/lb on a dry ash-free basis. We concluded that during the entire tests, the lignite's heating value did not change significantly (refer to Table 2-8).

Table 2-2
DECKER COAL PROXIMATE AND ULTIMATE ANALYSES

Basis	As Rec'd	Dry
Proximate Analysis, %		
Moisture	24.7	---
Volatile Matter	33.66	44.71
Fixed Carbon	37.99	50.47
Ash	3.63	4.82
Gross Heating Value		
Btu per lb	9384	12466
Btu per lb (M&A Free)	---	13097
Ultimate Analysis, %		
Moisture	24.72	---
Carbon	54.60	72.53
Hydrogen	3.82	5.08
Nitrogen	0.71	0.94
Sulfur	0.24	0.32
Chlorine	<0.02	<0.02
Ash	3.63	4.82
Oxygen (Difference)	12.28	16.31
Total	100.00	100.00

Table 2-5

NORTH DAKOTA LIGNITE FLY ASH ANALYSIS

Ash Analysis (I.C.P.)*, %	
Silicon as SiO_2	10.77
Aluminum as Al_2O_3	8.05
Iron as Fe_2O_3	13.26
Titanium as TiO_2	0.24
Calcium as CaO	22.47
Magnesium as MgO	6.51
Sodium as Na_2O**	6.20
Potassium as K_2O**	0.47
Sulfur as SO_3	32.02
Phosphorus as P_2O_5	1.53

* The results of I.C.P. analysis are reported by the Research Center as the oxides. This does not necessarily mean that the elements occur as such in the sample.

** By Flame Photometer

Table 2-6

NORTH DAKOTA LIGNITE ASH FUSION TEMPERATURES

Atmosphere	**Red.**	**Oxid.**
A (I.D.)	2320F	2360F
B (S.T., Sp)	2400F	2400F
C (S.T., HSp)	2405F	2410F
D (F.T., 1/16")	2410F	2750F
E (F.T., Flat)	2410F	*

* Laboratory furnace maximum temperature is 2750F.

Table 2-7

NORTH DAKOTA LIGNITE HARDGROVE GRINDABILITY INDEX (HGI)

At 35.96% moisture (as received)	56
At 22.30% moisture	44
At 12.64% moisture	48
At 5.34% moisture (air dried)	46

INSTRUMENTATION

Gas Analyzers

The gas analysis system uses on-line analyzers to continuously monitor and record stack concentrations of O_2, SO_2, NO_x, CO, and CO_2 (see Table 2-9 and Figure 2-2).

In this program, the analyzers were calibrated daily (before and after the tests) with standard gases. The calibrated gases were injected at two locations: 1) at the stack into the gas sampling line, and 2) at the inlet of the gas analyzers. First, the analyzer was calibrated with the calibration gases introduced into the analyzer inlet. To ensure that there is no interference with the NO_x/SO_2 reading, the calibration gases were introduced at the stack. When the gas analyzer readings were compared to the known concentration of the calibration gases, they showed less than 2% deviation. The flue gas cleanup system utilizes a water trap system to dehumidify the flue gases. A Perma-Pure dryer is used for additional dehumidifying before the gases enter the analyzers.

Suction Pyrometer

Gas temperature measurements were obtained with a single-shield suction pyrometer. In the uninsulated convection pass, the temperature measurements could be in error by as much as 80F (at 2200F) due to radiation heat loss to the cold walls. The measured gas temperatures in the insulated furnace are fairly accurate and were not corrected for the radiation loss (since it is small).

H_2S Measurements

In-furnace sulfur species (H_2S and SO_2) sampling were performed by a water-cooled probe, SO_2 analyzer, and drager tubes. A water-cooled probe was utilized to cool the flue gas, but not below 300F to avoid condensation of water vapor. The gas temperature was adjusted by inlet water temperature as well as flow rate. H_2S drager tubes were used to measure the H_2S concentration. These drager tubes are hydrogen sulfide #29801 and #67-19001 (purchased from Safety First Supply Co., Pittsburgh, Pennsylvania). The detection ranges are 1 to 200 ppm and 5 to 600 ppm. The drager tubes were randomly calibrated against H_2S standard calibration gas. A minimum of one tube from each package was calibrated and good agreement (within ±5%) was observed. Duplicate measurements were performed in the majority of the tests to ensure the reliability of the data. In addition, SO_2 concentrations were measured (with an on-line analyzer) to ensure that the H_2S measurements were reasonably accurate. An accuracy of ±10% was achieved with this technique and is acceptable for corrosion rate calculations.

Section 3

RESULTS

INTRODUCTION

Prior to this investigation, the reburning technology has never been applied to cyclone-equipped boilers using lignite as the cyclone and reburn fuel. Our technical approach for evaluation of lignite was to utilize B&W's 6-million Btu/hr small boiler simulator (SBS) to fully characterize lignite as the cyclone and reburn fuel. Two coals were used: Decker — a western subbituminous coal that is fired at the Nelson Dewey Station — and a representative lignite from North Dakota. The experimental results of lignite reburning in the SBS were evaluated against other coals fired in both the SBS and full-scale boilers.

Baseline conditions simulated conditions similar to the full-scale lignite-fired boilers. Baseline tests (no reburning) were performed as a point of reference. All other reburning results compared to the baseline test results. The major parameters affecting NO_x emissions were investigated. For example, fuel split between cyclone and reburn burners were varied. In some test conditions, flue gas recirculation (FGR) was introduced into the reburn burners to enhance the mixing between reburn fuel and flue gases from the cyclone.

Potential side-effects of the technology were also studied. Unburned combustibles and dust loading samplings were performed at the stack to assess the potential of higher combustible losses under reburning conditions. Furnace exit gas temperature (FEGT) was measured in order to evaluate the potential variation in FEGT. Since the reburn zone is operated under reducing conditions, potential for corrosion in this zone was studied. By operating the cyclone under normal oxidizing conditions, the majority of the sulfur will be oxidized to SO_2. Some H_2S could be formed inside of the reburn zone. High levels of H_2S near the tubes can be conducive to corrosion. In-furnace H_2S measurements within the reburn zone were performed to assess potential for fireside corrosion. The simulated superheater ash deposition was studied for potential higher ash concentrations and/or fly ash compositions in the flue gas.

WESTERN SUBBITUMINOUS COAL EVALUATION

NO_x Emission Levels

Baseline NO_x emission levels adjusted to 3% O_2 ranged from 736 to 829 ppm while varying the stack O_2 from 2.2 to 4.1%, respectively, at 5-million Btu/hr. Since 3% stack O_2 is typical of Nelson Dewey Station operation, all subsequent reburning conditions are shown while maintaining an overall stack O_2 of 3%. Thus, the referenced baseline NO_x level when operating at 3% O_2 is 769 ppm. Reducing the SBS load to 3.7-million Btu/hr reduced the NO_x level to 717 ppm. This was the minimum load of the SBS as judged from the cyclone slag tapping and darkness. Figures 3-1 and 3-2 show these results of the NO_x emissions versus stack O_2 concentrations and SBS load, respectively.

Incorporating the coal reburning system at the SBS revealed NO_x reductions on the order of 48 to 68% from the baseline depending on reburn zone stoichiometry (0.93 to 0.85). Maintaining the cyclone furnace stoichiometry at 1.1 throughout the test sequence is critical due to the potential corrosion/operating concerns (slag tapping) of commercial cyclones. Thus, while maintaining cyclone stoichiometry of 1.1, the reburn zone stoichiometry is varied by increasing the amount of the heat input diverted to the reburn burners (while also maintaining a constant reburn burner stoichiometry). To obtain these NO_x reductions, the corresponding cyclone/reburn burner coal splits are approximately 79/21 (0.95 stoichiometry) and 65/35 (0.85 stoichiometry). At a reburn zone stoichiometry of 0.9 (29% reburn fuel which is typical in the Nelson Dewey Station operation), NO_x emissions of 340 ppm were measured which corresponds to 55.8% NO_x reduction from the baseline conditions. There is a data point at 0.95 stoichiometry which corresponds to 30% NO_x reduction, but the NO_x level was much above the least-square fit and was considered scatter in data and not the general trend. Figure 3-3 shows the NO_x levels versus reburn zone stoichiometry. Figure 3-4 shows that reburning NO_x levels increased from 270 to 429 ppm when the SBS load increased from 4 to 5.8-million Btu/hr and at the reburn zone stoichiometry of 0.9.

All of the aforementioned data correspond to 0% flue gas recirculation (FGR) in the reburn burners. Adding FGR to the reburn burners increases the mass flow through the burner and thus results in higher burner velocities. When approximately 5 and 9% FGR was added to the reburn burners (at 5-million Btu/hr and reburn zone stoichiometry of 0.9), NO_x levels of 278 and 260 ppm were achieved, respectively.

Furnace Exit Gas Temperature (FEGT)

Furnace exit gas temperature (FEGT) did not change significantly between baseline and reburning operation. Baseline FEGT at 5-million Btu/hr and 3% stack O_2 was 2003F. Incorporating reburning revealed minimum FEGT effects within a range of ±50F for the majority of test conditions. FEGT increased to 2132F (approximately 130F increase) at the reburn zone stoichiometry of 0.85. This corresponds to a 34.8% heat input to the reburn burners. FEGT decreased to 1934F when approximately 5% FGR was introduced into the reburn burners. Although changes in FEGT are low for most of the tests (with exception of high reburn fuel heat input), convection pass metal temperatures should be monitored in future full-scale retrofits to assure that no problems are encountered.

Combustion Efficiency

The unburned combustibles in the SBS were all very low during baseline and reburn conditions. Unburned combustibles in the fly ash were below 1% (refer to Appendix D) and did not increase with the reburning operation. These results were obtained with a fine grind reburn fuel (84% through 200 mesh; refer to Appendix C). This grind size is similar to the nominal coal reburn size (90% through 200 mesh) that is used at Nelson Dewey. The total ash input to stack increased, as expected, from approximately 20% for the baseline to 30% at reburning conditions. Although unburned carbon content of the fly ash did not change, the total ash loading at the stack increased. This would predict an increase in full-scale operation.

NORTH DAKOTA LIGNITE EVALUATION

Reburn burner flame with North Dakota lignite was stable and attached to the burner during all reburning test conditions. A commercial infrared (IR) flicker-type flame scanner detected the reburn burner flame firing North Dakota lignite. The flame detector worked satisfactorily with 29% reburn fuel and was insensitive to the background radiation.

NO_x Emission Levels

Baseline NO_x emission levels adjusted to 3% O_2 ranged from 602 to 707 ppm while varying the stack O_2 from 3.3 to 5.2%, respectively, at 5-million Btu/hr. In these tests, nominally 3.5% of the total fuel input and 15% of total air were introduced to the main furnace to simulate the lignite-fired coal dryer system. Therefore, the cyclone furnace was running between 1 to 3% excess oxygen. Since 4% stack O_2 is average of lignite-fired cyclone boilers, the referenced baseline NO_x level when operating at 4% O_2 is 690 ppm (corrected to 3% O_2).

All subsequent reburning tests were performed while maintaining an overall stack O_2 of 3%. Incorporating the coal reburning system at the SBS revealed NO_x reductions on the order of 45 to 58% from baseline depending on reburn zone stoichiometry (0.95 to 0.86). Maintaining the cyclone furnace stoichiometry at 1.1 throughout the test sequence is critical due to the potential corrosion/operating concerns (slag tapping) of the cyclone furnace. Thus, while maintaining cyclone furnace stoichiometry of 1.1, the reburn zone stoichiometry is varied by increasing the amount of the heat input diverted to the reburn burners (while also maintaining a constant reburn burner stoichiometry). To obtain these NO_x reductions, the corresponding cyclone/reburn burner coal splits are approximately 78.1/21.9 (0.95 stoichiometry) and 66.6/33.4 (0.86 stoichiometry). At a reburn zone stoichiometry of 0.9 (28% reburn fuel), NO_x emissions of 335 ppm were measured which corresponds to 51.4% NO_x reduction from the baseline conditions. Figure 3-5 shows the NO_x levels versus reburn zone stoichiometry. All of the aforementioned data correspond to 0% flue gas recirculation (FGR) in the reburn burners. Adding FGR to the reburn burners increases the mass flow through the burner and thus results in higher burner velocities. Figure 3-6 shows that when approximately 10% FGR was added to the reburn burners, NO_x levels of 202 and 279 ppm were achieved depending on reburn zone stoichiometry (0.85 and 0.93, respectively). The corresponding NO_x reduction is 70.7 to 59.6%. The effect of FGR on NO_x has been observed in the SBS with various coals. However, the NO_x levels from the Nelson Dewey Station tests did not vary with FGR. This effect must be substantiated on full-scale lignite-fired boilers.

Figure 3-7 shows that reburning NO_x levels decreased slightly from 323 to 303 ppm when SBS load decreased from 5.7 to 3-million Btu/hr and at the reburn zone stoichiometry of 0.91. Baseline NO_x levels decreased substantially. NO_x levels dropped from 754 to 471 ppm when SBS load decreased from 5.7 to 3.6-million Btu/hr. This indicates that although the NO_x reduction at the SBS full-load conditions was 57%, the reduction at a lower load (3.5-million Btu/hr) was only 35% (see Figure 3-8). This lower NO_x reduction at the lower load could be due to lower cyclone temperature at the SBS with the lignite. Higher NO_x reductions can be obtained by using FGR and/or more reburn fuel. However, if the lower NO_x reduction is duplicated at the commercial units at lower loads, the NO_x levels are still very low.

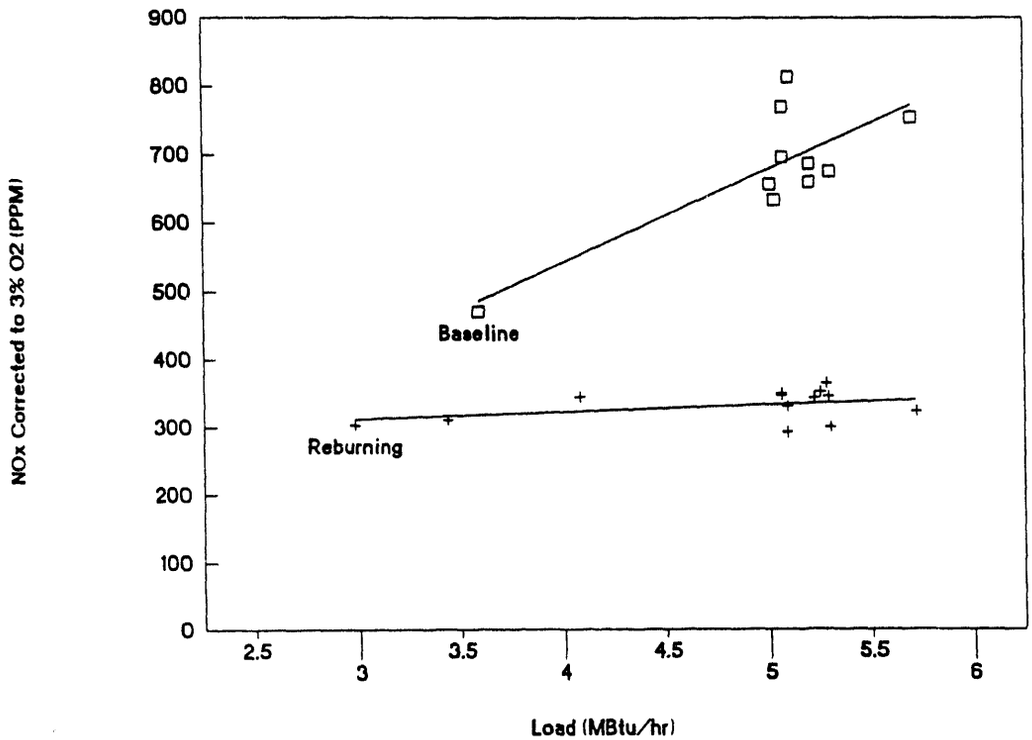


Figure 3-7 SBS NO_x levels with North Dakota lignite at different loads

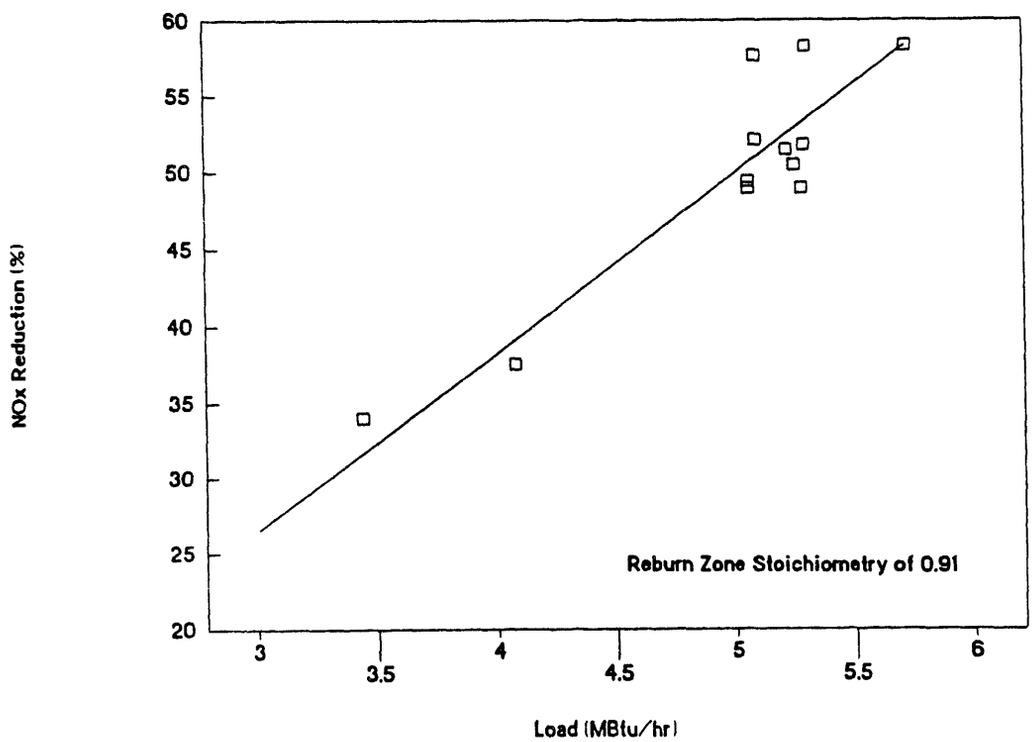


Figure 3-8 SBS NO_x reduction with North Dakota lignite at different loads

High concentrations of H_2S can be conducive to increased rates of corrosion. Flue gas chemistry analyses were obtained throught the SBS baseline and reburning tests with Decker coal and North Dakota lignite to help quantify this potential concern. The main objective was to evaluate the formation of H_2S within the reburn zone. The Decker coal data were taken in order to evaluate the potential for tube corrosion in the Nelson Dewey Station Unit No. 2.

Table 3-1 shows the H_2S levels during firing of the Decker coal and the North Dakota lignite tested under baseline and reburning conditions. In the baseline conditions, 0 ppm H_2S was found with both the Decker coal and North Dakota lignite. The reburning system produced up to 13 ppm with the Decker coal. SO_2 measurements in the reburn zone also showed that most of the sulfur was SO_2 and not other corrosive species (e.g., H_2S, COS, etc.). The North Dakota lignite produced higher H_2S levels — up to 160 ppm. H_2S concentrations were low near the rear (reburn burner) wall indicating that good reburn burner flame penetration exists in the SBS. Also, in most cases, H_2S levels were low near the side walls with the exception of one point. SO_2 concentrations within the reburn zone was much higher (about one order of magnitude) than H_2S levels indicating that only small amount of sulfur was converted to H_2S. If the design of the future reburning retrofits produces H_2S within the reburn zone inside the boiler and low H_2S levels near walls (like Nelson Dewey Station where up to 15 ppm were detected near rear wall with a medium-sulfur eastern bituminous coal) then the corrosion potential should not be a concern. In-furnace H_2S, SO_2, and other gaseous species are shown in Appendix E.

Table 3-1
H_2S CONCENTRATIONS IN REBURN ZONE

	Baseline	*Reburning*
Decker coal (0.32% sulfur, dry)	0 ppm	0-13 ppm
North Dakota lignite (1.61% sulfur, dry)	0 ppm	0-160 ppm

Fireside Ash Deposition

Convective surface ash deposition is a potential concern during operation of a reburning system. Since reburning involves delaying the combustion process, slightly lower/higher FEGTs could result and thus change the boiler deposition characteristics during lignite reburning. Also, lignite reburning may present deposition concerns due to the potential added dust loading to the convection pass which results during this mode of reburning operation. Not only could the increased mass loading magnify an ash build-up problem, but a change in particle size distribution and increases in average gas velocity through the convection surface could promote deposition and erosion. Two 32-hour convective surface deposition tests were performed during baseline and lignite reburning conditions to investigate simulated superheater surface deposition, heat flux variations, and sootblower cycle frequency and jet energy requirements.

Furnace waterwall deposition is also a potential area which needs to be addressed. Unfortunately, no provisions to investigate this parameter at the pilot-scale were included in this test project. Since the SBS furnace walls are refractory-board covered to maintain proper gas temperature at this scale, full-scale utility conditions are not simulated such that general deposition observations in this region would not be directly applicable. However, no change in SBS furnace deposition was observed between the baseline and reburning conditions.

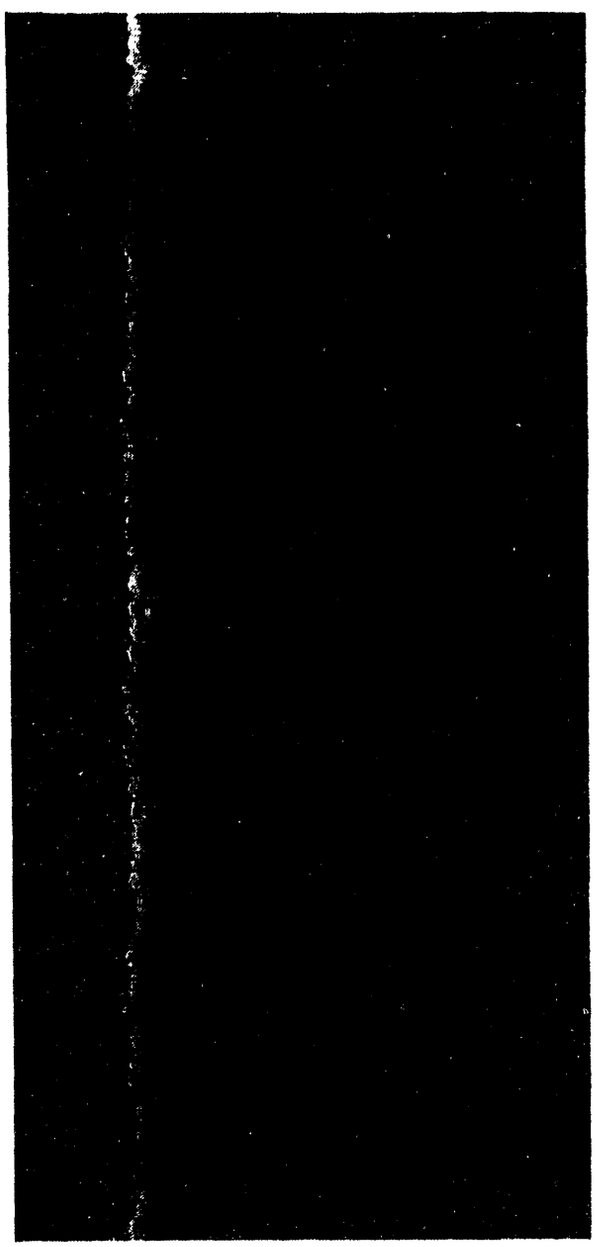
deposits during baseline and deposition tests were critical data for lignite reburning and were not affected by tube material. In addition, heat recovery could be somewhat different but still the data can be used for relative comparison of baseline and reburning tests.

Heat Flux. Two 32-hour, 5-million Btu/hr baseline and lignite reburning tests were performed with the North Dakota lignite to evaluate the heat flux variations versus time and sootblower pressure. Figures 3-9 and 3-10 illustrate the simulated superheater probe heat flux data during the 32-hour baseline and coal reburning tests, respectively. The clean superheater probe initial heat flux was approximately 14,500 Btu/hr-ft^2.

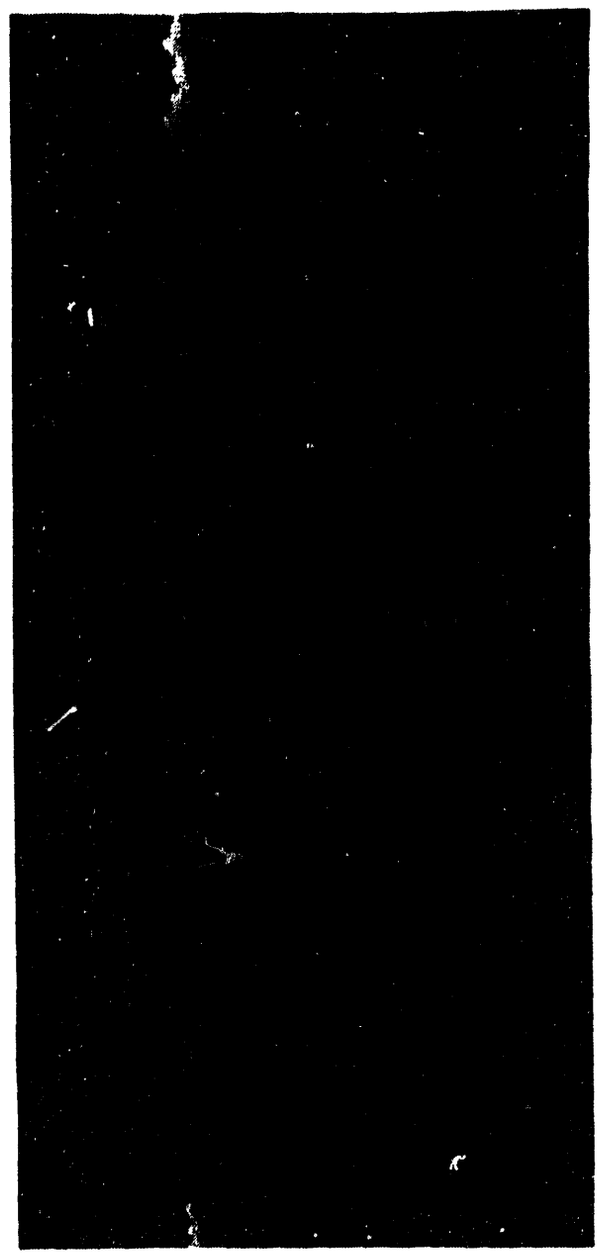
Prior SBS deposition investigations revealed that sootblower pressure requirements ranged from 30 to 100 psi. Utilizing this pressure range corresponds to PIPs of 9 to 20 inches Hg, which is well within the capabilities of commercial (approximately 60 inches Hg) sootblowing systems.

During the baseline tests, four sootblowing cycles were performed. The results show that the heat flux degradation leveled out to about 75% of the initial clean probe values in about a 7- to 8-hour time span. Utilizing sootblower pressure of 90 psi provided the necessary jet energy to restore initial clean heat flux levels. Thus, 90 psi was utilized throughout the sootblowing cycles. The lignite reburning deposition test sequence involved another four sootblowing cycles of approximately 8 hours in duration. The data reveal that the heat flux decreased and leveled out to approximately 70% of the initial clean probe values at approximately the 8-hour time span. The data indicate that slightly more sootblowing may be required in a commercial application but sootblower pressure will not be affected. This was confirmed by analyzing superheater probe deposits. Figure 3-11 shows the deposition probe prior and after sootblowing during baseline and reburning tests.

Chemical Analysis of Superheater Probe Deposit. Chemical analysis of the fly ash, coal ash, and superheater probe deposits for the baseline and lignite reburning are shown in Tables 3-2 and 3-3 , respectively. As expected, the data show that concentrations of sodium and potassium are higher in the probe deposits than in lignite ash. However, concentrations of sodium and potassium in the superheater probe deposits are very similar for the baseline and the reburning conditions of lignite firing in the SBS. Previous work with two eastern bituminous coals showed that superheater probe deposit under reburning conditions contains less sodium and potassium than the baseline conditions. Typical cyclone-equipped boiler superheater deposits contain more sodium and potassium than pulverized coal (PC) boilers since these compounds evaporate in the cyclone barrel and then condense out on the superheater tube surface. Also, fly ash concentrations in the boiler convective bank are lower in cyclone boilers than in PC boilers due to cyclone slagging capability. With the eastern bituminous coals under reburning conditions, sodium and potassium concentrations of the superheater probe were less than the baseline conditions. Those data suggest that the ash from the PC reburn burner did not evaporate as much as ash from the cyclone. With lignite, approximately 50% of the ash was entrained as fly ash during the baseline tests. The fly ash concentrations were similar for both baseline and reburning conditions presumably due to better cyclone slagging at the reburning conditions (refer to the previous discussion on combustible losses in this section). These recent data with lignite suggest that since the cyclone furnace is cooler with lignite firing than with eastern bituminous coals, sodium and potassium were evaporated similarly in the cyclone and the reburn burner. The chemical analysis of the deposits and required sootblowing pressure to recover the heat flux indicates that the fouling potential on the superheater tubes should not be adversely affected with lignite reburning.



BASELINE TESTS



REBURNING TESTS

Figure 3-11 Center of the superheater deposition probe during the baseline and reburning tests

Comparison of the Results from the SBS and Nelson Dewey Station

The SBS data show the potential of reburning technology for NO_x reduction from cyclone boilers that utilize North Dakota lignite. In order to assess the potential of the technology at full-scale, the data from SBS are compared to the SBS data from other coals and the 110-MW_e data from the Nelson Dewey Station utilizing an eastern bituminous coal and Decker coal. It is important to mention that a major difference between SBS and full-scale boilers is the number of cyclones — the SBS is fired by a single cyclone versus full-scale boilers firing multiple cyclones. As a result, with the turndown on load, the SBS fuel input is reduced to the single cyclone but in a full-scale boiler, cyclone(s) can be taken out of service. NO_x emissions and other boiler characteristics could be substantially different at lower loads. Therefore, it is reasonable to compare the results of the full-load conditions for the SBS and Nelson Dewey Station.

Figure 3-12 shows the SBS NO_x levels with an eastern bituminous coal (Lamar), a western subbituminous coal (Decker), and the North Dakota lignite. At the baseline conditions, Lamar produced the highest NO_x emissions and North Dakota lignite the lowest (940, 769 and 690 ppm for Lamar, Decker, and North Dakota lignite, respectively). Incorporating the reburning system produced NO_x reductions of 44 to 62% for Lamar, 48 to 68% for Decker, and 45 to 58% for lignite. The difference in NO_x emission levels can be partially explained by the flame temperature, coal volatile matter, and nitrogen contents. Lamar is a high-volatile-matter coal with a fixed carbon/volatile matter (FC/VM) ratio of 1.15 and a fuel nitrogen content of 1.57 on a dry-ash-free (DAF) basis. Decker has a FC/VM ratio of 1.13 and a much lower fuel nitrogen content of 0.99 on a DAF basis. The North Dakota lignite has a FC/VM of 0.92 and nitrogen content of 1.12 on a DAF basis. Generally, fuels with low FC/VM and high nitrogen content

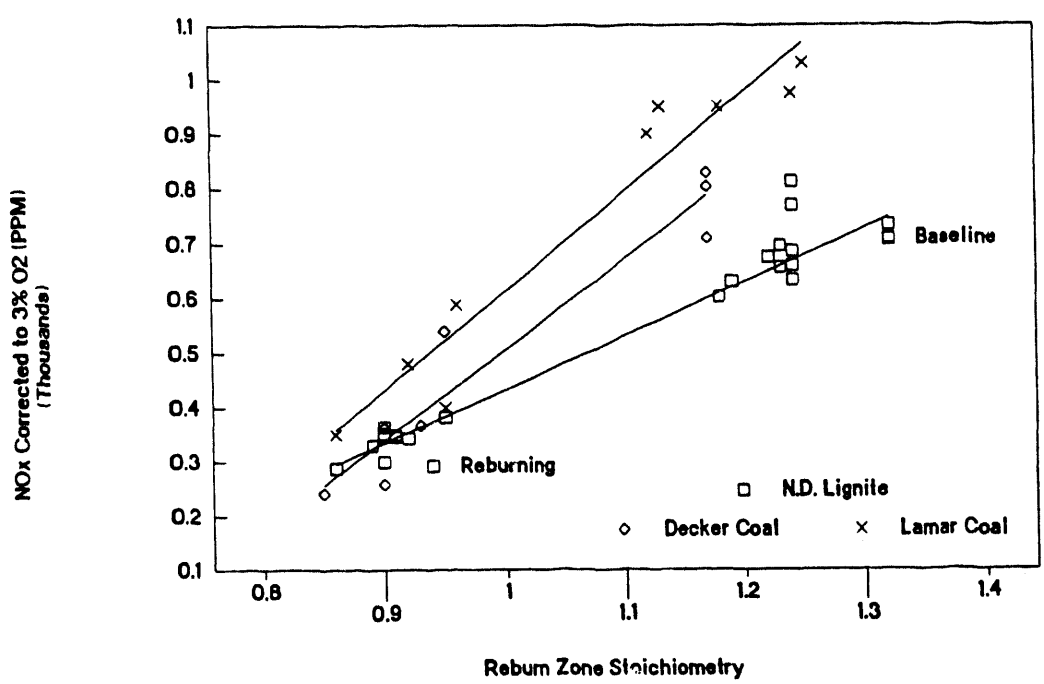


Figure 3-12 SBS NO_x levels with North Dakota lignite, western subbituminous coal, and eastern bituminous coal

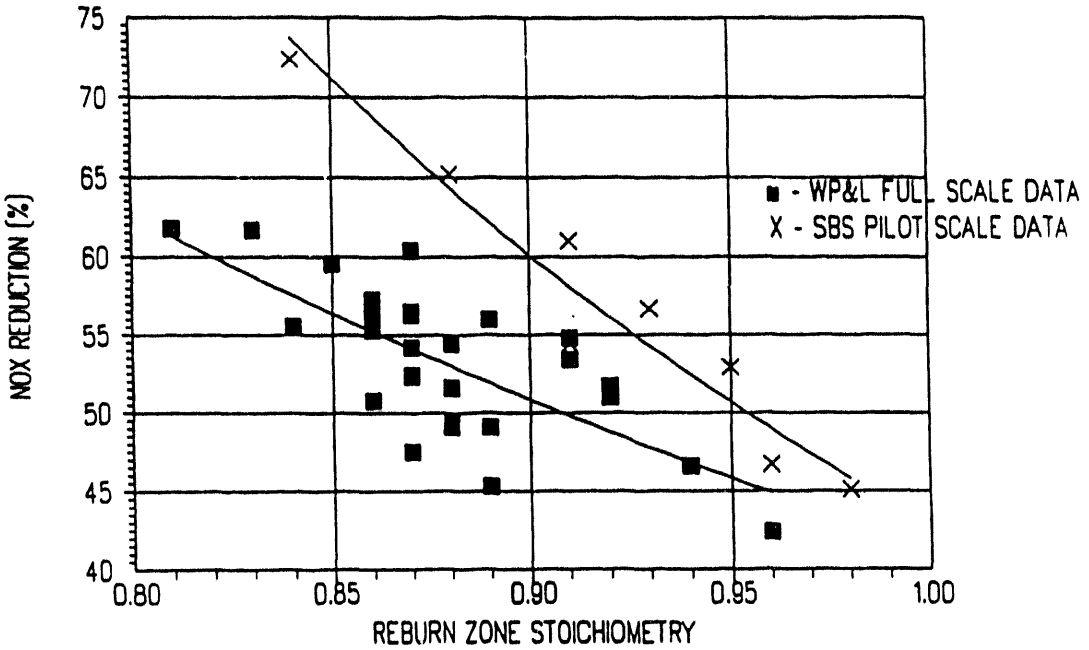


Figure 3-13 Comparison of the SBS and Nelson Dewey NO_x levels with the eastern bituminous coal

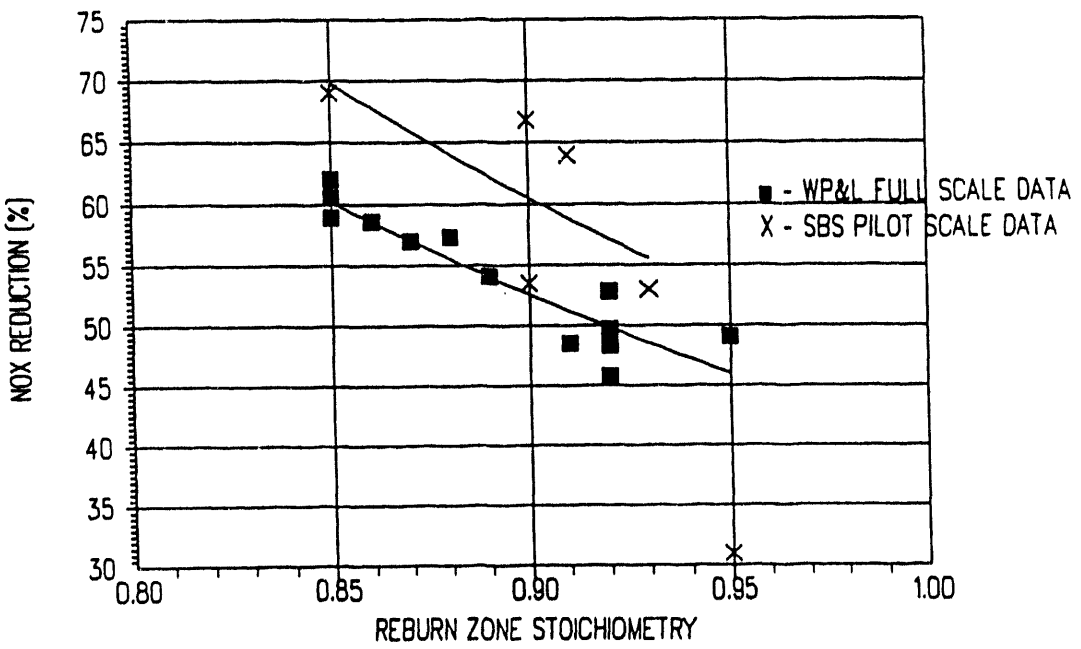


Figure 3-14 Comparison of the SBS and Nelson Dewey NO_x levels with the western subbituminous coal

Section 4

CONCLUSIONS

Based on the Babcock & Wilcox small boiler simulator (SBS) pilot-scale results and comparison of data with the full-scale Wisconsin Power & Light's Nelson Dewey Station Unit No. 2, the following conclusions can be derived:

- Reburning is a technically feasible NO_x reduction technology for cyclone boilers firing lignite.

- A 45 - 58% overall NO_x reduction was achievable in pilot-scale testing using North Dakota lignite. This overall NO_x reduction is attributed to two different mechanisms:
  - NO_x reduction in the reducing environment of the reburn zone via the reburning process
  - NO_x reduction via reduced heat input at the cyclone

- Flue gas recirculation (FGR) to the reburn burners improved the NO_x reduction capabilities at the SBS facility. The overall NO_x reduction with 10% FGR was 59.6 - 70.7% while firing the North Dakota lignite. The effect of FGR on NO_x levels has been observed in the SBS with various coals. The Nelson Dewey Station results did not show a significant effect of FGR on the NO_x levels. The effect of FGR on the NO_x levels is not clear and requires full-scale evaluation on lignite-fired cyclone boilers.

- The lower reburn zone stoichiometry provided the overall best NO_x reduction.

- SBS NO_x reduction levels were approximately 8% greater than those observed during the Nelson Dewey Station test project. The higher NO_x reduction in the SBS is attributed to better mixing between the reburn fuel and boiler gases and also possibly due to the higher baseline NO_x levels. However, SBS baseline NO_x levels during lignite firing were substantially lower than that observed while firing bituminous coal (690 ppm versus 950 ppm). Therefore, similar NO_x reduction is expected in full-scale lignite-fired cyclone boilers and the SBS if the mixing characteristics of the SBS can be duplicated.

- Combustible losses were not affected by the reburning process while firing North Dakota lignite at full-load conditions in the SBS. Unburned carbon (UBC) content of the fly ash was always below 1%.

- CO emission levels were low (less than 40 ppm) throughout the various conditions and thus should not be a problem when using the reburning process.

Section 5

RECOMMENDATIONS

- For retrofit applications, site-specific engineering and economic evaluations, will be required in order to determine the reburning technology potential.

- Improved combustion controls, including air and fuel input to cyclones, reburn burners, and overfire air (OFA) ports, are essential to the successful application of the reburning technology.

- Cyclone must operate under an oxidizing environment to minimize possible corrosion in the cyclone.

- Mixing between reburn fuel/air and cyclone gases is a key factor on the performance of the reburning system. Mixing performance of the SBS and Nelson Dewey Unit No. 2 should be considered as a minimum criteria in design of full-scale retrofits

- Utilize the SBS stoichiometries and average residence times in the design of the full-scale retrofit as a starting point. Physical and/or numerical modeling is recommended to assess/improve the mixing performance if required.

Section 6

REFERENCES

1. G. J. Maringo, et al., "Feasibility of Reburning for Cyclone Boiler NO_x Control," 1987 EPA/EPRI Joint Symposium on Stationary Combustion NO_x Control, New Orleans, Louisiana, March 23-27, 1987.

2. H. Farzan, et al., "Pilot Evaluation of Reburning for Cyclone Boiler NO_x Control," in the Proceedings of EPRI/EPA Joint Symposium on Stationary NO_x Control," San Francisco, California, March 6-9, 1989.

3. A. S. Yagiela, et al., "Update on Coal Reburning Technology for Reducing NO_x in Cyclone Boiler," in the proceeding of EPRI/EPA Joint Symposium on Stationary NO_x Control," Washington, D.C., March 1991.

4. EERC, "Evaluation of In-Furnace NO_x Reduction and Sorbent Injection on NO_x/SO_x Emissions of U.S. Designed Pulverized Coal-Fired Boilers," 1st and 2nd Technical Review Panel on In-Furnace NO_x Reduction, Salt Lake City, Utah, 1984 and 1985.

5. Okigami, et al., "Three-Stage Pulverized Coal Combustion System for In-Furnace NO_x Reduction," 1985 EPA/EPRI Joint Symposium on Stationary NO_x Control, Boston, Massachusetts.

6. Wendt, et al., "Reduction of Sulfur Trioxide and Nitrogen Oxides by Secondary Fuel Injection," 14th International Symposium on Combustion.

7. Takahashi, et al., "Development of Mitsubishi (MACT) In-Furnace NO_x Removal Process," U.S.-Japan NO_x Information Exchange.

8. Chen, et al., "Controlling Pollutant Emissions From Coal and Oil Through the Supplemental Use of Natural Gas," 1986 EPA/EPRI Symposium on Dry SO_2 and Simultaneous SO_2/NO_x Technology, Raleigh, North Carolina, June 2-6, 1986.

9. H. Farzan, et al., "Reburning Scale-Up Methodology for NO_x Control From Cyclone Boilers," Presented at the International Power Generation Conference, San Diego, California, October 6-10, 1991.

Appendix A

SMALL BOILER SIMULATOR (SBS)

Appendix A

SMALL BOILER SIMULATOR (SBS)

SMALL BOILER SIMULATOR (SBS)

Based on the industry need for a pilot-scale cyclone boiler simulator, Babcock & Wilcox (B&W) designed, fabricated, and installed such a facility at its Alliance Research Center (ARC) in 1985. The project involved conversion of an existing pulverized coal-fired facility to be cyclone-firing capable. Additionally, convective section tube banks were installed in the upper furnace in order to simulate a typical boiler convection pass. The small boiler simulator (SBS) is designed to simulate most fireside aspects of full-size utility boilers such as combustion and flue gas emissions characteristics, fireside deposition, etc.

Simulation Criteria

Prior to the design of the pilot-scale cyclone boiler simulator, the various cyclone boiler types were reviewed in order to identify the inherent cyclone boiler design characteristics which are applicable to the majority of these boilers. The cyclone boiler characteristics that were reviewed include NO_x emissions, furnace exit gas temperature (FEGT), carbon loss, and total furnace residence time. Previous pilot-scale cyclone-fired furnace experience identified the following concerns:

- Operability of a small cyclone furnace (e.g., continuous slag tapping capability).

- The optimum cyclone(s) configuration for the pilot-scale unit was debated. Commercial cyclone boiler systems can include front-wall fired, opposed-wall fired, and single or multiple cyclone elevations. In addition, there are different cyclone burner and cyclone furnace designs presently in operation.

- Compatibility of NO_x levels, carbon burnout, cyclone ash carryover to the convection pass, cyclone temperature, furnace residence time, and FEGT. Due to the various sizes/types/fuels burned, commercial cyclone units operate within a large range of combustion and pollutant conditions.

Originally, an opposed-wall fired, cyclone design was proposed, based on the large number of cyclone utility boilers falling into this design category. Using this as the design basis for the pilot-scale unit would involve having two 3-million Btu/hr cyclones. A review of past experience revealed that the smallest cyclone ever designed/operated was 10-million Btu/hr. Based on this and coupled with concerns about fabrication and slag tap operation (due to size), it was decided to proceed with designing a single 6-million Btu/hr cyclone to accommodate the SBS facility.

this review, a range of residence times was generated in order to bracket the general cyclone boiler population. Generally, the study showed that single-wall-fired cyclone units contain furnace residence times on the lower side of the general population range. Although this is true, the majority of single-wall fired units do have sufficient residence time available for the reburning technology. Thus, the SBS cyclone design criteria was to simulate the geometry of B&W's commercially operated, single-wall-fired cyclone boiler type. In addition, the SBS furnace was insulated in order to achieve a comparable flue gas time/temperature relationship to actual field operating experience.

Pilot-Scale Furnace Facility Description

B&W's 6-million Btu/hr small boiler simulator (Figure 1) was utilized to perform the pilot-scale cyclone reburning tests. The SBS is fired by a single, scaled-down version of B&W's cyclone furnace. Coarse pulverized coal (44% through 200 mesh), carried by primary air, enters tangentially into the burner. (Pulverized coal had to be utilized in the SBS instead of crushed coal in order to obtain complete combustion in this small cyclone.) Preheated combustion air at 700°F enters tangentially into the cyclone furnace. The larger coal particles are captured and burn in the molten slag layer formed within the cyclone furnace, while the finer particles burn in suspension. The mineral matter melts, exits the cyclone furnace from the tap at the cyclone throat, and is dropped into a water-filled slag tank. Only 15 - 20% of the ash leaves the cyclone with the flue gases and enters the main furnace.

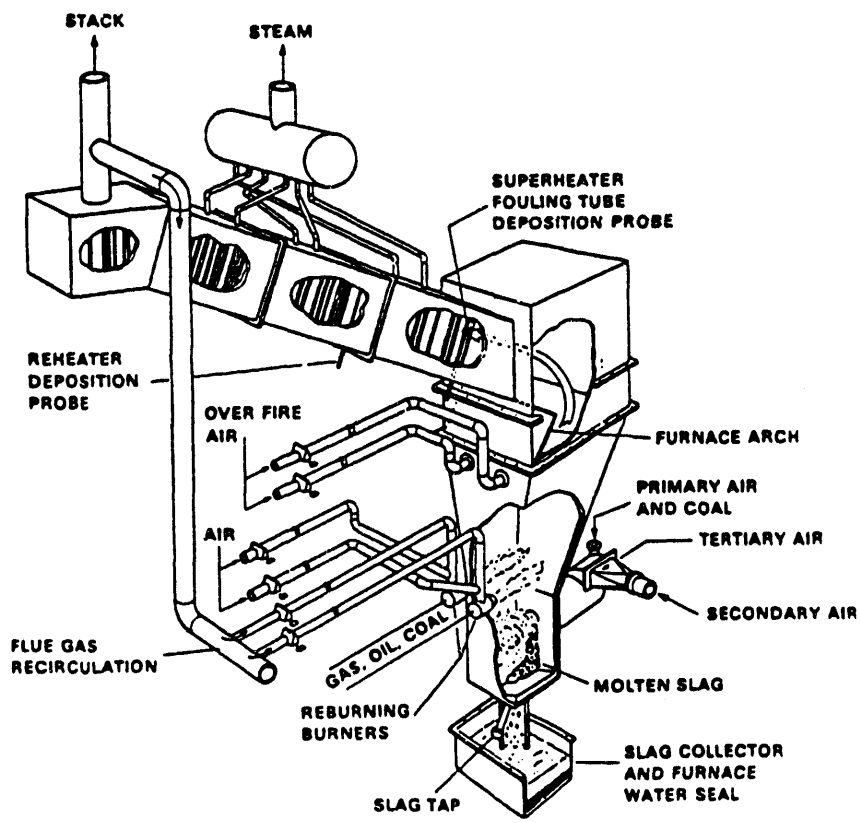


Figure 1 Small Boiler Simulator (SBS) Facility

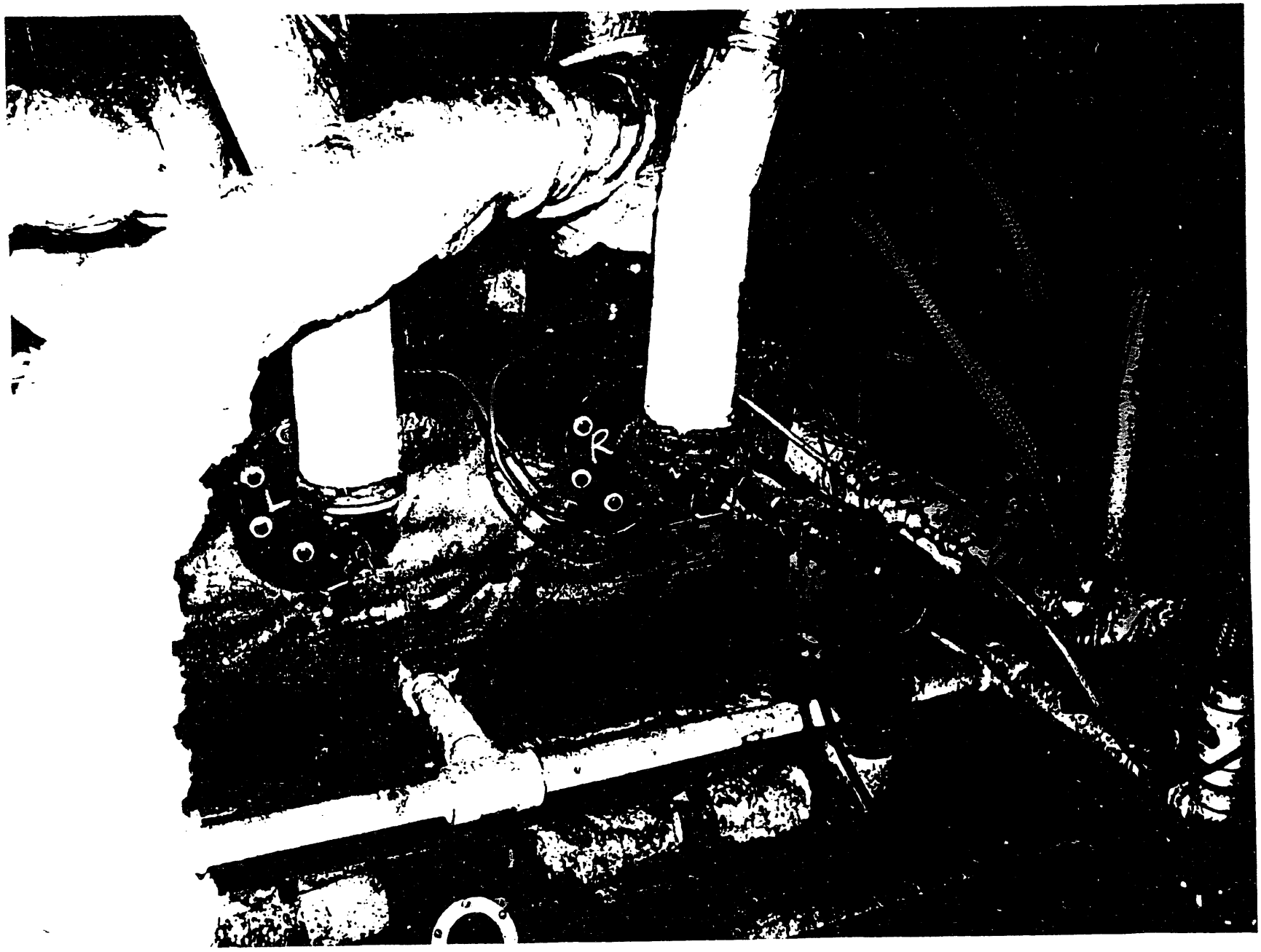


Figure 2 SBS Reburning Burners and Associated Piping Location

Appendix B

LIGNITE-FIRED CYCLONE BOILER OPERATIONAL CONDITIONS

	MR Young U2 Data	Coyote Data	LOS Data	Test Parameters
Cyclone Coal Flow Rate (Lift Line)	95–96%	96.5%	98%	96.5%
Cyclone Coal Feed Particle Size Distribution	12%–200 Mesh	N/A	16%–200 Mesh	14%–200 Mesh
Primary Air Flow Rate	10–12%	15%	11–15%	13%
Secondary Air Flow Rate	70–75%	75%	65–75%	70%
Secondary Air Temperature	720–750 Deg. F	720 Deg. F	650–750 Deg. F	720 Deg. F
Tertiary Air Flow Rate	0.5–1%	5%	1–2%	2%
Cyclone Excess Oxygen	2% O2	N/A	2–3% O2	2% O2
Vent Line Coal Flow Rate	4–5%	3.5%	2%	3.5%
Vent Line Coal Moisture Content	6–7%	16.5%	20–23%	15%
Vent Line Coal/Air Temperature	140 Deg. F	140 Deg. F	120 Deg. F	140 Deg F.
Vent Line Static Pressure	2–4"H2O	1" H2O	–1" to +3" H2O	1.5" H2O
Vent Line Coal Fineness	95%–325 Mesh	98%–200 Mesh	86%–200 Mesh	95%–200 Mesh
Vent Line Air Flow Rate	12–14 %	15%	15–19%	15%
Fuel Conditioner Discharge Line	N/A	N/A	N/A	N/A
Static Pressure & Temperature	270–300 Deg. F	140 Deg. F	120 Deg. F	140 Deg. F
Gas Temperaing/Recirculation Flow Rate	33–40%	1.4 MLB/HR All Loads GT/GR – 50/50 varies w/ FEGT & MS Temp	1.3 MLB/HR–Full Load 600 KLB/HR–Half Load	1.4 MLB/HR–Full Load 600 KLB/HR–Half Load
Temperature vs Load	670–700 Deg. F	650 Deg. F @ 400 550 Deg. F @ 280	580 Deg. F–Full Load 440 Deg. F–Half Load	650 Deg. F–Full Load 550 Deg. F–Half Load
Furnace Exit Gas Temperature (FEGT)	1780–1850 Deg. F	1850 Deg. F @400	1750–1850 Deg. F	1850 Deg. F
Furnace Pressure at the Vent Line Elevation vs Load	0"+–0.2" H2O	–0.5" H2O	0" to –0.5" H2O	0" H2O
Economizer Outlet Oxygen (%) vs Load	3.8–4.0 %	3.2% @ 400 4.5% @ 280	4%–FULL LOAD 6%–Half Load	3.8%–Full Load 5%–Half Load
Air Heater Outlet (Air) Pressure vs Load	42–44" H20	46" H2O	40–42" H2O	44" H2O
Air Heater Outlet (Air) Temperature vs Load	720–750 Deg.	725 Deg. F	650 Deg. F–Full Load 550 Deg. F–Half Load	700 Deg. F–Full Load 550 Deg. F–Half Load
Unburned Combustibles/NOx/CO Data vs Load	0.6–2% LOI	1.5% LOI	2% LOI	1.5% LOI
Secondary Superheater/Reheater Attemperator	0–Clean	250 KLB/HR–SSH	10 KLB/HR–SSH	10 KLB/HR–SSH
Spray Flow Rates vs Load (Dirty vs Clean)	0–Dirty	0 KLB/HR–RSH	5 KLB/HR–RSH	5 KLB/HR–RSH
Fly Ash/Slag Split	45% Fly Ash 55% Bot. Ash	50% Fly Ash 50% Bot. Ash	40% Fly Ash 60% Bot. Ash	45% Fly Ash 55% Bot. Ash

Appendix C

PARTICLE SIZE DISTRIBUTION OF DECKER COAL AND NORTH DAKOTA LIGNITE

C-21128, PULVERIZED COAL
FROM BELT, 2/2/93 @
0500 HRS.

MICRONS	% LESS	DIFF
4800.00		
3394.11		
2400.00	100.00	.65
1697.06	99.35	.49
1200.00	98.86	1.76
848.53	97.10	1.31
600.00	95.79	3.87
424.26	91.92	2.74
300.00	89.18	4.41
212.13	84.77	5.99
150.00	78.78	9.69
106.07	69.09	13.13
75.00	55.96	11.64
53.03	44.32	10.84
37.50	33.49	8.90
26.52	24.59	6.34
18.75	18.25	4.94
13.26	13.31	5.38
9.38	7.93	2.91
6.63	5.02	1.44
4.69	3.58	1.37
3.31	2.20	.88
2.34	1.32	.45
1.66	.87	.37
1.17	.50	.28
.83	.22	.16
.59	.06	.06
.41	.00	.00
.29		
.21		
.15		

CS(CAL SURF AREA)= .27 M**2/CM**3
MMD(D43)=142.57 MICRONS
SMD(D32)= 22.51 MICRONS

C-21087, PULVERIZED COAL,
12/8/92 @ 1645 HRS., DECKER
COAL SUB-BITUMINOUS-WESTERN,
BELT OF WEIGH FEEDER(POST CAL)

MICRONS	% LESS	DIFF
4800.00		
3394.11		
2400.00		
1697.06		
1200.00	100.00	.17
848.53	99.83	.13
600.00	99.70	.23
424.26	99.47	.17
300.00	99.30	.30
212.13	99.00	.70
150.00	98.30	3.21
106.07	95.09	10.90
75.00	84.18	17.92
53.03	66.26	17.72
37.50	48.54	13.14
26.52	35.40	12.17
18.75	23.23	7.40
13.26	15.83	5.36
9.38	10.47	4.77
6.63	5.70	2.74
4.69	2.96	1.50
3.31	1.45	.74
2.34	.72	.30
1.66	.41	.24
1.17	.18	.14
.83	.04	.04
.59	.00	.00
.41		
.29		
.21		
.15		

CS(CAL SURF AREA)= .30 M**2/CM**3
MMD(D43)= 49.38 MICRONS
SMD(D32)= 20.26 MICRONS

C-21118, BASIN ELECTRIC/
ARC SBS PILOT, AS FIRED
LIGNITE, 1/11/93 @ 1500 HRS.,
BASELINE TEST

MICRONS	% LESS	DIFF
4800.00		
3394.11		
2400.00	100.00	.01
1697.06	99.99	.00
1200.00	99.99	.22
848.53	99.77	.17
600.00	99.60	1.00
424.26	98.60	.70
300.00	97.90	9.67
212.13	88.23	12.39
150.00	75.83	12.29
106.07	63.55	17.42
75.00	46.13	10.46
53.03	35.67	9.39
37.50	26.29	7.55
26.52	18.74	3.00
18.75	15.74	6.77
13.26	8.97	1.55
9.38	7.42	1.94
6.63	5.48	3.07
4.69	2.41	1.10
3.31	1.31	.58
2.34	.73	.30
1.66	.43	.22
1.17	.22	.15
.83	.07	.06
.59	.01	.01
.41	.00	.00
.29		
.21		
.15		

CS(CAL SURF AREA)= .21 M**2/CM**3
MMD(D43)=105.73 MICRONS
SMD(D32)= 28.45 MICRONS

Appendix D

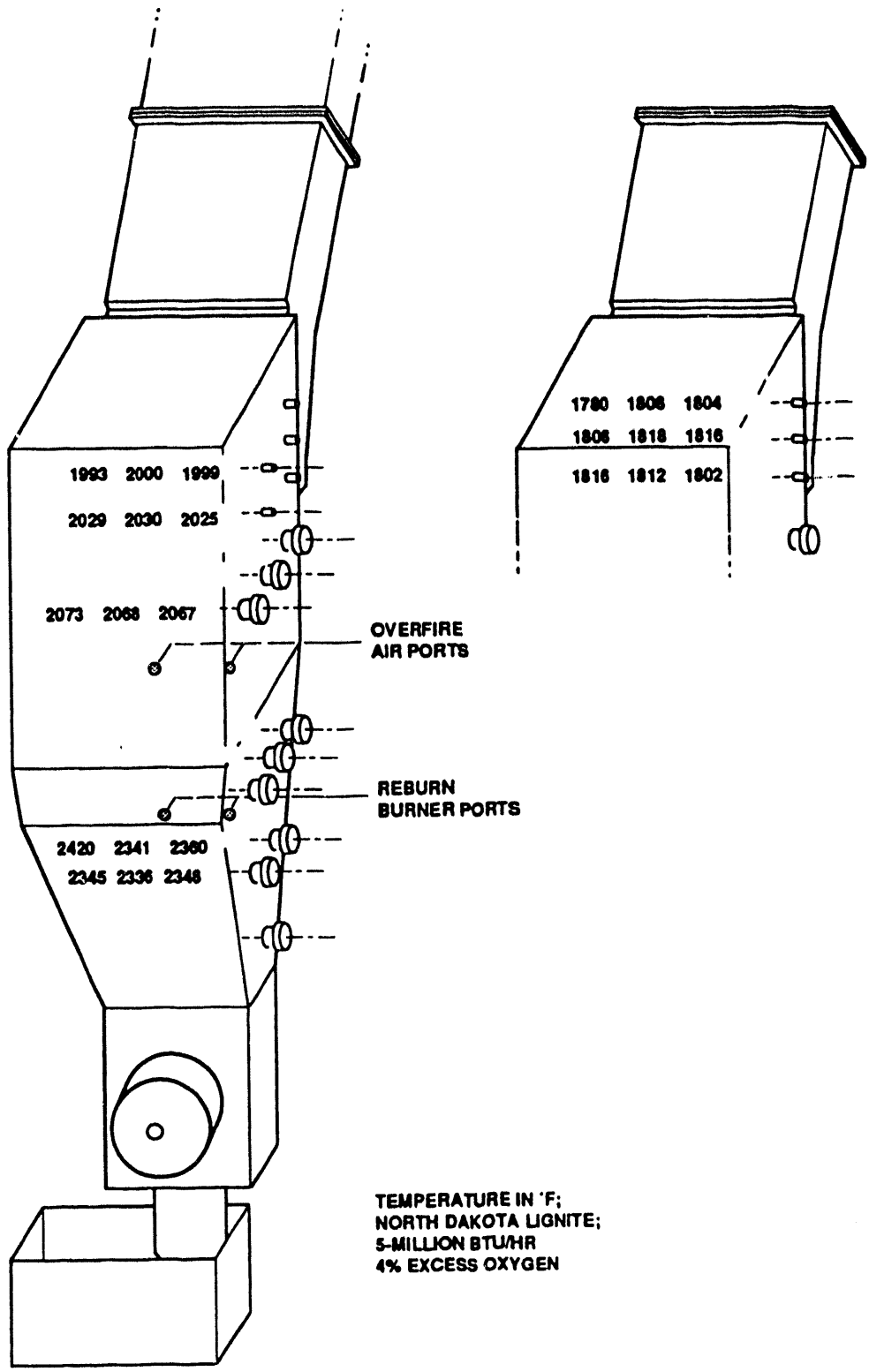
PARAMETRIC LIGNITE REBURNING EVALUATION RESULTS

Parametric Lignite Reburning Evaluation Results

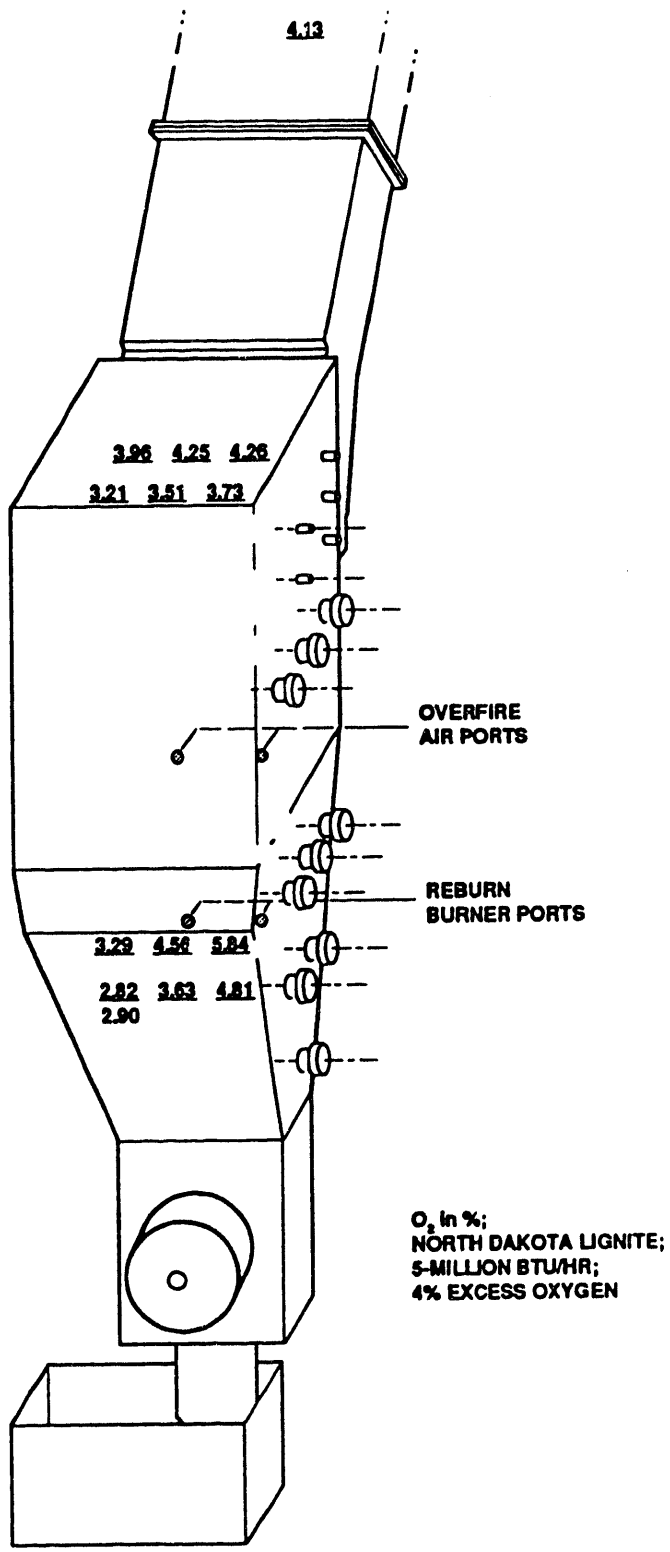
Test No.	Coal	Load	O2	NOx	NOx @ 3%	CO	C	SO2	CO2	SA Temp	Stoichiometries Cyclone	Reb. burner	Reb. Zone	Reb. Fuel	FGR	FEGT
		MBtu/hr	%	PPM	O2, PPM	PPM	%	PPM	%	F				% of Total	%	F
WB52	Deckor	5.02	2.8	610	602	34		289	16.27	678	1.15	N/A	1.15	0	0	
WB53	Deckor	5.00	3.3	699	710	14	0.98	238	15.69	645	1.17	N/A	1.17	0	0	2003
WB52R	Deckor	4.85	2.2	767	736	24		296	16.57		1.11	N/A	1.11	0	0	
WB54R	Deckor	5.03	4.2	740	791	20		248	14.84		1.25	N/A	1.25	0	0	
WB53RR	Deckor	5.00	3.2	797	804	27		215	15.96	672	1.17	N/A	1.17	0	0	
WB53RRR	Deckor	4.89	3.1	825	826	26		174	15.74	705	1.17	N/A	1.17	0	0	
WB54	Deckor	4.99	4.1	778	829	27	1.5	275	14.9	660	1.25	N/A	1.25	0	0	
WB43	Deckor	4.04	3.0	717	717	22		205	15.92	663	1.16	N/A	1.16	0	0	
WB33	Deckor	3.72	3.0	717	718	20	0.77	174	15.69	700	1.16	N/A	1.16	0	0	
WRB4er1	Deckor	4.1	3.5	263	270	23	0.26	196	15.67	664	1.06	0.43	0.86	28.38	0	1927
WRB6er3	Deckor	5.1	2.9	244	242	28	0.37	196	16.36	666	1.1	0.37	0.85	34.8	0	2132
WRB6er1	Deckor	5.0	3.0	259	259	27	0.36	173	16.16	660	1.11	0.36	0.9	29.06	0	
WRB6er1R	Deckor	5.1	3.1	362	363	25		213	16.05	663	1.1	0.4	0.9	28.33	0	2061
WRBer1rr	Deckor	5.0	3.2	362	367	29		188	15.98	679	1.15	0.39	0.93	29	0	1986
WRB6er2	Deckor	5.2	2.9	542	539	25	0.21	186	16.06	700	1.08	0.44	0.95	21.45	0	2039
WRB6er1	Deckor	5.8	3.8	410	429	30	0.26	157	15.07	665	1.14	0.44	0.93	29.77	0	2125
WRBFGR1	Deckor	4.9	3.1	278	279	27	0.24	169	16.09	696	1.12	0.42	0.91	29.18	5.05	1934
WRBFGR2	Deckor	4.9	2.9	260	259	37					1.12	0.41	0.91	29.23	9.34	
LB44	Ugnite	3.6	4.4	436	471	29	0.42	1134	14.97	649	1.06	N/A	1.26	3.39		
LB55	Ugnite	4.97	5.2	621	707	37	0.43	1269	14.07	658	1.18	N/A	1.32	3.58		1875
LB53	Ugnite	5.0	3.3	591	602	36	0.3	1244	15.57	672	1.06	N/A	1.18	3.58		1924
LB54R	Ugnite	5.03	4.1	594	633	36		1415	14.96	678	1.1	N/A	1.24	3.48		1976
LB54RR	Ugnite	5.1	4.1	721	769	29		1540	15.28	674	1.12	N/A	1.24	3.52		1907
LB54	Ugnite	5.1	4.2	760	813	24	0.23	1517	15.07	696	1.09	N/A	1.24	3.18		
LB54R4	Ugnite	5.2	4.0	670	709	27					1.11	N/A	1.32	3.45		
LB54R3	Ugnite	5.2	4.0	693	734	36					1.1	N/A	1.32	3.45		
BD11501	Ugnite	5.2	4.1	619	659	23	0.2	1100	15.76	679	1.1	N/A	1.24	3.48		1857
BD11402	Ugnite	5.3	3.8	645	675	33	0.22	1241	15.64	682	1.08	N/A	1.22	3.36		1809
BD11401	Ugnite	5.01	4.3	609	656	36		1365	14.96	696	1.12	N/A	1.23	3.56		1790
BD11404	Ugnite	5.2	4.1	643	686	27		1060	15.46	679	1.11	N/A	1.24	3.42		1852
BD11502	Ugnite	5.1	3.9	660	696	24		1026	15.11	690	1.1	N/A	1.23	3.51		1879
BD11403	Ugnite	5.23	3.46	614	630	28		1069	15.72	673	1.08	N/A	1.19	3.41		
LB64	Ugnite	5.7	4.1	707	754	27		1394	15.11	658	1.13	N/A	1.25	3.84		
LRB5SR1	Ugnite	5.09	2.98	331	331	29	0.23	1138	15.98	663	1.06	0.43	0.89	28.65	0	1809
LRB5SR1R	Ugnite	5.06	3.21	343	347	37				664	1.06	0.45	0.9	28.01	0	
LRB5SR1FGR	Ugnite	5.1	3.13	289	291	33	0.2	1029	15.86	670	1.06	0.44	0.9	27.6	10.51	1768
LRB5SR2	Ugnite	5.14	2.86	290	286	29	0.26	1002	16.41	666	1.07	0.45	0.86	33.41	0	1826
LRB5SR2FGR	Ugnite	5.41	2.9	234	233	45	0.42	1032	16.21	676	1.06	0.44	0.87	32.03	9.34	1801
LRB5SR2NAF	Ugnite	5.45	2.7	205	202	54		1002	16.31		1.06	0.34	0.85	31.81	9.68	
LRB5SR3FGR	Ugnite	5.07	3.0	279	279	33	0.7	927	16.11	685	1.09	0.39	0.93	22.36	9.86	1777
LRB5SR3	Ugnite	5.17	3.1	360	362	22		1002	16.23	674	1.09	0.45	0.95	21.94		1825
LRB6SR1	Ugnite	5.72	2.91	325	323	30		1022	16.02	664	1.09	0.44	0.91	27.73		1907
LRB6SR1GT	Ugnite	5.7	3.17	345	348	28		927	16.02		1.1	0.43	0.91	27.53	20.6	1763
LRB3.5SR1	Ugnite	3.44	6.4	252	311	23		561	13.02	738	1.11	0.47	0.93	28.99	0	
LRB3SR1	Ugnite	2.96	7.52	227	303	18		560	11.65	731	1.12	0.49	0.93	30.65	0	
LRB4SR1	Ugnite	4.06	3.95	327	345	170				733	1.08	0.48	0.92	27.47	0	
LRB601	Ugnite	5.28	2.61	369	365	31		926	16.71	672	1.06	0.42	0.9	27.06	0	1820
LRB602	Ugnite	5.3	2.89	302	300	65		1166	16.54	696	1.07	0.43	0.9	26.97	0	1804
LRB602A	Ugnite	5.06	3.16	347	350	40		1223	16.24	661	1.11	0.42	0.91	28.21	0	
LRB603	Ugnite	5.29	3.36	339	346	36		1251	16.04	674	1.09	0.43	0.91	27	0	1892
LRB603A	Ugnite	5.22	3.18	340	343	30		1139	16.19	665	1.1	0.43	0.92	27.36	0	
LRB604	Ugnite	5.09	3.45	285	292	24		1176	15.76	696	1.14	0.41	0.94	28.06	0	1909
LRB604B	Ugnite	5.25	2.82	366	362	75		1006	15.85	690	1.06	0.42	0.9	27.19	0	

Appendix E

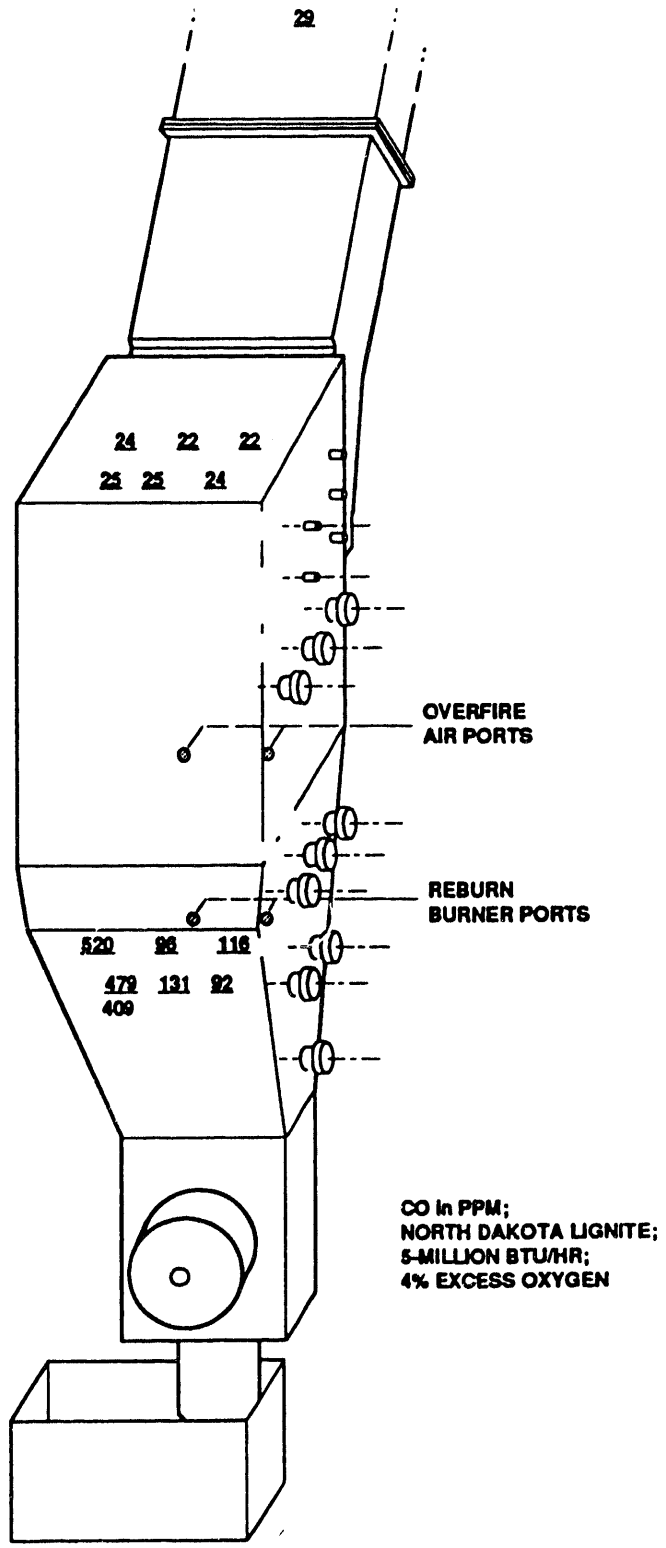
IN-FURNACE PROBING DATA



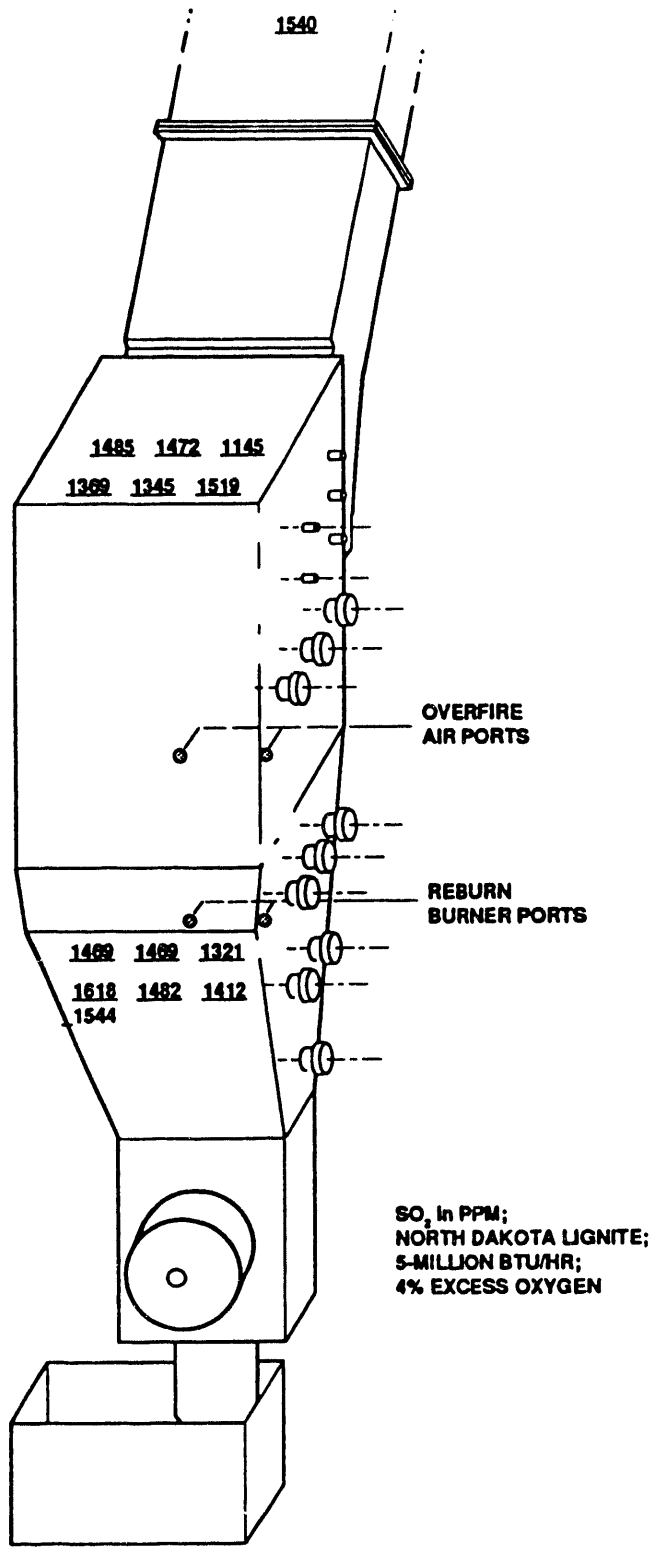
IN-FURNACE TEMPERATURE LEVELS – BASELINE CONDITIONS



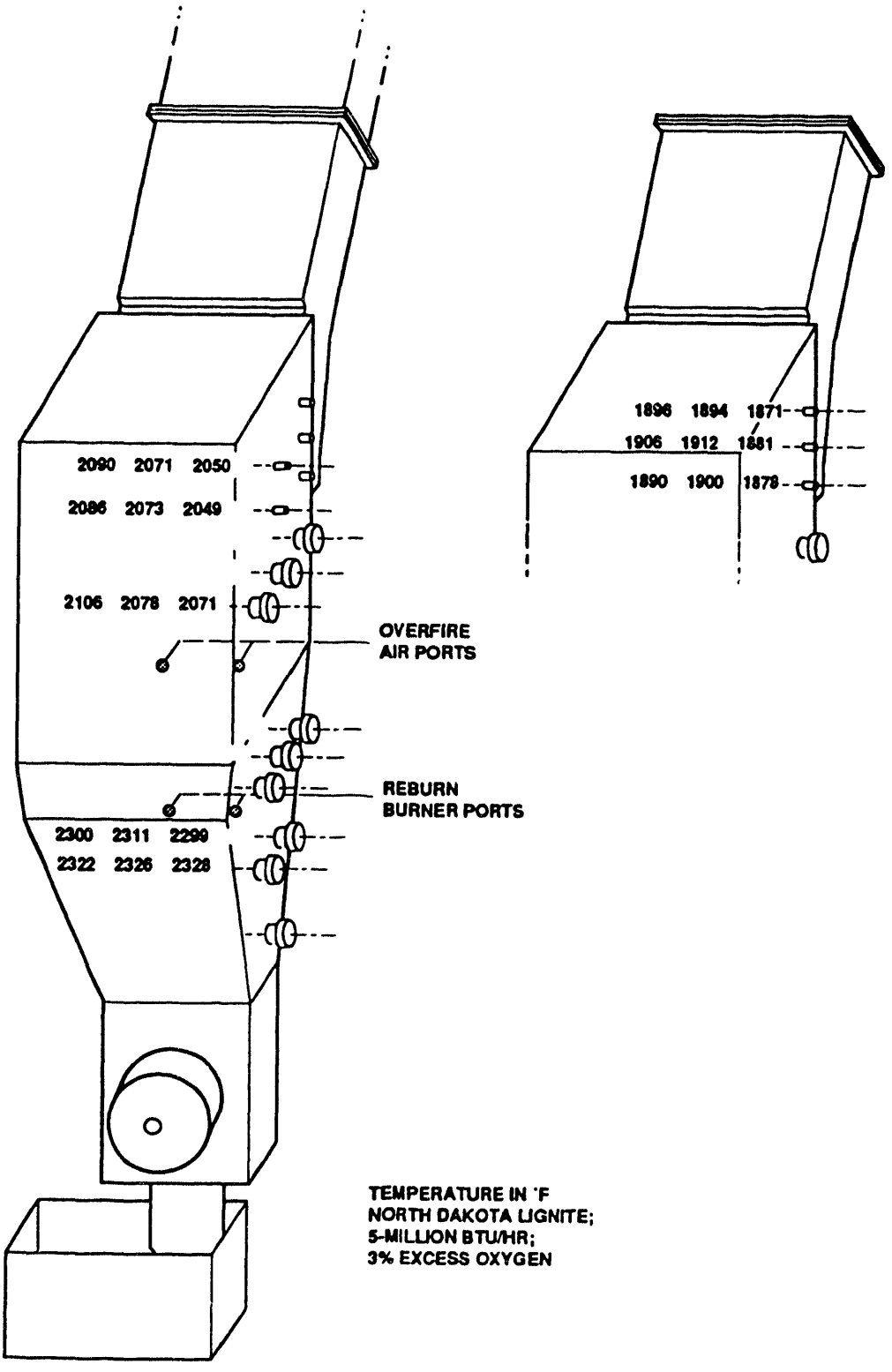
IN-FURNACE O_2 LEVELS – BASELINE CONDITIONS



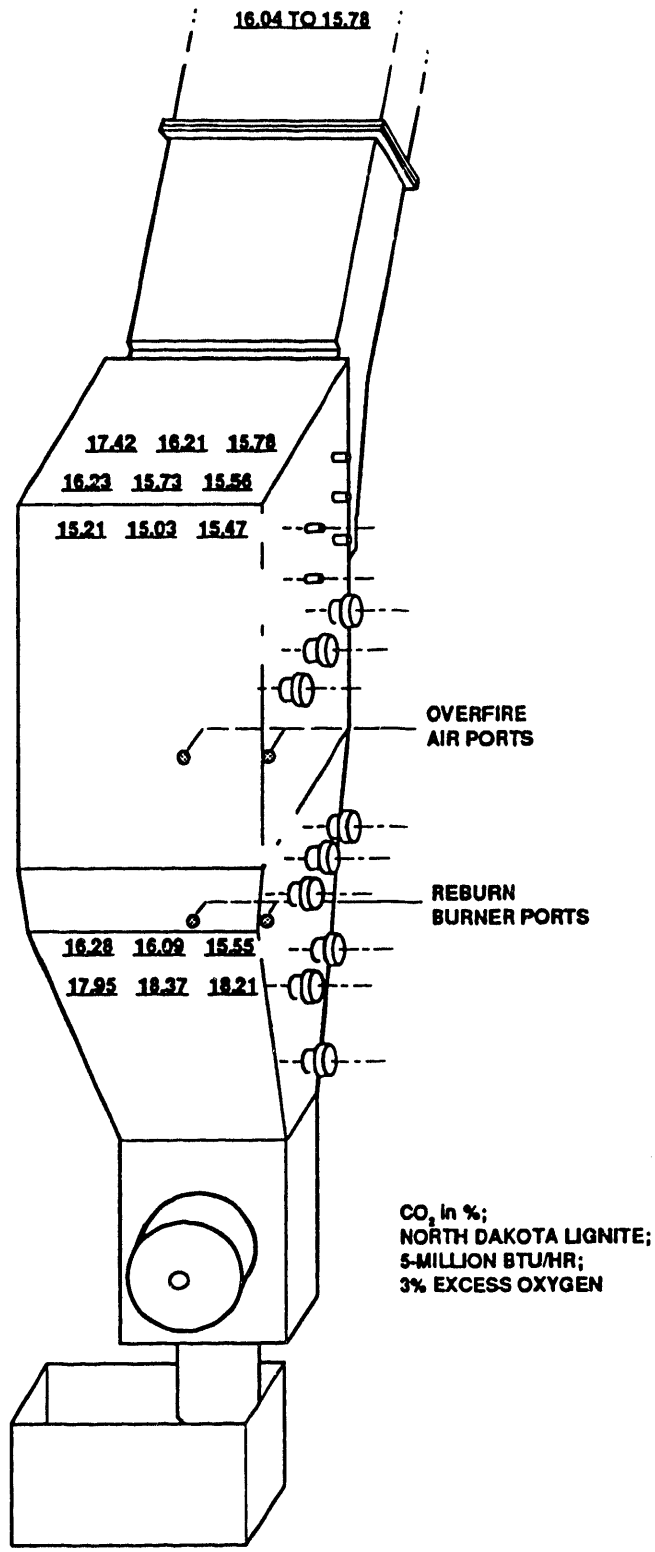
IN-FURNACE CO LEVELS – BASELINE CONDITIONS



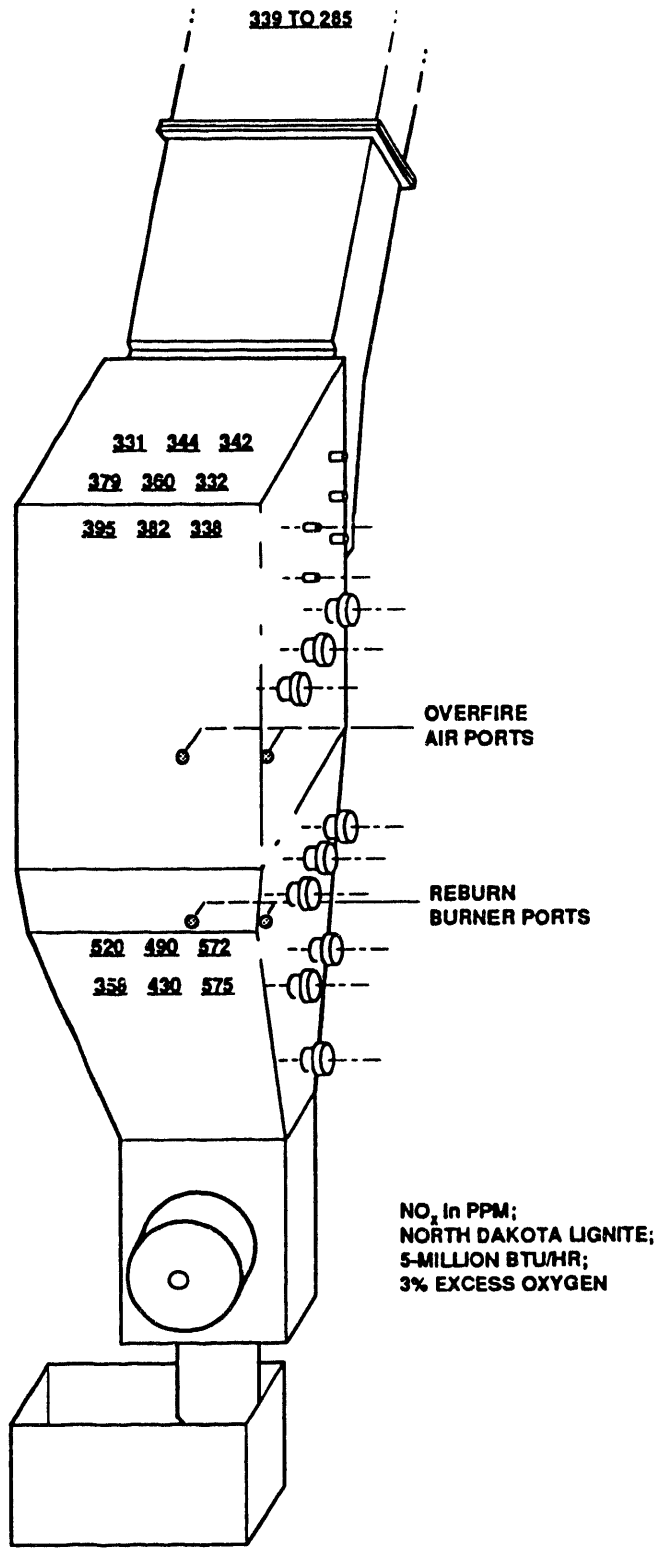
IN-FURNACE SO_2 LEVELS – BASELINE CONDITIONS



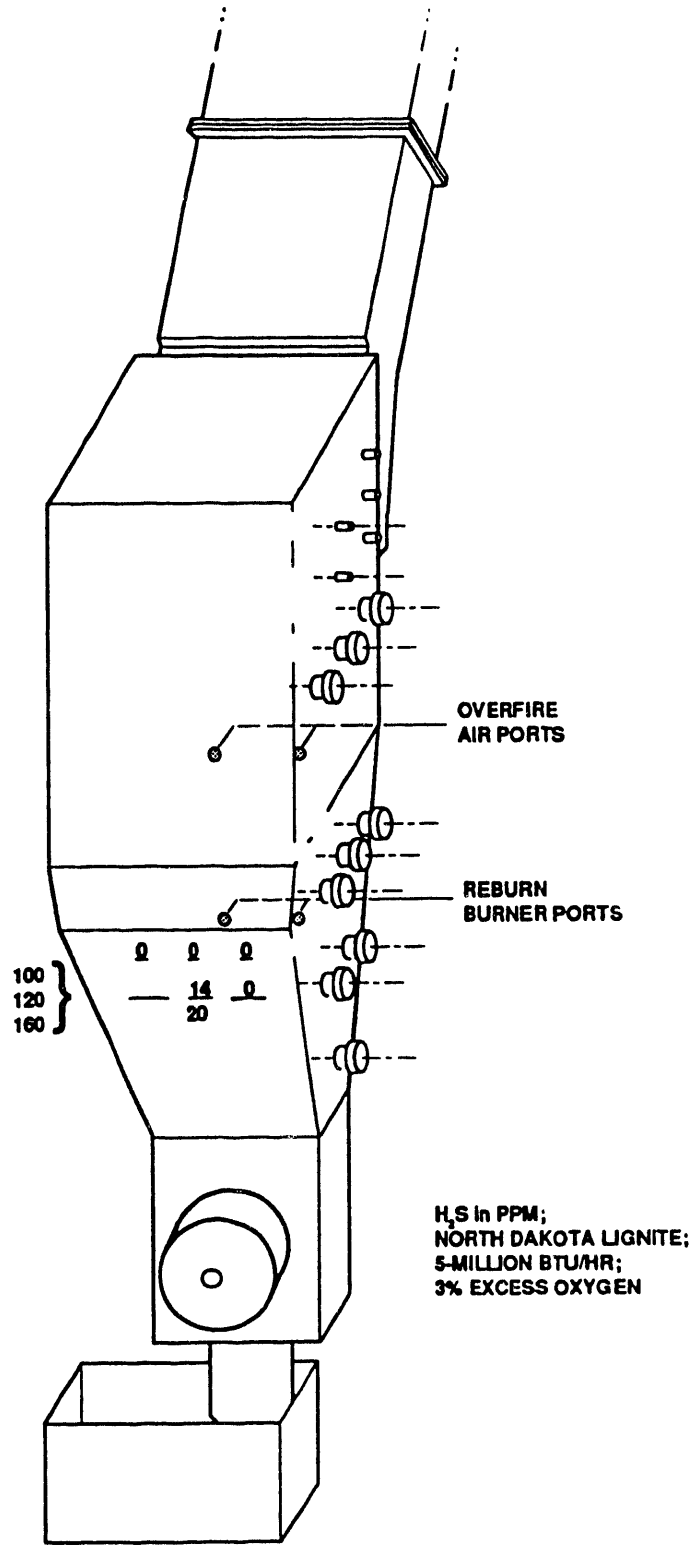
IN-FURNACE TEMPERATURE LEVELS – REBURNING CONDITIONS



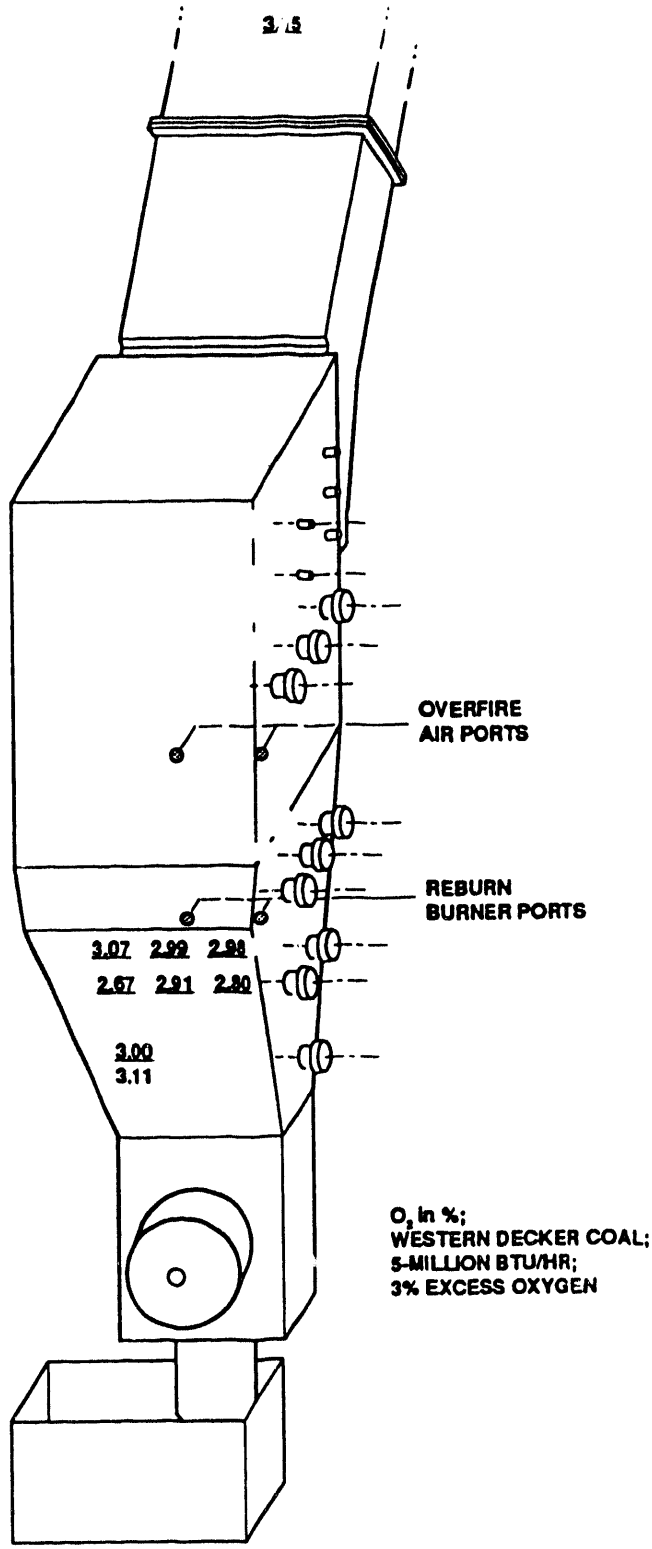
IN-FURNACE CO_2 LEVELS – REBURNING CONDITIONS



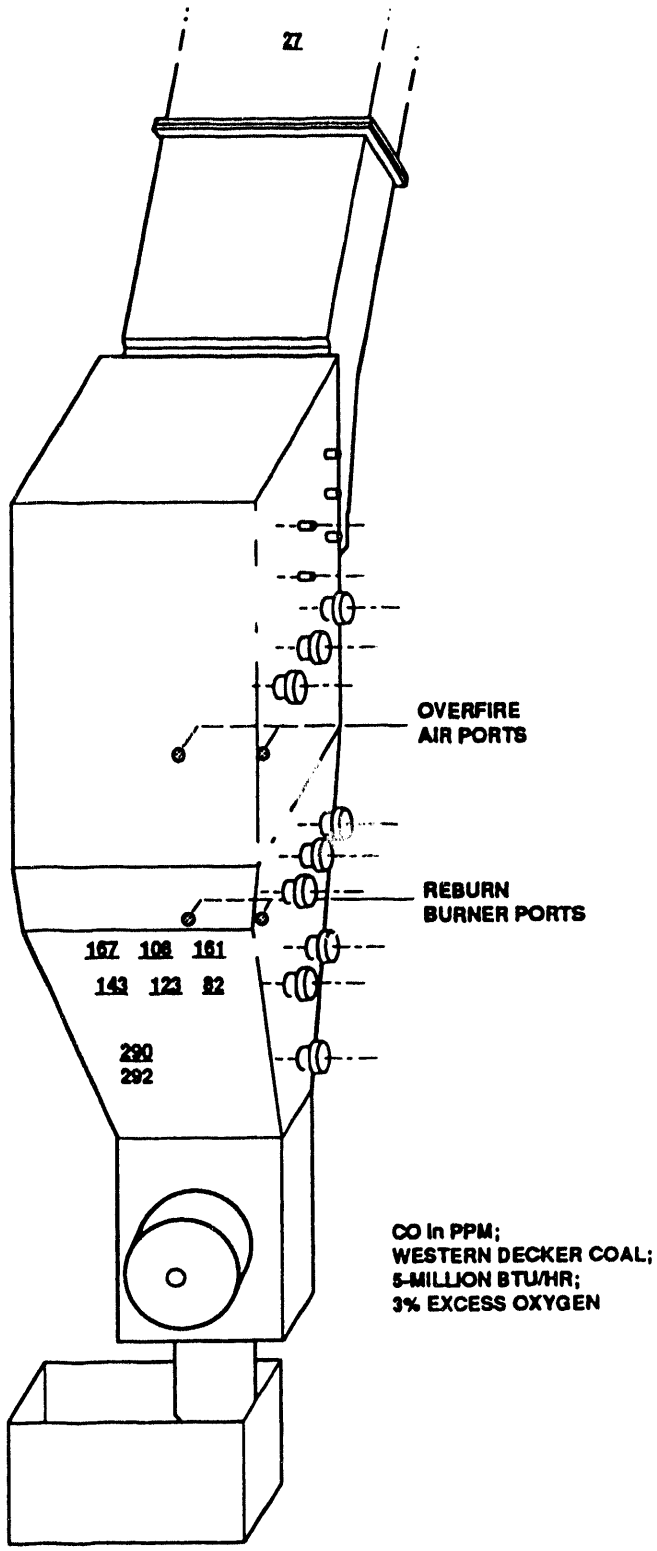
IN-FURNACE NO_x LEVELS – REBURNING CONDITIONS



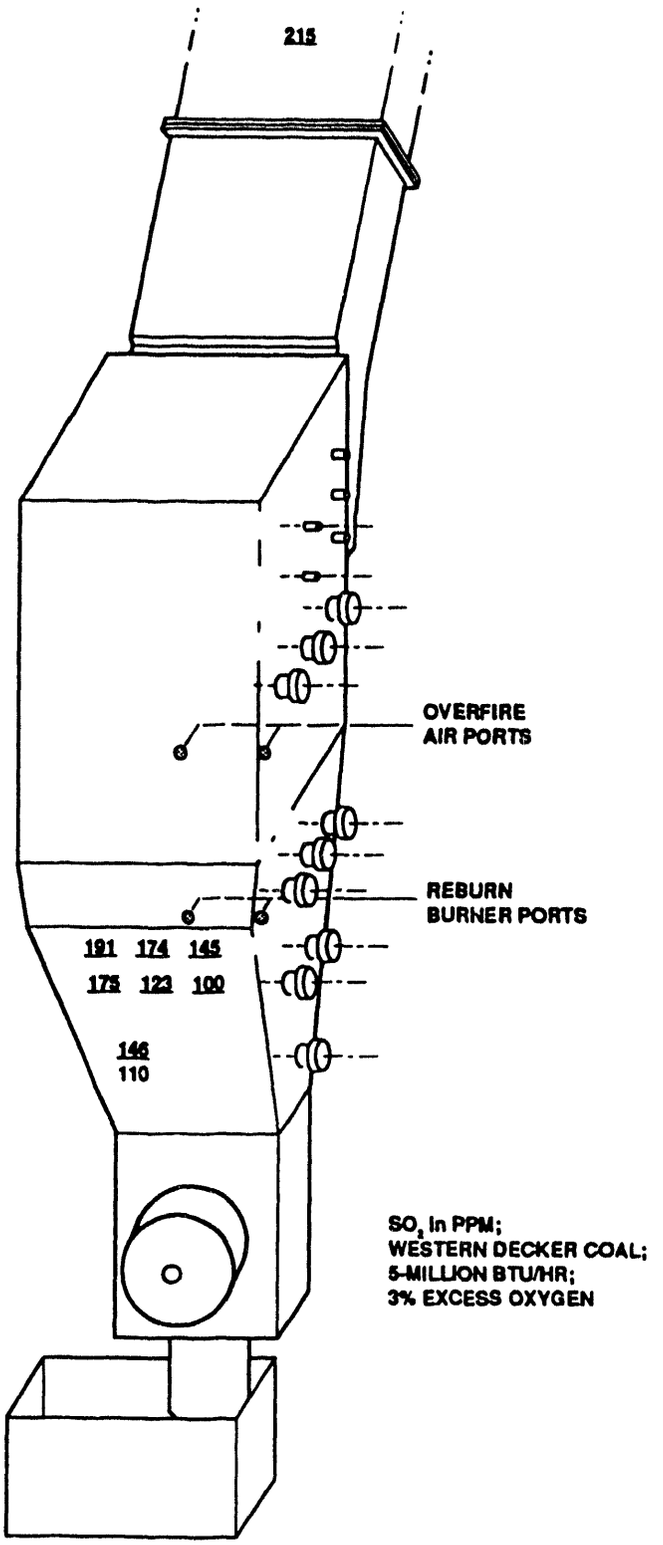
IN-FURNACE H_2S LEVELS – REBURNING CONDITIONS



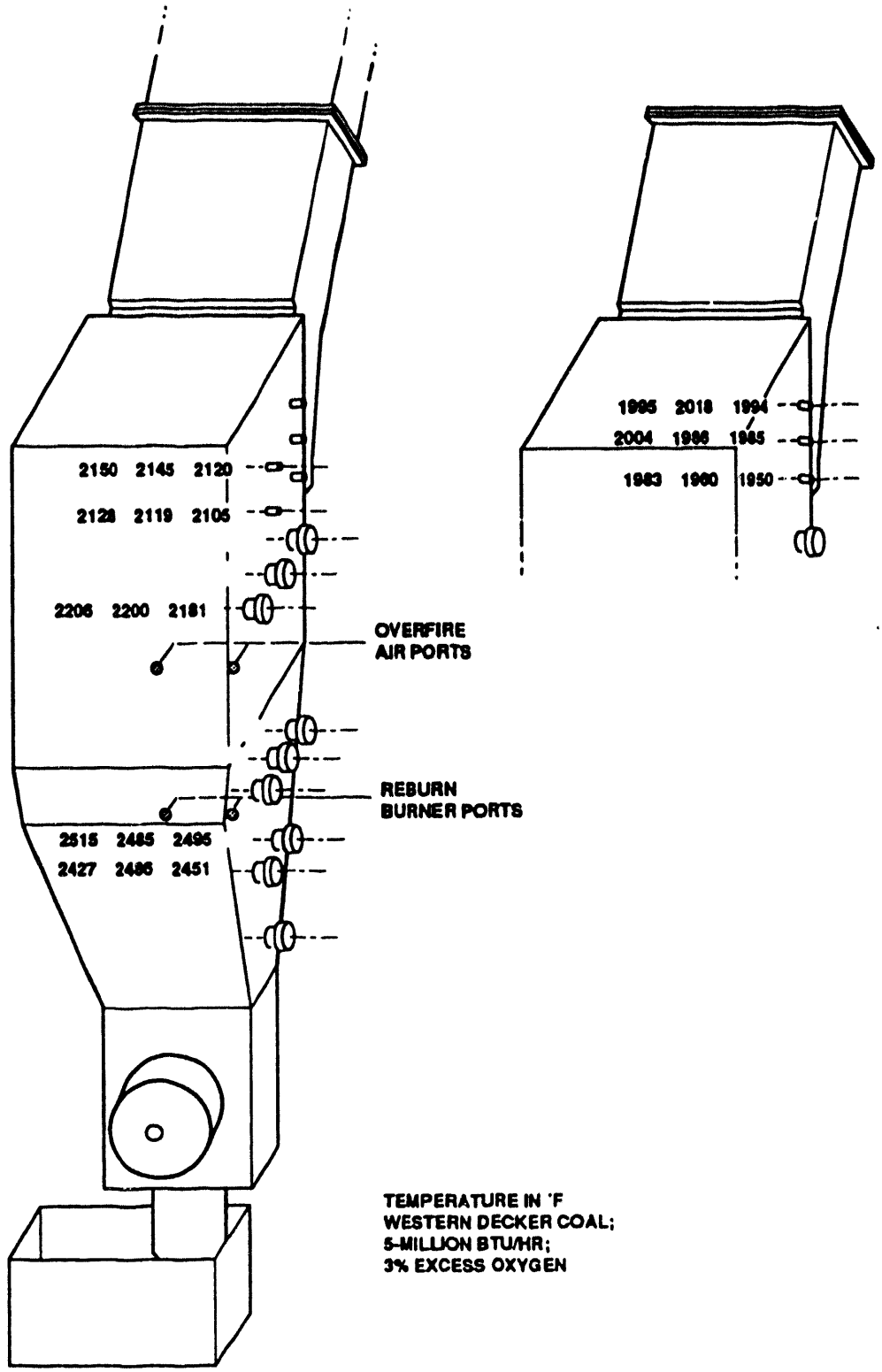
IN-FURNACE O_2 LEVELS – BASELINE CONDITIONS



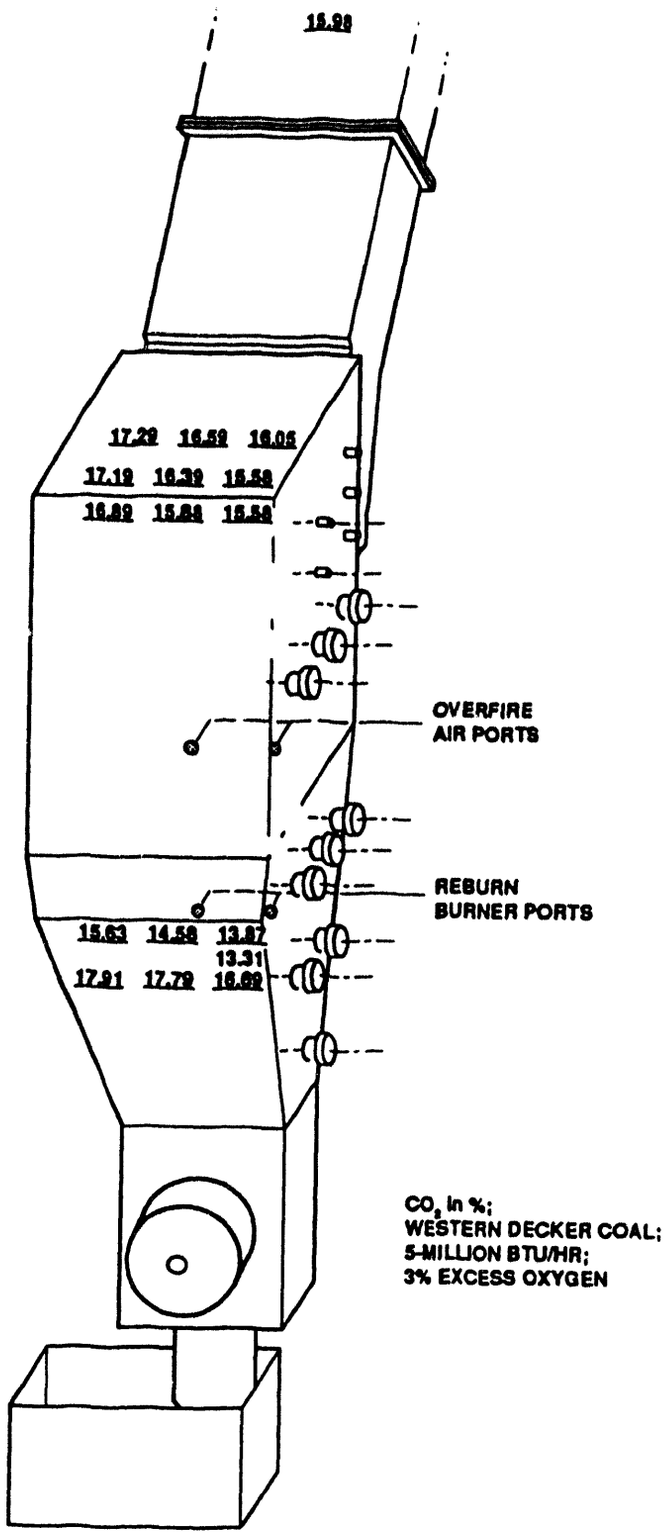
IN-FURNACE CO LEVELS – BASELINE CONDITIONS



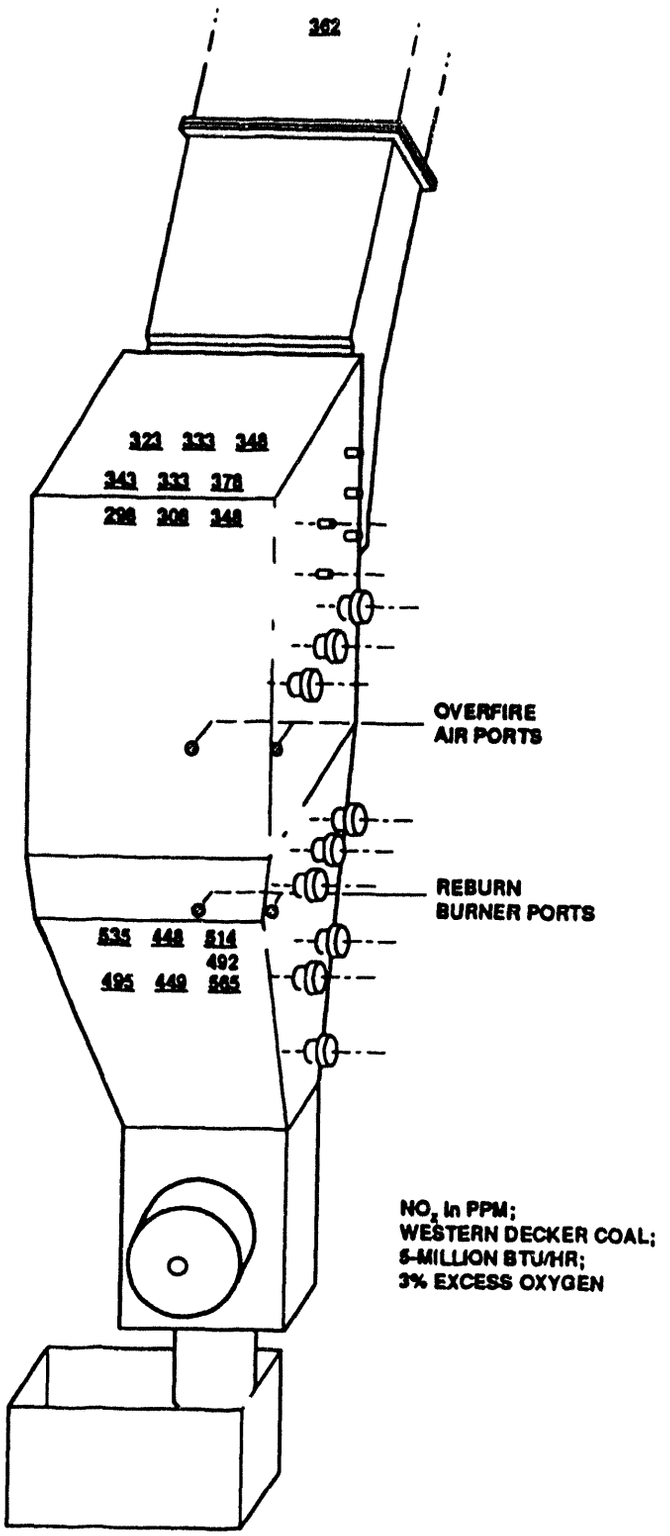
IN-FURNACE SO_2 LEVELS – BASELINE CONDITIONS



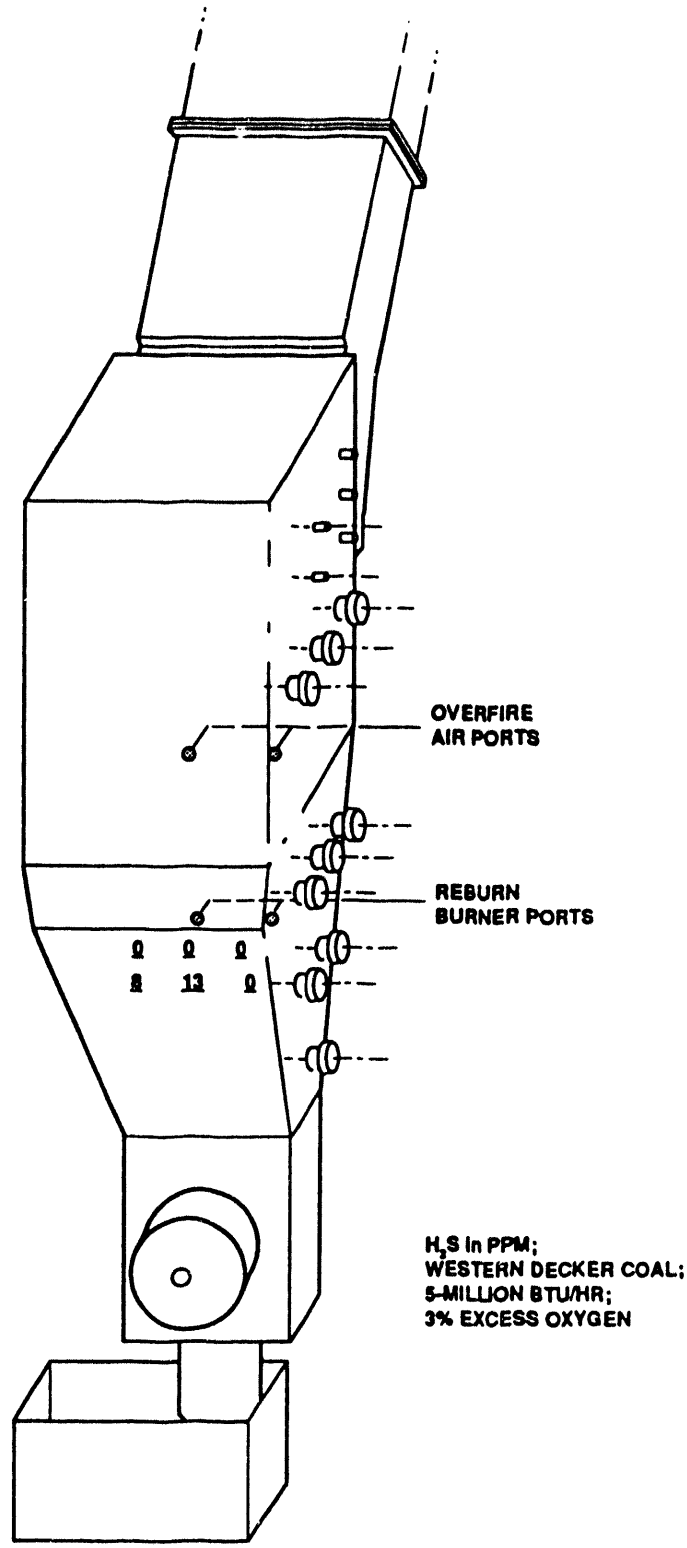
IN-FURNACE TEMPERATURE LEVELS – REBURNING CONDITIONS



IN-FURNACE CO_2 LEVELS – REBURNING CONDITIONS



IN-FURNACE NO_x LEVELS – REBURNING CONDITIONS



IN-FURNACE H_2S LEVELS – REBURNING CONDITIONS

APPENDIX NO. 4

Nelson Dewey In-Furnace Gas Species and Temperature Measurements

- Baseline/Reburning In-Furnace Probing Data at 110 MW
- Baseline/Reburning In-Furnace Probing Data at 82 MW

BASELINE/REBURNING IN-FURNACE MEASUREMENTS AT 110 MW

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 700

Test ID: 2B
Condition: Post-retrofit baseline 110 MW

Temperatures F

Rearwall

AVG: 2246

2297	2285	2263	2277	2258	2223	2097	2071	2294	2318	2323

LHSW **RHSW**

AVG: 2269

	2266	2276	2327	2313	2279	2298	2249	2225	2239	2222

Averaged Economizer Outlet Data

O_2	3.5
CO @3% O_2	70
NO_x @3% O_2	603

Frontwall

Test ID: 20T
Condition: Reburning - 110 MW GR fan on/GR to BNR optimized secondary air

Temperatures F

Rearwall

AVG: 2087

1973	2054	2037	2013	2010	2032	2088	2110	2124	2161	2241

LHSW **RHSW**

AVG: 2190

1989	2125	2174	2197	2234	2237	2206	2246	2244	2230	2203

Averaged Economizer Outlet Data

O_2	3
CO @3% O_2	77
NO_x @3% O_2	270

Frontwall

Test ID: Similar to 8P
Condition: Reburning - 110 MW GR fan on/GR to BNRS optimized secondary air

Temperatures F

Rearwall

AVG: 2203

1957	2098	2125	2132	2153	2227	2282	2315	2333	2412	

LHSW **RHSW**

AVG: 2217

2078	2108	2162	2215	2266	2266	2253	2258	2279	2284	

Averaged Economizer Outlet Data

O_2	2.84
CO @3% O_2	81
NO_x @3% O_2	272

Frontwall

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 700

Test ID: 2B
Condition: Baseline - 110 MW

O_2%

Rearwall

AVG: 2.5

1.5	1.6	2.6	3.0	3.5	3.8	2.1	2.1	2.2	2.5	2.1

LHSW **RHSW**

AVG: 3.7

	3.7	3.7	3.9	3.8	3.8	3.6	3.8	3.7	3.6	3.8

Frontwall

Averaged Economizer Outlet Data

O_2	3.5
CO @3% O_2	70
NO_x @3% O_2	603

Test ID: 20T
Condition: Reburning - 110 MW
GR fan on/GR to BNR
optimized secondary air

O_2%

Rearwall

AVG: 5.1

	3.3	3.1	4.3	5.6	6.3	6.2	5.8	5.5	5.2	5.4

LHSW **RHSW**

AVG: 2.8

2.8	2.8	3.2	2.7	2.7	2.5	2.8	3.0	2.9	2.9	2.8

Frontwall

Averaged Economizer Outlet Data

O_2	3
CO @3% O_2	77
NO_x @3% O_2	270

Test ID: Similar to 8P
Condition: Reburning -110 MW
GR fan on/GR to BNRS
optimized secondary air

O_2%

Rearwall

AVG: 2.7

1.8	1.9	1.6	3	3.2	3.3	3.6	3.2	2.3	3.1	

LHSW **RHSW**

AVG: 4

4.8	4.1	3.9	3.8	3.6	3.8	3.9	4.1	4.1	4.3	

Frontwall

Averaged Economizer Outlet Data

O_2	2.84
CO @3% O_2	81
NO_x @3% O_2	272

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 700

CO ppm

Test ID: 2B
Condition: Baseline - 110 MW

Rearwall

AVG: 174

180	185	165	180	170	180	175	175	175	170	160

LHSW **RHSW**

AVG: 213

220	215	225	205	210	200	210	200	205	215	250

Averaged Economizer Outlet Data

O_2	3.5
CO @3% O_2	70
NO_x @3% O_2	603

Frontwall

Test ID: 20T
Condition: Reburning - 110 MW
GR fan on/GR to BNR
optimized secondary air

CO ppm

Rearwall

AVG: 653

	2350	2110	1175	90	40	110	170	220	70	200

LHSW **RHSW**

AVG: 1481

1080	700	1220	1920	1520	2050	2070	*****	1640	1390	1210

Averaged Economizer Outlet Data

O_2	3
CO @3% O_2	77
NO_x @3% O_2	270

Frontwall

Test ID: Similar to 8P
Condition: Reburning - 110 MW
GR fan on/GR to BNRS
optimized

CO ppm

Rearwall

AVG: 1320

3500	2750	3000	1000	367	312	275	200	1200	600	

LHSW **RHSW**

AVG: 246

170	175	170	200	275	670	400	160	115	130	

Averaged Economizer Outlet Data

O_2	2.84
CO @3% O_2	81
NO_x @3% O_2	272

Frontwall

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 676

Test ID: 2B
Condition: Baseline - 110 MW

Temperatures F

Rearwall

2354	2462
2570	2602
2580	2572

LHSW **RHSW**

AVG: 2260

2181	2188	2183	2211	2243	2260	2281	2334	2383

Averaged Economizer Outlet Data

O_2	3.5
CO @3% O_2	70
NO_x @3% O_2	603

Frontwall

Test ID: 20T
Condition: Reburning - 110 MW
GR fan on/GR to BNR
optimized secondary air

Temperatures F

Rearwall

LHSW **RHSW**

AVG: 2658

2555	2626	2702	2699	2671	2639	2674	2696	2659

Averaged Economizer Outlet Data

O_2	3
CO @3% O_2	77
NO_x @3% O_2	270

Frontwall

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 676

O_2%

Test ID: 2B
Condition: Baseline - 110 MW

Rearwall

	3.5
	3.2

	3.2
	3.0

LHSW **RHSW**

AVG: 3.7

	4.0	4.1	3.6	3.8	3.6	3.5	3.7	3.5

Averaged Economizer Outlet Data

O_2	3.5
CO @3% O_2	70
NO_x @3% O_2	603

Frontwall

Test ID: 20T
Condition: Reburning - 110 MW
GR fan on/GR to BNR
optimized secondary air

O_2%

Rearwall

LHSW **RHSW**

AVG: 0.5

0.2	0.1	0.4	0.2	0.1	0.1	0.5	1.5	1.6

Averaged Economizer Outlet Data

O_2	3
CO @3% O_2	77
NO_x @3% O_2	270

Frontwall

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 676

Test ID: 2B
Condition: Baseline - 110 MW

CO ppm

Rearwall

330	160
190	170

LHSW **RHSW**

AVG: 239

230	230	255	250	280	260	210	200

Averaged Economizer Outlet Data

O_2	3.5
CO @3% O_2	70
NO_x @3% O_2	603

Frontwall

Test ID: 20T
Condition: Reburning - 110 MW
GR fan on/GR to BNR
optimized secondary air

CO ppm

Rearwall

LHSW **RHSW**

AVG: 6639

6650	7200	6400	6400	7200	7200	6900	5900	5900

Averaged Economizer Outlet Data

O_2	3
CO @3% O_2	77
NO_x @3% O_2	270

Frontwall

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 676

Test ID: 2B
Condition: Baseline - 110 MW

NO_x ppm

Rearwall

495	525
390	390

LHSW **RHSW**

AVG: 490

585	377	350	390	600	615	600	401

Averaged Economizer Outlet Data

O_2	3.5
CO @3% O_2	70
NO_x @3% O_2	603

Frontwall

Test ID: 20T
Condition: Reburning - 110 MW
GR fan on/GR to BNR
optimized secondary air

NO_x ppm

Rearwall

LHSW **RHSW**

AVG: 443

340	460	440	480	460	390	440	500	480

Averaged Economizer Outlet Data

O_2	3
CO @3% O_2	77
NO_x @3% O_2	270

Frontwall

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 666

Test ID: 20T
Condition: Reburning - 110 MW
GR fan on/GR to BNR
optimized secondary air

O_2%

Rearwall

AVG: 1.96

LHSW							RHSW
	2.3	1.9	2.0	1.3	1.8	2.0	2.4

Averaged Economizer Outlet Data

O_2	3
CO @3% O_2	77
NO_x @3% O_2	270

Frontwall

Test ID: 20T
Condition: Reburning - 110 MW
GR fan on/GR to BNR
optimized secondary air

CO ppm

Rearwall

AVG: 364

LHSW							RHSW
	195	260	460.0	850	390	195.0	200

Averaged Economizer Outlet Data

O_2	3
CO @3% O_2	77
NO_x @3% O_2	270

Frontwall

BASELINE/REBURNING IN-FURNACE MEASUREMENTS AT 82 MW

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 700

Test ID: 4B
Condition: Baseline - 82 MW

Temperatures F

Rearwall

AVG: 2119

2130	2136	2097	2136	2121	2109	2090	2094		2135	2143

LHSW **RHSW**

AVG: 2089

	2030	2122	2122	2101	2087	2077	2063	2069	2110	2110

Averaged Economizer Outlet Data

O_2	3.65
CO @3% O_2	94
NO_x @3% O_2	237

Frontwall

Test ID: 47T
Condition: Reburning - 82 MW
GR fan on/GR to BNR
optimized condition

Temperatures F

Rearwall

AVG: 1989

1792	1929	1957	1970	2008	2027	2030	2017	1989	1975	1990

LHSW **RHSW**

AVG: 2120

1962	2056	2069	2095	2102	2103	2125	2160	2166	2184	2142

Averaged Economizer Outlet Data

O_2	2.83
CO @3% O_2	121
NO_x @3% O_2	237

Frontwall

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 700

O_2%

Test ID: 4B
Condition: Baseline - 82 MW

Rearwall

AVG: 3.5

3.4	3.2	3.5	3.4	3.5	3.8	3.7	3.7	3.8	3.1	3.1

LHSW **RHSW**

AVG: 3.0

	3.9	3.0	2.9	2.8	3.0	3.1	2.9	2.9	2.9	3.0

Averaged Economizer Outlet Data

O_2	3.65
CO @3% O_2	94
NO_x @3% O_2	237

Frontwall

Test ID: 47T
Condition: Reburning - 82 MW
GR fan on/GR to BNR
optimized condition

O_2%

Rearwall

AVG: 6.2

	6.2	5.9	5.7	6.2	5.8	5.7	6.2	6.6	6.9	7

LHSW **RHSW**

AVG: 3.2

	4.2	4.6	4.4	4.2	3.7	3.8	2.4	2	2	0.5

Averaged Economizer Outlet Data

O_2	2.83
CO @3% O_2	121
NO_x @3% O_2	237

Frontwall

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 700

Test ID: 4B
Condition: Baseline - 82 MW

CO ppm

Rearwall

AVG: 42

80	70	60	50	50	50	50	50	5	0	0

LHSW **RHSW**

AVG: 3

	50	70	40	40	40	80		0	0	0

Averaged Economizer Outlet Data

O_2	3.65
CO @3% O_2	94
NO_x @3% O_2	237

Frontwall

Test ID: 47T
Condition: Reburning - 82 MW
GR fan on/GR to BNR
optimized condition

CO ppm

Rearwall

AVG: 96

	70	35	35	30	190	170	200	100	60	70

LHSW **RHSW**

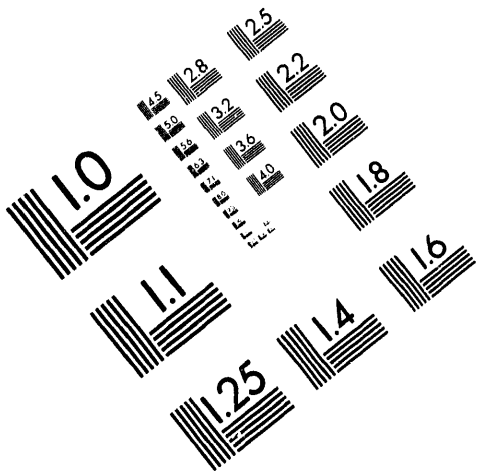
AVG: 2175

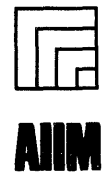
	800	1575	650	400	900	1600	2000	3250	4525	6050

Averaged Economizer Outlet Data

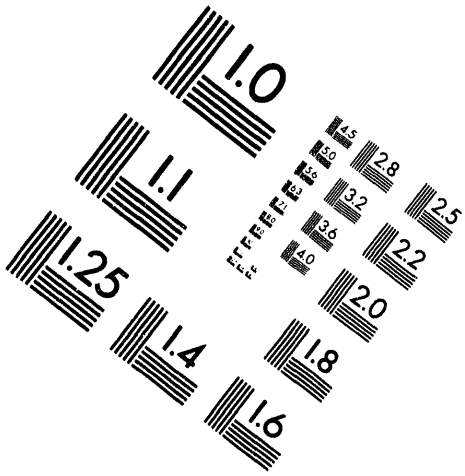
O_2	2.83
CO @3% O_2	121
NO_x @3% O_2	237

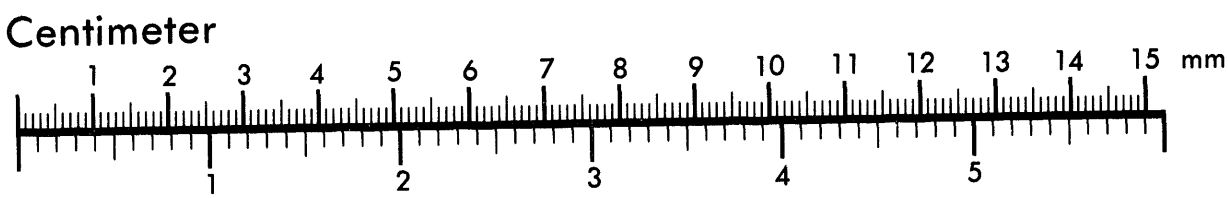
Frontwall

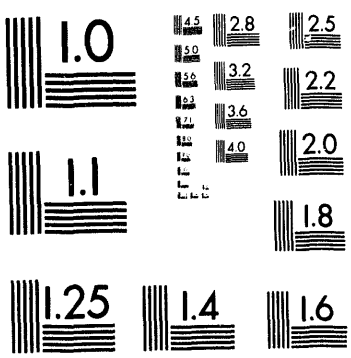


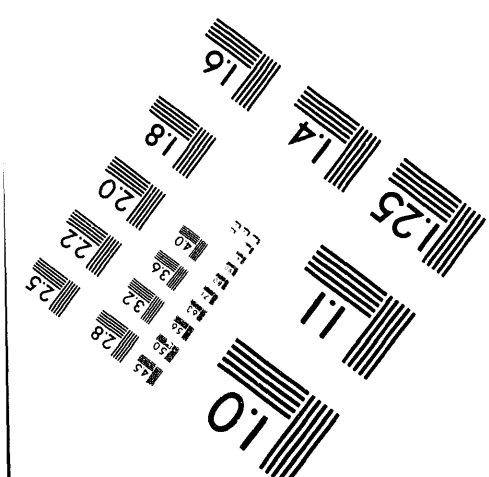


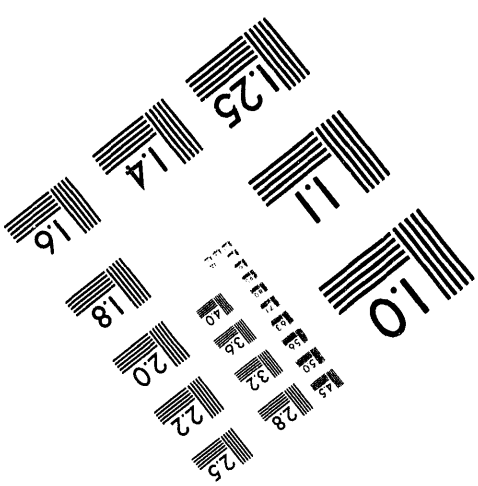
Association for Information and Image Management
1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202











MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

2 of 9

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 676

Temperatures F

Test ID: 4B
Condition: Baseline - 82 MW

Rearwall

2358	2358
2381	2381

LHSW **RHSW**

AVG: 1952

1873	1926	1966	1943	1982	1945	1942	2040

Averaged Economizer Outlet Data

O_2	3.65
CO @3% O_2	94
NO_x @3% O_2	237

Frontwall

Temperatures F

Test ID: 47T
Condition: Reburning - 82 MW
GR fan on/GR to BNR
optimized condition

Rearwall

LHSW **RHSW**

AVG: 2489

2470	2535	2566	2474	2483	2434	2461	2499	2457

Averaged Economizer Outlet Data

O_2	2.83
CO @3% O_2	121
NO_x @3% O_2	237

Frontwall

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 676

O_2%

Test ID: 4B
Condition: Baseline - 82 MW

Rearwall

3.4	3.3
2.8	3.2

LHSW **RHSW**

AVG: 3.4

4.9	3.3	3.2	3.1	3	3.1	3.3	3.2

Averaged Economizer Outlet Data

O_2	3.65
CO @3% O_2	94
NO_x @3% O_2	237

Frontwall

Test ID: 47T
Condition: Reburning - 82 MW
GR fan on/GR to BNR
optimized condition

O_2%

Rearwall

LHSW **RHSW**

AVG: 0.4

0.8	0.7	0.4	0.1	0	0.1	0.1	0.6

Averaged Economizer Outlet Data

O_2	2.83
CO @3% O_2	121
NO_x @3% O_2	237

Frontwall

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 676

Test ID: 4B
Condition: Baseline - 82 MW

CO ppm

Rearwall

60	100
0	80

LHSW **RHSW**

AVG: 48

60	45	45	40	45	50	53	47

Averaged Economizer Outlet Data

O_2	3.65
CO @3% O_2	94
NO_x @3% O_2	237

Frontwall

Test ID: 47T
Condition: Reburning - 82 MW
GR fan on/GR to BNR
optimized condition

CO ppm

Rearwall

LHSW **RHSW**

AVG: 6156

5900	5300	6100	6250	6850	6350	6200	6300

Averaged Economizer Outlet Data

O_2	2.83
CO @3% O_2	121
NO_x @3% O_2	237

Frontwall

Wisconsin Power & Light
Nelson Dewey Station Cyclone Reburn
In-furnace Probing Elevation 676

Test ID: 4B
Condition: Baseline - 82 MW

NO_x ppm

Rearwall

495	525
480	465

LHSW **RHSW**

AVG: 480

420	420	435	480	510	525	540	510

Averaged Economizer Outlet Data

O_2	3.65
CO @3% O_2	94
NO_x @3% O_2	237

Frontwall

Test ID: 47T
Condition: Reburning - 82 MW
GR fan on/GR to BNR
optimized condition

NO_x ppm

Rearwall

LHSW **RHSW**

AVG: 358

425	450	390	280	210	330	380	400

Averaged Economizer Outlet Data

O_2	2.83
CO @3% O_2	121
NO_x @3% O_2	237

Frontwall

APPENDIX NO. 5

Balance of Plant Details

1.0 Pulverizer & Feeder Enclosure

An enclosure was built to house the coal reburn fuel preparation equipment and its auxiliaries. The new structure is attached to, and integrated with the existing Unit #2 boiler house.

1.1 Foundation

A new foundation was installed for the pulverizer/feeder enclosure. Design of the foundation indicated a need for 81 pilings to be driven, reinforced with steel bar internally and filled with concrete. These reinforcing bars are tied into the foundation concrete reinforcing bars. Once this was complete and the reinforcing steel was placed into position for the main slab, the bulk of the concrete was poured. The main slab is 5-1/2 feet deep, about 60 feet long and 30 feet wide. All anchor bolts for major equipment and structural steel were set prior to pouring the concrete.

1.2 Structure

The coal reburn enclosure consists of insulated metal siding, a metal sided roof, and is approximately 61 feet long by 28 feet wide and has an overall approximate height of 71 feet. The enclosure, which is directly attached to the east side of the existing Unit #2 boiler house, consists of two (2) main floors; the pulverizer floor and the feeder floor.

The facility includes the following items:

- Insulated rolling steel door
- Floor drainage system
- Gutters and downspouts
- Heating and ventilation system
- Lighting
- Public address system
- Fire protection system
- Access platforms and stairways
- Direct access to the existing boiler house

1.3 Steam Heating & Pulverizer Inerting System

Steam is supplied for both building heat and the pulverizer inerting process. The steam source is from the plant's existing heating steam piping. Steam is available from both Unit #1 and Unit #2 heating systems.

1.4 Fire Protection System

Four (4) fire hose stations are located throughout the new reburn facility. Water for the new fire protection system is sourced from the plant's existing service water system.

1.5 Conveyor Extension Enclosure

A newly built enclosure accommodates the extension of the existing tripper conveyor equipment. The new enclosure is attached to the main boiler house directly above the reburn coal silo and pulverizer enclosure. The conveyor extension is now an integral part of the existing conveyor system. A new coal chute directs the coal from the feeder extension enclosure at elevation 738′ - 0" to the top of the new coal silo at elevation 718′ - 0".

The new enclosure consists of insulated aluminum siding and roof. The structure, attached to the East side of the existing boiler house, extends out approximately 12′. The structure is approximately 16′ wide with a nominal height of 12′.

The new enclosure houses the following equipment:

- Relocated conveyor head pulley & drive
- Relocated dust collection pick-up duct
- Relocated belt cleaner
- Miscellaneous related hardware

2.0 Auxiliaries

2.1 Service Water

Service water is required for the pulverizer inerting and clearing process, pyrites removal system, providing the cooling medium for the pulverizer lube oil set, PA fan bearings, and the pulverizer hydraulic loading system. A 4" pipe connection ties into the existing 12" High Head Service Water line, located in the main boiler house, to satisfy the service water requirements.

2.2 Instrument Air

Instrument air is required to operate the various components involved in the coal reburn process. The existing plant instrument air system is capable of meeting the total needs for the newly installed equipment.

2.3 Service Air

Service air requirements will be met with the existing plant station air system. The majority of plant station air will be used for the atomizing air requirements at the reburn burner front.

2.4 Seal Air

Two (2) separate seal air systems were installed to meet the needs of various equipment. One system, a skid mounted package, provides the seal air for the pulverizer, gravimetric feeder, hot primary air fan, and the rotating classifier gearbox. The newly installed seal air blower and motor are capable of supplying approximately 3100 scfm at 79" w.c. boost. The blower/motor skid is mounted on the feeder floor.

The reburn burner flame scanners require seal (cooling) air to provide adequate protection for the flame scanner hardware during conditions when overheat damage can occur. The primary source of cooling air is the forced draft fan discharge duct.

In order to provide adequate cooling when the primary system fails or becomes inoperable (FD fans/boiler trips), a skid mounted blower will provide back-up protection. The single blower system was installed and tied into the primary scanner cooling air system.

3.0 Miscellaneous Mechanical Modifications

3.1 Observation & Test Ports

Observation test ports were installed in the furnace walls to provide access for test equipment and for monitoring furnace conditions. This was done in April, 1990, prior to baseline testing.

3.2 Furnace Wall Throat Openings

Two (2) bi-metallic (carbon steel with a stainless cladding) furnace wall throat openings were installed to monitor the affects of the inherent reducing atmosphere of the reburn process at the reburn burner throat region on two of the four burners. The other two burner throat regions were made up of standard carbon steel tubes. Impact of the reducing atmosphere on two materials are thus studied.

3.3 Furnace Wall Corrosion Test Tubes

An additional corrosion evaluation to determine if corrosion is more of a problem at higher metal temperature was done via thicker-walled tubes installed at three (3) selected furnace regions. The thicker walled tubes artificially elevate tube OD metal temperatures. The location of these new thicker tubes was between the reburn burners (EL. 664'- 6") and the overfire air ports (EL. 681'- 2"). Three (3) sets of straight tubes were installed on the left-hand sidewall, right-hand sidewall, and rear wall locations. Each set of tubes consists of one tube made of standard (thicker) material, and the other of bi-metallic (thicker) material.

3.4 Metal Temperatures/Attemperators/Thermocouples

Due to the nature of reburn operation, cyclone firing with simultaneous combustion of pulverized fuel at a higher elevation within the furnace, higher furnace exit gas temperatures can be expected. Consequently, higher component metal temperatures are likely. Operating the unit at 110% of it's maximum continuous rating also contributes to higher furnace exit gas temperatures than used for the original design.

With the expectation of higher metal temperatures, many boiler operational scenarios were evaluated, and worst case conditions were studied. Five (5) potential components were identified which exhibit the possibility of exceeding allowable metal temperature. These were:

1. Rear Vertical PSH Outlet Leg
2. Top Horizontal PSH Outlet Leg
3. PSH Outlet Piping Bend
4. SSH Intermediate Header
5. RH Intermediate Header

Prior to the baseline testing of Unit #2 at WP&L's Nelson Dewey Station, thermocouples were installed on the secondary superheater and reheater intermediate header outlet legs. Ten thermocouples were installed per header. During construction, eleven (11) additional thermocouples were installed on the primary superheater outlet legs and header wall. The primary superheater is expected to exhibit the greatest potential for exceeding the maximum allowable stresses due to increased metal temperatures. Additionally, two thermocouples were installed on the reheater intermediate header end caps. The end caps are theoretically the limiting factor for maximum allowable temperature of the header.

In recognizing the potential for higher metal temperatures, B&W installed an ample number of thermocouples to confidently monitor the major components within the unit when the reburn system is in service. In addition, temperature alarms were set for the various components.

4.0 Control System Modifications

An upgrade of the plant's Bailey Net 90 System was installed to control the reburn system and to interface with the existing controls for Nelson Dewey Unit No. 2. Control functions impacted by the reburn system are described below:

4.1 Cyclones

Cyclone operation is governed by the existing Net 90 system which interfaces with the reburn Net 90 control system. With the reburn burners in service, the cyclones contribute approximately 70-75% of the total required fuel (BTU) input to the boiler. Total fuel flow to the cyclones is based on the summation of the individual cyclone feeder mass flows. The fuel (BTU) demand for each cyclone establishes the stoichiometric combustion requirements for the cyclones. This stoichiometry is then adjusted to the desired value (1.1 expected) with the reburn burners in service. Measured O_2 correction or trim apply to the cyclone firing parameters when the reburn burners are out-of-service only.

4.2 Fuel Preparation Equipment & Reburn Burners

Fuel input to the coal reburn system, during "normal" boiler firing conditions, ranges between 25-30% of the total heat (fuel) required to maintain a specific boiler load. The existing Net 90 control system, at an estimated minimum boiler fuel loading of

approximately 30-35% boiler MCR, "releases" the reburn system for operation.

The energy flow demand to the reburn burners is established as a function of the total boiler energy release demand from the Boiler Master, or the actual cyclone energy release rate. The reburn burner firing rate is not used to automatically make up cyclone fuel flow which has been lost or cross limited. The Reburn Master serves as the "Pulverizer" Master due to the single pulverizer system. The Reburn/Cyclone Ratio Controller allows the control room operator to make minor (small) adjustments to the reburn firing rate in direct proportion to the cyclone firing rate.

Feeder Speed

The coal feeder delivers coal to the pulverizer on a weight flow basis, but the pulverizer firing rate demand is on an energy flow basis. This energy (BTU) flow demand is converted to a weight flow demand using the actual fuel heating value before it is utilized by the feeder. The feeder demand is sent directly to Stock's gravimetric feeder control package (local panel), which converts the demand into a coal flow rate (feeder speed), via a closed loop system. The feeder demand has a cross limiting function to prevent coal flow from exceeding the limits of the reburn system.

Primary Air (PA) Fan

Primary air serves to transport the pulverized coal from the pulverizer to the reburn burners, and its flow requirements are based solely on the fuel flow demand to the feeder. The difference between the primary air flow demand and the measured primary air flow entering the pulverizer windbox, is used to control the primary air fan variable speed drive. The primary air flow is temperature compensated, and in order to maintain required burner line velocities, a minimum limit on primary air flow is provided.

Reburn Air Flow

Total reburn air flow consists of the summation of the primary air flow, secondary air flow, and gas recirculation flow to the reburn burners. Both the secondary air and gas recirculation flow are controlled by individual dampers with integrated electric drives. In-line flow monitors, situated downstream of the control dampers, measure the respective flows.

The total reburn air flow demand developed from the pulverizer demand is on a stoichiometric basis (0% excess air). Controls allow for adjustment of the stoichiometric demand to the desired fuel/air ratio at the burners. The operators also have the means to adjust the ratio between the secondary air and gas recirculation flow.

Burner Gas Recirculation Flow

The burner gas recirculation flow demand is established as a function of the reburn flow demand. This allows adjustment of the mass flow to the burners to achieve the desired penetration into the furnace while maintaining the desired stoichiometric conditions. The operator can use a secondary air/gas recirculation ratio controller, but the controller has a limited adjustment range.

Pulverizer Outlet Temperature

In addition to using primary air for transporting the pulverized coal to the burners, the hot primary air is also used to partially dry the coal in the pulverizing process. The primary air system is comprised of separate hot air and tempering (cold) air ducts, where the junction point is located upstream of the primary air fan.

Each hot air and tempering air duct is equipped with a single control damper for regulation of their respective flows. A single element control using the pulverizer outlet temperature modulates the dampers to maintain the pulverizer outlet temperature at its set point. The hot air and tempering air dampers are positioned inversely, and at no time during normal operation does the control system allow for both dampers to be closed at the same time.

Burner Management Coordination

The burner management system coordinates the actions of the pulverizer/reburn system with the overall unit controls, during start-up and shutdown of the pulverizer/reburn system. For example, the operator has the means to start-up or shut down the reburn system in a controlled manner, prior to or after full automatic operation of the boiler.

4.3 Overfire Air Ports

The overfire air (OFA) ports provide the remainder of the required secondary air flow, based on the total boiler air flow demand. The secondary air flow to the OFA ports is regulated by a butterfly damper located downstream of the air heater air recirculation duct.

The total boiler air flow is established as a function of the total boiler energy release demand. Flow through the OFA ports is regulated to provide any additional air flow needed to make up the difference between the total boiler air flow demand and the summation of the measured individual cyclone air flows, and the pulverizer group flows. The pulverizer group flows include the measured primary air flow, secondary air flow, and gas recirculation flow.

When the reburn burners are in service, the existing O_2 trim control station will adjust the OFA port air flow rate to meet the total air flow requirement based on the O_2 set point. Measured O_2 trim may be used with the OFA control where the O_2 set point also serves as the excess air set point for the total boiler air flow demand.

5.0 Electrical

5.1 Main Switchgear

A new 4160 Volt switchgear circuit breaker was added to the plant's existing 4160 Volt switchgear to service the coal reburn motor control center (MCC). The electrical contractor made all the necessary high voltage bus and grounding connections to existing switchgear.

5.2 Coal Reburn Transformer

A "step-down" transformer was required to lower the voltage to accommodate the 480 Volt Coal Reburn MCC. Accordingly, a 1500 kVA transformer was installed to decrease the voltage to the required 480/277 volts.

5.3 480V Coal Reburn MCC

To meet the requirements of the coal reburn system equipment, a newly installed motor control cabinet was provided. The coal reburn MCC provides power distribution to small and medium sized motors, heaters, and lighting. The MCC also provides 120-Vac distribution to the coal reburn equipment. The motor control center consists of the following twenty-five (25) compartments connected directly to the 2000 Amp bus:

- Incoming Feed
- Lighting Transformer
- Gravimetric Feeder Motor
- Primary Air Fan Shut-off Damper
- Rotating Classifier/Hydraulic Loader
- Welding Receptacles 2-1 & 2-2
- Pulverizer Lube Oil Set
- Coal Feeder Discharge Valve
- Pulverizer/Feeder Seal Air Fan
- Coal Reburn Roof Vent Fan 2B
- Roll Wheel Pump
- Coal Reburn Building Motor Operated Door
- Coal Reburn Roof Vent Fan 2A
- Primary Air Fan VFDS
- Diverter Gate Motor Operator
- Silo Fill Chute Heating Panel
- 120/240V Distribution Panel
- Damper Drive Distribution Panel
- 4 Spares

5.4 Damper Drive Distribution Panel

A distribution panel, powered by the 480V Coal Reburn MCC, is available to power the individual coal reburn process damper control drives. These drives include the following:

- Burner Secondary Air Damper Control Drive
- Burner Gas Recirculation Damper Control Drive
- Hot Air Damper Control Drive

- Secondary Air/Gas Recirc. Damper Control Drive
- Overfire Air Damper Control Drive

5.5 120/240V Distribution Panel

Power from the 120/240V distribution panel is supplied from the 480V Coal Peburn MCC. The voltage is reduced to the necessary 120/240V via a transformer located within the 480V Coal Reburn MCC cabinet. The following equipment is tied into the 120/240V distribution panel, all with 20 Amp breakers.

- Steam Unit Heater Fans
- Coal Reburn Roof Vent Fan 2C
- Coal Reburn Roof Vent Fan 2D
- Silo Level Detector
- Junction Box RB03
- Pulverizer Motor Space Heater
- Secoal III Monitor Cabinets
- Stock Feeder Cabinets
- 24 Spares

5.6 Variable Frequency Drive

An Allen-Bradley variable frequency drive is used for controlling the speed of the primary air fan. The VFDS is installed adjacent to the 480V Coal Reburn MCC.

5.7 Lighting

All of the lighting was furnished and installed to conform to the specifications set forth in Sargent & Lundy Specification W-2595, "Electrical Installation Work."

5.8 Bailey NET-90 Cabinets

Three (3) Bailey Net-90 cabinets were furnished for the coal reburn project. The cabinets were installed in the control room near the existing Net-90 cabinets.

5.9 Control Room Panel Board

Panel board modifications were required to meet the needs of the newly installed reburn equipment. The modifications basically consisted of control switches and lights, manual/auto control stations for the reburn process, annunciators, and ammeters.

6.0 Start-Up Review

Once the construction work was completed, start-up activities were formally initiated by B&W on October 29, 1991. The start-up activities included operator training, cold and hot air flow calibrations of all the air/gas recirculation duct/flue systems, and then actual reburn equipment operation. Based upon the reburn

system start-up unknowns, it was decided to initiate reburn operation at 90 MW. This would provide adequate boiler capability for any temperature/pressure excursions that might occur with the units control system. Each of these activities will now be discussed.

6.1 Operator Training

A series of five training sessions were provided by B&W and WP&L for the Nelson Dewey plant operators prior to initiation of reburn system operation. The five sessions were:

1) General overview

This session provided an overview of the reburn system including background and emphasizing reburn combustion equipment (burners, flame scanners, ignitors, etc.).

2) Pulverizer Training

This session consisted of classroom instruction emphasizing MPS pulverizer operation and safety. The pulverizer hydraulic and lubrication systems were also reviewed.

3) Inerting and Clearing Procedure

This session consisted of hands-on operation of the pulverizer inerting and clearing system as well as the pyrite removal system.

4) Reburn Auxiliary Equipment

Topics for this hands-on session were the seal air system, the rotating classifier lube set, hydraulic loading system and the primary air fan variable frequency drive operation.

5) Controls and Interlocks

Reburn equipment start and stop sequences were reviewed and training was provided at the main control board to explain interlocks and alarm indications.

6.2 Boiler Start-up

Prior to actual boiler start-up, cold air flow calibrations were performed on each of the new reburn systems flow paths in order to ensure accurate air monitor indications. The actual measured values were compared to the air monitor indications. The following ducts were tested at various flow rates/damper positions: overfire air (OFA), gas recirculation to the burners, secondary air, and the primary air. Based upon initial indications, leakage rates for the control dampers appeared to exceed specification and the damper vendor was notified and attempts were made to reduce the flows to meet the specifications. Subsequent to these tests, the boiler start-up was initiated.

With the boiler in operation and firing a blend of bituminous and sub-bituminous coals, cooling air flow rates for the reburn burners and overfire air (OFA) ports were optimized to maintain acceptable metal temperatures. The air control damper's limit switches were set to stop the dampers from closing beyond the minimum position for adequate flow. In addition, the boiler controls were modified to accommodate the extra air flow required for cooling the reburn system components.

Operating the boiler under no reburn conditions, hot air flow calibrations of the same instruments previously tested on cold air flow were carried out. Inconsistencies between the measured flow rates and the air monitor indications were identified for a few of the systems and investigations commenced to identify the problems. Other activities carried out to ready the reburn system for operation included check out of the reburn burner oil lighters and flame scanners. These systems were successfully started-up and debugged as oil and air pressures were optimized to minimize lighter heat input while maintaining successful scanner operation. This was done to reduce impacts on boiler operation during reburning start-up/shut-down sequences. Also, as part of burner and lighter system start-up, verification of all the control interlocks was completed to assure safe operation.

APPENDIX NO. 6

Test Report - Nelson Dewey Cyclone Reburn Optimization and Performance Environmental Tests

Acurex Environmental Technical Report TR-93-101

TEST REPORT
NELSON DEWEY CYCLONE REBURN OPTIMIZATION AND PERFORMANCE ENVIRONMENTAL TESTS

June 1993

Acurex Environmental Project 8408

Prepared For

Babcock & Wilcox
20 S. Van Buren Avenue
Barberton, Ohio 44203

By

Acurex Environmental Corporation
555 Clyde Avenue
P.O. Box 7044
Mountain View, California 94039

Acurex Environmental
CORPORATION
A Geraghty & Miller Company

Acurex Environmental Technical Report TR-93-101

TEST REPORT
NELSON DEWEY CYCLONE REBURN OPTIMIZATION AND PERFORMANCE ENVIRONMENTAL TESTS

June 1993

Acurex Environmental Project 8408

Prepared For

Babcock & Wilcox
20 S. Van Buren Avenue
Barberton, Ohio 44203

By

Acurex Environmental Corporation
555 Clyde Avenue
P.O. Box 7044
Mountain View, California 94039

TABLE OF CONTENTS

SECTION 1 INTRODUCTION 1-1

SECTION 2 TEST PLAN 2-1

2.1 FACILITY 2-1
2.2 TEST MATRIX 2-3

2.2.1 Optimization Tests 2-3
2.2.2 Performance Tests 2-7
2.2.3 Western Coal Tests 2-7

2.3 SAMPLING AND ANALYSIS PROTOCOLS 2-7

2.3.1 Continuous Emission Monitors 2-7
2.3.2 Method 17 Particulate Loading and Particle Sizing 2-10
2.3.3 Method 5 Particulate Loading and Trace Metals Loading 2-12
2.3.4 Particle Sizing 2-12
2.3.5 In-Situ Flyash Resistivity 2-12
2.3.6 Method 18 Organics Sampling 2-15
2.3.7 Unburned Carbon 2-15
2.3.8 Sulfate Analysis 2-15
2.3.9 Flyash Toxicity Characterization Leachate Procedure 2-15

2.4 QUALITY CONTROL 2-18

SECTION 3 TEST RESULTS 3-1

3.1 CONTINUOUS EMISSIONS MONITORING DATA 3-2
3.2 PARTICULATE LOADING 3-4
3.3 PARTICLE SIZE DISTRIBUTION 3-4
3.4 FLYASH RESISTIVITY 3-7
3.5 CARBON IN FLYASH 3-7
3.6 TRACE METALS 3-7
3.7 SULFATES 3-9
3.8 HYDROCARBONS 3-9
3.9 TOXICITY CHARACTERIZATION LEACHATE PROCEDURE 3-9

LIST OF ILLUSTRATIONS

Figure 2-1. Test facility 2-2

Figure 2-2. Orientation of sampling ports 2-4

Figure 2-3. Continuous emission monitoring system 2-9

Figure 2-4. Method 17 particulate train 2-11

Figure 2-5. Metals sampling train 2-13

Figure 2-6. In-situ resistivity sampling system 2-14

Figure 2-7. Bag sample for organic analyses 2-16

Figure 2-8. Schematic of modified miniature acid condensation system 2-17

LIST OF TABLES

Table 2-1. Coal analyses 2-5

Table 2-2. Test matrix for optimization tests 2-6

Table 2-3. Test matrix for performance tests 2-8

Table 3-1. O_2/NO_x stratification results: ESP outlet ducts, baseline, 110 MW, 4/3/92 3-3

Table 3-2. O_2/NO_x stratification results: ESP outlet ducts, reburn, 110 MW, 4/2/92 3-3

Table 3-3. Summary of test results — optimization tests 3-5

Table 3-4. Summary of test results — performance tests 3-6

Table 3-5. Summary of test results — Western coal tests 3-7

Table 3-6. Summary of trace metal emissions at ESP outlet: μg/dscm 3-8

Table 3-7 Summary of toxicity characteristic leachate procedure (TCLP) on ash slurry samples, mg/L 3-10

SECTION 1

INTRODUCTION

Unit Number 2 of the Nelson Dewey Station of Wisconsin Power and Light was used as the host site for a demonstration of coal reburning for NO_x control. This demonstration was conducted as one of the Clean Coal Technology Round 2 projects. The overall purpose of the demonstration was to evaluate coal reburning as a control option for the B&W cyclone-fired slag tap boiler design as is used in the Nelson Dewey test boiler. The cyclone boiler design features high-intensity slagging combustion which yields high baseline NO_x emissions. This design is also not easily modified for low-NO_x operation by simple combustion modifications.

The scope of the CCT coal reburning program was to conduct initial baseline characterization tests, and then retrofit and test the reburn hardware (pulverizer, reburn burners, overfire air ports) under short term optimization runs and long term performance operation. The post retrofit testing was designed to evaluate the following parameters:

- Effects of reburn configuration on NO_x reduction effectiveness; effects of reburn fuel fraction, stoichiometric ratios, temperatures and mixing configuration
- Effects of reburning on boiler operation: efficiency, carbon loss, fireside temperature distributions, slagging, steam temperatures
- Effects of reburning on environmental loadings from the boiler: NO_x and other criteria species, particulate, particle size, trace metals, organics, ash leaching.

Acurex Environmental was contracted to conduct environmental monitoring to support the third evaluation and to contribute data to B&W and WP&L to support the first and second evaluations.

The schedule for the coal reburning program was as follows:

Baseline Characterization	September 1989 to June 1990
Design & Installation	March 1990 to November 1991
Startup	December 1991 to March 1992
Optimization & Parametric Tests	February 1992 to May 1992
Long Term Performance Tests	June 1992 to December 1992
Western Coal Tests	January 1993

The environmental testing in support of the baseline characterization was documented in a separate report, Reference 1. The purpose of this report is to document the data and results of the three post-retrofit test series: optimization, performance and western coals testing.

The overall purpose and scope of the environmental monitoring component of the clean coals project was documented in an Environmental Monitoring plan, Reference 2. The purpose of the environmental testing was to quantify emissions parameters which may be affected by the reburn retrofit. The emphasis was on gaseous criteria pollutants and particle loading upstream and downstream of the precipitator. Other secondary environmental parameters were also tested on a less frequent basis. The test program for the baseline and optimization tests included the following parameters:

- Continuous emissions monitoring of O_2, NO_x, CO, CO_2, and SO_2
- Particulate loading sampling upstream and downstream of the electrostatic precipitator (ESP)
- Carbon in flyash loss on ignition (LOI) analyses of flyash catch
- Particle sizing upstream and downstream of the ESP
- Metals loading downstream of the ESP
- Total sulfur species at the ESP inlet
- In-situ flyash resistivity at the ESP inlet
- Total organics downstream of the ESP
- Toxicity characterization leachate procedure (TCLP) for the ESP hopper ash slurry

For the performance tests and western coal tests, the effort focused on continuous monitoring, ash loading upstream and downstream of the ESP, and LOI. Long term continuous monitoring was also conducted for the period May 1992 through December 1992. These CEM results were transmitted to B&W directly and magnetic disks of reduced data were submitted intermittently. The quality assurance plan for the optimization series of tests was submitted separately, Reference 3.

In November of 1992, the boiler was subjected to hazardous air pollutant (HAP) testing for triplicate baseline and reburn conditions. This series of tests was separate from the clean coals project and the results are documented in a separate report, Reference 4. The scope of that test program included the following:

- Particulate loading upstream and downstream of the ESP
- Trace metals emissions upstream and downstream of the ESP
- Volatile and semi-volatile organics, aldehydes and chlorides/fluorides emissions downstream of the ESP
- Inlet concentrations in the coal feed stream of trace metals and chlorides/fluorides
- Trace metals concentrations in the ESP hopper and cyclone slag discharge streams

REFERENCES

1. Test Report Nelson Dewey Cyclone Reburn Baseline Environmental Tests, Acurex Technical Report TR-91-101/ESD, March 27, 1991.

2. Environmental Monitoring Plan Babcock & Wilcox Demonstration of Coal Reburning for Cyclone Boiler NO_x Control, Acurex Project 8408, November 18, 1991.

3. Quality Assurance Project Plan Phase III Testing for Cyclone Boiler NO_x Control, Acurex Technical Report 8408-92-01, January 1992.

4 Hazardous Air Pollution Monitoring: Demonstration of Coal Reburning for Cyclone Boiler NO_x Control, Test Report, Acurex Project 6676, June 1993.

SECTION 2

TEST PLAN

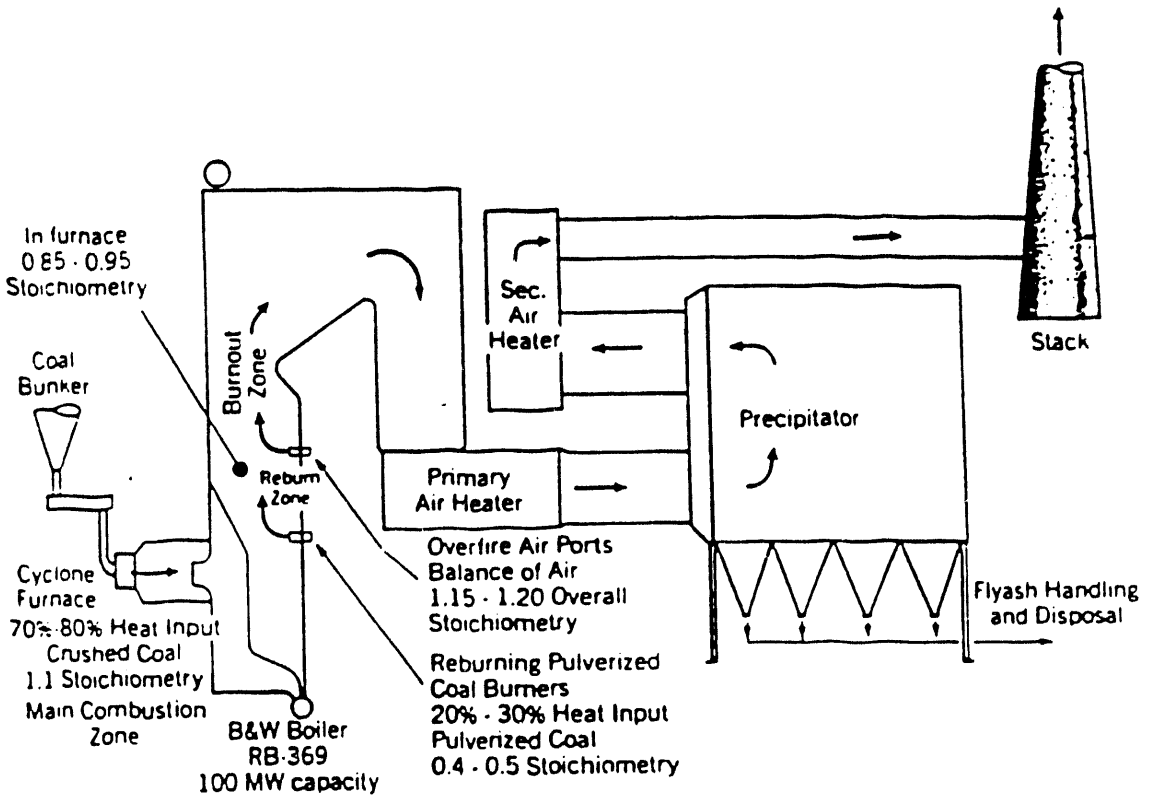
The Phase III testing reported here consisted of three sequential series: optimization tests, performance tests, and western coal tests. This section summarizes the test matrix and protocols for these tests.

2.1 FACILITY

The Nelson Dewey station of Wisconsin Power and Light is located at Cassville, Wisconsin, 50 miles north of Dubuque, Iowa on the Mississippi river. The specifications of the WP&L host site test facility are as follows:

Utility	Wisconsin Power & Light, Neison Dewey Unit No. 2
Location	County Trunk VV, Cassville, Grant County Wisconsin 53806
Boiler Type	Babcock & Wilcox, cyclone fired reheat
Boiler Model	B&W R8-369
Burner Configuration	Three single-wall cyclones
Preheat	Tubular primary and secondary preheat
Draft type	Forced draft with a duct pressure of 20 in. H_2O at the ESP
Boiler Capacity	100 MW_e
Installed	October, 1962
Fuel	Indiana Lamar bituminous
Reburn burners	pulverized coal single-wall-fired
Particulate control	dual Research Cottrell electrostatic precipitator

Figure 2-1 shows the overall unit 2 configuration with the reburn retrofit. The low-NO_x reburn retrofit consisted of installation of the pulverizer, reburn burners in the upper furnace, overfire air ports, and modifications to the control system. The unit could be operated in either the baseline



Coal reburn project - system layout, cyclone firing.

Figure 2-1. Test facility

mode without the reburn burners or in the low-NO_x mode with approximately 20 percent of the heat input from the reburn burners. Under low NO_x reburn operation, the existing cyclone burners are fired with 70 to 80 percent of the total coal feed as crushed coal. The cyclones are operated at around 110 percent excess air in the main combustion zone. The reburn burners are fired with the remaining 20 to 30 percent of the coal feed as pulverized coal. These reburn burners are operated fuel rich at a reducing stoichiometry of 0.85 to 0.95. This reducing condition converts the nitrogen oxides formed in the cyclone burners to molecular nitrogen, thereby reducing NO_x. The balance of air required to complete combustion is added in the burnout zone above the reburn zone through the use of overfire air ports.

The electrostatic precipitator was installed with dual divided horizontal inlet and outlet ducts. Each section of the divided duct was fitted with four 4 inch ports through which samples

were extracted. Figure 2-2 shows the orientation of the sampling stations relative to the ESP and heat exchangers.

The standard baseline coal used for the bulk of the reburn testing was a Lamar Illinois basin coal. Representative analyses for the baseline coal taken during the HAP testing are listed on Table 2-1. At the conclusion of the reburn demonstration, the unit was converted to a Powder River Basin western coal. The final western coal series was run with this coal.

2.2 TEST MATRIX

2.2.1 Optimization Tests

After installation of the reburn hardware, the reburn system was put through an initial series of start-up and characterization tests. These tests were focused on identifying the preferred operating parameters and did not involve environmental monitoring. Following this initial series of operational tests, the optimization environmental testing was conducted from March 31, 1992 through May 20, 1992. Table 2-2 summarizes the overall run conditions and environmental test matrix for the optimization test series.

The optimization series was run in two stages. From March 31 through May 1, the testing was focused on the major parameters influenced by reburn: CEM's, particulate loading, LOI, and periodic particle sizing and flyash resistivity. The particle sizing and resistivity was sampled to help interpret any changes in ESP performance identified from the particle loading results. During this initial stage, a parametric series of reburn parameters was evaluated: reburn stoichiometry, coal fineness and gas recirculation rate. During this series, three baseline runs were also made to compare to the prior baseline series in Phase I.

The second stage of the optimization tests was run from May 16 through May 20 and was focused on optimum reburn parameters identified during the initial parametric tests. For this stage, more extensive environmental measurements were made including outlet metals, sulfates, total hydrocarbons, and a composite flyash slurry toxicity characterization leachate procedure (TCLP).

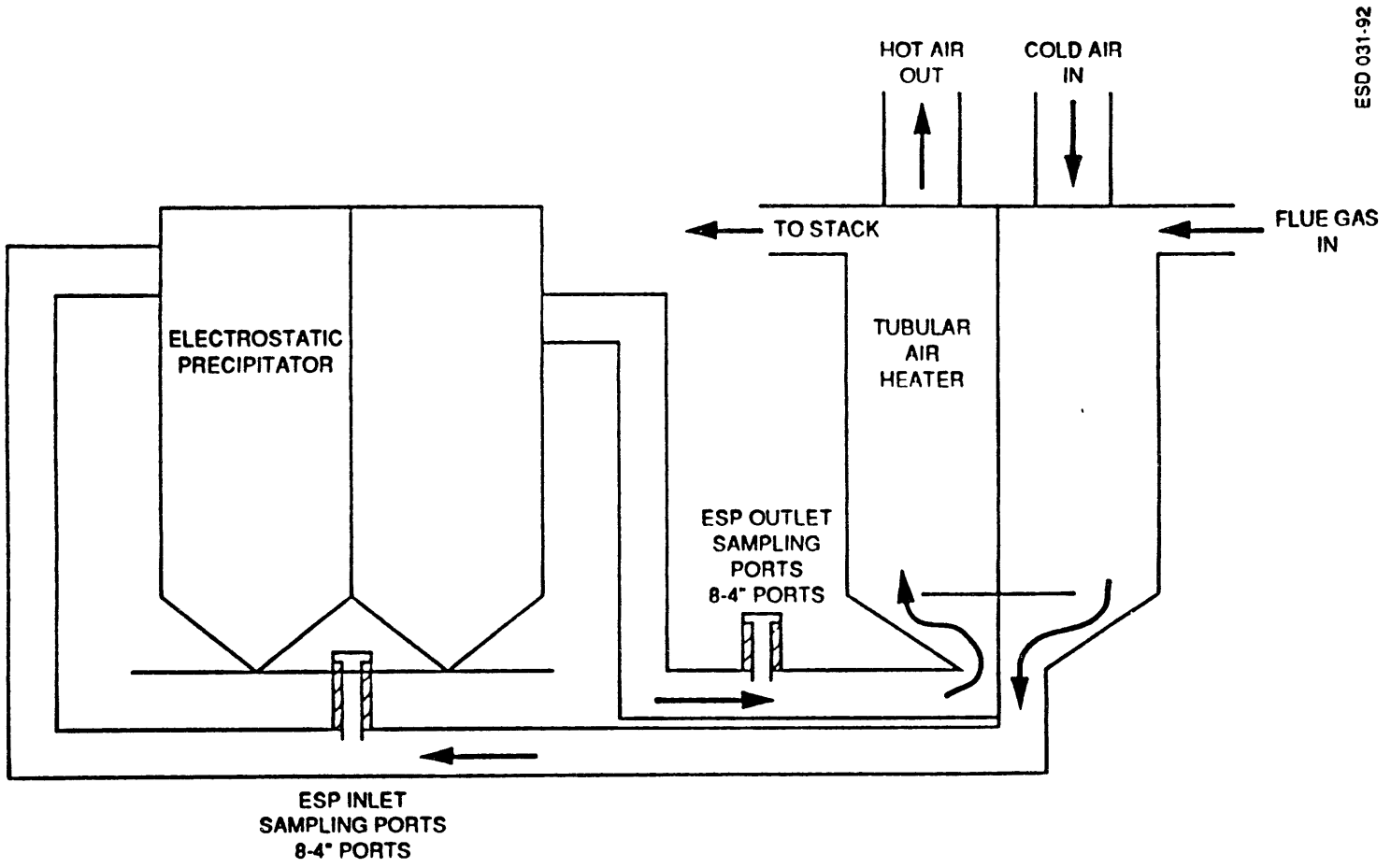


Figure 2-2. Orientation of sampling ports

Table 2-1. Coal analyses

Test Run	1	2	3	4	5	6
Proximate Analysis						
HHV, Btu/lb	11092	11680	11954	11453	11389	11657
Moisture, %	15.68	13.81	12.0	12.94	17.28	12.51
Vol. Mtr, % dry	39.84	40.34	40.0	39.36	39.03	38.81
Fixed C, % dry	52.57	49.65	51.8	51.4	52.56	51.79
Ash, % dry	7.59	10.01	8.21	9.2	8.41	9.40
Ultimate Analysis, percent dry basis						
Carbon	72.9	72.19	72.15	71.57	73.15	71.76
Hydrogen	5.1	5.11	5.11	5.05	5.19	5.08
Nitrogen	1.37	1.27	1.24	1.21	1.27	1.03
Sulfur	1.34	2.32	1.72	1.37	1.57	1.43
Oxygen, Diff.	11.71	9.10	11.6	11.6	10.41	11.3
Ash	7.59	10.01	8.21	9.20	8.41	9.40
Trace Species, ppm, as received						
Arsenic	6.02	19.8	2.69	9.21	5.14	9.33
Beryllium	2.94	3.13	3.04	2.84	3.13	2.69
Cadmium	<1	1.11	70.4	52.2	93.9	<1
Chromium	4.91	11.8	8.6	7.3	11.6	8.8
Mercury	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	20.5	22.2	29	23.4	24.3	18.7
Nickel	13	13.9	49	37.4	42.3	34.8
Lead	38.5	39.5	10.7	18.1	14.9	11.9
Selenium	<1	<1	<1	<1	<1	<1
Chlorine	58.1	23.2	90.9	65.5	65.3	83.4
Fluoride	<4.74	<3.48	<3.4	<3.45	<4.83	<3.43
Chloride	<17.8	<18.6	<19.3	<17.2	<19.3	<18.3

Table 2-2. Test matrix for optimization tests

Date	B&W Run No.	Acurex Environmental Run No. Inlet/Outlet	Unit Load (MW)	Reburn Rate (Tons/hr)	CEM	Measurements							
						Inlet Part Load	Outlet Part Load	Carbon LOI	Ash Resist.	Outlet Metals	Inlet Sulfate	Part Size	Hydrocarbon
3/31	1A	I1	68	Baseline	X	X		X					
4/1	2A	I2-01	110	3	X	X	X	X	X				
4/2	3A	I3-02	110	3	X	X	X	X					
4/3	4A	I4-03	110	Baseline	X	X	X	X					
4/6	5A	I5-04	82	Baseline	X	X	X	X					
4/7	6A	I6-05	110	13	X	X	X	X					
4/8	7A	I7-06	110	13	X	X	X	X					
4/9	8A	I8-07	110	3	X	X	X	X					
4/10	9A	I9-08	110	13	X	X	X	X					
4/13	10A	I10-09	110	13	X	X	X	X					
4/15	11A	I11-010	82	11.5	X	X	X	X					
4/16	12A	I12-011	82	11.5	X	X	X	X					
4/21	13A	I13-012	82	0.5	X	X	X	X	X				
4/22	14A	I14-013	55	0.5	X	X	X	X	X			X	
4/23	15A	I15-014	58	0.5	X	X	X	X	X			X	
4/24	16A	I16-015	111	0.5	X	X	X	X	X			X	
4/27	17A	I17-016	111	0.05	X	X	X	X	X			X	
4/28	18A	I18-017	90	OPT	X	X	X	X	X			X	
4/29	19A	I19-018	82	OPT	X	X	X	X	X			X	
4/30	20A	I20-019	57	OPT	X	X	X	X				X	
5/1	21A	I21-020	110	OPT	X	X	X	X				X	
5/16	22A	I22-M1	82	OPT	X	X	X	X		X		X	
5/16	23A	I23-M2	59	OPT	X	X	X	X		X			
5/17	24A	I24-M3	58	OPT	X	X	X	X	X	X		X	X
5/17	25A	I25-M4	58	OPT	X	X	X	X	X	X	X		
5/18	26A	I26-M5	110	OPT	X	X	X	X	X	X	X	X	X
5/19	27A	I27-M6	110	OPT	X	X	X	X	X	X	X	X	X
5/19	28A	I28-M7	82	OPT	X	X	X	X	X	X	X	X	
5/20	29A	I29-M8	110	OPT	X	X	X	X	X	X	X	X	
5/20	30A	I30-M9	82	OPT	X	X	X	X	X	X	X	X	

These parameters were sampled for comparison to earlier baseline measurements or to evaluate on an absolute basis whether emissions levels were of concern relative to regulatory thresholds.

2.2.2 Performance Tests

Following the parametric and optimization testing in May 1992, the boiler was subjected to long-term performance testing where reburn was used in a routine operating mode for much of the time. During the performance testing, from June 1992 through December 1992, the gaseous emissions were monitored continuously with the CEM system described in Section 2.3. In addition, during the period September 28 through October 5, 1992, a series of particulate sampling tests were conducted to observe the performance after long term operation and to confirm results of the optimization tests. Table 2-3 summarize the test matrix. The tests included repeats of baseline conditions and triplicate reburn runs at three load conditions. Additional parametric runs were made for how the cyclones were operated at low load and excess air conditions.

2.2.3 Western Coal Tests

Following completion of the demonstration testing on Illinois Basin Lamar coal, the unit was converted to firing Powder River Basin western coal. On January 19 and 20, 1993, particulate loading tests were conducted with western coal with the unit running at the preferred optimum reburn settings selected for western coal. Particulate measurements were made upstream and downstream of the ESP for three load conditions: 110 MW, 82 MW, and 60 MW. A single run was made at each load condition.

2.3 SAMPLING AND ANALYSIS PROTOCOLS

2.3.1 Continuous Emission Monitors

Continuous emission monitoring was made for O_2, NO_x, CO, CO_2, and SO_2. During the baseline testing, the measurements had been made with a mobile laboratory brought in on a short term basis. For the Phase III testing, which included long term CEM monitoring, a CEM facility, shown in Figure 2-3 was built and installed at the site. This is a dilution based system which eliminates the need for a sample conditioning system by diluting the gases below the moisture dew

Table 2-3. Test matrix for performance tests

Date	Run No.	Load	Reburn	Cyclone Rate (Tons/hr)	Measurements			
					CEM	Inlet Part Load	Outlet Part Load	Carbon LOI
9/28	1	110	X	33	X	X	X	X
9/28	2	79		33	X	X	X	X
9/28	3	110	X	33	X	X	X	X
9/29	4	79		33	X	X	X	X
9/29	5	110	X	33	X	X	X	X
9/30	6	54		23	X	X	X	X
9/30	7	82	X	23	X	X	X	X
9/30	8	82	X	23	X	X	X	X
10/1	9	54		23	X	X	X	X
10/2	10	82	X	23	X	X	X	X
10/2	11	40		18	X	X	X	X
10/3	12	60	X	18	X	X	X	X
10/3	13	60	X	18	X	X	X	X
10/3	14	40		18	X	X	X	X
10/4	15	60	X	18	X	X	X	X
10/4	16	38	X	9	X	X	X	X
10/5	17	60	X	18	X	X	X	X
10/5	18	60	X	18	X	X	X	X
10/5	19	110	X	33	X	X	X	X

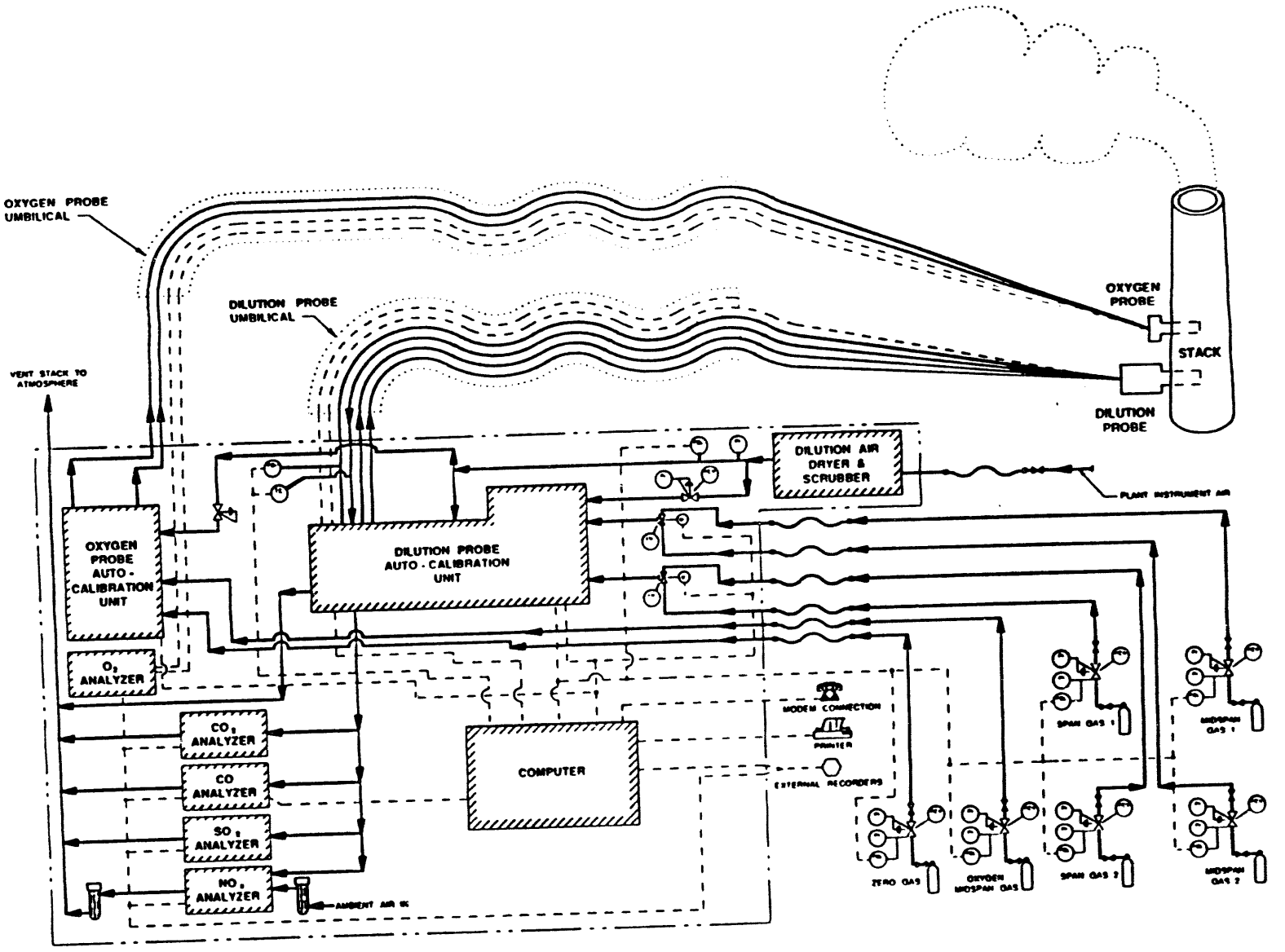


Figure 2-3. Continuous emission monitoring system

point. Calibration gases are sent to the stack and undergo the same dilution as the stack gas as a bias check. The unit was equipped for automatic calibration and remote access by modem to monitor the status during periods where no staff were on-site. The CEM results were transmitted directly to B&W in Barberton for performance monitoring along with the operational data from the Black and Veach system.

The CEM system was installed at the start of the optimization testing and used for that series. During the optimization tests, a series of 8 stratification tests were made to evaluate the degree of NO_x and O_2 stratification across the two ducts at the ESP outlet. Following the optimization tests, a single sample was drawn from each duct at point judged to be near average on the basis of the stratification testing. The two samples were blended in approximately equal proportions and used as the single sample for the remainder of the CEM testing. During the portions of the testing where staff were on-site, the EPA calibration, bias and drift checks were performed manually, usually three times per run. During unmanned testing, calibrations were performed automatically once each day, or when remote modem data monitoring indicated a need for more frequent calibration.

The CEM measurements were made on a wet basis consistent with the dilution procedure which does not dry the sample. Where required, the wet measurements were corrected using either the moisture measurements made on site as part of Methods 1-5, or using estimated flue gas water contents from the coal analyses and ambient humidity. The CEM system was housed in a trailer adjacent to the ESP.

2.3.2 Method 17 Particulate Loading and Particle Sizing

For the ESP inlet particulate characterization, Method 17 rather than Method 5 was selected because of the better performance of Method 17 with the higher particulate loading streams. Figure 2-4 shows the basic Method 17 train. This train was traversed isokinetically across the 8 ports of the ESP inlet ducts. A total sample of approximately 50 dscf was sampled.

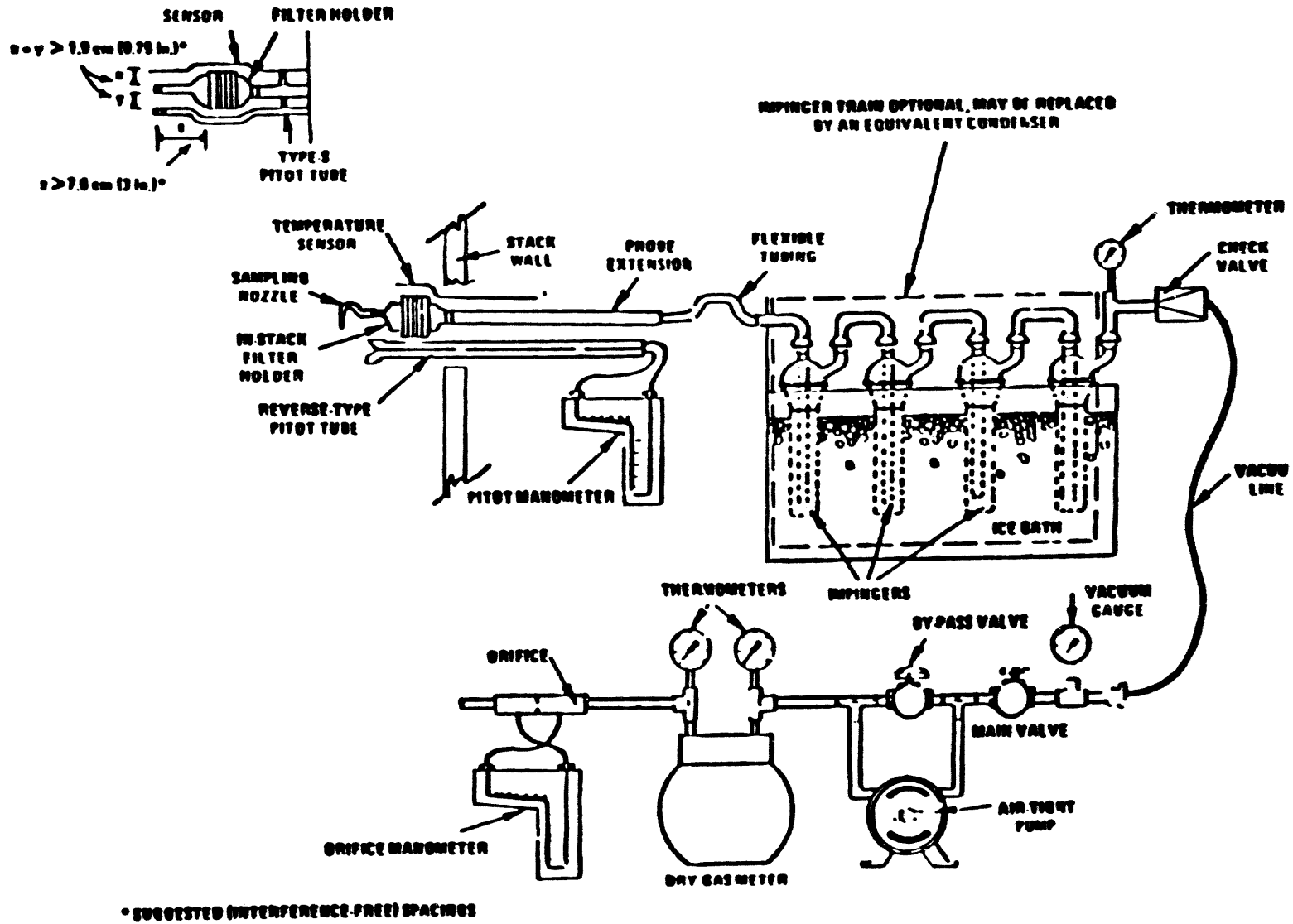


Figure 2-4. Method 17 particulate train

2.3.3 Method 5 Particulate Loading and Trace Metals Loading

For the initial runs in the optimization series and all runs in the performance and western coal series, the particulate loading at the ESP outlet was sampled with the EPA method 5 train which was traversed isokinetically over the 8 ports of the divided duct. For the final 9 runs in the optimization series, the method 5 train was configured for Method 0012 as shown in Figure 2-5 for simultaneously sampling trace metals. The primary modification is to the impinger solutions which are selected to enhance collection of volatile metals. The sample was drawn with the isokinetic traversing protocol of Method 5. After the particle loading was quantified by gravimetric analysis, the filter and impinger catchs were analyzed for arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. These are the same metals as specified in the RCRA protocol for TCLP.

2.3.4 Particle Sizing

For particle size determination, an Andersen cascade impactor was run at the ESP inlet for 16 of the optimization runs as indicated on Table 2-2. Three ESP outlet duct measurements were also made for comparison. The Andersen impactor uses 8 size fraction cuts and a final filter for size fractionation. The individual size cut filters were weighed to show size distribution. Because of the high grain loading at the ESP inlet, short run times of the order of 4 to 6 minutes were used within the limits of the impactor loading. Longer run times are desirable with this technique, but even with this compromise, the results should be more accurate than the Bahco technique used for the baseline tests.

2.3.5 In-Situ Flyash Resistivity

In-situ measurements of flyash resistivity were made at the ESP inlet duct. Figure 2-6 illustrates the probe which was used. Measurements were made for 10 of the optimization series runs as shown on Table 2-2. The system used here is based on a Southern Research Institute design adapted by Dr. Marlin Anderson who was retained as a subcontractor to set up the system and perform the initial series of resistivity tests. Because the sampling was done upstream of the

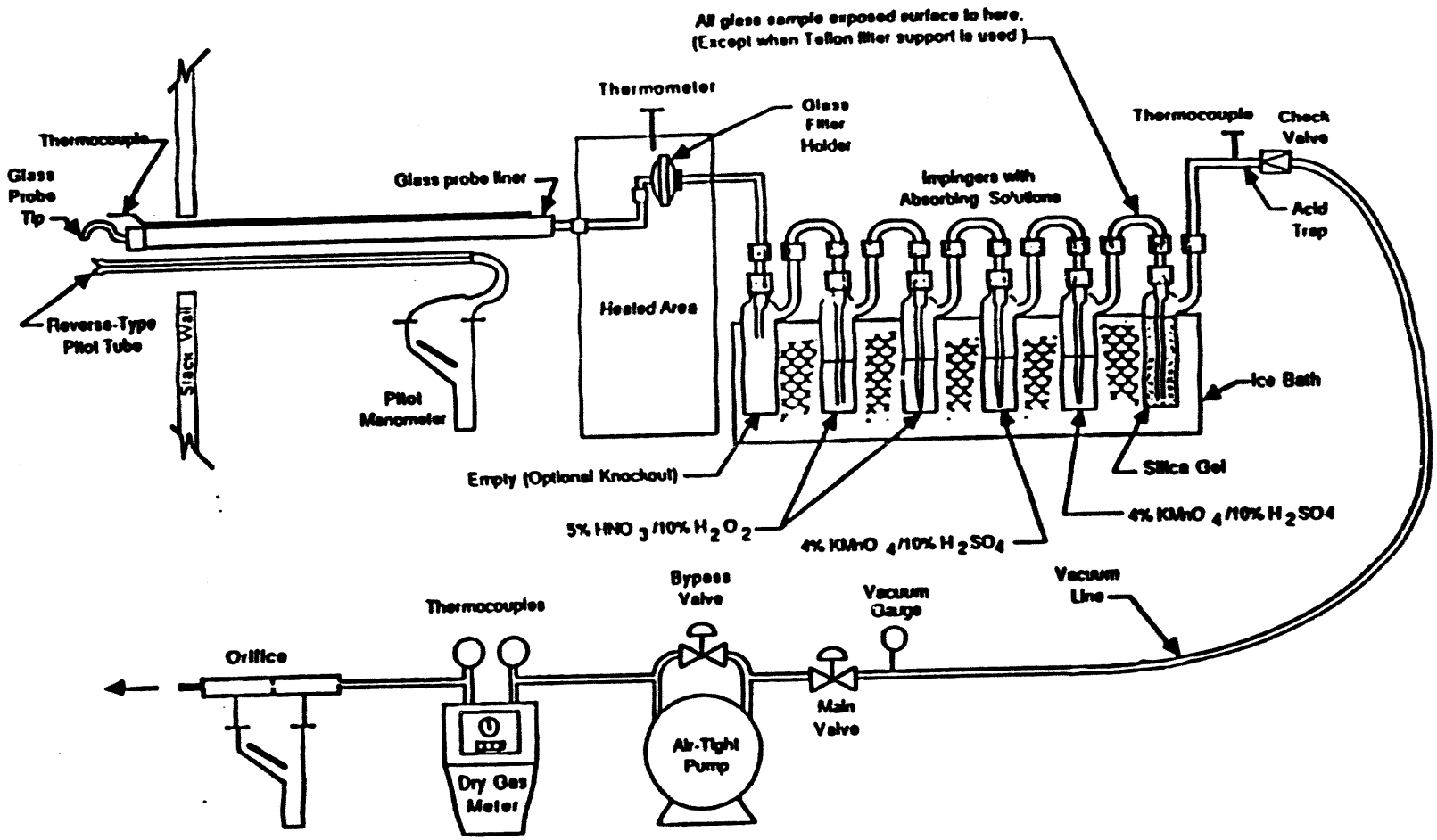


Figure 2-5. Metals sampling train

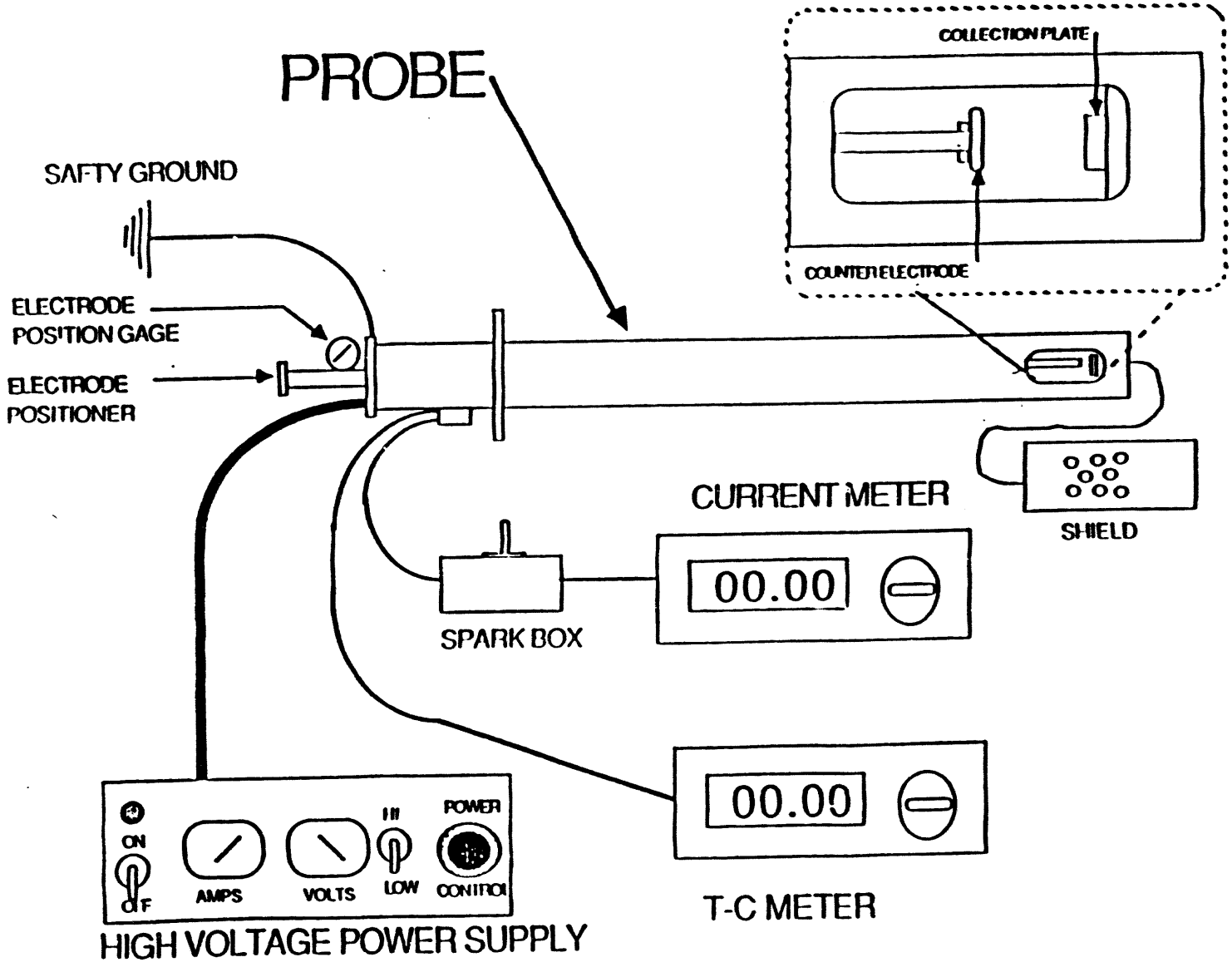


Figure 2-6. In-situ resistivity sampling system

primary preheater, the system was operating at the upper limit of materials capability. For this reason, there were several runs for which measurements were attempted but not achieved.

2.3.6 Method 18 Organics Sampling

To quantitate volatile organics and low boiling point semi-volatiles, flue gas samples were collected in Tedlar bags and shipped in carboys to the Acurex chemical analysis laboratory for Method 18 analysis. Figure 2-7 shows a schematic of the sampling train. This procedure involves gas chromatograph screening analysis of the grab samples and a total hydrocarbon estimate.

2.3.7 Unburned Carbon

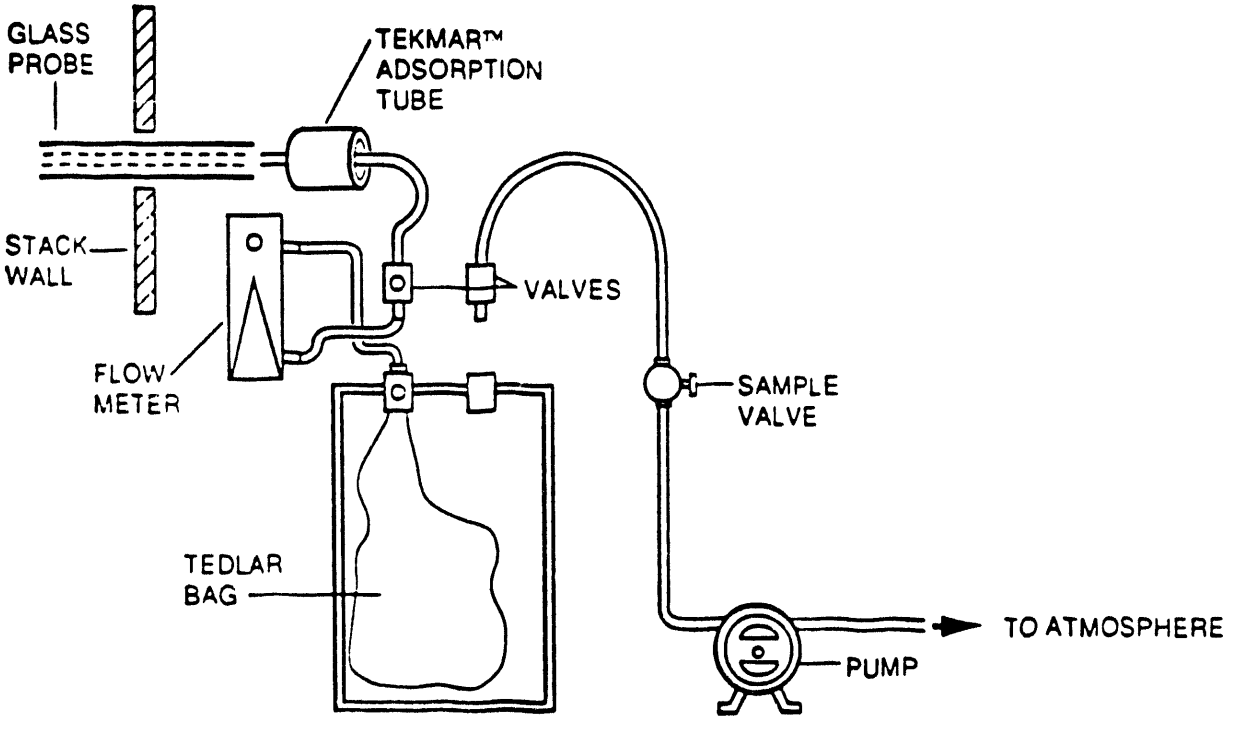
Carbon loss in flyash was analyzed by the ASME PTC 28, 4.04 procedure for loss on ignition (LOI). This involves heating a dry particulate sample to 800 C and recording the weight loss. The samples used for analysis were taken from the Method 17 particulate catch at the ESP inlet.

2.3.8 Sulfate Analysis

Gas phase sulfates (H_2SO_4 mist or SO_3) were sampled with the modified miniature acid condensation system (MACs) shown in Figure 2-8. This method replaced the Method 6/8 procedure used for the baseline tests. The MACs gives a better sulfate measurement, because of less interference with SO_2 compared to the baseline procedure. SO_2 was measured with the CEM system, however, so the MACs SO_2 measurement was not used. The MACs was chosen for the better sulfate accuracy which are the species of most interest for the precipitator performance evaluation. Sample was extracted at the ESP outlet ducts at a rate of 3 Liters per minute. The sulfate condensate and impinger catch was analyzed with barium chloride titration as is done for the method 6 train.

2.3.9 Flyash Toxicity Characterization Leachate Procedure

The TCLP procedure has replaced the EP toxicity procedure for screening risk of solid samples. The procedure is from 40 CFR 268 as updated in the March 29, 1990 Federal Register. The flyash slurry samples collected from May 16 through May 20 were composited and subjected



ESD400 90

Figure 2-7. Bag sample for organic analyses

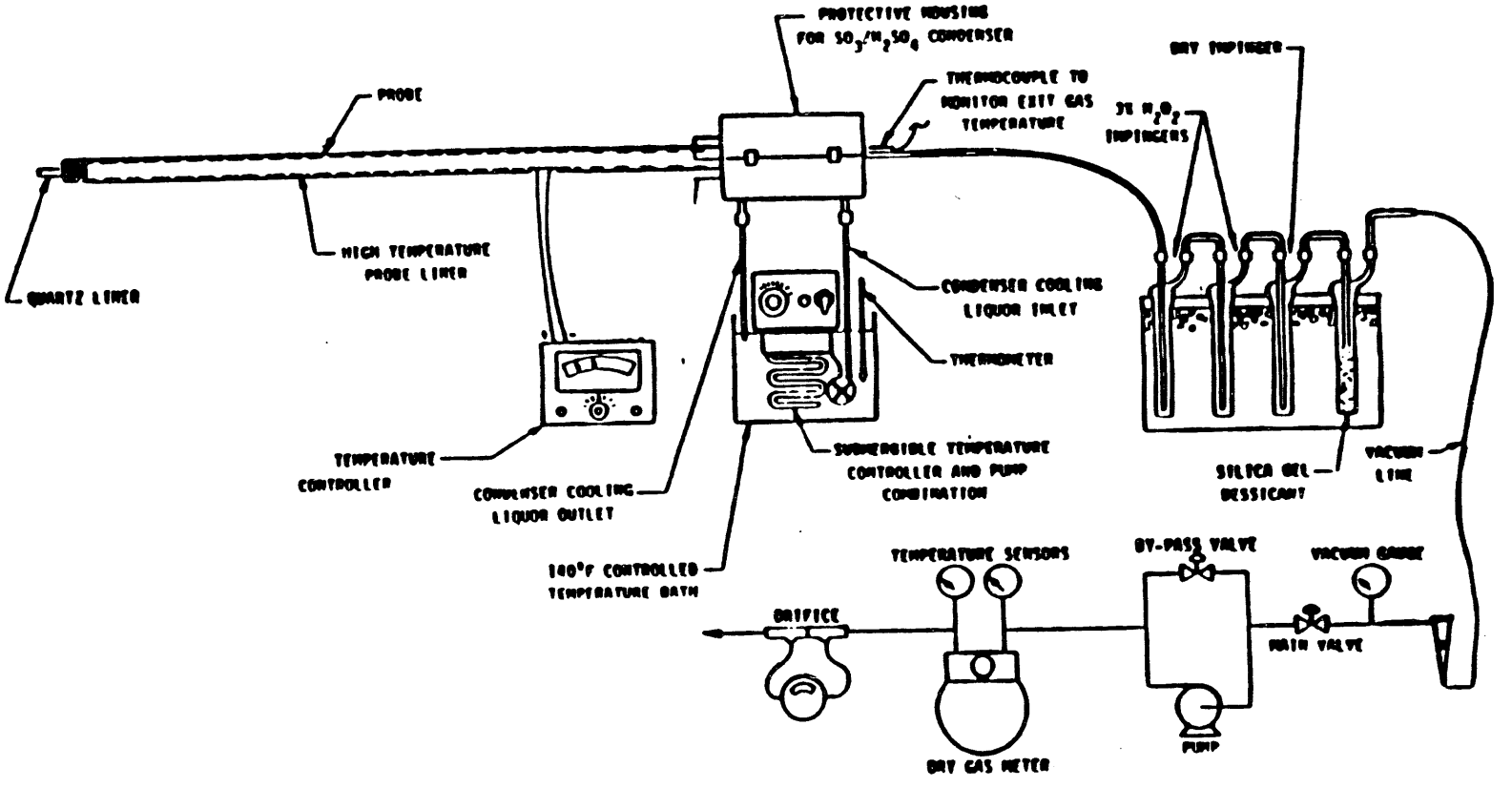


Figure 2-8. Schematic of modified miniature acid condensation system

to the leachate procedure. The leachate was analyzed for arsenic, barium, chromium, cadmium, lead, mercury, and selenium as is specified in the RCRA protocol.

2.4 QUALITY CONTROL

A separate quality assurance project plan was documented for the Phase III testing. The most pervasive aspects of the QA plan are replication of most of the key runs and adherence to the EPA protocols for calibration, leak checking, and sample handling and recovery. Additionally, sampling activities destined for laboratory analysis included provision for blanks, spikes and calibration standards or surrogates.

SECTION 3

TEST RESULTS

The Phase III testing was directed at quantifying environmental parameters which may be significantly modified by conversion to coal reburning. The most conspicuous change with coal reburning is the use of pulverized coal in the upper furnace for 20 to 30 percent of the total heat release. This fuel displaces 20 to 30 percent of the coal which would otherwise be fired in the cyclones. The cyclones are efficient at removing the coal mineral matter and are especially efficient for the particulate sizes above 1 micron. Firing the pulverized coal in the upper furnace would tend to increase the total particle loading as well as shift the particle sizing to larger size fractions. These two impacts would have compensating effects on precipitator performance. The composite effect on emissions discharged to the environment from the precipitator outlet was unknown at the start of the project. Accordingly, most of the environmental monitoring over and above simple NO_x performance was directed at the parameters influencing precipitator performance: particle loading, flyash resistivity, carbon in flyash, particle sizing, and SO_3/SO_4 levels.

The reduced data summaries for the three test series are contained in the Appendices. Original data sheets and laboratory analytical reports are not provided because of the large volume. These are retained by Acurex and will be made available to B&W or DOE as required. The following text summarizes major observations on the results, particularly as relevant to the issues outlined above. More discussion and data analysis are contained in the B&W test report which incorporates the data herein as well as boiler operational data.

3.1 CONTINUOUS EMISSIONS MONITORING DATA

Continuous emissions monitoring was done for the bulk of the Phase III testing. During the periods of on-site sampling, the CEM system was operated manually and data was tabulated for the run periods of the sample trains. At other times, data was stored and disseminated by the data logger and computer with the CEM system. The continuous emissions monitoring data for the Phase III activities are summarized in the appendices as follows:

- Appendix A: Optimization test run averages and typical results for three reburn runs at the three load conditions
- Appendix B: Stratification test results for 8 of the optimization runs
- Appendix K: Performance test quarter-hour averages for the sampling periods
- Appendix N: Western coal quarter-hour averages for the sampling periods
- Appendix Q: Hourly averages for the long-term continuous monitoring period.

In general the measurements are corrected to a dry basis from the as measured wet condition. Unless otherwise indicated, the concentrations are at the as-measured oxygen level and are not corrected to 3 percent oxygen.

The CEM data suggest the following conclusions:

- For cases where baseline testing was repeated, the agreement with the May 1990 testing was good, with full load NO_x emissions varying between 600 to 650 ppm, at 3 percent oxygen.
- NO_x emission reductions at full load met or exceeded the 50 percent goal and were typically between 50 and 55 percent; Percentage NO_x reductions at partial load were less than at full load and at low loads, absolute emissions were higher than at high loads with reburn.
- SO_2 emissions agreed with fuel sulfur but showed variability reflecting the varying coal quality as shown on Table 2-1

- CO emissions were typically low, less than 50 ppm, except during startup or some other definable upset condition.
- Stratification (Tables 3-1 and 3-2 and Appendix B) were significant, approaching 20 percent total NO_x variation in some cases; Stratification levels were comparable to the baseline testing.

Table 3-1. O_2/NO_x stratification results: ESP outlet ducts, baseline, 110 MW, 4/3/92

		Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
14.2 in depth	O_2 %	4.8	4.2	4.3	4.0	4.4	3.9	3.8	5.1
	NO_x ppm	633	627	627	649	658	646	608	620
24.5 in depth	O_2 %	4.8	4.4	4.3	3.9	4.1	3.8	3.8	4.5
	NO_x ppm	631	627	633	639	607	624	612	601
29.6 in depth	O_2 %	4.8	4.6	4.0	4.1	4.0	3.6	3.1	4.3
	NO_x ppm	629	646	631	645	629	616	603	609
		Duct Average: 4.4% O_2 635 ppm NO_x				Duct Average: 4.1% O_2 619% NO_x			

Table 3-2. O_2/NO_x stratification results: ESP outlet ducts, reburn, 110 MW, 4/2/92

		Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
14.2 in depth	O_2 %	3.3	3.5	3.5	3.4	3.5	3.7	3.2	3.2
	NO_x ppm	267	286	296	306	335	347	342	344
24.5 in depth	O_2 %	3.3	3.5	3.3	3.5	3.7	3.5	3.1	3.1
	NO_x ppm	274	290	290	311	349	348	331	331
29.6 in depth	O_2 %	3.7	3.3	3.5	3.5	3.7	3.1	3.1	4.3
	NO_x ppm	283	285	296	314	354	337	340	314
		Duct Average: 3.8% O_2 292 ppm NO_x				Duct Average: 3.4% O_2 339% NO_x			

3.2 PARTICULATE LOADING

The particulate loading run summaries and other measurements are shown on Table 3-3 for the optimization testing, on Table 3-4 for the performance testing, and on Table 3-5 for the western coal tests. The particulate loading results show considerable variability as was also experienced during the baseline testing. The high degree of replication of these tests and the QA procedures used throughout indicate this variability reflects actual changes in grain loading. Some of this variability may be due to soot blowing patterns. In nearly all cases, soot blowing was conducted as the routine manner, and this could influence grain loading, particularly at the ESP inlet. Despite this variability, it appears that the introduction of reburning does increase particle loading at the ESP inlet. The increase is not reflected in the particle loading at the ESP outlet, however. The small effect, and in some cases a decrease, at the ESP outlet due to reburn may be attributable to the increase in particle sizing with reburn. The larger size fractions are more readily captured with the ESP. Thus, despite a higher loading, the ESP efficiency may increase to give discharge particle loadings comparable to baseline.

The particle loading with western coal shows an increase both at the ESP inlet and outlet, possibly due to ash composition.

The detailed run summaries for the particulate runs are contained in Appendices C, D, L, M, O and P.

3.3 PARTICLE SIZE DISTRIBUTION

The particle size tabulations are summarized in Appendix H and are plotted in Appendix I. These show the expected reduction in size distribution at the ESP outlet compared to the ESP inlet. In comparison to the impactor runs during the May 1990 baseline tests, there is also the expected increase in particle loading into the ESP with reburn due to the larger pulverized coal size fraction compared to particulate escaping the ESP.

Table 3-3. Summary of test results — optimization tests

Date	Load MW	Reburn	Measurements Flow (dscfm)	Measurements Part (gr/dscf)	Measurements Part (lb/MMBtu)	ESP Outlet Flow (dscfm)	ESP Outlet Part (gr/dscf)	ESP Outlet Part (lb/MMBtu)	ESP Eff. (%)	Ash LOI (%)	Inlet resistivity (10^{10} Ohm-cm)
3/31	68		147,000	1.09	2.06					23.5	
4/1	110	X	234,900	1.90	3.20	248,500	0.021	0.035	98.9	12.4	4.2
4/2	110	X	228,400	2.48	4.13	238,900	0.034	0.058	98.6	10.8	
4/3	110		271,400	0.55	1.00	253,000	0.077	0.014	86.0	3.3	
4/6	82		189,200	1.11	1.95	199,900	0.023	0.041	97.9	8.0	
4/7	110	X	244,200	0.62	1.01	240,000	0.052	0.085	91.8	6.2	
4/8	110	X	239,000	0.97	1.55	246,100	0.056	0.090	94.2	8.1	
4/9	110	X	239,200	1.72	2.77	246,100	0.038	0.062	97.8	14.0	
4/10	110	X	233,400	1.33	2.16	247,300	0.017	0.028	98.7	21.0	
4/13	110	X	235,500	2.82	4.73	243,800	0.014	0.024	99.5	19.9	
4/15	82	X	173,500	1.23	2.16	182,300	0.016	0.028	98.7	16.4	
4/16	82	X	172,000	1.64	2.82	177,800	0.020	0.034	98.8	14.7	
4/21	82	X	179,400	1.82	3.25	191,000	0.014	0.025	99.2	15.2	15
4/22	55	X	119,600	2.05	3.69	124,000	0.025	0.044	98.8	20.0	4.5
4/23	58	X	121,600	2.69	5.05	135,400	0.015	0.028	99.4	20.3	0.37
4/24	111	X	235,600	1.34	2.35	240,300	0.022	0.039	98.4	30.4	0.15
4/27	110	X	232,600	1.49	2.48	236,600	0.042	0.069	97.2	12.4	11
4/28	90	X	196,100	1.40	2.41	195,500	0.017	0.029	98.8	19.0	13
4/29	82	X	179,200	1.96	3.55	184,200	0.021	0.037	99.0	32.3	
4/30	57	X	130,500	2.63	4.75	137,411	0.025	0.0046	99.0	34.9	
5/1	110	X	226,100	1.36	2.35	243,100	0.020	0.034	98.5	11.3	
5/16	82	X	177,300	2.81	4.91	199,400	0.003	0.006	99.9	22.6	
5/16	59	X	121,900	2.92	5.06	146,800	0.013	0.023	99.5	31.5	
5/17	58	X	125,900	2.63	4.82	146,700	0.003	0.005	99.9	34.5	
5/17	58	X	125,900	3.69	6.94	148,000	0.031	0.058	99.2	28.3	
5/18	110	X	231,300	2.07	3.52	244,200	0.016	0.027	99.2	13.9	0.59
5/19	110	X	233,000	1.34	2.29	247,400	0.009	0.015	99.3	14.9	0.95
5/19	82	X	170,700	1.29	2.20	186,600	0.0055	0.0096	99.6	13.6	2.7
5/20	110	X	228,500	2.38	4.06	243,600	0.0084	0.014	99.6	14.3	
5/20	82	X	172,100	2.82	4.81	189,100	0.0037	0.0064	99.9	23.8	

Table 3-4. Summary of test results — performance tests

Date	Load MW	Reburn	Measurements			ESP Outlet			ESP Eff. (%)	Ash LOI (%)
			Flow (dscfm)	Part (gr/dscf)	Part (lb/MMBtu)	Flow (dscfm)	Part (gr/dscf)	Part (lb/MMBtu)		
9/28	110	X	240,800	1.63	2.70	252,200	0.038	0.063	97.7	10.8
9/28	79		185,900	0.99	1.70	170,400	0.0091	0.016	99.1	13.2
9/28	110	X	234,600	1.47	2.45	240,400	0.031	0.051	97.9	8.8
9/29	79		326,500	1.07	1.83	173,500	0.0097	0.017	99.1	3.7
9/29	110	X	227,300	1.40	2.33	238,100	0.041	0.069	97.1	8.8
9/30	54		116,100	1.80	3.18	121,600	0.011	0.020	99.4	11.7
9/30	82	X	190,600	1.58	2.64	178,700	0.015	0.025	99.0	16.8
9/30	82	X	194,500	1.50	2.51	178,200	0.014	0.024	99.1	16.6
10/1	54		126,300	2.05	3.55	138.200	0.023	0.040	98.9	13.4
10/2	82	X	168,900	1.20	1.99	180,300	0.019	0.032	98.4	12.9
10/2	40		128,700	2.33	3.95	133,100	0.016	0.027	99.3	26.1
10/3	60	X	134,900	2.56	4.31	128,500	0.013	0.022	99.5	35.1
10/3	60	X	109,100	0.82	1.57	101,600	0.008	0.015	99.1	11.7
10/3	40		112,500	0.76	1.46	90.400	0.0087	0.017	98.9	12.4
10/4	60	X	139,500	2.51	4.24	135,200	0.0069	0.012	99.7	36.0
10/4	38	X	97,200	1.43	2.62	91,400	0.025	0.046	98.2	21.1
10/5	60	X	141,500	1.75	2.95	126,900	0.035	0.058	98.0	26.6
10/5	60	X	138,100	1.80	3.17	138.300	0.033	0.058	98.2	3.6
10/5	110	X	256,700	0.90	1.55	251,300	0.089	0.15	90.2	16.6

Table 3-5. Summary of test results — Western coal tests

Date 1993	Load MW	Reburn	ESP Inlet Flow (dscfm)	ESP Inlet Part (gr/dscf)	ESP Inlet Part (lb/MMBtu)	ESP Outlet Flow (dscfm)	ESP Outlet Part (gr/dscf)	ESP Outlet Part (lb/MMBtu)	ESP Eff. (%)
1/19	110	X	256,900	3.84	6.38	240,600	0.128	0.212	96.9
1/20	82	X	187,700	1.45	2.40	163,200	0.170	0.283	89.8
1/20	60	X	130,000	1.67	2.77	133,200	0.183	0.303	88.8

3.4 FLYASH RESISTIVITY

The flyash resistivity results are summarized in Table 3-3 and the run details are given in Appendix F. The measured in-situ resistivity ranged from 1.5×10^9 to 1.5×10^{11}. These values span the range measured during the baseline testing in May 1990 and show a comparable average level and degree of variation. On this basis, there does not appear to be a significant change in resistivity with reburning.

3.5 CARBON IN FLYASH

The ash loss on ignition, LOI, results on Tables 3-3 and 3-4 range from 6.2 percent to over 30 percent for some parametric runs. In general the higher levels were for lower loads. The LOI levels spanned the same range as the baseline tests, but the average levels with reburn were somewhat higher.

3.6 TRACE METALS

Table 3-6 summarizes the trace metals results for the optimization runs and compares the emission levels to the 1990 baseline tests and the November 1992 HAP tests. The run summaries are contained at the end of Appendix D, and the analytical results are tabulated in Appendix G. In general, the metals showed a fair degree of replication given the usual variability in trace metals concentration in coal. The agreement with the prior baseline and the HAP runs is satisfactory except for chromium for the 1990 baseline. None of these results show any particular cause for concern.

Table 3-6. Summary of trace metal emissions at ESP outlet: μg/dscm

Metal	Reburn Run									Average Baseline 5/90	Average Baseline 11/92	Average Reburn 11/92
	M_1 5/16	M_2 5/16	M_3 5/17	M_4 5/17	M_5 5/18	M_6 5/19	M_7 5/19	M_8 5/20	M_9 5/20			
Ag	<0.85	<1.14	<1.39	<1.22	<0.68	<0.67	<0.89	<0.65	<0.90	<0.68		
As	3.62	25.6	14.8	57.3	16.9	13.2	38	30.2	53.9	18.1	11.0	12.1
Ba	36.4	26.8	8.78	57.8	20.6	12.1	13	13.8	5.95	39.5		
Cd	2.71	2.10	2.36	4.85	12.6	2.28	6.72	3.16	7.08	2.49	3.98	2.37
Cr	13.5	8.0	4.51	23.2	10.8	5.89	13.6	12.1	6.22	260	20.5	7.40
Pb	46.8	19.4	3.87	61.9	33.4	14.2	13.1	13.1	11.0	10.7	127	78.0
Se	116	72.2	62.7	95.8	231	188	138	188	108	77.0	356	218
Hg	5.92	2.94	3.29	3.67	5.62	6.06	6.28	4.83	4.16	1.35	7.48	5.66

3.7 SULFATES

The results of the MACs train runs are tabulated in Appendix O. The total sulfate levels for the 6 runs which were sampled varied from 9 to 28 ppm. The average of the 6 runs was 15.7 ppm. For the 1990 baseline tests, the sulfate levels varied from 1.4 ppm to 23 ppm with an average of 9.1 ppm. Given the variability in sulfate formation and emission levels, this difference is not significant, and would be unlikely to affect ESP performance.

3.8 HYDROCARBONS

Method 18 hydrocarbon sampling and analyses were conducted for three reburn runs during the optimization testing. All three results showed no detection of total hydrocarbon to a detection limit of 1 ppm. This was consistent with the baseline testing which also showed very low or non-detectable emissions. The November 1992 HAP tests, using more refined techniques, also showed non-detectable hydrocarbon down to the ppb level. In that case, no significant effect of reburning on hydrocarbon emissions was seen.

3.9 TOXICITY CHARACTERIZATION LEACHATE PROCEDURE

The EPA/RCRA TCLP testing was performed on the composite flyash slurry sample collected during May 16 through May 20, 1992 during the optimization testing. The results are summarized on Table 3-7 in terms of leachate concentrations in mg/L. The table also shows the RCRA threshold level which is used to designate whether a sample is hazardous. The composite reburn concentrations are uniformly well below the threshold levels, in most cases by several orders of magnitude. The table also lists the results for the May 1990 baseline test. No significant difference is evident. In both the baseline and reburn case, there is no basis for concern.

Table 3-7. Summary of toxicity characteristic leachate procedure (TCLP) on ash slurry samples, mg/L

TCLP Metal	Composite Baseline	Composite Reburn	RCRA TCLP Threshold Limit
Ag	<0.005	<0.014	5.0
As	<0.2	<0.3	5.0
Ba	0.52	0.093	100
Cd	<0.005	<0.008	1.0
Cr	0.016	0.109	5.0
Hg	<0.0002	<0.004	0.2
Pb	<0.05	<0.3	5.0
Se	<0.2	<0.1	1.0

APPENDIX A

OPTIMIZATION TEST

CONTINUOUS EMISSION MONITOR DATA SUMMARY

A1 — Average CEM Readings
A2 — Typical Result 110-MW Reburn
A3 — Typical Result 82-MW Reburn
A4 — Typical Result 55-MW Reburn

A1 — Average CEM readings, dry basis

Date	O_2	CO	NO_x	SO_2
4/2	2.5	NA	314	1,388
4/6	4.4	47	470	1,099
4/7	3.0	134	298	1,294
4/10	2.9	NA	359	1,539
4/13	3.4	35	339	1,368
4/15	14.2	69	223	1,205
4/16	3.8	49	458	1,257
4/21	4.5	39	299	1,281
4/22	4.6	18	375	1,262
4/23	5.3	63	251	1,314
4/24	4.2	21	303	1,166
4/27	3.3	37	244	1,414
4/29	4.7	71	240	1,302
4/30	4.7	68	305	1,333
5/1	3.9	51	361	1,103
5/16	4.1	61	274	1,192
5/16	4.0	96	314	1,227
5/17	4.9	67	323	1,202
5/17	5.3	66	317	1,146
5/18	3.5	35	323	1,099
5/19	3.4	44	280	1,176
5/19	3.9	51	271	1,179
5/20	3.7	24	268	1,147
5/20	4.0	62	254	1,198

A2 — Typical Result 110-MW Reburn

Continuous Monitoring April 10, 110 MW Reburn

TIME	Wet CO PPM	Wet CO2 %	Wet NOX PPM	Wet SO2 PPM	Wet O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
10:50:09	17	14.3	321	1398	2.7	2.9	15.5	347	15.5
10:50:29	16	14.4	323	1399	2.7	2.9	15.5	349	15.5
10:50:49	20	14.3	324	1398	2.6	2.8	15.4	350	15.4
10:51:09	19	14.3	323	1399	2.7	2.9	15.4	349	15.4
10:51:29	22	14.4	322	920	2.6	2.8	15.5	348	15.5
10:51:49	17	14.3	322	1400	2.7	2.9	15.4	348	15.4
10:52:09	13	14.3	322	1405	2.6	2.8	15.4	348	15.4
10:52:29	15	14.2	323	1408	2.7	2.9	15.3	349	15.3
10:52:49	16	14.2	323	1409	2.7	2.9	15.3	349	15.3
10:53:09	17	14.2	326	1410	2.8	3.0	15.4	352	15.4
10:53:29	17	14.3	328	1410	2.6	2.8	15.4	355	15.4
10:53:49	16	14.3	331	1413	2.7	2.9	15.4	358	15.4
10:54:09	19	14.2	333	1414	2.7	2.9	15.4	360	15.4
10:54:29	18	14.3	336	1416	2.7	2.9	15.5	363	15.5
10:54:49	19	14.2	338	1416	2.7	2.9	15.4	365	15.4
10:55:09	20	14.3	343	1416	2.7	2.9	15.4	371	15.4
10:55:29	15	14.3	341	1418	2.8	3.0	15.5	369	15.5
10:55:49	14	14.3	340	1416	2.7	2.9	15.4	368	15.4
10:56:09	17	14.3	337	1418	2.6	2.8	15.4	364	15.4
10:56:29	18	14.4	335	1416	2.7	2.9	15.5	362	15.5
10:56:49	16	14.3	335	1420	2.7	2.9	15.4	362	15.4
10:57:09	15	14.3	337	1419	2.6	2.8	15.5	364	15.5
10:57:29	18	14.4	337	1423	2.7	2.9	15.5	364	15.5
10:57:49	18	14.4	337	1421	2.6	2.8	15.5	364	15.5
10:58:09	18	14.3	337	1421	2.6	2.8	15.4	364	15.4
10:58:29	20	14.4	337	1420	2.7	2.9	15.6	364	15.6
10:58:49	19	14.3	336	1420	2.7	2.9	15.4	363	15.4
10:59:09	20	14.2	335	1420	2.6	2.8	15.4	362	15.4
10:59:29	20	14.4	335	1418	2.7	2.9	15.5	362	15.5
10:59:49	18	14.3	333	1418	2.7	2.9	15.5	360	15.5
11:00:09	17	14.2	333	1420	2.7	2.9	15.3	360	15.3
11:00:29	15	14.3	334	1419	2.5	2.7	15.4	361	15.4
11:00:49	18	14.5	335	1418	2.6	2.8	15.7	362	15.7
11:01:09	17	14.2	337	1420	2.6	2.8	15.3	364	15.3
11:01:29	17	14.3	338	1420	2.6	2.8	15.5	365	15.5
11:01:49	17	14.4	336	1423	2.6	2.8	15.5	363	15.5
11:02:09	17	14.2	334	1423	2.6	2.8	15.4	361	15.4
11:02:29	16	14.3	334	1423	2.6	2.8	15.5	361	15.5
11:02:49	17	14.4	335	1421	2.5	2.7	15.5	362	15.5
11:03:09	19	14.4	334	1424	2.7	2.9	15.5	361	15.5
11:03:29	18	14.3	334	1423	2.6	2.8	15.4	361	15.4
11:03:49	19	14.3	334	1415	2.6	2.8	15.5	361	15.5
11:04:09	17	14.3	335	1424	2.5	2.7	15.5	362	15.5
11:04:29	17	14.2	336	1423	2.5	2.7	15.4	363	15.4
11:04:49	19	14.4	336	1423	2.7	2.9	15.6	363	15.6
11:05:09	20	14.3	337	1421	2.6	2.8	15.5	364	15.5
11:05:29	17	14.3	336	1423	2.7	2.9	15.4	363	15.4
11:05:49	18	14.4	340	1416	2.5	2.7	15.5	368	15.5
11:06:09	20	14.3	341	1421	2.4	2.6	15.4	369	15.4
11:06:29	18	14.5	343	1421	2.5	2.7	15.6	371	15.6
11:06:49	17	14.4	344	1425	2.7	2.9	15.5	372	15.5
11:07:09	17	14.3	340	1426	2.7	2.9	15.4	368	15.4
11:07:29	16	14.3	339	1430	2.7	2.9	15.4	366	15.4
11:07:49	15	14.3	338	1430	2.7	2.9	15.4	365	15.4
11:08:09	18	14.3	340	1430	2.6	2.8	15.4	368	15.4
11:08:29	18	14.2	340	1429	2.6	2.8	15.3	368	15.3
11:08:49	19	14.3	339	1428	2.6	2.8	15.5	366	15.5
11:09:09	18	14.3	339	1430	2.5	2.7	15.4	366	15.4
11:09:29	18	14.2	337	1429	2.5	2.7	15.4	364	15.4
11:09:49	17	14.3	338	1430	2.5	2.7	15.5	365	15.5
11:10:09	16	14.4	337	1430	2.5	2.7	15.6	364	15.6
11:10:29	17	14.3	335	1430	2.6	2.8	15.4	362	15.4
11:10:49	15	14.4	333	1430	2.7	2.9	15.5	360	15.5
11:11:09	18	14.2	333	1431	2.7	2.9	15.4	360	15.4
11:11:29	17	14.2	338	1428	2.7	2.9	15.4	365	15.4

Continuous Monitoring April 10, 110 MW Reburn

TIME	CO PPM	CO2 %	Wet NOX PPM	Wet SO2 PPM	Wet O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
11:11:49	16	14.3	336	1424	2.6	2.8	15.4	363	15.4
11:12:09	17	14.3	336	1421	2.6	2.8	15.4	363	15.4
11:12:29	17	14.3	336	1420	2.6	2.8	15.5	363	15.5
11:12:49	15	14.4	335	1420	2.8	3.0	15.5	362	15.5
11:13:09	17	14.2	335	1421	2.7	2.9	15.4	362	15.4
11:13:29	17	14.3	335	1421	2.6	2.8	15.5	362	15.5
11:13:49	20	14.3	335	1420	2.6	2.8	15.4	362	15.4
11:14:09	19	14.3	337	1419	2.7	2.9	15.4	364	15.4
11:14:29	20	14.3	339	1419	2.6	2.8	15.5	366	15.5
11:14:49	14	14.3	337	1419	2.7	2.9	15.5	364	15.5
11:15:09	15	14.3	338	1419	2.7	2.9	15.4	365	15.4
11:15:29	16	14.3	338	1419	2.6	2.8	15.5	365	15.5
11:15:49	19	14.3	342	1416	2.6	2.8	15.4	370	15.4
11:16:09	17	14.3	347	1419	2.7	2.9	15.5	375	15.5
11:16:29	20	14.3	347	1420	2.6	2.8	15.5	375	15.5
11:16:49	17	14.2	345	1421	2.6	2.8	15.3	373	15.3
11:17:09	16	14.4	343	1423	2.5	2.7	15.5	371	15.5
11:17:29	18	14.4	339	1424	2.7	2.9	15.6	366	15.6
11:17:49	18	14.2	339	1428	2.5	2.7	15.3	366	15.3
11:18:09	19	14.2	338	1428	2.5	2.7	15.4	365	15.4
11:18:29	18	14.4	345	1425	2.5	2.7	15.6	373	15.6
11:18:49	19	14.3	341	1428	2.6	2.8	15.4	369	15.4
11:19:09	19	14.3	340	1429	2.5	2.7	15.4	368	15.4
11:19:29	18	14.4	336	1426	2.6	2.8	15.6	363	15.6
11:19:49	17	14.2	335	1426	2.6	2.8	15.3	362	15.3
11:20:09	20	14.3	335	1424	2.6	2.8	15.5	362	15.5
11:20:29	17	14.3	336	1421	2.5	2.7	15.5	363	15.5
11:20:49	18	14.4	336	1420	2.6	2.8	15.5	363	15.5
11:21:09	15	14.3	337	1420	2.5	2.7	15.5	364	15.5
11:21:29	18	14.4	338	1421	2.6	2.8	15.6	365	15.6
11:21:49	18	14.4	340	1423	2.5	2.7	15.5	368	15.5
11:22:09	19	14.4	340	1425	2.6	2.8	15.6	368	15.6
11:22:29	19	14.3	338	1428	2.4	2.6	15.5	365	15.5
11:22:49	17	14.4	337	1431	2.5	2.7	15.6	364	15.6
11:23:09	17	14.3	336	1434	2.7	2.9	15.5	363	15.5
11:23:29	19	14.2	336	1436	2.4	2.6	15.4	363	15.4
11:23:49	20	14.4	334	1436	2.8	3.0	15.5	361	15.5
11:24:09	18	14.3	333	1438	2.4	2.6	15.4	360	15.4
11:24:29	17	14.4	334	1436	2.5	2.7	15.5	361	15.5
11:24:49	18	14.4	336	1436	2.5	2.7	15.5	363	15.5
11:25:09	19	14.3	337	1438	2.7	2.9	15.5	364	15.5
11:25:29	20	14.2	335	1439	2.6	2.8	15.4	362	15.4
11:25:49	19	14.3	334	1439	2.7	2.9	15.4	361	15.4
11:26:09	17	14.1	336	1436	2.7	2.9	15.2	363	15.2
11:26:29	17	14.2	341	1434	2.7	2.9	15.4	369	15.4
11:26:49	20	14.3	343	1431	2.7	2.9	15.4	371	15.4
11:27:09	22	14.2	348	1429	2.6	2.8	15.3	376	15.3
11:27:29	22	14.2	353	1428	2.6	2.8	15.4	382	15.4
11:27:49	19	14.3	360	1425	2.6	2.8	15.4	389	15.4
11:28:09	19	14.2	360	1428	2.6	2.8	15.4	389	15.4
11:28:29	20	14.3	358	1426	2.7	2.9	15.5	387	15.5
11:28:49	19	14.3	357	1429	2.6	2.8	15.4	386	15.4
11:29:09	19	14.3	353	1430	2.7	2.9	15.4	382	15.4
11:29:29	19	14.3	360	1429	2.7	2.9	15.5	389	15.5
11:29:49	19	14.2	352	1428	2.7	2.9	15.3	381	15.3
11:30:09	17	14.2	342	1428	2.7	2.9	15.3	370	15.3
11:30:29	18	14.2	334	1421	2.7	2.9	15.4	361	15.4
11:30:49	22	14.2	334	1419	2.6	2.8	15.4	361	15.4
11:31:09	18	14.3	340	1416	2.6	2.8	15.5	368	15.5
11:31:29	18	14.3	351	1418	2.6	2.8	15.5	379	15.5
11:31:49	20	14.3	360	1416	2.7	2.9	15.4	389	15.4
11:32:09	20	14.3	358	1416	2.7	2.9	15.4	387	15.4
11:32:29	19	14.2	350	1415	2.7	2.9	15.3	378	15.3
11:32:49	19	14.3	344	1413	2.6	2.8	15.4	372	15.4
11:33:09	19	14.3	342	1413	2.7	2.9	15.4	370	15.4
11:33:29	20	14.1	341	1413	2.6	2.8	15.3	369	15.3

Continuous Monitoring April 10, 110 MW Reburn

TIME	CO PPM	CO2 %	Wet NOX PPM	SO2 PPM	O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
11:33:49	22	14.3	339	1413	2.9	3.1	15.4	366	15.4
11:34:09	15	14.2	337	1411	2.7	2.9	15.3	364	15.3
11:34:29	18	14.0	336	1411	2.7	2.9	15.1	363	15.1
11:34:49	18	14.2	338	1409	2.7	2.9	15.4	365	15.4
11:35:09	20	14.2	340	1409	2.5	2.7	15.3	368	15.3
11:35:29	20	14.1	340	1413	2.6	2.8	15.3	368	15.3
11:35:49	20	14.2	338	1409	2.7	2.9	15.4	365	15.4
11:36:09	20	14.2	335	1414	2.6	2.8	15.4	362	15.4
11:36:29	18	14.2	334	1416	2.6	2.8	15.4	361	15.4
11:36:49	17	14.2	333	1419	2.6	2.8	15.4	360	15.4
11:37:09	18	14.3	332	1421	2.7	2.9	15.5	359	15.5
11:37:29	20	14.2	332	1423	2.6	2.8	15.3	359	15.3
11:37:49	18	14.3	332	1424	3.0	3.2	15.4	359	15.4
11:38:09	18	14.2	334	1425	2.7	2.9	15.3	361	15.3
11:38:29	20	14.1	335	1425	2.7	2.9	15.3	362	15.3
11:38:49	18	14.2	339	1430	2.6	2.8	15.4	366	15.4
11:39:09	18	14.3	345	1424	2.6	2.8	15.4	373	15.4
11:39:29	18	14.3	350	1435	2.6	2.8	15.5	378	15.5
11:39:49	18	14.3	347	1424	2.7	2.9	15.4	375	15.4
11:40:09	18	14.3	338	1424	2.6	2.8	15.4	365	15.4
11:40:29	19	14.3	333	1423	2.7	2.9	15.4	360	15.4
11:40:49	19	14.2	332	1420	2.6	2.8	15.4	359	15.4
11:41:09	17	14.2	330	1418	2.5	2.7	15.4	357	15.4
11:41:29	15	14.3	328	1418	2.6	2.8	15.4	355	15.4
11:41:49	19	14.2	328	1418	2.6	2.8	15.4	355	15.4
11:42:09	22	14.3	330	1418	2.7	2.9	15.4	357	15.4
11:42:29	18	14.2	332	1418	2.7	2.9	15.4	359	15.4
11:42:49	19	14.1	333	1418	2.7	2.9	15.2	360	15.2
11:43:09	19	14.2	335	1415	2.6	2.8	15.3	362	15.3
11:43:29	17	14.3	336	1415	2.7	2.9	15.4	363	15.4
11:43:49	18	14.1	336	1413	2.7	2.9	15.3	363	15.3
11:44:09	17	14.2	335	1413	2.6	2.8	15.3	362	15.3
11:44:29	17	14.2	335	1411	2.7	2.9	15.4	362	15.4
11:44:49	22	14.1	334	1404	2.7	2.9	15.2	361	15.2
11:45:09	19	14.1	334	1411	2.6	2.8	15.3	361	15.3
11:45:29	19	14.3	333	1410	2.7	2.9	15.4	360	15.4
11:45:49	17	14.1	333	1414	2.6	2.8	15.3	360	15.3
11:46:09	16	14.2	333	1413	2.6	2.8	15.4	360	15.4
11:46:29	17	14.2	336	1420	2.6	2.8	15.4	363	15.4
11:46:49	17	14.2	337	1414	2.7	2.9	15.4	364	15.4
11:47:09	20	14.2	337	1413	2.4	2.6	15.4	364	15.4
11:47:29	18	14.3	335	1416	2.7	2.9	15.4	362	15.4
11:47:49	19	14.2	336	1419	2.6	2.8	15.4	363	15.4
11:48:09	20	14.1	342	1420	2.6	2.8	15.2	370	15.2
11:48:29	18	14.2	353	1420	2.7	2.9	15.4	382	15.4
11:48:49	21	14.2	362	1421	2.7	2.9	15.3	391	15.3
11:49:09	18	14.1	368	1421	2.6	2.8	15.3	398	15.3
11:49:29	18	14.3	373	1420	2.6	2.8	15.4	403	15.4
11:49:49	19	14.2	366	1421	2.6	2.8	15.4	396	15.4
11:50:09	19	14.2	360	1424	2.6	2.8	15.4	389	15.4
11:50:29	18	14.3	349	1424	2.7	2.9	15.4	377	15.4
11:50:49	20	14.2	339	1424	2.7	2.9	15.4	366	15.4
11:51:09	20	14.1	333	1425	2.7	2.9	15.2	360	15.2
11:51:29	22	14.2	331	1425	2.7	2.9	15.4	358	15.4
11:51:49	18	14.2	331	1424	2.7	2.9	15.4	358	15.4
11:52:09	18	14.1	331	1424	2.8	3.0	15.2	358	15.2
11:52:29	20	14.1	330	1425	2.7	2.9	15.3	357	15.3
11:52:49	19	14.1	329	1424	2.8	3.0	15.2	356	15.2
11:53:09	20	14.0	331	1421	3.0	3.2	15.2	358	15.2
11:53:29	19	13.9	334	1421	2.7	2.9	15.1	361	15.1
11:53:49	22	14.1	338	1420	2.7	2.9	15.3	365	15.3
11:54:09	20	14.2	341	1419	2.9	3.1	15.3	369	15.3
11:54:29	19	14.1	342	1419	2.7	2.9	15.2	370	15.2
11:54:49	20	14.0	342	1421	2.6	2.8	15.2	370	15.2
11:55:09	20	14.2	343	1419	2.5	2.7	15.4	371	15.4
11:55:29	22	14.3	344	1423	2.6	2.8	15.5	372	15.5

Continuous Monitoring April 10, 110 MW Reburn

TIME	Wet CO PPM	Wet CO2 %	Wet NOX PPM	Wet SO2 PPM	Wet O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
11:55:49	20	14.2	342	1426	2.6	2.8	15.4	370	15.4
11:56:09	20	14.3	337	1429	2.6	2.8	15.4	364	15.4
11:56:29	18	14.2	333	1431	2.6	2.8	15.4	360	15.4
11:56:49	18	14.2	332	1434	2.6	2.8	15.4	359	15.4
11:57:09	20	14.1	332	1434	2.6	2.8	15.3	359	15.3
11:57:29	18	14.2	331	1433	2.7	2.9	15.3	358	15.3
11:57:49	21	14.2	332	1433	2.6	2.8	15.3	359	15.3
11:58:09	20	14.3	333	1428	2.7	2.9	15.4	360	15.4
11:58:29	19	14.1	332	1428	2.6	2.8	15.2	359	15.2
11:58:49	22	14.2	331	1425	2.6	2.8	15.4	358	15.4
11:59:09	22	14.2	329	1424	2.6	2.8	15.3	356	15.3
11:59:29	23	14.1	329	1424	2.8	3.0	15.3	356	15.3
11:59:49	22	14.1	329	1425	2.7	2.9	15.2	356	15.2
12:00:19	20	14.1	329	1424	2.8	3.0	15.2	356	15.2
12:00:39	19	14.1	329	1423	2.8	3.0	15.2	356	15.2
12:00:59	19	13.9	331	1419	2.7	2.9	15.0	358	15.0
12:01:19	18	14.1	334	1416	2.5	2.7	15.3	361	15.3
12:01:39	18	14.3	335	1415	2.6	2.8	15.5	362	15.5
12:01:59	19	14.1	335	1416	2.8	3.0	15.3	362	15.3
12:02:19	19	14.1	333	1418	2.7	2.9	15.2	360	15.2
12:02:39	20	14.1	331	1416	2.7	2.9	15.2	358	15.2
12:02:59	22	14.1	332	1415	2.6	2.8	15.2	359	15.2
12:03:19	18	14.1	333	1414	2.6	2.8	15.2	360	15.2
12:03:39	17	14.2	327	1411	2.7	2.9	15.3	354	15.3
12:03:59	19	14.1	325	1411	2.7	2.9	15.2	351	15.2
12:04:19	20	14.1	328	1411	2.6	2.8	15.2	355	15.2
12:04:39	20	14.2	328	1411	2.8	3.0	15.3	355	15.3
12:04:59	19	14.1	328	1411	2.6	2.8	15.2	355	15.2
12:05:19	19	14.2	328	1414	2.5	2.7	15.3	355	15.3
12:05:39	22	14.2	326	1413	2.7	2.9	15.3	352	15.3
12:05:59	22	14.1	324	1415	2.7	2.9	15.2	350	15.2
12:06:19	20	14.1	323	1415	2.7	2.9	15.2	349	15.2
12:06:39	19	14.0	323	1419	2.7	2.9	15.2	349	15.2
12:06:59	19	14.0	324	1418	2.6	2.8	15.1	350	15.1
12:07:19	18	14.1	326	1410	2.7	2.9	15.2	352	15.2
12:07:39	22	14.1	326	1418	2.8	3.0	15.3	352	15.3
12:07:59	20	14.1	327	1421	2.8	3.0	15.2	354	15.2
12:08:19	19	13.9	325	1423	2.8	3.0	15.0	351	15.0
12:08:39	18	14.1	327	1425	2.6	2.8	15.2	354	15.2
12:08:59	20	14.2	328	1423	2.6	2.8	15.3	355	15.3
12:09:19	22	14.0	330	1424	2.6	2.8	15.1	357	15.1
12:09:39	22	14.2	329	1415	2.7	2.9	15.3	356	15.3
12:09:59	20	14.1	323	1429	2.7	2.9	15.3	349	15.3
12:10:19	22	14.1	322	1428	2.7	2.9	15.2	348	15.2
12:10:39	19	14.1	318	1425	2.7	2.9	15.2	344	15.2
12:10:59	20	14.1	319	1423	2.7	2.9	15.2	345	15.2
12:11:19	19	14.1	320	1420	2.8	3.0	15.2	346	15.2
12:11:39	16	14.0	323	1420	2.7	2.9	15.1	349	15.1
12:11:59	19	14.1	324	1419	2.7	2.9	15.3	350	15.3
12:12:19	20	14.1	326	1420	2.7	2.9	15.2	352	15.2
12:12:39	12	14.1	325	1421	2.5	2.7	15.2	351	15.2
12:12:59	18	14.1	325	1421	2.5	2.7	15.3	351	15.3
12:13:19	18	14.2	325	1423	2.7	2.9	15.3	351	15.3
12:13:39	20	14.1	326	1425	2.7	2.9	15.3	352	15.3
12:13:59	20	14.2	326	1424	2.6	2.8	15.3	352	15.3
12:14:19	20	14.1	327	1424	2.6	2.8	15.2	354	15.2
12:14:39	20	14.1	328	1423	2.6	2.8	15.2	355	15.2
12:14:59	20	14.2	327	1416	2.6	2.8	15.4	354	15.4
12:15:19	22	14.2	326	1415	2.7	2.9	15.3	352	15.3
12:15:39	19	13.9	324	1409	2.5	2.7	15.1	350	15.1
12:15:59	20	14.0	322	1405	2.6	2.8	15.2	348	15.2
12:16:19	17	14.1	323	1404	2.6	2.8	15.2	349	15.2
12:16:39	18	14.0	323	1401	2.7	2.9	15.1	349	15.1
12:16:59	22	14.1	324	1401	2.7	2.9	15.2	350	15.2
12:17:19	22	14.0	325	1400	2.6	2.8	15.2	351	15.2
12:17:39	19	13.8	325	1399	2.7	2.9	15.0	351	15.0

Continuous Monitoring April 10, 110 MW Reburn

TIME	CO PPM	CO2 %	Wet NOX PPM	SO2 PPM	O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
12:17:59	22	14.0	329	1398	2.5	2.7	15.1	356	15.1
12:18:19	23	14.1	330	1400	2.6	2.8	15.2	357	15.2
12:18:39	22	13.9	329	1404	2.6	2.8	15.0	356	15.0
12:18:59	19	14.0	327	1405	2.6	2.8	15.2	354	15.2
12:19:19	19	14.0	326	1409	2.6	2.8	15.2	352	15.2
12:19:39	22	14.1	326	1413	2.6	2.8	15.2	352	15.2
12:19:59	20	14.0	329	1415	2.6	2.8	15.1	356	15.1
12:20:19	22	14.0	329	1416	2.6	2.8	15.2	356	15.2
12:20:39	20	13.9	328	1420	2.5	2.7	15.0	355	15.0
12:20:59	23	14.1	328	1419	2.5	2.7	15.2	355	15.2
12:21:19	23	14.0	328	1421	2.6	2.8	15.2	355	15.2
12:21:39	20	14.0	328	1423	2.6	2.8	15.1	355	15.1
12:21:59	19	14.0	326	1424	2.6	2.8	15.1	352	15.1
12:22:19	20	14.0	324	1424	2.7	2.9	15.1	350	15.1
12:22:39	18	13.9	324	1424	2.7	2.9	15.1	350	15.1
12:22:59	18	13.9	325	1424	2.6	2.8	15.1	351	15.1
12:23:19	20	14.0	327	1424	2.7	2.9	15.1	354	15.1
12:23:39	22	13.9	326	1423	2.7	2.9	15.0	352	15.0
12:23:59	22	13.8	325	1418	2.7	2.9	15.0	351	15.0
12:24:19	19	13.9	326	1419	2.7	2.9	15.0	352	15.0
12:24:39	20	13.9	327	1416	2.7	2.9	15.0	354	15.0
12:24:59	20	13.8	329	1418	2.6	2.8	14.9	356	14.9
12:25:19	22	14.0	330	1416	2.7	2.9	15.1	357	15.1
12:25:39	22	13.9	331	1418	2.6	2.8	15.0	358	15.0
12:25:59	20	13.8	331	1419	2.7	2.9	15.0	358	15.0
12:26:19	17	14.0	331	1420	2.7	2.9	15.1	358	15.1
12:26:39	21	13.9	330	1423	2.7	2.9	15.1	357	15.1
12:26:59	18	13.8	329	1423	2.5	2.7	15.0	356	15.0
12:27:19	20	14.0	328	1424	2.6	2.8	15.1	355	15.1
12:27:39	19	14.0	329	1426	2.6	2.8	15.1	356	15.1
12:27:59	17	13.9	327	1429	2.6	2.8	15.1	354	15.1
12:28:19	19	14.0	324	1429	2.7	2.9	15.1	350	15.1
12:28:39	19	13.9	323	1430	2.7	2.9	15.1	349	15.1
12:28:59	20	13.9	323	1431	2.6	2.8	15.0	349	15.0
12:29:19	20	13.9	325	1430	2.6	2.8	15.0	351	15.0
12:29:39	20	13.9	326	1429	2.6	2.8	15.1	352	15.1
12:29:59	20	14.1	326	1429	2.6	2.8	15.2	352	15.2
12:30:19	21	14.1	321	1429	2.6	2.8	15.2	347	15.2
12:30:39	19	13.8	326	1430	2.6	2.8	15.0	352	15.0
12:30:59	19	14.0	327	1430	2.6	2.8	15.1	354	15.1
12:31:19	20	14.0	326	1430	2.5	2.7	15.1	352	15.1
12:31:39	20	14.0	327	1430	2.6	2.8	15.1	354	15.1
12:31:59	22	14.0	327	1429	2.7	2.9	15.2	354	15.2
12:32:19	20	13.9	327	1429	2.7	2.9	15.0	354	15.0
12:32:39	19	14.0	326	1428	2.6	2.8	15.1	352	15.1
12:32:59	18	14.0	326	1429	2.5	2.7	15.1	352	15.1
12:33:19	22	13.9	327	1428	2.6	2.8	15.0	354	15.0
12:33:39	17	14.0	328	1418	2.5	2.7	15.2	355	15.2
12:33:59	18	14.0	327	1429	2.7	2.9	15.1	354	15.1
12:34:19	22	13.9	325	1429	2.6	2.8	15.1	351	15.1
12:34:39	18	14.0	323	1430	2.6	2.8	15.1	349	15.1
12:34:59	19	13.9	323	1429	2.7	2.9	15.0	349	15.0
12:35:19	22	13.9	323	1428	2.6	2.8	15.0	349	15.0
12:35:39	20	13.9	323	1425	2.6	2.8	15.0	349	15.0
12:35:59	18	14.0	323	1425	2.7	2.9	15.1	349	15.1
12:36:19	18	13.9	324	1424	2.7	2.9	15.0	350	15.0
12:36:39	19	13.9	325	1424	2.7	2.9	15.0	351	15.0
12:36:59	20	13.9	328	1420	2.7	2.9	15.1	355	15.1
12:37:19	20	13.9	330	1419	2.7	2.9	15.0	357	15.0
12:37:39	22	13.9	331	1418	2.6	2.8	15.1	358	15.1
12:37:59	18	13.9	330	1416	2.6	2.8	15.1	357	15.1
12:38:19	20	14.0	332	1416	2.6	2.8	15.1	359	15.1
12:38:39	20	13.9	328	1418	2.6	2.8	15.1	355	15.1
12:38:59	19	14.0	327	1419	2.7	2.9	15.1	354	15.1
12:39:19	18	14.0	326	1419	2.7	2.9	15.1	352	15.1
12:39:39	19	14.0	326	1420	2.5	2.7	15.1	352	15.1

Continuous Monitoring April 10, 110 MW Reburn

TIME	CO PPM	CO2 %	Wet NOX PPM	SO2 PPM	O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
12:39:59	18	14.0	327	1420	2.7	2.9	15.1	354	15.1
12:40:19	22	14.0	328	1419	2.7	2.9	15.1	355	15.1
12:40:39	23	13.9	327	1420	2.5	2.7	15.1	354	15.1
12:40:59	22	14.0	326	1419	2.6	2.8	15.2	352	15.2
12:41:19	22	14.0	324	1421	2.7	2.9	15.2	350	15.2
12:41:39	20	13.8	322	1423	2.6	2.8	14.9	348	14.9
12:41:59	19	13.9	322	1421	2.6	2.8	15.1	348	15.1
12:42:19	20	14.0	323	1414	2.5	2.7	15.1	349	15.1
12:42:39	20	13.9	325	1414	2.5	2.7	15.0	351	15.0
12:42:59	22	14.1	327	1424	2.6	2.8	15.2	354	15.2
12:43:19	21	14.0	326	1426	2.7	2.9	15.1	352	15.1
12:43:39	19	13.9	325	1426	2.6	2.8	15.0	351	15.0
12:43:59	17	14.0	325	1428	2.6	2.8	15.1	351	15.1
12:44:19	19	14.0	325	1426	2.6	2.8	15.1	351	15.1
12:44:39	20	13.9	326	1428	2.7	2.9	15.1	352	15.1
12:44:59	19	14.1	326	1428	2.6	2.8	15.2	352	15.2
12:45:19	20	14.0	326	1426	2.6	2.8	15.1	352	15.1
12:45:39	20	14.1	326	1428	2.6	2.8	15.2	352	15.2
12:45:59	19	14.0	326	1428	2.6	2.8	15.1	352	15.1
12:46:19	18	14.0	326	1429	2.6	2.8	15.1	352	15.1
12:46:39	20	14.0	325	1430	2.5	2.7	15.2	351	15.2
12:46:59	22	14.2	323	1430	2.7	2.9	15.3	349	15.3
12:47:19	18	14.0	322	1430	2.7	2.9	15.1	348	15.1
12:47:39	19	14.0	320	1430	2.7	2.9	15.1	346	15.1
12:47:59	20	14.0	319	1429	2.7	2.9	15.1	345	15.1
12:48:19	17	13.9	320	1429	2.7	2.9	15.0	346	15.0
12:48:39	20	14.0	322	1428	2.7	2.9	15.1	348	15.1
12:48:59	23	13.9	324	1424	2.7	2.9	15.0	350	15.0
12:49:19	20	14.0	325	1419	2.7	2.9	15.1	351	15.1
12:49:39	22	14.0	325	1415	2.6	2.8	15.1	351	15.1
12:49:59	18	13.9	325	1413	2.7	2.9	15.0	351	15.0
12:50:19	20	13.9	325	1411	2.7	2.9	15.1	351	15.1
12:50:39	17	13.9	326	1411	2.7	2.9	15.1	352	15.1
12:50:59	19	13.9	327	1410	2.7	2.9	15.0	354	15.0
12:51:19	22	13.9	326	1408	2.7	2.9	15.1	352	15.1
12:51:39	16	13.9	326	1404	2.7	2.9	15.1	352	15.1
12:51:59	20	13.9	325	1400	2.9	3.1	15.0	351	15.0
12:52:19	23	13.8	326	1400	2.8	3.0	14.9	352	14.9
12:52:39	18	13.8	328	1395	2.7	2.9	15.0	355	15.0
12:52:59	22	13.9	331	1394	2.7	2.9	15.0	358	15.0
12:53:19	22	13.9	333	1395	2.7	2.9	15.0	360	15.0
12:53:39	22	14.0	332	1395	2.7	2.9	15.1	359	15.1
12:53:59	20	13.9	330	1396	2.6	2.8	15.1	357	15.1
12:54:19	17	14.0	326	1395	2.8	3.0	15.2	352	15.2
12:54:39	18	14.0	324	1395	2.7	2.9	15.1	350	15.1
12:54:59	20	14.0	321	1394	2.8	3.0	15.1	347	15.1
12:55:19	21	13.9	322	1394	2.7	2.9	15.0	348	15.0
12:55:39	22	14.0	322	1391	2.7	2.9	15.1	348	15.1
12:55:59	20	13.9	326	1394	2.7	2.9	15.0	352	15.0
12:56:19	19	13.9	329	1394	2.6	2.8	15.1	356	15.1
12:56:39	19	14.0	329	1395	2.6	2.8	15.1	356	15.1
12:56:59	19	14.0	332	1401	2.7	2.9	15.1	359	15.1
12:57:19	20	14.0	338	1404	2.7	2.9	15.1	365	15.1
12:57:39	19	14.0	340	1410	2.6	2.8	15.1	368	15.1
12:57:59	23	14.0	336	1414	2.7	2.9	15.2	363	15.2
12:58:19	23	13.8	331	1414	2.7	2.9	15.0	358	15.0
12:58:39	25	13.9	327	1414	2.6	2.8	15.0	354	15.0
12:58:59	22	14.0	327	1414	2.8	3.0	15.2	354	15.2
12:59:19	23	13.8	327	1411	2.7	2.9	15.0	354	15.0
12:59:39	20	13.9	329	1411	2.7	2.9	15.0	356	15.0
12:59:59	20	14.0	326	1410	2.9	3.1	15.2	352	15.2
13:00:19	22	13.9	324	1408	2.9	3.1	15.0	350	15.0
13:00:39	20	13.9	325	1409	2.8	3.0	15.0	351	15.0
13:00:59	20	13.9	323	1408	2.8	3.0	15.0	349	15.0
13:01:19	23	13.8	330	1399	2.7	2.9	14.9	357	14.9
13:01:39	20	13.9	332	1404	2.8	3.0	15.1	359	15.1

Continuous Monitoring April 10, 110 MW Reburn

TIME	CO PPM	CO2 %	Wet NOX PPM	Wet SO2 PPM	Wet O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
13:01:59	20	13.9	333	1405	2.8	3.0	15.0	360	15.0
13:02:19	19	13.8	333	1404	2.8	3.0	14.9	360	14.9
13:02:39	22	13.8	334	1404	2.6	2.8	14.9	361	14.9
13:02:59	23	14.0	335	1403	2.6	2.8	15.2	362	15.2
13:03:19	22	14.0	334	1403	2.7	2.9	15.2	361	15.2
13:03:39	20	14.0	329	1405	2.7	2.9	15.1	356	15.1
13:03:59	18	14.0	325	1406	2.7	2.9	15.2	351	15.2
13:04:19	20	14.0	322	1409	2.7	2.9	15.1	348	15.1
13:04:39	23	14.0	322	1410	2.8	3.0	15.1	348	15.1
13:04:59	27	13.9	321	1413	2.8	3.0	15.0	347	15.0
13:05:19	25	14.0	321	1410	2.7	2.9	15.1	347	15.1
13:05:39	19	13.9	322	1410	2.6	2.8	15.0	348	15.0
13:05:59	20	14.0	325	1408	2.5	2.7	15.1	351	15.1
13:06:19	23	14.2	327	1410	2.5	2.7	15.3	354	15.3
13:06:39	22	14.0	331	1415	2.6	2.8	15.1	358	15.1
13:06:59	22	14.0	335	1420	2.6	2.8	15.2	362	15.2
13:07:19	18	14.0	343	1424	2.6	2.8	15.1	371	15.1
13:07:39	19	13.9	348	1424	2.7	2.9	15.1	376	15.1
13:07:59	22	14.0	342	1423	2.8	3.0	15.1	370	15.1
13:08:19	19	14.0	342	1421	2.7	2.9	15.1	370	15.1
13:08:39	19	13.9	342	1415	2.6	2.8	15.0	370	15.0
13:08:59	20	14.0	343	1413	2.9	3.1	15.2	371	15.2
13:09:19	23	14.0	343	1409	2.6	2.8	15.1	371	15.1
13:09:39	23	14.0	340	1406	2.7	2.9	15.1	368	15.1
13:09:59	19	14.0	337	1405	2.7	2.9	15.1	364	15.1
13:10:19	17	14.0	335	1414	2.7	2.9	15.1	362	15.1
13:10:39	18	13.9	335	1405	2.7	2.9	15.1	362	15.1
13:10:59	20	13.9	334	1406	2.7	2.9	15.1	361	15.1
13:11:19	22	13.9	335	1406	2.8	3.0	15.0	362	15.0
13:11:39	22	14.0	335	1408	2.7	2.9	15.1	362	15.1
13:11:59	22	14.0	335	1408	2.8	3.0	15.1	362	15.1
13:12:19	20	13.9	335	1410	2.6	2.8	15.0	362	15.0
13:12:39	22	14.0	335	1411	2.7	2.9	15.1	362	15.1
13:12:59	22	14.0	335	1411	2.8	3.0	15.1	362	15.1
13:13:19	20	14.0	333	1410	2.5	2.7	15.1	360	15.1
13:13:39	19	14.1	331	1411	2.7	2.9	15.2	358	15.2
13:13:59	20	14.0	331	1413	2.8	3.0	15.2	358	15.2
13:14:19	22	14.0	332	1414	2.6	2.8	15.1	359	15.1
13:14:39	19	14.1	334	1413	2.8	3.0	15.2	361	15.2
13:14:59	20	13.9	332	1411	2.7	2.9	15.0	359	15.0
13:15:19	22	13.9	331	1410	2.8	3.0	15.0	358	15.0
13:15:39	19	14.0	333	1408	2.6	2.8	15.1	360	15.1
13:15:59	21	13.9	334	1408	2.8	3.0	15.0	361	15.0
13:16:19	20	13.9	334	1408	2.7	2.9	15.1	361	15.1
13:16:39	19	13.9	331	1406	2.7	2.9	15.0	358	15.0
13:16:59	19	13.7	332	1406	2.6	2.8	14.9	359	14.9
13:17:19	20	13.9	332	1406	2.7	2.9	15.0	359	15.0
13:17:39	22	14.0	338	1406	2.8	3.0	15.2	365	15.2
13:17:59	23	13.9	337	1406	2.7	2.9	15.0	364	15.0
13:18:19	22	13.9	336	1408	2.6	2.8	15.1	363	15.1
13:18:39	22	14.0	338	1408	2.6	2.8	15.1	365	15.1
13:18:59	20	14.0	335	1411	2.6	2.8	15.1	362	15.1
13:19:19	18	14.0	338	1415	2.6	2.8	15.1	365	15.1
13:19:39	22	14.1	334	1418	2.8	3.0	15.2	361	15.2
13:19:59	23	13.9	329	1423	2.6	2.8	15.0	356	15.0
13:20:19	22	14.0	328	1423	2.7	2.9	15.1	355	15.1
13:20:39	18	14.0	326	1423	2.8	3.0	15.1	352	15.1
13:20:59	20	14.0	327	1424	2.7	2.9	15.1	354	15.1
13:21:19	20	13.9	327	1424	2.8	3.0	15.0	354	15.0
13:21:39	20	13.9	327	1425	2.7	2.9	15.1	354	15.1
13:21:59	18	13.9	330	1424	2.7	2.9	15.1	357	15.1
13:22:19	20	14.0	328	1423	2.8	3.0	15.1	355	15.1
13:22:39	19	13.9	326	1424	2.8	3.0	15.0	352	15.0
13:22:59	22	13.9	326	1425	2.7	2.9	15.0	352	15.0
13:23:19	23	13.9	327	1426	2.7	2.9	15.0	354	15.0
13:23:39	20	13.9	330	1415	2.8	3.0	15.1	357	15.1

Continuous Monitoring April 10, 110 MW Reburn

TIME	CO PPM	CO2 %	Wet NOX PPM	SO2 PPM	O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
13:23:59	20	14.0	330	1426	2.9	3.1	15.1	357	15.1
13:24:19	20	13.8	327	1429	2.7	2.9	14.9	354	14.9
13:24:39	18	14.0	325	1426	2.7	2.9	15.1	351	15.1
13:24:59	20	13.9	326	1424	2.8	3.0	15.0	352	15.0
13:25:19	20	13.8	326	1424	2.7	2.9	14.9	352	14.9
13:25:39	20	13.9	326	1416	2.8	3.0	15.0	352	15.0
13:25:59	22	13.9	329	1419	2.6	2.8	15.0	356	15.0
13:26:19	20	13.8	330	1418	2.6	2.8	15.0	357	15.0
13:26:39	20	13.9	331	1415	2.7	2.9	15.0	358	15.0
13:26:59	19	13.9	329	1416	2.7	2.9	15.1	356	15.1
13:27:19	19	13.9	328	1415	2.7	2.9	15.0	355	15.0
13:27:39	20	13.9	328	1415	2.8	3.0	15.1	355	15.1
13:27:59	20	13.9	329	1414	2.7	2.9	15.1	356	15.1
13:28:19	20	13.9	329	1414	2.7	2.9	15.0	356	15.0
13:28:39	18	13.9	329	1413	2.7	2.9	15.0	356	15.0
13:28:59	20	13.9	332	1410	2.6	2.8	15.0	359	15.0
13:29:19	20	14.0	337	1410	2.7	2.9	15.1	364	15.1
13:29:39	22	14.1	338	1410	2.8	3.0	15.2	365	15.2
13:29:59	22	13.9	335	1410	2.7	2.9	15.1	362	15.1
13:30:19	20	13.9	332	1409	2.7	2.9	15.0	359	15.0
13:30:39	20	13.9	327	1405	2.7	2.9	15.0	354	15.0
13:30:59	20	14.0	325	1401	2.7	2.9	15.1	351	15.1
13:31:19	20	14.0	327	1400	2.6	2.8	15.1	354	15.1
13:31:39	22	14.0	329	1399	2.6	2.8	15.1	356	15.1
13:31:59	18	14.0	332	1398	2.6	2.8	15.2	359	15.2
13:32:19	19	14.1	330	1398	2.7	2.9	15.2	357	15.2
13:32:39	22	13.8	326	1400	2.7	2.9	14.9	352	14.9
13:32:59	22	13.9	321	1403	2.7	2.9	15.0	347	15.0
13:33:19	19	13.9	323	1401	2.7	2.9	15.0	349	15.0
13:33:39	18	13.9	325	1401	2.6	2.8	15.0	351	15.0
13:33:59	20	13.9	327	1401	2.7	2.9	15.0	354	15.0
13:34:19	20	14.0	327	1403	2.7	2.9	15.1	354	15.1
13:34:39	20	13.9	328	1406	2.6	2.8	15.0	355	15.0
13:34:59	20	14.0	329	1406	2.7	2.9	15.1	356	15.1
13:35:19	25	14.0	331	1406	2.7	2.9	15.1	358	15.1
13:35:39	19	13.9	333	1410	2.8	3.0	15.0	360	15.0
13:35:59	22	14.0	334	1409	2.7	2.9	15.1	361	15.1
13:36:19	20	13.9	335	1413	2.7	2.9	15.1	362	15.1
13:36:39	19	13.9	336	1414	2.6	2.8	15.0	363	15.0
13:36:59	22	14.0	336	1413	2.6	2.8	15.2	363	15.2
13:37:19	19	14.0	333	1416	2.6	2.8	15.2	360	15.2
13:37:39	18	14.1	330	1415	2.6	2.8	15.2	357	15.2
13:37:59	20	14.0	328	1416	2.7	2.9	15.2	355	15.2
13:38:19	22	13.9	329	1416	2.7	2.9	15.0	356	15.0
13:38:39	19	14.0	330	1414	2.6	2.8	15.1	357	15.1
13:38:59	18	14.0	327	1409	2.7	2.9	15.2	354	15.2
13:39:19	19	14.0	330	1404	2.7	2.9	15.1	357	15.1
13:39:39	20	14.0	329	1400	2.7	2.9	15.1	356	15.1
13:39:59	15	13.9	325	1398	2.7	2.9	15.0	351	15.0
13:40:19	18	13.9	324	1396	2.7	2.9	15.0	350	15.0
13:40:39	20	13.9	325	1394	2.6	2.8	15.1	351	15.1
13:40:59	18	13.9	328	1391	2.7	2.9	15.0	355	15.0
13:41:19	19	13.9	330	1393	2.6	2.8	15.0	357	15.0
13:41:39	20	14.0	330	1393	2.7	2.9	15.1	357	15.1
13:41:59	19	13.8	330	1395	2.6	2.8	15.0	357	15.0
Avg	19	14.1	332	1416	2.7	2.9	15.2	359	15.2
	CO PPM	CO2 %	NOX PPM	SO2 PPM	O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM

A3 — Typical Result 82-MW Reburn

Continuous Monitoring April 15, 82 MW. Reburn

TIME	Wet CO PPM	Wet CO2 %	Wet NOX PPM	Wet SO2 PPM	Wet O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
21:39:19	29	13.6	197	1078	4.0	4.4	14.9	217	32
21:39:39	25	13.5	201	1078	4.1	4.5	14.9	221	28
21:39:59	25	13.5	203	1084	4.1	4.5	14.9	223	28
21:40:19	30	13.5	203	1084	4.0	4.4	14.9	223	33
21:40:39	27	13.5	202	1080	4.0	4.4	14.9	222	30
21:40:59	25	13.5	201	1079	4.0	4.4	14.9	221	28
21:41:19	23	13.5	200	1078	4.0	4.4	14.8	220	25
21:41:39	27	13.5	200	1075	4.0	4.4	14.9	220	30
21:41:59	27	13.5	200	1073	4.0	4.4	14.8	220	30
21:42:19	23	13.6	200	1073	3.8	4.2	14.9	220	25
21:42:39	29	13.6	198	1073	3.9	4.3	15.0	218	32
21:42:59	28	13.6	198	1075	3.9	4.3	14.9	218	31
21:43:19	28	13.6	197	1076	4.1	4.5	14.9	217	31
21:43:39	29	13.5	196	1076	4.0	4.4	14.9	216	32
21:43:59	29	13.4	195	1079	3.9	4.3	14.7	215	32
21:44:19	31	13.5	195	1078	3.8	4.2	14.9	215	34
21:44:39	29	13.6	195	1079	3.8	4.2	14.9	215	32
21:44:59	25	13.4	196	1085	3.8	4.2	14.8	216	28
21:45:19	33	13.6	196	1086	3.8	4.2	15.0	216	36
21:45:39	28	13.7	197	1094	3.8	4.2	15.0	217	31
21:45:59	30	13.5	197	1099	3.7	4.1	14.8	217	33
21:46:19	35	13.6	197	1104	3.5	3.9	15.0	217	39
21:46:39	35	13.9	197	1108	4.0	4.4	15.3	217	39
21:46:59	65	13.4	196	1120	3.6	4.0	14.7	216	72
21:47:19	70	13.7	196	1124	4.0	4.4	15.1	216	77
21:47:39	64	13.5	197	1128	4.0	4.4	14.9	217	70
21:47:59	52	13.6	198	1126	3.8	4.2	14.9	218	57
21:48:19	37	13.6	200	1124	3.9	4.3	14.9	220	41
21:48:39	33	13.6	198	1123	3.8	4.2	14.9	218	36
21:48:59	28	13.5	197	1119	3.8	4.2	14.8	217	31
21:49:19	29	13.6	196	1115	3.9	4.3	14.9	216	32
21:49:39	33	13.6	195	1110	3.8	4.2	15.0	215	36
21:49:59	30	13.6	195	1110	3.7	4.1	15.0	215	33
21:50:19	29	13.6	194	1110	3.8	4.2	14.9	213	32
21:50:39	31	13.6	194	1111	3.9	4.3	15.0	213	34
21:50:59	33	13.5	193	1115	3.8	4.2	14.9	212	36
21:51:19	30	13.6	193	1115	3.9	4.3	14.9	212	33
21:51:39	31	13.6	193	1116	3.9	4.3	15.0	212	34
21:51:59	33	13.6	194	1118	3.8	4.2	15.0	213	36
21:52:19	32	13.6	195	1120	3.9	4.3	14.9	215	35
21:52:39	33	13.5	194	1123	4.0	4.4	14.9	213	36
21:52:59	33	13.5	194	1124	3.8	4.2	14.9	213	36
21:53:19	36	13.4	193	1121	3.9	4.3	14.7	212	40
21:53:39	35	13.5	193	1120	3.8	4.2	14.9	212	39
21:53:59	31	13.5	193	1119	3.8	4.2	14.8	212	34
21:54:19	33	13.4	192	1113	3.7	4.1	14.7	211	36
21:54:39	37	13.6	192	1114	3.9	4.3	14.9	211	41
21:54:59	35	13.6	193	1113	3.8	4.2	14.9	212	39
21:55:19	33	13.5	194	1114	3.8	4.2	14.8	213	36
21:55:39	31	13.6	195	1111	3.8	4.2	15.0	215	34
21:55:59	35	13.6	196	1111	3.6	4.0	15.0	216	39
21:56:19	36	13.6	198	1116	3.8	4.2	15.0	218	40
21:56:39	36	13.7	197	1119	3.7	4.1	15.0	217	40
21:56:59	33	13.7	195	1121	3.8	4.2	15.0	215	36
21:57:19	33	13.5	193	1121	3.8	4.2	14.9	212	36
21:57:39	35	13.6	193	1119	3.8	4.2	15.0	212	39
21:57:59	30	13.6	193	1118	3.8	4.2	15.0	212	33
21:58:19	33	13.7	193	1118	3.7	4.1	15.0	212	36
21:58:39	32	13.7	193	1119	3.8	4.2	15.1	212	35
21:58:59	32	13.6	194	1119	3.7	4.1	15.0	213	35
21:59:19	33	13.6	195	1119	3.8	4.2	15.0	215	36
21:59:39	36	13.6	196	1118	3.6	4.0	15.0	216	40
21:59:59	29	13.7	195	1118	3.7	4.1	15.1	215	32
22:00:19	30	13.7	196	1118	3.8	4.2	15.0	216	33
22:00:39	35	13.6	196	1120	3.7	4.1	15.0	216	39

Continuous Monitoring April 15, 82 MW, Reburn

	Wet					Dry	Dry	Dry	Dry
	CO	CO2	NOX	SO2	O2	O2	CO2	NOX	CO
TIME	PPM	%	PPM	PPM	%	%	%	PPM	PPM
22:00:59	36	13.6	195	1116	3.8	4.2	15.0	215	40
22:01:19	28	13.6	194	1115	3.7	4.1	15.0	213	31
22:01:39	31	13.5	194	1115	3.8	4.2	14.9	213	34
22:01:59	30	13.6	193	1116	3.6	4.0	15.0	212	33
22:02:19	30	13.7	193	1116	3.5	3.9	15.1	212	33
22:02:39	40	13.7	193	1115	3.5	3.9	15.1	212	44
22:02:59	44	13.9	192	1121	3.5	3.9	15.3	211	48
22:03:19	45	13.9	192	1128	3.5	3.9	15.3	211	50
22:03:39	48	13.7	192	1129	3.4	3.7	15.1	211	53
22:03:59	47	13.9	192	1129	3.6	4.0	15.3	211	52
22:04:19	45	13.9	192	1129	3.6	4.0	15.2	211	50
22:04:39	39	13.8	192	1128	3.7	4.1	15.1	211	43
22:04:59	38	13.7	192	1123	3.6	4.0	15.1	211	42
22:05:19	47	13.8	192	1121	3.6	4.0	15.1	211	52
22:05:39	55	13.7	192	1120	3.6	4.0	15.1	211	61
22:05:59	58	13.7	190	1119	3.8	4.2	15.0	209	64
22:06:19	57	13.7	188	1113	3.8	4.2	15.0	207	63
22:06:39	52	13.5	187	1105	3.8	4.2	14.9	206	57
22:06:59	65	13.6	188	1100	3.8	4.2	14.9	207	72
22:07:19	60	13.5	190	1095	4.1	4.5	14.8	209	66
22:07:39	42	13.4	194	1091	4.0	4.4	14.8	213	46
22:07:59	38	13.4	197	1085	4.0	4.4	14.7	217	42
22:08:19	43	13.4	201	1079	4.0	4.4	14.8	221	47
22:08:39	35	13.5	205	1075	3.7	4.1	14.8	226	39
22:08:59	35	13.6	208	1075	3.8	4.2	14.9	229	39
22:09:19	47	13.7	208	1074	3.8	4.2	15.0	229	52
22:09:39	49	13.6	205	1081	3.7	4.1	14.9	226	54
22:09:59	40	13.5	200	1084	3.8	4.2	14.9	220	44
22:10:19	40	13.6	199	1085	3.9	4.3	14.9	219	44
22:10:39	43	13.6	198	1090	3.8	4.2	14.9	218	47
22:10:59	45	13.5	198	1093	3.6	4.0	14.8	218	50
22:11:19	42	13.7	200	1094	3.6	4.0	15.0	220	46
22:11:39	52	13.7	201	1095	3.8	4.2	15.1	221	57
22:11:59	52	13.5	200	1099	3.8	4.2	14.9	220	57
22:12:19	40	13.6	199	1098	3.7	4.1	15.0	219	44
22:12:39	36	13.5	199	1099	3.8	4.2	14.9	219	40
22:12:59	53	13.6	201	1098	3.7	4.1	15.0	221	58
22:13:19	56	13.6	202	1101	3.7	4.1	15.0	222	62
22:13:39	45	13.7	203	1104	3.7	4.1	15.1	223	50
22:13:59	44	13.6	203	1103	3.5	3.9	15.0	223	48
22:14:19	42	13.8	201	1104	3.6	4.0	15.1	221	46
22:14:39	50	13.8	199	1105	3.6	4.0	15.2	219	55
22:14:59	67	13.7	193	1108	3.8	4.2	15.1	212	74
22:15:19	62	13.7	192	1111	3.8	4.2	15.1	211	68
22:15:39	47	13.6	191	1109	3.7	4.1	15.0	210	52
22:15:59	42	13.6	192	1109	3.5	3.9	15.0	211	46
22:16:19	45	13.7	195	1108	3.6	4.0	15.1	215	50
22:16:39	60	13.7	195	1109	3.6	4.0	15.1	215	66
22:16:59	70	13.8	195	1110	3.7	4.1	15.1	215	77
22:17:19	76	13.8	195	1111	3.5	3.9	15.1	215	84
22:17:39	93	13.8	197	1116	3.7	4.1	15.2	217	102
22:17:59	72	13.9	198	1120	3.5	3.9	15.3	218	79
22:18:19	49	13.8	199	1126	3.7	4.1	15.2	219	54
22:18:39	44	13.8	198	1126	3.8	4.2	15.2	218	48
22:18:59	48	13.7	199	1125	3.8	4.2	15.0	219	53
22:19:19	37	13.6	201	1123	3.4	3.7	14.9	221	41
22:19:39	39	13.9	203	1119	3.5	3.9	15.2	223	43
22:19:59	60	13.9	202	1123	3.6	4.0	15.3	222	66
22:20:19	65	13.7	200	1124	3.6	4.0	15.1	220	72
22:20:39	61	13.8	195	1124	3.5	3.9	15.1	215	67
22:20:59	55	13.9	192	1125	3.7	4.1	15.3	211	61
22:21:19	62	13.6	192	1128	3.6	4.0	15.0	211	68
22:21:39	53	13.8	194	1124	3.6	4.0	15.1	213	58
22:21:59	55	13.8	195	1119	3.6	4.0	15.2	215	61
22:22:19	52	13.8	195	1123	3.5	3.9	15.1	215	57
22:22:39	62	13.9	194	1124	3.5	3.9	15.3	213	68

Continuous Monitoring April 15, 82 MW, Reburn

TIME	CO PPM	CO2 %	Wet NOX PPM	Wet SO2 PPM	Wet O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
22:22:59	77	14.0	192	1130	3.5	3.9	15.4	211	85
22:23:19	94	13.8	188	1136	3.5	3.9	15.2	207	103
22:23:39	85	13.8	188	1141	3.5	3.9	15.2	207	94
22:23:59	84	13.9	187	1140	3.5	3.9	15.3	206	92
22:24:19	87	13.8	187	1141	3.5	3.9	15.2	206	96
22:24:39	142	14.0	188	1143	3.5	3.9	15.4	207	156
22:24:59	158	13.8	190	1146	3.5	3.9	15.2	209	174
22:25:19	122	13.8	191	1148	3.7	4.1	15.2	210	134
22:25:39	95	13.8	191	1146	3.5	3.9	15.2	210	105
22:25:59	90	13.7	191	1144	3.7	4.1	15.0	210	99
22:26:19	80	13.7	191	1143	3.7	4.1	15.1	210	88
22:26:39	69	13.7	193	1138	3.7	4.1	15.1	212	76
22:26:59	66	13.6	195	1136	3.6	4.0	15.0	215	73
22:27:19	70	13.8	196	1136	3.5	3.9	15.1	216	77
22:27:39	92	13.6	198	1135	3.7	4.1	15.0	218	101
22:27:59	112	13.7	198	1136	3.7	4.1	15.1	218	123
22:28:19	112	13.7	198	1136	3.7	4.1	15.1	218	123
22:28:39	109	13.6	197	1135	3.8	4.2	14.9	217	120
22:28:59	115	13.5	197	1135	3.6	4.0	14.9	217	127
22:29:19	103	13.8	197	1133	3.7	4.1	15.2	217	113
22:29:39	132	13.5	198	1133	3.6	4.0	14.9	218	145
22:29:59	122	13.7	201	1133	3.7	4.1	15.0	221	134
22:30:19	119	13.8	201	1133	3.7	4.1	15.2	221	131
22:30:39	130	13.6	198	1133	3.7	4.1	15.0	218	143
22:30:59	103	13.7	199	1134	3.6	4.0	15.1	219	113
22:31:19	90	13.8	198	1134	3.9	4.3	15.2	218	99
22:31:39	118	13.5	199	1135	3.5	3.9	14.9	219	130
22:31:59	98	13.7	198	1131	3.6	4.0	15.0	218	108
22:32:19	98	13.8	200	1128	3.6	4.0	15.1	220	108
22:32:39	86	13.7	201	1130	3.5	3.9	15.0	221	95
22:32:59	67	13.9	201	1130	3.6	4.0	15.3	221	74
22:33:19	86	13.9	200	1135	3.4	3.7	15.2	220	95
22:33:39	67	13.8	198	1136	3.8	4.2	15.2	218	74
22:33:59	48	13.8	200	1136	3.7	4.1	15.1	220	53
22:34:19	53	13.8	198	1133	3.5	3.9	15.2	218	58
22:34:39	74	13.8	200	1129	3.5	3.9	15.2	220	81
22:34:59	122	13.8	199	1125	3.7	4.1	15.1	219	134
22:35:19	167	13.7	198	1123	3.8	4.2	15.1	218	184
22:35:39	139	13.7	196	1120	3.5	3.9	15.1	216	153
22:35:59	114	13.8	195	1115	3.8	4.2	15.1	215	125
22:36:19	108	13.7	198	1111	3.7	4.1	15.1	218	119
22:36:39	125	13.7	200	1115	3.5	3.9	15.1	220	138
22:36:59	138	13.7	201	1115	3.5	3.9	15.0	221	152
22:37:19	131	13.8	200	1114	3.8	4.2	15.2	220	144
22:37:39	160	13.8	198	1115	3.5	3.9	15.2	218	176
22:37:59	132	13.6	196	1114	3.6	4.0	15.0	216	145
22:38:19	86	13.7	195	1108	3.6	4.0	15.1	215	95
22:38:39	85	13.8	193	1109	3.6	4.0	15.2	212	94
22:38:59	133	13.7	194	1105	3.7	4.1	15.0	213	146
22:39:19	180	13.7	193	1105	3.8	4.2	15.0	212	198
22:39:39	144	13.7	194	1104	3.7	4.1	15.0	213	158
22:39:59	107	13.6	196	1100	3.9	4.3	15.0	216	118
22:40:19	118	13.5	197	1101	3.8	4.2	14.9	217	130
22:40:39	121	13.6	199	1096	4.0	4.4	14.9	219	133
22:40:59	111	13.5	202	1093	4.0	4.4	14.8	222	122
22:41:19	94	13.4	205	1089	3.9	4.3	14.8	226	103
22:41:39	77	13.5	208	1088	3.9	4.3	14.8	229	85
22:41:59	80	13.5	210	1084	4.1	4.5	14.9	231	88
22:42:19	80	13.6	212	1085	4.0	4.4	15.0	233	88
22:42:39	88	13.4	212	1085	3.8	4.2	14.8	233	97
22:42:59	99	13.5	210	1081	4.1	4.5	14.9	231	109
22:43:19	123	13.4	208	1081	4.0	4.4	14.7	229	135
22:43:39	112	13.4	208	1078	4.0	4.4	14.7	229	123
22:43:59	91	13.5	211	1076	3.9	4.3	14.8	232	100
22:44:19	78	13.5	211	1075	3.8	4.2	14.8	232	86
22:44:39	79	13.6	210	1074	3.9	4.3	14.9	231	87

Continuous Monitoring April 15, 82 MW, Reburn

TIME	CO PPM	CO2 %	Wet NOX PPM	Wet SO2 PPM	Wet O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
22:44:59	73	13.5	209	1080	3.8	4.2	14.9	230	80
22:45:19	60	13.5	208	1081	3.9	4.3	14.9	229	66
22:45:39	59	13.6	209	1083	4.0	4.4	14.9	230	65
22:45:59	79	13.5	208	1088	3.9	4.3	14.9	229	87
22:46:19	88	13.4	210	1084	3.8	4.2	14.7	231	97
22:46:39	67	13.5	211	1083	3.8	4.2	14.9	232	74
22:46:59	82	13.6	211	1079	3.8	4.2	14.9	231	90
22:47:19	98	13.3	211	1083	3.6	4.0	14.7	232	108
22:47:39	86	13.6	211	1080	3.9	4.3	15.0	232	95
22:47:59	91	13.7	211	1084	4.2	4.6	15.1	232	100
22:48:19	58	13.4	210	1091	4.1	4.5	14.7	231	64
22:48:39	43	13.4	212	1096	4.0	4.4	14.7	233	47
22:48:59	49	13.4	218	1098	3.8	4.2	14.8	240	54
22:49:19	68	13.4	224	1098	3.9	4.3	14.8	246	75
22:49:39	73	13.5	226	1093	3.9	4.3	14.9	249	80
22:49:59	80	13.5	218	1090	3.9	4.3	14.8	240	88
22:50:19	80	13.5	215	1090	3.9	4.3	14.8	237	88
22:50:39	69	13.5	209	1089	3.9	4.3	14.9	230	76
22:50:59	78	13.5	206	1091	3.9	4.3	14.9	227	86
22:51:19	67	13.5	206	1095	3.8	4.2	14.9	227	74
22:51:39	55	13.4	207	1095	3.9	4.3	14.8	228	61
22:51:59	62	13.5	209	1096	3.8	4.2	14.9	230	68
22:52:19	73	13.4	210	1095	4.1	4.5	14.8	231	80
22:52:39	77	13.5	212	1095	3.9	4.3	14.8	233	85
22:52:59	77	13.5	213	1096	3.9	4.3	14.9	234	85
22:53:19	65	13.5	214	1100	3.9	4.3	14.8	235	72
22:53:39	67	13.5	215	1099	4.0	4.4	14.9	237	74
22:53:59	72	13.3	214	1095	3.8	4.2	14.7	235	79
22:54:19	75	13.4	213	1093	3.9	4.3	14.7	234	83
22:54:39	79	13.5	211	1090	3.8	4.2	14.8	232	87
22:54:59	84	13.5	210	1094	3.9	4.3	14.8	231	92
22:55:19	60	13.4	211	1091	3.8	4.2	14.8	232	66
22:55:39	52	13.4	211	1086	4.0	4.4	14.7	232	57
22:55:59	60	13.4	211	1086	3.9	4.3	14.7	232	66
22:56:19	55	13.4	209	1083	4.0	4.4	14.7	230	61
22:56:39	54	13.3	210	1078	4.0	4.4	14.6	231	59
22:56:59	72	13.4	210	1076	3.9	4.3	14.7	231	79
22:57:19	69	13.3	212	1074	4.1	4.5	14.7	233	76
22:57:39	63	13.3	213	1073	4.0	4.4	14.6	234	69
22:57:59	57	13.4	215	1074	4.0	4.4	14.7	237	63
22:58:19	48	13.4	217	1073	3.9	4.3	14.7	239	53
22:58:39	57	13.4	219	1075	3.9	4.3	14.7	241	63
22:58:59	65	13.4	219	1073	3.8	4.2	14.7	241	72
22:59:19	55	13.5	217	1075	3.8	4.2	14.9	239	61
22:59:39	48	13.3	215	1078	3.8	4.2	14.6	237	53
22:59:59	52	13.5	215	1078	3.8	4.2	14.9	237	57
23:00:19	43	13.5	215	1079	3.8	4.2	14.8	237	47
23:00:39	43	13.5	216	1081	3.8	4.2	14.9	238	47
23:00:59	47	13.6	216	1086	3.8	4.2	14.9	238	52
23:01:19	39	13.5	214	1089	3.7	4.1	14.8	235	43
23:01:39	40	13.5	213	1090	3.9	4.3	14.9	234	44
23:01:59	48	13.5	214	1090	3.7	4.1	14.9	235	53
23:02:19	59	13.5	213	1094	3.9	4.3	14.9	234	65
23:02:39	57	13.6	213	1096	3.8	4.2	14.9	234	63
23:02:59	59	13.4	212	1099	4.0	4.4	14.8	233	65
23:03:19	72	13.4	212	1100	3.8	4.2	14.8	233	79
23:03:39	58	13.4	213	1099	3.9	4.3	14.7	234	64
23:03:59	53	13.3	215	1094	4.0	4.4	14.7	237	58
23:04:19	52	13.3	216	1091	3.9	4.3	14.7	238	57
23:04:39	47	13.4	215	1089	4.0	4.4	14.7	237	52
23:04:59	48	13.3	218	1086	3.9	4.3	14.6	240	53
23:05:19	58	13.3	219	1088	3.9	4.3	14.7	241	64
23:05:39	58	13.4	222	1086	3.9	4.3	14.7	244	64
23:05:59	50	13.2	221	1089	4.0	4.4	14.5	243	55
23:06:19	53	13.3	221	1088	3.8	4.2	14.6	243	58
23:06:39	62	13.4	220	1090	4.0	4.4	14.7	242	68

Continuous Monitoring April 15, 82 MW, Reburn

TIME	CO PPM (Wet)	CO2 % (Wet)	NOX PPM (Wet)	SO2 PPM (Wet)	O2 % (Wet)	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
23:06:59	58	13.3	220	1088	3.9	4.3	14.6	242	64
23:07:19	57	13.4	221	1091	3.8	4.2	14.7	243	63
23:07:39	62	13.4	221	1093	3.7	4.1	14.7	243	68
23:07:59	69	13.4	220	1099	3.8	4.2	14.7	242	76
23:08:19	72	13.4	218	1101	3.8	4.2	14.8	240	79
23:08:39	65	13.4	216	1101	3.7	4.1	14.7	238	72
23:08:59	89	13.4	216	1104	3.8	4.2	14.8	238	98
23:09:19	114	13.5	216	1110	3.8	4.2	14.8	238	125
23:09:39	88	13.4	217	1114	3.9	4.3	14.7	239	97
23:09:59	76	13.4	214	1113	3.9	4.3	14.8	235	84
23:10:19	69	13.4	213	1114	3.9	4.3	14.8	234	76
23:10:39	63	13.4	212	1115	3.9	4.3	14.8	233	69
23:10:59	92	13.4	213	1119	3.8	4.2	14.8	234	101
23:11:19	78	13.5	213	1119	3.9	4.3	14.8	234	86
23:11:39	62	13.4	214	1123	3.9	4.3	14.7	235	68
23:11:59	75	13.3	212	1128	3.8	4.2	14.6	233	83
23:12:19	68	13.4	212	1124	4.0	4.4	14.7	233	75
23:12:39	65	13.4	210	1126	3.7	4.1	14.7	231	72
23:12:59	50	13.4	211	1129	4.0	4.4	14.7	232	55
23:13:19	60	13.3	211	1129	4.0	4.4	14.6	232	66
23:13:39	65	13.3	212	1131	3.9	4.3	14.7	233	72
23:13:59	58	13.3	214	1133	3.9	4.3	14.6	235	64
23:14:19	53	13.3	216	1130	3.8	4.2	14.6	238	58
23:14:39	51	13.4	218	1131	3.8	4.2	14.7	240	56
23:14:59	58	13.5	218	1135	4.0	4.4	14.8	240	64
23:15:19	70	13.2	217	1135	4.0	4.4	14.5	239	77
23:15:39	73	13.3	215	1139	3.8	4.2	14.6	237	80
23:15:59	70	13.4	215	1135	3.8	4.2	14.8	237	77
23:16:19	70	13.4	216	1139	4.0	4.4	14.7	238	77
23:16:39	73	13.3	217	1139	3.9	4.3	14.6	239	80
23:16:59	53	13.4	217	1138	3.9	4.3	14.8	239	58
23:17:19	50	13.4	216	1140	3.8	4.2	14.7	238	55
23:17:39	72	13.3	214	1141	3.9	4.3	14.6	235	79
23:17:59	86	13.3	211	1140	4.0	4.4	14.6	232	95
23:18:19	81	13.3	210	1136	4.0	4.4	14.7	231	89
23:18:39	82	13.3	207	1134	3.8	4.2	14.6	228	90
23:18:59	67	13.4	205	1129	4.0	4.4	14.7	226	74
23:19:19	88	13.3	203	1131	3.9	4.3	14.6	223	97
23:19:39	82	13.2	203	1128	3.9	4.3	14.6	223	90
23:19:59	65	13.3	208	1128	4.0	4.4	14.6	229	72
23:20:19	74	13.3	210	1126	4.0	4.4	14.6	231	81
23:20:39	69	13.2	212	1124	4.0	4.4	14.5	233	76
23:20:59	84	13.3	214	1121	4.0	4.4	14.6	235	92
23:21:19	87	13.3	213	1123	4.0	4.4	14.6	234	96
23:21:39	72	13.1	213	1123	4.0	4.4	14.4	234	79
23:21:59	63	13.2	213	1119	3.8	4.2	14.6	234	69
23:22:19	52	13.3	213	1119	3.8	4.2	14.6	234	57
23:22:39	57	13.2	212	1121	3.9	4.3	14.5	233	63
23:22:59	59	13.3	210	1124	3.9	4.3	14.6	231	65
23:23:19	56	13.2	207	1125	3.9	4.3	14.6	228	62
23:23:39	72	13.2	206	1124	3.9	4.3	14.5	227	79
23:23:59	68	13.2	205	1123	3.8	4.2	14.6	226	75
23:24:19	58	13.3	205	1124	3.8	4.2	14.6	226	64
23:24:39	81	13.2	204	1125	3.8	4.2	14.5	224	89
23:24:59	78	13.3	203	1128	3.8	4.2	14.6	223	86
23:25:19	58	13.3	203	1129	3.8	4.2	14.6	223	64
23:25:39	57	13.3	201	1133	3.8	4.2	14.6	221	63
23:25:59	67	13.2	200	1130	3.8	4.2	14.6	220	74
23:26:19	72	13.3	200	1130	3.7	4.1	14.6	220	79
23:26:39	67	13.4	199	1129	3.6	4.0	14.7	219	74
23:26:59	73	13.4	198	1128	3.9	4.3	14.7	218	80
23:27:19	70	13.3	199	1134	3.7	4.1	14.6	219	77
23:27:39	66	13.3	198	1130	3.8	4.2	14.6	218	73
23:27:59	54	13.3	200	1129	3.7	4.1	14.6	220	59
23:28:19	48	13.2	202	1128	3.7	4.1	14.5	222	53
23:28:39	51	13.3	204	1126	4.0	4.4	14.6	224	56

Continuous Monitoring April 15, 82 MW, Reburn

	Wet					Dry	Dry	Dry	Dry
	CO	CO2	NOX	SO2	O2	O2	CO2	NOX	CO
TIME	PPM	%	PPM	PPM	%	%	%	PPM	PPM
23:28:59	60	13.2	205	1123	3.7	4.1	14.6	226	66
23:29:19	59	13.2	206	1124	3.8	4.2	14.6	227	65
23:29:39	60	13.3	208	1123	4.0	4.4	14.6	229	66
23:29:59	72	13.2	210	1121	3.8	4.2	14.5	231	79
23:30:19	65	13.1	210	1118	3.8	4.2	14.5	231	72
23:30:39	53	13.2	210	1118	3.8	4.2	14.6	231	58
23:30:59	57	13.2	211	1115	3.8	4.2	14.5	232	63
Avg	64	13.5	203	1109	3.8	4.2	14.9	223	70
	CO	CO2	NOX	SO2	O2	Dry	Dry	Dry	Dry
	PPM	%	PPM	PPM	%	O2	CO2	NOX	CO
						%	%	PPM	PPM

Continuous Monitoring April 22, 55 MW, Reburn

TIME	CO PPM	CO2 %	Wet NOX PPM	Wet SO2 PPM	Wet O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
22:24:09	9	12.9	343	1158	4.1	4.5	14.2	377	9.9
22:24:29	12	13.0	340	1160	4.4	4.8	14.3	374	13.2
22:24:49	13	12.8	338	1170	4.4	4.8	14.1	372	14.3
22:25:09	12	12.7	335	1165	4.3	4.7	14.0	369	13.2
22:25:29	13	12.7	334	1159	4.4	4.8	14.0	367	14.3
22:25:49	12	12.7	335	1156	4.5	5.0	13.9	369	13.2
22:26:09	12	12.7	338	1153	4.4	4.8	13.9	372	13.2
22:26:29	10	12.6	342	1148	4.4	4.8	13.9	376	11.0
22:26:49	12	12.6	346	1144	4.2	4.6	13.9	381	13.2
22:27:09	12	12.8	348	1144	4.2	4.6	14.1	383	13.2
22:27:29	12	12.8	347	1149	4.2	4.6	14.1	382	13.2
22:27:49	13	12.9	344	1159	4.3	4.7	14.1	378	14.3
22:28:09	15	12.7	342	1163	4.4	4.8	14.0	376	16.5
22:28:29	12	12.7	342	1163	4.5	5.0	14.0	376	13.2
22:28:49	10	12.7	344	1160	4.5	5.0	13.9	378	11.0
22:29:09	10	12.5	347	1148	4.4	4.8	13.8	382	11.0
22:29:29	12	12.6	350	1138	4.4	4.8	13.9	385	13.2
22:29:49	11	12.7	353	1125	4.2	4.6	13.9	388	12.1
22:30:09	13	12.6	354	1119	4.3	4.7	13.9	389	14.3
22:30:29	11	12.8	353	1113	4.2	4.6	14.0	388	12.1
22:30:49	10	12.9	350	1108	4.3	4.7	14.1	385	11.0
22:31:09	12	12.7	348	1109	4.2	4.6	13.9	383	13.2
22:31:29	11	12.6	347	1103	4.2	4.6	13.9	382	12.1
22:31:49	10	12.7	347	1104	4.2	4.6	14.0	382	11.0
22:32:09	12	12.8	347	1106	4.2	4.6	14.0	382	13.2
22:32:29	11	12.8	347	1109	4.2	4.6	14.1	382	12.1
22:32:49	12	12.8	346	1110	4.2	4.6	14.1	381	13.2
22:33:09	13	12.9	347	1110	4.2	4.6	14.1	382	14.3
22:33:29	9	12.9	348	1115	4.2	4.6	14.1	383	9.9
22:33:49	13	12.9	348	1120	4.2	4.6	14.1	383	14.3
22:34:09	13	12.8	347	1124	4.2	4.6	14.1	382	14.3
22:34:29	10	12.8	345	1126	4.2	4.6	14.1	380	11.0
22:34:49	13	12.8	343	1130	4.2	4.6	14.1	377	14.3
22:35:09	14	12.9	343	1131	4.2	4.6	14.2	377	15.4
22:35:29	12	12.8	344	1136	4.2	4.6	14.1	378	13.2
22:35:49	11	12.9	344	1138	4.2	4.6	14.2	378	12.1
22:36:09	12	13.0	344	1144	4.2	4.6	14.3	378	13.2
22:36:29	14	12.8	343	1146	4.4	4.8	14.1	377	15.4
22:36:49	13	12.8	339	1146	4.4	4.8	14.1	373	14.3
22:37:09	13	12.7	338	1140	4.3	4.7	14.0	372	14.3
22:37:29	10	12.5	340	1138	4.2	4.6	13.8	374	11.0
22:37:49	10	12.6	343	1138	4.2	4.6	13.9	377	11.0
22:38:09	13	12.6	346	1144	4.3	4.7	13.9	381	14.3
22:38:29	10	12.5	344	1149	4.2	4.6	13.8	378	11.0
22:38:49	12	12.6	342	1146	4.4	4.8	13.9	376	13.2
22:39:09	12	12.8	340	1144	4.4	4.8	14.1	374	13.2
22:39:29	12	12.7	341	1146	4.3	4.7	14.0	375	13.2
22:39:49	10	12.8	342	1144	4.4	4.8	14.1	376	11.0
22:40:09	10	12.8	345	1145	4.2	4.6	14.1	380	11.0
22:40:29	12	12.8	347	1145	4.0	4.4	14.0	382	13.2
22:40:49	13	12.9	348	1148	3.7	4.1	14.2	383	14.3
22:41:09	14	13.1	345	1155	3.9	4.3	14.4	380	15.4
22:41:29	14	13.2	339	1169	3.9	4.3	14.6	373	15.4
22:41:49	14	13.2	328	1184	3.9	4.3	14.5	361	15.4
22:42:09	16	13.2	322	1190	3.9	4.3	14.5	354	17.6
22:42:29	50	13.3	319	1194	4.2	4.6	14.6	351	55.0
22:42:49	90	12.9	315	1200	4.3	4.7	14.2	347	99.0
22:43:09	52	12.9	318	1189	4.2	4.6	14.1	350	57.2
22:43:29	30	13.0	325	1179	4.3	4.7	14.3	358	33.0
22:43:49	30	12.8	335	1173	4.4	4.8	14.0	369	33.0
22:44:09	30	12.8	341	1168	4.5	5.0	14.1	375	33.0
22:44:29	19	12.7	343	1163	4.4	4.8	14.0	377	20.9
22:44:49	14	12.7	345	1156	4.4	4.8	13.9	380	15.4
22:45:09	17	12.7	347	1153	4.3	4.7	14.0	382	18.7
22:45:29	13	12.5	347	1150	4.3	4.7	13.8	382	14.3

Continuous Monitoring April 22, 55 MW, Reburn

TIME	CO PPM	CO2 %	Wet NOX PPM	Wet SO2 PPM	Wet O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
22:45:49	10	12.5	347	1154	4.2	4.6	13.8	382	11.0
22:46:09	14	12.6	348	1156	4.1	4.5	13.9	383	15.4
22:46:29	15	12.8	348	1158	4.1	4.5	14.0	383	16.5
22:46:49	14	12.9	348	1164	4.2	4.6	14.2	383	15.4
22:47:09	14	13.0	345	1169	4.3	4.7	14.3	380	15.4
22:47:29	15	12.9	343	1171	4.4	4.8	14.2	377	16.5
22:47:49	13	12.8	343	1169	4.4	4.8	14.0	377	14.3
22:48:09	16	12.8	345	1166	4.3	4.7	14.0	380	17.6
22:48:29	13	12.8	347	1164	4.2	4.6	14.1	382	14.3
22:48:49	11	12.9	348	1161	4.2	4.6	14.1	383	12.1
22:49:09	15	12.9	348	1156	4.2	4.6	14.2	383	16.5
22:49:29	12	12.9	347	1156	4.4	4.8	14.2	382	13.2
22:49:49	14	12.9	347	1156	4.4	4.8	14.1	382	15.4
22:50:09	12	12.7	347	1154	4.4	4.8	13.9	382	13.2
22:50:29	12	12.8	347	1151	4.2	4.6	14.1	382	13.2
22:50:49	14	12.8	348	1150	4.3	4.7	14.1	383	15.4
22:51:09	12	12.8	348	1158	4.2	4.6	14.0	383	13.2
22:51:29	14	12.9	346	1164	4.2	4.6	14.2	381	15.4
22:51:49	15	13.0	340	1171	4.2	4.6	14.2	374	16.5
22:52:09	14	12.9	334	1179	4.1	4.5	14.1	367	15.4
22:52:29	12	13.0	331	1184	4.0	4.4	14.3	364	13.2
22:52:49	14	13.1	331	1188	4.1	4.5	14.4	364	15.4
22:53:09	14	13.0	333	1190	4.1	4.5	14.3	366	15.4
22:53:29	15	13.1	336	1186	4.0	4.4	14.4	370	16.5
22:53:49	13	12.9	338	1181	4.0	4.4	14.2	372	14.3
22:54:09	14	12.8	340	1174	4.2	4.6	14.0	374	15.4
22:54:29	13	12.8	340	1173	4.2	4.6	14.1	374	14.3
22:54:49	15	12.9	340	1173	4.1	4.5	14.2	374	16.5
22:55:09	12	12.9	342	1173	4.0	4.4	14.2	376	13.2
22:55:29	14	13 0	342	1175	4.0	4.4	14.3	376	15.4
22:55:49	17	13.1	341	1183	3.9	4.3	14.4	375	18.7
22:56:09	15	13.1	338	1190	4.0	4.4	14.5	372	16.5
22:56:29	14	13.1	335	1195	4.0	4.4	14.4	369	15.4
22:56:49	13	13.1	334	1199	4.0	4.4	14.4	367	14.3
22:57:09	16	13.1	335	1194	4.0	4.4	14.4	369	17.6
22:57:29	14	13.0	338	1196	4.0	4.4	14.3	372	15.4
22:57:49	13	13.0	340	1193	4.0	4.4	14.3	374	14.3
22:58:09	15	13.0	342	1189	4.0	4.4	14.3	376	16.5
22:58:29	12	13.0	342	1184	3.8	4.2	14.3	376	13.2
22:58:49	12	13.1	340	1185	3.7	4.1	14.4	374	13.2
22:59:09	12	13.0	339	1189	3.8	4.2	14.3	373	13.2
22:59:29	13	13.0	337	1191	3.9	4.3	14.3	371	14.3
22:59:49	11	13.0	334	1199	4.0	4.4	14.3	367	12.1
23:00:09	12	13.0	330	1201	4.0	4.4	14.3	363	13.2
23:00:29	13	13.1	329	1203	4.2	4.6	14.4	362	14.3
23:00:49	14	13.0	330	1203	4.3	4.7	14.3	363	15.4
23:01:09	13	12.9	335	1200	4.3	4.7	14.2	369	14.3
23:01:29	13	12.8	339	1191	4.2	4.6	14.1	373	14.3
23:01:49	12	13.0	342	1184	4.2	4.6	14.2	376	13.2
23:02:09	16	12.9	342	1176	4.2	4.6	14.2	376	17.6
23:02:29	14	12.9	339	1180	4.2	4.6	14.2	373	15.4
23:02:49	14	12.9	335	1181	4.2	4.6	14.2	369	15.4
23:03:09	15	12.9	332	1181	4.2	4.6	14.2	365	16.5
23:03:29	17	12.9	330	1178	4.3	4.7	14.1	363	18.7
23:03:49	12	12.8	331	1175	4.4	4.8	14.1	364	13.2
23:04:09	16	12.8	333	1170	4.2	4.6	14.1	366	17.6
23:04:29	17	12.8	338	1168	4.1	4.5	14.1	372	18.7
23:04:49	17	12.9	342	1168	4.0	4.4	14.2	376	18.7
23:05:09	13	13.1	342	1174	4.0	4.4	14.4	376	14.3
23:05:29	13	13.1	340	1180	4.0	4.4	14.4	374	14.3
23:05:49	15	13.0	337	1183	4.1	4.5	14.2	371	16.5
23:06:09	13	13.0	337	1185	4.1	4.5	14.3	371	14.3
23:06:29	12	13.0	338	1185	4.1	4.5	14.3	372	13.2
23:06:49	13	12.9	340	1184	4.2	4.6	14.2	374	14.3
23:07:09	11	12.9	340	1185	4.3	4.7	14.2	374	12.1
23:07:29	10	12.8	339	1185	4.3	4.7	14.1	373	11.0

Continuous Monitoring April 22, 55 MW, Reburn

TIME	Wet CO PPM	Wet CO2 %	Wet NOX PPM	Wet SO2 PPM	Wet O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
23:07:49	11	12.7	338	1180	4.2	4.6	13.9	372	12.1
23:08:09	13	12.9	338	1173	4.3	4.7	14.1	372	14.3
23:08:29	12	12.9	338	1170	4.2	4.6	14.2	372	13.2
23:08:49	12	12.9	335	1171	4.2	4.6	14.1	369	13.2
23:09:09	16	12.9	333	1169	4.2	4.6	14.2	366	17.6
23:09:29	14	12.9	331	1166	4.2	4.6	14.2	364	15.4
23:09:49	13	12.8	332	1161	4.3	4.7	14.1	365	14.3
23:10:09	13	12.8	336	1159	4.2	4.6	14.1	370	14.3
23:10:29	14	12.9	338	1154	4.1	4.5	14.2	372	15.4
23:10:49	15	12.9	338	1158	4.1	4.5	14.2	372	16.5
23:11:09	14	12.9	337	1158	4.0	4.4	14.2	371	15.4
23:11:29	14	13.0	334	1163	4.0	4.4	14.3	367	15.4
23:11:49	13	12.8	331	1170	4.0	4.4	14.1	364	14.3
23:12:09	17	12.9	331	1176	4.0	4.4	14.2	364	18.7
23:12:29	12	13.1	332	1180	4.0	4.4	14.4	365	13.2
23:12:49	13	13.1	332	1189	4.2	4.6	14.4	365	14.3
23:13:09	11	12.9	331	1189	4.2	4.6	14.1	364	12.1
23:13:29	12	12.9	333	1189	4.1	4.5	14.2	366	13.2
23:13:49	14	13.0	337	1185	4.2	4.6	14.3	371	15.4
23:14:09	15	12.8	341	1186	4.2	4.6	14.1	375	16.5
23:14:29	15	12.9	342	1184	4.2	4.6	14.1	376	16.5
23:14:49	13	12.9	340	1178	4.2	4.6	14.1	374	14.3
23:15:09	13	12.8	341	1176	4.3	4.7	14.1	375	14.3
23:15:29	13	12.9	341	1174	4.2	4.6	14.1	375	14.3
23:15:49	15	12.8	340	1170	4.2	4.6	14.1	374	16.5
23:16:09	14	12.8	341	1170	4.2	4.6	14.1	375	15.4
23:16:29	14	12.8	339	1166	4.2	4.6	14.1	373	15.4
23:16:49	14	12.7	338	1165	4.3	4.7	13.9	372	15.4
23:17:09	18	12.5	337	1163	4.2	4.6	13.7	371	19.8
23:17:29	9	12.6	337	1159	4.3	4.7	13.8	371	9.9
23:17:49	16	12.6	339	1154	4.2	4.6	13.9	373	17.6
23:18:09	15	12.5	342	1145	4.4	4.8	13.8	376	16.5
23:18:29	14	12.5	343	1143	4.3	4.7	13.8	377	15.4
23:18:49	12	12.6	343	1139	4.2	4.6	13.9	377	13.2
23:19:09	17	12.8	341	1139	4.2	4.6	14.1	375	18.7
23:19:29	15	12.9	341	1144	4.2	4.6	14.2	375	16.5
23:19:49	13	12.9	340	1150	4.2	4.6	14.2	374	14.3
23:20:09	15	12.9	340	1155	4.2	4.6	14.1	374	16.5
23:20:29	16	12.8	340	1159	4.2	4.6	14.1	374	17.6
23:20:49	14	12.9	340	1163	3.9	4.3	14.2	374	15.4
23:21:09	13	13.0	341	1164	4.1	4.5	14.3	375	14.3
23:21:29	19	13.0	338	1169	4.0	4.4	14.3	372	20.9
23:21:49	45	13.0	331	1180	3.6	4.0	14.3	364	49.5
23:22:09	50	13.2	327	1184	4.0	4.4	14.6	360	55.0
23:22:29	173	13.2	324	1204	4.2	4.6	14.6	356	190.3
23:22:49	182	13.0	322	1215	4.3	4.7	14.3	354	200.2
23:23:09	82	13.0	321	1210	4.4	4.8	14.3	353	90.2
23:23:29	39	12.7	325	1200	4.3	4.7	14.0	358	42.9
23:23:49	26	12.8	333	1189	4.3	4.7	14.1	366	28.6
23:24:09	18	12.8	338	1180	4.4	4.8	14.1	372	19.8
23:24:29	17	12.7	340	1171	4.3	4.7	14.0	374	18.7
23:24:49	19	12.8	342	1166	4.2	4.6	14.1	376	20.9
23:25:09	15	12.8	343	1160	4.2	4.6	14.1	377	16.5
23:25:29	16	12.8	342	1158	4.3	4.7	14.1	376	17.6
23:25:49	20	12.8	338	1155	4.2	4.6	14.0	372	22.0
23:26:09	13	12.8	338	1150	4.2	4.6	14.1	372	14.3
23:26:29	12	12.7	340	1150	4.2	4.6	14.0	374	13.2
23:26:49	14	12.6	342	1151	4.3	4.7	13.9	376	15.4
23:27:09	15	12.6	343	1153	4.2	4.6	13.8	377	16.5
23:27:29	13	12.5	343	1151	4.2	4.6	13.8	377	14.3
23:27:49	14	12.8	345	1151	4.2	4.6	14.0	380	15.4
23:28:09	15	13.0	346	1156	4.1	4.5	14.2	381	16.5
23:28:29	14	12.9	343	1160	4.2	4.6	14.2	377	15.4
23:28:49	13	12.9	343	1164	4.2	4.6	14.1	377	14.3
23:29:09	14	12.9	343	1166	4.0	4.4	14.2	377	15.4
23:29:29	15	13.0	345	1169	4.1	4.5	14.3	380	16.5

Continuous Monitoring April 22, 55 MW, Reburn

TIME	Wet CO PPM	Wet CO2 %	Wet NOX PPM	Wet SO2 PPM	Wet O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
23:29:49	15	12.9	346	1175	4.0	4.4	14.2	381	16.5
23:30:09	16	12.9	344	1179	4.1	4.5	14.2	378	17.6
23:30:29	17	13.0	343	1180	4.1	4.5	14.3	377	18.7
23:30:49	14	12.9	341	1186	4.1	4.5	14.2	375	15.4
23:31:09	16	13.0	340	1189	4.2	4.6	14.3	374	17.6
23:31:29	17	13.0	338	1189	4.1	4.5	14.3	372	18.7
23:31:49	15	12.8	338	1186	4.0	4.4	14.1	372	16.5
23:32:09	14	13.0	339	1185	4.0	4.4	14.3	373	15.4
23:32:29	17	13.1	340	1185	4.2	4.6	14.4	374	18.7
23:32:49	14	13.0	341	1185	4.2	4.6	14.3	375	15.4
23:33:09	16	12.9	340	1184	4.3	4.7	14.2	374	17.6
23:33:29	16	12.9	341	1179	4.4	4.8	14.2	375	17.6
23:33:49	16	12.8	342	1169	4.4	4.8	14.1	376	17.6
23:34:09	15	12.7	345	1154	4.4	4.8	14.0	380	16.5
23:34:29	15	12.8	347	1136	4.3	4.7	14.0	382	16.5
23:34:49	14	12.8	348	1121	4.3	4.7	14.1	383	15.4
23:35:09	14	12.8	348	1110	4.4	4.8	14.0	383	15.4
23:35:29	16	12.8	350	1104	4.3	4.7	14.1	385	17.6
23:35:49	14	12.8	349	1105	4.2	4.6	14.0	384	15.4
23:36:09	16	12.8	349	1105	4.2	4.6	14.1	384	17.6
23:36:29	16	12.9	348	1106	4.2	4.6	14.2	383	17.6
23:36:49	17	12.9	348	1115	4.2	4.6	14.2	383	18.7
23:37:09	13	12.8	348	1118	4.2	4.6	14.1	383	14.3
23:37:29	14	13.0	347	1123	4.2	4.6	14.2	382	15.4
23:37:49	12	12.9	347	1123	4.3	4.7	14.2	382	13.2
23:38:09	16	12.8	346	1126	4.3	4.7	14.1	381	17.6
23:38:29	18	12.9	345	1129	4.3	4.7	14.1	380	19.8
23:38:49	18	12.8	343	1128	4.3	4.7	14.1	377	19.8
23:39:09	15	12.8	343	1128	4.2	4.6	14.1	377	16.5
23:39:29	17	12.9	343	1128	4.2	4.6	14.2	377	18.7
23:39:49	18	13.0	341	1130	4.2	4.6	14.2	375	19.8
23:40:09	12	13.0	339	1138	4.2	4.6	14.2	373	13.2
23:40:29	15	12.8	336	1139	4.3	4.7	14.0	370	16.5
23:40:49	16	12.9	336	1139	4.2	4.6	14.1	370	17.6
23:41:09	12	12.8	336	1140	4.2	4.6	14.1	370	13.2
23:41:29	13	12.8	337	1135	4.2	4.6	14.1	371	14.3
23:41:49	17	12.9	339	1135	4.2	4.6	14.2	373	18.7
23:42:09	13	12.9	340	1131	4.2	4.6	14.2	374	14.3
23:42:29	14	12.8	340	1129	4.2	4.6	14.1	374	15.4
23:42:49	16	12.9	339	1128	4.2	4.6	14.2	373	17.6
23:43:09	12	12.9	338	1130	4.2	4.6	14.2	372	13.2
23:43:29	15	12.9	338	1125	4.1	4.5	14.1	372	16.5
23:43:49	16	13.0	339	1128	4.2	4.6	14.3	373	17.6
23:44:09	15	13.0	339	1133	4.2	4.6	14.3	373	16.5
23:44:29	14	13.0	339	1139	4.2	4.6	14.2	373	15.4
23:44:49	16	12.8	338	1143	4.2	4.6	14.1	372	17.6
23:45:09	13	13.0	338	1143	4.1	4.5	14.2	372	14.3
23:45:29	16	13.0	341	1144	4.2	4.6	14.3	375	17.6
23:45:49	17	13.1	343	1146	4.0	4.4	14.4	377	18.7
23:46:09	18	13.1	343	1151	4.0	4.4	14.4	377	19.8
23:46:29	13	13.1	343	1158	4.0	4.4	14.4	377	14.3
23:46:49	15	13.2	342	1160	4.2	4.6	14.5	376	16.5
23:47:09	18	13.1	340	1158	4.2	4.6	14.4	374	19.8
23:47:29	18	13.0	340	1155	4.1	4.5	14.3	374	19.8
23:47:49	17	12.9	341	1148	4.2	4.6	14.2	375	18.7
23:48:09	15	12.9	342	1151	4.2	4.6	14.1	376	16.5
23:48:29	14	12.8	343	1153	4.2	4.6	14.1	377	15.4
23:48:49	15	12.7	344	1153	4.1	4.5	14.0	378	16.5
23:49:09	17	12.8	343	1159	4.1	4.5	14.1	377	18.7
23:49:29	16	12.9	340	1165	4.1	4.5	14.1	374	17.6
23:49:49	17	12.8	338	1175	4.0	4.4	14.1	372	18.7
23:50:09	16	13.2	337	1178	4.1	4.5	14.5	371	17.6
23:50:29	19	13.2	336	1184	4.2	4.6	14.6	370	20.9
23:50:49	15	13.1	336	1191	4.2	4.6	14.4	370	16.5
23:51:09	18	13.1	337	1189	4.2	4.6	14.4	371	19.8
23:51:29	19	13.1	338	1188	4.1	4.5	14.4	372	20.9

Continuous Monitoring April 22, 55 MW, Reburn

TIME	Wet CO PPM	Wet CO2 %	Wet NOX PPM	Wet SO2 PPM	Wet O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
23:51:49	19	13.0	338	1183	4.2	4.6	14.3	372	20.9
23:52:09	19	13.1	339	1179	4.2	4.6	14.5	373	20.9
23:52:29	18	13.1	339	1176	4.3	4.7	14.4	373	19.8
23:52:49	19	12.9	338	1173	4.3	4.7	14.2	372	20.9
23:53:09	17	13.0	342	1165	4.4	4.8	14.3	376	18.7
23:53:29	17	12.9	346	1161	4.3	4.7	14.2	381	18.7
23:53:49	17	12.9	349	1156	4.2	4.6	14.2	384	18.7
23:54:09	20	13.0	350	1153	4.1	4.5	14.3	385	22.0
23:54:29	16	13.1	347	1156	4.0	4.4	14.4	382	17.6
23:54:49	18	13.1	343	1164	4.0	4.4	14.4	377	19.8
23:55:09	19	13.1	339	1166	4.1	4.5	14.4	373	20.9
23:55:29	20	13.2	337	1168	4.0	4.4	14.5	371	22.0
23:55:49	19	13.1	335	1170	4.1	4.5	14.4	369	20.9
23:56:09	18	13.1	333	1174	4.2	4.6	14.4	366	19.8
23:56:29	15	13.0	333	1170	4.2	4.6	14.3	366	16.5
23:56:49	17	13.0	334	1165	4.2	4.6	14.3	367	18.7
23:57:09	17	13.0	335	1159	4.2	4.6	14.2	369	18.7
23:57:29	16	13.1	338	1154	4.1	4.5	14.4	372	17.6
23:57:49	17	13.1	341	1154	4.0	4.4	14.4	375	18.7
23:58:09	18	12.9	343	1153	4.0	4.4	14.2	377	19.8
23:58:29	17	13.0	342	1158	4.1	4.5	14.2	376	18.7
23:58:49	15	12.9	340	1163	4.2	4.6	14.2	374	16.5
23:59:09	16	12.7	338	1166	4.3	4.7	14.0	372	17.6
23:59:29	15	12.7	339	1161	4.2	4.6	14.0	373	16.5
23:59:49	15	12.7	342	1155	4.2	4.6	14.0	376	16.5
00:00:19	15	13.0	347	1150	4.2	4.6	14.3	382	16.5
00:00:39	14	13.0	347	1149	4.2	4.6	14.3	382	15.4
00:00:59	16	13.1	346	1146	4.2	4.6	14.4	381	17.6
00:01:19	16	13.0	346	1144	4.2	4.6	14.3	381	17.6
00:01:39	16	13.0	346	1145	4.1	4.5	14.3	381	17.6
00:01:59	14	13.1	345	1148	4.2	4.6	14.4	380	15.4
00:02:19	14	13.0	341	1153	4.3	4.7	14.3	375	15.4
00:02:39	21	13.0	339	1156	4.2	4.6	14.2	373	23.1
00:02:59	16	12.9	338	1159	4.2	4.6	14.2	372	17.6
00:03:19	15	13.0	341	1161	4.0	4.4	14.3	375	16.5
00:03:39	15	13.0	341	1169	4.0	4.4	14.3	375	16.5
00:03:59	16	13.1	340	1176	4.0	4.4	14.4	374	17.6
00:04:19	17	13.2	337	1186	4.0	4.4	14.5	371	18.7
00:04:39	21	13.1	335	1195	4.0	4.4	14.4	369	23.1
00:04:59	17	13.0	331	1203	4.2	4.6	14.3	364	18.7
00:05:19	17	13.0	331	1204	4.1	4.5	14.3	364	18.7
00:05:39	18	13.0	331	1205	4.2	4.6	14.3	364	19.8
00:05:59	17	12.9	332	1201	4.2	4.6	14.2	365	18.7
00:06:19	17	13.0	334	1199	4.2	4.6	14.3	367	18.7
00:06:39	16	13.0	336	1196	4.2	4.6	14.3	370	17.6
00:06:59	12	12.7	339	1195	4.2	4.6	14.0	373	13.2
00:07:19	14	12.9	342	1190	4.3	4.7	14.2	376	15.4
00:07:39	15	12.9	344	1179	4.3	4.7	14.2	378	16.5
00:07:59	18	12.9	346	1171	4.2	4.6	14.1	381	19.8
00:08:19	15	13.0	347	1164	4.2	4.6	14.2	382	16.5
00:08:39	17	12.9	347	1155	4.2	4.6	14.2	382	18.7
00:08:59	15	12.9	346	1154	4.3	4.7	14.2	381	16.5
00:09:19	17	13.0	345	1155	4.2	4.6	14.2	380	18.7
00:09:39	18	12.9	345	1158	4.3	4.7	14.2	380	19.8
00:09:59	17	12.9	343	1161	4.3	4.7	14.1	377	18.7
00:10:19	16	12.9	344	1168	4.1	4.5	14.1	378	17.6
00:10:39	16	12.9	344	1173	4.2	4.6	14.2	378	17.6
00:10:59	24	13.0	343	1176	4.3	4.7	14.3	377	26.4
00:11:19	29	12.8	341	1181	4.5	5.0	14.1	375	31.9
00:11:39	25	12.8	338	1183	4.6	5.1	14.1	372	27.5
00:11:59	23	12.5	340	1180	4.5	5.0	13.7	374	25.3
00:12:19	19	12.4	346	1169	4.4	4.8	13.6	381	20.9
00:12:39	17	12.7	354	1159	4.3	4.7	13.9	389	18.7
00:12:59	18	12.8	357	1156	4.3	4.7	14.1	393	19.8
00:13:19	16	12.7	354	1156	4.3	4.7	14.0	389	17.6
00:13:39	16	12.8	347	1158	4.2	4.6	14.1	382	17.6

Continuous Monitoring April 22, 55 MW, Reburn

TIME	CO PPM	CO2 %	NOX PPM	SO2 PPM	O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
	----------	----------	Wet	----------					
00:13:59	14	12.9	344	1158	4.1	4.5	14.2	378	15.4
00:14:19	18	12.9	342	1164	4.2	4.6	14.2	376	19.8
00:14:39	18	13.0	341	1168	4.0	4.4	14.3	375	19.8
00:14:59	16	13.1	338	1166	4.1	4.5	14.5	372	17.6
00:15:19	17	12.9	338	1168	4.2	4.6	14.2	372	18.7
00:15:39	18	12.9	339	1169	4.2	4.6	14.1	373	19.8
00:15:59	16	13.0	342	1166	4.2	4.6	14.3	376	17.6
00:16:19	14	12.9	343	1165	4.2	4.6	14.2	377	15.4
00:16:39	17	13.0	343	1168	4.1	4.5	14.3	377	18.7
00:16:59	15	13.0	342	1169	4.2	4.6	14.3	376	16.5
00:17:19	17	13.0	342	1176	4.3	4.7	14.3	376	18.7
00:17:39	17	12.9	342	1175	4.3	4.7	14.2	376	18.7
00:17:59	17	12.9	342	1169	4.4	4.8	14.1	376	18.7
00:18:19	15	12.9	344	1164	4.4	4.8	14.1	378	16.5
00:18:39	15	12.8	347	1156	4.4	4.8	14.1	382	16.5
00:18:59	18	12.7	349	1150	4.4	4.8	14.0	384	19.8
00:19:19	16	12.7	350	1145	4.3	4.7	14.0	385	17.6
00:19:39	17	12.7	350	1136	4.4	4.8	13.9	385	18.7
00:19:59	14	12.7	352	1134	4.3	4.7	14.0	387	15.4
00:20:19	14	12.7	351	1129	4.2	4.6	14.0	386	15.4
00:20:39	15	12.7	350	1126	4.2	4.6	14.0	385	16.5
00:20:59	15	12.8	348	1126	4.3	4.7	14.1	383	16.5
Avg	17	12.9	341	1161	4.2	4.6	14.2	375	18.3
	CO PPM	CO2 %	NOX PPM	SO2 PPM	O2 %	Dry O2 %	Dry CO2 %	Dry NOX PPM	Dry CO PPM
	----------	----------	Wet	----------					

APPENDIX B

OPTIMIZATION TEST

CONTINUOUS EMISSION MONITOR STRATIFICATION TESTS

Stratification Traverse #1, 1 April 92, Full load w/reburn

Samp. Pt.	CO (PPM)	CO2 (%)	NOx (PPM)	SO2 (PPM)	O2 (%)	NOx (PPM,
A1	74	14.6	262	1273	2.5	280
2	73	14.8	263	1274	2.4	280
3	72	14.5	263	1276	2.4	280
B1	47	14.2	268	1211	2.7	290
2	75	14.3	268	1218	2.6	289
3	48	14.5	272	1244	2.6	293
C1	38	13.7	282	1099	3.1	313
2	64	14.2	285	1151	3.0	314
3	32	14.1	280	1140	3.1	311
D1	32	13.4	264	1033	3.4	298
2	22	14.2	297	1131	2.9	326
3	25	14.1	295	1139	2.9	323
Duct Avg.	50	14.2	275	1182	2.8	300
E1	17	14.1	312	1123	3.1	346
2	17	14.2	312	1130	3.2	348
3	17	14.1	315	1131	3.1	350
F1	23	14.4	316	1103	2.9	346
2	23	14.5	325	1168	2.9	356
3	23	14.7	315	1160	2.9	345
G1	25	14.4	331	1183	3.2	370
2	25	14.6	317	1200	2.5	339
3	27	14.6	319	1211	2.4	339
H1	24	14.1	294	1196	3.2	328
2	30	14.7	305	1254	2.4	324
3	25	14.8	300	1261	2.2	315
Duct Avg.	24	14.5	314	1182	2.8	342

Stratification Traverse #2, 2 April 92, Full load w/reburn, Hi

Samp. Pt.	CO (ppm)	CO2 (%)	NOx (ppm)	SO2 (ppm)	O2 (%)	NOx (ppm,
A1	37	14.2	238	1233	3.3	267
2	37	14.3	244	1229	3.3	274
3	33	13.0	246	1214	3.7	283
B1	37	14.0	251	1213	3.5	286
2	35	14.0	255	1221	3.5	290
3	37	14.0	254	1230	3.3	285
C1	35	13.9	260	1184	3.5	296
2	28	12.5	258	1220	3.3	290
3	30	14.1	260	1223	3.5	296
D1	30	12.3	271	1195	3.4	306
2	30	13.9	273	1213	3.5	311
3	30	14.4	276	1210	3.5	314
Duct Avg.	33	13.7	257	1215	3.4	292
E1	28	14.6	294	1194	3.5	335
2	30	13.9	303	1214	3.7	349
3	32	14.0	307	1193	3.7	354
F1	54	14.4	301	1195	3.7	347
2	37	14.3	306	1221	3.5	348
3	38	14.3	304	1220	3.1	337
G1	50	13.9	306	1218	3.2	342
2	37	13.9	298	1196	3.1	331
3	45	14.3	306	1243	3.1	340
H1	35	14.1	308	1246	3.2	344
2	37	13.6	298	1210	3.1	331
3	40	12.6	262	1071	4.3	314
Duct Avg.	39	14.0	299	1202	3.4	339

Stratification Traverse #3, 3 April 92, Full load baseline

Samp. Pt.	CO (PPM)	CO2 (%)	NOx (PPM)	SO2 (PPM)	O2 (%)	NOx (PPM,
A1	16	12.6	511	1055	4.8	633
2	12	12.6	509	1088	4.8	631
3	11	12.4	507	1111	4.8	629
B1	16	12.6	527	1124	4.2	627
2	27	12.7	520	1126	4.4	627
3	20	12.5	528	1144	4.6	646
C1	17	12.6	523	1136	4.3	627
2	13	12.7	528	1135	4.3	633
3	19	12.6	537	1126	4.0	631
D1	15	13.0	552	1126	4.0	649
2	14	12.8	547	1093	3.9	639
3	16	12.9	545	1115	4.1	645
Duct Avg.	16	12.7	528	1115	4.4	635
E1	11	13.0	545	1065	4.4	658
2	40	13.2	513	1063	4.1	607
3	17	13.0	535	1184	4.0	629
F1	20	13.0	553	1179	3.9	646
2	18	13.4	538	1215	3.8	624
3	19	13.2	526	1190	3.9	616
G1	21	13.4	524	1158	3.8	608
2	19	13.4	526	1171	3.8	612
3	24	13.3	527	1191	3.6	603
H1	22	12.3	490	1116	5.1	620
2	23	12.7	495	1118	4.5	601
3	27	12.9	508	1129	4.3	609
Duct Avg.	22	13.1	524	1148	4.1	619

Stratification Traverse #4, 11 April 92, Full load baseline

Samp. Pt.	CO (PPM)	CO2 (%)	NOx (PPM)	SO2 (PPM)	O2 (%)	NOx (PPM,
A1	N/A	14.0	569	1051	5.2	725
2	N/A	14.3	565	1053	5.2	720
3	N/A	14.4	568	1053	5.4	734
B1	N/A	14.5	550	1036	5.0	691
2	N/A	14.8	575	1039	5.0	723
3	N/A	14.8	573	1048	4.8	710
C1	N/A	14.8	567	1063	4.8	703
2	N/A	14.9	576	1074	4.7	709
3	N/A	15.1	589	1091	4.8	730
D1	N/A	15.0	581	1101	4.6	710
2	N/A	15.1	593	1128	4.6	725
3	N/A	15.3	588	1144	4.7	724
Duct Avg.	0	14.8	575	1073	4.9	717
E1	N/A	15.2	575	1053	4.6	703
2	N/A	15.4	594	1049	4.4	717
3	N/A	15.4	595	1030	4.6	728
F1	N/A	12.2	463	925	4.6	566
2	N/A	14.1	517	749	4.6	632
3	N/A	14.8	503	665	4.7	619
G1	N/A	14.5	509	656	4.6	622
2	N/A	14.5	527	646	4.7	649
3	N/A	14.9	553	700	4.6	676
H1	N/A	14.4	539	711	5.9	723
2	N/A	14.1	512	649	5.7	677
3	N/A	14.0	492	594	5.7	650
Duct Avg.	0	14.5	532	786	4.9	663

Stratification Traverse #5, 13 April 92, Full load w/reburn

Samp. Pt.	CO (PPM)	CO2 (%)	NOx (PPM)	SO2 (PPM)	O2 (%)	NOx (PPM,
A1	37	N/A	284	N/A	3.2	317
2	37	N/A	277	N/A	3.2	309
3	40	N/A	272	N/A	3.0	300
B1	38	N/A	286	N/A	3.0	315
2	37	N/A	276	N/A	2.9	303
3	43	N/A	290	N/A	3.1	322
C1	48	N/A	294	N/A	3.2	328
2	38	N/A	296	N/A	3.3	333
3	38	N/A	295	N/A	3.3	331
D1	37	N/A	293	N/A	3.3	329
2	40	N/A	292	N/A	3.1	324
3	39	N/A	295	N/A	3.2	329
Duct Avg.	39	0.0	288		3.2	320
E1	26	N/A	315	N/A	3.3	354
2	38	N/A	318	N/A	3.4	360
3	38	N/A	318	N/A	3.5	362
F1	33	N/A	324	N/A	3.2	362
2	37	N/A	316	N/A	3.2	353
3	41	N/A	316	N/A	3.1	351
G1	38	N/A	318	N/A	3.0	351
2	40	N/A	322	N/A	3.1	357
3	39	N/A	320	N/A	2.7	347
H1	35	N/A	303	N/A	3.4	343
2	36	N/A	311	N/A	3.0	343
3	38	N/A	322	N/A	2.6	347
Duct Avg.	37	0.0	317		3.1	352

Stratification Traverse #6, 20 May 92, Full Load w/reburn

Samp. Pt.	CO (PPM)	CO2 (%)	NOx (PPM)	SO2* (PPM)	O2 (%)	NOx (PPM,
A1	119	14.0	234	267	4.3	280
2	128	14.0	233	254	4.3	279
3	132	14.1	234	253	4.3	280
B1	143	14.2	236	249	4.2	281
2	145	14.4	236	247	4.2	281
3	148	14.4	237	245	4.1	280
C1	152	14.4	237	244	4.2	282
2	153	14.5	238	245	4.0	280
3	153	14.6	239	247	4.1	283
D1	153	14.7	242	250	4.0	284
2	160	14.7	241	257	3.8	280
3	160	14.8	244	274	3.8	283
Duct Avg.	146	14.4	238	253	4.1	281
E1	155	14.9	243	263	3.9	284
2	158	14.9	243	258	3.8	282
3	153	15.0	245	257	3.7	282
F1	148	15.1	245	252	3.7	282
2	148	15.1	247	252	3.6	283
3	140	15.2	249	257	3.5	283
G1	143	15.3	251	260	3.5	286
2	141	15.3	253	267	3.3	284
3	138	15.4	255	273	3.3	287
H1	133	15.5	258	285	3.4	292
2	133	15.6	260	294	3.5	296
3	137	15.6	256	293	3.5	291
Duct Avg.	144	15.2	250	268	3.6	286

Stratification Traverse #7, 27 May 92, Full Load w/reburn

Samp. Pt.	CO (PPM)	CO2 (%)	NOx (PPM)	SO2 (PPM)	O2 (%)	NOx (PPM,
A1	229	14.9	227	1190	3.9	265
2	299	14.6	229	1194	3.8	266
3	259	14.8	230	1203	3.8	267
B1	190	14.7	225	1146	3.9	263
2	304	14.9	227	1159	3.7	262
3	257	14.8	229	1150	3.7	264
C1	227	14.6	228	1116	3.8	264
2	123	14.5	230	1097	3.8	267
3	103	14.4	229	1021	3.9	267
D1	74	14.1	228	913	4.3	273
2	61	14.0	229	910	4.3	274
3	53	14.1	230	925	4.3	276
Duct Avg.	182	14.5	228	1085	3.9	267
E1	29	13.4	248	784	5.2	316
2	25	13.9	255	807	4.6	312
3	26	13.9	254	860	4.4	306
F1	29	13.6	250	787	5.1	316
2	25	14.2	285	1201	4.1	337
3	20	14.4	292	1203	4.0	343
G1	23	14.6	302	1170	4.1	357
2	36	14.6	296	1179	4.3	355
3	45	15.0	293	1208	4.0	344
H1	26	14.3	287	1116	4.5	349
2	23	14.6	293	1131	4.2	349
3	28	14.6	297	1144	4.1	351
Duct Avg.	28	14.3	279	1049	4.4	337

Stratification Traverse #8, 28 May 92, Full Load w/reburn

Samp. Pt.	CO (PPM)	CO2 (%)	NOx (PPM)	SO2 (PPM)	O2 (%)	NOx (PPM,
A1	195	14.6	235	1054	4.4	284
2	315	14.3	238	1105	4.2	283
3	203	14.5	238	1091	4.3	285
B1	245	14.4	237	1074	4.2	282
2	340	14.6	236	1079	4.1	279
3	231	14.6	241	1069	4.0	283
C1	122	14.2	239	1015	4.2	285
2	97	14.0	240	999	4.3	288
3	75	14.1	236	958	4.5	287
D1	75	13.5	235	850	5.1	297
2	51	13.4	234	808	5.0	294
3	38	13.4	232	781	5.0	292
Duct Avg.	166	14.1	237	990	4.4	286
E1	32	13.0	242	734	5.4	313
2	27	13.7	257	714	4.9	321
3	29	13.7	257	1021	4.9	321
F1	31	13.4	256	935	5.2	326
2	28	13.9	285	1201	4.1	337
3	20	14.4	292	1203	4.0	343
G1	23	14.6	302	1170	4.1	357
2	36	14.6	296	1179	4.3	355
3	45	15.0	293	1208	4.0	344
H1	26	14.3	287	1116	4.5	349
2	23	14.6	293	1131	4.2	349
3	28	14.6	297	1144	4.1	351
Duct Avg.	29	14.2	280	1143	4.5	339

APPENDIX C

OPTIMIZATION TEST

M17 PARTICULATE LOADING AT ESP INLET—DATA SUMMARY

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 3/31/92 Printed 18-Jun — Test No./Type: M17-I1
Sample Location: Unit 2, ESP Inlet — Start/Stop Time:

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.203
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(72.00)
Barometric Pressure (in Hg)	P(b)	29.61
Stack Static Pressure (in H20)	P(stack)	12.000
Gas Meter Initial Reading (cu ft)		44.54
Gas Meter Final Reading (cu ft)		73.10
Net Gas Sample Volume (cu ft)	V(m)	(28.56)
Vol of Liquid Collected (ml)	Vl(c)	80.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.766)
Wt. of Filter Particulate (gm)		1.9972
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(1.9972)
O2 Concentration (by CEM)	% O2	5.30 from run I15:
CO2 Concentration (by CEM)	% CO2	14.40 (no CEM data availab
CO Concentration (by CEM)	% CO	0.0 for this run)
N2 Concentration (by diff.)	% N2	(80.30)

Sample Point	dClock Time	Velocity Head, dP (in H20)	Orifice Meter,dH (in H20)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	3.00	0.40	0.49	438	72.0	72.0	0.6325
2	3.00	0.35	0.43	450	70.0	71.0	0.5916
3	3.00	0.44	0.55	465	70.0	71.0	0.6633
B1	3.00	0.41	0.51	448	73.0	72.0	0.6403
2	3.00	0.37	0.44	464	73.0	72.0	0.6083
3	3.00	0.34	0.42	476	74.0	72.0	0.5831
C1	3.00	0.45	0.55	430	75.0	73.0	0.6708
2	3.00	0.45	0.54	435	76.0	73.0	0.6708
3	3.00	0.57	0.68	453	77.0	74.0	0.7550
D1	3.00	0.55	0.66	432	77.0	74.0	0.7416
2	3.00	0.47	0.56	445	79.0	75.0	0.6856
3	3.00	0.54	0.65	459	79.0	75.0	0.7348
E1	3.00	0.47	0.56	443	79.0	75.0	0.6856
2	3.00	0.41	0.49	463	80.0	75.0	0.6403
3	3.00	0.45	0.54	478	80.0	75.0	0.6708
F1	3.00	0.54	0.64	453	79.0	75.0	0.7348
2	3.00	0.46	0.55	452	79.0	75.0	0.6782
3	3.00	0.48	0.56	465	79.0	75.0	0.6928
G1	3.00	0.46	0.55	446	78.0	75.0	0.6782
2	3.00	0.44	0.52	465	78.0	75.0	0.6633
3	3.00	0.43	0.51	480	79.0	75.0	0.6557
H1	3.00	0.57	0.68	478	79.0	75.0	0.7550
2	3.00	0.45	0.53	473	80.0	75.0	0.6708
3	3.00	0.47	0.55	479	80.0	75.0	0.6856
TOTALS	72.00	10.97	13.16	10970.0	1845.0	1774.0	16.1890

FIELD DATA AVERAGES

Avg Velocity Head (in H20)	dP(avg)	=	0.457
Avg Orifice Meter Reading (in H20)	dH(avg)	=	0.545
Avg Stack Temperature (degF)	T(s avg)	=	457.1
Average Meter Temperature (degF)	T(m avg)	=	75.4
Avg SQRT(dP)		=	0.675

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	28.17
Stack Gas Water Vapor Proportion	B(wo)	=	0.118
Mol. Wt., Stack Gas Dry	M(d)	=	30.52
Mol. Wt., Stack Gas Wet	M(s)	=	29.04
Abs Stack Pressure (in Hg)	P(s)	=	30.49
Avg Stack Velocity (ft/sec)	V(s avg)	=	49.3
Isokineticity (%)	% I	=	113.8
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	146963
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	283944
Percent XS Air	PEA	=	33.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.0938
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2232
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.9754
Heat Input Rate, MBtu/hr		=	670.23
Particulate Emission Rate(lb/hr)	E(p)	=	1377.609
Particulate Emissi Rate(lb/MBtu)		=	2.0558

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tony Lombardo
Date: 4/1/92 Printed 18-Jun — Test No./Type: M17-12
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1910-2155

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.203
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(72.00)
Barometric Pressure (in Hg)	P(b)	29.54
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		73.32
Gas Meter Final Reading (cu ft)		116.10
Net Gas Sample Volume (cu ft)	V(m)	(42.78)
Vol of Liquid Collected (ml)	Vl(c)	80.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.766)
Wt. of Filter Particulate (gm)		5.1028
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.1028)
O2 Concentration (by CEM)	% O2	3.50
CO2 Concentration (by CEM)	% CO2	15.40
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.10)

from 29 Apr repeat: (bad CEM data on first attempt)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	3.00	0.96	1.03	500	85.0	86.0	0.9798
2	3.00	0.95	1.04	504	86.0	86.0	0.9747
3	3.00	1.01	1.10	514	87.0	86.0	1.0050
B1	3.00	1.00	1.10	446	86.0	85.0	1.0000
2	3.00	0.85	0.89	517	87.0	86.0	0.9220
3	3.00	0.90	0.95	523	87.0	86.0	0.9487
C1	3.00	1.40	1.50	506	87.0	86.0	1.1832
2	3.00	1.10	1.18	517	89.0	86.0	1.0488
3	3.00	1.40	1.50	524	90.0	86.0	1.1832
D1	3.00	1.50	1.65	507	90.0	87.0	1.2247
2	3.00	1.00	1.10	520	81.0	84.0	1.0000
3	3.00	1.20	1.30	529	81.0	84.0	1.0954
E1	3.00	1.50	1.65	537	82.0	83.0	1.2247
2	3.00	1.05	1.12	559	82.0	83.0	1.0247
3	3.00	1.20	1.30	568	82.0	83.0	1.0954
F1	3.00	1.50	1.65	571	83.0	82.0	1.2247
2	3.00	1.10	1.18	571	84.0	82.0	1.0488
3	3.00	1.10	1.18	579	84.0	82.0	1.0488
G1	3.00	1.50	1.65	533	84.0	82.0	1.2247
2	3.00	1.20	1.30	557	85.0	81.0	1.0954
3	3.00	1.20	1.30	568	85.0	81.0	1.0954
H1	3.00	1.50	1.65	578	86.0	81.0	1.2247
2	3.00	1.10	1.18	575	88.0	81.0	1.0488
3	3.00	1.10	1.18	579	89.0	82.0	1.0488
TOTALS	72.00	28.32	30.68	12882.0	2050.0	2011.0	25.9708

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.180
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.278
Avg Stack Temperature (degF)	T(s avg)	=	536.8
Average Meter Temperature (degF)	T(m avg)	=	84.6
Avg SQRT(dP)		=	1.082

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	41.48
Stack Gas Water Vapor Proportion	B(wo)	=	0.083
Mol. Wt., Stack Gas Dry	M(d)	=	30.60
Mol. Wt., Stack Gas Wet	M(s)	=	29.55
Abs Stack Pressure (in Hg)	P(s)	=	31.01
Avg Stack Velocity (ft/sec)	V(s avg)	=	61.0
Isokineticity (%)	% I	=	[illegible]
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	234946
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	466762
Percent XS Air	PEA	=	19.5
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.8984
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	3475
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.5187
Heat Input Rate, MBtu/hr		=	1195.12
Particulate Emission Rate(lb/hr)	E(p)	=	3822.384
Particulate Emission Rate(lb/MBtu)		=	3.1989

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tony Lombardo
Date: 4/2/92 Printed 18-Jun — Test No./Type: M17-13
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1132-1357

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.203
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.44
Stack Static Pressure (in H20)	P(stack)	21.000
Gas Meter Initial Reading (cu ft)		129.70
Gas Meter Final Reading (cu ft)		190.00
Net Gas Sample Volume (cu ft)	V(m)	(60.30)
Vol of Liquid Collected (ml)	Vl(c)	122.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.743)
Wt. of Filter Particulate (gm)		9.4696
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(9.4696)
O2 Concentration (by CEM)	% O2	3.30
CO2 Concentration (by CEM)	% CO2	15.50
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.20)

from 29 Apr repeat: (bad CEM data on first attempt)

Sample Point	dClock Time	Velocity Head, dP (in H20)	Orifice Meter, dH (in H20)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.92	0.96	488	78.0	76.0	0.9592
2	4.00	0.88	0.93	490	75.0	73.0	0.9381
3	4.00	1.05	1.10	493	78.0	74.0	1.0247
B1	4.00	1.10	1.18	485	77.0	75.0	1.0488
2	4.00	0.88	0.93	502	81.0	75.0	0.9381
3	4.00	0.92	0.96	507	81.0	75.0	0.9592
C1	4.00	1.10	1.18	489	76.0	75.0	1.0488
2	4.00	1.00	1.22	496	79.0	74.0	1.0000
3	4.00	1.20	1.51	500	81.0	75.0	1.0954
D1	4.00	1.30	1.85	499	84.0	76.0	1.1402
2	4.00	1.20	1.51	500	84.0	76.0	1.0954
3	4.00	1.15	1.50	504	85.0	76.0	1.0724
E1	4.00	1.20	1.51	510	80.0	76.0	1.0954
2	4.00	1.10	1.18	537	84.0	77.0	1.0488
3	4.00	1.15	1.50	545	83.0	76.0	1.0724
E1	4.00	1.30	1.85	548	83.0	76.0	1.1402
2	4.00	1.05	1.10	549	83.0	76.0	1.0247
3	4.00	1.15	1.05	551	83.0	76.0	1.0724
F1	4.00	1.20	1.51	515	80.0	76.0	1.0954
2	4.00	1.10	1.18	529	83.0	75.0	1.0488
3	4.00	1.10	1.18	540	83.0	76.0	1.0488
F1	4.00	1.10	1.18	544	83.0	76.0	1.0488
2	4.00	1.10	1.18	544	84.0	76.0	1.0488
3	4.00	1.15	1.50	543	84.0	76.0	1.0724
TOTALS	96.00	26.40	30.75	12408.0	1952.0	1812.0	25.1372

FIELD DATA AVERAGES

Avg Velocity Head (in H20)	dP(avg)	=	1.100
Avg Orifice Meter Reading (in H20)	dH(avg)	=	1.281
Avg Stack Temperature (degF)	T(s avg)	=	517.0
Average Meter Temperature (degF)	T(m avg)	=	78.4
Avg SQRT(dP)		=	1.047

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	58.93
Stack Gas Water Vapor Proportion	B(wo)	=	0.089
Mol. Wt., Stack Gas Dry	M(d)	=	30.61
Mol. Wt., Stack Gas Wet	M(s)	=	29.49
Abs Stack Pressure (in Hg)	P(s)	=	30.98
Avg Stack Velocity (ft/sec)	V(s avg)	=	77.8
Isokineticity (%)	% I	=	114.9
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	226445
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	447968
Percent XS Air	PEA	=	18.2
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.4794
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	4457
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.9611
Heat Input Rate, MBtu/hr		=	1175.41
Particulate Emission Rate(lb/hr)	E(p)	=	4854.124
Particulate Emission Rate(lb/MBtu)		=	4.1304

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tony Lombardo
Date: 4/3/92 Printed 18-Jun — Test No./Type: M17-14
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1140-1348

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.203
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.60
Stack Static Pressure (in H2O)	P(stack)	21.000
Gas Meter Initial Reading (cu ft)		191.10
Gas Meter Final Reading (cu ft)		256.30
Net Gas Sample Volume (cu ft)	V(m)	(65.20)
Vol of Liquid Collected (ml)	Vl(c)	112.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.272)
Wt. of Filter Particulate (gm)		2.3125
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(2.3125)
O2 Concentration (by CEM)	% O2	4.70
CO2 Concentration (by CEM)	% CO2	14.70 from 29 Apr repeat:
CO Concentration (by CEM)	% CO	0.0 (no concurrent CEM d
N2 Concentration (by diff.)	% N2	(80.60)avalable)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.20	1.50	482	69.0	69.0	1.0954
2	4.00	1.20	1.50	488	69.0	70.0	1.0954
3	4.00	1.50	1.88	499	70.0	69.0	1.2247
B1	4.00	1.80	2.25	493	71.0	70.0	1.3416
2	4.00	1.30	1.65	517	74.0	69.0	1.1402
3	4.00	1.40	1.75	523	76.0	70.0	1.1832
C1	4.00	1.50	1.88	496	75.0	71.0	1.2247
2	4.00	1.40	1.75	505	78.0	71.0	1.1832
3	4.00	1.50	1.88	517	79.0	71.0	1.2247
D1	4.00	1.80	2.25	506	79.0	72.0	1.3416
2	4.00	1.60	2.00	520	80.0	72.0	1.2649
3	4.00	1.70	2.20	525	81.0	73.0	1.3038
E1	4.00	1.70	2.20	541	78.0	75.0	1.3038
2	4.00	1.40	1.75	564	81.0	73.0	1.1832
3	4.00	1.60	2.00	579	82.0	74.0	1.2649
E1	4.00	1.70	2.20	582	83.0	74.0	1.3038
2	4.00	1.30	1.65	583	84.0	74.0	1.1402
3	4.00	1.50	1.88	488	84.0	75.0	1.2247
F1	4.00	1.50	1.88	544	82.0	75.0	1.2247
2	4.00	1.70	2.20	568	85.0	76.0	1.3038
3	4.00	1.60	2.00	588	86.0	76.0	1.2649
F1	4.00	1.80	2.25	591	88.0	77.0	1.3416
2	4.00	1.60	2.00	591	88.0	77.0	1.2649
3	4.00	1.60	2.00	596	88.0	78.0	1.2649
TOTALS	96.00	36.90	46.50	12886.0	1910.0	1751.0	29.7095

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.538
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.938
Avg Stack Temperature (degF)	T(s avg)	=	536.9
Average Meter Temperature (degF)	T(m avg)	=	76.3
Avg SQRT(dP)		=	1.238

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	64.43
Stack Gas Water Vapor Proportion	B(wo)	=	0.076
Mol. Wt., Stack Gas Dry	M(d)	=	30.54
Mol. Wt., Stack Gas Wet	M(s)	=	29.59
Abs Stack Pressure (in Hg)	P(s)	=	31.14
Avg Stack Velocity (ft/sec)	V(s avg)	=	92.5
Isokineticity (%)	% I	=	1[illegible]
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	271[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	532548
Percent XS Air	PEA	=	26.4
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.5538
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	1068
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.4757
Heat Input Rate, MBtu/hr		=	1285.26
Particulate Emission Rate(lb/hr)	E(p)	=	1288.103
Particulate Emission Rate(lb/MBtu)		=	1.0024

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tony Lombard
Date: 4/6/92 Printed 18-Jun — Test No./Type: M17-I5
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1326-1522

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.252
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.60
Stack Static Pressure (in H20)	P(stack)	12.000
Gas Meter Initial Reading (cu ft)		256.60
Gas Meter Final Reading (cu ft)		331.20
Net Gas Sample Volume (cu ft)	V(m)	(74.60)
Vol of Liquid Collected (ml)	Vl(c)	136.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(6.402)
Wt. of Filter Particulate (gm)		5.0905
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.0905)
O2 Concentration (by CEM)	% O2	4.20
CO2 Concentration (by CEM)	% CO2	11.10
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(84.70)

Sample Point	dClock Time	Velocity Head, dP (in H20)	Orifice Meter, dH (in H20)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.80	1.00	468	92.0	85.0	0.8944
2	4.00	0.65	0.82	474	92.0	86.0	0.8062
3	4.00	0.75	0.94	490	93.0	87.0	0.8660
B1	4.00	0.80	1.00	446	95.0	88.0	0.8944
2	4.00	0.65	0.82	459	99.0	88.0	0.8062
3	4.00	0.58	0.69	478	102.0	90.0	0.7616
C1	4.00	0.75	0.94	450	100.0	91.0	0.8660
2	4.00	0.58	0.69	450	103.0	92.0	0.7616
3	4.00	0.75	0.94	472	104.0	93.0	0.8660
D1	4.00	0.80	1.00	453	103.0	97.0	0.8944
2	4.00	0.80	1.00	459	104.0	93.0	0.8944
3	4.00	0.88	1.10	474	105.0	93.0	0.9381
E1	4.00	0.65	0.82	444	103.0	94.0	0.8062
2	4.00	0.65	0.82	443	107.0	95.0	0.8062
3	4.00	0.58	0.69	462	109.0	96.0	0.7616
E1	4.00	0.58	0.69	474	110.0	97.0	0.7616
2	4.00	0.68	0.84	484	110.0	98.0	0.8246
3	4.00	0.68	0.84	496	107.0	98.0	0.8246
F1	4.00	0.75	0.94	456	105.0	98.0	0.8660
2	4.00	0.80	1.00	469	106.0	99.0	0.8660
3	4.00	0.70	0.86	485	107.0	99.0	0.8944
F1	4.00	0.70	0.86	494	108.0	99.0	0.8367
2	4.00	0.70	0.86	500	109.0	99.0	0.8367
3	4.00	0.68	0.84	509	109.0	99.0	0.8367
TOTALS	96.00	16.26	21.00	11289.0	2482.0	2254.0	20.1708

FIELD DATA AVERAGES

Avg Velocity Head (in H20)	dP(avg)	=	0.676
Avg Orifice Meter Reading (in H20)	dH(avg)	=	0.875
Avg Stack Temperature (degF)	T(s avg)	=	470.4
Average Meter Temperature (degF)	T(m avg)	=	98.7
Avg SQRT(dP)		=	0.840

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	70.57
Stack Gas Water Vapor Proportion	B(wc)	=	0.083
Mol. Wt., Stack Gas Dry	M(d)	=	29.94
Mol. Wt., Stack Gas Wet	M(s)	=	28.95
Abs Stack Pressure (in Hg)	P(s)	=	30.46
Avg Stack Velocity (ft/sec)	V(s avg)	=	62.0
Isokineticity (%)	% I	=	107.8
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	169216
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	356947
Percent XS Air	PEA	=	23.1
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.1130
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2122
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.9275
Heat Input Rate, MBtu/hr		=	923.75
Particulate Emission Rate(lb/hr)	E(p)	=	1804.766
Particulate Emission Rate(lb/MBtu)		=	1.9540

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tony Lombardo
Date: 4/7/92 Printed 18-Jun — Test No./Type: M17-I6
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1019-1210

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.203
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.65
Stack Static Pressure (in H2O)	P(stack)	21.000
Gas Meter Initial Reading (cu ft)		342.02
Gas Meter Final Reading (cu ft)		399.95
Net Gas Sample Volume (cu ft)	V(m)	(57.93)
Vol of Liquid Collected (ml)	Vl(c)	101.6
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.782)
Wt. of Filter Particulate (gm)		2.2501
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(2.2501)
O2 Concentration (by CEM)	% O2	3.00
CO2 Concentration (by CEM)	% CO2	15.60
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.40)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.10	1.32	491	77.0	78.0	1.0488
2	4.00	1.30	1.60	509	77.0	78.0	1.1402
3	4.00	1.10	1.32	520	78.0	78.0	1.0488
B1	4.00	1.40	1.75	459	79.0	78.0	1.1832
2	4.00	1.10	1.32	473	81.0	78.0	1.0488
3	4.00	1.10	1.32	491	84.0	79.0	1.0488
C1	4.00	1.20	1.48	467	85.0	80.0	1.0954
2	4.00	1.10	1.32	472	88.0	80.0	1.0488
3	4.00	1.30	1.60	493	90.0	81.0	1.1402
D1	4.00	1.50	1.85	472	88.0	81.0	1.2247
2	4.00	1.20	1.48	478	90.0	81.0	1.0954
3	4.00	1.40	1.75	490	91.0	82.0	1.1832
E1	4.00	1.10	1.32	470	88.0	82.0	1.0488
2	4.00	1.10	1.32	491	91.0	83.0	1.0488
3	4.00	1.10	1.32	506	94.0	84.0	1.0488
E1	4.00	1.10	1.32	517	93.0	83.0	1.0488
2	4.00	1.20	1.48	532	96.0	85.0	1.0954
3	4.00	1.10	1.32	548	96.0	86.0	1.0488
F1	4.00	1.40	1.75	517	94.0	87.0	1.1832
2	4.00	1.40	1.75	528	96.0	87.0	1.1832
3	4.00	1.10	1.32	544	97.0	88.0	1.1832
F1	4.00	1.10	1.32	551	98.0	89.0	1.0488
2	4.00	1.20	1.48	560	99.0	90.0	1.0488
3	4.00	1.20	1.48	565	100.0	90.0	1.0954
TOTALS	96.00	27.70	35.29	12144.0	2150.0	1988.0	26.3887

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.154
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.470
Avg Stack Temperature (degF)	T(s avg)	=	506.0
Average Meter Temperature (degF)	T(m avg)	=	86.2
Avg SQRT(dP)		=	1.100

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	56.23
Stack Gas Water Vapor Proportion	B(wc)	=	0.078
Mol. Wt., Stack Gas Dry	M(d)	=	30.62
Mol. Wt., Stack Gas Wet	M(s)	=	29.63
Abs Stack Pressure (in Hg)	P(s)	=	31.19
Avg Stack Velocity (ft/sec)	V(s avg)	=	80.7
Isokineticity (%)	% I	=	1[illegible]
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	244[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	464976
Percent XS Air	PEA	=	16.2
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.6174
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	1099
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.4802
Heat Input Rate, MBtu/hr		=	1277.90
Particulate Emission Rate(lb/hr)	E(p)	=	1292.204
Particulate Emission Rate(lb/MBtu)		=	1.0114

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tony Lombardo
Date: 4/8/92 Printed 18-Jun — Test No./Type: M17-17
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1115-1330

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.203
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.48
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		400.44
Gas Meter Final Reading (cu ft)		458.35
Net Gas Sample Volume (cu ft)	V(m)	(57.92)
Vol of Liquid Collected (ml)	Vl(c)	115.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.437)
Wt. of Filter Particulate (gm)		3.5014
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(3.5014)
O2 Concentration (by CEM)	% O2	2.60 (from B&W)
CO2 Concentration (by CEM)	% CO2	15.90 (estimate)
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.50)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.10	1.32	484	82.0	83.0	1.0486
2	4.00	0.95	1.15	484	80.0	82.0	0.9747
3	4.00	1.10	1.32	486	82.0	82.0	1.0488
B1	4.00	1.20	1.47	460	83.0	82.0	1.0954
2	4.00	0.93	1.12	468	85.0	82.0	0.9644
3	4.00	0.93	1.12	484	87.0	83.0	0.9644
C1	4.00	1.20	1.47	468	88.0	84.0	1.0954
2	4.00	1.00	1.20	470	90.0	84.0	1.0000
3	4.00	1.30	1.61	484	91.0	84.0	1.1402
D1	4.00	1.40	1.70	458	90.0	85.0	1.1832
2	4.00	1.10	1.32	469	93.0	85.0	1.0488
3	4.00	1.20	1.47	479	93.0	85.0	1.0954
E1	4.00	1.20	1.47	434	92.0	87.0	1.0954
2	4.00	1.20	1.47	453	95.0	87.0	1.0954
3	4.00	1.05	1.30	470	95.0	87.0	1.0247
E1	4.00	1.10	1.32	482	95.0	87.0	1.0488
2	4.00	1.20	1.47	487	95.0	88.0	1.0954
3	4.00	1.10	1.32	495	95.0	87.0	1.0488
F1	4.00	1.30	1.61	478	93.0	88.0	1.1402
2	4.00	1.40	1.70	491	94.0	88.0	1.1402
3	4.00	1.40	1.70	495	96.0	88.0	1.1832
F1	4.00	1.10	1.32	500	97.0	88.0	1.1832
2	4.00	1.10	1.32	503	97.0	89.0	1.0488
3	4.00	1.20	1.47	506	97.0	89.0	1.0488
TOTALS	96.00	26.56	33.74	11488.0	2185.0	2054.0	25.8126

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.107
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.408
Avg Stack Temperature (degF)	T(s avg)	=	478.7
Average Meter Temperature (degF)	T(m avg)	=	86.3
Avg SQRT(dP)		=	1.076

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	55.57
Stack Gas Water Vapor Proportion	B(ws)	=	0.089
Mol. Wt., Stack Gas Dry	M(d)	=	30.65
Mol. Wt., Stack Gas Wet	M(s)	=	29.50
Abs Stack Pressure (in Hg)	P(s)	=	30.95
Avg Stack Velocity (ft/sec)	V(s avg)	=	76.3
Isokineticity (%)	% I	=	103.7
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	239038
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	450900
Percent XS Air	PEA	=	13.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.9705
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	1689
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.7384
Heat Input Rate, MBtu/hr		=	1278.76
Particulate Emission Rate(lb/hr)	E(p)	=	1967.959
Particulate Emission Rate(lb/MBtu)		=	1.5549

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tony Lombardo
Date: 4/9/92 Printed 18-Jun — Test No./Type: M17-18
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1100-1245

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.203
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.44
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		456.46
Gas Meter Final Reading (cu ft)		515.87
Net Gas Sample Volume (cu ft)	V(m)	(57.41)
Vol of Liquid Collected (ml)	Vl(c)	115.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.437)
Wt. of Filter Particulate (gm)		6.0893
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(6.0893)
O2 Concentration (by CEM)	% O2	2.70 (from B&W)
CO2 Concentration (by CEM)	% CO2	15.80 (estimate)
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.50)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.10	1.32	459	99.0	101.0	1.0488
2	4.00	1.10	1.32	464	96.0	100.0	1.0488
3	4.00	1.10	1.32	474	96.0	99.0	1.0488
B1	4.00	1.20	1.45	449	96.0	98.0	1.0954
2	4.00	0.90	1.08	461	97.0	97.0	0.9487
3	4.00	0.95	1.18	479	96.0	97.0	0.9747
C1	4.00	1.10	1.32	456	96.0	95.0	1.0488
2	4.00	0.95	1.18	468	95.0	95.0	0.9747
3	4.00	1.40	1.72	478	95.0	95.0	1.1832
D1	4.00	1.50	1.83	449	94.0	93.0	1.2247
2	4.00	1.20	1.45	461	94.0	92.0	1.0954
3	4.00	1.20	1.45	470	95.0	92.0	1.0954
E1	4.00	1.20	1.45	442	93.0	91.0	1.0954
2	4.00	1.30	1.60	451	93.0	91.0	1.1402
3	4.00	1.10	1.32	462	93.0	93.0	1.0488
E1	4.00	1.00	1.20	471	93.0	89.0	1.0000
2	4.00	1.10	1.32	484	93.0	89.0	1.0488
3	4.00	1.20	1.45	492	93.0	89.0	1.0954
F1	4.00	1.30	1.60	470	91.0	87.0	1.1402
2	4.00	1.10	1.32	486	91.0	87.0	1.1402
3	4.00	1.20	1.45	494	92.0	87.0	1.0488
F1	4.00	1.10	1.32	497	92.0	86.0	1.0954
2	4.00	1.20	1.45	501	92.0	86.0	1.0488
3	4.00	1.20	1.45	504	92.0	86.0	1.0954
TOTALS	96.00	26.50	33.55	11322.0	2257.0	2215.0	25.7851

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.104
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.398
Avg Stack Temperature (degF)	T(s avg)	=	471.8
Average Meter Temperature (degF)	T(m avg)	=	93.2
Avg SQRT(dP)		=	1.074

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	54.62
Stack Gas Water Vapor Proportion	B(wo)	=	0.091
Mol. Wt., Stack Gas Dry	M(d)	=	30.64
Mol. Wt., Stack Gas Wet	M(s)	=	29.49
Abs Stack Pressure (in Hg)	P(s)	=	30.91
Avg Stack Velocity (ft/sec)	V(s avg)	=	78.0
Isokineticity (%)	% I	=	[illegible]
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	449281
Percent XS Air	PEA	=	14.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.7201
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	3011
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.3159
Heat Input Rate, MBtu/hr		=	1272.79
Particulate Emission Rate(lb/hr)	E(p)	=	3526.261
Particulate Emission Rate(lb/MBtu)		=	2.7710

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tony Lombardo
Date: 4/10/92 Printed 18-Jun — Test No./Type: M17-19
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1055-1250

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.203
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.62
Stack Static Pressure (in H2O)	P(stack)	19.000
Gas Meter Initial Reading (cu ft)		516.04
Gas Meter Final Reading (cu ft)		571.92
Net Gas Sample Volume (cu ft)	V(m)	(55.88)
Vol of Liquid Collected (ml)	Vl(c)	114.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.366)
Wt. of Filter Particulate (gm)		4.7924
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(4.7924)
O2 Concentration (by CEM)	% O2	2.90
CO2 Concentration (by CEM)	% CO2	15.20
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.00	1.20	436	66.0	67.0	1.0000
2	4.00	0.85	1.02	450	65.0	66.0	0.9220
3	4.00	0.83	1.00	460	66.0	66.0	0.9083
B1	4.00	1.10	1.32	448	67.0	66.0	1.0488
2	4.00	0.80	0.98	462	68.0	66.0	0.8944
3	4.00	0.85	1.02	472	70.0	67.0	0.9220
C1	4.00	1.10	1.32	443	70.0	67.0	1.0488
2	4.00	0.90	1.18	447	72.0	67.0	0.9487
3	4.00	1.20	1.48	469	73.0	67.0	1.0954
D1	4.00	1.50	1.80	432	72.0	68.0	1.2247
2	4.00	1.10	1.32	447	74.0	68.0	1.0488
3	4.00	1.10	1.32	464	75.0	68.0	1.0488
E1	4.00	1.20	1.48	445	74.0	69.0	1.0954
2	4.00	1.10	1.32	450	75.0	69.0	1.0488
3	4.00	1.00	1.20	463	76.0	69.0	1.0000
E1	4.00	1.10	1.32	474	76.0	70.0	1.0488
2	4.00	1.20	1.48	482	77.0	69.0	1.0954
3	4.00	1.10	1.32	487	77.0	69.0	1.0488
F1	4.00	1.20	1.48	468	74.0	69.0	1.0954
2	4.00	1.20	1.46	480	74.0	69.0	1.0954
3	4.00	1.10	1.32	487	74.0	69.0	1.0954
F1	4.00	1.20	1.48	494	76.0	69.0	1.0488
2	4.00	1.10	1.32	497	76.0	69.0	1.0954
3	4.00	1.00	1.20	499	77.0	69.0	1.0488
TOTALS	96.00	24.83	31.36	11156.0	1744.0	1632.0	24.9275

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.034
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.305
Avg Stack Temperature (degF)	T(s avg)	=	464.8
Average Meter Temperature (degF)	T(m avg)	=	70.3
Avg SQRT(dP)		=	1.039

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	55.79
Stack Gas Water Vapor Proportion	B(ws)	=	0.088
Mol. Wt., Stack Gas Dry	M(d)	=	30.55
Mol. Wt., Stack Gas Wet	M(s)	=	29.45
Abs Stack Pressure (in Hg)	P(s)	=	31.00
Avg Stack Velocity (ft/sec)	V(s avg)	=	75.1
Isokineticity (%)	% I	=	100.4
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	233410
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	432310
Percent XS Air	FEA	=	15.5
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.3258
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2348
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.0253
Heat Input Rate, MBtu/hr		=	1226.24
Particulate Emission Rate(lb/hr)	E(p)	=	2651.568
Particulate Emission Rate(lb/MBtu)		=	2.1592

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tony Lombardo
Date: 4/13/92 Printed 18-Jun — Test No./Type: M17-110
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1105-1257

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.203
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.60
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		573.57
Gas Meter Final Reading (cu ft)		627.11
Net Gas Sample Volume (cu ft)	V(m)	(53.54)
Vol of Liquid Collected (ml)	Vl(c)	98.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.638)
Wt. of Filter Particulate (gm)		9.8267
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(9.8267)
O2 Concentration (by CEM)	% O2	3.40
CO2 Concentration (by CEM)	% CO2	15.10
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.50)

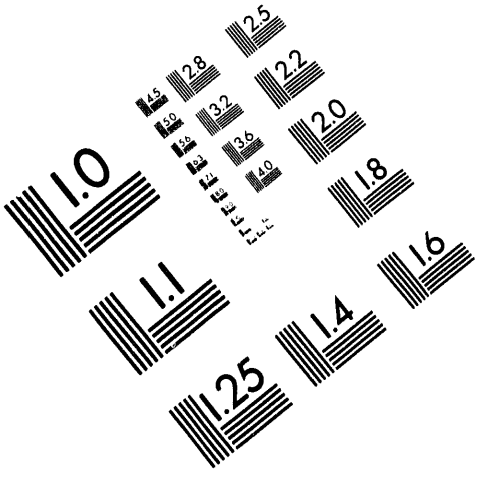
Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.95	1.05	421	65.0	67.0	0.9747
2	4.00	0.85	0.94	432	63.0	66.0	0.9220
3	4.00	1.00	1.10	452	63.0	65.0	1.0000
B1	4.00	1.10	1.20	432	65.0	65.0	1.0488
2	4.00	0.90	0.98	436	66.0	65.0	0.9487
3	4.00	0.90	0.98	459	67.0	65.0	0.9487
C1	4.00	1.00	1.10	429	67.0	65.0	1.0000
2	4.00	0.85	0.94	433	67.0	65.0	0.9220
3	4.00	1.20	1.32	457	70.0	65.0	1.0954
D1	4.00	1.10	1.20	431	70.0	65.0	1.0488
2	4.00	1.00	1.10	444	71.0	65.0	1.0000
3	4.00	1.20	1.32	458	71.0	65.0	1.0954
E1	4.00	1.10	1.20	429	70.0	65.0	1.0488
2	4.00	1.10	1.20	436	70.0	66.0	1.0488
3	4.00	0.90	0.98	447	70.0	65.0	0.9487
E1	4.00	0.90	0.98	464	71.0	65.0	0.9487
2	4.00	1.20	1.32	473	71.0	65.0	1.0954
3	4.00	1.10	1.20	483	71.0	65.0	1.0488
F1	4.00	1.40	1.58	454	70.0	65.0	1.1832
2	4.00	1.30	1.48	467	71.0	65.0	1.1832
3	4.00	1.10	1.20	479	71.0	65.0	1.1402
F1	4.00	1.10	1.20	487	71.0	65.0	1.0488
2	4.00	1.10	1.20	490	71.0	65.0	1.0488
3	4.00	1.10	1.20	494	72.0	65.0	1.0488
TOTALS	96.00	24.35	27.97	10887.0	1654.0	1564.0	24.7967

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.015
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.165
Avg Stack Temperature (degF)	T(s avg)	=	453.6
Average Meter Temperature (degF)	T(m avg)	=	67.0
Avg SQRT(dP)		=	1.033

CALCULATED VALUES

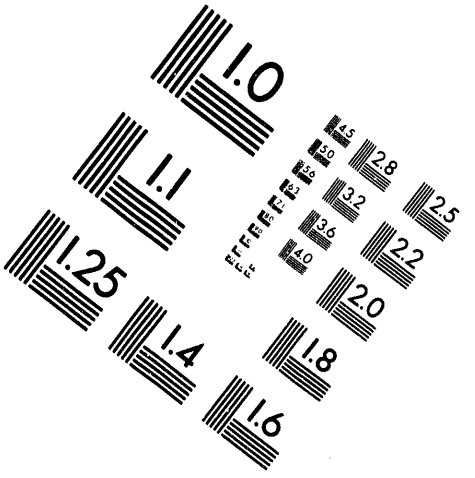
Meter Volume (std, cu. ft.)	V(m std)	=	53.73
Stack Gas Water Vapor Proportion	B(wo)	=	0.079
Mol. Wt., Stack Gas Dry	M(d)	=	30.55
Mol. Wt., Stack Gas Wet	M(s)	=	29.55
Abs Stack Pressure (in Hg)	P(s)	=	31.07
Avg Stack Velocity (ft/sec)	V(s avg)	=	74.0
Isokineticity (%)	% I	=	[illegible]
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	426260
Percent XS Air	PEA	=	16.9
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.8219
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	5136
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	2.2447
Heat Input Rate, MBtu/hr		=	1204.85
Particulate Emission Rate(lb/hr)	E(p)	=	5695.492
Particulate Emission Rate(lb/MBtu)		=	4.7279



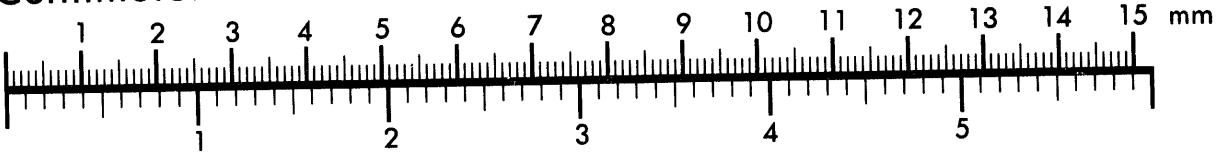
Association for Information and Image Management

1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910

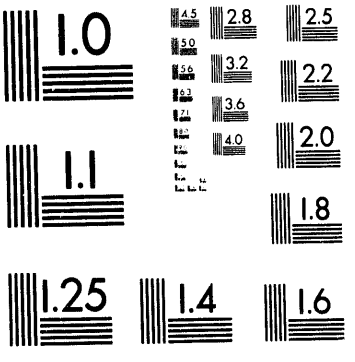
301/587-8202

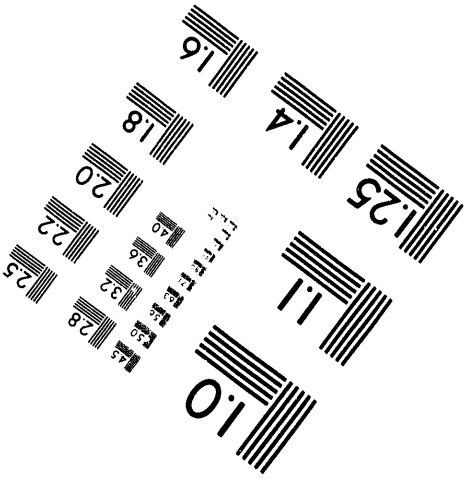


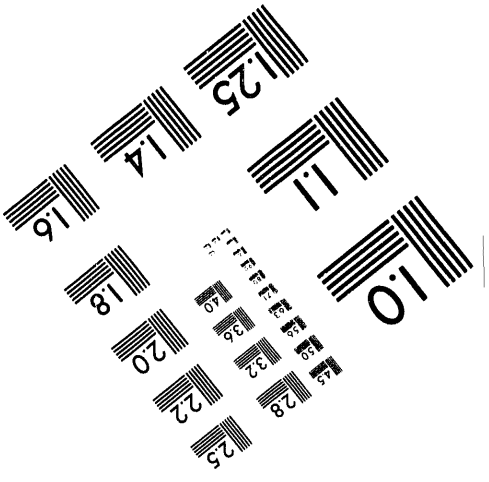
Centimeter



Inches







MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

3 of 9

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tony Lombardo
Date: 4/14/92 Printed 18-Jun — Test No./Type: M17-111
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 2139-2230

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.203
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.54
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		627.43
Gas Meter Final Reading (cu ft)		668.50
Net Gas Sample Volume (cu ft)	V(m)	(41.07)
Vol of Liquid Collected (ml)	Vl(c)	86.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.072)
Wt. of Filter Particulate (gm)		3.1456
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(3.1456)
O2 Concentration (by CEM)	% O2	4.20
CO2 Concentration (by CEM)	% CO2	14.90
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.75	0.84	407	101.0	104.0	0.8660
2	4.00	0.65	0.71	430	94.0	102.0	0.8062
3	4.00	0.65	0.71	447	92.0	99.0	0.8062
B1	4.00	0.55	0.59	419	92.0	97.0	0.7416
2	4.00	0.43	0.47	439	90.0	95.0	0.6557
3	4.00	0.43	0.47	457	89.0	94.0	0.6557
C1	4.00	0.55	0.59	414	89.0	93.0	0.7416
2	4.00	0.45	0.48	431	87.0	91.0	0.6708
3	4.00	0.63	0.69	449	86.0	90.0	0.7937
D1	4.00	0.70	0.77	431	86.0	89.0	0.8367
2	4.00	0.65	0.71	428	86.0	88.0	0.8062
3	4.00	0.75	0.84	446	86.0	87.0	0.8660
E1	4.00	0.55	0.59	398	86.0	86.0	0.7416
2	4.00	0.58	0.64	398	85.0	85.0	0.7616
3	4.00	0.50	0.54	405	85.0	85.0	0.7071
E1	4.00	0.50	0.54	417	85.0	84.0	0.7071
2	4.00	0.60	0.66	430	84.0	83.0	0.7746
3	4.00	0.60	0.66	439	84.0	83.0	0.7746
F1	4.00	0.65	0.71	412	82.0	81.0	0.8062
2	4.00	0.68	0.75	415	82.0	82.0	0.8062
3	4.00	0.60	0.66	429	82.0	82.0	0.8246
F1	4.00	0.50	0.54	433	82.0	81.0	0.7746
2	4.00	0.55	0.59	442	82.0	81.0	0.7071
3	4.00	0.55	0.59	448	82.0	81.0	0.7416
TOTALS	96.00	13.50	15.34	10264.0	2079.0	2123.0	18.3737

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.563
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.639
Avg Stack Temperature (degF)	T(s avg)	=	427.7
Average Meter Temperature (degF)	T(m avg)	=	87.5
Avg SQRT(dP)		=	0.768

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	39.54
Stack Gas Water Vapor Proportion	B(wc)	=	0.093
Mol. Wt., Stack Gas Dry	M(d)	=	30.55
Mol. Wt., Stack Gas Wet	M(s)	=	29.38
Abs Stack Pressure (in Hg)	P(s)	=	30.57
Avg Stack Velocity (ft/sec)	V(s avg)	=	54.7
Isokineticity (%)	% I	=	101.5
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	173481
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	314615
Percent XS Air	PEA	=	24.5
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.2275
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2540
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.0229
Heat Input Rate, MBtu/hr		=	848.65
Particulate Emission Rate(lb/hr)	E(p)	=	1824.783
Particulate Emission Rate(lb/MBtu)		=	2.1501

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tony Lombardo
Date: 4/16/92 Printed 18-Jun — Test No./Type: M17-I12
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 2045-2222

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.203
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.64
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		668.65
Gas Meter Final Reading (cu ft)		709.94
Net Gas Sample Volume (cu ft)	V(m)	(41.28)
Vol of Liquid Collected (ml)	Vl(c)	88.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.142)
Wt. of Filter Particulate (gm)		4.2428
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(4.2428)
O2 Concentration (by CEM)	% O2	3.80
CO2 Concentration (by CEM)	% CO2	15.90
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.30)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.50	0.55	400	82.0	84.0	0.7071
2	4.00	0.50	0.55	428	82.0	83.0	0.7071
3	4.00	0.60	0.68	442	83.0	84.0	0.7746
B1	4.00	0.65	0.72	436	84.0	83.0	0.8062
2	4.00	0.50	0.55	445	85.0	84.0	0.7071
3	4.00	0.50	0.55	461	86.0	84.0	0.7071
C1	4.00	0.60	0.68	416	86.0	84.0	0.7746
2	4.00	0.50	0.55	417	88.0	85.0	0.7071
3	4.00	0.65	0.72	436	89.0	85.0	0.8062
D1	4.00	0.77	0.85	428	90.0	86.0	0.8775
2	4.00	0.70	0.79	429	92.0	87.0	0.8367
3	4.00	0.60	0.68	442	93.0	87.0	0.7746
E1	4.00	0.60	0.68	422	92.0	87.0	0.7746
2	4.00	0.62	0.77	402	93.0	88.0	0.7874
3	4.00	0.50	0.55	406	94.0	88.0	0.7071
E1	4.00	0.50	0.55	415	94.0	89.0	0.7071
2	4.00	0.55	0.63	433	94.0	89.0	0.7416
3	4.00	0.55	0.63	441	94.0	89.0	0.7416
F1	4.00	0.60	0.68	427	91.0	89.0	0.7746
2	4.00	0.60	0.68	432	91.0	89.0	0.7746
3	4.00	0.60	0.68	437	91.0	89.0	0.7746
F1	4.00	0.60	0.68	443	91.0	89.0	0.7746
2	4.00	0.58	0.67	449	92.0	89.0	0.7746
3	4.00	0.58	0.67	453	92.0	89.0	0.7616
TOTALS	96.00	13.37	15.74	10340.0	2149.0	2080.0	18.2799

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.557
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.655
Avg Stack Temperature (degF)	T(s avg)	=	430.8
Average Meter Temperature (degF)	T(m avg)	=	86.1
Avg SQRT(dP)		=	0.762

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	39.64
Stack Gas Water Vapor Proportion	B(wo)	=	0.094
Mol. Wt., Stack Gas Dry	M(d)	=	30.72
Mol. Wt., Stack Gas Wet	M(s)	=	29.50
Abs Stack Pressure (in Hg)	P(s)	=	30.67
Avg Stack Velocity (ft/sec)	V(s avg)	=	54.3
Isokineticity (%)	% I	=	10[illegible]
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	172[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	312617
Percent XS Air	PEA	=	21.8
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.6433
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	3060
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.3576
Heat Input Rate, MBtu/hr		=	860.05
Particulate Emission Rate(lb/hr)	E(p)	=	2422.898
Particulate Emission Rate(lb/MBtu)		=	2.8176

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 4/21/92 Printed 18-Jun — Test No./Type: M17-I13
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 2207-2353

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.203
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(95.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	28.82
Stack Static Pressure (in H2O)	P(stack)	15.000
Gas Meter Initial Reading (cu ft)		710.12
Gas Meter Final Reading (cu ft)		754.63
Net Gas Sample Volume (cu ft)	V(m)	(44.51)
Vol of Liquid Collected (ml)	Vl(c)	70.9
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.337)
Wt. of Filter Particulate (gm)		4.9819
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(4.9819)
O2 Concentration (by CEM)	% O2	4.50
CO2 Concentration (by CEM)	% CO2	13.80
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.70)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.59	0.68	464	73.0	75.0	0.7681
2	4.00	0.60	0.68	470	73.0	74.0	0.7746
3	4.00	0.58	0.66	486	75.0	74.0	0.7616
B1	4.00	0.61	0.69	480	77.0	75.0	0.7810
2	4.00	0.52	0.59	490	75.0	76.0	0.7211
3	4.00	0.50	0.57	497	80.0	76.0	0.7071
C1	4.00	0.57	0.65	430	80.0	76.0	0.7550
2	4.00	0.51	0.58	444	81.0	77.0	0.7141
3	4.00	0.75	0.86	470	83.0	78.0	0.8660
D1	4.00	0.80	0.91	460	83.0	78.0	0.8944
2	4.00	0.62	0.71	469	84.0	79.0	0.7874
3	4.00	0.68	0.78	474	85.0	79.0	0.8246
E1	4.00	0.67	0.77	470	85.0	80.0	0.8185
2	4.00	0.65	0.74	430	86.0	81.0	0.8062
3	4.00	0.69	0.79	466	87.0	81.0	0.8307
E1	4.00	0.62	0.71	467	88.0	82.0	0.7874
2	4.00	0.59	0.67	459	88.0	82.0	0.7681
3	4.00	0.56	0.64	475	88.0	82.0	0.7483
F1	4.00	0.65	0.74	452	88.0	83,0	0.8062
2	4.00	0.69	0.79	466	88.0	83.0	0.8062
3	4.00	0.65	0.74	470	89.0	84.0	0.8307
F1	4.00	0.91	1.00	474	90.0	84.0	0.8062
2	4.00	0.85	0.97	478	90.0	84.0	0.9539
3	4.00	0.75	0.85	479	91.0	85.0	0.9220
TOTALS	96.00	14.86	17.77	11220.00	2007.0	1908.0	19.2396

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.619
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.740
Avg Stack Temperature (degF)	T(s avg)	=	467.5
Average Meter Temperature (degF)	T(m avg)	=	81.6
Avg SQRT(dP)		=	0.802

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	43.28
Stack Gas Water Vapor Proportion	B(ws)	=	0.073
Mol. Wt., Stack Gas Dry	M(d)	=	30.39
Mol. Wt., Stack Gas Wet	M(s)	=	29.48
Abs Stack Pressure (in Hg)	P(s)	=	29.90
Avg Stack Velocity (ft/sec)	V(s avg)	=	59.0
Isokineticity (%)	% I	=	104.9
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	179412
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	340002
Percent XS Air	PEA	=	26.4
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.8181
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	3529
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.5428
Heat Input Rate, MBtu/hr		=	860.18
Particulate Emission Rate(lb/hr)	E(p)	=	2795.385
Particulate Emission Rate(lb/MBtu)		=	3.2503

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 4/22/92 Printed 18-Jun — Test No./Type: M17-I14
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 2227-0000

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.46
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		754.70
Gas Meter Final Reading (cu ft)		786.66
Net Gas Sample Volume (cu ft)	V(m)	(31.96)
Vol of Liquid Collected (ml)	Vl(c)	66.3
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.121)
Wt. of Filter Particulate (gm)		4.1664
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(4.1664)
O2 Concentration (by CEM)	% O2	4.60
CO2 Concentration (by CEM)	% CO2	14.20
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.20)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter,dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.27	0.38	357	70.0	71.0	0.5196
2	4.00	0.27	0.38	389	70.0	70.0	0.5196
3	4.00	0.28	0.39	406	70.0	70.0	0.5292
B1	4.00	0.34	0.40	406	71.0	71.0	0.5831
2	4.00	0.22	0.31	422	72.0	71.0	0.4690
3	4.00	0.18	0.25	427	73.0	72.0	0.4243
C1	4.00	0.24	0.34	380	73.0	71.0	0.4899
2	4.00	0.29	0.31	395	74.0	71.0	0.5385
3	4.00	0.32	0.45	410	74.0	72.0	0.5657
D1	4.00	0.32	0.45	394	75.0	72.0	0.5657
2	4.00	0.27	0.38	401	77.0	73.0	0.5196
3	4.00	0.32	0.45	410	77.0	74.0	0.5657
E1	4.00	0.27	0.38	360	76.0	73.0	0.5196
2	4.00	0.24	0.34	370	77.0	74.0	0.4899
3	4.00	0.24	0.34	389	78.0	74.0	0.4899
E1	4.00	0.27	0.38	384	79.0	75.0	0.5196
2	4.00	0.24	0.34	393	80.0	76.0	0.4899
3	4.00	0.26	0.36	400	80.0	76.0	0.5099
F1	4.00	0.30	0.42	406	79.0	76.0	0.5477
2	4.00	0.26	0.36	413	81.0	77.0	0.5477
3	4.00	0.25	0.35	416	82.0	77.0	0.5099
F1	4.00	0.31	0.43	416	82.0	78.0	0.5000
2	4.00	0.27	0.38	417	82.0	78.0	0.5568
3	4.00	0.28	0.39	417	82.0	78.0	0.5196
TOTALS	96.00	6.23	8.96	9578.00	1834.0	1770.0	12.4904

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.260
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.373
Avg Stack Temperature (degF)	T(s avg)	=	399.1
Average Meter Temperature (degF)	T(m avg)	=	75.1
Avg SQRT(dP)		=	0.520

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	31.3[illegible]
Stack Gas Water Vapor Proportion	B(wo)	=	0.090
Mol. Wt., Stack Gas Dry	M(d)	=	30.48
Mol. Wt., Stack Gas Wet	M(s)	=	29.33
Abs Stack Pressure (in Hg)	P(s)	=	30.20
Avg Stack Velocity (ft/sec)	V(s avg)	=	38.6
Isokineticity (%)	% I	=	[illegible]
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	119[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	212022
Percent XS Air	PEA	=	27.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.0489
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	4002
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.7490
Heat Input Rate, MBtu/hr		=	569.98
Particulate Emission Rate(lb/hr)	E(p)	=	2100.251
Particulate Emission Rate(lb/MBtu)		=	3.6854

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 4/23/92 Printed 18-Jun — Test No./Type: M17-I15
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 2242-0020

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.53
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		787.89
Gas Meter Final Reading (cu ft)		821.79
Net Gas Sample Volume (cu ft)	V(m)	(33.90)
Vol of Liquid Collected (ml)	Vl(c)	96.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.542)
Wt. of Filter Particulate (gm)		5.7258
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.7258)
O2 Concentration (by CEM)	% O2	5.30
CO2 Concentration (by CEM)	% CO2	14.40
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.30)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.30	0.42	393	79.0	80.0	0.5477
2	4.00	0.29	0.41	406	77.0	79.0	0.5385
3	4.00	0.32	0.45	417	78.0	79.0	0.5657
B1	4.00	0.28	0.39	394	79.0	79.0	0.5292
2	4.00	0.27	0.38	414	80.0	79.0	0.5196
3	4.00	0.27	0.38	421	80.0	79.0	0.5196
C1	4.00	0.31	0.43	396	80.0	79.0	0.5568
2	4.00	0.27	0.36	430	81.0	80.0	0.5196
3	4.00	0.35	0.49	430	82.0	80.0	0.5916
D1	4.00	0.36	0.50	426	82.0	80.0	0.6000
2	4.00	0.30	0.42	431	86.0	82.0	0.5477
3	4.00	0.29	0.41	433	86.0	82.0	0.5385
E1	4.00	0.29	0.41	386	86.0	85.0	0.5385
2	4.00	0.27	0.38	387	87.0	83.0	0.5196
3	4.00	0.26	0.36	404	87.0	83.0	0.5099
E1	4.00	0.30	0.42	400	88.0	84.0	0.5477
2	4.00	0.26	0.36	399	88.0	84.0	0.5099
3	4.00	0.25	0.35	412	88.0	84.0	0.5000
F1	4.00	0.36	0.50	430	88.0	85.0	0.6000
2	4.00	0.30	0.42	440	89.0	85.0	0.6000
3	4.00	0.33	0.46	442	89.0	86.0	0.5745
F1	4.00	0.35	0.49	441	90.0	86.0	0.5916
2	4.00	0.31	0.43	440	91.0	87.0	0.5568
3	4.00	0.32	0.45	442	91.0	87.0	0.5657
TOTALS	96.00	7.21	10.07	10014.00	2032.0	1977.0	13.1887

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.300
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.420
Avg Stack Temperature (degF)	T(s avg)	=	417.3
Average Meter Temperature (degF)	T(m avg)	=	83.5
Avg SQRT(dP)		=	0.550

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	30.85
Stack Gas Water Vapor Proportion	B(ws)	=	0.121
Mol. Wt., Stack Gas Dry	M(d)	=	30.50
Mol. Wt., Stack Gas Wet	M(s)	=	29.00
Abs Stack Pressure (in Hg)	P(s)	=	30.27
Avg Stack Velocity (ft/sec)	V(s avg)	=	39.5
Isokineticity (%)	% I	=	104.3
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	121556
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	227265
Percent XS Air	PEA	=	35.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.6896
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	5487
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	2.3963
Heat Input Rate, MBtu/hr		=	554.37
Particulate Emission Rate(lb/hr)	E(p)	=	2801.812
Particulate Emission Rate(lb/MBtu)		=	5.0549

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 4/24/92 Printed 18-Jun — Test No./Type: M17-116
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1110-1258

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.53
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		822.98
Gas Meter Final Reading (cu ft)		884.17
Net Gas Sample Volume (cu ft)	V(m)	(61.19)
Vol of Liquid Collected (ml)	Vl(c)	139.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(6.566)
Wt. of Filter Particulate (gm)		5.1884
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.1884)
O2 Concentration (by CEM)	% O2	4.20
CO2 Concentration (by CEM)	% CO2	15.30
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.50)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.00	1.40	455	73.0	73.0	1.0000
2	4.00	1.30	1.80	461	72.0	73.0	1.1402
3	4.00	0.98	1.40	472	73.0	72.0	0.9899
B1	4.00	1.30	1.82	442	75.0	73.0	1.1402
2	4.00	0.92	1.30	463	77.0	73.0	0.9592
3	4.00	0.99	1.40	476	79.0	73.0	0.9950
C1	4.00	1.10	1.50	437	80.0	74.0	1.0488
2	4.00	0.92	1.30	453	82.0	75.0	0.9592
3	4.00	1.20	1.70	465	84.0	76.0	1.0954
D1	4.00	1.30	1.80	442	83.0	76.0	1.1402
2	4.00	1.20	1.70	456	83.0	76.0	1.0954
3	4.00	1.30	1.80	469	87.0	77.0	1.1402
E1	4.00	1.30	1.80	430	86.0	78.0	1.1402
2	4.00	1.00	1.40	445	88.0	79.0	1.0000
3	4.00	1.10	1.50	478	88.0	79.0	1.0488
E1	4.00	1.10	1.50	475	89.0	79.0	1.0488
2	4.00	1.00	1.40	480	90.0	80.0	1.0000
3	4.00	1.20	1.70	489	91.0	81.0	1.0954
F1	4.00	1.20	1.70	480	89.0	81.0	1.0954
2	4.00	1.10	1.50	499	92.0	82.0	1.0954
3	4.00	1.20	1.70	502	93.0	83.0	1.0954
F1	4.00	1.20	1.70	503	93.0	83.0	1.0954
2	4.00	1.10	1.50	503	93.0	83.0	1.0488
3	4.00	1.10	1.50	504	92.0	83.0	1.0488
TOTALS	96.00	27.11	37.82	11279.00	2032.0	1862.0	25.5163

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.130
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.576
Avg Stack Temperature (degF)	T(s avg)	=	470.0
Average Meter Temperature (degF)	T(m avg)	=	81.1
Avg SQRT(dP)		=	1.063

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	59.73
Stack Gas Water Vapor Proportion	B(wo)	=	0.099
Mol. Wt., Stack Gas Dry	M(d)	=	30.82
Mol. Wt., Stack Gas Wet	M(s)	=	29.37
Abs Stack Pressure (in Hg)	P(s)	=	31.00
Avg Stack Velocity (ft/sec)	V(s avg)	=	77.2
Isokineticity (%)	% I	=	[illegible]
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	235[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	444473
Percent XS Air	PEA	=	24.6
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.3404
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2556
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.1170
Heat Input Rate, MBtu/hr		=	1150.10
Particulate Emission Rate(lb/hr)	E(p)	=	2706.079
Particulate Emission Rate(lb/MBtu)		=	2.3533

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 4/27/92 Printed 16-Jun — Test No./Type: M17-117
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1143-1328

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.82
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		889.20
Gas Meter Final Reading (cu ft)		949.64
Net Gas Sample Volume (cu ft)	V(m)	(60.43)
Vol of Liquid Collected (ml)	Vl(c)	131.2
Vol of Liq @ Std. Conds. (scf)	V(w std)	(6.176)
Wt. of Filter Particulate (gm)		5.7137
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.7137)
O2 Concentration (by CEM)	% O2	3.30
CO2 Concentration (by CEM)	% CO2	15.80
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.00	1.40	489	73.0	72.0	1.0000
2	4.00	1.20	1.70	489	73.0	72.0	1.0954
3	4.00	0.97	1.40	492	77.0	73.0	0.9849
B1	4.00	1.29	1.80	475	78.0	74.0	1.1358
2	4.00	0.93	1.30	486	82.0	75.0	0.9644
3	4.00	0.98	1.37	488	83.0	76.0	0.9899
C1	4.00	1.00	1.40	450	83.0	77.0	1.0000
2	4.00	0.99	1.30	465	86.0	77.0	0.9950
3	4.00	1.10	1.50	476	87.0	78.0	1.0488
D1	4.00	1.20	1.70	451	88.0	80.0	1.0954
2	4.00	1.30	1.70	465	90.0	80.0	1.1402
3	4.00	1.10	1.30	479	91.0	81.0	1.0488
E1	4.00	1.20	1.70	470	89.0	82.0	1.0954
2	4.00	0.99	1.40	479	91.0	82.0	0.9950
3	4.00	1.20	1.70	497	92.0	83.0	1.0954
E1	4.00	1.20	1.70	484	92.0	84.0	1.0954
2	4.00	1.00	1.40	489	93.0	85.0	1.0000
3	4.00	1.10	1.50	494	94.0	85.0	1.0488
F1	4.00	1.10	1.50	500	92.0	85.0	1.0488
2	4.00	1.20	1.70	505	92.0	85.0	1.0488
3	4.00	1.10	1.50	514	93.0	87.0	1.0488
F1	4.00	1.10	1.50	512	94.0	86.0	1.0488
2	4.00	1.20	1.70	514	95.0	86.0	1.0954
3	4.00	1.20	1.70	515	95.0	87.0	1.0954
TOTALS	96.00	26.65	36.87	11678.0	2103.0	1932.0	25.2149

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.110
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.536
Avg Stack Temperature (degF)	T(s avg)	=	486.6
Average Meter Temperature (degF)	T(m avg)	=	84.1
Avg SQRT(dP)		=	1.051

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	59.24
Stack Gas Water Vapor Proportion	B(wo)	=	0.094
Mol. Wt., Stack Gas Dry	M(d)	=	30.66
Mol. Wt., Stack Gas Wet	M(s)	=	29.48
Abs Stack Pressure (in Hg)	P(s)	=	31.29
Avg Stack Velocity (ft/sec)	V(s avg)	=	76.4
Isokineticity (%)	% I	=	98.3
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	232616
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	440335
Percent XS Air	PEA	=	18.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.4883
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2693
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.1772
Heat Input Rate, MBtu/hr		=	1196.86
Particulate Emission Rate(lb/hr)	E(p)	=	2968.931
Particulate Emission Rate(lb/MBtu)		=	2.4793

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 4/28/92 Printed 18-Jun — Test No./Type: M17-I18
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1640-1830

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.45
Stack Static Pressure (in H2O)	P(stack)	16.000
Gas Meter Initial Reading (cu ft)		951.74
Gas Meter Final Reading (cu ft)		1003.54
Net Gas Sample Volume (cu ft)	V(m)	(51.79)
Vol of Liquid Collected (ml)	Vl(c)	92.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.354)
Wt. of Filter Particulate (gm)		4.5221
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(4.5221)
O2 Concentration (by CEM)	% O2	3.90 (from B&W)
CO2 Concentration (by CEM)	% CO2	15.10 (estimate)
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.00)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.72	1.01	450	79.0	79.0	0.8485
2	4.00	0.69	0.96	452	78.0	78.0	0.8307
3	4.00	0.70	0.98	462	79.0	80.0	0.8367
B1	4.00	0.72	1.01	448	81.0	79.0	0.8485
2	4.00	0.65	0.91	465	84.0	80.0	0.8062
3	4.00	0.69	0.96	470	85.0	80.0	0.8307
C1	4.00	0.69	0.96	428	85.0	81.0	0.8307
2	4.00	0.65	0.91	440	87.0	81.0	0.8062
3	4.00	0.80	1.20	457	88.0	82.0	0.8944
D1	4.00	0.81	1.22	421	88.0	82.0	0.9000
2	4.00	0.79	1.10	430	90.0	83.0	0.8888
3	4.00	0.82	1.10	451	90.0	83.0	0.9055
E1	4.00	0.75	1.10	433	91.0	85.0	0.8660
2	4.00	0.72	1.00	448	92.0	85.0	0.8485
3	4.00	0.79	1.10	465	92.0	85.0	0.8888
E1	4.00	0.75	1.10	452	94.0	86.0	0.8660
2	4.00	0.72	1.00	457	95.0	87.0	0.8485
3	4.00	0.81	1.10	460	95.0	87.0	0.9000
F1	4.00	0.85	1.20	464	94.0	88.0	0.9220
2	4.00	0.73	1.00	474	94.0	88.0	0.9220
3	4.00	0.77	1.10	480	94.0	88.0	0.8775
F1	4.00	0.87	1.20	480	94.0	88.0	0.9327
2	4.00	0.73	1.00	485	95.0	88.0	0.8544
3	4.00	0.81	1.10	487	94.0	88.0	0.9000
TOTALS	96.00	18.03	25.32	10959	2138.0	2011.0	20.8534

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.751
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.055
Avg Stack Temperature (degF)	T(s avg)	=	456.6
Average Meter Temperature (degF)	T(m avg)	=	86.4
Avg SQRT(dP)		=	0.869

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	49.86
Stack Gas Water Vapor Proportion	B(wo)	=	0.080
Mol. Wt., Stack Gas Dry	M(d)	=	30.57
Mol. Wt., Stack Gas Wet	M(s)	=	29.56
Abs Stack Pressure (in Hg)	P(s)	=	30.63
Avg Stack Velocity (ft/sec)	V(s avg)	=	63.8
Isokineticity (%)	% I	=	
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	19[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	361627
Percent XS Air	PEA	=	22.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.3994
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2621
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.1457
Heat Input Rate, MBtu/hr		=	974.59
Particulate Emission Rate(lb/hr)	E(p)	=	2351.754
Particulate Emission Rate(lb/MBtu)		=	2.4135

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 4/29/92 Printed 18-Jun — Test No./Type: M17-119
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1700-1845

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.26
Stack Static Pressure (in H2O)	P(stack)	15.000
Gas Meter Initial Reading (cu ft)		5.16
Gas Meter Final Reading (cu ft)		53.82
Net Gas Sample Volume (cu ft)	V(m)	(48.66)
Vol of Liquid Collected (ml)	Vl(c)	70.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.318)
Wt. of Filter Particulate (gm)		5.6888
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.6888)
O2 Concentration (by CEM)	% O2	4.70 need CEMs
CO2 Concentration (by CEM)	% CO2	14.40
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.60	0.84	448	99.0	100.0	0.7746
2	4.00	0.60	0.84	465	99.0	100.0	0.7746
3	4.00	0.59	0.83	472	100.0	100.0	0.7681
B1	4.00	0.61	0.85	478	102.0	101.0	0.7810
2	4.00	0.51	0.71	477	103.0	101.0	0.7141
3	4.00	0.49	0.70	480	104.0	101.0	0.7000
C1	4.00	0.56	0.78	446	106.0	103.0	0.7483
2	4.00	0.52	0.73	455	106.0	103.0	0.7211
3	4.00	0.74	1.00	474	108.0	104.0	0.8602
D1	4.00	0.80	1.12	476	109.0	104.0	0.8944
2	4.00	0.62	0.87	443	111.0	105.0	0.7874
3	4.00	0.67	0.94	462	111.0	105.0	0.8185
E1	4.00	0.66	0.92	448	111.0	106.0	0.8124
2	4.00	0.66	0.92	444	113.0	107.0	0.8124
3	4.00	0.67	0.95	469	113.0	107.0	0.8185
E1	4.00	0.65	0.91	465	115.0	108.0	0.8062
2	4.00	0.60	0.84	466	115.0	109.0	0.7746
3	4.00	0.60	0.84	473	116.0	109.0	0.7746
F1	4.00	0.64	0.89	470	114.0	109.0	0.8000
2	4.00	0.68	0.95	475	115.0	109.0	0.8000
3	4.00	0.64	0.89	479	116.0	110.0	0.8000
F1	4.00	0.66	0.92	478	115.0	111.0	0.8124
2	4.00	0.68	0.95	482	117.0	111.0	0.8246
3	4.00	0.73	1.00	485	117.0	111.0	0.8544
TOTALS	96.00	15.18	21.19	11210	2635.0	2534.0	19.0327

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.633
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.883
Avg Stack Temperature (degF)	T(s avg)	=	467.1
Average Meter Temperature (degF)	T(m avg)	=	107.7
Avg SQRT(dP)		=	0.793

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	44.79
Stack Gas Water Vapor Proportion	B(ws)	=	0.089
Mol. Wt., Stack Gas Dry	M(d)	=	30.49
Mol. Wt., Stack Gas Wet	M(s)	=	29.63
Abs Stack Pressure (in Hg)	P(s)	=	30.38
Avg Stack Velocity (ft/sec)	V(s avg)	=	57.6
Isokineticity (%)	% I	=	98.5
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	179178
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	332988
Percent XS Air	PEA	=	26.2
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.9599
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	3852
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.6834
Heat Input Rate, MBtu/hr		=	846.57
Particulate Emission Rate(lb/hr)	E(p)	=	3009.528
Particulate Emission Rate(lb/MBtu)		=	3.5472

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 4/30/92 Printed 18-Jun — Test No./Type: M17-I20
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 0020-0203

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.24
Stack Static Pressure (in H20)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		55.44
Gas Meter Final Reading (cu ft)		90.61
Net Gas Sample Volume (cu ft)	V(m)	(35.18)
Vol of Liquid Collected (ml)	Vl(c)	59.8
Vol of Liq @ Std. Conds. (scf)	V(w std)	(2.815)
Wt. of Filter Particulate (gm)		5.7382
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.7382)
O2 Concentration (by CEM)	% O2	4.70
CO2 Concentration (by CEM)	% CO2	13.90
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.40)

Sample Point	dClock Time	Velocity Head, dP (in H20)	Orifice Meter, dH (in H20)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.30	0.42	451	75.0	75.0	0.5477
2	4.00	0.26	0.36	453	76.0	75.0	0.5099
3	4.00	0.33	0.46	454	78.0	76.0	0.5745
B1	4.00	0.34	0.48	429	80.0	77.0	0.5831
2	4.00	0.29	0.41	446	81.0	78.0	0.5385
3	4.00	0.25	0.35	452	82.0	79.0	0.5000
C1	4.00	0.31	0.43	425	83.0	80.0	0.5568
2	4.00	0.28	0.39	439	84.0	80.0	0.5292
3	4.00	0.35	0.49	451	85.0	81.0	0.5916
D1	4.00	0.38	0.52	415	86.0	82.0	0.6164
2	4.00	0.34	0.48	427	88.0	83.0	0.5831
3	4.00	0.38	0.52	436	88.0	83.0	0.6164
E1	4.00	0.34	0.48	402	88.0	84.0	0.5831
2	4.00	0.30	0.42	420	88.0	84.0	0.5477
3	4.00	0.33	0.46	430	89.0	85.0	0.5831
E1	4.00	0.34	0.48	425	91.0	87.0	0.5568
2	4.00	0.31	0.43	433	90.0	86.0	0.5568
3	4.00	0.31	0.43	445	89.0	86.0	0.6164
F1	4.00	0.38	0.53	432	89.0	86.0	0.6164
2	4.00	0.33	0.46	444	90.0	86.0	0.6164
3	4.00	0.31	0.43	450	90.0	87.0	0.5568
F1	4.00	0.38	0.53	442	91.0	87.0	0.6164
2	4.00	0.32	0.45	450	91.0	88.0	0.5657
3	4.00	0.33	0.46	452	91.0	87.0	0.5745
TOTALS	96.00	7.79	10.87	10503	2063.0	1982.0	13.7374

FIELD DATA AVERAGES

Avg Velocity Head (in H20)	dP(avg)	=	0.325
Avg Orifice Meter Reading (in H20)	dH(avg)	=	0.453
Avg Stack Temperature (degF)	T(s avg)	=	437.6
Average Meter Temperature (degF)	T(m avg)	=	84.3
Avg SQRT(dP)		=	0.572

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	33.71
Stack Gas Water Vapor Proportion	B(wo)	=	0.077
Mol. Wt., Stack Gas Dry	M(d)	=	30.41
Mol. Wt., Stack Gas Wet	M(s)	=	29.45
Abs Stack Pressure (in Hg)	P(s)	=	30.27
Avg Stack Velocity (ft/sec)	V(s avg)	=	41.2
Isokineticity (%)	% I	=	[illegible]
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	13[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	237559
Percent XS Air	PEA	=	28.0
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.6268
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	5162
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	2.2582
Heat Input Rate, MBtu/hr		=	617.92
Particulate Emission Rate(lb/hr)	E(p)	=	2937.199
Particulate Emission Rate(lb/MBtu)		=	4.7542

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 5/1/92 Printed 18-Jun — Test No./Type: M17-I21
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1005-1150

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.15
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		91.51
Gas Meter Final Reading (cu ft)		153.11
Net Gas Sample Volume (cu ft)	V(m)	(61.60)
Vol of Liquid Collected (ml)	Vl(c)	160.0 check moisture catc
Vol of Liq @ Std. Conds. (scf)	V(w std)	(7.531)
Wt. of Filter Particulate (gm)		5.1162
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.1162)
O2 Concentration (by CEM)	% O2	3.90
CO2 Concentration (by CEM)	% CO2	15.10
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.00)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.00	1.40	487	88.0	89.0	1.0000
2	4.00	0.90	1.30	487	88.0	89.0	0.9487
3	4.00	1.00	1.40	492	89.0	89.0	1.0000
B1	4.00	1.20	1.70	474	91.0	89.0	1.0954
2	4.00	0.91	1.30	489	93.0	89.0	0.9539
3	4.00	0.93	1.30	496	93.0	90.0	0.9644
C1	4.00	1.10	1.40	465	94.0	89.0	1.0488
2	4.00	0.95	1.30	475	95.0	90.0	0.9747
3	4.00	1.20	1.70	489	97.0	90.0	1.0954
D1	4.00	1.30	1.80	478	95.0	90.0	1.1402
2	4.00	1.10	1.40	480	99.0	91.0	1.0488
3	4.00	1.20	1.70	488	98.0	91.0	1.0954
E1	4.00	1.10	1.40	456	97.0	91.0	1.0488
2	4.00	1.00	1.40	478	100.0	92.0	1.0000
3	4.00	1.00	1.40	488	100.0	92.0	1.0488
E1	4.00	1.10	1.40	470	101.0	92.0	1.0000
2	4.00	1.00	1.40	482	102.0	93.0	1.0488
3	4.00	1.10	1.40	485	102.0	93.0	1.1402
F1	4.00	1.30	1.30	481	100.0	94.0	1.1402
2	4.00	1.00	1.40	492	101.0	93.0	1.1402
3	4.00	1.10	1.50	495	102.0	95.0	1.0488
F1	4.00	1.30	1.80	493	103.0	95.0	1.1402
2	4.00	1.00	1.40	494	104.0	96.0	1.0000
3	4.00	1.10	1.50	495	106.0	95.0	1.0488
TOTALS	96.00	25.89	35.00	11609	2338.0	2197.0	25.1705

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.079
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.455
Avg Stack Temperature (degF)	T(s avg)	=	483.7
Average Meter Temperature (degF)	T(m avg)	=	94.5
Avg SQRT(dP)		=	1.049

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	57.91
Stack Gas Water Vapor Proportion	B(wc)	=	0.115
Mol. Wt., Stack Gas Dry	M(d)	=	30.57
Mol. Wt., Stack Gas Wet	M(s)	=	29.13
Abs Stack Pressure (in Hg)	P(s)	=	30.62
Avg Stack Velocity (ft/sec)	V(s avg)	=	77.5
Isokineticity (%)	% I	=	98.9
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	226113
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	446248
Percent XS Air	PEA	=	22.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.3632
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2554
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.1161
Heat Input Rate, MBtu/hr		=	1123.75
Particulate Emission Rate(lb/hr)	E(p)	=	2641.639
Particulate Emission Rate(lb/MBtu)		=	2.3511

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 5/16/92 Printed 16-Jun — Test No./Type: M17-I22
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1058-1205

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.43
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		154.65
Gas Meter Final Reading (cu ft)		202.10
Net Gas Sample Volume (cu ft)	V(m)	(47.45)
Vol of Liquid Collected (ml)	Vl(c)	91.3
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.297)
Wt. of Filter Particulate (gm)		8.2504
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(8.2504)
O2 Concentration (by CEM)	% O2	4.10
CO2 Concentration (by CEM)	% CO2	14.80
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.10)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.54	0.76	449.00	83.0	83.0	0.7348
2	4.00	0.51	0.71	450.00	84.0	83.0	0.7141
3	4.00	0.56	0.78	454.00	85.0	84.0	0.7483
B1	4.00	0.58	0.84	408.00	86.0	84.0	0.7616
2	4.00	0.52	0.73	430.00	87.0	85.0	0.7211
3	4.00	0.48	0.67	452.00	89.0	85.0	0.6928
C1	4.00	0.59	0.83	406.00	89.0	86.0	0.7681
2	4.00	0.55	0.77	427.00	91.0	86.0	0.7416
3	4.00	0.79	1.10	451.00	92.0	87.0	0.8888
D1	4.00	0.75	1.10	415.00	93.0	88.0	0.8660
2	4.00	0.66	0.92	426.00	94.0	89.0	0.8124
3	4.00	0.71	0.99	449.00	95.0	89.0	0.8426
E1	4.00	0.63	0.88	415.00	94.0	90.0	0.7937
2	4.00	0.54	0.77	431.00	95.0	90.0	0.7348
3	4.00	0.62	0.88	455.00	97.0	91.0	0.7874
E1	4.00	0.62	0.88	444.00	96.0	91.0	0.7416
2	4.00	0.55	0.77	452.00	97.0	91.0	0.7937
3	4.00	0.63	0.88	461.00	97.0	92.0	0.8367
F1	4.00	0.70	0.98	430.00	97.0	92.0	0.8367
2	4.00	0.60	0.84	443.00	98.0	92.0	0.8367
3	4.00	0.62	0.87	455.00	99.0	93.0	0.7874
F1	4.00	0.67	0.95	448.00	100.0	94.0	0.8185
2	4.00	0.61	0.84	458.00	101.0	94.0	0.7810
3	4.00	0.62	0.87	462.00	102.0	95.0	0.7874
TOTALS	96.00	14.65	20.61	10571.00	2241.0	2134.0	18.8281

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.610
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.859
Avg Stack Temperature (degF)	T(s avg)	=	440.5
Average Meter Temperature (degF)	T(m avg)	=	91.1
Avg SQRT(dP)		=	0.785

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	45.24
Stack Gas Water Vapor Proportion	B(wo)	=	0.087
Mol. Wt., Stack Gas Dry	M(d)	=	30.53
Mol. Wt., Stack Gas Wet	M(s)	=	29.44
Abs Stack Pressure (in Hg)	P(s)	=	30.46
Avg Stack Velocity (ft/sec)	V(s avg)	=	56.4
Isokineticity (%)	% I	=	[illegible]
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	177253
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	325147
Percent XS Air	PEA	=	23.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.8142
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	5334
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	2.3313
Heat Input Rate, MBtu/hr		=	870.56
Particulate Emission Rate(lb/hr)	E(p)	=	4274.992
Particulate Emission Rate(lb/MBtu)		=	4.9115

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 5/16/92 Printed 18-Jun — Test No./Type: M17-I23
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1645-1836

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.43
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		203.53
Gas Meter Final Reading (cu ft)		237.77
Net Gas Sample Volume (cu ft)	V(m)	(34.24)
Vol of Liquid Collected (ml)	Vl(c)	75.1
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.535)
Wt. of Filter Particulate (gm)		6.0318
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(6.0318)
O2 Concentration (by CEM)	% O2	4.00
CO2 Concentration (by CEM)	% CO2	15.10
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.30	0.42	429.00	99.0	98.0	0.5477
2	4.00	0.27	0.38	430.00	99.0	98.0	0.5196
3	4.00	0.29	0.41	455.00	100.0	99.0	0.5385
B1	4.00	0.30	0.43	426.00	101.0	99.0	0.5477
2	4.00	0.26	0.48	439.00	101.0	100.0	0.5099
3	4.00	0.26	0.38	444.00	102.0	100.0	0.5099
C1	4.00	0.30	0.43	410.00	102.0	100.0	0.5477
2	4.00	0.26	0.38	421.00	104.0	101.0	0.5099
3	4.00	0.32	0.45	426.00	104.0	102.0	0.5657
D1	4.00	0.36	0.50	407.00	104.0	102.0	0.6000
2	4.00	0.35	0.49	412.00	106.0	102.0	0.5916
3	4.00	0.32	0.45	415.00	106.0	102.0	0.5657
E1	4.00	0.30	0.42	391.00	105.0	103.0	0.5477
2	4.00	0.26	0.38	400.00	106.0	103.0	0.5099
3	4.00	0.28	0.38	414.00	107.0	104.0	0.5477
E1	4.00	0.30	0.42	411.00	107.0	104.0	0.5099
2	4.00	0.26	0.38	426.00	106.0	104.0	0.5099
3	4.00	0.26	0.38	433.00	106.0	104.0	0.5745
F1	4.00	0.33	0.46	406.00	106.0	104.0	0.5745
2	4.00	0.27	0.38	422.00	106.0	104.0	0.5745
3	4.00	0.27	0.38	429.00	107.0	104.0	0.5196
F1	4.00	0.32	0.46	430.00	107.0	105.0	0.5657
2	4.00	0.28	0.39	433.00	108.0	105.0	0.5292
3	4.00	0.27	0.38	430.00	109.0	106.0	0.5196
TOTALS	96.00	6.99	10.01	10139.00	2508.0	2453.0	13.0366

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.291
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.417
Avg Stack Temperature (degF)	T(s avg)	=	422.5
Average Meter Temperature (degF)	T(m avg)	=	103.4
Avg SQRT(dP)		=	0.543

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	31.90
Stack Gas Water Vapor Proportion	B(wo)	=	0.100
Mol. Wt., Stack Gas Dry	M(d)	=	30.56
Mol. Wt., Stack Gas Wet	M(s)	=	29.32
Abs Stack Pressure (in Hg)	P(s)	=	30.17
Avg Stack Velocity (ft/sec)	V(s avg)	=	39.0
Isokineticity (%)	% I	=	101.1
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	121874
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	224425
Percent XS Air	PEA	=	23.0
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.9176
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	5498
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	2.4029
Heat Input Rate, MBtu/hr		=	602.13
Particulate Emission Rate(lb/hr)	E(p)	=	3047.482
Particulate Emission Rate(lb/MBtu)		=	5.0620

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 5/17/92 Printed 18-Jun — Test No./Type: M17-I24
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 0934-1126

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.62
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		237.89
Gas Meter Final Reading (cu ft)		271.66
Net Gas Sample Volume (cu ft)	V(m)	(33.77)
Vol of Liquid Collected (ml)	Vl(c)	60.6
Vol of Liq @ Std. Conds. (scf)	V(w std)	(2.852)
Wt. of Filter Particulate (gm)		5.5995
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.5995)
O2 Concentration (by CEM)	% O2	4.90
CO2 Concentration (by CEM)	% CO2	14.20
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter,dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.27	0.38	429.00	81.0	80.0	0.5196
2	4.00	0.25	0.35	429.00	82.0	81.0	0.5000
3	4.00	0.29	0.41	433.00	82.0	81.0	0.5385
B1	4.00	0.32	0.45	408.00	83.0	82.0	0.5657
2	4.00	0.25	0.35	424.00	83.0	82.0	0.5000
3	4.00	0.25	0.35	434.00	83.0	82.0	0.5000
C1	4.00	0.30	0.42	388.00	83.0	82.0	0.5477
2	4.00	0.27	0.38	402.00	84.0	82.0	0.5196
3	4.00	0.37	0.52	418.00	84.0	82.0	0.6083
D1	4.00	0.36	0.50	416.00	84.0	82.0	0.6000
2	4.00	0.31	0.42	422.00	85.0	82.0	0.5568
3	4.00	0.35	0.49	425.00	85.0	82.0	0.5916
E1	4.00	0.30	0.45	405.00	85.0	83.0	0.5477
2	4.00	0.27	0.38	412.00	85.0	83.0	0.5196
3	4.00	0.32	0.45	421.00	86.0	83.0	0.5657
E1	4.00	0.32	0.45	420.00	86.0	83.0	0.5196
2	4.00	0.27	0.38	421.00	86.0	83.0	0.5385
3	4.00	0.29	0.41	426.00	87.0	84.0	0.5657
F1	4.00	0.32	0.45	414.00	86.0	83.0	0.5657
2	4.00	0.30	0.42	423.00	87.0	83.0	0.5657
3	4.00	0.30	0.42	431.00	87.0	84.0	0.5477
F1	4.00	0.35	0.49	428.00	87.0	84.0	0.5916
2	4.00	0.30	0.42	431.00	87.0	84.0	0.5477
3	4.00	0.28	0.39	436.00	88.0	84.0	0.5292
TOTALS	96.00	7.21	10.13	10096.00	2036.0	1981.0	13.1522

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.300
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.422
Avg Stack Temperature (degF)	T(s avg)	=	420.7
Average Meter Temperature (degF)	T(m avg)	=	83.7
Avg SQRT(dP)		=	0.548

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	32.82
Stack Gas Water Vapor Proportion	B(wo)	=	0.080
Mol. Wt., Stack Gas Dry	M(d)	=	30.47
Mol. Wt., Stack Gas Wet	M(s)	=	29.47
Abs Stack Pressure (in Hg)	P(s)	=	30.36
Avg Stack Velocity (ft/sec)	V(s avg)	=	39.0
Isokineticity (%)	% I	=	1[illegible]
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	125[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	224904
Percent XS Air	PEA	=	29.6
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.6329
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	5238
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	2.2895
Heat Input Rate, MBtu/hr		=	586.72
Particulate Emission Rate(lb/hr)	E(p)	=	2839.920
Particulate Emission Rate(lb/MBtu)		=	4.8247

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 5/16/92 Printed 18-Jun — Test No./Type: M17-123
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1645-1836

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.43
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		203.53
Gas Meter Final Reading (cu ft)		237.77
Net Gas Sample Volume (cu ft)	V(m)	(34.24)
Vol of Liquid Collected (ml)	Vl(c)	75.1
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.535)
Wt. of Filter Particulate (gm)		6.0318
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(6.0318)
O2 Concentration (by CEM)	% O2	4.00
CO2 Concentration (by CEM)	% CO2	15.10
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.30	0.42	429.00	99.0	98.0	0.5477
2	4.00	0.27	0.38	430.00	99.0	98.0	0.5196
3	4.00	0.29	0.41	455.00	100.0	99.0	0.5385
B1	4.00	0.30	0.43	426.00	101.0	99.0	0.5477
2	4.00	0.26	0.48	439.00	101.0	100.0	0.5099
3	4.00	0.26	0.38	444.00	102.0	100.0	0.5099
C1	4.00	0.30	0.43	410.00	102.0	100.0	0.5477
2	4.00	0.26	0.38	421.00	104.0	101.0	0.5099
3	4.00	0.32	0.45	426.00	104.0	102.0	0.5657
D1	4.00	0.36	0.50	407.00	104.0	102.0	0.6000
2	4.00	0.35	0.49	412.00	106.0	102.0	0.5916
3	4.00	0.32	0.45	415.00	106.0	102.0	0.5657
E1	4.00	0.30	0.42	391.00	105.0	103.0	0.5477
2	4.00	0.26	0.38	400.00	106.0	103.0	0.5099
3	4.00	0.28	0.38	414.00	107.0	104.0	0.5477
E1	4.00	0.30	0.42	411.00	107.0	104.0	0.5099
2	4.00	0.26	0.38	426.00	106.0	104.0	0.5099
3	4.00	0.26	0.38	433.00	106.0	104.0	0.5745
F1	4.00	0.33	0.46	406.00	106.0	104.0	0.5745
2	4.00	0.27	0.38	422.00	106.0	104.0	0.5745
3	4.00	0.27	0.38	429.00	107.0	104.0	0.5196
F1	4.00	0.32	0.46	430.00	107.0	105.0	0.5657
2	4.00	0.28	0.39	433.00	108.0	105.0	0.5292
3	4.00	0.27	0.38	430.00	109.0	106.0	0.5196
TOTALS	96.00	6.99	10.01	10139.00	2508.0	2453.0	13.0366

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.291
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.417
Avg Stack Temperature (degF)	T(s avg)	=	422.5
Average Meter Temperature (degF)	T(m avg)	=	103.4
Avg SQRT(dP)		=	0.543

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	31.9[illegible]
Stack Gas Water Vapor Proportion	B(wo)	=	0.100
Mol. Wt., Stack Gas Dry	M(d)	=	30.55
Mol. Wt., Stack Gas Wet	M(s)	=	29.32
Abs Stack Pressure (in Hg)	P(s)	=	30.17
Avg Stack Velocity (ft/sec)	V(s avg)	=	39.0
Isokineticity (%)	% I	=	101.1
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	121674
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	224423
Percent XS Air	PEA	=	23.0
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.9178
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	5498
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	2.4029
Heat Input Rate, MBtu/hr		=	602.13
Particulate Emission Rate(lb/hr)	E(p)	=	3047.482
Particulate Emission Rate(lb/MBtu)		=	5.0620

DO NOT MICROFILM THIS PAGE

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 5/17/92 Printed 18-Jun — Test No./Type: M17-124
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 0934-1126

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.62
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		237.89
Gas Meter Final Reading (cu ft)		271.66
Net Gas Sample Volume (cu ft)	V(m)	(33.77)
Vol of Liquid Collected (ml)	Vl(c)	60.6
Vol of Liq @ Std. Conds. (scf)	V(w std)	(2.852)
Wt. of Filter Particulate (gm)		5.5995
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.5995)
O2 Concentration (by CEM)	% O2	4.90
CO2 Concentration (by CEM)	% CO2	14.20
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.90)

Sample Point	dClock Time	Velocity Head, dP (in H20)	Orifice Meter, dH (in H20)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.27	0.38	429.00	81.0	80.0	0.5196
2	4.00	0.25	0.35	429.00	82.0	81.0	0.5000
3	4.00	0.29	0.41	433.00	82.0	81.0	0.5385
B1	4.00	0.32	0.45	408.00	83.0	82.0	0.5657
2	4.00	0.25	0.35	424.00	83.0	82.0	0.5000
3	4.00	0.25	0.35	434.00	83.0	82.0	0.5000
C1	4.00	0.30	0.42	388.00	83.0	82.0	0.5477
2	4.00	0.27	0.38	402.00	84.0	82.0	0.5196
3	4.00	0.37	0.52	418.00	84.0	82.0	0.6083
D1	4.00	0.36	0.50	416.00	84.0	82.0	0.6000
2	4.00	0.31	0.42	422.00	85.0	82.0	0.5568
3	4.00	0.35	0.49	425.00	85.0	82.0	0.5916
E1	4.00	0.30	0.45	405.00	85.0	83.0	0.5477
2	4.00	0.27	0.38	412.00	85.0	83.0	0.5196
3	4.00	0.32	0.45	421.00	86.0	83.0	0.5657
E1	4.00	0.32	0.45	420.00	86.0	83.0	0.5196
2	4.00	0.27	0.38	421.00	86.0	83.0	0.5385
3	4.00	0.29	0.41	426.00	87.0	84.0	0.5657
F1	4.00	0.32	0.45	414.00	86.0	83.0	0.5657
2	4.00	0.30	0.42	423.00	87.0	83.0	0.5657
3	4.00	0.30	0.42	431.00	87.0	84.0	0.5477
F1	4.00	0.35	0.49	428.00	87.0	84.0	0.5916
2	4.00	0.30	0.42	431.00	87.0	84.0	0.5477
3	4.00	0.28	0.39	436.00	88.0	84.0	0.5292
TOTALS	96.00	7.21	10.13	10096.00	2036.0	1981.0	13.1522

FIELD DATA AVERAGES

Avg Velocity Head (in H20)	dP(avg)	=	0.300
Avg Orifice Meter Reading (in H20)	dH(avg)	=	0.422
Avg Stack Temperature (degF)	T(s avg)	=	420.7
Average Meter Temperature (degF)	T(m avg)	=	83.7
Avg SQRT(dP)		=	0.548

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	32.83
Stack Gas Water Vapor Proportion	B(wo)	=	0.060
Mol. Wt., Stack Gas Dry	M(d)	=	30.47
Mol. Wt., Stack Gas Wet	M(s)	=	29.47
Abs Stack Pressure (in Hg)	P(s)	=	30.36
Avg Stack Velocity (ft/sec)	V(s avg)	=	39.0
Isokineticity (%)	% I	=	1[illegible]
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	12[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	224904
Percent XS Air	PEA	=	29.8
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.6329
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	5238
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	2.2895
Heat Input Rate, MBtu/hr		=	586.72
Particulate Emission Rate(lb/hr)	E(p)	=	2839.920
Particulate Emission Rate(lb/MBtu)		=	4.8247

DO NOT MICROFILM THIS PAGE

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 5/17/92 Printed 18-Jun — Test No./Type: M17-125
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1421-1604

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.62
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		271.77
Gas Meter Final Reading (cu ft)		305.87
Net Ga. Sample Volume (cu ft)	V(m)	(34.11)
Vol of Liquid Collected (ml)	Vl(c)	84.7
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.987)
Wt. of Filter Particulate (gm)		7.9032
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(7.9032)
O2 Concentration (by CEM)	% O2	5.30
CO2 Concentration (by CEM)	% CO2	14.10
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.60)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.27	0.38	415.00	78.0	78.0	0.5196
2	4.00	0.27	0.38	422.00	78.0	78.0	0.5196
3	4.00	0.31	0.43	430.00	79.0	78.0	0.5568
B1	4.00	0.32	0.45	399.00	80.0	79.0	0.5657
2	4.00	0.27	0.38	416.00	81.0	79.0	0.5196
3	4.00	0.25	0.35	434.00	82.0	80.0	0.5000
C1	4.00	0.32	0.45	406.00	83.0	80.0	0.5657
2	4.00	0.30	0.42	420.00	84.0	81.0	0.5477
3	4.00	0.38	0.53	429.00	85.0	82.0	0.6164
D1	4.00	0.38	0.53	427.00	85.0	82.0	0.6164
2	4.00	0.36	0.50	425.00	86.0	83.0	0.6000
3	4.00	0.36	0.50	430.00	88.0	83.0	0.6000
E1	4.00	0.35	0.49	405.00	88.0	84.0	0.5916
2	4.00	0.28	0.39	412.00	90.0	85.0	0.5292
3	4.00	0.30	0.42	414.00	90.0	86.0	0.5831
E1	4.00	0.34	0.48	420.00	90.0	86.0	0.5477
2	4.00	0.30	0.42	424.00	92.0	87.0	0.5568
3	4.00	0.31	0.43	434.00	92.0	87.0	0.5745
F1	4.00	0.33	0.46	414.00	92.0	88.0	0.5745
2	4.00	0.30	0.42	422.00	93.0	88.0	0.5745
3	4.00	0.31	0.43	431.00	93.0	89.0	0.5568
F1	4.00	0.32	0.44	426.00	94.0	90.0	0.5657
2	4.00	0.31	0.42	425.00	95.0	90.0	0.5568
3	4.00	0.30	0.42	430.00	95.0	90.0	0.5477
TOTALS	96.00	7.54	10.52	10110.00	2093.00	2013.0	13.4863

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.314
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.438
Avg Stack Temperature (degF)	T(s avg)	=	421.3
Average Meter Temperature (degF)	T(m avg)	=	85.5
Avg SQRT(dP)		=	0.562

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	33.03
Stack Gas Water Vapor Proportion	B(wo)	=	0.108
Mol. Wt., Stack Gas Dry	M(d)	=	30.47
Mol. Wt., Stack Gas Wet	M(s)	=	29.13
Abs Stack Pressure (in Hg)	P(s)	=	30.36
Avg Stack Velocity (ft/sec)	V(s avg)	=	40.3
Isokineticity (%)	% I	=	101.3
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	125868
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	232058
Percent XS Air	PEA	=	33.2
Particulate Loading, dry(gr/dscf)	C(s std)	=	3.6919
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	7532
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	3.2921
Heat Input Rate, MBtu/hr		=	574.03
Particulate Emission Rate(lb/hr)	E(p)	=	3962.400
Particulate Emission Rate(lb/MBtu)		=	6.9388

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 5/18/92 Printed 15-Jun — Test No./Type: M17-I26
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1055-1246

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.84
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		306.76
Gas Meter Final Reading (cu ft)		367.84
Net Gas Sample Volume (cu ft)	V(m)	(61.08)
Vol of Liquid Collected (ml)	Vl(c)	143.1
Vol of Liq @ Std. Conds. (scf)	V(w std)	(6.736)
Wt. of Filter Particulate (gm)		8.0154
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(8.0154)
O2 Concentration (by CEM)	% O2	3.50
CO2 Concentration (by CEM)	% CO2	15.70
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.69)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.96	1.30	450.00	74.0	74.0	0.9798
2	4.00	0.87	1.20	459.00	74.0	74.0	0.9327
3	4.00	1.00	1.40	462.00	76.0	75.0	1.0000
B1	4.00	1.10	1.50	436.00	77.0	75.0	1.0488
2	4.00	0.91	1.30	456.00	80.0	76.0	0.9539
3	4.00	0.91	1.30	469.00	81.0	76.0	0.9539
C1	4.00	1.10	1.50	426.00	82.0	77.0	1.0488
2	4.00	0.95	1.30	449.00	86.0	78.0	0.9747
3	4.00	1.30	1.80	463.00	86.0	78.0	1.1402
D1	4.00	1.20	1.70	455.00	85.0	78.0	1.0954
2	4.00	1.10	1.50	460.00	88.0	79.0	1.0488
3	4.00	1.10	1.50	465.00	89.0	80.0	1.0488
E1	4.00	1.10	1.50	470.00	90.0	82.0	1.0488
2	4.00	1.00	1.40	482.00	91.0	82.0	1.0000
3	4.00	1.10	1.50	493.00	92.0	83.0	1.0488
E1	4.00	1.10	1.50	486.00	94.0	84.0	1.0488
2	4.00	1.10	1.50	492.00	95.0	85.0	1.0488
3	4.00	1.10	1.50	497.00	95.0	85.0	1.0954
F1	4.00	1.20	1.70	500.00	93.0	86.0	1.0954
2	4.00	1.10	1.50	502.00	94.0	87.0	1.0954
3	4.00	1.10	1.50	504.00	95.0	87.0	1.0488
F1	4.00	1.30	1.80	504.00	95.0	87.0	1.1402
2	4.00	1.10	1.50	505.00	96.0	87.0	1.0488
3	4.00	1.10	1.50	509.00	97.0	88.0	1.0488
TOTALS	96.00	25.90	35.70	11394.00	2105.00	1943.0	24.9941

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.079
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.486
Avg Stack Temperature (degF)	T(s avg)	=	474.8
Average Meter Temperature (degF)	T(m avg)	=	84.3
Avg SQRT(dP)		=	1.041

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	59.87
Stack Gas Water Vapor Proportion	B(wo)	=	0.101
Mol. Wt., Stack Gas Dry	M(d)	=	30.49
Mol. Wt., Stack Gas Wet	M(s)	=	29.22
Abs Stack Pressure (in Hg)	P(s)	=	31.31
Avg Stack Velocity (ft/sec)	V(s avg)	=	75.6
Isokineticity (%)	% I	=	99.9
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	231340
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	43[illegible]
Percent XS Air	PEA	=	2[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.065[illegible]
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	3825
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.6716
Heat Input Rate, MBtu/hr		=	1163.25
Particulate Emission Rate(lb/hr)	E(p)	=	4095.366
Particulate Emission Rate(lb/MBtu)		=	3.5212

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 5/19/92 Printed 15-Jun — Test No./Type: M17-127
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 0926-1115

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Facto	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.62
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		369.34
Gas Meter Final Reading (cu ft)		431.03
Net Gas Sample Volume (cu ft)	V(m)	(61.69)
Vol of Liquid Collected (ml)	Vl(c)	141.4
Vol of Liq @ Std. Conds. (scf)	V(w std)	(6.656)
Wt. of Filter Particulate (gm)		5.2557
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.2557)
O2 Concentration (by CEM)	% O2	3.40
CO2 Concentration (by CEM)	% CO2	15.70
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.69)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.10	1.54	465.00	70.0	71.0	1.0488
2	4.00	0.90	1.30	466.00	71.0	71.0	0.9487
3	4.00	1.00	1.40	472.00	73.0	71.0	1.0000
B1	4.00	1.10	1.50	443.00	74.0	72.0	1.0488
2	4.00	0.91	1.30	459.00	77.0	73.0	0.9539
3	4.00	0.93	1.30	476.00	76.0	73.0	0.9644
C1	4.00	1.10	1.50	439.00	80.0	74.0	1.0488
2	4.00	1.00	1.40	457.00	82.0	75.0	1.0000
3	4.00	1.40	1.90	470.00	84.0	75.0	1.1832
D1	4.00	1.30	1.80	458.00	83.0	76.0	1.1402
2	4.00	1.00	1.40	463.00	89.0	77.0	1.0000
3	4.00	1.20	1.70	469.00	86.0	77.0	1.0954
E1	4.00	1.10	1.50	450.00	86.0	76.0	1.0488
2	4.00	1.00	1.40	472.00	87.0	79.0	1.0000
3	4.00	1.10	1.50	486.00	88.0	79.0	1.0954
E1	4.00	1.20	1.70	472.00	89.0	80.0	1.0000
2	4.00	1.00	1.40	479.00	89.0	80.0	1.0954
3	4.00	1.20	1.70	480.00	90.0	81.0	1.0954
F1	4.00	1.20	1.70	492.00	89.0	81.0	1.0954
2	4.00	1.10	1.50	497.00	90.0	82.0	1.0954
3	4.00	1.10	1.50	500.00	90.0	82.0	1.0488
F1	4.00	1.20	1.70	500.00	91.0	83.0	1.0954
2	4.00	1.10	1.50	501.00	93.0	83.0	1.0488
3	4.00	1.10	1.50	502.00	93.0	83.0	1.0488
TOTALS	96.00	26.34	36.64	11368.00	2020.00	1854.0	25.2002

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.098
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.527
Avg Stack Temperature (degF)	T(s avg)	=	473.7
Average Meter Temperature (degF)	T(m avg)	=	80.7
Avg SQRT(dP)		=	1.050

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	60.44
Stack Gas Water Vapor Proportion	B(wo)	=	0.099
Mol. Wt., Stack Gas Dry	M(d)	=	30.49
Mol. Wt., Stack Gas Wet	M(s)	=	29.25
Abs Stack Pressure (in Hg)	P(s)	=	31.09
Avg Stack Velocity (ft/sec)	V(s avg)	=	76.4
Isokineticity (%)	% I	=	100.2
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	232963
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	440096
Percent XS Air	PEA	=	20.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.3418
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2464
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.0859
Heat Input Rate, MBtu/hr		=	1171.41
Particulate Emission Rate(lb/hr)	E(p)	=	2678.926
Particulate Emission Rate(lb/MBtu)		=	2.2873

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 5/19/92 Printed 15-Jun — Test No./Type: M17-I28
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1447-1631

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.62
Stack Static Pressure (in H20)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		432.62
Gas Meter Final Reading (cu ft)		479.99
Net Gas Sample Volume (cu ft)	V(m)	(47.37)
Vol of Liquid Collected (ml)	Vl(c)	93.7
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.410)
Wt. of Filter Particulate (gm)		3.7714
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(3.7714)
O2 Concentration (by CEM)	% O2	3.90
CO2 Concentration (by CEM)	% CO2	14.90
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.69)

Sample Point	dClock Time	Velocity Head, dP (in H20)	Orifice Meter, dH (in H20)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.55	0.77	456.00	87.0	87.0	0.7416
2	4.00	0.50	0.70	457.00	87.0	88.0	0.7071
3	4.00	0.57	0.79	459.00	89.0	89.0	0.7550
B1	4.00	0.58	0.81	425.00	91.0	89.0	0.7616
2	4.00	0.47	0.66	439.00	93.0	85.0	0.6856
3	4.00	0.46	0.64	458.00	94.0	90.0	0.6782
C1	4.00	0.56	0.78	425.00	94.0	91.0	0.7483
2	4.00	0.50	0.70	440.00	95.0	91.0	0.7071
3	4.00	0.70	0.98	454.00	97.0	92.0	0.8367
D1	4.00	0.70	0.98	440.00	97.0	92.0	0.8367
2	4.00	0.61	0.85	446.00	99.0	93.0	0.7810
3	4.00	0.65	0.91	451.00	99.0	94.0	0.8062
E1	4.00	0.60	0.85	437.00	99.0	94.0	0.7746
2	4.00	0.55	0.77	445.00	100.0	94.0	0.7416
3	4.00	0.60	0.85	458.00	100.0	95.0	0.7616
E1	4.00	0.58	0.81	450.00	101.0	95.0	0.7348
2	4.00	0.54	0.76	454.00	102.0	95.0	0.7746
3	4.00	0.60	0.85	463.00	102.0	96.0	0.7937
F1	4.00	0.63	0.88	457.00	100.0	99.0	0.7937
2	4.00	0.55	0.77	463.00	101.0	96.0	0.7937
3	4.00	0.55	0.77	465.00	101.0	96.0	0.7416
F1	4.00	0.60	0.85	465.00	101.0	96.0	0.7746
2	4.00	0.55	0.77	466.00	101.0	96.0	0.7416
3	4.00	0.55	0.77	468.00	101.0	96.0	0.7416
TOTALS	96.00	13.75	19.27	10841.00	2331.00	2229.0	18.2130

FIELD DATA AVERAGES

Avg Velocity Head (in H20)	dP(avg)	=	0.573
Avg Orifice Meter Reading (in H20)	dH(avg)	=	0.803
Avg Stack Temperature (degF)	T(s avg)	=	451.7
Average Meter Temperature (degF)	T(m avg)	=	95.0
Avg SQRT(dP)		=	0.759

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	45.13
Stack Gas Water Vapor Proportion	B(wo)	=	0.089
Mol. Wt., Stack Gas Dry	M(d)	=	30.49
Mol. Wt., Stack Gas Wet	M(s)	=	29.37
Abs Stack Pressure (in Hg)	P(s)	=	30.65
Avg Stack Velocity (ft/sec)	V(s avg)	=	54.6
Isokineticity (%)	% I	=	102.1
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	17
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	315679
Percent XS Air	PEA	=	20.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.2894
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2387
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.0435
Heat Input Rate, MBtu/hr		=	858.40
Particulate Emission Rate(lb/hr)	E(p)	=	1886.426
Particulate Emission Rate(lb/MBtu)		=	2.1980

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 5/20/92 Printed 15-Jun — Test No./Type: M17-129
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 0933-1130

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.75
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		480.36
Gas Meter Final Reading (cu ft)		541.88
Net Gas Sample Volume (cu ft)	V(m)	(61.53)
Vol of Liquid Collected (ml)	Vl(c)	144.1
Vol of Liq @ Std. Conds. (scf)	V(w std)	(6.783)
Wt. of Filter Particulate (gm)		9.0787
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(9.0787)
O2 Concentration (by CEM)	% O2	3.70
CO2 Concentration (by CEM)	% CO2	15.60
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.69)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.99	1.40	464.00	88.0	88.0	0.9950
2	4.00	0.90	1.30	462.00	87.0	88.0	0.9487
3	4.00	0.97	1.40	466.00	89.0	88.0	0.9849
B1	4.00	1.10	1.50	436.00	91.0	89.0	1.0488
2	4.00	0.90	1.30	451.00	92.0	89.0	0.9487
3	4.00	0.85	1.20	469.00	93.0	89.0	0.9220
C1	4.00	1.10	1.50	443.00	95.0	90.0	1.0488
2	4.00	0.95	1.40	453.00	96.0	90.0	0.9747
3	4.00	1.30	1.80	462.00	98.0	90.0	1.1402
D1	4.00	1.20	1.70	451.00	98.0	92.0	1.0954
2	4.00	1.00	1.40	457.00	101.0	93.0	1.0000
3	4.00	1.10	1.50	461.00	102.0	94.0	1.0488
E1	4.00	1.10	1.50	451.00	100.0	94.0	1.0488
2	4.00	1.00	1.40	465.00	102.0	95.0	1.0000
3	4.00	1.10	1.50	476.00	103.0	95.0	1.0488
E1	4.00	1.10	1.50	468.00	104.0	95.0	1.0000
2	4.00	1.00	1.40	476.00	105.0	96.0	1.0000
3	4.00	1.00	1.40	483.00	105.0	96.0	1.0488
F1	4.00	1.10	1.50	485.00	103.0	97.0	1.0488
2	4.00	1.00	1.40	487.00	104.0	97.0	1.0488
3	4.00	1.20	1.70	492.00	105.0	97.0	1.0954
F1	4.00	1.30	1.80	490.00	106.0	97.0	1.1402
2	4.00	1.00	1.40	490.00	107.0	98.0	1.0000
3	4.00	1.10	1.50	491.00	107.0	98.0	1.0488
TOTALS	96.00	25.36	35.40	11229.00	2381.00	2235.0	24.6844

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.057
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.475
Avg Stack Temperature (degF)	T(s avg)	=	467.9
Average Meter Temperature (degF)	T(m avg)	=	96.2
Avg SQRT(dP)		=	1.029

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	58.85
Stack Gas Water Vapor Proportion	B(wo)	=	0.103
Mol. Wt., Stack Gas Dry	M(d)	=	30.49
Mol. Wt., Stack Gas Wet	M(s)	=	29.20
Abs Stack Pressure (in Hg)	P(s)	=	31.22
Avg Stack Velocity (ft/sec)	V(s avg)	=	74.5
Isokineticity (%)	% I	=	99.4
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	228532
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	429236
Percent XS Air	PEA	=	20.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.3803
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	4407
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.9263
Heat Input Rate, MBtu/hr		=	1149.13
Particulate Emission Rate(lb/hr)	E(p)	=	4661.908
Particulate Emission Rate(lb/MBtu)		=	4.0576

B&W/WP&L, Reburn Optimization Test Series

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Tom Drake
Date: 5/20/92 Printed 15-Jun — Test No./Type: M17-130
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1430-1610

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.75
Stack Static Pressure (in H20)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		543.53
Gas Meter Final Reading (cu ft)		589.66
Net Gas Sample Volume (cu ft)	V(m)	(46.13)
Vol of Liquid Collected (ml)	Vl(c)	93.8
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.415)
Wt. of Filter Particulate (gm)		8.8225
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(8.8225)
O2 Concentration (by CEM)	% O2	4.00
CO2 Concentration (by CEM)	% CO2	15.20
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.69)

Sample Point	dClock Time	Velocity Head, dP (in H20)	Orifice Meter, dH (in H20)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.55	0.77	430.00	93.0		0.7416
2	4.00	0.50	0.70	435.00	93.0		0.7071
3	4.00	0.55	0.77	452.00	93.0		0.7416
B1	4.00	0.60	0.84	430.00	94.0		0.7746
2	4.00	0.50	0.70	445.00	94.0		0.7071
3	4.00	0.48	0.66	456.00	95.0		0.6928
C1	4.00	0.56	0.78	428.00	95.0		0.7483
2	4.00	0.50	0.70	442.00	95.0		0.7071
3	4.00	0.67	0.94	452.00	96.0		0.8185
D1	4.00	0.70	0.98	442.00	96.0		0.8367
2	4.00	0.55	0.77	444.00	97.0		0.7416
3	4.00	0.65	0.91	448.00	97.0		0.8062
E1	4.00	0.60	0.84	429.00	97.0		0.7746
2	4.00	0.55	0.77	444.00	98.0		0.7416
3	4.00	0.60	0.84	452.00	98.0		0.7416
E1	4.00	0.55	0.77	443.00	98.0		0.7211
2	4.00	0.52	0.73	450.00	99.0		0.7681
3	4.00	0.59	0.83	458.00	99.0		0.7874
F1	4.00	0.62	0.84	449.00	98.0		0.7874
2	4.00	0.56	0.78	455.00	98.0		0.7874
3	4.00	0.56	0.78	461.00	99.0		0.7483
F1	4.00	0.66	0.92	460.00	99.0		0.8124
2	4.00	0.55	0.77	461.00	99.0		0.7416
3	4.00	0.57	0.80	462.00	100.0		0.7550
TOTALS	96.00	13.74	19.19	10728.00	2320.00	0.0	18.1900

FIELD DATA AVERAGES

Avg Velocity Head (in H20)	dP(avg)	=	0.573
Avg Orifice Meter Reading (in H20)	dH(avg)	=	0.800
Avg Stack Temperature (degF)	T(s avg)	=	447.0
Average Meter Temperature (degF)	T(m avg)	=	48.3
Avg SQRT(dP)		=	0.756

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	48.20
Stack Gas Water Vapor Proportion	B(wo)	=	0.064
Mol. Wt., Stack Gas Dry	M(d)	=	30.49
Mol. Wt., Stack Gas Wet	M(s)	=	29.44
Abs Stack Pressure (in Hg)	P(s)	=	30.78
Avg Stack Velocity (ft/sec)	V(s avg)	=	54.5
Isokineticity (%)	% I	=	108.1
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	17[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	313[illegible]
Percent XS Air	PEA	=	20.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.8244
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	5230
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	2.2857
Heat Input Rate, MBtu/hr		=	865.25
Particulate Emission Rate(lb/hr)	E(p)	=	4165.127
Particulate Emission Rate(lb/MBtu)		=	4.8146

APPENDIX D

OPTIMIZATION TEST

M5 PARTICULATE LOADING AT ESP OUTLET—DATA SUMMARY

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/1/92 Printed 04-Aug — Test No./Type: M5-01
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1910-2210

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.172
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.44
Stack Static Pressure (in H2O)	P(stack)	19.000
Gas Meter Initial Reading (cu ft)		60.30
Gas Meter Final Reading (cu ft)		102.20
Net Gas Sample Volume (cu ft)	V(m)	(41.90)
Vol of Liquid Collected (ml)	Vl(c)	81.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.813)
Wt. of Filter Particulate (gm)		0.0557
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0557)
O2 Concentration (by CEM)	% O2	3.80
CO2 Concentration (by CEM)	% CO2	15.40
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.80)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter,dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.4	0.73	496	60.0	60.0	1.1832
2	4.00	1.1	0.57	496	62.0	60.0	1.0488
3	4.00	1.1	0.57	498	64.0	60.0	1.0488
B1	4.00	1.4	0.73	500	65.0	61.0	1.1832
2	4.00	1.5	0.78	502	67.0	62.0	1.2247
3	4.00	1.3	0.68	505	69.0	62.0	1.1402
C1	4.00	1.0	0.52	503	70.0	64.0	1.0000
2	4.00	1.4	0.73	507	71.0	64.0	1.1832
3	4.00	1.5	0.78	507	71.0	64.0	1.2247
D1	4.00	1.6	0.84	515	72.0	65.0	1.2649
2	4.00	1.5	0.78	514	73.0	66.0	1.2247
3	4.00	1.1	0.57	512	73.0	66.0	1.0488
E1	4.00	1.2	0.63	532	74.0	67.0	1.0954
2	4.00	1.1	0.57	544	74.0	67.0	1.0488
3	4.00	0.9	0.47	546	75.0	68.0	0.9487
F1	4.00	1.5	0.78	551	75.0	69.0	1.2247
2	4.00	1.4	0.73	550	75.0	70.0	1.1832
3	4.00	1.4	0.73	547	75.0	70.0	1.1832
G1	4.00	1.5	0.78	551	76.0	71.0	1.2247
2	4.00	1.3	0.68	555	76.0	71.0	1.1402
3	4.00	1.3	0.68	550	76.0	72.0	1.1402
H1	4.00	1.1	0.57	518	77.0	72.0	1.0488
2	4.00	1.5	0.78	528	77.0	72.0	1.2247
3	4.00	1.3	0.68	534	79.0	73.0	1.1402
TOTALS	96.00	31.40	16.36	12561.0	1726.0	1596.0	27.3783

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.308
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.682
Avg Stack Temperature (degF)	T(s avg)	=	523.4
Average Meter Temperature (degF)	T(m avg)	=	69.2
Avg SQRT(dP)		=	1.141

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	41.60
Stack Gas Water Vapor Proportion	B(wo)	=	0.084
Mol. Wt., Stack Gas Dry	M(d)	=	30.62
Mol. Wt., Stack Gas Wet	M(s)	=	29.56
Abs Stack Pressure (in Hg)	P(s)	=	30.84
Avg Stack Velocity (ft/sec)	V(s avg)	=	85.1
Isokineticity (%)	% I	=	103.8
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	248455
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	490126
Percent XS Air	PEA	=	21.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0207
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	38
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0165
Heat Input Rate, MBtu/hr		=	1242.05
Particulate Emission Rate(lb/hr)	E(p)	=	43.991
Particulate Emission Rate(lb/MBtu)		=	0.0354

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/2/92 Printed 04-Aug — Test No./Type: M5-02
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1130-1405

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.172
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.44
Stack Static Pressure (in H2O)	P(stack)	19.000
Gas Meter Initial Reading (cu ft)		60.30
Gas Meter Final Reading (cu ft)		102.20
Net Gas Sample Volume (cu ft)	V(m)	(41.90)
Vol of Liquid Collected (ml)	Vl(c)	65.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.060)
Wt. of Filter Particulate (gm)		0.0930
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0930)
O2 Concentration (by CEM)	% O2	3.60
CO2 Concentration (by CEM)	% CO2	15.50
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter,dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.30	0.68	490	56.0	54.0	1.1402
2	4.00	1.10	0.57	490	59.0	55.0	1.0488
3	4.00	1.10	0.57	490	61.0	56.0	1.0488
B1	4.00	1.30	0.68	494	62.0	57.0	1.1402
2	4.00	1.40	0.73	496	65.0	58.0	1.1832
3	4.00	1.20	0.62	497	66.0	58.0	1.0954
C1	4.00	1.00	0.52	497	66.0	59.0	1.0000
2	4.00	1.30	0.68	501	68.0	60.0	1.1402
3	4.00	0.98	0.51	501	68.0	60.0	0.9899
D1	4.00	1.50	0.78	509	66.0	61.0	1.2247
2	4.00	1.50	0.78	508	69.0	61.0	1.2247
3	4.00	1.10	0.57	506	70.0	62.0	1.0488
E1	4.00	0.20	0.62	532	67.0	62.0	0.4472
2	4.00	1.10	0.57	542	70.0	63.0	1.0488
3	4.00	0.80	0.41	540	71.0	64.0	0.8944
F1	4.00	1.40	0.73	544	69.0	64.0	1.1832
2	4.00	1.30	0.68	544	71.0	64.0	1.1402
3	4.00	1.30	0.68	541	72.0	64.0	1.1402
G1	4.00	1.40	0.73	545	71.0	64.0	1.1832
2	4.00	1.20	0.62	545	72.0	65.0	1.0954
3	4.00	1.20	0.62	544	72.0	65.0	1.0954
H1	4.00	1.10	0.57	510	70.0	65.0	1.0488
2	4.00	1.50	0.78	522	72.0	66.0	1.2247
3	4.00	1.20	0.62	525	73.0	66.0	1.0954
TOTALS	96.00	28.48	15.32	12413.0	1626.0	1473.0	25.8822

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.187
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.638
Avg Stack Temperature (degF)	T(s avg)	=	517.2
Average Meter Temperature (degF)	T(m avg)	=	64.6
Avg SQRT(dP)		=	1.078

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	41.96
Stack Gas Water Vapor Proportion	B(wo)	=	0.065
Mol. Wt., Stack Gas Dry	M(d)	=	30.62
Mol. Wt., Stack Gas Wet	M(s)	=	29.77
Abs Stack Pressure (in Hg)	P(s)	=	30.64
Avg Stack Velocity (ft/sec)	V(s avg)	=	79.9
Isokineticity (%)	% I	=	109.0
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	2[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	460[illegible]
Percent XS Air	PEA	=	20.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0342
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	63
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0275
Heat Input Rate, MBtu/hr		=	1206.19
Particulate Emission Rate(lb/hr)	E(p)	=	69.987
Particulate Emission Rate(lb/MBtu)		=	0.0579

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/3/92 Printed 04-Aug — Test No./Type: M5-03
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1138-1335

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.172
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.60
Stack Static Pressure (in H2O)	P(stack)	21.000
Gas Meter Initial Reading (cu ft)		102.40
Gas Meter Final Reading (cu ft)		147.20
Net Gas Sample Volume (cu ft)	V(m)	(44.80)
Vol of Liquid Collected (ml)	Vl(c)	89.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.189)
Wt. of Filter Particulate (gm)		0.2221
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.2221)
O2 Concentration (by CEM)	% O2	4.70
CO2 Concentration (by CEM)	% CO2	14.70
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.60)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.60	0.83	496	66.0	65.0	1.2649
2	4.00	1.50	0.78	496	68.0	66.0	1.2247
3	4.00	1.30	0.68	499	70.0	66.0	1.1402
B1	4.00	1.50	0.78	503	70.0	66.0	1.2247
2	4.00	1.70	0.88	510	72.0	67.0	1.3038
3	4.00	1.40	0.73	512	73.0	67.0	1.1832
C1	4.00	1.40	0.73	518	70.0	66.0	1.1832
2	4.00	1.60	0.83	521	72.0	66.0	1.2649
3	4.00	1.30	0.68	522	73.0	67.0	1.1402
D1	4.00	1.60	0.83	530	71.0	66.0	1.2649
2	4.00	1.80	0.93	532	73.0	67.0	1.3416
3	4.00	1.30	0.68	531	75.0	67.0	1.1402
E1	4.00	1.50	0.78	511	72.0	68.0	1.2247
2	4.00	1.60	0.83	582	74.0	68.0	1.2649
3	4.00	1.10	0.57	585	75.0	68.0	1.0488
F1	4.00	1.10	0.57	583	73.0	69.0	1.0488
2	4.00	1.10	0.57	589	75.0	69.0	1.0488
3	4.00	0.97	0.51	585	75.0	70.0	0.9849
G1	4.00	1.10	0.57	590	75.0	70.0	1.0488
2	4.00	1.20	0.62	593	75.0	70.0	1.0954
3	4.00	0.91	0.47	588	76.0	71.0	0.9539
H1	4.00	1.60	0.83	559	76.0	71.0	1.2649
2	4.00	1.80	0.94	564	79.0	72.0	1.3416
3	4.00	1.10	0.57	563	80.0	72.0	1.0488
TOTALS	96.00	33.08	17.19	13062.0	1758.0	1634.0	28.0512

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.378
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.716
Avg Stack Temperature (degF)	T(s avg)	=	544.3
Average Meter Temperature (degF)	T(m avg)	=	70.7
Avg SQRT(dP)		=	1.169

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	44.60
Stack Gas Water Vapor Proportion	B(wo)	=	0.085
Mol. Wt., Stack Gas Dry	M(d)	=	30.54
Mol. Wt., Stack Gas Wet	M(s)	=	29.46
Abs Stack Pressure (in Hg)	P(s)	=	31.14
Avg Stack Velocity (ft/sec)	V(s avg)	=	87.8
Isokineticity (%)	% I	=	109.3
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	253027
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	505766
Percent XS Air	PEA	=	28.4
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0765
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	151
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0660
Heat Input Rate, MBtu/hr		=	1196.33
Particulate Emission Rate(lb/hr)	E(p)	=	166.596
Particulate Emission Rate(lb/MBtu)		=	0.1390

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/6/92 Printed 04-Aug — Test No./Type: M5-04
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1325-1519

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.172
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.60
Stack Static Pressure (in H20)	P(stack)	12.000
Gas Meter Initial Reading (cu ft)		147.30
Gas Meter Final Reading (cu ft)		182.90
Net Gas Sample Volume (cu ft)	V(m)	(35.60)
Vol of Liquid Collected (ml)	Vl(c)	62.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(2.918)
Wt. of Filter Particulate (gm)		0.0527
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0527)
O2 Concentration (by CEM)	% O2	4.20
CO2 Concentration (by CEM)	% CO2	11.10
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(84.70)

Sample Point	dClock Time	Velocity Head, dP (in H20)	Orifice Meter, dH (in H20)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.90	0.47	483	79.0	77.0	0.9487
2	4.00	0.78	0.41	483	80.0	78.0	0.8832
3	4.00	0.77	0.40	484	81.0	78.0	0.8775
B1	4.00	1.10	0.57	489	81.0	79.0	1.0488
2	4.00	0.95	0.49	490	83.0	79.0	0.9747
3	4.00	0.80	0.42	490	84.0	79.0	0.8944
C1	4.00	0.62	0.32	489	83.0	80.0	0.7874
2	4.00	0.77	0.40	489	84.0	79.0	0.8775
3	4.00	0.68	0.35	489	84.0	80.0	0.8246
D1	4.00	1.00	0.52	492	84.0	81.0	1.0000
2	4.00	1.10	0.57	493	85.0	81.0	1.0488
3	4.00	0.82	0.43	493	85.0	81.0	0.9055
E1	4.00	0.71	0.37	508	83.0	80.0	0.8426
2	4.00	0.70	0.36	510	84.0	81.0	0.8367
3	4.00	0.40	0.21	508	84.0	80.0	0.6325
F1	4.00	0.95	0.49	509	82.0	80.0	0.9747
2	4.00	0.88	0.46	511	83.0	80.0	0.9381
3	4.00	0.81	0.42	510	84.0	80.0	0.9000
G1	4.00	0.79	0.41	510	83.0	80.0	0.8888
2	4.00	0.80	0.42	511	84.0	80.0	0.8944
3	4.00	0.87	0.45	509	84.0	80.0	0.9327
H1	4.00	0.77	0.40	481	84.0	81.0	0.8775
2	4.00	0.86	0.45	492	85.0	81.0	0.9274
3	4.00	0.61	0.32	493	85.0	81.0	0.7810
TOTALS	96.00	19.44	10.11	11916.0	1998.0	1916.0	21.4975

FIELD DATA AVERAGES

Avg Velocity Head (in H20)	dP(avg)	=	0.810
Avg Orifice Meter Reading (in H20)	dH(avg)	=	0.421
Avg Stack Temperature (degF)	T(s avg)	=	496.5
Average Meter Temperature (degF)	T(m avg)	=	81.5
Avg SQRT(dP)		=	0.896

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	34.70
Stack Gas Water Vapor Proportion	B(wo)	=	0.078
Mol. Wt., Stack Gas Dry	M(d)	=	29.94
Mol. Wt., Stack Gas Wet	M(s)	=	29.02
Abs Stack Pressure (in Hg)	P(s)	=	30.48
Avg Stack Velocity (ft/sec)	V(s avg)	=	66.9
Isokineticity (%)	% I	=	107.7
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	19[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	385285
Percent XS Air	PEA	=	23.1
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0234
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	45
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0195
Heat Input Rate, MBtu/hr		=	975.80
Particulate Emission Rate(lb/hr)	E(p)	=	40.158
Particulate Emission Rate(lb/MBtu)		=	0.0412

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/7/92 Printed 04-Aug — Test No./Type: M5-05
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1017-1209

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.172
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.50
Stack Static Pressure (in H2O)	P(stack)	21.000
Gas Meter Initial Reading (cu ft)		183.10
Gas Meter Final Reading (cu ft)		226.50
Net Gas Sample Volume (cu ft)	V(m)	(43.40)
Vol of Liquid Collected (ml)	Vl(c)	88.7
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.175)
Wt. of Filter Particulate (gm)		0.1418
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.1418)
O2 Concentration (by CEM)	% O2	3.00
CO2 Concentration (by CEM)	% CO2	15.60
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.40)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter,dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.40	0.73	499	74.0	73.0	1.1832
2	4.00	1.20	0.62	499	76.0	74.0	1.0954
3	4.00	1.30	0.68	499	79.0	75.0	1.1402
B1	4.00	1.50	0.78	500	80.0	75.0	1.2247
2	4.00	1.40	0.73	505	83.0	76.0	1.1832
3	4.00	1.30	0.68	505	83.0	76.0	1.1402
C1	4.00	1.10	0.57	501	83.0	77.0	1.0488
2	4.00	1.40	0.73	509	84.0	77.0	1.1832
3	4.00	1.10	0.57	509	85.0	77.0	1.0488
D1	4.00	1.50	0.78	516	83.0	77.0	1.2247
2	4.00	1.60	0.83	516	84.0	77.0	1.2649
3	4.00	1.20	0.62	514	85.0	78.0	1.0954
E1	4.00	1.30	0.68	557	82.0	78.0	1.1402
2	4.00	1.10	0.57	558	85.0	78.0	1.0488
3	4.00	0.74	0.38	556	85.0	79.0	0.8602
F1	4.00	1.40	0.73	561	84.0	79.0	1.1832
2	4.00	1.20	0.62	563	85.0	80.0	1.0954
3	4.00	1.20	0.62	562	86.0	80.0	1.0954
G1	4.00	1.30	0.68	563	85.0	80.0	1.1402
2	4.00	1.10	0.57	564	86.0	80.0	1.0488
3	4.00	0.98	0.51	562	87.0	81.0	0.9899
H1	4.00	1.40	0.73	542	86.0	81.0	1.1832
2	4.00	0.98	0.51	543	88.0	82.0	0.9899
3	4.00	0.98	0.51	543	88.0	82.0	0.9899
TOTALS	96.00	29.68	15.43	12746.0	2006.0	1872.0	26.5983

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.237
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.643
Avg Stack Temperature (degF)	T(s avg)	=	531.1
Average Meter Temperature (degF)	T(m avg)	=	80.8
Avg SQRT(dP)		=	1.108

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	42.25
Stack Gas Water Vapor Proportion	B(wo)	=	0.090
Mol. Wt., Stack Gas Dry	M(d)	=	30.62
Mol. Wt., Stack Gas Wet	M(s)	=	29.46
Abs Stack Pressure (in Hg)	P(s)	=	31.04
Avg Stack Velocity (ft/sec)	V(s avg)	=	82.8
Isokineticity (%)	% I	=	109.2
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	239974
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	477036
Percent XS Air	PEA	=	16.2
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0516
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	92
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0403
Heat Input Rate, MBtu/hr		=	1255.77
Particulate Emission Rate(lb/hr)	E(p)	=	106.487
Particulate Emission Rate(lb/MBtu)		=	0.0846

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/8/92 Printed 04-Aug — Test No./Type: M5-06
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1109-1309

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.172
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.48
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		226.70
Gas Meter Final Reading (cu ft)		268.90
Net Gas Sample Volume (cu ft)	V(m)	(42.20)
Vol of Liquid Collected (ml)	Vl(c)	73.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.460)
Wt. of Filter Particulate (gm)		0.1499
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.1499)
O2 Concentration (by CEM)	% O2	2.60 (from B&W)
CO2 Concentration (by CEM)	% CO2	15.90 (estimate)
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.50)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter,dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.30	0.68	486	72.0	71.0	1.1402
2	4.00	1.10	0.57	488	74.0	72.0	1.0488
3	4.00	1.40	0.73	487	76.0	72.0	1.1832
B1	4.00	1.40	0.73	491	78.0	73.0	1.1832
2	4.00	1.30	0.68	492	79.0	73.0	1.1402
3	4.00	1.20	0.65	492	80.0	73.0	1.0954
C1	4.00	1.20	0.65	475	79.0	74.0	1.0954
2	4.00	1.30	0.68	490	80.0	74.0	1.1402
3	4.00	1.20	0.65	490	80.0	74.0	1.0954
D1	4.00	1.50	0.78	489	78.0	74.0	1.2247
2	4.00	1.50	0.78	492	80.0	74.0	1.2247
3	4.00	1.30	0.68	492	80.0	74.0	1.1402
E1	4.00	1.40	0.73	499	77.0	74.0	1.1832
2	4.00	1.00	0.52	503	79.0	74.0	1.0000
3	4.00	0.90	0.47	501	80.0	75.0	0.9487
F1	4.00	1.30	0.68	500	79.0	75.0	1.1402
2	4.00	1.30	0.68	504	79.0	74.0	1.1402
3	4.00	1.10	0.57	503	80.0	74.0	1.0488
G1	4.00	1.20	0.62	504	79.0	75.0	1.0954
2	4.00	1.20	0.62	505	80.0	75.0	1.0954
3	4.00	0.93	0.48	503	80.0	74.0	0.9644
H1	4.00	1.50	0.78	504	79.0	75.0	1.2247
2	4.00	1.00	0.52	506	80.0	75.0	1.0000
3	4.00	0.97	0.50	505	80.0	74.0	0.9849
TOTALS	96.00	29.50	15.43	11901.0	1888.0	1772.0	26.5377

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.229
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.643
Avg Stack Temperature (degF)	T(s avg)	=	495.9
Average Meter Temperature (degF)	T(m avg)	=	76.3
Avg SQRT(dP)		=	1.106

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	41.40
Stack Gas Water Vapor Proportion	B(wo)	=	0.077
Mol. Wt., Stack Gas Dry	M(d)	=	30.65
Mol. Wt., Stack Gas Wet	M(s)	=	29.67
Abs Stack Pressure (in Hg)	P(s)	=	30.95
Avg Stack Velocity (ft/sec)	V(s avg)	=	81.0
Isokineticity (%)	% I	=	104.4
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	24[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	4666[illegible]
Percent XS Air	PEA	=	13.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0559
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	.97
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0425
Heat Input Rate, MBtu/hr		=	1316.40
Particulate Emission Rate(lb/hr)	E(p)	=	117.792
Particulate Emission Rate(lb/MBtu)		=	0.0895

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/9/92 Printed 04-Aug — Test No./Type: M5-07
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1100-1249

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.172
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.44
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		268.80
Gas Meter Final Reading (cu ft)		309.90
Net Gas Sample Volume (cu ft)	V(m)	(41.10)
Vol of Liquid Collected (ml)	Vl(c)	45.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(2.142)
Wt. of Filter Particulate (gm)		0.1005
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.1005)
O2 Concentration (by CEM)	% O2	2.70 (from B&W)
CO2 Concentration (by CEM)	% CO2	15.80 (estimate)
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.50)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.30	0.68	482	68.0	66.0	1.1402
2	4.00	1.10	0.57	481	69.0	67.0	1.0488
3	4.00	1.00	0.52	480	71.0	68.0	1.0000
B1	4.00	1.50	0.78	482	72.0	68.0	1.2247
2	4.00	1.20	0.62	484	74.0	68.0	1.0954
3	4.00	1.30	0.68	484	75.0	69.0	1.1402
C1	4.00	0.86	0.45	483	73.0	69.0	0.9274
2	4.00	1.20	0.62	484	74.0	69.0	1.0954
3	4.00	1.00	0.52	484	75.0	69.0	1.0000
D1	4.00	1.50	0.78	486	74.0	70.0	1.2247
2	4.00	1.50	0.78	488	76.0	70.0	1.2247
3	4.00	1.10	0.57	488	77.0	70.0	1.0488
E1	4.00	1.10	0.57	493	75.0	70.0	1.0488
2	4.00	1.10	0.57	500	76.0	71.0	1.0488
3	4.00	0.62	0.32	499	77.0	71.0	0.7874
F1	4.00	1.40	0.73	497	76.0	71.0	1.1832
2	4.00	1.10	0.57	503	77.0	71.0	1.0488
3	4.00	1.10	0.57	505	77.0	71.0	1.0488
G1	4.00	1.30	0.68	503	76.0	71.0	1.1402
2	4.00	1.10	0.57	504	77.0	71.0	1.0488
3	4.00	1.10	0.57	503	77.0	71.0	1.0488
H1	4.00	1.20	0.62	505	75.0	71.0	1.0954
2	4.00	1.30	0.68	505	77.0	71.0	1.1402
3	4.00	1.20	0.62	504	78.0	71.0	1.0954
TOTALS	96.00	28.18	14.64	11827.0	1796.0	1674.0	25.9052

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.174
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.610
Avg Stack Temperature (degF)	T(s avg)	=	492.8
Average Meter Temperature (degF)	T(m avg)	=	72.3
Avg SQRT(dP)		=	1.079

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	40.56
Stack Gas Water Vapor Proportion	B(wo)	=	0.050
Mol. Wt., Stack Gas Dry	M(d)	=	30.64
Mol. Wt., Stack Gas Wet	M(s)	=	30.00
Abs Stack Pressure (in Hg)	P(s)	=	30.91
Avg Stack Velocity (ft/sec)	V(s avg)	=	76.6
Isokineticity (%)	% I	=	102.2
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	246091
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	452544
Percent XS Air	PEA	=	14.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0382
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	67
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0292
Heat Input Rate, MBtu/hr		=	1309.36
Particulate Emission Rate(lb/hr)	E(p)	=	80.606
Particulate Emission Rate(lb/MBtu)		=	0.0616

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/10/92 Printed 04-Aug — Test No./Type: M5-D8
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1053-1338

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.172
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.62
Stack Static Pressure (in H2O)	P(stack)	19.000
Gas Meter Initial Reading (cu ft)		310.60
Gas Meter Final Reading (cu ft)		351.40
Net Gas Sample Volume (cu ft)	V(m)	(40.80)
Vol of Liquid Collected (ml)	Vl(c)	59.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(2.777)
Wt. of Filter Particulate (gm)		0.0476
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0476)
O2 Concentration (by CEM)	% O2	2.90
CO2 Concentration (by CEM)	% CO2	15.20
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter,dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.40	0.73	471	49.0	48.0	1.1832
2	4.00	1.10	0.57	471	52.0	49.0	1.0488
3	4.00	1.10	0.57	471	53.0	49.0	1.0488
B1	4.00	1.40	0.73	474	54.0	50.0	1.1832
2	4.00	1.30	0.68	475	56.0	50.0	1.1402
3	4.00	1.20	0.62	475	56.0	50.0	1.0954
C1	4.00	1.10	0.57	472	55.0	51.0	1.0488
2	4.00	1.20	0.62	474	57.0	51.0	1.0954
3	4.00	0.95	0.49	474	56.0	51.0	0.9747
D1	4.00	1.10	0.57	473	56.0	51.0	1.0488
2	4.00	1.40	0.73	477	57.0	52.0	1.1832
3	4.00	1.10	0.57	479	58.0	52.0	1.0488
E1	4.00	1.20	0.62	497	50.0	49.0	1.0954
2	4.00	1.10	0.57	497	51.0	49.0	1.0488
3	4.00	0.57	0.30	495	53.0	50.0	0.7550
F1	4.00	1.40	0.73	492	52.0	50.0	1.1832
2	4.00	1.20	0.62	501	54.0	50.0	1.0954
3	4.00	1.20	0.62	500	55.0	50.0	1.1832
G1	4.00	1.30	0.68	500	55.0	50.0	1.0954
2	4.00	1.20	0.62	501	56.0	50.0	1.0954
3	4.00	1.20	0.62	500	56.0	50.0	1.0954
H1	4.00	1.30	0.68	502	55.0	50.0	1.1402
2	4.00	1.30	0.68	502	57.0	51.0	1.1402
3	4.00	1.20	0.62	500	57.0	51.0	1.0954
TOTALS	96.00	28.52	14.81	11673.0	1310.0	1204.0	26.1227

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.188
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.617
Avg Stack Temperature (degF)	T(s avg)	=	486.4
Average Meter Temperature (degF)	T(m avg)	=	52.4
Avg SQRT(dP)		=	1.088

CALCULATED VALUES

Meter Volume (std, cu ft.)	V(m std)	=	42.09
Stack Gas Water Vapor Proportion	B(wo)	=	0.062
Mol. Wt., Stack Gas Dry	M(d)	=	30.55
Mol. Wt., Stack Gas Wet	M(s)	=	29.77
Abs Stack Pressure (in Hg)	P(s)	=	31.02
Avg Stack Velocity (ft/sec)	V(s avg)	=	79.1
Isokineticity (%)	% I	=	105.6
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	2[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	45[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0174
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	31
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0135
Heat Input Rate, MBtu/hr		=	1301.31
Particulate Emission Rate(lb/hr)	E(p)	=	36.977
Particulate Emission Rate(lb/MBtu)		=	0.0284

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/13/92 Printed 04-Aug — Test No./Type: M5-09
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1104-1254

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.172
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.60
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		351.80
Gas Meter Final Reading (cu ft)		392.70
Net Gas Sample Volume (cu ft)	V(m)	(40.90)
Vol of Liquid Collected (ml)	Vl(c)	97.7
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.599)
Wt. of Filter Particulate (gm)		0.0397
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0397)
O2 Concentration (by CEM)	% O2	3.40
CO2 Concentration (by CEM)	% CO2	15.10
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.50)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.30	0.68	462	42.0	40.0	1.1402
2	4.00	1.10	0.57	461	44.0	40.0	1.0488
3	4.00	1.10	0.57	462	46.0	41.0	1.0488
B1	4.00	1.50	0.78	464	46.0	41.0	1.2247
2	4.00	1.30	0.68	467	48.0	42.0	1.1402
3	4.00	1.30	0.68	468	50.0	43.0	1.1402
C1	4.00	1.10	0.57	470	49.0	44.0	1.0488
2	4.00	1.20	0.62	472	51.0	44.0	1.0954
3	4.00	0.95	0.49	472	51.0	44.0	0.9747
D1	4.00	1.50	0.78	475	50.0	45.0	1.2247
2	4.00	1.50	0.78	478	52.0	45.0	1.2247
3	4.00	1.10	0.57	477	53.0	46.0	1.0488
E1	4.00	1.20	0.62	488	50.0	46.0	1.0954
2	4.00	1.20	0.62	489	52.0	46.0	1.0954
3	4.00	0.88	0.46	488	53.0	47.0	0.9381
F1	4.00	1.20	0.62	489	52.0	47.0	1.0954
2	4.00	1.30	0.68	494	53.0	47.0	1.1402
3	4.00	1.10	0.57	493	54.0	47.0	1.0954
G1	4.00	1.20	0.62	493	53.0	48.0	1.1402
2	4.00	1.30	0.68	495	54.0	48.0	1.0488
3	4.00	1.30	0.68	494	55.0	48.0	1.1402
H1	4.00	1.10	0.57	471	53.0	48.0	1.0488
2	4.00	1.30	0.68	478	54.0	49.0	1.1402
3	4.00	1.20	0.62	482	55.0	49.0	1.0954
TOTALS	96.00	29.23	15.19	11482.0	1220.0	1085.0	26.4337

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.218
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.633
Avg Stack Temperature (degF)	T(s avg)	=	478.4
Average Meter Temperature (degF)	T(m avg)	=	48.0
Avg SQRT(dP)		=	1.101

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	42.52
Stack Gas Water Vapor Proportion	B(wo)	=	0.095
Mol. Wt., Stack Gas Dry	M(d)	=	30.55
Mol. Wt., Stack Gas Wet	M(s)	=	29.33
Abs Stack Pressure (in Hg)	P(s)	=	31.07
Avg Stack Velocity (ft/sec)	V(s avg)	=	80.3
Isokineticity (%)	% I	=	105.2
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	243772
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	462332
Percent XS Air	PEA	=	16.8
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0144
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	26
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0115
Heat Input Rate, MBtu/hr		=	1247.14
Particulate Emission Rate(lb/hr)	E(p)	=	30.117
Particulate Emission Rate(lb/MBtu)		=	0.0242

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/15/92 Printed 04-Aug — Test No./Type: M5-010
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 2139-2330

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.172
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.54
Stack Static Pressure (in H20)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		393.40
Gas Meter Final Reading (cu ft)		424.10
Net Gas Sample Volume (cu ft)	V(m)	(30.70)
Vol of Liquid Collected (ml)	Vl(c)	64.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.036)
Wt. of Filter Particulate (gm)		0.0326
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0326)
O2 Concentration (by CEM)	% O2	4.20
CO2 Concentration (by CEM)	% CO2	14.90
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.90)

Sample Point	dClock Time	Velocity Head, dP (in H20)	Orifice Meter,dH (in H20)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.65	0.34	468	58.0	57.0	0.8062
2	4.00	0.62	0.32	466	58.0	57.0	0.7874
3	4.00	0.58	0.30	465	58.0	57.0	0.7616
B1	4.00	0.74	0.38	462	59.0	57.0	0.8602
2	4.00	0.74	0.38	468	60.0	58.0	0.8602
3	4.00	0.66	0.34	469	61.0	58.0	0.8124
C1	4.00	0.62	0.32	463	61.0	58.0	0.7874
2	4.00	0.68	0.35	465	62.0	58.0	0.8246
3	4.00	0.58	0.30	464	62.0	58.0	0.7616
D1	4.00	0.63	0.33	464	61.0	58.0	0.7937
2	4.00	0.70	0.36	465	62.0	59.0	0.8367
3	4.00	0.60	0.31	463	62.0	59.0	0.7746
E1	4.00	0.66	0.34	446	61.0	59.0	0.8124
2	4.00	0.66	0.34	458	63.0	59.0	0.8124
3	4.00	0.55	0.29	457	63.0	59.0	0.7416
F1	4.00	0.82	0.43	452	62.0	59.0	0.9055
2	4.00	0.82	0.43	455	63.0	59.0	0.9055
3	4.00	0.68	0.35	451	64.0	59.0	0.9055
G1	4.00	0.48	0.25	445	63.0	59.0	0.9055
2	4.00	0.48	0.25	448	64.0	60.0	0.8246
3	4.00	0.34	0.18	446	63.0	60.0	0.5831
H1	4.00	0.57	0.30	419	62.0	59.0	0.7550
2	4.00	0.76	0.39	424	63.0	60.0	0.8718
3	4.00	0.69	0.36	428	63.0	60.0	0.8307
TOTALS	96.00	15.31	7.94	10911.0	1478.0	1406.0	19.5204

FIELD DATA AVERAGES

Avg Velocity Head (in H20)	dP(avg)	=	0.638
Avg Orifice Meter Reading (in H20)	dH(avg)	=	0.331
Avg Stack Temperature (degF)	T(s avg)	=	454.6
Average Meter Temperature (degF)	T(m avg)	=	60.1
Avg SQRT(dP)		=	0.813

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	31.09
Stack Gas Water Vapor Proportion	B(wo)	=	0.089
Mol. Wt., Stack Gas Dry	M(d)	=	30.55
Mol. Wt., Stack Gas Wet	M(s)	=	29.44
Abs Stack Pressure (in Hg)	P(s)	=	30.57
Avg Stack Velocity (ft/sec)	V(s avg)	=	58.9
Isokineticity (%)	% I	=	105.8
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	1[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	3[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0162
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	31
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0135
Heat Input Rate, MBtu/hr		=	889.82
Particulate Emission Rate(lb/hr)	E(p)	=	25.231
Particulate Emission Rate(lb/MBtu)		=	0.0284

B&W/WPL, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/16/92 Printed 04-Aug — Test No./Type: M5-011
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 2048-2232

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.172
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.64
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		424.30
Gas Meter Final Reading (cu ft)		455.10
Net Gas Sample Volume (cu ft)	V(m)	(30.80)
Vol of Liquid Collected (ml)	Vl(c)	79.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.719)
Wt. of Filter Particulate (gm)		0.0392
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0392)
O2 Concentration (by CEM)	% O2	3.80
CO2 Concentration (by CEM)	% CO2	15.90
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.30)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.75	0.39	476	62.0	61.0	0.8660
2	4.00	0.64	0.33	474	64.0	62.0	0.8000
3	4.00	0.63	0.33	473	65.0	62.0	0.7937
B1	4.00	0.83	0.43	472	66.0	63.0	0.9110
2	4.00	0.76	0.40	475	67.0	64.0	0.8718
3	4.00	0.74	0.38	476	68.0	64.0	0.8602
C1	4.00	0.49	0.25	471	69.0	65.0	0.7000
2	4.00	0.75	0.39	471	70.0	65.0	0.8660
3	4.00	0.60	0.31	468	71.0	66.0	0.7746
D1	4.00	0.54	0.28	470	71.0	66.0	0.7348
2	4.00	0.75	0.39	470	71.0	67.0	0.8660
3	4.00	0.59	0.31	467	72.0	67.0	0.7681
E1	4.00	0.77	0.40	441	71.0	68.0	0.8775
2	4.00	0.61	0.32	458	72.0	68.0	0.7810
3	4.00	0.52	0.27	456	73.0	69.0	0.7211
F1	4.00	0.73	0.38	454	72.0	69.0	0.8544
2	4.00	0.69	0.36	455	73.0	69.0	0.8307
3	4.00	0.67	0.35	452	73.0	69.0	0.8544
G1	4.00	0.47	0.24	447	72.0	69.0	0.8307
2	4.00	0.43	0.22	449	72.0	69.0	0.8185
3	4.00	0.38	0.20	448	72.0	69.0	0.6164
H1	4.00	0.60	0.31	420	72.0	69.0	0.7746
2	4.00	0.72	0.37	425	72.0	70.0	0.8485
3	4.00	0.63	0.33	429	73.0	70.0	0.7937
TOTALS	96.00	15.29	7.94	10997.0	1683.0	1600.0	19.4140

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.837
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.331
Avg Stack Temperature (degF)	T(s avg)	=	455.2
Average Meter Temperature (degF)	T(m avg)	=	68.4
Avg SQRT(dP)		=	0.805

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	30.81
Stack Gas Water Vapor Proportion	B(wo)	=	0.105
Mol. Wt., Stack Gas Dry	M(d)	=	30.70
Mol. Wt., Stack Gas Wet	M(s)	=	29.33
Abs Stack Pressure (in Hg)	P(s)	=	30.87
Avg Stack Velocity (ft/sec)	V(s avg)	=	56.7
Isokineticity (%)	% I	=	107.5
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	177603
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	336080
Percent XS Air	PEA	=	21.8
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0195
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	37
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0160
Heat Input Rate, MBtu/hr		=	886.85
Particulate Emission Rate(lb/hr)	E(p)	=	29.925
Particulate Emission Rate(lb/MBtu)		=	0.0337

B&W/WPL., Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/21/92 Printed 04-Aug — Test No./Type: M5-012
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 2204-2356

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.172
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	28.82
Stack Static Pressure (in H2O)	P(stack)	15.000
Gas Meter Initial Reading (cu ft)		455.90
Gas Meter Final Reading (cu ft)		487.30
Net Gas Sample Volume (cu ft)	V(m)	(31.40)
Vol of Liquid Collected (ml)	Vl(c)	34.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(1.600)
Wt. of Filter Particulate (gm)		0.0294
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0294)
O2 Concentration (by CEM)	% O2	4.50
CO2 Concentration (by CEM)	% CO2	13.80
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.70)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.76	0.40	485	43.0	43.0	0.8718
2	4.00	0.71	0.37	484	44.0	43.0	0.8426
3	4.00	0.65	0.34	483	45.0	43.0	0.8062
B1	4.00	0.91	0.47	485	46.0	43.0	0.9539
2	4.00	0.83	0.43	487	47.0	44.0	0.9110
3	4.00	0.76	0.40	488	48.0	44.0	0.8718
C1	4.00	0.61	0.31	483	48.0	44.0	0.7810
2	4.00	0.65	0.34	483	48.0	45.0	0.8062
3	4.00	0.58	0.30	484	49.0	45.0	0.7616
D1	4.00	0.67	0.35	483	48.0	45.0	0.8185
2	4.00	0.70	0.36	482	48.0	45.0	0.8367
3	4.00	0.61	0.31	481	49.0	45.0	0.7810
E1	4.00	0.84	0.44	466	48.0	45.0	0.9165
2	4.00	0.75	0.39	475	49.0	45.0	0.8660
3	4.00	0.54	0.28	474	49.0	46.0	0.7348
F1	4.00	0.80	0.42	471	49.0	46.0	0.8944
2	4.00	0.66	0.34	470	50.0	46.0	0.8124
3	4.00	0.62	0.32	467	50.0	46.0	0.8944
G1	4.00	0.56	0.29	467	49.0	46.0	0.8124
2	4.00	0.64	0.33	467	50.0	46.0	0.7874
3	4.00	0.57	0.30	467	50.0	46.0	0.7550
H1	4.00	0.73	0.38	441	49.0	46.0	0.8544
2	4.00	0.89	0.46	446	49.0	46.0	0.9434
3	4.00	0.64	0.33	448	50.0	46.0	0.8000
TOTALS	96.00	16.68	8.66	11367.0	1155.0	1079.0	20.1137

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.69[illegible]
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.3[illegible]
Avg Stack Temperature (degF)	T(s avg)	=	473.6
Average Meter Temperature (degF)	T(m avg)	=	46.5
Avg SQRT(dP)		=	0.835

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	31.85
Stack Gas Water Vapor Proportion	B(wc)	=	0.04[illegible]
Mol. Wt., Stack Gas Dry	M(d)	=	30.39
Mol. Wt., Stack Gas Wet	M(s)	=	29.80
Abs Stack Pressure (in Hg)	P(s)	=	29.92
Avg Stack Velocity (ft/sec)	V(s avg)	=	61.6
Isokineticity (%)	% I	=	103.4
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	1[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0142
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	26
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0121
Heat Input Rate, MBtu/hr		=	915.93
Particulate Emission Rate(lb/hr)	E(p)	=	23.297
Particulate Emission Rate(lb/MBtu)		=	0.0254

B&W/WPL, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/22/92 Printed 04-Aug — Test No./Type: M5-013
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 2224-0011

PARAMETER	SYMBO.	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.48
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		487.50
Gas Meter Final Reading (cu ft)		521.00
Net Gas Sample Volume (cu ft)	V(m)	(33.50)
Vol of Liquid Collected (ml)	Vl(c)	73.8
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.474)
Wt. of Filter Particulate (gm)		0.0544
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0544)
O2 Concentration (by CEM)	% O2	4.60
CO2 Concentration (by CEM)	% CO2	14.20
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.20)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.27	0.38	429	48.0	47.0	0.5196
2	4.00	0.30	0.42	432	48.0	47.0	0.5477
3	4.00	0.28	0.39	431	50.0	48.0	0.5292
B1	4.00	0.35	0.49	439	51.0	48.0	0.5916
2	4.00	0.35	0.49	432	52.0	49.0	0.5916
3	4.00	0.33	0.46	431	53.0	49.0	0.5745
C1	4.00	0.26	0.36	427	53.0	50.0	0.5099
2	4.00	0.30	0.42	427	55.0	50.0	0.5477
3	4.00	0.28	0.39	425	56.0	51.0	0.5292
D1	4.00	0.27	0.38	425	56.0	51.0	0.5196
2	4.00	0.30	0.42	425	57.0	52.0	0.5477
3	4.00	0.28	0.39	423	58.0	52.0	0.5292
E1	4.00	0.32	0.45	417	57.0	53.0	0.5657
2	4.00	0.28	0.39	422	59.0	54.0	0.5292
3	4.00	0.22	0.31	421	59.0	54.0	0.4690
F1	4.00	0.35	0.49	415	59.0	55.0	0.5916
2	4.00	0.33	0.46	418	60.0	55.0	0.5745
3	4.00	0.32	0.45	416	61.0	55.0	0.5916
G1	4.00	0.15	0.21	411	59.0	55.0	0.5745
2	4.00	0.20	0.28	412	60.0	55.0	0.5657
3	4.00	0.17	0.24	411	60.0	56.0	0.4123
H1	4.00	0.28	0.39	397	59.0	56.0	0.5292
2	4.00	0.35	0.49	397	60.0	57.0	0.5916
3	4.00	0.35	0.49	393	61.0	56.0	0.5916
TOTALS	96.00	6.89	9.64	10076.0	1351.0	1255.0	13.1238

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.287
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.402
Avg Stack Temperature (degF)	T(s avg)	=	419.8
Average Meter Temperature (degF)	T(m avg)	=	54.3
Avg SQRT(dP)		=	0.547

CALCULATED VALUES

Meter Volume (std. cu ft.)	V(m std)	=	34.22
Stack Gas Water Vapor Proportion	B(wo)	=	0.092
Mol. Wt., Stack Gas Dry	M(d)	=	30.48
Mol. Wt., Stack Gas Wet	M(s)	=	29.32
Abs Stack Pressure (in Hg)	P(s)	=	30.20
Avg Stack Velocity (ft/sec)	V(s avg)	=	39.2
Isokineticity (%)	% I	=	106.8
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	124000
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	225528
Percent XS Air	PEA	=	27.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0245
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	48
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0210
Heat Input Rate, MBtu/hr		=	590.89
Particulate Emission Rate(lb/hr)	E(p)	=	26.084
Particulate Emission Rate(lb/MBtu)		=	0.0442

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/23/92 Printed 04-Aug — Test No./Type: M5-014
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 2240-0025

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.53
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		521.20
Gas Meter Final Reading (cu ft)		557.90
Net Gas Sample Volume (cu ft)	V(m)	(36.70)
Vol of Liquid Collected (ml)	Vl(c)	71.7
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.375)
Wt. of Filter Particulate (gm)		0.0355
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0355)
O2 Concentration (by CEM)	% O2	5.30
CO2 Concentration (by CEM)	% CO2	14.40
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.30)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.38	0.53	433	55.0	54.0	0.6164
2	4.00	0.38	0.53	439	55.0	54.0	0.6164
3	4.00	0.32	0.45	438	55.0	54.0	0.5657
B1	4.00	0.44	0.62	438	56.0	55.0	0.6633
2	4.00	0.41	0.57	441	58.0	55.0	0.6403
3	4.00	0.39	0.55	442	60.0	55.0	0.6245
C1	4.00	0.33	0.46	436	60.0	56.0	0.5745
2	4.00	0.38	0.53	441	61.0	56.0	0.6164
3	4.00	0.33	0.46	439	62.0	57.0	0.5745
D1	4.00	0.32	0.45	440	62.0	58.0	0.5657
2	4.00	0.38	0.53	440	64.0	58.0	0.6164
3	4.00	0.33	0.46	439	65.0	59.0	0.5745
E1	4.00	0.34	0.48	419	64.0	59.0	0.5831
2	4.00	0.37	0.52	443	65.0	60.0	0.6083
3	4.00	0.25	0.35	442	66.0	60.0	0.5000
F1	4.00	0.37	0.52	432	65.0	61.0	0.6083
2	4.00	0.37	0.52	441	67.0	61.0	0.6083
3	4.00	0.37	0.52	439	68.0	62.0	0.6083
G1	4.00	0.39	0.55	436	67.0	62.0	0.6083
2	4.00	0.25	0.35	436	68.0	63.0	0.6083
3	4.00	0.23	0.32	434	68.0	63.0	0.4796
H1	4.00	0.33	0.46	417	68.0	63.0	0.5745
2	4.00	0.41	0.57	416	69.0	64.0	0.6403
3	4.00	0.43	0.60	413	69.0	64.0	0.6557
TOTALS	96.00	8.50	11.90	10434.0	1517.0	1413.0	14.3315

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.354
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.495
Avg Stack Temperature (degF)	T(s avg)	=	434.8
Average Meter Temperature (degF)	T(m avg)	=	61.0
Avg SQRT(dP)		=	0.597

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	37.10
Stack Gas Water Vapor Proportion	B(wc)	=	0.083
Mol. Wt., Stack Gas Dry	M(d)	=	30.52
Mol. Wt., Stack Gas Wet	M(s)	=	29.47
Abs Stack Pressure (in Hg)	P(s)	=	30.27
Avg Stack Velocity (ft/sec)	V(s avg)	=	42.9
Isokineticity (%)	% I	=	105.8
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	13[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	247382
Percent XS Air	PEA	=	3[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0[illegible]
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	[illegible]
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0132
Heat Input Rate, MBtu/hr		=	617.29
Particulate Emission Rate(lb/hr)	E(p)	=	17.140
Particulate Emission Rate(lb/MBtu)		=	0.0278

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/24/92 Printed 04-Aug — Test No./Type: M5-015
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1108-1255

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.55
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		558.20
Gas Meter Final Reading (cu ft)		623.20
Net Gas Sample Volume (cu ft)	V(m)	(65.00)
Vol of Liquid Collected (ml)	Vl(c)	147.5
Vol of Liq @ Std Conds. (scf)	V(w std)	(6.943)
Wt. of Filter Particulate (gm)		0.0933
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0933)
O2 Concentration (by CEM)	% O2	4.20
CO2 Concentration (by CEM)	% CO2	15.30
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.50)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.20	1.70	468	54.0	53.0	1.0954
2	4.00	1.10	1.50	469	55.0	53.0	1.0488
3	4.00	1.10	1.50	469	57.0	53.0	1.0488
B1	4.00	1.50	2.10	470	60.0	56.0	1.2247
2	4.00	1.40	2.00	474	63.0	56.0	1.1832
3	4.00	1.20	1.70	473	64.0	55.0	1.0954
C1	4.00	1.10	1.50	466	63.0	55.0	1.0488
2	4.00	1.30	1.80	471	66.0	56.0	1.1402
3	4.00	1.10	1.50	471	67.0	57.0	1.0488
D1	4.00	1.10	1.50	471	66.0	57.0	1.0488
2	4.00	1.30	1.80	472	68.0	58.0	1.1402
3	4.00	1.10	1.50	472	69.0	58.0	1.0488
E1	4.00	1.20	1.70	466	65.0	59.0	1.0954
2	4.00	1.20	1.70	490	69.0	59.0	1.0954
3	4.00	0.85	1.20	490	71.0	60.0	0.9220
F1	4.00	1.30	1.80	492	70.0	61.0	1.1402
2	4.00	1.50	2.10	497	73.0	63.0	1.2247
3	4.00	1.40	2.00	496	74.0	62.0	1.1402
G1	4.00	0.92	1.30	496	71.0	62.0	1.2247
2	4.00	0.92	1.30	496	72.0	63.0	1.1832
3	4.00	0.73	1.00	496	73.0	63.0	0.9592
H1	4.00	1.20	1.70	475	71.0	63.0	0.9592
2	4.00	1.40	2.00	480	73.0	64.0	0.8544
3	4.00	1.20	1.70	484	74.0	64.0	1.0954
TOTALS	96.00	28.32	39.60	11504.0	1608.0	1410.0	26.0661

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.18[illegible]
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.65[illegible]
Avg Stack Temperature (degF)	T(s avg)	=	479.3
Average Meter Temperature (degF)	T(m avg)	=	62.9
Avg SQRT(dP)		=	1.08[illegible]

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	65.72
Stack Gas Water Vapor Proportion	B(wo)	=	0.03[illegible]
Mol. Wt., Stack Gas Dry	M(d)	=	30.82
Mol. Wt., Stack Gas Wet	M(s)	=	29.41
Abs Stack Pressure (in Hg)	P(s)	=	31.02
Avg Stack Velocity (ft/sec)	V(s avg)	=	79.1
Isokineticity (%)	% I	=	105.8
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	240271
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	455644
Percent XS Air	PEA	=	24.6
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0219
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	42
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0183
Heat Input Rate, MBtu/hr		=	1173.04
Particulate Emission Rate(lb/hr)	E(p)	=	45.104
Particulate Emission Rate(lb/MBtu)		=	0.0385

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/27/92 Printed 04-Aug — Test No./Type: M5-016
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1135-1325

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.82
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		623.50
Gas Meter Final Reading (cu ft)		686.60
Net Gas Sample Volume (cu ft)	V(m)	(63.10)
Vol of Liquid Collected (ml)	Vl(c)	123.3
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.804)
Wt. of Filter Particulate (gm)		0.1690
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.1690)
O2 Concentration (by CEM)	% O2	3.30
CO2 Concentration (by CEM)	% CO2	15.80
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.40	2.00	487	65.0	63.0	1.1832
2	4.00	1.20	1.70	487	67.0	63.0	1.0954
3	4.00	1.10	1.50	487	70.0	64.0	1.0488
B1	4.00	1.40	2.00	482	71.0	65.0	1.1832
2	4.00	1.30	1.80	490	74.0	65.0	1.1402
3	4.00	1.20	1.70	490	76.0	66.0	1.0954
C1	4.00	1.10	1.50	484	75.0	67.0	1.0488
2	4.00	1.20	1.70	486	79.0	68.0	1.0954
3	4.00	0.94	1.30	486	80.0	69.0	0.9695
D1	4.00	0.99	1.40	486	80.0	70.0	0.9950
2	4.00	1.20	1.70	486	81.0	71.0	1.0954
3	4.00	0.96	1.30	486	82.0	71.0	0.9798
E1	4.00	1.20	1.70	480	77.0	72.0	1.0954
2	4.00	1.10	1.50	505	81.0	73.0	1.0488
3	4.00	0.88	1.20	504	83.0	73.0	0.9381
F1	4.00	1.20	1.70	506	81.0	74.0	1.0954
2	4.00	1.30	1.80	509	84.0	75.0	1.1402
3	4.00	1.20	1.70	507	85.0	75.0	1.0954
G1	4.00	1.30	1.80	506	84.0	76.0	1.1402
2	4.00	1.00	1.40	508	86.0	76.0	1.0954
3	4.00	0.64	0.90	507	86.0	77.0	1.1402
H1	4.00	1.00	1.40	488	83.0	77.0	1.0000
2	4.00	1.30	1.80	493	86.0	77.0	0.8000
3	4.00	0.93	1.30	496	87.0	77.0	1.0000
TOTALS	96.00	27.04	37.80	11846.0	1903.0	1704.0	25.5195

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.127
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.575
Avg Stack Temperature (degF)	T(s avg)	=	493.6
Average Meter Temperature (degF)	T(m avg)	=	75.1
Avg SQRT(dP)		=	1.063

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	62.89
Stack Gas Water Vapor Proportion	B(wo)	=	0.064
Mol. Wt., Stack Gas Dry	M(d)	=	30.66
Mol. Wt., Stack Gas Wet	M(s)	=	29.59
Abs Stack Pressure (in Hg)	P(s)	=	31.29
Avg Stack Velocity (ft/sec)	V(s avg)	=	77.5
Isokineticity (%)	% I	=	102.6
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	2[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0415
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	75
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0326
Heat Input Rate, MBtu/hr		=	1217.51
Particulate Emission Rate(lb/hr)	E(p)	=	84.063
Particulate Emission Rate(lb/MBtu)		=	0.0691

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/28/92 Printed 04-Aug — Test No./Type: M5-017
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1628-1830

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.45
Stack Static Pressure (in H2O)	P(stack)	16.000
Gas Meter Initial Reading (cu ft)		686.90
Gas Meter Final Reading (cu ft)		740.90
Net Gas Sample Volume (cu ft)	V(m)	(54.00)
Vol of Liquid Collected (ml)	Vl(c)	115.7
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.446)
Wt. of Filter Particulate (gm)		0.0582
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0582)
O2 Concentration (by CEM)	% O2	3.90
CO2 Concentration (by CEM)	% CO2	15.10
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.00)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.84	1.20	453	64.0	63.0	0.9165
2	4.00	0.78	1.10	456	65.0	63.0	0.8832
3	4.00	0.72	1.00	457	68.0	65.0	0.8485
B1	4.00	1.10	1.50	456	70.0	66.0	1.0488
2	4.00	0.85	1.20	462	73.0	66.0	0.9220
3	4.00	0.88	1.20	462	75.0	67.0	0.9381
C1	4.00	0.68	0.95	458	74.0	68.0	0.8246
2	4.00	0.84	1.20	458	76.0	68.0	0.9165
3	4.00	0.68	0.95	457	77.0	69.0	0.8246
D1	4.00	0.68	0.95	458	76.0	69.0	0.8246
2	4.00	0.79	1.10	459	77.0	70.0	0.8888
3	4.00	0.74	1.00	458	78.0	70.0	0.8602
E1	4.00	0.83	1.20	454	75.0	70.0	0.9110
2	4.00	0.74	1.00	473	78.0	71.0	0.8602
3	4.00	0.60	0.84	472	79.0	71.0	0.7746
F1	4.00	0.90	1.30	468	77.0	71.0	0.9487
2	4.00	0.92	1.30	477	79.0	72.0	0.9592
3	4.00	0.86	1.20	476	80.0	72.0	0.9487
G1	4.00	0.60	0.84	475	79.0	72.0	0.9592
2	4.00	0.62	0.87	476	80.0	73.0	0.9274
3	4.00	0.45	0.63	476	80.0	73.0	0.7746
H1	4.00	0.76	1.10	456	79.0	73.0	0.7874
2	4.00	0.93	1.30	461	80.0	74.0	0.6708
3	4.00	0.85	1.20	464	81.0	74.0	0.8718
TOTALS	96.00	18.64	26.13	11122.0	1820.0	1670.0	21.0900

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.777
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.089
Avg Stack Temperature (degF)	T(s avg)	=	463.4
Average Meter Temperature (degF)	T(m avg)	=	72.7
Avg SQRT(dP)		=	0.879

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	53.33
Stack Gas Water Vapor Proportion	B(wo)	=	0.093
Mol. Wt., Stack Gas Dry	M(d)	=	30.57
Mol. Wt., Stack Gas Wet	M(s)	=	29.41
Abs Stack Pressure (in Hg)	P(s)	=	30.63
Avg Stack Velocity (ft/sec)	V(s avg)	=	63.9
Isokineticity (%)	% I	=	105.4
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	195457
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	368050
Percent XS Air	PEA	=	22.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0165
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	32
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0136
Heat Input Rate, MBtu/hr		=	971.35
Particulate Emission Rate(lb/hr)	E(p)	=	26.210
Particulate Emission Rate(lb/MBtu)		=	0.0290

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/29/92 Printed 04-Aug — Test No./Type: M5-018
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1700-1843

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.26
Stack Static Pressure (in H2O)	P(stack)	15.000
Gas Meter Initial Reading (cu ft)		742.00
Gas Meter Final Reading (cu ft)		793.71
Net Gas Sample Volume (cu ft)	V(m)	(51.71)
Vol of Liquid Collected (ml)	Vl(c)	92.3
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.345)
Wt. of Filter Particulate (gm)		0.0648
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0648)
O2 Concentration (by CEM)	% O2	4.70
CO2 Concentration (by CEM)	% CO2	14.40
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.82	1.10	479	85.0	84.0	0.9055
2	4.00	0.71	0.99	479	87.0	85.0	0.8426
3	4.00	0.64	0.90	478	89.0	85.0	0.8000
B1	4.00	0.90	1.30	474	90.0	86.0	0.9487
2	4.00	0.80	1.10	481	93.0	87.0	0.8944
3	4.00	0.76	1.00	481	94.0	87.0	0.8718
C1	4.00	0.63	0.88	477	93.0	88.0	0.7937
2	4.00	0.71	0.99	478	95.0	88.0	0.8426
3	4.00	0.60	0.84	476	97.0	89.0	0.7746
D1	4.00	0.66	0.92	477	96.0	89.0	0.8124
2	4.00	0.71	0.99	478	97.0	90.0	0.8426
3	4.00	0.60	0.84	476	98.0	90.0	0.7746
E1	4.00	0.74	1.00	475	95.0	91.0	0.8602
2	4.00	0.72	1.00	482	98.0	91.0	0.8485
3	4.00	0.49	0.69	480	100.0	92.0	0.7000
F1	4.00	0.83	1.20	475	99.0	92.0	0.9110
2	4.00	0.81	1.10	479	101.0	93.0	0.9000
3	4.00	0.77	1.10	477	102.0	93.0	0.9110
G1	4.00	0.51	0.71	474	100.0	94.0	0.9000
2	4.00	0.48	0.67	475	101.0	94.0	0.8775
3	4.00	0.40	0.56	475	101.0	94.0	0.7141
H1	4.00	0.66	0.92	454	100.0	94.0	0.6928
2	4.00	0.80	1.10	456	102.0	95.0	0.6325
3	4.00	0.78	1.10	460	103.0	95.0	0.8124
TOTALS	96.00	16.53	23.00	11396.0	2316.0	2166.0	19.8638

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.689
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.958
Avg Stack Temperature (degF)	T(s avg)	=	474.8
Average Meter Temperature (degF)	T(m avg)	=	93.4
Avg SQRT(dP)		=	0.828

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	48.83
Stack Gas Water Vapor Proportion	B(ws)	=	0.083
Mol. Wt., Stack Gas Dry	M(d)	=	30.49
Mol. Wt., Stack Gas Wet	M(s)	=	29.47
Abs Stack Pressure (in Hg)	P(s)	=	30.38
Avg Stack Velocity (ft/sec)	V(s avg)	=	60.7
Isokineticity (%)	% I	=	102.4
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	18[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	34[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.02[illegible]
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	[illegible].40
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0176
Heat Input Rate, MBtu/hr		=	872.24
Particulate Emission Rate(lb/hr)	E(p)	=	32.34[illegible]
Particulate Emission Rate(lb/MBtu)		=	0.037[illegible]

B&W/WPL, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 4/30/92 Printed 04-Aug — Test No./Type: M5-019
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 0021-0205

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.216
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.24
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		794.11
Gas Meter Final Reading (cu ft)		833.41
Net Gas Sample Volume (cu ft)	V(m)	(39.30)
Vol of Liquid Collected (ml)	Vl(c)	73.7
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.469)
Wt. of Filter Particulate (gm)		0.0626
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0626)
O2 Concentration (by CEM)	% O2	4.70 need CM data
CO2 Concentration (by CEM)	% CO2	13.90
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.40)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.45	0.63	457	70.0	70.0	0.6708
2	4.00	0.39	0.55	457	71.0	70.0	0.6245
3	4.00	0.37	0.52	456	72.0	70.0	0.6083
B1	4.00	0.48	0.67	453	73.0	70.0	0.6928
2	4.00	0.47	0.66	459	75.0	71.0	0.6856
3	4.00	0.40	0.56	459	77.0	72.0	0.6325
C1	4.00	0.37	0.52	454	77.0	73.0	0.6083
2	4.00	0.41	0.57	456	78.0	73.0	0.6403
3	4.00	0.34	0.48	454	80.0	74.0	0.5831
D1	4.00	0.28	0.39	454	79.0	74.0	0.5292
2	4.00	0.39	0.55	455	80.0	74.0	0.6245
3	4.00	0.33	0.46	453	80.0	75.0	0.5745
E1	4.00	0.38	0.53	454	78.0	74.0	0.6164
2	4.00	0.37	0.52	458	80.0	75.0	0.6083
3	4.00	0.27	0.38	457	80.0	75.0	0.5196
F1	4.00	0.44	0.62	448	79.0	75.0	0.6633
2	4.00	0.42	0.59	456	80.0	76.0	0.6481
3	4.00	0.38	0.53	454	81.0	76.0	0.6633
G1	4.00	0.30	0.42	449	81.0	76.0	0.6481
2	4.00	0.28	0.39	449	81.0	76.0	0.6164
3	4.00	0.25	0.35	446	81.0	76.0	0.5477
H1	4.00	0.38	0.53	428	80.0	76.0	0.5292
2	4.00	0.49	0.69	427	81.0	76.0	0.5000
3	4.00	0.47	0.66	426	82.0	77.0	0.6164
TOTALS	96.00	9.11	12.77	10819.0	1876.0	1774.0	14.6511

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.380
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.530
Avg Stack Temperature (degF)	T(s avg)	=	450.8
Average Meter Temperature (degF)	T(m avg)	=	76.0
Avg SQRT(dP)		=	0.610

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	38.24
Stack Gas Water Vapor Proportion	B(wo)	=	0.083
Mol. Wt., Stack Gas Dry	M(d)	=	30.42
Mol. Wt., Stack Gas Wet	M(s)	=	29.38
Abs Stack Pressure (in Hg)	P(s)	=	30.27
Avg Stack Velocity (ft/sec)	V(s avg)	=	44.4
Isokineticity (%)	% I	=	107.9
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	137407
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	255541
Percent XS Air	PEA	=	26.0
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0253
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	50
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0217
Heat Input Rate, MBtu/hr		=	650.75
Particulate Emission Rate(lb/hr)	E(p)	=	29.613
Particulate Emission Rate(lb/MBtu)		=	0.0458

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 5/1/92 Printed 04-Aug — Test No./Type: M5-020
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 0021-0205

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.218
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.15
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		833.61
Gas Meter Final Reading (cu ft)		902.51
Net Gas Sample Volume (cu ft)	V(m)	(68.90)
Vol of Liquid Collected (ml)	Vl(c)	164.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(7.743)
Wt. of Filter Particulate (gm)		0.0847
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0847)
O2 Concentration (by CEM)	% O2	3.90
CO2 Concentration (by CEM)	% CO2	15.10
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.00)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.70	2.40	474	79.0	77.0	1.3038
2	4.00	1.30	1.80	484	81.0	77.0	1.1402
3	4.00	1.30	1.80	484	83.0	78.0	1.1402
B1	4.00	1.30	1.80	476	84.0	79.0	1.1402
2	4.00	1.50	2.10	488	87.0	79.0	1.2247
3	4.00	1.30	1.80	488	89.0	80.0	1.1402
C1	4.00	1.10	1.50	484	89.0	81.0	1.0488
2	4.00	1.40	2.00	489	91.0	81.0	1.1832
3	4.00	1.10	1.50	485	92.0	82.0	1.0488
D1	4.00	1.10	1.50	485	91.0	82.0	1.0488
2	4.00	1.40	2.00	486	92.0	83.0	1.1832
3	4.00	1.10	1.50	486	93.0	83.0	1.0488
E1	4.00	1.30	1.80	485	89.0	84.0	1.1402
2	4.00	1.20	1.70	495	93.0	85.0	1.0954
3	4.00	0.93	1.30	494	94.0	85.0	0.9644
F1	4.00	1.60	2.20	489	92.0	85.0	1.2649
2	4.00	1.30	1.80	495	95.0	86.0	1.1402
3	4.00	1.30	1.80	492	96.0	87.0	1.2649
G1	4.00	0.98	1.40	481	94.0	87.0	1.1402
2	4.00	1.00	1.40	484	96.0	88.0	1.1402
3	4.00	0.75	1.10	482	97.0	88.0	0.9899
H1	4.00	1.30	1.80	453	95.0	88.0	1.0000
2	4.00	1.60	2.20	455	97.0	88.0	0.8660
3	4.00	1.30	1.80	456	98.0	89.0	1.1402
TOTALS	96.00	30.16	42.00	11570.0	2187.0	2002.0	26.7974

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.257
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.750
Avg Stack Temperature (degF)	T(s avg)	=	482.1
Average Meter Temperature (degF)	T(m avg)	=	87.3
Avg SQRT(dP)		=	1.117

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	65.68
Stack Gas Water Vapor Proportion	B(wo)	=	0.105
Mol. Wt., Stack Gas Dry	M(d)	=	30.57
Mol. Wt., Stack Gas Wet	M(s)	=	29.25
Abs Stack Pressure (in Hg)	P(s)	=	30.62
Avg Stack Velocity (ft/sec)	V(s avg)	=	82.2
Isokineticity (%)	% I	=	104.3
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	24
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	47[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0199
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	37
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0163
Heat Input Rate, MBtu/hr		=	1207.92
Particulate Emission Rate(lb/hr)	E(p)	=	41.431
Particulate Emission Rate(lb/MBtu)		=	0.0343

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 5/16/92 Printed 04-Aug — Test No./Type: M5/Metals-M1
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1055-1240

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.250
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.43
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		903.71
Gas Meter Final Reading (cu ft)		975.70
Net Gas Sample Volume (cu ft)	V(m)	(71.99)
Vol of Liquid Collected (ml)	Vl(c)	150.1
Vol of Liq @ Std. Conds. (scf)	V(w std)	(7.065)
Wt. of Filter Particulate (gm)		0.0153
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0153)
Wt of Total Metals (ug)	M(m)	495.1
O2 Concentration (by CEM)	% O2	4.10
CO2 Concentration (by CEM)	% CO2	14.80
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.10)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.84	2.00	453	81.0	77.0	0.9165
2	4.00	0.78	1.80	453	80.0	77.0	0.8832
3	4.00	0.72	1.70	455	87.0	78.0	0.8485
B1	4.00	1.00	2.40	454	85.0	79.0	1.0000
2	4.00	0.92	2.20	457	88.0	79.0	0.9592
3	4.00	0.86	2.00	455	89.0	80.0	0.9274
C1	4.00	0.82	1.90	461	91.0	81.0	0.9055
2	4.00	0.87	2.00	464	93.0	82.0	0.9327
3	4.00	0.81	1.90	463	93.0	83.0	0.9000
D1	4.00	0.83	2.00	458	94.0	83.0	0.9110
2	4.00	0.86	2.00	453	95.0	84.0	0.9274
3	4.00	0.80	1.90	457	96.0	85.0	0.8944
E1	4.00	0.90	2.10	455	96.0	86.0	0.9487
2	4.00	0.83	2.00	456	97.0	86.0	0.9110
3	4.00	0.62	1.50	453	97.0	87.0	0.7874
F1	4.00	0.85	2.00	448	97.0	87.0	0.9220
2	4.00	0.76	1.80	445	98.0	88.0	0.8718
3	4.00	0.73	1.70	450	98.0	88.0	0.9220
G1	4.00	0.64	1.50	448	98.0	89.0	0.8718
2	4.00	0.70	1.60	450	98.0	89.0	0.8544
3	4.00	0.66	1.60	452	98.0	89.0	0.8000
H1	4.00	0.81	1.90	446	98.0	89.0	0.8367
2	4.00	0.96	2.30	448	99.0	89.0	0.8124
3	4.00	0.72	1.70	453	99.0	90.0	0.9000
TOTALS	96.00	19.29	45.50	10887.0	2245.0	2025.0	21.4439

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.804
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.896
Avg Stack Temperature (degF)	T(s avg)	=	453.6
Average Meter Temperature (degF)	T(m avg)	=	89.0
Avg SQRT(dP)		=	0.893

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	69.09
Stack Gas Water Vapor Proportion	B(wo)	=	0.093
Mol. Wt., Stack Gas Dry	M(d)	=	30.53
Mol. Wt., Stack Gas Wet	M(s)	=	29.37
Abs Stack Pressure (in Hg)	P(s)	=	30.45
Avg Stack Velocity (ft/sec)	V(s avg)	=	64.8
Isokineticity (%)	% I	=	101.7
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	199355
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	373496
Percent XS Air	PEA	=	23.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0034
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	6
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0026
Heat Input Rate, MBtu/hr		=	979.11
Particulate Emission Rate(lb/hr)	E(p)	=	5.842
Particulate Emission Rate(lb/MBtu)		=	0.0060
Total Metals Emission Rate(lb/MBtu)		=	0.00019

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 5/16/92 Printed 04-Aug — Test No./Type: M5/Metals-M2
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1630-1833

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.250
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.43
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		975.80
Gas Meter Final Reading (cu ft)		1029.61
Net Gas Sample Volume (cu ft)	V(m)	(53.81)
Vol of Liquid Collected (ml)	Vl(c)	118.8
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.592)
Wt. of Filter Particulate (gm)		0.0435
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0435)
Wt of Total Metals (ug)	M(m)	225.3
O2 Concentration (by CEM)	% O2	4.00
CO2 Concentration (by CEM)	% CO2	15.10
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.41	0.96	434	89.0	88.0	0.6403
2	4.00	0.43	1.00	436	90.0	88.0	0.6557
3	4.00	0.42	0.98	435	92.0	89.0	0.6481
B1	4.00	0.51	1.20	433	94.0	89.0	0.7141
2	4.00	0.50	1.20	436	95.0	89.0	0.7071
3	4.00	0.53	1.20	435	96.0	89.0	0.7280
C1	4.00	0.45	1.10	438	97.0	90.0	0.6708
2	4.00	0.48	1.10	440	98.0	91.0	0.6928
3	4.00	0.47	1.10	441	98.0	91.0	0.6856
D1	4.00	0.46	1.10	439	99.0	91.0	0.6782
2	4.00	0.48	1.10	439	99.0	92.0	0.6928
3	4.00	0.41	0.96	437	99.0	92.0	0.6403
E1	4.00	0.42	0.98	442	99.0	92.0	0.6481
2	4.00	0.39	0.92	443	99.0	92.0	0.6245
3	4.00	0.33	0.78	441	99.0	93.0	0.5745
F1	4.00	0.43	1.00	438	99.0	93.0	0.6557
2	4.00	0.41	0.96	439	99.0	93.0	0.6403
3	4.00	0.42	0.98	437	99.0	93.0	0.6557
G1	4.00	0.40	0.94	433	100.0	93.0	0.6403
2	4.00	0.42	0.99	435	99.0	93.0	0.6481
3	4.00	0.41	0.96	434	100.0	93.0	0.6325
H1	4.00	0.43	1.00	430	99.0	93.0	0.6481
2	4.00	0.43	1.00	436	99.0	93.0	0.6403
3	4.00	0.42	0.99	435	100.0	93.0	0.6557
TOTALS	96.00	10.46	24.50	10486.0	2337.0	2193.0	15.8178

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.436
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.021
Avg Stack Temperature (degF)	T(s avg)	=	436.9
Average Meter Temperature (degF)	T(m avg)	=	94.4
Avg SQRT(dP)		=	0.655

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	51.02
Stack Gas Water Vapor Proportion	B(wo)	=	0.099
Mol. Wt., Stack Gas Dry	M(d)	=	30.58
Mol. Wt., Stack Gas Wet	M(s)	=	29.33
Abs Stack Pressure (in Hg)	P(s)	=	30.17
Avg Stack Velocity (ft/sec)	V(s avg)	=	47.7
Isokineticity (%)	% I	=	102.0
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	14[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	274[illegible]
Percent XS Air	PEA	=	2[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0[illegible]
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	25
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0106
Heat Input Rate, MBtu/hr		=	725.32
Particulate Emission Rate(lb/hr)	E(p)	=	16.555
Particulate Emission Rate(lb/MBtu)		=	0.0226
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 5/17/92 Printed 04-Aug — Test No./Type: M5/Metals-M3
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 0920-1120

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.250
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.62
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		29.71
Gas Meter Final Reading (cu ft)		82.50
Net Gas Sample Volume (cu ft)	V(m)	(52.80)
Vol of Liquid Collected (ml)	Vl(c)	121.3
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.710)
Wt. of Filter Particulate (gm)		0.0091
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0091)
Wt of Total Metals (ug)	M(m)	145.2
O2 Concentration (by CEM)	% O2	4.90
CO2 Concentration (by CEM)	% CO2	14.20
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.42	0.99	438	71.0	69.0	0.6481
2	4.00	0.44	1.00	440	73.0	69.0	0.6633
3	4.00	0.45	1.10	439	75.0	70.0	0.6708
B1	4.00	0.49	1.20	435	78.0	70.0	0.7000
2	4.00	0.47	1.10	438	79.0	71.0	0.6856
3	4.00	0.51	1.20	442	80.0	71.0	0.7141
C1	4.00	0.47	1.10	441	81.0	71.0	0.6856
2	4.00	0.49	1.20	443	80.0	72.0	0.7000
3	4.00	0.49	1.20	442	80.0	72.0	0.7000
D1	4.00	0.43	1.00	440	81.0	72.0	0.6557
2	4.00	0.45	1.10	443	81.0	73.0	0.6708
3	4.00	0.40	0.98	444	81.0	73.0	0.6325
E1	4.00	0.43	1.00	437	80.0	73.0	0.6557
2	4.00	0.37	0.87	445	80.0	73.0	0.6083
3	4.00	0.36	0.80	442	80.0	73.0	0.6000
F1	4.00	0.42	0.99	440	81.0	73.0	0.6481
2	4.00	0.40	0.94	446	81.0	73.0	0.6325
3	4.00	0.41	0.96	447	81.0	73.0	0.6481
G1	4.00	0.39	0.91	437	81.0	73.0	0.6325
2	4.00	0.43	1.00	440	81.0	73.0	0.6403
3	4.00	0.42	0.99	439	81.0	74.0	0.6245
H1	4.00	0.41	0.92	438	82.0	74.0	0.6557
2	4.00	0.42	0.99	441	82.0	74.0	0.6481
3	4.00	0.42	0.99	442	82.0	75.0	0.6403
TOTALS	96.00	10.39	24.53	10579.0	1912.0	1734.0	15.7605

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.433
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.022
Avg Stack Temperature (degF)	T(s avg)	=	440.8
Average Meter Temperature (degF)	T(m avg)	=	76.0
Avg SQRT(dP)		=	0.657

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	52.12
Stack Gas Water Vapor Proportion	B(wo)	=	0.099
Mol. Wt., Stack Gas Dry	M(d)	=	30.47
Mol. Wt., Stack Gas Wet	M(s)	=	29.24
Abs Stack Pressure (in Hg)	P(s)	=	30.35
Avg Stack Velocity (ft/sec)	V(s avg)	=	47.5
Isokineticity (%)	% I	=	104.3
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	146669
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	273655
Percent XS Air	PEA	=	29.6
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0027
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	5
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0029
Heat Input Rate, MBtu/hr		=	666.05
Particulate Emission Rate(lb/hr)	E(p)	=	3.390
Particulate Emission Rate(lb/MBtu)		=	0.0049
Total Metals Emission Rate(lb/MBtu)		=	0.00022

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 5/17/92 Printed 04-Aug — Test No./Type: M5/Metals-M4
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1417-1600

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.250
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.84
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		82.60
Gas Meter Final Reading (cu ft)		134.81
Net Gas Sample Volume (cu ft)	V(m)	(52.20)
Vol of Liquid Collected (ml)	Vl(c)	107.8
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.074)
Wt. of Filter Particulate (gm)		0.1036
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.1036)
Wt of Total Metals (ug)	M(m)	438.6
O2 Concentration (by CEM)	% O2	5.30
CO2 Concentration (by CEM)	% CO2	14.10
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.60)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.40	0.94	434	74.0	72.0	0.6325
2	4.00	0.42	0.99	436	76.0	72.0	0.6481
3	4.00	0.41	0.96	435	77.0	72.0	0.6403
B1	4.00	0.47	1.10	431	79.0	73.0	0.6856
2	4.00	0.45	1.10	437	81.0	74.0	0.6708
3	4.00	0.49	1.20	436	82.0	74.0	0.7000
C1	4.00	0.46	1.10	434	84.0	75.0	0.6782
2	4.00	0.50	1.20	438	84.0	75.0	0.7071
3	4.00	0.51	1.20	437	85.0	75.0	0.7141
D1	4.00	0.41	0.96	439	85.0	76.0	0.6403
2	4.00	0.46	1.10	441	85.0	77.0	0.6782
3	4.00	0.42	0.99	438	85.0	76.0	0.6481
E1	4.00	0.41	0.96	433	86.0	77.0	0.6403
2	4.00	0.38	0.89	436	87.0	78.0	0.6164
3	4.00	0.33	0.78	436	87.0	78.0	0.5745
F1	4.00	0.41	0.96	434	87.0	79.0	0.6403
2	4.00	0.40	0.94	435	88.0	79.0	0.6325
3	4.00	0.42	0.99	437	89.0	80.0	0.6403
G1	4.00	0.38	0.89	435	89.0	80.0	0.6325
2	4.00	0.42	0.99	438	90.0	80.0	0.6481
3	4.00	0.41	0.96	437	90.0	81.0	0.6164
H1	4.00	0.40	0.94	437	90.0	81.0	0.6481
2	4.00	0.43	1.00	440	90.0	81.0	0.6403
3	4.00	0.41	0.96	439	90.0	82.0	0.6325
TOTALS	96.00	10.20	24.10	10473.0	2040.0	1847.0	15.6054

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.425
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.004
Avg Stack Temperature (degF)	T(s avg)	=	436.4
Average Meter Temperature (degF)	T(m avg)	=	81.0
Avg SQRT(dP)		=	0.650

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	51.43
Stack Gas Water Vapor Proportion	B(wo)	=	0.090
Mol. Wt., Stack Gas Dry	M(d)	=	30.47
Mol. Wt., Stack Gas Wet	M(s)	=	29.35
Abs Stack Pressure (in Hg)	P(s)	=	30.87
Avg Stack Velocity (ft/sec)	V(s avg)	=	46.4
Isokineticity (%)	% I	=	102.0
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	14
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	2[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0511
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	63
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0277
Heat Input Rate, MBtu/hr		=	674.93
Particulate Emission Rate(lb/hr)	E(p)	=	39.430
Particulate Emission Rate(lb/MBtu)		=	0.0584
Total Metals Emission Rate(lb/MBtu)		=	0.00025

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples, Worksheet 2

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 5/18/92 Printed 04-Aug — Test No./Type: M5/Metals-M5
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1047-1250

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.250
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.84
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		134.90
Gas Meter Final Reading (cu ft)		221.00
Net Gas Sample Volume (cu ft)	V(m)	(86.10)
Vol of Liquid Collected (ml)	Vl(c)	169.4
Vol of Liq @ Std. Conds. (scf)	V(w std)	(7.974)
Wt. of Filter Particulate (gm)		0.0854
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0854)
Wt of Total Metals (ug)	M(m)	768.1
O2 Concentration (by CEM)	% O2	3.50
CO2 Concentration (by CEM)	% CO2	15.70
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.80)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.30	3.10	468	83.0	76.0	1.1402
2	4.00	1.20	2.80	470	88.0	78.0	1.0954
3	4.00	1.10	2.60	469	89.0	78.0	1.0488
B1	4.00	1.40	3.30	471	92.0	79.0	1.1832
2	4.00	1.30	3.10	474	94.0	80.0	1.1402
3	4.00	1.30	3.10	472	95.0	81.0	1.1402
C1	4.00	1.10	2.60	470	96.0	81.0	1.0488
2	4.00	1.20	2.80	473	97.0	83.0	1.0954
3	4.00	0.99	2.30	469	97.0	83.0	0.9950
D1	4.00	1.00	2.40	468	98.0	84.0	1.0000
2	4.00	1.50	3.50	470	99.0	85.0	1.2247
3	4.00	1.10	2.60	472	101.0	86.0	1.0488
E1	4.00	1.10	2.60	471	100.0	86.0	1.0488
2	4.00	1.20	2.80	473	102.0	87.0	1.0954
3	4.00	0.60	1.40	472	102.0	88.0	0.7746
F1	4.00	1.30	3.10	472	102.0	89.0	1.1402
2	4.00	1.20	2.80	474	104.0	90.0	1.0954
3	4.00	1.10	2.60	473	105.0	91.0	1.1402
G1	4.00	1.20	2.80	466	106.0	92.0	1.0954
2	4.00	1.30	3.10	468	106.0	93.0	1.0488
3	4.00	1.20	2.80	468	107.0	94.0	1.0954
H1	4.00	1.30	3.10	470	108.0	94.0	1.1402
2	4.00	1.20	2.80	471	108.0	95.0	1.0954
3	4.00	1.10	2.60	469	109.0	95.0	1.1402
TOTALS	96.00	28.29	66.70	11293.0	2388.0	2068.0	26.0709

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.175
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	2.775
Avg Stack Temperature (degF)	T(s avg)	=	470.5
Average Meter Temperature (degF)	T(m avg)	=	92.6
Avg SQRT(dP)		=	1.088

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	83.36
Stack Gas Water Vapor Proportion	B(wo)	=	0.057
Mol. Wt., Stack Gas Dry	M(d)	=	30.65
Mol. Wt., Stack Gas Wet	M(s)	=	29.55
Abs Stack Pressure (in Hg)	P(s)	=	31.31
Avg Stack Velocity (ft/sec)	V(s avg)	=	76.2
Isokineticity (%)	% I	=	100.2
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	244220
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	450634
Percent XS Air	PEA	=	19.6
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0156
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	29
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0126
Heat Input Rate, MBtu/hr		=	1242.29
Particulate Emission Rate(lb/hr)	E(p)	=	33.064
Particulate Emission Rate(lb/MBtu)		=	0.0266
Total Metals Emission Rate(lb/MBtu)		=	0.00024

B&W/WPL, Reburn Optimization Test Series

ESP Outlet Method 5 Samples, Worksheet 2

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 5/19/92 Printed 04-Aug — Test No./Type: M5/Metals-M6
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 0925-1123

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.250
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.62
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		221.21
Gas Meter Final Reading (cu ft)		308.60
Net Gas Sample Volume (cu ft)	V(m)	(87.40)
Vol of Liquid Collected (ml)	Vl(c)	186.9
Vol of Liq @ Std. Conds. (scf)	V(w std)	(8.797)
Wt. of Filter Particulate (gm)		0.0493
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0493)
Wt of Total Metals (ug)	M(m)	575.0
O2 Concentration (by CEM)	% O2	3.40
CO2 Concentration (by CEM)	% CO2	15.70
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.40	3.20	466	71.0	68.0	1.1832
2	4.00	1.20	2.80	468	77.0	69.0	1.0954
3	4.00	1.10	2.60	467	82.0	70.0	1.0488
B1	4.00	1.30	3.10	465	85.0	71.0	1.1402
2	4.00	1.20	2.80	465	87.0	72.0	1.0954
3	4.00	1.20	2.80	464	89.0	73.0	1.0954
C1	4.00	1.20	2.80	468	91.0	74.0	1.0954
2	4.00	1.30	3.10	470	92.0	76.0	1.1402
3	4.00	0.99	2.30	469	93.0	77.0	0.9950
D1	4.00	1.10	2.60	472	93.0	78.0	1.0488
2	4.00	1.50	3.50	473	94.0	79.0	1.2247
3	4.00	1.20	2.80	471	96.0	80.0	1.0954
E1	4.00	1.30	3.10	469	97.0	81.0	1.1402
2	4.00	1.20	2.60	471	97.0	82.0	1.0954
3	4.00	0.61	1.40	468	97.0	82.0	0.7810
F1	4.00	1.50	3.50	467	97.0	83.0	1.2247
2	4.00	1.30	3.10	469	99.0	84.0	1.1402
3	4.00	1.20	2.80	470	100.0	85.0	1.2247
G1	4.00	1.40	3.30	474	102.0	86.0	1.1402
2	4.00	1.30	3.10	476	103.0	87.0	1.0954
3	4.00	1.30	3.10	475	105.0	88.0	1.1832
H1	4.00	1.20	2.80	476	106.0	89.0	1.1402
2	4.00	1.30	3.10	478	106.0	90.0	1.1402
3	4.00	1.10	2.60	477	107.0	91.0	1.0954
TOTALS	96.00	29.40	68.90	11288.00	2266.0	1915.0	26.6591

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.225
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	2.871
Avg Stack Temperature (degF)	T(s avg)	=	470.3
Average Meter Temperature (degF)	T(m avg)	=	87.1
Avg SQRT(dP)		=	1.111

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	84.90
Stack Gas Water Vapor Proportion	B(wo)	=	0.094
Mol. Wt., Stack Gas Dry	M(d)	=	30.65
Mol. Wt., Stack Gas Wet	M(s)	=	29.46
Abs Stack Pressure (in Hg)	P(s)	=	31.09
Avg Stack Velocity (ft/sec)	V(s avg)	=	80.4
Isokineticity (%)	% I	=	100.7
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	24
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	46[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.00[illegible]
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	16
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0071
Heat Input Rate, MBtu/hr		=	1265.94
Particulate Emission Rate(lb/hr)	E(p)	=	16.998
Particulate Emission Rate(lb/MBtu)		=	0.0150
Total Metals Emission Rate(lb/MBtu)		=	0.00016

B&W/WPL, Reburn Optimization Test Series

ESP Outlet Method 5 Samples, Worksheet 2

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 5/19/92 Printed 04-Aug — Test No./Type: M5/Metals-M7
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1445-1635

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.250
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.62
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		308.81
Gas Meter Final Reading (cu ft)		376.51
Net Gas Sample Volume (cu ft)	V(m)	(67.70)
Vol of Liquid Collected (ml)	Vl(c)	138.3
Vol of Liq @ Std. Conds. (scf)	V(w std)	(6.510)
Wt. of Filter Particulate (gm)		0.0232
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0232)
Wt of Total Metals (ug)	M(m)	409.0
O2 Concentration (by CEM)	% O2	3.90
CO2 Concentration (by CEM)	% CO2	14.90
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.20)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.78	1.80	460	87.0	86.0	0.8832
2	4.00	0.73	1.70	462	90.0	86.0	0.8544
3	4.00	0.66	1.60	461	92.0	87.0	0.8124
B1	4.00	0.90	2.10	459	95.0	88.0	0.9487
2	4.00	0.82	1.90	461	97.0	88.0	0.9055
3	4.00	0.77	1.80	463	98.0	89.0	0.8775
C1	4.00	0.63	1.50	462	99.0	89.0	0.7937
2	4.00	0.64	1.50	464	99.0	90.0	0.8000
3	4.00	0.59	1.40	462	100.0	91.0	0.7681
D1	4.00	0.66	1.60	463	100.0	91.0	0.8124
2	4.00	0.70	1.60	463	101.0	92.0	0.8367
3	4.00	0.64	1.50	461	101.0	92.0	0.8000
E1	4.00	0.83	2.00	460	102.0	92.0	0.9110
2	4.00	0.74	1.70	461	103.0	93.0	0.8602
3	4.00	0.56	1.30	461	103.0	93.0	0.7483
F1	4.00	0.82	1.90	462	103.0	93.0	0.9055
2	4.00	0.68	1.60	464	103.0	93.0	0.8246
3	4.00	0.65	1.50	463	102.0	93.0	0.9055
G1	4.00	0.59	1.40	465	102.0	93.0	0.8246
2	4.00	0.66	1.60	463	102.0	93.0	0.8062
3	4.00	0.60	1.40	464	102.0	93.0	0.7681
H1	4.00	0.72	1.70	463	102.0	94.0	0.8124
2	4.00	0.87	2.00	465	103.0	94.0	0.7746
3	4.00	0.68	1.60	465	104.0	94.0	0.8485
TOTALS	96.00	16.92	39.70	11097.00	2390.0	2187.0	20.0824

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.705
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.654
Avg Stack Temperature (degF)	T(s avg)	=	462.4
Average Meter Temperature (degF)	T(m avg)	=	95.4
Avg SQRT(dP)		=	0.837

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	64.59
Stack Gas Water Vapor Proportion	B(wo)	=	0.092
Mol. Wt., Stack Gas Dry	M(d)	=	30.54
Mol. Wt., Stack Gas Wet	M(s)	=	29.39
Abs Stack Pressure (in Hg)	P(s)	=	30.65
Avg Stack Velocity (ft/sec)	V(s avg)	=	60.8
Isokineticity (%)	% I	=	101.6
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	186566
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	350227
Percent XS Air	PEA	=	22.2
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0055
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	10
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0045
Heat Input Rate, MBtu/hr		=	927.21
Particulate Emission Rate(lb/hr)	E(p)	=	8.872
Particulate Emission Rate(lb/MBtu)		=	0.0096
Total Metals Emission Rate(lb/MBtu)		=	0.00017

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples, Worksheet 2

KINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

ant: WPL		Performed by:	Eric Squier
te: 5/20/92	Printed 04-Aug	Test No./Type:	M5/Metals-M8
ample Location: Unit 2, ESP Outlet		Start/Stop Time:	0935-1126

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.250
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.75
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		376.71
Gas Meter Final Reading (cu ft)		464.81
Net Gas Sample Volume (cu ft)	V(m)	(88.10)
Vol of Liquid Collected (ml)	Vl(c)	191.1
Vol of Liq @ Std. Conds. (scf)	V(w std)	(8.995)
Wt. of Filter Particulate (gm)		0.0465
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0465)
Wt of Total Metals (ug)	M(m)	634.7
O2 Concentration (by CEM)	% O2	3.70
CO2 Concentration (by CEM)	% CO2	15.60
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.70)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.50	3.50	462	76.0	74.0	1.2247
2	4.00	1.30	3.10	464	82.0	75.0	1.1402
3	4.00	1.10	2.60	463	86.0	76.0	1.0488
B1	4.00	1.40	3.30	461	89.0	77.0	1.1832
2	4.00	1.20	2.80	462	92.0	78.0	1.0954
3	4.00	1.30	3.10	462	93.0	79.0	1.1402
C1	4.00	1.20	2.80	463	94.0	80.0	1.0954
2	4.00	1.10	2.60	465	96.0	81.0	1.0488
3	4.00	1.40	3.30	464	97.0	82.0	1.1832
D1	4.00	1.20	2.60	462	98.0	83.0	1.0954
2	4.00	1.00	2.40	463	98.0	84.0	1.0000
3	4.00	1.10	2.60	462	98.0	85.0	1.0488
E1	4.00	1.40	3.30	460	99.0	86.0	1.1832
2	4.00	1.30	3.10	462	101.0	87.0	1.1402
3	4.00	1.20	2.80	464	103.0	88.0	1.0954
F1	4.00	1.00	2.40	465	103.0	89.0	1.0000
2	4.00	0.63	1.50	467	104.0	89.0	0.7937
3	4.00	1.40	3.30	466	103.0	90.0	1.0000
G1	4.00	1.50	3.50	467	105.0	91.0	0.7937
2	4.00	1.40	3.30	469	106.0	92.0	1.1832
3	4.00	1.20	2.80	468	107.0	92.0	1.2247
H1	4.00	1.30	3.10	466	107.0	93.0	1.1832
2	4.00	1.20	2.80	468	108.0	94.0	1.0954
3	4.00	1.20	2.80	465	108.0	94.0	1.1402
TOTALS	96.00	29.53	69.40	11140.00	2353.0	2039.0	26.1374

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.230
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	2.892
Avg Stack Temperature (degF)	T(s avg)	=	464.2
Average Meter Temperature (degF)	T(m avg)	=	91.5
Avg SQRT(dP)		=	1.085

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	85.27
Stack Gas Water Vapor Proportion	B(wo)	=	0.095
Mol. Wt., Stack Gas Dry	M(d)	=	30.64
Mol. Wt., Stack Gas Wet	M(s)	=	29.44
Abs Stack Pressure (in Hg)	P(s)	=	31.22
Avg Stack Velocity (ft/sec)	V(s avg)	=	76.4
Isokineticity (%)	% I	=	1[illegible]
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	24[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	4[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0064
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	16
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0068
Heat Input Rate, MBtu/hr		=	1224.9[illegible]
Particulate Emission Rate(lb/hr)	E(p)	=	17.58[illegible]
Particulate Emission Rate(lb/MBtu)		=	0.0144
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Optimization Test Series

ESP Outlet Method 5 Samples, Worksheet 2

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 5/20/92 Printed 04-Aug — Test No./Type: M5/Metals-M9
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 0935-1126

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.250
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	1.0100
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.74
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		465.01
Gas Meter Final Reading (cu ft)		533.71
Net Gas Sample Volume (cu ft)	V(m)	(68.70)
Vol of Liquid Collected (ml)	Vl(c)	159.9
Vol of Liq @ Std. Conds. (scf)	V(w std)	(7.526)
Wt. of Filter Particulate (gm)		0.0155
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0155)
Wt of Total Metals (ug)	M(m)	359.9
O2 Concentration (by CEM)	% O2	4.00
CO2 Concentration (by CEM)	% CO2	15.20
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.80)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.84	2.00	461	97.0	97.0	0.9165
2	4.00	0.83	2.00	463	99.0	97.0	0.9110
3	4.00	0.86	2.00	462	101.0	97.0	0.9274
B1	4.00	0.88	2.10	460	103.0	97.0	0.9381
2	4.00	0.81	1.90	461	104.0	97.0	0.9000
3	4.00	0.79	1.90	461	104.0	97.0	0.8888
C1	4.00	0.69	1.60	463	105.0	97.0	0.8307
2	4.00	0.68	1.60	466	105.0	97.0	0.8246
3	4.00	0.62	1.50	467	105.0	97.0	0.7874
D1	4.00	0.68	1.60	465	104.0	96.0	0.8246
2	4.00	0.74	1.70	468	104.0	96.0	0.8602
3	4.00	0.67	1.60	463	103.0	96.0	0.8185
E1	4.00	0.82	1.90	462	103.0	96.0	0.9055
2	4.00	0.78	1.80	465	104.0	96.0	0.8832
3	4.00	0.62	1.50	464	103.0	95.0	0.7874
F1	4.00	0.83	2.00	463	103.0	95.0	0.9110
2	4.00	0.70	1.60	463	103.0	95.0	0.8367
3	4.00	0.69	1.60	462	103.0	95.0	0.9110
G1	4.00	0.62	1.50	458	103.0	95.0	0.8367
2	4.00	0.65	1.50	460	103.0	95.0	0.8307
3	4.00	0.60	1.40	459	102.0	95.0	0.7874
H1	4.00	0.71	1.70	457	102.0	95.0	0.8062
2	4.00	0.85	2.00	459	102.0	95.0	0.7746
3	4.00	0.70	1.60	458	104.0	95.0	0.8426
TOTALS	96.00	17.66	41.60	11090.00	2469.0	2303.0	20.5409

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.736
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.733
Avg Stack Temperature (degF)	T(s avg)	=	462.1
Average Meter Temperature (degF)	T(m avg)	=	99.4
Avg SQRT(dP)		=	0.856

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	65.35
Stack Gas Water Vapor Proportion	B(wo)	=	0.103
Mol. Wt., Stack Gas Dry	M(d)	=	30.59
Mol. Wt., Stack Gas Wet	M(s)	=	29.29
Abs Stack Pressure (in Hg)	P(s)	=	30.77
Avg Stack Velocity (ft/sec)	V(s avg)	=	62.2
Isokineticity (%)	% I	=	101.5
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	189085
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	358080
Percent XS Air	PEA	=	23.1
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0037
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	7
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0035
Heat Input Rate, MBtu/hr		=	934.20
Particulate Emission Rate(lb/hr)	E(p)	=	5.938
Particulate Emission Rate(lb/MBtu)		=	0.0064
Total Metals Emission Rate(lb/MBtu)		=	0.00015

APPENDIX E

OPTIMIZATION TEST

MACS TRAIN SULFATE MEASUREMENT DATA SUMMARY

MACS Analysis, ESP Inlet

Run Number	Run Date	MWe	Sample ID	Stack Gas Collected (Vmstd)	Titrant Normality (Nt)	Sample Titer Volume (Vt)	Blank Titer Volume (Vtb)	Liquid Sample Volume (Vsol)	Liquid Aliquot Volume (Va)	Weight of SO2 (gm)	[SO2] (PPM)	Weight of SO3 (gm)	[SO3] (PPM)	CEMS [SO2]	Run Total Gas Pha [SO3]
SO3-1	17 May	58	SO3-1-I	5.06	0.09130	23.08	0.00	93	20	0.3138	824	N/A	N/A	1094	25
SO3-2	18 May	110	SO3-2-I	4.88	0.09130	16.50	0.00	130	20	0.3136	854	N/A	N/A	995	10
SO3-3	19 May	110	SO3-3-I	5.44	0.09130	22.53	0.00	128	20	0.4217	1030	N/A	N/A	1063	20
SO3-4	19 May	82	SO3-4-I	5.93	0.09130	29.37	0.00	130	20	0.5582	1251	N/A	N/A	1072	8
SO3-5	20 May	100	SO3-5-I	5.70	0.09130	22.07	0.00	128	20	0.4130	962	N/A	N/A	1032	12
SO3-6	20 May	82	SO3-6-I	7.49	0.09130	28.17	0.00	130	20	0.5354	949	N/A	N/A	1084	8
SO3-1	17 May	58	SO3-1-C	5.06	0.00917	3.04	0.00	78.3	20	N/A	N/A	0.0044	17	-	-
SO3-2	18 May	110	SO3-2-C	4.88	0.00855	1.20	0.00	68	20	N/A	N/A	0.0014	6	-	-
SO3-3	19 May	110	SO3-3-C	5.44	0.00855	4.53	0.00	50	20	N/A	N/A	0.0039	14	-	-
SO3-4	19 May	82	SO3-4-C	5.93	0.00855	1.93	0.00	46	20	N/A	N/A	0.0015	5	-	-
SO3-5	20 May	100	SO3-5-C	5.70	0.00855	1.58	0.00	79	20	N/A	N/A	0.0021	7	-	-
SO3-6	20 May	82	SO3-6-C	7.49	0.00855	1.07	0.00	84	20	N/A	N/A	0.0015	4	-	-
SO3-1	17 May	58	SO3-1-Pr	5.06	0.00855	1.90	0.00	66	20	N/A	N/A	0.0021	8	-	-
SO3-2	18 May	110	SO3-2-Pr	4.88	0.00855	1.10	0.00	46	20	N/A	N/A	0.0009	4	-	-
SO3-3	19 May	110	SO3-3-Pr	5.44	0.00855	1.80	0.00	57	20	N/A	N/A	0.0018	6	-	-
SO3-4	19 May	82	SO3-4-Pr	5.93	0.00855	1.25	0.00	45	20	N/A	N/A	0.0010	3	-	-
SO3-5	20 May	100	SO3-5-Pr	5.70	0.00855	1.75	0.00	52	20	N/A	N/A	0.0016	5	-	-
SO3-6	20 May	82	SO3-6-Pr	7.49	0.00855	1.45	0.00	64	20	N/A	N/A	0.0016	4	-	-
SO3-1	17 May	58	SO3-1-Pl	5.06	0.00855	0.50	0.10	101	20	N/A	N/A	0.0007	3	-	-
SO3-2	18 May	110	SO3-2-Pl	4.88	0.00855	0.53	0.10	75	20	N/A	N/A	0.0006	2	-	-
SO3-3	19 May	110	SO3-3-Pl	5.44	0.00855	0.50	0.10	93	20	N/A	N/A	0.0006	2	-	-
SO3-4	19 May	82	SO3-4-Pl	5.93	0.00855	0.40	0.10	97	20	N/A	N/A	0.0005	2	-	-
SO3-5	20 May	100	SO3-5-Pl	5.70	0.00855	0.77	0.10	65	20	N/A	N/A	0.0002	1	-	-
SO3-6	20 May	82	SO3-6-Pl	7.49	0.00855	0.40	0.10	99	20	N/A	N/A	0.0005	1	-	-
N/A	composite	N/A	IPA Blank	N/A	0.00855	0.00	0.00	20	20	N/A	N/A	N/A	N/A	-	-
N/A	composite	N/A	DI Blank	N/A	0.00855	0.00	0.00	20	20	N/A	N/A	N/A	N/A	-	-
N/A	composite	N/A	H2O2 Blank	N/A	0.00855	0.00	0.00	23	20	N/A	N/A	N/A	N/A	-	-
N/A	composite	N/A	Plug Blank	N/A	0.00855	0.10	0.00	100	20	N/A	N/A	N/A	N/A	-	-

SO3-x-I = Impinger Sample (SO2)
SO3-x-C = Condenser Sample (gas phase SO3)
SO3-x-Pr = Probe Sample (gas phase SO3)
SO3-x-Pl = Glass Plug Sample (particulate absorbed SO3)

APPENDIX F

OPTIMIZATION TEST

FLYASH RESISTIVITY AT ESP INLET—DATA SUMMARY

Resistivity Calculations

Date	Run	MWe	V-I Curve Data: I(uA)	Delta V (KV)	Plate Area(cm2)	Ash Depth(cm)	Spark Data: Volts	uAmps	Ash Resistivity, Ohm/c from: V-I Curve	Spark
1 Apr	RI2	110	1.00	3.151	5	0.175	800	1.68	9.0E+10	4.2E+10
21 Apr	RI13	98	2.00	0.470	5	0.053	100	0.19	2.2E+10	1.5E+11
21 Apr	RI13	82	0.48	8.470	5	0.427	*	*	2.1E+11	*
22 Apr	RI14	57	1.00	4.814	5	0.091	100	0.26	2.6E+11	4.5E+10
23 Apr	RI15	57	0.75	3.610	5	0.246	100	1.24	9.7E+10	3.7E+09
24 Apr	RI16	110	1.00	1.590	5	0.073	100	9.6	1.1E+11	1.5E+09
27 Apr	RI17	110	1.00	2.056	5	0.100	100	0.1	1.0E+11	1.1E+11
28 Apr	RI18	90	1.00	2.889	5	0.105	100	0.06	1.4E+11	1.3E+11
29 Apr	RI19	82	1.00	4.000	5	0.143	*	*	1.4E+11	*
17 May	RI24	55	2.00	2.000	5	0.210	*	*	2.4E+10	*
17 May	RI25	56	2.55	2.000	5	0.166	*	*	2.1E+10	*
18 May	RI26	110	1.00	3.745	5	0.236	400	3.07	7.9E+10	5.9E+09
19 May	RI27	110	1.00	4.467	5	0.067	200	3.39	3.3E+11	9.5E+09
19 May	RI28	82	1.00	3.813	5	0.282	100	0.14	6.8E+10	2.7E+10
20 May	RI29	[illegible]	1.00	3.326	5	0.439	*	*	3.8E+10	*
20 May	RI30	82	2.00	1.200	5	0.439	*	*	6.8E+09	*

* - premature spark, no spark data

Resistivity Data, Nelson Dewey Station, Unit 2, North ESP Inlet

Run I2, 4/1/92, 110MWe

Plate Voltage	Current, uA Clean	Current, uA Dirty
4.0	0.00	0.00
5.0	0.16	0.01
6.0	0.37	0.02
7.0	0.56	0.04
8.0	0.87	0.12
9.0	1.00	0.25
10.0	1.56	0.53
11.0	1.83	0.62
12.0	2.32	1.12
13.0	2.85	1.49
14.0	3.48	1.90
15.0	4.15	2.53

Run E1, 4/21/92, 98MWe

Plate Voltage	Current, uA Clean	Current, uA Dirty
6.0	0.00	0.09
7.0	0.05	0.14
8.0	0.18	0.24
9.0	0.42	0.27
10.0	0.62	0.52
11.0	0.81	0.63
12.0	1.06	0.89
13.0	1.45	1.18
14.0	2.02	1.72
15.0	2.74	2.42
16.0	3.30	

Run I13, 4/21/92, 82MWe

Plate Voltage,K	Current, uA Clean	Current, uA Dirty
5.0	0.00	0.00
6.0	0.14	0.09
7.0	0.34	0.09
8.0	0.46	0.14
9.0	0.52	0.12
10.0	0.81	0.24
11.0	0.94	0.27
12.0	1.48	0.32
13.0	1.75	0.33
14.0	2.11	0.38
15.0	2.44	0.40
16.0	2.91	0.42
17.0	3.15	0.47

Run 114, 4/22/92, 57MWe

Plate Voltage	Current, uA Clean	Dirty
5.0	0.00	0.00
6.0	0.06	0.00
7.0	0.21	0.00
8.0	0.37	0.00
9.0	0.50	0.03
10.0	0.81	0.07
11.0	1.11	0.09
12.0	1.49	0.14
13.0	1.89	0.22
14.0	1.96	0.55
15.0	2.48	0.77
16.0	2.96	1.22
17.0	3.68	

Run 115, 4/23/92, 57MWe

Plate Voltage	Current, uA Clean	Dirty
7.0	0.00	0.00
8.0	0.06	0.00
9.0	0.48	0.00
10.0	0.77	0.00
11.0	1.01	0.09
12.0	1.28	0.39
13.0	1.67	0.58
14.0	2.00	0.77
15.0	2.22	
16.0	2.64	
17.0	3.08	

Run 116, 4/24/92, 110M

Plate Voltage	Current, uA Clean	Dirty
6.0	0.00	0.00
7.0	0.14	0.13
8.0	0.32	0.16
9.0	0.53	0.34
10.0	0.79	0.39
11.0	1.08	0.58
12.0	1.28	0.98
13.0	1.71	1.19
14.0	2.14	1.55
15.0	2.82	1.74
16.0	3.29	2.28
17.0	4.01	

Run 117, 4/27/92, 110MWe

Plate Voltage	Current, uA Clean	Dirty
6.0	0.00	0.00
7.0	0.40	0.00
8.0	0.72	0.12
9.0	1.22	0.32
10.0	1.52	0.69
11.0	1.84	1.11
12.0	2.32	1.49
13.0	2.76	2.07
14.0	3.55	2.50
15.0	3.97	3.15
16.0	4.73	
17.0	5.52	

Run 118, 4/28/92, 90MWe

Plate Voltage	Current, uA Clean	Dirty
6.0	0.00	0.00
7.0	0.03	0.00
8.0	0.03	0.00
9.0	0.37	0.03
10.0	0.34	0.06
11.0	0.97	0.11
12.0	1.33	0.20
13.0	1.60	0.32
14.0	2.21	1.14
15.0	2.71	1.55
16.0	3.50	1.87
17.0	4.00	2.36

Run 124, 5/17/92, 55MW

Plate Voltage	Current, uA Clean	Dirty
4.0	0.00	0.00
5.0	0.26	0.28
6.0	0.36	0.50
7.0	0.62	0.75
8.0	0.82	1.12
9.0	1.07	1.73
10.0	1.41	2.01
11.0	1.65	2.37
12.0	2.02	2.73
13.0	2.64	3.19
14.0	3.08	
15.0	3.56	
16.0	4.22	

Run 125, 5/17/92, 58MWe

Plate Voltage	Current, uA Clear	Dirty
3.0	0.00	0.00
4.0	0.12	0.00
5.0	0.32	0.00
6.0	0.59	0.04
7.0	0.84	0.45
8.0	1.14	1.67
9.0	1.61	2.55
10.0	2.15	4.75
11.0	2.55	6.30
12.0	3.32	7.78
13.0	4.03	9.95

Run 126, 5/18/92, 110MWe

Plate Voltage	Current, uA Clean	Dirty
4.0	0.00	0.00
5.0	0.05	0.00
6.0	0.44	0.00
7.0	0.66	0.00
8.0	0.97	0.03
9.0	1.18	0.07
10.0	1.67	0.35
11.0	2.01	0.68
12.0	2.49	0.97
13.0	2.75	1.45
14.0	3.64	1.73
15.0		2.14

Run 127, 5/19/92, 110M

Plate Voltage	Current, uA Clean	Dirty
4.0	0.00	0.00
5.0	0.05	0.00
6.0	0.34	0.00
7.0	0.59	0.00
8.0	0.80	0.00
9.0	1.03	0.03
10.0	1.44	0.05
11.0	1.74	0.08
12.0	2.08	0.62
13.0	2.64	0.81
14.0	3.30	1.42
15.0	3.94	
16.0	4.75	

Run 128, 5/19/92, 82MWe

Plate Voltage	Current, uA Clean	Current, uA Dirty
4.0	0.00	0.00
5.0	0.03	0.00
6.0	0.19	0.00
7.0	0.46	0.00
8.0	0.76	0.00
9.0	1.10	0.03
10.0	1.41	0.07
11.0	1.71	0.15
12.0	2.03	0.42
13.0	2.71	0.86
14.0	3.34	2.41
15.0	4.02	3.17
16.0	4.68	

Run 129, 5/20/92, 110MWe

Plate Voltage	Current, uA Clean	Current, uA Dirty
4.0	0.00	0.00
5.0	0.04	0.00
6.0	0.16	0.00
7.0	0.34	0.00
8.0	0.52	0.00
9.0	0.70	0.03
10.0	0.90	0.08
11.0	1.44	0.19
12.0	1.73	0.46
13.0	2.30	0.90
14.0	2.76	1.49
15.0	3.57	1.72

Run 130, 5/20/92, 82MW

Plate Voltage	Current, uA Clean	Current, uA Dirty
4.0	0.00	0.00
5.0	0.05	0.00
6.0	0.26	0.25
7.0	0.45	0.57
8.0	0.73	0.94
9.0	1.11	1.50
10.0	1.56	2.01
11.0	1.91	2.66
12.0	2.36	3.30
13.0	2.96	4.01
14.0	3.65	4.63
15.0	4.26	5.57
16.0	4.81	

Run 114, 4/22/92, 57MWe

Plate Voltage	Current, uA Clean	Dirty
5.0	0.00	0.00
6.0	0.06	0.00
7.0	0.21	0.00
8.0	0.37	0.00
9.0	0.50	0.03
10.0	0.81	0.07
11.0	1.11	0.09
12.0	1.49	0.14
13.0	1.89	0.22
14.0	1.98	0.55
15.0	2.48	0.77
16.0	2.98	1.22
17.0	3.68	
18.0	4.04	

Run 115, 4/23/92, 57MWe

Plate Voltage	Current, uA Clean	Dirty
7.0	0.00	0.00
8.0	0.06	0.00
9.0	0.48	0.00
10.0	0.77	0.00
11.0	1.01	0.09
12.0	1.28	0.39
13.0	1.67	0.58
14.0	2.00	0.77
15.0	2.22	
16.0	2.64	
17.0	3.08	

Run 116, 4/24/92, 110MW

Plate Voltage	Current, uA Clean	Dirty
6.0	0.00	0.00
7.0	0.14	0.13
8.0	0.32	0.16
9.0	0.53	0.34
10.0	0.79	0.39
11.0	1.08	0.58
12.0	1.28	0.96
13.0	1.71	1.19
14.0	2.14	1.55
15.0	2.82	1.74
16.0	3.29	2.28
17.0	4.01	

Run 117, 4/27/92, 110MWe

Plate Voltage	Current, uA Clean	Dirty
6.0	0.00	0.00
7.0	0.40	0.00
8.0	0.72	0.12
9.0	1.22	0.32
10.0	1.52	0.89
11.0	1.84	1.11
12.0	2.32	1.49
13.0	2.78	2.07
14.0	3.55	2.50
15.0	3.97	3.15
16.0	4.73	
17.0	5.52	

Run 118, 4/28/92, 90MWe

Plate Voltage	Current, uA Clean	Dirty
6.0	0.00	0.00
7.0	0.03	0.00
8.0	0.03	0.00
9.0	0.37	0.03
10.0	0.34	0.06
11.0	0.97	0.11
12.0	1.33	0.20
13.0	1.60	0.32
14.0	2.21	1.14
15.0	2.71	1.55
16.0	3.50	1.87
17.0	4.00	2.36

Run 124, 5/17/92, 55MW

Plate Voltage	Current, uA Clean	Dirty
4.0	0.00	0.00
5.0	0.26	0.28
6.0	0.36	0.50
7.0	0.62	0.75
8.0	0.82	1.12
9.0	1.07	1.73
10.0	1.41	2.01
11.0	1.65	2.37
12.0	2.02	2.73
13.0	2.64	3.19
14.0	3.08	
15.0	3.55	
16.0	4.22	
17.0	4.86	
18.0	5.69	
19.0	6.66	

Run 125, 5/17/92, 58MWe

Plate Voltage	Current, uA Clean	Dirty
3.0	0.00	0.00
4.0	0.12	0.00
5.0	0.32	0.00
6.0	0.59	0.04
7.0	0.84	0.48
8.0	1.14	1.67
9.0	1.61	2.55
10.0	2.15	4.75
11.0	2.56	6.30
12.0	3.32	7.78
13.0	4.03	9.95

Run 126, 5/18/92, 110MWe

Plate Voltage	Current, uA Clean	Dirty
4.0	0.00	0.00
5.0	0.05	0.00
6.0	0.44	0.00
7.0	0.66	0.00
8.0	0.97	0.03
9.0	1.18	0.07
10.0	1.67	0.35
11.0	2.01	0.68
12.0	2.49	0.97
13.0	2.75	1.45
14.0	3.64	1.73
15.0		2.14

Run 127, 5/19/92, 110M

Plate Voltage	Current, uA Clean	Dirty
4.0	0.00	0.00
5.0	0.05	0.00
6.0	0.34	0.00
7.0	0.59	0.00
8.0	0.80	0.00
9.0	1.03	0.03
10.0	1.44	0.05
11.0	1.74	0.06
12.0	2.08	0.62
13.0	2.64	0.81
14.0	3.30	1.42
15.0	3.94	
16.0	4.75	
17.0	5.42	

Run 128, 5/19/92, 82MWe

Plate Voltage	Current, uA Clean	Dirty
4.0	0.00	0.00
5.0	0.03	0.00
6.0	0.19	0.00
7.0	0.46	0.00
8.0	0.76	0.00
9.0	1.10	0.03
10.0	1.41	0.07
11.0	1.71	0.15
12.0	2.03	0.42
13.0	2.71	0.86
14.0	3.34	2.41
15.0	4.02	3.17
16.0	4.68	
17.0	5.65	

Run 129, 5/20/92, 110MWe

Plate Voltage	Current, uA Clean	Dirty
4.0	0.00	0.00
5.0	0.04	0.00
6.0	0.16	0.00
7.0	0.34	0.00
8.0	0.52	0.00
9.0	0.70	0.03
10.0	0.90	0.08
11.0	1.44	0.19
12.0	1.73	0.46
13.0	2.30	0.90
14.0	2.76	1.49
15.0	3.57	1.72

Run 130, 5/20/92, 82MW

Plate Voltage	Current, uA Clean	Dirty
4.0	0.00	0.00
5.0	0.05	0.00
6.0	0.26	0.25
7.0	0.45	0.57
8.0	0.73	0.94
9.0	1.11	1.50
10.0	1.56	2.01
11.0	1.91	2.66
12.0	2.36	3.30
13.0	2.96	4.01
14.0	3.65	4.63
15.0	4.26	5.57
16.0	4.81	
17.0	5.80	

APPENDIX G

OPTIMIZATION TEST

TRACE METALS AT ESP OUTLET—DATA SUMMARY

B&W2 - Metals Analysis

Run 1 - Front Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 0.7	69.09	199355	< 0.000
Arsenic	69.3	"	"	0.026
Barium	68.4	"	"	0.026
Cadmium	4.17	"	"	0.002
Chromium	22.6	"	"	0.009
Lead	71.8	"	"	0.027
Selenium	11.5	"	"	0.004
Total Metals	< 248.5	"	"	< 0.095

Run 1 - Back Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 0.959	69.09	199355	< 0.000
Arsenic	1.6	"	"	0.001
Barium	3.1	"	"	0.001
Cadmium	1.15	"	"	0.000
Chromium	3.99	"	"	0.002
Lead	19.9	"	"	0.005
Selenium	218	"	"	0.082
Total Metals	< 246.6	"	"	< 0.094
Total Train	< 495.1	"	"	<0.1890

Run 2 - Front Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 0.7	51.02	146808	< 0.000
Arsenic	32.6	"	"	0.012
Barium	34.8	"	"	0.013
Cadmium	2.35	"	"	0.001
Chromium	11.5	"	"	0.004
Lead	27.9	"	"	0.011
Selenium	22.0	"	"	0.008
Total Metals	< 131.9	"	"	< 0.050

Run 2 - Back Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 0.95	51.02	146808	< 0.000
Arsenic	4.28	"	"	0.002
Barium	3.66	"	"	0.001
Cadmium	0.676	"	"	0.000
Chromium	< 1.63	"	"	< 0.001
Lead	< 0.271	"	"	< 0.000
Selenium	81.9	"	"	0.031
Total Metals	< 93.4	"	"	< 0.036
Total Train	< 225.2	"	"	<0.0859

Run 3 - Front Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 1.08	52.12	146669	< 0.000
Arsenic	21.8	"	"	0.008
Barium	9.35	"	"	0.004
Cadmium	2.25	"	"	0.001
Chromium	4.8	"	"	0.002
Lead	5.69	"	"	0.002
Selenium	17.1	"	"	0.007
Total Metals	< 62.1	"	"	< 0.024

Run 3 - Back Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 0.959	52.12	146669	< 0.000
Arsenic	< 0.274	"	"	< 0.000
Barium	3.51	"	"	0.001
Cadmium	1.220	"	"	0.000
Chromium	1.83	"	"	0.001
Lead	< 0.274	"	"	< 0.000
Selenium	75.0	"	"	0.029
Total Metals	< 83.1	"	"	< 0.032
Total Train	< 145.1	"	"	<0.0554

Run 4 - Front Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	0.731	51.43	147993	0.000
Arsenic	82.2	"	"	0.031
Barium	83.2	"	"	0.032
Cadmium	5.82	"	"	0.002
Chromium	33.3	"	"	0.013
Lead	87.8	"	"	0.034
Selenium	15.7	"	"	0.006
Total Metals	308.8	"	"	0.118

Run 4 - Back Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 1.02	51.43	147993	< 0.000
Arsenic	0.669	"	"	0.000
Barium	< 2.91	"	"	< 0.001
Cadmium	1.16	"	"	0.000
Chromium	< 1.75	"	"	< 0.001
Lead	1.29	"	"	0.000
Selenium	121	"	"	0.046
Total Metals	< 129.8	"	"	< 0.050
Total Train	< 438.6	"	"	<0.1674

Run 5 - Front Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 0.700	83.36	244220	< 0.000
Arsenic	39.2	"	"	0.015
Barium	48.4	"	"	0.018
Cadmium	28.9	"	"	0.011
Chromium	23.7	"	"	0.009
Lead	76.7	"	"	0.029
Selenium	17.5	"	"	0.007
Total Metals	< 235.1	"	"	< 0.090

Run 5 - Back Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 0.900	83.36	244220	< 0.000
Arsenic	0.360	"	"	0.000
Barium	< 2.57	"	"	< 0.001
Cadmium	0.756	"	"	0.000
Chromium	1.56	"	"	0.001
Lead	1.83	"	"	0.001
Selenium	525	"	"	0.200
Total Metals	< 533.0	"	"	< 0.203
Total Train	< 768.1	"	"	<0.2932

Run 6 - Front Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 0.700	84.9	247446	< 0.000
Arsenic	31.6	"	"	0.012
Barium	29.2	"	"	0.011
Cadmium	4.85	"	"	0.002
Chromium	14.2	"	"	0.005
Lead	32.8	"	"	0.013
Selenium	20.2	"	"	0.008
Total Metals	< 133.6	"	"	< 0.051

Run 6 - Back Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 0.906	84.9	247446	< 0.000
Arsenic	0.259	"	"	0.000
Barium	< 2.59	"	"	< 0.001
Cadmium	0.640	"	"	0.000
Chromium	< 1.55	"	"	< 0.001
Lead	1.50	"	"	0.001
Selenium	434	"	"	0.166
Total Metals	< 441.4	"	"	< 0.169
Total Train	< 575.0	"	"	<0.2195

Run 7 - Front Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 0.700	64.59	186568	< 0.000
Arsenic	26.8	"	"	0.010
Barium	18.5	"	"	0.007
Cadmium	11.30	"	"	0.004
Chromium	22.8	"	"	0.009
Lead	22.1	"	"	0.008
Selenium	17.1	"	"	0.007
Total Metals	< 119.3	"	"	< 0.046

Run 7 - Back Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 0.926	64.59	186568	< 0.000
Arsenic	42.7	"	"	0.016
Barium	5.3	"	"	0.002
Cadmium	1.03	"	"	0.000
Chromium	1.95	"	"	0.001
Lead	1.76	"	"	0.001
Selenium	236	"	"	0.090
Total Metals	< 289.7	"	"	< 0.111
Total Train	< 409.0	"	"	<0.1561

Run 8 - Front Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 0.700	85.27	243603	< 0.000
Arsenic	38.4	"	"	0.015
Barium	33.4	"	"	0.013
Cadmium	7.05	"	"	0.003
Chromium	27.5	"	"	0.010
Lead	30.2	"	"	0.012
Selenium	14.3	"	"	0.005
Total Metals	< 151.6	"	"	< 0.058

Run 8 - Back Half

Metal	ug/sample	Vmstd (ft3)	Qs (ACFM)	Emissio Rate (lb/hr)
Silver	< 0.884	85.27	243603	< 0.000
Arsenic	34.9	"	"	0.013
Barium	< 2.53	"	"	< 0.001
Cadmium	0.614	"	"	0.000
Chromium	1.85	"	"	0.001
Lead	1.36	"	"	0.001
Selenium	441	"	"	0.168
Total Metals	< 483.1	"	"	< 0.184
Total Train	< 634.7	"	"	<0.2422

Run 9 - Front Half

Metal		ug/sample	Vmstd (ft3)	Qs (ACFM)		Emissio Rate (lb/hr)
Silver	<	0.700	85.27	243603	<	0.000
Arsenic		21.4	"	"		0.008
Barium		11.0	"	"		0.004
Cadmium		12.4	"	"		0.005
Chromium		9.23	"	"		0.004
Lead		18.8	"	"		0.007
Selenium		10.7	"	"		0.004
Total Metals	<	84.2	"	"	<	0.032

Run 9 - Back Half

Metal		ug/sample	Vmstd (ft3)	Qs (ACFM)		Emissio Rate (lb/hr)
Silver	<	0.969	85.27	243603	<	0.000
Arsenic		78.4	"	"		0.030
Barium	<	2.77	"	"	<	0.001
Cadmium		0.670	"	"		0.000
Chromium		2.24	"	"		0.001
Lead		1.62	"	"		0.001
Selenium		189	"	"		0.072
Total Metals	<	275.7	"	"	<	0.105
Total Train	<	359.9	"	"	<	0.1373

APPENDIX H

OPTIMIZATION TEST

PARTICULATE SIZING DATA SUMMARY AT ESP INLET AND OUTLET

WP&L Particle Sizing

Run And1, Inlet, 11 Apr, Full Load Baseline

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (microns)
E-time=	3	1	0.7	2.9	97.1	11.6
Vm=	1.105	2	1.5	6.3	90.8	7.2
Pb=	29.44	3	3.7	15.5	75.3	4.9
Ts=	460	4	4.1	17.2	58.2	3.4
Sstat=	21	5	3.7	15.5	42.7	2.1
Tm=	70	6	5.6	23.4	19.2	1.0
Delta h=	0.416	7	1.4	5.9	13.4	0.66
Delta p=	0.95	8	0.8	3.3	10.0	0.44
Dn=	0.172	Backup	2.4	10.0	0.0 <	0.44
% Isokin=	91.9	Total	23.9	100.0		
Imp ACFM=	0.63					

Run And2, Inlet, 22 Apr

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (micron
E-time=	6	1	0.5	4.1	95.9	16.3
Vm=	1.209	2	0.3	2.5	93.4	10.2
Pb=	29.54	3	0.3	2.5	91.0	6.9
Ts=	400	4	0.4	3.3	87.7	4.7
Sstat=	10	5	0.6	4.9	82.8	3.0
Tm=	50	6	3.9	32.0	50.8	1.50
Delta h=	0.098	7	2.2	18.0	32.8	0.95
Delta p=	0.30	8	1.6	13.1	19.7	0.64
Dn=	0.172	Backup	2.4	19.7	0.0 <	0.64
% Isokin=	91.2	Total	12.2	100.0		
Imp ACFM=	0.34					

Run And3, Inlet, 23 Apr

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (microns)
E-time=	4	1	17.5	16.2	83.8	13.9
Vm=	1.139	2	11.6	10.8	73.0	8.6
Pb=	29.53	3	27.2	25.2	47.8	5.9
Ts=	420	4	10.9	10.1	37.7	4.0
Sstat=	10	5	12.4	11.5	26.2	2.6
Tm=	85	6	15.7	14.6	11.6	1.3
Delta h=	0.105	7	7.8	7.2	4.4	0.79
Delta p=	0.30	8	3.2	3.0	1.4	0.54
Dn=	0.172	Backup	1.5	1.4	0.0 <	0.54
% Isokin=	121.9	Total	107.8	100.0		
Imp ACFM=	0.47					

Run And4, Inlet, 24 Apr

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (micron
E-time=	4	1	4.5	7.3	92.7	11.3
Vm=	1.716	2	7.1	11.5	81.2	7.0
Pb=	29.55	3	13.4	21.8	59.4	4.8
Ts=	430	4	8.1	13.1	46.3	3.3
Sstat=	20	5	9.9	16.1	30.2	2.1
Tm=	70	6	10.9	17.7	12.5	1.00
Delta h=	0.617	7	4.1	6.7	5.8	0.64
Delta p=	1.05	8	1.8	2.9	2.9	0.43
Dn=	0.172	Backup	1.8	2.9	0.0 <	0.43
% Isokin=	100.5	Total	61.6	100.0		
Imp ACFM=	0.71					

WP&L Particle Sizing

Run And5, Inlet, 27 Apr

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (microns)
E-time=	4	1	5.6	7.3	92.7	10.9
Vm=	1.784	2	9.7	12.7	79.9	6.8
Pb=	29.82	3	20.9	27.4	52.5	4.6
Ts=	470	4	13.0	17.1	35.4	3.2
Sstat=	20	5	10.8	14.2	21.3	2.0
Tm=	90	6	9.3	12.2	9.1	1.0
Delta h=	0.534	7	3.3	4.3	4.7	0.61
Delta p=	1.10	8	1.3	1.7	3.0	0.41
Dn=	0.172	Backup	2.3	3.0	0.0 <	0.41
% Isokin=	101.0	Total	76.2	100.0		
Imp ACFM=	0.75					

Run And6, Inlet, 28 Apr

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (micron
E-time=	4	1	2.8	5.5	94.5	11.8
Vm=	1.497	2	4.2	8.3	86.2	7.3
Pb=	29.45	3	10.7	21.1	65.1	5.0
Ts=	460	4	8.6	17.0	48.1	3.4
Sstat=	16	5	9.7	19.1	29.0	2.2
Tm=	70	6	9.5	18.7	10.3	1.10
Delta h=	0.481	7	2.3	4.5	5.7	0.67
Delta p=	0.84	8	1.3	2.6	3.2	0.45
Dn=	0.172	Backup	1.6	3.2	0.0 <	0.45
% Isokin=	99.9	Total	50.7	100.0		
Imp ACFM=	0.65					

Run And7, Inlet, 29 Apr

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (microns)
E-time=	4	1	26.7	33.9	66.1	11.9
Vm=	1.536	2	8.4	10.7	55.5	7.4
Pb=	29.26	3	10.7	13.6	41.9	5.0
Ts=	470	4	8.6	10.9	31.0	3.4
Sstat=	15	5	9.7	12.3	18.7	2.2
Tm=	100	6	9.5	12.1	6.6	1.1
Delta h=	0.3	7	2.3	2.9	3.7	0.67
Delta p=	0.75	8	1.3	1.6	2.0	0.45
Dn=	0.172	Backup	1.6	2.0	0.0 <	0.45
% Isokin=	103.0	Total	78.8	100.0		
Imp ACFM=	0.64					

Run And8, Inlet, 1 May

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (micron
E-time=	4	1	19.5	25.3	74.7	13.4
Vm=	1.177	2	14.5	18.8	55.8	8.4
Pb=	29.24	3	9.9	12.9	43.0	5.7
Ts=	430	4	8.3	10.8	32.2	3.9
Sstat=	10	5	8.0	10.4	21.8	2.5
Tm=	75	6	9.8	12.7	9.1	1.2
Delta h=	0.259	7	4.1	5.3	3.8	0.77
Delta p=	0.45	8	1.5	1.9	1.8	0.52
Dn=	0.172	Backup	1.4	1.8	0.0 <	0.52
% Isokin=	104.9	Total	77	100.0		
Imp ACFM=	0.50					

WP&L Particle Sizing

Run And9, Inlet, 1 May, 110MWe

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (microns)
E-time=	4	1	6.5	14.6	85.4	11.2
Vm=	1.668	2	4.2	9.4	76.0	7.0
Pb=	29.15	3	7.0	15.7	60.2	4.7
Ts=	480	4	7.9	17.8	42.5	3.2
Sstat=	20	5	5.0	11.2	31.2	2.1
Tm=	80	6	10.1	22.7	8.5	1.00
Delta h=	0.684	7	2.2	4.9	3.6	0.63
Delta p=	1.20	8	0.8	1.8	1.8	0.43
Dn=	0.172	Backup	0.8	1.8	0.0 <	0.43
% Isokin=	91.5	Total	44.5	100.0		
Imp ACFM=	0.72					

Run And10, Inlet, 16 May, 82MWe

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (micron
E-time=	4	1	12.6	15.3	84.7	13.4
Vm=	1.239	2	12.5	15.2	69.5	8.4
Pb=	29.43	3	13.0	15.8	53.7	5.7
Ts=	430	4	11.2	13.6	40.1	3.9
Sstat=	14	5	12.2	14.8	25.3	2.5
Tm=	98	6	12.9	15.7	9.6	1.2
Delta h=	0.77	7	5.4	6.6	3.0	0.77
Delta p=	0.46	8	1.4	1.7	1.3	0.52
Dn=	0.172	Backup	1.1	1.3	0.0 <	0.52
% Isokin=	104.8	Total	82.3	100.0		
Imp ACFM=	0.50					

Run And11, Inlet, 17 May, 57MWe

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (microns)
E-time=	4	1	22.9	35.7	64.3	17.0
Vm=	0.804	2	6.5	10.1	54.1	10.6
Pb=	29.62	3	10.3	16.1	38.1	7.2
Ts=	420	4	3.3	5.1	32.9	4.9
Sstat=	20	5	7.2	11.2	21.7	3.2
Tm=	98	6	8.8	13.7	8.0	1.60
Delta h=	0.113	7	3.6	5.6	2.3	0.99
Delta p=	0.40	8	1.4	2.2	0.2	0.67
Dn=	0.154	Backup	0.1	0.2	0.0 <	0.67
% Isokin=	89.9	Total	64.1	100.0		
Imp ACFM=	0.31					

Run And12, Inlet, 18 May, 110MWe

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (micron
E-time=	4	1	9.9	22.3	77.7	12.3
Vm=	1.438	2	8.6	19.4	58.2	7.6
Pb=	29.84	3	7.3	16.5	41.8	5.2
Ts=	460	4	6.0	13.5	28.2	3.5
Sstat=	14	5	5.5	12.4	15.8	2.3
Tm=	90	6	5.6	12.6	3.2	1.1
Delta h=	0.387	7	0.7	1.6	1.6	0.70
Delta p=	1.10	8	0.7	1.6	0.0	0.47
Dn=	0.162	Backup	0.0	0.0	0.0 <	0.47
% Isokin=	91.9	Total	44.3	100.0		
Imp ACFM=	0.60					

WP&L Particle Sizing

Run And13, Inlet, 19 May, 110MWe

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (microns)
E-time=	4	1	4.9	14.4	85.6	11.8
Vm=	1.5	2	4.5	13.2	72.4	7.3
Pb=	29.74	3	5.5	16.1	56.3	5.0
Ts=	475	4	5.3	15.5	40.8	3.4
Sstat=	20	5	5.1	15.0	25.8	2.2
Tm=	78	6	6.5	19.1	6.7	1.10
Delta h=	0.373	7	1.9	5.6	1.2	0.67
Delta p=	1.30	8	0.0	0.0	1.2	0.45
Dn=	0.162	Backup	0.4	1.2	0.0 <	0.45
% Isokin=	90.1	Total	34.1	100.0		
Imp ACFM=	0.65					

Run And14, Inlet, 19 May, 82MWe

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (micron
E-time=	4	1	2.1	8.0	92.0	13.9
Vm=	1.154	2	2.1	8.0	84.0	8.6
Pb=	29.62	3	3.6	13.7	70.3	5.9
Ts=	440	4	4.4	16.7	53.6	4.0
Sstat=	14	5	6.2	23.6	30.0	2.6
Tm=	95	6	4.6	17.5	12.5	1.3
Delta h=	0.258	7	1.5	5.7	6.8	0.79
Delta p=	0.70	8	0.3	1.1	5.7	0.54
Dn=	0.162	Backup	1.5	5.7	0.0 <	0.54
% Isokin=	90.3	Total	26.3	100.0		
Imp ACFM=	0.47					

Run And15, Inlet, 20 May, 110MWe

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (microns)
E-time=	4	1	8.3	12.4	87.6	12.5
Vm=	1.412	2	9.8	14.6	72.9	7.8
Pb=	29.74	3	12.1	18.1	54.9	5.3
Ts=	460	4	11.9	17.8	37.1	3.6
Sstat=	20	5	9.3	13.9	23.2	2.3
Tm=	95	6	10.0	14.9	8.2	1.10
Delta h=	0.398	7	3.5	5.2	3.0	0.71
Delta p=	1.05	8	0.8	1.2	1.8	0.48
Dn=	0.162	Backup	1.2	1.8	0.0 <	0.48
% Isokin=	90.8	Total	66.9	100.0		
Imp ACFM=	0.58					

Run And16, Inlet, 20 May, 82MWe

Sampling Data		Stage	Catch(mg)	%	Cum. % Less Than	ECD (micron
E-time=	4	1	17.5	18.1	81.9	14.5
Vm=	1.052	2	11.7	12.1	69.8	9.0
Pb=	29.72	3	20.8	21.5	48.3	6.1
Ts=	450	4	21.6	22.3	26.0	4.2
Sstat=	14	5	6.9	7.1	18.8	2.7
Tm=	95	6	6.5	6.7	12.1	1.3
Delta h=	0.204	7	6.1	6.3	5.8	0.83
Delta p=	0.70	8	4.1	4.2	1.6	0.56
Dn=	0.154	Backup	1.5	1.6	0.0 <	0.56
% Isokin=	91.7	Total	96.7	100.0		
Imp ACFM=	0.43					

Run And01. Outlet. 16 May. 82MWe

Sampling Data

E-time=	60
Vm=	17.619
Pb=	29.43
Ts=	460
Sstat=	14
Tm=	80
Delta h=	0.281
Delta p=	0.90
Dn=	0.148
% Isokin=	100.6
Imp ACFM=	0.50

Stage	Catch(mg)	%	Cum. % Less Than	ECD (microns)
1	0.1	2.1	97.9	13.4
2	0.3	6.2	91.7	8.4
3	0.5	10.3	81.4	5.7
4	1.0	20.7	60.7	3.9
5	0.9	19.4	41.3	2.5
6	1.0	20.7	20.7	1.20
7	0.5	10.3	10.3	0.77
8	0.4	8.3	2.1	0.52
Backup	0.1	2.1	0.0 <	0.52
Total	4.8	100.0		

Run And02. Outlet. 17 May. 58MWe

Sampling Data

E-time=	60
Vm=	14.294
Pb=	29.62
Ts=	440
Sstat=	14
Tm=	80
Delta h=	0.157
Delta p=	0.50
Dn=	0.148
% Isokin=	108.6
Imp ACFM=	0.40

Stage	Catch(mg)	%	Cum. % Less Than	ECD (micron
1	0.0	0.0	100.0	15.0
2	0.2	4.5	95.5	9.4
3	0.9	20.5	75.0	6.4
4	0.9	20.5	54.5	4.3
5	0.7	15.9	38.6	2.8
6	0.7	15.9	22.7	1.4
7	0.4	9.1	13.6	0.87
8	0.4	9.1	4.5	0.59
Backup	0.2	4.5	0.0 <	0.59
Total	4.4	100.0		

Run And03. Outlet. 19 May. 110MWe

Sampling Data

E-time=	60
Vm=	21.124
Pb=	29.62
Ts=	470
Sstat=	20
Tm=	84
Delta h=	0.377
Delta p=	1.20
Dn=	0.148
% Isokin=	103.8
Imp ACFM=	0.60

Stage	Catch(mg)	%	Cum. % Less Than	ECD (microns)
1	0.2	3.1	96.9	12.3
2	0.5	7.7	89.2	7.6
3	0.6	9.2	80.0	5.2
4	1.3	20.0	60.0	3.5
5	1.1	16.9	43.1	2.3
6	1.2	18.5	24.6	1.10
7	0.7	10.8	13.8	0.70
8	0.6	9.2	4.6	0.47
Backup	0.3	4.6	0.0 <	0.47
Total	6.5	100.0		

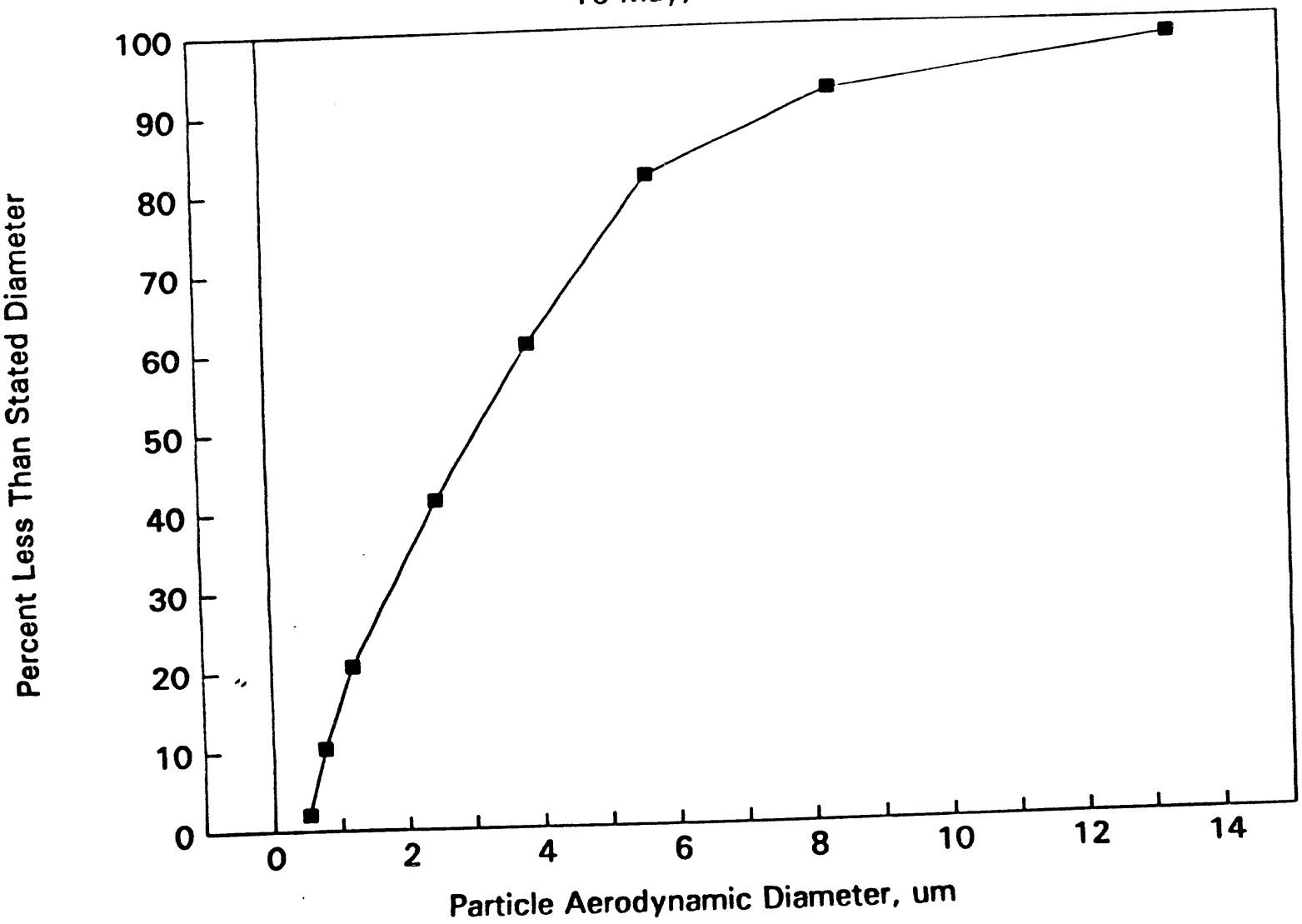
APPENDIX I

OPTIMIZATION TEST

PARTICLE SIZING PLOTS—
ESP INLET AND OUTLET

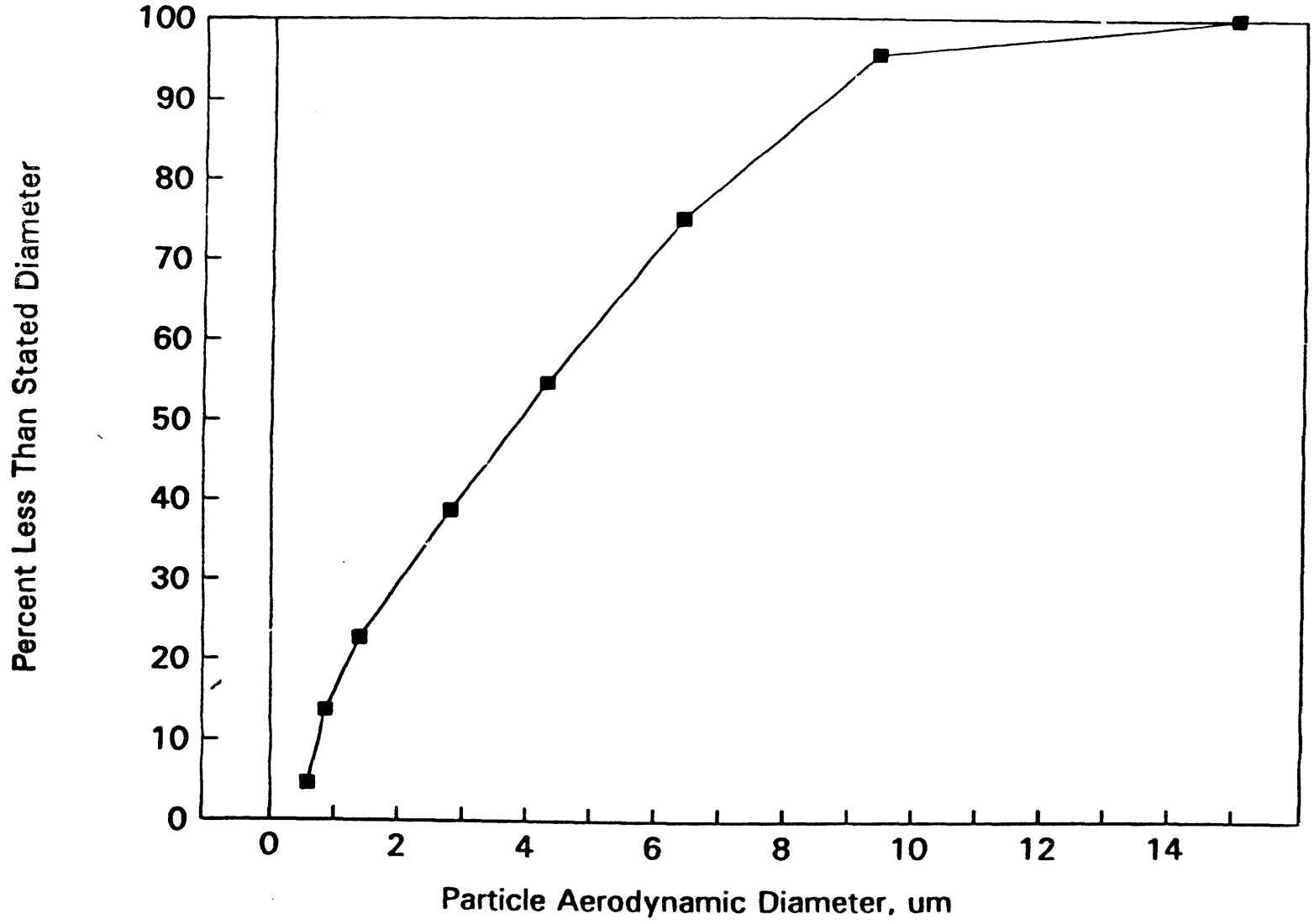
ESP Outlet Run 1

16 May, 1992



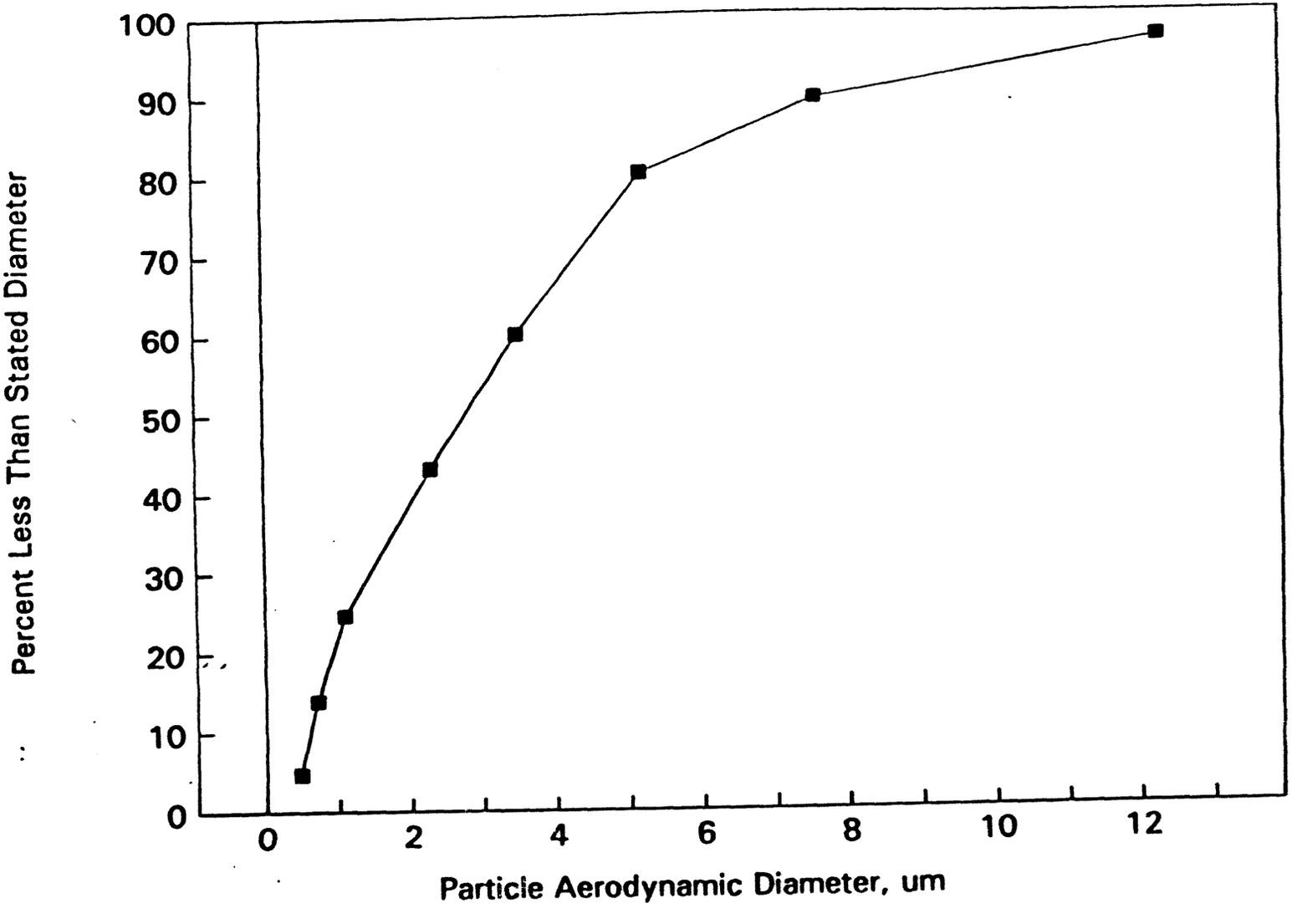
ESP Outlet Run 2

17 May, 1992



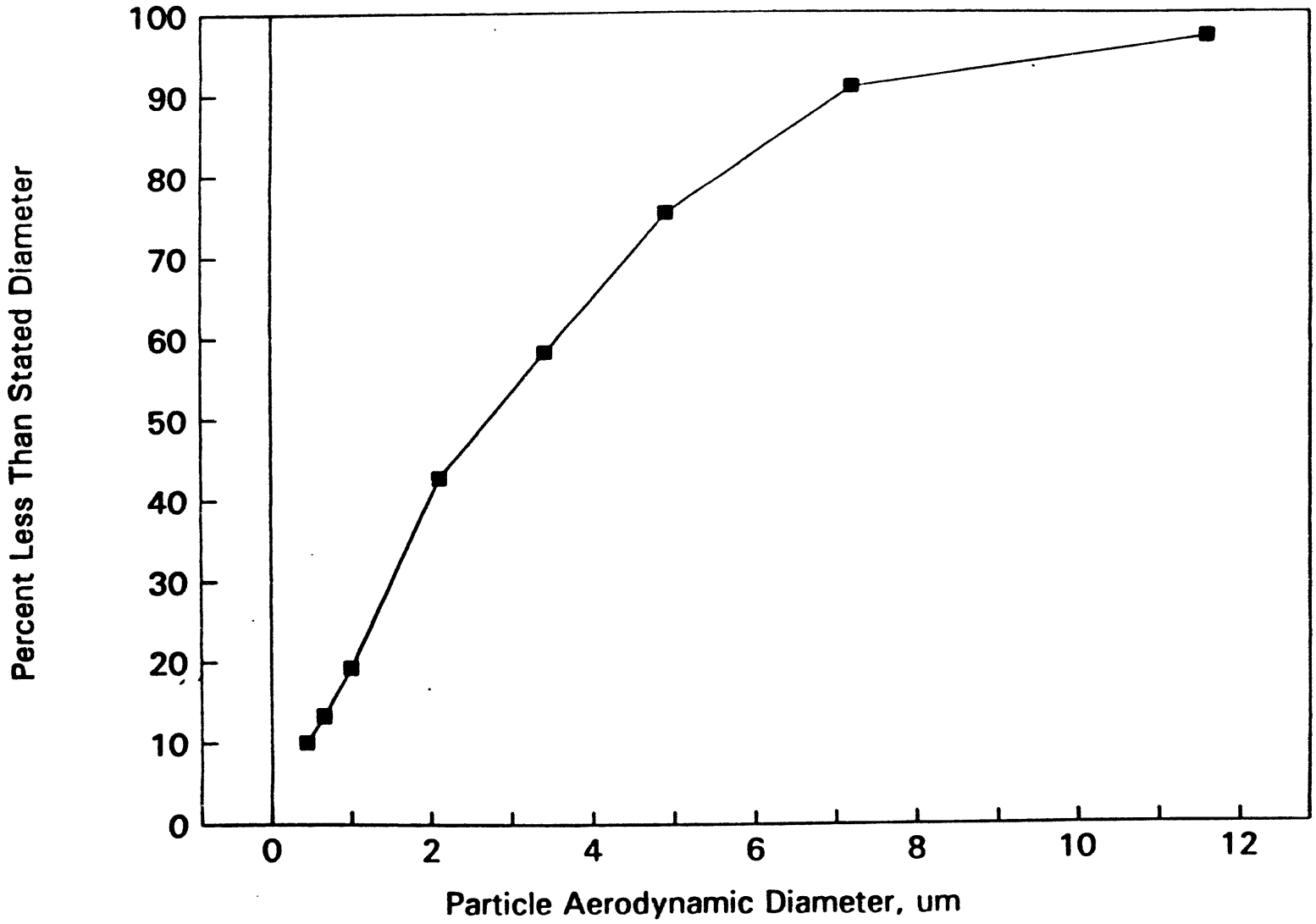
ESP Outlet Run 3

19 May, 1992



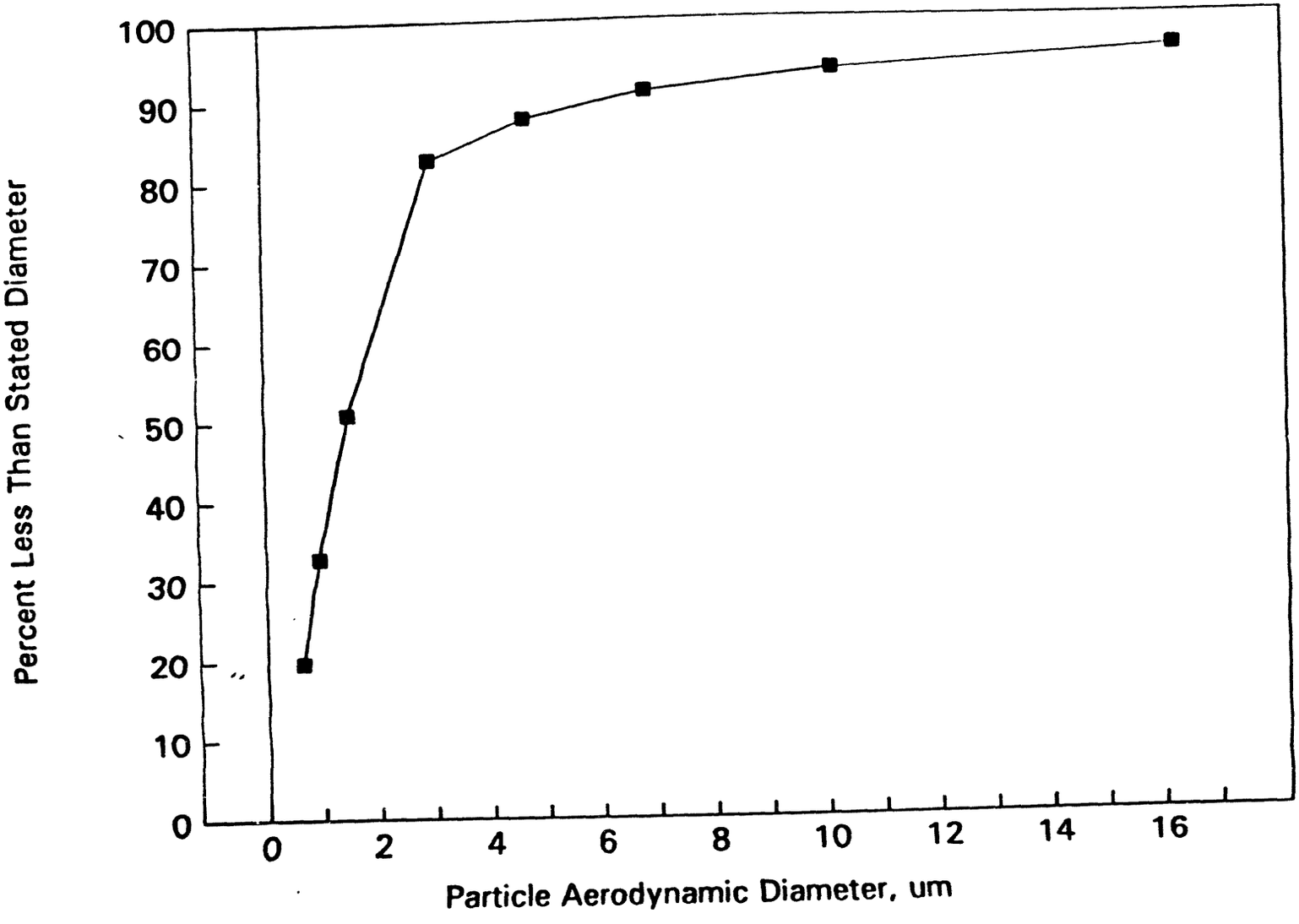
ESP Inlet Run 1

11 April, 1992



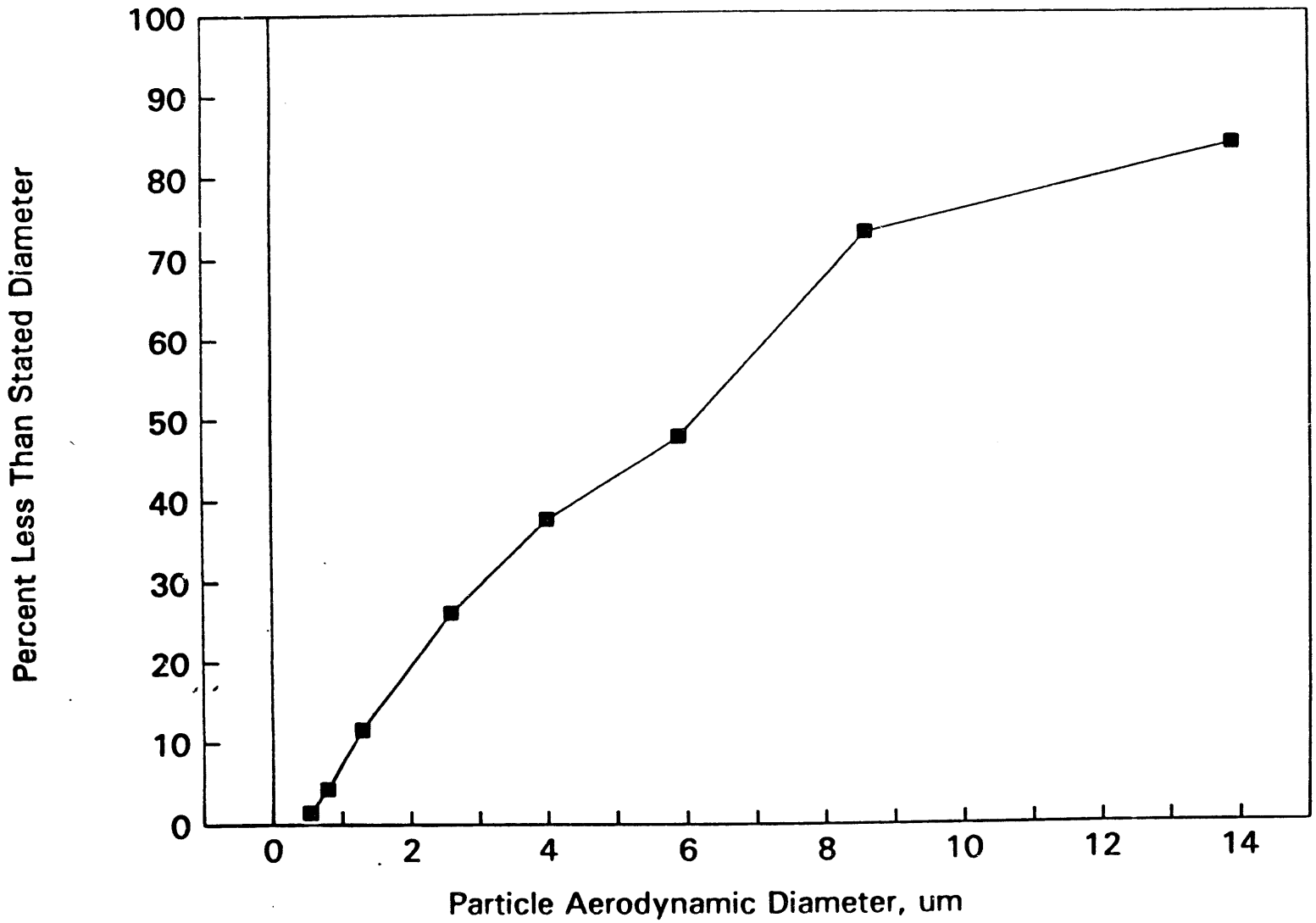
ESP Inlet Run 2

22 April, 1992



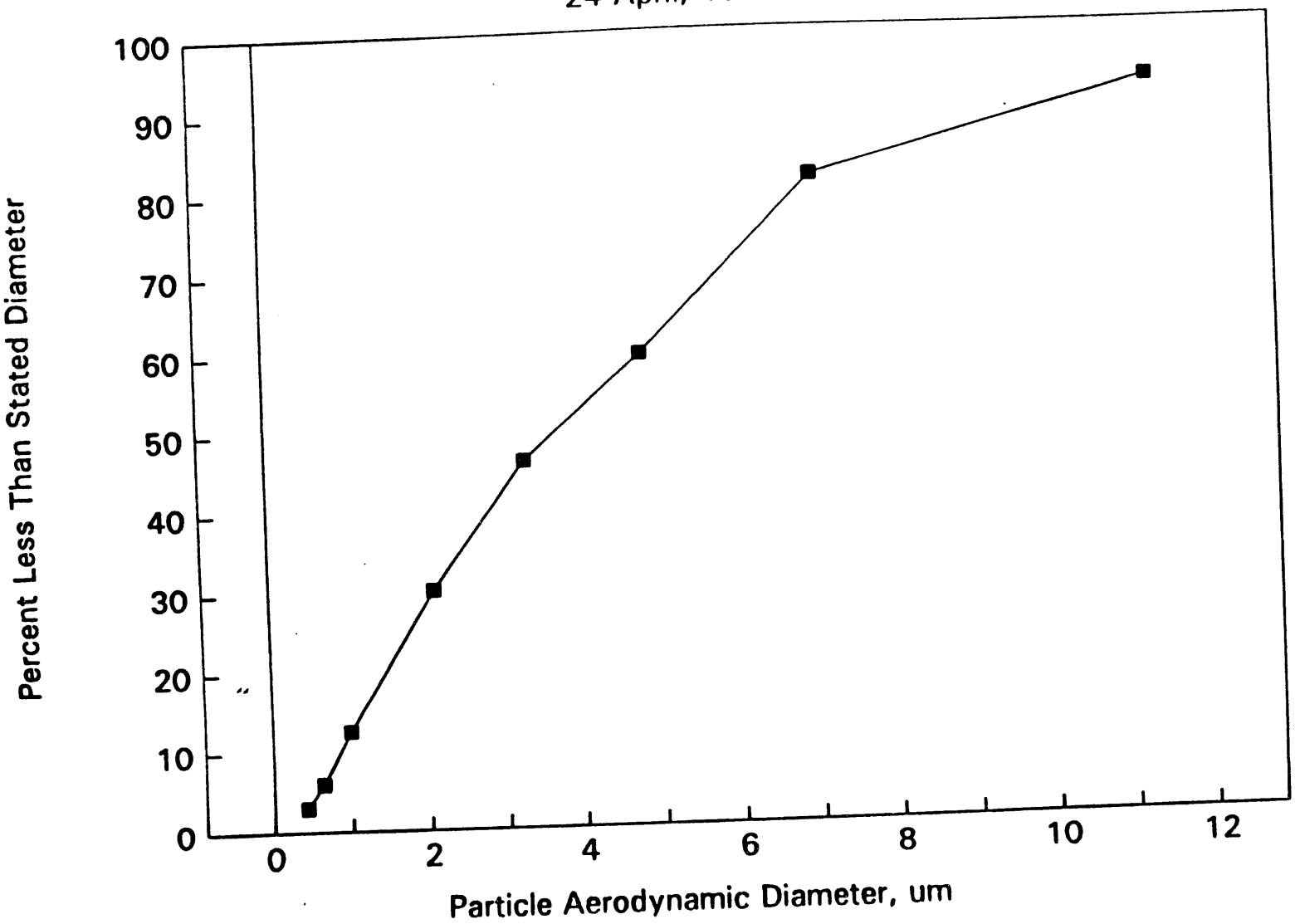
ESP Inlet Run 3

23 April, 1992



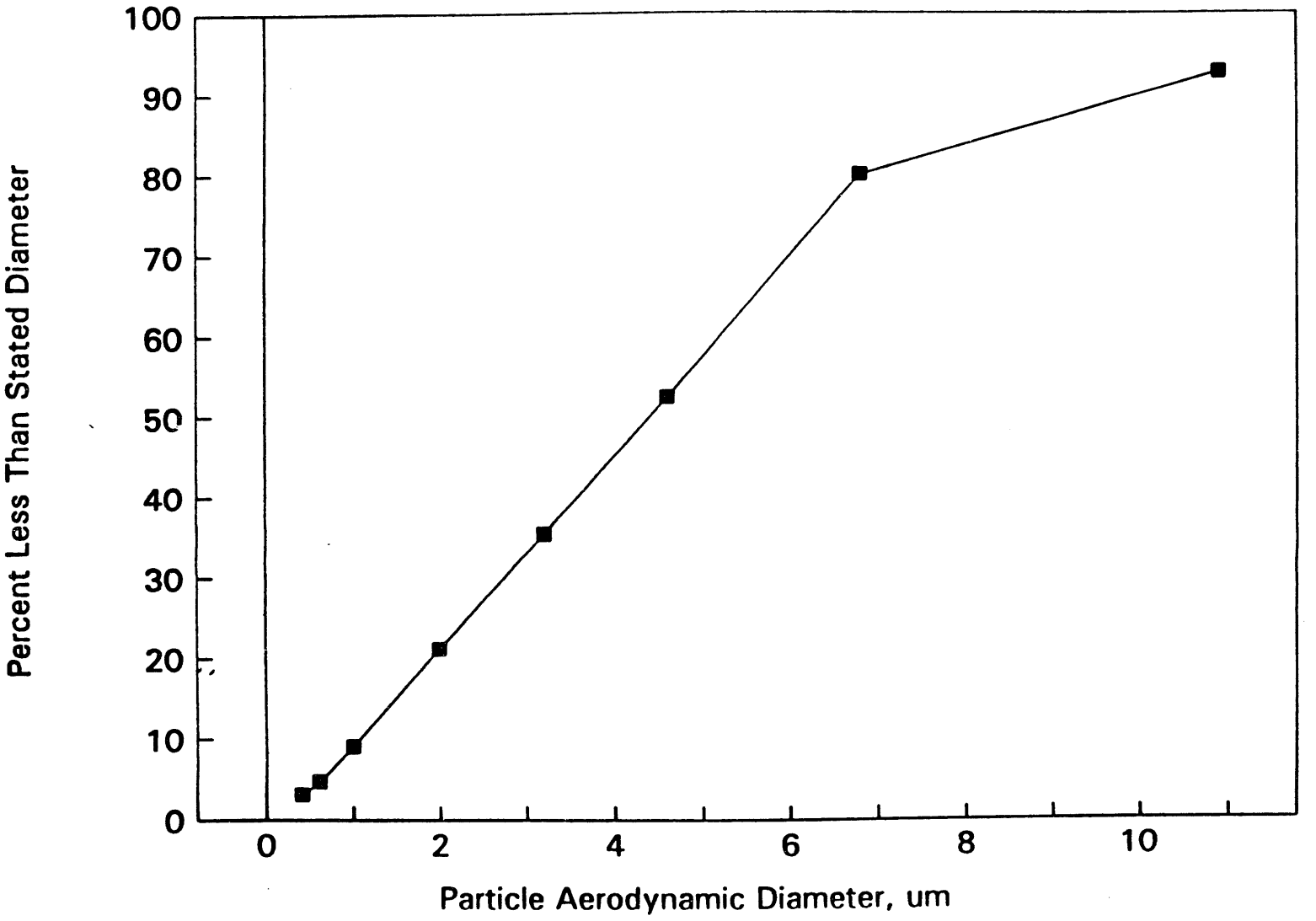
ESP Inlet Run 4

24 April, 1992



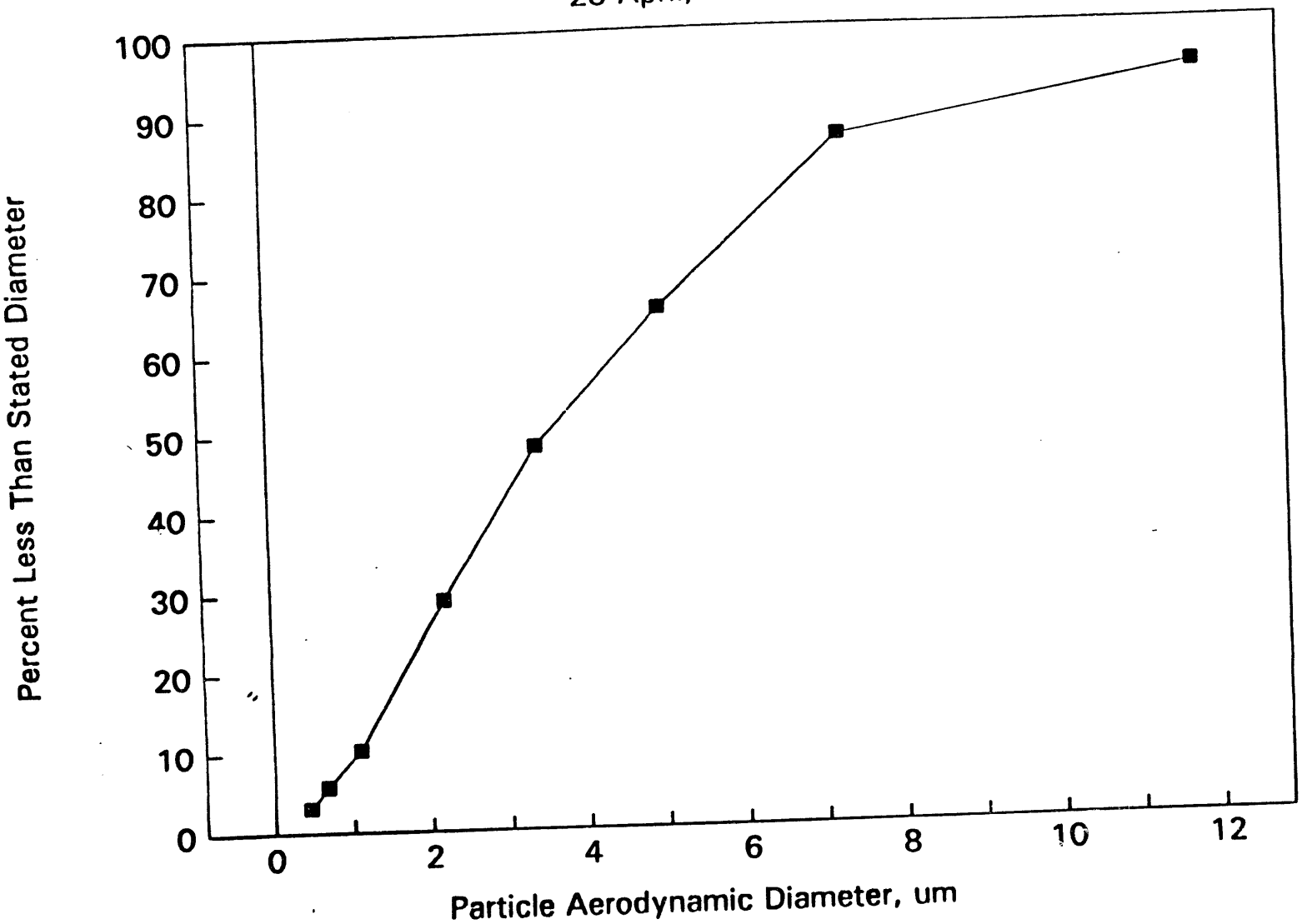
ESP Inlet Run 5

27 April, 1992



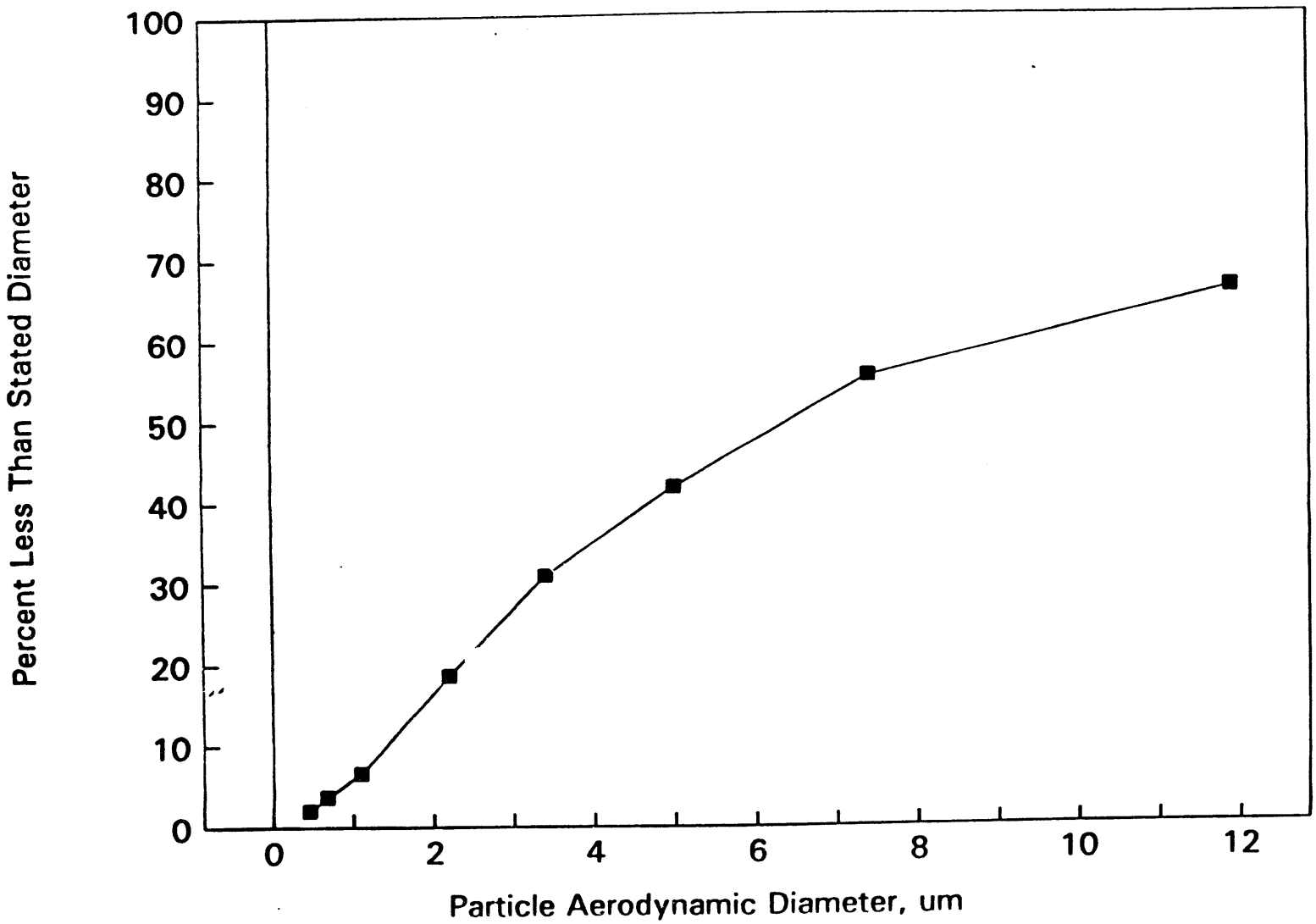
ESP Inlet Run 6

28 April, 1992



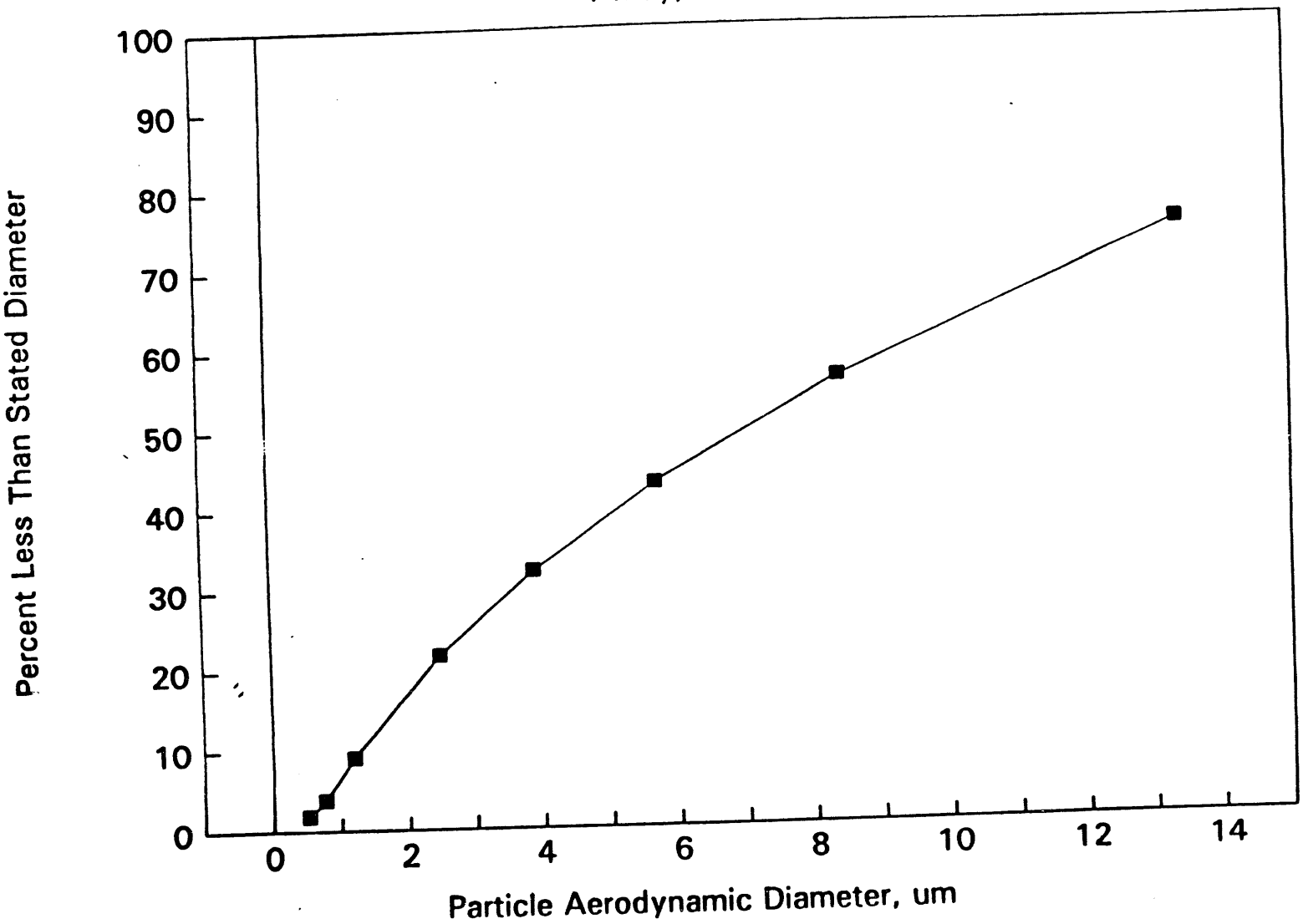
ESP Inlet Run 7

29 April, 1992



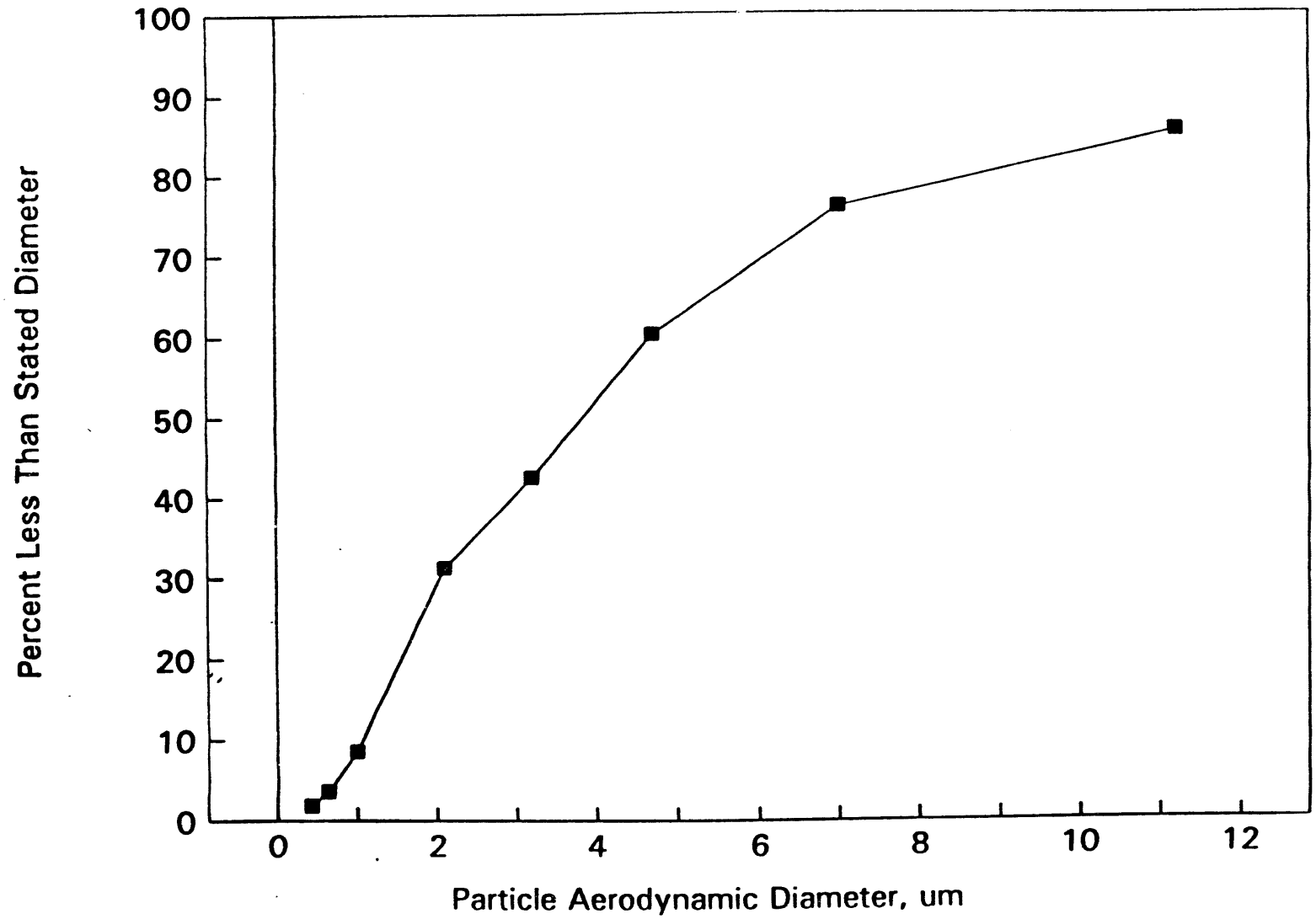
ESP Inlet Run 8

1 May, 1992



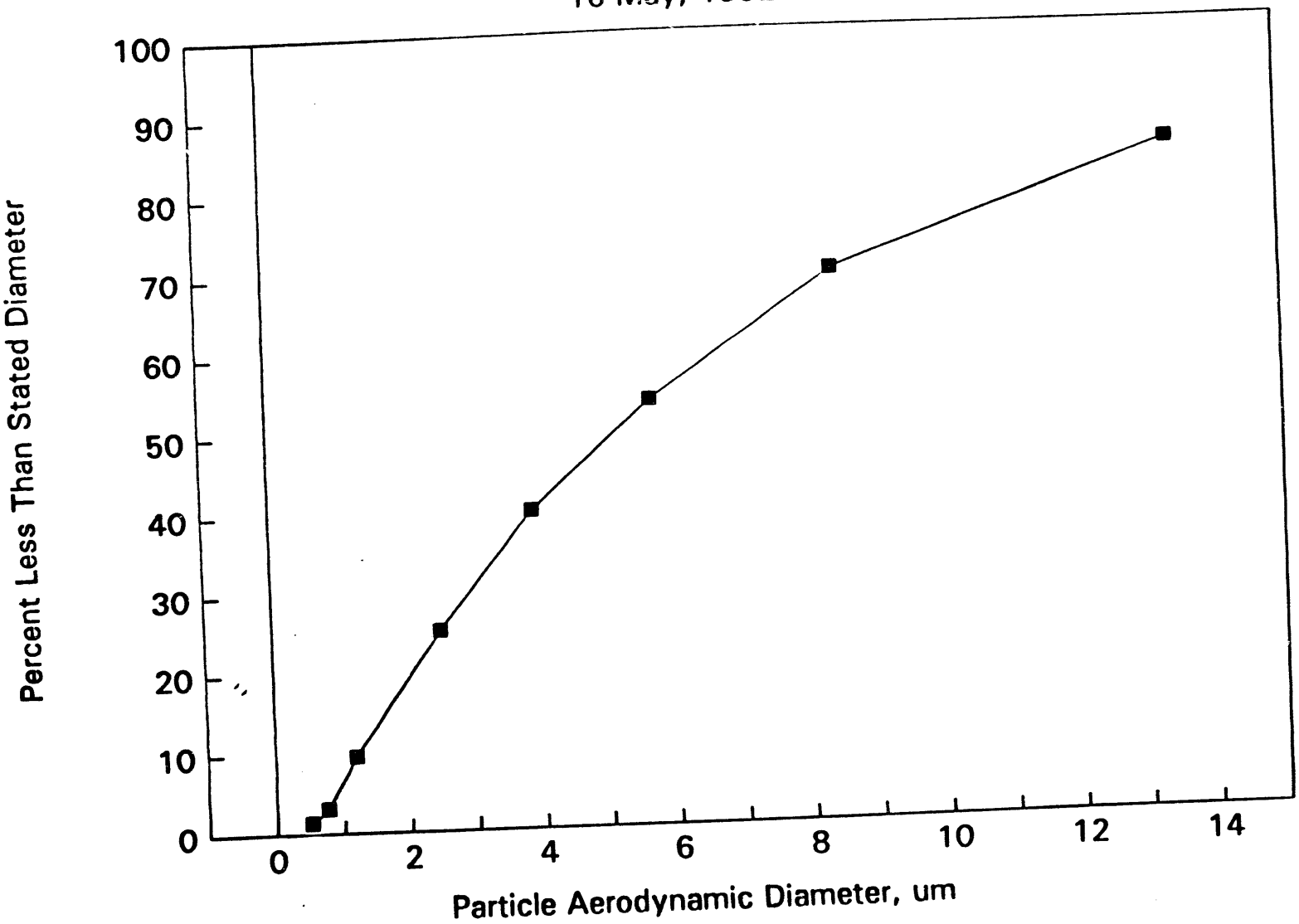
ESP Inlet Run 9

1 May, 1992



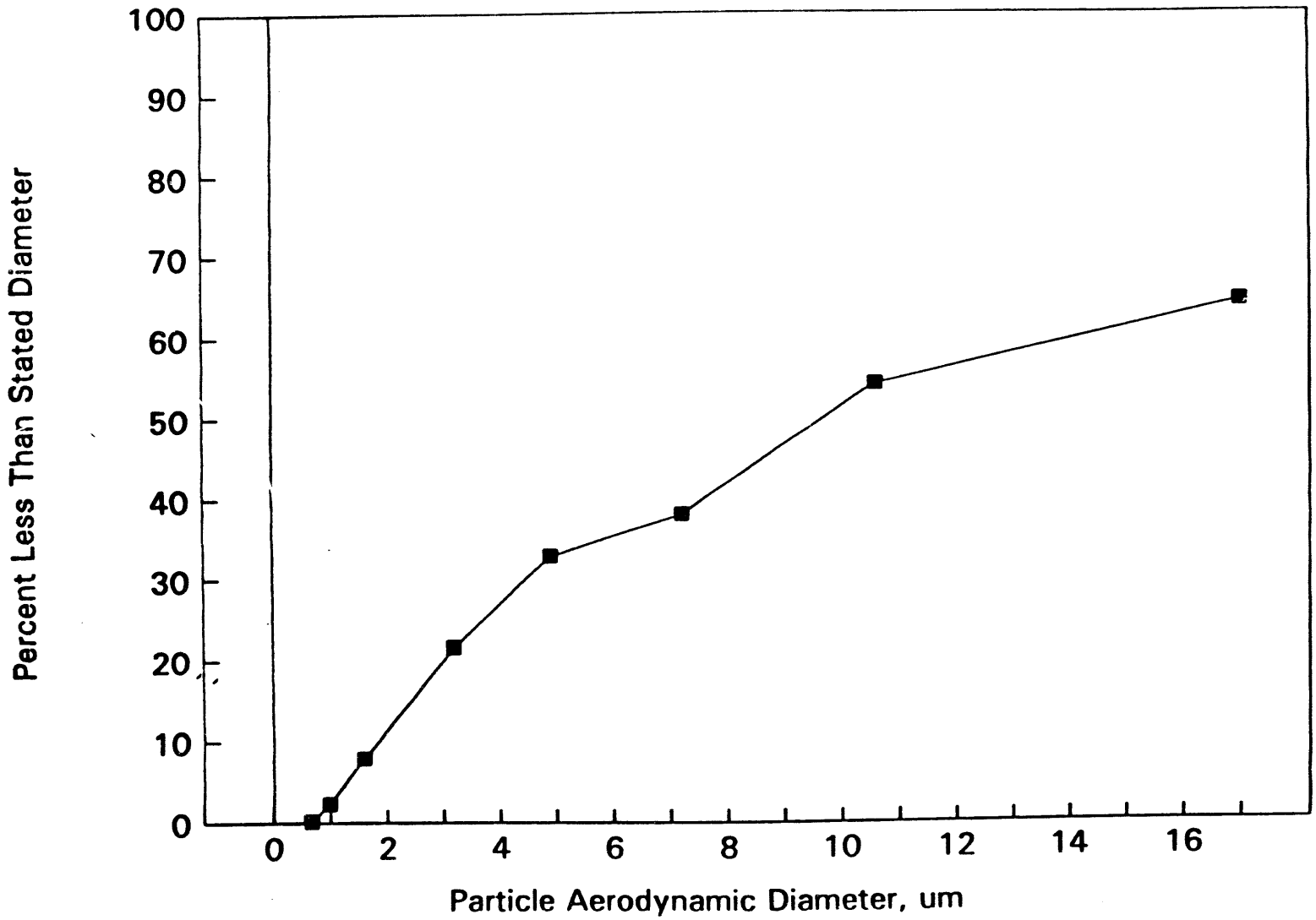
ESP Inlet Run 10

16 May, 1992



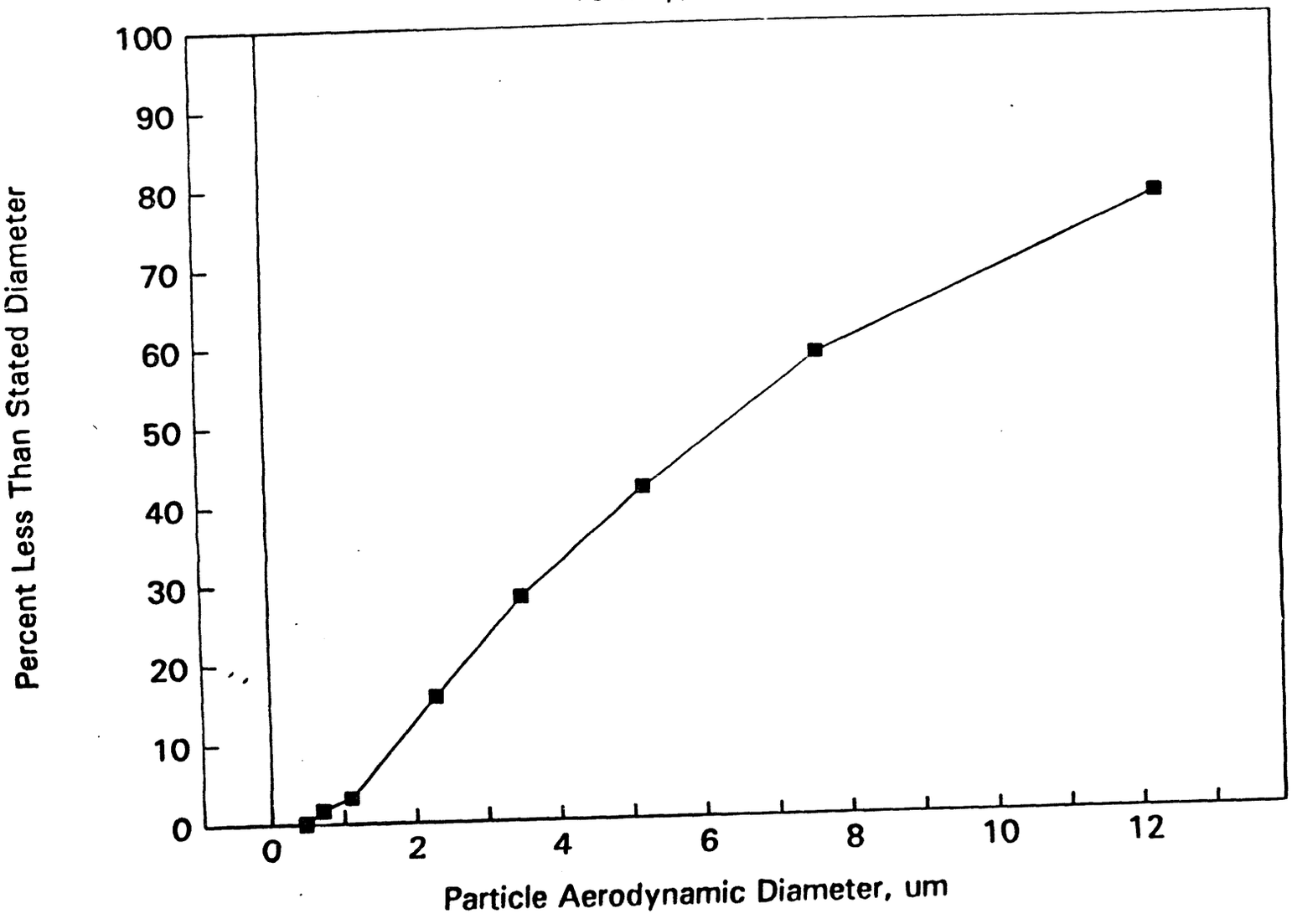
ESP Inlet Run 11

17 May, 1992



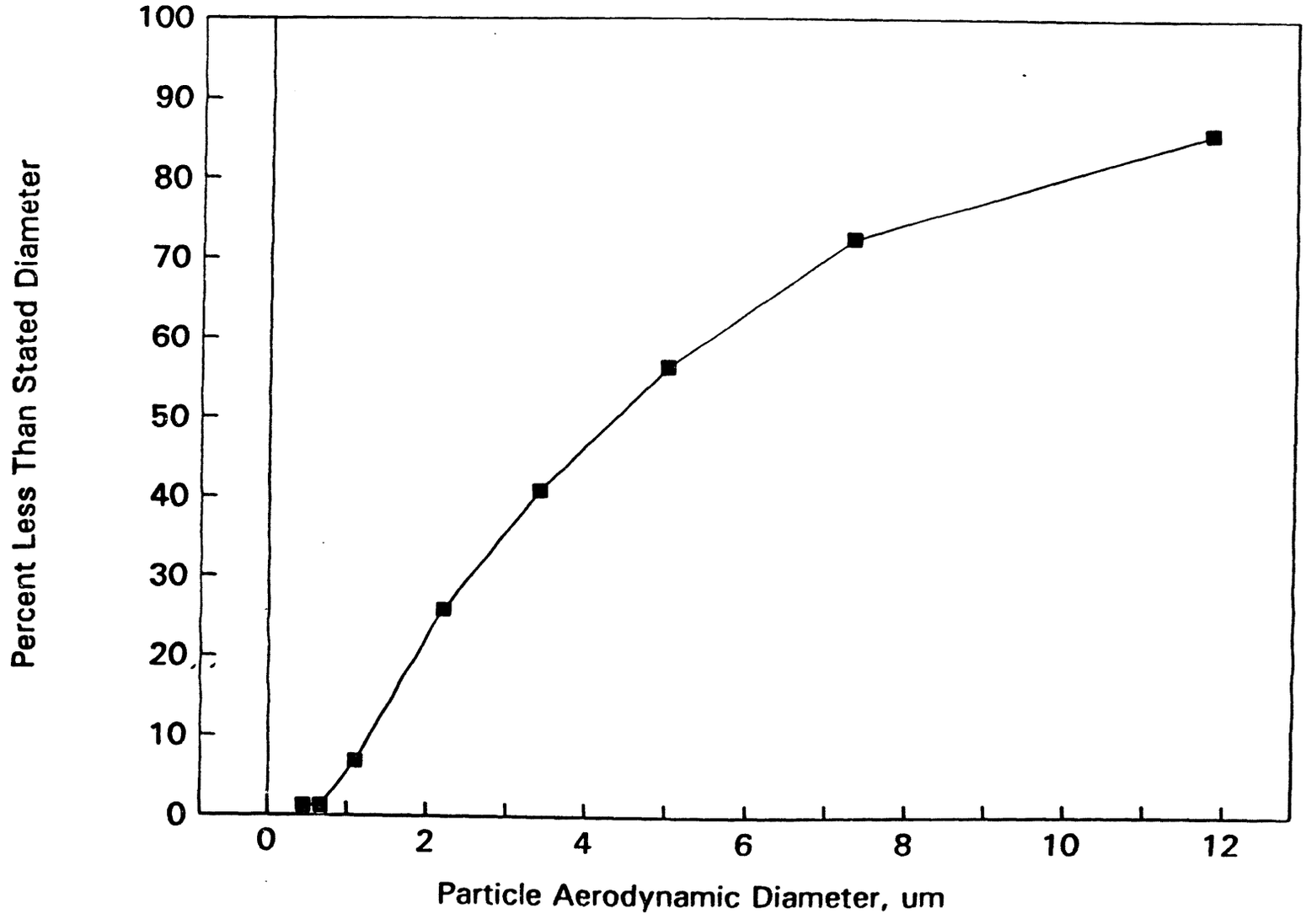
ESP Inlet Run 12

18 May, 1992



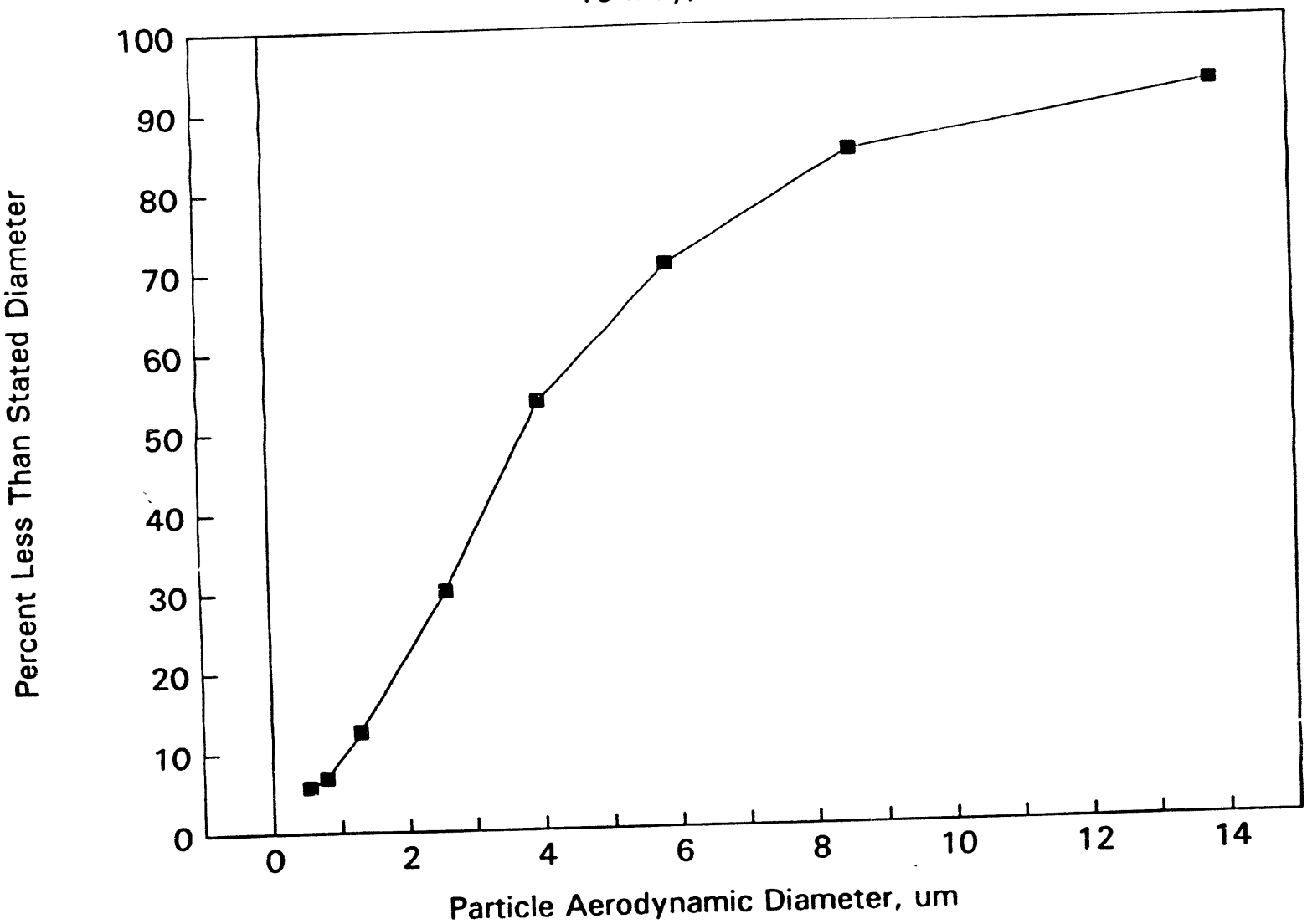
ESP Inlet Run 13

19 May, 1992



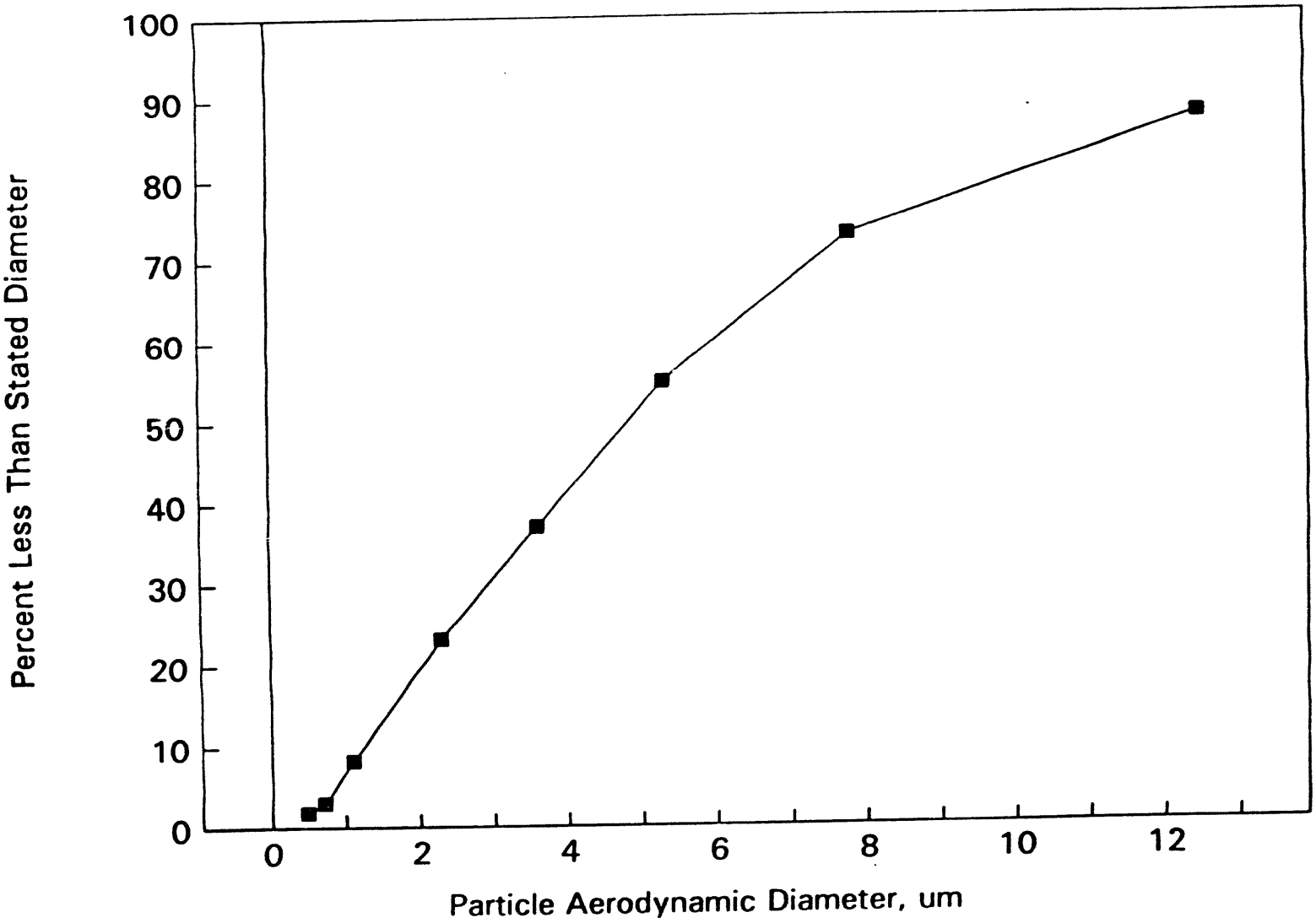
ESP Inlet Run 14

19 May, 1992



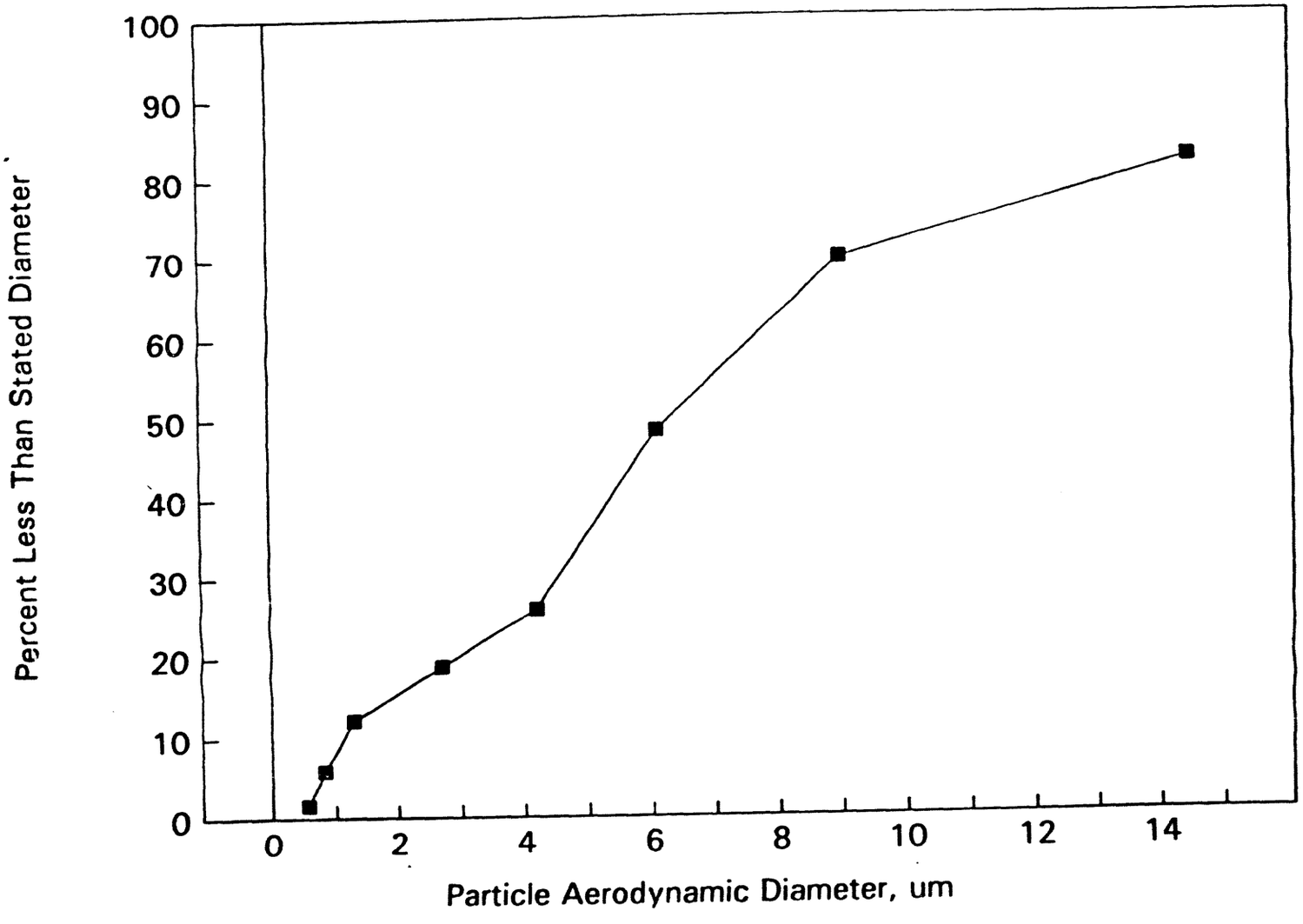
ESP Inlet Run 15

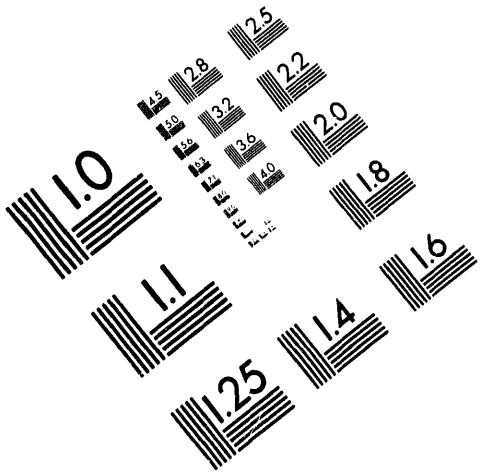
20 May, 1992



ESP Inlet Run 16

20 May, 1992

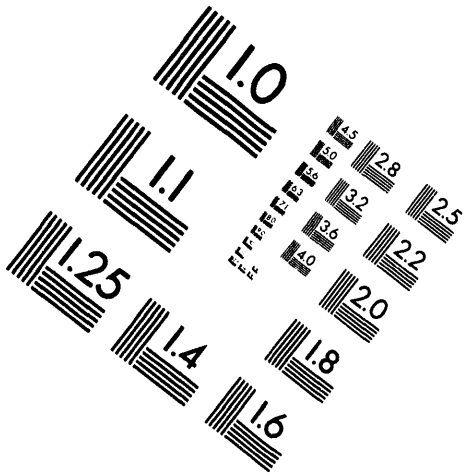




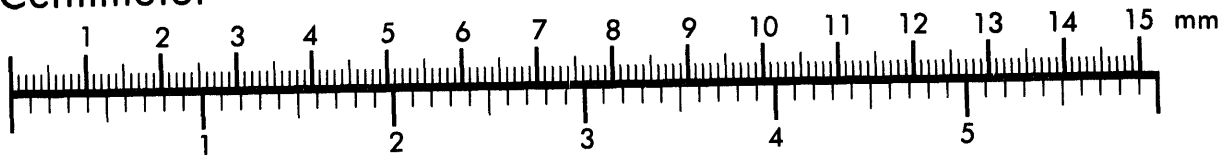
Association for Information and Image Management

1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910

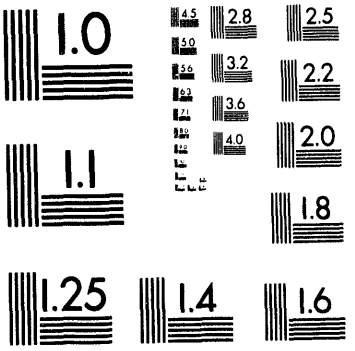
301/587-8202

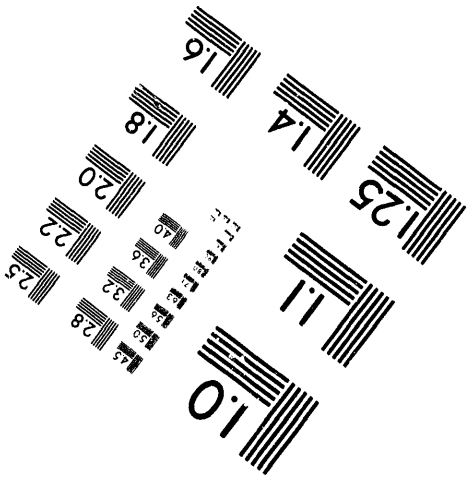


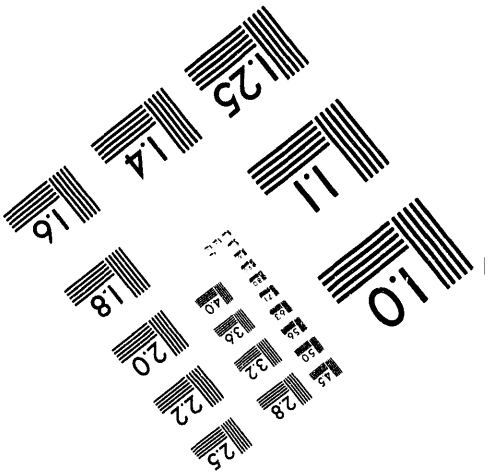
Centimeter



Inches







MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

4 of 9

APPENDIX J

OPTIMIZATION TEST

CARBON IN FLYASH
LOI DATA SUMMARY

B&W - Cassville, Ash % Carbon (ASTM-D3178) Re

Date	Sample #	% Carbon
3/31	I1	23.5
4/1	I2	12.4
4/2	I3	10.8
4/3	I4	3.3
4/6	I5	8.0
4/7	I6	6.2
4/8	I7	8.1
4/9	I8	14.0
4/10	I9	21.0
4/13	I10	19.9
4/15	I11	16.4
4/16	I12	14.7
4/21	I13	15.2
4/22	I14	20.0
4/23	I15	20.3
4/24	I16	30.4
4/27	I17	12.4
4/28	I18	19.0
4/29	I19	32.3
5/1	I20	34.9
5/1	I21	11.3
5/16	I22	22.6
5/16	I23	31.5
5/17	I24	34.5
5/17	I25	28.3
5/18	I26	13.9
5/19	I27	14.9
5/19	I28	13.6
5/20	I29	14.3
5/20	I30	23.8

APPENDIX K

PERFORMANCE TEST

CONTINUOUS EMISSION MONITOR DATA SUMMARY

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
10:00:21	28-Sep-92	15.22	15.22	15.39	308.85	1254.86	1255.03	3.41
10:15:21	28-Sep-92	16.73	16.71	15.39	303.93	1238.56	1238.87	3.18
10:30:21	28-Sep-92	25.31	25.35	15.39	308.23	1258.49	1258.73	3.18
10:45:21	28-Sep-92	22.87	22.81	15.39	313.34	1274.55	1274.58	3.18
11:00:21	28-Sep-92	15.27	15.18	15.39	313.34	1286.38	1286.27	3.18
11:15:21	28-Sep-92	19.13	19.11	15.39	309.06	1286.38	1286.27	3.18
11:30:21	28-Sep-92	20.90	20.84	15.39	314.41	1269.66	1269.59	3.18
11:45:21	28-Sep-92	14.18	14.10	15.39	311.44	1271.86	1271.92	3.18
12:00:21	28-Sep-92	14.18	14.10	15.51	309.97	1279.40	1279.14	3.18
12:15:21	28-Sep-92	14.18	14.10	15.51	312.99	1283.45	1283.50	3.18
12:30:21	28-Sep-92	16.06	16.01	15.51	316.88	1294.21	1294.39	3.18
12:45:21	28-Sep-92	17.61	17.61	15.51	313.44	1296.91	1297.21	3.18
13:00:21	28-Sep-92	21.48	21.51	15.51	350.03	1320.73	1320.80	3.51
13:15:21	28-Sep-92	18.57	18.63	15.38	505.76	1596.67	1596.56	4.18
13:30:21	28-Sep-92	9.31	9.39	15.51	544.46	1297.12	1297.31	4.18
13:45:21	28-Sep-92	9.31	9.39	15.51	520.37	1326.65	1326.96	3.67
14:00:21	28-Sep-92	12.16	12.32	15.62	508.60	1358.60	1358.67	3.67
14:15:21	28-Sep-92	20.60	20.80	15.62	527.42	1311.36	1311.62	3.67
14:30:21	28-Sep-92	13.67	13.81	15.62	536.53	1296.85	1297.06	3.91
14:45:21	28-Sep-92	13.67	13.81	15.62	534.31	1273.49	1273.85	3.91
15:00:21	28-Sep-92	15.14	15.25	15.62	544.79	1268.20	1268.86	3.91
15:15:21	28-Sep-92	15.14	16.25	15.62	552.10	1327.40	1327.83	3.91
15:30:21	28-Sep-92	17.19	17.26	15.62	567.85	1336.27	1336.80	3.91
15:45:21	28-Sep-92	17.19	17.26	15.52	584.22	1298.15	1298.56	3.91
16:00:21	28-Sep-92	31.81	31.98	15.52	596.07	1305.01	1305.38	3.91
16:15:21	28-Sep-92	16.78	16.98	15.52	547.72	1328.45	1328.62	3.91
16:30:21	28-Sep-92	16.78	16.98	15.52	544.44	1360.73	1361.14	3.91
16:45:21	28-Sep-92	16.78	16.98	15.52	539.41	1351.12	1351.41	3.91
17:00:21	28-Sep-92	16.78	16.98	15.67	536.95	1334.91	1335.37	4.28
17:15:21	28-Sep-92	21.05	21.28	15.37	514.11	1304.38	1304.83	5.33
17:30:21	28-Sep-92	13.62	13.81	15.45	542.96	1333.25	1333.66	3.92
17:45:21	28-Sep-92	13.62	13.81	15.45	570.11	1358.82	1359.05	3.57
18:00:21	28-Sep-92	9.69	9.96	15.45	584.38	1357.77	1357.95	3.57
18:15:21	28-Sep-92	8.69	8.83	15.45	588.43	1334.56	1334.96	3.57
18:30:21	28-Sep-92	12.09	12.18	15.27	509.44	1261.75	1262.02	3.27
18:45:21	28-Sep-92	47.43	47.77	15.38	382.61	1269.02	1269.30	2.74
19:00:21	28-Sep-92	19.98	20.04	15.54	332.56	1266.74	1267.00	3.36
19:15:21	28-Sep-92	18.29	18.36	15.54	318.93	1245.00	1245.38	3.36
19:30:21	28-Sep-92	18.29	18.36	15.54	312.69	1241.54	1241.98	3.36
19:45:21	28-Sep-92	18.29	18.36	15.54	316.23	1243.20	1243.59	3.36
20:00:21	28-Sep-92	18.29	18.36	15.77	324.18	1254.84	1254.74	3.36
20:15:21	28-Sep-92	16.99	16.80	15.77	327.09	1266.27	1266.00	3.36
20:30:21	28-Sep-92	16.99	16.80	15.94	329.67	1263.97	1263.87	3.36
20:45:21	28-Sep-92	16.99	16.80	15.94	327.71	1267.58	1267.48	3.36
21:00:21	28-Sep-92	18.80	18.63	15.76	328.33	1274.16	1274.00	3.36
21:15:21	28-Sep-92	17.07	16.92	15.60	320.34	1287.18	1286.81	3.36
21:30:21	28-Sep-92	17.07	16.92	15.60	315.17	1289.37	1289.23	3.15
21:45:21	28-Sep-92	17.07	16.92	15.60	311.81	1321.14	1320.87	3.15
22:00:21	28-Sep-92	17.07	16.92	15.60	315.02	1339.51	1339.20	3.15
22:15:21	28-Sep-92	26.07	25.98	15.69	308.16	1349.51	1349.37	3.68
22:30:21	28-Sep-92	18.06	17.78	15.69	319.77	1300.76	1300.59	3.68

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
22:45:21	28-Sep-92	20.19	20.00	15.69	316.35	1342.98	1342.79	3.68
23:00:21	28-Sep-92	22.81	22.72	15.69	324.46	1391.69	1391.36	3.68
23:15:21	28-Sep-92	36.42	36.34	15.69	304.30	1545.11	1544.68	3.32
23:30:21	28-Sep-92	32.08	31.89	15.80	386.73	1541.31	1540.80	4.54
23:45:21	28-Sep-92	37.06	36.95	15.80	272.85	1357.77	1357.43	3.43
01:30:21	29-Sep-92	46.87	47.12	15.28	310.43	1268.63	1268.40	4.71
01:45:21	29-Sep-92	50.83	51.06	15.43	304.81	1311.10	1311.15	4.71
02:00:21	29-Sep-92	53.36	53.62	15.43	303.30	1327.16	1327.19	4.71
02:15:21	29-Sep-92	53.36	53.62	15.53	310.14	1304.27	1304.15	4.71
02:30:21	29-Sep-92	45.20	45.44	15.53	324.32	1313.22	1313.07	4.71
02:45:21	29-Sep-92	43.07	43.29	15.53	327.22	1305.10	1304.70	4.71
03:00:21	29-Sep-92	41.60	41.82	15.53	339.98	1321.73	1321.54	4.98
03:15:21	29-Sep-92	41.60	41.82	15.53	334.15	1312.23	1312.21	4.73
03:30:21	29-Sep-92	41.60	41.82	15.53	334.36	1328.11	1328.23	4.73
03:45:21	29-Sep-92	38.11	38.33	15.53	360.47	1329.46	1329.47	4.97
04:00:21	29-Sep-92	38.11	37.33	15.53	365.67	1312.97	1312.63	4.97
04:15:21	29-Sep-92	38.11	37.33	15.53	358.17	1312.97	1312.63	4.97
04:30:21	29-Sep-92	38.11	37.33	15.53	366.14	1321.69	1321.57	4.97
04:45:21	29-Sep-92	39.29	39.47	15.53	368.71	1323.22	1322.88	4.97
05:00:21	29-Sep-92	39.29	39.47	15.53	369.88	1335.43	1335.38	4.97
05:15:21	29-Sep-92	30.70	30.82	15.53	383.84	1322.80	1322.53	4.97
05:30:21	29-Sep-92	28.98	29.15	15.53	382.26	1309.61	1309.48	4.97
05:45:21	29-Sep-92	28.98	29.15	15.53	391.20	1312.24	1311.92	4.97
06:00:21	29-Sep-92	61.23	61.35	15.53	302.63	1379.50	1379.42	3.28
06:15:21	29-Sep-92	26.27	26.34	15.53	267.62	1299.41	1299.36	3.28
06:30:21	29-Sep-92	24.06	24.17	15.53	258.69	1299.41	1299.36	3.28
06:45:21	29-Sep-92	24.06	24.17	15.43	307.51	1297.21	1297.00	3.67
07:00:21	29-Sep-92	19.02	19.07	15.33	292.93	1230.46	1230.42	3.35
07:15:21	29-Sep-92	28.52	28.56	15.45	278.18	1308.70	1308.64	3.35
11:00:21	29-Sep-92	1.58	1.72	15.25	624.03	1263.96	1263.83	4.00
11:15:21	29-Sep-92	3.12	3.24	15.25	606.37	1253.80	1253.50	4.00
11:30:21	29-Sep-92	3.12	3.24	15.25	574.05	1256.97	1256.84	4.00
11:45:21	29-Sep-92	3.12	3.24	15.25	535.08	1245.00	1244.83	3.78
12:00:21	29-Sep-92	6.94	7.07	15.25	525.13	1267.97	1267.98	3.52
12:15:21	29-Sep-92	8.70	8.85	15.41	529.09	1285.00	1285.14	3.77
12:30:21	29-Sep-92	21.66	21.80	15.41	524.41	1269.05	1269.19	3.77
12:45:21	29-Sep-92	9.72	9.87	15.41	534.66	1286.32	1266.37	3.77
13:00:21	29-Sep-92	11.32	11.48	15.29	517.22	1274.95	1275.05	3.77
13:15:21	29-Sep-92	11.32	11.48	15.29	512.11	1278.02	1278.15	3.77
13:30:21	29-Sep-92	12.93	13.00	15.29	511.34	1296.78	1296.74	3.77
13:45:21	29-Sep-92	12.93	14.01	15.29	513.37	1298.93	1298.89	3.77
14:00:21	29-Sep-92	12.93	14.01	15.29	517.28	1277.21	1277.39	3.77
14:15:21	29-Sep-92	12.93	12.32	15.29	525.75	1273.57	1273.80	3.77
14:30:21	29-Sep-92	11.65	12.32	15.29	524.04	1261.34	1261.41	3.77
14:45:21	29-Sep-92	11.65	12.32	15.29	526.74	1253.23	1253.21	3.77
15:00:21	29-Sep-92	13.04	12.32	15.29	533.05	1288.22	1288.45	3.77
15:15:21	29-Sep-92	11.79	12.32	15.29	534.29	1285.40	1285.54	3.77
15:30:21	29-Sep-92	21.93	22.10	15.29	534.59	1299.26	1299.20	3.77
15:45:21	29-Sep-92	9.33	9.41	15.14	522.08	1256.21	1255.99	4.82
16:00:21	29-Sep-92	11.17	11.30	15.14	459.65	1248.16	1247.91	3.71
16:15:21	29-Sep-92	19.03	19.16	15.23	311.32	1260.80	1260.74	3.32

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
16:30:21	29-Sep-92	35.35	35.57	15.23	316.42	1260.80	1260.74	3.32
16:45:21	29-Sep-92	23.39	23.59	15.23	311.50	1234.19	1233.91	3.32
17:00:21	29-Sep-92	19.84	20.02	15.13	319.81	1234.19	1235.14	3.32
17:15:21	29-Sep-92	24.82	25.05	15.13	319.81	1251.64	1251.75	3.32
17:30:21	29-Sep-92	24.82	25.05	15.13	319.91	1268.03	1267.92	3.32
17:45:21	29-Sep-92	24.82	25.05	15.13	319.01	1273.52	1273.27	3.32
18:00:21	29-Sep-92	23.02	23.20	15.13	305.40	1281.66	1281.41	3.32
18:15:21	29-Sep-92	23.02	23.20	15.13	300.78	1281.66	1281.41	3.32
18:30:21	29-Sep-92	21.87	22.01	15.13	301.51	1283.58	1283.41	3.32
18:45:21	29-Sep-92	21.87	22.01	15.13	299.97	1287.28	1287.15	3.32
19:00:21	29-Sep-92	21.87	22.01	15.13	295.40	1283.40	1283.24	3.32
19:15:21	29-Sep-92	21.87	22.01	15.05	295.86	1283.40	1283.24	3.32
19:30:21	29-Sep-92	21.87	22.01	15.05	297.39	1283.40	1283.24	3.32
19:45:21	29-Sep-92	21.87	22.01	15.05	299.18	1274.88	1274.77	3.32
20:00:21	29-Sep-92	21.87	22.01	15.05	307.74	1281.32	1281.33	3.57
20:15:21	29-Sep-92	29.04	29.33	15.05	313.49	1283.90	1283.82	3.57
20:30:21	29-Sep-92	26.29	26.55	15.05	329.19	1286.82	1286.71	3.57
20:45:21	29-Sep-92	34.30	34.56	15.05	326.14	1286.82	1286.71	3.33
21:00:21	29-Sep-92	31.60	31.70	15.05	338.22	1285.47	1285.23	3.33
21:15:21	29-Sep-92	27.86	28.16	15.05	327.12	1284.38	1285.23	3.33
21:30:21	29-Sep-92	27.86	28.16	15.05	308.90	1284.38	1283.92	3.33
21:45:21	29-Sep-92	20.34	20.47	15.05	303.85	1286.65	1286.42	3.07
22:00:21	29-Sep-92	14.65	14.81	15.05	285.61	1291.65	1291.54	3.07
22:15:21	29-Sep-92	13.64	14.81	15.15	291.91	1299.59	1299.61	3.07
22:30:21	29-Sep-92	26.66	26.89	15.15	280.30	1312.16	1312.14	3.07
22:45:21	29-Sep-92	49.02	49.33	15.15	282.81	1319.32	1319.32	3.38
23:00:21	29-Sep-92	34.20	34.46	15.15	282.81	1335.80	1335.94	3.38
23:15:21	29-Sep-92	72.97	73.19	15.15	274.59	1447.19	1447.32	3.10
23:30:21	29-Sep-92	52.59	52.88	15.30	299.10	1559.05	1559.04	4.51
23:45:21	29-Sep-92	52.59	52.88	15.12	330.53	1435.06	1435.09	5.17
00:00:21	30-Sep-92	55.60	56.14	15.24	288.52	1357.42	1357.53	4.57
01:30:21	30-Sep-92	56.32	56.49	15.27	358.24	1271.16	1271.28	4.99
01:45:21	30-Sep-92	52.92	53.05	15.27	367.33	1267.90	1268.04	4.99
02:00:21	30-Sep-92	55.94	56.05	15.27	365.82	1292.63	1292.54	4.99
02:15:21	30-Sep-92	54.07	54.20	15.27	371.19	1296.40	1296.47	4.99
02:30:21	30-Sep-92	48.90	48.94	15.37	331.27	1298.70	1298.59	4.99
02:45:21	30-Sep-92	43.81	43.87	15.37	336.87	1279.11	1279.08	4.99
03:00:21	30-Sep-92	41.83	41.86	15.37	327.38	1279.11	1279.08	4.99
03:15:21	30-Sep-92	40.27	40.27	15.37	334.52	1270.17	1270.16	4.99
03:30:21	30-Sep-92	40.27	40.27	15.37	331.69	1270.17	1270.16	4.99
03:45:21	30-Sep-92	41.64	41.69	15.37	331.81	1270.17	1270.16	4.71
04:00:21	30-Sep-92	41.64	41.69	15.37	343.70	1271.83	1271.80	4.71
04:15:21	30-Sep-92	41.64	41.69	15.37	355.38	1296.26	1296.19	4.71
04:30:21	30-Sep-92	38.23	38.25	15.16	411.26	1393.98	1393.58	4.30
04:45:21	30-Sep-92	13.48	13.48	15.16	482.39	1232.65	1232.66	4.30
05:00:21	30-Sep-92	9.24	9.17	15.35	453.25	1261.68	1261.78	3.64
05:15:21	30-Sep-92	10.43	10.35	15.35	430.24	1256.28	1256.29	3.64
05:30:21	30-Sep-92	12.15	12.05	15.35	437.36	1238.82	1238.89	3.64
05:45:21	30-Sep-92	8.39	8.30	15.35	459.03	1250.93	1250.84	3.64
06:00:21	30-Sep-92	22.74	22.70	15.35	440.68	1261.53	1261.40	3.20
06:15:21	30-Sep-92	9.33	9.24	15.35	464.26	1257.42	1257.36	3.20

Time	Date	CEM_MEAS DRY_CO_ OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
06:30:21	30-Sep-92	5.56	5.52	15.35	517.46	1234.88	1234.87	3.42
06:45:21	30-Sep-92	3.91	3.87	15.35	474.09	1244.32	1244.30	2.77
07:00:21	30-Sep-92	3.91	3.87	15.35	481.16	1236.69	1236.63	2.77
07:15:21	30-Sep-92	2.65	2.56	15.23	511.50	1245.46	1245.54	3.57
07:30:21	30-Sep-92	1.56	1.48	15.23	531.10	1253.97	1254.10	3.57
07:45:21	30-Sep-92	1.56	1.48	15.23	538.38	1268.20	1268.23	3.57
08:00:21	30-Sep-92	1.56	1.48	15.23	549.88	1282.31	1282.09	3.57
08:15:21	30-Sep-92	1.56	1.48	15.23	549.25	1252.29	1252.26	3.36
08:30:21	30-Sep-92	1.56	1.48	15.11	541.33	1254.87	1254.86	3.57
08:45:21	30-Sep-92	1.56	1.48	15.11	543.58	1254.87	1254.86	3.57
09:00:21	30-Sep-92	1.56	1.48	15.11	540.88	1210.69	1210.55	3.57
09:15:21	30-Sep-92	1.56	1.48	15.11	531.44	1216.50	1216.40	3.57
09:30:21	30-Sep-92	2.93	2.90	15.11	547.27	1226.60	1226.50	3.57
09:45:21	30-Sep-92	2.93	2.90	15.11	557.62	1239.91	1240.03	3.36
10:00:21	30-Sep-92	2.93	2.90	15.11	557.62	1239.91	1240.03	3.36
10:15:21	30-Sep-92	4.38	4.36	15.11	541.74	1210.24	1210.19	3.36
10:30:21	30-Sep-92	4.38	4.36	15.11	530.09	1229.37	1229.51	3.36
10:45:21	30-Sep-92	5.85	5.80	15.33	531.58	1241.90	1242.14	3.36
11:00:21	30-Sep-92	5.85	5.80	15.20	538.63	1208.07	1208.09	3.36
11:15:21	30-Sep-92	5.85	5.80	15.20	555.86	1185.43	1185.58	3.62
11:30:21	30-Sep-92	13.49	13.47	15.08	487.12	1207.83	1207.83	2.68
11:45:21	30-Sep-92	13.49	13.47	15.08	431.88	1212.26	1212.04	3.14
12:00:21	30-Sep-92	16.82	16.70	15.08	444.46	1201.75	1201.70	4.05
12:15:21	30-Sep-92	19.51	19.47	15.35	448.13	1234.17	1233.82	4.05
12:30:21	30-Sep-92	22.59	22.51	15.35	459.42	1239.03	1238.49	4.05
12:45:21	30-Sep-92	25.45	25.43	15.35	457.29	1195.48	1195.23	4.05
13:00:21	30-Sep-92	26.99	26.96	15.35	463.52	1172.19	1171.81	4.05
13:15:21	30-Sep-92	26.99	26.96	15.25	474.68	1224.28	1224.05	4.05
13:30:21	30-Sep-92	30.27	30.35	15.25	476.37	1227.14	1226.93	4.05
13:45:21	30-Sep-92	30.27	30.35	15.25	480.82	1227.14	1226.93	4.26
14:00:21	30-Sep-92	31.91	31.96	15.25	494.12	1220.78	1220.58	4.26
14:15:21	30-Sep-92	42.78	42.74	15.25	479.67	1232.54	1232.12	4.26
14:30:21	30-Sep-92	28.73	28.66	15.07	478.19	1220.77	1220.65	4.26
14:45:21	30-Sep-92	31.29	31.24	15.30	482.49	1225.58	1225.23	3.86
15:00:21	30-Sep-92	25.35	25.25	15.30	480.56	1254.14	1253.83	3.19
15:15:21	30-Sep-92	21.52	21.38	15.22	499.67	1225.08	1224.69	3.43
15:30:21	30-Sep-92	18.02	17.90	15.12	509.31	1201.65	1201.02	3.43
15:45:21	30-Sep-92	18.02	17.90	15.12	515.87	1176.62	1176.42	3.43
16:00:21	30-Sep-92	16.35	16.20	15.12	530.88	1158.17	1157.88	3.89
16:15:21	30-Sep-92	13.13	13.01	14.85	478.67	1098.71	1098.54	3.89
16:30:21	30-Sep-92	26.82	26.71	14.99	351.00	1128.69	1128.73	3.41
16:45:21	30-Sep-92	32.78	32.67	14.99	291.33	1140.71	1140.41	3.41
17:00:21	30-Sep-92	40.51	40.47	15.08	285.94	1128.25	1128.17	3.41
17:15:21	30-Sep-92	36.16	36.15	15.08	294.52	1123.28	1122.88	3.41
17:30:21	30-Sep-92	93.50	93.49	14.97	295.58	1135.71	1135.53	3.41
17:45:21	30-Sep-92	36.23	36.19	15.10	286.57	1128.28	1128.29	3.41
18:00:21	30-Sep-92	36.23	36.19	15.10	296.52	1134.11	1133.83	3.41
18:15:21	30-Sep-92	39.33	39.29	15.01	287.91	1153.18	1153.07	3.41
18:30:21	30-Sep-92	33.15	33.08	15.01	288.10	1154.54	1154.30	3.41
18:45:21	30-Sep-92	36.02	35.94	15.01	292.85	1140.08	1139.92	3.41
19:00:21	30-Sep-92	36.02	35.94	15.10	291.04	1152.57	1152.29	3.41

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
19:15:21	30-Sep-92	34.75	34.67	15.10	284.53	1152.57	1152.29	3.41
19:30:21	30-Sep-92	37.78	37.69	15.10	293.67	1167.06	1166.70	3.41
19:45:21	30-Sep-92	34.12	33.97	14.98	290.91	1157.03	1156.59	3.41
20:00:21	30-Sep-92	36.09	36.00	14.98	293.48	1168.27	1168.00	3.41
20:15:21	30-Sep-92	37.71	37.67	14.98	301.38	1176.18	1175.70	3.41
20:30:21	30-Sep-92	37.71	37.67	14.98	301.00	1166.62	1166.20	3.41
20:45:21	30-Sep-92	37.71	37.67	14.98	294.78	1176.39	1176.05	3.41
21:00:21	30-Sep-92	37.71	37.67	14.98	304.94	1184.22	1183.84	3.41
21:15:21	30-Sep-92	37.71	37.67	14.98	285.84	1186.85	1186.39	3.41
21:30:21	30-Sep-92	37.71	37.67	14.98	292.54	1186.85	1186.39	3.41
21:45:21	30-Sep-92	39.93	39.90	15.09	297.74	1197.86	1197.66	3.41
22:00:21	30-Sep-92	42.33	42.34	15.09	303.57	1196.67	1196.45	3.41
22:15:21	30-Sep-92	48.81	48.86	15.00	273.96	1186.90	1186.46	3.41
22:30:21	30-Sep-92	60.31	60.35	15.00	246.47	1194.82	1194.63	2.88
22:45:21	30-Sep-92	56.65	56.64	15.00	285.51	1315.85	1315.52	2.88
23:00:21	30-Sep-92	68.51	68.45	15.00	302.92	1770.24	1769.66	4.03
23:15:21	30-Sep-92	66.81	66.79	15.00	371.00	1304.60	1304.33	5.28
23:30:21	30-Sep-92	70.27	70.22	15.09	338.65	1234.59	1234.55	4.94
23:45:21	30-Sep-92	70.27	70.22	15.09	337.20	1224.91	1224.48	4.94
01:30:21	01-Oct-92	60.68	60.71	15.17	367.52	1198.45	1198.47	5.14
01:45:21	01-Oct-92	61.74	61.79	15.17	367.74	1206.52	1206.55	5.14
02:00:21	01-Oct-92	61.74	61.79	15.29	366.05	1208.39	1208.49	5.14
02:15:21	01-Oct-92	60.03	60.10	15.29	367.08	1204.06	1204.19	5.14
02:30:21	01-Oct-92	61.57	61.61	15.29	365.29	1204.06	1204.19	5.14
02:45:21	01-Oct-92	59.54	59.58	15.29	361.64	1212.04	1211.95	5.14
03:00:21	01-Oct-92	59.54	59.58	15.29	361.13	1213.35	1213.13	5.14
03:15:21	01-Oct-92	61.25	61.32	15.29	359.08	1213.35	1213.13	5.14
03:30:21	01-Oct-92	62.74	62.81	15.29	359.76	1215.55	1215.55	5.14
03:45:21	01-Oct-92	58.02	57.90	15.29	362.87	1213.41	1213.25	5.14
04:00:21	01-Oct-92	58.02	57.90	15.29	364.22	1213.41	1213.25	5.14
04:15:21	01-Oct-92	59.80	59.96	15.29	365.91	1210.95	1211.08	5.14
04:30:21	01-Oct-92	59.80	59.96	15.29	369.59	1220.76	1220.77	5.14
04:45:21	01-Oct-92	56.30	56.31	15.29	369.14	1220.76	1220.77	5.14
05:00:21	01-Oct-92	55.06	55.09	15.29	372.19	1216.89	1216.97	5.14
05:15:21	01-Oct-92	47.17	47.22	15.29	339.97	1261.76	1261.94	4.22
05:30:21	01-Oct-92	39.39	39.38	15.29	326.49	1258.38	1258.40	3.51
05:45:21	01-Oct-92	30.86	30.83	15.29	355.07	1238.38	1238.76	3.26
06:00:21	01-Oct-92	27.88	27.83	15.29	382.82	1226.00	1226.34	3.26
06:15:21	01-Oct-92	14.64	14.58	15.17	408.01	1226.00	1226.34	3.04
06:30:21	01-Oct-92	11.42	11.35	15.17	423.93	1249.22	1249.62	2.68
06:45:21	01-Oct-92	14.18	14.14	15.17	423.93	1184.39	1184.54	3.01
07:00:21	01-Oct-92	14.18	14.14	15.01	487.43	1270.57	1270.79	3.96
07:15:21	01-Oct-92	3.32	3.28	15.16	535.5	1235.10	1234.97	3.96
07:30:21	01-Oct-92	10.50	10.49	15.16	544.84	1233.66	1233.65	3.69
14:00:21	01-Oct-92	16.48	16.62	14.92	611.34	1249.85	1249.61	4.01
14:15:21	01-Oct-92	28.99	29.31	14.92	608.30	1269.07	1269.52	4.01
14:30:21	01-Oct-92	37.46	37.93	14.92	607.99	1288.61	1289.69	4.01
14:45:21	01-Oct-92	45.39	45.95	14.92	606.02	1303.89	1305.22	4.01
15:00:21	01-Oct-92	52.02	52.69	14.92	597.76	1314.26	1315.65	4.01
15:15:21	01-Oct-92	55.69	56.52	14.92	584.78	1305.79	1307.30	4.01
15:30:21	01-Oct-92	58.91	59.67	14.92	586.28	1303.72	1305.33	4.01

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
15:45:21	01-Oct-92	60.30	61.03	14.92	585.67	1297.98	1299.79	4.01
16:00:21	01-Oct-92	64.35	65.11	14.92	582.21	1286.83	1288.64	4.01
16:15:21	01-Oct-92	63.26	64.06	14.92	598.01	1295.99	1297.94	4.01
16:30:21	01-Oct-92	63.26	64.06	14.92	578.78	1300.82	1302.60	4.01
16:45:21	01-Oct-92	63.26	64.06	14.92	573.43	1295.95	1297.78	4.01
17:00:21	01-Oct-92	63.26	64.06	14.92	570.09	1287.02	1288.87	4.01
17:15:21	01-Oct-92	63.26	64.06	14.92	577.06	1277.39	1279.06	4.01
17:30:21	01-Oct-92	63.26	64.06	14.92	580.55	1244.04	1245.58	4.01
17:45:21	01-Oct-92	61.85	62.70	14.92	575.15	1239.75	1241.22	4.01
18:00:21	01-Oct-92	60.41	61.23	14.92	570.50	1241.98	1243.43	4.01
18:15:21	01-Oct-92	58.76	59.68	14.92	569.17	1220.68	1222.24	4.01
18:30:21	01-Oct-92	58.76	59.68	14.92	564.17	1205.74	1207.33	4.01
18:45:21	01-Oct-92	56.54	57.52	14.80	560.40	1203.12	1204.62	4.01
19:00:21	01-Oct-92	56.54	57.52	14.80	564.58	1208.56	1210.15	4.01
19:15:21	01-Oct-92	54.63	55.59	14.80	558.51	1197.68	1199.31	4.01
19:30:21	01-Oct-92	53.06	54.05	14.80	554.68	1189.07	1190.69	4.01
19:45:21	01-Oct-92	51.60	52.54	14.80	555.53	1197.36	1198.99	4.01
20:00:21	01-Oct-92	51.60	52.54	14.80	558.96	1204.82	1206.40	4.01
20:15:21	01-Oct-92	50.18	51.08	14.80	567.58	1209.14	1210.66	4.01
20:30:21	01-Oct-92	36.92	37.66	14.80	563.89	1215.12	1216.05	4.01
20:45:21	01-Oct-92	12.47	12.97	14.71	567.98	1181.27	1181.81	4.01
21:00:21	01-Oct-92	10.89	11.36	14.71	573.51	1181.27	1181.81	4.01
21:15:21	01-Oct-92	15.08	15.48	14.81	582.67	1186.45	1187.59	4.01
23:00:21	01-Oct-92	11.15	11.12	15.00	471.63	1247.63	1247.42	4.09
23:15:21	01-Oct-92	15.20	15.26	15.00	483.95	1223.85	1223.86	4.09
23:30:21	01-Oct-92	18.55	18.62	15.10	492.71	1256.22	1256.12	4.09
23:45:21	01-Oct-92	18.55	18.62	15.10	493.22	1259.06	1259.17	4.09
00:00:21	02-Oct-92	20.62	20.78	15.10	496.98	1250.65	1250.75	4.09
00:15:21	02-Oct-92	19.15	19.18	15.10	504.38	1246.19	1246.24	4.09
00:30:21	02-Oct-92	21.18	21.23	15.01	499.84	1265.27	1265.52	3.58
00:45:21	02-Oct-92	18.34	18.41	15.01	481.23	1212.60	1212.62	3.58
01:00:21	02-Oct-92	18.34	18.41	14.78	471.97	1188.15	1188.45	3.58
01:15:21	02-Oct-92	57.80	57.96	14.78	341.23	1156.35	1156.68	2.70
01:30:21	02-Oct-92	22.56	22.71	14.93	304.03	1185.85	1186.13	3.29
01:45:21	02-Oct-92	28.68	28.80	14.93	273.35	1180.13	1180.41	3.29
02:00:21	02-Oct-92	28.68	28.80	14.93	267.77	1165.27	1165.57	3.29
02:15:21	02-Oct-92	32.26	32.40	14.93	263.39	1175.27	1175.78	3.29
02:30:21	02-Oct-92	36.94	37.10	14.93	258.10	1187.60	1187.78	3.07
02:45:21	02-Oct-92	47.99	48.20	14.93	257.32	1195.23	1195.49	3.07
03:00:21	02-Oct-92	76.41	76.62	15.04	258.56	1197.65	1197.94	3.07
03:15:21	02-Oct-92	75.39	75.62	15.14	262.94	1188.60	1188.92	3.07
03:30:21	02-Oct-92	79.52	79.68	15.01	262.72	1184.83	1184.87	3.07
03:45:21	02-Oct-92	62.29	62.44	14.90	267.61	1173.43	1173.45	3.07
04:00:21	02-Oct-92	70.08	70.23	14.90	266.13	1156.51	1156.74	3.07
04:15:21	02-Oct-92	46.58	46.75	14.90	264.16	1156.51	1156.74	3.07
04:30:21	02-Oct-92	57.31	57.49	14.90	239.97	1258.96	1259.50	3.07
04:45:21	02-Oct-92	69.19	69.40	14.90	239.18	1320.10	1320.42	3.07
05:00:21	02-Oct-92	48.40	48.61	14.98	293.54	1394.19	1394.79	3.51
05:15:21	02-Oct-92	73.65	73.84	14.98	204.40	1263.98	1264.61	2.80
05:30:21	02-Oct-92	56.91	57.16	14.98	229.21	1253.08	1253.52	3.04
05:45:21	02-Oct-92	43.02	43.27	14.98	265.48	1223.85	1224.29	3.31

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
06:00:21	02-Oct-92	33.75	33.93	14.98	287.92	1191.62	1191.89	3.61
06:15:21	02-Oct-92	28.84	29.01	14.86	292.60	1193.48	1193.88	3.61
06:30:21	02-Oct-92	27.47	27.66	14.86	254.37	1210.53	1211.06	3.02
06:45:21	02-Oct-92	36.62	36.78	14.86	248.70	1215.12	1215.60	3.02
07:00:21	02-Oct-92	32.53	32.70	14.86	254.38	1215.12	1215.60	3.02
07:15:21	02-Oct-92	14.73	14.90	14.86	274.89	1213.86	1214.03	3.37
07:30:21	02-Oct-92	5.72	5.74	14.86	289.16	1204.56	1204.76	3.37
07:45:21	02-Oct-92	9.98	10.07	14.86	278.24	1200.16	1200.44	3.37
09:30:21	02-Oct-92	17.85	17.95	15.06	274.66	1305.63	1306.02	3.10
09:45:21	02-Oct-92	17.85	17.95	15.20	286.77	1333.14	1333.53	3.10
10:00:21	02-Oct-92	17.85	17.95	15.20	292.76	1326.55	1326.65	3.10
12:00:21	02-Oct-92	9.04	8.70	15.17	310.16	1266.68	1266.97	3.34
12:15:21	02-Oct-92	9.04	8.70	15.17	312.04	1283.94	1284.08	3.34
12:30:21	02-Oct-92	10.05	8.70	15.17	315.21	1291.13	1291.17	3.34
12:45:21	02-Oct-92	9.03	8.70	15.17	315.35	1285.63	1285.91	3.34
13:00:21	02-Oct-92	7.35	6.99	15.30	304.81	1295.61	1295.67	3.34
13:15:21	02-Oct-92	7.35	6.99	15.30	303.96	1283.66	1283.62	3.34
13:30:21	02-Oct-92	5.88	5.38	15.30	294.89	1253.03	1252.53	3.34
13:45:21	02-Oct-92	5.88	5.38	15.30	293.99	1263.20	1262.80	3.34
14:00:21	02-Oct-92	2.92	2.39	15.22	295.13	1241.80	1241.25	3.34
14:15:21	02-Oct-92	5.29	4.68	15.22	292.69	1245.00	1244.41	3.34
14:30:21	02-Oct-92	2.93	2.35	15.22	299.52	1245.00	1244.41	3.34
14:45:21	02-Oct-92	10.04	9.48	15.22	293.13	1231.85	1231.23	3.34
15:00:21	02-Oct-92	19.42	18.88	15.22	268.29	1229.99	1229.26	2.98
15:15:21	02-Oct-92	21.18	20.63	15.22	260.05	1234.81	1234.11	2.98
15:30:21	02-Oct-92	19.78	19.24	15.22	258.83	1238.09	1237.55	2.98
15:45:21	02-Oct-92	35.11	34.70	15.22	266.08	1243.02	1242.53	2.98
16:00:21	02-Oct-92	20.63	20.11	15.22	265.45	1259.99	1259.66	2.98
16:15:21	02-Oct-92	14.82	14.25	15.22	270.59	1284.03	1283.67	2.98
16:30:21	02-Oct-92	14.82	14.25	15.22	274.35	1286.66	1286.23	2.98
16:45:21	02-Oct-92	12.54	12.01	15.22	278.69	1286.66	1286.23	2.98
17:00:21	02-Oct-92	29.80	29.32	15.22	284.91	1287.85	1287.39	2.98
17:15:21	02-Oct-92	13.53	12.97	15.22	276.31	1289.85	1289.38	3.18
17:30:21	02-Oct-92	14.69	14.12	15.22	276.67	1289.85	1289.38	3.18
17:45:21	02-Oct-92	14.69	14.12	15.22	277.76	1281.34	1280.88	3.18
18:00:21	02-Oct-92	14.69	14.12	15.22	276.08	1287.28	1286.85	3.18
18:15:21	02-Oct-92	17.86	17.30	15.22	287.69	1293.74	1293.44	3.18
18:30:21	02-Oct-92	35.79	35.89	15.22	287.36	1284.84	1284.45	3.18
18:45:21	02-Oct-92	52.75	52.36	15.22	284.54	1291.72	1291.27	2.58
19:00:21	02-Oct-92	55.87	55.51	15.22	278.59	1281.39	1280.92	2.58
19:15:21	02-Oct-92	81.25	80.97	15.22	274.86	1263.20	1263.14	2.58
19:30:21	02-Oct-92	96.43	96.20	15.22	275.41	1298.08	1298.18	2.58
19:45:21	02-Oct-92	105.79	105.62	15.22	272.06	1306.44	1306.42	2.58
20:00:21	02-Oct-92	92.69	92.44	15.22	277.42	1314.45	1314.15	2.58
20:15:21	02-Oct-92	43.71	43.46	15.22	277.86	1270.57	1270.49	2.85
20:30:21	02-Oct-92	20.68	20.37	15.22	274.01	1308.37	1308.13	3.14
20:45:21	02-Oct-92	19.04	18.79	15.31	285.44	1322.01	1321.86	3.14
21:00:21	02-Oct-92	16.88	16.54	15.31	288.17	1297.94	1297.85	3.97
21:15:21	02-Oct-92	16.88	16.54	15.22	308.31	1315.27	1315.27	3.97
21:30:21	02-Oct-92	27.64	27.41	15.22	300.60	1517.01	1517.16	3.61
21:45:21	02-Oct-92	25.56	25.38	15.22	356.84	1677.43	1677.66	4.29

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
22:00:21	02-Oct-92	26.61	26.42	15.22	380.79	1387.07	1387.43	4.29
22:15:21	02-Oct-92	32.28	32.14	15.22	309.91	1334.28	1334.69	3.57
22:30:21	02-Oct-92	42.91	42.72	15.35	321.30	1341.09	1341.35	3.57
22:45:21	02-Oct-92	45.82	45.75	15.35	320.54	1327.33	1327.70	3.57
23:00:21	02-Oct-92	47.11	47.08	15.35	317.15	1292.52	1292.91	3.57
23:15:21	02-Oct-92	48.38	48.32	15.35	321.21	1302.52	1302.90	3.57
23:30:21	02-Oct-92	49.67	49.62	15.35	319.64	1331.13	1331.38	3.57
23:45:21	02-Oct-92	50.87	50.85	15.35	319.07	1329.62	1329.82	3.57
00:00:21	03-Oct-92	50.87	50.85	15.35	327.21	1341.40	1341.62	3.57
00:15:21	03-Oct-92	52.93	52.93	15.35	323.25	1344.54	1344.83	3.57
00:30:21	03-Oct-92	52.93	52.93	15.35	328.06	1344.54	1344.83	3.57
00:45:21	03-Oct-92	54.41	54.46	15.35	364.52	1334.81	1335.51	3.94
01:00:21	03-Oct-92	53.39	53.37	15.35	362.17	1351.95	1352.43	3.94
01:15:21	03-Oct-92	55.08	55.17	15.27	351.06	1339.08	1339.42	3.61
01:30:21	03-Oct-92	57.78	57.67	15.27	345.92	1329.01	1329.46	3.61
01:45:21	03-Oct-92	61.42	61.31	15.27	347.22	1338.40	1338.72	3.61
02:00:21	03-Oct-92	68.45	68.31	15.27	343.91	1343.59	1344.02	3.40
02:15:21	03-Oct-92	72.97	72.87	15.27	336.51	1340.80	1341.20	3.40
02:30:21	03-Oct-92	72.97	72.87	15.27	320.53	1348.75	1349.23	3.40
02:45:21	03-Oct-92	77.06	76.97	15.27	322.42	1338.81	1339.20	3.40
03:00:21	03-Oct-92	77.06	76.97	15.27	323.09	1334.55	1334.82	3.40
03:15:21	03-Oct-92	75.63	75.54	15.27	309.51	1303.70	1304.04	3.14
03:30:21	03-Oct-92	79.28	79.20	15.12	372.14	1315.04	1315.65	3.57
03:45:21	03-Oct-92	43.02	42.90	15.12	455.33	1398.96	1399.34	4.14
04:00:21	03-Oct-92	26.13	26.05	15.34	435.03	1329.59	1329.97	3.50
04:15:21	03-Oct-92	32.68	32.48	15.34	460.21	1341.10	1341.54	3.78
04:30:21	03-Oct-92	36.63	36.45	15.34	479.38	1277.16	1277.62	4.37
04:45:21	03-Oct-92	30.91	30.78	15.34	515.25	1283.16	1283.58	5.18
05:00:21	03-Oct-92	28.86	28.86	15.34	564.58	1254.49	1255.13	5.69
05:15:21	03-Oct-92	32.22	32.28	15.34	581.35	1293.63	1294.48	5.69
05:30:21	03-Oct-92	35.18	35.36	15.49	582.84	1307.30	1308.47	5.69
05:45:21	03-Oct-92	37.11	37.32	15.61	588.37	1307.30	1308.47	5.69
06:00:21	03-Oct-92	38.65	38.92	15.61	583.15	1318.50	1319.28	5.69
06:15:21	03-Oct-92	38.65	38.92	15.61	567.93	1305.80	1307.01	5.69
06:30:21	03-Oct-92	39.80	40.11	15.61	578.26	1321.49	1322.73	5.69
06:45:21	03-Oct-92	39.80	40.11	15.61	580.36	1313.20	1314.30	5.69
07:00:21	03-Oct-92	39.80	40.11	15.47	566.17	1299.43	1300.78	5.69
07:15:21	03-Oct-92	42.32	42.61	15.47	514.36	1326.59	1327.67	4.47
07:30:21	03-Oct-92	42.32	42.61	15.47	449.60	1358.02	1358.90	3.05
07:45:21	03-Oct-92	47.60	47.86	15.47	451.60	1338.62	1339.85	3.05
08:00:21	03-Oct-92	40.41	40.66	15.39	458.80	1292.03	1293.17	3.60
08:15:21	03-Oct-92	35.94	36.23	15.39	462.22	1242.26	1243.25	3.81
08:30:21	03-Oct-92	35.94	36.23	15.39	455.11	1183.57	1184.63	3.81
08:45:21	03-Oct-92	26.56	26.81	15.39	466.96	1191.74	1192.84	3.81
09:00:21	03-Oct-92	26.56	26.81	15.30	464.24	1245.77	1246.71	3.81
09:15:21	03-Oct-92	19.67	19.78	15.18	508.14	1315.76	1316.79	4.07
09:30:21	03-Oct-92	15.98	16.11	15.18	535.07	1370.69	1371.79	4.07
09:45:21	03-Oct-92	11.56	11.74	15.18	490.64	1391.55	1392.68	4.07
10:00:21	03-Oct-92	12.81	12.98	15.18	498.52	1354.70	1355.72	4.07
10:15:21	03-Oct-92	14.41	14.57	15.18	464.65	1351.18	1352.27	4.07
10:30:21	03-Oct-92	19.12	19.17	15.18	464.58	1385.44	1386.29	3.83

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
10:45:21	03-Oct-92	19.12	19.17	15.28	466.26	1382.86	1384.11	3.83
11:00:21	03-Oct-92	19.12	19.17	15.28	464.66	1374.39	1375.31	3.83
11:15:21	03-Oct-92	21.22	21.29	15.28	470.77	1344.13	1345.20	3.83
11:30:21	03-Oct-92	23.94	24.11	15.28	474.66	1328.78	1329.80	3.83
11:45:21	03-Oct-92	23.94	24.11	15.28	488.32	1308.86	1309.91	3.83
12:00:21	03-Oct-92	25.98	26.24	15.28	475.36	1312.30	1313.30	3.83
12:15:21	03-Oct-92	27.25	27.54	15.28	472.46	1315.04	1316.19	3.83
12:30:21	03-Oct-92	28.78	29.12	15.28	473.25	1355.44	1356.12	3.83
12:45:21	03-Oct-92	28.78	29.12	15.28	472.56	1370.87	1371.60	3.83
13:00:21	03-Oct-92	31.02	31.26	15.28	474.69	1373.25	1374.07	3.83
13:15:21	03-Oct-92	31.02	31.26	15.20	475.63	1370.20	1371.18	4.24
13:30:21	03-Oct-92	24.71	25.00	15.20	472.44	1364.54	1365.57	4.24
13:45:21	03-Oct-92	22.02	22.21	15.20	476.69	1298.86	1300.05	4.24
14:00:21	03-Oct-92	22.02	22.21	15.20	481.45	1359.21	1360.34	4.24
14:15:21	03-Oct-92	22.02	22.21	15.20	478.86	1374.31	1375.34	4.02
14:30:21	03-Oct-92	20.34	20.57	15.20	475.66	1333.57	1334.73	4.02
14:45:21	03-Oct-92	20.34	20.57	15.20	476.54	1333.57	1334.73	4.02
15:00:21	03-Oct-92	19.24	19.44	15.20	478.62	1354.72	1355.81	4.02
15:15:21	03-Oct-92	19.24	19.44	15.20	479.76	1314.60	1315.68	4.02
15:30:21	03-Oct-92	22.28	22.56	15.20	483.74	1291.79	1292.84	4.02
15:45:21	03-Oct-92	39.61	39.92	15.20	477.93	1260.49	1261.80	4.02
16:00:21	03-Oct-92	25.85	26.16	15.20	490.93	1306.89	1308.08	4.02
16:15:21	03-Oct-92	25.85	26.16	15.20	478.81	1369.07	1370.15	3.79
16:30:21	03-Oct-92	23.39	23.69	15.20	478.72	1335.28	1336.69	3.79
16:45:21	03-Oct-92	23.39	23.69	15.20	474.83	1325.04	1326.11	3.79
17:00:21	03-Oct-92	23.39	23.69	15.20	478.81	1279.88	1280.98	4.03
17:15:21	03-Oct-92	23.39	23.69	15.20	480.12	1301.07	1302.37	4.03
17:30:21	03-Oct-92	23.39	23.69	15.20	478.68	1278.47	1279.51	3.74
17:45:21	03-Oct-92	24.54	24.82	15.20	480.04	1256.04	1257.11	3.74
18:00:21	03-Oct-92	24.54	24.82	15.20	487.30	1247.76	1248.77	3.74
18:15:21	03-Oct-92	26.05	26.26	15.20	491.17	1274.49	1275.42	3.74
18:30:21	03-Oct-92	26.05	26.26	15.20	494.92	1262.99	1264.04	3.94
18:45:21	03-Oct-92	26.05	26.26	15.20	515.62	1309.62	1310.79	3.94
19:00:21	03-Oct-92	26.05	26.26	15.20	519.27	1332.43	1333.62	3.94
19:15:21	03-Oct-92	19.52	19.66	15.20	586.04	1329.72	1330.91	3.94
19:30:21	03-Oct-92	16.03	16.17	15.20	581.93	1307.70	1308.88	3.94
19:45:21	03-Oct-92	14.53	14.63	15.20	561.42	1291.08	1292.16	3.71
20:00:21	03-Oct-92	14.53	14.63	15.20	535.46	1291.08	1292.16	3.71
20:15:21	03-Oct-92	20.52	20.61	15.20	537.14	1318.49	1319.51	4.61
20:30:21	03-Oct-92	24.75	24.88	15.09	547.84	1306.20	1307.50	6.05
20:45:21	03-Oct-92	20.17	20.24	15.21	596.78	1255.68	1257.07	6.05
21:00:21	03-Oct-92	17.12	17.27	15.21	599.48	1290.81	1292.12	6.05
21:15:21	03-Oct-92	19.65	19.71	15.21	597.87	1325.33	1326.50	6.05
21:30:21	03-Oct-92	21.64	21.72	15.21	595.68	1311.44	1312.51	5.78
21:45:21	03-Oct-92	23.57	23.71	15.41	601.02	1265.92	1267.06	5.78
22:00:21	03-Oct-92	25.68	25.88	15.41	604.32	1292.94	1294.15	5.78
22:15:21	03-Oct-92	26.77	26.99	15.52	602.64	1245.73	1247.03	5.78
22:30:21	03-Oct-92	28.21	28.50	15.52	604.55	1297.27	1298.46	5.78
22:45:21	03-Oct-92	29.49	29.80	15.60	599.76	1291.04	1292.31	5.78
23:00:21	03-Oct-92	29.49	29.80	15.60	602.10	1312.61	1313.85	5.78
23:15:21	03-Oct-92	31.60	31.92	15.60	578.15	1299.14	1300.46	5.41

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
23:30:21	03-Oct-92	36.68	37.01	15.60	474.60	1356.59	1357.71	4.25
23:45:21	03-Oct-92	31.49	31.81	15.60	450.01	1346.12	1347.17	3.64
00:00:21	04-Oct-92	71.20	71.42	15.18	372.05	1229.12	1230.09	3.26
00:15:21	04-Oct-92	98.10	98.42	15.37	266.51	1241.17	1242.05	3.26
00:30:21	04-Oct-92	65.15	65.46	15.37	269.90	1346.01	1346.95	3.02
00:45:21	04-Oct-92	54.33	54.73	15.37	298.61	1333.50	1334.65	3.42
01:00:21	04-Oct-92	52.88	53.21	15.37	316.25	1335.27	1336.33	3.42
01:15:21	04-Oct-92	57.11	57.48	15.37	300.54	1314.12	1315.11	3.42
01:30:21	04-Oct-92	59.67	60.01	15.49	307.49	1329.71	1330.76	3.42
01:45:21	04-Oct-92	57.66	58.01	15.59	311.65	1324.99	1325.99	3.42
02:00:21	04-Oct-92	56.24	56.61	15.59	313.37	1294.73	1295.79	3.42
02:15:21	04-Oct-92	57.29	57.64	15.59	312.03	1301.05	1302.17	3.42
02:30:21	04-Oct-92	57.29	57.64	15.46	319.70	1328.49	1329.41	3.42
02:45:21	04-Oct-92	52.17	52.42	15.46	321.00	1326.43	1327.28	3.42
03:00:21	04-Oct-92	46.64	46.67	15.46	331.24	1334.86	1335.10	3.95
03:15:21	04-Oct-92	59.93	59.98	15.46	308.05	1347.72	1347.90	4.86
03:30:21	04-Oct-92	63.13	63.15	15.46	327.44	1330.83	1331.16	5.20
03:45:21	04-Oct-92	64.97	64.93	15.57	328.39	1274.97	1275.30	5.20
04:00:21	04-Oct-92	66.25	66.14	15.57	323.62	1280.17	1280.51	5.20
04:15:21	04-Oct-92	66.25	66.14	15.57	325.68	1284.56	1284.99	5.20
04:30:21	04-Oct-92	68.94	68.80	15.57	329.89	1292.09	1292.69	5.20
04:45:21	04-Oct-92	70.35	70.24	15.57	326.75	1299.72	1300.41	5.20
05:00:21	04-Oct-92	70.35	70.24	15.57	327.35	1318.51	1318.69	5.20
05:15:21	04-Oct-92	70.35	70.24	15.57	324.48	1309.26	1309.67	5.20
05:30:21	04-Oct-92	70.35	70.24	15.57	328.36	1297.17	1297.73	5.20
05:45:21	04-Oct-92	71.65	71.54	15.57	320.83	1282.09	1282.43	5.20
06:00:21	04-Oct-92	71.65	71.54	15.57	323.46	1260.25	1260.50	5.20
06:15:21	04-Oct-92	70.29	70.22	15.66	324.19	1262.67	1263.19	5.20
06:30:21	04-Oct-92	70.29	70.22	15.66	325.66	1264.95	1265.36	5.20
06:45:21	04-Oct-92	70.29	70.22	15.66	325.59	1263.15	1263.69	4.97
07:00:21	04-Oct-92	70.29	70.22	15.66	327.00	1269.08	1269.68	4.97
07:15:21	04-Oct-92	70.29	69.18	15.66	326.39	1251.84	1252.28	4.97
07:30:21	04-Oct-92	67.99	67.86	15.66	329.63	1257.64	1258.09	4.97
07:45:21	04-Oct-92	67.99	67.86	15.66	336.09	1271.14	1271.53	5.23
08:00:21	04-Oct-92	41.86	41.62	15.54	369.13	1258.60	1259.12	5.67
08:15:21	04-Oct-92	29.87	29.65	15.54	368.14	1209.61	1210.02	5.67
08:30:21	04-Oct-92	32.36	32.11	15.54	362.11	1289.67	1290.14	5.67
08:45:21	04-Oct-92	32.36	32.11	15.54	353.44	1339.89	1340.24	5.46
09:00:21	04-Oct-92	36.12	35.94	15.18	353.77	1338.75	1339.22	5.46
09:15:21	04-Oct-92	42.34	42.17	15.56	341.91	1383.34	1383.85	5.21
09:30:21	04-Oct-92	38.39	38.32	15.56	336.69	1300.99	1301.54	5.21
09:45:21	04-Oct-92	38.39	38.32	15.56	325.90	1237.35	1237.86	5.21
10:00:21	04-Oct-92	29.45	29.32	15.56	343.83	1204.75	1205.93	5.53
12:00:21	04-Oct-92	45.12	45.15	15.10	322.77	1224.24	1224.25	4.78
12:15:21	04-Oct-92	52.17	52.20	15.10	278.69	1233.06	1233.21	4.48
12:30:21	04-Oct-92	57.25	57.23	15.10	252.47	1245.91	1245.72	4.27
12:45:21	04-Oct-92	66.46	66.34	15.20	233.58	1253.87	1253.61	4.27
13:00:21	04-Oct-92	63.49	63.66	15.20	243.21	1267.35	1267.23	4.27
13:15:21	04-Oct-92	60.57	60.66	15.20	257.47	1258.77	1258.72	4.27
13:30:21	04-Oct-92	61.86	61.96	15.20	255.18	1268.90	1268.64	4.27
13:45:21	04-Oct-92	61.86	61.96	15.20	257.95	1284.42	1283.97	4.27

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
14:00:21	04-Oct-92	60.57	60.61	15.20	252.97	1273.26	1272.87	4.27
14:15:21	04-Oct-92	61.84	61.89	15.20	251.47	1270.73	1270.45	4.27
14:30:21	04-Oct-92	61.84	61.89	15.20	265.35	1278.96	1278.72	4.27
14:45:21	04-Oct-92	61.84	61.89	15.20	257.67	1294.53	1294.55	4.27
15:00:21	04-Oct-92	66.10	66.14	15.20	257.07	1309.57	1309.60	4.27
15:15:21	04-Oct-92	58.25	58.16	15.20	260.51	1280.35	1280.22	4.27
15:30:21	04-Oct-92	58.25	58.16	15.28	265.57	1176.92	1176.79	4.27
15:45:21	04-Oct-92	58.25	58.16	15.28	267.52	1315.99	1315.81	4.27
16:00:21	04-Oct-92	86.01	86.02	15.28	272.52	1364.39	1364.31	3.93
16:15:21	04-Oct-92	48.29	48.25	15.28	374.96	1363.25	1364.31	3.54
16:30:21	04-Oct-92	108.39	108.07	15.18	396.97	1266.61	1267.42	3.54
16:45:21	04-Oct-92	26.24	26.18	15.05	486.84	1259.74	1259.65	4.14
17:00:21	04-Oct-92	20.46	20.37	15.25	486.49	1382.15	1382.13	3.04
17:15:21	04-Oct-92	22.61	22.53	15.25	493.98	1338.86	1338.68	3.04
17:30:21	04-Oct-92	24.13	23.99	15.25	502.36	1364.64	1364.47	3.35
17:45:21	04-Oct-92	24.13	25.01	15.25	502.87	1312.30	1312.06	3.35
18:00:21	04-Oct-92	24.13	25.01	14.96	477.12	1242.57	1242.71	4.59
18:15:21	04-Oct-92	35.27	35.25	15.12	283.78	1255.83	1255.82	3.26
18:30:21	04-Oct-92	57.92	57.89	15.32	214.50	1261.02	1260.97	2.53
18:45:21	04-Oct-92	61.86	61.75	15.32	272.77	1318.25	1317.73	3.12
19:00:21	04-Oct-92	43.29	43.26	15.32	318.57	1335.77	1335.60	3.84
19:15:21	04-Oct-92	51.37	51.27	15.40	333.73	1387.56	1387.46	5.32
19:30:21	04-Oct-92	58.79	58.75	15.40	365.34	1333.62	1333.58	5.64
19:45:21	04-Oct-92	51.46	51.46	15.31	429.77	1285.63	1285.70	5.64
20:00:21	04-Oct-92	39.78	39.72	15.31	417.54	1317.84	1317.51	4.96
20:15:21	04-Oct-92	42.61	42.56	15.49	391.19	1322.13	1321.73	4.96
20:30:21	04-Oct-92	45.01	44.88	15.49	387.11	1295.27	1295.13	4.96
20:45:21	04-Oct-92	46.12	46.05	15.65	384.02	1272.40	1272.29	4.71
21:00:21	04-Oct-92	46.12	46.05	15.49	381.35	1316.74	1316.40	4.71
21:15:21	04-Oct-92	49.03	48.93	15.49	384.43	1274.60	1274.48	4.71
21:30:21	04-Oct-92	49.03	48.93	15.49	386.45	1325.80	1325.50	4.93
21:45:21	04-Oct-92	51.73	51.77	15.62	389.88	1270.38	1270.28	4.93
22:00:21	04-Oct-92	51.73	51.77	15.62	394.44	1323.01	1323.12	4.93
22:15:21	04-Oct-92	53.60	53.60	15.62	391.88	1353.00	1353.24	4.93
22:30:21	04-Oct-92	53.60	53.60	15.62	363.01	1356.82	1356.96	4.08
22:45:21	04-Oct-92	58.40	58.50	15.62	374.46	1332.51	1332.48	4.08
23:00:21	04-Oct-92	58.40	58.50	15.62	367.00	1326.76	1326.76	4.08
23:15:21	04-Oct-92	58.40	58.50	15.50	347.25	1333.01	1333.20	3.87
23:30:21	04-Oct-92	58.40	58.50	15.50	300.92	1347.27	1347.32	3.34
23:45:21	04-Oct-92	60.82	60.89	15.58	277.64	1330.03	1329.98	3.34
00:00:21	05-Oct-92	73.52	73.51	15.68	292.74	1305.80	1305.85	3.34
00:15:21	05-Oct-92	60.40	60.37	15.49	292.49	1335.79	1335.43	3.34
00:30:21	05-Oct-92	58.72	58.69	15.49	285.87	1380.02	1379.66	3.34
00:45:21	05-Oct-92	60.30	60.29	15.49	291.47	1392.83	1392.68	3.34
01:00:21	05-Oct-92	58.48	58.54	15.49	296.01	1389.24	1389.09	3.34
01:15:21	05-Oct-92	58.48	58.54	15.49	301.64	1372.95	1373.00	3.55
01:30:21	05-Oct-92	61.92	62.02	15.49	300.27	1406.19	1406.14	3.55
01:45:21	05-Oct-92	60.23	60.33	15.49	308.91	1409.76	1409.73	3.55
02:00:21	05-Oct-92	66.65	66.68	15.40	332.29	1384.32	1384.34	4.12
02:15:21	05-Oct-92	56.87	56.92	15.52	318.43	1386.08	1386.02	3.73
02:30:21	05-Oct-92	62.69	62.80	15.52	325.40	1360.40	1360.46	4.15

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
02:45:21	05-Oct-92	62.69	62.80	15.52	335.37	1366.77	1366.65	4.15
03:00:21	05-Oct-92	62.69	62.80	15.52	334.16	1358.39	1358.29	4.15
03:15:21	05-Oct-92	60.04	60.16	15.41	338.98	1361.64	1361.72	4.15
03:30:21	05-Oct-92	58.44	58.52	15.41	336.05	1371.74	1371.83	4.15
03:45:21	05-Oct-92	56.04	55.98	15.41	334.19	1375.18	1375.53	4.15
04:00:21	05-Oct-92	54.77	54.71	15.41	336.31	1380.45	1380.50	4.15
04:15:21	05-Oct-92	54.77	54.71	15.41	333.48	1369.65	1369.65	4.15
04:30:21	05-Oct-92	53.51	53.47	15.41	333.48	1335.08	1335.31	4.15
06:00:21	05-Oct-92	22.59	22.31	15.12	338.25	1292.50	1292.78	3.78
06:15:21	05-Oct-92	22.59	22.31	15.12	346.93	1314.35	1314.46	3.78
06:30:21	05-Oct-92	22.59	22.31	15.12	316.14	1332.80	1332.84	3.25
06:45:21	05-Oct-92	21.22	20.97	15.12	290.80	1311.86	1312.18	3.25
07:00:21	05-Oct-92	27.39	27.16	15.12	295.18	1317.19	1317.46	3.25
07:15:21	05-Oct-92	27.39	28.19	15.12	319.45	1332.05	1332.17	3.25
07:30:21	05-Oct-92	29.03	28.19	15.20	320.94	1323.24	1323.44	3.25
07:45:21	05-Oct-92	27.89	28.19	15.20	319.03	1324.79	1325.03	3.25
08:00:21	05-Oct-92	19.55	19.28	15.20	343.42	1327.89	1328.06	3.25
08:15:21	05-Oct-92	21.77	21.47	15.20	334.64	1336.36	1336.27	2.96
08:30:21	05-Oct-92	23.37	23.06	15.20	323.95	1357.42	1357.42	2.96
08:45:21	05-Oct-92	20.35	20.05	15.20	329.50	1346.68	1346.59	2.96
09:00:21	05-Oct-92	17.58	17.25	15.20	332.54	1341.63	1341.72	3.18
09:15:21	05-Oct-92	14.26	13.93	15.20	315.73	1359.10	1359.13	3.42
09:30:21	05-Oct-92	21.72	21.34	15.20	304.68	1304.47	1304.35	3.42
09:45:21	05-Oct-92	10.33	9.95	15.20	305.25	1313.56	1313.33	3.42
10:00:21	05-Oct-92	17.51	17.15	15.20	309.35	1341.26	1341.01	3.42
10:15:21	05-Oct-92	27.40	27.08	15.20	304.07	1339.70	1339.51	3.42
10:30:21	05-Oct-92	40.09	39.69	15.20	296.12	1333.75	1333.55	3.42
10:45:21	05-Oct-92	34.72	34.31	15.08	293.76	1322.59	1322.30	3.21
11:00:21	05-Oct-92	34.72	34.31	15.24	296.77	1314.65	1314.66	3.21
11:15:21	05-Oct-92	34.72	34.31	15.24	296.77	1314.65	1314.66	3.21
11:30:21	05-Oct-92	30.91	30.56	15.24	308.09	1291.27	1291.18	3.21
11:45:21	05-Oct-92	37.34	36.91	15.12	292.70	1248.37	1248.07	3.21
12:00:21	05-Oct-92	76.62	76.39	15.12	272.63	1238.03	1237.87	3.21
12:15:21	05-Oct-92	43.70	43.41	15.12	255.06	1271.56	1271.15	2.87
12:30:21	05-Oct-92	33.66	33.29	15.12	267.50	1297.74	1297.41	2.87
12:45:21	05-Oct-92	60.49	60.25	15.22	399.59	1379.53	1379.45	2.87
13:00:21	05-Oct-92	14.74	14.54	15.22	464.43	1545.94	1546.08	3.33
13:15:21	05-Oct-92	14.74	14.54	15.22	489.18	1576.49	1576.90	3.33
13:30:21	05-Oct-92	14.74	14.54	15.22	480.89	1381.08	1381.40	3.04
13:45:21	05-Oct-92	14.74	14.54	15.22	476.86	1339.83	1340.27	3.04
14:00:21	05-Oct-92	18.51	18.49	15.14	435.80	1406.30	1406.53	3.04
14:15:21	05-Oct-92	18.51	18.49	15.14	466.67	1559.25	1559.72	3.26
14:30:21	05-Oct-92	20.86	20.92	15.14	489.86	1422.37	1422.80	3.26
14:45:21	05-Oct-92	19.37	19.41	15.30	513.87	1319.18	1319.80	4.15
15:00:21	05-Oct-92	19.37	19.41	15.30	494.09	1256.78	1257.58	4.42

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
15:15:21	05-Oct-92	19.37	19.41	15.18	410.35	1238.37	1238.96	3.65
15:30:21	05-Oct-92	23.67	23.75	15.18	381.67	1271.37	1272.21	3.65
15:45:21	05-Oct-92	22.47	22.55	15.18	431.60	1262.25	1262.84	4.03
16:00:21	05-Oct-92	35.24	35.33	15.18	365.27	1275.30	1275.69	2.72
16:15:21	05-Oct-92	41.33	41.39	15.31	350.29	1305.85	1306.61	2.72
16:30:21	05-Oct-92	37.58	37.67	15.21	358.98	1310.81	1311.50	3.18
16:45:21	05-Oct-92	22.65	22.75	15.21	354.91	1286.80	1287.53	3.46
17:00:21	05-Oct-92	30.65	30.80	15.21	396.23	1279.19	1280.00	3.46
17:15:21	05-Oct-92	25.02	25.11	15.13	447.04	1314.91	1315.68	3.46
17:30:21	05-Oct-92	25.02	25.11	15.13	499.23	1309.53	1310.36	3.46
17:45:21	05-Oct-92	21.02	21.10	15.13	510.21	1320.81	1321.46	3.46
18:00:21	05-Oct-92	18.12	18.19	15.03	523.16	1322.98	1323.66	3.79
18:15:21	05-Oct-92	18.12	18.19	15.03	513.00	1329.93	1330.83	3.79
18:30:21	05-Oct-92	18.12	18.19	15.03	500.12	1332.67	1333.44	3.47
18:45:21	05-Oct-92	32.36	32.49	15.03	413.51	1335.86	1336.37	3.00
19:00:21	05-Oct-92	21.61	21.69	15.03	409.67	1338.28	1338.88	3.00
19:15:21	05-Oct-92	26.44	26.52	15.03	404.94	1325.15	1325.87	3.20
19:30:21	05-Oct-92	26.44	26.52	15.13	381.65	1345.93	1346.59	3.20
19:45:21	05-Oct-92	26.44	26.52	15.13	363.10	1364.02	1364.65	3.20
20:00:21	05-Oct-92	25.30	25.30	15.13	353.45	1360.77	1361.91	3.40
20:15:21	05-Oct-92	29.63	29.69	15.13	340.75	1328.95	1329.68	3.40
20:30:21	05-Oct-92	29.63	29.69	15.13	351.57	1335.17	1335.98	3.63
20:45:21	05-Oct-92	29.63	29.69	15.13	353.57	1320.76	1321.43	3.63
21:00:21	05-Oct-92	36.32	36.40	15.13	332.35	1297.13	1297.98	3.13
21:15:21	05-Oct-92	33.54	33.62	15.31	378.17	1305.47	1306.40	3.43
21:30:21	05-Oct-92	27.59	27.67	15.12	524.52	1437.55	1437.94	3.73
21:45:21	05-Oct-92	15.99	15.88	15.01	591.76	1256.05	1256.34	4.08
22:00:21	05-Oct-92	9.74	9.49	15.01	582.59	1277.31	1277.24	3.58
22:15:21	05-Oct-92	9.74	9.49	15.15	587.25	1280.48	1280.44	3.58
22:30:21	05-Oct-92	11.18	10.88	15.29	595.66	1267.89	1267.97	3.58
22:45:21	05-Oct-92	13.50	13.16	15.29	602.98	1248.61	1248.21	3.56
23:00:21	05-Oct-92	13.50	13.16	15.29	618.22	1268.11	1268.12	3.86
23:15:21	05-Oct-92	13.50	13.16	15.29	625.15	1261.21	1261.22	3.86
23:30:21	05-Oct-92	11.78	11.41	15.38	624.41	1208.72	1208.68	3.86
23:45:21	05-Oct-92	11.78	11.41	15.38	620.94	1223.27	1223.04	3.86
00:00:21	06-Oct-92	11.78	11.41	15.21	607.86	1223.27	1223.04	3.86
00:15:21	06-Oct-92	13.61	13.23	15.21	592.95	1219.76	1219.95	4.09
00:30:21	06-Oct-92	11.75	11.38	15.21	574.58	1232.82	1232.82	4.39
00:45:21	06-Oct-92	9.19	8.74	15.12	563.50	1223.47	1223.31	4.62
01:00:21	06-Oct-92	11.73	11.31	15.12	530.68	1237.28	1237.17	3.97
01:15:21	06-Oct-92	17.68	17.32	15.32	495.49	1242.80	1242.70	3.97
01:30:21	06-Oct-92	14.69	14.26	15.32	473.60	1241.40	1241.29	4.32
01:45:21	06-Oct-92	37.44	35.46	21.79	810.32	2136.30	2134.59	11.68
02:00:21	06-Oct-92	46.22	40.62	1.60	78.58	174.04	169.10	21.00
02:15:21	06-Oct-92	61.14	57.19	-0.64	9.16	-26.90	-29.58	21.00
02:30:21	06-Oct-92	79.33	75.66	-1.00	1.91	-74.86	-77.49	21.00
02:45:21	06-Oct-92	88.58	85.24	-1.00	0.82	-93.98	-96.34	21.00
03:00:21	06-Oct-92	68.05	62.71	-1.00	2.47	-104.77	-105.76	21.00
03:15:21	06-Oct-92	73.57	69.66	-1.35	1.91	-111.82	-114.65	21.00
03:30:21	05-Oct-92	62.12	78.55	-1.15	1.40	-116.35	-119.50	21.00
03:45:21	06-Oct-92	67.04	63.24	-1.15	2.48	-119.67	-126.37	21.00

APPENDIX L

PERFORMANCE TEST

M17 PARTICULATE LOADING AT ESP INLET—DATA SUMMARY

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 9/28/92 Printed 29-Oct — Test No./Type: M17-1101
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1100-1250

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.89
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		947.16
Gas Meter Final Reading (cu ft)		1015.51
Net Gas Sample Volume (cu ft)	V(m)	(68.35)
Vol of Liquid Collected (ml)	Vl(c)	122.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.743)
Wt. of Filter Particulate (gm)		7.0081
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(7.0081)
O2 Concentration (by CEM)	% O2	3.23
CO2 Concentration (by CEM)	% CO2	15.46
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.31)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter,dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.96	1.81	438.00	78.0	79.0	0.9798
2	4.00	0.93	1.77	458.00	82.0	79.0	0.9644
3	4.00	0.93	1.77	460.00	83.0	79.0	0.9644
B1	4.00	1.02	2.28	470.00	84.0	80.0	1.0100
2	4.00	0.96	1.82	477.00	83.0	79.0	0.9798
3	4.00	0.98	1.86	480.00	85.0	80.0	0.9899
C1	4.00	1.20	2.28	483.00	86.0	80.0	1.0954
2	4.00	1.20	2.28	474.00	86.0	80.0	1.0954
3	4.00	1.80	3.42	480.00	88.0	81.0	1.3416
D1	4.00	1.50	2.85	481.00	87.0	81.0	1.2247
2	4.00	1.20	2.28	481.00	88.0	81.0	1.0954
3	4.00	1.20	2.28	478.00	88.0	82.0	1.0954
E1	4.00	1.20	2.28	466.00	87.0	81.0	1.0954
2	4.00	1.30	2.47	483.00	88.0	82.0	1.1402
3	4.00	1.00	1.90	489.00	88.0	82.0	1.0000
E1	4.00	1.00	1.90	494.00	88.0	82.0	0.9950
2	4.00	0.99	1.88	495.00	88.0	82.0	1.0954
3	4.00	1.20	2.28	499.00	88.0	82.0	1.0000
F1	4.00	1.00	3.04	476.00	89.0	83.0	1.0000
2	4.00	1.60	3.04	488.00	90.0	83.0	1.0000
3	4.00	1.20	2.28	495.00	90.0	83.0	1.0954
F1	4.00	1.20	2.28	496.00	91.0	83.0	1.0954
2	4.00	1.40	2.66	501.00	91.0	83.0	1.1832
3	4.00	1.20	2.28	506.00	92.0	83.0	1.0954
TOTALS	96.00	28.17	54.99	11548.00	2088.00	1950.0	25.6320

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.174
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	2.291
Avg Stack Temperature (degF)	T(s avg)	=	481.2
Average Meter Temperature (degF)	T(m avg)	=	84.1
Avg SQRT(dP)		=	1.068

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	66.54
Stack Gas Water Vapor Proportion	B(wo)	=	0.079
Mol. Wt., Stack Gas Dry	M(d)	=	30.60
Mol. Wt., Stack Gas Wet	M(s)	=	29.60
Abs Stack Pressure (in Hg)	P(s)	=	31.38
Avg Stack Velocity (ft/sec)	V(s avg)	=	77.2
Isokineticity (%)	% I	=	94.2
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	240775
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	444807
Percent XS Air	PEA	=	17.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.6251
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2929
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.2803
Heat Input Rate, MBtu/hr		=	1243.77
Particulate Emission Rate(lb/hr)	E(p)	=	3353.301
Particulate Emission Rate(lb/MBtu)		=	2.6955

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 9/28/92 Printed 29-Oct — Test No./Type: M17-I102
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1500-1654

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.90
Stack Static Pressure (in H20)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		17.11
Gas Meter Final Reading (cu ft)		72.10
Net Gas Sample Volume (cu ft)	V(m)	(55.00)
Vol of Liquid Collected (ml)	Vl(c)	93.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.378)
Wt. of Filter Particulate (gm)		3.4098
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(3.4098)
O2 Concentration (by CEM)	% O2	3.83
CO2 Concentration (by CEM)	% CO2	15.45
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.72)

Sample Point	dClock Time	Velocity Head, dP (in H20)	Orifice Meter, dH (in H20)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.62	1.18	447.00	74.0	75.0	0.7874
2	4.00	0.61	1.16	446.00	75.0	75.0	0.7810
3	4.00	0.59	1.12	457.00	78.0	76.0	0.7681
B1	4.00	0.64	1.22	462.00	80.0	77.0	0.8000
2	4.00	0.61	1.16	439.00	82.0	77.0	0.7810
3	4.00	0.56	1.06	460.00	84.0	78.0	0.7483
C1	4.00	0.70	1.33	469.00	85.0	79.0	0.8367
2	4.00	0.66	1.25	448.00	86.0	80.0	0.8124
3	4.00	0.67	1.27	457.00	87.0	81.0	0.8185
D1	4.00	0.82	1.56	465.00	88.0	82.0	0.9055
2	4.00	0.71	1.35	450.00	89.0	82.0	0.8426
3	4.00	0.74	1.41	459.00	90.0	83.0	0.8602
E1	4.00	0.75	1.43	448.00	91.0	84.0	0.8660
2	4.00	0.69	1.31	452.00	91.0	85.0	0.8307
3	4.00	0.60	1.14	454.00	92.0	85.0	0.8000
E1	4.00	0.64	1.22	457.00	92.0	86.0	0.8124
2	4.00	0.66	1.25	458.00	93.0	87.0	0.8124
3	4.00	0.66	1.25	461.00	93.0	87.0	0.8426
F1	4.00	0.71	1.35	429.00	93.0	88.0	0.8426
2	4.00	0.69	1.31	442.00	93.0	88.0	0.8426
3	4.00	0.61	1.16	448.00	94.0	88.0	0.7810
F1	4.00	0.61	1.16	454.00	94.0	88.0	0.7810
2	4.00	0.64	1.22	457.00	94.0	89.0	0.8000
3	4.00	0.67	1.27	460.00	94.0	89.0	0.8185
TOTALS	96.00	15.86	30.14	10879.00	2112.00	1989.0	19.5718

FIELD DATA AVERAGES

Avg Velocity Head (in H20)	dP(avg)	=	0.661
Avg Orifice Meter Reading (in H20)	dH(avg)	=	1.256
Avg Stack Temperature (degF)	T(s avg)	=	453.3
Average Meter Temperature (degF)	T(m avg)	=	85.4
Avg SQRT(dP)		=	0.815

CALCULATED VALUES

Meter Volume (std, cu ft.)	V(m std)	=	53.29
Stack Gas Water Vapor Proportion	B(wo)	=	0.076
Mol. Wt., Stack Gas Dry	M(d)	=	30.63
Mol. Wt., Stack Gas Wet	M(s)	=	29.67
Abs Stack Pressure (in Hg)	P(s)	=	30.93
Avg Stack Velocity (ft/sec)	V(s avg)	=	55.4
Isokineticity (%)	% I	=	97.8
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	185853
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	338527
Percent XS Air	PEA	=	21.9
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.9872
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	1842
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.8050
Heat Input Rate, MBtu/hr		=	927.47
Particulate Emission Rate(lb/hr)	E(p)	=	1572.440
Particulate Emission Rate(lb/MBtu)		=	1.6957

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 9/28/92 Printed 29-Oct — Test No./Type: M17-I103
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1913-2055

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.90
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		76.00
Gas Meter Final Reading (cu ft)		146.30
Net Gas Sample Volume (cu ft)	V(m)	(70.30)
Vol of Liquid Collected (ml)	Vl(c)	146.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(6.872)
Wt. of Filter Particulate (gm)		6.3691
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(6.3691)
O2 Concentration (by CEM)	% O2	3.40
CO2 Concentration (by CEM)	% CO2	15.97
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.63)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.00	1.90	483.00	86.0	87.0	1.0000
2	4.00	1.00	1.90	483.00	87.0	87.0	1.0000
3	4.00	0.99	1.80	484.00	90.0	88.0	0.9950
B1	4.00	1.00	1.90	489.00	91.0	88.0	1.0000
2	4.00	0.97	1.84	468.00	94.0	89.0	0.9849
3	4.00	0.94	1.79	482.00	94.0	89.0	0.9695
C1	4.00	1.20	2.28	480.00	95.0	90.0	1.0954
2	4.00	1.00	1.90	477.00	97.0	90.0	1.0000
3	4.00	1.30	2.47	485.00	98.0	91.0	1.1402
D1	4.00	1.20	2.28	493.00	98.0	92.0	1.0954
2	4.00	1.00	1.90	483.00	100.0	93.0	1.0000
3	4.00	1.20	2.28	490.00	100.0	93.0	1.0954
E1	4.00	1.20	2.28	468.00	99.0	93.0	1.0954
2	4.00	1.20	2.28	492.00	100.0	93.0	1.0954
3	4.00	1.00	1.90	497.00	100.0	94.0	1.0000
E1	4.00	1.00	1.90	499.00	100.0	94.0	1.0954
2	4.00	1.20	2.28	500.00	101.0	94.0	1.0954
3	4.00	1.20	2.28	506.00	101.0	95.0	1.1402
F1	4.00	1.30	2.47	480.00	102.0	96.0	1.1402
2	4.00	1.30	2.47	495.00	102.0	95.0	1.1402
3	4.00	1.20	2.28	501.00	102.0	94.0	1.0954
F1	4.00	1.10	2.09	506.00	102.0	96.0	1.0488
2	4.00	1.20	2.28	509.00	101.0	96.0	1.0954
3	4.00	1.00	1.90	512.00	101.0	96.0	1.0000
TOTALS	96.00	26.70	50.65	11762.00	2341.0	2213.0	25.4179

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.113
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	2.110
Avg Stack Temperature (degF)	T(s avg)	=	490.1
Average Meter Temperature (degF)	T(m avg)	=	94.9
Avg SQRT(dP)		=	1.059

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	67.10
Stack Gas Water Vapor Proportion	B(ws)	=	0.093
Mol. Wt., Stack Gas Dry	M(d)	=	30.69
Mol. Wt., Stack Gas Wet	M(s)	=	29.51
Abs Stack Pressure (in Hg)	P(s)	=	31.37
Avg Stack Velocity (ft/sec)	V(s avg)	=	77.0
Isokineticity (%)	% I	=	97.5
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	234560
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	443777
Percent XS Air	PEA	=	19.0
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.4645
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2665
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.1650
Heat Input Rate, MBtu/hr		=	1200.01
Particulate Emission Rate(lb/hr)	E(p)	=	2943.990
Particulate Emission Rate(lb/MBtu)		=	2.4537

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 9/29/92 Printed 29-Oct — Test No./Type: M17-1104
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1330-1534

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	30.10
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		148.21
Gas Meter Final Reading (cu ft)		207.56
Net Gas Sample Volume (cu ft)	V(m)	(59.35)
Vol of Liquid Collected (ml)	Vl(c)	87.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.095)
Wt. of Filter Particulate (gm)		4.0230
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(4.0230)
O2 Concentration (by CEM)	% O2	3.80
CO2 Concentration (by CEM)	% CO2	15.05
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.15)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.62	1.18	420.00	74.0	73.0	0.7874
2	4.00	0.55	1.05	430.00	74.0	74.0	0.7416
3	4.00	0.55	1.05	453.00	76.0	75.0	0.7416
B1	4.00	0.60	1.14	444.00	76.0	75.0	0.7746
2	4.00	0.57	1.08	444.00	80.0	75.0	0.7550
3	4.00	0.54	1.03	467.00	82.0	76.0	0.7348
C1	4.00	0.64	1.22	462.00	83.0	77.0	0.8000
2	4.00	0.60	1.14	450.00	84.0	78.0	0.7746
3	4.00	0.72	1.34	459.00	86.0	79.0	0.8485
D1	4.00	0.78	1.48	440.00	86.0	80.0	0.8832
2	4.00	0.70	1.33	461.00	87.0	80.0	0.8367
3	4.00	0.70	1.33	467.00	88.0	81.0	0.8367
E1	4.00	0.65	1.24	440.00	87.0	81.0	0.8062
2	4.00	0.56	1.06	450.00	88.0	82.0	0.7483
3	4.00	0.65	1.24	457.00	89.0	83.0	0.8426
E1	4.00	0.71	1.35	450.00	88.0	83.0	0.8000
2	4.00	0.64	1.22	442.00	90.0	84.0	0.8185
3	4.00	0.67	1.27	450.00	91.0	84.0	0.8124
F1	4.00	0.66	1.25	445.00	87.0	85.0	0.8124
2	4.00	0.59	1.12	452.00	88.0	85.0	0.8124
3	4.00	0.60	1.14	459.00	90.0	85.0	0.7746
F1	4.00	0.64	1.22	466.00	91.0	86.0	0.8000
2	4.00	0.60	1.14	464.00	92.0	86.0	0.7746
3	4.00	0.60	1.14	467.00	92.0	87.0	0.7746
TOTALS	96.00	15.14	28.76	10839.00	2049.00	1934.0	19.0914

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.631
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.196
Avg Stack Temperature (degF)	T(s avg)	=	451.6
Average Meter Temperature (degF)	T(m avg)	=	83.0
Avg SQRT(dP)		=	0.795

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	58.15
Stack Gas Water Vapor Proportion	B(wo)	=	0.066
Mol. Wt., Stack Gas Dry	M(d)	=	30.56
Mol. Wt., Stack Gas Wet	M(s)	=	29.73
Abs Stack Pressure (in Hg)	P(s)	=	31.13
Avg Stack Velocity (ft/sec)	V(s avg)	=	56.7
Isokineticity (%)	% I	=	107.8
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	183529
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	326544
Percent XS Air	PEA	=	21.6
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.0675
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	1998
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.8669
Heat Input Rate, MBtu/hr		=	918.97
Particulate Emission Rate(lb/hr)	E(p)	=	1691.736
Particulate Emission Rate(lb/MBtu)		=	1.8403

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 9/29/92 Printed 29-Oct — Test No./Type: M17-I105
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1710-1914

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	30.10
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		210.91
Gas Meter Final Reading (cu ft)		275.53
Net Gas Sample Volume (cu ft)	V(m)	(64.62)
Vol of Liquid Collected (ml)	Vl(c)	158.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(7.437)
Wt. of Filter Particulate (gm)		5.6487
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.6487)
O2 Concentration (by CEM)	% O2	3.37
CO2 Concentration (by CEM)	% CO2	15.46
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.15)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.98	1.67	470.00	82.0	83.0	0.9899
2	4.00	0.87	1.48	479.00	82.0	83.0	0.9327
3	4.00	1.00	1.70	486.00	83.0	83.0	1.0000
B1	4.00	1.00	1.70	468.00	85.0	84.0	1.0000
2	4.00	0.86	1.46	486.00	86.0	83.0	0.9274
3	4.00	0.87	1.48	505.00	86.0	84.0	0.9327
C1	4.00	1.00	1.70	467.00	86.0	85.0	1.0000
2	4.00	0.97	1.65	480.00	89.0	85.0	0.9849
3	4.00	1.20	2.04	493.00	91.0	86.0	1.0954
D1	4.00	1.30	2.21	460.00	91.0	87.0	1.1402
2	4.00	1.10	1.87	476.00	94.0	87.0	1.0488
3	4.00	1.10	1.87	497.00	95.0	88.0	1.0488
E1	4.00	1.20	2.04	486.00	96.0	89.0	1.0954
2	4.00	1.10	1.87	497.00	89.0	90.0	1.0488
3	4.00	1.00	1.70	501.00	100.0	99.0	1.0000
E1	4.00	1.00	1.70	509.00	102.0	100.0	1.0000
2	4.00	1.00	1.70	508.00	101.0	93.0	1.0488
3	4.00	1.10	1.87	514.00	101.0	94.0	1.1832
F1	4.00	1.40	2.38	493.00	93.0	93.0	1.1832
2	4.00	1.20	2.04	498.00	94.0	93.0	1.1832
3	4.00	0.99	1.68	510.00	97.0	93.0	0.9950
F1	4.00	0.98	1.67	523.00	98.0	93.0	0.9899
2	4.00	1.10	1.87	526.00	100.0	94.0	1.0488
3	4.00	1.00	1.70	531.00	102.0	95.0	1.0000
TOTALS	96.00	25.32	43.05	11863.00	2223.0	2144.0	24.8774

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.055
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.794
Avg Stack Temperature (degF)	T(s avg)	=	494.3
Average Meter Temperature (degF)	T(m avg)	=	91.0
Avg SQRT(dP)		=	1.037

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	62.48
Stack Gas Water Vapor Proportion	B(wc)	=	0.106
Mol. Wt., Stack Gas Dry	M(d)	=	30.61
Mol. Wt., Stack Gas Wet	M(s)	=	29.27
Abs Stack Pressure (in Hg)	P(s)	=	31.57
Avg Stack Velocity (ft/sec)	V(s avg)	=	75.6
Isokineticity (%)	% I	=	93.7
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	227316
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	435710
Percent XS Air	PEA	=	18.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.3950
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2535
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.1078
Heat Input Rate, MBtu/hr		=	1164.94
Particulate Emission Rate(lb/hr)	E(p)	=	2717.566
Particulate Emission Rate(lb/MBtu)		=	2.3332

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 9/30/92 Printed 29-Oct — Test No./Type: M17-1106
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1240-1445

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(a)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	30.10
Stack Static Pressure (in H20)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		275.80
Gas Meter Final Reading (cu ft)		311.16
Net Gas Sample Volume (cu ft)	V(m)	(35.36)
Vol of Liquid Collected (ml)	Vl(c)	80.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.766)
Wt. of Filter Particulate (gm)		4.0000
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(4.0000)
O2 Concentration (by CEM)	% O2	4.32
CO2 Concentration (by CEM)	% CO2	15.62
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.06)

Sample Point	dClock Time	Velocity Head, dP (in H20)	Orifice Meter, dH (in H20)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.27	0.46	345.00	85.0	86.0	0.5196
2	4.00	0.24	0.41	368.00	84.0	86.0	0.4899
3	4.00	0.26	0.44	399.00	85.0	86.0	0.5099
B1	4.00	0.24	0.41	416.00	86.0	88.0	0.4899
2	4.00	0.24	0.41	401.00	86.0	86.0	0.4899
3	4.00	0.23	0.39	416.00	87.0	87.0	0.4796
C1	4.00	0.22	0.37	434.00	87.0	87.0	0.4690
2	4.00	0.26	0.44	407.00	87.0	87.0	0.5099
3	4.00	0.33	0.56	416.00	87.0	87.0	0.5745
D1	4.00	0.35	0.60	396.00	88.0	87.0	0.5916
2	4.00	0.26	0.44	418.00	90.0	88.0	0.5099
3	4.00	0.31	0.53	423.00	90.0	88.0	0.5568
E1	4.00	0.26	0.44	378.00	90.0	88.0	0.5099
2	4.00	0.26	0.44	399.00	90.0	88.0	0.5099
3	4.00	0.23	0.39	409.00	91.0	89.0	0.4690
E1	4.00	0.22	0.37	413.00	90.0	88.0	0.4796
2	4.00	0.23	0.39	412.00	90.0	88.0	0.4796
3	4.00	0.23	0.39	416.00	89.0	88.0	0.5385
F1	4.00	0.29	0.49	375.00	87.0	86.0	0.5385
2	4.00	0.27	0.46	387.00	86.0	87.0	0.5385
3	4.00	0.24	0.41	400.00	87.0	87.0	0.4899
F1	4.00	0.24	0.41	409.00	88.0	87.0	0.4899
2	4.00	0.21	0.36	415.00	89.0	87.0	0.4583
3	4.00	0.21	0.36	418.00	89.0	87.0	0.4583
TOTALS	96.00	6.10	10.37	9670.00	2108.0	2093.0	12.1504

FIELD DATA AVERAGES

Avg Velocity Head (in H20)	dP(avg)	=	0.254
Avg Orifice Meter Reading (in H20)	dH(avg)	=	0.432
Avg Stack Temperature (degF)	T(s avg)	=	402.9
Average Meter Temperature (degF)	T(m avg)	=	87.5
Avg SQRT(dP)		=	0.506

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	34.29
Stack Gas Water Vapor Proportion	B(wo)	=	0.099
Mol. Wt., Stack Gas Dry	M(d)	=	30.67
Mol. Wt., Stack Gas Wet	M(s)	=	29.42
Abs Stack Pressure (in Hg)	P(s)	=	30.84
Avg Stack Velocity (ft/sec)	V(s avg)	=	35.5
Isokineticity (%)	% I	=	100.7
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	116050
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	204243
Percent XS Air	PEA	=	25.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.7998
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	3456
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.5106
Heat Input Rate, MBtu/hr		=	562.51
Particulate Emission Rate(lb/hr)	E(p)	=	1790.017
Particulate Emission Rate(lb/MBtu)		=	3.1827

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 9/30/92 Printed 29-Oct — Test No./Type: M17-1107
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1710-1900

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	30.10
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		311.31
Gas Meter Final Reading (cu ft)		369.55
Net Gas Sample Volume (cu ft)	V(m)	(58.24)
Vol of Liquid Collected (ml)	Vl(c)	80.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.766)
Wt. of Filter Particulate (gm)		5.7138
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.7138)
O2 Concentration (by CEM)	% O2	3.33
CO2 Concentration (by CEM)	% CO2	15.07
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.60)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter,dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.66	1.12	434.00	86.0	86.0	0.8124
2	4.00	0.60	1.02	437.00	86.0	86.0	0.7746
3	4.00	0.65	1.11	444.00	88.0	86.0	0.8062
B1	4.00	0.63	1.07	449.00	90.0	87.0	0.7937
2	4.00	0.63	1.07	423.00	93.0	88.0	0.7937
3	4.00	0.60	1.00	440.00	95.0	89.0	0.7746
C1	4.00	0.67	1.14	435.00	97.0	91.0	0.8185
2	4.00	0.63	1.07	430.00	100.0	92.0	0.7937
3	4.00	0.77	1.31	443.00	101.0	93.0	0.8775
D1	4.00	0.75	1.28	400.00	100.0	94.0	0.8660
2	4.00	0.66	1.12	424.00	103.0	95.0	0.8124
3	4.00	0.70	1.19	442.00	103.0	95.0	0.8367
E1	4.00	0.70	1.19	452.00	104.0	96.0	0.8367
2	4.00	0.66	1.12	445.00	104.0	96.0	0.8124
3	4.00	0.60	1.02	451.00	104.0	97.0	0.7810
E1	4.00	0.61	1.04	454.00	104.0	98.0	0.8062
2	4.00	0.65	1.11	456.00	104.0	98.0	0.8062
3	4.00	0.65	1.11	460.00	103.0	98.0	0.8602
F1	4.00	0.74	1.26	426.00	102.0	98.0	0.8602
2	4.00	0.70	1.19	445.00	102.0	98.0	0.8602
3	4.00	0.65	1.11	453.00	101.0	98.0	0.8062
F1	4.00	0.65	1.11	461.00	103.0	100.0	0.8062
2	4.00	0.70	1.19	462.00	101.0	98.0	0.8367
3	4.00	0.67	1.14	466.00	102.0	98.0	0.8185
TOTALS	96.00	15.93	27.09	10632.00	2376.0	2255.0	19.6510

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.664
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.129
Avg Stack Temperature (degF)	T(s avg)	=	443.0
Average Meter Temperature (degF)	T(m avg)	=	96.5
Avg SQRT(dP)		=	0.819

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	55.66
Stack Gas Water Vapor Proportion	B(wo)	=	0.063
Mol. Wt., Stack Gas Dry	M(d)	=	30.54
Mol. Wt., Stack Gas Wet	M(s)	=	29.75
Abs Stack Pressure (in Hg)	P(s)	=	31.13
Avg Stack Velocity (ft/sec)	V(s avg)	=	58.1
Isokineticity (%)	% I	=	99.6
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	190552
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	334433
Percent XS Air	PEA	=	18.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.5838
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2871
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.2549
Heat Input Rate, MBtu/hr		=	978.82
Particulate Emission Rate(lb/hr)	E(p)	=	2586.607
Particulate Emission Rate(lb/MBtu)		=	2.6430

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 9/30/92 Printed 29-Oct — Test No./Type: M17-1108
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1945-2131

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	30.10
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		370.01
Gas Meter Final Reading (cu ft)		425.33
Net Gas Sample Volume (cu ft)	V(m)	(55.32)
Vol of Liquid Collected (ml)	Vl(c)	76.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.601)
Wt. of Filter Particulate (gm)		5.1345
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.1345)
O2 Concentration (by CEM)	% O2	3.34
CO2 Concentration (by CEM)	% CO2	15.03
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.63)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.62	1.05	450.00	88.0	90.0	0.7874
2	4.00	0.57	0.97	451.00	89.0	90.0	0.7550
3	4.00	0.70	1.20	453.00	89.0	90.0	0.8367
B1	4.00	0.70	1.20	413.00	92.0	90.0	0.8367
2	4.00	0.60	1.02	441.00	93.0	91.0	0.7746
3	4.00	0.63	1.07	458.00	94.0	91.0	0.7937
C1	4.00	0.69	1.16	430.00	95.0	92.0	0.8307
2	4.00	0.68	1.16	450.00	98.0	94.0	0.8246
3	4.00	0.85	1.45	459.00	99.0	94.0	0.9220
D1	4.00	0.82	1.39	443.00	99.0	94.0	0.9055
2	4.00	0.74	1.26	454.00	101.0	95.0	0.8602
3	4.00	0.76	1.29	460.00	102.0	96.0	0.8718
E1	4.00	0.74	1.26	446.00	103.0	97.0	0.8602
2	4.00	0.70	1.20	460.00	103.0	97.0	0.8367
3	4.00	0.64	1.09	463.00	104.0	98.0	0.7937
E1	4.00	0.63	1.07	472.00	106.0	100.0	0.8660
2	4.00	0.75	1.24	465.00	106.0	99.0	0.8775
3	4.00	0.77	1.30	466.00	105.0	100.0	0.8718
F1	4.00	0.76	1.29	440.00	105.0	100.0	0.8718
2	4.00	0.80	1.36	453.00	105.0	100.0	0.8718
3	4.00	0.69	1.16	461.00	105.0	100.0	0.8307
F1	4.00	0.67	1.14	467.00	105.0	100.0	0.8185
2	4.00	0.70	1.20	471.00	105.0	101.0	0.8367
3	4.00	0.72	1.22	472.00	105.0	101.0	0.8485
TOTALS	96.00	16.93	28.75	10898.00	2396.0	2300.0	20.1827

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.705
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.198
Avg Stack Temperature (degF)	T(s avg)	=	454.1
Average Meter Temperature (degF)	T(m avg)	=	97.8
Avg SQRT(dP)		=	0.841

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	52.76
Stack Gas Water Vapor Proportion	B(wo)	=	0.064
Mol. Wt., Stack Gas Dry	M(d)	=	30.54
Mol. Wt., Stack Gas Wet	M(s)	=	29.74
Abs Stack Pressure (in Hg)	P(s)	=	31.13
Avg Stack Velocity (ft/sec)	V(s avg)	=	60.0
Isokineticity (%)	% I	=	92.5
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	194456
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	345654
Percent XS Air	PEA	=	18.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.5017
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2724
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.1904
Heat Input Rate, MBtu/hr		=	998.26
Particulate Emission Rate(lb/hr)	E(p)	=	2502.512
Particulate Emission Rate(lb/MBtu)		=	2.5073

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 10/01/92 Printed 29-Oct — Test No./Type: M17-I109
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 2250-0030

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.84
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		425.50
Gas Meter Final Reading (cu ft)		463.74
Net Gas Sample Volume (cu ft)	V(m)	(38.23)
Vol of Liquid Collected (ml)	Vl(c)	66.1
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.111)
Wt. of Filter Particulate (gm)		4.7831
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(4.7831)
O2 Concentration (by CEM)	% O2	3.98
CO2 Concentration (by CEM)	% CO2	15.11
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.91)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter,dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.33	0.56	386.00	101.0	103.0	0.5745
2	4.00	0.21	0.36	413.00	101.0	103.0	0.4583
3	4.00	0.24	0.41	425.00	101.0	103.0	0.4899
B1	4.00	0.31	0.53	425.00	102.0	103.0	0.5568
2	4.00	0.30	0.51	426.00	101.0	103.0	0.5477
3	4.00	0.27	0.46	445.00	101.0	102.0	0.5196
C1	4.00	0.31	0.53	450.00	101.0	102.0	0.5568
2	4.00	0.21	0.36	431.00	101.0	101.0	0.4583
3	4.00	0.36	0.61	441.00	100.0	101.0	0.6000
D1	4.00	0.39	0.66	410.00	100.0	100.0	0.6245
2	4.00	0.34	0.58	431.00	100.0	100.0	0.5831
3	4.00	0.34	0.58	442.00	99.0	99.0	0.5831
E1	4.00	0.31	0.53	419.00	98.0	98.0	0.5568
2	4.00	0.33	0.56	431.00	99.0	98.0	0.5745
3	4.00	0.30	0.51	434.00	96.0	97.0	0.5568
E1	4.00	0.31	0.53	437.00	96.0	96.0	0.5477
2	4.00	0.30	0.51	438.00	96.0	96.0	0.5292
3	4.00	0.28	0.48	438.00	95.0	95.0	0.5745
F1	4.00	0.33	0.56	401.00	94.0	94.0	0.5745
2	4.00	0.34	0.58	403.00	93.0	94.0	0.5745
3	4.00	0.30	0.51	409.00	93.0	93.0	0.5477
F1	4.00	0.30	0.51	414.00	93.0	93.0	0.5477
2	4.00	0.28	0.48	420.00	92.0	92.0	0.5292
3	4.00	0.28	0.48	424.00	93.0	92.0	0.5292
TOTALS	96.00	7.27	12.39	10193.00	2346.0	2358.0	13.1944

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.303
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.516
Avg Stack Temperature (degF)	T(s avg)	=	424.7
Average Meter Temperature (degF)	T(m avg)	=	98.0
Avg SQRT(dP)		=	0.550

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	36.08
Stack Gas Water Vapor Proportion	B(wo)	=	0.079
Mol. Wt., Stack Gas Dry	M(d)	=	30.58
Mol. Wt., Stack Gas Wet	M(s)	=	29.58
Abs Stack Pressure (in Hg)	P(s)	=	30.58
Avg Stack Velocity (ft/sec)	V(s avg)	=	39.0
Isokineticity (%)	% I	=	97.4
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	126252
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	224919
Percent XS Air	PEA	=	22.9
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.0458
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	3650
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.6828
Heat Input Rate, MBtu/hr		=	624.65
Particulate Emission Rate(lb/hr)	E(p)	=	2214.065
Particulate Emission Rate(lb/MBtu)		=	3.5451

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 10/02/92 Printed 29-Oct — Test No./Type: M17-1110
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 0200-0340

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.84
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		464.71
Gas Meter Final Reading (cu ft)		515.71
Net Gas Sample Volume (cu ft)	V(m)	(51.00)
Vol of Liquid Collected (ml)	Vl(c)	129.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(6.096)
Wt. of Filter Particulate (gm)		3.7322
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(3.7322)
O2 Concentration (by CEM)	% O2	3.24
CO2 Concentration (by CEM)	% CO2	15.41
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.35)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter,dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.66	1.12	411.00	94.0	94.0	0.8124
2	4.00	0.48	0.82	424.00	93.0	94.0	0.6928
3	4.00	0.55	0.94	444.00	95.0	94.0	0.7416
B1	4.00	0.57	0.97	438.00	97.0	95.0	0.7550
2	4.00	0.48	0.82	442.00	98.0	95.0	0.6928
3	4.00	0.50	0.85	463.00	99.0	96.0	0.7071
C1	4.00	0.55	0.94	444.00	99.0	96.0	0.7416
2	4.00	0.56	0.95	442.00	100.0	97.0	0.7483
3	4.00	0.68	1.16	457.00	101.0	97.0	0.8246
D1	4.00	0.77	1.31	435.00	101.0	97.0	0.8775
2	4.00	0.64	1.09	452.00	101.0	97.0	0.8000
3	4.00	0.61	1.04	461.00	103.0	98.0	0.7810
E1	4.00	0.62	1.05	450.00	103.0	99.0	0.7874
2	4.00	0.62	1.05	453.00	103.0	98.0	0.7874
3	4.00	0.48	0.82	456.00	104.0	99.0	0.7071
E1	4.00	0.50	0.85	459.00	104.0	100.0	0.7141
2	4.00	0.51	0.87	460.00	105.0	100.0	0.7141
3	4.00	0.51	0.87	465.00	104.0	100.0	0.8000
F1	4.00	0.64	1.09	430.00	104.0	100.0	0.8000
2	4.00	0.72	1.22	437.00	104.0	100.0	0.8000
3	4.00	0.57	0.97	440.00	104.0	100.0	0.7550
F1	4.00	0.57	0.97	453.00	106.0	102.0	0.7550
2	4.00	0.58	0.99	454.00	105.0	102.0	0.7616
3	4.00	0.59	1.00	457.00	105.0	101.0	0.7681
TOTALS	96.00	13.96	23.76	10727.00	2432.0	2351.0	18.3247

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.582
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.990
Avg Stack Temperature (degF)	T(s avg)	=	447.0
Average Meter Temperature (degF)	T(m avg)	=	99.6
Avg SQRT(dP)		=	0.764

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	46.04
Stack Gas Water Vapor Proportion	B(ws)	=	0.113
Mol. Wt., Stack Gas Dry	M(d)	=	30.60
Mol. Wt., Stack Gas Wet	M(s)	=	29.18
Abs Stack Pressure (in Hg)	P(s)	=	30.87
Avg Stack Velocity (ft/sec)	V(s avg)	=	55.0
Isokineticity (%)	% I	=	97.0
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	168921
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	316922
Percent XS Air	PEA	=	17.6
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.1989
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2162
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.9450
Heat Input Rate, MBtu/hr		=	872.10
Particulate Emission Rate(lb/hr)	E(p)	=	1735.434
Particulate Emission Rate(lb/MBtu)		=	1.9903

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 10/02/92 Printed 29-Oct — Test No./Type: M17-1111
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 0200-0340

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.71
Stack Static Pressure (in H2O)	P(stack)	9.000
Gas Meter Initial Reading (cu ft)		516.00
Gas Meter Final Reading (cu ft)		556.24
Net Gas Sample Volume (cu ft)	V(m)	(40.24)
Vol of Liquid Collected (ml)	Vl(c)	86.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.072)
Wt. of Filter Particulate (gm)		5.6452
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.6452)
O2 Concentration (by CEM)	% O2	3.59
CO2 Concentration (by CEM)	% CO2	15.61
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.80)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.34	0.58	453.00	103.0	107.0	0.5831
2	4.00	0.35	0.60	454.00	103.0	107.0	0.5916
3	4.00	0.34	0.58	450.00	103.0	106.0	0.5831
B1	4.00	0.34	0.58	427.00	103.0	105.0	0.5831
2	4.00	0.30	0.51	439.00	103.0	104.0	0.5477
3	4.00	0.32	0.54	452.00	103.0	104.0	0.5657
C1	4.00	0.33	0.56	460.00	103.0	104.0	0.5745
2	4.00	0.32	0.54	440.00	103.0	104.0	0.5657
3	4.00	0.41	0.70	441.00	104.0	104.0	0.6403
D1	4.00	0.40	0.68	430.00	104.0	104.0	0.6325
2	4.00	0.32	0.54	439.00	105.0	104.0	0.5657
3	4.00	0.37	0.63	439.00	104.0	104.0	0.6083
E1	4.00	0.34	0.55	435.00	106.0	105.0	0.5831
2	4.00	0.35	0.60	439.00	106.0	104.0	0.5916
3	4.00	0.32	0.54	442.00	107.0	105.0	0.5568
E1	4.00	0.31	0.53	442.00	107.0	105.0	0.5385
2	4.00	0.29	0.49	444.00	106.0	105.0	0.6325
3	4.00	0.40	0.57	449.00	106.0	105.0	0.5831
F1	4.00	0.34	0.55	413.00	105.0	105.0	0.5831
2	4.00	0.36	0.61	414.00	106.0	105.0	0.5831
3	4.00	0.28	0.48	419.00	106.0	105.0	0.5292
F1	4.00	0.28	0.48	431.00	106.0	105.0	0.5292
2	4.00	0.30	0.51	437.00	105.0	104.0	0.5477
3	4.00	0.30	0.51	444.00	105.0	104.0	0.5477
TOTALS	96.00	8.01	13.46	10533.00	2512.0	2514.0	13.8467

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.334
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.561
Avg Stack Temperature (degF)	T(s avg)	=	438.9
Average Meter Temperature (degF)	T(m avg)	=	104.7
Avg SQRT(dP)		=	0.577

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	37.36
Stack Gas Water Vapor Proportion	B(wo)	=	0.096
Mol. Wt., Stack Gas Dry	M(d)	=	30.64
Mol. Wt., Stack Gas Wet	M(s)	=	29.40
Abs Stack Pressure (in Hg)	P(s)	=	30.37
Avg Stack Velocity (ft/sec)	V(s avg)	=	41.6
Isokineticity (%)	% I	=	98.9
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	128740
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	239443
Percent XS Air	PEA	=	20.2
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.3318
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	4290
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.8751
Heat Input Rate, MBtu/hr		=	651.49
Particulate Emission Rate(lb/hr)	E(p)	=	2572.652
Particulate Emission Rate(lb/MBtu)		=	3.9498

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 10/03/92 Printed 29-Oct — Test No./Type: M17-1112
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 0112-0306

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.71
Stack Static Pressure (in H20)	P(stack)	9.000
Gas Meter Initial Reading (cu ft)		556.41
Gas Meter Final Reading (cu ft)		597.62
Net Gas Sample Volume (cu ft)	V(m)	(41.21)
Vol of Liquid Collected (ml)	Vl(c)	81.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.813)
Wt. of Filter Particulate (gm)		6.3773
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(6.3773)
O2 Concentration (by CEM)	% O2	3.48
CO2 Concentration (by CEM)	% CO2	15.44
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.08)

Sample Point	dClock Time	Velocity Head, dP (in H20)	Orifice Meter,dH (in H20)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.35	0.60	390.00	98.0	99.0	0.5916
2	4.00	0.31	0.53	410.00	97.0	98.0	0.5568
3	4.00	0.35	0.60	433.00	98.0	98.0	0.5916
B1	4.00	0.35	0.60	410.00	99.0	99.0	0.5916
2	4.00	0.30	0.53	425.00	100.0	99.0	0.5477
3	4.00	0.30	0.53	433.00	100.0	99.0	0.5477
C1	4.00	0.35	0.60	415.00	102.0	100.0	0.5916
2	4.00	0.32	0.54	421.00	102.0	101.0	0.5657
3	4.00	0.43	0.71	430.00	103.0	101.0	0.6557
D1	4.00	0.43	0.71	421.00	104.0	101.0	0.6557
2	4.00	0.37	0.63	429.00	104.0	101.0	0.6083
3	4.00	0.40	0.68	434.00	103.0	101.0	0.6325
E1	4.00	0.34	0.58	424.00	103.0	102.0	0.5831
2	4.00	0.35	0.60	430.00	104.0	102.0	0.5916
3	4.00	0.31	0.53	434.00	104.0	102.0	0.5477
E1	4.00	0.30	0.53	434.00	105.0	102.0	0.5831
2	4.00	0.34	0.58	436.00	105.0	102.0	0.5745
3	4.00	0.33	0.56	438.00	105.0	103.0	0.6325
F1	4.00	0.40	0.68	415.00	105.0	102.0	0.6325
2	4.00	0.38	0.65	416.00	105.0	103.0	0.6325
3	4.00	0.34	0.58	423.00	105.0	103.0	0.5831
F1	4.00	0.36	0.61	426.00	106.0	103.0	0.6000
2	4.00	0.35	0.60	433.00	106.0	103.0	0.5916
3	4.00	0.35	0.60	435.00	106.0	103.0	0.5916
TOTALS	96.00	8.41	14.36	10195.00	2469.0	2427.0	14.2802

FIELD DATA AVERAGES

Avg Velocity Head (in H20)	dP(avg)	=	0.350
Avg Orifice Meter Reading (in H20)	dH(avg)	=	0.598
Avg Stack Temperature (degF)	T(s avg)	=	424.8
Average Meter Temperature (degF)	T(m avg)	=	102.0
Avg SQRT(dP)		=	0.595

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	38.45
Stack Gas Water Vapor Proportion	B(wo)	=	0.090
Mol. Wt., Stack Gas Dry	M(d)	=	30.61
Mol. Wt., Stack Gas Wet	M(s)	=	29.47
Abs Stack Pressure (in Hg)	P(s)	=	30.37
Avg Stack Velocity (ft/sec)	V(s avg)	=	42.5
Isokineticity (%)	% I	=	97.2
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	134852
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	244691
Percent XS Air	PEA	=	19.4
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.5595
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	4680
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	2.0453
Heat Input Rate, MBtu/hr		=	686.75
Particulate Emission Rate(lb/hr)	E(p)	=	2958.004
Particulate Emission Rate(lb/MBtu)		=	4.3080

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 10/03/92 Printed 29-Oct — Test No./Type: M17-1113
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 0520-0700

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.71
Stack Static Pressure (in H2O)	P(stack)	5.000
Gas Meter Initial Reading (cu ft)		599.91
Gas Meter Final Reading (cu ft)		633.40
Net Gas Sample Volume (cu ft)	V(m)	(33.49)
Vol of Liquid Collected (ml)	Vl(c)	64.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.036)
Wt. of Filter Particulate (gm)		1.6902
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(1.6902)
O2 Concentration (by CEM)	% O2	5.69
CO2 Concentration (by CEM)	% CO2	15.66
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(78.65)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.29	0.49	419.00	86.0	88.0	0.5385
2	4.00	0.22	0.37	419.00	86.0	88.0	0.4690
3	4.00	0.22	0.37	418.00	86.0	88.0	0.4690
B1	4.00	0.22	0.37	400.00	88.0	88.0	0.4690
2	4.00	0.20	0.34	387.00	88.0	88.0	0.4472
3	4.00	0.21	0.36	399.00	88.0	87.0	0.4583
C1	4.00	0.23	0.39	404.00	89.0	88.0	0.4796
2	4.00	0.23	0.39	388.00	90.0	88.0	0.4796
3	4.00	0.26	0.44	398.00	90.0	88.0	0.5099
D1	4.00	0.25	0.43	393.00	90.0	89.0	0.5000
2	4.00	0.24	0.41	396.00	90.0	89.0	0.4899
3	4.00	0.24	0.41	405.00	90.0	90.0	0.4899
E1	4.00	0.21	0.36	387.00	90.0	91.0	0.4583
2	4.00	0.21	0.36	396.00	89.0	91.0	0.4583
3	4.00	0.33	0.56	400.00	90.0	91.0	0.4472
E1	4.00	0.20	0.34	405.00	90.0	92.0	0.4583
2	4.00	0.21	0.36	406.00	91.0	90.0	0.4690
3	4.00	0.22	0.37	408.00	90.0	89.0	0.4899
F1	4.00	0.24	0.41	388.00	91.0	89.0	0.4899
2	4.00	0.23	0.39	380.00	91.0	90.0	0.4899
3	4.00	0.23	0.39	380.00	91.0	89.0	0.4796
F1	4.00	0.20	0.34	396.00	91.0	89.0	0.4472
2	4.00	0.22	0.37	399.00	92.0	90.0	0.4690
3	4.00	0.22	0.37	404.00	92.0	90.0	0.4690
TOTALS	96.00	5.53	9.39	9575.00	2149.0	2140.0	11.4256

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.230
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.391
Avg Stack Temperature (degF)	T(s avg)	=	399.0
Average Meter Temperature (degF)	T(m avg)	=	89.4
Avg SQRT(dP)		=	0.476

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	31.95
Stack Gas Water Vapor Proportion	B(wo)	=	0.097
Mol. Wt , Stack Gas Dry	M(d)	=	30.73
Mol. Wt., Stack Gas Wet	M(s)	=	29.83
Abs Stack Pressure (in Hg)	P(s)	=	30.08
Avg Stack Velocity (ft/sec)	V(s avg)	=	30.6
Isokineticity (%)	% I	=	99.6
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	109098
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	193326
Percent XS Air	PEA	=	37.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.8182
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	1706
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.7464
Heat Input Rate, MBtu/hr		=	485.11
Particulate Emission Rate(lb/hr)	E(p)	=	763.159
Particulate Emission Rate(lb/MBtu)		=	1.5734

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 10/03/92 Printed 29-Oct — Test No./Type: M17-I114
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 2130-2310

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.74
Stack Static Pressure (in H20)	P(stack)	5.000
Gas Meter Initial Reading (cu ft)		634.01
Gas Meter Final Reading (cu ft)		666.35
Net Gas Sample Volume (cu ft)	V(m)	(32.35)
Vol of Liquid Collected (ml)	Vl(c)	42.6
Vol of Liq @ Std. Conds. (scf)	V(w std)	(2.005)
Wt. of Filter Particulate (gm)		1.5522
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(1.5522)
O2 Concentration (by CEM)	% O2	5.74
CO2 Concentration (by CEM)	% CO2	15.36
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(78.90)

Sample Point	dClock Time	Velocity Head, dP (in H20)	Orifice Meter, dH (in H20)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.21	0.36	380.00	75.0	76.0	0.4583
2	4.00	0.22	0.37	388.00	74.0	75.0	0.4690
3	4.00	0.23	0.39	397.00	73.0	74.0	0.4796
B1	4.00	0.21	0.36	367.00	73.0	73.0	0.4583
2	4.00	0.21	0.36	373.00	73.0	72.0	0.4583
3	4.00	0.22	0.37	381.00	73.0	72.0	0.4690
C1	4.00	0.22	0.37	383.00	72.0	71.0	0.4690
2	4.00	0.22	0.37	386.00	71.0	71.0	0.4690
3	4.00	0.27	0.46	402.00	73.0	72.0	0.5196
D1	4.00	0.25	0.43	383.00	76.0	74.0	0.5000
2	4.00	0.27	0.46	386.00	77.0	74.0	0.5196
3	4.00	0.24	0.41	399.00	78.0	74.0	0.4899
E1	4.00	0.22	0.37	387.00	79.0	76.0	0.4690
2	4.00	0.21	0.36	389.00	79.0	76.0	0.4583
3	4.00	0.23	0.39	394.00	80.0	76.0	0.4472
E1	4.00	0.20	0.34	399.00	80.0	77.0	0.4583
2	4.00	0.21	0.36	402.00	81.0	77.0	0.4690
3	4.00	0.22	0.37	405.00	81.0	77.0	0.5000
F1	4.00	0.25	0.43	385.00	81.0	77.0	0.5000
2	4.00	0.24	0.41	388.00	81.0	78.0	0.5000
3	4.00	0.21	0.36	390.00	81.0	78.0	0.4583
F1	4.00	0.20	0.34	397.00	81.0	78.0	0.4472
2	4.00	0.23	0.39	401.00	81.0	78.0	0.4796
3	4.00	0.24	0.41	403.00	81.0	78.0	0.4899
TOTALS	96.00	5.43	9.24	9365.00	1854.0	1804.0	11.4364

FIELD DATA AVERAGES

Avg Velocity Head (in H20)	dP(avg)	=	0.226
Avg Orifice Meter Reading (in H20)	dH(avg)	=	0.365
Avg Stack Temperature (degF)	T(s avg)	=	390.2
Average Meter Temperature (degF)	T(m avg)	=	76.2
Avg SQRT(dP)		=	0.477

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	31.65
Stack Gas Water Vapor Proportion	B(wo)	=	0.060
Mol. Wt., Stack Gas Dry	M(d)	=	30.69
Mol. Wt., Stack Gas Wet	M(s)	=	29.93
Abs Stack Pressure (in Hg)	P(s)	=	30.11
Avg Stack Velocity (ft/sec)	V(s avg)	=	37.2
Isokineticity (%)	% I	=	95.9
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	112513
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	191451
Percent XS Air	PEA	=	38.0
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.7565
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	1589
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.6943
Heat Input Rate, MBtu/hr		=	498.65
Particulate Emission Rate(lb/hr)	E(p)	=	729.746
Particulate Emission Rate(lb/MBtu)		=	1.4637

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 10/04/92 Printed 29-Oct — Test No./Type: M17-1115
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 0100-0240

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.74
Stack Static Pressure (in H2O)	P(stack)	9.000
Gas Meter Initial Reading (cu ft)		666.50
Gas Meter Final Reading (cu ft)		707.16
Net Gas Sample Volume (cu ft)	V(m)	(40.66)
Vol of Liquid Collected (ml)	Vl(c)	82.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.860)
Wt. of Filter Particulate (gm)		6.4607
Wt. of Probe Wash Particulate (gm)		0.0000
Wt. of Combined Particulate (gm)	M(p)	(6.4607)
O2 Concentration (by CEM)	% O2	3.58
CO2 Concentration (by CEM)	% CO2	15.59
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.83)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter,dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.40	0.68	407.00	72.0	72.0	0.6325
2	4.00	0.28	0.48	408.00	71.0	72.0	0.5292
3	4.00	0.32	0.54	410.00	72.0	72.0	0.5657
B1	4.00	0.37	0.63	374.00	73.0	73.0	0.6083
2	4.00	0.32	0.54	385.00	74.0	73.0	0.5657
3	4.00	0.32	0.54	401.00	75.0	73.0	0.5657
C1	4.00	0.40	0.68	375.00	75.0	73.0	0.6325
2	4.00	0.36	0.61	391.00	76.0	73.0	0.6000
3	4.00	0.40	0.68	404.00	77.0	73.0	0.6325
D1	4.00	0.45	0.75	391.00	77.0	74.0	0.6708
2	4.00	0.40	0.68	402.00	78.0	74.0	0.6325
3	4.00	0.36	0.61	411.00	79.0	74.0	0.6000
E1	4.00	0.37	0.63	405.00	78.0	75.0	0.6083
2	4.00	0.36	0.61	411.00	79.0	75.0	0.6000
3	4.00	0.33	0.56	412.00	80.0	76.0	0.5745
E1	4.00	0.33	0.56	416.00	80.0	75.0	0.6000
2	4.00	0.36	0.61	419.00	80.0	76.0	0.6000
3	4.00	0.36	0.61	421.00	81.0	76.0	0.6557
F1	4.00	0.43	0.73	395.00	81.0	77.0	0.6557
2	4.00	0.44	0.75	399.00	82.0	77.0	0.6557
3	4.00	0.35	0.60	409.00	82.0	78.0	0.5916
F1	4.00	0.36	0.61	418.00	82.0	78.0	0.6000
2	4.00	0.36	0.61	420.00	84.0	79.0	0.6000
3	4.00	0.36	0.61	425.00	84.0	79.0	0.6000
TOTALS	96.00	8.79	14.91	9709.00	1872.0	1797.0	14.5767

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.366
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.621
Avg Stack Temperature (degF)	T(s avg)	=	404.5
Average Meter Temperature (degF)	T(m avg)	=	76.4
Avg SQRT(dP)		=	0.607

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	39.78
Stack Gas Water Vapor Proportion	B(wo)	=	0.088
Mol. Wt., Stack Gas Dry	M(d)	=	30.64
Mol. Wt., Stack Gas Wet	M(s)	=	29.52
Abs Stack Pressure (in Hg)	P(s)	=	30.40
Avg Stack Velocity (ft/sec)	V(s avg)	=	42.8
Isokineticity (%)	% I	=	97.2
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	139483
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	246576
Percent XS Air	PEA	=	20.2
Particulate Loading, dry(gr/dscf)	C(s std)	=	2.5055
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	4605
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	2.0139
Heat Input Rate, MBtu/hr		=	706.26
Particulate Emission Rate(lb/hr)	E(p)	=	2995.377
Particulate Emission Rate(lb/MBtu)		=	4.2419

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 10/04/92 Printed 29-Oct — Test No./Type: M17-1116
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 2030-2215

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.81
Stack Static Pressure (in H2O)	P(stack)	5.000
Gas Meter Initial Reading (cu ft)		707.41
Gas Meter Final Reading (cu ft)		735.91
Net Gas Sample Volume (cu ft)	V(m)	(28.50)
Vol of Liquid Collected (ml)	Vl(c)	53.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(2.495)
Wt. of Filter Particulate (gm)		2.6018
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(2.6018)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	4.88
CO2 Concentration (by CEM)	% CO2	15.68
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(79.44)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.18	0.31	384.00	75.0	75.0	0.4243
2	4.00	0.16	0.27	383.00	74.0	75.0	0.4000
3	4.00	0.16	0.27	388.00	74.0	75.0	0.4000
B1	4.00	0.18	0.31	337.00	75.0	74.0	0.4243
2	4.00	0.16	0.27	355.00	75.0	74.0	0.4000
3	4.00	0.16	0.27	379.00	75.0	74.0	0.4000
C1	4.00	0.16	0.27	366.00	75.0	74.0	0.4000
2	4.00	0.16	0.27	375.00	76.0	74.0	0.4000
3	4.00	0.22	0.37	386.00	76.0	74.0	0.4690
D1	4.00	0.21	0.36	371.00	76.0	74.0	0.4583
2	4.00	0.17	0.29	377.00	76.0	74.0	0.4123
3	4.00	0.17	0.29	385.00	76.0	74.0	0.4123
E1	4.00	0.17	0.29	370.00	76.0	74.0	0.4123
2	4.00	0.17	0.29	373.00	76.0	74.0	0.4123
3	4.00	0.16	0.27	378.00	76.0	74.0	0.4000
F1	4.00	0.15	0.26	383.00	76.0	74.0	0.3873
2	4.00	0.17	0.29	385.00	76.0	74.0	0.4123
3	4.00	0.18	0.31	387.00	76.0	74.0	0.4243
G1	4.00	0.19	0.32	350.00	76.0	74.0	0.4359
2	4.00	0.19	0.32	351.00	76.0	74.0	0.4359
3	4.00	0.16	0.27	355.00	75.0	73.0	0.4000
H1	4.00	0.17	0.29	367.00	75.0	74.0	0.4123
2	4.00	0.17	0.29	372.00	76.0	74.0	0.4123
3	4.00	0.17	0.29	378.00	75.0	73.0	0.4123
TOTALS	96.00	4.14	7.04	8935.00	1812.0	1704.0	9.9577

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.173
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.293
Avg Stack Temperature (degF)	T(s avg)	=	372.3
Average Meter Temperature (degF)	T(m avg)	=	73.3
Avg SQRT(dP)		=	0.415

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	28.10
Stack Gas Water Vapor Proportion	B(wc)	=	0.082
Mol. Wt., Stack Gas Dry	M(d)	=	30.70
Mol. Wt., Stack Gas Wet	M(s)	=	29.67
Abs Stack Pressure (in Hg)	P(s)	=	30.18
Avg Stack Velocity (ft/sec)	V(s avg)	=	28.7
Isokineticity (%)	% I	=	98.5
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	97242
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	165485
Percent XS Air	PEA	=	30.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.4288
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2839
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.2409
Heat Input Rate, MBtu/hr		=	455.42
Particulate Emission Rate(lb/hr)	E(p)	=	1190.739
Particulate Emission Rate(lb/MBtu)		=	2.6151
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WPL, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 10/05/92 Printed 29-Oct — Test No./Type: M17-1117
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 0010-0142

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.81
Stack Static Pressure (in H2O)	P(stack)	9.000
Gas Meter Initial Reading (cu ft)		736.10
Gas Meter Final Reading (cu ft)		777.53
Net Gas Sample Volume (cu ft)	V(m)	(41.43)
Vol of Liquid Collected (ml)	Vl(c)	113.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.319)
Wt. of Filter Particulate (gm)		4.6652
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(4.6652)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.51
CO2 Concentration (by CEM)	% CO2	15.95
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.54)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.35	0.60	336.00	66.0	66.0	0.5916
2	4.00	0.33	0.56	367.00	66.0	68.0	0.5745
3	4.00	0.39	0.66	397.00	66.0	66.0	0.6245
B1	4.00	0.42	0.71	350.00	67.0	66.0	0.6481
2	4.00	0.35	0.60	366.00	69.0	66.0	0.5916
3	4.00	0.35	0.60	403.00	70.0	67.0	0.5916
C1	4.00	0.40	0.68	384.00	70.0	67.0	0.6325
2	4.00	0.36	0.61	392.00	71.0	68.0	0.6000
3	4.00	0.45	0.77	409.00	72.0	68.0	0.6708
D1	4.00	0.45	0.77	401.00	72.0	68.0	0.6708
2	4.00	0.40	0.68	407.00	73.0	69.0	0.6325
3	4.00	0.42	0.71	420.00	74.0	69.0	0.6481
E1	4.00	0.40	0.68	410.00	73.0	69.0	0.6325
2	4.00	0.40	0.68	415.00	74.0	70.0	0.6325
3	4.00	0.37	0.63	418.00	74.0	70.0	0.6083
F1	4.00	0.35	0.61	423.00	75.0	70.0	0.5916
2	4.00	0.49	0.68	426.00	75.0	70.0	0.7000
3	4.00	0.40	0.68	428.00	75.0	71.0	0.6325
G1	4.00	0.43	0.73	393.00	75.0	71.0	0.6557
2	4.00	0.43	0.73	397.00	75.0	71.0	0.6557
3	4.00	0.39	0.66	407.00	76.0	71.0	0.6245
H1	4.00	0.38	0.65	418.00	76.0	72.0	0.6164
2	4.00	0.41	0.70	424.00	77.0	72.0	0.6403
3	4.00	0.40	0.68	430.00	77.0	72.0	0.6325
TOTALS	96.00	9.52	16.06	9621.00	1738.0	1585.0	15.0989

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.397
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.669
Avg Stack Temperature (degF)	T(s avg)	=	400.9
Average Meter Temperature (degF)	T(m avg)	=	69.2
Avg SQRT(dP)		=	0.629

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	41.19
Stack Gas Water Vapor Proportion	B(wo)	=	0.114
Mol. Wt., Stack Gas Dry	M(d)	=	30.69
Mol. Wt., Stack Gas Wet	M(s)	=	29.24
Abs Stack Pressure (in Hg)	P(s)	=	30.47
Avg Stack Velocity (ft/sec)	V(s avg)	=	44.4
Isokineticity (%)	% I	=	99.2
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	141523
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	255788
Percent XS Air	PEA	=	19.6
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.7475
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	3200
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.3988
Heat Input Rate, MBtu/hr		=	719.36
Particulate Emission Rate(lb/hr)	E(p)	=	2119.140
Particulate Emission Rate(lb/MBtu)		=	2.9463
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 10/05/92 Printed 29-Oct — Test No./Type: M17-1118
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 0245-0430

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.81
Stack Static Pressure (in H2O)	P(stack)	9.000
Gas Meter Initial Reading (cu ft)		777.68
Gas Meter Final Reading (cu ft)		818.19
Net Gas Sample Volume (cu ft)	V(m)	(40.51)
Vol of Liquid Collected (ml)	Vl(c)	82.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.860)
Wt. of Filter Particulate (gm)		4.6930
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(4.6930)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	4.30
CO2 Concentration (by CEM)	% CO2	15.52
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.18)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.34	0.58	419.00	65.0	66.0	0.5831
2	4.00	0.28	0.49	424.00	65.0	66.0	0.5292
3	4.00	0.32	0.54	429.00	66.0	66.0	0.5657
B1	4.00	0.39	0.66	395.00	67.0	66.0	0.6245
2	4.00	0.32	0.54	402.00	68.0	66.0	0.5657
3	4.00	0.32	0.54	425.00	69.0	66.0	0.5657
C1	4.00	0.38	0.65	403.00	69.0	66.0	0.6164
2	4.00	0.38	0.65	415.00	70.0	67.0	0.6164
3	4.00	0.44	0.75	437.00	71.0	67.0	0.6633
D1	4.00	0.45	0.77	425.00	71.0	68.0	0.6708
2	4.00	0.38	0.65	433.00	73.0	68.0	0.6164
3	4.00	0.39	0.66	441.00	73.0	68.0	0.6245
E1	4.00	0.40	0.68	415.00	73.0	68.0	0.6325
2	4.00	0.39	0.66	423.00	73.0	68.0	0.6245
3	4.00	0.33	0.56	431.00	74.0	69.0	0.5745
F1	4.00	0.35	0.60	433.00	74.0	69.0	0.5916
2	4.00	0.32	0.54	437.00	74.0	69.0	0.5657
3	4.00	0.35	0.60	440.00	74.0	69.0	0.5916
G1	4.00	0.45	0.77	395.00	73.0	70.0	0.6708
2	4.00	0.43	0.73	402.00	73.0	70.0	0.6557
3	4.00	0.37	0.63	417.00	75.0	70.0	0.6083
H1	4.00	0.35	0.60	426.00	76.0	71.0	0.5916
2	4.00	0.35	0.60	432.00	76.0	71.0	0.5916
3	4.00	0.37	0.63	435.00	76.0	71.0	0.6083
TOTALS	96.00	8.85	15.08	10134.00	1718.0	1564.0	14.5484

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.369
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.626
Avg Stack Temperature (degF)	T(s avg)	=	422.3
Average Meter Temperature (degF)	T(m avg)	=	68.4
Avg SQRT(dP)		=	0.606

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	40.34
Stack Gas Water Vapor Proportion	B(wo)	=	0.087
Mol. Wt., Stack Gas Dry	M(d)	=	30.66
Mol. Wt., Stack Gas Wet	M(s)	=	29.55
Abs Stack Pressure (in Hg)	P(s)	=	30.47
Avg Stack Velocity (ft/sec)	V(s avg)	=	43.1
Isokineticity (%)	% I	=	99.0
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	135065
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	24819
Percent XS Air	PEA	=	25.5
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.7950
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	3443
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.5046
Heat Input Rate, MBtu/hr		=	670.02
Particulate Emission Rate(lb/hr)	E(p)	=	2123.931
Particulate Emission Rate(lb/MBtu)		=	3.1705
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September, 1992

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling/Janek
Date: 10/05/92 Printed 29-Oct — Test No./Type: M17-1119
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 2155-2340

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.86
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		818.41
Gas Meter Final Reading (cu ft)		892.40
Net Gas Sample Volume (cu ft)	V(m)	(73.99)
Vol of Liquid Collected (ml)	Vl(c)	181.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(8.520)
Wt. of Filter Particulate (gm)		4.1800
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(4.1800)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.86
CO2 Concentration (by CEM)	% CO2	15.63
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.51)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter,dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.20	2.04	504.00	82.0	83.0	1.0954
2	4.00	1.10	1.87	503.00	81.0	83.0	1.0488
3	4.00	1.20	2.04	499.00	82.0	83.0	1.0954
B1	4.00	1.60	2.72	441.00	84.0	83.0	1.2649
2	4.00	1.20	2.04	466.00	88.0	85.0	1.0954
3	4.00	1.10	1.87	489.00	88.0	84.0	1.0488
C1	4.00	1.40	2.38	489.00	89.0	84.0	1.1832
2	4.00	1.30	2.21	490.00	90.0	85.0	1.1402
3	4.00	1.60	2.72	500.00	92.0	86.0	1.2649
D1	4.00	1.70	2.89	442.00	94.0	86.0	1.3038
2	4.00	1.50	2.55	490.00	94.0	87.0	1.2247
3	4.00	1.50	2.55	501.00	95.0	87.0	1.2247
E1	4.00	1.50	2.55	460.00	94.0	88.0	1.2247
2	4.00	1.40	2.38	508.00	95.0	87.0	1.1832
3	4.00	1.20	2.04	518.00	95.0	87.0	1.0954
F1	4.00	1.20	2.04	522.00	95.0	88.0	1.0954
2	4.00	1.40	2.38	524.00	94.0	87.0	1.1832
3	4.00	1.40	2.38	529.00	93.0	87.0	1.1832
G1	4.00	1.60	2.72	488.00	91.0	87.0	1.2649
2	4.00	1.60	2.72	507.00	92.0	87.0	1.2649
3	4.00	1.40	2.38	518.00	93.0	87.0	1.1832
H1	4.00	1.40	2.38	529.00	92.0	87.0	1.1832
2	4.00	1.50	2.55	532.00	91.0	86.0	1.2247
3	4.00	1.50	2.55	540.00	91.0	86.0	1.2247
TOTALS	96.00	33.50	56.95	11989.00	2175.0	2060.0	28.3015

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.396
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	2.373
Avg Stack Temperature (degF)	T(s avg)	=	499.5
Average Meter Temperature (degF)	T(m avg)	=	88.2
Avg SQRT(dP)		=	1.179

CALCULATED VALUES

Meter Volume (std. cu ft.)	V(m std)	=	71.44
Stack Gas Water Vapor Proportion	B(wc)	=	0.107
Mol. Wt., Stack Gas Dry	M(d)	=	30.66
Mol. Wt., Stack Gas Wet	M(s)	=	29.31
Abs Stack Pressure (in Hg)	P(s)	=	31.33
Avg Stack Velocity (ft/sec)	V(s avg)	=	86.6
Isokineticity (%)	% I	=	94.9
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	255699
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	498831
Percent XS Air	PEA	=	22.2
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.9029
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	1687
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.7375
Heat Input Rate, MBtu/hr		=	1278.76
Particulate Emission Rate(lb/hr)	E(p)	=	1986.224
Particulate Emission Rate(lb/MBtu)		=	1.5535
Total Metals Emission Rate(lb/MBtu)		=	0.00000

APPENDIX M

PERFORMANCE TEST

M5 PARTICULATE LOADING AT ESP OUTLET—DATA SUMMARY

B&W/WPL, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 9/28/92 Printed 29-Oct — Test No./Type: M5/O-101
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1100-1252

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.90
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		894.31
Gas Meter Final Reading (cu ft)		977.81
Net Gas Sample Volume (cu ft)	V(m)	(83.50)
Vol of Liquid Collected (ml)	Vl(c)	155.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(7.296)
Wt. of Filter Particulate (gm)		0.2046
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.2046)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.23
CO2 Concentration (by CEM)	% CO2	15.46
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.31)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.80	3.80	477	60.0	60.0	1.3416
2	4.00	1.30	3.10	476	61.0	60.0	1.1402
3	4.00	1.10	2.60	475	64.0	60.0	1.0488
B1	4.00	1.10	2.60	474	65.0	60.0	1.0488
2	4.00	1.20	2.90	473	66.0	60.0	1.0954
3	4.00	2.00	4.80	473	68.0	61.0	1.4142
C1	4.00	1.10	2.60	473	67.0	61.0	1.0488
2	4.00	1.20	2.90	479	70.0	61.0	1.0954
3	4.00	1.10	2.60	480	71.0	61.0	1.0488
D1	4.00	1.50	3.60	482	67.0	61.0	1.2247
2	4.00	1.40	3.40	485	71.0	61.0	1.1832
3	4.00	1.20	2.90	484	71.0	61.0	1.0954
E1	4.00	1.10	2.60	489	65.0	60.0	1.0488
2	4.00	1.20	2.90	494	69.0	61.0	1.0954
3	4.00	0.98	2.40	493	71.0	61.0	0.9899
F1	4.00	0.93	2.20	494	67.0	61.0	0.9644
2	4.00	0.93	2.20	496	69.0	61.0	0.9644
3	4.00	0.73	1.80	497	70.0	61.0	0.9644
G1	4.00	1.70	1.70	496	70.0	61.0	0.9644
2	4.00	2.20	2.20	497	70.0	61.0	0.8544
3	4.00	2.20	2.20	497	70.0	61.0	1.3038
H1	4.00	1.00	1.00	468	68.0	62.0	1.4832
2	4.00	3.40	3.40	482	70.0	62.0	1.4832
3	4.00	2.60	2.60	485	73.0	62.0	1.0000
TOTALS	96.00	34.97	65.00	11619.0	1633.0	1399.0	26.9019

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.457
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	2.705
Avg Stack Temperature (degF)	T(s avg)	=	464.1
Average Meter Temperature (degF)	T(m avg)	=	63.2
Avg SQRT(dP)		=	1.121

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	83.89
Stack Gas Water Vapor Proportion	B(wo)	=	0.080
Mol. Wt., Stack Gas Dry	M(d)	=	30.60
Mol. Wt., Stack Gas Wet	M(s)	=	29.59
Abs Stack Pressure (in Hg)	P(s)	=	31.37
Avg Stack Velocity (ft/sec)	V(s avg)	=	61.2
Isokineticity (%)	% I	=	106.0
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	252224
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	467580
Percent XS Air	PEA	=	17.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0376
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	66
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0297
Heat Input Rate, MBtu/hr		=	1302.92
Particulate Emission Rate(lb/hr)	E(p)	=	81.359
Particulate Emission Rate(lb/MBtu)		=	0.0625
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 9/28/92 Printed 29-Oct — Test No./Type: M5/0-102
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1500-1650

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.244
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.90
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		978.71
Gas Meter Final Reading (cu ft)		1039.40
Net Gas Sample Volume (cu ft)	V(m)	(60.70)
Vol of Liquid Collected (ml)	Vl(c)	104.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.895)
Wt. of Filter Particulate (gm)		0.0355
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0355)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.83
CO2 Concentration (by CEM)	% CO2	15.45
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.72)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.96	2.30	468.00	57.0	56.0	0.9798
2	4.00	0.67	1.60	467.00	58.0	56.0	0.8185
3	4.00	0.56	1.30	467.00	61.0	57.0	0.7483
B1	4.00	0.57	1.40	467.00	63.0	58.0	0.7550
2	4.00	0.63	1.50	467.00	65.0	58.0	0.7937
3	4.00	0.90	2.20	467.00	67.0	59.0	0.9487
C1	4.00	0.50	1.20	468.00	67.0	60.0	0.7071
2	4.00	0.63	1.50	471.00	69.0	61.0	0.7937
3	4.00	0.52	1.20	469.00	71.0	62.0	0.7211
D1	4.00	0.76	1.80	461.00	70.0	62.0	0.8718
2	4.00	0.72	1.70	461.00	73.0	63.0	0.8485
3	4.00	0.64	1.50	462.00	74.0	64.0	0.8000
E1	4.00	0.53	1.30	462.00	70.0	64.0	0.7280
2	4.00	0.58	1.40	465.00	73.0	65.0	0.7616
3	4.00	0.42	1.00	463.00	75.0	66.0	0.6481
F1	4.00	0.54	1.30	458.00	71.0	66.0	0.7348
2	4.00	0.42	1.00	458.00	74.0	67.0	0.6481
3	4.00	0.35	0.84	457.00	74.0	67.0	0.7348
G1	4.00	0.33	0.80	457.00	75.0	67.0	0.6481
2	4.00	0.42	1.00	457.00	75.0	68.0	0.5916
3	4.00	0.48	1.20	457.00	75.0	68.0	0.5745
H1	4.00	0.63	1.50	430.00	73.0	67.0	0.6481
2	4.00	0.78	1.90	434.00	75.0	68.0	0.6928
3	4.00	0.71	1.70	437.00	76.0	67.0	0.7937
TOTALS	96.00	14.25	34.14	11030.00	1681.0	1516.0	17.9905

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.594
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.423
Avg Stack Temperature (degF)	T(s avg)	=	459.6
Average Meter Temperature (degF)	T(m avg)	=	66.6
Avg SQRT(dP)		=	0.750

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	60.40
Stack Gas Water Vapor Proportion	B(wo)	=	0.075
Mol. Wt., Stack Gas Dry	M(d)	=	30.63
Mol. Wt., Stack Gas Wet	M(s)	=	29.65
Abs Stack Pressure (in Hg)	P(s)	=	30.93
Avg Stack Velocity (ft/sec)	V(s avg)	=	53.9
Isokineticity (%)	% I	=	109.2
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	170[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	3.[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0[illegible]
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	17
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0074
Heat Input Rate, MBtu/hr		=	850.29
Particulate Emission Rate(lb/hr)	E(p)	=	13.233
Particulate Emission Rate(lb/MBtu)		=	0.0156
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 9/28/92 Printed 29-Oct — Test No./Type: M5-0-103
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1920-2110

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.244
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.90
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		40.00
Gas Meter Final Reading (cu ft)		124.60
Net Gas Sample Volume (cu ft)	V(m)	(84.60)
Vol of Liquid Collected (ml)	Vl(c)	191.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(8.990)
Wt. of Filter Particulate (gm)		0.1654
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.1654)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.40
CO2 Concentration (by CEM)	% CO2	15.97
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.63)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.60	3.60	485	59.0	58.0	1.2649
2	4.00	1.30	2.90	486	64.0	59.0	1.1402
3	4.00	1.20	2.70	487	68.0	60.0	1.0954
B1	4.00	1.10	2.50	487	72.0	61.0	1.0488
2	4.00	1.30	2.40	488	73.0	62.0	1.1402
3	4.00	1.60	3.60	488	76.0	63.0	1.2649
C1	4.00	1.10	2.50	488	74.0	64.0	1.0488
2	4.00	1.30	2.90	493	77.0	65.0	1.1402
3	4.00	1.10	2.50	493	79.0	66.0	1.0488
D1	4.00	1.60	3.60	495	75.0	66.0	1.2649
2	4.00	1.50	3.40	496	80.0	66.0	1.2247
3	4.00	1.20	2.70	496	81.0	67.0	1.0954
E1	4.00	1.30	2.90	497	74.0	67.0	1.1402
2	4.00	1.30	2.90	505	78.0	68.0	1.1402
3	4.00	0.96	2.20	505	80.0	68.0	0.9798
F1	4.00	1.10	2.50	498	74.0	67.0	1.0488
2	4.00	1.00	2.30	505	78.0	68.0	1.0000
3	4.00	0.78	1.80	505	78.0	68.0	1.0488
G1	4.00	0.76	1.70	505	78.0	69.0	1.0000
2	4.00	0.92	2.10	506	78.0	69.0	0.8832
3	4.00	1.50	3.40	507	80.0	69.0	0.8718
H1	4.00	1.30	2.90	488	76.0	69.0	0.9592
2	4.00	1.60	3.60	492	81.0	70.0	1.2247
3	4.00	1.40	3.20	494	82.0	70.0	1.1402
TOTALS	96.00	29.82	66.80	11889.00	1815.0	1579.0	26.2141

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.243
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	2.763
Avg Stack Temperature (degF)	T(s avg)	=	495.4
Average Meter Temperature (degF)	T(m avg)	=	70.7
Avg SQRT(dP)		=	1.092

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	83.81
Stack Gas Water Vapor Proportion	B(wo)	=	0.097
Mol. Wt., Stack Gas Dry	M(d)	=	30.69
Mol. Wt., Stack Gas Wet	M(s)	=	29.48
Abs Stack Pressure (in Hg)	P(s)	=	31.37
Avg Stack Velocity (ft/sec)	V(s avg)	=	79.7
Isokineticity (%)	% I	=	107.5
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	240364
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	459344
Percent XS Air	PEA	=	19.0
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0305
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	55
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0242
Heat Input Rate, MBtu/hr		=	1229.61
Particulate Emission Rate(lb/hr)	E(p)	=	62.748
Particulate Emission Rate(lb/MBtu)		=	0.0510
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 9/29/92 Printed 29-Oct — Test No./Type: M5/O-104
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1328-1518

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.244
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	30.10
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		124.81
Gas Meter Final Reading (cu ft)		184.01
Net Gas Sample Volume (cu ft)	V(m)	(59.20)
Vol of Liquid Collected (ml)	Vl(c)	87.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.095)
Wt. of Filter Particulate (gm)		0.0369
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0369)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.80
CO2 Concentration (by CEM)	% CO2	15.05
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.15)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.80	1.80	472	61.0	61.0	0.8944
2	4.00	0.65	1.50	473	62.0	61.0	0.8062
3	4.00	0.52	1.20	473	64.0	61.0	0.7211
B1	4.00	0.55	1.20	473	65.0	62.0	0.7416
2	4.00	0.62	1.40	473	67.0	62.0	0.7874
3	4.00	0.73	1.60	474	69.0	63.0	0.8544
C1	4.00	0.54	1.20	476	69.0	64.0	0.7348
2	4.00	0.58	1.30	478	72.0	65.0	0.7616
3	4.00	0.50	1.10	477	75.0	66.0	0.7071
D1	4.00	0.75	1.70	467	74.0	67.0	0.8660
2	4.00	0.71	1.60	467	77.0	68.0	0.8426
3	4.00	0.59	1.30	467	79.0	68.0	0.7681
E1	4.00	0.55	1.20	466	74.0	69.0	0.7416
2	4.00	0.63	1.40	468	78.0	69.0	0.7937
3	4.00	0.45	1.00	467	79.0	70.0	0.6708
F1	4.00	0.50	1.10	459	76.0	70.0	0.7071
2	4.00	0.52	1.20	461	79.0	71.0	0.7211
3	4.00	0.41	0.92	459	80.0	71.0	0.7071
G1	4.00	0.38	0.85	458	79.0	71.0	0.7211
2	4.00	0.47	1.10	459	79.0	71.0	0.6403
3	4.00	0.65	1.50	460	80.0	72.0	0.8164
H1	4.00	0.70	1.60	435	78.0	72.0	0.6856
2	4.00	0.77	1.70	439	81.0	73.0	0.8062
3	4.00	0.75	1.70	443	82.0	73.0	0.8367
TOTALS	96.00	14.32	32.17	11144.00	1779.0	1620.0	18.1333

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.597
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.340
Avg Stack Temperature (degF)	T(s avg)	=	464.3
Average Meter Temperature (degF)	T(m avg)	=	70.8
Avg SQRT(dP)		=	0.756

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	58.82
Stack Gas Water Vapor Proportion	B(wo)	=	0.065
Mol. Wt., Stack Gas Dry	M(d)	=	30.56
Mol. Wt., Stack Gas Wet	M(s)	=	29.74
Abs Stack Pressure (in Hg)	P(s)	=	31.13
Avg Stack Velocity (ft/sec)	V(s avg)	=	54.2
Isokineticity (%)	% I	=	104.5
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	173503
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	3[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0097
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	18
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0079
Heat Input Rate, MBtu/hr		=	867.35
Particulate Emission Rate(lb/hr)	E(p)	=	14.402
Particulate Emission Rate(lb/MBtu)		=	0.0166
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 9/29/92 Printed 29-Oct — Test No./Type: M5/0-105
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1710-1902

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	30.10
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		184.11
Gas Meter Final Reading (cu ft)		266.51
Net Gas Sample Volume (cu ft)	V(m)	(82.40)
Vol of Liquid Collected (ml)	Vl(c)	184.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(8.661)
Wt. of Filter Particulate (gm)		0.2150
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.2150)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.37
CO2 Concentration (by CEM)	% CO2	15.48
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.15)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.60	3.40	494	66.0	66.0	1.2649
2	4.00	1.20	2.50	494	69.0	66.0	1.0954
3	4.00	1.10	2.30	495	71.0	66.0	1.0488
B1	4.00	1.10	2.30	495	74.0	67.0	1.0488
2	4.00	1.30	2.70	496	76.0	68.0	1.1402
3	4.00	1.50	3.20	497	79.0	68.0	1.2247
C1	4.00	0.94	2.00	501	76.0	69.0	0.9695
2	4.00	1.20	2.50	502	80.0	70.0	1.0954
3	4.00	1.10	2.30	503	83.0	71.0	1.0488
D1	4.00	1.60	3.40	504	81.0	72.0	1.2649
2	4.00	1.50	3.20	505	86.0	72.0	1.2247
3	4.00	1.20	2.50	505	88.0	73.0	1.0954
E1	4.00	1.70	3.60	505	83.0	75.0	1.3038
2	4.00	1.20	2.50	509	89.0	76.0	1.0954
3	4.00	0.89	1.90	510	91.0	76.0	0.9434
F1	4.00	1.30	2.70	507	86.0	77.0	1.1402
2	4.00	0.92	1.90	513	91.0	78.0	0.9592
3	4.00	0.94	2.00	513	91.0	78.0	1.1402
G1	4.00	0.76	1.60	514	91.0	79.0	0.9592
2	4.00	0.74	1.50	514	91.0	79.0	0.9695
3	4.00	0.93	2.00	515	90.0	79.0	0.8718
H1	4.00	1.50	3.20	492	87.0	79.0	0.8602
2	4.00	1.60	3.40	499	92.0	80.0	0.9644
3	4.00	1.40	2.90	504	93.0	79.0	1.2247
TOTALS	96.00	29.22	61.50	12086.00	2004.0	1763.0	25.9538

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.216
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	2.563
Avg Stack Temperature (degF)	T(s avg)	=	503.6
Average Meter Temperature (degF)	T(m avg)	=	76.5
Avg SQRT(dP)		=	1.081

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	80.94
Stack Gas Water Vapor Proportion	B(wo)	=	0.097
Mol. Wt., Stack Gas Dry	M(d)	=	30.61
Mol. Wt., Stack Gas Wet	M(s)	=	29.39
Abs Stack Pressure (in Hg)	P(s)	=	31.57
Avg Stack Velocity (ft/sec)	V(s avg)	=	79.1
Isokineticity (%)	% I	=	108.3
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	238072
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	455816
Percent XS Air	PEA	=	16.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0410
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	74
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0325
Heat Input Rate, MBtu/hr		=	1220.07
Particulate Emission Rate(lb/hr)	E(p)	=	83.619
Particulate Emission Rate(lb/MBtu)		=	0.0685
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 9/30/92 Printed 29-Oct — Test No./Type: M5/0-106
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1241-1430

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	30.10
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		266.90
Gas Meter Final Reading (cu ft)		308.60
Net Gas Sample Volume (cu ft)	V(m)	(41.70)
Vol of Liquid Collected (ml)	Vl(c)	98.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.636)
Wt. of Filter Particulate (gm)		0.0302
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0302)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	4.32
CO2 Concentration (by CEM)	% CO2	15.62
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.06)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.37	0.78	444.00	71.0	71.0	0.6083
2	4.00	0.33	0.69	444.00	72.0	71.0	0.5745
3	4.00	0.29	0.61	443.00	73.0	71.0	0.5385
B1	4.00	0.28	0.59	442.00	74.0	72.0	0.5292
2	4.00	0.32	0.67	441.00	75.0	72.0	0.5657
3	4.00	0.36	0.76	442.00	76.0	72.0	0.6000
C1	4.00	0.23	0.48	433.00	76.0	72.0	0.4796
2	4.00	0.32	0.67	440.00	77.0	73.0	0.5657
3	4.00	0.31	0.65	438.00	78.0	73.0	0.5568
D1	4.00	0.32	0.67	429.00	77.0	74.0	0.5657
2	4.00	0.38	0.80	428.00	79.0	74.0	0.6164
3	4.00	0.33	0.69	426.00	80.0	75.0	0.5745
E1	4.00	0.29	0.61	424.00	77.0	75.0	0.5385
2	4.00	0.30	0.63	430.00	79.0	75.0	0.5477
3	4.00	0.24	0.50	428.00	80.0	75.0	0.4899
F1	4.00	0.18	0.38	423.00	78.0	75.0	0.4243
2	4.00	0.21	0.44	423.00	79.0	75.0	0.4583
3	4.00	0.20	0.42	421.00	79.0	75.0	0.4472
G1	4.00	0.19	0.40	420.00	79.0	75.0	0.4359
2	4.00	0.22	0.46	420.00	79.0	76.0	0.4690
3	4.00	0.26	0.55	422.00	80.0	76.0	0.5099
H1	4.00	0.36	0.76	404.00	79.0	76.0	0.6000
2	4.00	0.39	0.82	405.00	81.0	76.0	0.6245
3	4.00	0.39	0.82	404.00	82.0	77.0	0.6245
TOTALS	96.00	7.07	14.85	10274.00	1860.0	1776.0	12.9444

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.295
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.619
Avg Stack Temperature (degF)	T(s avg)	=	428.1
Average Meter Temperature (degF)	T(m avg)	=	75.8
Avg SQRT(dP)		=	0.539

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	40.98
Stack Gas Water Vapor Proportion	B(wo)	=	0.102
Mol. Wt., Stack Gas Dry	M(d)	=	30.67
Mol. Wt., Stack Gas Wet	M(s)	=	29.38
Abs Stack Pressure (in Hg)	P(s)	=	30.84
Avg Stack Velocity (ft/sec)	V(s avg)	=	38.3
Isokineticity (%)	% I	=	107.4
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	121577
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	22[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0[illegible]
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	22[illegible]
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0095
Heat Input Rate, MBtu/hr		=	589.29
Particulate Emission Rate(lb/hr)	E(p)	=	11.840
Particulate Emission Rate(lb/MBtu)		=	0.0201
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 9/30/92 Printed 29-Oct — Test No./Type: M5/0-107
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1710-1900

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	30.10
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		308.71
Gas Meter Final Reading (cu ft)		366.10
Net Gas Sample Volume (cu ft)	V(m)	(57.40)
Vol of Liquid Collected (ml)	Vl(c)	131.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(6.190)
Wt. of Filter Particulate (gm)		0.0548
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0548)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.33
CO2 Concentration (by CEM)	% CO2	15.07
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.60)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.95	1.80	444.00	75.0	74.0	0.9747
2	4.00	0.67	1.30	448.00	76.0	75.0	0.8185
3	4.00	0.57	1.10	448.00	78.0	75.0	0.7550
B1	4.00	0.59	1.10	448.00	80.0	76.0	0.7681
2	4.00	0.74	1.40	449.00	83.0	77.0	0.8602
3	4.00	0.97	1.80	451.00	85.0	77.0	0.9849
C1	4.00	0.58	1.10	444.00	84.0	78.0	0.7616
2	4.00	0.68	1.30	452.00	87.0	79.0	0.8246
3	4.00	0.53	1.00	451.00	89.0	80.0	0.7280
D1	4.00	1.00	1.90	445.00	87.0	81.0	1.0000
2	4.00	0.79	1.50	447.00	91.0	81.0	0.8888
3	4.00	0.72	1.40	449.00	92.0	82.0	0.8485
E1	4.00	0.59	1.10	446.00	89.0	83.0	0.7681
2	4.00	0.66	1.30	459.00	92.0	84.0	0.8124
3	4.00	0.52	0.99	459.00	93.0	84.0	0.7211
F1	4.00	0.58	1.10	460.00	91.0	84.0	0.7616
2	4.00	0.46	0.87	462.00	92.0	84.0	0.6782
3	4.00	0.39	0.74	461.00	91.0	84.0	0.6245
G1	4.00	0.40	0.76	461.00	91.0	84.0	0.6325
2	4.00	0.45	0.86	461.00	91.0	83.0	0.6708
3	4.00	0.53	1.00	462.00	90.0	83.0	0.7280
H1	4.00	0.60	1.10	441.00	88.0	83.0	0.7746
2	4.00	0.79	1.50	447.00	90.0	83.0	0.8888
3	4.00	0.72	1.40	447.00	91.0	83.0	0.8485
TOTALS	96.00	15.48	29.42	10842.00	2096.0	1937.0	19.1222

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.645
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.226
Avg Stack Temperature (degF)	T(s avg)	=	451.6
Average Meter Temperature (degF)	T(m avg)	=	84.0
Avg SQRT(dP)		=	0.797

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	55.63
Stack Gas Water Vapor Proportion	B(wo)	=	0.100
Mol. Wt., Stack Gas Dry	M(d)	=	30.54
Mol. Wt., Stack Gas Wet	M(s)	=	29.29
Abs Stack Pressure (in Hg)	P(s)	=	31.13
Avg Stack Velocity (ft/sec)	V(s avg)	=	57.2
Isokineticity (%)	% I	=	99.2
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	178657
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	329570
Percent XS Air	PEA	=	18.3
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0152
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	26
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0120
Heat Input Rate, MBtu/hr		=	917.82
Particulate Emission Rate(lb/hr)	E(p)	=	23.278
Particulate Emission Rate(lb/MBtu)		=	0.0254
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 9/30/92 Printed 29-Oct — Test No./Type: M5/0-108
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1949-2139

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	30.10
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		366.30
Gas Meter Final Reading (cu ft)		423.41
Net Gas Sample Volume (cu ft)	V(m)	(57.10)
Vol of Liquid Collected (ml)	Vl(c)	127.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.978)
Wt. of Filter Particulate (gm)		0.0509
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0509)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.34
CO2 Concentration (by CEM)	% CO2	15.03
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.63)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.80	1.50	457.00	73.0	73.0	0.8944
2	4.00	0.65	1.20	458.00	74.0	73.0	0.8062
3	4.00	0.61	1.20	459.00	77.0	73.0	0.7810
B1	4.00	0.65	1.20	460.00	79.0	74.0	0.8062
2	4.00	0.62	1.20	459.00	81.0	74.0	0.7874
3	4.00	0.74	1.40	461.00	83.0	75.0	0.8602
C1	4.00	0.57	1.10	462.00	81.0	75.0	0.7550
2	4.00	0.67	1.30	464.00	84.0	76.0	0.8185
3	4.00	0.61	1.20	464.00	85.0	76.0	0.7810
D1	4.00	0.83	1.60	462.00	83.0	77.0	0.9110
2	4.00	0.81	1.50	462.00	86.0	77.0	0.9000
3	4.00	0.57	1.10	463.00	87.0	78.0	0.7550
E1	4.00	0.67	1.30	465.00	82.0	78.0	0.8185
2	4.00	0.63	1.20	469.00	85.0	78.0	0.7937
3	4.00	0.51	0.97	467.00	86.0	78.0	0.7141
F1	4.00	0.57	1.10	467.00	83.0	78.0	0.7550
2	4.00	0.55	1.00	471.00	84.0	78.0	0.7416
3	4.00	0.44	0.84	470.00	85.0	78.0	0.6633
G1	4.00	0.42	0.80	470.00	84.0	78.0	0.6481
2	4.00	0.52	0.99	471.00	85.0	78.0	0.7211
3	4.00	0.52	0.99	473.00	85.0	78.0	0.7211
H1	4.00	0.72	1.40	448.00	83.0	78.0	0.8485
2	4.00	0.87	1.70	453.00	85.0	78.0	0.9327
3	4.00	0.83	1.60	456.00	87.0	78.0	0.9110
TOTALS	96.00	15.38	29.39	11111.00	1987.0	1837.0	19.1250

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.641
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.225
Avg Stack Temperature (degF)	T(s avg)	=	463.0
Average Meter Temperature (degF)	T(m avg)	=	79.7
Avg SQRT(dP)		=	0.797

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	55.79
Stack Gas Water Vapor Proportion	B(wo)	=	0.097
Mol. Wt., Stack Gas Dry	M(d)	=	30.54
Mol. Wt., Stack Gas Wet	M(s)	=	29.32
Abs Stack Pressure (in Hg)	P(s)	=	31.13
Avg Stack Velocity (ft/sec)	V(s avg)	=	57.5
Isokineticity (%)	% I	=	99.7
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	178175
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	3[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0141
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	26
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0112
Heat Input Rate, MBtu/hr		=	914.68
Particulate Emission Rate(lb/hr)	E(p)	=	21.505
Particulate Emission Rate(lb/MBtu)		=	0.0235
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 10/01/92 Printed 29-Oct — Test No./Type: M5/O-109
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 2245-0035

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.84
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		423.70
Gas Meter Final Reading (cu ft)		465.10
Net Gas Sample Volume (cu ft)	V(m)	(41.40)
Vol of Liquid Collected (ml)	Vl(c)	84.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.977)
Wt. of Filter Particulate (gm)		0.0611
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0611)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.98
CO2 Concentration (by CEM)	% CO2	15.11
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.91)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter,dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.43	0.82	479.00	73.0	73.0	0.6557
2	4.00	0.35	0.67	481.00	73.0	73.0	0.5916
3	4.00	0.28	0.53	479.00	74.0	73.0	0.5292
B1	4.00	0.28	0.53	478.00	75.0	73.0	0.5292
2	4.00	0.36	0.68	476.00	76.0	73.0	0.6000
3	4.00	0.39	0.74	475.00	77.0	73.0	0.6245
C1	4.00	0.29	0.55	473.00	75.0	73.0	0.5385
2	4.00	0.35	0.67	472.00	77.0	73.0	0.5916
3	4.00	0.31	0.59	470.00	77.0	73.0	0.5568
D1	4.00	0.42	0.80	457.00	76.0	73.0	0.6481
2	4.00	0.42	0.80	456.00	78.0	73.0	0.6481
3	4.00	0.33	0.63	454.00	78.0	73.0	0.5745
E1	4.00	0.33	0.63	446.00	75.0	73.0	0.5745
2	4.00	0.34	0.64	450.00	76.0	73.0	0.5831
3	4.00	0.28	0.53	448.00	77.0	73.0	0.5292
F1	4.00	0.26	0.49	437.00	74.0	72.0	0.5099
2	4.00	0.25	0.48	436.00	76.0	72.0	0.5000
3	4.00	0.21	0.40	434.00	75.0	72.0	0.4583
G1	4.00	0.38	0.38	433.00	75.0	72.0	0.6164
2	4.00	0.42	0.42	433.00	75.0	72.0	0.6481
3	4.00	0.48	0.48	433.00	75.0	72.0	0.6928
H1	4.00	0.61	0.61	414.00	75.0	73.0	0.7810
2	4.00	0.78	0.78	413.00	76.0	73.0	0.8832
3	4.00	0.84	0.84	410.00	78.0	74.0	0.9165
TOTALS	96.00	9.39	14.69	10837.00	1816.0	1673.0	14.7806

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.391
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.612
Avg Stack Temperature (degF)	T(s avg)	=	451.5
Average Meter Temperature (degF)	T(m avg)	=	72.7
Avg SQRT(dP)		=	0.616

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	40.55
Stack Gas Water Vapor Proportion	B(wo)	=	0.089
Mol. Wt., Stack Gas Dry	M(d)	=	30.56
Mol. Wt., Stack Gas Wet	M(s)	=	29.45
Abs Stack Pressure (in Hg)	P(s)	=	30.55
Avg Stack Velocity (ft/sec)	V(s avg)	=	44.5
Isokineticity (%)	% I	=	93.5
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	136156
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	256289
Percent XS Air	PEA	=	22.9
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0232
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	44
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0191
Heat Input Rate, MBtu/hr		=	683.38
Particulate Emission Rate(lb/hr)	E(p)	=	27.515
Particulate Emission Rate(lb/MBtu)		=	0.0403
Total Metals Emission Rate(lb/MBtu)		=	0.0000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 10/02/92 Printed 29-Oct — Test No./Type: M5/0-110
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 0157-0346

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.84
Stack Static Pressure (in H2O)	P(stack)	14.000
Gas Meter Initial Reading (cu ft)		465.21
Gas Meter Final Reading (cu ft)		522.71
Net Gas Sample Volume (cu ft)	V(m)	(57.50)
Vol of Liquid Collected (ml)	Vl(c)	126.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.954)
Wt. of Filter Particulate (gm)		0.0702
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0702)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.24
CO2 Concentration (by CEM)	% CO2	15.41
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.35)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.87	1.70	461.00	70.0	69.0	0.9327
2	4.00	0.71	1.30	465.00	71.0	69.0	0.8426
3	4.00	0.66	1.30	465.00	74.0	70.0	0.8124
B1	4.00	0.71	1.30	465.00	75.0	70.0	0.8426
2	4.00	0.69	1.30	466.00	77.0	71.0	0.8307
3	4.00	0.87	1.70	467.00	79.0	72.0	0.9327
C1	4.00	0.59	1.10	466.00	78.0	72.0	0.7681
2	4.00	0.72	1.40	471.00	80.0	73.0	0.8485
3	4.00	0.64	1.20	471.00	82.0	74.0	0.8000
D1	4.00	0.89	1.70	459.00	80.0	74.0	0.9434
2	4.00	0.81	1.50	463.00	83.0	75.0	0.9000
3	4.00	0.65	1.20	464.00	85.0	75.0	0.8062
E1	4.00	0.69	1.30	446.00	80.0	75.0	0.8307
2	4.00	0.65	1.20	454.00	83.0	76.0	0.8062
3	4.00	0.53	1.00	452.00	84.0	76.0	0.7280
F1	4.00	0.53	1.00	442.00	81.0	76.0	0.7280
2	4.00	0.52	0.99	443.00	83.0	76.0	0.7211
3	4.00	0.44	0.84	442.00	83.0	76.0	0.6633
G1	4.00	0.42	0.80	441.00	83.0	76.0	0.6481
2	4.00	0.52	0.99	442.00	83.0	76.0	0.7211
3	4.00	0.55	1.00	444.00	83.0	76.0	0.7416
H1	4.00	0.47	0.89	419.00	81.0	76.0	0.6856
2	4.00	0.79	1.50	425.00	82.0	76.0	0.8888
3	4.00	0.82	1.60	427.00	82.0	76.0	0.9055
TOTALS	96.00	15.74	29.81	10860.00	1922.0	1699.0	19.3281

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.656
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.242
Avg Stack Temperature (degF)	T(s avg)	=	452.5
Average Meter Temperature (degF)	T(m avg)	=	75.4
Avg SQRT(dP)		=	0.805

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	56.13
Stack Gas Water Vapor Proportion	B(wo)	=	0.096
Mol. Wt., Stack Gas Dry	M(d)	=	30.60
Mol. Wt., Stack Gas Wet	M(s)	=	29.39
Abs Stack Pressure (in Hg)	P(s)	=	30.87
Avg Stack Velocity (ft/sec)	V(s avg)	=	56.0
Isokineticity (%)	% I	=	99.2
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	180323
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	3[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.[illegible]
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	35
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0152
Heat Input Rate, MBtu/hr		=	930.97
Particulate Emission Rate(lb/hr)	E(p)	=	29.825
Particulate Emission Rate(lb/MBtu)		=	0.0320
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 10/02/92 Printed 29-Oct — Test No./Type: M5/O-111
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 2248-0036

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.71
Stack Static Pressure (in H2O)	P(stack)	9.000
Gas Meter Initial Reading (cu ft)		523.00
Gas Meter Final Reading (cu ft)		566.61
Net Gas Sample Volume (cu ft)	V(m)	(43.61)
Vol of Liquid Collected (ml)	Vl(c)	90.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(4.236)
Wt. of Filter Particulate (gm)		0.0439
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0439)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.59
CO2 Concentration (by CEM)	% CO2	15.61
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.80)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.56	1.10	454.00	73.0	73.0	0.7483
2	4.00	0.38	0.72	459.00	74.0	73.0	0.6164
3	4.00	0.33	0.63	460.00	75.0	74.0	0.5745
B1	4.00	0.33	0.63	459.00	76.0	74.0	0.5745
2	4.00	0.38	0.72	459.00	77.0	74.0	0.6164
3	4.00	0.50	0.95	460.00	79.0	75.0	0.7071
C1	4.00	0.28	0.53	456.00	79.0	75.0	0.5292
2	4.00	0.36	0.68	459.00	80.0	76.0	0.6000
3	4.00	0.31	0.59	457.00	81.0	76.0	0.5568
D1	4.00	0.43	0.82	449.00	81.0	77.0	0.6557
2	4.00	0.43	0.82	449.00	84.0	78.0	0.6557
3	4.00	0.35	0.67	447.00	85.0	78.0	0.5916
E1	4.00	0.33	0.63	441.00	82.0	78.0	0.5745
2	4.00	0.35	0.67	455.00	85.0	79.0	0.5916
3	4.00	0.28	0.53	455.00	86.0	80.0	0.5292
F1	4.00	0.33	0.63	445.00	84.0	80.0	0.5745
2	4.00	0.30	0.57	447.00	86.0	80.0	0.5477
3	4.00	0.25	0.48	445.00	87.0	81.0	0.5000
G1	4.00	0.25	0.48	443.00	86.0	81.0	0.5000
2	4.00	0.30	0.57	443.00	86.0	80.0	0.5477
3	4.00	0.30	0.57	444.00	86.0	80.0	0.5477
H1	4.00	0.35	0.67	425.00	83.0	80.0	0.5916
2	4.00	0.48	0.91	424.00	85.0	80.0	0.6928
3	4.00	0.46	0.87	423.00	85.0	80.0	0.6782
TOTALS	96.00	8.62	16.44	10758.00	1965.0	1782.0	14.3018

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.359
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.685
Avg Stack Temperature (degF)	T(s avg)	=	448.3
Average Meter Temperature (degF)	T(m avg)	=	76.1
Avg SQRT(dP)		=	0.596

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	42.12
Stack Gas Water Vapor Proportion	B(wo)	=	0.091
Mol. Wt., Stack Gas Dry	M(d)	=	30.64
Mol. Wt., Stack Gas Wet	M(s)	=	29.49
Abs Stack Pressure (in Hg)	P(s)	=	30.37
Avg Stack Velocity (ft/sec)	V(s avg)	=	43.1
Isokineticity (%)	% I	=	100.8
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	133098
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	248231
Percent XS Air	PEA	=	20.2
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0161
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	30
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0129
Heat Input Rate, MBtu/hr		=	673.54
Particulate Emission Rate(lb/hr)	E(p)	=	18.357
Particulate Emission Rate(lb/MBtu)		=	0.0273
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 10/03/92 Printed 29-Oct — Test No./Type: M5/0-112
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 0124-0313

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.71
Stack Static Pressure (in H2O)	P(stack)	9.000
Gas Meter Initial Reading (cu ft)		566.71
Gas Meter Final Reading (cu ft)		609.70
Net Gas Sample Volume (cu ft)	V(m)	(43.00)
Vol of Liquid Collected (ml)	Vl(c)	109.3
Vol of Liq @ Std. Conds. (scf)	V(w std)	(5.145)
Wt. of Filter Particulate (gm)		0.0343
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0343)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.48
CO2 Concentration (by CEM)	% CO2	15.44
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.08)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.45	0.86	442.00	75.0	75.0	0.6708
2	4.00	0.35	0.67	446.00	77.0	76.0	0.5916
3	4.00	0.31	0.59	446.00	79.0	76.0	0.5568
B1	4.00	0.30	0.57	445.00	80.0	77.0	0.5477
2	4.00	0.32	0.61	444.00	81.0	77.0	0.5657
3	4.00	0.40	0.76	445.00	82.0	77.0	0.6325
C1	4.00	0.32	0.61	441.00	81.0	77.0	0.5657
2	4.00	0.36	0.68	444.00	83.0	78.0	0.6000
3	4.00	0.32	0.61	442.00	84.0	78.0	0.5657
D1	4.00	0.43	0.82	436.00	83.0	78.0	0.6557
2	4.00	0.42	0.80	436.00	85.0	79.0	0.6481
3	4.00	0.35	0.67	434.00	86.0	79.0	0.5916
E1	4.00	0.35	0.67	426.00	83.0	79.0	0.5916
2	4.00	0.33	0.63	440.00	85.0	80.0	0.5745
3	4.00	0.31	0.59	439.00	85.0	80.0	0.5568
F1	4.00	0.34	0.65	432.00	83.0	80.0	0.5831
2	4.00	0.27	0.51	433.00	85.0	80.0	0.5196
3	4.00	0.23	0.44	433.00	85.0	80.0	0.4796
G1	4.00	0.21	0.40	431.00	85.0	80.0	0.4583
2	4.00	0.25	0.48	432.00	86.0	80.0	0.5000
3	4.00	0.31	0.59	433.00	86.0	81.0	0.5568
H1	4.00	0.35	0.67	414.00	84.0	80.0	0.5916
2	4.00	0.45	0.86	416.00	86.0	81.0	0.6708
3	4.00	0.44	0.84	413.00	86.0	80.0	0.6633
TOTALS	96.00	8.17	15.58	10443.00	1995.0	1808.0	13.9378

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.340
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.649
Avg Stack Temperature (degF)	T(s avg)	=	435.1
Average Meter Temperature (degF)	T(m avg)	=	79.2
Avg SQRT(dP)		=	0.581

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	41.44
Stack Gas Water Vapor Proportion	B(wo)	=	0.110
Mol. Wt., Stack Gas Dry	M(d)	=	30.61
Mol. Wt., Stack Gas Wet	M(s)	=	29.22
Abs Stack Pressure (in Hg)	P(s)	=	30.37
Avg Stack Velocity (ft/sec)	V(s avg)	=	41.9
Isokineticity (%)	% I	=	102.7
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	128[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	24.[illegible]
Percent XS Air	PEA	=	19.[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0128
Particulate Loading, @7% O2(mg/oscm)	C(s std)	=	23
Particulate Loading, dry @ 7 % O2 (gr/oscf)		=	0.0100
Heat Input Rate, MBtu/hr		=	654.43
Particulate Emission Rate(lb/hr)	E(p)	=	14.058
Particulate Emission Rate(lb/MBtu)		=	0.0215
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 10/03/92 Printed 29-Oct — Test No./Type: M5/0-113
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 0518-0707

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.71
Stack Static Pressure (in H2O)	P(stack)	9.000
Gas Meter Initial Reading (cu ft)		609.81
Gas Meter Final Reading (cu ft)		642.91
Net Gas Sample Volume (cu ft)	V(m)	(33.10)
Vol of Liquid Collected (ml)	Vl(c)	60.5
Vol of Liq @ Std. Conds. (scf)	V(w std)	(2.848)
Wt. of Filter Particulate (gm)		0.0162
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0162)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	5.69
CO2 Concentration (by CEM)	% CO2	15.66
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(78.65)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.25	0.48	408.00	66.0	65.0	0.5000
2	4.00	0.22	0.42	423.00	66.0	66.0	0.4690
3	4.00	0.20	0.38	427.00	67.0	66.0	0.4472
B1	4.00	0.20	0.38	426.00	68.0	66.0	0.4472
2	4.00	0.20	0.38	425.00	69.0	66.0	0.4472
3	4.00	0.24	0.46	424.00	70.0	67.0	0.4899
C1	4.00	0.18	0.34	422.00	69.0	67.0	0.4243
2	4.00	0.20	0.38	424.00	71.0	67.0	0.4472
3	4.00	0.19	0.36	422.00	72.0	68.0	0.4359
D1	4.00	0.25	0.48	419.00	71.0	68.0	0.5000
2	4.00	0.25	0.48	419.00	72.0	68.0	0.5000
3	4.00	0.21	0.40	417.00	73.0	69.0	0.4583
E1	4.00	0.19	0.36	411.00	71.0	69.0	0.4359
2	4.00	0.21	0.40	415.00	73.0	70.0	0.4583
3	4.00	0.17	0.32	415.00	74.0	70.0	0.4123
F1	4.00	0.19	0.36	403.00	73.0	70.0	0.4359
2	4.00	0.15	0.29	406.00	75.0	71.0	0.3873
3	4.00	0.13	0.25	406.00	75.0	71.0	0.3606
G1	4.00	0.13	0.25	405.00	72.0	72.0	0.3606
2	4.00	0.15	0.29	404.00	72.0	72.0	0.3873
3	4.00	0.17	0.32	404.00	72.0	72.0	0.4123
H1	4.00	0.13	0.25	398.00	72.0	72.0	0.3606
2	4.00	0.28	0.53	399.00	72.0	72.0	0.5292
3	4.00	0.26	0.49	397.00	73.0	73.0	0.5099
TOTALS	96.00	4.75	9.05	9919.00	1708.0	1584.0	10.6162

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.198
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.377
Avg Stack Temperature (degF)	T(s avg)	=	413.3
Average Meter Temperature (degF)	T(m avg)	=	68.6
Avg SQRT(dP)		=	0.442

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	32.52
Stack Gas Water Vapor Proportion	B(wo)	=	0.08[illegible]
Mol. Wt., Stack Gas Dry	M(d)	=	30.73
Mol. Wt., Stack Gas Wet	M(s)	=	29.71
Abs Stack Pressure (in Hg)	P(s)	=	30.37
Avg Stack Velocity (ft/sec)	V(s avg)	=	31.3
Isokineticity (%)	% I	=	102.0
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	101582
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	180004
Percent XS Air	PEA	=	37.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0077
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	16
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0070
Heat Input Rate, MBtu/hr		=	451.68
Particulate Emission Rate(lb/hr)	E(p)	=	6.683
Particulate Emission Rate(lb/MBtu)		=	0.0148
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 10/03/92 Printed 29-Oct — Test No./Type: M5/0-114
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 2128-2317

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.71
Stack Static Pressure (in H2O)	P(stack)	5.000
Gas Meter Initial Reading (cu ft)		643.01
Gas Meter Final Reading (cu ft)		672.71
Net Gas Sample Volume (cu ft)	V(m)	(29.70)
Vol of Liquid Collected (ml)	Vl(c)	59.3
Vol of Liq @ Std. Conds. (scf)	V(w std)	(2.791)
Wt. of Filter Particulate (gm)		0.0165
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0165)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	5.74
CO2 Concentration (by CEM)	% CO2	15.36
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(78.90)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.28	0.53	420.00	69.0	69.0	0.5292
2	4.00	0.21	0.40	424.00	69.0	69.0	0.4583
3	4.00	0.17	0.32	425.00	70.0	69.0	0.4123
B1	4.00	0.16	0.30	424.00	70.0	69.0	0.4000
2	4.00	0.17	0.32	423.00	71.0	69.0	0.4123
3	4.00	0.23	0.44	422.00	71.0	69.0	0.4796
C1	4.00	0.14	0.27	420.00	71.0	69.0	0.3742
2	4.00	0.17	0.32	422.00	72.0	69.0	0.4123
3	4.00	0.17	0.32	420.00	72.0	69.0	0.4123
D1	4.00	0.23	0.44	415.00	71.0	69.0	0.4796
2	4.00	0.22	0.42	416.00	73.0	69.0	0.4690
3	4.00	0.17	0.32	413.00	73.0	69.0	0.4123
E1	4.00	0.14	0.27	400.00	71.0	69.0	0.3742
2	4.00	0.18	0.34	407.00	72.0	69.0	0.4243
3	4.00	0.13	0.25	409.00	72.0	69.0	0.3606
F1	4.00	0.10	0.19	390.00	71.0	68.0	0.3162
2	4.00	0.12	0.23	399.00	71.0	69.0	0.3464
3	4.00	0.10	0.19	400.00	71.0	68.0	0.3162
G1	4.00	0.08	0.15	398.00	71.0	68.0	0.2828
2	4.00	0.10	0.19	398.00	71.0	68.0	0.3162
3	4.00	0.11	0.21	399.00	71.0	68.0	0.3317
H1	4.00	0.09	0.17	386.00	70.0	68.0	0.3000
2	4.00	0.17	0.32	390.00	70.0	68.0	0.4123
3	4.00	0.24	0.46	391.00	71.0	68.0	0.4899
TOTALS	96.00	3.88	7.37	9811.00	1704.0	1580.0	9.5221

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.162
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.307
Avg Stack Temperature (degF)	T(s avg)	=	408.8
Average Meter Temperature (degF)	T(m avg)	=	68.4
Avg SQRT(dP)		=	0.397

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	29.19
Stack Gas Water Vapor Proportion	B(wo)	=	0.087
Mol. Wt., Stack Gas Dry	M(d)	=	30.69
Mol. Wt., Stack Gas Wet	M(s)	=	29.58
Abs Stack Pressure (in Hg)	P(s)	=	30.08
Avg Stack Velocity (ft/sec)	V(s avg)	=	28.2
Isokineticity (%)	% I	=	102.8
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	90[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0057
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	18
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0080
Heat Input Rate, MBtu/hr		=	400.78
Particulate Emission Rate(lb/hr)	E(p)	=	6.744
Particulate Emission Rate(lb/MBtu)		=	0.0168
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 10/04/92 Printed 29-Oct — Test No./Type: M5/0-115
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 0101-0244

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.74
Stack Static Pressure (in H2O)	P(stack)	9.000
Gas Meter Initial Reading (cu ft)		672.80
Gas Meter Final Reading (cu ft)		715.41
Net Gas Sample Volume (cu ft)	V(m)	(42.60)
Vol of Liquid Collected (ml)	Vl(c)	79.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.719)
Wt. of Filter Particulate (gm)		0.0188
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0188)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.56
CO2 Concentration (by CEM)	% CO2	15.59
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.83)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.34	0.65	391.00	60.0	60.0	0.5831
2	4.00	0.36	0.68	405.00	62.0	60.0	0.6000
3	4.00	0.32	0.61	412.00	63.0	60.0	0.5657
B1	4.00	0.33	0.63	413.00	64.0	61.0	0.5745
2	4.00	0.36	0.66	413.00	66.0	61.0	0.6000
3	4.00	0.45	0.86	414.00	67.0	61.0	0.6708
C1	4.00	0.33	0.63	414.00	65.0	61.0	0.5745
2	4.00	0.38	0.72	418.00	68.0	62.0	0.6164
3	4.00	0.33	0.63	417.00	68.0	62.0	0.5745
D1	4.00	0.46	0.87	412.00	68.0	63.0	0.6782
2	4.00	0.45	0.86	413.00	71.0	64.0	0.6708
3	4.00	0.37	0.70	412.00	73.0	64.0	0.6083
E1	4.00	0.35	0.67	406.00	70.0	65.0	0.5916
2	4.00	0.36	0.68	416.00	72.0	65.0	0.6000
3	4.00	0.28	0.53	417.00	73.0	65.0	0.5292
F1	4.00	0.31	0.59	415.00	72.0	66.0	0.5568
2	4.00	0.28	0.53	416.00	74.0	67.0	0.5292
3	4.00	0.24	0.46	415.00	74.0	68.0	0.4899
G1	4.00	0.22	0.42	414.00	75.0	68.0	0.4690
2	4.00	0.26	0.49	416.00	75.0	68.0	0.5099
3	4.00	0.28	0.53	417.00	75.0	69.0	0.5292
H1	4.00	0.39	0.74	402.00	74.0	69.0	0.6245
2	4.00	0.45	0.86	402.00	76.0	69.0	0.6708
3	4.00	0.46	0.87	402.00	77.0	70.0	0.6782
TOTALS	96.00	8.36	15.89	9872.00	1682.0	1478.0	14.0950

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.348
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.662
Avg Stack Temperature (degF)	T(s avg)	=	411.3
Average Meter Temperature (degF)	T(m avg)	=	65.8
Avg SQRT(dP)		=	0.587

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	42.19
Stack Gas Water Vapor Proportion	B(ws)	=	0.081
Mol. Wt., Stack Gas Dry	M(d)	=	30.64
Mol. Wt., Stack Gas Wet	M(s)	=	29.61
Abs Stack Pressure (in Hg)	P(s)	=	30.42
Avg Stack Velocity (ft/sec)	V(s avg)	=	41.5
Isokineticity (%)	% I	=	99.3
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	135219
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	238985
Percent XS Air	PEA	=	20.2
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0089
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	13
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0055
Heat Input Rate, MBtu/hr		=	664.67
Particulate Emission Rate(lb/hr)	E(p)	=	7.959
Particulate Emission Rate(lb/MBtu)		=	0.0116
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 10/04/92 Printed 29-Oct — Test No./Type: M5/0-116
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 2028-2221

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.81
Stack Static Pressure (in H2O)	P(stack)	5.000
Gas Meter Initial Reading (cu ft)		715.51
Gas Meter Final Reading (cu ft)		745.00
Net Gas Sample Volume (cu ft)	V(m)	(29.49)
Vol of Liquid Collected (ml)	Vl(c)	59.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(2.777)
Wt. of Filter Particulate (gm)		0.0481
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0481)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	4.88
CO2 Concentration (by CEM)	% CO2	15.68
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(79.44)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.25	0.48	407.00	64.0	64.0	0.5000
2	4.00	0.18	0.34	412.00	65.0	64.0	0.4243
3	4.00	0.15	0.29	412.00	66.0	64.0	0.3873
B1	4.00	0.15	0.29	411.00	67.0	64.0	0.3873
2	4.00	0.16	0.30	410.00	66.0	64.0	0.4000
3	4.00	0.23	0.44	409.00	67.0	64.0	0.4796
C1	4.00	0.09	0.17	408.00	66.0	64.0	0.3000
2	4.00	0.18	0.34	408.00	67.0	65.0	0.4243
3	4.00	0.17	0.32	407.00	68.0	65.0	0.4123
D1	4.00	0.21	0.40	405.00	67.0	65.0	0.4583
2	4.00	0.20	0.38	405.00	69.0	65.0	0.4472
3	4.00	0.17	0.32	403.00	69.0	65.0	0.4123
E1	4.00	0.15	0.29	395.00	67.0	65.0	0.3873
2	4.00	0.16	0.30	397.00	69.0	65.0	0.4000
3	4.00	0.11	0.21	397.00	69.0	65.0	0.3317
F1	4.00	0.13	0.25	388.00	67.0	65.0	0.3606
2	4.00	0.11	0.21	390.00	68.0	65.0	0.3317
3	4.00	0.11	0.21	389.00	68.0	65.0	0.3317
G1	4.00	0.11	0.21	388.00	68.0	65.0	0.3317
2	4.00	0.12	0.23	388.00	68.0	65.0	0.3464
3	4.00	0.12	0.23	387.00	68.0	65.0	0.3464
H1	4.00	0.17	0.32	382.00	67.0	65.0	0.4123
2	4.00	0.21	0.40	383.00	68.0	65.0	0.4583
3	4.00	0.23	0.44	380.00	69.0	65.0	0.4796
TOTALS	96.00	3.87	7.37	9561.00	1617.0	1488.0	9.5503

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.161
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.307
Avg Stack Temperature (degF)	T(s avg)	=	396.4
Average Meter Temperature (degF)	T(m avg)	=	64.7
Avg SQRT(dP)		=	0.398

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	29.29
Stack Gas Water Vapor Proportior	B(wo)	=	0.087
Mol. Wt., Stack Gas Dry	M(d)	=	30.70
Mol. Wt., Stack Gas Wet	M(s)	=	29.62
Abs Stack Pressure (in Hg)	P(s)	=	30.18
Avg Stack Velocity (ft/sec)	V(s avg)	=	28.0
Isokineticity (%)	% I	=	102.0
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	9[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	1[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0253
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	50
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0220
Heat Input Rate, MBtu/hr		=	428.19
Particulate Emission Rate(lb/hr)	E(p)	=	19.861
Particulate Emission Rate(lb/MBtu)		=	0.0464
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 10/04/92 Printed 29-Oct — Test No./Type: M5/D-117
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 2356-0150

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.81
Stack Static Pressure (in H2O)	P(stack)	9.000
Gas Meter Initial Reading (cu ft)		745.10
Gas Meter Final Reading (cu ft)		785.51
Net Gas Sample Volume (cu ft)	V(m)	(40.40)
Vol of Liquid Collected (ml)	Vl(c)	84.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.954)
Wt. of Filter Particulate (gm)		0.0906
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0906)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.51
CO2 Concentration (by CEM)	% CO2	15.95
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.54)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.56	1.06	410.00	58.0	58.0	0.7483
2	4.00	0.31	0.59	414.00	59.0	58.0	0.5568
3	4.00	0.29	0.55	415.00	61.0	58.0	0.5385
B1	4.00	0.28	0.53	416.00	62.0	58.0	0.5292
2	4.00	0.33	0.63	417.00	63.0	59.0	0.5745
3	4.00	0.44	0.84	418.00	64.0	59.0	0.6633
C1	4.00	0.20	0.38	419.00	63.0	60.0	0.4472
2	4.00	0.34	0.65	424.00	65.0	60.0	0.5831
3	4.00	0.29	0.55	423.00	66.0	61.0	0.5385
D1	4.00	0.40	0.76	411.00	65.0	61.0	0.6325
2	4.00	0.40	0.76	417.00	67.0	62.0	0.6325
3	4.00	0.33	0.63	421.00	68.0	62.0	0.5745
E1	4.00	0.27	0.51	417.00	65.0	62.0	0.5196
2	4.00	0.32	0.61	421.00	68.0	63.0	0.5657
3	4.00	0.22	0.42	423.00	69.0	63.0	0.4690
F1	4.00	0.25	0.48	420.00	66.0	63.0	0.5000
2	4.00	0.25	0.48	423.00	68.0	63.0	0.5000
3	4.00	0.20	0.38	422.00	68.0	63.0	0.4472
G1	4.00	0.19	0.36	421.00	69.0	64.0	0.4359
2	4.00	0.24	0.46	422.00	68.0	64.0	0.4899
3	4.00	0.26	0.49	425.00	69.0	64.0	0.5099
H1	4.00	0.35	0.67	425.00	66.0	64.0	0.5916
2	4.00	0.45	0.86	425.00	68.0	64.0	0.6708
3	4.00	0.45	0.86	425.00	69.0	64.0	0.6708
TOTALS	96.00	7.62	14.51	10074.00	1574.0	1413.0	13.3892

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.316
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.605
Avg Stack Temperature (degF)	T(s avg)	=	419.6
Average Meter Temperature (degF)	T(m avg)	=	62.2
Avg SQRT(dP)		=	0.555

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	40.34
Stack Gas Water Vapor Proportion	B(wo)	=	0.069
Mol. Wt., Stack Gas Dry	M(d)	=	30.69
Mol. Wt., Stack Gas Wet	M(s)	=	29.58
Abs Stack Pressure (in Hg)	P(s)	=	30.47
Avg Stack Velocity (ft/sec)	V(s avg)	=	39.6
Isokineticity (%)	% I	=	101.2
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	126953
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	228055
Percent XS Air	PEA	=	19.6
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0347
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	83
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0277
Heat Input Rate, MBtu/hr		=	645.41
Particulate Emission Rate(lb/hr)	E(p)	=	37.716
Particulate Emission Rate(lb/MBtu)		=	0.0584
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 10/05/92 Printed 29-Oct — Test No./Type: M5/0-118
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 0244-0438

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.81
Stack Static Pressure (in H2O)	P(stack)	9.000
Gas Meter Initial Reading (cu ft)		785.61
Gas Meter Final Reading (cu ft)		829.40
Net Gas Sample Volume (cu ft)	V(m)	(43.79)
Vol of Liquid Collected (ml)	Vl(c)	82.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(3.860)
Wt. of Filter Particulate (gm)		0.0939
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.0939)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	4.30
CO2 Concentration (by CEM)	% CO2	15.52
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.18)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.52	0.99	427.00	57.0	57.0	0.7211
2	4.00	0.39	0.74	433.00	58.0	57.0	0.6245
3	4.00	0.36	0.68	435.00	60.0	57.0	0.6000
B1	4.00	0.35	0.67	435.00	61.0	57.0	0.5916
2	4.00	0.37	0.70	435.00	63.0	58.0	0.6083
3	4.00	0.49	0.93	436.00	64.0	58.0	0.7000
C1	4.00	0.32	0.61	433.00	62.0	59.0	0.5657
2	4.00	0.39	0.74	440.00	65.0	59.0	0.6245
3	4.00	0.33	0.63	440.00	66.0	59.0	0.5745
D1	4.00	0.48	0.91	434.00	64.0	60.0	0.6928
2	4.00	0.46	0.87	436.00	67.0	61.0	0.6782
3	4.00	0.40	0.76	436.00	68.0	61.0	0.6325
E1	4.00	0.37	0.70	422.00	64.0	61.0	0.6083
2	4.00	0.37	0.70	437.00	67.0	61.0	0.6083
3	4.00	0.27	0.51	435.00	68.0	62.0	0.5196
F1	4.00	0.29	0.55	430.00	65.0	62.0	0.5385
2	4.00	0.29	0.55	435.00	67.0	62.0	0.5385
3	4.00	0.25	0.48	432.00	68.0	62.0	0.5000
G1	4.00	0.25	0.48	433.00	68.0	63.0	0.5000
2	4.00	0.28	0.53	433.00	68.0	63.0	0.5292
3	4.00	0.30	0.57	435.00	68.0	63.0	0.5477
H1	4.00	0.44	0.84	416.00	66.0	62.0	0.6633
2	4.00	0.50	0.95	418.00	69.0	63.0	0.7071
3	4.00	0.48	0.91	415.00	70.0	63.0	0.6928
TOTALS	96.00	8.95	17.00	10361.00	1563.0	1387.0	14.5670

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.373
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.705
Avg Stack Temperature (degF)	T(s avg)	=	431.7
Average Meter Temperature (degF)	T(m avg)	=	61.5
Avg SQRT(dP)		=	0.607

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	43.80
Stack Gas Water Vapor Proportion	B(wo)	=	0.081
Mol. Wt., Stack Gas Dry	M(d)	=	30.66
Mol. Wt., Stack Gas Wet	M(s)	=	29.63
Abs Stack Pressure (in Hg)	P(s)	=	30.47
Avg Stack Velocity (ft/sec)	V(s avg)	=	43.3
Isokineticity (%)	% I	=	100.9
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	136273
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	24.
Percent XS Air	PEA	=	2
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.03
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	63
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0277
Heat Input Rate, MBtu/hr		=	671.03
Particulate Emission Rate(lb/hr)	E(p)	=	39.210
Particulate Emission Rate(lb/MBtu)		=	0.0584
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, September 1992

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Eric Squier
Date: 10/05/92 Printed 29-Oct — Test No./Type: M5/0-119
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 2150-2337

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.240
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.86
Stack Static Pressure (in H2O)	P(stack)	20.000
Gas Meter Initial Reading (cu ft)		829.70
Gas Meter Final Reading (cu ft)		910.61
Net Gas Sample Volume (cu ft)	V(m)	(80.90)
Vol of Liquid Collected (ml)	Vl(c)	178.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(8.376)
Wt. of Filter Particulate (gm)		0.4576
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.4576)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.86
CO2 Concentration (by CEM)	% CO2	15.63
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(80.51)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	2.10	4.00	493.00	67.0	66.0	1.4491
2	4.00	1.30	2.50	503.00	71.0	67.0	1.1402
3	4.00	1.20	2.30	505.00	74.0	68.0	1.0954
B1	4.00	1.20	2.30	505.00	76.0	69.0	1.0954
2	4.00	1.30	2.50	505.00	79.0	69.0	1.1402
3	4.00	1.80	3.40	506.00	81.0	70.0	1.3416
C1	4.00	1.20	2.30	504.00	79.0	70.0	1.0954
2	4.00	1.30	2.50	512.00	82.0	71.0	1.1402
3	4.00	1.20	2.30	512.00	84.0	72.0	1.0954
D1	4.00	1.80	3.40	511.00	82.0	72.0	1.3416
2	4.00	1.70	3.20	514.00	85.0	72.0	1.3038
3	4.00	1.20	2.30	514.00	86.0	73.0	1.0954
E1	4.00	1.30	2.50	517.00	81.0	72.0	1.1402
2	4.00	1.40	2.70	528.00	84.0	73.0	1.1832
3	4.00	1.10	2.10	528.00	84.0	71.0	1.0488
F1	4.00	1.10	2.10	521.00	81.0	72.0	1.0488
2	4.00	0.95	1.80	523.00	83.0	73.0	0.9747
3	4.00	0.79	1.50	523.00	84.0	73.0	0.8888
G1	4.00	0.78	1.50	522.00	84.0	73.0	0.8832
2	4.00	0.90	1.70	524.00	84.0	73.0	0.9487
3	4.00	1.20	2.30	526.00	84.0	74.0	1.0954
H1	4.00	1.70	3.20	494.00	83.0	73.0	1.3038
2	4.00	1.90	3.60	497.00	86.0	74.0	1.3784
3	4.00	1.90	3.60	500.00	88.0	74.0	1.3784
TOTALS	96.00	32.32	61.60	12287.00	1952.0	1640.0	27.6065

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.347
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	2.567
Avg Stack Temperature (degF)	T(s avg)	=	512.0
Average Meter Temperature (degF)	T(m avg)	=	74.8
Avg SQRT(dP)		=	1.150

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	79.38
Stack Gas Water Vapor Proportion	B(wc)	=	0.095
Mol. Wt., Stack Gas Dry	M(d)	=	30.66
Mol. Wt., Stack Gas Wet	M(s)	=	29.45
Abs Stack Pressure (in Hg)	P(s)	=	31.33
Avg Stack Velocity (ft/sec)	V(s avg)	=	84.8
Isokineticity (%)	% I	=	100.6
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	251276
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	488355
Percent XS Air	PEA	=	22.2
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.0683
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	166
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.0726
Heat Input Rate, MBtu/hr		=	1251.74
Particulate Emission Rate(lb/hr)	E(p)	=	191.523
Particulate Emission Rate(lb/MBtu)		=	0.1530
Total Metals Emission Rate(lb/MBtu)		=	0.00000

APPENDIX N

WESTERN COAL TEST

CONTINUOUS EMISSION MONITOR DATA SUMMARY

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
15:00:18	19-Jan-93	-61.88	-63.11	31.40	-72.22	2230.83	2230.67	11.05
15:15:18	19-Jan-93	138.74	138.24	23.39	-128.52	1466.27	1466.13	6.62
15:30:18	19-Jan-93	29.71	29.56	14.46	238.55	241.07	240.86	3.11
15:45:18	19-Jan-93	29.71	29.56	14.46	240.91	246.56	246.35	3.11
16:00:18	19-Jan-93	29.71	29.56	14.46	240.37	246.56	245.17	3.11
16:15:18	19-Jan-93	31.84	31.65	14.54	240.68	239.23	238.99	3.11
16:30:18	19-Jan-93	34.41	34.28	14.54	254.44	234.60	234.24	3.35
16:45:18	19-Jan-93	31.37	31.25	14.65	244.55	235.68	235.39	3.35
17:00:18	19-Jan-93	31.37	31.25	14.65	242.58	240.79	240.47	3.35
17:15:18	19-Jan-93	33.67	33.45	14.65	250.35	239.31	238.94	3.35
17:30:18	19-Jan-93	33.67	33.45	14.65	252.91	240.60	240.35	3.35
17:45:18	19-Jan-93	35.12	35.16	14.65	258.18	243.98	243.66	3.35
18:00:18	19-Jan-93	31.89	31.71	14.65	257.70	241.82	241.43	3.35
18:15:18	19-Jan-93	31.89	31.71	14.65	246.24	241.82	241.43	3.35
18:30:18	19-Jan-93	35.98	35.82	14.65	236.13	246.31	246.04	3.35
18:45:18	19-Jan-93	30.76	30.57	14.65	240.42	238.17	237.91	3.35
19:00:18	19-Jan-93	29.35	29.18	14.65	234.09	238.17	237.91	3.35
19:15:18	19-Jan-93	29.35	29.18	14.65	239.39	238.17	237.91	3.35
19:30:18	19-Jan-93	22.95	22.82	14.65	224.47	240.70	240.42	3.35
19:45:18	19-Jan-93	22.95	22.82	14.65	203.64	240.70	240.42	3.35
20:00:18	19-Jan-93	21.12	21.01	14.65	192.51	243.34	243.05	3.35
20:15:18	19-Jan-93	23.11	22.96	14.65	194.70	235.45	235.09	3.35
20:30:18	19-Jan-93	30.37	30.17	14.54	254.78	242.44	242.13	3.35
20:45:18	19-Jan-93	47.42	47.16	14.54	473.80	350.29	349.95	4.43
21:00:18	19-Jan-93	51.54	51.36	14.54	540.73	244.70	244.45	4.43
21:15:18	19-Jan-93	44.24	43.88	14.54	537.09	234.02	233.80	4.43
21:30:18	19-Jan-93	52.32	52.01	14.54	506.45	229.95	229.61	4.43
21:45:18	19-Jan-93	54.59	54.26	14.54	498.94	228.85	228.48	4.43

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
05:00:18	20-Jan-93	18.62	14.44	[illegible]	162.44	-2.25	-6.71	14.47
05:15:18	20-Jan-93	72.76	72.23	15.63	393.04	150.81	150.19	4.48
05:30:18	20-Jan-93	93.49	93.09	15.11	449.46	219.36	218.83	4.00
05:45:18	20-Jan-93	59.33	58.78	14.89	466.71	204.40	203.78	4.00
06:00:18	20-Jan-93	71.02	70.51	14.68	464.14	204.40	203.78	4.00
06:15:18	20-Jan-93	47.90	47.24	14.28	454.21	219.85	219.30	4.00
06:30:18	20-Jan-93	47.90	47.24	14.16	490.33	225.61	225.05	4.00
06:45:18	20-Jan-93	38.86	38.22	14.03	498.78	217.66	217.16	4.32
07:00:18	20-Jan-93	41.16	40.49	13.83	471.74	211.78	211.23	4.60
07:15:18	20-Jan-93	31.14	30.46	13.69	421.58	232.23	231.69	4.28
07:30:18	20-Jan-93	31.14	30.46	14.11	287.76	231.09	230.62	3.69
07:45:18	20-Jan-93	33.15	32.52	14.22	296.51	224.53	223.97	3.95
08:00:18	20-Jan-93	28.66	28.11	14.48	234.25	249.92	249.33	3.12
08:15:18	20-Jan-93	29.81	29.15	14.61	247.48	237.71	237.10	3.12
08:30:18	20-Jan-93	25.12	24.54	14.73	230.46	242.58	242.04	3.12
08:45:18	20-Jan-93	25.12	24.54	14.73	234.78	242.58	242.04	3.12
09:00:18	20-Jan-93	25.12	24.54	14.59	248.55	219.16	218.64	3.12
09:15:18	20-Jan-93	25.12	24.54	14.59	230.85	223.68	223.19	3.12
09:30:18	20-Jan-93	124.65	124.06	14.72	256.36	229.27	228.75	3.53
09:45:18	20-Jan-93	40.06	39.43	14.72	324.08	223.09	222.51	3.93
10:00:18	20-Jan-93	111.22	110.57	14.72	290.94	229.07	228.54	3.36
10:15:18	20-Jan-93	320.91	320.20	14.72	274.05	233.93	233.30	3.36
10:30:18	20-Jan-93	281.40	280.69	14.72	241.62	232.03	231.43	3.59
10:45:18	20-Jan-93	475.88	475.26	14.72	210.97	226.51	225.92	3.59
11:00:18	20-Jan-93	378.96	378.48	14.72	230.34	226.51	225.92	3.59
11:15:18	20-Jan-93	480.43	452.35	14.72	230.93	222.61	222.17	3.59
11:30:18	20-Jan-93	196.15	195.88	14.72	237.53	222.61	222.17	3.59
11:45:18	20-Jan-93	106.01	105.73	14.60	233.94	227.01	226.56	3.59

Time	Date	CEM_MEAS DRY_COL OUT	CEM_MEAS DRY_COH OUT	CEM_MEAS DRY_CO2 OUT	CEM_MEAS DRY_NOX OUT	CEM_MEAS DRY_SO2L OUT	CEM_MEAS DRY_SO2H OUT	CEM_MEAS DRY_O2 OUT
12:00:18	20-Jan-93	69.00	68.59	14.46	235.41	221.71	221.25	3.59
12:15:18	20-Jan-93	60.24	59.87	14.38	250.67	218.36	218.01	3.79
12:30:18	20-Jan-93	55.00	54.63	14.38	250.23	217.11	216.70	3.79
12:45:18	20-Jan-93	127.37	127.19	14.48	237.21	223.05	222.55	3.49
13:00:18	20-Jan-93	115.40	115.20	14.48	243.31	223.05	222.55	3.49
13:15:18	20-Jan-93	71.40	71.53	14.48	246.63	224.94	224.34	3.49
13:30:18	20-Jan-93	55.52	55.16	14.38	250.54	220.39	220.04	3.76
13:45:18	20-Jan-93	52.89	55.16	14.38	255.06	211.33	211.03	3.76
14:00:18	20-Jan-93	65.96	65.69	14.29	267.22	209.64	209.16	4.37
14:15:18	20-Jan-93	98.19	97.96	14.47	237.04	218.81	218.57	4.12
14:30:18	20-Jan-93	83.56	83.27	14.47	258.86	227.53	227.05	4.12
14:45:18	20-Jan-93	63.72	63.43	14.47	287.14	225.64	225.35	4.12
15:00:18	20-Jan-93	101.69	101.49	14.47	300.55	225.64	225.35	4.12
15:15:18	20-Jan-93	99.46	99.24	14.47	305.70	239.00	238.73	4.12
15:30:18	20-Jan-93	78.00	77.76	14.47	309.24	252.78	252.50	3.88
15:45:18	20-Jan-93	131.77	131.63	14.47	304.37	258.93	258.68	3.88
16:00:18	20-Jan-93	100.16	100.01	14.47	310.83	257.40	256.96	3.88
16:15:18	20-Jan-93	71.98	71.81	14.47	309.86	265.74	265.38	3.88
16:30:18	20-Jan-93	79.90	79.76	14.58	352.69	275.41	275.15	3.88
16:45:18	20-Jan-93	87.50	87.28	14.15	491.83	322.29	322.04	4.97
17:00:18	20-Jan-93	73.29	73.16	14.01	502.32	279.78	279.37	4.49
17:15:18	20-Jan-93	58.64	58.48	14.17	465.67	283.43	283.31	3.56
17:30:18	20-Jan-93	61.10	61.01	14.03	505.68	273.49	273.32	4.06
17:45:18	20-Jan-93	51.46	51.34	14.03	518.83	266.58	266.29	4.06
18:00:18	20-Jan-93	56.91	56.86	13.89	533.43	261.80	261.52	4.06
18:15:18	20-Jan-93	123.44	123.35	13.89	541.33	264.40	264.22	4.06
18:30:18	20-Jan-93	292.85	292.68	13.89	538.30	251.71	251.56	4.06
18:45:18	20-Jan-93	46.98	47.01	13.89	532.71	256.76	256.62	4.06

APPENDIX O

WESTERN COAL TEST

M17 PARTICULATE LOADING AT ESP INLET—DATA SUMMARY

B&W/WP&L, Reburn Test Series, Low Sulfur Coal, Jan 93

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling

Date: 1/19/93 Printed 02-Feb — Test No./Type: M17-I1, 110MWe

Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1445-1710

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	30.28
Stack Static Pressure (in H2O)	P(stack)	18.000
Gas Meter Initial Reading (cu ft)		425.97
Gas Meter Final Reading (cu ft)		508.33
Net Gas Sample Volume (cu ft)	V(m)	(82.36)
Vol of Liquid Collected (ml)	Vl(c)	168.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(7.908)
Wt. of Filter Particulate (gm)		20.3396
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(20.3396)
O2 Concentration (by CEM)	% O2	3.23
CO2 Concentration (by CEM)	% CO2	15.46
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.31)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.40	2.52	483.00	71.0	70.0	1.1832
2	4.00	1.20	2.16	489.00	73.0	70.0	1.0954
3	4.00	1.40	2.52	495.00	75.0	71.0	1.1832
B1	4.00	1.50	2.70	437.00	76.0	72.0	1.2247
2	4.00	1.15	2.07	436.00	78.0	72.0	1.0724
3	4.00	1.10	1.98	474.00	78.0	72.0	1.0488
C1	4.00	1.40	2.52	450.00	78.0	73.0	1.1832
2	4.00	1.35	2.43	461.00	79.0	73.0	1.1619
3	4.00	1.60	2.88	492.00	81.0	74.0	1.2649
D1	4.00	1.85	3.33	470.00	75.0	73.0	1.3601
2	4.00	1.50	2.70	474.00	78.0	73.0	1.2247
3	4.00	1.55	2.79	502.00	83.0	74.0	1.2450
E1	4.00	1.35	2.43	471.00	80.0	74.0	1.1619
2	4.00	1.30	2.34	484.00	81.0	74.0	1.1402
3	4.00	1.20	2.16	497.00	82.0	74.0	1.0954
E1	4.00	1.20	2.16	508.00	82.0	74.0	1.0954
2	4.00	1.20	2.16	513.00	83.0	74.0	1.0954
3	4.00	1.20	2.16	530.00	83.0	74.0	1.0488
F1	4.00	1.10	1.98	488.00	79.0	74.0	1.0488
2	4.00	1.50	2.70	490.00	80.0	75.0	1.0488
3	4.00	1.50	2.70	495.00	82.0	75.0	1.2247
F1	4.00	1.25	2.25	517.00	84.0	75.0	1.1180
2	4.00	1.25	2.25	529.00	85.0	75.0	1.1180
3	4.00	1.25	2.25	537.00	85.0	75.0	1.1180
TOTALS	96.00	32.30	58.14	11722.00	1911.00	1760.0	27.5614

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.346
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	2.423
Avg Stack Temperature (degF)	T(s avg)	=	486.4
Average Meter Temperature (degF)	T(m avg)	=	76.5
Avg SQRT(dP)		=	1.145

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	81.66
Stack Gas Water Vapor Proportion	B(wo)	=	0.086
Mol. Wt., Stack Gas Dry	M(d)	=	30.62
Mol. Wt., Stack Gas Wet	M(s)	=	29.43
Abs Stack Pressure (in Hg)	P(s)	=	31.60
Avg Stack Velocity (ft/sec)	V(s avg)	=	83.2
Isokineticity (%)	% I	=	108.4
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	256902
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	479182
Percent XS Air	PEA	=	17.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	3.8432
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	6933
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	3.0275
Heat Input Rate, MBtu/hr		=	1352.84
Particulate Emission Rate(lb/hr)	E(p)	=	8461.372
Particulate Emission Rate(lb/MBtu)		=	6.3770

B&W/WP&L, Reburn Test Series, Low Sulfur Coal, Jan 93

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling
Date: 1/20/93 Printed 02-Feb — Test No./Type: M17-I2, 82MWe
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1110-1315

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.232
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.62
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		508.93
Gas Meter Final Reading (cu ft)		569.83
Net Gas Sample Volume (cu ft)	V(m)	(60.89)
Vol of Liquid Collected (ml)	Vl(c)	157.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(7.390)
Wt. of Filter Particulate (gm)		5.6043
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.6043)
O2 Concentration (by CEM)	% O2	3.23
CO2 Concentration (by CEM)	% CO2	15.46
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.31)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.70	1.26	468.00	64.0	63.0	0.8367
2	4.00	0.62	1.12	457.00	61.0	61.0	0.7874
3	4.00	0.73	1.31	460.00	62.0	61.0	0.8544
B1	4.00	0.73	1.31	433.00	63.0	61.0	0.8544
2	4.00	0.66	1.19	464.00	66.0	62.0	0.8124
3	4.00	0.62	1.12	469.00	67.0	62.0	0.7874
C1	4.00	0.83	1.49	420.00	68.0	63.0	0.9110
2	4.00	0.77	1.39	432.00	70.0	64.0	0.8775
3	4.00	0.86	1.55	448.00	72.0	64.0	0.9274
D1	4.00	0.86	1.55	409.00	70.0	65.0	0.9274
2	4.00	0.88	1.58	419.00	73.0	65.0	0.9381
3	4.00	0.88	1.58	433.00	74.0	66.0	0.9381
E1	4.00	0.69	1.24	424.00	69.0	66.0	0.8307
2	4.00	0.72	1.30	430.00	72.0	67.0	0.8485
3	4.00	0.68	1.22	441.00	73.0	67.0	0.8307
E1	4.00	0.69	1.24	449.00	74.0	67.0	0.8062
2	4.00	0.65	1.17	456.00	75.0	68.0	0.7937
3	4.00	0.63	1.13	463.00	75.0	68.0	0.8718
F1	4.00	0.76	1.37	446.00	72.0	68.0	0.8718
2	4.00	0.73	1.31	455.00	74.0	68.0	0.8718
3	4.00	0.68	1.22	458.00	74.0	68.0	0.8246
F1	4.00	0.66	1.19	460.00	75.0	69.0	0.8124
2	4.00	0.68	1.22	465.00	76.0	69.0	0.8246
3	4.00	0.72	1.30	465.00	76.0	69.0	0.8485
TOTALS	96.00	17.43	31.37	10724.00	1695.00	1571.0	20.4874

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.726
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.307
Avg Stack Temperature (degF)	T(s avg)	=	446.8
Average Meter Temperature (degF)	T(m avg)	=	68.0
Avg SQRT(dP)		=	0.854

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	59.85
Stack Gas Water Vapor Proportion	B(wo)	=	0.110
Mol. Wt., Stack Gas Dry	M(d)	=	30.62
Mol. Wt., Stack Gas Wet	M(s)	=	29.22
Abs Stack Pressure (in Hg)	P(s)	=	30.36
Avg Stack Velocity (ft/sec)	V(s avg)	=	62.0
Isokineticity (%)	% I	=	108.7
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	187728
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	357
Percent XS Air	PEA	=	17
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.445
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	2605
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.1384
Heat Input Rate, MBtu/hr		=	986.57
Particulate Emission Rate(lb/hr)	E(p)	=	2324.692
Particulate Emission Rate(lb/MBtu)		=	2.3976

B&W/WP&L, Reburn Test Series, Low Sulfur Coal, Jan 93

ESP Inlet Method 17 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Bowling
Date: 1/20/93 Printed 02-Feb — Test No./Type: M17-13, 60MWe
Sample Location: Unit 2, ESP Inlet — Start/Stop Time: 1354-1651

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.256
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9900
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.62
Stack Static Pressure (in H20)	P(stack)	6.000
Gas Meter Initial Reading (cu ft)		570.02
Gas Meter Final Reading (cu ft)		620.65
Net Gas Sample Volume (cu ft)	V(m)	(50.63)
Vol of Liquid Collected (ml)	Vl(c)	128.3
Vol of Liq @ Std. Conds. (scf)	V(w std)	(6.039)
Wt. of Filter Particulate (gm)		5.3468
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(5.3468)
O2 Concentration (by CEM)	% O2	3.23
CO2 Concentration (by CEM)	% CO2	15.46
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.31)

Sample Point	dClock Time	Velocity Head, dP (in H20)	Orifice Meter, dH (in H20)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.38	0.68	418.00	68.0	67.0	0.6164
2	4.00	0.35	0.63	420.00	68.0	67.0	0.5916
3	4.00	0.37	0.67	429.00	67.0	66.0	0.6083
B1	4.00	0.32	0.58	433.00	68.0	66.0	0.5657
2	4.00	0.30	0.54	435.00	69.0	66.0	0.5477
3	4.00	0.35	0.63	439.00	70.0	67.0	0.5916
C1	4.00	0.41	0.74	395.00	70.0	67.0	0.6403
2	4.00	0.45	0.81	384.00	72.0	67.0	0.6708
3	4.00	0.37	0.67	389.00	73.0	68.0	0.6083
D1	4.00	0.36	0.65	408.00	74.0	68.0	0.6000
2	4.00	0.44	0.79	425.00	74.0	68.0	0.6633
3	4.00	0.43	0.77	435.00	75.0	69.0	0.6557
E1	4.00	0.30	0.54	388.00	72.0	68.0	0.5477
2	4.00	0.33	0.59	389.00	74.0	68.0	0.5745
3	4.00	0.31	0.56	392.00	75.0	69.0	0.5477
E1	4.00	0.30	0.54	400.00	75.0	69.0	0.5196
2	4.00	0.27	0.49	405.00	76.0	69.0	0.5196
3	4.00	0.27	0.49	420.00	75.0	69.0	0.5745
F1	4.00	0.33	0.59	400.00	72.0	69.0	0.5745
2	4.00	0.34	0.61	403.00	73.0	69.0	0.5745
3	4.00	0.30	0.54	407.00	75.0	69.0	0.5477
F1	4.00	0.30	0.54	414.00	75.0	69.0	0.5477
2	4.00	0.30	0.54	418.00	76.0	69.0	0.5477
3	4.00	0.28	0.50	424.00	76.0	69.0	0.5292
TOTALS	96.00	8.16	14.69	9870.00	1742.00	1632.0	13.9646

FIELD DATA AVERAGES

Avg Velocity Head (in H20)	dP(avg)	=	0.340
Avg Orifice Meter Reading (in H20)	dH(avg)	=	0.612
Avg Stack Temperature (degF)	T(s avg)	=	411.3
Average Meter Temperature (degF)	T(m avg)	=	70.3
Avg SQRT(dP)		=	0.582

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	49.46
Stack Gas Water Vapor Proportion	B(wo)	=	0.109
Mol. Wt., Stack Gas Dry	M(d)	=	30.60
Mol. Wt., Stack Gas Wet	M(s)	=	29.23
Abs Stack Pressure (in Hg)	P(s)	=	30.06
Avg Stack Velocity (ft/sec)	V(s avg)	=	41.6
Isokineticity (%)	% I	=	106.5
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	130042
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	239650
Percent XS Air	PEA	=	17.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	1.6679
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	3007
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	1.3141
Heat Input Rate, MBtu/hr		=	684.80
Particulate Emission Rate(lb/hr)	E(p)	=	1858.642
Particulate Emission Rate(lb/MBtu)		=	2.7678

APPENDIX P

WESTERN COAL TEST

M5 PARTICULATE LOADING AT ESP OUTLET—DATA SUMMARY

B&W/WP&L, Reburn Test Series, Low Sulfur Coal, Jan 93

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Janek
Date: 1/19/93 Printed 02-Feb — Test No./Type: M5/0-1
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1100-1252

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.236
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta).	(96.00)
Barometric Pressure (in Hg)	P(b)	30.28
Stack Static Pressure (in H2O)	P(stack)	18.000
Gas Meter Initial Reading (cu ft)		734.41
Gas Meter Final Reading (cu ft)		813.81
Net Gas Sample Volume (cu ft)	V(m)	(79.39)
Vol of Liquid Collected (ml)	Vl(c)	193.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(9.085)
Wt. of Filter Particulate (gm)		0.6457
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.6457)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.23
CO2 Concentration (by CEM)	% CO2	15.46
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.31)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	1.20	2.46	487.00	85.0	84.0	1.0954
2	4.00	1.20	2.46	497.00	81.0	82.0	1.0954
3	4.00	0.65	1.33	499.00	90.0	88.0	0.8062
B1	4.00	1.20	2.46	512.00	84.0	83.0	1.0954
2	4.00	1.30	2.67	513.00	86.0	83.0	1.1402
3	4.00	1.50	3.08	514.00	89.0	83.0	1.2247
C1	4.00	1.40	2.87	514.00	91.0	84.0	1.1832
2	4.00	1.30	2.67	513.00	92.0	84.0	1.1402
3	4.00	1.40	2.87	515.00	94.0	84.0	1.1832
D1	4.00	1.70	3.49	518.00	91.0	85.0	1.3038
2	4.00	1.80	3.69	520.00	94.0	85.0	1.3416
3	4.00	1.30	2.67	520.00	96.0	85.0	1.1402
E1	4.00	0.76	1.56	535.00	89.0	85.0	0.8718
2	4.00	0.82	1.68	534.00	92.0	86.0	0.9055
3	4.00	1.30	2.67	540.00	93.0	85.0	1.1402
F1	4.00	1.30	2.67	541.00	95.0	86.0	1.1402
2	4.00	0.95	1.95	539.00	95.0	86.0	0.9747
3	4.00	0.94	1.93	540.00	96.0	86.0	1.1402
G1	4.00	0.94	1.93	538.00	96.0	87.0	0.9747
2	4.00	1.20	2.46	540.00	96.0	87.0	0.9695
3	4.00	1.90	3.90	541.00	97.0	87.0	0.9695
H1	4.00	1.90	3.90	542.00	99.0	87.0	1.0954
2	4.00	1.00	2.05	542.00	100.0	88.0	1.3784
3	4.00	1.20	2.46	543.00	99.0	88.0	1.3784
TOTALS	96.00	30.16	61.83	12597.0	2220.0	1960.0	26.6883

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	1.257
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	2.576
Avg Stack Temperature (degF)	T(s avg)	=	524.9
Average Meter Temperature (degF)	T(m avg)	=	87.1
Avg SQRT(dP)		=	1.112

CALCULATED VALUES

Meter Volume (std, cu. ft.)	V(m std)	=	77.92
Stack Gas Water Vapor Proportion	B(wo)	=	0.104
Mol. Wt., Stack Gas Dry	M(d)	=	30.60
Mol. Wt., Stack Gas Wet	M(s)	=	29.29
Abs Stack Pressure (in Hg)	P(s)	=	31.60
Avg Stack Velocity (ft/sec)	V(s avg)	=	82.4
Isokineticity (%)	% I	=	106.7
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	240629
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	474474
Percent XS Air	PEA	=	17.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.1279
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	230
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.1007
Heat Input Rate, MBtu/hr		=	1267.15
Particulate Emission Rate(lb/hr)	E(p)	=	263.656
Particulate Emission Rate(lb/MBtu)		=	0.2121
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, Low Sulfur Coal, Jan 93

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Janek
Date: 1/20/93 Printed 02-Feb — Test No./Type: M5/O-2
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1100-1252

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.236
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.62
Stack Static Pressure (in H2O)	P(stack)	10.000
Gas Meter Initial Reading (cu ft)		814.00
Gas Meter Final Reading (cu ft)		869.51
Net Gas Sample Volume (cu ft)	V(m)	(55.50)
Vol of Liquid Collected (ml)	Vl(c)	145.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(6.825)
Wt. of Filter Particulate (gm)		0.5965
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.5965)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.23
CO2 Concentration (by CEM)	% CO2	15.46
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.31)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.62	1.27	458.00	63.0	61.0	0.7874
2	4.00	0.62	1.27	459.00	69.0	67.0	0.7874
3	4.00	0.78	1.60	460.00	69.0	67.0	0.8832
B1	4.00	0.78	1.60	460.00	72.0	68.0	0.8832
2	4.00	0.67	1.37	460.00	74.0	69.0	0.8185
3	4.00	0.72	1.48	467.00	77.0	71.0	0.8485
C1	4.00	0.56	1.15	469.00	79.0	72.0	0.7483
2	4.00	0.52	1.07	470.00	80.0	73.0	0.7211
3	4.00	0.61	1.25	502.00	81.0	73.0	0.7810
D1	4.00	0.65	1.33	514.00	82.0	74.0	0.8062
2	4.00	0.74	1.52	460.00	84.0	75.0	0.8602
3	4.00	0.77	1.58	463.00	85.0	76.0	0.8775
E1	4.00	0.49	1.00	465.00	83.0	78.0	0.7000
2	4.00	0.55	1.13	468.00	88.0	78.0	0.7416
3	4.00	0.43	0.88	468.00	88.0	79.0	0.6557
F1	4.00	0.43	0.88	470.00	89.0	80.0	0.6557
2	4.00	0.35	0.72	485.00	89.0	81.0	0.5916
3	4.00	0.50	1.03	500.00	90.0	82.0	0.6557
G1	4.00	0.56	1.15	510.00	91.0	82.0	0.5916
2	4.00	0.55	1.13	520.00	91.0	82.0	0.7071
3	4.00	0.58	1.19	530.00	92.0	84.0	0.7483
H1	4.00	0.64	1.31	489.00	92.0	83.0	0.7416
2	4.00	0.53	1.09	470.00	92.0	84.0	0.7616
3	4.00	0.38	0.78	473.00	93.0	84.0	0.8000
TOTALS	96.00	14.03	28.76	11490.0	1993.0	1739.0	18.1533

FIELD DATA AVERAGES

Avg Velocity Head (in H2O)	dP(avg)	=	0.565
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	1.198
Avg Stack Temperature (degF)	T(s avg)	=	476.8
Average Meter Temperature (degF)	T(m avg)	=	77.8
Avg SQRT(dP)		=	0.756

CALCULATED VALUES

Meter Volume (std. cu. ft.)	V(m std)	=	54.04
Stack Gas Water Vapor Proportion	B(wo)	=	0.112
Mol. Wt., Stack Gas Dry	M(d)	=	30.62
Mol. Wt., Stack Gas Wet	M(s)	=	29.19
Abs Stack Pressure (in Hg)	P(s)	=	30.36
Avg Stack Velocity (ft/sec)	V(s avg)	=	55.9
Isokineticity (%)	% I	=	109.1
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	163[illegible]
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	32[illegible]
Percent XS Air	PEA	=	[illegible]
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.17[illegible]
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	307
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.1342
Heat Input Rate, MBtu/hr		=	859.19
Particulate Emission Rate(lb/hr)	E(p)	=	238.151
Particulate Emission Rate(lb/MBtu)		=	0.2826
Total Metals Emission Rate(lb/MBtu)		=	0.00000

B&W/WP&L, Reburn Test Series, Low Sulfur Coal, Jan 93

ESP Outlet Method 5 Samples

ISOKINETIC PERFORMANCE WORKSHEET AND PARTICULATE CALCULATIONS

Plant: WPL — Performed by: Janek
Date: 1/20/93 Printed 02-Feb — Test No./Type: M5/0-3
Sample Location: Unit 2, ESP Outlet — Start/Stop Time: 1100-1252

PARAMETER	SYMBOL	VALUE (calc.)
Nozzle Diameter, Actual (in)	N(d)	0.251
Pitot Tube Correction Factor	C(p)	0.8400
Gas Meter Correction Factor	(alpha)	0.9990
Stack (Duct) Dimensions (in):		
Radius (if round)	R	0.00
Length (if rectangular)	L	64.00
Width (if rectangular)	W	216.00
Area of Stack (sq ft)	A(s)	(96.00)
# of Sample Points	#	24
Total Sampling Time (min)	(theta)	(96.00)
Barometric Pressure (in Hg)	P(b)	29.62
Stack Static Pressure (in H2O)	P(stack)	4.000
Gas Meter Initial Reading (cu ft)		869.60
Gas Meter Final Reading (cu ft)		917.51
Net Gas Sample Volume (cu ft)	V(m)	(47.90)
Vol of Liquid Collected (ml)	Vl(c)	159.0
Vol of Liq @ Std. Conds. (scf)	V(w std)	(7.464)
Wt. of Filter Particulate (gm)		0.5459
Wt. of Probe Wash Particulate (gm)		0.0000
Wt of Combined Particulate (gm)	M(p)	(0.5459)
Wt of Total Metals (ug)	M(m)	0.0
O2 Concentration (by CEM)	% O2	3.23
CO2 Concentration (by CEM)	% CO2	15.46
CO Concentration (by CEM)	% CO	0.0
N2 Concentration (by diff.)	% N2	(81.31)

Sample Point	dClock Time	Velocity Head, dP (in H2O)	Orifice Meter, dH (in H2O)	Stack Temp (degF)	Gas Temp in	Meter (degF) out	SQRT(dP)
A1	4.00	0.45	0.92	454.00	78.0	79.0	0.6708
2	4.00	0.43	0.88	452.00	78.0	79.0	0.6557
3	4.00	0.44	0.90	451.00	80.0	79.0	0.6633
B1	4.00	0.43	0.88	451.00	81.0	79.0	0.6557
2	4.00	0.44	0.90	460.00	84.0	79.0	0.6633
3	4.00	0.43	0.88	472.00	85.0	80.0	0.6557
C1	4.00	0.35	0.72	450.00	85.0	81.0	0.5916
2	4.00	0.41	0.84	448.00	87.0	81.0	0.6403
3	4.00	0.44	0.90	450.00	91.0	83.0	0.6633
D1	4.00	0.47	0.96	450.00	89.0	82.0	0.6856
2	4.00	0.45	0.92	449.00	90.0	83.0	0.6708
3	4.00	0.41	0.84	446.00	90.0	83.0	0.6403
E1	4.00	0.27	0.55	436.00	87.0	83.0	0.5196
2	4.00	0.35	0.72	437.00	88.0	84.0	0.5916
3	4.00	0.34	0.70	437.00	89.0	84.0	0.5831
F1	4.00	0.37	0.76	436.00	90.0	84.0	0.6083
2	4.00	0.46	0.94	436.00	91.0	85.0	0.6782
3	4.00	0.34	0.70	435.00	92.0	85.0	0.6083
G1	4.00	0.32	0.66	434.00	92.0	85.0	0.6782
2	4.00	0.31	0.64	433.00	92.0	85.0	0.5831
3	4.00	0.36	0.74	434.00	92.0	86.0	0.5657
H1	4.00	0.35	0.72	433.00	92.0	86.0	0.5568
2	4.00	0.31	0.64	431.00	94.0	87.0	0.6000
3	4.00	0.34	0.70	431.00	94.0	87.0	0.5916
TOTALS	96.00	9.27	19.00	10646.0	2111.0	1902.0	15.0211

FIELD DATA AVERAGES

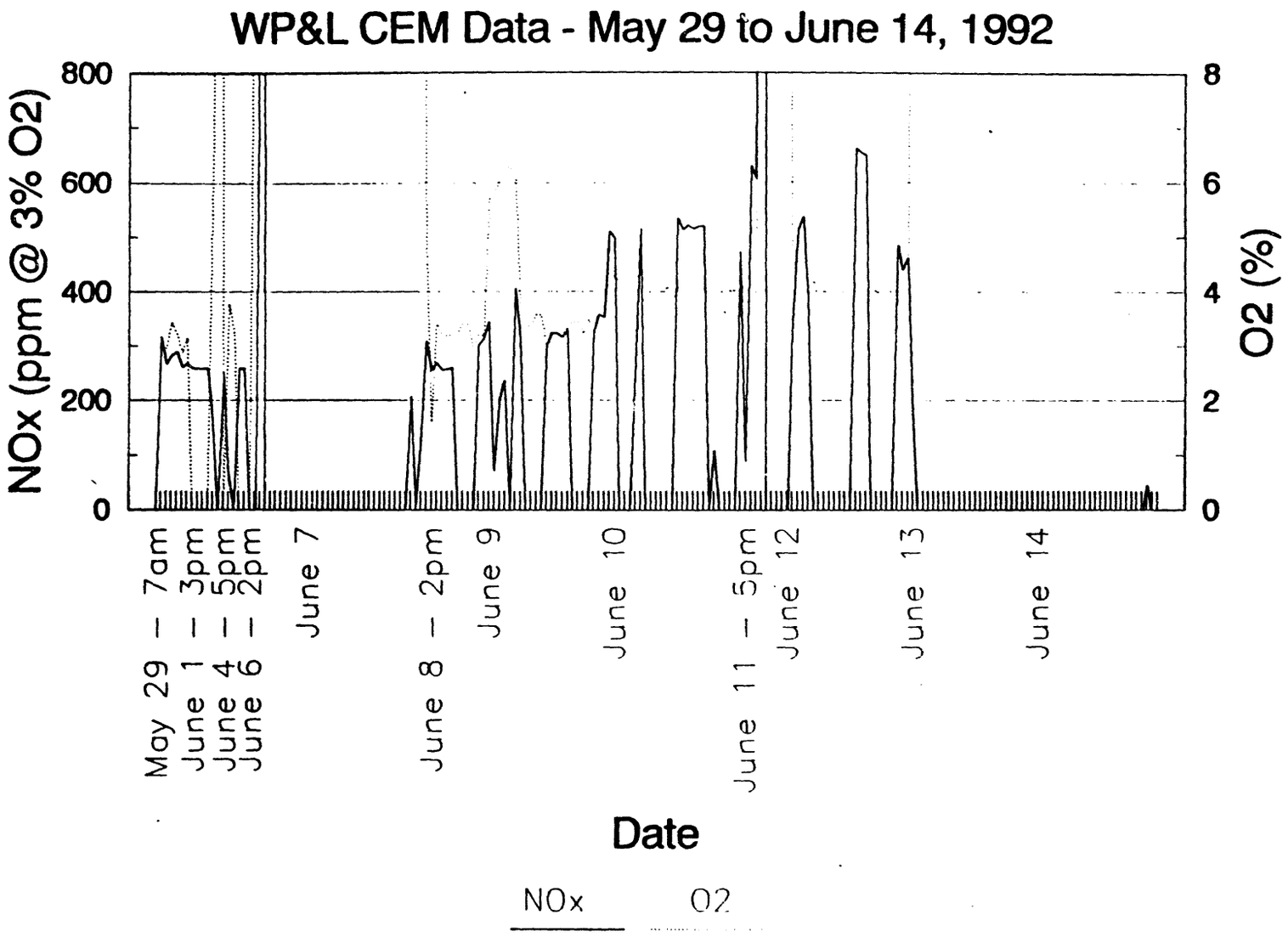
Avg Velocity Head (in H2O)	dP(avg)	=	0.385
Avg Orifice Meter Reading (in H2O)	dH(avg)	=	0.792
Avg Stack Temperature (degF)	T(s avg)	=	443.6
Average Meter Temperature (degF)	T(m avg)	=	83.6
Avg SQRT(dP)		=	0.626

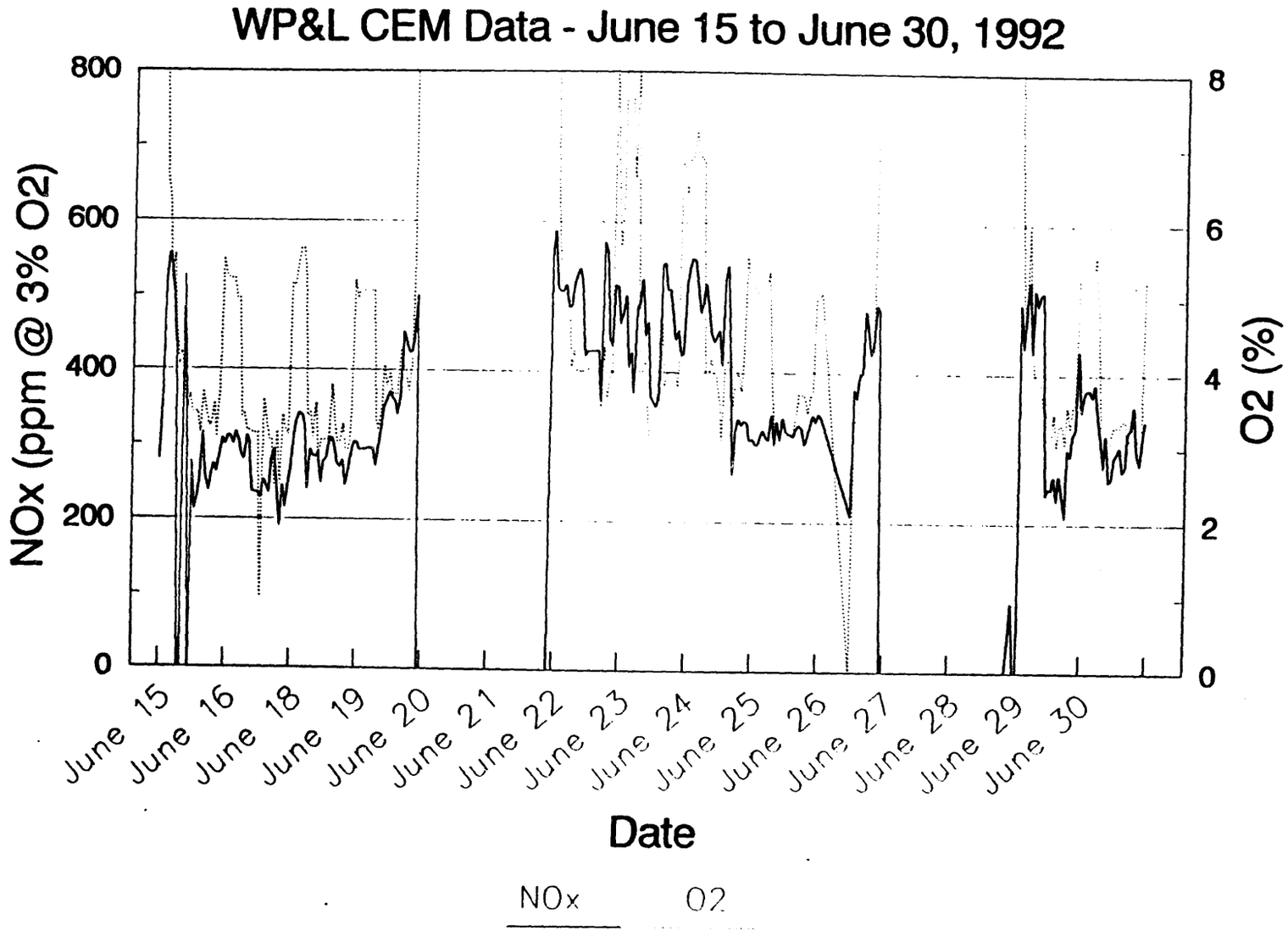
CALCULATED VALUES

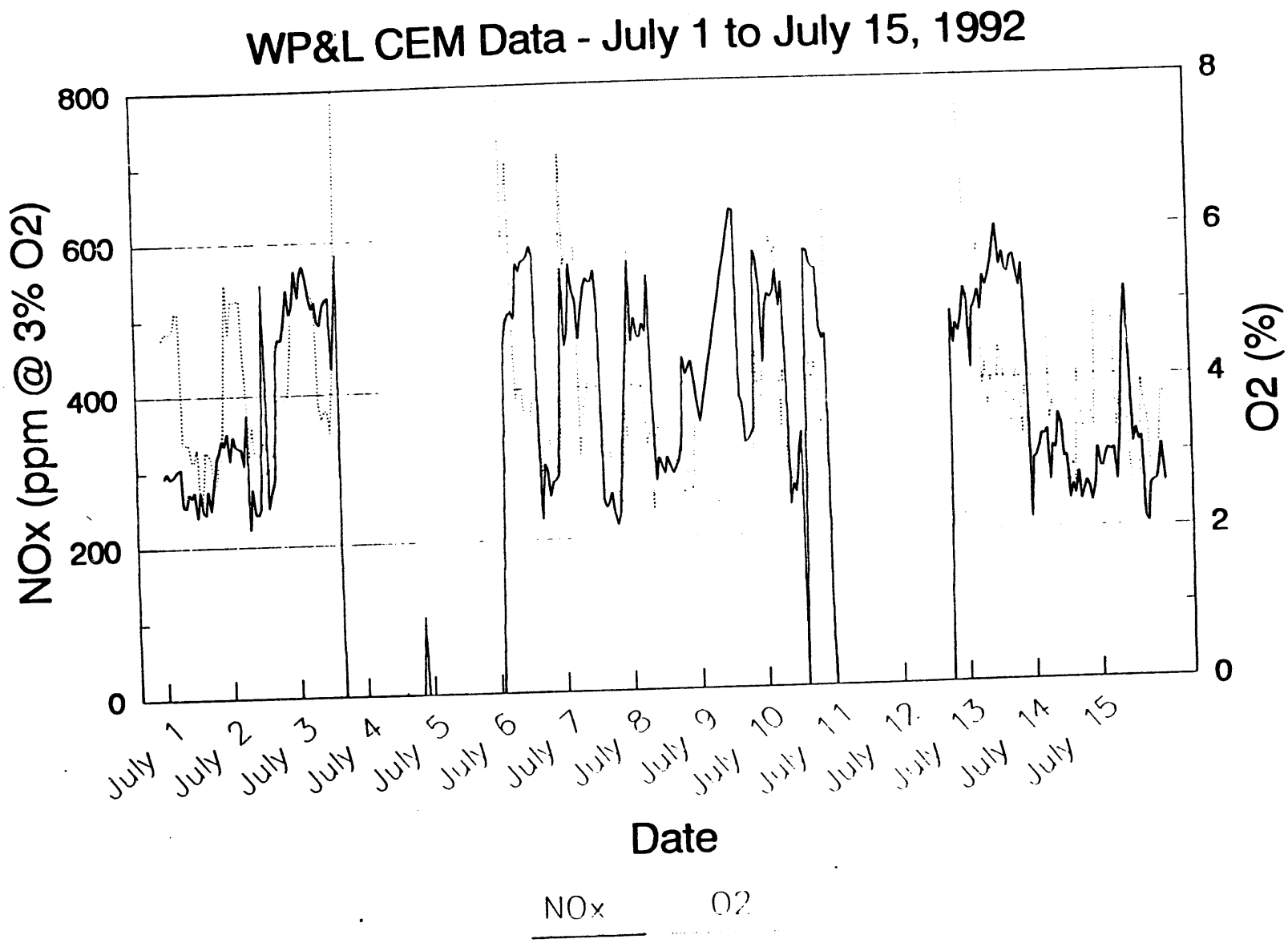
Meter Volume (std, cu. ft.)	V(m std)	=	46.09
Stack Gas Water Vapor Proportion	B(wo)	=	0.140
Mol. Wt., Stack Gas Dry	M(d)	=	30.60
Mol. Wt., Stack Gas Wet	M(s)	=	28.84
Abs Stack Pressure (in Hg)	P(s)	=	29.91
Avg Stack Velocity (ft/sec)	V(s avg)	=	46.0
Isokineticity (%)	% I	=	100.8
Stack Gas STD Vol Flow (dscfm)	Q(s)	=	133159
Actual Stack Gas Vol Flow (acfm)	Q(a)	=	264936
Percent XS Air	PEA	=	17.7
Particulate Loading, dry(gr/dscf)	C(s std)	=	0.1828
Particulate Loading, @7% O2(mg/dscm)	C(s std)	=	329
Particulate Loading, dry @ 7 % O2 (gr/dscf)		=	0.1440
Heat Input Rate, MBtu/hr		=	701.21
Particulate Emission Rate(lb/hr)	E(p)	=	208.556
Particulate Emission Rate(lb/MBtu)		=	0.3032
Total Metals Emission Rate(lb/MBtu)		=	0.00000

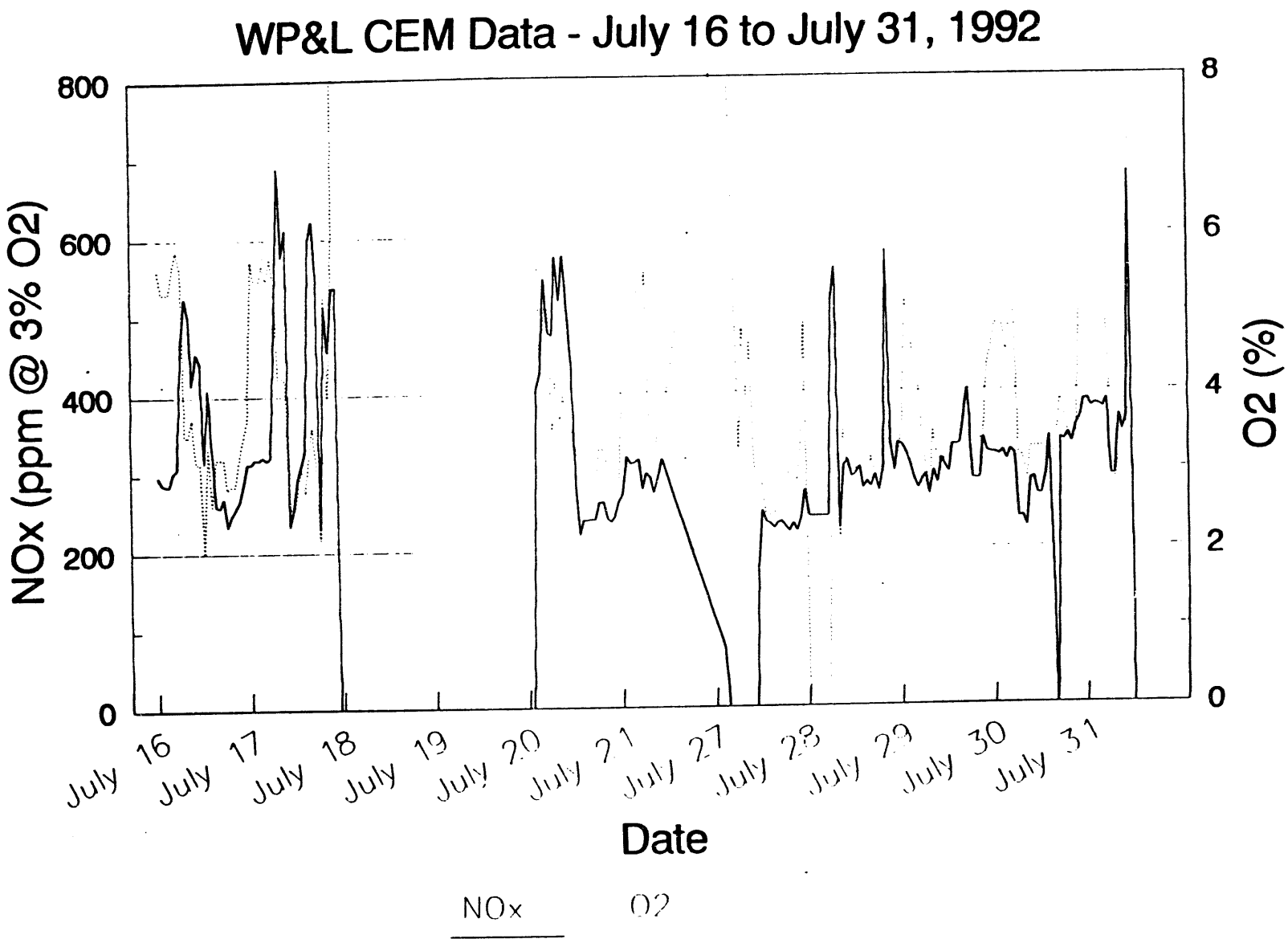
APPENDIX Q

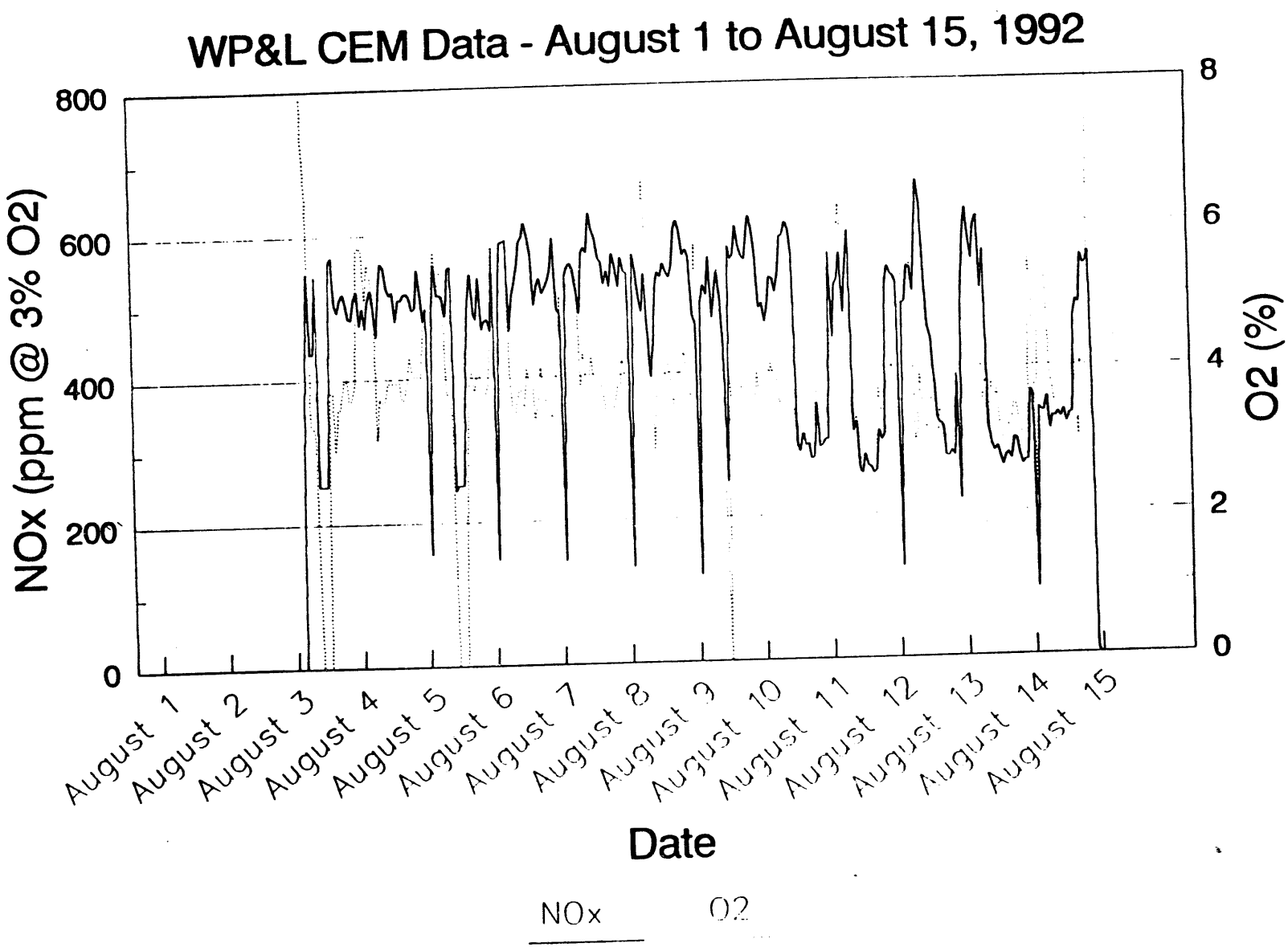
LONG-TERM CONTINUOUS EMISSION MONITORING SUMMARY: HOURLY DATA AVERAGES

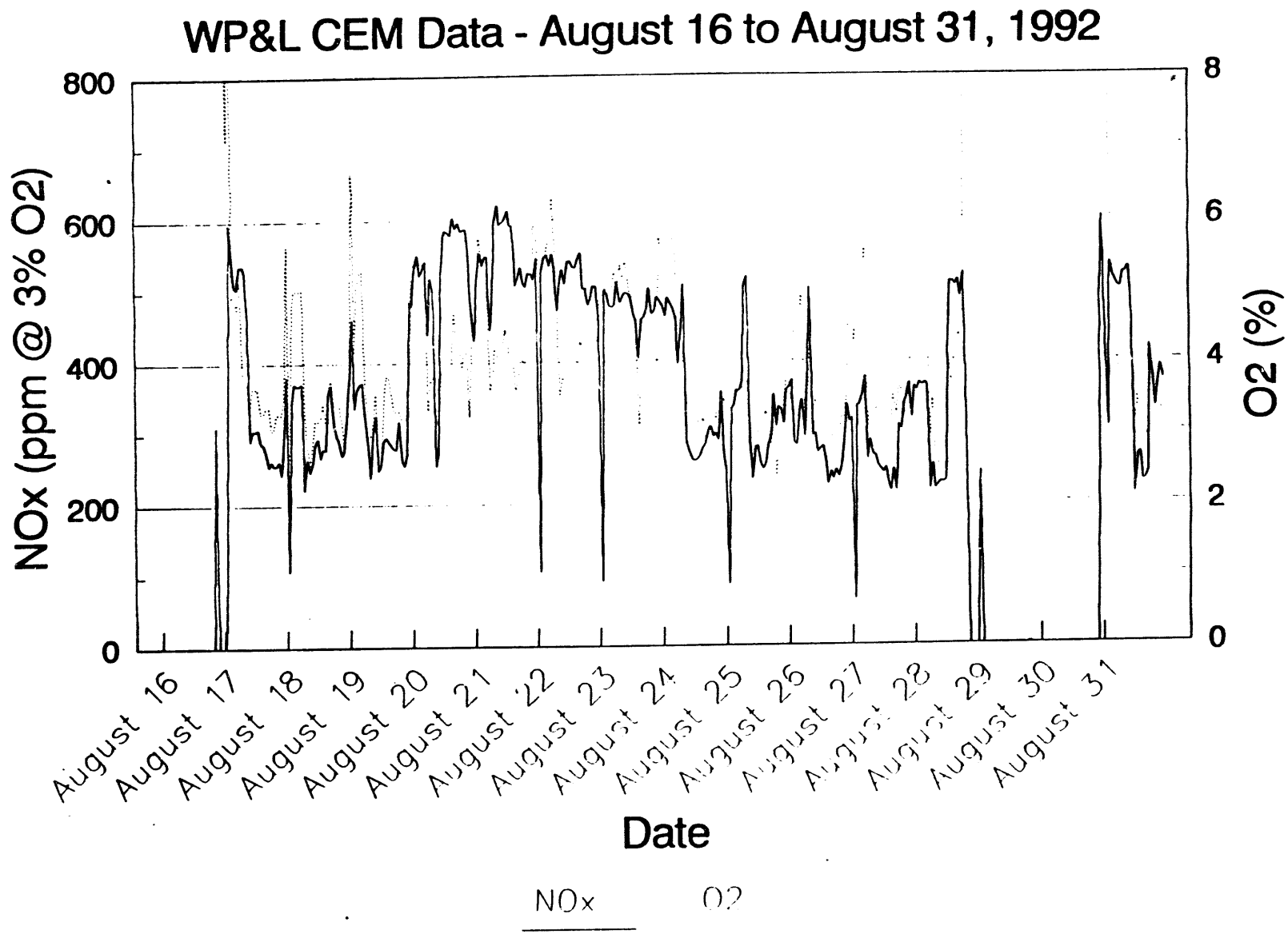

WP&L CEM Data - May 29 to June 14, 1992
NOx (ppm @ 3% O2)
800
600
400
200
0
O2 (%)
8
6
4
2
0
May 29 – 7am
June 1 – 3pm
June 4 – 5pm
June 6 – 2pm
June 7
June 8 – 2pm
June 9
June 10
June 11 – 5pm
June 12
June 13
June 14
Date
NOx
O2

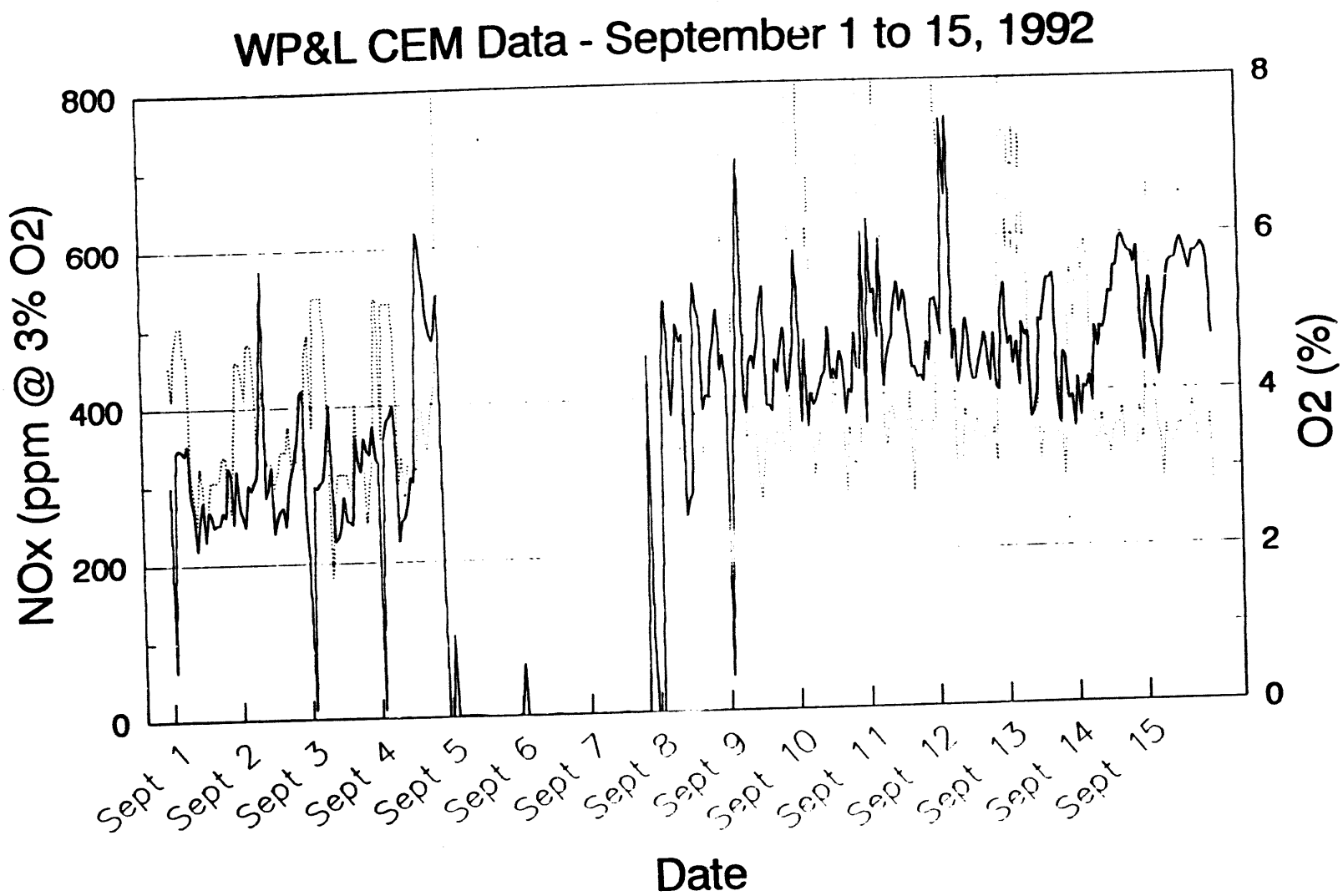

WP&L CEM Data - June 15 to June 30, 1992
NOx (ppm @ 3% O2)
O2 (%)
800
600
400
200
0
8
6
4
2
0
June 15
June 16
June 18
June 19
June 20
June 21
June 22
June 23
June 24
June 25
June 26
June 27
June 28
June 29
June 30
Date
NOx
O2

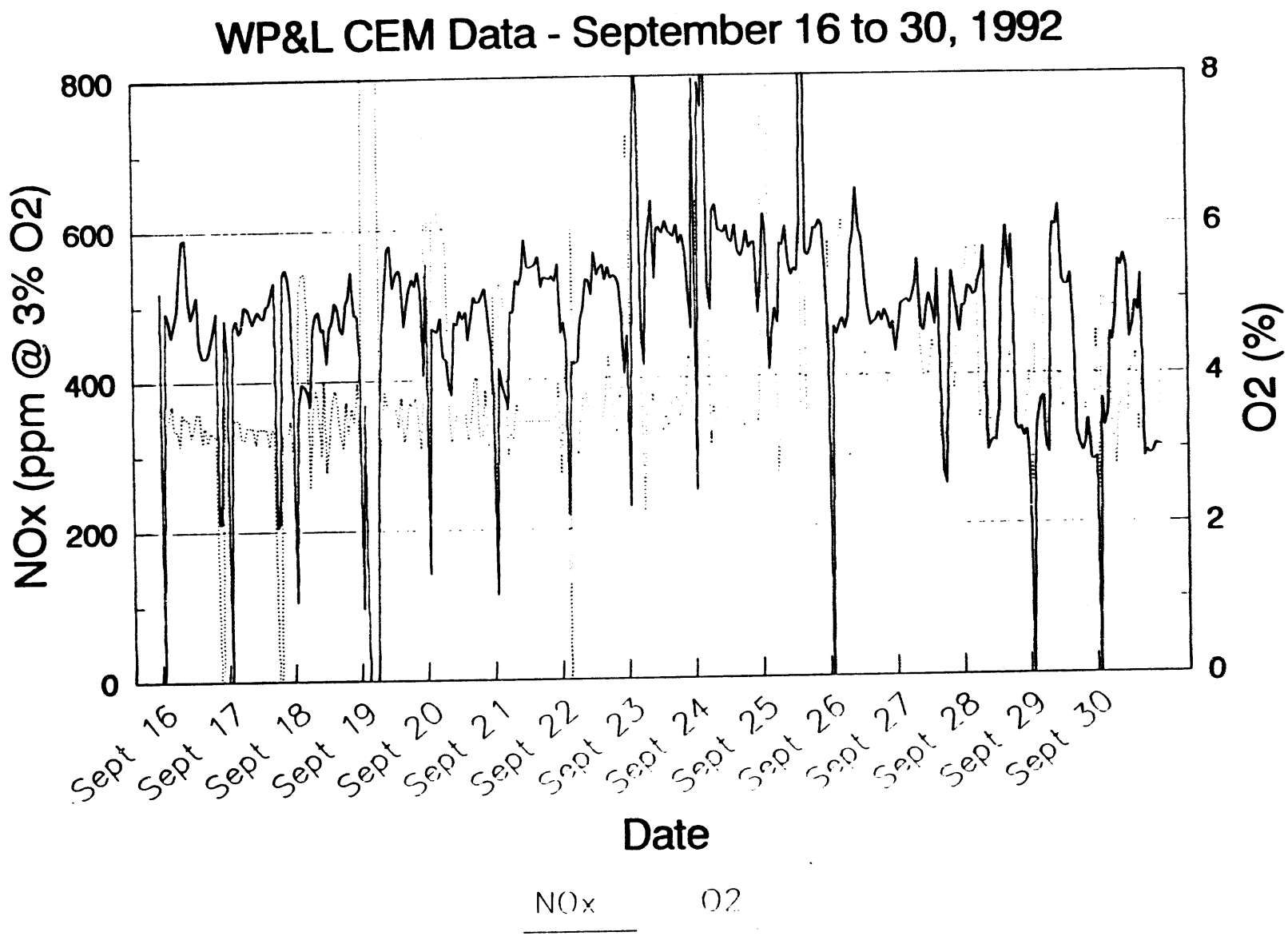

WP&L CEM Data - July 1 to July 15, 1992
NOx (ppm @ 3% O2)
O2 (%)
800
600
400
200
0
8
6
4
2
0
July 1
July 2
July 3
July 4
July 5
July 6
July 7
July 8
July 9
July 10
July 11
July 12
July 13
July 14
July 15
Date
NOx
O2

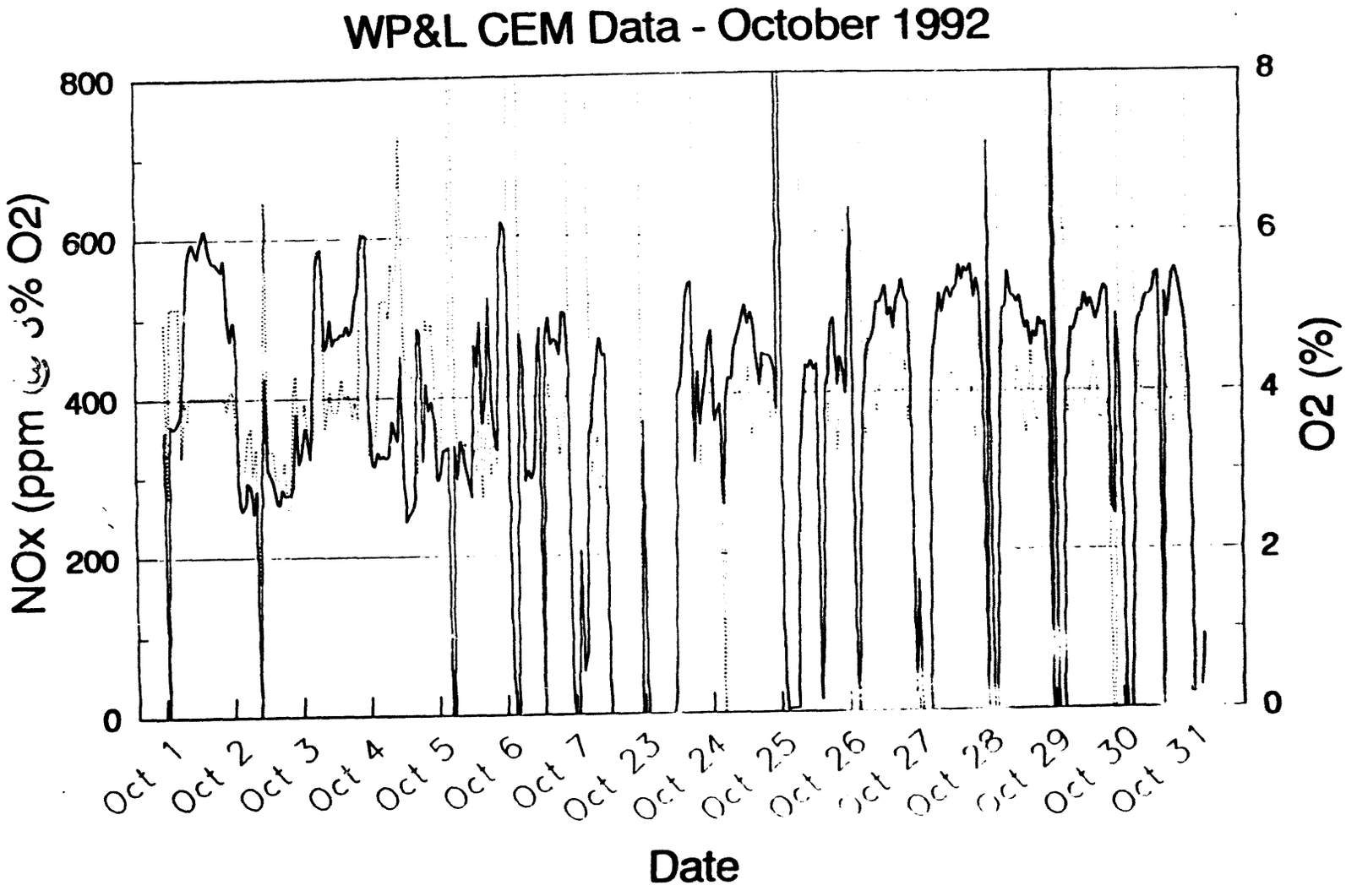

WP&L CEM Data - July 16 to July 31, 1992
NOx (ppm @ 3% O2)
O2 (%)
800
600
400
200
0
8
6
4
2
0
July 16
July 17
July 18
July 19
July 20
July 21
July 27
July 28
July 29
July 30
July 31
Date
NOx
O2

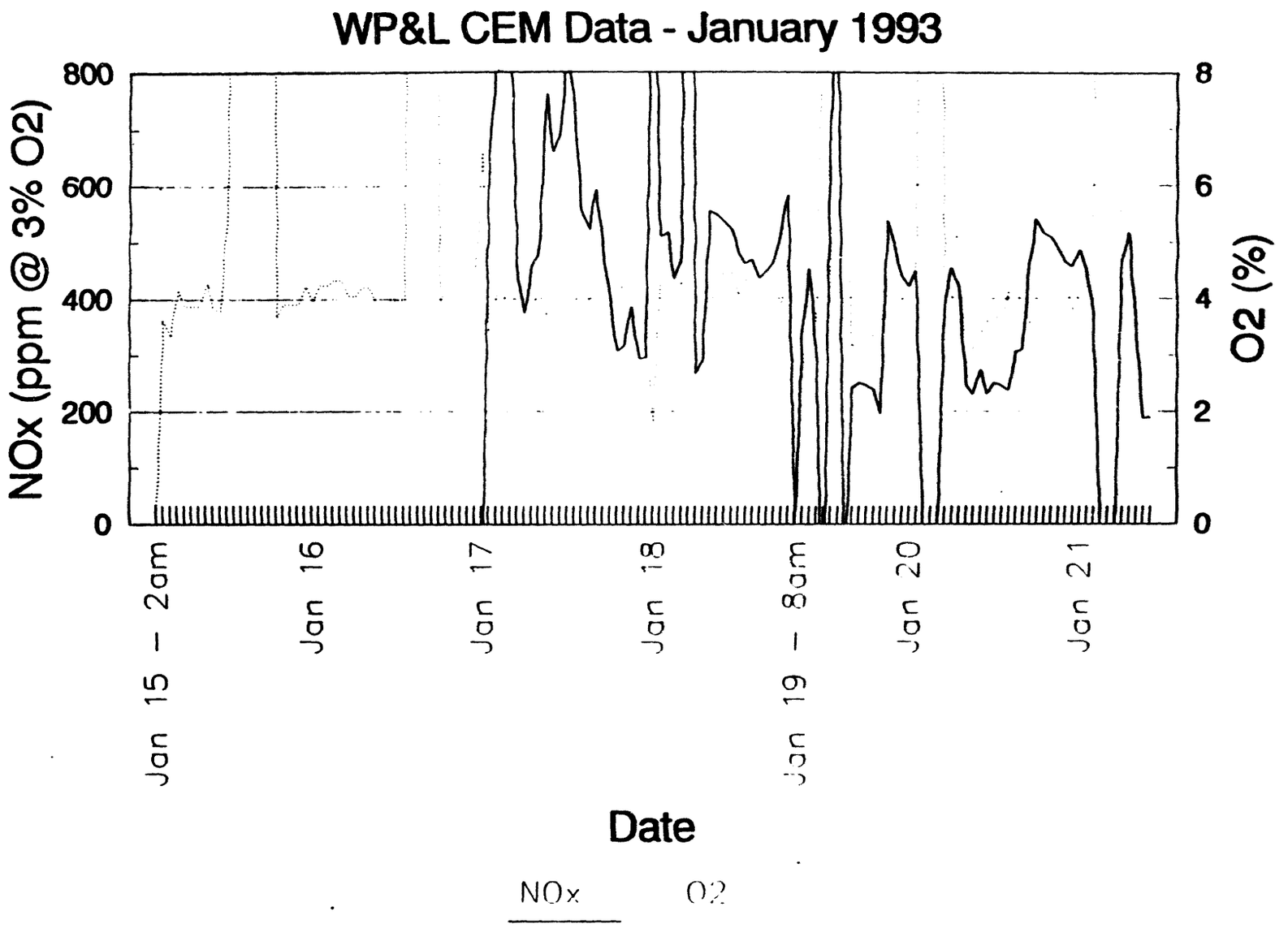

WP&L CEM Data - August 1 to August 15, 1992
NOx (ppm @ 3% O2)
O2 (%)
800
600
400
200
0
8
6
4
2
0
August 1
August 2
August 3
August 4
August 5
August 6
August 7
August 8
August 9
August 10
August 11
August 12
August 13
August 14
August 15
Date
NOx
O2


WP&L CEM Data - August 16 to August 31, 1992
NOx (ppm @ 3% O2)
O2 (%)
800
600
400
200
0
8
6
4
2
0
August 16
August 17
August 18
August 19
August 20
August 21
August 22
August 23
August 24
August 25
August 26
August 27
August 28
August 29
August 30
August 31
Date
NOx
O2


WP&L CEM Data - September 1 to 15, 1992
NOx (ppm @ 3% O2)
O2 (%)
800
600
400
200
0
8
6
4
2
0
Sept 1
Sept 2
Sept 3
Sept 4
Sept 5
Sept 6
Sept 7
Sept 8
Sept 9
Sept 10
Sept 11
Sept 12
Sept 13
Sept 14
Sept 15
Date
NOx
O2


WP&L CEM Data - September 16 to 30, 1992
NOx (ppm @ 3% O2)
800
600
400
200
0
O2 (%)
8
6
4
2
0
Sept 16
Sept 17
Sept 18
Sept 19
Sept 20
Sept 21
Sept 22
Sept 23
Sept 24
Sept 25
Sept 26
Sept 27
Sept 28
Sept 29
Sept 30
Date
NOx
O2


WP&L CEM Data - October 1992
NOx (ppm @ 3% O2)
800
600
400
200
0
O2 (%)
8
6
4
2
0
Oct 1
Oct 2
Oct 3
Oct 4
Oct 5
Oct 6
Oct 7
Oct 23
Oct 24
Oct 25
Oct 26
Oct 27
Oct 28
Oct 29
Oct 30
Oct 31
Date
NOx
O2


WP&L CEM Data - January 1993
NOx (ppm @ 3% O2)
800
600
400
200
0
O2 (%)
8
6
4
2
0
Jan 15 - 2am
Jan 16
Jan 17
Jan 18
Jan 19 - 8am
Jan 20
Jan 21
Date
NOx
O2

APPENDIX NO. 7

Emissions Test Data Summary

The following appendix contains the day to day emissions data summary for each of the various test series. This data was used to generate all the emission figures shown in Section 7.0 of this report. In addition, a summary of all the coal analyses obtained throughout the project are included. The tables presented in this appendix are:

- TABLE 1. Daily Log of B&W Reburn Test Results - "T" Series
- TABLE 2. Daily Log of Reburn Test Results - "A" Series
- TABLE 3. Daily Log of Reburn Test Results - "P"/"F" Series
- TABLE 4. Coal Analyses for WP&L Nelson Dewey #2
- TABLE 5. Daily Log of Reburn Test Results - "W" Series

PARAMETRIC/OPTIMIZATION TESTING (LAMAR COAL FIRING)

TABLE 1. DAILY LOG OF B&W REBURN TEST RESULTS – "T" PHASE

DATE	TEST #	CONDITION	MW	CYC STOIC	REB ZONE STOIC	B&W NOX ppm @3%O2	B&W NOX #/MKB	B&W BASE % NOX RED.	B&W O2 (%)	B&W CO ppm @3%O2	B&W ESP %UBC	B&W HOP %UBC	PLANT %UBC	PPT. IN gr/DSCF	PPT. OUT gr/DSCF	PPT. EFF. (%)
11/21	A	BASELINE W/NO REB,NO GR FAN	110	1.09	1.09	602	0.82	–	3.47	126	–	–	–	–	–	–
11/25	B	BASELINE W/NO REB,NO GR FAN	110	1.10	1.10	583	0.79	–	3.51	72	–	–	–	–	–	–
2/13	2	BASELINE W/NO REB,W/NO GR FAN	110	1.11	1.11	602	0.82	–	3.64	43	–	–	13.91	–	–	–
2/19	21	BASELINE W/NO REB,NO GR FAN	110	1.13	1.13	587	0.80	–	3.50	63	–	–	24.89	–	–	–
2/21	26	12.2 T/HR REBURN,W/NO GR FAN	110	1.08	0.97	362	0.49	40.6	2.73	77	25.43	21.51	24.70	3.21	–	–
2/21	27	12.2 T/HR REBURN,W/GR TO BRNS	110	1.09	0.89	291	0.39	52.2	2.83	102	27.54	21.51	24.70	4.04	–	–
2/12	1	14 T/HR REBURN,W/GR TO BRNS	110	1.20	0.96	300	0.41	50.7	3.00	152	5.81	–	11.79	–	–	–
2/13	4	13.7 T/HR REBURN,W/GR TO BRNS	110	1.13	0.89	268	0.36	56.0	3.36	123	22.85	–	–	2.62	–	–
2/15	8	14 T/HR REBURN,W/REB TO BRNS	110	1.13	0.90	301	0.41	50.6	3.05	117	–	–	–	–	–	–
2/15	10	14 T/HR REBURN,W/GR TO BRNS	110	1.12	0.90	294	0.40	51.7	2.94	114	–	–	–	–	–	–
2/17	16	14.5 T/HR REBURN,W/GR TO BRNS	110	1.11	0.86	263	0.36	56.8	2.99	117	–	–	–	–	–	–
2/17	17	14.5 T/HR REBURN,W/GR TO BRNS	110	1.10	0.87	265	0.36	56.5	3.01	92	24.43	–	–	3.49	0.048	98.6
2/18	19	14 T/HR REBURN,W/GR TO BRNS	110	1.10	0.87	272	0.37	55.3	3.01	88	–	–	–	–	–	–
2/18	20	14 T/HR REBURN,W/GR TO BRNS	110	1.10	0.86	270	0.37	55.7	3.00	77	–	–	–	–	–	–
2/19	23	14 T/HR REBURN,W/GR TO BRNS	110	1.10	0.86	260	0.35	57.3	2.83	85	31.92	–	–	–	–	–
3/5	50	14 T/HR REBURN,W/GR TO BRN	110	1.08	0.85	244	0.33	60.0	3.02	167	11.13	–	24.34	–	–	–
2/13	3	13.7 T/HR REBURN,W/NO GR TO BRN	110	1.11	0.94	325	0.44	46.6	3.19	151	10.74	–	–	4.38	–	–
2/14	5	14.1 T/HR REB,W/NO GR TO BRNS	110	1.10	0.88	278	0.38	54.4	3.15	149	–	–	12.33	–	–	–
2/14	6	14 T/HR REBURN,W/NO GR TO BRNS	111	1.11	0.88	295	0.40	51.6	3.09	141	–	–	–	–	–	–
2/15	7	14 T/HR REBURN,NO GR TO BRNS	110	1.11	0.87	297	0.40	51.2	3.13	83	–	–	16.35	–	–	–
2/15	9	14 T/HR REBURN,W/ NO GR TO BRNS	110	1.10	0.89	284	0.38	53.4	2.75	129	–	–	–	–	–	–
2/17	15	14.5 T/HR REB,W/NO GR TO BRNS	110	1.13	0.89	297	0.40	51.2	3.04	91	–	–	42.32	–	–	–
2/18	18	14 T/HR REBURN,W/NO GR TO BRNS	110	1.10	0.91	284	0.39	53.4	3.00	91	–	–	25.95	–	–	–
2/19	22	14 T/HR REBURN,W/NO GR FAN	110	1.08	0.92	294	0.40	51.7	2.75	71	29.88	–	–	3.91	0.034	99.1
2/20	24	14 T/HR REBURN,W/NO GR FAN	110	1.10	0.93	298	0.40	51.0	2.84	71	–	–	–	–	–	–
2/20	25	16 T/HR REBURN,W/NO GR FAN	111	1.12	0.91	275	0.37	54.8	2.90	92	26.71	–	–	2.95	0.036	98.8
2/24	31	6 T/HR REB,W/NO GR FAN,LOWER RZ	111	1.10	0.87	260	0.35	57.3	2.71	73	–	–	–	–	–	–
2/24	32	16 T/HR REBURN,W/GR TO BRNS	111	1.12	0.83	233	0.32	61.7	2.76	77	25.18	–	22.90	3.50	–	–
3/2	45	12 T/HR REBURN,W/GR TO BRNS	86	1.12	0.87	266	0.36	50.0	3.04	99	25.73	15.66	12.00	–	–	–
2/16	11	BASELINE W/NO REBURNING	81	1.13	1.13	537	0.73	–	3.50	64	–	–	13.43	–	–	–
2/24	33	BASELINE W/NO REBURN	83	1.13	1.13	537	0.73	–	3.43	45	–	–	–	–	–	–

TABLE 1. DAILY LOG OF B&W REBURN TEST RESULTS – "T" PHASE (cont)

DATE	TEST #	CONDITION	MW	CYC STOIC	REB ZONE STOIC	B&W NOX ppm @3%O2	B&W NOX #/MKB	B&W BASE % NOX RED.	B&W O2 (%)	B&W CO ppm @3%O2	B&W ESP %UBC	B&W HOP %UBC	PLANT %UBC	PPT. IN gr/DSCF	PPT. OUT gr/DSCF	PPT. EFF. (%)
3/4	49	12.8 T/HR REBURN,W/GR TO BRNS	82	1.15	0.85	233	0.32	56.1	3.58	121	22.51	27.58	24.63	–	–	–
2/16	12	11.5 T/HR REBURN,W/GR TO BRNS	82	1.15	0.88	249	0.34	53.1	3.11	141	–	–	–	–	–	–
2/16	13	11.5 T/HR REBURN,W/GR TO BRNS	82	1.13	0.87	250	0.34	52.9	3.22	120	37.54	–	–	4.38	0.383	91.3
2/16	14	11.5 T/HR REBURN,W/GR TO BRNS	82	1.13	0.86	256	0.35	51.8	3.12	130	33.10	–	–	3.76	0.539	85.7
3/3	47	11.5 T/HR REBURN,W/GR TO BRNS	82	1.11	0.85	237	0.32	55.4	2.83	121	30.03	21.66	11.10	–	–	–
2/22	28	11.5 T/HR REBURN,W/GR TO BRNS	83	1.13	0.87	256	0.35	51.8	3.08	113	34.87	–	23.94	4.05	–	–
2/22	29	11.5 T/HR REBURN,W/GR TO BRNS	83	1.11	0.86	247	0.33	53.5	2.93	128	–	–	–	–	–	–
2/24	34	11.5 T/HR REBURN,W/GR TO BRNS	83	1.12	0.86	241	0.33	54.6	3.01	82	–	–	–	–	–	–
3/3	46	11.5 T/HR REB,W/NO GR TO BRNS	83	1.11	0.87	252	0.34	52.5	2.66	128	33.83	17.61	11.10	–	–	–
2/25	37	BASELINE W/NO REBURN	70	1.11	1.11	495	0.67	–	3.91	51	–	–	–	–	–	–
2/25	35	11.5 T/HR REBURN,W/GR TO BRNS	70	1.20	0.91	266	0.36	48.4	3.02	101	–	–	–	–	–	–
2/25	39	11.5 T/HR REBURN,W/GR TO BRNS	70	1.19	0.93	250	0.34	51.5	2.83	103	38.12	24.09	–	4.10	–	–
2/25	38	1.5 T/HR REBURN,W/NO GR TO BRN	70	1.19	0.93	251	0.34	51.2	2.83	95	–	–	–	–	–	–
2/27	42	11 T/HR REBURN,W/NO GR TO BRNS	71	1.12	0.87	237	0.32	54.0	3.29	109	34.04	25.46	22.38	4.56	–	–
2/28	44	10 T/HR REBURN,W/MIN GR TO BRNS	66	1.15	0.89	287	0.39	43.6	2.60	79	–	–	–	–	–	–
2/23	30	BASELINE W/NO REBURN	56	1.14	1.14	470	0.64	–	4.80	94	–	–	–	–	–	–
2/26	40	8.4 T/HR REB,W/NO GR TO BRNS	55	1.22	1.07	387	0.52	23.5	2.91	85	–	–	–	–	–	–
2/26	41	8.4 T/HR REB,W/NO GR TO BRNS	55	1.16	0.97	349	0.47	31.0	3.13	87	–	–	–	–	–	–
2/27	43	8 T/HR REB,W/MIN GR TO BRNS	55	1.11	0.98	318	0.43	37.5	3.05	99	33.86	30.10	–	5.30		
3/3	48	7.9 T/HR REB,W/MIN GR TO BRN	57	1.07	0.96	353	0.48	30.7	2.82	95	35.85	24.16	–	–	–	–
12/6	C	BASE LAMAR/DECKER NO GR FAN	90	1.18	1.18	483	0.66	–	4.65	35	–	–	5.48	–	–	–
12/9	D	10.5 T/HR REBURN,L/D COAL,NO GR	91	1.25	1.09	374	0.51	20.0	4.10	95	–	–	4.14	–	–	–
12/10	E	12 T/HR REBURN,L/D COAL,NO GR	90	1.25	1.06	368	0.50	27.0	4.60	100	–	–	1.21	–	–	–
12/11	F	10 T/HR REBURN,L/D COAL,W/GR	90	1.18	1.01	353	0.48	32.0	2.90	74	–	–	4.95	–	–	–
12/12	G	12 T/HR REBURN,L/D COAL,W/GR	90	1.18	0.97	340	0.46	40.0	4.50	144	–	–	13.78	–	–	–
2/11	H	13 T/HR REBURN,L/D COAL,W/GR	100	1.20	1.00	383	0.52	33.0	3.35	65	–	–	8.71	–	–	–
2/25	36	13 T/HR REBURN W/DECKER COAL	101	1.11	0.91	289	0.39	–	3.23	68	–	–	–	–	–	–

TABLE 2. DAILY LOG OF REBURN TEST RESULTS – "A" PHASE

DATE	TEST #	CONDITION	MW	CYC STOIC	REB ZONE STOIC	B&W NOX ppm @3%O2	B&W NOX #/MKB	B&W % NOX RED.	B&W O2 (%)	B&W CO (PPM)	ACUX NOX ppm @3%O2	ACUX NOX #/MKB	ACUX % NOX RED.	ACUX O2 (%)	ACUX CO ppm @3%O2	ACUX UBC (%)	%UBC PLANT	PPT. IN gr/DSCF	PPT. OUT gr/DSCF	PPT. EFF (%)	RES OHM-CM E10
4-3	4A	ACUREX FULL LOAD BASELINE	110	1.12	1.12	639	0.87	–	4.08	172	653	0.89	–	4.70	–	3.34	6.99	0.55	0.0768	86.0	–
4-29	4A'	ACUREX FULL LOAD BASELINE	110	1.11	1.11	619	0.84	–	3.95	52	653	0.89	–	4.70	16	–	11.45	–	–	–	–
4-1	2A	13 T/HR REB W/140RPM/HIGH STOIC/NO GR	110	1.04	0.89	320	0.43	49.1	2.96	194	323	0.44	51.1	3.80	96	12.37	2.91	1.90	0.0207	96.9	9.0
4-2	3A	13 T/HR REB W/140RPM/MED STOIC/NO GR	110	1.05	0.87	290	0.39	52.3	2.73	115	297	0.40	55.0	3.60	–	10.80	2.51	2.48	0.0342	96.6	–
4-7	6A	13 T/HR REB W/140RPM/LOW STOIC/w GR	110	1.05	0.84	270	0.37	55.6	2.91	107	299	0.41	54.8	3.00	133	6.24	6.47	0.62	0.0518	91.6	–
4-8	7A	13 T/HR REB W/160RPM/LOW STOIC/w GR	110	1.07	0.86	267	0.36	56.2	2.99	60	294	0.40	55.5	2.65	33	6.09	5.57	0.97	0.0559	94.2	–
4-9	8A	13 T/HR REB W/160RPM/MED STOIC/NO GR	110	1.09	0.88	308	0.42	49.4	3.15	75	317	0.43	52.0	2.70	33	13.96	5.13	1.72	0.0382	97.8	–
4-10	9A	13 T/HR REB W/100RPM/MED STOIC/w GR	110	1.07	0.88	310	0.42	49.1	3.07	63	357	0.48	46.1	2.90	20	20.97	7.45	1.33	0.0174	98.7	–
4-13	10A	13 T/HR REB W/100RPM/LOW STOIC/w GR	110	1.08	0.87	290	0.39	52.4	3.04	85	346	0.47	47.7	3.40	65	19.90	8.74	2.82	0.0144	99.5	–
4-24	16A	13 T/HR REB PER AUTO CRTL (OPT COND)	111	1.07	0.87	266	0.36	56.3	3.08	66	326	0.44	50.8	4.20	22	30.70	7.98	1.34	0.0219	98.4	11.0
4-27	17A	15.5 T/HR REB W/LOW STOICH CONDITIONS	110	1.06	0.81	233	0.32	61.8	2.68	104	248	0.34	62.5	3.30	37	12.40	7.68	1.49	0.0415	97.2	10.0
4-29	2A'	13 T/HR REB W/140RPM/HIGH STOIC/NO GR	110	1.09	0.89	333	0.45	45.3	2.98	65	323	0.44	51.1	3.80	32	–	11.45	–	–	–	–
4-29	3A'	13 T/HR REB W/140RPM/MED STOIC/NO GR	110	1.06	0.86	300	0.41	50.8	2.73	70	297	0.40	55.1	3.60	37	–	11.45	–	–	–	–
5-1	21A	13 T/HR REB W/HIGH STOIC/NO GR FAN	110	1.09	0.96	351	0.48	42.4	3.78	72	379	0.51	42.7	3.70	53	–	9.12	1.36	0.0199	98.5	–
4-28	18A	11.2 T/HR REB W/AUTO/3 CYC OPERATION	90	1.04	0.84	257	0.35	55.2	2.88	70	287	0.39	53.0	3.88	49	18.95	5.75	1.40	0.0168	98.8	14.0
4-6	5A	ACUREX MED LOAD BASELINE	82	1.19	1.19	568	0.77	–	4.13	76	505	0.68	–	4.20	50	7.94	8.49	1.11	0.0234	97.9	–
4-29	19A	11.1 T/HR REB PER AUTO CRTL(OPT COND)	82	1.07	0.87	305	0.41	42.6	3.35	85	265	0.36	54.7	4.70	78	–	11.45	1.96	0.0205	99.0	14.0
4-15	11A	11.5 T/HR REB W/LOW STOICH @ 160 RPM	82	1.10	0.85	231	0.31	56.4	3.03	92	239	0.32	59.1	4.20	74	16.44	2.76	1.23	0.0162	98.7	–
4-16	12A	11.5 T/HR REB W/MED STOICH @ 160 RPM	83	1.07	0.88	262	0.36	50.7	3.13	69	260	0.35	55.6	3.80	51	14.69	2.77	1.84	0.0195	98.8	–
4-21	13A	11.5 T/HR REB W/HIGH STOICH @ 160 RPM	82	1.12	0.91	299	0.41	43.8	3.37	68	327	0.44	44.1	4.50	42	15.15	10.39	1.82	0.0142	99.2	21.0
3-31	1A	ACUREX BASELINE-PPT IN/OUT DUST LOAD	68	1.16	1.16	559	0.76	–	4.18	92	–	–	–	–	–	23.46	–	–	–	–	–
5-1	20A	8.0 T/HR REB W/HIGHER STOICH/160 RPM	60	1.04	1.00	389	0.53	23.0	3.56	87	337	0.46	39.0	4.70	75	–	7.56	2.63	0.0253	99.0	–
4-23	15A	8.0 T/HR REB W/LOW STOICH @ 160 RPM	59	1.04	0.92	224	0.30	55.8	3.17	115	288	0.39	46.2	5.30	72	20.33	8.40	2.69	0.0148	99.4	9.7
4-22	14A	8.0 T/HR REB W/HIGH STOICH @ 160 RPM	55	1.04	0.97	362	0.49	28.5	2.91	53	412	0.56	25.5	4.60	20	20.01	7.62	2.05	0.0245	98.8	26.0
4-1	2	B&W PRE-REBURN BASELINE	109	1.10	1.10	599	0.81	–	4.07	122	–	–	–	–	–	–	–	–	–	–	–
4-2	3	B&W PRE-REBURN BASELINE	110	1.06	1.06	573	0.78	–	3.97	95	–	–	–	–	–	–	–	–	–	–	–
4-3	4	B&W FULL LOAD BASELINE – SLM UBC	110	1.12	1.12	613	0.83	–	4.15	115	–	–	–	4.23	–	–	6.99	–	–	–	–
4-6	5	B&W FULL LOAD BASELINE	110	1.05	1.05	609	0.83	–	–	–	–	–	–	4.41	–	–	8.49	–	–	–	–
4-7	6	B&W PRE-REBURN BASELINE	110	1.11	1.11	609	0.83	–	4.02	85	–	–	–	–	–	–	–	–	–	–	–
4-8	7	B&W PRE-REBURN BASELINE	110	1.09	1.09	604	0.82	–	4.10	63	621	0.84	–	4.60	76	–	–	–	–	–	–
4-9	8	B&W PRE-REBURN BASELINE	110	1.11	1.11	657	0.89	–	3.84	41	682	0.92	–	4.12	23	–	–	–	–	–	–
4-2	3B	13 T/HR B&W/MED STOIC/HIGH OFA *	110	1.04	0.87	320	0.43	47.5	3.54	142	313	0.42	52.7	3.65	36	–	2.51	–	–	–	–
4-13	10B	14 T/HR REB W/OPT CODITIONS @ 140 RPM	110	1.06	0.87	290	0.39	52.4	3.02	70	313	0.42	52.7	2.80	81	–	–	–	–	–	–
4-13	10C	14 T/HR REB W/OPT CODITIONS @ 160 RPM	111	1.05	0.87	279	0.38	54.2	3.00	64	296	0.40	55.1	2.80	65	–	–	–	–	–	–
4-16	11B	11.5 T/HR W/OPT CODITIONS @ 160 RPM	82	1.09	0.87	243	0.33	54.2	3.24	115	245	0.33	58.1	3.82	74	–	2.77	–	–	–	–
4-16	11C	11.5 T/HR W/OPT/HIGH OFA @ 160 RPM	82	1.09	0.85	251	0.34	52.7	4.06	59	261	0.35	55.4	4.73	29	–	2.77	–	–	–	–
4-16	12B	10.5 T/HR REB W/HIGH STOICH @ 160 RPM	83	1.10	0.93	291	0.39	45.2	3.24	65	286	0.39	51.1	3.56	41	–	2.77	–	–	–	–
5-5	1BM	12.8 T/HR CASCADE W/NEW BRN MODS	110	1.07	0.87	308	0.42	49.4	2.87	60	319	0.43	51.7	3.28	37	–	8.59	–	–	–	–
5-6	2BM	8.7 T/HR CASCADE W/NEW BRN MODS	60	1.02	0.97	328	0.44	35.1	3.52	102	309	0.42	42.3	4.45	120	–	9.78	–	–	–	–
5-7	3BM	14 T/HR W/NEW BRN MOD/HIGHER HI	110	1.06	0.88	307	0.42	49.6	2.78	88	306	0.41	53.7	3.35	60	–	9.80	–	–	–	–
5-7	4BM	11.8 T/HR W/NEW BRN MODS/HIGHER HI	82	1.08	0.85	290	0.39	45.4	2.91	82	285	0.39	49.4	3.20	82	–	9.80	–	–	–	–

TABLE 3. DAILY LOG OF REBURN TEST RESULTS – "P"/"F" PHASES

DATE	TEST #	CONDITION	MW	CYC STOIC	REB ZONE STOIC	B&W NOX ppm 3%O	B&W NOX #/MKB	B&W % NOX RED.	B&W O2 (%)	B&W CO (PPM)	ACUX NOX ppm @3%O2	ACUX NOX #/MKB	ACUX % NOX RED.	ACUX O2 (%)	ACUX CO ppm @3%O2	ACUX UBC (%)	%UBC PLANT	PPT. IN gr/DSCF	PPT. OUT gr/DSCF	PPT. EFF (%)	PPT. RES OHM-CM
INITIAL PERFORMANCE PHASE																					
5-16	1P	MEDIUM LOAD PERFORMANCE TEST	80	1.11	0.89	281	0.38	47.1	3.05	98	292	0.40	50.1	3.93	73	22.63	21.01	2.81	0.0034	99.9	–
5-16	2P	LOW LOAD PERFORMANCE TEST	58	1.06	0.98	322	0.44	36.3	3.01	113	331	0.45	40.1	3.90	100	31.53	21.01	2.92	0.0132	99.5	–
5-17	3P	LOW LOAD PERFORMANCE TEST	58	1.06	1.01	340	0.46	32.8	3.32	111	361	0.49	34.7	4.90	75	34.46	15.04	2.63	0.0027	99.9	2.4
5-17	4P	LOW LOAD PERF TEST W/SOOTBLOWING	58	1.08	1.00	326	0.44	35.5	3.45	101	364	0.49	34.2	4.80	77	28.27	15.04	3.69	0.0311	99.2	2.1
5-18	5P	HIGH LOAD PERFORMANCE TEST	110	1.05	0.85	289	0.39	52.6	3.04	65	332	0.45	49.8	3.26	33	13.91	29.36	2.07	0.0158	99.2	7.9
5-19	6P	HIGH LOAD PERFORMANCE TEST	110	1.06	0.84	267	0.36	56.2	2.93	96	286	0.39	56.7	3.30	44	14.93	22.47	1.34	0.0090	99.3	33.0
5-19	7P	MEDIUM LOAD PERFORMANCE TEST	82	1.07	0.87	268	0.36	49.6	2.91	93	285	0.39	51.3	3.90	52	13.60	22.47	1.29	0.0055	99.6	6.8
5-20	8P	HIGH LOAD PERF TEST W/SOOTBLOWING	109	1.08	0.84	272	0.37	55.4	2.84	81	278	0.38	57.9	3.70	25	14.29	15.78	2.38	0.0084	99.6	3.8
5-20	9P	MED LOAD PERF TEST W/SOOTBLOWING	82	1.12	0.90	261	0.35	50.9	2.83	92	266	0.36	54.5	4.00	64	23.80	15.78	2.82	0.0037	99.9	0.7
FINAL PERFORMANCE TEST PHASE																					
9-28	F1	BASE PERF TEST-CYC @ 100% W/REB	77	1.10	1.10	563	0.76	–	3.51	65	585	0.79	–	3.83	18	13.20	5.32	0.9872	0.0091	99.1	–
9-28	F2	HIGH LOAD FINAL REBURN PERF. TEST	110	1.08	0.85	303	0.41	50.2	2.94	105	317	0.43	52.0	3.23	16	10.83	5.32	1.6251	0.0376	97.7	–
9-28	FFB	PRE-REBURN BASELINE HIGH LOAD	110	1.10	1.10	578	0.78	–	3.19	80	613	0.83	–	3.37	10	–	–	–	–	–	–
9-28	F3	HIGH LOAD FINAL REBURN PERF. TEST	110	1.07	0.85	301	0.41	50.5	3.02	140	335	0.45	49.3	3.40	18	8.67	5.32	1.4645	0.0305	97.9	–
9-29	F4	BASE PERF TEST-CYC @ 100% W/REB	77	1.10	1.10	509	0.69	–	3.57	72	539	0.73	–	3.80	13	3.73	6.36	1.0675	0.0097	99.1	–
9-29	F5	HIGH LOAD FINAL REBURN PERF. TEST	110	1.07	0.84	298	0.40	51.1	2.97	168	325	0.44	50.9	3.37	24	8.80	6.36	1.3950	0.0410	97.1	–
9-30	F6	BASE PERF TEST-CYC @ 100% W/REB	52	1.05	1.05	474	0.64	–	3.83	65	524	0.71	–	4.32	31	11.67	5.23	1.7998	0.0114	99.4	–
9-30	FMB	PRE-REBURN BASELINE MEDIUM LOAD	82	1.15	1.15	528	0.72	–	3.36	98	556	0.75	–	3.57	22	–	–	–	–	–	–
9-30	F7	MEDIUM LOAD FINAL REBURN PERF TEST	83	1.11	0.85	291	0.39	45.2	3.06	100	297	0.40	49.2	3.33	44	16.78	–	1.5838	0.0152	99.0	–
9-30	F8	MEDIUM LOAD FINAL REBURN PERF TEST	82	1.09	0.85	298	0.40	43.8	3.02	107	303	0.41	48.3	3.34	37	16.55	–	1.5017	0.0141	99.1	–
10-1	F9	BASE PERF TEST-CYC @ 100% W/REB	54	1.03	1.03	495	0.67	–	3.69	58	516	0.70	–	3.98	15	13.42	23.93	2.0458	0.0232	98.9	–
10-2	F10	MEDIUM LOAD FINAL REBURN PERF TEST	82	1.09	0.84	266	0.36	50.0	2.97	118	274	0.37	53.2	3.24	54	12.89	18.14	1.1988	0.0193	98.4	–
10-3	F11	BASE PERF TEST-CYC @ 100% W/REB	37	1.03	1.03	598	0.81	–	5.31	56	685	0.93	–	5.69	37	11.66	15.23	0.8162	0.0077	99.1	–
10-2	F12	LOW LOAD FINAL REBURN PERF. TEST	58	1.06	0.93	326	0.44	35.5	3.29	80	338	0.46	38.9	3.59	50	26.14	18.14	2.3318	0.0161	99.3	–
10-3	F13	LOW LOAD FINAL REBURN PERF. TEST	58	1.07	0.94	341	0.46	32.6	3.11	105	351	0.48	36.5	3.48	67	35.06	15.23	2.5595	0.0128	99.5	–
10-3	FLB	PRE-REBURN BASELINE LOW LOAD	58	1.10	1.10	480	0.65	–	3.70	80	494	0.67	–	3.72	44	–	–	–	–	–	–
10-3	F14	BASE PERF TEST-CYC @ 100% W/REB	38	1.04	1.04	599	0.81	–	5.25	57	705	0.96	–	5.74	26	12.35	15.23	0.7568	0.0087	98.9	–
10-4	F15	LOW LOAD FINAL REBURN PERF TEST	59	1.07	0.93	317	0.43	37.3	3.08	120	323	0.44	41.5	3.58	57	36.00	22.45	2.5058	0.0069	99.7	–
10-4	F16	LOWEST REBURN LOAD w/180 RPM	38	1.07	0.94	400	0.54	33.2	4.26	88	435	0.59	36.4	4.88	49	21.07	22.45	1.4288	0.0253	98.2	–
10-5	F17	LOW LOAD REBURN W/1 CYCLONE	59	1.11	0.90	290	0.39	42.7	2.81	116	310	0.42	44.0	3.51	63	26.61	17.87	1.7475	0.0347	98.0	–
10-5	F18	LOW LOAD REB W/2 CYCS HIGH AIR	59	1.06	0.94	349	0.47	30.9	3.95	131	363	0.49	34.3	4.30	59	3.58	–	1.7950	0.0331	98.2	–
10-5	F19	BASELINE FULL LOAD	110	1.09	1.09	585	0.79	–	3.31	209	651	0.88	–	3.86	12	16.61	17.87	0.9029	0.0889	90.2	–

TABLE 4. COAL ANALYSES FOR WISCONSIN POWER & LIGHT NELSON DEWEY UNIT #2

LAMAR COAL ANALYSES

TEST ID	OPT	OPT	OPT	#11-14	2A	2A	4A	4A	12A	1P	3P	5P	8P	FINE	F1	F4	F6	F9	F10	F11	F15
FUEL ANAL (As Rec'	WARNER	WARNER	WARNER	WARNER	B&W	WARNER	B&W	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER	B&W	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER
SOURCE	11-21-91	11-25-91	12-17-91	2-16-92	4-1-92	4-1-92	4-3-92	4-3-92	4-16-92	5-16-92	5-17-92	5-18-92	5-19-92	7-14-92	9-28-92	9-29-92	9-30-92	10-1-92	10-2-92	10-3-92	10-4-92
MOISTURE	17.87	19.32	18.80	17.24	16.31	15.53	14.88	15.06	18.22	16.22	16.80	16.32	16.09	15.36	17.66	17.24	17.46	17.14	18.33	16.94	17.37
VOLATILE MATTER	31.89	31.10	31.69	30.67	33.91	32.52	34.33	32.06	31.36	32.51	32.28	32.03	31.99	36.26	31.55	32.15	32.46	32.55	32.00	32.27	32.19
FIXED CARBON	43.89	43.43	43.83	44.99	44.23	46.01	44.41	46.08	44.68	45.03	44.33	45.34	44.99	42.90	44.14	44.13	43.68	44.38	43.95	44.43	43.90
ASH	6.35	6.15	5.68	7.10	5.55	5.94	6.38	6.80	5.74	6.24	6.59	6.31	6.13	5.48	6.65	6.48	6.40	5.93	5.72	6.36	6.54
SUM	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.20	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
HHV, Btu/lb	11020	10848	10886	10945	11399	11437	11364	11288	10880	11210	11023	11232	11151	11445	10928	10996	11003	11173	10948	11111	11066
SUM OF INERTS	24.22	25.47	24.48	24.34	21.86	21.47	21.26	21.86	23.96	22.46	23.39	22.63	22.22	20.84	24.31	23.72	23.86	23.07	24.05	23.30	23.91
FC/VM	1.38	1.40	1.38	1.47	1.30	1.41	1.29	1.44	1.42	1.39	1.37	1.42	1.41	1.18	1.40	1.37	1.35	1.36	1.37	1.38	1.36
CARBON	61.39	60.24	60.33	60.93	63.80	64.00	63.76	62.84	61.27	64.46	61.81	62.43	64.62	64.46	60.51	61.23	61.22	62.17	61.12	61.58	61.65
HYDROGEN	4.14	4.39	4.22	4.00	4.28	4.32	4.27	4.31	4.24	3.44	4.17	4.23	3.44	4.47	4.18	3.93	4.27	4.26	4.10	4.14	4.29
NITROGEN	1.11	1.08	1.07	1.13	1.26	1.37	1.30	1.24	1.22	1.18	1.10	1.19	1.23	1.33	1.12	1.12	1.08	1.17	1.05	1.13	1.10
SULFUR	1.31	1.29	1.27	1.34	1.46	1.56	1.49	1.55	1.52	1.42	1.39	1.32	1.36	1.62	1.41	1.36	1.37	1.38	1.25	1.42	1.42
MOISTURE	17.87	19.32	18.80	17.24	16.31	15.53	14.88	15.06	18.22	16.22	16.80	16.32	16.09	15.36	17.66	17.24	17.46	17.14	18.33	16.94	17.37
ASH	6.35	6.15	5.68	7.10	5.55	5.94	6.38	6.80	5.74	6.24	6.59	6.31	6.13	5.48	6.65	6.48	6.40	5.93	5.72	6.36	6.54
OXYGEN	7.83	7.53	8.63	8.26	7.34	7.28	7.92	8.20	7.79	7.04	8.14	8.20	6.33	7.28	8.47	8.64	8.20	7.93	8.43	8.43	7.63
SUM	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.20	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EPA Fd FACTOR	9646	9732	9606	9585	9722	9738	9722	9667	9601	9713	9702	9621	9813	9843	9596	9544	9667	9666	9629	9574	9705
AVERAGE EPA Fd																					9724

WESTERN COAL ANALYSES

TEST ID	1W	2W	3W	4W	5W	6W	7W	8W	10W	11W	12W	14W	16W	17W	FEQT	23W	29W	30W
FUEL ANAL (As Rec'	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER	WARNER
SOURCE	11-16-92	11-16-92	11-17-92	11-19-92	11-19-92	11-19-92	11-20-92	11-20-92	11-30-92	11-30-92	12-1-92	12-1-92	12-2-92	12-2-92	12-3-92	12-4-92	12-7-92	12-7-92
MOISTURE	24.83	25.32	25.98	26.58	27.15	27.48	27.98	28.51	26.39	26.60	26.81	26.69	27.00	26.89	26.21	26.45	25.94	25.85
VOLATILE MATTER	31.60	32.06	31.23	30.88	31.17	31.11	30.89	30.53	31.57	31.40	31.45	31.04	30.97	30.13	31.53	30.60	30.67	30.79
FIXED CARBON	38.94	38.10	38.36	38.29	37.60	36.98	37.10	37.12	37.94	37.93	37.72	38.17	37.76	38.65	37.74	38.35	38.65	38.65
ASH	4.63	4.52	4.43	4.25	4.08	4.43	4.03	3.84	4.10	4.07	4.02	4.10	4.27	4.33	4.52	4.60	4.74	4.71
SUM	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
HHV, Btu/lb	9541	9403	9321	9177	9150	9000	9030	8928	9108	9132	9123	9122	9123	9125	9254	9266	9304	9382
SUM OF INERTS	29.46	29.84	30.41	30.83	31.23	31.91	32.01	32.35	30.49	30.67	30.83	30.79	31.27	31.22	30.73	31.05	30.68	30.56
FC/VM	1.23	1.19	1.23	1.24	1.21	1.19	1.20	1.22	1.20	1.21	1.20	1.23	1.22	1.28	1.20	1.25	1.26	1.26
CARBON	54.74	53.59	54.39	52.30	51.89	51.70	51.81	51.07	52.04	52.13	52.44	52.28	52.42	52.41	53.77	52.80	53.58	53.16
HYDROGEN	3.40	3.46	3.26	3.18	3.76	3.53	3.64	3.45	2.71	3.19	3.26	3.27	3.21	3.20	3.26	3.10	3.15	3.32
NITROGEN	0.74	0.71	0.78	0.70	0.66	0.65	0.65	0.64	0.67	0.62	0.63	0.67	0.71	0.70	0.73	0.70	0.69	0.68
SULFUR	0.49	0.43	0.40	0.39	0.34	0.33	0.30	0.29	0.32	0.33	0.32	.0.34	0.38	0.39	0.43	0.47	0.53	0.54
MOISTURE	24.83	25.32	25.98	26.58	27.15	27.48	27.98	28.51	26.39	26.60	26.81	26.69	27.00	26.89	26.21	26.45	25.94	25.85
ASH	4.63	4.52	4.43	4.25	4.08	4.43	4.03	3.84	4.10	4.07	4.02	4.10	4.27	4.33	4.52	4.60	4.74	4.71
OXYGEN	11.17	11.97	10.76	12.60	12.12	11.88	11.59	12.20	13.77	13.06	12.52	12.65	12.01	12.08	11.08	11.88	11.37	11.74
SUM	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EPA Fd FACTOR	9577	9510	9706	9384	9594	9641	9684	9558	9160	9378	9494	9467	9501	9490	9659	9386	9524	9425
AVERAGE EPA Fd																		9606

TABLE 5. DAILY LOG OF REBURN TEST RESULTS ("W" PHASE)

DATE	TEST #	CONDITION	MW	CYC STOIC	REB ZONE STOIC	B&W NOX ppm @3%O2	B&W NOX #/MKB	B&W BASE % NOX RED.	B&W O2 (%)	B&W CO (PPM)	ACUX NOX ppm @3%O2	ACX NOX #/MKB	ACUX BASE % NOX RED.	ACUX O2 (%)	ACUX CO ppm @3%O2	B&W ESP UBC (%)	B&W HOP UBC (%)	PPT. IN gr/DSCF	PPT. OUT gr/DSCF	PPT. EFF (%)
12-4	23W	REBURN @ MAX LOAD POSSIBLE	118	1.06	0.87	275	0.37	54.2	3.04	73	298	0.40	50.6	2.92	89	11.15	9.95	2.3902	-	-
12-9	C8	REBURN @ MAXIMUM LOAD	116	1.05	0.87	239	0.32	58.3	3.25	85	245	0.33	57.2	3.59	74	-	-	-	-	-
12-10	C15	REBURN @ MAXIMUM LOAD	115	1.06	0.87	228	0.31	58.0	3.35	57	234	0.31	56.9	3.33	90	-	-	-	-	-
12-8	C2	REBURN @ FULL LOAD	112	1.09	0.85	210	0.28	57.7	3.10	51	216	0.29	56.5	3.15	76	-	-	-	-	-
11-16	1W	BASELINE - FULL LOAD	109	1.05	1.05	498	0.67	-	3.38	59	519	0.69	-	3.75	30	3.30	-	0.4236	0.0114	97.3
11-16	1W'	REBURN @ FULL LOAD W/LAMAR SETTINGS	110	1.07	0.88	235	0.31	52.9	3.05	78	238	0.31	54.1	3.26	38	-	-	-	-	-
11-16	1W'	ABOVE W/GR DAMPER 80%	110	1.07	0.90	219	0.29	56.1	3.15	75	220	0.29	57.7	3.14	45	-	-	-	-	-
11-16	1W'	ABOVE W/GR DAMPER 100%	110	1.07	0.88	212	0.28	57.4	3.20	78	221	0.29	57.4	3.18	45	-	-	-	-	-
11-16	1W'	ABOVE W/GR DAMPER 70%	110	1.07	0.88	217	0.29	56.4	3.10	78	221	0.29	57.4	3.27	51	-	-	-	-	-
11-16	1W'	ABOVE W/GR DAMPER 70%/HIGHER HI%	110	1.07	0.86	214	0.29	56.9	2.95	87	218	0.29	57.9	3.04	47	-	-	-	-	-
11-16	1W'	ABOVE W/GR DAMP. 70%/HIGHER HI%/LOW SA	110	1.07	0.85	211	0.28	57.6	3.00	95	211	0.28	59.3	3.12	61	-	-	-	-	-
11-16	1W'	ABOVE W/IMPELLER @ -1/2"	110	1.07	0.85	201	0.27	59.6	2.95	103	206	0.27	60.4	3.05	61	-	-	-	-	-
11-19	4W	BASELINE - FULL LOAD	110	1.07	1.07	603	0.81	-	3.58	63	638	0.85	-	4.07	44	16.88	26.59	1.2619	0.0128	99.0
12-1	12W	BASELINE - FULL LOAD	110	1.06	1.06	517	0.69	-	3.52	59	542	0.73	-	3.85	58	6.08	-	1.5908	-	-
12-2	15W	BASELINE - FULL LOAD	108	1.06	1.06	581	0.78	-	3.56	36	477	0.64	-	-	72	-	-	-	-	-
12-3	18W	BASELINE @ FULL LOAD W/GR FAN: FEGT	109	1.07	1.07	576	0.77	-	3.49	74	610	0.82	-	3.29	72	-	-	-	-	-
12-3	19W	BASELINE @ FULL LOAD NO GR FAN: FEGT	110	1.04	1.04	594	0.80	-	3.58	85	610	0.82	-	3.71	82	-	-	-	-	-
12-4	22W	BASELINE @ FULL LOAD: SINGLE SCAN	109	1.05	1.05	562	0.75	-	3.64	55	564	0.76	-	3.80	82	-	-	-	-	-
12-7	26W	BASELINE - FULL LOAD	110	1.07	1.07	549	0.74	-	3.52	47	-	-	-	-	-	-	-	-	-	-
12-8	C1	BASELINE - FULL LOAD	111	1.10	1.10	492	0.66	-	3.65	30	502	0.67	-	3.52	64	-	-	-	-	-
12-9	C6	BASELINE - FULL LOAD	110	1.08	1.08	548	0.73	-	3.65	55	546	0.73	-	3.93	66	-	-	-	-	-
12-10	C13	BASELINE - FULL LOAD	110	1.08	1.08	528	0.71	-	3.50	26	528	0.71	-	3.22	74	-	-	-	-	-
11-17	3W	REB @ FULL LOAD W/LAMAR COND	110	1.05	0.85	234	0.31	58.2	2.94	144	242	0.32	56.7	3.03	120	4.15	5.96	0.9906	0.0174	98.2
11-19	5W	REBURN @ FULL LOAD W/NO GR FAN	110	1.10	0.95	307	0.41	49.1	2.91	68	323	0.43	49.4	3.30	45	4.41	3.50	0.9364	0.0166	98.0
12-1	13W	REBURN @ FULL LOAD W/OPT COND	110	1.08	0.86	214	0.29	58.6	3.28	89	224	0.30	56.7	3.48	63	2.68	7.08	1.1905	-	-
12-2	16W	REBURN @ FULL LOAD W/HIGH % HI	110	1.07	0.85	229	0.31	60.6	3.00	93	236	0.32	59.4	3.06	96	11.24	2.86	1.5291	-	-
12-2	17W	REBURN @ FULL LOAD W/LOW % HI	109	1.07	0.91	299	0.40	48.5	3.19	56	317	0.42	45.4	3.05	70	11.64	8.81	1.5585	-	-
12-2	17W'	REB @ FULL LOAD W/GOOD COND/LOW SA	109	1.09	0.88	248	0.33	57.3	3.20	69	252	0.34	56.6	3.03	95	-	-	-	-	-
12-2	17W'	ABOVE W/HIGH % HI/NO GR FAN	109	1.06	0.92	274	0.37	52.8	3.16	56	282	0.38	51.5	3.15	89	-	-	-	-	-
12-3	20W	REBURN @ FULL LOAD W/GR FAN: FEGT	110	1.12	0.92	322	0.43	45.8	3.32	74	315	0.42	47.0	3.13	77	-	-	-	-	-
12-3	21W	REBURN @ FULL LOAD NO GR FAN: FEGT	109	1.06	0.92	307	0.41	48.3	3.37	78	309	0.41	48.0	3.42	76	-	-	-	-	-
12-7	27W	REBURN @ FULL LOAD NO GR FAN	110	1.08	0.92	276	0.37	49.7	3.27	95	-	-	-	-	-	-	-	-	-	-
12-7	28W	REBURN @ FULL LOAD W/GR FAN	110	1.11	0.89	252	0.34	54.1	3.64	101	-	-	-	-	-	-	-	-	-	-
12-9	C7	REBURN @ FULL LOAD	110	1.06	0.85	208	0.28	62.0	2.80	98	217	0.29	60.3	3.31	90	-	-	-	-	-
12-9	C12	REBURN @ FULL LOAD	109	1.03	0.84	-	-	-	-	-	215	0.29	60.1	3.32	106	-	-	-	-	-
12-10	C14	REBURN @ FULL LOAD	111	1.08	0.87	227	0.30	57.0	3.25	64	237	0.32	55.1	3.30	104	-	-	-	-	-
12-10	C21	REBURN @ HIGH LOAD	103	1.07	0.85	-	-	-	-	-	232	0.31	56.1	3.21	99	-	-	-	-	-
12-10	C20	REBURN @ HIGH LOAD	100	1.13	0.93	-	-	-	-	-	255	0.34	51.7	3.05	90	-	-	-	-	-
12-10	C19	REBURN @ MEDIUM LOAD	89	1.14	0.95	-	-	-	-	-	254	0.34	51.9	3.47	89	-	-	-	-	-
11-16	2W	BASELINE - MEDIUM LOAD	78	1.08	1.08	479	0.64	-	3.60	44	486	0.65	-	3.79	37	2.65	3.30	0.8570	0.0104	98.8
11-30	11W	BASELINE - MEDIUM LOAD	83	1.10	1.10	478	0.64	-	3.73	16	507	0.68	-	3.70	66	4.18	4.20	1.9397	-	-

TABLE 5. DAILY LOG OF REBURN TEST RESULTS – "W" PHASE (cont)

DATE	TEST #	CONDITION	MW	CYC STOIC	REB ZONE STOIC	B&W NOX ppm @3%O2	B&W NOX #/MKB	B&W BASE % NOX RED.	B&W O2 (%)	B&W CO (PPM)	ACUX NOX ppm @3%O2	ACX NOX #/MKB	ACUX BASE % NOX RED.	ACUX O2 (%)	ACUX CO ppm @3%O2	B&W ESP UBC (%)	B&W HOP UBC (%)	PPT. IN gr/DSCF	PPT. OUT gr/DSCF	PPT. EFF (%)
11-19	6W	REB @ MED LOAD W/LAMAR CONDITIONS	83	1.08	0.88	234	0.31	51.1	3.02	57	241	0.32	51.4	3.26	54	14.91	11.84	1.0681	0.0218	98.0
11-19	6W	REB @ MED LOAD W/LAMAR CONDITIONS	83	1.09	0.89	–	–	–	–	–	244	0.33	51.0	3.26	63	–	–	–	–	–
11-19	6W	REBURN @ MED LOAD W/GR @ 60%	83	1.12	0.91	–	–	–	–	–	235	0.32	52.7	3.33	55	–	–	–	–	–
11-19	6W	REBURN @ MED LOAD W/GR HIGH/LOW SA	83	1.09	0.87	–	–	–	–	–	203	0.27	59.1	3.01	74	–	–	–	–	–
11-19	6W	REB @ MED LOAD W/GR HIGH/LOWER SA	83	1.11	0.85	–	–	–	–	–	187	0.25	62.3	2.75	130	–	–	–	–	–
11-20	8W	REB @ MED LOAD W/LOW SA/HIGH GR	82	1.09	0.84	208	0.28	56.5	3.20	123	224	0.30	54.9	3.48	130	12.75	10.99	0.9865		
11-30	10W	REB @ MED LOAD W/HIGH RBZS-LOW HI%	82	1.13	0.99	314	0.42	34.4	4.11	29	320	0.43	35.7	3.77	59	7.24	11.34	1.4091	–	–
12-8	C3	REBURN @ MEDIUM LOAD	82	1.10	0.90	214	0.29	55.3	3.75	25	217	0.29	56.3	3.75	74	–	–	–	–	–
12-9	C9	REBURN @ MEDIUM LOAD	81	1.06	0.86	209	0.28	56.4	3.25	32	218	0.29	56.1	3.56	109	–	–	–	–	–
12-9	C11	REBURN @ MEDIUM LOAD	81	1.08	0.91	–	–	–	–	–	208	0.28	58.1	3.76	79	–	–	–	–	–
12-10	C18	REBURN @ MEDIUM LOAD	80	1.07	0.94	–	–	–	–	–	227	0.30	54.3	3.32	96	–	–	–	–	–
12-10	C17	REBURN @ LOW LOAD	70	1.08	0.90	–	–	–	–	–	200	0.27	56.3	3.06	101	–	–	–	–	–
12-5	25W	BASELINE – LOW LOAD	61	1.05	1.05	455	0.61	–	3.99	27	473	0.63	–	3.76	71	7.62	0.79	1.1292	–	–
12-1	14W	BASELINE – LOW LOAD	56	1.04	1.04	473	0.63	–	3.84	36	494	0.66	–	3.60	87	4.14	7.27	2.0205	–	–
11-20	7W	REBURN @ LOW LOAD W/LAMAR COND	60	1.08	0.95	232	0.31	50.0	3.22	43	247	0.33	49.0	3.50	68	17.37	15.64	1.1485	0.0170	98.5
12-4	24W	REB @ LOW LOAD W/OPT COND: TEST ABORT	59	1.02	0.91	172	0.23	63.0	3.51	68	177	0.24	63.5	3.28	107	20.74	–	1.7961	–	–
12-7	29W	REBURN @ LOW LOAD W/HIGH % HI	60	1.05	0.92	207	0.28	55.4	2.86	87	239	0.32	50.6	3.63	109	10.40	6.56	2.3332	–	–
12-7	30W	REBURN @ LOW LOAD W/MED % HI	60	1.05	0.93	246	0.33	47.0	3.61	47	277	0.37	42.8	4.10	92	3.17	–	1.2568	–	–
12-8	C4	REBURN @ LOW LOAD	60	1.10	0.90	251	0.34	45.9	3.60	30	265	0.35	45.2	3.73	87	–	–	–	–	–
12-9	C10	REBURN @ LOW LOAD	62	1.12	0.93	219	0.29	52.8	3.55	44	225	0.30	53.5	3.80	86	–	–	–	–	–
12-10	C16	REBURN @ LOW LOAD	61	1.07	0.95	–	–	–	–	–	294	0.39	39.3	3.61	116	–	–	–	–	–
11-20	9W	REB @ LOWEST LOAD W/LOW SA/HIGH GR	42	1.07	0.94	206	0.28	55.5	4.25	47	208	0.28	55.2	4.65	63	5.23	–	0.4792		
12-8	C5	REBURN @ LOWEST LOAD	44	1.15	0.89	213	0.29	54.1	4.10	44	210	0.28	54.7	4.31	100	–	–	–	–	–

APPENDIX NO. 8

Air Pollution Control Technology Company (APCO) Research Reports on Precipitator Performance

The following contains all the Nelson Dewey Precipitator Evaluation Reports prepared by APCO throughout the Cyclone Coal Reburning Project. Their review includes determining the precipitators performance during baseline and coal reburn operation. The reports included in this appendix are:

- Model Projections of Nelson Dewey Unit #2 Precipitator Performance following the Implementation of Coal Reburn Technology (includes addendum)

- Initial Projections of Nelson Dewey Unit #2 Precipitator Performance with the Application of Coal Reburn Technology

- Trip Report: Nelson Dewey Unit #2 Precipitator Inspection (September 16, 1991)

- Baseline Precipitator Performance Evaluation

MODEL PROJECTIONS OF NELSON DEWEY UNIT #2 PRECIPITATOR PERFORMANCE FOLLOWING THE IMPLEMENTATION OF COAL REBURN TECHNOLOGY

INTRODUCTION:

Babcock & Wilcox and Wisconsin Power and Light are taking part in a NO_x reduction program sponsored by the U. S. Department of Energy. This Coal Reburn Project has involved retrofitting boilers with pulverized coal burners to supplement existing cyclone burners. The pulverized coal burners are located in such a way as to alter the combustion and temperature profile of the boiler and, thereby, reduce NO_x emissions. Unit #2 of the Nelson Dewey Station of Wisconsin Power and Light was chosen as the demonstration unit for this technology.

It was anticipated that the modifications to the boiler would impact the performance of the precipitator used for particulate removal from flue gases exiting the boiler. The percentage of ash appearing as fly ash was expected to increase and the particle size distribution of the ash was expected to change. Fly ash from cyclone boilers typically has a small mass median diameter and contains a large number of fine particles. It was felt that the use of pulverized coal burners would increase the MMD of the ash exiting the boiler and reduce the percentage of fine particles. The effect of the change in the temperature profile on precipitator inlet particle size distribution was not known.

APCO Services, Inc. was asked to model the performance of the Nelson Dewey Unit #2 precipitator prior to the boiler modifications to determine if it was reasonable to expect the unit to remain in compliance with existing particulate emission limits after the modifications were made. Initial projections were made using: reburn data gathered at the SBS Combustor facility at the B & W Research Center in Alliance, Ohio; baseline performance test conducted by Acurex Corporation; precipitator electrical readings taken on May 31, 1990, just after the Acurex tests were completed;

and precipitator design data. The measured baseline collection efficiency while burning Lamar coal had been 82.6% (17.4% penetration) for a boiler load of 110 MW. Earlier data obtained while firing a different coal had indicated a collection efficiency of 92.9%. Model projections indicated a collection efficiency of 83.8% (16.2% penetration) as baseline performance. This represents a difference of 7% between measured and predicted performance. It was felt that this was good agreement between measured and predicted performance.

The above model projections were based on a particle size distribution having an MMD of 3.10 μm and a standard deviation of 2.46 (measured distribution for the SBS combustor). The gas flow rate of 475,000 acfm which was used was a measured value from an earlier test. The inlet mass loading of 0.0855 gr/acf (0.35 lb/MBtu) and the electrical conditions used were measured values. The non-ideal parameters which gave the best agreement between measured and modeled performance were a standard deviation in gas-flow distribution of 25% and a sneakage per baffled section of 10%. The values of these last two parameters were adjusted to obtain the best fit and are typical for older precipitators.

The model was next used to predict precipitator performance following the boiler modifications. Three gas flow rates were considered: the measured one above, 475,000 acfm; a calculated value of 440,000 acfm based upon an excess air of 30%; and 416,700 acfm which was calculated assuming 3.0% O_2 at the economizer outlet. Also, the electrical conditions for the precipitator fields were varied to determine how the precipitator would react to improvement in electrical conditions and how it would respond to changes in fly-ash resistivity. Finally, model runs were made by assuming no change in the inlet particle size distribution, and by assuming a size distribution having a larger MMD with a smaller percentage of fine particles.

The model projections of precipitator performance with-reburn indicated the following:

- o If no improvement in the electrical operating conditions was seen, the performance of the unit would be marginal for the increased inlet mass loading associated with reburning, assuming the size distribution shifted toward a larger MMD with a smaller percentage of fine particles.

- o If no improvement in the electrical operating conditions was seen, and the particle size distribution did not change with reburning; the unit would be out of compliance with emission standards.

- o Improving electrical operating conditions to those one would anticipate for the Lamar coal ash would improve precipitator performance significantly. It was felt that the unit should be in compliance even if the size distribution of the particulate at the ESP inlet remained essentially that of the without-reburn case.

The boiler modifications have been completed and the performance of the precipitator has been measured for both the Lamar coal and for a western coal. The mathematical model has now been used to see how well its predictions match actual performance for the two coals tested.

COMPUTER MODEL DESCRIPTION:

Predictions of precipitator performance were made using a mathematical model developed at Southern Research Institute[1,2] with the sponsorship of EPA. A flow diagram of the model showing important input parameters and some of the output information is shown in Figure 1.

The mathematical model is based on the exponential Deutch-Anderson equation. It is structured so that the precipitator is divided into small incremental lengths in the direction of gas flow. In each increment, calculations are made for each particle size band contained in the inlet particle size distribution. Also calculated for each incremental length are, the electric field at the plate, the particle charge for each particle size band, the migration velocities of the particles toward the plate, and collection efficiencies for each particle size band. The particulate which is not collected in a given increment becomes the inlet loading for the succeeding increment. The incremental structure of the model is required to allow for the changing conditions present along the length of a precipitator and to insure that the assumptions made in the Deutch-Anderson equation are met. The model computes length-averaged migration velocity as a function of particle size, and the overall mass collection efficiency by summation over the fractional collection efficiency. In addition, the model uses empirical expressions to adjust the length-averaged migration velocities for non-ideal effects such as gas bypassing a collector section (sneakage, S) and variations in the gas velocity distribution (%RMS deviation, σ_g). A sneakage of 10% per baffled section and σ_g of 25% are typically required to match measured performance with modeled results for older precipitators. For newer units, S = 5% and σ_g = 15% are usually more representative.

The model is very sensitive to change in: the electrical conditions within each collecting field, the inlet particle size distribution, the gas volume flow rate, the electrical properties of the gas, the electrical properties of the particles, rapping re-entrainment, and non-ideal effects.

If the particle size distribution does not change, variations in the inlet mass loading cause minor variations in the overall collection efficiency for inlet loadings less than 3-4 gr/acf, but opacity is very sensitive to changes in the mass loading.

INLET PARTICLE SIZE DISTRIBUTION:

The inlet particle size data used for the Lamar coal was from Test 6P. This distribution had an MMD of 4.35 and a standard deviation of 2.53. This distribution did not give good agreement between measured and modeled performance when other measured parameters were used.

No particle size data were available for the western coal. The size distribution measured during Test 6P was again used for these model runs.

INLET MASS LOADING:

The inlet mass loadings for the model were those found at the precipitator inlet for each of the tests with which model results were compared. These are listed in Table 1.

GAS VELOCITY DISTRIBUTION AND SNEAKAGE PER BAFFLED SECTION:

A standard deviation in gas flow distribution of 25% was used for Runs 1W and 3W (western coal tests). This was the value found to give the best fit of modeled-to-measured performance testing for the 1990 baseline test series. Other values were also tested for Test 6P since agreement between measured and modeled performance was not as good as expected.

The sneakage per baffled section of 10% used to give the best agreement for the baseline modeling was also used for these model runs. Again additional values of sneakage were used for Test 6P in an attempt to obtain better agreement between measured and modeled results.

Association for Information and Image Management
1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202

Centimeter

Inches

MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

5 of 9

PRECIPITATOR ELECTRICAL CONDITIONS:

Measured electrical conditions were used for each case considered. Readings taken during the tests were used for the western coal model runs. Electrical readings were not provided for the Lamar coal test, Test 6P. Therefore readings taken during Test 8P, Lamar coal with reburning and soot blowing at 110 MW, and Test 9P, Lamar coal with reburning at 82 MW, were used in the model for Test 6P. Additional model runs were made using calculated electrical conditions since using the above readings in association with other measured parameters did not give good agreement between model results and measured performance. The measured electrical readings are listed in Tables 2 - 5. Theoretical values for an ash resistivity of 3.0×10^{10} ohm-cm and 3.5×10^{10} ohm-cm are listed in Table 7.

OTHER MODEL INPUT PARAMETERS:

Other model input parameters such as flue-gas flow rate, average gas velocity, and flue gas temperature which were used were measured values. These are listed in Table 1. In an attempt to better understand the Test 6P result, a volume flow rate was calculated for use in the model. This will be discussed later. Also the same precipitator geometry as that used in the earlier modeling effort was used for this work.

MODEL RESULTS FOR CURRENT OPERATION:

A comparison of measured performance with predicted performance is given in Table 6. Again, the non-ideal parameters which gave the best agreement between measured and modeled performance for the western coal was a sneakage per baffled section (σg) of 10%, and standard deviation in gas flow distribution of 25% just as was the case for the 1990 baseline comparison. These were not the best non-ideal parameters for the Lamar coal run however. The agreement between model projections

of collection efficiency and measured collection efficiency was extremely good for Test 1W and Test 3W. Measured opacity data were not made available to APCO Services, so no comparison of the predicted values with measured values could be made.

Model Case (3) of the Test 6P comparison gave the closest agreement between modeled and measured collection efficiencies. In this case, the electrical conditions for Test 9P were used. The sneakage per baffled section was 5% and the standard deviation in velocity distribution was 15%. Using the same electrical conditions with 10% sneakage and a standard deviation in velocity of 25%, the model predicted a collection efficiency of 97.81%. The penetration for this efficiency would have been 2.19%, or three times the measured penetration of 0.7%. It should be noted that the collection efficiency for later performance tests (Tests F2, F3, and F5) ranged from 97.6 to 97.9% with an average collection efficiency of 97.7%.

Additional model runs were made in an effort to understand the poorer agreement between the above comparison for the Lamar coal than that found for the western coal. The coal burn rate of 91.34 klb/hr and the high heating value of the Lamar coal 11,151 BTU/lb were used to calculate the flow rate with 3.3% O_2 at 474°F. The calculated flow rate was 389,900 acfm, approximately 11% lower than the measured flow rate. This was used in the model along with the associated reduced average gas velocity of 3.52 ft/sec. All other input parameters were held constant with the exception of the sneakage, set at 10%, and the standard deviation in velocity distribution, set at 25%. The calculated collection efficiency for this case was 97.91% with the penetration again calculated to be approximately three times the measured value. The predicted opacity was 10.6%.

Next, the the original input data were used with calculated electrical readings for a dust resistivity of 3.5×10^{10} ohm-cm being substituted for the measured ones. These calculated

electrical conditions are listed in Table 7. Also, the non-ideal parameter, S = 10% and σ_g = 25% were used. Using these data, the model predicted collection efficiency was 98.42% and the predicted opacity was 8.0%.

The particle size distribution measured during Test 5P differed from that measured for Test 6P. It had an MMD of 6.40 μm and a standard deviation of 2.47. This was used along with the electrical conditions for an ash resistivity of 3.5×10^{10} ohm-cm and the above non-ideal conditions. The predicted efficiency for this case was 98.6 % and the predicted opacity was 5.4%. Keeping other input parameters of the above run fixed with the exception of changing electrical conditions to those calculated for a dust resistivity of 3.0×10^{10} ohm-cm, the calculated efficiency was 99.05% and the predicted opacity was 3.6%.

Next, the MMD of the inlet particle size distribution was changed to 8.40 μm with the other input parameters being the same as those in the last model run. The calculated efficiency was 99.29%, equal to the measured efficiency, and the predicted opacity was 2.3%. Thus obtaining agreement between the model and measured collection efficiency while using the same non-ideal parameters used for the other conditions modeled. This required the use of better electrical conditions and a different particle size distribution than those measured.

The measured electrical conditions used to model Test 6P were not obtained during the test. Soot blowing tend to suppress both currents and voltages especially for inlet fields. The Test 8P data may have been lower than those for Test 6P because of soot blowing. Also, the electrical conditions taken during the 82 MW tests (Test 5P) could have been poorer than those associated with Test 6P since the gas temperature would have been lower than that found at 110 MW. This lower temperature would have led to higher dust resistivity (see Figure 2) and, thus, poorer electrical conditions. It should be noted, however, that the average

measured resistivity, as seen in Figure 2, was greater than the 3.0×10^{10} ohm-cm used to obtain the electrical conditions which gave the good agreement between measured and modeled results.

No argument can be made for choosing the size distribution with an MMD of 8.4% and a σ_p of 2.47 over the measured one. The percentage of inlet particulate with diameters below 2 μm was approximately 21% for the measured distribution, while it would have been only 8% for the alternate distribution. The lower percentage of fine particles in the alternate size distribution had a greater impact on the increased collection efficiency than did the improved electrical conditions.

Other attempts to obtain better agreement between measured and modeled results were made but were not successful. These included modifying rapping or assuming no rapping losses. Thus, one can only speculate as to why the agreement was not as good for the Lamar cal as it was for the other cases modeled.

REFERENCES:

1. McDonald, J. R. A Mathematical Model of Electrostatic Precipitation (Revision 1): Volume I. Modeling and Programing. EPA-600/7-78-111a, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, June 1978.

2. Mosley, R. B., M. H. Anderson, and J. R. McDonald. A Mathematical Model of Electrostatic Precipitation (Revision 2). EPA-600/7-80-034, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, (1980).

Table 1. Input parameters for the precipitator model which were used in modeling the Unit 2 precipitator at Nelson Dewey Station of Wisconsin Power and Light.

Inlet mass loading	- Without Reburn	
	1W)	0.215 gr/ACF (0.4238 gr/DSCF)
	- With Reburn	
	3W)	0.497 gr/ACF (0.9908 gr/DSCF)
	6P)	0.692 gr/ACF (1.34 gr/DSCF)
Flue gas temperature	-475 °F	
Volume flow rates;	- 1W)	427,900 ACFM, SCA = 310 ft^2/kACFM
	- 3W)	451,300 ACFM, SCA = 294 ft^2/kACFM
	6P)	440,100 ACFM, SCA = 302 ft^2/kACFM
Face velocity	- 1W)	3.866 ft/sec
	- 3W)	4.077 ft/sec
	- 6P)	3.976 ft/sec
# of Electrical fields		4
Plate height		30 ft
Plate length		9, 4.5, 4.5, & 9 feet
# of gas passages		82
Plate-to-Plate spacing		9 inches
Wire-to-Wire spacing		9 inches (average)
Wire diameter		0.109 inches

Table 2. Measured precipitator electrical operating conditions for Nelson Dewey Unit #2, 11/16/92, used for Run 1W.

FIELD	VOLTAGE (kV)	CURRENT (mA)
1	41	190
2	41.5	210
3	39.5	250
4	41.5	1350

Table 3. Measured precipitator electrical operating conditions for Nelson Dewey Unit #2, 11/15/92, used for Run 3W.

FIELD	VOLTAGE (kV)	CURRENT (mA)
1	39.5	350
2	44	250
3	39.5	400
4	39.5	1350

Table 4. Measured precipitator electrical operating conditions for Nelson Dewey Unit #2, 5/20/92, used for Run 6P.

FIELD	VOLTAGE (kV)	CURRENT (mA)
1	36.5	230
2	35.5	200
3	35.5	250
4	40.5	1470

Table 5. Measured precipitator electrical operating conditions for Nelson Dewey Unit #2, 5/19/92, used for Run 6P.

FIELD	VOLTAGE (kV)	CURRENT (mA)
1	36.5	235
2	38	220
3	36	210
4	41	1450

Table 6. Comparison of precipitator model predictions with measured performance for the Unit 2 precipitator at Nelson Dewey Station of Wisconsin Power and Light.

TEST #	MEASURED EFFICIENCY (%)	PREDICTED EFFICIENCY (%)	PREDICTED OPACITY (%)
1W	97.3	97.34	4.4
3W	98.2	98.21	6.7
6P (1)	99.3	98.08	10.7
6P (2)	99.3	97.02	14.9
6P (3)	99.3	98.67	7.5
6P (4)	99.3	97.81	11.1

NOTE 6P (1): 5/20/1992 Electrical Conditions, S = 5%, σg = 15%
(2): 5/20/1992 Electrical Conditions, S = 10%, σg = 25%
(3): 5/19/1992 Electrical Conditions, S = 5%, σg = 15%
(4): 5/19/1992 Electrical Conditions, S = 10%, σg = 25%

Table 7. Calculated precipitator electrical operating conditions for Nelson Dewey Unit #2 used for Test 6P assuming an ash resistivity of 3.0×10^{10} ohm-cm.

FIELD	VOLTAGE (kV)	CURRENT (mA)
1	41.6	599
2	40.5	445
3	38.8	487
4	37.0	1270

Calculated precipitator electrical operating conditions assuming an ash resistivity of 3.0×10^{10} ohm-cm.

FIELD	VOLTAGE (kV)	CURRENT (mA)
1	42.0	656
2	41.0	489
3	39.0	523
4	37.3	1370

ADDENDUM TO

MODEL PROJECTIONS OF NELSON DEWEY UNIT #2 PRECIPITATOR PERFORMANCE FOLLOWING THE IMPLEMENTATION OF COAL REBURN TECHNOLOGY

Acurex Environmental Corporation issued a report entitled: "Hazardous Air Pollutant Monitoring: Demonstration of Coal Reburning For Cyclone Boiler NO_x Control, Data Summary Report," dated April 1993. The precipitator performance test results found in this report supplement previous data for comparison performance with and without boiler reburn conditions. An Indiana bituminous (Lamar) coal was being burned during this test series.

The tests were performed during November 2-6, 1992. Two baseline tests were followed by two reburn tests which were then followed by a baseline and then a reburn test. The boiler was operated at a nominal load of 111 MW; and reburn, when in use, provided 30% of the heat input to the boiler.

The chemistry of the coal burned during the test was very similar to previous samples of Lamar coal. The moisture content was 15.68% and the ash content was 6.4%. This ash level represented an ash content of approximately 5.8 lb/MMBtu. Inlet mass loadings measured for the baseline cases averaged approximately 1.35 lb/MMBtu. This corresponds to 23% of the ash being converted to fly ash. With reburn, the average inlet mass loading was approximately 2.52 lb/MMBtu which would represent 44% of the ash appearing as fly ash.

The average collection efficiency of the precipitator for the baseline case was 97.3% while the average collection efficiency during the reburn case was 99.2%. Using these efficiencies and the above estimated inlet mass loadings, one would estimate that the emissions for the baseline case would have been .036 lb/MMBtu and for the with-reburn case, .020 lb/MMBtu. The outlet emissions in terms of lb/hr ranged from 25 lb/hr to 41 lb/hr for the three

baseline tests and 7.5 lb/hr to 37 lb/hr for the reburn tests. The limited number of tests and the fact that the ranges of emissions overlap for the two test conditions would lead one to question the validity of making a statement about the average reburn emissions being lower than the average baseline emissions. In order to see if this difference was statistically meaningful, earlier performance data were reviewed.

Limited data are available for baseline conditions. The 1990 baseline result indicated an average emission rate of 0.061 lb/MMBtu and Tests 4A and F19 had emission rates of approximately 0.14 lb/MMBtu and 0.15 lb/MMBtu respectively. Another test indicated an emission rate of 0.041 lb/MMBtu. Averaging these four tests gives an emission rate for the baseline case of 0.098 $\pm$ 0.48 lb/MMBtu.

Fourteen reburn tests made for several boiler firing conditions were used to determine the average reburn emissions. The average emissions for these tests was 0.024 $\pm$ 0.015 lb/MMBtu. The average collection efficiency for these 14 tests was 97.6 $\pm$ 2.1%. Collection efficiencies for baseline runs ranged from 82% to 98.6%. Average emissions from these tests would indicate that the reburn emissions are statistically lower than emissions for baseline conditions. But again, the limited number of baseline tests and the large spread in their results should make one cautious about making such a statement.

If emissions are indeed lower for the reburn technology, one must ask what changes in precipitator performance lead to this result. The inlet mass loading is higher with reburn and the collection efficiency is higher. The mass loadings measured for both boiler firing conditions are such that they should not significantly impact performance. One would expect a change in particle size distribution for the inlet mass in the reburn case. Limited particle size data were available for baseline full-load conditions. This limited data indicates that 43% of the mass has

a particle diameter smaller than 2 μm under baseline conditions. More data were available for reburn conditions. These data indicate that an average of 27% of the mass has particle diameters smaller than 2 μm. Precipitator collection efficiency is low for particle diameters in the range of 0.2 to 2 μm with the minimum efficiency occuring at approximately 0.6 to 0.7 μm. The greater number of fine particles with baseline firing conditions most likely contributes to the higher emission rates for this firing condition.

Another factor which could lead to improved precipitator performance is lower gas temperature with reburn. Flue gas temperature at the precipitator inlet for baseline conditions was in the range of 525°F to 550°F while the inlet temperature ranged from 470°F to 500°F during reburn operation. If heat rate and excess air were the same for both firing conditions, the average volume flow rate for reburn would be lower than the average flow rate for baseline due to the lower exit gas temperature. This lower flow rate would lead to improved precipitator performance if precipitator electrical conditions did not change.

The emissions with reburn, in any case, was well below the emission limit of 0.1 lb/MMBtu. While it was possible to obtain emissions below this limit for the baseline case, some tests indicated baseline emissions above this level. Thus, from the standpoint of precipitator performance, reburn firing is as good or better than cyclone-only firing.

Finally, all of the data were reviewed in terms of the ability to model the precipitator's performance. Table 1A, on the following page, summarizes the results of this review.

Table 1A. Summary of the comparison of measured precipitator performance with modeled precipitator performance for Nelson Dewey Unit #2.

Test	Measured Efficiency (%)	Modeled Efficiency (%)
1990 Baseline	82.6-92.3	83.8
Nov. 92 Baseline	97.3	97.8
1W	97.3	97.3
6P	99.3	97.8
3W	98.2	98.2
Nov. 92 Reburn	99.2	98.5

During the 1990 baseline tests only 8-10% of the ash appeared as fly ash. It is felt that this produced a finer inlet particle size distribution and that this was the primary contributor to the low collection efficiencies measured during these tests. Later baseline tests indicated that approximately 25% of the ash was converted to fly ash. Thus, one would expect a smaller percentage of fine particles.

Electrical conditions were not available for modeling the November 1992 tests. Flue gas volumes and gas temperatures were also not available. The electrical conditions were calculated assuming an ash resistivity of 2.0×10^{10} ohm-cm and flue gas volumes were calculated from coal chemistry by assuming a boiler input of 1,020 MMBtu/hr. In all cases but Test 6P, the non-ideal parameters used to obtain the model results were a sneakage per baffle section of

10% and a standard deviation in gas flow distribution of 25%. It is felt that in general the model does an adequate job of predicting precipitator performance and that the knowledge gained from this project can be used to estimate performance of precipitators for future projects.

PROJECTIONS OF NELSON DEWEY UNIT #2 PRECIPITATOR PERFORMANCE WITH THE APPLICATION OF COAL REBURN TECHNOLOGY

INTRODUCTION:

Babcock & Wilcox is involved in an NO_x reduction program for cyclone fired boilers sponsored by the U.S. Department of Energy. The Coal Reburn Project involves retrofitting boilers with pulverized coal burners to supplement existing cyclone burners. The PC burners will be located in such a way as to alter the temperature profile of the boiler and thereby reduce the production of NO_x. The technology has been tested at pilot-scale in the SBS combustor at the B&W Research and Development Center in Alliance, Ohio. A full-scale demonstration is planned on Unit #2 of the Nelson Dewey Station of Wisconsin Power and Light.

Particulate emissions from Nelson Dewey Unit #2 are controlled by an electrostatic precipitator. The application of reburn technology will impact the performance of the precipitator. The mass emissions from the boiler will increase with coal reburn which will increase the mass loading into the precipitator. One would also anticipate a change in the particle size distribution of the material entering the precipitator when reburning is implemented and there is the possibility that the resistivity of the ash might change. All of these changes will have an effect on precipitator performance.

APCO Services, Inc. was contracted by B&W to perform "in-situ" resistivity measurements at the outlet of the SBS combustor to determine the effect that reburn would have on ash resistivity. APCO Services was also employed to make projections of the Unit #2 precipitator performance when the reburn technology is implemented. A mathematical model of the precipitator was used in making these these projections. First, data taken during baseline testing for cyclone firing only was used to set up the precipitator model. Then changes in model input parameters indicated by data obtained during reburn tests at the SBS combustor were used to predict performance during reburn.

Electrical data were obtained from the precipitator TR sets at the conclusion of the Baseline Tests. These readings were not consistent with those one would predict for the operating conditions of the boiler and/or the characteristics of the fly ash. Thus the model was also used to predict precipitator performance under ideal conditions. This report gives the results of the precipitator modeling effort and makes recommendations for performance improvement.

ESTIMATIONS OF PRECIPITATOR PERFORMANCE:

A model developed by Southern Research Institute[2,3] with the sponsorship of EPA was used to model the precipitator. The mathematical model is based on the exponential Deutch-Anderson equation. It is structured such that the precipitator is divided into small incremental lengths in the direction of gas flow. In each increment, calculations are made for each particle size contained in the inlet particle size distribution. Also calculated for each incremental length are, the electric field at the plate, the particle charge for each particle size, the migration velocities of the particles toward the plate, and collection efficiencies for each particle size. The particulate which is not collected in a given increment becomes the inlet loading for the succeeding increment. The incremental structure of the model is required to allow for the changing conditions present along the length of a precipitator and to insure that the assumptions made in the Deutch-Anderson equation are met. The model computes length-averaged migration velocity as a function of particle size, and an overall mass collection efficiency by summation over the fractional collection efficiencies. In addition, the model uses empirical expressions to adjust the length-averaged migration velocities for non-ideal effects such as gas bypassing a collector section (sneakage, S) and variations in the gas velocity distribution (%RMS deviation, σ_g). A sneakage of 10% per baffled section and a σ_g of 25% are typically required to

match measured performance with modeled results for older precipitators. For newer units, S = 5% and σ_g = 15% are usually more representative.

The model is very sensitive to change in: the electrical conditions within each collecting field, the inlet particle size distribution, the gas volume flow rate, the electrical properties of the gas and of the particles, rapping re-entrainment, and non-ideal effects. Variations in the inlet mass loading cause minor variations in the overall collection efficiency, but it can have a significant impact on stack opacity.

Nelson Dewey Unit #2 precipitator design data were used for geometry related input parameters of the model. Coal and ash chemistries were used to calculate flue gas volume flow rates, ash resistivity, and inlet mass loadings. Three flow rates were used in the modeling effort: 440,000 ACFM based upon 30% excess air (3.9 % O2 at ESP inlet), 416,700 ACFM based upon 3.0 % O2 as measured at economizer outlet, and 475,000 ACFM from earlier data provided by WPL. Flow rates measured during the baseline tests at full load conditions were in the range of 422,000 ACFM to 462,000 ACFM. The modeled flows span this range.

Inlet mass loadings without reburn were calculated for each flow rate based upon the measured inlet loading of approximately 0.35 lb/MBTU. Next, inlet mass loadings were calculated based upon 10% of the ash appearing as fly ash without reburn and 85% of the reburn ash appearing as fly ash. In making these calculations, it was assumed 72% of the coal would be fired through the cyclone burners and 28% through the PC burners. These were the percentages found in pilot-scale tests. Thus, the percentage of ash entering the precipitator as fly ash with reburning would be:

$$72\% \times .10 + 28\% \times .85 = 31\%$$

Ash resistivity was calculated to aid in determining the precipitator electrical conditions one would expect for a unit in good mechanical condition and to see if one should anticipate a time dependent degradation in ESP performance. One can see form the plot that operating at 525°F, the initial resistivity would be in the mid 10^{10} ohm-cm range. With time, one would expect the layer adjacent to the collection plates become depleted in sodium leading to an increase in the resistivity of this depleted layer to 2 - 3 x 10^{11} ohm-cm. Figure 1 is a plot of calculated resistivity versus temperature for the Lamar coal burned during the baseline testing at Nelson Dewey Station. Similar calculations for the ash chemistry of a sample from the pilot-scale unit are shown in Figure 2. Resistivity calculation results are given in an appendix. The results of the calculations indicate that a time dependent degradation in precipitator performance should be expected.

Table 1. list the results from "in-situ" resistivity measurements made at the SBS combustor facility. One can see that the resistivity predicted above for an undepleted layer is in good agreement with measured resistivities at the assumed operating temperature of 525°F. Also, one can see that little difference was seen between measured values with reburn and those found without reburn. Thus one would not expect any changes in precipitator field electrical conditions due to a change in ash resistivity when reburning is initiated.

The particle size distribution measured during the SBS tests without reburn and with reburn were very similar (see Figure 3). A log-normal distribution which fit a wide range of these data, MMD = 3.1 um and σp = 2.46, was used to model the without reburn cases, and for some of the with reburn model runs. A second size distribution was constructed by proportionately adding the above size distribution to an average distribution for bituminous coal ashes from PC boilers from an EPRI study (MMD = 16.3, σp = 3.4). The constructed distribution had a mass median

Table 1. In Situ Resistivity measured at the outlet of the Babcock & Wilcox Research Center pilot combustor.

DATE	TIME	GAS TEMPERATURE (°F)	RESISTIVITY V-I (ohm-cm)	RESISTIVITY SPARK (ohm-cm)
With Reburn:				
4/2/90	1220	496	7.5×10^{10}	
4/3/90		532		2.1×10^{10}
4/3/90	1626	514	4.2×10^{10}	
4/3/90	1750	536	4.6×10^{10}	4.5×10^{10}
4/3/90	1910	538	6.9×10^{10}	5.8×10^{10}
Baseline:				
4/5/90	0956	534	2.4×10^{10}	4.6×10^{10}
4/5/90	1325	496	5.9×10^{10}	5.9×10^{10}
4/5/90	1631	511	4.3×10^{10}	3.7×10^{10}

diameter (MMD) of 15.0 um and a standard deviation (σp) of 4.85. This distribution is also shown in the plot of cumulative percent mass versus particle diameter shown in Figure 3.

For each case modeled, a range of non-ideal parameters, sneakage per baffled section (S) and standard deviation in velocity distribution (σg), was used. Again, S = 10% and σg = 25% give the best agreement between measured and modeled results for older precipitators while S = 5% and σg = 15% are more representative of newer ESPs. S = 0, σg = 0 would represent an ideal precipitator.

Model input parameters, with the exception of predicted improved electrical conditions, are listed in Tables 2 and 3. Table 4 are electrical conditions predicted from Electric Power Research Institute correlations between resistivity and electrical operating conditions. Comparing the operating conditions measured on May 31, 1990 (Table 3) to the computed values shown in Table 4,

the measured inlet field readings would indicate that the ash resistivity was on the order of 1×10^{12} ohm-cm. The measured currents were also indicative of a resistivity in the range of 10^{12} ohm-cm, while the measured voltage for the outlet field was indicative of a resistivity on the order of 5×10^{10} ohm-cm.

Electrical readings were also obtained from the TR sets of the Unit #1 precipitator on May 31, 1990. These readings are listed in Table 5; they are are more representative of those to be expected for the Lamar coal ash. One can see good agreement between these reading and those predicted for a 5×10^{10} ohm-cm ash. This then calls into questions the readings obtained from Unit #2. Were they due to a depleted ash layer, or to problems within the precipitator? Plant personnel indicated that Unit #2 had been firing Lamar coal for approximately a week at the time that the precipitator data were obtained, and that ESP performance had deteriorated with the switch to Lamar coal. It is felt that a week is too short a time for the ash layer to have become depleted in sodium to the extent that the electrical data would indicate. Thus, the poor electrical conditions must have been due, at least in part, to problems within the precipitator, or firing conditions of the boiler.

The mass collection efficiency was calculated to be 82.6% based upon the inlet and outlet loadings measured during baseline tests at 110 MW. That is:

Inlet mass loading = 0.35 lb/MBTU

Outlet mass loading = 0.061 lb/MBTU

EFFICIENCY = (1 - 0.061/0.35) = .826

Earlier data had indicated an inlet loading of 0.364 lb/MBTU and an outlet loading of 0.026 lb/MBTU these data would indicate a collection efficiency of 92.9 %. Thus, one should expect a

Table 2. Input parameters for the precipitator model which were used in modeling the Unit 2 precipitator at Nelson Dewey Station of Wisconsin Power and Light.

Inlet mass loading	- Without Reburn	
	1)	0.0855 - 0.107 gr/ACF
	2)	0.0923 - 0.115 gr/ACF
	3)	0.0975 - 0.122 gr/ACF
	- With Reburn	
	1)	0.300 gr/ACF
	2)	0.322 gr/ACF
	3)	0.342 gr/ACF
Flue gas temperature	-525 °F	
Volume flow rates;	-1)	475,000 ACFM, SCA = 279 ft^2/kACFM
	-2)	440,000 ACFM, SCA = 302 ft^2/kACFM
	-3)	416,700 ACFM, SCA = 318 ft^2/kACFM
Face velocity	-1)	4.29 ft/sec
	2)	3.97 ft/sec
	3)	3.76 ft/sec
# of Electrical fields		4
Plate height		30 ft
Plate length		9, 4.5, 4.5, & 9 feet
# of gas passages		82
Plate-to-Plate spacing		9 inches
Wire-to-Wire spacing		9 inches (average)
Wire diameter		0.109 inches

Table 3. Measured precipitator electrical operating conditions for Nelson Dewey Unit #2, 5/31/90, 0957.

FIELD	AVERAGE VOLTAGE (kV)	AVERAGE CURRENT (mA)
1	34.5	90
2	36	60
3	34.5	60
4	36.5	300

Table 4. Calculated precipitator electrical operating conditions for Nelson Dewey Unit #2 for indicated ash resistivities.

FIELD	RESISTIVITY (ohm-cm) 5×10^{10}		1×10^{11}		1×10^{12}	
	VOLTAGE (kV)	CURRENT (mA)	VOLTAGE (kV)	CURRENT (mA)	VOLTAGE (kV)	CURRENT (mA)
1	40.8	509	39.2	357	34.1	113
2	39.7	374	38.1	261	33.2	79
3	38.2	430	37.0	328	33.3	133
4	36.3	1116	35.0	846	31.0	336

Table 5. Measured precipitator electrical operating conditions for Nelson Dewey Unit #1, 5/31/90, 0954.

FIELD	AVERAGE VOLTAGE (kV)	AVERAGE CURRENT (mA)
1	39.5	250
2	43.0	400
3	36.5	460
4	36.0	900

collection efficiency in the range of 82.6% to 92.9% with the 82.6% being representative of performance with the Lamar coal ash. Efficiency was not measured on May 31, 1990 when the above electrical data were taken, but it was assumed that the performance would have been similar to that of the baseline tests. Stack opacity was 10 to 10.5% at the time the electrical readings were obtained. This could be compared with opacity levels during baseline testing to determine if the above assumption is valid.

Table 6 presents the model results without reburn. Run ND-1, S = 10%, σ_g = 25%, yields the closest fit to baseline measured efficiency. This run assumed a volume flow rate of 475,000 ACFM and an inlet loading of 0.35 lb/MBTU. Measured electrical conditions were used. Both efficiency and opacity were reasonably close to measured values. Run ND-3, S = 10%, σg = 25%, was the best fit to opacity for any of the without reburn runs. The predicted efficiency for this run would have led to an emission rate of 0.045 lb/MBTU which is 25% below that measured during baseline testing. The emission rate predicted for Run ND-1 would have been 0.057 lb/MMBTU as compared to the measured value of 0.061 lb/MMBTU.

Table 7 presents the results of calculations for the without reburn case which were made after assuming that 10% of the coal ash appears as fly ash at the ESP inlet. All other model input parameters used in these projections were the same as those used for the runs presented in Table 6. By comparison, one can see that the major change between the results of Table 6 and those of Table 7 is an increase in the predicted opacities as the inlet mass loading is increased. It was felt that the model was giving reasonably accurate fits to measured results as configured. Therefore runs were made to predict performance with reburn.

The reburn projections were first made by assuming that the only input parameters which would change were the inlet size distribution and the inlet mass loading. The inlet size distribution used was that constructed from the combining of the measured SBS distribution and the EPRI distribution. The model results obtained after these changes were made are given in Table 8. The run corresponding to Run ND-1, Run ND-7 (flow rate = 475,000 ACFM, S = 10%, and σ_g = 25%) predicts an opacity of approximately 16% for a boiler load of 110 MW. The emission rate for an efficiency of 93.02% would be on the order of .095 lb/MMBTU. If one assumes that the without reburn run most representative of baseline performance was Run ND-3, the corresponding run, ND-9, would predict a with reburn opacity of approximately 14% and the emission rate approximately 0.075 lb/MMBTU. Thus, the predicted emission level is below the permitted level of 0.14 lb/MMBTU for Nelson Dewey Unit #2. It is felt that an opacity margin of 4-6% is smaller than one would like in order to allow for boiler upsets, soot blowing, and uncertainties in the model projections.

Next, model projections were made assuming no change in inlet particle size distribution with reburning, and electrical conditions similar to those obtained on May 31, 1990. Calculations were made only at the intermediate flow rate, 440,000 ACFM. The results of these calculations are given in Table 9, Run ND-10. One can see that the unit would be out of compliance if the size distribution remained unchanged. The predicted opacity would be 34% and the calculated emission rate 0.19 lb/MMBTU. For higher flow rates or poorer electrical conditions the precipitator's performance would be worse than this projection.

Also shown in Table 9 are calculation showing the effects of improved electrical conditions. The input parameters of Run ND-10 were not changed except for the electrical conditions of each field. Run AND1, used electrical conditions indicative of an ash having a resistivity of 5 x 10^{10} ohm-cm (see Table 4). For these

conditions, The model predicted an opacity similar to that observed when the electrical reading were taken on May 31, 1990. The predicted emission rate would be 0.051 lb/MMBTU.

Run AND2, used the same input as Run ND-10 except for the substitution of electrical conditions one would expect for an ash having a resistivity of 1×10^{11} ohm-cm. The predicted opacity for this case would be on the order of 15% and the emission rate would be approximately 0.075 lb/MMBTU. These results show the trend one should expect as the ash layer on the plates becomes depleted in sodium.

CONCLUSIONS AND RECOMMENDATIONS:

It is felt that the baseline performance of the Nelson Dewey Unit #2 precipitator has been adequately modeled assuming the electrical condition obtained on May 31, 1990 were representative of those seen during the baseline tests. Using this model, projections of precipitator performance with reburn indicate the following:

- If no improvement in the electrical operating conditions is seen, the performance of the unit will be marginal for the increased inlet mass loading associated with reburning, assuming the size distribution shifts toward a larger MMD with a smaller percentage of fine particles.

- If no improvement in the electrical operating conditions is seen, and the particle size distribution does not change with reburning; the unit will be out of compliance with emission standards.

- Improving electrical operating conditions to those one would anticipate for the Lamar Coal ash would improve precipitator performance significantly. The unit should be in compliance even if the size distribute of the

particulate at the ESP inlet remains essentially that of the without reburn case.

Improvements in the operation of the precipitator should be possible, With that in mind, one should consider:

- o Performing an internal inspection of the Unit 2 ESP to determine if mechanical and/or alignment problems or rapping problems are contributing to the poor electrical conditions. Flow distribution problems and re-entrainment problems which would reduce performance could also be looked for during the inspection.

- o Installing a means of sodium injection to condition the ash in order to reduce resistivity and to avoid the apparent sodium depletion which is experienced when burning the Lamar coal.

[illegible] Precipitator model results, without [illegible] burn case for the three flows modeled, using the inlet mass load[illegible]s calculated by assuming 0.35 lb/MBTU at the inlet.

INLET PARTICLE SIZE DISTRIBUTION: MMD = 3.1 um, σ_p = 2.46

RUN #	FLOW RATE (acfm)	MASS LOADING (gr/acf)	AVERAGE VOLTAGE (kV)	CUR DEN (nA/cm2)	S (%)	σ_g (%)	EFFICIENCY (%)	OPACITY (%)
ND1	475,000	0.0855	34.1	4.13	0	0	88.74	8.9
					5	15	86.48	10.2
					5	20	86.03	10.4
					5	30	84.92	10.9
					10	15	84.85	11.1
					10	25	83.80	11.6
ND2	416,700	0.0975	34.9	4.37	0	0	92.61	7.0
					5	15	90.69	8.3
					5	20	90.28	8.5
					5	30	89.30	9.2
					10	15	89.30	9.2
					10	25	88.34	9.8
ND3	440,000	0.0923	34.9	4.37	0	0	91.52	7.5
					5	15	89.48	8.8
					5	20	89.06	9.0
					5	30	88.03	9.6
					10	15	88.02	9.7
					10	25	87.02	10.2

Ta[illegible] 7. Precipitator model results, withou[illegible]eburn case for the three flows modeled, using the inlet mass loadings calculated by assuming 10% of the coal ash appears as fly ash.

INLET PARTICLE SIZE DISTRIBUTION: MMD = 3.1 um, σ_p = 2.46

RUN #	FLOW RATE (acfm)	MASS LOADING (gr/acf)	AVERAGE VOLTAGE (kV)	CUR DEN (nA/cm2)	S (%)	σ_g (%)	EFFICIENCY (%)	OPACITY (%)
ND4	475,000	0.107	34.1	4.13	0	0	88.58	11.2
					5	15	86.30	12.7
					5	20	85.85	13.0
					5	30	84.74	13.6
					10	15	84.67	13.8
					10	25	83.62	14.4
ND5	416,700	0.122	34.9	4.37	0	0	92.48	8.8
					5	15	90.54	10.4
					5	20	90.14	10.7
					5	30	89.15	11.5
					10	15	89.14	11.6
					10	25	88.18	12.3
ND6	440,000	0.115	34.9	4.37	0	0	91.39	9.4
					5	15	89.34	10.9
					5	20	88.92	11.2
					5	30	87.88	12.0
					10	15	87.86	12.1
					10	25	86.86	12.8

Ta[illegible] 1. Precipitator model results, withou[illegible] burn case for the three flows modeled, using the inlet mass loadings calculated by assuming 10% of cyclone ash and 85% of reburn ash appears as fly ash.

INLET PARTICLE SIZE DISTRIBUTION: MMD = 15.0 um, σ_p = 4.85

RUN #	FLOW RATE (acfm)	MASS LOADING (gr/acf)	AVERAGE VOLTAGE (kV)	CUR DEN (nA/cm2)	S (%)	σ_g (%)	EFFICIENCY (%)	OPACITY (%)
ND7	475,000	0.300	34.1	4.13	0	0	95.26	12.2
					5	15	94.26	13.8
					5	20	94.06	14.1
					5	30	93.55	14.7
					10	15	93.52	14.9
					10	25	93.02	15.6
ND8	416,700	0.342	34.9	4.37	0	0	96.90	9.6
					5	15	96.09	11.3
					5	20	95.91	11.6
					5	30	95.48	12.4
					10	15	95.48	12.5
					10	25	95.05	13.3
ND9	440,000	0.322	34.9	4.37	0	0	96.46	10.2
					5	15	95.58	11.9
					5	20	95.40	12.2
					5	30	94.94	12.9
					10	15	94.93	13.0
					10	25	94.47	13.7

9. Precipitator model results, without reburn case for the three flows modeled, using the inlet mass loadings calculated by assuming 10% of cyclone ash and 85% of reburn ash appears as fly ash.

INLET PARTICLE SIZE DISTRIBUTION: MMD = 3.1 um, σ_p = 2.46

RUN #	FLOW RATE (acfm)	MASS LOADING (gr/acf)	AVERAGE VOLTAGE (kV)	CUR DEN (nA/cm2)	S (%)	σ_g (%)	EFFICIENCY (%)	OPACITY (%)
ND10	440,000	0.322	34.9	4.37	0	0	90.41	26.7
					5	15	88.29	30.3
					5	20	87.86	30.9
					5	30	86.81	32.5
					10	15	86.77	32.8
					10	25	85.75	34.2
AND1	440,000	0.322	38.4	19.7	0	0	98.34	5.4
					5	15	97.47	7.7
					5	20	97.26	8.2
					5	30	96.73	9.4
					10	15	96.77	9.4
					10	25	96.21	10.6
AND2	440,000	0.322	36.6	14.5	0	0	97.22	8.8
					5	15	96.04	11.7
					5	20	95.77	12.3
					5	30	95.09	13.8
					10	15	95.14	13.8
					10	25	94.44	15.2

Figure 1. Calculated resistivity Versus temperature for the Lamar coal burned at Nelson Dewey Station.

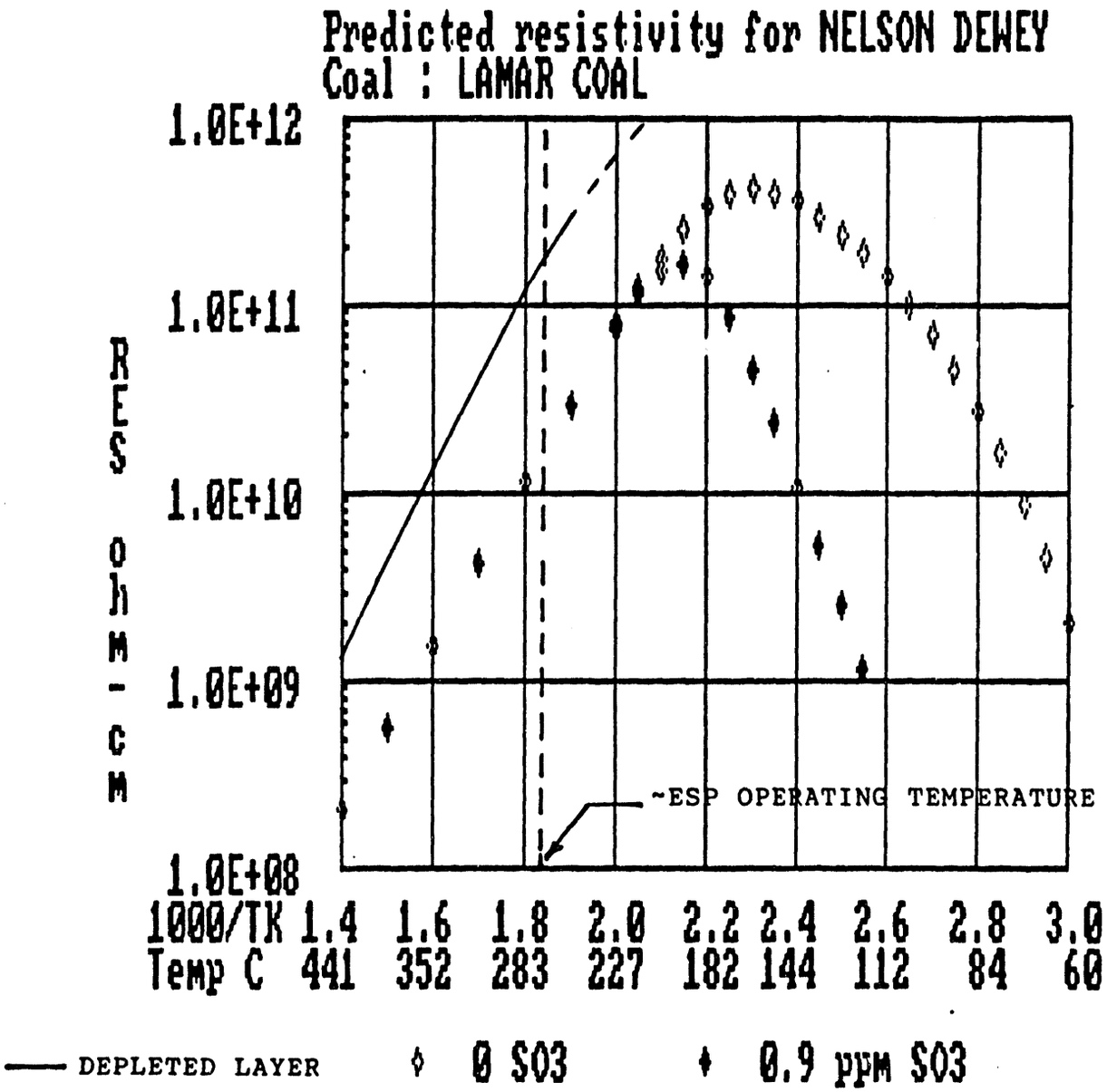


Figure 2. Calculated resistivity versus temperature for the Lamar coal burned in the B&W Pilot.

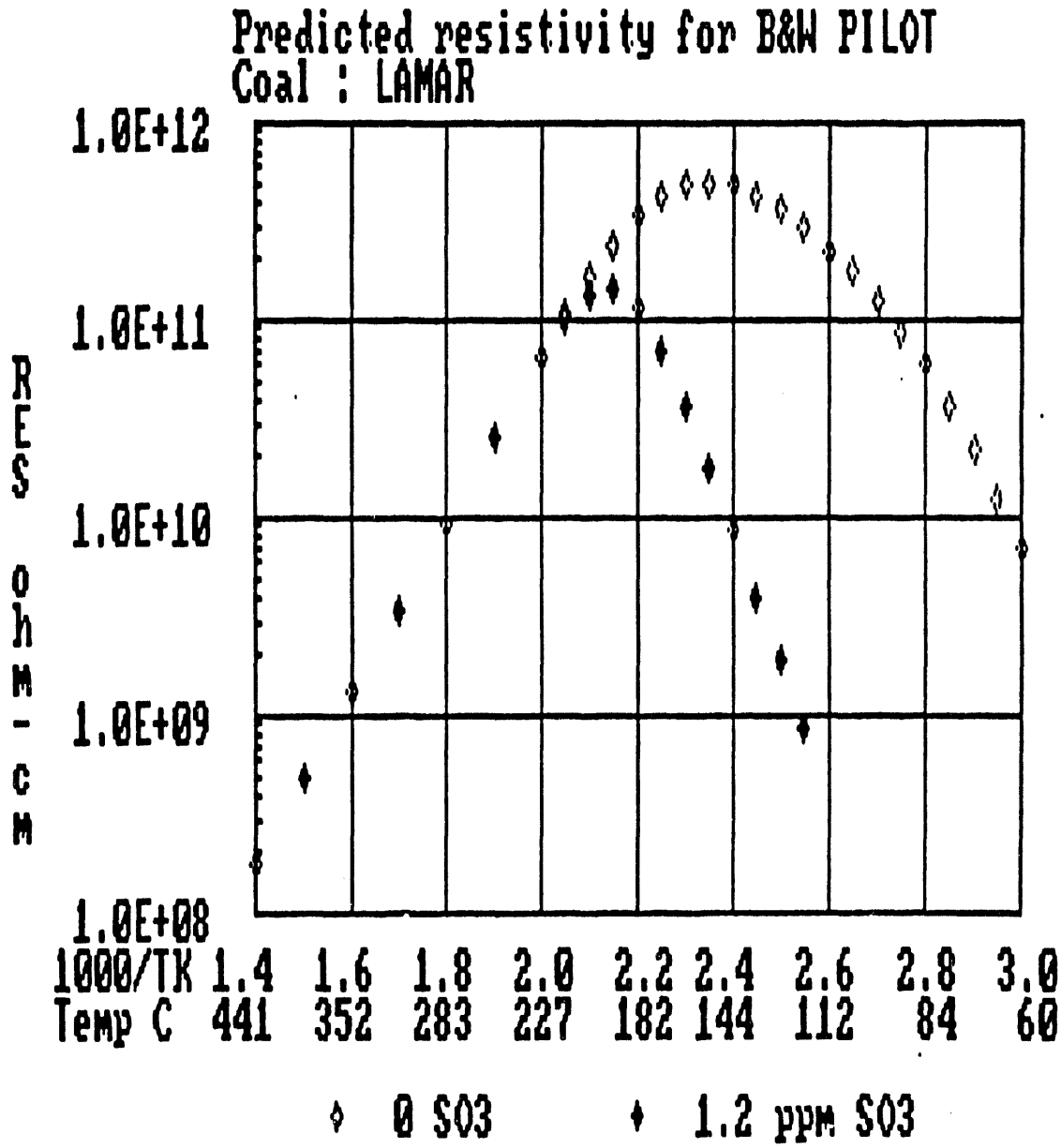
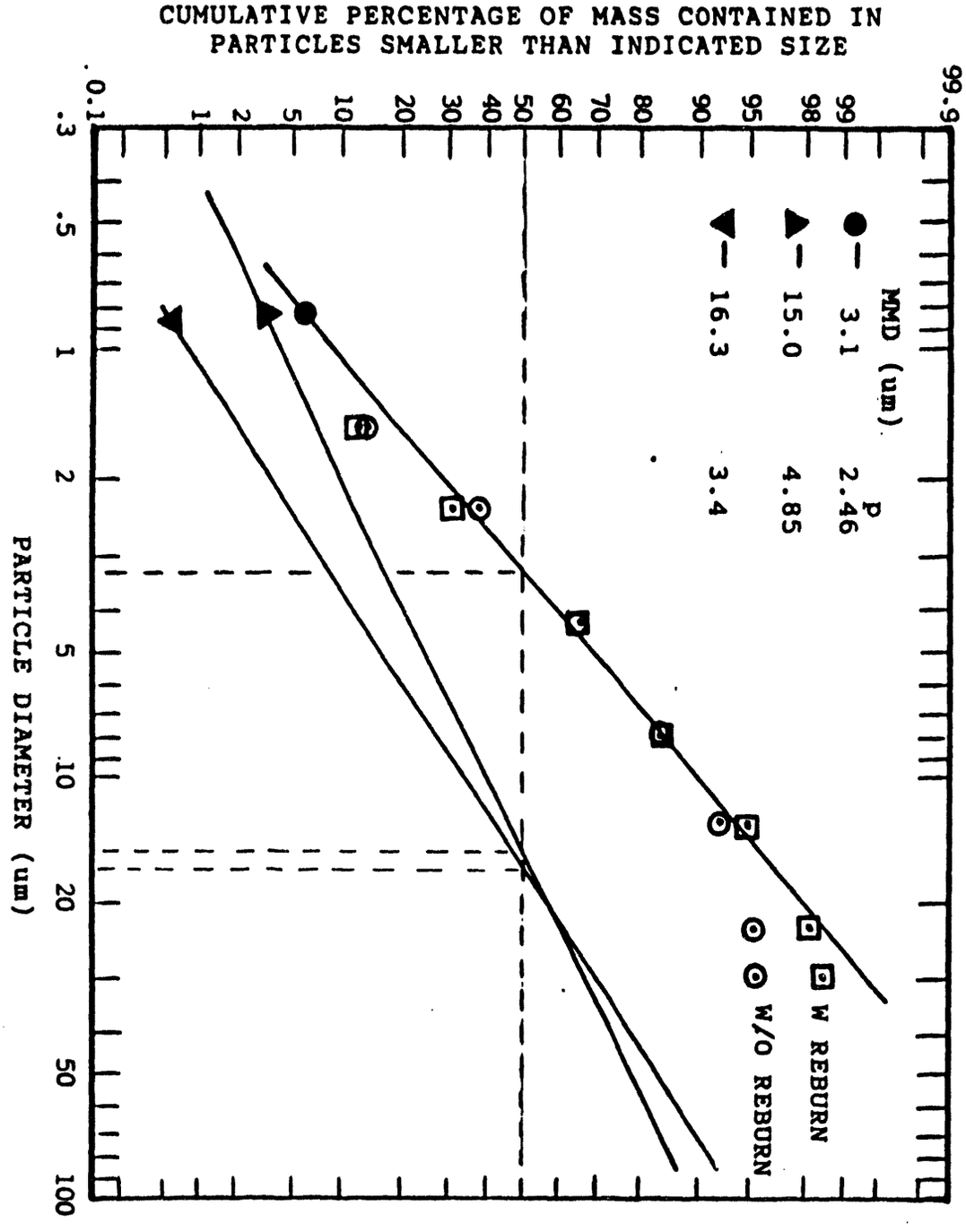


Figure 3. Plots of the precipitator inlet particle size distributions used to model the performance of the Nelson Dewey Unit #2 precipitator.



APPENDIX A

Stoichiometric Calculations of Flue Gas Composition and Flow Rate

COMBUSTION CALCULATION - MOLAL BASIS
N DEWEY, LAMAR COAL

Excess Air (%) = 30%

Fuel, O2, and Air per Unit of Fuel						Flue Gas (F.G.) composition Moles per Fuel Unit (AF)					
Fuel Constituent	Per Fuel Unit lb	Mol. Wt. Divi-sor	Fuel Con-stit-uent	O2 Mul-ti-plier	O2 Moles Theo Reqd	CO2	SO2	O2	N2	H2O	CO
C to CO2	63.47	12	5.29	1	5.29	5.29					
C to CO	0.02	12	0.00	0.5	0.00						0.00
C unburned	0.15										
H2 to H2O	4.35	2	2.18	0.5	1.09					2.18	
S to SO2	1.15	32	0.04	1	0.04		0.04				
O2 deduct	7.92	32	-0.25	1	-0.25			-0.25			
N2	1.24	28	0.04		0.00				0.04		
CO2											
H2O	16.74	18	0.93		0.00					0.93	
Ash	4.96										
Sum	100.00				6.17						
Moles of O2 and Air Required for 30% Excess Air											
O2 Required (Theoretical)					6.17						
O2 Excess (%E.A. x O2)					1.85			1.85			
O2 Total					8.02						
N2 Supplied (3.76 x O2)					30.14				30.14		
Air Supplied, Dry (N2 + O2)					38.15						
H2O in Air (Dry Air x A/(B-A))					0.81					0.81	
Air Supplied, Wet					38.96						
Flue Gas Constituents						5.29	0.04	1.60	30.18	3.91	0.00

NOTE: For air at 80 F and 60% relative humidity, A/(B-A) = 0.0212 is often used

CALCULATION OF VOLUME FLOW RATE
for N DEWEY, LAMAR

Boiler Heat Input = 1050.0 MMBTU/hr

HHV of Coal = 11326.0 BTU/lb

				SCFM	VOL % 64.0	VOL % (dry)
O_2 =	378.2 x	1.60	=	605.1	3.9%	4.3%
CO_2 =	376.1 x	5.29	=	1989.6	12.9%	14.2%
N_2 =	376.4 x	30.18	=	11359.8	73.5%	81.3%
H_2O =	378.3 x	3.91	=	1479.2	9.6%	
SO_2 =	405.6 x	0.04	=	16.2	0.1%	0.1%
SUM				15449.8	100.0%	100.0%

Coal Burn Rate = 92707.0 lb/hr

Flue Gas Temp = 525.0 Deg F

Stack Pressure = 12.0 in H_2O, or 30.80 in Hg

Stack O_2 Content = 3.0 %

Volume Flow Rate = 439233.5 ACFM at 525 Deg F and 30.80 in Hg
with 3.9 % O_2

Volume Flow Rate = 416739.8 ACFM at 525 Deg F and 30.80 in Hg
with 3.0 % O_2

CALCULATION OF VOLUME FLOW RATE
for N DEWEY, LAMAR

Boiler Heat Input = 1050.0 MMBTU/hr

HHV of Coal = 11326.0 BTU/lb

				SCFM	VOL % 64.0	VOL % (dry)
O2 =	378.2 x	1.60	=	605.1	3.9%	4.3%
CO2 =	376.1 x	5.29	=	1989.6	12.9%	14.2%
N2 =	376.4 x	30.18	=	11359.8	73.5%	81.3%
H2O =	378.3 x	3.91	=	1479.2	9.6%	
SO2 =	405.6 x	0.04	=	16.2	0.1%	0.1%
SUM				15449.8	100.0%	100.0%

Coal Burn Rate = 92707.0 lb/hr

Flue Gas Temp = 448.0 Deg F

Stack Pressure = 12.0 in H20, or 30.80 in Hg

Stack O2 Content = 3.0 %

Volume Flow Rate = 404897.5 ACFM at 448 Deg F and 30.80 in Hg
with 3.9 % O2

Volume Flow Rate = 384162.2 ACFM at 448 Deg F and 30.80 in Hg
with 3.0 % O2

APPENDIX B

Predicted Resistivities for Lamar Coal Ash

B&W PILOT, LAMAR COAL

	AS RECEIVED ULTIMATE COAL ANALYSIS	MOLES PER 100 LB FUEL	REQUIRED FOR COMBUSTION MOLES/100 LB FUEL AT 100% TOTAL AIR	
			O2	DRY AIR
C	63.64	5.299	5.299	25.223
H2	4.35	2.153	1.077	5.124
O2	7.92	.248	-.248	-1.180
N2	1.24	.044	.000	.000
S	1.15	.036	.036	.171
H2O	16.74	.929	.000	.000
ASH	4.96	.000	.000	.000
SUM	100.00	8.709	6.164	29.338

	REQ FOR COMBUSTION MOLES/100 LB FUEL @30% EXCESS AIR	
	O2	DRY AIR
O2 AND AIR * 130/100 TOTAL	8.013	38.139
EXCESS AIR		8.801
EXCESS O2	1.849	

PRODUCTS OF COMBUSTION

	TOTAL MOLES/100 LB FUEL	% BY VOL WET BASIS	% BY VOL DRY BASIS
CO2	5.299	12.850	14.184
H2O	3.881	9.411	.000
SO2	.036	.087	.096
N2	30.174	73.169	80.770
O2	1.849	4.484	4.949
SUM WET	41.239		
SUM DRY	37.358		

H2O	9.4
SO2	870
SO3	.9
E	12

	ASH ANALYSIS	CORRECTED ASH ANALYSIS	ATOMIC CONCENTRATION
LI2O	.02	.02	.035
NA2O	.51	.51	.431
K2O	1.23	1.24	.683
MGO	.88	.89	.857
CAO	8.34	8.41	5.837
FE2O3	21.43	21.62	4.213
AL2O3	19.16	19.33	5.900
SIO2	40.54	40.90	17.650
TIO2	.92	.93	.301
P2O5	.55	.55	.087
SO3	5.55	5.60	1.360
SUM	99.13	100.00	37.355

SUM OF LITHIUM AND SODIUM ATOMIC CONCENTRATIONS .47
SUM OF MAGNESIUM AND CALCIUM ATOMIC CONCENTRATIONS 6.7
IRON ATOMIC CONCENTRATION 4.2

1000/T(K)	DEG K	DEG C	DEG F	RHO(VS)	RHO(VSA) .9 PPM	RHO(VSA) 1.0 PPM	RHO(VSA) 4.0 PPM
1.40	714	441	826	2.1E+08	2.1E+08	2.1E+08	2.1E+08
1.50	667	394	740	5.7E+08	5.7E+08	5.7E+08	5.7E+08
1.60	625	352	665	1.5E+09	1.5E+09	1.5E+09	1.5E+09
1.70	588	315	599	4.2E+09	4.2E+09	4.2E+09	4.2E+09
1.80	556	282	540	1.1E+10	1.1E+10	1.1E+10	1.1E+10
1.90	526	253	488	3.0E+10	3.0E+10	3.0E+10	3.0E+10
2.00	500	227	440	7.8E+10	7.7E+10	7.6E+10	7.2E+10
2.05	488	215	418	1.2E+11	1.1E+11	1.1E+11	9.4E+10
2.10	476	203	397	1.8E+11	1.6E+11	1.5E+11	9.2E+10
2.15	465	192	378	2.6E+11	1.7E+11	1.6E+11	6.0E+10
2.20	455	181	359	3.3E+11	1.4E+11	1.3E+11	3.0E+10
2.25	444	171	340	4.0E+11	8.7E+10	7.6E+10	1.4E+10
2.30	435	162	323	4.2E+11	4.6E+10	4.0E+10	6.0E+09
2.35	426	152	306	4.0E+11	2.3E+10	2.0E+10	2.6E+09
2.40	417	144	290	3.6E+11	1.1E+10	9.4E+09	1.1E+09
2.44	410	137	278	3.1E+11			
2.45	408	135	275	3.0E+11	5.3E+09	4.5E+09	4.8E+08
2.49	402	128	263	2.5E+11			2.2E+08*
2.50	400	127	260	2.4E+11	2.5E+09	2.1E+09	
2.55	392	119	246	1.9E+11	1.2E+09	9.9E+08	
2.58	388	114	238	1.6E+11	7.1E+08*	6.6E+08*	
2.60	385	111	233	1.4E+11			
2.70	370	97	207	6.7E+10			
2.80	357	84	183	2.7E+10			

* RESISTIVITY AT ACID DEW POINT.

NOTE: BECAUSE THE PREDICTED RESISTIVITY VALUES ARE VERY SENSITIVE TO SEVERAL FLUE GAS AND ASH COMPOSITIONAL FACTORS, ONE MUST EXERCISE GREAT CARE IN THE SELECTION AND PREPARATION OF COAL AND ASH SAMPLES. FURTHERMORE, THE QUALITY OF THE QUANTITATIVE CHEMICAL ANALYSIS WORK IS OF GREAT IMPORTANCE. IN ESTABLISHING THIS PROGRAM, THE AS-RECEIVED, ULTIMATE COAL ANALYSES WERE OBTAINED USING ASTM D3176 PROCEDURE, AND THE COAL ASH WAS PRODUCED USING ASTM D271 PROCEDURE FOLLOWED BY A SECOND IGNITION AT 1050 DEGREES C + OR - 10 DEGREES C IN

RESISTIVITY PREDICTION BASED ON WORK DONE BY
DR. ROY BICKELHAUPT OF SOUTHERN RESEARCH INSTITUTE.
THE RESEARCH WAS SPONSORED BY THE PARTICULATE
TECHNOLOGY BRANCH, INDUSTRIAL ENVIRONMENTAL RESEARCH
LABORATORY OF THE ENVIRONMENTAL PROTECTION AGENCY,
DR. L. E. SPARKS, PROJECT OFFICER.

lamar

	AS RECEIVED ULTIMATE COAL ANALYSIS	MOLES PER 100 LB FUEL	REQUIRED FOR COMBUSTION MOLES/100 LB FUEL AT 100% TOTAL AIR	
			O2	DRY AIR
C	71.38	5.943	5.943	28.289
H2	4.96	2.455	1.228	5.843
O2	11.62	.363	-.363	-1.728
N2	1.68	.060	.000	.000
S	1.80	.056	.056	.267
H2O	3.79	.210	.000	.000
ASH	4.77	.000	.000	.000
SUM	100.00	9.087	6.864	32.671

	REQ FOR COMBUSTION MOLES/100 LB FUEL @30% EXCESS AIR	
	O2	DRY AIR
O2 AND AIR * 130/100 TOTAL	8.923	42.472
EXCESS AIR		9.801
EXCESS O2	2.059	

PRODUCTS OF COMBUSTION

	TOTAL MOLES/100 LB FUEL	% BY VOL WET BASIS	% BY VOL DRY BASIS
CO2	5.943	13.141	14.262
H2O	3.555	7.860	.000
SO2	.056	.124	.134
N2	33.613	74.323	80.663
O2	2.059	4.553	4.941
SUM WET	45.225		
SUM DRY	41.671		

H2O	7.9
SO2	1240
SO3	1.2
E	12

lamar

	ASH ANALYSIS	CORRECTED ASH ANALYSIS	ATOMIC CONCENTRATION
LI2O	.02	.02	.038
NA2O	.46	.46	.426
K2O	1.20	1.21	.732
MGO	.78	.78	.834
CAO	10.76	10.82	8.270
FE2O3	36.00	36.20	7.773
AL2O3	16.29	16.38	5.509
SIO2	29.23	29.39	13.976
TIO2	.93	.94	.334
P2O5	.43	.43	.075
SO3	3.34	3.36	.899
SUM	99.44	100.00	38.866

SUM OF LITHIUM AND SODIUM ATOMIC CONCENTRATIONS .46
SUM OF MAGNESIUM AND CALCIUM ATOMIC CONCENTRATIONS 9.1
IRON ATOMIC CONCENTRATION 7.8

1000/T(K)	DEG K	DEG C	DEG F	RHO(VS)	RHO(VSA) 1.2 PPM	RHO(VSA) 1.0 PPM	RHO(VSA) 4.0 PPM	RH 10
1.40	714	441	826	1.8E+08	1.8E+08	1.8E+08	1.8E+08	1
1.50	667	394	740	4.7E+08	4.7E+08	4.7E+08	4.7E+08	4
1.60	625	352	665	1.3E+09	1.3E+09	1.3E+09	1.3E+09	1
1.70	588	315	599	3.5E+09	3.5E+09	3.5E+09	3.5E+09	3
1.80	556	282	540	9.3E+09	9.3E+09	9.3E+09	9.3E+09	9
1.90	526	253	488	2.6E+10	2.6E+10	2.6E+10	2.5E+10	2
2.00	500	227	440	6.6E+10	6.5E+10	6.5E+10	6.3E+10	5
2.05	488	215	418	1.0E+11	9.8E+10	1.0E+11	8.6E+10	6
2.10	476	203	397	1.6E+11	1.4E+11	1.4E+11	9.3E+10	5
2.15	465	192	378	2.4E+11	1.5E+11	1.6E+11	6.6E+10	2
2.20	455	181	359	3.3E+11	1.2E+11	1.4E+11	3.5E+10	1
2.25	444	171	340	4.2E+11	7.0E+10	8.8E+10	1.6E+10	5
2.30	435	162	323	4.8E+11	3.6E+10	4.7E+10	7.1E+09	2
2.35	426	152	306	5.0E+11	1.8E+10	2.3E+10	3.0E+09	7
2.40	417	144	290	4.8E+11	8.4E+09	1.1E+10	1.3E+09	3
2.45	408	135	275	4.2E+11	4.0E+09	5.3E+09	5.6E+08	1
2.50	400	127	260	3.6E+11	1.9E+09	2.5E+09	2.4E+08	
2.51	398	125	257	3.5E+11			2.2E+08*	
2.55	392	119	246	2.9E+11	8.8E+08	1.2E+09		
2.58	388	114	238	2.5E+11	5.7E+08*			
2.59	386	113	235	2.4E+11		6.4E+08*		
2.60	385	111	233	2.3E+11				
2.70	370	97	207	1.2E+11				
2.80	357	84	183	5.8E+10				

* RESISTIVITY AT ACID DEW POINT.

NOTE: BECAUSE THE PREDICTED RESISTIVITY VALUES ARE VERY SENSITIVE TO SEVERAL FLUE GAS AND ASH COMPOSITIONAL FACTORS, ONE MUST EXERCISE GREAT CARE IN THE SELECTION AND PREPARATION OF COAL AND ASH SAMPLES. FURTHERMORE, THE QUALITY OF THE QUANTITATIVE CHEMICAL ANALYSIS WORK IS OF GREAT IMPORTANCE.

Calculated values of resistivity for a sodium depleted layer of Lamar coal ash

1000/T(K)	DEG K	DEG C	DEG F	RHO(VI)	RHO(VD)
1.3	769	496	925	7.8E+07	4.7E+08
1.4	714	441	826	2.1E+08	1.4E+09
1.5	667	394	740	5.7E+08	4.2E+09
1.6	625	352	665	1.5E+09	1.3E+10
1.7	588	315	599	4.2E+09	3.8E+10
1.8	556	282	540	1.1E+10	1.1E+11
1.9	526	253	488	3.1E+10	3.5E+11

NOTE: BECAUSE THE PREDICTED RESISTIVITY VALUES ARE VERY SENSITIVE TO SEVERAL ASH COMPOSITIONAL FACTORS, ONE MUST EXERCISE GREAT CARE IN THE SELECTION AND PREPARATION OF COAL AND ASH SAMPLES. FURTHERMORE, THE QUALITY OF THE QUANTITATIVE CHEMICAL ANALYSIS WORK IS OF GREAT IMPORTANCE. WHEN USING THIS PROGRAM, THE COAL ASH SHOULD BE PRODUCED USING ASTM D271 PROCEDURE FOLLOWED BY A SECOND IGNITION AT 1050 DEGREES C + OR - 10 DEGREES C IN STILL AIR FOR AT LEAST 10 HOURS.

NOTE: RHO(VI) is the initial resistivity, and RHO(VD) is the deplet resistivity.

TRIP REPORT
NELSON DEWEY UNIT 2 PRECIPITATOR INSPECTION
September 16, 1991

A visit was made to the Nelson Dewey Station of Wisconsin Power and Light Company to perform an internal inspection of the Unit 2 electrostatic precipitator. The inspection was begun in the penthouse area (insulator compartment) and the focus of the inspection was locating any problems which might limit the performance of the unit.

The precipitator was supplied by Research Cottrell. It has two chambers, each having three mechanical fields in the direction of gas flow. The center mechanical field is split into two electrical field in the direction of gas flow, thus, there are four electrical fields. That is, the inlet field is a 9 foot field, followed by a 4 1/2 foot field, followed by a 4 1/2 foot field and then the outlet is a 9 foot field. The mechanical sections are rapped on the leading and the trailing edges of the plates.

The Unit 2 precipitator has some features which should be pointed out. There is no baffles below the plate suspension at the leading and trailing edges of the fields therefore, there is the potential for high sneakage over the tops of the plates. This was evidenced by heavy ash deposits on the wire frames. Also, the number of vibrators on the wire frames were greater than one would typically find. For the inlet and outlet fields, one vibrator is attached to the support members of frame, and there are 3 additional vibrators equally spaced between the frame supports. The center fields have vibrators on their supports and two equally spaced between the supports.

For counting purposes, the north chamber of the precipitator was designated Chamber 1, and lanes were counted from north to south. The results of the inspection were as follows:

PENTHOUSE:

- All of the high voltage feed-through bushings had a heavy coating of dust on them, but did not appear to have any electrical tracking.

- The wire rapper isolation insulators had a light coating of dust, but for the most part are fairly clean.

- All but two of the wire rapper shafts were bound in their upper penetrations of the penthouse. That is, where they extend through the roof for connection to the vibrators. A plant electrician indicated that plans were to modify these feed-throughs by replacing the gland packings with boot seals. This modification should free these shafts. A similar modification has been made to the plate rapper shafts in the past 18 months.

UPPER WIRE FRAMES:

CHAMBER 1, INLET FIELD:

- o Ash deposits on the plates were very light, thus, it was felt that these plates were being sufficiently rapped.
- o The dust deposits were uniformly built-up on individual wires. The smallest deposits had a diameter of about 3/8 of an inch. The largest deposits were about 1 inch in diameter. It was felt that wire cleanliness was a problem which could have limited electrical conditions.
- o The north and south sides of Cell 1 were carbon copies of each other.
- o The wire-to-plate alignment was good at the tops of the plates.

CHAMBER 1, CENTER FIELD:

- o The upper 6 to 8 feet of the plates had 1/4 to 3/8 inch deposits on all plates.
- o Wire build-up was similar to that seen in the inlet field.
- o The wire-to-plate alignment was good at the tops of the plates.

CHAMBER 1, OUTLET FIELD:

- o The wire deposits were uniform and not very thick. All of the wires were about 3/8 of an inch in diameter, the dust was fairly hard to remove.
- o Plate deposits were spotty, but very heavy in some locations, with deposits up to 1/2 inch thick or thicker. It appeared that a lot of dust had fallen off after the unit had come off line which contributed to the spotty build-ups.
- o The wire-to-plate alignment was good at the tops of the plates.

CHAMBER 1, T/R SET 2B:

- o The voltage divider on the north side of this set seemed to have an encasement which was leaking oil. This had allowed the divider to track (electrical current path). This could be limiting voltage to this set and should be checked.

CHAMBER 2, INLET FIELD:

- o The wire deposits on both the north and south sides of the field were similar to those seen in Cell 1. All wires had nominally 3/8 inch diameters with a few having diameters up to an inch. It was estimated that approximately 10-15% of the wires had the larger diameters.

- o The plates had minimal deposits of ash.

- o The wire-to-plate alignment was good at the tops of the plates.

CHAMBER 2, CENTER FIELD:

- o The upper 6 to 8 feet of the plates had 1/4 to 3/8 inch deposits on all plates. The outer layer of the deposits contained a large amount of carbon. The carbon was most likely deposited during shut down. The underlying ash was a gray color, and was very fluffy. Below the gray layer was a thin orange colored ash, which was almost like cement. It was crusty and could not be rubbed, but had to be scraped from the plate.

- o Wire build-up was similar to that seen in the inlet field.

- o The wire-to-plate alignment was good at the tops of the plates.

CHAMBER 2, OUTLET FIELD:

- o Condition of this field very similar to that of the outlet outlet field of Chamber 1, there was very heavy plate deposits in some areas. Again, it looked as if dust had fallen off in some areas. The deposits were heavier on the back half of the plates.

- o There were one or two areas where wire deposits were heavy, but in general, they were similar to those seen in the outlet field of Chamber 1.

- o The wire-to-plate alignment was good at the tops of the plates.

LOWER ACCESS:

CHAMBER 1, INLET FIELD:

- o Looking toward the inlet between fields 1 and 2, the wire deposits consisted of a fluffy layer for the outer surface, but the inner layer of ash was very hard and crusty. This crusty layer would be difficult to remove.

- o The plates also had a very crusty layer which was from 1/32 to 1/16 inch thick. It was felt that it would require either sand blasting or water washing to remove this layer.

CHAMBER 1, CENTER FIELD:

- o Looking toward the outlet into field 2, the wires were slightly out of tolerance, that is, the lower wire frame was slightly out of alignment. In some lanes, the wire-to-plate spacing was 4 inches, where the minimum should be 4-1/4 inches. There were a few lanes with a wire-to-plate spacing at the bottom of 3 3/4 inches.

- o Again, the problem of the crusty under layer of ash on the plates and wires was seen.

- o Lane 9 of the 3rd field looking toward the inlet from the outlet side of the field, the wire-to-plate spacing at the bottom of the plates was approximately 3 1/2 inches towards the south side of the lane. This problem was caused by the combination of the plate-to-plate spacing being off and the lower wire frame being slightly out of adjustment. This would definitely limit the voltage attainable for this field. This alignment problem carried over for several lanes, but was not as severe in other lanes.

CHAMBER 1, OUTLET FIELD:

- o Looking toward the outlet, the 1st two of wires in lanes 11 and 12 had wire-to-plate spacings of approximately 4 inches to one side. The problem did not carry throughout the field, but was seen in only a few lanes. This spacing problem should be corrected, or the effected wires removed.

CHAMBER 2, INLET FIELD:

- o The wire and plate deposits were similar to those seen in Chamber 1.

CHAMBER 2, CENTER FIELD:

- o The 2nd field looking toward the outlet, the wire and plate build-up similar to that seen in Chamber 1.

- o Lower wire fame alignment for the field was pretty good.

- o The 3rd field looking toward the inlet, the wire-to-plate spacing at the bottom in lane 15 was approximately 4 inches to one side. There were several lanes in the area which had this problem.

- o In lane 30 and carrying through to 41, There were several lanes with wire-to-plate spacings below 4 inches. Some as low as 3 3/4 inches.

CHAMBER 2, OUTLET FIELD:

- o The the lower wire frame was slightly out of alignment (off approximately 1/4 inch).

GENERAL:

- o At the inlet of Chamber 2, there was 3 to 4 feet of ash between the 1st and 2nd perforated plates.
- o All of the door gaskets were hardened and should be replaced.
- o Several of the access door covers had no insulation. The lack of insulation was permitting severe corrosion to take place in these areas.

RECOMMENDATIONS:

- o The surfaces of the plates and wires should be cleaned down to the metal to insure that a resistive coating is not limiting power input.
- o All wire-to-plate spacings should be checked for alignment. Those wires or wire frames which are not within tolerance should be brought back into alignment.
- o The voltage divider for T/R set 2B should be checked and replaced if found to be bad.
- o The roof penetrations for the vibrator rapper shafts should be freed.
- o Areas having inadequate insulation should be properly insulated.
- o The fly ash which has collected between the inlet perforated plates should be removed, and the perforated plates modified to avoid future deposits or a "puffer" system installed to keep this area clear of ash deposit.

4.6 BASELINE PRECIPITATOR PERFORMANCE EVALUATION

Nelson Dewey #2's precipitator was supplied by Research Cottrell, Inc. and operates under positive pressure at a temperature of approximately 500°F at full load. The Air Pollution Control Technology Company (APCO) was contracted during the baseline tests to aid in evaluating pre-retrofit precipitator performance. In addition, a subsequent report by APCO will address precipitator performance predictions during cyclone reburn operation.

APCO Services obtained current voltage data from each of the precipitators T/R sets in conjunction with the baseline tests. These data are tabulated in the following Tables 4.6-1 to 4.6-4.

Table 4.6-1. Current versus Voltage data for T/R set 2A of Nelson Dewey Station Unit 2 taken May 31, 1990.

PRIMARY		SECONDARY	
VOLTAGE (volts)	CURRENT (amps)	VOLTAGE (kV)	CURRENT (mA)
40	0	20	0
55	0	22	10
65	0	24.5	15
85	0	26	25
100	0	28	40
120	5	30.3	50
150	15	34.5	100
165	40	35	150 spark

Table 4.6-2. Current versus Voltage data for T/R set 2B of Nelson Dewey Station Unit 2 taken May 31, 1990.

PRIMARY		SECONDARY	
VOLTAGE (volts)	CURRENT (amps)	VOLTAGE (kV)	CURRENT (mA)
45	0	20	0
50	0	22	0
60	0	24.5	0
70	0	27	0
85	0	30	0
95	0	32.5	10
		34	20
140	20	35.5	50
145	25	36	75
150	30	34.8	110 spark

Completed 0924

Table 4.6-3. Current versus Voltage data for T/R set 2C of Nelson Dewey Station Unit 2 taken May 31, 1990.

PRIMARY		SECONDARY	
VOLTAGE (volts)	CURRENT (amps)	VOLTAGE (kV)	CURRENT (mA)
40	0	20.3	0
45	0	22.3	5
55	0	24.8	5
75	0	26.8	5
95	0	29.8	10
110	0	31.8	20
125	0	33.8	40
140	5	34.8	50 spark

Completed 0932

Table 4.6-4. Current versus Voltage data for T/R set 2D of Nelson Dewey Station Unit 2 taken May 31, 1990.

PRIMARY		SECONDARY	
VOLTAGE (volts)	CURRENT (amps)	VOLTAGE (kV)	CURRENT (mA)
45	0	20.5	0
50	0	22.3	5
65	5	24.5	10
85	10	27	15
105	10	29	40
130	15	31.5	75
140	20	32.5	100
160	35	34.3	155
175	50	35	210
183	60	35.8	275
190	68	36.8	310
195	75	36.5	350 spark

Completed 0942

Plots of the individual V-I curves are given in Figures 4.6-1 - 4.6-4. Also, plotted in these figures are typical V-I curves for a precipitator of this design operating at design conditions. The measured V-I curves are represented by solid lines and the theoretical curves by dashed lines. One can see that reasonably good agreement was obtained for the inlet field of the precipitator even though the current density was low, but poor agreement was obtained for the remaining three fields. The shapes of the measured curves indicate that the ash resistivity was high (5×10^{11} ohm-cm to 1×10^{12} ohm-cm). Resistivity predicted from coal and ash chemistry was on the order of 4×10^{9} ohm-cm for the precipitators operating temperature. Also, the curves indicate that the discharge electrodes or collecting plates associated with T/R sets 2B and 2C may have had excessively thick dust deposits.

Figure 4.6-1 Current versus Voltage for T/R Set 2A of Nelson Dewey Station, Wisconsin Power and Light, May 31, 1990.

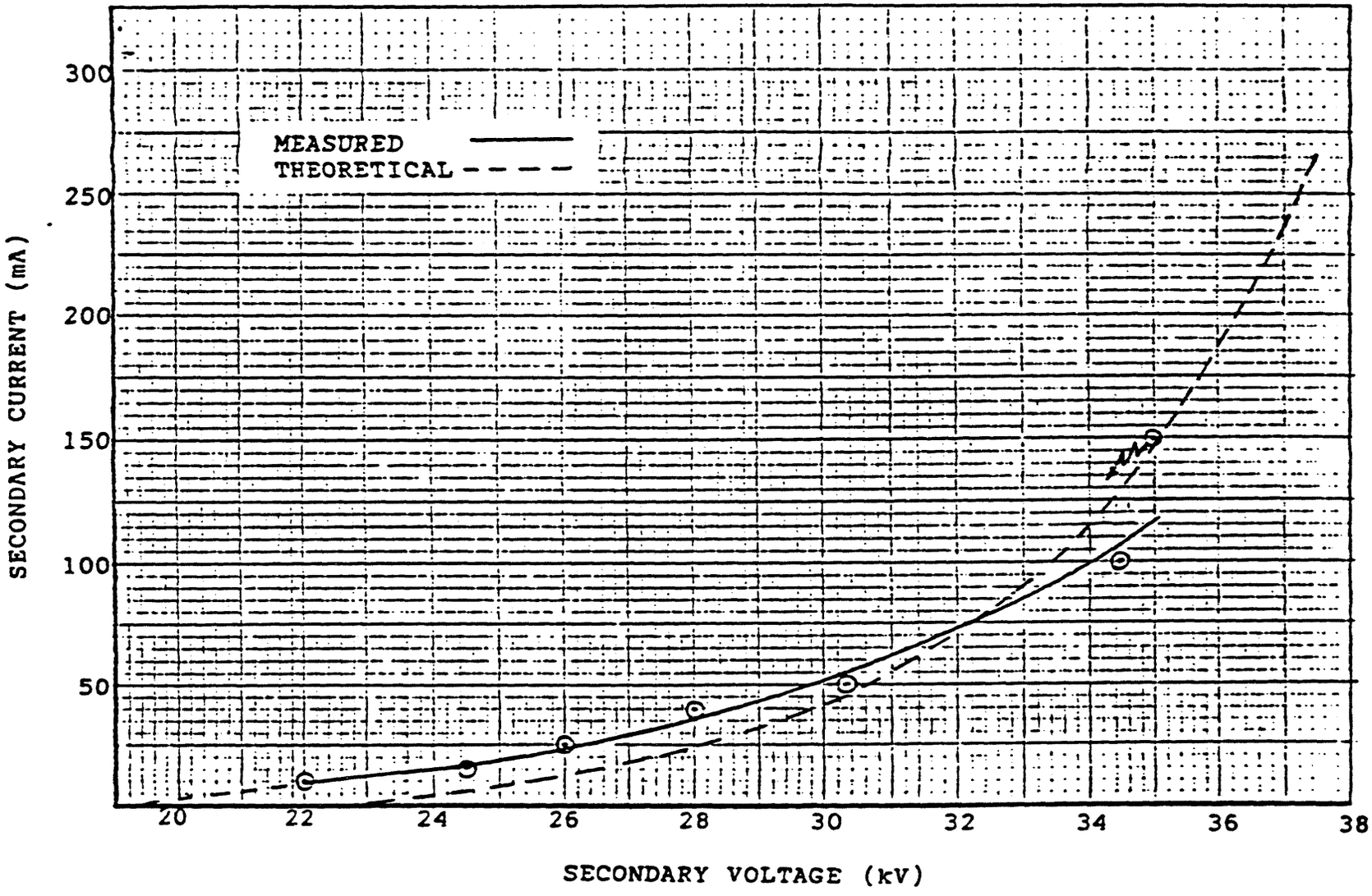


Figure 4.6-2 Current versus Voltage for T/R Set 2B of Nelson Dewey Station, Wisconsin Power and Light, May 31, 1990.

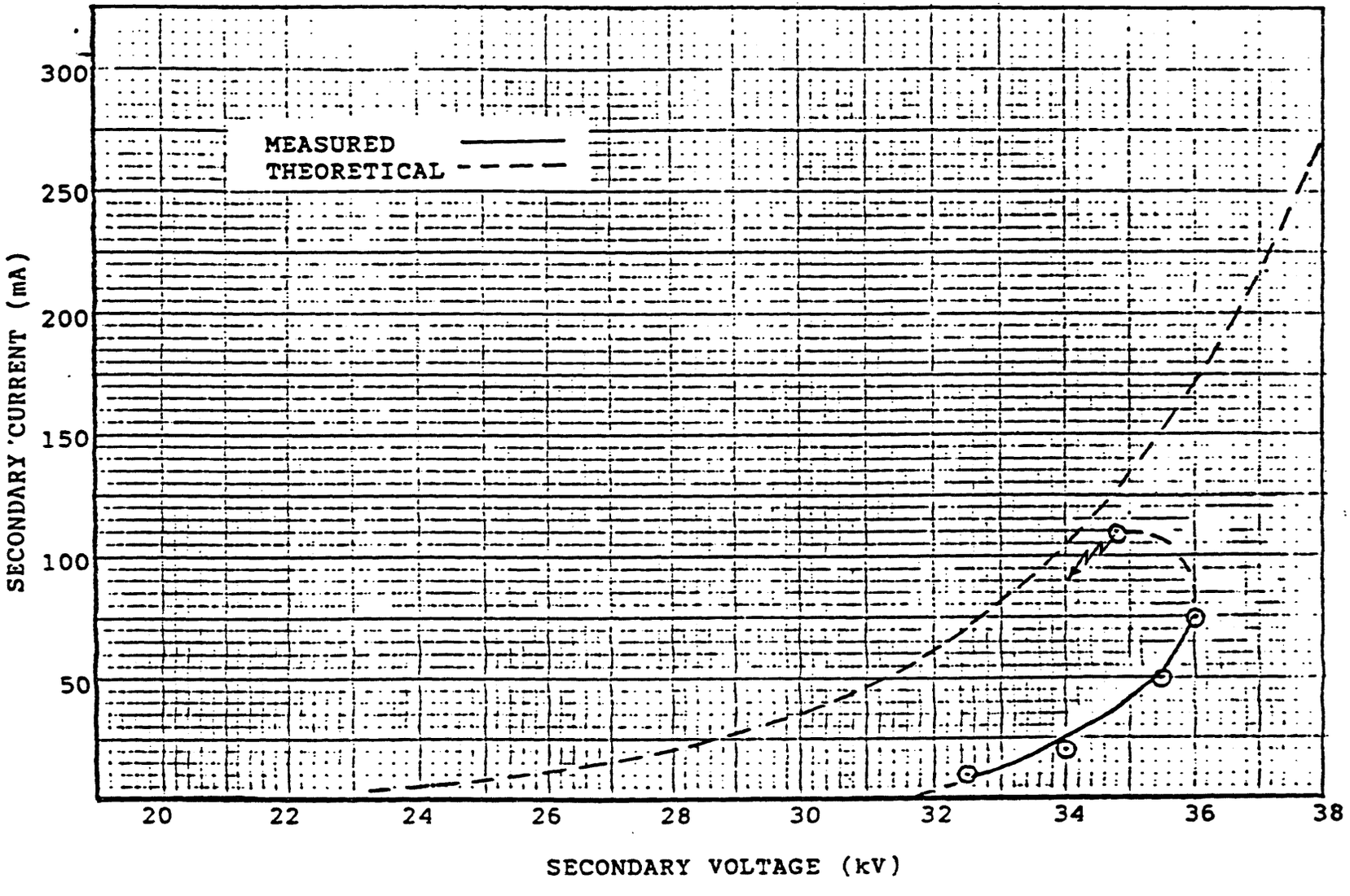


Figure 4.6-3 Current versus Voltage for T/R Set 2C of Nelson Dewey Station, Wisconsin Power and Light, May 31, 1990.

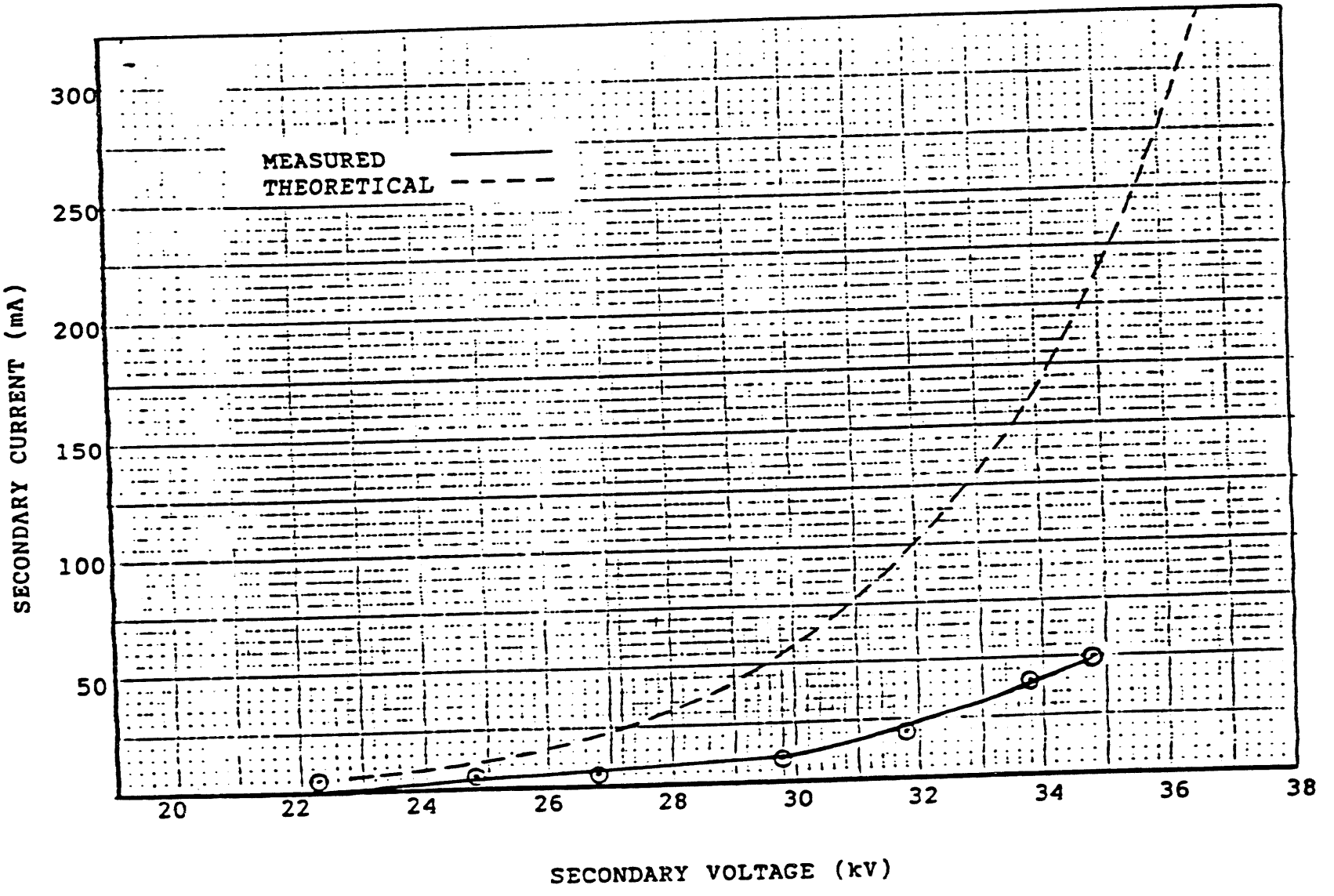
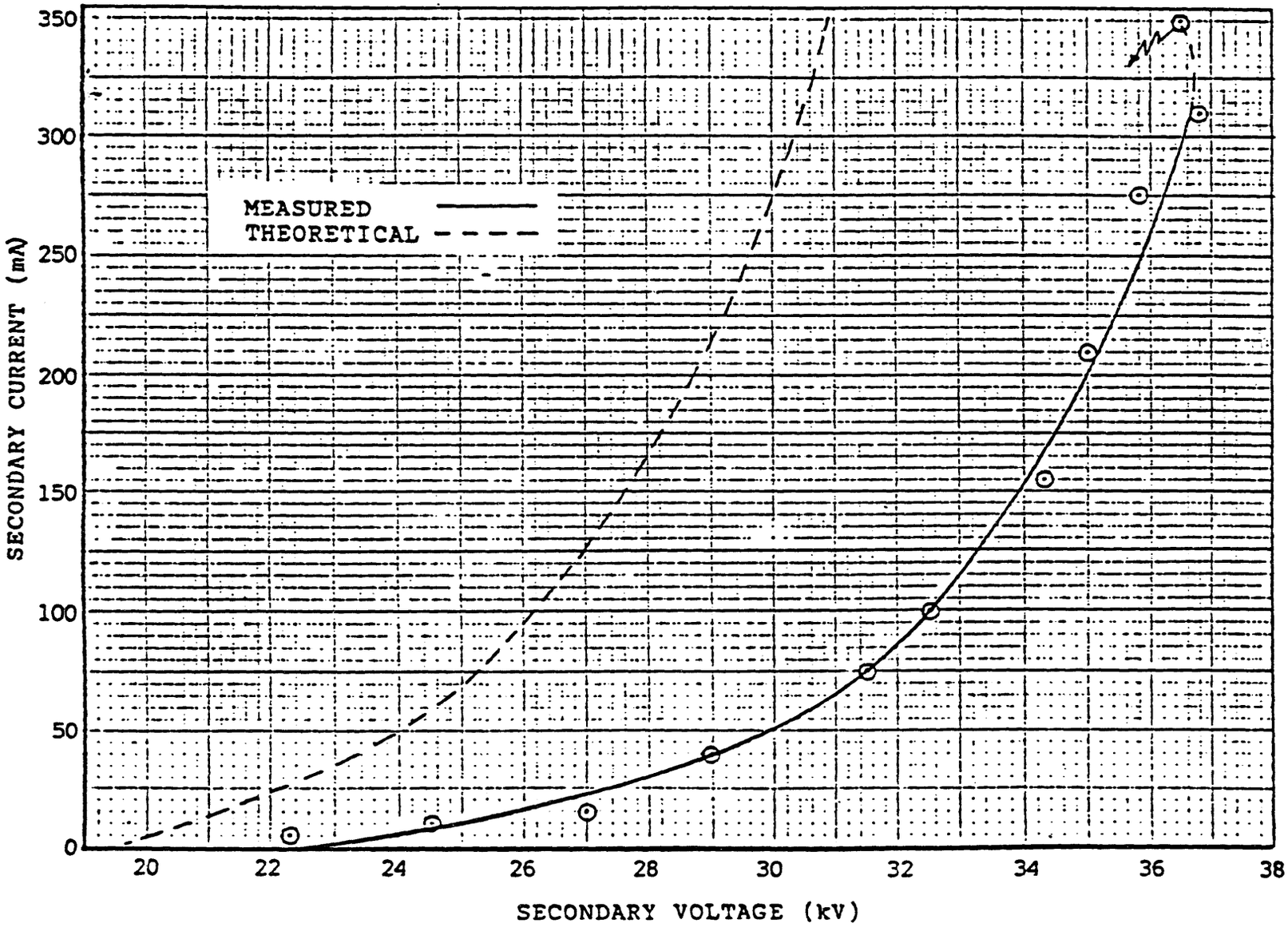


Figure 4.6-4 Current versus Voltage for T/R Set 2D of Nelson Dewey Station, Wisconsin Power and Light, May 31, 1990.



The boiler was operating at a load of 110 MW with a steam flow of 784 klb/hr at the time the precipitator V-I curves were taken. The economizer O_2 concentration was 2.6% and the stack opacity was approximately 10.3%. The operating points for the individual T/R sets following the taking of the current-voltage data are given in Table 4.6-5. Also given In Table 4.6-5 are T/R set readings for Unit 1. Although the theoretical curves plotted in Figure 4.6-1 thru 4.6-4 do not extend into the range of the operating points for Unit 1, one can see that much better agreement between measured and theoretical values would be obtained for the Unit 1 data.

Table 4.6-5. Electrical conditions obtained for Unit 1 and Unit 2 precipitators at Nelson Dewey Station of Wisconsin Power and Light, May 31, 1990.

T/R SET	PRIMARY		SECONDARY		AVERAGE
	VOLTAGE (V)	CURRENT (A)	VOLTAGE (kV)	CURRENT (mA)	CUR DEN (nA/cm^2)
Unit 2:					
2A	145	10	34.5	90	2.1
2B	135	20	36	60	2.8
2C	145	15	34.5	60	2.8
2D	190	62	36.5	300	6.9
Unit 1:					
1A	210	70	39.5	250	5.8
1B	230	95	43	400	18.4
1C	238	105	36.5	460	21.2
1D	240	170	26	900	20.7

A mathematical model developed by Southern Research Institute for the U.S. EPA was used to predict precipitator performance based on the electrical data obtained for Unit 2. The flue gas flow rate and inlet mass loading were estimated from coal chemistry data for the Indiana Lamar Coal which was being burned. The parameters used in this model are

listed in Table 4.6-6. Several model runs were made, with the inlet particle size distribution being adjusted between runs, until a predicted opacity value was obtained which was in close agreement with the measured opacity. The best results were obtained for a particle size distribution having a mass median diameter (MMD) of 13 μm and a RMS standard deviation (σ_p) of 2.9. This standard deviation would be typical for a cyclone boiler, but the MMD would be approximately 45% larger than that normally found for a cyclone boiler. A smaller size distribution would have led to a lower predicted collection efficiency and a higher opacity.

Table 4.6-6. Input parameters for the precipitator model which were used in modeling the Unit 2 precipitator at Nelson Dewey Station of Wisconsin Power and Light.

Inlet mass loading	- 0.492 gr/ACF w/o reburn
Flue gas temperature	- 525 °F
Volume flow rate	- 475,000 ACFM, SCA = 272 ft^2/kACFM
Face velocity	- 4.[illegible]9 ft/sec
# of Electrical fields	- 4
Plate height	- 30 ft
Plate length	- 9 ft, flds 1 & 4; 4.5 ft, flds 2 & 3
# of gas passages	- 82
Plate-to-Plate spacing	- 9 inches
Wire-to-Wire spacing	- 9 inches
Wire diameter	- 0.109 inches

The results of the model calculation are listed in Table 4.6-7. A value of 5% sneakage per baffled section (S) with a 15% RMS deviation in gas velocity (σ_g) gave a predicted opacity closest to that measured. These values of S and σ_g are typical.

Plant personnel indicated that a degradation in precipitator performance with time was noticed when a switch to the Indiana Lamar coal was made. Many "hot-side" precipitators experience a similar degradation when burning coals having ashes with low sodium and/or high calcium content.

These ashes usually have a moderate inherent resistivity (5×10^9 to 1×10^{10} ohm-cm). With time, the ash layer adjacent to the collecting plates becomes depleted in sodium ions (the primary current carrier) and the resistivity of the adjacent layer rises. This layer is not removed with rapping and the net resistivity of the layer (old plus new deposits) increases, thus leading to the degradation in performance. Sodium depletion could be a problem with the Lamar coal which has an ash containing approximately 0.5% sodium and approximately 8.5% calcium.

Table 4.6-7. Results from model calculations for the Unit 2 precipitator at Nelson Dewey Station of Wisconsin Power and Light.

RUN #	SCA (ft / kACFM)	AVE. CUR. DEN. (nA/cm^2)	AVE. VOLT. (kV)	MMD (%)	INLET σ_{par} (μm)	SNEAK (%)	σ_{gas} (%)	EFF. (%)	OPACITY (%)
	280	4.37	34.9	13.0	2.9	0.0	0.0	97.20	8.7
						0.05	0.15	96.32	10.4
						0.05	0.20	96.12	10.8
						0.05	0.30	95.64	11.6

APPENDIX NO. 9

Summary of T and A Series Tuning and Optimization Test Data

SUMMARY OF T AND A SERIES TUNING AND OPTIMIZATION TESTS

	TEST MW	DATE MO DAY YEAR	LOAD MW	STEAM FLOW KLB/HR	SH OUT TEMP	RH OUT TEMP	SH SPRAY FLOW KLB/HR	RH SPRAY FLOW KLB/HR	CYCLONE COAL FLOW KLB/HR	% OF MAX CYCLONE INPUT	CYC IN SERV	REBURN INPUT %	REBURN INPUT KLB/HR	ROTARY CLASS. RPM	EXCESS AIR %	REBURN STOICH	CYCLONE STOICH	ACTUAL FLYASH SPLIT %	ADJUSTED FLYASH SPLIT %
1	BS1	11 21 91	110	783.30	998	999	41.98	13.60	96.18	102.27	3	0.00	0.00	0	19.30	1.1610	1.0940	0.00	0.00
2	BS2	11 25 91	110	779.68	999	996	38.42	0.00	96.20	[illegible]	3	0.00	0.00	0	19.70	1.1640	1.1000	0.00	0.00
3	4	4 3 92	110	776.73	999	997	46.47	4.23	91.30	95.10	3	0.00	0.00	0	24.10	1.1820	1.1190	0.00	0.00
4	4A	4 3 92	111	780.97	999	1002	55.72	11.18	92.79	96.66	3	0.00	0.00	0	23.60	1.1790	1.1180	16.86	16.86
5	4AA	4 29 92	110	778.86	1000	1003	60.00	11.75	92.02	95.85	3	0.00	0.00	0	22.70	1.1810	1.1070	0.00	0.00
6	26T	2 21 92	110	793.33	977	978	0.00	0.00	72.98	76.02	3	25.23	24.57	140	14.60	0.9711	1.0798	46.95	46.95
7	27T	2 21 92	110	778.05	996	1001	2.68	0.00	72.97	76.01	3	25.42	24.58	140	15.20	0.8871	1.0856	56.78	44.76
8	21A	5 1 92	110	786.12	994	998	0.00	0.00	70.61	73.55	3	27.86	26.11	160	21.40	0.9587	1.0888	4.03	43.48
9	2	4 1 92	109	773.18	996	992	67.60	9.82	93.80	97.71	3	0.00	0.00	0	23.50	1.1810	1.0980	0.00	0.00
10	2A	4 1 92	110	772.33	998	1000	26.54	9.65	65.51	68.24	3	26.95	26.25	140	16.00	0.8945	1.0394	50.08	50.08
11	2AA	4 29 92	110	778.85	994	998	1.36	0.00	64.74	67.44	3	28.22	26.30	160	16.20	0.8889	1.0883	0.00	0.00
12	3	4 2 92	110	781.88	1002	996	54.28	22.00	93.38	97.27	3	0.00	0.00	0	22.70	1.1970	1.0450	0.00	0.00
13	3A	4 2 92	110	778.32	999	1001	3.95	0.00	64.54	67.23	3	27.37	26.33	140	14.60	0.8670	1.0533	63.71	44.88
14	3AA	4 29 92	110	784.14	1001	996	3.43	0.00	65.19	67.91	3	28.06	26.32	160	14.60	0.8604	1.0549	0.00	0.00
15	3B	4 2 92	110	774.00	999	1003	6.98	3.48	65.12	67.83	3	27.39	26.43	140	19.80	0.8713	1.0397	0.00	0.00
16	6	4 7 92	110	780.46	994	998	79.99	15.51	92.52	96.38	3	0.00	0.00	0	23.10	1.1910	1.1120	0.00	0.00
17	6A	4 7 92	110	780.55	999	1007	29.54	0.00	65.63	68.36	3	27.92	26.22	140	15.70	0.8347	1.0515	17.60	44.47
18	8	4 9 92	110	785.83	1000	1000	49.46	2.81	92.21	96.05	3	0.00	0.00	0	21.90	1.1680	1.1080	0.00	0.00
19	8A	4 9 92	110	787.67	999	1001	9.45	0.00	65.63	68.36	3	28.02	26.48	160	17.20	0.8841	1.0883	46.95	46.95
20	7	4 8 92	109	784.50	1000	993	65.46	9.80	92.47	96.32	3	0.00	0.00	0	23.70	1.1830	1.0930	0.00	0.00
21	7A	4 8 92	110	786.41	999	1004	16.69	0.00	65.61	68.34	3	27.90	26.31	160	16.20	0.8569	1.0744	27.53	44.27
22	9	4 10 92	110	790.16	998	1002	69.85	14.65	93.33	97.22	3	0.00	0.00	0	22.70	1.1740	1.0890	0.00	0.00
23	9A	4 10 92	110	789.49	999	1003	14.86	0.00	66.18	68.94	3	27.69	26.28	100	16.70	0.8775	1.0746	35.39	35.39
24	10	4 13 92	110	790.73	996	993	49.85	13.52	93.29	97.18	3	0.00	0.00	0	22.70	1.1790	1.0930	0.00	0.00
25	10A	4 13 92	110	784.02	999	1002	8.69	0.00	65.75	68.49	3	27.88	26.26	100	16.50	0.8732	1.0796	69.98	44.33
26	16A	4 24 92	111	785.08	998	1003	38.49	5.21	66.37	69.14	3	27.34	26.06	160	16.80	0.8673	1.0652	34.55	34.55
27	16M	5 5 92	110	801.44	998	1003	13.17	0.00	69.58	72.48	3	27.56	25.99	150	15.50	0.8715	1.0646	21.36	44.78
28	3T	2 13 92	110	781.04	987	993	6.24	0.00	68.43	71.28	3	28.86	27.79	140	17.50	0.9385	1.1095	69.36	44.18
29	4T	2 13 92	110	778.79	991	1002	0.00	0.00	69.22	72.10	3	28.57	27.71	140	18.60	0.8871	1.1266	40.73	40.73
30	10B	4 13 92	110	784.75	1000	1004	21.04	9.41	64.30	66.98	3	29.65	28.40	140	16.40	0.8721	1.0592	27.83	43.89
31	10C	4 13 92	111	786.99	999	1008	26.20	10.92	64.76	67.46	3	29.49	28.37	160	16.10	0.8715	1.0538	25.17	43.83
32	5T	2 14 92	111	778.20	998	1005	0.00	0.00	68.53	71.39	3	29.25	28.34	140	17.20	0.8754	1.1015	0.00	0.00
33	7T	2 15 92	111	787.35	980	997	0.00	0.00	68.85	71.72	3	29.08	28.24	140	17.10	0.8685	1.1062	0.00	0.00
34	18T	2 18 92	109	752.90	1008	1023	38.90	0.00	66.06	68.81	3	29.96	28.31	140	16.30	1.0313	1.4071	0.00	0.00
35	22T	2 19 92	110	785.59	954	985	0.79	0.00	69.83	72.74	3	28.80	28.25	140	14.70	0.9176	1.0840	56.57	44.47
36	24T	2 20 92	110	799.30	966	959	0.75	0.00	68.61	71.47	3	29.29	28.41	140	15.30	0.9267	1.1039	0.00	0.00
37	6T	2 14 92	111	781.57	997	999	3.35	0.00	68.54	71.40	3	29.22	28.34	140	16.80	0.8798	1.1054	0.00	0.00
38	15T	2 17 92	110	780.34	995	995	2.04	0.00	67.02	69.81	3	30.42	29.33	140	16.50	0.8932	1.1345	0.00	0.00
39	10T	2 15 92	110	778.62	985	997	0.00	0.00	68.02	70.85	3	29.30	28.19	140	15.90	0.8485	1.1170	0.00	0.00
40	8T	2 15 92	110	774.94	996	1002	0.00	0.00	67.95	70.78	3	29.33	28.24	140	16.60	0.8534	1.1257	0.00	0.00

SUMMARY OF T AND A SERIES TUNING AND OPTIMIZATION TESTS

	TEST MW	DATE MO DAY YEAR	LOAD MW	STEAM FLOW KLB/HR	SH OUT TEMP	RH OUT TEMP	SH SPRAY FLOW KLB/HR	RH SPRAY FLOW KLB/HR	CYCLON COAL FLOW KLB/HR	% OF MAX CYCLON INPUT	CYC IN SERV	REBURN INPUT %	REBURN INPUT KLB/HR	ROTARY CLASS. RPM	EXCESS AIR %	REBURN STOICH	CYCLONE STOICH	ACTUAL FLYASH SPLIT %	ADJUSTED FLYASH SPLIT %
41	19T	2 18 92	110	775.92	996	998	4.01	0.00	67.74	70.56	3	29.41	28.26	140	16.30	0.8649	1.1038	0.00	0.00
42	23T	2 19 92	110	782.90	994	1000	0.68	0.00	68.64	71.50	3	29.17	28.29	140	15.20	0.8595	1.1029	44.95	44.95
43	16T	2 17 92	110	778.03	997	996	7.99	0.00	66.84	69.63	3	30.42	29.26	140	16.10	0.8609	1.1122	0.00	0.00
44	9T	2 15 92	109	784.30	978	988	0.00	0.00	68.28	71.13	3	29.18	28.16	140	14.70	0.8455	1.1004	0.00	0.00
45	17T	2 17 92	110	777.77	995	997	0.00	0.00	66.96	69.75	3	30.39	29.24	140	16.30	0.8683	1.1027	51.39	51.39
46	3BM	5 7 92	110	819.59	998	996	29.45	8.69	70.11	73.03	3	29.36	27.98	150	14.90	0.8600	1.1000	26.15	44.10
47	50T	3 5 92	110	774.04	1000	1004	22.19	0.00	67.34	70.15	3	29.51	28.21	140	16.40	0.8504	1.0785	34.33	34.33
48	25T	2 20 92	111	793.67	991	979	2.98	0.00	65.04	67.75	3	33.00	32.08	140	15.60	0.9057	1.1243	43.54	43.54
49	31T	2 24 92	111	800.57	974	982	0.00	0.00	65.77	68.51	3	32.76	32.07	140	14.40	0.8726	1.1005	0.00	0.00
50	32T	2 24 92	111	783.03	998	1003	3.51	0.00	64.71	67.41	3	33.13	32.07	140	14.70	0.8255	1.1228	50.62	50.62
51	17A	4 27 92	110	783.37	998	1000	20.26	0.00	60.08	62.58	3	33.27	31.17	160	14.30	0.8051	1.0571	39.75	39.75
52	18A	4 28 92	90	614.39	1000	1000	11.36	0.00	51.69	53.84	3	29.82	22.78	160	15.50	0.8423	1.0419	36.80	50.04
53	45T	3 2 92	86	574.60	998	1000	3.36	0.00	49.94	52.02	3	31.75	24.29	140	16.50	0.8669	1.1241	49.02	49.02
54	5A	4 6 92	82	543.22	999	1000	17.12	0.00	66.83	104.42	2	0.00	0.00	0	23.90	1.1690	1.1940	33.35	33.35
55	11A	4 15 92	82	554.33	992	1000	0.00	0.00	44.72	69.88	2	33.80	23.32	160	16.40	0.8513	1.0983	33.66	52.01
56	11B	4 16 92	82	553.68	991	1000	3.38	0.00	44.97	70.27	2	33.49	23.31	160	17.80	0.8645	1.0909	31.86	51.66
57	11C	4 16 92	82	552.78	994	1003	0.00	0.00	45.06	70.41	2	33.14	23.30	160	23.40	0.8458	1.0913	29.11	50.79
58	12A	4 16 92	83	556.90	999	1001	5.75	0.00	45.59	71.23	2	33.18	23.19	160	17.10	0.8835	1.0735	44.60	44.60
59	13A	4 21 92	82	548.89	997	996	15.56	0.00	44.67	69.80	2	32.87	23.24	160	18.70	0.9135	1.1174	49.72	49.72
60	4BM	5 7 92	82	518.24	998	997	23.66	0.00	49.18	76.84	2	32.88	22.98	150	15.70	0.8419	1.0825	18.96	52.02
61	11T	2 16 92	81	488.07	996	996	9.38	0.00	69.83	109.11	2	0.00	0.00	0	19.50	1.1410	1.1270	0.00	0.00
62	12T	2 16 92	82	497.57	982	976	6.27	0.00	47.81	74.70	2	32.78	23.37	140	17.00	0.8753	1.1470	0.00	0.00
63	13T	2 16 92	82	494.10	991	994	2.85	0.00	47.88	74.81	2	32.70	23.35	150	17.60	0.8744	1.1284	57.33	57.33
64	14T	2 16 92	82	488.73	998	1001	3.23	0.00	47.51	74.23	2	32.93	23.38	160	17.00	0.8586	1.1295	52.31	52.31
65	33T	2 24 92	83	502.59	976	979	20.99	0.00	71.52	111.75	2	0.00	0.00	140	19.10	1.1400	1.0120	0.00	0.00
66	34T	2 24 92	83	495.00	994	989	2.42	0.00	48.60	75.94	2	32.35	23.23	140	16.30	0.8595	1.1209	0.00	0.00
67	28T	2 22 92	83	501.75	998	979	14.06	0.00	48.63	75.98	2	32.18	23.14	140	16.80	0.8723	1.1336	54.76	54.76
68	29T	2 22 92	83	508.21	999	971	16.52	0.00	49.59	77.48	2	31.70	23.08	140	15.80	0.8614	1.1081	0.00	0.00
69	46T	3 3 92	83	494.02	999	999	11.42	0.00	48.72	76.13	2	32.10	23.21	140	14.20	0.8640	1.1066	45.96	45.96
70	47T	3 3 92	82	490.86	998	994	21.25	0.00	48.05	75.08	2	32.51	23.21	140	15.20	0.8545	1.1066	44.31	44.31
71	48T	3 4 92	82	488.30	998	1003	0.96	0.00	45.09	70.45	2	36.37	25.86	140	20.00	0.8565	1.1454	46.87	46.87
72	12B	4 16 92	83	500.84	998	995	15.74	0.00	47.34	73.97	2	30.20	21.20	160	17.80	0.9209	1.1009	48.75	48.75
73	19A	4 29 92	82	549.92	1000	1001	13.71	0.00	46.60	72.81	2	31.97	22.51	160	18.60	0.8727	1.0643	48.82	48.82
74	37T	2 25 92	70	415.73	1000	958	5.69	0.00	60.66	94.78	2	0.00	0.00	0	22.30	1.1670	1.0900	0.00	0.00
75	42T	2 27 92	71	413.19	999	993	7.63	0.00	38.86	60.72	2	36.31	22.26	140	18.10	0.8720	1.1157	61.19	61.19
76	36T	2 25 92	70	415.17	991	975	2.38	0.00	38.00	59.38	2	37.87	23.25	140	15.20	0.9326	1.1888	0.00	0.00
77	35T	2 25 92	70	410.75	998	988	4.60	0.00	37.65	58.83	2	38.08	23.23	140	16.40	0.9128	1.2040	0.00	0.00
78	39T	2 26 92	70	460.47	991	975	2.38	0.00	37.99	59.36	2	37.87	23.25	140	15.20	0.9326	1.1888	53.79	53.79
79	1A	3 31 92	68	446.41	996	965	0.00	0.00	55.71	87.05	2	0.00	0.00	0	24.30	1.1600	1.1610	30.34	30.34
80	20A	5 1 92	60	400.40	985	984	0.00	0.00	36.33	56.77	2	31.06	16.43	160	19.90	0.9439	0.9912	60.60	60.60

SUMMARY OF T AND A SERIES TUNING AND OPTIMIZATION TESTS

	TEST MW	DATE MO DAY YEAR	LOAD MW	STEAM FLOW KLB/HR	SH OUT TEMP	RH OUT TEMP	SH SPRAY FLOW KLB/HR	RH SPRAY FLOW KLB/HR	CYCLON COAL FLOW KLB/HR	% OF MAX CYCLON INPUT	CYC IN SERV	REBURN INPUT %	REBURN INPUT KLB/HR	ROTARY CLASS. RPM	EXCESS AIR %	REBURN STOICH	CYCLONE STOICH	ACTUAL FLYASH SPLIT %	ADJUSTED FLYASH SPLIT %
61	28M	5 6 92	60	409.29	993	961	0.00	0.00	36.17	56.52	2	32.20	17.26	160	19.70	0.9788	1.0143	52.54	52.54
62	15A	4 23 92	59	392.32	907	971	0.00	0.00	33.60	52.50	2	32.18	16.51	160	17.40	0.9202	1.0378	66.14	66.14
63	44T	2 27 92	66	433.20	991	973	0.72	0.00	57.68	90.13	2	0.00	0.00	0	13.80	1.0750	1.0730	0.00	0.00
64	46T	3 3 92	57	372.26	991	964	0.00	0.00	34.48	53.88	2	31.52	15.95	160	15.10	0.9623	1.0697	58.14	58.14
65	30T	2 23 92	56	368.34	975	953	0.00	0.00	49.12	76.75	2	0.00	0.00	0	28.90	1.2060	1.1410	0.00	0.00
66	43T	2 27 92	55	364.90	982	943	0.00	0.00	33.23	51.92	2	32.47	16.04	140	16.60	0.9766	1.1073	68.25	68.25
67	40T	2 26 92	55	355.09	996	982	17.44	0.00	31.76	49.63	2	34.68	16.96	140	15.70	1.0747	1.2266	0.00	0.00
68	41T	2 26 92	55	352.87	988	976	12.83	0.00	31.35	48.98	2	34.93	16.94	140	17.10	0.9639	1.1586	0.00	0.00
69	14A	4 22 92	55	382.31	952	928	0.00	0.00	31.76	49.63	2	32.99	16.23	160	15.70	0.9706	1.0369	52.73	52.73

SUMMARY OF T AND A SERIES TUNING AND OPTIMIZATION TESTS

	TEST MW	ACTUAL UBC LB/ 100LB	ADJUSTED UBC LB/ 100LB	UBC EFF LOSS %	GAS WT. WITHOUT RECIRC. MLB/HR	TOTAL GR MLB/HR	GR TO REBURN KLB/HR	AS TESTED EFF %	CORR. EFF %	ACT. FEGT	TOTAL SEC NF	SEC IN NF	SEC OUT NF	PTI NF	RH NF	ECON NF	DRY GAS LOSS %	EXIT GAS TEMP CORR
1	BS1	0.00	0.10	0.13	1053.0	0.0	0.0	87.40	88.38	2154	0.95	0.99	0.92	1.03	0.93	0.88	4.23	318.40
2	BS2	0.00	0.11	0.15	1034.0	0.0	0.0	87.29	88.58	2095	1.19	1.27	1.11	0.99	1.13	0.90	4.01	308.30
3	4	0.00	0.10	0.13	1075.0	0.0	0.0	87.66	87.89	2124	1.19	1.22	1.15	0.85	1.46	0.61	4.68	338.80
4	4A	0.04	0.04	0.05	1092.0	0.0	0.0	87.51	87.64	2198	1.06	1.10	1.03	0.76	1.23	0.57	4.98	352.60
5	4AA	0.00	0.04	0.05	1077.0	0.0	0.0	88.22	88.63	2171	1.19	1.21	1.18	0.99	1.24	0.91	4.08	311.30
6	28T	0.86	0.86	1.15	998.0	0.0	0.0	86.69	87.97	1991	1.21	1.25	1.17	1.05	1.36	0.92	3.66	294.20
7	27T	1.16	0.87	1.16	994.0	78.1	13.2	86.92	87.77	1956	1.19	1.21	1.16	1.02	1.34	0.90	3.84	302.60
8	21A	0.04	0.53	0.69	1042.0	0.0	0.0	87.77	88.10	2000	1.20	1.22	1.18	0.99	1.17	0.84	3.95	306.90
9	2	0.00	0.08	0.05	1084.0	0.0	0.0	87.33	88.09	2171	1.29	1.38	1.21	0.88	1.54	0.61	4.51	330.90
10	2A	0.41	0.41	0.55	1014.0	52.9	0.0	86.92	87.37	2114	1.03	1.01	1.04	0.80	1.38	0.55	4.75	343.30
11	2AA	0.00	0.56	0.73	994.0	100.6	2.5	87.96	88.00	1953	1.24	1.26	1.22	0.96	1.34	0.81	4.01	309.60
12	3	0.00	0.08	0.05	1101.0	0.0	0.0	87.38	88.45	2170	1.09	1.06	1.11	0.95	1.44	0.65	4.19	316.30
13	3A	0.46	0.32	0.43	990.0	50.9	0.0	87.47	87.83	2036	1.07	1.03	1.10	0.88	1.50	0.61	4.44	328.60
14	3AA	0.00	0.56	0.73	989.0	88.7	2.0	88.00	88.05	1988	1.25	1.27	1.23	0.95	1.27	0.81	3.97	307.70
15	3B	0.00	0.53	0.71	1038.0	51.5	4.5	86.90	87.40	2016	1.03	0.97	1.07	0.84	1.57	0.61	4.58	335.80
16	6	0.00	0.04	0.05	1092.0	0.0	0.0	87.74	88.29	2226	1.23	1.28	1.17	0.82	1.55	0.56	4.39	325.50
17	6A	0.08	0.55	0.71	1003.0	58.6	9.1	87.41	87.62	2101	1.15	1.17	1.13	0.80	1.45	0.56	4.38	326.50
18	8	0.00	0.05	0.06	1069.0	0.0	0.0	87.84	88.59	2132	1.27	1.28	1.24	1.01	1.16	0.79	4.11	313.00
19	8A	0.44	0.44	0.57	1019.0	52.6	0.0	87.79	88.15	2024	1.17	1.21	1.13	0.95	1.21	0.80	4.03	310.20
20	7	0.00	0.04	0.05	1094.0	0.0	0.0	87.56	88.51	2143	1.34	1.34	1.34	1.02	1.39	0.60	4.19	316.20
21	7A	0.15	0.24	0.31	1011.0	54.8	0.0	87.99	88.39	2054	1.13	1.10	1.17	0.96	1.15	0.84	4.05	310.80
22	9	0.00	0.04	0.05	1094.0	0.0	0.0	88.31	88.71	2186	1.24	1.25	1.22	1.03	1.29	0.89	4.00	307.70
23	9A	0.52	0.52	0.68	1017.0	53.5	0.0	87.66	87.94	2036	1.18	1.20	1.16	0.98	1.24	0.78	4.12	314.50
24	10	0.00	0.04	0.05	1090.0	0.0	0.0	87.84	88.67	2135	1.22	1.34	1.10	1.00	1.27	0.87	4.04	309.50
25	10A	1.01	0.60	0.78	1009.0	101.9	0.0	87.49	87.89	1976	1.22	1.27	1.16	0.95	1.27	0.80	4.08	312.80
26	18A	0.76	0.76	0.99	1018.0	59.8	9.6	87.66	87.71	2094	1.23	1.21	1.23	0.99	1.27	0.85	4.06	312.50
27	18M	0.23	0.48	0.64	1003.0	101.4	11.3	87.92	88.10	1976	1.30	1.32	1.26	0.98	1.46	0.85	4.01	309.60
28	3T	0.50	0.31	0.41	1014.0	44.1	0.0	87.36	88.26	1988	1.18	1.21	1.15	0.92	1.19	0.84	4.07	311.60
29	4T	0.65	0.65	0.87	1026.0	64.2	18.9	86.90	87.84	1958	1.19	1.23	1.14	0.91	1.23	0.89	4.03	310.70
30	10B	0.14	0.22	0.29	1024.0	92.5	0.0	87.86	88.25	2046	1.12	1.16	1.08	0.91	1.17	0.77	4.21	317.60
31	10C	0.13	0.22	0.29	1026.0	91.8	0.0	87.87	88.29	2081	1.06	1.09	1.03	0.87	1.10	0.86	4.17	315.90
32	5T	0.00	0.55	0.74	1015.0	43.6	0.0	87.12	87.99	1989	1.14	1.18	1.10	0.93	1.28	0.86	4.01	309.60
33	7T	0.00	0.54	0.72	1017.0	40.5	0.0	87.26	88.18	1965	1.22	1.29	1.16	1.04	1.22	0.92	3.87	303.20
34	18T	0.00	0.57	0.76	982.0	47.3	0.0	87.39	88.21	2094	1.15	1.03	1.24	1.04	1.30	0.99	3.79	299.60
35	22T	1.15	0.87	1.16	1004.0	0.0	0.0	86.76	88.00	1986	1.25	1.28	1.21	1.12	1.31	0.94	3.64	293.20
36	24T	0.00	0.55	0.74	1001.0	0.0	0.0	87.13	88.47	1966	1.25	1.36	1.15	1.08	1.37	0.97	3.58	290.00
37	6T	0.00	0.55	0.74	1013.0	44.0	0.0	87.10	87.93	2002	1.10	1.12	1.07	0.90	1.25	0.86	4.07	312.60
38	15T	0.00	0.55	0.74	1004.0	45.6	1.3	87.31	88.29	1963	1.21	1.27	1.15	1.07	1.36	0.96	3.75	297.50
39	10T	0.00	0.56	0.75	998.0	76.6	54.5	87.15	87.96	1955	1.18	1.24	1.12	0.94	1.21	0.86	4.03	310.40
40	8T	0.00	0.55	0.74	1004.0	77.4	48.6	87.23	88.07	1956	1.19	1.23	1.14	0.95	1.26	0.92	3.94	306.60

SUMMARY OF T AND A SERIES TUNING AND OPTIMIZATION TESTS

	TEST MW	ACTUAL UBC LB/ 100LB	ADJUSTED UBC LB/ 100LB	UBC EFF LOSS %	GAS WT. WITHOUT RECIRC. MLB/HR	TOTAL GR MLB/HR	GR TO REBURN KLB/HR	AS TESTED EFF %	CORR. EFF %	ACT. FEGT	TOTAL SEC IN	SEC IN IN	SEC OUT IN	PTI IN	RH IN	ECON IN	DRY GAS LOSS %	EXIT GAS TEMP CORR
41	19T	0.00	0.55	0.74	1000.0	64.0	10.0	87.23	88.19	1962	1.19	1.21	1.16	1.00	1.39	0.91	3.84	301.70
42	23T	1.05	0.55	0.74	1000.0	75.3	14.4	87.18	88.12	1942	1.21	1.24	1.18	1.15	1.25	0.97	3.90	304.60
43	16T	0.00	0.56	0.75	999.0	67.1	10.2	87.28	88.19	1969	1.20	1.23	1.17	1.03	1.29	0.91	3.83	301.40
44	8T	0.00	0.56	0.75	991.0	46.3	2.9	87.28	87.99	1987	1.15	1.20	1.09	0.91	1.19	0.87	4.00	309.10
45	17T	0.90	0.55	0.74	1001.0	67.5	11.8	87.19	88.19	1949	1.26	1.30	1.21	1.01	1.29	0.91	3.84	301.70
46	3BM	0.28	0.48	0.62	1008.0	0.0	0.0	88.07	88.17	2037	1.27	1.25	1.28	1.04	1.28	0.83	3.97	307.50
47	50T	0.25	0.25	0.33	999.0	61.9	8.8	87.85	88.38	2016	1.19	1.24	1.14	0.97	1.55	0.80	4.03	309.60
48	25T	0.83	0.83	0.74	1006.0	0.0	0.0	87.21	88.42	1998	1.40	1.54	1.26	1.09	1.44	0.92	3.63	292.20
49	31T	0.00	0.55	0.74	1003.0	0.0	0.0	87.17	88.35	1995	1.27	1.42	1.13	1.11	1.38	0.88	3.70	295.50
50	32T	0.92	0.55	0.75	995.0	65.8	11.6	87.33	88.20	1966	1.32	1.39	1.25	1.06	1.46	0.88	3.82	300.70
51	17A	0.33	0.33	0.43	989.0	68.6	12.8	88.13	88.00	2072	1.14	1.16	1.12	0.90	1.09	0.81	4.30	322.20
52	18A	0.48	0.65	0 84	812.0	82.5	9.9	87.96	88.08	1975	1.06	1.02	1.10	0.95	1.24	0.85	3.69	295.30
53	45T	0.91	0.91	1.22	771.0	203.7	10.1	87.15	87.79	1768	1.26	1.38	1.17	1.08	1.38	0.93	3.54	289.00
54	5A	0.18	0.18	0.38	784.0	121.6	0.0	87.74	88.09	1880	1.15	1.25	1.06	0.87	1.24	0.65	3.98	307.50
55	11A	0.37	0.58	0.75	744.0	104.6	22.0	87.74	88.27	1867	1.17	1.15	1.17	1.17	1.22	0.84	3.50	286.10
56	11B	0.33	0.89	1.16	756.0	101.2	10.3	87.36	87.90	1885	1.12	1.12	1.12	1.13	1.12	0.91	3.47	285.70
57	11C	0.21	0.83	1.08	786.0	56.1	10.0	87.27	88.01	1884	1.06	1.01	1.09	1.02	1.31	0.89	3.44	283.80
58	12A	0.44	0.89	1.16	756.0	212.6	4.0	87.28	87.90	1763	1.42	1.40	1.43	1.33	1.29	0.88	3.48	286.20
59	13A	0.51	0.88	1.16	760.0	268.8	2.4	87.05	87.57	1741	1.42	1.40	1.43	1.31	1.07	0.76	3.77	299.30
60	4BM	0.24	0.67	0.86	743.0	195.4	13.4	87.84	88.12	1839	1.34	1.25	1.41	1.17	1.23	0.81	3.54	288.20
61	11T	0.00	0.91	0.44	749.0	198.4	2.0	87.90	88.76	1764	1.38	1.38	1.38	1.15	1.25	1.00	3.32	277.30
62	12T	0.00	0.92	1.24	742.0	210.7	11.7	87.10	87.90	1735	1.37	1.39	1.34	1.20	1.19	0.96	3.38	281.80
63	13T	1.71	0.91	1.22	746.0	203.0	12.2	87.05	87.85	1752	1.31	1.31	1.31	1.17	1.20	0.94	3.44	284.50
64	14T	1.31	0.93	1.24	739.0	191.4	13.3	86.97	87.79	1777	1.25	1.29	1.21	1.06	1.22	0.91	3.47	285.90
65	33T	0.00	0.88	0.41	764.0	165.1	2.6	87.38	88.81	1783	1.43	1.32	1.50	1.49	1.29	0.90	3.32	277.60
66	34T	0.00	0.92	1.51	743.0	230.9	11.8	86.85	87.91	1714	1.48	1.56	1.40	1.42	1.25	0.92	3.37	280.90
67	28T	1.51	0.91	1.22	747.0	232.6	11.2	87.08	87.91	1753	1.32	1.37	1.28	1.10	1.22	0.95	3.40	282.40
68	29T	0.00	0.90	1.22	751.0	228.6	10.2	87.05	87.86	1772	1.31	1.35	1.26	1.10	1.16	0.93	3.45	284.70
69	46T	1.16	1.16	1.55	734.0	203.5	2.2	86.73	87.56	1790	1.25	1.25	1.23	1.12	1.32	0.89	3.42	283.80
70	47T	0.97	0.97	1.30	732.0	178.0	10.3	86.89	87.76	1837	1.23	1.29	1.17	1.11	1.23	0.84	3.45	285.10
71	49T	0.75	0.75	1.00	759.0	109.9	10.6	87.05	88.14	1817	1.29	1.36	1.22	1.19	1.33	0.87	3.38	281.10
72	12B	0.55	0.55	1.08	759.0	195.5	11.8	87.70	88.21	1818	1.27	1.25	1.29	1.11	1.18	0.81	3.60	290.60
73	19A	1.18	1.18	1.53	760.0	270.7	11.0	87.10	87.34	1749	1.41	1.43	1.38	1.09	1.23	0.77	3.64	293.90
74	37T	0.00	1.12	0.64	663.0	232.8	2.3	87.04	88.52	1631	1.50	1.59	1.41	1.18	1.36	0.88	3.19	271.90
75	42T	1.64	1.18	1.58	641.0	226.3	1.9	86.62	87.55	1694	1.31	1.43	1.22	1.18	1.30	0.93	3.21	274.30
76	38T	0.00	1.22	1.63	627.0	234.9	1.5	86.43	87.55	1663	1.38	1.45	1.31	1.17	1.32	0.90	3.17	272.30
77	35T	0.00	1.21	1.63	630.0	236.8	11.3	86.48	87.60	1666	1.38	1.43	1.34	1.43	1.28	0.96	3.12	270.30
78	39T	1.61	1.22	1.63	627.0	235.3	1.5	86.44	87.55	1663	1.37	1.45	1.30	1.19	1.28	0.89	3.17	272.30
79	1A	0.50	0.50	0.67	650.0	203.9	0.0	87.09	88.01	1667	1.25	1.43	1.09	0.94	1.21	0.68	3.59	290.40
80	20A	1.67	1.67	2.17	573.0	281.0	4.1	86.09	86.86	1554	1.26	1.19	1.30	1.29	1.29	0.87	3.15	272.30

SUMMARY OF T AND A SERIES TUNING AND OPTIMIZATION TESTS

	TEST MW	ACTUAL UBC LB/ 100LB	ADJUSTED UBC LB/ 100LB	UBC EFF LOSS %	GAS WT. WITHOUT RECIRC. MLB/HR	TOTAL GR MLB/HR	GR TO REBURN KLB/HR	AS TESTED EFF %	CORR. EFF %	ACT. FEGT	TOTAL SEC KF	SEC IN KF	SEC OUT KF	PTI KF	RH KF	ECON KF	DRY GAS LOSS %	EXIT GAS TEMP CORR
81	28M	1.72	1.72	2.23	578.0	277.2	11.7	86.17	86.92	1543	1.52	1.52	1.52	1.47	1.33	0.93	3.05	268.10
82	15A	0.97	1.48	1.92	546.0	217.1	12.9	86.67	87.25	1617	1.19	1.17	1.20	1.38	1.20	0.91	2.99	264.70
83	44T	0.00	1.35	1.82	0.0	215.6	1.7	86.68	87.40	1666	1.20	1.32	1.09	1.35	1.14	0.98	3.06	267.80
84	46T	1.64	1.64	2.19	513.0	240.9	4.4	86.03	87.08	1563	1.37	1.30	1.40	1.45	1.35	0.96	2.83	257.40
85	30T	0.00	1.42	0.87	563.0	221.1	2.3	87.08	88.28	1522	1.28	1.39	1.18	1.28	1.27	0.96	2.93	260.10
86	43T	1.86	1.86	2.49	506.0	234.5	7.7	85.69	86.77	1543	1.45	1.65	1.26	1.22	1.39	0.94	2.81	257.00
87	40T	0.00	1.63	2.19	499.0	226.7	2.4	85.78	86.89	1668	1.16	1.11	1.20	1.04	1.20	0.87	2.95	263.30
88	41T	0.00	1.63	2.19	500.0	228.1	2.3	85.70	86.87	1635	1.12	1.09	1.15	1.04	1.18	0.89	2.96	263.60
89	14A	0.74	1.58	2.06	516.0	113.7	9.0	86.56	87.21	1687	1.24	1.24	1.23	1.30	1.41	0.92	2.84	257.70

RB-369 17 Jun 1992 14:21:55

TEST NO.	BS1	BS2	4	4A	4AA	26T	27T	21A
TEST SEQ. NO.	1	2	3	4	5	6	7	8
DATE	11/21/91	11/25/91	04/03/92	04/03/92	04/29/92	02/21/91	02/21/91	05/01/92
TIME START	1458	1005	0902	1205	0928	1057	1407	1005
TIME END	1714	1335	1131	1401	0945	1303	1706	1217
LOAD MW	110	110	110	111	110	110	110	110
FUEL	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR

BS1 AVG SCANS ? -->? : 110 MW : NO REBURN
BS2 AVG SCANS ? -->? : 110 MW : NO REBURN
4 AVG SCANS 7 -->20 : 110 MW : NO REBURN : BASE : B&W TRAV
4A AVG SCANS 24-->34 : 110 MW : NO REBURN : BASE : ACUREX TRAV
4AA AVG SCANS 6 -->8 : REPEAT 4A : 110 MW : NO REBURN
26T AVG SCANS 20-->31 : 110 MW : 12.2 TPH REBRN : NO GR TO BRNRS
27T AVG SCANS 38-->54 : 110 MW : 12.2 TPH REBRN : W/ GR TO BRNRS
21A AVG SCANS 6 -->17 : 110 MW : 13 TPH : HIGH REBRN STOIC

DATA PAGE NO. 2 FLOWS MLB/HR (MT/HR)

LOAD MW	20-005	110.4	110.2	110.0	110.9	109.8	109.9	110.1	110.2	2	1
MAIN STEAM FLOW	03-033	792.1	796.8	795.9	796.8	764.8	815.1	804.2	776.8	2	2
1ST STG STM FLW	CALC	762.7	767.3	766.4	767.5	760.0	783.9	773.7	772.8	2	23
FW FLOW	12-170	783.3	779.7	776.7	781.0	778.9	793.3	778.0	786.1	2	3
BLOW DOWN FLOW	EST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	4
RH SPRAY FLOW	14-192	13.60	0.00	4.23	11.18	11.75	0.00	0.00	0.00	2	5
SH SPRAY FLOW L	17-052	16.11	15.70	18.00	22.75	22.34	.99	2.62	1.20	2	7
SH SPRAY FLOW R	17-056	15.92	14.96	20.03	23.74	26.17	0.00	0.00	0.00	2	8
GR FAN AMPS A	16-181	.08	.08	.08	.08	.08	.08	25.81	.08	2	12
GR FAN AMPS B	16-183	-.0314	-.0206	-.0206	-.0206	-.0223	-.0206	-.0206	-.0206	2	13
GR FAN BUS VOLT	EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2	14
TOTAL GR FLOW	CALC	0.00	0.00	0.00	0.00	0.00	0.00	78.11	0.00	2	24
GR TO SEC AIR	06-932	0.00	0.00	-10.46	-21.91	.79	0.00	0.00	.85	2	25
GR TO SEC AIR	CALC	0.00	0.00	0.00	0.00	0.00	0.00	13.16	0.00	2	26
GR TO FURN	CALC	0.00	0.00	0.00	0.00	0.00	0.00	64.96	0.00	2	27
OFA AIR FLOW	06-931	17.5	17.2	35.4	35.2	28.2	129.9	200.0	193.1	2	28
TMP AIR FLOW	CALC	64.07	60.41	77.85	77.01	78.88	35.93	36.02	82.59	14	10
SEC AIR FLOW	06-320	24.56	24.78	27.82	26.96	30.93	41.29	27.42	39.59	2	29
1st STG PRESS	18-128	1061.0	1067.6	1066.3	1067.9	1057.2	1091.3	1076.8	1075.5	2	19
OIL FLOW 2A	05-100	.0017	.0017	.0017	.0017	0.0000	.0030	.0018	.0019	2	20
OIL FLOW 2B	07-100	.0017	.0017	.0017	.0017	.0017	.0033	.0033	.0017	2	21
OIL FLOW 2C	09-100	.0016	.0016	.0027	.0017	.0016	.0016	.0016	.0016	2	22
% PWDR RVR BASN COAL	USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	30
CYCLONE STOIC	CALC	1.0943	1.1003	1.1192	1.1176	1.1070	1.0798	1.0856	1.0888	4	20
REBRN WB STOIC	CALC	100.0	100.0	100.0	100.0	100.0	.6	.4	.6	4	21
REBRN STOIC	CALC	1.1612	1.1644	1.1822	1.1788	1.1801	.9711	.8871	.9587	4	22
LVG FURN STOIC	CALC	1.1826	1.1860	1.2264	1.2219	1.2152	1.1352	1.1414	1.2034	4	23
LVG ECON STOIC	CALC	1.1922	1.1958	1.2360	1.2314	1.2251	1.1450	1.1511	1.2132	4	24

TEST NO.			BS1	BS2	4	4A	4AA	26T	27T	21A	
TEST SEQ. NO.			1	2	3	4	5	6	7	8	
DATE			11/21/91	11/25/91	04/03/92	04/03/92	04/29/92	02/21/91	02/21/91	05/01/92	
TIME START			1458	1005	0902	1205	0928	1057	1407	1005	
TIME END			1714	1335	1131	1401	0945	1303	1706	1217	
LOAD MW			110	110	110	111	110	110	110	110	
DATA PAGE NO. 3	**FLUID TEMPERATURES F (C) - PLANT**										
SSH OUT T	L	15-152	998.6	998.9	998.1	998.5	999.4	988.8	998.3	993.2	3 1
SSH OUT T	R	15-150	998.1	999.2	999.0	999.9	1000.5	965.4	992.9	994.7	3 2
SSH OUT AVE T		13-160	999.2	1001.6	999.2	999.7	999.2	981.2	997.9	995.3	14 1
LVG SH ATTMP T	L	13-164	736.7	720.1	719.8	714.3	708.9	733.1	741.4	738.7	3 8
LVG SH ATTMP T	R	13-162	744.4	730.7	720.8	719.4	704.7	740.1	768.3	759.0	3 9
PRI SH OUT T	L	HW	808.5	778.6	786.0	797.6	792.6	733.0	752.0	737.1	3 10
PRI SH OUT T	R	HW	807.1	788.2	795.6	807.7	802.5	740.9	766.2	757.4	3 11
ECON H2O OUT T	L	HW	516.7	515.2	511.6	515.7	516.6	504.9	510.1	511.9	3 27
ECON H2O OUT T	R	HW	525.0	519.4	502.9	507.9	521.4	505.1	512.8	505.6	3 28
ECON H2O IN T		20-007	459.5	459.5	459.6	460.8	459.8	457.7	457.8	458.2	3 5
RH SPRAY H2O T		HW	318.7	318.2	316.3	315.6	317.1	317.0	316.7	318.2	3 7
LVG RH T		14-150	998.9	996.1	996.9	1002.3	1002.7	978.5	1001.4	998.2	3 12
ENT RH T		CALC	660.6	706.6	699.5	683.3	687.9	723.0	733.6	713.1	3 16
COLD RH T		20-006	743.0	743.6	743.1	745.1	744.6	728.0	741.1	741.7	3 18
DATA PAGE NO. 4	**FLUID TEMPERATURES F (C) - B&W**										
AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 18
GAS LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 19
DATA PAGE NO. 5	**FLUID PRESSURES PSIG (KG/CM2)**										
TURB THROT P		03-170	1450.1	1450.4	1449.9	1450.0	1449.8	1450.4	1448.9	1449.9	5 1
SEC SH OUT P		CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 2
DRUM PRESS		04-013	1600.8	1603.2	1599.2	1599.2	1597.9	1612.4	1607.4	1605.5	5 3
LVG RH PRESS		15-102	429.0	427.5	427.0	430.6	427.2	429.7	425.6	427.3	5 4

TEST NO.		BS1	BS2	4	4A	4AA	26T	27T	21A	
TEST SEQ. NO.		1	2	3	4	5	6	7	8	
DATE		11/21/91	11/25/91	04/03/92	04/03/92	04/29/92	02/21/91	02/21/91	05/01/92	
TIME START		1458	1005	0902	1205	0928	1057	1407	1005	
TIME END		1714	1335	1131	1401	0945	1303	1706	1217	
LOAD MW		110	110	110	111	110	110	110	110	
DATA PAGE NO. 5	FLUID PRESSURES PSIG (KG/CM2)									
ENT RH PRESS		15-100	457.6	452.8	452.6	457.5	454.8	458.0	454.7	457.3	5 5
FW HTR E EXT P		20-035	438.1	435.6	435.1	439.5	436.7	437.4	434.3	436.8	5 6
FW HTR E EXT P		TRANS	440.1	438.4	438.1	442.3	439.2	439.8	436.5	438.6	5 7
SEC SH OUT P	(T)	TRANS	1496.0	1492.7	1492.2	1494.1	1493.7	1497.9	1496.6	1495.4	5 17
DRUM PRESS	(T)	TRANS	1590.4	1589.2	1588.3	1589.6	1587.8	1602.2	1598.8	1597.7	5 18
LVG RH-1 P	(T)	TRANS	433.4	431.7	431.2	435.0	431.4	433.7	430.0	432.4	5 19
ENT RH-1 P	(T)	TRANS	454.1	452.4	0.0	0.0	0.0	454.4	450.5	0.0	5 20
DATA PAGE NO. 6	AIR & GAS DATA - PLANT									
AMBIENT AIR DB TEMP		TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 1
AIR ENT FD FAN T		HW	0.0	0.0	0.0	0.0	103.9	0.0	0.0	112.8	6 4
AIR LVG FD FAN T	A	09-028	130.1	109.2	122.8	127.6	131.6	121.3	128.2	135.0	7 2
AIR LVG FD FAN T	B	09-029	132.1	111.8	124.3	128.0	134.6	124.7	129.6	136.6	7 3
AIR ENT AH T	RA	20-017	177.2	144.0	127.1	130.7	136.9	177.5	159.7	139.1	6 2
AIR ENT AH T	RB	20-018	161.3	135.6	126.8	130.7	137.4	149.8	152.6	139.6	6 3
AIR ENT AH T	LA	20-025	189.9	175.3	126.1	130.7	134.9	188.2	188.7	138.5	13 25
AIR ENT AH T	LB	20-029	160.7	153.8	126.5	131.0	135.0	173.8	171.4	138.8	13 26
AIR LVG AH T	R	HW	618.9	589.6	678.3	707.4	598.6	560.8	574.6	593.1	6 6
AIR LVG AH T	L	HW	586.9	561.9	573.9	598.4	560.1	546.7	551.7	578.2	6 7
BRN SEC AIR T		08-002	561.8	533.6	587.4	614.8	539.8	512.4	522.3	551.1	14 2
BRN SA/GR T		08-001	495.9	472.7	544.0	562.7	512.0	489.7	506.1	530.3	14 3
OFA TEMP		09-002	504.3	478.4	218.8	215.6	403.3	516.3	526.5	530.5	14 4
GAS LVG AH T	RA	20-019	331.0	307.5	345.9	362.7	323.1	307.0	307.9	323.9	6 10
GAS LVG AH T	RB	20-020	306.8	283.0	316.5	330.8	302.4	291.0	291.2	307.0	6 11
GAS LVG AH T	LA	20-027	304.3	279.4	287.4	298.1	291.9	285.3	283.0	301.5	13 27
GAS LVG AH T	LB	20-024	306.7	292.2	294.3	306.5	298.3	298.9	296.6	307.4	13 28
GAS LVG RH PS T		AVE	680.7	644.4	656.1	687.7	642.4	622.1	633.4	657.1	13 17
GAS LVG SH PS T		AVE	665.1	653.4	744.1	781.6	660.6	617.1	639.3	643.0	13 19
GR GAS TEMP	A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 8
GR GAS TEMP	B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 9
O2 LVG ECON	R	11-172	3.5521	3.5598	3.7190	3.6698	3.5677	1.8062	2.5284	2.6025	6 20
O2 LVG ECON	L	11-170	3.3971	3.4376	3.2670	3.3150	3.4837	2.5954	3.3208	2.8324	6 21
O2 IN SEC AIR		06-254	20.65	20.63	18.57	17.49	20.55	20.66	14.77	20.62	13 29
ACCUREX NOX	PPM	06-553	0.0	0.0	533.9	571.9	549.8	0.0	0.0	323.7	13 9
ACCUREX SOX	PPM	06-555	0.0	0.0	1171.1	1207.1	1211.9	0.0	0.0	990.0	13 10
ACCUREX CO	PPM	06-425	0.00	0.00	16.70	14.92	13.48	0.00	0.00	49.00	13 11
ACCUREX O2	%	06-554	0.0000	0.0000	3.9278	3.6730	4.2113	0.0000	0.0000	3.3260	13 12
BRN SEC AIR P	IN WG	06-250	20.78	19.66	20.94	22.10	22.43	20.56	21.66	22.34	14 5
BRN GAS REC P	IN WG	06-252	20.60	19.56	20.92	22.13	22.51	20.16	21.60	22.22	14 6
FURNACE GAS P	IN WG	08-100	21.33	20.38	20.94	22.06	22.10	19.01	19.24	20.90	14 7
BAROMETRIC P	IN HG	PB	0.00	0.00	0.00	0.00	29.08	0.00	0.00	28.92	6 29
REL HUMIDITY	%	TST	0.0000	0.0000	0.0000	0.0000	7.6285	0.0000	0.0000	7.6266	6 30

TEST NO.		BS1	BS2	4	4A	4AA	26T	27T	21A	
TEST SEQ. NO.		1	2	3	4	5	6	7	8	
DATE		11/21/91	11/25/91	04/03/92	04/03/92	04/29/92	02/21/91	02/21/91	05/01/92	
TIME START		1458	1005	0902	1205	0928	1057	1407	1005	
TIME END		1714	1335	1131	1401	0945	1303	1706	1217	
LOAD MW		110	110	110	111	110	110	110	110	
DATA PAGE NO. 7	**AIR & GAS DATA - B&W**									
AMBIENT AIR TEMP	TC	0.00	0.00	47.82	54.00	59.38	0.00	0.00	78.65	7 1
AIR LVG FD FAN T A	TC	132.8	112.2	126.4	131.3	135.1	124.4	131.1	138.4	7 6
AIR LVG FD FAN T B	TC	134.7	114.6	127.2	131.0	137.8	127.1	131.9	139.6	7 7
AIR ENT AH (T)	GRID	171.8	153.7	127.7	132.0	137.3	174.4	167.9	140.3	7 4
GAS LVG AH (T)	GRID	303.8	285.1	301.9	315.7	295.8	291.7	291.2	300.2	7 10
GAS LVG ECON (T) L	GRID	687.7	660.7	703.3	738.8	657.5	639.2	652.6	676.4	7 14
GAS LVG ECON (T) R	GRID	685.2	658.8	787.0	825.5	673.2	598.3	634.0	633.5	7 15
GAS TEMP LVG GR FAN	GRID	173.2	0.0	181.6	173.7	232.3	0.0	0.0	193.8	13 7
O2 LVG ECON (T) L	GRID	3.5674	3.7232	4.3907	4.2787	4.1140	2.8661	3.0307	3.4845	7 20
O2 LVG ECON (T) R	GRID	3.3730	3.3200	3.9052	3.8823	3.7934	2.6095	2.6287	4.0659	7 21
CO LVG ECON (T) L	GRID	85.7	53.0	108.2	136.8	32.2	81.5	95.1	76.6	13 5
CO LVG ECON (T) R	GRID	160.2	86.0	107.0	186.8	67.1	73.9	111.5	60.9	13 6
CO2 LVG ECON (T) L	GRID	15.49	16.30	14.75	14.50	14.49	16.33	16.06	15.05	7 22
CO2 LVG ECON (T) R	GRID	15.32	16.23	14.81	14.80	14.41	16.08	16.02	14.29	7 23
NOX LVG ECON (T) L	GRID	573.7	581.0	577.4	606.5	586.0	371.7	287.0	335.4	7 24
NOX LVG ECON (T) R	GRID	599.4	552.3	570.4	594.1	0.0	363.8	300.6	0.0	7 25
O2 LVG AH (T)	GRID	5.0000	4.9000	5.3000	5.2800	5.2400	4.2000	3.9100	4.3400	13 1
CO2 LVG AH (T)	GRID	48.09	29.54	30.29	28.33	22.50	37.51	40.97	25.68	13 3
O2 LVG GR FAN (T)	GRID	19.61	19.25	11.55	11.40	0.00	18.59	18.51	0.00	13 4
DRY BULB TEMP (T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP (T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27
DATA PAGE NO. 8	**FW HTR TEMPERATURES F (C) - PLANT**									
FW HTR E EXT T	HW	743.4	743.6	740.8	742.1	743.7	726.9	740.1	741.2	8 1
FW HTR E LVG T	HW	459.9	459.5	459.3	458.3	459.3	457.5	457.6	458.5	8 5
FW HTR E ENT T	HW	385.3	387.1	383.0	383.5	385.2	385.0	383.5	384.0	8 7
FW HTR E DRN T	HW	404.9	404.0	404.5	405.1	404.5	403.6	402.2	405.9	8 13
DATA PAGE NO. 9	**FW HTR TEMPERATURES F (C) - B&W**									
SSH PEND IN LEG 1	10-017	859.2	856.6	848.1	847.1	843.0	837.5	859.3	851.5	9 17
SSH PEND IN LEG 2	10-018	873.3	874.4	865.4	862.5	859.4	853.3	878.0	871.1	9 18
SSH PEND IN LEG 3	10-019	873.0	875.4	866.0	864.0	860.4	850.5	876.5	879.3	9 19
SSH PEND IN LEG 4	10-020	878.1	880.9	875.2	874.7	865.9	862.6	888.0	894.4	9 20
SSH PEND IN LEG 5	10-021	882.8	884.0	862.7	861.8	845.0	868.1	886.2	883.5	9 21
SSH PEND IN LEG 6	10-033	884.7	882.1	874.2	871.7	859.4	886.8	894.3	895.1	9 22
SSH PEND IN LEG 7	10-034	880.8	879.1	875.3	870.9	864.7	892.2	890.3	887.1	9 23
SSH PEND IN LEG 8	10-035	874.9	872.8	866.7	863.8	857.4	880.8	885.6	877.3	9 24
SSH PEND IN LEG 9	10-036	880.0	877.5	869.3	867.6	864.4	871.0	884.9	876.2	9 25
SSH PEND IN LEG 10	10-037	858.2	854.3	851.6	849.8	853.6	836.7	852.7	848.4	9 26
RH PEND IN LEG 1	09-049	938.8	936.6	936.0	939.9	936.8	928.3	950.3	947.7	8 17
RH PEND IN LEG 2	09-050	930.1	927.6	926.9	930.0	925.7	925.4	946.3	943.2	8 18

TEST NO.	BS1	BS2	4	4A	4AA	26T	27T	21A	
TEST SEQ. NO.	1	2	3	4	5	6	7	8	
DATE	11/21/91	11/25/91	04/03/92	04/03/92	04/29/92	02/21/91	02/21/91	05/01/92	
TIME START	1458	1005	0902	1205	0928	1057	1407	1005	
TIME END	1714	1335	1131	1401	0945	1303	1706	1217	
LOAD MW	110	110	110	111	110	110	110	110	

DATA PAGE NO. 9 FW HTR TEMPERATURES F (C) - B&W

RH PEND IN LEG 3	09-051	933.2	930.9	928.7	932.5	929.5	923.4	945.1	942.4	8 19
RH PEND IN LEG 4	09-052	930.7	928.6	926.8	930.1	926.5	923.5	944.8	941.6	8 20
RH PEND IN LEG 5	09-053	923.0	928.3	0.0	0.0	0.0	885.5	912.2	0.0	8 21
RH PEND IN LEG 6	10-001	960.4	955.6	953.5	959.1	953.0	944.7	966.8	963.2	8 22
RH PEND IN LEG 7	10-002	932.1	929.8	924.2	929.5	925.8	913.6	937.4	934.9	8 23
RH PEND IN LEG 8	10-003	932.7	933.0	928.5	934.0	934.7	910.0	935.7	936.9	8 24
RH PEND IN LEG 9	10-004	939.5	937.3	935.2	939.1	935.5	928.2	950.3	947.1	8 25
RH PEND IN LEG 10	10-005	903.6	910.5	902.0	907.0	920.1	867.1	893.0	892.1	8 26
RH INTM HND HOLE R	10-038	936.3	933.6	934.8	938.9	937.6	925.6	947.1	946.3	8 27
RH INTM HND HOLE L	10-039	857.8	864.2	854.5	862.3	875.6	829.7	851.9	849.6	8 28
PSH OUT LEG T	09-017	806.4	788.2	793.7	804.8	800.2	744.0	768.0	756.3	14 11
PSH OUT LEG T	09-018	815.3	794.7	804.5	817.5	809.7	745.8	773.1	760.9	14 12
PSH OUT LEG T	09-019	797.0	773.7	788.3	804.3	793.5	723.0	735.5	720.7	14 13
PSH OUT LEG T	09-020	803.5	781.1	794.0	808.0	797.6	734.0	751.2	734.5	14 14
PSH OUT LEG T	09-021	792.5	775.3	781.8	792.0	788.6	737.3	757.7	744.8	14 15
PSH OUT LEG T	09-022	796.0	780.2	785.5	795.7	792.9	739.3	762.2	752.1	14 16
PSH OUT LEG T	09-023	800.5	779.8	790.2	803.2	795.0	729.4	753.4	738.7	14 17
PSH OUT LEG T	09-024	817.4	798.2	806.7	820.2	812.3	749.5	777.8	767.3	14 18
PSH OUT LEG T	09-025	799.2	779.0	791.7	804.7	795.1	731.6	756.8	747.4	14 19
PSH OUT LEG T	09-026	798.6	783.2	793.4	803.8	800.2	742.5	765.2	763.3	14 20
PSH OUT LEG T	09-027	809.2	793.9	803.7	813.3	808.9	757.7	780.9	777.0	14 21

DATA PAGE NO. 10 PULVERIZER COAL AND PA FLOW

CYC A COAL FLOW KLB	05-104	31.03	31.70	30.62	31.03	30.95	23.66	24.05	21.46	10 1
CYC B COAL FLOW KLB	07-110	31.02	31.67	30.65	31.07	30.89	23.66	24.05	21.42	10 2
CYC C COAL FLOW KLB	09-110	31.07	31.68	30.62	31.03	30.93	23.67	23.85	21.45	10 3
CYC A SEC AIR FLOW %	06-170	311.1	302.9	305.5	310.8	300.9	212.3	213.5	209.0	10 16
CYC B SEC AIR FLOW %	08-170	292.1	305.8	308.6	313.9	304.5	219.7	226.2	207.9	10 17
CYC C SEC AIR FLOW %	10-170	292.0	270.1	282.5	287.8	283.3	203.7	201.2	208.6	10 18
CYC A SEC AIR T	20-002	544.0	526.2	617.8	644.3	547.1	489.5	516.7	521.8	11 1
CYC B SEC AIR T	20-003	594.5	566.0	610.8	638.9	565.7	549.2	560.5	585.2	11 2
CYC C SEC AIR T	20-004	539.7	513.4	540.4	563.9	522.5	501.2	503.1	536.3	11 3
PULV COAL FLOW KLB	06-314	.09	.08	.07	.07	.06	24.57	24.58	26.11	10 4
PULV PA FLOW	06-275	6.64	6.53	0.00	.92	0.00	52.98	53.98	55.52	10 19
PULV INLET T	09-034	197.2	171.9	103.9	112.3	98.0	486.0	481.5	551.6	11 7
PULV OUTLET T	09-040	108.6	75.1	106.3	104.4	99.5	143.3	148.3	174.8	11 8

DATA PAGE NO. 11 PULVERIZER INLET TEMP AND PA DIFF

PULV DIFF P IN WG	06-274	-.06	-.05	-.02	-.01	-.08	12.49	11.20	14.52	11 9
PULV AMPS	06-276	0.0	0.0	.1	0.0	.1	240.5	246.1	276.3	11 10
PULV PA FAN AMPS	06-277	.05	-.10	-.15	0.00	-.09	56.98	56.78	85.65	11 11

TEST NO.	BS1	BS2	4	4A	4AA	26T	27T	21A
TEST SEQ. NO.	1	2	3	4	5	6	7	8
DATE	11/21/91	11/25/91	04/03/92	04/03/92	04/29/92	02/21/91	02/21/91	05/01/92
TIME START	1458	1005	0902	1205	0928	1057	1407	1005
TIME END	1714	1335	1131	1401	0945	1303	1706	1217
LOAD MW	110	110	110	111	110	110	110	110

DATA PAGE NO. 11 PULVERIZER INLET TEMP AND PA DIFF

ROT CLASS AMPS	06-278	1.49	1.85	.03	0.00	21.74	40.16	38.67	48.60	11 12
ROT CLASS RPM	06-270	59.6	4.3	-.2	-.2	66.7	139.6	139.8	159.5	11 13
ROT CLASS DP IN WG	06-345	-.0148	-.0080	-.0189	-.0189	.1775	.3659	.3283	.5371	11 14
COAL SILO LEVEL	06-310	0.00	0.00	12.09	11.83	58.28	80.83	41.77	35.25	11 15
FLAME INTENSITY #1 %	06-279	4.9	7.4	3.4	2.6	3.0	106.2	106.1	106.1	11 16
FLAME INTENSITY #2 %	06-295	16.0	6.9	3.4	3.5	3.5	105.4	105.7	105.9	11 17
FLAME INTENSITY #3 %	06-296	12.9	4.6	3.5	3.0	3.4	106.2	106.2	106.2	11 18
FLAME INTENSITY #4 %	06-297	4.9	3.8	5.4	4.2	4.3	105.8	105.6	106.1	11 19

DATA PAGE NO. 12 OPERATOR POSITIONS %

RH SP VLV POS	15-077	26.86	14.50	16.34	23.03	24.17	-5.00	-3.57	8.57	12 1
SH SP VLV POS R	13-190	47.93	46.93	59.98	68.71	73.10	0.00	0.00	15.02	12 3
SH SP VLV POS L	13-191	50.45	50.28	55.81	66.04	65.78	0.00	31.68	27.42	12 4
GR DMPR DEMAND	16-044	-5.0000	-2.3015	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	12 9
RECIRC AIR DMPR POS	12-176	27.91	32.09	0.00	0.00	0.00	.08	71.96	0.00	12 13
SH PASS DMPR POS	14-180	100.0	100.0	99.3	99.9	100.0	62.7	100.0	42.1	12 15
RH PASS DMPR POS	14-180	48.5	75.1	76.0	72.3	57.8	100.0	58.4	100.0	12 16
OVRFIRE AIR DMPR POS	06-115	10.07	10.07	15.67	15.67	5.00	37.09	50.04	43.12	12 17
BRN SEC AIR DMPR POS	06-286	10.21	10.17	15.06	15.06	16.23	25.04	13.03	38.26	12 18
HOT PRI AIR DMPR POS	06-556	-.1	-.1	0.0	0.0	0.0	100.0	100.0	100.0	12 19
BRN GAS REC DMPR POS	06-324	-0.00	-5.00	0.00	0.00	0.00	0.00	35.01	0.00	12 20

DATA PAGE NO. 15 MISCELLANEOUS

GAS LVG SH PASS 1A	08-003	660.6	-497.0	-627.4	-658.5	-451.1	-427.0	-420.4	-410.4	15 1
GAS LVG SH PASS 1B	08-004	675.5	665.7	765.6	804.4	659.4	625.7	656.2	648.4	15 2
GAS LVG SH PASS 1C	08-005	0.0	661.6	807.5	846.7	676.9	644.7	685.5	661.0	15 3
GAS LVG SH PASS 1D	08-006	714.5	703.0	785.5	825.8	709.5	662.6	690.6	692.6	15 4
GAS LVG SH PASS 2A	08-017	635.1	621.2	704.8	739.6	623.8	586.5	599.4	604.7	15 5
GAS LVG SH PASS 2B	08-018	658.4	632.5	725.2	760.5	635.5	592.9	608.6	617.3	15 6
GAS LVG SH PASS 2C	08-019	677.0	633.0	712.1	749.2	640.3	590.9	615.3	621.2	15 7
GAS LVG SH PASS 2D	08-020	659.1	671.8	750.0	786.5	677.7	637.6	657.2	663.9	15 8
GAS LVG SH PASS 3A	08-021	644.3	654.5	742.4	779.9	660.4	612.6	620.8	633.1	15 9
GAS LVG SH PASS 3B	08-022	664.2	655.8	731.7	768.7	669.9	613.0	642.4	649.4	15 10
GAS LVG SH PASS 3C	08-023	662.9	634.5	716.0	754.7	652.7	604.8	616.7	638.2	15 11
GAS LVG SH PASS 3D	08-024	663.9	-584.2	-650.1	-681.2	-582.2	-543.0	-541.6	-553.6	15 12
GAS LVG RH PASS 4A	08-033	-502.4	640.4	643.7	674.9	632.1	609.7	617.0	635.9	15 13
GAS LVG RH PASS 4B	08-034	695.1	651.2	656.9	688.7	642.0	626.1	636.0	659.9	15 14
GAS LVG RH PASS 4C	08-035	709.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15
GAS LVG RH PASS 4D	08-036	738.1	680.0	699.7	736.6	682.1	660.9	686.8	710.1	15 16
GAS LVG RH PASS 5A	08-049	639.9	624.2	629.8	658.3	623.5	594.4	601.4	625.8	15 17
GAS LVG RH PASS 5B	08-050	657.1	637.3	645.5	676.4	630.3	612.3	620.4	643.7	15 18

TEST NO.		BS1	BS2	4	4A	4AA	26T	27T	21A
TEST SEQ. NO.		1	2	3	4	5	6	7	8
DATE		11/21/91	11/25/91	04/03/92	04/03/92	04/29/92	02/21/91	02/21/91	05/01/92
TIME START		1458	1005	0902	1205	0928	1057	1407	1005
TIME END		1714	1335	1131	1401	0945	1303	1706	1217
LOAD MW		110	110	110	111	110	110	110	110

DATA PAGE NO. 15 MISCELLANEOUS

GAS LVG RH PASS	5C	08-051	661.2	646.3	659.6	694.4	641.7	629.6	645.0	659.8	15 19
GAS LVG RH PASS	5D	08-052	703.0	632.2	656.7	687.8	635.0	619.4	638.7	659.2	15 20
GAS LVG RH PASS	6A	08-053	666.7	635.2	638.4	668.2	631.8	608.2	614.4	638.1	15 21
GAS LVG RH PASS	6B	08-054	680.2	649.9	656.1	688.1	648.0	628.3	639.2	664.2	15 22
GAS LVG RH PASS	6C	08-055	656.2	644.9	659.1	689.6	641.6	624.8	630.2	658.1	15 23
GAS LVG RH PASS	6D	08-056	-574.6	647.2	671.2	701.8	657.9	629.9	638.7	673.1	15 24
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W			2.00	3.00	60.00	61.00	88.00	4.00	5.00	92.00	15 28

RB-369 17 Jun 1992 14:22:54

TEST NO.	2	2A	2AA	3	3A	3AA	3B	6	6A
TEST SEQ. NO.	9	10	11	12	13	14	15	16	17
DATE	04/01/92	04/01/92	04/29/92	04/02/92	04/02/92	04/29/92	04/02/92	04/07/92	04/07/92
TIME START	0741	1912	1040	0735	1158	1133	1503	0825	1057
TIME END	0752	2117	1123	0837	1400	1204	1659	0835	1302
LOAD MW	109	110	110	110	110	110	110	110	110
FUEL	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR

2 SINGLE SCAN : 110 MW : PRE-REBURN BASE
2A AVG SCANS 68-->79 : 110 MW : 13 TPH : 140 RPB : HIGH STOIC
2AA AVG SCANS 14-->17: REPEAT 2A : 13 TPH : HIGH STOIC : 140 RPM
3 SINGLE SCAN : 110 MW : PRE-REBURN BASE
3A AVG SCANS 19-->29 : 110 MW : 13 TPH : 140 RPM : MED STOIC
3AA AVG SCANS 19-->21: REPEAT 3A : 13 TPH : MED STOIC : 140 RPM
3B AVG SCANS 36-->46 : 110 MW : 13 TPH : MED STOIC : HIGH OFA
6 SINGLE SCAN : 110 MW : PRE-REBURN BASE
6A AVG SCANS 18-->29 : 110 MW : 13 TPH : 140 RPM : LOW STOIC

DATA PAGE NO. 2 FLOWS MLB/HR (MT/HR)

LOAD MW	20-005	109.4	109.6	109.6	110.0	110.3	110.0	109.8	109.8	110.2	2	1
MAIN STEAM FLOW	03-033	785.3	788.6	775.1	793.2	799.6	775.0	794.2	793.0	780.6	2	2
1ST STG STM FLW	CALC	756.5	759.3	770.4	764.0	770.3	771.1	764.7	764.1	771.9	2	23
FW FLOW	12-170	773.2	772.3	778.8	785.6	778.3	784.1	774.0	780.5	780.6	2	3
BLOW DOWN FLOW	EST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	4
RH SPRAY FLOW	14-192	9.82	9.65	0.00	21.94	0.00	0.00	3.48	15.51	0.00	2	5
SH SPRAY FLOW L	17-052	27.26	13.89	0.00	17.71	3.72	0.00	3.38	29.40	13.03	2	7
SH SPRAY FLOW R	17-056	27.39	9.25	0.00	21.61	0.00	0.00	1.99	34.75	11.28	2	8
GR FAN AMPS A	16-181	.08	21.92	.08	.08	22.14	.08	21.99	.08	22.71	2	12
GR FAN AMPS B	16-183	-.02	-.02	27.88	-.02	-.02	26.65	-.02	-.02	-.02	2	13
GR FAN BUS VOLT	EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2	14
TOTAL GR FLOW	CALC	0.0	52.9	100.6	0.0	50.9	88.7	51.5	0.0	58.6	2	24
GR TO SEC AIR	06-932	-80.5	-151.8	2.8	-50.7	-11.1	2.3	-73.1	-78.6	-85.9	2	25
GR TO SEC AIR	CALC	0.0000	0.0000	2.4542	0.0000	0.0000	2.0270	4.5044	0.0000	9.1005	2	26
GR TO FURN	CALC	0.00	52.89	98.19	0.00	50.88	86.69	46.97	0.00	49.50	2	27
OFA AIR FLOW	06-931	33.9	202.0	204.1	34.4	209.9	215.8	249.5	25.5	245.2	2	28
TMP AIR FLOW	CALC	92.9	78.5	41.1	116.9	55.2	55.5	108.2	80.9	66.4	14	10
SEC AIR FLOW	06-320	28.49	47.72	47.34	28.54	36.97	36.65	36.79	27.96	27.48	2	29
1st STG PRESS	18-128	1052.1	1056.1	1071.9	1062.9	1071.8	1073.0	1063.8	1063.0	1074.1	2	19
OIL FLOW 2A	05-100	.0017	.0018	.0017	.0017	.0017	.0017	.0017	.0017	.0017	2	20
OIL FLOW 2B	07-100	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0017	2	21
OIL FLOW 2C	09-100	.0019	.0016	.0016	.0016	.0016	.0016	.0016	.0033	.0032	2	22
% PWDR RVR BASN COAL	USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	30
CYCLONE STOIC	CALC	1.0979	1.0394	1.0883	1.0639	1.0533	1.0549	1.0397	1.1122	1.0515	4	20
REBRN WB STOIC	CALC	100.0	.5	.5	100.0	.4	.4	.4	100.0	.4	4	21
REBRN STOIC	CALC	1.1810	.8945	.8889	1.1746	.8670	.8604	.8713	1.1907	.8347	4	22
LVG FURN STOIC	CALC	1.2231	1.1478	1.1511	1.2166	1.1333	1.1356	1.1864	1.2221	1.1458	4	23

TEST NO.		2	2A	2AA	3	3A	3AA	3B	6	6A		
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17		
DATE		04/01/92	04/01/92	04/29/92	04/02/92	04/02/92	04/29/92	04/02/92	04/07/92	04/07/92		
TIME START		0741	1912	1040	0735	1158	1133	1503	0825	1057		
TIME END		0752	2117	1123	0837	1400	1204	1659	0835	1302		
LOAD MW		109	110	110	110	110	110	110	110	110		
DATA PAGE NO. 2	**FLOWS MLB/HR (MT/HR)**											
LVG ECON STOIC	CALC	1.2327	1.1572	1.1608	1.2263	1.1429	1.1454	1.1959	1.2319	1.1554	4	24
DATA PAGE NO. 3	**FLUID TEMPERATURES F (C) - PLANT**											
SSH OUT T L	15-152	996.2	997.7	989.2	995.5	998.1	1001.8	998.0	992.2	999.2	3	1
SSH OUT T R	15-150	996.1	999.0	998.2	996.0	999.1	999.3	999.3	995.4	998.8	3	2
SSH OUT AVE T	13-160	998.2	1000.5	996.6	996.0	1001.3	1003.5	999.9	993.6	1000.9	14	1
LVG SH ATTMP T L	13-164	686.7	726.4	742.8	729.1	744.2	743.4	754.3	690.1	718.2	3	8
LVG SH ATTMP T R	13-162	698.0	754.2	759.8	722.3	773.6	755.0	776.7	680.8	741.7	3	9
PRI SH OUT T L	HW	786.5	772.0	739.5	792.4	755.8	739.9	764.4	799.7	761.8	3	10
PRI SH OUT T R	HW	798.5	790.6	765.6	802.1	775.1	768.2	789.4	807.0	786.5	3	11
ECON H2O OUT T L	HW	511.8	506.4	507.3	511.0	506.9	508.9	506.8	515.6	510.2	3	27
ECON H2O OUT T R	HW	499.5	499.9	508.5	499.3	494.9	510.0	498.8	501.4	497.9	3	28
ECON H2O IN T	20-007	459.6	459.0	456.6	460.6	458.6	457.7	458.3	461.7	459.9	3	5
RH SPRAY H2O T	HW	315.2	313.7	316.0	315.7	316.3	317.3	315.4	317.5	318.4	3	7
LVG RH T	14-150	992.5	999.8	998.2	987.0	1000.5	995.7	1002.6	997.7	1006.5	3	12
ENT RH T	CALC	686.5	685.9	728.2	597.9	710.8	717.2	705.4	652.9	711.6	3	16
COLD RH T	20-006	740.8	743.5	738.0	742.9	745.1	746.5	743.6	744.0	746.6	3	18
DATA PAGE NO. 4	**FLUID TEMPERATURES F (C) - B&W**											
AIR ENT AH P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	1
AIR LVG AH P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	2
CYC A TA DIFF P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	3
CYC A PA DIFF P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	4
CYC A TOT P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	5
CYC B TA DIFF P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	6
CYC B PA DIFF P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	7
CYC B TOT P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	8
CYC C TA DIFF P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	9
CYC C PA DIFF P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	10
CYC C TOT P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	11
LVG SSH PLAT P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	12
ENT PSH P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	13
LVG PSH P R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	14
LVG PSH P L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	15
LVG ECON P R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	16
LVG ECON P L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	17
GAS ENT AH P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	18
GAS LVG AH P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	19

TEST NO.	2	2A	2AA	3	3A	3AA	3B	6	6A	
TEST SEQ. NO.	9	10	11	12	13	14	15	16	17	
DATE	04/01/92	04/01/92	04/29/92	04/02/92	04/02/92	04/29/92	04/02/92	04/07/92	04/07/92	
TIME START	0741	1912	1040	0735	1158	1133	1503	0825	1057	
TIME END	0752	2117	1123	0837	1400	1204	1659	0835	1302	
LOAD MW	109	110	110	110	110	110	110	110	110	

DATA PAGE NO. 5 FLUID PRESSURES PSIG (KG/CM2)

TURB THROT P		03-170	1450.1	1450.0	1451.7	1452.1	1449.9	1450.7	1449.8	1450.1	1449.4	5 1
SEC SH OUT P		CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 2
DRUM PRESS		04-013	1594.9	1598.8	1609.4	1600.3	1603.5	1607.9	1601.0	1596.4	1601.2	5 3
LVG RH PRESS		15-102	424.5	424.7	423.3	430.4	426.1	425.9	424.1	431.3	428.9	5 4
ENT RH PRESS		15-100	451.5	453.5	452.1	458.7	454.9	455.1	452.6	458.3	456.6	5 5
FW HTR E EXT P		20-035	433.9	433.9	432.0	439.4	434.8	434.8	432.9	440.7	437.8	5 6
FW HTR E EXT P		TRANS	436.2	436.1	434.4	442.0	437.2	437.0	435.3	443.3	440.6	5 7
SEC SH OUT P	(T)	TRANS	1494.7	1495.0	1496.8	1495.9	1495.4	1497.7	1495.0	1493.9	1494.9	5 17
DRUM PRESS	(T)	TRANS	1585.5	1590.8	1599.4	1590.8	1596.2	1599.5	1594.3	1586.4	1593.6	5 18
LVG RH-1 P	(T)	TRANS	428.3	428.8	428.1	434.5	431.0	430.5	429.0	435.5	433.6	5 19
ENT RH-1 P	(T)	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 20

DATA PAGE NO. 6 AIR & GAS DATA - PLANT

AMBIENT AIR DB TEMP		TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 1
AIR ENT FD FAN T		HW	0.0	0.0	106.4	0.0	0.0	105.4	0.0	93.3	93.7	6 4
AIR LVG FD FAN T	A	09-028	118.6	125.2	134.6	124.8	127.0	133.9	128.5	123.2	127.5	7 2
AIR LVG FD FAN T	B	09-029	119.4	125.4	138.8	123.5	127.6	138.0	128.3	122.9	128.5	7 3
AIR ENT AH T	RA	20-017	122.2	128.1	140.7	126.5	130.2	140.4	131.0	125.3	131.1	6 2
AIR ENT AH T	RB	20-018	122.6	128.3	141.5	126.0	130.1	140.9	131.0	125.5	131.1	6 3
AIR ENT AH T	LA	20-025	121.9	128.0	138.1	127.4	129.8	137.5	131.2	125.8	130.4	13 25
AIR ENT AH T	LB	20-029	122.6	128.8	138.3	128.6	130.8	137.9	132.3	126.6	131.1	13 26
AIR LVG AH T	R	HW	662.1	701.3	597.1	655.5	662.9	622.7	684.3	677.2	683.8	6 6
AIR LVG AH T	L	HW	570.6	601.0	565.4	562.8	582.9	570.7	583.9	568.5	592.0	6 7
BRN SEC AIR T		08-002	578.0	626.8	544.4	576.9	594.4	548.4	612.8	587.5	607.0	14 2
BRN SA/GR T		08-001	535.6	607.9	524.1	539.4	569.7	524.3	588.0	544.2	571.6	14 3
OFA TEMP		09-002	221.6	572.6	523.6	264.7	547.0	530.9	560.8	201.5	559.8	14 4
GAS LVG AH T	RA	20-019	331.7	349.6	324.7	341.1	333.4	323.5	341.5	344.0	346.8	6 10
GAS LVG AH T	RB	20-020	303.0	324.1	306.4	312.2	310.4	305.8	315.2	316.6	324.9	6 11
GAS LVG AH T	LA	20-027	280.8	294.1	294.4	286.0	286.4	293.4	289.1	286.5	294.2	13 27
GAS LVG AH T	LB	20-024	286.7	301.7	299.3	292.8	290.2	298.5	294.1	295.1	299.9	13 28
GAS LVG RH PS T		AVE	652.4	679.1	645.8	637.9	655.4	649.8	657.6	658.3	670.1	13 17
GAS LVG SH PS T		AVE	730.1	769.4	654.8	717.5	723.2	658.2	750.1	756.5	752.2	13 19
GR GAS TEMP	A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 8
GR GAS TEMP	B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 9
O2 LVG ECON	R	11-172	4.0795	2.5579	2.7029	3.7875	1.9215	2.4037	3.3819	3.4492	2.8903	6 20
O2 LVG ECON	L	11-170	2.6933	2.1353	2.1363	3.2255	2.1888	1.9149	2.6220	3.5583	2.0032	6 21
O2 IN SEC AIR		06-254	0.00	0.00	19.95	20.70	0.00	19.88	18.66	0.00	16.40	13 29
ACCUREX NOX	PPM	06-553	-4.6	291.6	290.5	618.6	288.3	267.8	279.1	-3.0	275.7	13 9
ACCUREX SOX	PPM	06-555	1552.3	871.4	1142.7	831.3	1303.4	1062.6	1231.9	1717.0	1227.1	13 10
ACCUREX CO	PPM	06-425	773.9	58.7	29.0	283.9	18.5	33.4	32.2	682.0	122.0	13 11
ACCUREX O2	%	06-554	13.07	7.42	3.46	.01	2.21	3.32	3.35	9.80	2.59	13 12
BRN SEC AIR P	IN WG	06-250	21.43	22.12	22.61	19.75	18.34	20.25	19.91	21.80	19.58	14 5
BRN GAS REC P	IN WG	06-252	21.28	21.49	22.25	19.48	18.10	20.18	19.73	21.55	19.66	14 6

TEST NO.		2	2A	2AA	3	3A	3AA	3B	6	6A	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		04/01/92	04/01/92	04/29/92	04/02/92	04/02/92	04/29/92	04/02/92	04/07/92	04/07/92	
TIME START		0741	1912	1040	0735	1158	1133	1503	0825	1057	
TIME END		0752	2117	1123	0837	1400	1204	1659	0835	1302	
LOAD MW		109	110	110	110	110	110	110	110	110	
DATA PAGE NO. 6	**AIR & GAS DATA - PLANT**										
FURNACE GAS P	IN WG	08-100	21.53	18.55	19.70	19.46	17.01	19.15	18.47	21.59	18.53	14 7
BAROMETRIC P	IN HG	PB	0.00	0.00	29.10	0.00	0.00	29.11	0.00	29.23	29.24	6 29
REL HUMIDITY	%	TST	0.0000	0.0000	7.6101	0.0000	0.0000	7.5998	0.0000	7.8155	7.7217	6 30
DATA PAGE NO. 7	**AIR & GAS DATA - B&W**										
AMBIENT AIR TEMP		TC	33.44	34.78	64.07	32.19	42.34	66.73	44.70	49.25	57.29	7 1
AIR LVG FD FAN T	A	TC	122.3	128.7	138.2	128.4	130.2	137.5	131.8	126.6	130.7	7 6
AIR LVG FD FAN T	B	TC	122.3	128.2	142.0	126.3	130.2	141.2	130.9	125.8	131.1	7 7
AIR ENT AH	(T)	GRID	123.4	129.4	141.1	128.5	131.2	140.5	132.3	127.0	131.9	7 4
GAS LVG AH	(T)	GRID	292.8	308.4	296.7	298.6	295.5	296.4	300.8	302.2	306.4	7 10
GAS LVG ECON	(T) L	GRID	704.9	739.7	662.9	675.3	709.9	654.3	723.5	653.9	670.2	7 14
GAS LVG ECON	(T) R	GRID	739.5	776.4	663.3	681.8	725.0	659.4	751.5	755.8	750.7	7 15
GAS TEMP LVG GR FAN		GRID	0.0	0.0	428.8	0.0	0.0	504.7	0.0	192.9	573.2	13 7
O2 LVG ECON	(T) L	GRID	3.9743	3.1618	2.9270	4.0267	3.0088	2.7114	3.6524	4.4669	2.9735	7 20
O2 LVG ECON	(T) R	GRID	4.1644	2.7617	3.0280	3.9006	2.4492	2.7490	3.4318	3.5640	2.8399	7 21
CO LVG ECON	(T) L	GRID	92.4	159.3	70.9	96.8	138.9	76.5	125.1	40.2	97.1	13 5
CO LVG ECON	(T) R	GRID	137.9	229.0	59.9	82.5	93.9	65.0	149.9	119.6	117.3	13 6
CO2 LVG ECON	(T) L	GRID	15.16	15.75	15.46	15.31	15.77	15.56	14.87	14.76	15.85	7 22
CO2 LVG ECON	(T) R	GRID	14.66	16.27	14.92	15.05	15.83	15.06	14.77	15.16	15.58	7 23
NOX LVG ECON	(T) L	GRID	563.5	308.5	333.8	535.0	282.2	304.1	294.8	578.9	262.9	7 24
NOX LVG ECON	(T) R	GRID	451.6	333.0	0.0	549.0	306.5	0.0	326.1	570.2	280.4	7 25
O2 LVG AH	(T)	GRID	5.1200	4.1200	3.7400	5.0000	3.9000	3.5500	4.7300	5.3000	4.2100	13 1
CO2 LVG AH	(T)	GRID	231.3	1571.1	23.3	275.1	1856.2	24.9	2872.2	34.1	117.2	13 3
O2 LVG GR FAN	(T)	GRID	5.8825	3.5809	0.0000	7.0633	4.0311	0.0000	5.5542	0.0000	8.4172	13 4
DRY BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27
DATA PAGE NO. 8	**FW HTR TEMPERATURES F (C) - PLANT**										
FW HTR E EXT T		HW	738.1	739.2	736.9	740.2	743.1	746.3	740.9	742.2	745.2	8 1
FW HTR E LVG T		HW	457.0	456.9	456.5	458.3	457.6	458.0	456.6	460.5	459.5	8 5
FW HTR E ENT T		HW	382.8	380.5	381.7	383.8	383.4	383.4	382.2	386.3	387.6	8 7
FW HTR E DRN T		HW	401.7	399.3	401.7	403.7	402.6	402.9	401.7	408.1	407.1	8 13
DATA PAGE NO. 9	**FW HTR TEMPERATURES F (C) - B&W**										
SSH PEND IN LEG	1	10-017	840.9	847.3	848.6	848.0	854.8	845.7	852.9	829.6	841.6	9 17
SSH PEND IN LEG	2	10-018	860.1	865.8	871.8	863.1	870.8	869.6	871.4	844.4	863.4	9 18
SSH PEND IN LEG	3	10-019	859.1	872.2	883.1	863.1	876.4	881.8	880.7	843.6	872.7	9 19
SSH PEND IN LEG	4	10-020	868.7	887.1	898.1	870.6	892.9	898.8	895.9	849.8	889.0	9 20
SSH PEND IN LEG	5	10-021	857.9	876.9	885.5	858.3	890.6	888.5	886.9	836.9	880.4	9 21

TEST NO.	2	2A	2AA	3	3A	3AA	3B	6	6A	
TEST SEQ. NO.	9	10	11	12	13	14	15	16	17	
DATE	04/01/92	04/01/92	04/29/92	04/02/92	04/02/92	04/29/92	04/02/92	04/07/92	04/07/92	
TIME START	0741	1912	1040	0735	1158	1133	1503	0825	1057	
TIME END	0752	2117	1123	0337	1400	1204	1659	0835	1302	
LOAD MW	109	110	110	110	110	110	110	110	110	

DATA PAGE NO. 9 FW HTR TEMPERATURES F (C) - B&W

SSH PEND IN LEG 6	10-033	864.5	882.1	893.7	871.6	899.2	900.8	893.9	853.6	885.9	9 22
SSH PEND IN LEG 7	10-034	858.5	871.7	882.8	875.2	888.5	893.3	885.0	861.1	872.4	9 23
SSH PEND IN LEG 8	10-035	850.6	868.1	873.5	866.8	880.6	883.2	880.2	850.5	864.4	9 24
SSH PEND IN LEG 9	10-036	854.8	871.2	874.3	868.5	877.8	882.2	882.0	853.8	868.7	9 25
SSH PEND IN LEG 10	10-037	839.7	849.2	849.1	855.4	851.5	853.2	861.4	835.9	847.5	9 26
RH PEND IN LEG 1	09-049	926.8	940.4	944.4	926.1	946.3	940.9	945.6	932.2	946.5	8 17
RH PEND IN LEG 2	09-050	916.0	930.7	940.0	917.6	941.9	936.3	937.3	921.5	938.2	8 18
RH PEND IN LEG 3	09-051	919.2	933.2	939.3	919.2	941.0	936.0	938.9	924.6	939.6	8 19
RH PEND IN LEG 4	09-052	916.7	930.6	938.9	916.7	940.2	935.1	936.9	921.5	937.8	8 20
RH PEND IN LEG 5	09-053	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8 21
RH PEND IN LEG 6	10-001	945.1	959.5	959.2	944.4	961.3	955.6	961.8	949.9	963.1	8 22
RH PEND IN LEG 7	10-002	919.1	933.7	933.3	910.6	934.1	929.7	932.9	919.7	934.9	8 23
RH PEND IN LEG 8	10-003	926.4	940.6	936.6	912.5	936.7	931.6	940.0	922.5	941.8	8 24
RH PEND IN LEG 9	10-004	926.2	939.8	944.5	924.2	945.9	940.5	944.9	930.0	946.0	8 25
RH PEND IN LEG 10	10-005	900.7	897.9	894.8	886.5	895.9	888.9	918.4	892.2	916.2	8 26
RH INTM HND HOLE R	10-038	924.3	939.5	940.1	928.4	944.9	940.4	945.0	935.0	945.5	8 27
RH INTM HND HOLE L	10-039	851.3	842.9	848.1	840.9	846.7	844.4	856.2	849.7	857.3	8 28
PSH OUT LEG T	09-017	801.2	792.5	759.4	807.6	773.1	760.9	786.6	812.9	780.8	14 11
PSH OUT LEG T	09-018	812.1	802.4	770.5	818.9	781.1	772.8	799.3	825.5	793.0	14 12
PSH OUT LEG T	09-019	790.6	759.4	721.6	800.6	740.0	722.3	748.3	809.0	745.5	14 13
PSH OUT LEG T	09-020	796.1	776.6	736.7	803.7	757.0	737.0	764.1	813.0	761.9	14 14
PSH OUT LEG T	09-021	782.9	779.1	745.6	790.2	762.1	746.4	770.4	794.5	766.6	14 15
PSH OUT LEG T	09-022	789.6	785.6	753.6	796.2	766.3	754.6	778.8	799.3	773.6	14 16
PSH OUT LEG T	G9-023	794.6	781.1	750.2	800.9	754.7	751.1	778.1	806.8	772.2	14 17
PSH OUT LEG T	09-024	810.7	808.8	776.1	816.9	786.0	778.3	803.1	821.0	798.1	14 18
PSH OUT LEG T	09-025	793.8	789.2	756.9	801.2	768.2	759.6	785.2	805.1	779.8	14 19
PSH OUT LEG T	09-026	796.1	791.1	768.2	801.4	778.7	771.1	790.2	804.5	786.8	14 20
PSH OUT LEG T	09-027	805.1	804.1	781.5	810.3	791.5	784.4	801.5	813.7	799.9	14 21

DATA PAGE NO. 10 PULVERIZER COAL AND PA FLOW

CYC A COAL FLOW KLB	05-104	30.29	22.00	22.61	30.58	21.87	21.63	21.64	30.99	22.72	10 1
CYC B COAL FLOW KLB	07-110	30.29	21.97	22.57	30.59	21.89	21.59	21.65	30.94	22.69	10 2
CYC C COAL FLOW KLB	09-110	30.31	22.01	22.60	30.60	21.88	21.62	21.64	31.00	22.73	10 3
CYC A SEC AIR FLOW %	06-170	301.7	205.4	210.7	288.6	209.1	206.9	205.0	290.9	199.9	10 16
CYC B SEC AIR FLOW %	08-170	305.1	202.7	210.4	291.4	197.1	205.8	198.7	294.6	209.0	10 17
CYC C SEC AIR FLOW %	10-170	278.3	199.4	199.5	291.6	202.8	195.0	200.3	315.6	202.1	10 18
CYC A SEC AIR T	20-002	608.9	637.2	540.1	600.0	597.7	543.2	613.5	622.8	616.4	11 1
CYC B SEC AIR T	20-003	600.7	648.8	573.4	600.4	617.2	578.0	631.0	616.8	628.5	11 2
CYC C SEC AIR T	20-004	535.2	562.4	523.4	531.1	542.4	527.1	545.0	535.2	550.7	11 3
PULV COAL FLOW KLB	06-314	.05	26.25	26.30	.05	26.33	26.32	26.43	.05	26.22	10 4
PULV PA FLOW	06-275	0.00	54.34	55.95	0.00	54.20	55.97	54.29	0.00	53.51	10 19
PULV INLET T	09-034	96.6	594.0	523.8	98.1	565.8	538.1	576.0	104.9	570.4	11 7
PULV OUTLET T	09-040	71.9	176.7	139.3	113.5	170.9	153.6	173.8	110.0	183.0	11 8

TEST NO.		2	2A	2AA	3	3A	3AA	3B	6	6A	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		04/01/92	04/01/92	04/29/92	04/02/92	04/02/92	04/29/92	04/02/92	04/07/92	04/07/92	
TIME START		0741	1912	1040	0735	1158	1133	1503	0825	1057	
TIME END		0752	2117	1123	0837	1400	1204	1659	0835	1302	
LOAD MW		109	110	110	110	110	110	110	110	110	
DATA PAGE NO. 11 PULVERIZER INLET TEMP AND PA DIFF											
PULV DIFF P IN WG	06-274	-.01	11.35	14.06	-.14	11.47	14.42	11.73	-.12	11.60	11 9
PULV AMPS	06-276	.1	241.2	255.7	-.1	240.1	273.6	242.6	-.1	233.7	11 10
PULV PA FAN AMPS	06-277	.06	75.11	82.57	-.06	74.63	84.96	74.64	.02	72.87	11 11
ROT CLASS AMPS	06-278	5.48	42.36	48.16	43.87	41.98	48.11	41.24	43.48	41.57	11 12
ROT CLASS RPM	06-270	.1	140.7	158.6	141.0	139.8	158.3	139.8	140.2	138.6	11 13
ROT CLASS DP IN WG	06-345	-.0149	.3544	.5490	.3153	.3653	.5425	.3622	.3106	.3608	11 14
COAL SILO LEVEL	06-310	83.25	34.88	94.18	94.78	51.59	89.57	26.06	93.81	58.10	11 15
FLAME INTENSITY #1 %	06-279	2.1	106.1	106.1	2.6	106.1	106.1	106.1	2.3	106.0	11 16
FLAME INTENSITY #2 %	06-295	2.4	105.8	105.9	3.2	105.6	105.9	105.6	3.3	105.3	11 17
FLAME INTENSITY #3 %	06-296	2.9	106.1	0.0	3.6	106.1	0.0	106.1	2.3	105.7	11 18
FLAME INTENSITY #4 %	06-297	3.6	106.0	106.2	5.3	105.9	106.1	105.7	4.2	105.6	11 19
DATA PAGE NO. 12 OPERATOR POSITIONS %											
RH SP VLV POS	15-077	20.67	20.81	-2.97	35.31	10.93	9.20	12.01	29.09	11.65	12 1
SH SP VLV POS R	13-190	75.94	38.49	26.88	59.35	24.31	28.76	28.77	91.88	40.25	12 3
SH SP VLV POS L	13-191	76.90	46.34	0.00	52.09	32.29	0.00	32.16	78.16	43.70	12 4
GR DMPR DEMAND	16-044	-5.0000	-5.0000	-5.0000	1.6000	1.6000	-5.0000	1.6000	-5.0000	-5.0000	12 9
RECIRC AIR DMPR POS	12-176	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12 13
SH PASS DMPR POS	14-180	100.0	100.0	77.6	63.1	52.3	63.5	100.0	100.0	99.7	12 15
RH PASS DMPR POS	14-180	54.4	49.3	100.0	100.0	100.0	100.0	60.6	86.3	66.5	12 16
OVRFIRE AIR DMPR POS	06-115	15.41	52.45	44.49	15.41	53.08	46.67	65.84	15.45	64.31	12 17
BRN SEC AIR DMPR POS	06-286	15.08	34.43	31.55	15.02	24.53	22.76	25.36	15.07	15.96	12 18
HOT PRI AIR DMPR POS	06-556	0.0	100.0	100.0	0.0	100.0	100.0	100.0	0.0	82.8	12 19
BRN GAS REC DMPR POS	06-324	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.26	12 20
DATA PAGE NO. 15 MISCELLANEOUS											
GAS LVG SH PASS 1A	08-003	-577.0	-571.3	-427.3	-539.9	-508.9	-412.3	-530.7	-608.8	-566.3	15 1
GAS LVG SH PASS 1B	08-004	745.1	789.9	666.0	726.0	747.2	665.2	778.3	767.5	775.8	15 2
GAS LVG SH PASS 1C	08-005	776.6	847.7	675.7	768.0	792.6	677.4	827.3	809.9	824.9	15 3
GAS LVG SH PASS 1D	08-006	771.1	825.8	708.0	763.0	774.1	714.5	816.3	802.2	810.6	15 4
GAS LVG SH PASS 2A	08-017	693.3	709.1	611.3	677.2	673.1	613.7	686.7	712.9	692.0	15 5
GAS LVG SH PASS 2B	08-018	716.7	743.3	627.0	693.9	696.3	630.9	720.3	734.9	724.1	15 6
GAS LVG SH PASS 2C	08-019	700.3	745.2	634.7	684.3	690.9	638.3	719.2	728.4	726.9	15 7
GAS LVG SH PASS 2D	08-020	737.1	785.9	673.7	735.2	746.9	677.9	767.2	769.5	771.6	15 8
GAS LVG SH PASS 3A	08-021	723.1	752.9	641.2	715.1	697.9	643.8	725.7	752.0	727.4	15 9
GAS LVG SH PASS 3B	08-022	721.6	750.7	660.4	708.0	703.6	665.8	730.5	744.1	732.8	15 10
GAS LVG SH PASS 3C	08-023	715.9	743.1	650.4	703.9	709.1	654.8	729.6	743.3	736.4	15 11
GAS LVG SH PASS 3D	08-024	-627.2	-645.9	-566.7	-616.3	-609.6	-576.6	-620.2	-663.5	-644.7	15 12
GAS LVG RH PASS 4A	08-033	647.6	664.2	631.9	633.5	644.2	634.9	645.9	647.2	661.9	15 13
GAS LVG RH PASS 4B	08-034	657.9	689.8	648.4	637.7	657.8	653.1	659.3	657.3	675.5	15 14
GAS LVG RH PASS 4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15

TEST NO.	2	2A	2AA	3	3A	3AA	3B	6	6A	
TEST SEQ. NO.	9	10	11	12	13	14	15	16	17	
DATE	04/01/92	04/01/92	04/29/92	04/02/92	04/02/92	04/29/92	04/02/92	04/07/92	04/07/92	
TIME START	0741	1912	1040	0735	1158	1133	1503	0825	1057	
TIME END	0752	2117	1123	0837	1400	1204	1659	0835	1302	
LOAD MW	109	110	-110	110	110	110	110	110	110	

DATA PAGE NO. 15 MISCELLANEOUS

GAS LVG RH PASS	4D	08-036	683.5	745.0	690.3	669.4	710.4	695.4	717.3	691.3	715.3	15 16
GAS LVG RH PASS	5A	08-049	627.6	635.7	621.7	613.5	619.4	623.2	625.9	634.1	645.6	15 17
GAS LVG RH PASS	5B	08-050	641.4	664.3	635.9	626.3	638.6	639.2	640.0	647.5	659.3	15 18
GAS LVG RH PASS	5C	08-051	652.5	693.1	645.3	635.6	662.3	650.2	660.3	658.3	673.6	15 19
GAS LVG RH PASS	5D	08-052	646.1	685.7	640.7	631.8	659.6	645.6	666.7	655.2	666.2	15 20
GAS LVG RH PASS	6A	08-053	640.0	649.6	629.3	623.8	632.2	631.1	635.9	645.5	651.3	15 21
GAS LVG RH PASS	6B	08-054	658.9	680.1	654.6	646.7	660.2	659.2	660.0	667.9	676.5	15 22
GAS LVG RH PASS	6C	08-055	652.7	679.1	645.7	637.6	652.4	650.0	651.7	662.5	666.8	15 23
GAS LVG RH PASS	6D	08-056	668.7	682.9	659.9	660.9	672.6	665.8	669.9	674.8	678.9	15 24
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W			55.00	56.00	89.00	57.00	58.00	90.00	59.00	64.00	65.00	15 28

RB-369 16 Jun 1992 13:54:47

TEST NO.	8	8A	7	7A	9	9A	10	10A
TEST SEQ. NO.	1	2	3	4	5	6	7	8
DATE	04/09/92	04/09/92	04/08/92	04/08/92	04/10/92	04/10/92	04/13/92	04/13/92
TIME START	0804	1100	0820	1128	0759	1029	0827	1031
TIME END	0814	1247	0830	1330	0810	1331	0838	1256
LOAD MW	110	110	109	110	110	110	110	110
FUEL	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR
ALPHA1								
ALPHA2								

8 SINGLE SCAN : 110 MW : PRE-REBURN BASE
8A AVG SCANS 21-->31 : 110 MW : 13 TPH : 160 RPM : MED STOIC
7 SINGLE SCAN : 110 MW : PRE-REBURN BASE
7A AVG SCANS 18-->28 : 110 MW : 13 TPH : 160 RPM : LOW STOIC
9 SINGLE SCAN : 110 MW : PRE-REBURN BASE
9A AVG SCANS 5 -->14 : 110 MW : 13 TPH : 100 RPM : MED STOIC
10 SINGLE SCAN : 110 MW : PRE-REBURN BASE
10A AVG SCANS 18-->31 : 110 MW : 13 TPH : 100 RPM : LOW STOIC

DATA PAGE NO. 2 FLOWS MLB/HR (MT/HR)

LOAD MW		20-005	109.6	109.8	109.3	110.3	110.4	110.5	110.1	109.9	2 1
MAIN STEAM FLOW		03-033	773.4	782.0	771.5	777.8	772.9	781.6	775.1	776.0	2 2
1ST STG STM FLW		CALC	770.2	777.5	767.8	774.0	769.1	777.6	770.9	772.2	2 23
FW FLOW		12-170	785.8	787.7	784.5	786.4	790.2	789.5	790.7	784.0	2 3
BLOW DOWN FLOW		EST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 4
RH SPRAY FLOW		14-192	2.81	0.00	9.80	0.00	14.65	0.00	13.52	0.00	2 5
SH SPRAY FLOW	L	17-052	20.05	3.11	25.64	6.47	26.65	7.60	17.30	6.29	2 7
SH SPRAY FLOW	R	17-056	20.56	1.98	27.43	6.11	30.12	3.21	23.02	0.00	2 8
GR FAN AMPS	A	16-181	.08	22.73	.08	22.96	.08	22.83	.08	.08	2 12
GR FAN AMPS	B	16-183	-.02	-.02	-.02	-.02	-.03	-.02	-.02	27.84	2 13
GR FAN BUS VOLT		EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2 14
TOTAL GR FLOW		CALC	0.0	52.6	0.0	54.8	0.0	53.5	0.0	101.9	2 24
GR TO SEC AIR		06-932	4.39	4.39	-79.49	7.87	4.39	7.92	4.39	9.70	2 25
GR TO SEC AIR		CALC	4.3900	0.0000	0.0000	0.0000	4.3900	0.0000	4.3900	0.0000	2 26
GR TO FURN		CALC	0.0	52.6	0.0	54.8	0.0	53.5	0.0	101.9	2 27
OFA AIR FLOW		06-931	31.5	218.2	33.3	231.3	33.4	221.1	27.3	221.6	2 28
TMP AIR FLOW		CALC	71.67	48.88	97.77	51.44	94.94	57.15	89.12	51.46	14 10
SEC AIR FLOW		06-320	29.57	37.04	28.40	27.60	33.76	37.40	37.18	25.20	2 29
1st STG PRESS		18-128	1071.7	1082.1	1068.3	1077.1	1070.2	1082.3	1072.8	1074.6	2 19
OIL FLOW 2A		05-100	.0017	.0019	.0017	.0029	.0017	.0024	.0017	.0018	2 20
OIL FLOW 2B		07-100	.0033	.0033	.0033	.0023	.0031	.0020	.0033	.0033	2 21
OIL FLOW 2C		09-100	.0033	.0033	.0033	.0024	.0033	.0019	.0033	.0032	2 22
% PWDR RVR BASN COAL		USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 30
CYCLONE STOIC		CALC	1.1077	1.0883	1.0932	1.0744	1.0891	1.0746	1.0931	1.0796	4 20
REBRN WB STOIC		CALC	100.0	.4	100.0	.4	100.0	.4	100.0	.4	4 21
REBRN STOIC		CALC	1.1679	.8841	1.1831	.8569	1.1745	.8775	1.1793	.8732	4 22

TEST NO.			8	8A	7	7A	9	9A	10	10A	
TEST SEQ. NO.			1	2	3	4	5	6	7	8	
DATE			04/09/92	04/09/92	04/08/92	04/08/92	04/10/92	04/10/92	04/13/92	04/13/92	
TIME START			0804	1100	0820	1128	0759	1029	0827	1031	
TIME END			0814	1247	0830	1330	0810	1331	0838	1256	
LOAD MW			110	110	109	110	110	110	110	110	
DATA PAGE NO. 2		**FLOWS MLB/HR (MT/HR)**									
LVG FURN STOIC		CALC	1.2073	1.1601	1.2242	1.1495	1.2155	1.1569	1.2130	1.1550	4 23
LVG ECON STOIC		CALC	1.2171	1.1699	1.2340	1.1593	1.2254	1.1667	1.2228	1.1648	4 24
DATA PAGE NO. 3		**FLUID TEMPERATURES F (C) - PLANT**									
SSH OUT T	L	15-152	1000.7	999.3	1000.6	998.7	997.4	998.9	997.7	999.2	3 1
SSH OUT T	R	15-150	999.2	999.5	999.4	999.1	998.1	999.3	999.0	999.2	3 2
SSH OUT AVE T		13-160	1000.5	1003.3	1000.7	1001.7	998.6	1003.7	1000.9	1003.6	14 1
LVG SH ATTMP T	L	13-164	707.5	741.4	696.4	738.1	700.0	734.0	720.6	736.7	3 8
LVG SH ATTMP T	R	13-162	715.5	759.6	701.3	754.2	698.9	757.9	711.0	766.3	3 9
PRI SH OUT T	L	HW	778.8	750.0	788.4	758.9	797.3	756.5	784.1	757.0	3 10
PRI SH OUT T	R	HW	791.7	778.1	803.6	784.1	808.3	779.0	794.9	773.9	3 11
ECON H2O OUT T	L	HW	512.9	509.7	512.6	512.7	515.9	508.2	514.4	511.1	3 27
ECON H2O OUT T	R	HW	513.5	512.2	496.1	514.0	520.0	511.3	519.6	513.6	3 28
ECON H2O IN T		20-007	459.8	458.6	461.2	459.4	461.0	459.7	462.2	459.1	3 5
RH SPRAY H2O T		HW	316.6	316.4	317.0	316.6	316.2	314.9	316.3	315.0	3 7
LVG RH T		14-150	999.9	1001.1	993.1	1003.7	1002.0	1003.1	993.3	1002.2	3 12
ENT RH T		CALC	703.0	725.6	694.6	716.9	673.3	721.8	682.8	715.6	3 16
COLD RH T		20-006	743.5	746.8	745.8	746.2	744.8	747.4	746.0	746.8	3 18
DATA PAGE NO. 4		**FLUID TEMPERATURES F (C) - B&W**									
AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 18
GAS LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 19

TEST NO.			8	8A	7	7A	9	9A	10	10A	
TEST SEQ. NO.			1	2	3	4	5	6	7	8	
DATE			04/09/92	04/09/92	04/08/92	04/08/92	04/10/92	04/10/92	04/13/92	04/13/92	
TIME START			0804	1100	0820	1128	0759	1029	0827	1031	
TIME END			0814	1247	0830	1330	0810	1331	0838	1256	
LOAD MW			110	110	109	110	110	110	110	110	
DATA PAGE NO. 5		**FLUID PRESSURES PSIG (KG/CM2)**									
TURB THROT P		03-170	1452.4	1449.7	1449.5	1449.7	1450.5	1449.9	1451.1	1449.7	5 1
SEC SH OUT P		CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 2
DRUM PRESS		04-013	1604.5	1608.4	1599.0	1605.1	1600.9	1607.8	1603.8	1606.1	5 3
LVG RH PRESS		15-102	429.8	428.7	429.6	428.5	433.8	430.2	432.0	427.4	5 4
ENT RH PRESS		15-100	454.0	454.1	454.8	455.3	459.7	456.2	457.0	452.7	5 5
FW HTR E EXT P		20-035	437.9	436.0	437.9	436.5	442.3	437.8	440.2	434.6	5 6
FW HTR E EXT P		TRANS	440.8	439.1	440.9	439.3	445.2	440.9	443.5	437.8	5 7
SEC SH OUT P	(T)	TRANS	1496.8	1495.0	1493.3	1494.7	1494.8	1495.3	1494.9	1492.9	5 17
DRUM PRESS	(T)	TRANS	1592.9	1597.7	1588.0	1595.2	1589.4	1597.5	1592.8	1594.3	5 18
LVG RH-1 P	(T)	TRANS	433.5	432.7	433.5	432.8	437.3	434.4	436.2	431.1	5 19
ENT RH-1 P	(T)	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 20
DATA PAGE NO. 6		**AIR & GAS DATA - PLANT**									
AMBIENT AIR DB TEMP		TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 1
AIR ENT FD FAN T		HW	80.26	87.86	85.84	91.56	84.13	84.34	74.04	76.33	6 4
AIR LVG FD FAN T	A	09-028	112.9	118.2	116.3	122.2	112.6	111.5	104.1	108.7	7 2
AIR LVG FD FAN T	B	09-029	111.8	119.3	115.5	123.0	114.7	115.9	107.5	112.8	7 3
AIR ENT AH T	RA	20-017	115.2	121.7	118.7	125.7	117.6	118.8	147.2	146.6	6 2
AIR ENT AH T	RB	20-018	115.4	121.9	118.7	125.6	117.7	118.6	131.4	138.6	6 3
AIR ENT AH T	LA	20-025	116.4	121.7	119.2	124.9	116.3	115.6	163.3	166.6	13 25
AIR ENT AH T	LB	20-029	117.4	122.2	120.3	125.9	115.9	115.7	122.9	127.8	13 26
AIR LVG AH T	R	HW	599.5	606.1	643.0	608.6	586.3	608.6	587.3	604.4	6 6
AIR LVG AH T	L	HW	573.0	570.4	578.5	578.2	549.7	567.7	546.1	559.4	6 7
BRN SEC AIR T		08-002	548.4	553.3	575.5	555.9	533.5	553.4	531.2	546.0	14 2
BRN SA/GR T		08-001	511.7	524.6	536.2	534.3	504.3	536.0	496.7	536.7	14 3
OFA TEMP		09-002	220.8	516.3	217.3	523.0	273.9	527.5	485.7	544.2	14 4
GAS LVG AH T	RA	20-019	310.5	311.7	339.7	317.6	303.2	309.2	303.7	304.1	6 10
GAS LVG AH T	RB	20-020	291.8	294.7	314.5	299.6	284.5	292.2	288.2	291.8	6 11
GAS LVG AH T	LA	20-027	284.6	282.6	286.1	288.0	274.9	276.3	270.9	272.2	13 27
GAS LVG AH T	LB	20-024	290.9	286.0	294.7	290.5	281.4	279.7	283.8	284.8	13 28
GAS LVG RH PS T		AVE	658.1	653.9	660.6	659.9	632.6	654.1	638.6	653.5	13 17
GAS LVG SH PS T		AVE	662.8	667.7	706.0	665.7	651.3	669.4	661.4	670.7	13 19
GR GAS TEMP	A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 8
GR GAS TEMP	B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 9
O2 LVG ECON	R	11-172	3.6026	2.3439	3.8108	2.6399	3.6199	2.3682	3.1403	2.5777	6 20
O2 LVG ECON	L	11-170	0.0000	2.3714	3.3941	2.3501	3.1560	2.2460	3.7417	2.7060	6 21
O2 IN SEC AIR		06-254	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 29
ACCUREX NOX	PPM	06-553	598.4	300.1	541.4	281.2	526.4	330.7	1.2	313.5	13 9
ACCUREX SOX	PPM	06-555	1051.6	1131.3	1250.1	1212.6	775.9	1431.0	1431.0	1301.8	13 10
ACCUREX CO	PPM	06-425	19.5	28.2	65.6	30.6	206.2	15.8	0.0	0.0	13 11
ACCUREX O2	%	06-554	3.8231	2.3632	4.2312	2.5177	9.7791	2.5641	3.3774	2.9479	13 12
BRN SEC AIR P	IN WG	06-250	20.46	19.20	20.74	18.97	21.06	20.32	20.92	19.27	14 5
BRN GAS REC P	IN WG	06-252	20.30	18.94	20.56	19.00	20.89	20.08	20.65	19.26	14 6

TEST NO.		8	8A	7	7A	9	9A	10	10A	
TEST SEQ. NO.		1	2	3	4	5	6	7	8	
DATE		04/09/92	04/09/92	04/08/92	04/08/92	04/10/92	04/10/92	04/13/92	04/13/92	
TIME START		0804	1100	0820	1128	0759	1029	0827	1031	
TIME END		0814	1247	0830	1330	0810	1331	0838	1256	
LOAD MW		110	110	109	110	110	110	110	110	
DATA PAGE NO. 6 AIR & GAS DATA - PLANT										
FURNACE GAS P	IN WG	08-100	20.50	18.14	21.37	18.14	20.49	18.10	20.04	17.74	14 7
BAROMETRIC P	IN HG	PB	29.35	29.30	29.35	29.37	29.19	29.12	29.72	29.68	6 29
REL HUMIDITY	%	TST	7.9691	7.8571	7.8267	7.7488	7.8773	7.8876	7.9211	7.9073	6 30
DATA PAGE NO. 7 AIR & GAS DATA - B&W										
AMBIENT AIR TEMP		TC	42.57	48.68	44.13	55.50	50.11	45.86	35.67	38.93	7 1
AIR LVG FD FAN T	A	TC	117.1	122.1	119.9	125.6	116.0	115.2	107.7	112.2	7 6
AIR LVG FD FAN T	B	TC	115.3	122.3	118.5	126.0	117.8	119.0	110.5	115.7	7 7
AIR ENT AH	(T)	GRID	117.4	123.1	120.0	126.5	118.0	118.2	140.4	144.1	7 4
GAS LVG AH	(T)	GRID	287.1	286.1	300.0	290.8	279.2	281.6	279.6	280.8	7 10
GAS LVG ECON	(T) L	GRID	674.9	655.9	660.7	660.0	648.8	675.3	654.0	665.0	7 14
GAS LVG ECON	(T) R	GRID	666.4	671.2	698.0	670.6	658.4	675.6	665.0	678.0	7 15
GAS TEMP LVG GR FAN		GRID	182.8	514.8	184.8	0.0	215.5	0.0	0.0	0.0	13 7
O2 LVG ECON	(T) L	GRID	3.9078	3.3748	4.2631	3.2225	3.9810	3.0328	4.4399	2.9084	7 20
O2 LVG ECON	(T) R	GRID	3.7650	2.9111	3.9393	2.7596	3.9205	3.1057	3.4735	3.1575	7 21
CO LVG ECON	(T) L	GRID	39.4	92.5	43.1	68.1	33.4	70.0	30.9	107.7	13 5
CO LVG ECON	(T) R	GRID	38.14	55.74	75.82	51.47	36.21	55.12	70.36	61.35	13 6
CO2 LVG ECON	(T) L	GRID	14.77	15.26	14.55	15.49	15.15	15.81	14.99	16.23	7 22
CO2 LVG ECON	(T) R	GRID	14.96	14.94	14.76	15.09	15.09	15.60	15.18	15.38	7 23
NOX LVG ECON	(T) L	GRID	639.2	301.4	576.6	258.8	587.6	287.7	565.3	269.1	7 24
NOX LVG ECON	(T) R	GRID	612.9	309.3	556.9	275.9	558.8	329.9	589.9	310.3	7 25
O2 LVG AH	(T)	GRID	5.2400	4.2500	5.3500	4.3500	4.3000	4.2200	5.2500	4.2500	13 1
CO2 LVG AH	(T)	GRID	.39	22.48	22.81	23.58	32.03	26.01	24.57	21.84	13 3
O2 LVG GR FAN	(T)	GRID	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 4
DRY BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27
DATA PAGE NO. 8 FW HTR TEMPERATURES F (C) - PLANT										
FW HTR E EXT T		HW	742.2	744.6	743.6	744.2	742.1	743.4	743.2	743.5	8 1
FW HTR E LVG T		HW	458.8	457.6	476.4	458.0	459.1	456.3	459.0	456.6	8 5
FW HTR E ENT T		HW	383.6	382.6	384.8	386.0	384.7	381.7	383.6	381.7	8 7
FW HTR E DRN T		HW	405.7	405.5	407.0	404.3	405.9	402.9	404.7	402.0	8 13
DATA PAGE NO. 9 FW HTR TEMPERATURES F (C) - B&W										
SSH PEND IN LEG	1	10-017	847.8	848.2	838.3	842.6	836.1	847.3	853.2	858.8	9 17
SSH PEND IN LEG	2	10-018	864.4	869.2	857.3	863.5	852.5	865.9	871.4	879.1	9 18
SSH PEND IN LEG	3	10-019	864.6	880.8	856.7	872.7	854.1	876.0	871.0	883.3	9 19
SSH PEND IN LEG	4	10-020	871.5	898.3	864.7	888.4	860.1	893.5	878.7	896.8	9 20
SSH PEND IN LEG	5	10-021	856.1	894.8	851.1	879.3	843.6	887.8	863.6	890.6	9 21

TEST NO.	8	8A	7	7A	9	9A	10	10A
TEST SEQ. NO.	1	2	3	4	5	6	7	8
DATE	04/09/92	04/09/92	04/08/92	04/08/92	04/10/92	04/10/92	04/13/92	04/13/92
TIME START	0804	1100	0820	1128	0759	1029	0827	1031
TIME END	0814	1247	0830	1330	0810	1331	0838	1256
LOAD MW	110	110	109	110	110	110	110	110

DATA PAGE NO. 9 FW HTR TEMPERATURES F (C) - B&W

SSH PEND IN LEG 6	10-033	864.8	905.4	862.8	892.6	857.1	899.3	880.0	901.7	9 22
SSH PEND IN LEG 7	10-034	865.2	898.4	861.5	886.0	861.0	890.7	884.6	892.8	9 23
SSH PEND IN LEG 8	10-035	860.5	886.8	852.0	877.2	853.6	881.4	873.6	883.8	9 24
SSH PEND IN LEG 9	10-036	866.5	879.7	853.2	875.7	860.1	879.0	874.4	881.3	9 25
SSH PEND IN LEG 10	10-037	848.7	846.8	833.0	846.5	846.3	846.8	855.3	851.3	9 26
RH PEND IN LEG 1	09-049	936.3	950.0	927.1	946.1	935.6	948.4	933.3	950.8	8 17
RH PEND IN LEG 2	09-050	924.6	945.5	918.1	941.0	925.4	943.7	923.9	946.5	8 18
RH PEND IN LEG 3	09-051	927.5	943.7	920.2	940.9	928.4	943.1	926.4	945.4	8 19
RH PEND IN LEG 4	09-052	925.2	943.8	918.1	939.8	925.8	942.6	923.9	944.5	8 20
RH PEND IN LEG 5	09-053	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8 21
RH PEND IN LEG 6	10-001	955.1	965.6	945.6	961.5	953.6	963.1	951.3	967.5	8 22
RH PEND IN LEG 7	10-002	927.1	936.5	916.7	934.9	924.7	936.9	924.2	937.8	8 23
RH PEND IN LEG 8	10-003	933.6	933.7	920.5	937.3	930.3	937.9	928.4	937.1	8 24
RH PEND IN LEG 9	10-004	935.6	949.6	926.5	945.9	934.8	948.3	932.5	950.6	8 25
RH PEND IN LEG 10	10-005	913.6	890.5	889.5	894.2	910.3	897.6	895.6	895.2	8 26
RH INTM HND HOLE R	10-038	934.3	948.0	925.6	945.4	935.4	946.8	933.5	950.1	8 27
RH INTM HND HOLE L	10-039	865.3	846.2	842.4	846.5	862.7	850.1	852.3	849.2	8 28
PSH OUT LEG T	09-017	786.9	772.3	798.3	780.7	810.3	777.7	793.4	776.0	14 11
PSH OUT LEG T	09-018	797.5	783.9	808.8	791.6	821.8	788.2	803.2	781.7	14 12
PSH OUT LEG T	09-019	778.9	731.7	786.5	740.6	799.9	738.9	784.1	739.0	14 13
PSH OUT LEG T	09-020	782.2	747.6	791.9	756.8	804.7	757.4	789.2	757.3	14 14
PSH OUT LEG T	09-021	774.9	757.4	784.2	765.2	796.1	764.9	780.1	764.4	14 15
PSH OUT LEG T	09-022	781.1	766.3	792.2	773.3	802.2	771.2	784.9	769.2	14 16
PSH OUT LEG T	09-023	781.8	761.4	794.4	769.9	804.5	766.3	787.1	761.1	14 17
PSH OUT LEG T	09-024	800.7	790.7	811.9	795.4	821.9	793.4	806.0	786.3	14 18
PSH OUT LEG T	09-025	782.5	770.9	793.3	776.6	804.2	773.7	787.8	767.7	14 19
PSH OUT LEG T	09-026	790.8	779.4	802.9	784.4	807.3	782.2	791.6	776.6	14 20
PSH OUT LEG T	09-027	799.7	793.2	812.3	797.4	815.2	796.1	801.1	791.3	14 21

DATA PAGE NO. 10 PULVERIZER COAL AND PA FLOW

CYC A COAL FLOW KLB	05-104	30.60	22.82	30.89	23.22	31.50	21.82	30.21	22.19	10 1
CYC B COAL FLOW KLB	07-110	30.62	22.83	30.92	23.26	31.43	21.75	30.26	22.21	10 2
CYC C COAL FLOW KLB	09-110	30.61	22.83	30.93	23.24	31.47	21.79	30.27	22.22	10 3
CYC A SEC AIR FLOW %	06-170	292.8	210.8	293.0	206.9	294.5	209.5	293.2	208.5	10 16
CYC B SEC AIR FLOW %	08-170	296.3	211.2	296.4	213.8	295.6	208.4	296.7	208.3	10 17
CYC C SEC AIR FLOW %	10-170	297.5	210.7	293.9	205.5	297.8	209.5	297.0	208.0	10 18
CYC A SEC AIR T	20-002	544.0	547.8	587.5	553.5	533.6	550.6	528.0	541.4	11 1
CYC B SEC AIR T	20-003	579.0	585.4	601.8	588.3	560.2	583.9	559.8	576.6	11 2
CYC C SEC AIR T	20-004	534.9	529.6	541.8	537.0	516.3	526.8	508.1	515.7	11 3
PULV COAL FLOW KLB	06-314	.05	26.48	.06	26.31	.05	26.28	.03	26.26	10 4
PULV PA FLOW	06-275	0.00	54.74	0.00	54.34	0.00	54.53	0.00	54.31	10 19
PULV INLET T	09-034	99.0	544.0	99.4	547.3	96.5	535.4	82.8	524.0	11 7
PULV OUTLET T	09-040	99.2	158.6	113.7	150.8	110.0	154.9	66.6	146.7	11 8

TEST NO.		8	8A	7	7A	9	9A	10	10A	
TEST SEQ. NO.		1	2	3	4	5	6	7	8	
DATE		04/09/92	04/09/92	04/08/92	04/08/92	04/10/92	04/10/92	04/13/92	04/13/92	
TIME START		0804	1100	0820	1128	0759	1029	0827	1031	
TIME END		0814	1247	0830	1330	0810	1331	0838	1256	
LOAD MW		110	110	109	110	110	110	110	110	
DATA PAGE NO. 11 PULVERIZER INLET TEMP AND PA DIFF										
PULV DIFF P IN WG	06-274	-.02	15.73	-.16	13.99	-.03	9.38	-.09	9.21	11 9
PULV AMPS	06-276	0.0	284.8	.1	270.2	-0.0	232.7	0.0	236.5	11 10
PULV PA FAN AMPS	06-277	-.06	79.02	-.06	74.50	-.06	69.08	6.61	67.83	11 11
ROT CLASS AMPS	06-278	.03	47.67	44.63	47.23	.03	37.17	41.69	37.95	11 12
ROT CLASS RPM	06-270	-.2	156.6	160.6	159.3	-.2	99.4	99.7	99.7	11 13
ROT CLASS DP IN WG	06-345	.0073	.5514	.3978	.5558	.0074	.1801	.2031	.1863	11 14
COAL SILO LEVEL	06-310	62.67	76.28	66.42	82.28	92.37	73.06	95.19	82.16	11 15
FLAME INTENSITY #1 %	06-279	3.7	105.6	3.1	105.9	3.0	105.6	18.3	105.6	11 16
FLAME INTENSITY #2 %	06-295	5.9	104.9	3.6	105.1	6.8	105.0	58.8	104.9	11 17
FLAME INTENSITY #3 %	06-296	3.1	105.7	2.4	106.1	2.7	103.7	18.2	105.7	11 18
FLAME INTENSITY #4 %	06-297	4.5	105.1	4.7	105.4	5.8	105.2	19.3	105.2	11 19
DATA PAGE NO. 12 OPERATOR POSITIONS %										
RH SP VLV POS	15-077	15.80	4.60	20.60	8.74	26.91	6.90	25.42	8.97	12 1
SH SP VLV POS R	13-190	61.58	30.53	73.51	34.31	77.24	31.87	67.54	27.46	12 3
SH SP VLV POS L	13-191	58.80	31.94	71.31	35.24	73.29	36.08	54.17	35.23	12 4
GR DMPR DEMAND	16-044	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	12 9
RECIRC AIR DMPR POS	12-176	0.00	0.00	0.00	0.00	0.00	0.00	22.45	27.68	12 13
SH PASS DMPR POS	14-180	100.0	87.8	64.3	100.0	100.0	100.0	89.2	100.0	12 15
RH PASS DMPR POS	14-180	53.4	99.5	100.0	47.6	21.3	71.1	100.0	67.3	12 16
OVRFIRE AIR DMPR POS	06-115	15.49	53.51	15.48	56.58	0.00	54.36	14.28	56.59	12 17
BRN SEC AIR DMPR POS	06-286	16.00	22.63	15.01	14.04	10.72	23.85	21.92	11.68	12 18
HOT PRI AIR DMPR POS	06-556	0.0	100.0	0.0	100.0	0.0	100.0	0.0	99.8	12 19
BRN GAS REC DMPR POS	06-324	0.00	0.00	0.00	25.08	0.00	25.21	0.00	32.70	12 20
DATA PAGE NO. 15 MISCELLANEOUS										
GAS LVG SH PASS 1A	08-003	-496.3	-477.9	-569.9	-472.3	-482.7	-484.0	-500.2	-481.6	15 1
GAS LVG SH PASS 1B	08-004	665.7	673.8	712.1	674.9	643.6	677.7	660.6	679.5	15 2
GAS LVG SH PASS 1C	08-005	682.5	691.2	753.6	681.7	665.4	702.0	673.5	696.8	15 3
GAS LVG SH PASS 1D	08-006	723.0	735.0	757.8	728.3	699.1	722.0	710.2	722.0	15 4
GAS LVG SH PASS 2A	08-017	625.9	623.1	668.9	627.8	613.6	626.2	625.6	631.6	15 5
GAS LVG SH PASS 2B	08-018	639.1	637.4	683.6	640.3	627.6	639.3	636.0	642.6	15 6
GAS LVG SH PASS 2C	08-019	640.4	647.8	679.7	645.9	632.2	648.8	640.0	650.1	15 7
GAS LVG SH PASS 2D	08-020	675.7	683.9	727.8	681.8	674.3	692.0	677.6	691.7	15 8
GAS LVG SH PASS 3A	08-021	657.2	657.1	699.2	659.5	654.4	657.2	667.0	661.4	15 9
GAS LVG SH PASS 3B	08-022	663.3	671.6	690.5	667.5	663.5	669.4	671.5	672.5	15 10
GAS LVG SH PASS 3C	08-023	655.2	656.0	687.2	649.6	639.3	659.1	651.9	658.8	15 11
GAS LVG SH PASS 3D	08-024	-616.8	-616.6	-627.7	-598.5	-599.5	-618.7	-617.9	-619.6	15 12
GAS LVG RH PASS 4A	08-033	650.6	635.8	653.0	647.9	623.4	639.9	623.3	633.6	15 13
GAS LVG RH PASS 4B	08-034	660.2	653.9	662.7	665.8	632.3	658.2	637.9	654.7	15 14
GAS LVG RH PASS 4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15

TEST NO.		8	8A	7	7A	9	9A	10	10A
TEST SEQ. NO.		1	2	3	4	5	6	7	8
DATE		04/09/92	04/09/92	04/08/92	04/08/92	04/10/92	04/10/92	04/13/92	04/13/92
TIME START		0804	1100	0820	1128	0759	1029	0827	1031
TIME END		0814	1247	0830	1330	0810	1331	0838	1256
LOAD MW		110	110	109	110	110	110	110	110

DATA PAGE NO. 15 MISCELLANEOUS

GAS LVG RH PASS 4D	08-036	699.8	707.0	695.4	709.8	664.9	701.3	673.6	699.5	15 16
GAS LVG RH PASS 5A	08-049	636.1	620.4	639.4	627.1	611.2	624.1	615.7	626.0	15 17
GAS LVG RH PASS 5B	08-050	646.8	640.7	653.1	648.4	619.8	641.4	627.5	641.1	15 18
GAS LVG RH PASS 5C	08-051	656.7	659.6	660.7	665.1	630.3	659.1	643.4	658.9	15 19
GAS LVG RH PASS 5D	08-052	649.7	656.3	655.6	658.1	627.8	651.0	632.1	652.2	15 20
GAS LVG RH PASS 6A	08-053	648.0	634.6	646.3	640.9	621.1	633.0	625.8	634.8	15 21
GAS LVG RH PASS 6B	08-054	664.4	660.5	665.8	663.9	640.7	660.7	645.0	659.9	15 22
GAS LVG RH PASS 6C	08-055	656.8	654.6	662.4	659.2	633.9	654.5	641.5	655.3	15 23
GAS LVG RH PASS 6D	08-056	669.8	670.2	671.8	672.5	653.3	672.2	658.5	672.9	15 24
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W		68.00	69.00	66.00	67.00	70.00	71.00	72.00	73.00	15 28

RB-369 16 Jun 1992 13:55:48

TEST NO.	16A	1BM	3T	4T	10B	10C	5T	7T	18T
TEST SEQ. NO.	9	10	11	12	13	14	15	16	17
DATE	04/24/92	05/05/92	02/13/91	02/13/91	04/13/92	04/13/92	02/14/91	02/15/91	02/18/91
TIME START	1110	1039	1710	1915	1524	1822	1408	1009	0919
TIME END	1311	1200	1741	2008	1647	1914	1604	1024	0929
LOAD MW	111	110	110	110	110	111	111	111	109
FUEL	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR
ALPHA1									
ALPHA2									

16A AVG SCANS 4 -->15 : 110 MW : ALL CONTROLS AUTOMATIC :OPTIMUM
1BM AVG SCANS 14-->18 : 110 MW : 13 TPH : LOW REBRN STOIC
3T AVG SCANS 48-->50 : 110 MW : 13.7 TPH REBURN : NO GR TO BNRS
4T AVG SCANS 60-->64 : 110 MW : 13.7 TPH REBURN : W/ GR TO BNRS
10B AVG SCANS 42-->45 : 110 MW : 14 TPH : 140 RPM : OPTIMUM
10C AVG SCANS 55-->59 : 110 MW : 14 TPH : 160 RPM : OPTIMUM
5T AVG SCANS 34-->44 : 110 MW : 14.1 TPH REBURN : NO GR TO BNRS
7T AVG SCANS 8 --> 8 : 110 MW : 14 TPH REBURN : NO GR TO BNRS
18T AVG SCANS 10-->10 : 110 MW : 14 TPH REBRN : NO GR TO BRNRS

DATA PAGE NO. 2 FLOWS MLB/HR (MT/HR)

LOAD MW		20-005	110.8	110.5	109.7	110.0	110.1	110.6	110.5	110.6	109.4	2 1
MAIN STEAM FLOW		03-033	773.4	779.8	798.7	799.3	771.8	773.4	805.6	810.1	782.3	2 2
1ST STG STM FLW		CALC	769.5	775.3	769.4	769.9	767.4	769.7	775.4	778.8	752.7	2 23
FW FLOW		12-170	785.1	788.3	781.0	778.8	784.8	787.0	778.2	787.3	752.9	2 3
BLOW DOWN FLOW		EST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 4
RH SPRAY FLOW		14-192	5.21	0.00	0.00	0.00	9.41	10.92	0.00	0.00	0.00	2 5
SH SPRAY FLOW	L	17-052	15.23	1.97	2.96	1.48	10.43	11.98	4.83	0.00	19.88	2 7
SH SPRAY FLOW	R	17-056	16.69	7.23	1.96	2.65	5.74	10.19	2.69	0.00	11.45	2 8
GR FAN AMPS	A	16-181	23.63	.08	21.86	24.13	.08	.08	21.83	21.73	22.54	2 12
GR FAN AMPS	B	16-183	-.02	27.98	-.02	-.02	26.63	26.63	-.02	-.02	-.02	2 13
GR FAN BUS VOLT		EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2 14
TOTAL GR FLOW		CALC	59.8	101.4	44.1	64.2	92.5	91.8	43.6	40.5	47.3	2 24
GR TO SEC AIR		06-932	9.61	10.92	0.00	0.00	6.37	6.37	0.00	0.00	0.00	2 25
GR TO SEC AIR		CALC	9.61	[illegible] 26	.94	18.90	0.00	0.00	.75	.50	.29	2 26
GR TO FURN		CALC	50.16	[illegible].74	43.19	45.31	92.52	91.83	42.89	39.99	46.97	2 27
OFA AIR FLOW		06-931	230.3	217.3	178.1	226.6	224.7	224.0	223.9	231.5	93.9	2 28
TMP AIR FLOW		CALC	65.59	56.20	35.16	30.48	67.13	69.69	39.11	35.05	0.00	14 10
SEC AIR FLOW		06-320	32.90	31.03	52.79	27.63	32.04	31.95	49.53	49.73	51.46	2 29
1st STG PRESS		18-128	1070.7	1079.0	1070.6	1071.3	1067.7	1071.0	1079.1	1084.0	1046.7	2 19
OIL FLOW 2A		05-100	.0017	.0017	.0017	.0017	.0024	.0025	.0017	.0017	.0017	2 20
OIL FLOW 2B		07-100	.0017	.0021	.0017	.0017	.0025	.0018	.0018	.0033	.0033	2 21
OIL FLOW 2C		09-100	.0016	.0016	.0016	.0016	.0026	.0016	.0016	.0016	.0016	2 22
% PWDR RVR BASN COAL		USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 30
CYCLONE STOIC		CALC	1.0652	1.0646	1.1095	1.1266	1.0592	1.0538	1.1015	1.1062	1.4071	4 20
REBRN WB STOIC		CALC	.4207	.4160	.4896	.3825	.3848	.3903	.4768	.4706	.4811	4 21

TEST NO.			16A	1BM	3T	4T	10B	10C	5T	7T	18T	
TEST SEQ. NO.			9	10	11	12	13	14	15	16	17	
DATE			04/24/92	05/05/92	02/13/91	02/13/91	04/13/92	04/13/92	02/14/91	02/15/91	02/18/91	
TIME START			1110	1039	1710	1915	1524	1822	1408	1009	0919	
TIME END			1311	1200	1741	2008	1647	1914	1604	1024	0929	
LOAD MW			111	110	110	110	110	111	111	111	109	
DATA PAGE NO. 2		**FLOWS MLB/HR (MT/HR)**										
REBRN STOIC		CALC	.8673	.8715	.9385	.8871	.8721	.8715	.8754	.8685	1.0313	4 22
LVG FURN STOIC		CALC	1.1580	1.1459	1.1641	1.1754	1.1532	1.1507	1.1615	1.1604	1.1523	4 23
LVG ECON STOIC		CALC	1.1678	1.1557	1.1736	1.1850	1.1630	1.1605	1.1710	1.1701	1.1620	4 24
DATA PAGE NO. 3		**FLUID TEMPERATURES F (C) - PLANT**										
SSH OUT T	L	15-152	999.9	997.8	997.5	998.3	1000.1	999.1	998.6	975.8	1019.7	3 1
SSH OUT T	R	15-150	996.3	997.4	977.2	984.0	999.4	999.4	996.7	985.0	995.4	3 2
SSH OUT AVE T		13-160	1002.1	1000.5	989.2	993.7	1004.7	1003.4	1000.5	982.6	1008.0	14 1
LVG SH ATTMP T	L	13-164	713.1	745.4	733.8	744.2	731.5	732.5	747.7	726.2	712.7	3 8
LVG SH ATTMP T	R	13-162	730.4	743.3	749.8	754.8	761.0	755.6	764.5	751.5	746.1	3 9
PRI SH OUT T	L	HW	764.6	751.0	745.8	746.4	766.3	772.6	747.9	726.5	785.6	3 10
PRI SH OUT T	R	HW	792.8	774.7	755.9	749.9	790.0	796.4	750.1	726.6	795.5	3 11
ECON H2O OUT T	L	HW	512.2	510.3	510.5	515.3	512.4	521.2	508.9	516.1	515.8	3 27
ECON H2O OUT T	R	HW	516.2	513.4	511.9	512.6	517.2	525.2	513.0	503.3	519.3	3 28
ECON H2O IN T		20-007	460.2	459.5	457.0	457.0	459.8	460.7	457.1	457.6	458.3	3 5
RH SPRAY H2O T		HW	315.0	316.6	316.7	316.9	315.7	316.2	316.6	317.4	314.3	3 7
LVG RH T		14-150	1003.3	1003.5	992.9	1001.6	1003.9	1007.9	1005.1	997.2	1022.9	3 12
ENT RH T		CALC	703.0	719.7	706.8	719.0	698.7	693.5	739.4	722.9	706.3	3 16
COLD RH T		20-006	746.8	743.4	733.7	736.3	748.8	749.0	741.9	727.9	743.7	3 18
DATA PAGE NO. 4		**FLUID TEMPERATURES F (C) - B&W**										
AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 18
GAS LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 19

TEST NO.		16A	1BM	3T	4T	10B	10C	5T	7T	18T	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		04/24/92	05/05/92	02/13/91	02/13/91	04/13/92	04/13/92	02/14/91	02/15/91	02/18/91	
TIME START		1110	1039	1710	1915	1524	1822	1408	1009	0919	
TIME END		1311	1200	1741	2008	1647	1914	1604	1024	0929	
LOAD MW		111	110	110	110	110	111	111	111	109	
DATA PAGE NO. 5	**FLUID PRESSURES PSIG (KG/CM2)**										
TURB THROT P	03-170	1450.1	1450.0	1453.1	1452.4	1448.6	1450.0	1456.0	1450.8	1456.8	5 1
SEC SH OUT P	CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 2
DRUM PRESS	04-013	1605.4	1607.0	1606.8	1609.6	1601.8	1602.7	1614.5	1610.7	1599.7	5 3
LVG RH PRESS	15-102	429.9	427.4	426.2	426.4	428.7	431.1	426.4	429.6	420.2	5 4
ENT RH PRESS	15-100	456.5	453.0	456.4	455.8	455.3	457.9	456.0	459.6	449.5	5 5
FW HTR E EXT P	20-035	438.9	433.3	436.0	435.6	436.8	439.6	435.5	438.2	431.1	5 6
FW HTR E EXT P	TRANS	441.7	436.2	437.8	437.3	439.9	442.5	437.2	440.5	434.5	5 7
SEC SH OUT P (T)	TRANS	1493.8	1492.7	1501.2	1499.1	1492.8	1493.9	1504.4	1498.1	1500.4	5 17
DRUM PRESS (T)	TRANS	1592.2	1594.6	1601.0	1600.0	1591.8	1593.1	1606.6	1602.7	1592.7	5 18
LVG RH-1 P (T)	TRANS	434.3	431.4	431.5	430.9	432.8	435.2	430.7	434.3	427.5	5 19
ENT RH-1 P (T)	TRANS	0.0	0.0	452.0	451.6	0.0	0.0	451.5	455.1	447.7	5 20
DATA PAGE NO. 6	**AIR & GAS DATA - PLANT**										
AMBIENT AIR DB TEMP	TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 1
AIR ENT FD FAN T	HW	89.74	86.47	0.00	0.00	80.72	81.49	0.00	0.00	0.00	6 4
AIR LVG FD FAN T A	09-028	121.6	118.5	124.6	123.0	113.7	114.7	126.2	126.0	122.3	7 2
AIR LVG FD FAN T B	09-029	125.6	121.5	127.7	125.9	117.0	117.9	127.5	124.3	125.1	7 3
AIR ENT AH T RA	20-017	127.6	123.9	151.3	154.0	133.8	131.7	156.3	160.9	166.6	6 2
AIR ENT AH T RB	20-018	128.3	124.2	151.1	149.8	138.5	137.9	150.5	147.0	147.8	6 3
AIR ENT AH T LA	20-025	125.5	122.1	184.4	184.6	166.9	165.4	186.9	185.4	182.7	13 25
AIR ENT AH T LB	20-029	125.5	122.4	155.8	157.1	124.9	124.4	161.2	165.2	164.7	13 26
AIR LVG AH T R	HW	599.2	596.9	592.4	584.0	627.1	625.6	580.6	551.2	561.2	6 6
AIR LVG AH T L	HW	562.7	551.3	580.6	581.5	578.4	575.4	576.3	552.8	537.0	6 7
BRN SEC AIR T	08-002	545.3	540.2	543.9	537.8	569.9	568.6	535.4	517.0	507.3	14 2
BRN SA/GR T	08-001	525.4	526.6	532.0	565.4	557.5	557.0	521.5	502.5	491.2	14 3
OFA TEMP	09-002	526.6	521.1	544.9	539.6	565.9	564.3	535.4	517.3	467.9	14 4
GAS LVG AH T RA	20-019	309.8	309.6	319.7	315.9	316.7	318.9	314.6	305.9	300.0	6 10
GAS LVG AH T RB	20-020	293.5	292.9	301.0	298.3	304.4	306.5	295.4	287.5	281.9	6 11
GAS LVG AH T LA	20-027	280.2	279.0	288.3	286.4	282.2	282.6	285.5	281.3	271.3	13 27
GAS LVG AH T LB	20-024	284.3	284.3	301.6	300.2	294.6	295.9	299.5	295.0	283.7	13 28
GAS LVG RH PS T	AVE	649.3	633.1	653.8	654.2	673.6	668.1	650.1	647.7	624.6	13 17
GAS LVG SH PS T	AVE	663.6	658.5	656.0	650.1	695.8	691.3	655.2	617.9	637.2	13 19
GR GAS TEMP A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 8
GR GAS TEMP B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 9
O2 LVG ECON R	11-172	2.8919	2.7915	1.5781	1.7642	2.5331	2.3765	2.2565	3.4222	3.5539	6 20
O2 LVG ECON L	11-170	2.4435	2.9608	2.6886	3.2939	2.4313	2.2878	3.3211	3.9052	3.4208	6 21
O2 IN SEC AIR	06-254	16.86	16.26	20.22	13.50	0.00	0.00	20.26	20.35	20.42	13 29
ACCUREX NOX PPM	06-553	273.8	291.1	0.0	0.0	296.4	280.1	0.0	0.0	0.0	13 9
ACCUREX SOX PPM	06-555	1049.7	1190.1	0.0	0.0	1170.8	1175.9	0.0	0.0	0.0	13 10
ACCUREX CO PPM	06-425	19.76	70.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13 11
ACCUREX O2 %	06-554	3.7190	3.0382	0.0000	0.0000	2.5946	2.5612	0.0000	0.0000	0.0000	13 12
BRN SEC AIR P IN WG	06-250	21.35	21.79	24.49	24.59	19.86	19.91	23.57	25.21	23.89	14 5
BRN GAS REC P IN WG	06-252	21.21	21.59	23.79	24.47	19.82	19.79	23.01	24.72	23.25	14 6

TEST NO.		16A	1BM	3T	4T	10B	10C	5T	7T	18T	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		04/24/92	05/05/92	02/13/91	02/13/91	04/13/92	04/13/92	02/14/91	02/15/91	02/18/91	
TIME START		1110	1039	1710	1915	1524	1822	1408	1009	0919	
TIME END		1311	1200	1741	2008	1647	1914	1604	1024	0929	
LOAD MW		111	110	110	110	110	111	111	111	109	
DATA PAGE NO. 6	**AIR & GAS DATA - PLANT**										
FURNACE GAS P	IN WG	08-100	19.45	19.15	20.28	21.21	18.22	18.33	20.39	22.18	20.80	14 7
BAROMETRIC P	IN HG	PB	29.30	29.48	0.00	0.00	29.56	29.54	0.00	0.00	0.00	6 29
REL HUMIDITY	%	TST	7.7840	7.8107	0.0000	0.0000	7.8698	7.8657	0.0000	0.0000	0.0000	6 30
DATA PAGE NO. 7	**AIR & GAS DATA - B&W**										
AMBIENT AIR TEMP		TC	45.76	50.88	0.00	0.00	42.88	43.21	0.00	0.00	0.00	7 1
AIR LVG FD FAN T	A	TC	125.3	122.2	127.3	125.6	117.3	118.4	128.9	128.8	124.7	7 6
AIR LVG FD FAN T	B	TC	128.5	124.7	129.7	127.8	119.8	120.7	129.4	126.5	127.1	7 7
AIR ENT AH	(T)	GRID	128.0	124.3	157.8	158.8	139.3	138.4	161.3	162.9	164.4	7 4
GAS LVG AH	(T)	GRID	283.6	282.4	295.6	293.5	290.8	291.9	292.7	286.7	279.9	7 10
GAS LVG ECON	(T) L	GRID	669.7	660.7	673.7	673.4	664.5	658.6	670.8	661.7	643.2	7 14
GAS LVG ECON	(T) R	GRID	669.6	663.1	664.6	658.9	702.8	698.2	655.1	626.9	629.9	7 15
GAS TEMP LVG GR FAN		GRID	542.3	537.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 7
O2 LVG ECON	(T) L	GRID	3.1170	2.9197	3.3074	3.4541	3.0197	2.9945	3.2015	3.1191	3.0000	7 20
O2 LVG ECON	(T) R	GRID	3.0360	2.8212	3.0726	3.2678	3.0104	2.9556	3.0865	3.1352	3.0000	7 21
CO LVG ECON	(T) L	GRID	78.4	78.9	199.7	146.8	74.1	62.2	164.2	85.0	90.0	13 5
CO LVG ECON	(T) R	GRID	52.9	41.9	99.1	93.8	65.6	66.7	133.4	80.0	92.0	13 6
CO2 LVG ECON	(T) L	GRID	15.59	16.65	15.90	15.82	16.08	16.04	5.01	16.47	15.65	7 22
CO2 LVG ECON	(T) R	GRID	15.19	15.58	15.90	15.85	15.49	15.49	15.59	15.99	15.19	7 23
NOX LVG ECON	(T) L	GRID	242.5	310.0	318.9	258.9	274.4	271.6	263.6	278.6	284.0	7 24
NOX LVG ECON	(T) R	GRID	127.6	6.6	324.7	266.7	305.0	287.4	287.9	311.3	284.0	7 25
O2 LVG AH	(T)	GRID	3.9700	3.8900	4.3000	4.4500	4.2000	4.1300	4.4000	4.3500	4.1000	13 1
CO2 LVG AH	(T)	GRID	24.6	1728.7	1070.6	1919.8	21.3	24.8	497.3	1223.3	2169.3	13 3
O2 LVG GR FAN	(T)	GRID	0.00	3.82	2.51	4.08	0.00	0.00	15.17	2.94	4.58	13 4
DRY BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27
DATA PAGE NO. 8	**FW HTR TEMPERATURES F (C) - PLANT**										
FW HTR E EXT T		HW	743.0	741.7	733.3	736.2	745.7	746.0	741.7	726.7	743.8	8 1
FW HTR E LVG T		HW	456.9	458.0	455.7	421.3	457.4	458.1	419.7	402.0	458.3	8 5
FW HTR E ENT T		HW	382.2	383.0	383.2	383.3	383.0	383.8	386.9	383.2	383.1	8 7
FW HTR E DRN T		HW	402.4	434.0	401.7	401.9	402.9	403.6	401.1	402.1	400.9	8 13
DATA PAGE NO. 9	**FW HTR TEMPERATURES F (C) - B&W**										
SSH PEND IN LEG	1	10-017	831.4	843.8	838.7	843.0	852.2	848.1	854.1	846.8	844.2	9 17
SSH PEND IN LEG	2	10-018	852.3	867.6	857.9	864.6	870.2	867.6	877.9	874.6	861.8	9 18
SSH PEND IN LEG	3	10-019	863.1	876.7	863.1	873.2	877.5	876.2	885.5	880.6	857.4	9 19
SSH PEND IN LEG	4	10-020	878.5	889.7	877.4	888.3	895.7	893.4	899.6	887.7	866.5	9 20
SSH PEND IN LEG	5	10-021	868.7	876.7	875.4	885.6	890.3	885.7	896.3	878.0	864.8	9 21

TEST NO.	16A	1BM	3T	4T	10B	10C	5T	7T	18T
TEST SEQ. NO.	9	10	11	12	13	14	15	16	17
DATE	04/24/92	05/05/92	02/13/91	02/13/91	04/13/92	04/13/92	02/14/91	02/15/91	02/18/91
TIME START	1110	1039	1710	1915	1524	1822	1408	1009	0919
TIME END	1311	1200	1741	2008	1647	1914	1604	1024	0929
LOAD MW	111	110	110	110	110	111	111	111	109

DATA PAGE NO. 9 FW HTR TEMPERATURES F (C) - B&W

SSH PEND IN LEG 6	10-033	880.3	892.6	881.4	891.7	900.9	896.9	899.6	874.3	873.8	9	22
SSH PEND IN LEG 7	10-034	874.1	894.6	877.5	885.1	888.9	886.4	887.1	862.7	870.1	9	23
SSH PEND IN LEG 8	10-035	864.4	886.3	874.4	878.6	878.5	876.3	875.8	858.4	870.9	9	24
SSH PEND IN LEG 9	10-036	865.0	882.1	879.1	882.9	876.3	875.4	880.0	863.3	868.6	9	25
SSH PEND IN LEG 10	10-037	837.6	852.5	866.1	870.1	846.5	846.9	872.9	842.1	833.4	9	26
RH PEND IN LEG 1	09-049	943.4	950.7	934.5	943.4	949.2	952.2	947.6	944.8	962.7	8	17
RH PEND IN LEG 2	09-050	937.1	945.7	923.1	933.9	944.6	946.8	941.1	939.9	955.1	8	18
RH PEND IN LEG 3	09-051	936.9	945.1	927.4	936.8	943.8	946.7	942.2	939.0	955.9	8	19
RH PEND IN LEG 4	09-052	936.0	944.3	924.4	934.9	943.0	945.6	941.2	939.3	954.6	8	20
RH PEND IN LEG 5	09-053	0.0	0.0	944.4	959.5	0.0	0.0	965.1	943.2	928.6	8	21
RH PEND IN LEG 6	10-001	958.8	965.4	951.2	959.4	966.5	969.3	959.3	958.3	985.6	8	22
RH PEND IN LEG 7	10-002	932.3	938.6	923.9	930.1	939.0	943.4	927.8	929.0	953.0	8	23
RH PEND IN LEG 8	10-003	935.8	938.5	933.0	939.1	939.8	946.2	938.5	935.3	951.0	8	24
RH PEND IN LEG 9	10-004	942.6	949.7	933.8	943.4	949.1	952.0	947.5	945.2	963.0	8	25
RH PEND IN LEG 10	10-005	894.4	895.5	925.3	947.4	895.0	899.8	954.2	927.0	908.0	8	26
RH INTM HND HOLE R	10-038	941.4	950.5	934.3	940.6	948.1	951.0	945.5	937.2	950.4	8	27
RH INTM HND HOLE L	10-039	841.9	852.7	865.8	882.0	845.7	849.8	892.8	864.4	862.6	8	28
PSH OUT LEG T	09-017	786.6	773.4	764.6	765.1	785.4	792.7	766.7	746.6	798.8	14	11
PSH OUT LEG T	09-018	799.7	782.8	774.2	777.0	795.4	803.0	780.4	751.5	799.3	14	12
PSH OUT LEG T	09-019	744.3	734.0	728.0	726.2	746.6	754.4	731.7	708.4	770.6	14	13
PSH OUT LEG T	09-020	762.0	748.8	744.8	741.0	765.7	772.7	746.0	718.6	785.4	14	14
PSH OUT LEG T	09-021	770.9	757.0	751.1	750.4	773.7	780.5	752.1	733.6	790.3	14	15
PSH OUT LEG T	09-022	779.2	766.7	757.8	760.5	778.2	785.3	760.2	744.4	797.0	14	16
PSH OUT LEG T	09-023	778.2	761.6	751.8	754.1	771.7	778.5	760.0	732.4	786.3	14	17
PSH OUT LEG T	09-024	804.3	787.4	779.9	785.8	802.8	810.4	786.4	758.3	805.9	14	18
PSH OUT LEG T	09-025	785.1	768.4	758.8	762.3	783.5	790.8	757.5	736.7	781.8	14	19
PSH OUT LEG T	09-026	793.1	775.7	771.5	779.5	792.2	798.8	778.6	760.0	790.1	14	20
PSH OUT LEG T	09-027	804.8	789.7	783.1	790.6	806.0	811.9	791.8	773.4	805.9	14	21

DATA PAGE NO. 10 PULVERIZER COAL AND PA FLOW

CYC A COAL FLOW KLB	05-104	21.80	21.49	22.46	22.49	22.54	22.36	22.40	22.93	22.68	10	1
CYC B COAL FLOW KLB	07-110	21.78	21.48	22.45	22.48	22.56	22.37	22.42	22.86	22.66	10	2
CYC C COAL FLOW KLB	09-110	21.78	21.49	22.48	22.51	22.57	22.38	22.48	22.91	22.67	10	3
CYC A SEC AIR FLOW %	06-170	208.9	207.2	200.3	200.4	203.3	203.4	204.2	208.9	260.6	10	16
CYC B SEC AIR FLOW %	08-170	207.1	205.4	210.0	212.3	201.4	201.2	206.8	212.6	264.3	10	17
CYC C SEC AIR FLOW %	10-170	208.6	208.4	217.4	222.6	204.0	204.3	201.0	205.3	245.4	10	18
CYC A SEC AIR T	20-002	542.0	541.4	530.8	518.7	562.1	560.7	518.4	498.0	511.1	11	1
CYC B SEC AIR T	20-003	575.1	566.9	578.1	573.0	600.3	596.9	569.6	552.1	538.2	11	2
CYC C SEC AIR T	20-004	521.1	509.6	520.4	518.1	534.6	533.2	515.4	505.4	484.3	11	3
PULV COAL FLOW KLB	06-314	26.06	25.99	27.79	27.71	28.40	28.37	28.34	28.24	28.31	10	4
PULV PA FLOW	06-275	55.42	55.31	59.13	57.62	56.85	58.13	61.67	59.64	60.67	10	19
PULV INLET T	09-034	528.6	520.7	508.0	503.0	553.3	552.9	502.2	487.1	465.9	11	7
PULV OUTLET T	09-040	160.8	156.8	149.4	146.7	163.7	170.0	149.2	135.9	129.2	11	8

TEST NO.		16A	18M	3T	4T	10B	10C	5T	7T	18T	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		04/24/92	05/05/92	02/13/91	02/13/91	04/13/92	04/13/92	02/14/91	02/15/91	02/18/91	
TIME START		1110	1039	1710	1915	1524	1822	1408	1009	0919	
TIME END		1311	1200	1741	2008	1647	1914	1604	1024	0929	
LOAD MW		111	110	110	110	110	111	111	111	109	
DATA PAGE NO. 11 PULVERIZER INLET TEMP AND PA DIFF											
PULV DIFF P IN WG	06-274	14.57	12.72	12.04	12.39	12.52	16.54	11.69	12.42	11.02	11 9
PULV AMPS	06-276	270.0	255.5	257.7	264.3	251.4	281.5	253.2	264.4	244.8	11 10
PULV PA FAN AMPS	06-277	75.27	72.46	78.05	74.95	85.20	86.66	88.33	81.60	79.67	11 11
ROT CLASS AMPS	06-278	48.93	46.52	39.68	40.32	42.64	50.00	39.15	39.83	40.77	11 12
ROT CLASS RPM	06-270	158.1	153.3	140.7	140.7	138.6	160.0	139.9	139.7	140.8	11 13
ROT CLASS DP IN WG	06-345	.5445	.4752	.3671	.3797	.3930	.5725	.3571	.3862	.3663	11 14
COAL SILO LEVEL	06-310	44.58	36.85	68.45	32.36	82.82	57.78	83.74	71.88	80.82	11 15
FLAME INTENSITY #1 %	06-279	106.2	105.7	106.1	106.1	105.8	105.9	106.1	106.2	106.1	11 16
FLAME INTENSITY #2 %	06-295	105.5	105.0	105.5	102.7	105.2	105.2	106.0	106.1	105.8	11 17
FLAME INTENSITY #3 %	06-296	106.1	105.8	106.2	104.4	94.2	105.2	106.2	0.0	106.2	11 18
FLAME INTENSITY #4 %	06-297	105.8	105.1	106.1	105.2	105.4	105.5	106.1	0.0	0.0	11 19
DATA PAGE NO. 12 OPERATOR POSITIONS %											
RH SP VLV POS	15-077	16.90	7.06	8.70	5.10	20.54	22.01	-5.00	-5.00	12.40	12 1
SH SP VLV POS R	13-190	51.05	35.27	29.95	30.29	34.93	39.70	27.83	0.00	41.16	12 3
SH SP VLV POS L	13-191	49.37	30.97	31.87	28.58	40.87	42.87	24.61	0.00	59.19	12 4
GR DMPR DEMAND	16-044	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	1.0364	12 9
RECIRC AIR DMPR POS	12-176	0.00	0.00	22.59	33.68	20.63	18.88	36.37	56.46	31.61	12 13
SH PASS DMPR POS	14-180	100.0	100.0	65.1	52.1	100.0	100.0	100.0	35.0	100.0	12 15
RH PASS DMPR POS	14-180	-4.5	45.2	100.0	100.0	3.0	0.0	47.8	100.0	53.2	12 16
OVRFIRE AIR DMPR POS	06-115	49.37	46.39	47.05	60.19	58.88	58.61	59.11	58.12	28.26	12 17
BRN SEC AIR DMPR POS	06-286	19.84	18.30	35.88	14.17	19.62	19.66	32.41	32.01	32.11	12 18
HOT PRI AIR DMPR POS	06-556	100.0	100.0	100.0	100.0	99.9	99.6	100.0	100.0	100.0	12 19
BRN GAS REC DMPR POS	06-324	24.28	28.70	-5.00	39.99	21.06	21.06	-5.00	-5.00	-5.00	12 20
DATA PAGE NO. 15 MISCELLANEOUS											
GAS LVG SH PASS 1A	08-003	-443.9	-468.8	-411.0	-397.8	-492.8	-477.5	-407.7	-393.0	-427.2	15 1
GAS LVG SH PASS 1B	08-004	673.5	668.5	664.6	656.7	706.7	698.4	660.7	616.4	643.9	15 2
GAS LVG SH PASS 1C	08-005	691.5	681.9	696.1	703.8	732.3	727.0	680.1	627.0	659.1	15 3
GAS LVG SH PASS 1D	08-006	713.5	713.1	720.8	717.5	751.9	750.8	722.2	661.3	681.7	15 4
GAS LVG SH PASS 2A	08-017	618.8	617.6	608.9	595.9	646.4	638.7	604.8	580.6	603.2	15 5
GAS LVG SH PASS 2B	08-018	633.2	631.0	624.1	612.6	665.2	662.2	624.3	596.9	616.7	15 6
GAS LVG SH PASS 2C	08-019	643.2	638.6	635.6	628.5	676.4	676.0	640.6	601.2	615.0	15 7
GAS LVG SH PASS 2D	08-020	682.4	683.3	684.4	680.4	720.6	717.1	678.5	642.1	659.5	15 8
GAS LVG SH PASS 3A	08-021	650.0	652.2	635.7	627.5	680.7	675.1	635.7	619.6	638.6	15 9
GAS LVG SH PASS 3B	08-022	671.1	658.5	658.2	652.6	695.4	690.6	662.3	621.0	633.5	15 10
GAS LVG SH PASS 3C	08-023	658.7	652.1	632.2	625.8	682.2	677.5	643.1	612.4	621.1	15 11
GAS LVG SH PASS 3D	08-024	-600.4	-586.3	-554.5	-552.3	-636.6	-636.1	-552.9	-529.0	-532.3	15 12
GAS LVG RH PASS 4A	08-033	636.0	617.5	649.6	653.3	649.1	648.2	646.9	642.2	610.4	15 13
GAS LVG RH PASS 4B	08-034	650.6	634.8	665.5	664.7	674.8	668.2	656.7	652.5	625.1	15 14
GAS LVG RH PASS 4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15

TEST NO.		16A	1BM	3T	4T	10B	10C	5T	7T	18T	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		04/24/92	05/05/92	02/13/91	02/13/92	04/13/92	04/13/92	02/14/91	02/15/91	02/18/91	
TIME START		1110	1039	1710	1915	1524	1822	1408	1009	0919	
TIME END		1311	1200	1741	2008	1647	1914	1604	1024	0929	
LOAD MW		111	110	110	110	110	111	111	111	109	
DATA PAGE NO. 15	MISCELLANEOUS										
GAS LVG RH PASS 4D	08-036	696.4	672.4	704.7	714.5	732.9	722.3	691.8	685.1	656.0	15 16
GAS LVG RH PASS 5A	08-049	624.1	610.1	627.3	630.7	644.3	639.4	633.4	629.9	605.5	15 17
GAS LVG RH PASS 5B	08-050	640.2	621.3	645.1	643.8	660.5	660.1	636.3	637.4	615.1	15 18
GAS LVG RH PASS 5C	08-051	645.2	636.8	661.6	654.8	685.3	672.3	649.4	648.0	626.7	15 19
GAS LVG RH PASS 5D	08-052	646.3	628.7	646.8	649.8	674.3	669.2	645.7	637.5	616.3	15 20
GAS LVG RH PASS 6A	08-053	630.9	619.9	638.1	635.2	649.6	645.7	638.5	635.9	618.3	15 21
GAS LVG RH PASS 6B	08-054	658.1	645.2	658.3	657.5	677.4	674.9	657.9	654.6	634.7	15 22
GAS LVG RH PASS 6C	08-055	647.9	636.3	643.2	641.5	670.7	662.9	640.8	646.9	629.5	15 23
GAS LVG RH PASS 6D	08-056	666.5	656.3	652.0	650.5	691.0	686.0	653.2	654.2	632.9	15 24
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W		84.00	93.00	6.00	7.00	74.00	75.00	8.00	9.00	11.00	15 28

RB-369 16 Jun 1992 14:16:42

TEST NO.	22T	24T	6T	15T	10T	8T	19T	23T
TEST SEQ. NO.	1	2	3	4	5	6	7	8
DATE	02/19/91	02/20/91	02/14/91	02/17/91	02/15/91	02/15/91	02/18/91	02/19/91
TIME START	1132	0951	1604	1044	1614	1143	1045	1658
TIME END	1513	1012	1903	1103	1809	1204	1644	1854
LOAD MW	110	110	111	110	110	110	110	110
FUEL	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR

22T AVG SCANS 17-->32 : 110 MW : 14 TPH REBRN : NO GR TO BRNRS
24T AVG SCANS 9 -->10 : 110 MW : 14 TPH REBRN : NO GR TO BRNRS
6T AVG SCANS 45-->61 : 110 MW : 14 TPH REBURN : NO GR TO BNRS
15T AVG SCANS 9 -->10 : 110 MW : 14.5 TPH REBRN: NO GR TO BRNRS
10T AVG SCANS 40-->51 : 110 MW : 14 TPH REBURN : W/ GR TO BNRS
8T AVG SCANS 15-->16 : 110 MW : 14 TPH REBURN : W/ GR TO BNRS
19T AVG SCANS 15-->41 : 110 MW : 14 TPH REBRN : W/ GR TO BRNRS
23T AVG SCANS 43-->53 : 110 MW : 14 TPH REBRN : W/ GR TO BRNRS

DATA PAGE NO. 2 FLOWS MLB/HR (MT/HR)

LOAD MW	20-005	110.3	109.6	110.6	109.9	109.6	109.6	109.8	110.4	2	1
MAIN STEAM FLOW	03-033	813.9	818.3	808.0	804.9	799.3	799.2	802.1	807.3	2	2
1ST STG STM FLW	CALC	783.1	788.4	777.5	775.3	769.7	769.8	772.2	777.5	2	23
FW FLOW	12-170	798.6	799.3	781.6	780.3	778.6	774.9	775.9	782.9	2	3
BLOW DOWN FLOW	EST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	4
RH SPRAY FLOW	14-192	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	5
SH SPRAY FLOW L	17-052	1.4078	0.0000	2.9283	0.0000	0.0000	0.0000	2.9492	.9944	2	7
SH SPRAY FLOW R	17-056	0.0000	0.0000	4.9988	0.0000	2.5535	0.0000	0.0000	0.0000	2	8
GR FAN AMPS A	16-181	.08	.08	21.80	22.44	25.46	25.66	24.35	25.63	2	12
GR FAN AMPS B	16-183	-.0206	-.0206	-.0206	-.0206	-.0206	-.0206	-.0206	-.0206	2	13
GR FAN BUS VOLT	EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2	14
TOTAL GR FLOW	CALC	0.00	0.00	43.99	45.61	76.64	77.42	63.96	75.34	2	24
GR TO SEC AIR	06-932	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	25
GR TO SEC AIR	CALC	0.00	0.00	.43	1.34	54.48	48.59	9.99	14.37	2	26
GR TO FURN	CALC	0.00	0.00	43.56	44.27	22.17	28.83	53.97	60.97	2	27
OFA AIR FLOW	06-931	175.4	172.2	218.5	206.2	235.2	237.7	226.4	223.3	2	28
TMP AIR FLOW	CALC	34.94	23.88	33.19	8.21	17.14	16.13	30.95	23.09	14	10
SEC AIR FLOW	06-320	37.54	37.61	48.93	44.29	27.39	28.27	32.19	27.11	2	29
1st STG PRESS	18-128	1090.2	1097.7	1082.1	1079.0	1071.0	1071.2	1074.6	1082.1	2	19
OIL FLOW 2A	05-100	.0020	.0033	.0017	.0017	.0024	.0018	.0026	.0023	2	20
OIL FLOW 2B	07-100	.0033	.0033	.0017	.0033	.0017	.0031	.0026	.0026	2	21
OIL FLOW 2C	09-100	.0016	.0019	.0016	.0016	.0016	.0016	.0016	.0016	2	22
% PWDR RVR BASN COAL	USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	30
CYCLONE STOIC	CALC	1.0840	1.1039	1.1054	1.1345	1.1170	1.1257	1.1038	1.1029	4	20
REBRN WB STOIC	CALC	.5678	.5684	.4732	.4325	.3960	.3944	.3987	.3788	4	21
REBRN STOIC	CALC	.9176	.9267	.8798	.8932	.8485	.8534	.8649	.8595	4	22
LVG FURN STOIC	CALC	1.1379	1.1440	1.1576	1.1549	1.1488	1.1563	1.1533	1.1422	4	23
LVG ECON STOIC	CALC	1.1477	1.1538	1.1672	1.1646	1.1585	1.1659	1.1630	1.1519	4	24

TEST NO.			22T	24T	6T	15T	10T	8T	19T	23T	
TEST SEQ. NO.			1	2	3	4	5	6	7	8	
DATE			02/19/91	02/20/91	02/14/91	02/17/91	02/15/91	02/15/91	02/18/91	02/19/91	
TIME START			1132	0951	1604	1044	1614	1143	1045	1658	
TIME END			1513	1012	1903	1103	1809	1204	1644	1854	
LOAD MW			110	110	111	110	110	110	110	110	
DATA PAGE NO. 3		**FLUID TEMPERATURES F (C) - PLANT**									
SSH OUT T	L	15-152	965.8	964.1	998.0	990.4	993.4	991.0	998.5	996.8	3 1
SSH OUT T	R	15-150	942.0	967.3	996.3	999.8	977.3	1000.0	993.9	991.7	3 2
SSH OUT AVE T		13-160	955.8	970.7	999.4	998.7	986.7	997.9	999.2	996.0	14 1
LVG SH ATTMP T	L	13-164	706.9	722.5	753.0	745.5	743.1	744.0	740.4	746.9	3 8
LVG SH ATTMP T	R	13-162	725.9	740.9	763.3	761.1	750.1	763.2	767.0	766.4	3 9
PRI SH OUT T	L	HW	707.8	722.9	762.6	744.9	740.8	742.2	748.6	746.0	3 10
PRI SH OUT T	R	HW	727.1	742.8	764.3	767.3	740.8	742.2	771.8	765.9	3 11
ECON H2O OUT T	L	HW	515.3	504.0	506.6	510.3	512.0	512.2	508.7	508.6	3 27
ECON H2O OUT T	R	HW	492.5	503.2	519.7	510.1	512.0	514.9	514.2	512.5	3 28
ECON H2O IN T		20-007	457.9	457.0	458.4	457.9	457.6	457.1	457.6	458.5	3 5
RH SPRAY H2O T		HW	318.0	316.6	316.8	317.1	316.7	316.5	316.6	325.0	3 7
LVG RH T		14-150	985.3	958.9	999.2	994.9	997.3	1002.2	998.1	1000.0	3 12
ENT RH T		CALC	703.3	712.0	736.6	735.9	718.3	734.4	736.1	734.2	3 16
COLD RH T		20-006	707.3	715.9	740.8	740.4	731.7	739.5	740.6	740.1	3 18
DATA PAGE NO. 4		**FLUID TEMPERATURES F (C) - B&W**									
AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 18
GAS LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 19
DATA PAGE NO. 5		**FLUID PRESSURES PSIG (KG/CM2)**									
TURB THROT P		03-170	1450.1	1457.5	1463.4	1454.5	1451.1	1450.2	1452.9	1450.6	5 1
SEC SH OUT P		CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 2
DRUM PRESS		04-013	1609.9	1620.7	1621.6	1612.8	1606.6	1606.7	1609.9	1610.3	5 3
LVG RH PRESS		15-102	432.8	431.2	427.3	425.5	424.7	423.8	424.3	426.9	5 4

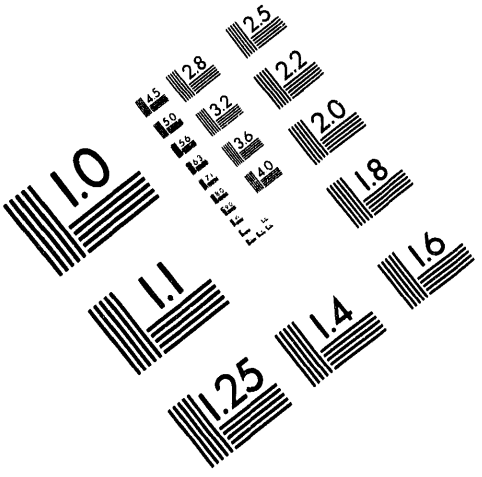
TEST NO.	22T	24T	6T	15T	10T	8T	19T	23T
TEST SEQ. NO.	1	2	3	4	5	6	7	8
DATE	02/19/91	02/20/91	02/14/91	02/17/91	02/15/91	02/15/91	02/18/91	02/19/91
TIME START	1132	0951	1604	1044	1614	1143	1045	1658
TIME END	1513	1012	1903	1103	1809	1204	1644	1854
LOAD MW	110	110	111	110	110	110	110	110

DATA PAGE NO. 5 FLUID PRESSURES PSIG (KG/CM2)

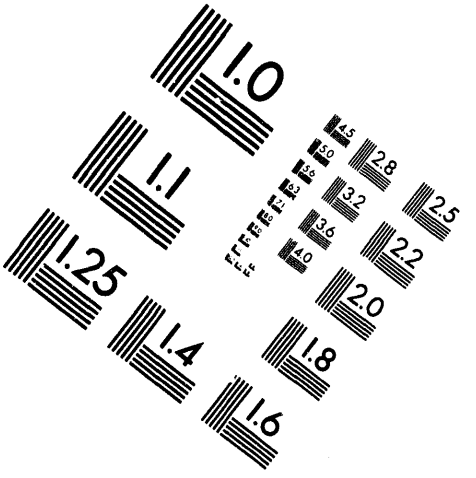
ENT RH PRESS		15-100	461.6	458.7	457.1	454.5	455.2	452.9	452.6	456.1	5 5
FW HTR E EXT P		20-035	440.7	437.9	436.5	434.0	434.7	432.6	432.6	435.1	5 6
FW HTR E EXT P		TRANS	442.9	440.6	438.1	436.0	436.3	434.3	434.6	437.3	5 7
SEC SH OUT P	(T)	TRANS	1497.1	1506.7	1512.4	1503.2	1499.4	1499.0	1500.8	1497.9	5 17
DRUM PRESS	(T)	TRANS	1600.6	1610.6	1613.9	1604.5	1599.8	1599.4	1601.7	1600.7	5 18
LVG RH-1 P	(T)	TRANS	436.8	434.8	431.6	429.7	429.9	428.0	428.3	431.3	5 19
ENT RH-1 P	(T)	TRANS	457.6	455.6	452.4	450.1	450.1	448.5	448.7	451.6	5 20

DATA PAGE NO. 6 AIR & GAS DATA - PLANT

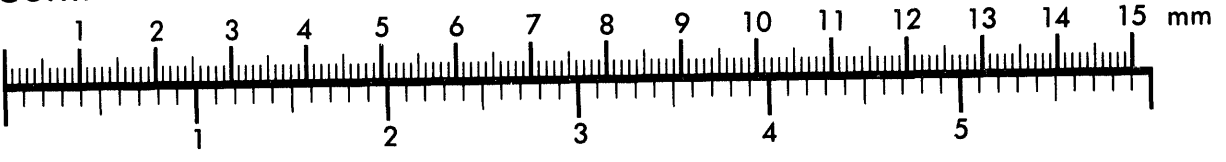
AMBIENT AIR DB TEMP		TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 1
AIR ENT FD FAN T		HW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 4
AIR LVG FD FAN T	A	09-028	124.7	122.3	124.3	120.2	133.6	127.8	126.9	124.0	7 2
AIR LVG FD FAN T	B	09-029	124.7	124.6	127.2	124.1	133.0	125.2	126.6	123.7	7 3
AIR ENT AH T	RA	20-017	166.1	178.2	152.4	170.6	148.6	160.9	162.1	166.7	6 2
AIR ENT AH T	RB	20-018	149.4	149.8	149.6	148.9	151.8	148.9	150.5	148.5	6 3
AIR ENT AH T	LA	20-025	185.6	186.0	184.8	182.8	187.7	188.4	187.2	186.1	13 25
AIR ENT AH T	LB	20-029	161.5	167.5	156.2	167.1	155.4	168.3	168.8	171.5	13 26
AIR LVG AH T	R	HW	544.5	551.7	593.9	591.7	583.3	570.9	574.2	565.6	6 6
AIR LVG AH T	L	HW	557.8	539.2	592.4	543.5	583.3	571.0	548.4	547.7	6 7
BRN SEC AIR T		08-002	513.8	507.7	545.1	508.8	539.2	523.9	521.4	518.0	14 2
BRN SA/GR T		08-001	485.6	484.8	530.6	493.7	574.1	552.3	530.8	492.3	14 3
OFA TEMP		09-002	516.4	509.8	542.1	511.6	543.0	527.1	523.8	521.1	14 4
GAS LVG AH T	RA	20-019	304.8	310.4	318.7	301.6	322.2	308.4	309.5	304.6	6 10
GAS LVG AH T	RB	20-020	290.0	292.8	299.1	283.4	302.8	290.3	290.6	288.0	6 11
GAS LVG AH T	LA	20-027	290.8	284.6	285.3	274.4	292.7	284.6	280.5	285.8	13 27
GAS LVG AH T	LB	20-024	302.5	297.7	300.5	287.9	305.6	298.0	293.8	298.0	13 28
GAS LVG RH PS T		AVE	634.3	610.1	644.2	626.3	655.5	639.9	626.2	622.2	13 17
GAS LVG SH PS T		AVE	587.9	610.2	671.6	622.7	648.2	644.6	641.9	634.3	13 19
GR GAS TEMP	A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 8
GR GAS TEMP	B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 9
O2 LVG ECON	R	11-172	2.3943	2.0672	2.8912	3.0479	4.2619	4.0184	2.9961	2.6780	6 20
O2 LVG ECON	L	11-170	2.3258	2.8728	3.4287	3.0353	3.1616	3.7717	2.9221	2.3977	6 21
O2 IN SEC AIR		06-254	20.71	20.65	20.37	20.01	8.70	9.37	16.37	14.38	13 29
ACCUREX NOX	PPM	06-553	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 9
ACCUREX SOX	PPM	06-555	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 10
ACCUREX CO	PPM	06-425	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 11
ACCUREX O2	%	06-554	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 12
BRN SEC AIR P	IN WG	06-250	22.39	20.96	24.61	22.45	25.19	26.79	23.16	22.56	14 5
BRN GAS REC P	IN WG	06-252	22.12	20.55	24.01	21.98	25.15	26.72	23.00	22.47	14 6
FURNACE GAS P	IN WG	08-100	21.30	19.93	21.34	20.26	20.69	20.88	20.22	20.21	14 7
BAROMETRIC P	IN HG	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 29
REL HUMIDITY	%	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 30



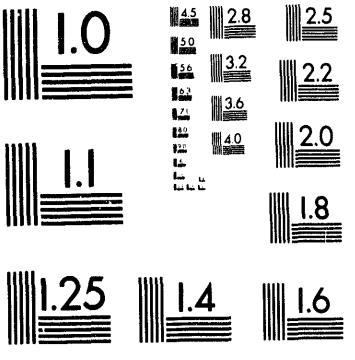
Association for Information and Image Management
1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202

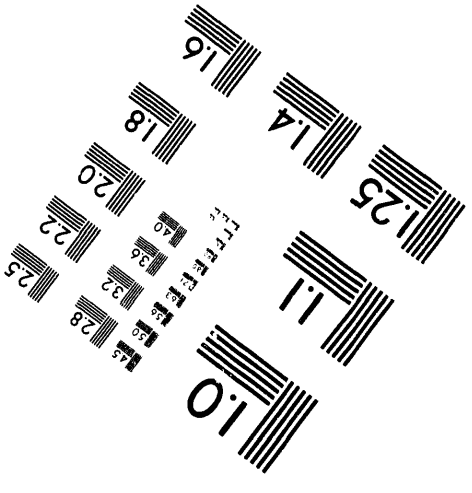


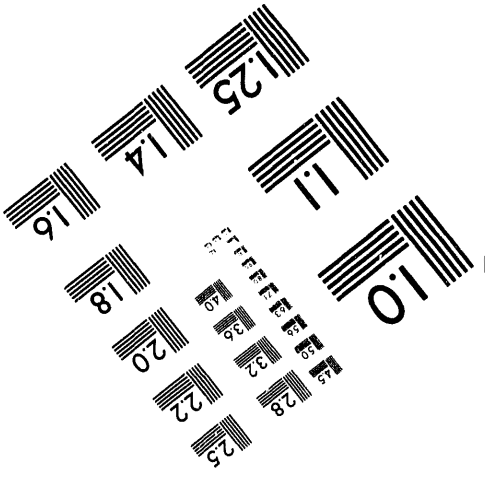
Centimeter



Inches







MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

6 of 9

TEST NO.		22T	24T	6T	15T	10T	8T	19T	23T	
TEST SEQ. NO.		1	2	3	4	5	6	7	8	
DATE		02/19/91	02/20/91	02/14/91	02/17/91	02/15/91	02/15/91	02/18/91	02/19/91	
TIME START		1132	0951	1604	1044	1614	1143	1045	1658	
TIME END		1513	1012	1903	1103	1809	1204	1644	1854	
LOAD MW		110	110	111	110	110	110	110	110	
DATA PAGE NO. 7	**AIR & GAS DATA - B&W**									
AMBIENT AIR TEMP	TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 1
AIR LVG FD FAN T A	TC	127.7	125.3	126.9	121.9	136.3	130.3	129.8	126.7	7 6
AIR LVG FD FAN T B	TC	127.0	127.0	129.1	126.1	135.3	127.4	128.9	126.0	7 7
AIR ENT AH (T)	GRID	166.3	172.1	158.0	166.7	158.0	164.9	166.9	168.9	7 4
GAS LVG AH (T)	GRID	292.8	292.2	294.8	281.8	300.0	290.1	289.9	290.4	7 10
GAS LVG ECON (T) L	GRID	653.0	627.4	671.8	645.2	677.2	660.4	649.4	671.0	7 14
GAS LVG ECON (T) R	GRID	577.7	586.3	671.0	612.2	654.6	649.5	633.3	626.4	7 15
GAS TEMP LVG GR FAN	GRID	164.0	0.0	0.0	0.0	0.0	0.0	0.0	514.0	13 7
O2 LVG ECON (T) L	GRID	2.5630	2.9817	3.1325	3.0326	2.6087	2.8637	3.1423	2.7219	7 20
O2 LVG ECON (T) R	GRID	2.9456	2.7023	3.0375	3.0462	3.2706	3.2283	2.8817	2.9375	7 21
CO LVG ECON (T) L	GRID	74.0	72.6	144.1	99.9	146.8	101.3	65.4	66.8	13 5
CO LVG ECON (T) R	GRID	69.6	71.0	137.1	80.7	81.8	132.1	111.1	104.4	13 6
CO2 LVG ECON (T) L	GRID	16.07	15.98	5.01	16.09	17.02	16.56	15.94	15.78	7 22
CO2 LVG ECON (T) R	GRID	15.73	16.02	15.58	15.70	15.92	15.73	15.70	15.70	7 23
NOX LVG ECON (T) L	GRID	299.6	314.4	285.5	286.0	279.6	289.3	266.7	254.3	7 24
NOX LVG ECON (T) R	GRID	296.8	286.8	301.5	306.5	309.9	311.4	277.3	271.5	7 25
O2 LVG AH (T)	GRID	4.0000	3.9600	4.1000	4.2500	4.2000	4.1500	4.2500	4.0000	13 1
CO2 LVG AH (T)	GRID	34.5	31.7	238.3	1556.3	1812.2	2478.2	480.5	42.0	13 3
O2 LVG GR FAN (T)	GRID	18.29	18.12	12.04	3.54	9.50	5.01	13.53	18.22	13 4
DRY BULB TEMP (T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP (T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27
DATA PAGE NO. 8	**FW HTR TEMPERATURES F (C) - PLANT**									
FW HTR E EXT T	HW	706.6	714.8	739.9	739.9	730.5	738.8	740.2	739.1	8 1
FW HTR E LVG T	HW	459.2	456.6	407.3	457.7	401.4	403.9	457.2	457.9	8 5
FW HTR E ENT T	HW	382.9	381.1	382.9	383.5	383.0	382.8	383.6	383.1	8 7
FW HTR E DRN T	HW	402.3	400.7	401.3	401.8	401.4	401.0	401.3	402.0	8 13
DATA PAGE NO. 9	**FW HTR TEMPERATURES F (C) - B&W**									
SSH PEND IN LEG 1	10-017	813.9	830.8	855.6	853.8	841.1	858.1	854.9	857.9	9 17
SSH PEND IN LEG 2	10-018	834.1	853.7	877.8	878.9	865.4	885.3	875.5	880.2	9 18
SSH PEND IN LEG 3	10-019	834.8	860.3	883.9	884.4	874.2	893.7	878.8	880.6	9 19
SSH PEND IN LEG 4	10-020	845.7	876.4	894.9	896.5	884.0	901.3	891.8	891.1	9 20
SSH PEND IN LEG 5	10-021	841.9	878.6	888.7	893.6	875.6	889.7	889.2	884.4	9 21
SSH PEND IN LEG 6	10-033	851.4	886.5	893.8	899.9	883.0	889.0	895.6	891.0	9 22
SSH PEND IN LEG 7	10-034	853.0	878.9	887.7	895.4	881.4	880.1	888.7	888.5	9 23
SSH PEND IN LEG 8	10-035	852.0	864.7	880.2	885.8	877.4	874.8	883.9	885.3	9 24
SSH PEND IN LEG 9	10-036	852.6	855.0	884.3	880.4	881.1	878.5	883.7	885.7	9 25
SSH PEND IN LEG 10	10-037	824.6	821.7	869.8	847.0	861.9	863.2	854.9	856.4	9 26
RH PEND IN LEG 1	09-049	932.6	910.4	942.4	944.8	942.6	946.9	944.9	947.2	8 17
RH PEND IN LEG 2	09-050	923.7	908.3	935.0	942.6	934.7	940.7	940.1	941.2	8 18

TEST NO.		22T	24T	6T	15T	10T	8T	19T	23T
TEST SEQ. NO.		1	2	3	4	5	6	7	8
DATE		02/19/91	02/20/91	02/14/91	02/17/91	02/15/91	02/15/91	02/18/91	02/19/91
TIME START		1132	0951	1604	1044	1614	1143	1045	1658
TIME END		1513	1012	1903	1103	1809	1204	1644	1854
LOAD MW		110	110	111	110	110	110	110	110

DATA PAGE NO. 9 FW HTR TEMPERATURES F (C) - B&W

RH PEND IN LEG 3	09-051	926.0	905.9	936.4	940.5	936.4	941.5	940.0	941.6	8	19
RH PEND IN LEG 4	09-052	923.6	906.0	935.2	941.0	934.7	940.4	939.4	940.4	8	20
RH PEND IN LEG 5	09-053	911.5	861.3	950.1	900.0	948.0	955.9	917.9	918.7	8	21
RH PEND IN LEG 6	10-001	951.6	924.9	955.9	959.7	958.8	960.4	960.0	964.9	8	22
RH PEND IN LEG 7	10-002	925.8	896.7	925.7	932.9	928.3	928.5	932.0	936.8	8	23
RH PEND IN LEG 8	10-003	931.4	891.6	934.7	929.9	934.4	935.5	933.7	937.3	8	24
RH PEND IN LEG 9	10-004	932.5	909.9	942.1	945.1	942.4	946.8	944.9	947.2	8	25
RH PEND IN LEG 10	10-005	888.5	844.2	934.3	881.3	933.2	943.7	896.0	895.5	8	26
RH INTM HND HOLE R	10-038	930.7	916.2	940.1	941.1	940.8	945.6	943.2	945.7	8	27
RH INTM HND HOLE L	10-039	844.0	817.0	877.6	842.3	873.1	882.2	850.2	849.1	8	28
PSH OUT LEG T	09-017	730.6	740.0	778.1	764.2	758.9	760.0	767.8	763.1	14	11
PSH OUT LEG T	09-018	733.9	744.0	792.6	771.5	772.0	772.2	777.0	771.2	14	12
PSH OUT LEG T	09-019	689.2	706.5	750.8	725.2	727.5	727.5	728.7	732.4	14	13
PSH OUT LEG T	09-020	699.2	719.6	764.8	739.0	739.6	739.0	744.5	745.2	14	14
PSH OUT LEG T	09-021	718.6	728.3	761.5	749.3	745.4	746.0	752.6	750.5	14	15
PSH OUT LEG T	09-022	730.6	736.5	768.8	759.1	753.1	754.2	761.1	756.9	14	16
PSH OUT LEG T	09-023	711.1	728.4	775.5	752.1	749.8	751.9	757.9	751.4	14	17
PSH OUT LEG T	09-024	742.0	750.3	794.5	777.0	779.2	778.3	780.8	775.3	14	18
PSH OUT LEG T	09-025	711.8	733.7	779.4	757.3	758.4	758.1	761.2	754.9	14	19
PSH OUT LEG T	09-026	732.9	742.1	782.8	766.5	773.6	773.3	769.2	764.6	14	20
PSH OUT LEG T	09-027	745.4	754.7	795.7	781.3	787.0	787.4	784.1	779.9	14	21

DATA PAGE NO. 10 PULVERIZER COAL AND PA FLOW

CYC A COAL FLOW KLB	05-104	23.78	23.38	22.32	22.65	22.89	22.76	22.68	23.54	10	1
CYC B COAL FLOW KLB	07-110	23.77	23.36	22.34	22.63	22.85	22.72	22.66	23.53	10	2
CYC C COAL FLOW KLB	09-110	23.31	23.38	22.40	22.66	22.89	22.77	22.67	23.52	10	3
CYC A SEC AIR FLOW %	06-170	208.4	205.6	205.2	204.3	202.4	204.6	207.5	208.7	10	16
CYC B SEC AIR FLOW %	08-170	207.9	209.3	207.4	215.8	216.1	214.0	209.8	213.1	10	17
CYC C SEC AIR FLOW %	10-170	193.5	200.6	205.9	206.8	203.7	210.2	199.4	199.4	10	18
CYC A SEC AIR T	20-002	475.4	482.7	530.0	499.7	527.1	515.2	515.5	507.9	11	1
CYC B SEC AIR T	20-003	556.0	540.3	578.0	543.0	575.0	558.4	556.0	554.4	11	2
CYC C SEC AIR T	20-004	511.9	495.4	515.0	492.2	524.8	507.2	498.5	500.1	11	3
PULV COAL FLOW KLB	06-314	28.25	28.41	28.34	29.33	28.19	28.24	28.26	28.29	10	4
PULV PA FLOW	06-275	59.62	60.43	61.42	60.00	59.60	58.87	59.61	59.81	10	19
PULV INLET T	09-034	506.7	486.8	503.7	479.3	507.9	492.1	485.7	489.8	11	7
PULV OUTLET T	09-040	138.2	132.9	152.1	133.5	140.7	135.6	138.6	138.6	11	8

DATA PAGE NO. 11 PULVERIZER INLET TEMP AND PA DIFF

PULV DIFF P IN WG	06-274	14.33	13.31	11.92	13.89	12.91	13.55	13.52	13.59	11	9
PULV AMPS	06-276	277.7	268.9	254.3	283.5	256.3	272.6	275.0	273.7	11	10
PULV PA FAN AMPS	06-277	86.51	85.12	88.03	86.76	83.37	81.41	83.30	83.58	11	11

TEST NO.	22T	24T	6T	15T	10T	8T	19T	23T
TEST SEQ. NO.	1	2	3	4	5	6	7	8
DATE	02/19/91	02/20/91	02/14/91	02/17/91	02/15/91	02/15/91	02/18/91	02/19/91
TIME START	1132	0951	1604	1044	1614	1143	1045	1658
TIME END	1513	1012	1903	1103	1809	1204	1644	1854
LOAD MW	110	110	111	110	110	110	110	110

DATA PAGE NO. 11 PULVERIZER INLET TEMP AND PA DIFF

ROT CLASS AMPS	06-278	40.21	41.07	39.42	41.09	39.78	39.64	39.86	39.43	11 12
ROT CLASS RPM	06-270	139.5	140.6	139.9	140.5	139.9	139.8	139.3	139.6	11 13
ROT CLASS DP IN WG	06-345	.3747	.3993	.3580	.4116	.3732	.3811	.3750	.3734	11 14
COAL SILO LEVEL	06-310	62.03	79.32	63.62	92.91	64.03	81.21	71.64	74.21	11 15
FLAME INTENSITY #1 %	06-279	106.1	106.0	106.1	106.1	106.1	106.1	106.1	106.1	11 16
FLAME INTENSITY #2 %	06-295	105.6	105.3	106.0	105.9	105.6	106.0	105.9	105.7	11 17
FLAME INTENSITY #3 %	06-296	106.1	106.1	0.0	106.1	98.9	0.0	106.1	106.2	11 18
FLAME INTENSITY #4 %	06-297	105.8	105.8	105.7	106.2	104.9	106.1	106.1	106.1	11 19

DATA PAGE NO. 12 OPERATOR POSITIONS %

RH SP VLV POS	15-077	-5.0000	-5.0000	-5.0000	-5.0000	-.2406	-5.0000	-5.0000	-5.0000	12 1
SH SP VLV POS R	13-190	0.00	0.00	31.15	26.17	30.10	26.44	23.94	0.00	12 3
SH SP VLV POS L	13-191	0.00	0.00	31.61	0.00	12.86	0.00	30.47	27.68	12 4
GR DMPR DEMAND	16-044	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	12 9
RECIRC AIR DMPR POS	12-176	27.63	.07	32.32	44.82	23.37	83.92	53.28	43.91	12 13
SH PASS DMPR POS	14-180	21.8	53.2	100.0	60.1	67.4	71.1	91.5	100.0	12 15
RH PASS DMPR POS	14-180	100.0	100.0	15.2	100.0	100.0	100.0	54.7	42.2	12 16
OVRFIRE AIR DMPR POS	06-115	45.06	44.15	65.50	50.64	60.45	61.00	55.56	55.02	12 17
BRN SEC AIR DMPR POS	06-286	22.06	22.04	32.41	27.45	14.45	15.55	18.04	12.05	12 18
HOT PRI AIR DMPR POS	06-556	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	12 19
BRN GAS REC DMPR POS	06-324	-5.00	0.00	-5.00	-5.00	47.91	50.34	35.01	34.01	12 20

DATA PAGE NO. 15 MISCELLANEOUS

GAS LVG SH PASS 1A	08-003	-379.1	-419.3	-433.1	-395.6	-401.4	-418.4	-414.0	-404.1	15 1
GAS LVG SH PASS 1B	08-004	591.5	623.7	689.1	623.8	646.4	637.6	650.1	639.2	15 2
GAS LVG SH PASS 1C	08-005	609.1	628.0	702.9	642.5	674.2	658.8	668.7	684.3	15 3
GAS LVG SH PASS 1D	08-006	618.4	652.8	739.8	673.1	711.8	700.4	698.7	698.5	15 4
GAS LVG SH PASS 2A	08-017	557.5	579.9	619.0	582.0	600.6	600.0	598.8	589.6	15 5
GAS LVG SH PASS 2B	08-018	571.6	589.1	638.0	599.3	614.2	620.4	617.5	604.2	15 6
GAS LVG SH PASS 2C	08-019	575.4	588.1	655.0	601.3	626.5	627.5	622.8	610.0	15 7
GAS LVG SH PASS 2D	08-020	610.3	628.5	693.5	649.9	677.5	671.3	665.0	655.5	15 8
GAS LVG SH PASS 3A	08-021	581.9	604.8	644.4	620.6	632.2	643.0	632.0	621.8	15 9
GAS LVG SH PASS 3B	08-022	585.1	608.8	672.6	623.6	660.9	651.6	642.7	629.7	15 10
GAS LVG SH PASS 3C	08-023	578.9	598.8	661.5	610.8	637.3	635.2	622.6	610.0	15 11
GAS LVG SH PASS 3D	08-024	-481.7	-524.7	-598.8	-526.3	-554.7	-549.4	-540.5	-523.2	15 12
GAS LVG RH PASS 4A	08-033	622.3	597.9	638.1	608.8	652.5	640.0	613.7	612.4	15 13
GAS LVG RH PASS 4B	08-034	647.3	616.6	648.3	631.6	664.2	640.9	631.1	630.8	15 14
GAS LVG RH PASS 4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15
GAS LVG RH PASS 4D	08-036	673.8	646.0	687.7	663.0	700.4	678.7	664.1	663.2	15 16
GAS LVG RH PASS 5A	08-049	611.3	585.2	623.1	605.7	641.9	623.5	602.2	597.5	15 17
GAS LVG RH PASS 5B	08-050	629.1	602.9	628.8	619.4	644.1	624.1	615.9	611.9	15 18

TEST NO.		22T	24T	6T	15T	10T	8T	19T	23T
TEST SEQ. NO.		1	2	3	4	5	6	7	8
DATE		02/19/91	02/20/91	02/14/91	02/17/91	02/15/91	02/15/91	02/18/91	02/19/91
TIME START		1132	0951	1604	1044	1614	1143	1045	1658
TIME END		1513	1012	1903	1103	1809	1204	1644	1854
LOAD MW		110	110	111	110	110	110	110	110

DATA PAGE NO. 15 MISCELLANEOUS

GAS LVG RH PASS	5C	08-051	641.2	614.0	644.7	629.6	652.2	637.6	631.4	626.6	15 19
GAS LVG RH PASS	5D	08-052	627.9	604.2	645.4	620.6	649.4	639.1	623.5	621.5	15 20
GAS LVG RH PASS	6A	08-053	621.1	598.4	631.6	614.9	643.1	628.1	615.3	608.5	15 21
GAS LVG RH PASS	6B	08-054	640.3	616.8	654.3	635.8	661.1	645.1	632.4	623.7	15 22
GAS LVG RH PASS	6C	08-055	631.4	613.0	636.2	628.9	645.7	636.3	627.0	620.0	15 23
GAS LVG RH PASS	6D	08-056	632.1	616.2	647.6	630.9	655.9	645.3	631.6	628.3	15 24
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W			12.00	13.00	14.00	20.00	16.00	15.00	17.00	18.00	15 28

RB-369 16 Jun 1992 14:17:51

TEST NO.	16T	9T	17T	3BM	50T	25T	31T	32T	17A
TEST SEQ. NO.	9	10	11	12	13	14	15	16	17
DATE	02/17/91	02/15/91	02/17/91	05/07/92	03/05/91	02/20/91	02/24/91	02/24/91	04/27/92
TIME START	1142	1513	1658	1444	1030	1248	1057	1504	1130
TIME END	1245	1542	1812	1517	1112	1447	1226	1702	1400
LOAD MW	110	109	110	110	110	111	111	111	110
FUEL	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR

16T AVG SCANS 16-->21 : 110 MW : 14.5 TPH REBRN : W/ GR TO BRNRS
9T AVG SCANS 35-->36 : 110 MW : 14 TPH REBURN : W/ GR TO BNRS
17T AVG SCANS 46-->52 : 110 MW : 14.5 TPH REBRN : W/ GR TO BRNRS
3BM AVG SCANS 34-->35 : 110 MW : 14 TPH
50T AVG SCANS 14-->17 : 110 MW : 14 TPH REBRN : HIGH CLASS RPM
25T AVG SCANS 24-->35 : 110 MW : 16 TPH REBRN : NO GR TO BRNRS
31T AVG SCANS 20-->28 : 110 MW : 16 TPH REBRN : NO GR TO BRNRS
32T AVG SCANS 44-->53 : 110 MW : 16 TPH REBRN : W/ GR TO BRNRS
17A AVG SCANS 14-->20 : 110 MW : 15 TPH REBRN

DATA PAGE NO. 2 FLOWS MLB/HR (MT/HR)

LOAD MW		20-005	109.8	109.4	109.6	110.5	109.9	110.5	111.2	110.8	110.1	2 1
MAIN STEAM FLOW		03-033	800.4	803.5	797.4	776.1	800.9	821.1	823.9	810.4	773.8	2 2
1ST STG STM FLW		CALC	770.9	773.8	768.1	772.1	771.2	788.7	791.0	779.2	770.2	2 23
FW FLOW		12-170	778.0	784.3	777.8	790.1	774.0	793.7	800.6	783.0	783.4	2 3
BLOW DOWN FLOW		EST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 4
RH SPRAY FLOW		14-192	0.0000	0.0000	0.0000	8.6863	0.0000	0.0000	0.0000	0.0000	0.0000	2 5
SH SPRAY FLOW	L	17-052	0.00	0.00	1.76	10.64	7.46	1.66	1.36	1.93	6.10	2 7
SH SPRAY FLOW	R	17-056	6.61	3.66	0.00	13.07	12.12	5.62	0.00	2.23	8.76	2 8
GR FAN AMPS	A	16-181	24.68	22.18	24.73	.08	23.91	.08	.08	24.60	24.29	2 12
GR FAN AMPS	B	16-183	-.02	-.02	-.02	27.81	-.02	-.02	-.02	-.02	-.02	2 13
GR FAN BUS VOLT		EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2 14
TOTAL GR FLOW		CALC	67.09	46.27	67.52	0.00	61.91	0.00	0.00	65.76	68.62	2 24
GR TO SEC AIR		06-932	0.00	0.00	0.00	11.79	9.71	0.00	0.00	0.00	13.30	2 25
GR TO SEC AIR		CALC	10.24	2.92	11.80	0.00	8.83	0.00	0.00	11.60	12.81	2 26
GR TO FURN		CALC	56.85	43.35	55.73	0.00	53.08	0.00	0.00	54.16	55.81	2 27
OFA AIR FLOW		06-931	228.1	226.7	222.9	234.1	237.2	189.7	208.2	245.7	257.2	2 28
TMP AIR FLOW		CALC	22.84	19.25	31.53	0.00	50.43	9.41	18.64	3.08	51.78	14 10
SEC AIR FLOW		06-320	33.87	44.06	31.70	31.35	30.58	39.68	39.85	28.29	26.75	2 29
1st Stg PRESS		18-128	1072.7	1076.9	1068.7	1074.4	1073.1	1098.1	1101.4	1084.6	1071.7	2 19
OIL FLOW 2A		05-100	.0017	.0022	.0017	.0027	.0017	.0023	.0017	.0032	.0021	2 20
OIL FLOW 2B		07-100	.0032	.0017	.0033	.0017	.0017	.0033	.0017	.0017	.0017	2 21
OIL FLOW 2C		09-100	.0016	.0016	.0016	.0016	.0016	.0017	.0016	.0016	.0016	2 22
% PWDR RVR BASN COAL		USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 30
CYCLONE STOIC		CALC	1.1122	1.1004	1.1027	0.0000	1.0785	1.1243	1.1005	1.1228	1.0571	4 20
REBRN WB STOIC		CALC	.3944	.4463	.3869	0.0000	.3832	.5248	.5192	.3459	.3555	4 21
REBRN STOIC		CALC	.8609	.8455	.8683	0.0000	.8504	.9057	.8726	.8255	.8051	4 22
LVG FURN STOIC		CALC	1.1513	1.1349	1.1530	0.0000	1.1528	1.1462	1.1338	1.1367	1.1331	4 23

TEST NO.		16T	9T	17T	3BM	50T	25T	31T	32T	17A	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		02/17/91	02/15/91	02/17/91	05/07/92	03/05/91	02/20/91	02/24/91	02/24/91	04/27/92	
TIME START		1142	1513	1658	1444	1030	1248	1057	1504	1130	
TIME END		1245	1542	1812	1517	1112	1447	1226	1702	1400	
LOAD MW		110	109	110	110	110	111	111	111	110	
DATA PAGE NO. 2		**FLOWS MLB/HR (MT/HR)**									
LVG ECON STOIC		CALC	1.1609	1.1446	1.1627	0.0000	1.1622	1.1560	1.1436	1.1464	1.1428	4 24
DATA PAGE NO. 3		**FLUID TEMPERATURES F (C) - PLANT**									
SSH OUT T	L	15-152	999.1	986.4	999.1	998.5	998.9	990.8	968.0	998.1	999.4	3 1
SSH OUT T	R	15-150	994.9	970.1	990.7	998.1	1000.9	991.4	979.2	997.9	996.7	3 2
SSH OUT AVE T		13-160	999.6	979.6	998.4	1000.4	1001.6	996.0	979.4	1002.1	999.4	14 1
LVG SH ATTMP T	L	13-164	753.5	738.4	734.6	726.1	740.1	717.8	715.1	729.8	735.4	3 8
LVG SH ATTMP T	R	13-162	749.7	740.6	762.8	739.8	744.9	739.3	745.8	755.0	740.8	3 9
PRI SH OUT T	L	HW	751.5	737.4	740.8	761.2	763.6	721.5	714.6	732.0	756.6	3 10
PRI SH OUT T	R	HW	775.8	737.5	746.5	789.3	788.7	744.5	743.5	761.5	778.6	3 11
ECON H2O OUT T	L	HW	510.7	509.7	510.9	510.4	505.9	506.2	507.8	508.8	512.8	3 27
ECON H2O OUT T	R	HW	513.3	509.7	511.5	514.2	510.0	504.0	498.1	507.2	516.1	3 28
ECON H2O IN T		20-007	458.2	457.4	458.1	460.4	457.3	458.6	458.8	459.1	459.1	3 5
RH SPRAY H2O T		HW	316.6	316.3	317.2	316.9	314.6	317.0	315.6	315.3	316.1	3 7
LVG RH T		14-150	996.1	987.5	997.5	996.3	1003.9	979.2	982.2	1002.8	1000.4	3 12
ENT RH T		CALC	726.0	719.4	721.6	696.2	736.6	735.7	718.6	735.4	713.8	3 16
COLD RH T		20-006	742.5	724.6	741.4	746.3	744.1	740.5	726.0	745.8	744.2	3 18
DATA PAGE NO. 4		**FLUID TEMPERATURES F (C) - B&W**									
AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 18
GAS LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 19

TEST NO.		16T	9T	17T	38M	50T	25T	31T	32T	17A	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		02/17/91	02/15/91	02/17/91	05/07/92	03/05/91	02/20/91	02/24/91	02/24/91	04/27/92	
TIME START		1142	1513	1658	1444	1030	1248	1057	1504	1130	
TIME END		1245	1542	1812	1517	1112	1447	1226	1702	1400	
LOAD MW		110	109	110	110	110	111	111	111	110	
DATA PAGE NO. 5	FLUID PRESSURES PSIG (KG/CM2)										
TURB THROT P	03-170	1452.8	1447.1	1453.4	1449.3	1449.7	1453.1	1464.6	1451.5	1450.0	5 1
SEC SH OUT P	CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 2
DRUM PRESS	04-013	1607.8	1605.8	1607.0	1599.8	1603.1	1616.5	1627.9	1611.1	1605.0	5 3
LVG RH PRESS	15-102	425.3	425.5	425.2	430.9	424.2	430.7	434.1	428.3	426.8	5 4
ENT RH PRESS	15-100	454.1	456.1	454.7	460.1	453.7	460.0	463.9	458.4	454.1	5 5
FW HTR E EXT P	20-035	434.0	434.8	434.3	440.3	433.7	438.9	442.4	437.3	435.4	5 6
FW HTR E EXT P	TRANS	435.9	436.5	436.1	442.4	435.7	441.0	444.6	439.2	437.9	5 7
SEC SH OUT P (T)	TRANS	1500.4	1494.6	1501.4	1493.9	1496.6	1502.8	1513.8	1499.7	1495.6	5 17
DRUM PRESS (T)	TRANS	1600.2	1596.2	1600.3	1593.3	1596.4	1607.0	1618.4	1602.2	1596.0	5 18
LVG RH-1 P (T)	TRANS	429.4	430.2	429.5	435.3	428.9	434.8	438.4	432.6	431.3	5 19
ENT RH-1 P (T)	TRANS	449.8	450.5	449.9	0.0	449.1	455.5	459.5	453.4	0.0	5 20
DATA PAGE NO. 6	AIR & GAS DATA - PLANT										
AMBIENT AIR DB TEMP	TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 1
AIR ENT FD FAN T	HW	0.0	0.0	0.0	101.2	0.0	0.0	0.0	0.0	98.8	6 4
AIR LVG FD FAN T A	09-028	121.4	134.9	121.1	132.4	136.3	127.2	124.3	129.7	128.4	7 2
AIR LVG FD FAN T B	09-029	125.9	133.0	127.8	134.9	141.0	130.0	124.4	129.2	131.3	7 3
AIR ENT AH T RA	20-017	165.3	149.5	157.1	138.0	146.7	180.3	161.2	162.5	133.5	6 2
AIR ENT AH T RB	20-018	150.0	152.3	151.5	137.9	151.5	154.7	148.0	152.6	134.1	6 3
AIR ENT AH T LA	20-025	183.5	188.5	182.6	135.5	143.2	189.6	182.2	188.8	131.7	13 25
AIR ENT AH T LB	20-029	164.5	157.5	157.4	136.3	140.3	169.2	155.6	167.0	132.4	13 26
AIR LVG AH T R	HW	567.0	580.4	573.5	599.9	609.1	555.8	551.7	560.6	618.9	6 6
AIR LVG AH T L	HW	548.3	580.4	571.8	561.2	552.5	544.9	553.5	553.0	585.9	6 7
BRN SEC AIR T	08-002	519.0	536.5	525.9	546.5	546.7	513.9	518.4	515.9	563.9	14 2
BRN SA/GR T	08-001	526.9	523.9	544.9	552.6	526.7	488.4	493.0	522.5	549.1	14 3
OFA TEMP	09-002	521.0	537.1	527.7	529.0	546.0	515.5	520.3	521.8	546.9	14 4
GAS LVG AH T RA	20-019	306.4	321.7	313.4	319.1	327.8	310.2	309.6	308.5	322.8	6 10
GAS LVG AH T RB	20-020	287.9	301.5	295.2	302.0	311.2	294.1	293.2	290.8	305.5	6 11
GAS LVG AH T LA	20-027	277.0	289.7	279.3	288.8	279.4	287.3	288.6	284.6	292.2	13 27
GAS LVG AH T LB	20-024	290.4	303.1	293.1	293.8	283.0	300.1	298.5	295.6	296.6	13 28
GAS LVG RH PS T	AVE	631.0	650.0	635.8	0.0	628.1	619.8	632.7	632.4	667.0	13 17
GAS LVG SH PS T	AVE	637.9	647.9	633.0	0.0	669.7	613.4	611.2	627.0	679.3	13 19
GR GAS TEMP A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 8
GR GAS TEMP B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 9
O2 LVG ECON R	11-172	3.1386	3.8764	3.1360	2.7931	2.6919	2.5216	2.6393	3.1770	3.2504	6 20
O2 LVG ECON L	11-170	2.7128	3.2703	2.4638	3.1003	2.7254	2.1109	2.3182	1.9623	2.4321	6 21
O2 IN SEC AIR	06-254	16.45	19.42	15.76	16.04	16.59	20.68	20.67	15.35	14.97	13 29
ACCUREX NOX PPM	06-553	0.0	0.0	0.0	277.8	0.0	0.0	0.0	0.0	229.2	13 9
ACCUREX SOX PPM	06-555	0.0	0.0	0.0	1245.1	0.0	0.0	0.0	0.0	1257.1	13 10
ACCUREX CO PPM	06-425	0.00	0.00	0.00	90.94	0.00	0.00	0.00	0.00	34.15	13 11
ACCUREX O2 %	06-554	0.0000	0.0000	0.0000	2.9953	0.0000	0.0000	0.0000	0.0000	3.1360	13 12
BRN SEC AIR P IN WG	06-250	23.21	23.90	23.28	22.88	22.52	21.20	22.09	21.93	21.39	14 5
BRN GAS REC P IN WG	06-252	23.04	23.54	23.16	22.88	22.28	20.89	21.75	21.87	21.47	14 6

TEST NO.		16T	9T	17T	3BM	50T	25T	31T	32T	17A	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		02/17/91	02/15/91	02/17/91	05/07/92	03/05/91	02/20/91	02/24/91	02/24/91	04/27/92	
TIME START		1142	1513	1658	1444	1030	1248	1057	1504	1130	
TIME END		1245	1542	1812	1517	1112	1447	1226	1702	1400	
LOAD MW		110	109	110	110	110	111	111	111	110	
DATA PAGE NO. 6	**AIR & GAS DATA - PLANT**										
FURNACE GAS P	IN WG	08-100	19.80	20.37	19.66	19.07	20.02	19.82	20.58	19.38	19.05	14 7
BAROMETRIC P	IN HG	PB	0.00	0.00	0.00	29.50	0.00	0.00	0.00	0.00	29.55	6 29
REL HUMIDITY	%	TST	0.0000	0.0000	0.0000	7.6412	0.0000	0.0000	0.0000	0.0000	7.6735	6 30
DATA PAGE NO. 7	**AIR & GAS DATA - B&W**										
AMBIENT AIR TEMP		TC	0.00	0.00	0.00	72.54	52.66	0.00	36.12	37.84	51.21	7 1
AIR LVG FD FAN T	A	TC	124.3	137.8	123.7	136.0	139.9	130.1	127.8	132.9	132.0	7 6
AIR LVG FD FAN T	B	TC	127.9	135.5	129.6	138.0	143.9	132.4	127.1	131.8	134.5	7 7
AIR ENT AH	(T)	GRID	165.3	158.9	159.9	137.8	146.7	175.4	162.9	168.4	134.3	7 4
GAS LVG AH	(T)	GRID	285.0	298.5	288.9	292.1	294.5	293.8	292.9	291.3	294.7	7 10
GAS LVG ECON	(T) L	GRID	651.1	671.4	657.1	660.0	657.6	637.6	651.0	653.2	709.2	7 14
GAS LVG ECON	(T) R	GRID	629.2	652.5	625.0	649.1	669.9	588.3	592.7	621.9	686.9	7 15
GAS TEMP LVG GR FAN		GRID	0.0	0.0	0.0	577.2	544.8	0.0	159.7	557.9	571.5	13 7
O2 LVG ECON	(T) L	GRID	2.9058	2.4632	2.9623	2.8381	3.1178	2.7404	2.7997	2.6522	2.7240	7 20
O2 LVG ECON	(T) R	GRID	3.0547	3.0371	3.0516	2.7098	2.9107	3.0586	2.6108	2.8555	2.6437	7 21
CO LVG ECON	(T) L	GRID	114.7	162.3	88.7	94.7	103.3	92.4	73.9	71.3	89.4	13 5
CO LVG ECON	(T) R	GRID	118.3	99.1	95.0	82.6	230.7	92.3	74.5	84.1	121.6	13 6
CO2 LVG ECON	(T) L	GRID	16.15	17.09	16.52	15.90	15.03	16.02	15.46	15.41	15.89	7 22
CO2 LVG ECON	(T) R	GRID	15.67	16.04	15.39	15.52	15.24	15.54	15.54	15.24	15.58	7 23
NOX LVG ECON	(T) L	GRID	249.7	269.4	257.1	310.8	233.8	279.1	244.7	228.8	237.0	7 24
NOX LVG ECON	(T) R	GRID	277.4	305.5	272.0	0.0	253.4	274.0	157.6	243.0	0.0	7 25
O2 LVG AH	(T)	GRID	4.1500	3.9000	4.2500	4.0000	4.2000	4.1000	3.8800	3.9000	5.1100	13 1
CO2 LVG AH	(T)	GRID	1456.3	2756.5	1401.3	1812.0	40.4	35.1	30.8	32.5	21.1	13 3
O2 LVG GR FAN	(T)	GRID	3.37	5.43	3.27	3.96	20.58	17.97	18.42	18.45	0.00	13 4
DRY BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27
DATA PAGE NO. 8	**FW HTR TEMPERATURES F (C) - PLANT**										
FW HTR E EXT T		HW	741.2	723.1	741.0	744.1	742.3	739.6	722.9	743.0	742.1	8 1
FW HTR E LVG T		HW	461.6	400.6	417.1	458.3	455.8	457.9	456.1	458.5	457.3	8 5
FW HTR E ENT T		HW	383.3	382.1	383.9	383.8	387.2	382.4	381.1	384.6	382.3	8 7
FW HTR E DRN T		HW	401.7	400.6	402.1	404.8	399.9	401.6	400.6	400.8	402.1	8 13
DATA PAGE NO. 9	**FW HTR TEMPERATURES F (C) - B&W**										
SSH PEND IN LEG	1	10-017	847.4	834.9	848.2	838.8	844.5	844.9	832.2	848.6	850.1	9 17
SSH PEND IN LEG	2	10-018	873.1	859.2	875.0	860.0	871.3	873.9	860.4	876.7	871.7	9 18
SSH PEND IN LEG	3	10-019	877.4	866.4	883.3	867.7	878.9	879.5	874.8	885.5	876.9	9 19
SSH PEND IN LEG	4	10-020	887.3	875.6	898.2	882.7	893.3	896.2	896.5	902.6	886.2	9 20
SSH PEND IN LEG	5	10-021	882.6	867.2	894.4	867.9	888.9	896.9	897.4	898.8	870.6	9 21

TEST NO.	16T	9T	17T	3BM	50T	25T	31T	32T	17A
TEST SEQ. NO.	9	10	11	12	13	14	15	16	17
DATE	02/17/91	02/15/91	02/17/91	05/07/92	03/05/91	02/20/91	02/24/91	02/24/91	04/27/92
TIME START	1142	1513	1658	1444	1030	1248	1057	1504	1130
TIME END	1245	1542	1812	1517	1112	1447	1226	1702	1400
LOAD MW	110	109	110	110	110	111	111	111	110

DATA PAGE NO. 9 FW HTR TEMPERATURES F (C) - B&W

SSH PEND IN LEG 6	10-033	894.2	875.9	895.2	880.8	896.8	902.2	897.6	901.2	883.4	9 22
SSH PEND IN LEG 7	10-034	898.5	876.7	881.2	876.3	895.4	891.2	879.6	886.4	876.6	9 23
SSH PEND IN LEG 8	10-035	891.0	872.9	876.8	869.7	887.4	879.3	866.2	878.8	866.1	9 24
SSH PEND IN LEG 9	10-036	889.2	877.3	881.2	869.5	884.6	873.7	856.6	877.8	875.5	9 25
SSH PEND IN LEG 10	10-037	859.3	856.1	858.1	842.7	852.1	838.5	819.9	846.1	874.5	9 26
RH PEND IN LEG 1	09-049	943.8	932.9	942.4	936.6	950.4	927.2	933.4	947.5	938.7	8 17
RH PEND IN LEG 2	09-050	939.2	927.0	935.4	930.5	946.3	925.9	932.2	941.8	931.1	8 18
RH PEND IN LEG 3	09-051	938.8	927.7	936.4	930.8	945.1	923.7	929.5	942.5	932.5	8 19
RH PEND IN LEG 4	09-052	938.3	926.7	935.2	929.6	945.1	924.4	930.5	941.6	930.9	8 20
RH PEND IN LEG 5	09-053	908.5	938.2	923.1	0.0	919.3	888.9	893.2	927.7	0.0	8 21
RH PEND IN LEG 6	10-001	957.7	949.4	958.2	953.1	964.7	940.6	946.4	962.1	948.5	8 22
RH PEND IN LEG 7	10-002	932.3	919.1	934.7	928.5	933.8	914.1	919.1	937.5	922.3	8 23
RH PEND IN LEG 8	10-003	932.[illegible]	92[illegible].4	938.4	931.3	934.1	912.1	917.0	940.4	937.6	8 24
RH PEND IN LEG 9	10-004	943.2	934.0	942.1	936.1	949.7	927.7	933.3	947.5	937.8	8 25
RH PEND IN LEG 10	10-005	886.9	922.6	899.5	887.1	898.2	869.6	874.6	903.9	945.0	8 26
RH INTM HND HOLE R	10-038	943.9	929.1	940.0	934.7	948.7	924.8	930.9	945.4	938.3	8 27
RH INTM HND HOLE L	10-039	844.5	858.4	848.7	837.2	852.8	830.8	833.6	852.2	881.4	8 28
PSH OUT LEG T	09-017	771.8	751.5	762.2	782.8	785.3	738.7	737.6	754.6	772.0	14 11
PSH OUT LEG T	09-018	781.5	762.7	776.7	795.7	796.8	747.5	747.9	768.1	781.7	14 12
PSH OUT LEG T	09-019	734.7	723.3	723.8	742.6	749.1	706.0	698.6	718.3	742.3	14 13
PSH OUT LEG T	09-020	747.7	734.4	736.8	758.7	762.7	717.6	709.4	730.9	756.0	14 14
PSH OUT LEG T	09-021	755.7	740.8	745.3	766.6	766.4	727.4	723.6	740.5	759.8	14 15
PSH OUT LEG T	09-022	765.1	746.9	756.5	775.5	777.3	735.1	734.7	750.3	765.1	14 16
PSH OUT LEG T	09-023	761.7	743.2	753.0	774.2	780.8	728.0	726.2	745.4	761.4	14 17
PSH OUT LEG T	09-024	786.1	770.1	784.3	800.5	799.9	754.2	755.9	776.0	787.4	14 18
PSH OUT LEG T	09-025	766.5	751.5	761.8	782.2	782.2	735.3	734.9	753.2	770.3	14 19
PSH OUT LEG T	09-026	774.3	765.1	774.9	789.8	785.8	747.6	752.3	767.4	781.5	14 20
PSH OUT LEG T	09-027	788.4	778.1	788.4	801.7	800.7	761.2	765.6	780.2	793.9	14 21

DATA PAGE NO. 10 PULVERIZER COAL AND PA FLOW

CYC A COAL FLOW KLB	05-104	22.59	22.66	22.41	20.81	21.37	21.68	21.75	21.31	20.32	10 1
CYC B COAL FLOW KLB	07-110	22.56	23.23	22.38	20.79	21.38	21.68	21.74	21.33	20.33	10 2
CYC C COAL FLOW KLB	09-110	22.60	23.04	22.42	20.80	21.39	21.68	21.65	21.34	20.29	10 3
CYC A SEC AIR FLOW %	06-170	200.0	199.8	200.0	202.9	201.1	195.4	192.9	195.3	191.2	10 16
CYC B SEC AIR FLOW %	08-170	210.2	209.0	209.1	200.1	205.4	204.5	202.2	210.1	185.4	10 17
CYC C SEC AIR FLOW %	10-170	202.2	204.7	195.7	202.3	195.9	188.8	192.9	191.3	191.9	10 18
CYC A SEC AIR T	20-002	512.6	528.0	513.8	546.3	551.6	484.2	485.4	506.5	560.2	11 1
CYC B SEC AIR T	20-003	553.2	569.7	562.4	574.7	576.0	547.5	554.1	553.8	595.2	11 2
CYC C SEC AIR T	20-004	498.3	517.1	504.9	520.2	509.5	499.9	510.3	505.7	541.7	11 3
PULV COAL FLOW KLB	06-314	29.26	28.16	29.24	27.98	28.21	32.08	32.07	32.07	31.17	10 4
PULV PA FLOW	06-275	60.18	59.14	60.28	57.58	57.53	64.06	62.37	62.02	62.43	10 19
PULV INLET T	09-034	486.5	498.6	493.6	473.7	504.5	496.5	507.6	497.4	550.6	11 7
PULV OUTLET T	09-040	134.9	133.4	144.9	146.1	144.3	138.5	139.2	140.0	159.6	11 8

TEST NO.		16T	9T	17T	3BM	50T	25T	31T	32T	17A	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		02/17/91	02/15/91	02/17/91	05/07/92	03/05/91	02/20/91	02/24/91	02/24/91	04/27/92	
TIME START		1142	1513	1658	1444	1030	1248	1057	1504	1130	
TIME END		1245	1542	1812	1517	1112	1447	1226	1702	1400	
LOAD MW		110	109	110	110	110	111	111	111	110	
DATA PAGE NO. 11	**PULVERIZER INLET TEMP AND PA DIFF**										
PULV DIFF P IN WG	06-274	13.79	13.24	13.67	13.40	14.73	16.36	15.87	17.13	16.50	11 9
PULV AMPS	06-276	285.8	279.5	276.1	277.0	290.6	303.8	302.8	325.2	275.1	11 10
PULV PA FAN AMPS	06-277	87.7	83.0	88.3	80.0	95.1	94.5	100.2	100.5	96.0	11 11
ROT CLASS AMPS	06-278	40.58	40.03	40.18	45.38	44.24	41.04	42.18	41.14	49.88	11 12
ROT CLASS RPM	06-270	140.4	139.9	140.4	150.7	150.7	140.1	139.6	139.6	158.4	11 13
ROT CLASS DP IN WG	06-345	.4014	.4065	.3821	.4706	.4940	.4008	.4173	.4154	.5746	11 14
COAL SILO LEVEL	06-310	79.54	95.19	66.89	45.09	46.05	42.60	83.95	54.00	78.17	11 15
FLAME INTENSITY #1 %	06-279	106.1	106.2	106.1	106.2	106.1	106.1	106.1	106.1	106.2	11 16
FLAME INTENSITY #2 %	06-295	105.9	105.5	106.0	105.7	105.9	105.7	105.6	105.8	105.6	11 17
FLAME INTENSITY #3 %	06-296	106.0	0.0	104.3	106.2	106.2	106.1	106.1	104.7	106.1	11 18
FLAME INTENSITY #4 %	06-297	106.1	104.1	106.1	106.1	106.2	105.7	105.9	106.0	105.9	11 19
DATA PAGE NO. 12	**OPERATOR POSITIONS %**										
RH SP VLV POS	15-077	2.58	-5.00	8.10	20.31	-5.00	-5.00	-5.00	-2.30	10.30	12 1
SH SP VLV POS R	13-190	32.60	30.74	27.26	44.32	41.01	22.60	0.00	26.76	37.81	12 3
SH SP VLV POS L	13-191	18.66	0.00	30.23	40.69	36.42	26.35	0.00	29.94	35.15	12 4
GR DMPR DEMAND	16-044	-5.0000	-5.0000	-5.0000	-.0002	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	12 9
RECIRC AIR DMPR POS	12-176	46.45	22.75	31.38	0.00	.08	.04	25.60	35.56	0.00	12 13
SH PASS DMPR POS	14-180	94.0	54.1	63.6	100.0	100.0	51.2	36.8	62.1	77.4	12 15
RH PASS DMPR POS	14-180	84.1	100.0	100.0	44.5	26.0	100.0	100.0	100.0	100.0	12 16
OVRFIRE AIR DMPR POS	06-115	56.07	58.05	55.97	50.39	60.28	47.71	51.67	62.08	58.50	12 17
BRN SEC AIR DMPR POS	06-286	20.03	29.10	18.03	4.81	17.07	24.03	24.42	13.25	14.61	12 18
HOT PRI AIR DMPR POS	06-556	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	12 19
BRN GAS REC DMPR POS	06-324	35.01	11.15	38.00	34.44	30.22	0.00	0.00	35.06	34.45	12 20
DATA PAGE NO. 15	**MISCELLANEOUS**										
GAS LVG SH PASS 1A	08-003	-405.1	-422.2	-384.3	-431.4	-446.3	-397.1	-406.8	-387.1	-480.6	15 1
GAS LVG SH PASS 1B	08-004	641.1	643.5	628.5	666.7	694.3	612.8	614.8	621.1	692.9	15 2
GAS LVG SH PASS 1C	08-005	664.2	666.0	671.2	685.0	716.0	639.8	630.6	654.6	701.2	15 3
GAS LVG SH PASS 1D	08-006	692.6	699.1	700.8	714.3	713.1	658.1	647.0	683.7	737.9	15 4
GAS LVG SH PASS 2A	08-017	593.8	609.2	586.1	613.4	618.4	578.7	576.8	584.1	638.0	15 5
GAS LVG SH PASS 2B	08-018	612.9	621.3	604.6	627.2	640.8	593.3	587.2	599.7	650.3	15 6
GAS LVG SH PASS 2C	08-019	617.7	628.7	614.9	635.1	646.8	595.5	593.9	607.0	657.7	15 7
GAS LVG SH PASS 2D	08-020	666.5	674.8	662.4	679.1	687.5	636.5	634.6	655.8	696.9	15 8
GAS LVG SH PASS 3A	08-021	629.1	640.1	618.9	650.8	665.3	607.1	614.5	623.1	670.9	15 9
GAS LVG SH PASS 3B	08-022	640.9	660.2	628.8	658.1	667.2	612.1	611.2	629.2	682.0	15 10
GAS LVG SH PASS 3C	08-023	619.9	636.1	614.0	650.1	647.5	600.3	601.5	611.2	668.1	15 11
GAS LVG SH PASS 3D	08-024	-530.5	-550.2	-530.0	-555.4	-547.3	-518.7	-520.8	-530.1	-610.6	15 12
GAS LVG RH PASS 4A	08-033	616.8	652.7	622.4	626.2	619.8	607.5	617.0	624.1	661.2	15 13
GAS LVG RH PASS 4B	08-034	636.8	654.3	648.6	647.1	629.9	624.1	638.9	641.8	673.7	15 14
GAS LVG RH PASS 4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15

TEST NO.		16T	9T	17T	3BM	50T	25T	31T	32T	17A
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17
DATE		02/17/91	02/15/91	02/17/91	05/07/92	03/05/91	02/20/91	02/24/91	02/24/91	04/27/92
TIME START		1142	1513	1658	1444	1030	1248	1057	1504	1130
TIME END		1245	1542	1812	1517	1112	1447	1226	1702	1400
LOAD MW		110	109	110	110	110	111	111	111	110
DATA PAGE NO. 15	MISCELLANEOUS									
GAS LVG RH PASS 4D	08-036	671.2	694.2	690.0	692.7	660.1	666.8	673.9	672.6	716.2	15 16
GAS LVG RH PASS 5A	08-049	606.6	633.3	609.5	619.1	607.1	593.1	607.4	611.2	650.9	15 17
GAS LVG RH PASS 5B	08-050	623.8	639.5	629.3	630.5	619.4	609.5	626.3	624.2	655.0	15 18
GAS LVG RH PASS 5C	08-051	637.5	646.2	643.0	642.4	630.6	624.4	640.1	635.9	664.1	15 19
GAS LVG RH PASS 5D	08-052	627.7	643.0	637.5	644.0	624.8	621.5	632.0	625.4	665.5	15 20
GAS LVG RH PASS 6A	08-053	616.9	637.0	619.5	625.4	617.9	605.0	619.0	624.0	655.8	15 21
GAS LVG RH PASS 6B	08-054	640.3	655.4	639.5	650.3	633.2	625.4	639.9	639.9	670.1	15 22
GAS LVG RH PASS 6C	08-055	628.2	642.3	623.2	639.4	629.4	616.6	628.7	626.0	656.1	15 23
GAS LVG RH PASS 6D	08-056	634.7	651.6	631.5	659.1	637.1	624.0	636.4	631.1	674.5	15 24
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W		21.00	10.00	22.00	95.00	19.00	23.00	24.00	25.00	86.00	15 28

RB-369 16 Jun 1992 14:40:23

TEST NO.	18A	45T	5A	11A	11B	11C	12A	13A
TEST SEQ. NO.	1	2	3	4	5	6	7	8
DATE	04/28/92	03/02/91	04/06/92	04/15/92	04/16/92	04/16/92	04/16/92	04/21/92
TIME START	1636	1605	1300	2130	0042	0236	2047	2202
TIME END	1820	1658	1506	2339	0215	0327	2229	2304
LOAD MW	90	86	82	82	82	82	83	82
FUEL	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR

18A AVG SCANS 24-->34 : 90 MW : 3 CYCLONES : 11TPH
45T AVG SCANS 42-->46 : 86 MW : 12 TPH REBRN : W/ GR TO BRNRS
5A AVG SCANS 61-->72 : 82 MW : NO REBURN : BASE : ACUREX TRAV
11A AVG SCANS 3 -->10 : 82 MW : 11.5 TPH : 160 RPM : LOW STOIC
11B AVG SCANS 16-->24 : 82 MW : 11.5 TPH : 160 RPM : OPTIMUM
11C AVG SCANS 27-->31 : 82 MW : 11.5 TPH : 160 RPM : HIGH OFA
12A AVG SCANS 11-->19 : 82 MW : 11.5 TPH : 160 RPM : MED STOIC
13A AVG SCANS 34-->38 : 82 MW : 11.5 TPH : 160 RPM : HIGH STOIC

DATA PAGE NO. 2 FLOWS MLB/HR (MT/HR)

LOAD MW		20-005	90.35	86.01	82.29	82.12	82.08	82.11	82.67	82.05	2 1
MAIN STEAM FLOW		03-033	626.4	594.1	553.3	560.7	560.1	558.9	565.6	558.8	2 2
1ST STG STM FLW		CALC	603.6	569.3	538.7	540.3	539.4	539.7	543.9	539.1	2 23
FW FLOW		12-170	614.4	574.6	543.2	554.3	553.7	552.8	556.9	548.9	2 3
BLOW DOWN FLOW		EST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 4
RH SPRAY FLOW		14-192	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 5
SH SPRAY FLOW	L	17-052	1.7926	2.4359	7.5115	0.0000	0.0000	0.0000	0.0000	4.8295	2 7
SH SPRAY FLOW	R	17-056	5.2034	2.2265	3.9935	0.0000	0.0000	0.0000	3.4955	4.9052	2 8
GR FAN AMPS	A	16-181	26.38	37.36	29.79	29.03	28.53	23.90	.08	.08	2 12
GR FAN AMPS	B	16-183	-.02	-.02	-.02	-.02	-.02	-.02	38.16	41.92	2 13
GR FAN BUS VOLT		EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2 14
TOTAL GR FLOW		CALC	82.5	203.7	121.6	104.6	101.2	56.1	212.6	268.8	2 24
GR TO SEC AIR		06-932	10.01	0.00	-81.95	21.27	10.31	10.08	4.15	2.64	2 25
GR TO SEC AIR		CALC	9.91	10.06	0.00	21.98	10.26	10.01	4.03	2.41	2 26
GR TO FURN		CALC	72.6	193.6	121.6	82.7	90.9	46.0	208.6	266.4	2 27
OFA AIR FLOW		06-931	196.5	170.4	32.0	174.1	175.1	219.2	160.6	151.0	2 28
TMP AIR FLOW		CALC	61.96	8.69	10.13	23.67	35.98	69.53	42.05	25.20	14 10
SEC AIR FLOW		06-320	32.13	39.39	29.22	25.08	32.88	33.36	37.29	46.58	2 29
1st STG PRESS		18-128	833.8	784.7	741.0	743.2	742.0	742.4	748.4	741.5	2 19
OIL FLOW 2A		05-100	.0017	.0020	.0017	.0017	.0017	.0017	.0018	.0017	2 20
OIL FLOW 2B		07-100	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0017	2 21
OIL FLOW 2C		09-100	.0016	.0016	.0016	.0016	.0016	.0016	.0032	.0016	2 22
% PWDR RVR BASN COAL		USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 30
CYCLONE STOIC		CALC	1.0419	1.1241	1.1940	1.0983	1.0909	1.0913	1.0735	1.1174	4 20
REBRN WB STOIC		CALC	.5	.5	100.0	.4	.5	.5	.5	.5	4 21
REBRN STOIC		CALC	.8423	.8669	1.1687	.8513	.8645	.8458	.8835	.9135	4 22
LVG FURN STOIC		CALC	1.1501	1.1506	1.2239	1.1514	1.1649	1.2233	1.1574	1.1729	4 23
LVG ECON STOIC		CALC	1.1610	1.1622	1.2361	1.1634	1.1767	1.2354	1.1693	1.1850	4 24

TEST NO.			18A	45T	5A	11A	11B	11C	12A	13A		
TEST SEQ. NO.			1	2	3	4	5	6	7	8		
DATE			04/28/92	03/02/91	04/06/92	04/15/92	04/16/92	04/16/92	04/16/92	04/21/92		
TIME START			1636	1605	1300	2130	0042	0236	2047	2202		
TIME END			1820	1658	1506	2339	0215	0327	2229	2304		
LOAD MW			90	86	82	82	82	82	83	82		
DATA PAGE NO. 3		**FLUID TEMPERATURES F (C) - PLANT**										
SSH OUT T	L	15-152	999.4	998.3	998.4	986.4	984.2	989.6	999.2	996.0	3	1
SSH OUT T	R	15-150	999.7	996.8	999.8	997.8	998.7	997.6	999.3	997.6	3	2
SSH OUT AVE T		13-160	1000.7	998.4	999.0	994.8	993.6	994.7	999.5	999.4	14	1
LVG SH ATTMP T	L	13-164	740.3	736.1	717.7	717.2	725.7	734.9	735.0	718.2	3	8
LVG SH ATTMP T	R	13-162	732.6	752.9	732.9	739.9	731.1	748.1	722.4	730.9	3	9
PRI SH OUT T	L	HW	746.4	737.7	756.2	715.4	722.9	731.5	732.8	747.3	3	10
PRI SH OUT T	R	HW	769.0	766.1	769.9	740.5	747.1	752.2	750.1	771.6	3	11
ECON H2O OUT T	L	HW	499.0	508.2	502.6	501.4	507.2	497.0	508.4	507.7	3	27
ECON H2O OUT T	R	HW	490.1	487.8	471.0	467.0	473.6	479.8	472.8	476.8	3	28
ECON H2O IN T		20-007	437.2	432.8	428.8	428.8	428.6	428.7	429.8	428.4	3	5
RH SPRAY H2O T		HW	302.1	300.9	294.4	294.9	294.5	294.3	295.6	291.9	3	7
LVG RH T		14-150	999.6	1000.5	999.6	1000.0	1000.2	1002.6	1001.4	996.2	3	12
ENT RH T		CALC	693.6	685.4	675.6	671.8	672.6	671.1	678.2	674.0	3	16
COLD RH T		20-006	700.9	693.4	683.5	679.2	678.3	679.3	685.5	682.5	3	18
DATA PAGE NO. 4		**FLUID TEMPERATURES F (C) - B&W**										
AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	18
GAS LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	19
DATA PAGE NO. 5		**FLUID PRESSURES PSIG (KG/CM2)**										
TURB THROT P		03-170	1450.1	1449.9	1450.2	1450.4	1450.0	1450.3	1449.9	1449.1	5	1
SEC SH OUT P		CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5	2
DRUM PRESS		04-013	1547.5	1534.4	1527.2	1529.0	1527.9	1528.4	1529.0	1527.6	5	3
LVG RH PRESS		15-102	336.6	317.0	301.8	302.4	302.4	302.1	304.3	301.4	5	4

TEST NO.			18A	45T	5A	11A	11B	11C	12A	13A	
TEST SEQ. NO.			1	2	3	4	5	6	7	8	
DATE			04/28/92	03/02/91	04/06/92	04/15/92	04/16/92	04/16/92	04/16/92	04/21/92	
TIME START			1636	1605	1300	2130	0042	0236	2047	2202	
TIME END			1820	1658	1506	2339	0215	0327	2229	2304	
LOAD MW			90	86	82	82	82	82	83	82	
DATA PAGE NO. 5	**FLUID PRESSURES PSIG (KG/CM2)**										
ENT RH PRESS		15-100	358.3	340.7	320.3	320.8	320.4	320.0	321.4	317.0	5 5
FW HTR E EXT P		20-035	342.8	324.6	307.1	307.8	307.7	307.3	309.6	306.9	5 6
FW HTR E EXT P		TRANS	345.3	326.3	309.9	310.5	310.4	310.2	312.5	309.9	5 7
SEC SH OUT P	(T)	TRANS	1478.4	1477.0	1472.6	1472.9	1472.4	1471.6	1471.7	1469.6	5 17
DRUM PRESS	(T)	TRANS	1540.0	1530.9	1519.3	1521.8	1520.3	1520.7	1520.9	1518.0	5 18
LVG RH-1 P	(T)	TRANS	340.0	321.9	305.3	306.4	306.3	306.1	308.1	305.7	5 19
ENT RH-1 P	(T)	TRANS	0.0	337.4	0.0	0.0	0.0	0.0	0.0	0.0	5 20
DATA PAGE NO. 6	**AIR & GAS DATA - PLANT**										
AMBIENT AIR DB TEMP		TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 1
AIR ENT FD FAN T		HW	95.8	0.0	102.0	92.8	92.6	92.5	90.2	86.9	6 4
AIR LVG FD FAN T	A	09-028	134.5	149.7	131.8	126.0	125.7	125.3	126.2	119.3	7 2
AIR LVG FD FAN T	B	09-029	136.4	150.9	133.4	129.2	128.5	128.1	127.1	124.2	7 3
AIR ENT AH T	RA	20-017	138.3	154.5	136.3	156.3	159.3	159.2	157.3	127.3	6 2
AIR ENT AH T	RB	20-018	138.7	157.4	135.8	148.6	148.9	149.3	148.0	126.6	6 3
AIR ENT AH T	LA	20-025	137.5	167.4	134.3	169.8	170.9	173.5	172.9	122.6	13 25
AIR ENT AH T	LB	20-029	138.3	155.9	135.6	143.1	143.6	143.1	146.1	123.6	13 26
AIR LVG AH T	R	HW	576.4	562.4	615.9	550.1	547.2	546.1	554.6	571.4	6 6
AIR LVG AH T	L	HW	555.2	560.0	583.7	556.2	551.8	535.3	561.0	591.2	6 7
BRN SEC AIR T		08-002	531.5	528.0	581.6	559.9	559.7	542.3	564.6	592.3	14 2
BRN SA/GR T		08-001	534.0	532.6	551.3	554.4	549.1	538.7	539.4	570.1	14 3
OFA TEMP		09-002	514.0	529.5	282.1	532.3	528.9	518.5	535.0	537.5	14 4
GAS LVG AH T	RA	20-019	304.3	318.2	321.8	294.2	291.2	291.4	293.1	301.0	6 10
GAS LVG AH T	RB	20-020	289.0	301.0	304.9	283.9	280.7	281.7	283.0	287.5	6 11
GAS LVG AH T	LA	20-027	277.1	285.8	282.6	276.0	272.2	271.0	280.9	283.1	13 27
GAS LVG AH T	LB	20-024	281.7	291.9	287.6	286.3	282.9	282.2	290.0	286.7	13 28
GAS LVG RH PS T		AVE	630.0	624.9	654.1	631.5	630.3	611.2	634.2	662.7	13 17
GAS LVG SH PS T		AVE	625.2	597.1	658.5	564.5	565.9	591.4	566.2	582.8	13 19
GR GAS TEMP	A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 8
GR GAS TEMP	B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 9
O2 LVG ECON	R	11-172	2.8347	3.1249	3.6665	2.5333	2.8264	3.4777	2.5913	2.9789	6 20
O2 LVG ECON	L	11-170	2.5722	2.0078	3.2910	2.3834	2.8700	3.7017	2.3658	2.3561	6 21
O2 IN SEC AIR		06-254	16.65	16.96	0.00	12.49	16.67	16.97	19.14	20.02	13 29
ACCUREX NOX	PPM	06-553	237.9	0.0	424.8	202.9	216.6	218.6	224.6	258.2	13 9
ACCUREX SOX	PPM	06-555	1204.2	0.0	1026.4	1093.4	1133.4	1069.6	1136.6	1131.1	13 10
ACCUREX CO	PPM	06-425	43.48	0.00	76.42	51.92	64.85	23.76	46.38	37.17	13 11
ACCUREX O2	%	06-554	3.5838	0.0000	3.8192	3.6579	3.5442	4.3843	3.3640	3.8609	13 12
BRN SEC AIR P	IN WG	06-250	15.77	17.46	13.41	14.57	13.91	14.11	14.02	16.93	14 5
BRN GAS REC P	IN WG	06-252	15.76	17.29	13.36	14.65	13.82	13.96	13.84	16.42	14 6
FURNACE GAS P	IN WG	08-100	13.85	13.87	13.30	12.40	12.41	12.44	12.77	14.19	14 7
BAROMETRIC P	IN HG	PB	29.23	0.00	29.19	29.16	29.10	29.07	29.28	28.88	6 29
REL HUMIDITY	%	TST	7.6956	0.0000	7.6419	7.8762	7.8317	7.8357	7.7984	7.8061	6 30

TEST NO.			18A	45T	5A	11A	I1B	11C	12A	13A	
TEST SEQ. NO.			1	2	3	4	5	6	7	8	
DATE			04/28/92	03/02/91	04/06/92	04/15/92	04/16/92	04/16/92	04/16/92	04/21/92	
TIME START			1636	1605	1300	2130	0042	0236	2047	2202	
TIME END			1820	1658	1506	2339	0215	0327	2229	2304	
LOAD MW			90	86	82	82	82	82	83	82	
DATA PAGE NO. 7		**AIR & GAS DATA - B&W**									
AMBIENT AIR TEMP		TC	61.36	61.06	69.02	52.15	50.09	50.93	47.82	36.82	7 1
AIR LVG FD FAN T	A	TC	137.9	152.9	135.2	129.1	128.8	128.4	129.4	123.0	7 6
AIR LVG FD FAN T	B	TC	139.2	153.7	136.3	131.9	131.0	130.6	129.6	127.1	7 7
AIR ENT AH	(T)	GRID	139.2	159.8	136.6	154.3	155.6	155.9	156.1	126.2	7 4
GAS LVG AH	(T)	GRID	279.4	291.9	289.4	277.5	274.7	274.2	279.4	280.5	7 10
GAS LVG ECON	(T) L	GRID	646.8	643.5	703.5	647.7	645.8	624.5	648.6	715.1	7 14
GAS LVG ECON	(T) R	GRID	635.2	613.7	673.0	597.9	596.4	607.3	595.2	610.1	7 15
GAS TEMP LVG GR FAN		GRID	588.3	599.5	615.7	0.0	0.0	0.0	581.7	595.7	13 7
O2 LVG ECON	(T) L	GRID	2.9286	2.7280	4.3069	3.0589	3.2139	4.1750	3.0599	3.2974	7 20
O2 LVG ECON	(T) R	GRID	2.8325	3.3441	3.9450	2.9879	3.2622	3.9403	3.1876	3.4349	7 21
CO LVG ECON	(T) L	GRID	71.9	97.1	103.2	120.9	164.0	51.7	77.1	81.4	13 5
CO LVG ECON	(T) R	GRID	68.6	100.8	40.1	63.6	62.8	58.4	59.2	52.7	13 6
CO2 LVG ECON	(T) L	GRID	15.42	16.21	14.97	15.67	15.53	14.68	15.76	15.57	7 22
CO2 LVG ECON	(T) R	GRID	15.11	15.25	14.70	15.38	15.09	14.48	15.34	15.15	7 23
NOX LVG ECON	(T) L	GRID	259.2	250.5	537.0	206.0	213.4	214.8	233.4	270.0	7 24
NOX LVG ECON	(T) R	GRID	0.0	281.3	527.6	256.3	266.5	257.9	286.9	314.7	7 25
O2 LVG AH	(T)	GRID	4.4200	4.2500	5.3000	4.5100	4.7600	5.5100	4.5800	4.7700	13 1
CO2 LVG AH	(T)	GRID	22.69	41.09	46.41	21.35	24.98	26.55	23.23	18.20	13 3
O2 LVG GR FAN	(T)	GRID	0.00	18.51	0.00	0.00	0.00	0.00	0.00	0.00	13 4
DRY BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27
DATA PAGE NO. 8		**FW HTR TEMPERATURES F (C) - PLANT**									
FW HTR E EXT T		HW	699.8	692.5	681.6	678.1	676.6	677.5	684.2	678.4	8 1
FW HTR E LVG T		HW	437.1	432.4	427.7	427.9	427.5	427.2	429.0	425.3	8 5
FW HTR E ENT T		HW	370.1	363.6	359.9	359.8	359.6	359.3	360.8	357.3	8 7
FW HTR E DRN T		HW	383.1	377.9	375.2	376.4	375.2	375.0	376.7	373.2	8 13
DATA PAGE NO. 9		**FW HTR TEMPERATURES F (C) - B&W**									
SSH PEND IN LEG	1	10-017	841.4	850.6	864.1	844.7	840.1	850.0	851.4	842.9	9 17
SSH PEND IN LEG	2	10-018	865.2	880.5	882.6	869.7	867.6	874.3	868.3	867.9	9 18
SSH PEND IN LEG	3	10-019	872.7	887.9	881.3	873.6	873.5	877.5	866.9	870.6	9 19
SSH PEND IN LEG	4	10-020	881.9	903.5	890.1	885.4	883.0	884.2	872.5	880.5	9 20
SSH PEND IN LEG	5	10-021	865.1	899.1	874.7	876.0	868.9	868.2	858.4	863.8	9 21
SSH PEND IN LEG	6	10-033	879.5	905.9	886.3	888.1	881.5	878.9	879.8	871.4	9 22
SSH PEND IN LEG	7	10-034	881.8	898.1	880.0	876.9	876.5	872.0	891.1	865.6	9 23
SSH PEND IN LEG	8	10-035	872.8	890.3	874.3	862.3	862.9	863.8	879.9	859.5	9 24
SSH PEND IN LEG	9	10-036	875.3	885.5	877.9	857.3	859.4	867.7	876.4	866.3	9 25
SSH PEND IN LEG	10	10-037	854.3	847.0	853.0	830.0	833.4	850.8	848.8	850.8	9 26
RH PEND IN LEG	1	09-049	940.8	953.2	944.1	948.4	948.6	946.9	950.4	937.2	8 17
RH PEND IN LEG	2	09-050	934.4	948.6	934.8	940.2	941.1	938.4	941.4	928.6	8 18

TEST NO.		18A	45T	5A	11A	11B	11C	12A	13A	
TEST SEQ. NO.		1	2	3	4	5	6	7	8	
DATE		04/28/92	03/02/91	04/06/92	04/15/92	04/16/92	04/16/92	04/16/92	04/21/92	
TIME START		1636	1605	1300	2130	0042	0236	2047	2202	
TIME END		1820	1658	1506	2339	0215	0327	2229	2304	
LOAD MW		90	86	82	82	82	82	83	82	
DATA PAGE NO. 9	**FW HTR TEMPERATURES F (C) - B&W**									
RH PEND IN LEG	3	09-051	935.1	948.3	937.9	941.4	941.9	940.6	942.9	930.1	8 19
RH PEND IN LEG	4	09-052	934.0	947.8	935.2	938.6	939.6	938.1	940.1	928.5	8 20
RH PEND IN LEG	5	09-053	0.0	906.9	0.0	0.0	0.0	0.0	0.0	0.0	8 21
RH PEND IN LEG	6	10-001	953.2	970.9	961.7	971.2	970.6	962.1	974.2	953.2	8 22
RH PEND IN LEG	7	10-002	928.0	944.0	931.0	938.5	938.1	930.3	942.9	926.7	8 23
RH PEND IN LEG	8	10-003	938.8	941.9	938.7	938.7	938.6	940.6	941.1	939.9	8 24
RH PEND IN LEG	9	10-004	940.3	953.3	944.0	948.0	948.2	946.1	950.1	937.3	8 25
RH PEND IN LEG	10	10-005	907.0	884.0	910.2	882.9	882.2	919.1	886.5	901.2	8 26
RH INTM HND HOLE	R	10-038	938.3	949.2	942.9	946.9	946.1	946.8	947.2	929.5	8 27
RH INTM HND HOLE	L	10-039	844.3	836.8	858.3	831.3	828.4	847.6	835.0	835.9	8 28
PSH OUT LEG T		09-017	768.5	764.3	775.0	744.3	750.7	757.3	757.9	770.7	14 11
PSH OUT LEG T		09-018	773.8	772.7	777.2	747.0	753.1	761.5	757.5	773.4	14 12
PSH OUT LEG T		09-019	727.9	715.6	745.0	692.0	701.0	710.0	711.9	717.6	14 13
PSH OUT LEG T		09-020	740.7	727.3	755.1	703.9	712.7	723.0	723.3	731.6	14 14
PSH OUT LEG T		09-021	756.2	750.7	766.0	731.3	739.4	744.3	746.7	758.2	14 15
PSH OUT LEG T		09-022	764.8	763.9	773.2	747.4	754.0	756.6	760.4	773.7	14 16
PSH OUT LEG T		09-023	751.3	745.2	754.3	719.5	725.9	737.4	731.3	748.4	14 17
PSH OUT LEG T		09-024	780.7	783.1	784.3	758.5	766.6	769.4	768.7	783.7	14 18
PSH OUT LEG T		09-025	757.9	751.1	756.7	724.6	732.9	736.6	734.2	750.9	14 19
PSH OUT LEG T		09-026	774.6	775.4	777.9	750.0	756.1	758.6	757.1	777.8	14 20
PSH OUT LEG T		09-027	787.1	788.8	788.9	761.0	766.9	772.0	767.1	787.1	14 21
DATA PAGE NO. 10	**PULVERIZER COAL AND PA FLOW**									
CYC A COAL FLOW KLB		05-104	17.44	15.74	34.47	24.34	23.60	23.10	24.52	24.71	10 1
CYC B COAL FLOW KLB		07-110	17.46	15.76	-.01	-.01	-.01	-.01	-.01	-.01	10 2
CYC C COAL FLOW KLB		09-110	17.43	15.76	34.49	24.38	23.64	23.13	24.56	24.70	10 3
CYC A SEC AIR FLOW %		06-170	161.4	151.6	344.8	218.5	215.8	214.2	220.1	221.2	10 16
CYC B SEC AIR FLOW %		08-170	155.6	149.7	5.6	4.5	3.8	4.7	3.4	3.8	10 17
CYC C SEC AIR FLOW %		10-170	160.7	155.5	347.7	211.9	215.4	213.9	209.5	220.2	10 18
CYC A SEC AIR T		20-002	524.9	517.1	575.9	497.1	493.8	496.3	500.0	520.8	11 1
CYC B SEC AIR T		20-003	560.1	564.2	577.1	552.5	549.7	538.1	555.5	579.8	11 2
CYC C SEC AIR T		20-004	512.5	515.8	548.9	520.0	514.9	501.9	523.0	550.6	11 3
PULV COAL FLOW KLB		06-314	22.78	24.29	.06	23.32	23.31	23.30	23.19	23.24	10 4
PULV PA FLOW		06-275	51.56	51.25	0.00	51.16	51.91	52.22	52.06	52.04	10 19
PULV INLET T		09-034	507.8	497.5	131.4	514.2	514.8	503.9	516.8	493.0	11 7
PULV OUTLET T		09-040	157.8	150.5	126.8	144.6	160.0	163.3	147.8	138.2	11 8
DATA PAGE NO. 11	**PULVERIZER INLET TEMP AND PA DIFF**									
PULV DIFF P IN WG		06-274	13.55	12.03	-.01	15.75	15.06	14.96	13.53	14.28	11 9
PULV AMPS		06-276	241.1	244.5	-.1	266.7	254.9	254.5	251.7	259.8	11 10
PULV PA FAN AMPS		06-277	60.41	59.34	-.10	61.27	62.17	62.20	60.00	59.08	11 11

TEST NO.	18A	45T	5A	11A	11B	11C	12A	13A
TEST SEQ. NO.	1	2	3	4	5	6	7	8
DATE	04/28/92	03/02/91	04/06/92	04/15/92	04/16/92	04/16/92	04/16/92	04/21/92
TIME START	1636	1605	1300	2130	0042	0236	2047	2202
TIME END	1820	1658	1506	2339	0215	0327	2229	2304
LOAD MW	90	86	82	82	82	82	83	82

DATA PAGE NO. 11 PULVERIZER INLET TEMP AND PA DIFF

ROT CLASS AMPS	06-278	46.53	39.98	0.00	48.92	48.73	49.01	48.55	48.65	11 12
ROT CLASS RPM	06-270	158.3	140.9	-.3	160.5	160.3	160.1	156.4	159.8	11 13
ROT CLASS DP IN WG	06-345	.4913	.3862	-.0150	.5612	.5326	.5274	.4957	.5242	11 14
COAL SILO LEVEL	06-310	77.03	88.29	83.82	76.74	41.50	38.27	79.59	62.58	11 15
FLAME INTENSITY #1 %	06-279	106.1	106.2	6.1	106.1	106.0	106.0	105.9	105.8	11 16
FLAME INTENSITY #2 %	06-295	105.8	106.1	20.5	105.5	105.3	105.3	105.2	105.1	11 17
FLAME INTENSITY #3 %	06-296	105.4	0.0	2.0	106.1	106.1	106.1	106.1	106.0	11 18
FLAME INTENSITY #4 %	06-297	105.5	106.1	3.9	105.7	105.6	105.6	105.5	105.3	11 19

DATA PAGE NO. 12 OPERATOR POSITIONS %

RH SP VLV POS		15-077	-5.0000	-5.0000	-4.7012	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	12 1
SH SP VLV POS	R	13-190	37.20	29.00	37.31	26.44	29.62	25.49	33.37	38.59	12 3
SH SP VLV POS	L	13-191	31.10	20.46	41.00	0.00	0.00	0.00	21.30	36.61	12 4
GR DMPR DEMAND		16-044	27.16	65.54	51.50	38.19	40.89	10.73	59.21	73.36	12 9
RECIRC AIR DMPR POS		12-176	0.00	.08	0.00	13.38	14.26	15.68	13.88	0.00	12 13
SH PASS DMPR POS		14-180	34.71	24.42	22.48	0.00	14.41	23.65	0.00	19.95	12 15
RH PASS DMPR POS		14-180	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	12 16
OVRFIRE AIR DMPR POS		06-115	43.06	45.09	15.45	0.00	0.00	0.00	0.00	37.05	12 17
BRN SEC AIR DMPR POS		06-286	18.72	25.04	15.01	10.91	18.44	18.44	23.19	31.96	12 18
HOT PRI AIR DMPR POS		06-556	100.0	100.0	0.0	100.0	100.0	100.0	100.0	77.9	12 19
BRN GAS REC DMPR POS		06-324	25.89	30.01	0.00	38.17	21.50	21.50	9.24	0.00	12 20

DATA PAGE NO. 15 MISCELLANEOUS

GAS LVG SH PASS	1A	08-003	-394.9	-343.6	-449.6	-358.4	-360.9	-389.9	-366.9	-407.1	15 1
GAS LVG SH PASS	1B	08-004	623.7	596.9	671.1	561.1	561.6	588.1	566.9	583.5	15 2
GAS LVG SH PASS	1C	08-005	648.7	614.5	700.6	576.9	573.6	605.6	578.7	596.2	15 3
GAS LVG SH PASS	1D	08-006	665.8	629.6	693.7	590.7	591.8	626.9	588.8	616.8	15 4
GAS LVG SH PASS	2A	08-017	584.5	561.7	619.1	534.9	535.5	556.5	539.6	544.8	15 5
GAS LVG SH PASS	2B	08-018	601.5	575.3	636.8	547.2	549.1	573.7	550.5	556.8	15 6
GAS LVG SH PASS	2C	08-019	606.6	584.2	636.4	548.7	550.0	573.4	550.1	560.7	15 7
GAS LVG SH PASS	2D	08-020	647.6	623.5	677.5	585.5	590.9	613.7	587.7	606.9	15 8
GAS LVG SH PASS	3A	08-021	618.5	599.3	650.7	561.1	561.0	588.6	562.1	581.8	15 9
GAS LVG SH PASS	3B	08-022	632.5	597.9	652.3	573.2	577.0	596.7	573.1	598.2	15 10
GAS LVG SH PASS	3C	08-023	622.6	587.7	646.8	565.5	568.6	590.3	564.4	582.3	15 11
GAS LVG SH PASS	3D	08-024	-550.6	-462.2	-529.8	-478.9	-494.2	-518.5	-484.9	-534.1	15 12
GAS LVG RH PASS	4A	08-033	620.4	603.1	641.1	613.5	608.9	603.4	619.2	652.5	15 13
GAS LVG RH PASS	4B	08-034	634.7	633.3	657.4	634.2	633.5	608.6	639.8	683.3	15 14
GAS LVG RH PASS	4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15
GAS LVG RH PASS	4D	08-036	665.0	673.6	696.3	667.7	666.8	645.9	675.6	707.1	15 16
GAS LVG RH PASS	5A	08-049	613.8	595.8	623.7	604.9	600.4	588.5	603.4	634.2	15 17
GAS LVG RH PASS	5B	08-050	617.2	615.0	642.6	622.9	618.2	598.0	627.6	654.4	15 18

TEST NO.	18A	45T	5A	11A	11B	11C	12A	13A
TEST SEQ. NO.	1	2	3	4	5	6	7	8
DATE	04/28/92	03/02/91	04/06/92	04/15/92	04/16/92	04/16/92	04/16/92	04/21/92
TIME START	1636	1605	1300	2130	0042	0236	2047	2202
TIME END	1820	1658	1506	2339	0215	0327	2229	2304
LOAD MW	90	86	82	82	82	82	83	82

DATA PAGE NO. 15 MISCELLANEOUS

GAS LVG RH PASS	5C	08-051	625.7	631 1	663.3	632.2	634.1	602.9	640.2	671.6	15 19
GAS LVG RH PASS	5D	08-052	623.3	622.9	655.1	627.3	629.2	604.5	629.2	664.2	15 20
GAS LVG RH PASS	6A	08-053	616.2	610.7	636.9	616.2	613.7	601.0	616.2	639.6	15 21
GAS LVG RH PASS	6B	08-054	636.9	633.8	660.7	643.9	640.2	620.6	642.5	663.8	15 22
GAS LVG RH PASS	6C	08-055	631.9	622.5	654.9	639.9	642.3	617.2	640.0	655.6	15 23
GAS LVG RH PASS	6D	08-056	644.8	631.6	663.1	643.3	646.4	632.5	642.3	662.8	15 24
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W			87.00	36.00	63.00	76.00	77.00	78.00	79.00	81.00	15 28

RB-369 16 Jun 1992 14:43:59

TEST NO.	24B	11T	12T	13T	14T	33T	34T	28T	29T
TEST SEQ. NO.	9	10	11	12	13	14	15	16	17
DATE	05/07/92	02/16/91	02/16/91	02/16/91	02/16/91	02/24/91	02/24/91	02/22/91	02/22/91
TIME START	1723	0814	1229	1508	1814	2158	2250	1101	1504
TIME END	1803	0814	1457	1759	2004	2209	2306	1257	1610
LOAD MW	82	81	82	82	82	83	83	83	83
FUEL	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR

24B AVG SCANS 36-->37 : 82 MW : 11.5 TPH
11T AVG SCANS 1 --> 1 : 81 MW : NO REBURN : NO GR TO BNRS
12T AVG SCANS 22-->35 : 82 MW : 11.5 TPH REBURN : W/ GR TO BNRS
13T AVG SCANS 37-->45 : 82.5 MW : 11.5 TPH REBURN : W/GR TO BNRS
14T AVG SCANS 47-->57 : 82 MW : 11.5 TPH : HIGHER CLASSIFIER RPM
33T AVG SCANS 81-->81 : 82 MW : NO REBURN
34T AVG SCANS 83-->85 : 82 MW : 11.5 TPH REBRN : W/ GR TO BRNRS
28T AVG SCANS 13-->23 : 82 MW : 11.5 TPH REBRN : W/ GR TO BRNRS
29T AVG SCANS 36-->39 : 82 MW : 11.5 TPH REBRN : W/ GR TO BRNRS

DATA PAGE NO. 2 FLOWS MLB/HR (MT/HR)

LOAD MW	20-005	82.25	81.41	81.94	82.26	81.97	83.10	82.66	82.77	83.33	2	1
MAIN STEAM FLOW	03-033	562.1	548.2	558.9	555.2	550.2	569.6	563.9	567.0	575.3	2	2
1ST STG STM FLW	CALC	541.4	532.9	543.2	540.8	536.3	551.4	547.3	549.4	555.3	2	23
FW FLOW	12-170	552.5	541.3	552.7	548.7	542.6	560.3	551.5	555.8	564.3	2	3
BLOW DOWN FLOW	EST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	4
RH SPRAY FLOW	14-192	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	5
SH SPRAY FLOW L	17-052	5.69	2.81	0.00	1.10	2.14	10.03	0.00	3.71	3.90	2	7
SH SPRAY FLOW R	17-056	11.44	2.91	7.29	3.67	1.50	13.75	0.00	9.18	9.52	2	8
GR FAN AMPS A	16-181	.08	37.32	38.18	37.43	36.44	34.58	39.79	39.75	39.37	2	12
GR FAN AMPS B	16-183	37.28	-.02	-.02	-.02	-.02	-.02	-.02	-.02	-.02	2	13
GR FAN BUS VOLT	EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2	14
TOTAL GR FLOW	CALC	195.4	198.4	210.7	203.0	191.4	165.1	230.9	232.6	228.6	2	24
GR TO SEC AIR	06-932	12.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2	25
GR TO SEC AIR	CALC	13.43	2.02	11.74	12.17	13.35	2.60	11.78	11.20	10.25	2	26
GR TO FURN	CALC	183.0	196.4	198.9	190.9	178.1	162.5	219.1	221.4	218.3	2	27
OFA AIR FLOW	06-931	162.9	24.0	162.4	166.8	166.7	23.2	169.6	164.5	168.2	2	28
TMP AIR FLOW	CALC	29.80	24.39	0.00	13.12	3.89	90.45	9.98	5.06	14.65	14	10
SEC AIR FLOW	06-320	30.54	26.28	30.46	30.20	30.03	53.06	30.73	30.57	31.02	2	29
1st STG PRESS	18-128	744.9	732.7	747.4	744.0	737.6	759.1	753.2	756.2	764.8	2	19
OIL FLOW 2A	05-100	.0018	.0017	.0017	.0017	.0017	.0017	.0027	.0017	.0017	2	20
OIL FLOW 2B	07-100	.0017	.0033	.0017	.0017	.0017	.0017	.0017	.0033	.0017	2	21
OIL FLOW 2C	09-100	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	2	22
% PWDR RVR BASN COAL	USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	30
CYCLONE STOIC	CALC	1.0825	1.1274	1.1470	1.1284	1.1295	1.0120	1.1209	1.1336	1.1081	4	20
REBRN WB STOIC	CALC	.5	100.0	.5	.5	.5	4.0	.4	.5	.5	4	21
REBRN STOIC	CALC	.8419	1.1406	.8753	.8744	.8586	1.1403	.8595	.8723	.8614	4	22
LVG FURN STOIC	CALC	1.1462	1.1823	1.1572	1.1636	1.1488	1.1801	1.1503	1.1545	1.1449	4	23

TEST NO.	24B	11T	12T	13T	14T	33T	34T	28T	29T	
TEST SEQ. NO.	9	10	11	12	13	14	15	16	17	
DATE	05/07/92	02/16/91	02/16/91	02/16/91	02/16/91	02/24/91	02/24/91	02/22/91	02/22/91	
TIME START	1723	0814	1229	1508	1814	2158	2250	1101	1504	
TIME END	1803	0814	1457	1759	2004	2209	2306	1257	1610	
LOAD MW	82	81	82	82	82	83	83	83	83	

DATA PAGE NO. 2 FLOWS MLB/HR (MT/HR)

LVG ECON STOIC	CALC	1.1582	1.1946	1.1693	1.1757	1.1609	1.1924	1.1625	1.1665	1.1567	4 24

DATA PAGE NO. 3 FLUID TEMPERATURES F (C) - PLANT

SSH OUT T	L	15-152	996.7	1000.4	967.8	984.3	999.2	971.6	988.8	997.5	998.5	3 1
SSH OUT T	R	15-150	999.0	992.0	996.2	998.1	997.7	980.5	999.0	999.5	999.6	3 2
SSH OUT AVE T		13-160	994.1	996.8	979.4	989.8	997.2	974.6	995.3	997.1	992.5	14 1
LVG SH ATTMP T	L	13-164	723.1	721.4	738.4	735.7	728.6	712.4	722.1	744.1	747.8	3 8
LVG SH ATTMP T	R	13-162	706.2	720.5	707.7	725.9	741.3	693.3	734.0	725.1	721.1	3 9
PRI SH OUT T	L	HW	755.8	741.5	736.5	737.2	742.2	736.1	719.5	763.7	769.6	3 10
PRI SH OUT T	R	HW	771.5	741.5	736.1	737.6	742.2	753.2	747.1	768.9	769.6	3 11
ECON H2O OUT T	L	HW	501.2	515.1	511.4	512.9	509.4	498.1	508.6	505.8	504.1	3 27
ECON H2O OUT T	R	HW	480.9	480.0	477.9	478.8	482.6	479.3	474.7	493.9	495.7	3 28
ECON H2O IN T		20-007	429.4	427.3	428.4	428.6	428.4	431.4	429.2	429.2	430.3	3 5
RH SPRAY H2O T		HW	294.5	295.0	295.4	295.6	295.3	293.6	293.2	295.6	296.8	3 7
LVG RH T		14-150	996.8	996.2	976.0	994.4	1000.8	978.9	989.3	979.1	970.9	3 12
ENT RH T		CALC	673.1	674.9	663.2	670.9	675.8	661.3	672.5	678.3	676.8	3 16
COLD RH T		20-006	681.9	679.5	669.1	676.5	681.3	671.3	680.2	683.8	682.3	3 18

DATA PAGE NO. 4 FLUID TEMPERATURES F (C) - B&W

AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 18
GAS LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 19

TEST NO.		24B	11T	12T	13T	14T	33T	34T	28T	29T		
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17		
DATE		05/07/92	02/16/91	02/16/91	02/16/91	02/16/91	02/24/91	02/24/91	02/22/91	02/22/91		
TIME START		1723	0814	1229	1508	1814	2158	2250	1101	1504		
TIME END		1803	0814	1457	1759	2004	2209	2306	1257	1610		
LOAD MW		82	81	82	82	82	83	83	83	83		
DATA PAGE NO. 5	**FLUID PRESSURES PSIG (KG/CM2)**											
TURB THROT P	03-170	1450.7	1449.9	1443.5	1450.5	1450.0	1457.9	1449.8	1450.1	1450.5	5	1
SEC SH OUT P	CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5	2
DRUM PRESS	04-013	1525.5	1525.9	1521.3	1526.5	1525.6	1539.6	1531.4	1531.3	1531.9	5	3
LVG RH PRESS	15-102	304.2	299.1	303.3	302.6	300.3	309.5	305.0	305.9	308.9	5	4
ENT RH PRESS	15-100	324.4	319.3	324.2	323.5	320.9	328.7	323.9	326.3	330.5	5	5
FW HTR E EXT P	20-035	310.7	304.6	309.9	309.4	307.0	316.7	309.7	312.0	315.5	5	6
FW HTR E EXT P	TRANS	312.6	306.4	311.6	310.8	308.7	318.6	313.1	314.2	317.6	5	7
SEC SH OUT P (T)	TRANS	1471.9	1473.9	1468.6	1474.5	1474.3	1483.3	1473.1	1473.4	1475.2	5	17
DRUM PRESS (T)	TRANS	1519.6	1518.6	1515.7	1521.0	1520.1	1531.1	1521.7	1522.2	1525.9	5	18
LVG RH-1 P (T)	TRANS	308.0	302.0	307.2	306.4	304.4	313.8	308.8	309.6	313.0	5	19
ENT RH-1 P (T)	TRANS	0.0	316.8	322.3	321.4	319.2	329.7	324.0	324.9	328.3	5	20
DATA PAGE NO. 6	**AIR & GAS DATA - PLANT**											
AMBIENT AIR DB TEMP	TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6	1
AIR ENT FD FAN T	HW	104.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6	4
AIR LVG FD FAN T A	09-028	138.8	140.7	144.7	144.2	142.8	130.4	130.5	141.1	145.7	7	2
AIR LVG FD FAN T B	09-029	143.1	140.4	144.8	144.7	143.8	131.7	131.7	141.8	146.0	7	3
AIR ENT AH T RA	20-017	145.8	182.4	170.8	168.9	167.4	172.7	177.1	191.7	195.8	6	2
AIR ENT AH T RB	20-018	145.3	164.9	166.6	165.7	165.1	155.8	154.9	168.9	172.9	6	3
AIR ENT AH T LA	20-025	141.2	197.2	196.0	194.4	193.7	186.9	186.0	220.9	224.4	13	25
AIR ENT AH T LB	20-029	142.4	182.3	175.8	173.0	172.1	163.5	167.0	215.9	221.2	13	26
AIR LVG AH T R	HW	560.3	534.8	543.2	547.6	548.9	526.1	534.1	536.0	546.0	6	6
AIR LVG AH T L	HW	560.1	534.7	541.9	547.6	548.9	547.5	550.9	532.8	540.5	6	7
BRN SEC AIR T	08-002	565.9	521.3	534.0	540.4	541.4	532.3	534.1	517.1	519.0	14	2
BRN SA/GR T	08-001	563.2	486.5	542.7	551.8	554.2	497.8	516.2	535.5	540.4	14	3
OFA TEMP	09-002	520.9	454.1	528.5	534.7	536.8	470.0	523.0	516.4	521.6	14	4
GAS LVG AH T RA	20-019	308.3	288.6	300.2	302.1	303.6	299.2	293.8	294.8	300.8	6	10
GAS LVG AH T RB	20-020	293.7	273.1	285.0	286.7	288.2	285.1	278.7	279.5	286.0	6	11
GAS LVG AH T LA	20-027	283.1	271.6	281.6	283.6	284.5	283.1	277.0	281.6	289.3	13	27
GAS LVG AH T LB	20-024	286.1	281.3	291.6	293.2	294.5	291.7	285.8	291.7	299.1	13	28
GAS LVG RH PS T	AVE	633.5	618.6	617.5	629.0	626.8	612.1	628.9	609.8	614.3	13	17
GAS LVG SH PS T	AVE	591.7	558.4	556.8	563.5	578.0	552.5	547.2	586.9	595.4	13	19
GR GAS TEMP A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14	8
GR GAS TEMP B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14	9
O2 LVG ECON R	11-172	2.7712	3.2754	2.7516	2.9340	3.5367	3.4950	3.4290	3.1402	3.5209	6	20
O2 LVG ECON L	11-170	3.0151	3.3187	3.0417	3.0131	3.4595	3.4243	2.2472	2.3926	2.3672	6	21
O2 IN SEC AIR	06-254	15.68	19.31	15.67	15.53	15.11	19.72	15.66	15.83	16.14	13	29
ACCUREX NOX PPM	06-553	251.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13	9
ACCUREX SOX PPM	06-555	1214.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13	10
ACCUREX CO PPM	06-425	107.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13	11
ACCUREX O2 %	06-554	3.5410	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	13	12
BRN SEC AIR P IN WG	06-250	15.76	13.96	16.45	16.42	16.19	16.84	16.40	15.35	15.48	14	5
BRN GAS REC P IN WG	06-252	15.72	13.87	16.42	16.36	16.11	16.15	16.32	15.33	15.44	14	6

TEST NO.		24B	11T	12T	13T	14T	33T	34T	28T	29T	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		05/07/92	02/16/91	02/16/91	02/16/91	02/16/91	02/24/91	02/24/91	02/22/91	02/22/91	
TIME START		1723	0814	1229	1508	1814	2158	2250	1101	1504	
TIME END		1803	0814	1457	1759	2004	2209	2306	1257	1610	
LOAD MW		82	81	82	82	82	83	83	83	83	
DATA PAGE NO. 6	**AIR & GAS DATA - PLANT**										
FURNACE GAS P	IN WG	08-100	13.06	14.01	14.15	13.90	13.37	13.65	14.28	13.20	13.33	14 7
BAROMETRIC P	IN HG	PB	29.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6 29
REL HUMIDITY	%	TST	7.6063	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	6 30
DATA PAGE NO. 7	**AIR & GAS DATA - B&W**										
AMBIENT AIR TEMP		TC	73.0	591.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 1
AIR LVG FD FAN T	A	TC	142.3	143.8	147.6	146.9	145.5	133.4	133.7	144.3	148.7	7 6
AIR LVG FD FAN T	B	TC	146.1	142.9	147.1	146.9	145.9	134.5	134.4	144.3	148.2	7 7
AIR ENT AH	(T)	GRID	144.8	179.3	176.9	174.8	173.9	171.3	175.4	199.2	203.3	7 4
GAS LVG AH	(T)	GRID	283.7	274.6	284.6	286.2	287.4	285.7	279.9	283.3	290.5	7 10
GAS LVG ECON	(T) L	GRID	645.0	635.3	635.6	646.3	645.8	628.3	644.8	627.2	631.9	7 14
GAS LVG ECON	(T) R	GRID	612.0	560.9	585.6	591.6	601.5	566.7	570.5	596.3	603.5	7 15
GAS TEMP LVG GR FAN		GRID	598.4	0.0	0.0	0.0	0.0	498.8	573.4	594.3	605.9	13 7
O2 LVG ECON	(T) L	GRID	2.9533	3.5000	3.1327	3.2165	2.6339	3.5764	2.9301	3.0387	2.7643	7 20
O2 LVG ECON	(T) R	GRID	2.8658	3.5000	3.0890	3.2156	3.5887	3.2850	3.0925	3.1247	3.0988	7 21
CO LVG ECON	(T) L	GRID	100.3	60.0	130.2	127.1	165.6	44.0	101.2	114.9	120.1	13 5
CO LVG ECON	(T) R	GRID	64.2	64.0	150.2	110.8	93.3	44.0	62.8	110.0	137.3	13 6
CO2 LVG ECON	(T) L	GRID	15.72	14.58	15.99	16.03	16.66	15.73	16.37	15.83	15.85	7 22
CO2 LVG ECON	(T) R	GRID	15.31	15.19	15.52	15.43	15.18	15.62	15.98	15.52	15.48	7 23
NOX LVG ECON	(T) L	GRID	291.2	512.0	239.6	237.0	241.6	524.0	225.1	243.7	247.5	7 24
NOX LVG ECON	(T) R	GRID	0.0	531.3	255.4	257.5	266.5	524.0	256.8	265.3	249.2	7 25
O2 LVG AH	(T)	GRID	4.6600	4.8500	4.3000	4.4100	4.3500	4.8000	4.2200	4.2500	4.1200	13 1
CO2 LVG AH	(T)	GRID	2218.7	2707.1	1284.2	1326.3	1460.0	43.5	27.6	26.1	33.6	13 3
O2 LVG GR FAN	(T)	GRID	4.63	5.28	3.39	3.14	3.38	18.58	18.59	18.26	18.21	13 4
DRY BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27
DATA PAGE NO. 8	**FW HTR TEMPERATURES F (C) - PLANT**										
FW HTR E EXT T		HW	679.6	679.3	668.4	676.1	681.0	668.1	677.2	683.3	682.2	8 1
FW HTR E LVG T		HW	437.0	374.1	374.2	374.4	373.9	427.9	426.8	407.3	375.8	8 5
FW HTR E ENT T		HW	359.9	360.3	360.4	360.7	360.5	359.9	358.2	363.1	361.9	8 7
FW HTR E DRN T		HW	375.1	374.1	374.2	374.4	373.9	374.3	372.6	375.1	375.8	8 13
DATA PAGE NO. 9	**FW HTR TEMPERATURES F (C) - B&W**										
SSH PEND IN LEG	1	10-017	844.3	849.0	849.7	849.9	853.9	819.2	853.0	853.2	873.7	9 17
SSH PEND IN LEG	2	10-018	860.2	859.4	868.0	872.8	878.5	846.4	885.5	877.4	885.3	9 18
SSH PEND IN LEG	3	10-019	853.1	853.5	862.0	873.1	882.4	843.6	886.5	874.3	872.5	9 19
SSH PEND IN LEG	4	10-020	855.0	865.7	863.2	877.4	888.5	842.4	893.8	878.4	871.4	9 20
SSH PEND IN LEG	5	10-021	830.4	867.4	849.4	866.1	876.9	822.3	880.5	864.8	848.7	9 21

TEST NO.		24B	11T	12T	13T	14T	33T	34T	28T	29T	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		05/07/92	02/16/91	02/16/91	02/16/91	02/16/91	02/24/91	02/24/91	02/22/91	02/22/91	
TIME START		1723	0814	1229	1508	1814	2158	2250	1101	1504	
TIME END		1803	0814	1457	1759	2004	2209	2306	1257	1610	
LOAD MW		82	81	82	82	82	83	83	83	83	
DATA PAGE NO. 9	**FW HTR TEMPERATURES F (C) - B&W**										
SSH PEND IN LEG 6	10-033	851.8	880.4	860.1	874.0	885.3	830.9	880.5	874.6	858.4	9 22
SSH PEND IN LEG 7	10-034	871.8	881.9	871.9	874.3	889.8	844.6	870.1	885.3	877.8	9 23
SSH PEND IN LEG 8	10-035	870.2	869.6	860.6	861.5	883.8	844.6	863.3	879.9	881.4	9 24
SSH PEND IN LEG 9	10-036	867.8	868.2	859.5	860.3	874.5	850.5	869.9	885.7	894.5	9 25
SSH PEND IN LEG 10	10-037	837.1	852.4	841.9	852.1	839.8	825.9	857.2	877.8	887.9	9 26
RH PEND IN LEG 1	09-049	939.8	938.5	924.8	940.6	952.3	919.0	935.5	922.2	908.9	8 17
RH PEND IN LEG 2	09-050	930.2	931.7	921.4	936.4	943.7	909.2	929.9	917.0	894.0	8 18
RH PEND IN LEG 3	09-051	932.5	932.2	920.1	935.4	945.4	912.8	930.4	916.6	900.6	8 19
RH PEND IN LEG 4	09-052	929.6	931.2	919.7	934.7	942.9	910.8	929.7	916.3	897.0	8 20
RH PEND IN LEG 5	09-053	0.0	935.9	896.2	936.1	901.8	910.2	932.1	916.4	937.2	8 21
RH PEND IN LEG 6	10-001	963.4	958.8	940.0	957.3	977.3	934.3	949.8	936.1	924.1	8 22
RH PEND IN LEG 7	10-002	939.3	923.8	908.4	918.8	948.3	912.4	923.5	908.8	907.4	8 23
RH PEND IN LEG 8	10-003	940.5	929.5	911.2	923.9	941.7	922.7	936.6	916.0	922.8	8 24
RH PEND IN LEG 9	10-004	940.0	939.7	924.8	940.8	952.2	918.4	936.7	922.3	908.2	8 25
RH PEND IN LEG 10	10-005	884.8	915.0	873.8	916.3	880.2	888.4	904.3	895.4	918.6	8 26
RH INTM HND HOLE R	10-038	935.0	928.1	922.5	937.1	949.3	911.2	925.8	917.4	906.3	8 27
RH INTM HND HOLE L	10-039	835.9	847.8	815.7	851.2	831.8	840.2	832.6	837.2	859.4	8 28
PSH OUT LEG T	09-017	777.6	762.4	759.5	762.2	769.0	753.2	745.3	784.3	781.9	14 11
PSH OUT LEG T	09-018	781.8	759.0	757.3	760.5	767.3	756.4	750.9	783.8	782.7	14 12
PSH OUT LEG T	09-019	734.8	722.3	712.2	709.3	713.7	725.7	701.7	745.8	760.9	14 13
PSH OUT LEG T	09-020	747.3	733.2	726.7	725.5	730.7	733.3	710.8	759.8	771.1	14 14
PSH OUT LEG T	09-021	763.5	751.6	751.8	753.3	757.8	746.2	733.9	772.1	772.2	14 15
PSH OUT LEG T	09-022	775.5	762.8	760.2	763.4	769.5	757.2	748.1	781.0	777.3	14 16
PSH OUT LEG T	09-023	758.1	734.9	734.2	735.1	741.2	744.4	726.5	766.4	766.1	14 17
PSH OUT LEG T	09-024	788.0	765.9	767.6	771.8	776.7	768.3	762.6	788.3	785.6	14 18
PSH OUT LEG T	09-025	756.0	734.5	736.3	738.3	741.6	742.1	732.5	765.0	762.4	14 19
PSH OUT LEG T	09-026	770.2	761.8	758.6	767.1	764.8	758.7	758.4	778.7	772.8	14 20
PSH OUT LEG T	09-027	779.8	772.0	767.1	777.1	776.5	767.9	763.4	788.0	778.1	14 21
DATA PAGE NO. 10	**PULVERIZER COAL AND PA FLOW**										
CYC A COAL FLOW KLB	05-104	21.35	35.26	24.99	24.42	24.25	31.25	24.36	24.07	24.17	10 1
CYC B COAL FLOW KLB	07-110	-.0120	-.0120	-.0120	-.0120	-.0120	-.0120	-.0120	-.0120	-.0120	10 2
CYC C COAL FLOW KLB	09-110	21.34	35.32	24.85	24.43	24.29	31.33	24.40	24.12	24.21	10 3
CYC A SEC AIR FLOW %	06-170	212.2	324.0	221.0	216.8	212.4	282.7	217.0	216.9	213.9	10 16
CYC B SEC AIR FLOW %	08-170	4.6812	2.7369	3.3282	2.6177	2.7577	.8566	1.5008	3.0278	3.3077	10 17
CYC C SEC AIR FLOW %	10-170	212.0	329.3	222.2	220.7	222.5	283.1	227.3	231.2	235.8	10 18
CYC A SEC AIR T	20-002	522.5	491.4	492.8	497.0	502.9	488.5	483.0	493.2	498.5	11 1
CYC B SEC AIR T	20-003	553.2	522.4	536.6	542.8	544.4	539.9	537.8	522.1	526.1	11 2
CYC C SEC AIR T	20-004	525.0	496.5	504.4	512.8	512.7	507.8	507.9	492.9	501.4	11 3
PULV COAL FLOW KLB	06-314	22.98	.07	23.37	23.35	23.38	3.40	23.23	23.14	23.08	10 4
PULV PA FLOW	06-275	52.41	0.00	55.32	55.40	55.55	58.69	53.37	57.24	56.98	10 19
PULV INLET T	09-034	515.7	148.0	491.8	498.9	500.6	158.0	484.2	479.6	486.2	11 7
PULV OUTLET T	09-040	173.1	101.7	146.3	147.0	149.7	141.8	142.1	155.9	152.1	11 8

TEST NO.		24B	11T	12T	13T	14T	33T	34T	28T	29T	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		05/07/92	02/16/91	02/16/91	02/16/91	02/16/91	02/24/91	02/24/91	02/22/91	02/22/91	
TIME START		1723	0814	1229	1508	1814	2158	2250	1101	1504	
TIME END		1803	0814	1457	1759	2004	2209	2306	1257	1610	
LOAD MW		82	81	82	82	82	83	83	83	83	
DATA PAGE NO. 11	PULVERIZER INLET TEMP AND PA DIFF										
PULV DIFF P IN WG	06-274	10.81	-.13	8.32	8.57	8.95	5.67	8.82	9.48	9.04	11 9
PULV AMPS	06-276	226.3	.1	225.0	228.1	232.4	78.9	229.4	220.5	215.4	11 10
PULV PA FAN AMPS	06-277	60.27	-.06	60.40	61.59	62.46	54.66	52.48	62.37	60.44	11 11
ROT CLASS AMPS	06-278	44.65	39.75	37.87	38.74	41.40	37.32	38.51	38.46	37.56	11 12
ROT CLASS RPM	06-270	150.9	135.5	140.6	147.1	160.1	141.1	140.7	139.5	139.7	11 13
ROT CLASS DP IN WG	06-345	.4250	.2664	.2561	.2907	.3547	.1420	.2830	.2606	.2589	11 14
COAL SILO LEVEL	06-310	76.80	65.03	74.10	81.52	53.51	40.20	23.51	58.55	77.95	11 15
FLAME INTENSITY #1 %	06-279	106.2	53.8	106.1	106.1	106.1	106.2	106.2	105.8	105.2	11 16
FLAME INTENSITY #2 %	06-295	105.8	29.8	98.2	105.7	106.1	105.7	105.5	105.3	105.6	11 17
FLAME INTENSITY #3 %	06-296	0.0	6.9	104.7	104.4	106.0	106.0	0.0	105.4	105.8	11 18
FLAME INTENSITY #4 %	06-297	106.2	6.2	102.7	95.1	106.0	105.8	106.0	106.1	106.1	11 19
DATA PAGE NO. 12	OPERATOR POSITIONS %										
RH SP VLV POS	15-077	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	12 1
SH SP VLV POS R	13-190	51.35	33.35	39.48	33.70	28.94	55.63	28.30	44.11	44.54	12 3
SH SP VLV POS L	13-191	38.53	33.58	0.00	32.14	32.54	38.87	0.00	34.33	35.01	12 4
GR DMPR DEMAND	16-044	50.5	85.6	100.0	94.0	84.4	53.1	93.1	105.0	95.0	12 9
RECIRC AIR DMPR POS	12-176	0.00	15.66	13.77	13.16	13.32	13.12	16.58	.04	8.51	12 13
SH PASS DMPR POS	14-180	23.36	11.07	0.00	14.64	20.80	15.71	9.75	30.20	33.95	12 15
RH PASS DMPR POS	14-180	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	12 16
OVRFIRE AIR DMPR POS	06-115	38.58	10.04	43.12	44.02	44.02	10.00	44.28	43.16	44.06	12 17
BRN SEC AIR DMPR POS	06-286	16.82	10.01	15.02	15.02	15.02	34.52	14.92	14.92	15.12	12 18
HOT PRI AIR DMPR POS	06-556	100.0	0.0	100.0	100.0	100.0	53.0	100.0	100.0	100.0	12 19
BRN GAS REC DMPR POS	06-324	32.90	-5.00	40.49	40.49	40.49	1.06	39.06	40.19	40.09	12 20
DATA PAGE NO. 15	MISCELLANEOUS										
GAS LVG SH PASS 1A	08-003	-360.5	-346.9	-318.6	-329.4	-343.8	-335.5	-320.3	-355.0	-358.5	15 1
GAS LVG SH PASS 1B	08-004	589.8	561.1	567.9	570.8	586.0	552.3	546.3	587.8	594.9	15 2
GAS LVG SH PASS 1C	08-005	606.3	562.2	573.2	582.3	598.5	557.1	551.3	595.4	607.1	15 3
GAS LVG SH PASS 1D	08-006	627.0	576.9	581.7	592.4	612.3	572.5	567.7	617.0	628.9	15 4
GAS LVG SH PASS 2A	08-017	559.4	537.9	529.2	533.1	542.2	531.3	523.0	557.1	568.6	15 5
GAS LVG SH PASS 2B	08-018	570.0	544.7	538.0	542.9	553.5	540.3	538.5	573.6	579.4	15 6
GAS LVG SH PASS 2C	08-019	575.5	542.7	545.4	553.3	567.6	537.4	534.6	571.3	579.7	15 7
GAS LVG SH PASS 2D	08-020	608.1	575.5	581.6	589.6	608.1	566.3	563.9	607.1	616.4	15 8
GAS LVG SH PASS 3A	08-021	586.7	556.8	548.0	553.2	565.0	559.6	549.2	591.8	595.9	15 9
GAS LVG SH PASS 3B	08-022	603.2	570.3	553.3	561.1	577.5	557.9	552.0	588.9	598.4	15 10
GAS LVG SH PASS 3C	08-023	589.6	555.9	550.3	556.1	569.7	550.0	545.7	578.9	584.3	15 11
GAS LVG SH PASS 3D	08-024	-477.7	-442.0	-425.4	-436.0	-461.0	-449.2	-438.9	-473.7	-470.1	15 12
GAS LVG RH PASS 4A	08-033	613.1	616.3	606.0	625.7	609.5	609.8	623.0	605.4	616.2	15 13
GAS LVG RH PASS 4B	08-034	633.6	624.2	627.2	640.2	633.2	620.6	643.6	618.9	627.7	15 14
GAS LVG RH PASS 4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15

TEST NO.	24B	11T	12T	13T	14T	33T	34T	28T	29T
TEST SEQ. NO.	9	10	11	12	13	14	15	16	17
DATE	05/07/92	02/16/91	02/16/91	02/16/91	02/16/91	02/24/91	02/24/91	02/22/91	02/22/91
TIME START	1723	0814	1229	1508	1814	2158	2250	1101	1504
TIME END	1803	0814	1457	1759	2004	2209	2306	1257	1610
LOAD MW	82	81	82	82	82	83	83	83	83

DATA PAGE NO. 15 MISCELLANEOUS

GAS LVG RH PASS	4D	08-036	675.5	634.5	649.4	660.0	664.8	642.7	650.3	639.9	641.5	15 16
GAS LVG RH PASS	5A	08-049	605.7	607.8	598.4	613.0	598.2	590.6	617.1	591.4	603.4	15 17
GAS LVG RH PASS	5B	08-050	621.3	612.9	608.3	619.0	614.0	602.4	626.3	604.2	610.4	15 18
GAS LVG RH PASS	5C	08-051	636.1	618.6	620.9	632.3	637.3	608.9	630.5	612.8	611.8	15 19
GAS LVG RH PASS	5D	08-052	632.6	610.6	611.5	623.4	624.0	603.7	622.0	602.0	600.1	15 20
GAS LVG RH PASS	6A	08-053	616.2	609.2	606.5	619.0	617.3	607.9	618.4	596.2	604.8	15 21
GAS LVG RH PASS	6B	08-054	642.6	626.1	627.8	635.0	636.4	623.4	634.0	616.7	624.9	15 22
GAS LVG RH PASS	6C	08-055	629.3	623.2	618.3	624.2	627.3	609.5	624.2	608.3	606.8	15 23
GAS LVG RH PASS	6D	08-056	640.5	620.6	618.2	627.1	632.8	613.2	628.9	612.2	609.8	15 24
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W			96.00	26.00	28.00	29.00	30.00	27.00	33.00	31.00	32.00	15 28

RB-369 16 Jun 1992 15:14:24

TEST NO.	46T	47T	49T	12B	37T	42T	38T	35T
TEST SEQ. NO.	1	2	3	4	5	6	7	8
DATE	03/03/91	03/03/91	03/04/91	04/16/92	02/25/91	02/27/91	02/25/91	02/25/92
TIME START	1038	1333	1101	2321	2058	0044	2230	0029
TIME END	1202	1426	1154	0103	2127	0301	2302	0132
LOAD MW	83	82	82	83	70	71	70	70
FUEL	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR

46T AVG SCANS 12-->19 : 82 MW : 11.5 TPH REBRN : NO GR TO BRNRS
47T AVG SCANS 28-->32 : 83 MW : 11.5 TPH REBRN : W/ GR TO BRNRS
49T AVG SCANS 16-->20 : 82 MW : 12.8 TPH REBRN : W/ GR TO BRNRS
12B AVG SCANS 24-->32 : 82 MW : 10.5 TPH : 160 RPM : HIGH STOIC
37T AVG SCANS 66-->68 : 70 MW : NO REBURN
42T AVG SCANS 16-->28 : 71 MW : 11 TPH REBRN : NO GR TO BRNRS
38T AVG SCANS 75-->77 : 70 MW : 11.5 TPH REBRN : NO GR TO BRNRS
35T AVG SCANS 94-->99 : 70 MW : 11.5 TPH REBRN : W/ GR TO BRNRS

DATA PAGE NO. 2 FLOWS MLB/HR (MT/HR)

LOAD MW	20-005	82.91	82.26	82.02	82.52	70.05	70.55	70.34	70.05	2	1
MAIN STEAM FLOW	03-033	562.4	555.1	552.2	565.4	437.8	433.8	436.7	431.7	2	2
1ST STG STM FLW	CALC	545.2	540.6	538.6	544.4	453.9	451.1	453.8	449.1	2	23
FW FLOW	12-170	551.6	548.0	544.5	556.9	461.5	457.1	460.5	454.9	2	3
BLOW DOWN FLOW	EST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	4
RH SPRAY FLOW	14-192	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	5
SH SPRAY FLOW L	17-052	5.2624	4.3388	0.0000	2.4939	3.4040	0.0000	1.7079	3.5787	2	7
SH SPRAY FLOW R	17-056	5.20	15.00	0.00	10.49	4.93	4.82	0.00	0.00	2	8
GR FAN AMPS A	16-181	37.41	35.33	29.54	.08	40.05	39.55	40.18	40.40	2	12
GR FAN AMPS B	16-183	-.02	-.02	-.02	36.56	-.02	-.02	-.02	-.02	2	13
GR FAN BUS VOLT	EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2	14
TOTAL GR FLOW	CALC	203.5	178.0	109.9	195.5	232.8	226.3	234.9	236.8	2	24
GR TO SEC AIR	06-932	3.32	11.18	11.30	11.19	0.00	0.00	0.00	0.00	2	25
GR TO SEC AIR	CALC	2.18	10.35	10.57	11.75	2.35	1.95	1.55	11.32	2	26
GR TO FURN	CALC	201.3	167.7	99.3	183.8	230.5	224.4	233.4	225.5	2	27
OFA AIR FLOW	06-931	153.1	164.0	191.3	144.1	22.4	146.5	101.2	114.8	2	28
TMP AIR FLOW	CALC	4.81	10.64	17.40	31.62	52.73	18.20	0.00	0.00	14	10
SEC AIR FLOW	06-320	44.46	32.79	37.01	29.22	35.92	45.89	53.51	39.36	2	29
1st STG PRESS	18-128	750.3	743.7	740.9	749.1	619.8	615.8	619.7	612.9	2	19
OIL FLOW 2A	05-100	.0017	.0018	.0020	.0017	.0018	.0018	.0017	.0023	2	20
OIL FLOW 2B	07-100	.0018	.0017	.0019	.0017	.0024	.0017	.0017	.0017	2	21
OIL FLOW 2C	09-100	.0016	.0016	.0016	.0033	.0016	.0016	.0016	.0016	2	22
% PWDR RVR BASN COAL	USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	30
CYCLONE STOIC	CALC	1.1066	1.1066	1.1454	1.1009	1.0905	1.1157	1.1888	1.2040	4	20
REBRN WB STOIC	CALC	.5	.5	.4	.5	100.0	.5	.6	.5	4	21
REBRN STOIC	CALC	.8640	.8545	.8565	.9209	1.1668	.8720	.9326	.9128	4	22
LVG FURN STOIC	CALC	1.1272	1.1374	1.1880	1.1671	1.2122	1.1668	1.1371	1.1459	4	23
LVG ECON STOIC	CALC	1.1392	1.1495	1.2001	1.1791	1.2267	1.1810	1.1513	1.1602	4	24

TEST NO.			46T	47T	49T	12B	37T	42T	38T	35T		
TEST SEQ. NO.			1	2	3	4	5	6	7	8		
DATE			03/03/91	03/03/91	03/04/91	04/16/92	02/25/91	02/27/91	02/25/91	02/25/92		
TIME START			1038	1333	1101	2321	2058	0044	2230	0029		
TIME END			1202	1426	1154	0103	2127	0301	2302	0132		
LOAD MW			83	82	82	83	70	71	70	70		
DATA PAGE NO. 3		**FLUID TEMPERATURES F (C) - PLANT**										
SSH OUT T	L	15-152	997.7	997.8	997.7	998.2	1000.7	999.1	996.5	998.2	3	1
SSH OUT T	R	15-150	999.7	999.0	998.9	998.8	998.6	999.6	986.1	997.9	3	2
SSH OUT AVE T		13-160	1000.5	1000.2	1001.9	997.8	999.6	999.4	993.0	997.3	14	1
LVG SH ATTMP T	L	13-164	727.1	740.3	711.2	748.0	734.2	731.2	703.1	698.5	3	8
LVG SH ATTMP T	R	13-162	741.0	701.0	740.9	706.2	732.5	719.2	745.7	752.5	3	9
PRI SH OUT T	L	HW	751.7	761.4	712.5	756.9	741.0	730.7	716.8	722.0	3	10
PRI SH OUT T	R	HW	766.6	775.4	743.5	766.0	756.0	759.9	742.9	753.1	3	11
ECON H2O OUT T	L	HW	503.4	499.7	504.4	503.1	495.0	505.1	499.3	501.5	3	27
ECON H2O OUT T	R	HW	484.0	485.4	468.5	482.7	471.4	469.3	464.6	466.8	3	28
ECON H2O IN T		20-007	429.7	428.7	428.2	429.7	412.7	412.7	413.4	412.3	3	5
RH SPRAY H2O T		HW	291.0	290.8	290.9	295.7	281.0	283.5	281.9	281.9	3	7
LVG RH T		14-150	998.9	994.1	1003.3	995.3	958.2	992.6	974.7	988.4	3	12
ENT RH T		CALC	678.1	674.2	675.7	677.2	644.2	650.1	639.1	645.3	3	16
COLD RH T		20-006	685.8	684.7	685.7	684.5	652.8	655.8	647.2	653.4	3	18
DATA PAGE NO. 4		**FLUID TEMPERATURES F (C) - B&W**										
AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	18
GAS LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	19
DATA PAGE NO. 5		**FLUID PRESSURES PSIG (KG/CM2)**										
TURB THROT P		03-170	1450.3	1449.9	1450.4	1449.7	1448.9	1450.0	1449.0	1449.7	5	1
SEC SH OUT P		CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5	2
DRUM PRESS		04-013	1529.7	1526.6	1525.5	1528.5	1505.5	1502.9	1504.4	1503.6	5	3
LVG RH PRESS		15-102	305.6	302.9	301.3	304.3	252.9	253.4	254.1	252.0	5	4

TEST NO.	46T	47T	49T	12B	37T	42T	38T	35T	
TEST SEQ. NO.	1	2	3	4	5	6	7	8	
DATE	03/03/91	03/03/91	03/04/91	04/16/92	02/25/91	02/27/91	02/25/91	02/25/92	
TIME START	1038	1333	1101	2321	2058	0044	2230	0029	
TIME END	1202	1426	1154	0103	2127	0301	2302	0132	
LOAD MW	83	82	82	83	70	71	70	70	

DATA PAGE NO. 5 FLUID PRESSURES PSIG (KG/CM2)

ENT RH PRESS		15-100	323.2	320.8	319.2	321.5	267.3	269.4	268.5	266.6	5 5
FW HTR E EXT P		20-035	310.7	308.1	306.4	309.7	256.6	257.8	257.4	255.7	5 6
FW HTR E EXT P		TRANS	313.6	310.9	309.3	312.6	259.2	259.8	260.0	258.1	5 7
SEC SH OUT P	(T)	TRANS	1472.0	1471.2	1468.4	1471.5	1462.9	1465.1	1462.9	1463.9	5 17
DRUM PRESS	(T)	TRANS	1520.4	1518.2	1516.1	1520.3	1495.1	1495.5	1494.6	1494.4	5 18
LVG RH-1 P	(T)	TRANS	308.9	306.2	304.9	308.0	256.1	256.6	256.9	255.0	5 19
ENT RH-1 P	(T)	TRANS	324.1	321.1	319.9	0.0	268.9	269.2	269.8	267.6	5 20

DATA PAGE NO. 6 AIR & GAS DATA - PLANT

AMBIENT AIR DB TEMP		TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 1
AIR ENT FD FAN T		HW	0.00	0.00	0.00	91.72	0.00	0.00	0.00	0.00	6 4
AIR LVG FD FAN T	A	09-028	126.8	129.3	130.5	126.3	129.0	142.1	131.3	134.5	7 2
AIR LVG FD FAN T	B	09-029	132.9	135.3	135.1	127.5	132.3	142.5	133.5	134.5	7 3
AIR ENT AH T	RA	20-017	179.2	173.1	171.7	157.5	161.8	179.5	169.7	181.3	6 2
AIR ENT AH T	RB	20-018	156.8	158.2	156.2	148.5	153.2	166.0	160.2	162.1	6 3
AIR ENT AH T	LA	20-025	184.8	185.1	177.8	173.3	172.8	195.5	180.9	192.0	13 25
AIR ENT AH T	LB	20-029	169.6	168.1	154.3	146.2	152.6	184.0	164.2	183.3	13 26
AIR LVG AH T	R	HW	536.4	544.7	534.9	562.6	533.5	532.8	537.2	529.4	6 6
AIR LVG AH T	L	HW	537.1	538.6	541.2	560.0	529.1	540.2	537.2	541.5	6 7
BRN SEC AIR T		08-002	527.9	532.0	535.5	569.0	516.7	526.3	529.7	521.7	14 2
BRN SA/GR T		08-001	510.6	537.0	529.2	557.3	479.8	510.9	513.8	524.2	14 3
OFA TEMP		09-002	520.1	528.2	523.9	538.0	466.0	518.3	509.3	516.3	14 4
GAS LVG AH T	RA	20-019	291.8	297.9	299.3	293.1	308.5	291.7	301.0	289.9	6 10
GAS LVG AH T	RB	20-020	275.2	281.2	283.1	282.6	286.3	275.0	279.8	272.5	6 11
GAS LVG AH T	LA	20-027	267.2	270.7	268.6	277.3	271.0	278.3	268.7	274.7	13 27
GAS LVG AH T	LB	20-024	276.6	280.0	277.5	287.1	278.7	285.4	276.6	283.0	13 28
GAS LVG RH PS T		AVE	619.1	621.7	624.8	636.7	593.6	609.8	605.5	607.6	13 17
GAS LVG SH PS T		AVE	587.1	595.4	558.6	598.2	565.5	549.7	550.3	533.2	13 19
GR GAS TEMP	A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 8
GR GAS TEMP	B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 9
O2 LVG ECON	R	11-172	2.3771	2.7519	2.7098	2.3393	3.7367	2.6021	2.7821	3.2002	6 20
O2 LVG ECON	L	11-170	1.7189	2.0418	2.9125	2.3335	3.5338	2.5064	1.9027	2.1311	6 21
O2 IN SEC AIR		06-254	19.69	16.27	16.74	15.81	19.50	19.82	20.03	16.60	13 29
ACCUREX NOX	PPM	06-553	0.0	0.0	0.0	256.2	0.0	0.0	0.0	0.0	13 9
ACCUREX SOX	PPM	06-555	0.0	0.0	0.0	1145.5	0.0	0.0	0.0	0.0	13 10
ACCUREX CO	PPM	06-425	0.00	0.00	0.00	37.19	0.00	0.00	0.00	0.00	13 11
ACCUREX O2	%	06-554	0.0000	0.0000	0.0000	3.3030	0.0000	0.0000	0.0000	0.0000	13 12
BRN SEC AIR P	IN WG	06-250	15.48	14.99	16.49	13.37	12.51	13.05	14.49	13.42	14 5
BRN GAS REC P	IN WG	06-252	14.96	14.80	16.25	13.36	12.24	12.62	13.89	13.14	14 6
FURNACE GAS P	IN WG	08-100	13.18	12.73	13.62	12.05	11.44	10.66	11.03	10.50	14 7
BAROMETRIC P	IN HG	PB	0.00	0.00	0.00	29.29	0.00	0.00	0.00	0.00	6 29
REL HUMIDITY	%	TST	0.0000	0.0000	0.0000	7.7777	0.0000	0.0000	0.0000	0.0000	6 30

TEST NO.	46T	47T	49T	12B	37T	42T	38T	35T	
TEST SEQ. NO.	1	2	3	4	5	6	7	8	
DATE	03/03/91	03/03/91	03/04/91	04/16/92	02/25/91	02/27/91	02/25/91	02/25/92	
TIME START	1038	1333	1101	2321	2058	0044	2230	0029	
TIME END	1202	1426	1154	0103	2127	0301	2302	0132	
LOAD MW	83	82	82	83	70	71	70	70	

DATA PAGE NO. 7 AIR & GAS DATA - B&W

AMBIENT AIR TEMP	TC	39.92	43.18	43.75	48.34	0.00	0.00	0.00	0.00	7	1
AIR LVG FD FAN T A	TC	130.3	132.7	134.2	129.4	132.2	145.6	134.5	138.1	7	6
AIR LVG FD FAN T B	TC	135.8	138.3	138.1	130.0	134.9	145.4	136.2	137.5	7	7
AIR ENT AH (T)	GRID	173.1	171.4	167.4	156.1	163.2	182.5	169.7	181.8	7	4
GAS LVG AH (T)	GRID	275.0	279.3	278.3	278.2	280.4	278.9	277.0	276.8	7	10
GAS LVG ECON (T) L	GRID	637.2	639.9	641.5	652.8	612.7	626.2	623.8	625.1	7	14
GAS LVG ECON (T) R	GRID	594.9	602.1	576.6	618.5	577.1	577.9	567.9	554.8	7	15
GAS TEMP LVG GR FAN	GRID	591.7	594.3	579.6	595.0	559.4	579.3	574.3	573.5	13	7
O2 LVG ECON (T) L	GRID	2.5674	2.6230	3.6577	3.3407	4.1268	3.3778	2.8359	2.8318	7	20
O2 LVG ECON (T) R	GRID	2.7608	3.0360	3.4924	3.1339	3.6841	3.1856	2.8172	3.2116	7	21
CO LVG ECON (T) L	GRID	128.6	109.9	99.2	67.1	49.5	111.5	103.3	116.8	13	5
CO LVG ECON (T) R	GRID	131.2	134.5	135.3	61.1	47.5	103.0	87.8	85.2	13	6
CO2 LVG ECON (T) L	GRID	16.39	16.11	15.52	15.56	15.27	15.73	16.19	16.45	7	22
CO2 LVG ECON (T) R	GRID	15.73	15.41	15.15	15.48	15.24	15.22	15.87	15.86	7	23
NOX LVG ECON (T) L	GRID	235.5	223.1	206.6	262.1	460.0	222.6	241.2	246.3	7	24
NOX LVG ECON (T) R	GRID	277.9	254.8	243.9	312.0	480.7	243.3	264.5	285.3	7	25
O2 LVG AH (T)	GRID	3.8400	4.0000	4.8000	4.7200	5.0000	4.5000	4.0000	4.1000	13	1
CO2 LVG AH (T)	GRID	32.46	31.35	30.59	23.48	32.22	38.94	31.58	37.10	13	3
O2 LVG GR FAN (T)	GRID	18.60	18.55	18.52	0.00	18.70	18.79	18.70	18.62	13	4
DRY BULB TEMP (T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7	26
WET BULB TEMP (T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7	27

DATA PAGE NO. 8 FW HTR TEMPERATURES F (C) - PLANT

FW HTR E EXT T	HW	681.3	679.6	681.0	683.4	649.0	654.4	643.6	650.9	8	1
FW HTR E LVG T	HW	424.4	424.0	423.9	429.2	409.7	412.1	410.2	410.4	8	5
FW HTR E ENT T	HW	356.6	356.3	356.1	361.2	344.7	347.8	345.7	346.1	8	7
FW HTR E DRN T	HW	372.6	370.3	371.5	377.1	357.6	359.8	358.2	358.2	8	13

DATA PAGE NO. 9 FW HTR TEMPERATURES F (C) - B&W

SSH PEND IN LEG	1	10-017	855.5	838.2	847.0	846.7	878.6	843.5	842.6	854.9	9	17
SSH PEND IN LEG	2	10-018	876.7	864.0	872.5	861.3	891.9	878.9	870.9	887.7	9	18
SSH PEND IN LEG	3	10-019	874.6	867.8	877.9	858.5	882.3	886.0	874.8	889.1	9	19
SSH PEND IN LEG	4	10-020	883.8	877.2	894.3	862.0	886.8	891.8	889.4	897.8	9	20
SSH PEND IN LEG	5	10-021	876.9	865.8	894.4	844.3	872.3	881.3	880.4	883.8	9	21
SSH PEND IN LEG	6	10-033	882.6	880.2	900.4	869.1	879.4	892.4	880.7	877.5	9	22
SSH PEND IN LEG	7	10-034	877.4	896.2	891.1	896.0	883.8	897.6	872.1	867.5	9	23
SSH PEND IN LEG	8	10-035	870.3	882.6	880.9	884.4	882.5	885.0	877.1	874.4	9	24
SSH PEND IN LEG	9	10-036	873.9	881.1	872.3	878.9	891.1	880.0	878.5	876.8	9	25
SSH PEND IN LEG	10	10-037	861.6	861.6	833.5	852.5	881.3	853.1	849.4	844.4	9	26
RH PEND IN LEG	1	09-049	942.2	941.5	952.4	945.1	898.9	944.2	916.3	931.9	8	17
RH PEND IN LEG	2	09-050	936.2	941.9	944.6	942.0	889.6	936.7	903.9	917.6	8	18

TEST NO.		46T	47T	49T	12B	37T	42T	38T	35T	
TEST SEQ. NO.		1	2	3	4	5	6	7	8	
DATE		03/03/91	03/03/91	03/04/91	04/16/92	02/25/91	02/27/91	02/25/91	02/25/92	
TIME START		1038	1333	1101	2321	2058	0044	2230	0029	
TIME END		1202	1426	1154	0103	2127	0301	2302	0132	
LOAD MW		83	82	82	83	70	71	70	70	
DATA PAGE NO. 9	**FW HTR TEMPERATURES F (C) - B&W**									
RH PEND IN LEG 3	09-051	936.2	937.9	945.5	939.8	892.7	937.4	908.8	923.7	8 19
RH PEND IN LEG 4	09-052	935.4	939.1	943.7	939.1	890.8	935.7	905.2	919.5	8 20
RH PEND IN LEG 5	09-053	936.9	903.4	916.9	0.0	903.6	902.2	897.3	922.0	8 21
RH PEND IN LEG 6	10-001	956.6	954.3	972.8	964.3	913.7	965.9	933.3	950.5	8 22
RH PEND IN LEG 7	10-002	925.4	920.7	942.6	930.3	888.9	933.3	911.2	929.7	8 23
RH PEND IN LEG 8	10-003	934.3	923.2	942.2	925.6	898.4	932.7	920.5	942.4	8 24
RH PEND IN LEG 9	10-004	941.9	941.3	951.9	944.9	899.1	944.0	915.0	931.0	8 25
RH PEND IN LEG 10	10-005	913.3	879.1	894.1	869.6	886.5	877.6	871.4	893.0	8 26
RH INTM HND HOLE R	10-038	937.8	938.2	948.3	943.7	894.2	940.6	914.8	932.0	8 27
RH INTM HND HOLE L	10-039	851.9	828.8	840.0	823.0	829.0	823.8	822.5	833.9	8 28
PSH OUT LEG T	09-017	777.8	785.7	748.0	777.1	752.5	761.4	755.8	753.4	14 11
PSH OUT LEG T	09-018	777.0	785.0	751.7	776.1	753.8	765.2	759.7	760.4	14 12
PSH OUT LEG T	09-019	732.6	747.8	688.0	742.3	729.2	706.0	693.6	698.8	14 13
PSH OUT LEG T	09-020	747.3	760.2	701.1	753.1	739.4	716.8	708.6	711.5	14 14
PSH OUT LEG T	09-021	765.9	776.5	732.9	768.3	748.2	747.3	734.9	738.1	14 15
PSH OUT LEG T	09-022	776.3	782.6	751.0	775.5	755.3	764.0	753.0	755.7	14 16
PSH OUT LEG T	09-023	756.4	765.3	721.9	753.7	740.0	736.0	729.8	732.5	14 17
PSH OUT LEG T	09-024	782.1	790.5	763.5	781.7	762.4	778.7	764.4	772.3	14 18
PSH OUT LEG T	09-025	752.6	767.3	728.0	752.9	738.3	743.1	730.8	738.3	14 19
PSH OUT LEG T	09-026	774.5	783.2	757.5	769.2	757.9	770.1	754.6	764.5	14 20
PSH OUT LEG T	09-027	787.2	797.0	769.2	782.5	766.4	779.8	763.1	772.8	14 21
DATA PAGE NO. 10	**PULVERIZER COAL AND PA FLOW**									
CYC A COAL FLOW KLB	05-104	23.20	22.96	21.40	25.57	30.04	19.28	20.12	19.23	10 1
CYC B COAL FLOW KLB	07-110	-.0120	-.0120	-.0120	-.0120	-.0120	-.0120	-.0120	-.0120	10 2
CYC C COAL FLOW KLB	09-110	23.23	22.98	21.40	25.61	30.07	19.29	20.12	19.25	10 3
CYC A SEC AIR FLOW %	06-170	211.4	209.2	203.7	229.8	269.1	169.1	173.0	176.2	10 16
CYC B SEC AIR FLOW %	08-170	1.5315	1.7057	3.1435	4.0242	3.2830	2.2298	2.5800	1.0951	10 17
CYC C SEC AIR FLOW %	10-170	225.3	225.4	216.2	226.5	272.0	185.0	191.6	192.0	10 18
CYC A SEC AIR T	20-002	496.5	505.2	489.5	514.2	505.9	484.0	499.3	477.3	11 1
CYC B SEC AIR T	20-003	528.3	534.8	537.7	557.8	528.0	527.4	532.8	528.5	11 2
CYC C SEC AIR T	20-004	497.8	501.3	501.6	523.6	493.4	499.9	498.6	502.8	11 3
PULV COAL FLOW KLB	06-314	23.21	23.21	25.86	21.20	.41	22.26	23.25	23.23	10 4
PULV PA FLOW	06-275	52.11	52.40	53.95	50.52	58.98	52.43	54.66	54.26	10 19
PULV INLET T	09-034	484.0	489.6	493.1	515.6	112.6	481.7	477.6	484.8	11 7
PULV OUTLET T	09-040	145.7	149.3	141.0	155.5	102.6	138.5	130.0	140.7	11 8
DATA PAGE NO. 11	**PULVERIZER INLET TEMP AND PA DIFF**									
PULV DIFF P IN WG	06-274	11.86	11.48	12.43	11.66	1.30	8.31	8.56	8.53	11 9
PULV AMPS	06-276	240.4	236.4	260.7	230.7	15.2	224.2	225.0	227.0	11 10
PULV PA FAN AMPS	06-277	61.41	61.56	74.74	52.29	15.04	46.00	53.42	53.62	11 11

TEST NO.	46T	47T	49T	12B	37T	42T	38T	35T
TEST SEQ. NO.	1	2	3	4	5	6	7	8
DATE	03/03/91	03/03/91	03/04/91	04/16/92	02/25/91	02/27/91	02/25/91	02/25/92
TIME START	1038	1333	1101	2321	2058	0044	2230	0029
TIME END	1202	1426	1154	0103	2127	0301	2302	0132
LOAD MW	83	82	82	83	70	71	70	70

DATA PAGE NO. 11 PULVERIZER INLET TEMP AND PA DIFF

ROT CLASS AMPS	06-278	41.32	40.04	41.25	46.33	20.32	38.23	40.23	38.59	11 12
ROT CLASS RPM	06-270	140.8	141.0	140.1	156.6	56.6	139.9	140.1	140.6	11 13
ROT CLASS DP IN WG	06-345	.3791	.3670	.3884	.4564	.0665	.2856	.2855	.2687	11 14
COAL SILO LEVEL	06-310	81.20	52.29	94.22	55.59	92.98	42.99	90.09	13.32	11 15
FLAME INTENSITY #1 %	06-279	105.9	106.2	106.1	105.9	33.2	106.1	106.1	101.4	11 16
FLAME INTENSITY #2 %	06-295	105.3	105.4	105.4	105.1	32.2	106.0	105.5	100.2	11 17
FLAME INTENSITY #3 %	06-296	106.1	105.9	106.2	106.1	28.8	106.2	101.0	99.3	11 18
FLAME INTENSITY #4 %	06-297	105.7	105.8	105.7	105.4	33.4	106.1	106.0	105.8	11 19

DATA PAGE NO. 12 OPERATOR POSITIONS %

RH SP VLV POS	15-077	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	12 1
SH SP VLV POS R	13-190	33.89	62.40	23.95	49.86	34.56	38.20	16.66	23.96	12 3
SH SP VLV POS L	13-191	36.94	35.96	29.69	31.91	32.51	28.47	33.62	36.71	12 4
GR DMPR DEMAND	16-044	68.2	57.0	41.7	51.4	99.2	100.0	98.6	93.1	12 9
RECIRC AIR DMPR POS	12-176	16.72	15.53	13.98	13.69	11.00	13.30	12.85	14.91	12 13
SH PASS DMPR POS	14-180	28.09	29.30	7.80	20.13	20.06	.06	.06	.04	12 15
RH PASS DMPR POS	14-180	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	12 16
OVRFIRE AIR DMPR POS	06-115	41.08	43.07	47.92	0.00	10.10	40.05	32.01	34.21	12 17
BRN SEC AIR DMPR POS	06-286	27.18	17.04	21.04	15.10	18.07	28.06	34.23	22.70	12 18
HOT PRI AIR DMPR POS	06-556	100.0	100.0	100.0	100.0	0.0	99.8	100.0	100.0	12 19
BRN GAS REC DMPR POS	06-324	0.00	30.02	30.02	29.32	0.00	0.00	0.00	35.93	12 20

DATA PAGE NO. 15 MISCELLANEOUS

GAS LVG SH PASS 1A	08-003	-395.0	-394.2	-355.1	-407.9	-355.4	-315.2	-322.3	-311.1	15 1
GAS LVG SH PASS 1B	08-004	592.1	596.5	558.8	599.3	571.6	551.6	558.3	533.7	15 2
GAS LVG SH PASS 1C	08-005	599.1	608.5	567.6	617.2	576.1	556.5	561.1	537.9	15 3
GAS LVG SH PASS 1D	08-006	614.2	631.3	580.2	632.8	586.0	572.1	564.1	553.8	15 4
GAS LVG SH PASS 2A	08-017	558.5	562.5	530.1	563.3	538.4	522.7	526.0	509.1	15 5
GAS LVG SH PASS 2B	08-018	574.2	574.6	545.0	581.1	552.8	532.4	538.8	523.6	15 6
GAS LVG SH PASS 2C	08-019	571.7	579.1	546.6	579.4	549.0	537.1	536.9	520.4	15 7
GAS LVG SH PASS 2D	08-020	608.1	622.0	580.5	623.8	575.2	568.5	563.5	549.3	15 8
GAS LVG SH PASS 3A	08-021	585.2	592.5	551.5	593.5	567.6	548.3	543.5	537.3	15 9
GAS LVG SH PASS 3B	08-022	590.7	602.5	567.4	601.2	578.1	557.8	562.9	535.8	15 10
GAS LVG SH PASS 3C	08-023	576.7	584.6	558.5	590.2	560.4	549.6	547.9	530.8	15 11
GAS LVG SH PASS 3D	08-024	-512.0	-519.7	-464.7	-516.7	-455.8	-429.8	-434.5	-423.2	15 12
GAS LVG RH PASS 4A	08-033	613.3	606.5	614.9	611.1	588.0	599.2	594.1	594.4	15 13
GAS LVG RH PASS 4B	08-034	631.0	630.0	634.5	636.5	599.4	613.5	619.4	625.0	15 14
GAS LVG RH PASS 4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15
GAS LVG RH PASS 4D	08-036	644.6	656.2	645.1	690.5	618.7	640.3	629.6	631.4	15 16
GAS LVG RH PASS 5A	08-049	602.6	597.3	601.9	602.7	581.6	584.0	590.8	592.5	15 17
GAS LVG RH PASS 5B	08-050	612.9	613.8	618.8	626.8	588.6	599.0	604.7	605.3	15 18

TEST NO.		46T	47T	49T	12B	37T	42T	38T	35T
TEST SEQ. NO.		1	2	3	4	5	6	7	8
DATE		03/03/91	03/03/91	03/04/91	04/16/92	02/25/91	02/27/91	02/25/91	02/25/92
TIME START		1038	1333	1101	2321	2058	0044	2230	0029
TIME END		1202	1426	1154	0103	2127	0301	2302	0132
LOAD MW		83	82	82	83	70	71	70	70

DATA PAGE NO. 15 MISCELLANEOUS

GAS LVG RH PASS	5C	08-051	619.2	625.3	629.2	644.8	589.8	616.0	606.7	609.5	15 19
GAS LVG RH PASS	5D	08-052	610.1	618.1	619.4	637.9	583.1	608.4	596.0	598.3	15 20
GAS LVG RH PASS	6A	08-053	609.2	608.8	614.0	614.9	586.5	598.3	595.5	601.4	15 21
GAS LVG RH PASS	6B	08-054	625.2	627.3	635.1	641.8	601.6	619.2	614.4	616.3	15 22
GAS LVG RH PASS	6C	08-055	618.9	624.8	631.6	643.4	593.3	615.4	603.9	605.3	15 23
GAS LVG RH PASS	6D	08-056	623.6	631.1	627.8	653.7	598.5	614.7	605.9	603.8	15 24
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W			34.00	35.00	37.00	80.00	38.00	39.00	40.00	41.00	15 28

RB-369 16 Jun 1992 15:15:23

TEST NO.	39T	1A	20A	2BM	15A	44T	48T	30T	43T
TEST SEQ. NO.	9	10	11	12	13	14	15	16	17
DATE	02/26/91	03/31/91	05/01/92	05/06/92	04/23/92	02/27/91	03/03/91	02/23/91	02/27/91
TIME START	0005	1435	0115	1636	2241	2103	2206	0859	0420
TIME END	0201	1642	0157	1809	0045	2124	2349	0930	0532
LOAD MW	70	68	60	60	59	66	57	56	55
FUEL	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR

39T AVG SCANS 84-->94 : 70 MW : 11.5 TPH REBRN : W/ GR TO BRNRS
1A AVG SCANS 40-->51 : 67 MW : NO RBRN : ACUREX TRAV
20A AVG SCANS 23-->26 : 60 MW : 8.2 TPH : .944 REBRN STOIC
2BM AVG SCANS 37-->45 : 60 MW : AFTER RAMP DOWN IN AUTO
15A AVG SCANS 41-->46 : 59 MW : 8.0 TPH : 160 RPM : LOW STOIC
44T AVG SCANS 127-->128: 65 MW : 10 TPH REBRN : MIN GR TO BRNRS
48T AVG SCANS 77-->86 : 57 MW : 7.9 TPH REBRN : MIN GR TO BRNRS
30T AVG SCANS 7 --> 9 : 55 MW : NO REBURN
43T AVG SCANS 37-->43 : 55 MW : 8 TPH REBRN : MIN GR TO BRNRS

DATA PAGE NO. 2 FLOWS MLB/HR (MT/HR)

LOAD MW		20-005	70.34	68.49	59.78	60.31	58.72	65.85	56.71	55.67	55.19	2 1
MAIN STEAM FLOW		03-033	436.7	420.4	388.7	394.3	382.6	400.8	349.6	344.9	343.2	2 2
1ST STG STM FLW		CALC	453.8	441.0	386.4	393.9	381.0	425.9	367.6	363.9	360.2	2 23
FW FLOW		12-170	460.5	446.4	400.4	409.3	392.3	433.2	372.3	368.3	364.9	2 3
BLOW DOWN FLOW		EST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 4
RH SPRAY FLOW		14-192	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 5
SH SPRAY FLOW	L	17-052	1.7079	2.4384	0.0000	0.0000	0.0000	0.0000	.9944	0.0000	0.0000	2 7
SH SPRAY FLOW	R	17-056	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 8
GR FAN AMPS	A	16-181	40.18	37.17	.08	.08	39.02	38.87	41.17	39.48	40.70	2 12
GR FAN AMPS	B	16-183	-.02	-.02	45.37	47.07	-.02	-.02	-.02	-.02	-.02	2 13
GR FAN BUS VOLT		EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2 14
TOTAL GR FLOW		CALC	235.3	203.9	281.0	277.2	217.1	215.6	240.9	221.1	234.5	2 24
GR TO SEC AIR		06-932	0.00	-84.26	4.45	10.67	12.51	0.00	5.52	0.00	0.00	2 25
GR TO SEC AIR		CALC	1.55	0.00	4.11	11.73	12.90	1.69	4.37	2.35	7.70	2 26
GR TO FURN		CALC	233.7	203.9	276.9	266.4	204.2	213.9	236.5	218.8	226.8	2 27
OFA AIR FLOW		06-931	101.2	32.1	104.8	94.2	98.9	22.2	67.4	26.0	66.7	2 28
TMP AIR FLOW		CALC	0.00	24.43	73.27	69.26	42.12	15.66	16.87	44.66	8.05	14 10
SEC AIR FLOW		06-320	53.51	30.26	55.56	44.38	35.45	54.93	45.89	37.70	41.25	2 29
1st STG PRESS		18-128	619.7	601.5	523.5	534.2	515.8	579.9	496.6	491.3	485.9	2 19
OIL FLOW 2A		05-100	.0017	.0017	.0023	.0023	.0017	.0017	.0024	.0017	.0022	2 20
OIL FLOW 2B		07-100	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0017	2 21
OIL FLOW 2C		09-100	.0016	.0016	.0016	.0016	0.0000	.0016	.0016	.0019	.0016	2 22
% PWDR RVR BASN COAL		USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 30
CYCLONE STOIC		CALC	1.1888	1.1607	.9912	1.0143	1.0378	1.0732	1.0697	1.1409	1.1073	4 20
REBRN WB STOIC		CALC	.6	100.0	.8	.7	.6	100.0	.7	100.0	.7	4 21
REBRN STOIC		CALC	.9326	1.1599	.9439	.9788	.9202	1.0746	.9623	1.2056	.9766	4 22
LVG FURN STOIC		CALC	1.1371	1.2268	1.1854	1.1932	1.1545	1.1222	1.1292	1.2706	1.1460	4 23

TEST NO.		39T	1A	20A	28M	15A	44T	48T	30T	43T	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		02/26/91	03/31/91	05/01/92	05/06/92	04/23/92	02/27/91	03/03/91	02/23/91	02/27/91	
TIME START		0005	1435	0115	1636	2241	2103	2206	0859	0420	
TIME END		0201	1642	0157	1809	0045	2124	2349	0930	0532	
LOAD MW		70	68	60	60	59	66	57	56	55	
DATA PAGE NO. 2 FLOWS MLB/HR (MT/HR)											
LVG ECON STOIC		CALC	1.1514	1.2416	1.2016	1.2091	1.1710	1.1374	1.1467	1.2883	1.1640	4 24
DATA PAGE NO. 3 FLUID TEMPERATURES F (C) - PLANT											
SSH OUT T	L	15-152	996.5	996.2	991.2	989.1	990.0	983.8	997.1	974.1	969.2	3 1
SSH OUT T	R	15-150	986.1	996.3	978.0	996.3	983.5	997.8	984.9	975.9	995.3	3 2
SSH OUT AVE T		13-160	993.0	996.8	983.6	991.5	986.4	993.0	989.0	974.9	983.2	14 1
LVG SH ATTMP T	L	13-164	703.1	739.3	732.1	730.6	724.6	732.6	718.5	730.3	709.7	3 8
LVG SH ATTMP T	R	13-162	745.7	746.3	761.7	744.5	756.2	738.8	743.6	747.3	731.6	3 9
PRI SH OUT T	L	HW	716.8	738.2	727.9	727.3	722.2	728.9	723.5	729.7	707.3	3 10
PRI SH OUT T	R	HW	742.9	748.0	757.5	744.8	752.4	747.3	738.7	744.9	732.0	3 11
ECON H2O OUT T	L	HW	499.3	494.5	495.2	492.2	488.7	498.0	488.2	491.4	484.9	3 27
ECON H2O OUT T	R	HW	464.6	455.3	458.5	458.0	454.0	464.5	454.7	458.9	453.7	3 28
ECON H2O IN T		20-007	413.4	410.5	398.9	400.4	397.8	407.3	394.8	392.9	392.4	3 5
RH SPRAY H2O T		HW	281.9	281.8	273.4	274.8	268.8	279.0	267.4	267.9	268.5	3 7
LVG RH T		14-150	974.7	964.6	983.5	961.3	970.7	973.3	964.2	952.5	943.3	3 12
ENT RH T		CALC	639.1	642.6	627.0	634.8	627.3	639.9	625.9	612.0	622.5	3 16
COLD RH T		20-006	647.2	649.5	636.5	642.7	636.2	647.4	635.9	619.9	630.9	3 18
DATA PAGE NO. 4 FLUID TEMPERATURES F (C) - B&W											
AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 18
GAS LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 19

TEST NO.		39T	1A	20A	28M	15A	44T	48T	30T	43T		
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17		
DATE		02/26/91	03/31/91	05/01/92	05/06/92	04/23/92	02/27/91	03/03/91	02/23/91	02/27/91		
TIME START		0005	1435	0115	1636	2241	2103	2206	0859	0420		
TIME END		0201	1642	0157	1809	0045	2124	2349	0930	0532		
LOAD MW		70	68	60	60	59	66	57	56	55		
DATA PAGE NO. 5	**FLUID PRESSURES PSIG (KG/CM2)**											
TURB THROT P		03-170	1449.0	1450.0	1449.5	1450.1	1449.7	1450.8	1449.9	1450.4	1450.0	5 1
SEC SH OUT P		CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 2
DRUM PRESS		04-013	1504.4	1502.2	1487.5	1490.9	1490.8	1498.4	1486.5	1486.2	1484.1	5 3
LVG RH PRESS		15-102	254.1	245.4	215.9	218.6	211.8	237.9	204.6	202.4	199.2	5 4
ENT RH PRESS		15-100	268.5	259.2	228.8	230.9	222.6	253.7	215.1	213.4	211.3	5 5
FW HTR E EXT P		20-035	257.4	249.2	219.0	221.2	214.4	242.0	206.7	204.2	202.0	5 6
FW HTR E EXT P		TRANS	260.0	251.7	221.2	223.7	217.1	243.5	209.3	206.3	203.7	5 7
SEC SH OUT P	(T)	TRANS	1462.9	1463.0	1459.1	1459.9	1459.6	1464.6	1460.0	1458.9	1460.5	5 17
DRUM PRESS	(T)	TRANS	1494.6	1493.2	1481.9	1483.2	1480.9	1491.6	1478.3	1476.8	1476.9	5 18
LVG RH-1 P	(T)	TRANS	256.9	248.6	219.2	221.6	214.9	240.8	207.4	204.7	202.2	5 19
ENT RH-1 P	(T)	TRANS	269.8	0.0	0.0	0.0	0.0	252.8	217.9	215.2	212.5	5 20
DATA PAGE NO. 6	**AIR & GAS DATA - PLANT**											
AMBIENT AIR DB TEMP		TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 1
AIR ENT FD FAN T		HW	0.0	0.0	105.2	101.0	98.2	0.0	0.0	0.0	0.0	6 4
AIR LVG FD FAN T	A	09-028	131.3	132.9	138.5	138.2	136.2	144.8	139.0	139.9	145.7	7 2
AIR LVG FD FAN T	B	09-029	133.5	133.8	141.6	141.8	141.4	146.9	143.1	140.9	146.3	7 3
AIR ENT AH T	RA	20-017	169.7	137.3	144.8	146.5	145.9	184.3	177.9	200.9	178.9	6 2
AIR ENT AH T	RB	20-018	160.2	136.2	144.0	144.2	143.9	170.5	176.7	183.4	178.6	6 3
AIR ENT AH T	LA	20-025	180.9	135.2	141.4	141.2	139.1	197.0	188.2	241.5	198.4	13 25
AIR ENT AH T	LB	20-029	164.2	136.8	142.5	142.0	140.0	185.3	173.1	216.5	184.9	13 26
AIR LVG AH T	R	HW	537.2	583.5	552.1	545.3	536.8	520.7	508.0	506.9	515.3	6 6
AIR LVG AH T	L	HW	537.2	573.6	555.2	542.8	543.5	532.7	524.2	509.2	514.6	6 7
BRN SEC AIR T		08-002	529.7	571.7	556.1	547.2	544.2	519.7	504.6	497.0	506.3	14 2
BRN SA/GR T		08-001	513.8	540.0	546.7	541.0	534.4	507.8	494.8	472.0	497.4	14 3
OFA TEMP		09-002	509.3	309.7	508.8	501.5	496.1	475.1	490.9	434.4	497.7	14 4
GAS LVG AH T	RA	20-019	301.0	306.6	300.0	301.1	292.8	287.0	293.0	274.0	292.0	6 10
GAS LVG AH T	RB	20-020	279.8	288.0	280.7	280.8	272.1	269.2	268.0	256.5	267.9	6 11
GAS LVG AH T	LA	20-027	268.7	271.9	276.1	277.1	267.5	271.1	262.3	269.5	272.1	13 27
GAS LVG AH T	LB	20-024	276.6	274.9	280.2	280.7	269.3	279.2	269.7	281.5	278.7	13 28
GAS LVG RH PS T		AVE	605.5	635.7	609.2	592.9	594.9	601.7	572.9	582.2	570.7	13 17
GAS LVG SH PS T		AVE	550.3	616.1	547.1	535.1	528.7	529.4	516.9	531.3	521.0	13 19
GR GAS TEMP	A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 8
GR GAS TEMP	B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 9
O2 LVG ECON	R	11-172	2.7821	3.9540	3.0178	3.0364	2.5929	3.5950	2.4443	5.3983	2.5777	6 20
O2 LVG ECON	L	11-170	1.9027	3.0975	2.2382	2.6082	1.9815	3.2806	1.9792	4.6481	2.2641	6 21
O2 IN SEC AIR		06-254	20.03	0.00	19.64	17.48	16.12	19.99	18.98	19.59	17.77	13 29
ACCUREX NOX	PPM	06-553	0.0	73.1	280.2	263.3	229.2	0.0	0.0	0.0	0.0	13 9
ACCUREX SOX	PPM	06-555	0.0	90.9	1188.3	1195.0	1186.6	0.0	0.0	0.0	0.0	13 10
ACCUREX CO	PPM	06-425	0.0	-9.6	64.3	137.1	59.0	0.0	0.0	0.0	0.0	13 11
ACCUREX O2	%	06-554	0.00	11.65	4.24	4.10	4.63	0.00	0.00	0.00	0.00	13 12
BRN SEC AIR P	IN WG	06-250	14.49	10.71	14.13	13.86	10.61	15.07	10.15	10.33	9.54	14 5
BRN GAS REC P	IN WG	06-252	13.89	10.58	13.42	13.45	10.34	14.43	9.69	10.05	9.16	14 6

TEST NO.		39T	1A	20A	28M	15A	44T	48T	30T	43T	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		02/26/91	03/31/91	05/01/92	05/06/92	04/23/92	02/27/91	03/03/91	02/23/91	02/27/91	
TIME START		0005	1435	0115	1636	2241	2103	2206	0859	0420	
TIME END		0201	1642	0157	1809	0045	2124	2349	0930	0532	
LOAD MW		70	68	60	60	59	66	57	56	55	
DATA PAGE NO. 6	**AIR & GAS DATA - PLANT**										
FURNACE GAS P	IN WG	08-100	11.03	10.63	9.10	9.45	8.43	11.09	7.39	9.12	7.17	14 7
BAROMETRIC P	IN HG	PB	0.00	0.00	28.97	29.56	29.30	0.00	0.00	0.00	0.00	6 29
REL HUMIDITY	%	TST	0.0000	0.0000	7.6229	7.6529	7.6823	0.0000	0.0000	0.0000	0.0000	6 30
DATA PAGE NO. 7	**AIR & GAS DATA - B&W**										
AMBIENT AIR TEMP		TC	0.00	39.97	65.63	67.20	44.81	0.00	39.00	0.00	0.00	7 1
AIR LVG FD FAN T	A	TC	134.5	136.4	142.1	141.7	139.8	148.2	142.7	143.8	149.2	7 6
AIR LVG FD FAN T	B	TC	136.2	136.9	144.8	144.8	144.6	149.8	146.2	144.1	149.2	7 7
AIR ENT AH	(T)	GRID	169.7	137.3	144.3	144.3	143.5	186.0	177.5	212.4	184.7	7 4
GAS LVG AH	(T)	GRID	277.0	276.0	276.7	277.8	268.7	273.6	270.3	270.6	274.4	7 10
GAS LVG ECON	(T) L	GRID	623.8	653.7	636.8	608.3	609.0	616.1	591.1	599.2	585.9	7 14
GAS LVG ECON	(T) R	GRID	567.9	658.4	576.8	575.9	559.9	557.1	539.1	551.4	546.4	7 15
GAS TEMP LVG GR FAN		GRID	574.3	0.0	579.8	570.4	565.9	570.4	554.6	523.7	553.3	13 7
O2 LVG ECON	(T) L	GRID	2.8359	4.1710	3.7104	3.9461	3.0948	2.6000	2.6164	4.8000	2.9870	7 20
O2 LVG ECON	(T) R	GRID	2.8172	4.1890	3.4064	3.0861	3.2445	2.6000	3.0141	4.8000	3.1090	7 21
CO LVG ECON	(T) L	GRID	103.3	101.2	90.7	111.6	113.5	79.1	98.9	93.3	95.2	13 5
CO LVG ECON	(T) R	GRID	87.8	71.4	77.1	86.8	114.4	81.7	92.9	76.1	101.8	13 6
CO2 LVG ECON	(T) L	GRID	16.19	14.29	14.80	14.66	15.63	14.84	16.32	14.28	16.11	7 22
CO2 LVG ECON	(T) R	GRID	15.87	14.72	14.65	14.47	15.19	15.13	15.56	14.00	15.28	7 23
NOX LVG ECON	(T) L	GRID	241.2	526.7	377.4	318.8	221.4	293.0	359.3	423.0	315.1	7 24
NOX LVG ECON	(T) R	GRID	264.5	517.9	0.0	0.0	134.7	294.0	353.6	423.0	319.7	7 25
O2 LVG AH	(T)	GRID	3.9500	5.3800	5.9300	5.2100	4.9600	3.8000	4.0000	5.0000	4.3000	13 1
CO2 LVG AH	(T)	GRID	31.6	1972.3	20.6	2605.6	22.8	34.1	31.6	38.4	35.5	13 3
O2 LVG GR FAN	(T)	GRID	18.70	4.25	0.00	5.21	0.00	18.22	18.57	18.33	18.84	13 4
DRY BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27
DATA PAGE NO. 8	**FW HTR TEMPERATURES F (C) - PLANT**										
FW HTR E EXT T		HW	643.6	647.2	634.2	639.9	632.5	646.0	630.7	616.2	629.0	8 1
FW HTR E LVG T		HW	410.2	409.0	398.0	398.8	403.9	406.4	393.6	390.8	391.4	8 5
FW HTR E ENT T		HW	345.7	344.7	335.9	336.3	333.2	342.9	329.2	329.6	330.2	8 7
FW HTR E DRN T		HW	358.2	357.4	346.6	356.4	343.3	353.9	339.3	339.0	339.4	8 13
DATA PAGE NO. 9	**FW HTR TEMPERATURES F (C) - B&W**										
SSH PEND IN LEG	1	10-017	842.6	885.6	843.5	861.4	846.4	870.2	861.8	856.9	848.1	9 17
SSH PEND IN LEG	2	10-018	870.9	895.7	866.2	884 0	871.8	891.5	880.2	881.5	885.2	9 18
SSH PEND IN LEG	3	10-019	874.8	886.9	872.3	879.0	879.4	887.6	869.3	879.3	898.2	9 19
SSH PEND IN LEG	4	10-020	889.4	895.0	882.7	882.1	888.3	898.4	872.3	883.4	910.2	9 20
SSH PEND IN LEG	5	10-021	880.4	884.7	864.9	866.4	867.1	895.4	860.8	873.9	902.9	9 21

TEST NO.	39T	1A	20A	28M	15A	44T	48T	30T	43T
TEST SEQ. NO.	9	10	11	12	13	14	15	16	17
DATE	02/26/91	03/31/91	05/01/92	05/06/92	04/23/92	02/27/91	03/03/91	02/23/91	02/27/91
TIME START	0005	1435	0115	1636	2241	2103	2206	0859	0420
TIME END	0201	1642	0157	1809	0045	2124	2349	0930	0532
LOAD MW	70	68	60	60	59	66	57	56	55

DATA PAGE NO. 9 FW HTR TEMPERATURES F (C) - B&W

SSH PEND IN LEG 6	10-033	880.7	898.4	873.2	886.4	876.9	901.0	866.2	881.5	907.8	9	22
SSH PEND IN LEG 7	10-034	872.1	896.8	865.6	893.7	874.5	885.8	867.0	880.2	895.1	9	23
SSH PEND IN LEG 8	10-035	877.1	890.0	867.8	888.0	876.4	872.4	873.2	874.1	877.7	9	24
SSH PEND IN LEG 9	10-036	878.5	891.2	876.8	879.8	877.0	873.8	881.4	871.7	860.8	9	25
SSH PEND IN LEG 10	10-037	849.4	874.3	861.1	843.1	843.5	848.6	860.0	841.9	817.2	9	26
RH PEND IN LEG 1	09-049	916.3	913.1	931.2	908.0	917.7	922.0	904.8	903.3	895.2	8	17
RH PEND IN LEG 2	09-050	903.9	904.8	917.2	895.3	903.6	918.4	887.6	895.2	889.7	8	18
RH PEND IN LEG 3	09-051	908.8	906.9	922.4	899.7	909.4	917.3	895.3	896.2	889.3	8	19
RH PEND IN LEG 4	09-052	905.2	904.7	918.3	895.9	905.4	916.7	890.5	894.7	888.0	8	20
RH PEND IN LEG 5	09-053	897.3	0.0	0.0	0.0	0.0	900.0	909.8	882.7	840.9	8	21
RH PEND IN LEG 6	10-001	933.3	931.0	951.6	929.9	939.3	936.4	924.5	925.8	914.8	8	22
RH PEND IN LEG 7	10-002	911.2	898.9	925.2	908.5	919.7	902.4	907.8	897.3	882.7	8	23
RH PEND IN LEG 8	10-003	920.5	905.4	936.8	909.3	927.5	909.4	920.3	900.6	871.1	8	24
RH PEND IN LEG 9	10-004	915.0	913.3	930.1	906.7	917.1	922.1	903.6	904.1	893.9	8	25
RH PEND IN LEG 10	10-005	871.4	887.7	897.5	853.3	879.0	882.6	883.2	863.2	827.4	8	26
RH INTM HND HOLE R	10-038	914.8	907.9	927.9	906.7	911.5	918.7	900.9	890.8	897.6	8	27
RH INTM HND HOLE L	10-039	822.5	831.9	831.7	804.2	824.3	833.4	821.1	811.1	787.9	8	28
PSH OUT LEG T	09-017	755.8	755.2	760.3	755.4	750.5	752.8	749.7	748.5	735.6	14	11
PSH OUT LEG T	09-018	759.7	753.3	764.0	756.2	758.6	750.9	749.8	747.6	739.2	14	12
PSH OUT LEG T	09-019	693.6	724.9	701.1	703.9	697.0	712.2	705.8	707.5	687.3	14	13
PSH OUT LEG T	09-020	708.6	733.3	715.6	717.4	709.3	720.9	718.5	719.1	699.3	14	14
PSH OUT LEG T	09-021	734.9	747.2	745.8	741.7	736.1	743.6	737.4	740.6	723.2	14	15
PSH OUT LEG T	09-022	753.0	757.7	764.1	757.7	753.0	755.7	751.5	753.2	737.2	14	16
PSH OUT LEG T	09-023	729.8	732.6	734.2	732.1	729.6	727.6	728.5	726.6	715.3	14	17
PSH OUT LEG T	09-024	764.4	762.5	777.4	763.9	770.5	760.2	756.8	759.1	748.9	14	18
PSH OUT LEG T	09-025	730.8	734.1	740.4	729.4	736.3	732.3	726.6	731.2	721.3	14	19
PSH OUT LEG T	09-026	754.6	754.8	768.8	748.4	762.0	760.1	748.8	753.5	742.7	14	20
PSH OUT LEG T	09-027	763.1	763.2	775.8	754.9	767.9	770.2	755.1	760.6	751.1	14	21

DATA PAGE NO. 10 PULVERIZER COAL AND PA FLOW

CYC A COAL FLOW KLB	05-104	20.12	28.23	17.00	16.52	16.64	28.28	16.82	24.40	16.46	10	1
CYC B COAL FLOW KLB	07-110	-.0120	-.0120	-.0120	-.0120	-.0120	-.0120	-.0120	-.0120	-.0120	10	2
CYC C COAL FLOW KLB	09-110	20.12	28.22	16.97	16.52	16.61	28.29	16.82	24.38	16.47	10	3
CYC A SEC AIR FLOW %	06-170	173.0	278.4	147.4	149.2	147.3	251.5	140.2	231.6	137.4	10	16
CYC B SEC AIR FLOW %	08-170	2.5800	4.3408	2.5341	3.9043	3.3802	2.4979	1.5716	3.6232	2.4518	10	17
CYC C SEC AIR FLOW %	10-170	191.6	280.8	146.9	148.9	146.9	253.3	156.3	228.3	156.2	10	18
CYC A SEC AIR T	20-002	499.3	551.0	506.7	504.7	496.1	480.4	472.6	462.4	476.2	11	1
CYC B SEC AIR T	20-003	532.8	560.2	544.4	537.4	531.4	516.2	507.2	496.0	512.0	11	2
CYC C SEC AIR T	20-004	498.6	539.2	518.5	510.1	506.6	488.3	480.9	461.8	483.1	11	3
PULV COAL FLOW KLB	06-314	23.25	.07	16.43	17.26	16.51	.07	15.95	.07	16.04	10	4
PULV PA FLOW	06-275	54.66	0.00	47.99	48.01	48.04	0.00	47.58	0.00	47.06	10	19
PULV INLET T	09-034	477.6	102.6	493.6	480.7	490.6	374.1	459.2	116.2	461.0	11	7
PULV OUTLET T	09-040	130.0	78.6	174.6	173.4	171.7	147.5	153.7	109.2	144.1	11	8

TEST NO.		39T	1A	20A	2BM	15A	44T	48T	30T	43T	
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17	
DATE		02/26/91	03/31/91	05/01/92	05/06/92	04/23/92	02/27/91	03/03/91	02/23/91	02/27/91	
TIME START		0005	1435	0115	1636	2241	2103	2206	0859	0420	
TIME END		0201	1642	0157	1809	0045	2124	2349	0930	0532	
LOAD MW		70	68	60	60	59	66	57	56	55	
DATA PAGE NO. 11 PULVERIZER INLET TEMP AND PA DIFF											
PULV DIFF P IN WG	06-274	8.5576	-.0063	6.0631	7.2382	6.5401	-.1224	6.1649	-.1442	5.4064	11 9
PULV AMPS	06-276	225.0	-.1	195.5	208.4	201.5	-.1	199.2	0.0	195.5	11 10
PULV PA FAN AMPS	06-277	53.42	-.05	37.15	34.08	30.53	-.06	35.29	-.05	30.41	11 11
ROT CLASS AMPS	06-278	40.23	.03	44.01	44.00	44.63	38.49	41.30	38.97	38.00	11 12
ROT CLASS RPM	06-270	140.1	-.3	162.3	160.1	162.9	140.9	161.7	140.2	140.1	11 13
ROT CLASS DP IN WG	06-345	.2855	-.0178	.3131	.3500	.3301	.2480	.3152	.3122	.2252	11 14
COAL SILO LEVEL	06-310	90.09	66.23	21.84	81.23	20.92	90.82	40.19	33.97	34.59	11 15
FLAME INTENSITY #1 %	06-279	106.1	3.5	106.1	106.2	106.1	.9	104.2	5.5	106.1	11 16
FLAME INTENSITY #2 %	06-295	105.5	2.4	105.8	105.5	105.7	1.0	105.4	1.2	94.9	11 17
FLAME INTENSITY #3 %	06-296	101.0	2.0	106.2	106.1	0.0	.9	106.1	.8	103.1	11 18
FLAME INTENSITY #4 %	06-297	106.0	3.2	105.9	105.7	97.8	.9	105.8	1.4	102.6	11 19
DATA PAGE NO. 12 OPERATOR POSITIONS %											
RH SP VLV POS	15-077	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	-5.0000	12 1
SH SP VLV POS R	13-190	16.66	30.90	0.00	18.31	0.00	26.58	0.00	0.00	17.61	12 3
SH SP VLV POS L	13-191	33.62	29.83	0.00	0.00	0.00	0.00	30.13	0.00	0.00	12 4
GR DMPR DEMAND	16-044	98.6	96.1	90.6	100.6	72.6	100.1	104.6	96.7	100.0	12 9
RECIRC AIR DMPR POS	12-176	12.85	0.00	0.00	0.00	0.00	12.20	9.82	1.13	9.27	12 13
SH PASS DMPR POS	14-180	.0598	8.6537	.0702	.0488	0.0000	.0315	0.0000	.1873	.0348	12 15
RH PASS DMPR POS	14-180	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	12 16
OVRFIRE AIR DMPR POS	06-115	32.01	15.41	30.62	28.85	29.26	10.40	26.08	10.07	26.11	12 17
BRN SEC AIR DMPR POS	06-286	34.23	15.08	38.40	29.84	20.81	35.14	28.23	19.28	23.67	12 18
HOT PRI AIR DMPR POS	06-556	100.0	0.0	89.2	83.5	99.4	0.0	100.0	0.0	95.1	12 19
BRN GAS REC DMPR POS	06-324	0.0	11.3	100.0	100.0	29.8	0.0	20.0	0.0	22.9	12 20
DATA PAGE NO. 15 MISCELLANEOUS											
GAS LVG SH PASS 1A	08-003	-322.3	-398.4	-300.3	-307.4	-304.0	-291.4	-313.1	-313.0	-287.1	15 1
GAS LVG SH PASS 1B	08-004	558.3	626.7	544.9	536.8	528.3	530.3	520.4	530.3	520.6	15 2
GAS LVG SH PASS 1C	08-005	561.1	647.1	559.1	553.2	538.1	532.6	521.8	535.7	531.2	15 3
GAS LVG SH PASS 1D	08-006	564.1	636.5	569.6	560.5	553.6	549.8	533.7	543.9	538.6	15 4
GAS LVG SH PASS 2A	08-017	526.0	584.1	519.8	505.4	500.9	506.8	494.7	508.9	495.4	15 5
GAS LVG SH PASS 2B	08-018	538.8	599.4	528.1	516.7	509.9	517.0	501.6	519.7	504.6	15 6
GAS LVG SH PASS 2C	08-019	536.9	592.7	534.6	524.7	513.5	515.9	502.7	519.8	509.8	15 7
GAS LVG SH PASS 2D	08-020	563.5	622.6	568.3	554.8	544.8	545.8	532.6	542.2	538.9	15 8
GAS LVG SH PASS 3A	08-021	543.5	616.5	541.5	530.3	527.9	534.1	517.6	537.4	526.5	15 9
GAS LVG SH PASS 3B	08-022	562.9	625.1	557.3	534.0	538.3	533.9	525.8	542.5	525.2	15 10
GAS LVG SH PASS 3C	08-023	547.9	610.2	547.5	534.6	531.8	527.9	518.3	532.5	519.3	15 11
GAS LVG SH PASS 3D	08-024	-434.5	-500.8	-447.4	-428.9	-434.6	-395.0	-407.1	-406.8	-389.8	15 12
GAS LVG RH PASS 4A	08-033	594.1	625.4	600.6	573.2	583.1	598.1	568.0	573.5	557.6	15 13
GAS LVG RH PASS 4B	08-034	619.4	639.7	614.1	595.9	601.1	606.5	581.6	583.7	566.2	15 14
GAS LVG RH PASS 4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15

TEST NO.		39T	1A	20A	2BM	15A	44T	48T	30T	43T
TEST SEQ. NO.		9	10	11	12	13	14	15	16	17
DATE		02/26/91	03/31/91	05/01/92	05/06/92	04/23/92	02/27/91	03/03/91	02/23/91	02/27/91
TIME START		0005	1435	0115	1636	2241	2103	2206	0859	0420
TIME END		0201	1642	0157	1809	0045	2124	2349	0930	0532
LOAD MW		70	68	60	60	59	66	57	56	55
DATA PAGE NO. 15	MISCELLANEOUS									
GAS LVG RH PASS	4D	08-036	629.6	673.4	649.5	633.3	634.4	626.6	592.7	597.4	600.2	15 16
GAS LVG RH PASS	5A	08-049	590.8	606.0	583.4	568.4	569.3	585.3	560.9	568.6	548.9	15 17
GAS LVG RH PASS	5B	08-050	604.7	623.8	595.6	584.2	586.3	593.8	566.8	575.5	557.6	15 18
GAS LVG RH PASS	5C	08-051	606.7	639.7	610.8	595.7	595.5	600.0	573.4	584.0	576.0	15 19
GAS LVG RH PASS	5D	08-052	596.0	630.8	607.4	589.5	591.1	593.4	562.6	575.2	568.1	15 20
GAS LVG RH PASS	6A	08-053	595.5	618.9	592.9	583.0	582.4	598.2	566.8	574.8	565.4	15 21
GAS LVG RH PASS	6B	08-054	614.4	640.0	616.1	606.5	604.7	608.9	584.0	592.2	584.1	15 22
GAS LVG RH PASS	6C	08-055	603.9	642.9	614.2	594.7	595.4	604.6	572.4	592.1	576.3	15 23
GAS LVG RH PASS	6D	08-056	605.9	651.9	616.4	597.9	601.2	603.5	572.5	587.2	576.9	15 24
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W			42.00	54.00	91.00	94.00	83.00	43.00	44.00	45.00	46.00	15 28

APPENDIX NO. 10

Summary of P and F Series Performance Data

SUMMARY OF P AND F SERIES PERFORMANCE TESTS

	TEST MW	DATE MO	DAY	YEAR	LOAD MW	STEAM FLOW KLB/HR	SH OUT TEMP	RH OUT TEMP	SH SPRAY FLOW KLB/HR	RH SPRAY FLOW KLB/HR	CYCLON COAL FLOW KLB/HR	% OF MAX CYCLON INPUT	CYC IN SERV	REBURN INPUT %	REBURN INPUT KLB/HR	ROTARY CLASS. RPM	EXCESS AIR %	REBURN STOICH	CYCLONE STOICH	ACTUAL FLYASH SPLIT %	ADJUSTED FLYASH SPLIT %
1	5P	5	18	92	110	790.71	999	1000	30.46	13.83	66.47	69.33	3	29.57	28.27	160	16.60	0.8483	1.0537	52.95	52.95
2	6P	5	19	92	110	790.56	999	1001	24.27	7.44	65.60	68.33	3	30.04	28.39	160	15.90	0.8340	1.0569	36.31	36.31
3	8P	5	20	92	109	784.32	998	995	10.35	0.00	64.32	67.00	3	30.52	28.14	160	15.40	0.8412	1.0797	61.72	45.20
4	F2	9	28	92	110	781.72	999	1001	10.13	0.00	65.20	67.92	3	30.40	29.04	160	15.90	0.8520	1.0820	39.80	39.80
5	F3	9	28	92	110	786.29	999	1002	8.67	1.43	66.07	68.82	3	30.20	29.02	160	16.40	0.8450	1.0650	36.75	36.75
6	F5	9	29	92	110	779.48	999	1005	5.83	0.00	64.47	67.16	3	30.40	28.95	160	16.10	0.8390	1.0730	35.83	35.83
7	F19	10	5	92	110	785.75	1000	1001	30.83	11.05	94.89	98.84	3	0.00	0.00	0	18.20	1.1410	1.0910	23.12	23.12
8	FFB	9	28	92	110	791.72	997	986	33.27	0.00	96.02	100.02	3	0.00	0.00	0	17.40	1.1240	1.1030	0.00	23.12
9	1P	5	16	92	80	550.04	988	985	12.99	0.00	44.76	70.67	2	32.81	22.34	150	16.70	0.8889	1.1108	66.72	52.65
10	7P	5	19	92	82	553.55	998	1001	7.90	0.00	45.67	72.19	2	32.90	22.93	160	15.80	0.8737	1.0713	35.24	52.21
11	9P	5	20	92	82	560.37	997	991	18.90	0.00	45.96	71.84	2	33.60	23.52	160	15.30	0.9026	1.1191	67.02	52.16
12	F1	9	28	92	79	516.83	999	999	8.93	0.00	65.96	68.71	3	0.00	0.00	0	19.50	1.1210	1.1020	25.11	25.11
13	F4	9	29	92	79	515.90	999	999	17.43	0.00	65.13	67.84	3	0.00	0.00	0	19.90	1.1300	1.0990	28.99	28.99
14	FMB	9	30	92	82	556.50	1005	991	24.72	0.00	69.66	108.84	2	0.00	0.00	0	18.50	1.1123	1.1510	0.00	0.00
15	F7	9	30	92	82	556.55	999	999	18.79	0.00	45.51	71.11	2	34.10	24.24	145	16.60	0.8460	1.1060	39.55	39.55
16	F8	9	30	92	82	554.97	998	1000	23.71	0.00	45.54	71.16	2	34.00	24.17	160	16.30	0.8490	1.0890	37.78	37.78
17	F10	10	2	92	82	562.63	978	991	0.00	0.00	44.65	69.77	2	33.90	24.10	160	16.00	0.8400	1.0930	33.09	33.09
18	2P	5	16	92	58	399.44	985	955	7.88	0.00	34.50	53.91	2	31.77	16.36	150	16.40	0.9783	1.0616	64.51	64.51
19	3P	5	17	92	58	387.14	997	995	6.54	0.00	35.52	55.50	2	30.71	16.03	155	18.40	1.0097	1.0605	55.67	55.67
20	4P	5	17	92	58	392.58	988	976	3.82	0.00	34.96	54.63	2	32.28	16.59	155	19.30	1.0055	1.0847	76.19	57.72
21	F6	9	30	92	54	368.20	943	923	0.00	0.00	46.84	73.19	2	0.00	0.00	0	21.70	1.1190	1.0480	47.58	47.58
22	F9	10	1	92	54	376.26	957	928	0.00	0.00	47.43	74.11	2	0.00	0.00	0	20.80	1.1180	1.0320	56.57	56.57
23	FLB	10	3	92	58	396.11	973	940	0.00	0.00	50.05	78.20	2	0.00	0.00	0	20.80	1.1260	1.1000	0.00	0.00
24	F12	10	2	92	58	391.48	998	979	4.83	0.00	33.70	52.66	2	33.30	17.51	160	18.10	0.9310	1.0550	55.40	55.40
25	F13	10	3	92	58	396.76	974	943	0.00	0.00	33.18	51.84	2	34.40	17.67	160	16.90	0.9350	1.0700	21.59	21.59
26	F15	10	4	92	58	406.21	983	955	0.68	0.00	34.81	54.39	2	32.60	17.51	160	16.70	0.9260	1.0700	52.48	52.48
27	F17	10	5	92	58	400.61	995	971	13.63	0.00	34.28	107.13	1	32.50	17.10	160	15.10	0.9000	1.1100	40.13	40.13
28	F18	10	5	92	58	395.56	1000	999	2.22	0.00	33.87	52.92	2	32.80	17.21	160	22.50	0.9350	1.0560	48.72	48.72
29	F11	10	3	92	40	275.32	919	898	0.00	0.00	36.40	56.88	2	0.00	0.00	0	32.90	1.1940	1.0320	70.16	70.16
30	F14	10	3	92	40	273.87	942	916	0.00	0.00	36.56	57.13	2	0.00	0.00	0	32.40	1.2010	1.0410	22.62	22.62
31	F16	10	4	92	38	277.61	949	891	0.00	0.00	36.35	113.59	1	41.50	15.50	180	24.80	0.9440	1.0660	36.97	36.97

SUMMARY OF P AND F SERIES PERFORMANCE TESTS

	TEST MW	ACTUAL UBC LB/ 100LB	ADJUSTED UBC LB/ 100LB	UBC EFF LOSS %	GAS WT. WITHOUT RECIRC. MLB/HR	TOTAL GR MLB/HR	GR TO REBURN KLB/HR	AS TESTED EFF %	CORR. EFF %	ACT. FEGT	TOTAL SEC KF	SEC IN KF	SEC OUT KF	PTI KF	RH KF	ECON KF	DRY GAS LOSS %	EXIT GAS TEMP CORR
1	5P	0.50	0.34	0.44	1008.0	67.0	11.3	88.17	88.29	2088	1.06	1.04	1.07	1.00	1.24	0.87	4.03	309.90
2	6P	0.36	0.36	0.47	1008.0	103.0	11.2	88.80	88.26	2031	1.16	1.14	1.17	1.02	1.23	0.87	4.03	309.90
3	8P	0.61	0.44	0.57	978.0	99.1	11.1	88.82	88.29	1965	1.37	1.37	1.37	1.09	1.47	0.92	3.90	304.10
4	F2	0.35	0.35	0.46	983.0	81.0	12.00	87.74	88.20	2033	1.05	1.05	1.05	0.97	1.31	0.86	4.08	312.20
5	F3	0.22	0.22	0.29	996.0	92.0	12.00	87.80	88.14	2044	1.12	1.09	1.15	0.88	1.08	0.82	4.30	321.80
6	F5	0.21	0.21	0.28	985.0	80.0	12.00	87.96	88.13	2037	1.08	1.02	1.13	0.93	1.22	0.71	4.31	322.20
7	F10	0.26	0.26	0.34	1010.0	0.0	0.00	87.67	88.03	2140	1.01	0.99	1.04	0.90	1.04	0.77	4.34	323.80
8	FFB	0.00	0.26	0.25	987.0	55.0	2.00	89.23	88.10	2124	1.13	1.13	1.13	0.88	1.12	0.79	4.34	323.80
9	1P	1.11	0.36	0.47	717.0	210.9	11.1	89.26	88.76	1786	1.42	1.49	1.36	1.39	1.19	0.87	3.36	279.70
10	7P	0.31	0.31	0.40	731.0	120.1	11.1	89.06	88.58	1884	1.13	1.07	1.18	1.10	1.31	0.85	3.53	287.10
11	8P	1.16	0.87	1.13	739.0	256.2	10.9	88.44	87.92	1751	1.62	1.59	1.65	1.40	1.56	0.94	3.49	286.20
12	F1	0.27	0.27	0.36	710.0	233.0	2.00	87.85	88.56	1769	1.29	1.29	1.29	1.09	1.21	0.83	3.53	287.10
13	F4	0.07	0.07	0.09	711.0	208.0	2.00	88.18	88.76	1821	1.28	1.26	1.29	1.13	1.16	0.77	3.80	289.50
14	FMB	0.00	0.27	0.36	729.0	240.0	2.00	89.39	88.50	1809	1.21	1.18	1.24	1.03	1.37	0.82	3.55	288.10
15	F7	0.46	0.46	0.61	736.0	228.0	12.00	88.10	88.38	1813	1.14	1.11	1.16	1.17	1.24	0.88	3.53	287.20
16	F8	0.43	0.43	0.57	735.0	229.0	12.00	87.96	88.29	1837	1.10	1.05	1.15	1.11	1.18	0.84	3.65	292.70
17	F10	0.26	0.26	0.34	738.0	139.0	12.00	88.21	88.58	1854	1.13	1.09	1.17	1.28	1.05	0.77	3.80	290.20
18	2P	1.59	1.59	2.06	540.0	276.3	11.7	87.71	87.22	1588	1.46	1.56	1.37	1.49	1.41	0.93	2.92	261.50
19	3P	1.56	1.56	2.05	549.0	276.9	12.6	86.80	87.21	1588	1.24	1.12	1.32	1.56	1.38	0.96	2.92	261.60
20	4P	1.81	1.23	1.62	547.0	275.3	12.7	87.16	87.68	1559	1.42	1.45	1.39	1.42	1.61	0.99	2.87	258.50
21	F6	0.38	0.38	0.50	516.0	273.0	2.00	87.68	88.64	1482	1.29	1.35	1.23	1.40	1.38	0.87	2.91	258.90
22	F9	0.49	0.49	0.65	526.0	267.0	3.00	87.33	88.46	1506	1.33	1.38	1.28	1.66	1.19	0.84	2.97	261.80
23	FLB	0.00	0.44	0.58	527.0	271.0	2.00	89.33	88.50	1551	1.28	1.35	1.21	1.14	1.25	0.78	2.95	260.00
24	F12	1.53	1.53	2.03	545.0	243.0	12.00	86.37	87.06	1633	1.38	1.38	1.38	1.29	1.40	0.85	3.06	267.90
25	F13	0.17	1.52	2.00	537.0	264.0	12.00	86.47	87.09	1561	1.44	1.52	1.37	1.31	1.45	0.83	3.06	265.10
26	F15	1.52	1.52	2.02	549.0	267.0	12.00	86.71	87.14	1583	1.43	1.55	1.33	1.27	1.44	0.87	3.03	266.60
27	F17	0.78	0.78	1.03	537.0	243.0	12.00	87.64	87.99	1688	1.37	1.46	1.27	1.22	1.25	0.80	3.15	270.70
28	F18	0.12	0.12	0.12	571.0	226.0	12.00	88.14	88.77	1644	1.23	1.20	1.25	1.10	1.38	0.79	3.24	273.50
29	F11	1.43	1.43	1.90	434.0	269.0	3.00	85.91	87.09	1355	1.20	1.33	1.09	1.20	1.54	0.85	2.61	247.10
30	F14	0.18	1.43	1.90	434.0	267.0	3.00	87.59	88.78	1376	1.28	1.38	1.20	1.33	1.64	0.96	2.60	244.20
31	F16	0.55	0.55	0.73	411.0	168.0	12.00	87.37	88.47	1478	1.49	1.84	1.18	1.53	1.91	0.88	2.44	237.70

RB-369 16 Jun 1992 15:26:40

TEST NO.	40T	41T	14A	19A	5P	6P	8P	1P	7P	9P	2P	3P	4P
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10	11	12	13
DATE	02/26/91	02/26/91	04/22/92	04/29/92	05/18/92	05/19/92	05/20/92	05/16/92	05/19/92	05/20/92	05/16/92	05/17/92	05/17/92
TIME START	0535	0559	2232	1745	1050	0922	0932	1056	1429	1435	1608	0933	1419
TIME END	0552	0610	0036	1859	1406	1212	1238	1311	1721	1642	1844	1127	1650
LOAD MW	55	55	55	82	110	110	109	80	82	82	58	58	58
FUEL	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR

40T AVG SCANS 116-->117: 55 MW : 8.4 TPH REBRN : HIGH CYC STOICH
41T AVG SCANS 119-->120: 55 MW : 8.4 TPH REBRN : LOW CYC STOICH
14A AVG SCANS 40-->48 : 55 MW : 8.0 TPH : 160 RPM : HIGH STOIC
19A AVG SCANS 43-->50 : 82 MW : CONTROLS AUTO W/CASCADE
5P AVG SCANS 13-->31 : 110 MW : FORMAL PERF. TEST
6P AVG SCANS 9 -->24 : 110 MW : FORMAL PERF. TEST
8P AVG SCANS 10-->21 : 110 MW : FORMAL PERF. TEST
1P AVG SCANS 18-->28 : 82 MW : FORMAL PERF. TEST
7P AVG SCANS 34-->45 : 82 MW : FORMAL PERF. TEST
9P AVG SCANS 23-->29 : 82 MW : FORMAL PERF. TEST
2P AVG SCANS 41-->52 : 58 MW : FORMAL PERF. TEST
3P AVG SCANS 7 -->17 : 58 MW : FORMAL PERF. TEST
4P AVG SCANS 29-->41 : 58 MW : FORMAL PERF. TEST

DATA PAGE NO. 2 FLOWS MLB/HR (MT/HR)

LOAD MW	20-005	55.1	54.8	55.1	82.2	110.3	110.2	109.1	80.4	81.6	82.0	58.3	57.7	57.9	2	1
MAIN STEAM FLOW	03-033	337.2	336.5	366.4	558.8	774.7	777.0	776.4	557.0	560.3	568.7	386.7	378.1	382.1	2	2
1ST STG STM FLW	CALC	351.8	353.5	362.3	538.9	771.1	773.1	772.6	536.0	540.0	545.5	384.8	375.1	379.6	2	23
FW FLOW	12-170	355.1	352.9	382.3	549.9	790.7	790.6	784.3	550.0	553.5	560.4	399.4	387.1	392.6	2	3
BLOW DOWN FLOW	EST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	4
RH SPRAY FLOW	14-192	0.00	0.00	0.00	0.00	13.83	7.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2	5
SH SPRAY FLOW L	17-052	6.9760	4.7817	0.0000	3.7437	9.2955	9.1847	3.6601	0.0000	0.0000	4.0166	0.0000	0.0000	3.6759	2	7
SH SPRAY FLOW R	17-056	6.85	3.55	0.00	5.15	16.63	12.24	8.96	10.20	4.81	11.33	4.77	2.76	2.69	2	8
GR FAN AMPS A	16-181	39.67	39.75	30.84	.08	24.36	.08	.08	.08	.08	.08	.08	.08	.08	2	12
GR FAN AMPS B	16-183	-.02	-.02	-.02	41.93	-.02	28.03	28.00	38.59	30.37	41.60	44.95	45.77	45.78	2	13
GR FAN BUS VOLT	EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2	14
TOTAL GR FLOW	CALC	226.7	228.1	113.7	270.7	67.0	103.0	99.1	210.9	120.1	256.2	276.3	276.9	275.3	2	24
GR TO SEC AIR	06-932	0.00	0.00	8.89	11.02	11.51	11.50	11.52	11.57	11.49	11.37	13.01	12.88	13.00	2	25
GR TO SEC AIR	CALC	2.38	2.26	9.01	11.03	11.27	11.18	11.05	11.10	11.06	10.86	11.65	12.61	12.72	2	26
GR TO FURN	CALC	224.4	225.8	104.6	259.6	55.8	91.8	88.1	199.9	109.0	245.4	264.7	264.3	262.6	2	27
OFA AIR FLOW	06-931	24.2	73.7	69.0	174.7	245.9	250.0	235.9	149.7	157.1	140.0	71.5	69.4	72.8	2	28
TMP AIR FLOW	CALC	0.00	0.00	35.10	56.47	72.61	64.46	42.81	20.49	34.30	12.34	28.46	40.72	32.18	14	10
SEC AIR FLOW	06-320	52.27	50.29	45.59	33.32	30.02	29.99	29.99	33.90	31.99	31.44	43.95	44.73	43.46	2	29
1st STG PRESS	18-128	473.9	476.5	489.0	741.3	1073.0	1075.9	1075.2	737.2	742.8	750.7	521.2	507.3	513.7	2	19
OIL FLOW 2A	05-100	.0033	.0031	.0020	.0017	.0033	.0032	.0020	.0019	.0017	.0017	.0017	.0017	.0017	2	20
OIL FLOW 2B	07-100	.0018	.0018	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0017	2	21
OIL FLOW 2C	09-100	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	2	22
% PWDR RVR BASN COAL	USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	30

TEST NO.			40T	41T	14A	19A	5P	6P	8P	1P	7P	9P	2P	3P	4P	
TEST SEQ. NO.			1	2	3	4	5	6	7	8	9	10	11	12	13	
DATE			02/26/91	02/26/91	04/22/92	04/29/92	05/18/92	05/19/92	05/20/92	05/16/92	05/19/92	05/20/92	05/16/92	05/17/92	05/17/92	
TIME START			0535	0559	2232	1745	1050	0922	0932	1056	1429	1435	1608	0933	1419	
TIME END			0552	0610	0036	1859	1406	1212	1238	1311	1721	1642	1844	1127	1650	
LOAD MW			55	55	55	82	110	110	109	80	82	82	58	58	58	
DATA PAGE NO. 2	**FLOWS MLB/HR (MT/HR)**															
CYCLONE STOIC		CALC	1.2266	1.1586	1.0369	1.0643	1.0537	1.0569	1.0797	1.1108	1.0713	1.1191	1.0616	1.0605	1.0847	4 20
REBRN WB STOIC		CALC	.7226	.7165	.7123	.4668	.3957	.3920	.3961	.4673	.4621	.4509	.6931	.7203	.6834	4 21
REBRN STOIC		CALC	1.0747	.9639	.9706	.8727	.8483	.8340	.8412	.8889	.8737	.9026	.9783	1.0097	1.0055	4 22
LVG FURN STOIC		CALC	1.1361	1.1516	1.1415	1.1735	1.1540	1.1479	1.1444	1.1578	1.1423	1.1412	1.1441	1.1730	1.1769	4 23
LVG ECON STOIC		CALC	1.1541	1.1696	1.1590	1.1855	1.1638	1.1575	1.1542	1.1697	1.1542	1.1531	1.1603	1.1894	1.1933	4 24
DATA PAGE NO. 3	**FLUID TEMPERATURES F (C) - PLANT**															
SSH OUT T	L	15-152	990.8	992.9	978.4	999.3	998.5	998.5	995.9	977.5	999.1	996.9	970.9	995.6	978.2	3 1
SSH OUT T	R	15-150	1000.7	983.9	925.4	1001.3	999.6	999.2	999.5	999.4	997.5	997.0	999.4	997.5	997.4	3 2
SSH OUT AVE T		13-160	991.4	984.0	956.3	999.7	1000.7	1000.8	998.7	990.0	996.0	994.0	986.0	998.0	990.2	14 1
LVG SH ATTMP T	L	13-164	702.4	713.6	676.5	726.3	747.0	744.7	740.9	733.0	745.4	727.3	743.3	752.9	726.3	3 8
LVG SH ATTMP T	R	13-162	712.5	721.2	704.8	731.1	743.7	748.8	741.4	695.8	722.5	697.6	698.9	737.3	736.9	3 9
PRI SH OUT T	L	HW	761.7	756.4	676.1	747.1	778.3	773.9	744.0	729.5	742.9	744.0	738.6	750.0	727.1	3 10
PRI SH OUT T	R	HW	777.1	769.9	704.5	771.5	806.6	794.9	767.3	753.3	759.0	758.8	752.3	784.3	761.4	3 11
ECON H2O OUT T	L	HW	488.3	490.3	465.9	508.8	513.5	512.5	510.7	506.3	497.3	506.1	491.0	499.1	494.7	3 27
ECON H2O OUT T	R	HW	469.3	468.2	436.8	479.7	518.8	519.2	507.3	470.9	476.1	478.0	457.8	463.3	460.4	3 28
ECON H2O IN T		20-007	392.1	391.7	393.0	427.9	461.2	460.7	458.9	427.4	428.7	430.1	398.9	397.6	398.1	3 5
RH SPRAY H2O T		HW	267.5	267.2	267.0	294.6	316.1	315.4	315.9	292.8	293.4	295.3	273.2	274.0	273.6	3 7
LVG RH T		14-150	982.3	975.7	928.0	1000.5	999.6	1000.7	995.4	985.5	1000.7	990.7	954.9	994.5	976.3	3 12
ENT RH T		CALC	629.6	623.1	596.2	677.9	667.8	699.8	721.2	668.8	674.5	674.4	629.0	638.9	633.5	3 16
COLD RH T		20-006	638.9	632.4	606.0	685.4	748.4	747.1	743.3	676.1	682.5	682.7	636.6	647.3	642.2	3 18
DATA PAGE NO. 4	**FLUID TEMPERATURES F (C) - B&W**															
AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 18

TEST NO.		40T	41T	14A	19A	5P	6P	8P	1P	7P	9P	2P	3P	4P		
TEST SEQ. NO.		1	2	3	4	5	6	7	8	9	10	11	12	13		
DATE		02/26/91	02/26/91	04/22/92	04/29/92	05/18/92	05/19/92	05/20/92	05/16/92	05/19/92	05/20/92	05/16/92	05/17/92	05/17/92		
TIME START		0535	0559	2232	1745	1050	0922	0932	1056	1429	1435	1608	0933	1419		
TIME END		0552	0610	0036	1859	1406	1212	1238	1311	1721	1642	1844	1127	1650		
LOAD MW		55	55	55	82	110	110	109	80	82	82	58	58	58		
DATA PAGE NO. 4	**FLUID TEMPERATURES F (C) - B&W**															
GAS LVG AH P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	19
DATA PAGE NO. 5	**FLUID PRESSURES PSIG (KG/CM2)**															
TURB THROT P	03-170	1448.3	1448.5	1449.8	1450.0	1449.9	1450.2	1450.0	1449.8	1449.9	1449.5	1450.0	1449.9	1450.0	5	1
SEC SH OUT P	CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5	2
DRUM PRESS	04-013	1481.7	1481.7	1487.0	1525.8	1600.4	1602.8	1603.3	1524.6	1525.2	1526.0	1487.1	1486.6	1487.2	5	3
LVG RH PRESS	15-102	197.3	197.1	201.5	301.8	431.6	431.3	426.1	300.3	302.5	305.6	214.7	209.6	211.5	5	4
ENT RH PRESS	15-100	206.9	206.6	210.1	322.9	460.1	459.0	454.5	319.4	322.9	327.2	228.7	221.2	223.7	5	5
FW HTR E EXT P	20-035	199.2	199.6	203.2	308.6	441.1	440.1	434.9	305.8	308.9	312.9	218.2	212.3	214.4	5	6
FW HTR E EXT P	TRANS	201.5	201.4	206.0	310.6	443.5	442.6	437.0	307.6	310.8	314.5	219.5	214.4	216.6	5	7
SEC SH OUT P (T)	TRANS	1457.5	1457.6	1458.6	1473.0	1492.7	1493.7	1493.5	1471.0	1471.5	1471.9	1461.4	1459.3	1459.5	5	17
DRUM PRESS (T)	TRANS	1472.9	1473.1	1476.7	1521.5	1592.5	1594.2	1595.2	1518.8	1520.6	1522.2	1483.4	1479.7	1480.5	5	18
LVG RH-1 P (T)	TRANS	199.9	199.8	204.3	306.0	436.2	435.4	430.3	303.2	306.2	309.9	217.2	212.3	214.5	5	19
ENT RH-1 P (T)	TRANS	209.9	209.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5	20
DATA PAGE NO. 6	**AIR & GAS DATA - PLANT**															
AMBIENT AIR DB TEMP	TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6	1
AIR ENT FD FAN T	HW	0.0	0.0	94.8	110.6	95.6	96.9	103.0	104.2	109.0	112.6	111.8	102.1	104.5	6	4
AIR LVG FD FAN T A	09-028	135.9	133.5	131.6	144.0	119.8	127.3	132.3	134.6	139.3	141.6	147.9	137.8	141.2	7	2
AIR LVG FD FAN T B	09-029	140.2	138.3	138.0	149.3	125.5	129.7	135.6	140.4	143.5	147.1	152.4	142.9	142.4	7	3
AIR ENT AH T RA	20-017	176.0	174.4	142.6	151.1	128.7	132.0	138.0	142.9	146.1	149.7	155.9	145.8	146.5	6	2
AIR ENT AH T RB	20-018	174.5	171.8	140.4	151.5	127.2	132.0	138.0	142.5	145.6	149.1	154.5	144.7	144.6	6	3
AIR ENT AH T LA	20-025	188.4	183.5	134.2	147.1	124.2	129.8	135.2	137.4	141.8	144.0	150.4	139.9	143.3	13	25
AIR ENT AH T LB	20-029	170.8	168.3	135.1	147.9	123.7	130.5	135.7	138.2	142.9	145.0	151.3	141.4	144.6	13	26
AIR LVG AH T R	HW	533.0	531.0	501.1	581.9	611.9	595.5	579.0	553.1	554.1	543.0	540.0	542.5	530.3	6	6
AIR LVG AH T L	HW	530.4	532.8	507.5	584.2	554.7	562.3	550.5	555.8	545.5	547.0	534.8	539.8	531.7	6	7
BRN SEC AIR T	08-002	521.2	520.9	509.4	585.5	553.3	544.6	532.8	564.9	553.3	550.7	540.6	536.2	530.8	14	2
BRN SA/GR T	08-001	511.7	509.5	496.4	575.5	546.3	538.4	526.0	554.5	547.8	545.2	535.6	531.3	527.6	14	3
OFA TEMP	09-002	499.9	502.9	456.9	538.2	533.0	530.6	518.3	518.7	515.9	512.1	491.9	488.8	484.9	14	4
GAS LVG AH T RA	20-019	295.1	296.0	282.3	314.3	318.4	313.8	314.2	294.3	312.4	309.5	294.7	287.4	287.8	6	10
GAS LVG AH T RB	20-020	269.7	269.0	261.0	298.5	297.4	294.0	296.4	280.6	295.7	294.1	274.3	264.6	265.9	6	11
GAS LVG AH T LA	20-027	267.6	266.4	256.7	291.4	276.9	282.3	283.6	272.2	279.5	282.0	271.2	262.7	266.2	13	27
GAS LVG AH T LB	20-024	275.5	274.6	260.5	294.8	284.7	288.1	287.1	276.9	283.0	284.2	275.3	266.0	271.0	13	28
GAS LVG RH PS T	AVE	591.5	595.8	555.0	648.0	641.1	648.9	628.2	634.4	617.8	609.8	590.1	595.0	584.2	13	17
GAS LVG SH PS T	AVE	556.1	555.8	500.9	601.6	672.1	662.0	630.4	555.4	587.2	564.0	533.7	530.5	529.3	13	19
GR GAS TEMP A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14	8
GR GAS TEMP B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14	9
O2 LVG ECON R	11-172	3.0315	4.0100	2.1445	2.9457	2.8776	3.0207	2.8706	2.9550	2.9621	2.9890	3.3510	2.6392	2.6661	6	20
O2 LVG ECON L	11-170	2.3750	2.7679	2.0723	2.5013	2.9398	2.8138	2.9855	3.0672	2.9121	2.9433	2.9272	3.6294	3.9454	6	21
O2 IN SEC AIR	06-254	19.75	19.77	17.91	16.45	15.99	15.99	16.00	16.41	16.23	16.21	16.92	17.00	16.93	13	29
ACCUREX NOX PPM	06-553	0.0	0.0	343.6	222.0	299.0	255.7	241.7	253.3	250.3	234.2	283.6	296.2	286.5	13	9

TEST NO.			40T	41T	14A	19A	5P	6P	8P	1P	7P	9P	2P	3P	4P	
TEST SEQ. NO.			1	2	3	4	5	6	7	8	9	10	11	12	13	
DATE			02/26/91	02/26/91	04/22/92	04/29/92	05/18/92	05/19/92	05/20/92	05/16/92	05/19/92	05/20/92	05/16/92	05/17/92	05/17/92	
TIME START			0535	0559	2232	1745	1050	0922	0932	1056	1429	1435	1608	0933	1419	
TIME END			0552	0610	0036	1859	1406	1212	1238	1311	1721	1642	1844	1127	1650	
LOAD MW			55	55	55	82	110	110	109	80	82	82	58	58	58	

DATA PAGE NO. 6 AIR & GAS DATA - PLANT

ACCUREX SOX	PPM	06-555	0.0	0.0	1132.0	1185.1	960.2	1034.4	1019.7	1075.6	1048.6	1059.7	1104.3	1073.2	1018.3	13 10
ACCUREX CO	PPM	06-425	0.00	0.00	16.82	68.10	35.31	39.51	23.21	60.74	50.66	53.69	88.74	61.66	61.37	13 11
ACCUREX O2	%	06-554	0.0000	0.0000	4.0956	4.1864	3.0371	2.9671	3.1927	3.6502	3.4046	3.5097	3.5008	4.3289	4.6128	13 12
BRN SEC AIR P	IN WG	06-250	10.55	11.13	9.92	16.24	23.49	23.93	22.72	16.02	14.69	15.55	13.71	13.31	13.04	14 5
BRN GAS REC P	IN WG	06-252	9.90	10.58	9.44	16.22	23.46	23.82	22.73	15.94	14.65	15.34	13.35	12.83	12.67	14 6
FURNACE GAS P	IN WG	08-100	7.14	8.09	6.84	14.18	20.33	20.61	19.87	13.70	12.47	13.53	8.77	8.46	8.56	14 7
BAROMETRIC P	IN HG	PB	0.00	0.00	29.31	29.06	29.59	29.51	29.50	29.20	29.46	29.46	29.10	29.34	29.41	6 29
REL HUMIDITY	%	TST	0.0000	0.0000	7.7180	7.5281	7.7503	7.7819	7.7016	7.7277	7.5568	7.5073	7.5299	7.6551	7.6237	6 30

DATA PAGE NO. 7 AIR & GAS DATA - B&W

AMBIENT AIR TEMP		TC	0.00	0.00	42.89	76.62	68.06	66.98	75.20	78.84	78.93	83.68	86.41	62.58	66.76	7 1
AIR LVG FD FAN T	A	TC	139.4	136.9	135.1	147.5	123.3	130.6	135.6	137.9	142.5	144.8	150.9	141.1	144.6	7 6
AIR LVG FD FAN T	B	TC	143.2	141.1	140.9	152.3	128.6	132.7	138.6	143.4	146.5	150.1	155.2	145.9	145.5	7 7
AIR ENT AH	(T)	GRID	177.1	175.2	139.3	150.7	127.3	132.3	137.7	141.5	145.1	148.0	154.6	144.0	145.7	7 4
GAS LVG AH	(T)	GRID	273.4	272.5	259.0	290.8	286.0	286.7	286.5	272.0	282.7	282.4	270.9	263.9	266.7	7 10
GAS LVG ECON	(T) L	GRID	609.7	613.6	606.1	661.6	644.4	660.0	656.8	622.4	647.0	659.7	581.6	589.2	575.6	7 14
GAS LVG ECON	(T) R	GRID	565.6	565.4	525.0	630.0	677.5	663.3	638.4	585.9	603.2	584.1	563.9	558.9	554.6	7 15
GAS TEMP LVG GR FAN		GRID	580.4	581.5	515.8	615.0	0.0	552.7	540.3	588.7	577.7	0.0	567.3	568.3	563.4	13 7
O2 LVG ECON	(T) L	GRID	2.7853	3.1000	3.0899	3.4967	3.1829	2.8967	2.8424	3.2158	3.0066	2.8930	2.8839	3.7080	3.9581	7 20
O2 LVG ECON	(T) R	GRID	3.0287	3.1500	2.7176	3.2026	2.8930	2.9570	2.8385	2.8848	2.8134	2.7654	3.1296	2.9340	2.9489	7 21
CO LVG ECON	(T) L	GRID	76.3	86.5	53.5	90.0	82.0	127.6	95.9	100.7	103.3	104.2	119.1	138.0	118.1	13 5
CO LVG ECON	(T) R	GRID	94.1	102.3	52.8	76.0	45.7	64.3	68.0	95.5	84.0	81.0	106.6	80.0	79.3	13 6
CO2 LVG ECON	(T) L	GRID	16.03	15.60	16.06	15.30	15.82	16.82	15.96	15.65	16.33	16.12	15.83	15.33	15.25	7 22
CO2 LVG ECON	(T) R	GRID	15.30	14.61	15.71	15.14	15.60	15.60	15.76	15.69	15.52	15.89	15.52	15.67	15.77	7 23
NOX LVG ECON	(T) L	GRID	384.9	353.9	343.2	299.4	260.2	249.5	249.0	256.3	250.6	232.8	324.0	296.4	304.9	7 24
NOX LVG ECON	(T) R	GRID	393.4	361.0	385.1	0.0	316.1	286.7	299.3	304.8	288.2	294.0	319.4	371.2	331.2	7 25
O2 LVG AH	(T)	GRID	10.64	10.39	5.22	4.96	4.41	4.42	4.49	5.19	6.36	5.69	6.17	6.82	10.97	13 1
CO2 LVG AH	(T)	GRID	38.02	27.33	20.09	22.23	39.43	42.15	33.91	39.77	34.81	33.39	37.23	36.17	40.79	13 3
O2 LVG GR FAN	(T)	GRID	18.31	18.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13 4
DRY BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27

DATA PAGE NO. 8 FW HTR TEMPERATURES F (C) - PLANT

FW HTR E EXT T		HW	636.0	629.4	601.3	684.2	744.8	743.2	740.7	673.1	679.2	679.9	633.6	645.1	640.0	8 1
FW HTR E LVG T		HW	390.2	389.9	389.3	427.6	458.1	457.0	456.5	424.8	425.8	427.2	396.8	396.2	396.9	8 5
FW HTR E ENT T		HW	330.1	329.7	328.0	360.0	383.3	382.7	382.0	357.3	358.0	359.2	336.6	336.3	335.4	8 7
FW HTR E DRN T		HW	339.5	339.2	338.5	373.9	406.4	406.4	403.6	372.8	373.5	374.9	345.5	351.7	349.0	8 13

TEST NO.	40T	41T	14A	19A	5P	6P	8P	1P	7P	9P	2P	3P	4P
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10	11	12	13
DATE	02/26/91	02/26/91	04/22/92	04/29/92	05/18/92	05/19/92	05/20/92	05/16/92	05/19/92	05/20/92	05/16/92	05/17/92	05/17/92
TIME START	0535	0559	2232	1745	1050	0922	0932	1056	1429	1435	1608	0933	1419
TIME END	0552	0610	0036	1859	1406	1212	1238	1311	1721	1642	1844	1127	1650
LOAD MW	55	55	55	82	110	110	109	80	82	82	58	58	58

DATA PAGE NO. 9 FW HTR TEMPERATURES F (C) - B&W

SSH PEND IN LEG 1	10-017	848.1	848.0	785.9	841.8	842.5	845.6	847.3	832.3	851.5	849.9	843.7	818.6	829.6	9	17
SSH PEND IN LEG 2	10-018	879.6	875.0	816.0	865.0	864.4	868.3	871.3	864.0	868.8	864.2	867.7	846.2	862.1	9	18
SSH PEND IN LEG 3	10-019	873.9	865.6	830.1	872.2	872.2	875.0	877.1	868.5	864.6	856.8	872.9	867.4	884.7	9	19
SSH PEND IN LEG 4	10-020	869.4	860.9	848.0	882.1	884.5	885.5	886.7	873.3	866.9	857.8	881.6	885.6	907.0	9	20
SSH PEND IN LEG 5	10-021	844.4	839.6	839.5	868.1	866.7	867.1	867.0	851.4	840.3	831.1	859.6	871.2	890.6	9	21
SSH PEND IN LEG 6	10-033	841.7	842.8	854.8	881.9	887.9	885.5	883.8	873.3	866.0	859.1	883.0	892.1	898.7	9	22
SSH PEND IN LEG 7	10-034	841.3	849.2	849.1	882.9	891.7	887.1	884.8	889.2	887.6	885.2	901.0	893.5	880.5	9	23
SSH PEND IN LEG 8	10-035	851.9	859.0	849.5	874.7	883.6	881.5	879.1	874.5	883.6	880.1	887.0	880.1	864.9	9	24
SSH PEND IN LEG 9	10-036	869.6	875.7	848.7	877.8	879.1	880.3	880.4	864.2	882.1	875.2	871.4	876.3	861.2	9	25
SSH PEND IN LEG 10	10-037	850.6	862.5	818.0	852.1	850.0	852.4	857.6	834.1	852.9	845.1	835.6	861.9	841.8	9	26
RH PEND IN LEG 1	09-049	916.7	913.5	871.5	946.1	945.0	944.6	939.9	938.3	948.2	936.0	908.7	941.5	925.3	8	17
RH PEND IN LEG 2	09-050	897.0	894.5	860.1	940.2	942.6	939.9	935.3	937.3	941.5	926.7	909.6	939.6	922.9	8	18
RH PEND IN LEG 3	09-051	907.1	904.0	863.7	940.0	940.8	939.6	934.9	934.0	942.1	929.2	905.2	937.6	921.4	8	19
RH PEND IN LEG 4	09-052	901.1	898.3	860.1	938.8	940.3	938.6	934.3	933.8	940.0	926.1	905.5	937.1	920.8	8	20
RH PEND IN LEG 5	09-053	937.2	933.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8	21
RH PEND IN LEG 6	10-001	931.9	930.7	893.6	961.9	962.3	960.9	953.7	957.9	969.8	958.3	928.9	956.9	938.3	8	22
RH PEND IN LEG 7	10-002	919.7	917.0	868.2	931.9	933.5	932.1	928.1	922.1	940.0	932.3	891.8	919.9	902.9	8	23
RH PEND IN LEG 8	10-003	940.1	935.4	870.0	939.6	928.4	932.8	932.5	913.4	937.2	929.1	878.6	923.9	907.9	8	24
RH PEND IN LEG 9	10-004	914.7	912.0	870.5	945.6	944.7	944.2	939.7	938.1	948.0	935.5	908.7	941.5	924.7	8	25
RH PEND IN LEG 10	10-005	912.5	908.8	824.9	895.6	885.6	899.0	896.6	860.4	891.5	875.8	833.3	889.1	870.3	8	26
RH INTM HND HOLE R	10-038	924.8	915.6	867.8	942.8	944.4	944.1	938.4	936.3	945.6	934.1	904.4	938.2	925.7	8	27
RH INTM HND HOLE L	10-039	848.7	844.2	771.5	839.8	844.1	850.5	847.2	817.8	844.0	829.6	790.4	822.4	815.6	8	28
PSH OUT LEG T	09-017	790.3	780.9	699.1	775.7	801.2	793.1	766.4	759.0	767.7	768.3	760.3	785.6	759.9	14	11
PSH OUT LEG T	09-018	794.6	783.4	705.7	778.9	814.3	801.1	774.6	760.9	769.7	770.2	758.1	791.9	767.5	14	12
PSH OUT LEG T	09-019	745.8	740.2	661.5	718.8	757.9	758.1	725.6	708.0	726.9	728.0	722.3	711.4	696.5	14	13
PSH OUT LEG T	09-020	760.2	753.9	672.2	733.6	774.9	775.8	739.4	717.3	738.3	737.0	732.4	731.4	712.5	14	14
PSH OUT LEG T	09-021	774.3	768.9	690.1	762.2	783.5	780.1	750.1	745.8	755.3	755.2	753.6	767.0	743.6	14	15
PSH OUT LEG T	09-022	786.1	780.4	703.2	775.7	792.2	785.3	760.8	761.1	765.3	767.9	762.8	786.3	759.8	14	16
PSH OUT LEG T	09-023	770.3	762.0	683.1	751.3	790.2	780.4	754.0	733.1	744.5	746.7	735.4	762.4	737.1	14	17
PSH OUT LEG T	09-024	796.8	788.5	716.5	788.7	818.9	806.5	778.9	772.6	776.9	776.9	768.3	801.6	776.8	14	18
PSH OUT LEG T	09-025	766.5	756.8	694.1	753.0	798.1	790.0	758.3	738.1	746.0	745.5	740.8	765.6	746.0	14	19
PSH OUT LEG T	09-026	783.1	774.3	717.2	777.6	805.6	796.7	770.2	761.3	764.0	762.1	759.9	789.8	771.3	14	20
PSH OUT LEG T	09-027	788.1	779.9	724.9	788.6	818.2	809.3	783.0	772.6	775.4	771.4	769.2	798.7	780.4	14	21

DATA PAGE NO. 10 PULVERIZER COAL AND PA FLOW

CYC A COAL FLOW KLB	05-104	16.23	16.62	16.22	22.67	21.58	20.97	20.65	22.96	21.57	22.45	17.13	16.79	16.82	10	1
CYC B COAL FLOW KLB	07-110	-.01	-.01	-.01	-.01	21.57	21.01	20.67	-.01	-.01	-.01	-.01	-.01	-.01	10	2
CYC C COAL FLOW KLB	09-110	16.25	16.63	16.23	22.65	21.54	20.97	20.68	22.92	21.57	22.47	17.10	16.76	16.78	10	3
CYC A SEC AIR FLOW %	06-170	147.9	140.7	138.4	212.8	204.7	202.2	201.9	216.8	212.5	218.4	155.1	158.8	159.1	10	16
CYC B SEC AIR FLOW %	08-170	1.5	1.7	4.2	4.8	202.9	199.5	198.5	5.3	5.2	6.3	5.2	2.4	3.8	10	17
CYC C SEC AIR FLOW %	10-170	162.9	157.4	138.3	213.1	204.4	202.5	202.6	216.7	213.2	218.8	154.6	150.1	149.1	10	18
CYC A SEC AIR T	20-002	498.2	493.7	466.2	531.0	552.2	545.4	530.1	502.6	520.0	508.7	499.2	499.8	492.7	11	1
CYC B SEC AIR T	20-003	526.0	524.3	500.6	572.2	574.8	574.8	560.2	551.5	544.9	543.5	528.6	524.5	519.5	11	2

TEST NO.		40T	41T	14A	19A	5P	6P	8P	1P	7P	9P	2P	3P	4P	
TEST SEQ. NO.		1	2	3	4	5	6	7	8	9	10	11	12	13	
DATE		02/26/91	02/26/91	04/22/92	04/29/92	05/18/92	05/19/92	05/20/92	05/16/92	05/19/92	05/20/92	05/16/92	05/17/92	05/17/92	
TIME START		0535	0559	2232	1745	1050	0922	0932	1056	1429	1435	1608	0933	1419	
TIME END		0552	0610	0036	1859	1406	1212	1238	1311	1721	1642	1844	1127	1650	
LOAD MW		55	55	55	82	110	110	109	80	82	82	58	58	58	
DATA PAGE NO. 10 PULVERIZER COAL AND PA FLOW															
CYC C SEC AIR T	20-004	498.1	496.1	477.6	541.2	513.9	521.4	510.6	520.2	513.7	515.4	502.7	501.5	498.2	11 3
PULV COAL FLOW KLB	06-314	16.96	16.94	16.23	22.51	28.27	28.39	28.14	22.34	22.93	23.52	16.36	16.03	16.59	10 4
PULV PA FLOW	06-275	48.40	49.40	47.74	51.33	60.05	59.65	59.90	52.95	53.43	54.12	48.01	48.05	48.05	10 19
PULV INLET T	09-034	475.1	470.7	461.9	540.5	526.9	528.2	516.2	510.5	509.1	509.1	485.0	477.9	477.9	11 7
PULV OUTLET T	09-040	146.4	144.7	148.6	171.4	164.1	165.3	163.9	165.8	174.9	175.2	181.0	170.1	166.0	11 8
DATA PAGE NO. 11 PULVERIZER INLET TEMP AND PA DIFF															
PULV DIFF P IN WG	06-274	6.32	6.02	6.08	13.11	14.31	15.71	14.65	8.94	13.10	13.75	5.65	5.52	5.73	11 9
PULV AMPS	06-276	201.9	201.9	202.2	239.2	269.7	295.7	271.5	217.2	240.5	246.9	197.7	195.0	197.4	11 10
PULV PA FAN AMPS	06-277	27.15	26.75	27.13	65.66	94.05	95.05	92.66	56.70	66.29	70.98	30.43	30.26	30.11	11 11
ROT CLASS AMPS	06-278	37.84	38.25	45.76	47.19	49.04	48.43	49.07	42.46	46.21	47.36	42.57	42.59	42.40	11 12
ROT CLASS RPM	06-270	140.7	140.6	163.4	160.1	160.5	162.0	161.5	148.6	160.2	161.8	153.6	155.0	155.0	11 13
ROT CLASS DP IN WG	06-345	.2254	.2364	.3357	.4881	.5177	.5611	.5426	.3350	.4738	.5007	.2644	.2726	.2790	11 14
COAL SILO LEVEL	06-310	29.83	24.88	35.80	72.22	76.91	79.52	81.87	81.31	80.86	83.68	83.52	78.99	77.61	11 15
FLAME INTENSITY #1 %	06-279	106.1	106.1	106.2	106.1	106.2	106.1	106.1	106.1	106.1	106.0	106.1	106.1	106.1	11 16
FLAME INTENSITY #2 %	06-295	91.5	105.7	105.5	106.1	105.5	105.4	105.6	105.8	106.0	106.1	106.1	105.7	105.7	11 17
FLAME INTENSITY #3 %	06-296	106.0	106.2	106.1	106.2	106.1	106.1	106.2	105.2	106.2	0.0	102.7	104.3	104.8	11 18
FLAME INTENSITY #4 %	06-297	105.8	105.9	105.7	106.1	105.6	105.6	105.9	106.0	106.2	106.1	106.1	105.7	105.4	11 19
DATA PAGE NO. 12 OPERATOR POSITIONS %															
RH SP VLV POS	15-077	-5.00	-5.00	-5.00	-5.00	56.14	50.29	38.46	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	12 1
SH SP VLV POS R	13-190	53.62	42.10	0.00	38.49	50.84	41.45	33.53	50.05	37.19	49.96	46.59	38.76	31.79	12 3
SH SP VLV POS L	13-191	52.08	43.15	0.00	35.09	39.03	38.18	31.99	0.00	26.40	33.99	0.00	0.00	27.22	12 4
GR DMPR DEMAND	16-044	84.42	93.29	40.19	70.52	-5.00	-5.00	-5.00	59.58	28.80	64.41	98.26	94.37	97.21	12 9
RECIRC AIR DMPR POS	12-176	9.26	10.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12 13
SH PASS DMPR POS	14-180	20.4	17.6	0.0	18.4	100.0	100.0	69.3	4.1	19.7	14.8	.1	.1	.5	12 15
RH PASS DMPR POS	14-180	100.0	100.0	100.0	100.0	20.6	72.9	67.5	100.0	100.0	100.0	100.0	100.0	100.0	12 16
OVRFIRE AIR DMPR POS	06-115	10.28	27.05	24.64	40.80	53.38	56.38	50.09	36.76	37.61	35.36	25.97	25.52	26.06	12 17
BRN SEC AIR DMPR POS	06-286	33.53	32.05	28.75	20.07	18.26	18.13	17.51	20.17	17.92	17.09	29.75	30.28	28.95	12 18
HOT PRI AIR DMPR POS	06-556	100.0	100.0	100.0	100.0	99.6	99.4	99.5	99.3	99.4	99.4	96.3	99.4	99.3	12 19
BRN GAS REC DMPR POS	06-324	0.00	0.00	21.37	31.47	33.00	33.65	31.47	30.04	27.22	28.91	50.14	78.24	44.74	12 20
DATA PAGE NO. 15 MISCELLANEOUS															
GAS LVG SH PASS 1A	08-003	-335.3	-333.5	-298.4	-340.9	-441.2	-452.3	-401.2	-311.5	-337.7	-316.9	-281.2	-290.1	-285.6	15 1
GAS LVG SH PASS 1B	08-004	559.1	559.2	498.3	597.3	675.6	665.3	631.4	549.6	582.7	561.5	529.8	529.9	526.1	15 2
GAS LVG SH PASS 1C	08-005	571.7	572.3	508.6	616.9	703.2	675.1	645.1	559.3	592.1	567.5	538.9	537.7	533.3	15 3
GAS LVG SH PASS 1D	08-006	581.9	579.7	518.5	632.1	725.6	712.9	677.6	576.2	619.5	588.0	553.3	549.0	546.0	15 4
GAS LVG SH PASS 2A	08-017	528.1	524.3	479.6	560.7	624.6	624.9	597.2	527.7	557.1	541.1	509.1	505.2	505.4	15 5
GAS LVG SH PASS 2B	08-018	541.1	540.7	488.8	572.4	641.2	636.4	609.6	539.2	568.6	545.6	518.4	518.0	512.4	15 6

TEST NO.			40T	41T	14A	19A	5P	6P	8P	1P	7P	9P	2P	3P	4P	
TEST SEQ. NO.			1	2	3	4	5	6	7	8	9	10	11	12	13	
DATE			02/26/91	02/26/91	04/22/92	04/29/92	05/18/92	05/19/92	05/20/92	05/16/92	05/19/92	05/20/92	05/16/92	05/17/92	05/17/92	
TIME START			0535	0559	2232	1745	1050	0922	0932	1056	1429	1435	1608	0933	1419	
TIME END			0552	0610	0036	1859	1406	1212	1238	1311	1721	1642	1844	1127	1650	
LOAD MW			55	55	55	82	110	110	109	80	82	82	58	58	58	
DATA PAGE NO. 15	MISCELLANEOUS															
GAS LVG SH PASS	2C	08-019	539.6	542.1	488.8	579.0	648.5	643.9	615.2	542.3	572.6	547.6	521.2	519.0	515.1	15 7
GAS LVG SH PASS	2D	08-020	574.3	575.1	513.5	624.1	699.5	685.3	660.5	578.0	606.3	585.0	554.8	551.5	547.5	15 8
GAS LVG SH PASS	3A	08-021	553.4	554.1	504.3	593.9	660.1	660.7	635.9	552.1	586.8	561.4	535.6	529.8	530.2	15 9
GAS LVG SH PASS	3B	08-022	559.3	558.0	507.0	615.3	676.2	660.2	633.3	560.4	586.3	572.7	540.6	534.6	536.6	15 10
GAS LVG SH PASS	3C	08-023	552.8	552.6	501.7	599.3	666.5	654.8	627.5	555.9	583.1	564.1	535.0	530.0	531.7	15 11
GAS LVG SH PASS	3D	08-024	-454.4	-451.4	-407.6	-488.9	-596.8	-596.2	-543.9	-449.9	-474.6	-439.3	-398.3	-428.4	-425.2	15 12
GAS LVG RH PASS	4A	08-033	582.8	587.2	545.2	634.2	621.0	632.8	615.3	608.5	601.1	595.4	574.8	586.1	572.3	15 13
GAS LVG RH PASS	4B	08-034	611.1	617.2	559.7	656.1	638.5	650.8	630.0	626.0	615.8	612.2	584.0	599.6	585.1	15 14
GAS LVG RH PASS	4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15
GAS LVG RH PASS	4D	08-036	616.3	618.2	579.0	696.7	684.2	688.5	659.0	668.2	650.5	635.5	632.4	619.6	606.4	15 16
GAS LVG RH PASS	5A	08-049	579.5	584.7	534.9	616.9	615.0	626.3	607.9	601.8	593.3	588.7	564.4	576.3	567.9	15 17
GAS LVG RH PASS	5B	08-050	596.2	602.4	547.5	640.2	630.6	632.9	619.0	616.8	605.6	601.2	573.6	586.4	574.0	15 18
GAS LVG RH PASS	5C	08-051	594.0	597.5	556.3	651.0	646.2	651.2	627.6	638.8	621.4	612.1	591.8	592.8	585.2	15 19
GAS LVG RH PASS	5D	08-052	576.5	580.3	548.4	650.4	640.4	649.0	624.7	633.7	616.1	607.0	586.6	590.3	581.7	15 20
GAS LVG RH PASS	6A	08-053	584.7	589.4	547.8	627.0	624.6	634.1	619.0	614.6	605.5	600.5	581.9	585.4	578.5	15 21
GAS LVG RH PASS	6B	08-054	599.1	603.5	566.1	651.6	650.0	658.2	638.5	642.3	629.8	622.7	600.4	607.4	598.5	15 22
GAS LVG RH PASS	6C	08-055	583.8	588.7	561.2	647.1	641.9	649.1	630.0	643.9	622.3	619.3	599.9	600.7	594.6	15 23
GAS LVG RH PASS	6D	08-056	582.4	585.0	559.0	655.8	659.9	665.1	641.5	643.4	629.7	617.6	601.5	599.9	594.4	15 24
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W			47.0	48.0	82.0	106.0	101.0	102.0	104.0	97.0	103.0	105.0	98.0	99.0	100.0	15 28

RB-369 21 Oct 1992 10:13:56

TEST NO.	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10	11
DATE	09/28/92	09/28/92	09/28/92	09/29/92	09/29/92	09/30/92	09/30/92	09/30/92	10/01/92	10/02/92	10/03/92
TIME START	1446	1057	1920	1333	1708	1235	1713	2005	2245	0210	0523
TIME END	1702	1302	2104	1545	1913	1429	1846	2138	0039	0354	0707
LOAD MW	77	110	110	77	110	52	83	82	54	82	37
FUEL	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
ALPHA1											
ALPHA2											

F1 AVG SCANS 35-->47 : 79 MW : CYC. SAME AS 110 MW W/RBN
F2 AVG SCANS 16-->27 : 110 MW : W/RBN
F3 AVG SCANS 61-->70 : 110 MW : WITH REBURN
F4 AVG SCANS 3-->12 : 79 MW : CYC. SAME AS 110 MW W/RBN
F5 AVG SCANS 3-->12 : 110 MW : WITH REBURN
F6 AVG SCANS 5-->15 : 54 MW : CYC SAME AS 82 MW W/REBURN
F7 AVG SCANS 27-->35 : 82 MW : W/RBN
F8 AVG SCANS 42-->50 : 82 MW : W/RBN
F9 AVG SCANS 11-->21 : 54 MW : CYC SAME AS 82 MW W/REBURN
F10 AVG SCANS 28-->37 : 82 MW : W/RBN
F11 AVG SCANS 48-->57 : 40 MW : CYC SAME AS 58 MW W/REBURN

DATA PAGE NO. 2 FLOWS MLB/HR

LOAD MW	20-005	77.3	109.8	110.1	77.2	109.9	52.4	82.6	82.5	54.0	82.4	37.3	2	1
MAIN STEAM FLOW	03-033	515.1	776.8	776.4	513.0	778.2	353.0	566.8	564.3	362.4	568.3	262.8	2	2
1ST STG STM FLW	CALC	503.3	772.9	772.7	501.6	774.4	347.4	545.6	542.9	358.1	547.4	247.0	2	23
FW FLOW	12-170	516.8	781.7	786.3	515.9	779.5	368.2	556.6	555.0	376.3	562.6	275.3	2	3
BLOW DOWN FLOW	EST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	4
RH SPRAY FLOW	14-192	0.0000	0.0000	1.4258	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2	5
SH SPRAY FLOW L	17-052	1.8887	4.7378	4.1890	5.3991	4.7386	0.0000	7.6953	8.2779	0.0000	0.0000	0.0000	2	7
SH SPRAY FLOW R	17-056	2.66	4.07	1.20	7.75	4.77	0.00	7.82	11.95	0.00	0.00	0.00	2	8
GR FAN AMPS A	16-181	39.45	25.80	26.63	37.44	25.31	-.02	-.02	0.00	42.74	31.59	0.00	2	12
GR FAN AMPS B	16-183	.06	.06	.06	.06	.06	43.62	39.18	38.99	.06	.06	44.26	2	13
GR FAN BUS VOLT	EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2	14
TOTAL GR FLOW	CALC	232.6	80.9	91.7	207.9	79.2	273.4	226.9	227.7	266.6	138.0	269.1	2	24
GR TO SEC AIR	06-932	1.98	11.92	12.08	2.32	12.02	2.78	11.54	11.67	3.04	11.90	3.42	2	25
GR TO SEC AIR	CALC	1.80	11.67	11.70	2.04	11.93	2.37	11.81	11.97	2.70	12.06	2.71	2	26
GR TO FURN	CALC	230.8	69.2	80.0	205.9	67.6	271.0	215.9	216.6	264.2	126.7	266.4	2	27
OFA AIR FLOW	06-931	31.6	235.2	246.2	30.9	245.0	30.0	175.6	174.1	27.5	175.3	27.1	2	28
TMP AIR FLOW	CALC	35.11	46.76	63.22	41.12	53.26	50.83	16.34	26.17	55.21	19.57	69.39	14	10
SEC AIR FLOW	06-320	18.39	30.00	30.00	31.24	30.00	31.21	31.30	31.32	31.22	31.42	31.20	2	29
1st STG PRESS	18-128	690.4	1075.5	1075.2	688.0	1077.7	467.8	750.9	747.0	483.0	753.4	324.2	2	19
OIL FLOW 2A	05-100	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0031	2	20
OIL FLOW 2B	07-100	.0027	.0029	.0023	.0017	.0017	.0017	0.0000	.0017	.0017	.0017	.0017	2	21
OIL FLOW 2C	09-100	.0016	.0016	.0016	.0016	.0016	.0016	0.0000	.0016	.0016	.0016	.0016	2	22
% PWDR RVR BASN COAL	USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	30

TEST NO.			F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	
TEST SEQ. NO.			1	2	3	4	5	6	7	8	9	10	11	
DATE			09/28/92	09/28/92	09/28/92	09/29/92	09/29/92	09/30/92	09/30/92	09/30/92	10/01/92	10/02/92	10/03/92	
TIME START			1446	1057	1920	1333	1708	1235	1713	2005	2245	0210	0523	
TIME END			1702	1302	2104	1545	1913	1429	1846	2138	0039	0354	0707	
LOAD MW			77	110	110	77	110	52	83	82	54	82	37	
DATA PAGE NO. 2		**FLOWS MLB/HR**												
CYCLONE STOIC		CALC	1.1022	1.0815	1.0652	1.0986	1.0733	1.0478	1.1055	1.0885	1.0318	1.0926	1.0317	4 20
REBRN WB STOIC		CALC	100.0	.4	.4	100.0	.4	100.0	.4	.4	100.0	.4	100.0	4 21
REBRN STOIC		CALC	1.1212	.8520	.8450	1.1299	.8389	1.1190	.8459	.8486	1.1183	.8398	1.1940	4 22
LVG FURN STOIC		CALC	1.1782	1.1510	1.1547	1.1858	1.1511	1.1954	1.1456	1.1452	1.1864	1.1383	1.2829	4 23
LVG ECON STOIC		CALC	1.1908	1.1607	1.1643	1.1986	1.1606	1.2134	1.1575	1.1571	1.2040	1.1501	1.3064	4 24
DATA PAGE NO. 3		**FLUID TEMPERATURES F - PLANT**												
SSH OUT T	L	15-152	998.9	998.3	998.5	998.3	998.6	940.6	998.6	998.2	957.4	989.6	913.2	3 1
SSH OUT T	R	15-150	999.2	998.8	998.6	999.1	998.7	944.9	1000.0	998.6	957.5	965.6	924.7	3 2
SSH OUT AVE T		13-160	999.7	1003.1	1001.5	998.5	1000.3	941.1	1001.0	998.0	955.4	980.2	916.7	14 1
LVG SH ATTMP T	L	13-164	730.6	753.2	738.6	719.0	748.5	721.8	738.9	745.6	724.4	713.5	717.3	3 8
LVG SH ATTMP T	R	13-162	730.4	776.0	763.2	717.8	771.9	732.3	752.3	736.7	736.0	740.9	725.3	3 9
PRI SH OUT T	L	HW	742.0	767.3	751.5	748.8	756.0	717.9	777.4	788.0	719.6	709.3	713.7	3 10
PRI SH OUT T	R	HW	761.5	794.7	777.4	770.1	782.8	728.7	801.6	805.5	732.0	737.1	723.0	3 11
ECON H2O OUT T	L	HW	506.0	504.2	511.1	502.6	501.2	477.5	499.4	499.2	478.6	498.5	459.1	3 27
ECON H2O OUT T	R	HW	474.0	517.3	519.0	469.2	511.0	447.4	491.7	494.3	448.9	465.7	434.6	3 28
ECON H2O IN T		20-007	421.8	457.8	458.4	421.3	457.5	388.0	428.8	428.8	390.7	428.3	354.2	3 5
RH SPRAY H2O T		HW	290.2	316.5	316.9	289.3	314.5	265.2	293.4	293.6	267.7	294.2	264.9	3 7
LVG RH T		14-150	999.4	1001.4	1001.8	999.3	1004.7	923.3	998.7	1000.2	928.0	991.0	897.6	3 12
ENT RH T		CALC	662.2	725.4	709.9	660.6	733.3	579.2	679.9	676.3	595.4	658.4	519.5	3 16
COLD RH T		20-006	670.9	746.4	746.6	670.2	744.4	590.1	687.5	684.6	607.2	669.5	525.9	3 18
DATA PAGE NO. 4		**FLUID TEMPERATURES F - B&W**												
AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 18

TEST NO.		F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11		
TEST SEQ. NO.		1	2	3	4	5	6	7	8	9	10	11		
DATE		09/28/92	09/28/92	09/28/92	09/29/92	09/29/92	09/30/92	09/30/92	09/30/92	10/01/92	10/02/92	10/03/92		
TIME START		1446	1057	1920	1333	1708	1235	1713	2005	2245	0210	0523		
TIME END		1702	1302	2104	1545	1913	1429	1846	2138	0039	0354	0707		
LOAD MW		77	110	110	77	110	52	83	82	54	82	37		
DATA PAGE NO. 4	FLUID TEMPERATURES F - B&W													
GAS LVG AH P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	19
DATA PAGE NO. 5	FLUID PRESSURES PSIG													
TURB THROT P	03-170	1450.1	1450.0	1450.2	1450.3	1450.1	1450.5	1450.4	1450.2	1450.0	1450.0	1449.8	5	1
SEC SH OUT P	CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5	2
DRUM PRESS	04-013	1520.5	1609.7	1608.9	1518.0	1607.7	1483.1	1531.4	1530.6	1484.3	1531.8	1467.0	5	3
LVG RH PRESS	15-102	282.3	426.2	428.6	281.9	425.1	192.5	305.1	304.5	197.9	305.8	129.8	5	4
ENT RH PRESS	15-100	295.8	450.1	453.6	297.9	453.1	201.7	324.2	323.0	207.5	323.6	133.7	5	5
FW HTR E EXT P	20-035	286.3	433.4	436.6	286.9	433.9	193.6	311.4	310.6	200.3	311.2	126.0	5	6
FW HTR E EXT P	TRANS	288.4	435.2	438.0	288.3	434.7	195.1	312.4	311.8	201.7	312.6	127.4	5	7
SEC SH OUT P (T)	TRANS	1456.9	1483.5	1484.1	1457.0	1483.7	1446.7	1462.0	1461.9	1446.8	1461.4	1442.1	5	17
DRUM PRESS (T)	TRANS	1486.3	1575.0	1574.8	1485.2	1574.0	1450.8	1496.5	1496.0	1451.5	1498.2	1434.4	5	18
LVG RH-1 P (T)	TRANS	284.5	429.0	431.9	284.2	428.9	193.9	307.8	307.2	200.1	308.5	131.1	5	19
ENT RH-1 P (T)	TRANS	296.7	447.3	450.1	296.4	446.7	0.0	0.0	0.0	0.0	0.0	0.0	5	20
DATA PAGE NO. 6	AIR & GAS DATA - PLANT													
AMBIENT AIR DB TEMP	TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6	1
AIR ENT FD FAN T	HW	81.9	75.1	82.2	93.8	96.7	94.4	99.2	94.7	95.1	93.1	100.8	6	4
AIR LVG FD FAN T A	09-028	119.1	108.1	112.4	129.4	127.2	134.5	133.2	129.6	135.8	129.5	145.3	7	2
AIR LVG FD FAN T B	09-029	119.5	109.7	109.3	126.8	122.4	132.5	132.7	128.6	134.5	128.2	144.5	7	3
AIR ENT AH T RA	20-017	163.3	151.8	140.3	161.3	141.5	174.7	160.3	157.2	162.0	167.1	176.4	6	2
AIR ENT AH T RB	20-018	143.8	136.1	134.0	149.4	143.6	168.7	154.7	150.6	162.7	152.1	181.2	6	3
AIR ENT AH T LA	20-025	179.1	173.4	175.1	190.6	189.4	194.7	187.4	184.9	186.6	191.3	201.9	13	25
AIR ENT AH T LB	20-029	162.6	153.8	147.9	174.3	160.1	187.8	166.9	163.7	174.1	172.1	186.5	13	26
AIR LVG AH T R	HW	0.0	0.0	0.0	557.1	618.8	511.7	551.5	568.9	525.9	547.2	506.0	6	6
AIR LVG AH T L	HW	566.7	552.8	583.3	571.6	581.5	517.8	545.0	557.7	540.4	577.3	501.1	6	7
BRN SEC AIR T	08-002	521.2	542.5	556.1	528.4	563.3	510.1	550.4	566.9	531.0	576.0	499.0	14	2
BRN SA/GR T	08-001	493.2	540.4	565.3	507.1	567.2	487.5	547.0	564.8	506.4	567.6	485.4	14	3
OFA TEMP	09-002	466.1	541.9	559.1	459.6	566.1	436.6	524.6	540.1	473.7	540.8	450.0	14	4
GAS LVG AH T RA	20-019	287.2	299.2	304.5	289.2	310.7	276.1	290.3	293.0	288.4	283.6	274.1	6	10
GAS LVG AH T RB	20-020	273.9	286.5	290.7	276.8	297.0	257.0	277.9	279.8	271.0	273.1	250.5	6	11
GAS LVG AH T LA	20-027	270.6	275.5	282.7	280.0	294.7	268.2	272.2	274.6	281.3	280.0	264.5	13	27
GAS LVG AH T LB	20-024	281.7	289.3	295.3	291.0	307.4	276.9	282.3	285.7	289.6	291.2	272.6	13	28
GAS LVG RH PS T	AVE	641.3	635.4	674.5	650.8	668.2	579.2	619.1	633.2	596.0	661.5	552.8	13	17
GAS LVG SH PS T	AVE	584.5	676.6	682.6	588.9	696.1	524.9	603.3	620.1	517.1	568.0	518.4	13	19
GR GAS TEMP A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14	8
GR GAS TEMP B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14	9
O2 LVG ECON R	11-172	3.4778	3.2733	3.3522	3.4334	3.3142	3.7947	3.1622	3.2468	3.6988	3.0402	4.9303	6	20
O2 LVG ECON L	11-170	3.4227	2.4255	2.5636	3.6374	2.5965	3.7672	2.6975	2.6296	3.6130	2.4940	5.0793	6	21
O2 IN SEC AIR	06-254	19.29	15.85	15.82	19.80	15.83	19.59	16.12	16.09	19.47	15.99	19.42	13	29
ACCUREX NOX PPM	06-553	514.8	298.7	306.3	490.6	298.1	434.6	279.9	284.8	448.7	251.0	474.1	13	9

TEST NO.	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10	11
DATE	09/28/92	09/28/92	09/28/92	09/29/92	09/29/92	09/30/92	09/30/92	09/30/92	10/01/92	10/02/92	10/03/92
TIME START	1446	1057	1920	1333	1708	1235	1713	2005	2245	0210	0523
TIME END	1702	1302	2104	1545	1913	1429	1846	2138	0039	0354	0707
LOAD MW	77	110	110	77	110	52	83	82	54	82	37

DATA PAGE NO. 6 AIR & GAS DATA - PLANT

ACCUREX SOX	PPM	06-555	1198.9	1206.7	1175.7	1180.5	1201.6	1099.6	1080.7	1113.3	1133.3	1126.7	1058.2	13 10
ACCUREX CO	PPM	06-425	20.65	19.58	20.22	17.59	26.76	33.19	51.52	43.30	26.43	63.81	42.13	13 11
ACCUREX O2	%	06-554	3.3658	2.7931	2.8945	3.3984	2.8499	3.6999	2.8647	2.8935	3.4493	2.6815	5.0425	13 12
BRN SEC AIR P	IN WG	06-250	11.12	21.39	21.67	12.22	22.40	7.49	13.56	13.60	7.77	14.57	5.74	14 5
BRN GAS REC P	IN WG	06-252	11.15	21.34	21.49	12.10	22.37	7.40	13.55	13.49	7.60	14.47	5.55	14 6
FURNACE GAS P	IN WG	08-100	12.15	18.51	18.43	11.99	19.02	7.52	11.80	11.72	7.62	12.40	5.64	14 7
BAROMETRIC P	IN HG	PB	29.52	29.53	29.57	29.54	29.49	29.44	29.41	29.36	29.22	29.19	29.07	6 29
REL HUMIDITY	%	TST	13.55	16.14	18.81	10.95	12.08	13.55	13.83	17.45	21.02	21.14	18.60	6 30

DATA PAGE NO. 7 AIR & GAS DATA - B&W

AMBIENT AIR TEMP		TC	104.3	102.3	102.8	108.8	111.5	115.7	116.2	109.1	113.5	110.9	105.9	7 1
AIR LVG FD FAN T	A	TC	121.1	110.4	114.3	131.3	129.1	136.7	135.5	131.6	137.7	131.3	147.0	7 6
AIR LVG FD FAN T	B	TC	121.4	111.8	111.3	128.5	124.3	134.9	135.1	130.4	136.7	130.2	146.4	7 7
AIR ENT AH	(T)	GRID	165.8	154.6	149.9	171.9	158.3	181.1	170.0	166.9	172.4	174.0	186.2	7 4
GAS LVG AH	(T)	GRID	270.2	279.7	284.8	276.4	294.5	264.1	273.1	275.8	275.1	275.2	262.4	7 10
GAS LVG ECON	(T) L	GRID	657.3	664.1	695.5	666.5	698.0	595.6	636.9	651.0	613.7	676.2	568.7	7 14
GAS LVG ECON	(T) R	GRID	605.5	677.0	698.8	611.3	699.9	550.1	615.2	634.1	547.5	593.0	540.4	7 15
GAS TEMP LVG GR FAN		GRID	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 7
O2 LVG ECON	(T) L	GRID	3.5723	2.7165	2.8420	3.7261	2.8940	3.9209	2.9869	2.8828	3.7099	2.8592	5.3812	7 20
O2 LVG ECON	(T) R	GRID	3.4454	3.1720	3.2107	3.3974	3.0538	3.7322	3.1307	3.1533	3.6743	3.0760	5.2319	7 21
CO LVG ECON	(T) L	GRID	71.8	74.9	109.8	75.2	114.8	68.0	104.7	104.1	66.3	170.1	56.2	13 5
CO LVG ECON	(T) R	GRID	56.5	133.5	169.6	68.8	220.1	61.5	95.3	109.2	48.9	66.1	54.7	13 6
CO2 LVG ECON	(T) L	GRID	15.87	16.56	15.65	15.49	16.19	15.30	15.79	15.84	16.22	17.08	14.60	7 22
CO2 LVG ECON	(T) R	GRID	15.39	15.63	15.70	15.30	15.59	15.18	15.73	15.67	14.68	14.99	13.04	7 23
NOX LVG ECON	(T) L	GRID	554.3	304.4	298.6	496.4	292.4	467.0	293.9	283.8	466.7	248.7	527.4	7 24
NOX LVG ECON	(T) R	GRID	539.0	304.3	304.2	490.0	304.0	436.7	286.0	312.0	485.4	282.7	514.9	7 25
O2 LVG AH	(T)	GRID	4.9428	4.1040	4.2260	5.0487	4.1668	5.6444	4.3584	4.3299	5.4734	4.2515	7.1416	13 1
CO2 LVG AH	(T)	GRID	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	13 3
O2 LVG GR FAN	(T)	GRID	0.00	0.00	0.00	26.33	3.22	0.00	4.28	4.41	5.37	4.13	0.00	13 4
DRY BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27

DATA PAGE NO. 8 FW HTR TEMPERATURES F - PLANT

FW HTR E EXT T		HW	669.1	744.5	744.1	668.0	740.8	585.6	684.5	682.2	604.1	666.4	523.8	8 1
FW HTR E LVG T		HW	420.0	456.5	456.2	419.1	454.0	383.9	425.6	425.7	388.4	425.7	352.5	8 5
FW HTR E ENT T		HW	355.4	386.0	383.1	354.7	381.0	325.2	359.3	359.7	328.9	359.3	301.4	8 7
FW HTR E DRN T		HW	371.2	405.4	405.1	369.1	401.6	338.0	374.6	375.2	346.0	376.5	318.7	8 13

TEST NO.	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10	11
DATE	09/28/92	09/28/92	09/28/92	09/29/92	09/29/92	09/30/92	09/30/92	09/30/92	10/01/92	10/02/92	10/03/92
TIME START	1446	1057	1920	1333	1708	1235	1713	2005	2245	0210	0523
TIME END	1702	1302	2104	1545	1913	1429	1846	2138	0039	0354	0707
LOAD MW	77	110	110	77	110	52	83	82	54	82	37

DATA PAGE NO. 9 FW HTR TEMPERATURES F - B&W

SSH PEND IN LEG 1	10-017	858.2	857.7	849.2	848.9	853.6	845.3	842.4	845.3	854.8	826.3	836.1	9 17
SSH PEND IN LEG 2	10-018	878.1	878.2	871.3	868.4	874.0	855.7	865.3	865.7	865.4	846.3	846.8	9 18
SSH PEND IN LEG 3	10-019	874.5	886.5	879.1	865.5	882.0	845.6	870.3	862.9	854.7	851.1	836.6	9 19
SSH PEND IN LEG 4	10-020	879.4	903.0	894.0	872.5	897.5	851.2	883.7	868.6	859.4	869.3	840.3	9 20
SSH PEND IN LEG 5	10-021	846.0	879.7	869.1	840.4	870.1	817.2	857.7	838.6	826.1	845.7	808.5	9 21
SSH PEND IN LEG 6	10-033	874.2	904.3	892.5	869.3	893.3	847.2	899.1	880.1	854.6	875.1	836.0	9 22
SSH PEND IN LEG 7	10-034	875.3	895.9	883.5	870.1	881.8	845.5	895.4	892.1	852.3	864.7	832.8	9 23
SSH PEND IN LEG 8	10-035	870.5	889.4	678.1	863.0	875.8	843.1	885.7	885.3	851.5	860.2	830.4	9 24
SSH PEND IN LEG 9	10-036	877.5	886.2	877.0	868.1	877.8	848.8	881.9	883.8	860.1	859.8	836.0	9 25
SSH PEND IN LEG 10	10-037	862.8	856.7	848.6	852.7	856.2	834.5	846.4	852.1	847.4	833.0	816.9	9 26
RH PEND IN LEG 1	09-049	942.1	950.5	945.2	938.6	947.3	870.3	943.7	945.3	871.9	934.7	848.5	8 17
RH PEND IN LEG 2	09-050	931.3	945.5	938.3	929.2	940.2	859.0	942.9	943.3	859.9	926.5	838.6	8 18
RH PEND IN LEG 3	09-051	935.9	946.0	940.2	933.0	942.4	865.1	941.1	941.9	866.3	929.1	843.6	8 19
RH PEND IN LEG 4	09-052	932.1	944.3	937.9	929.5	940.1	860.3	940.6	940.9	861.4	926.0	839.4	8 20
RH PEND IN LEG 5	09-053	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8 21
RH PEND IN LEG 6	10-001	961.4	968.3	962.9	957.3	963.0	889.7	962.1	962.9	889.1	957.4	864.8	8 22
RH PEND IN LEG 7	10-002	931.5	939.7	936.7	926.1	935.4	865.6	931.0	931.7	866.0	926.0	844.8	8 23
RH PEND IN LEG 8	10-003	940.4	939.2	939.4	934.7	940.7	872.7	927.8	930.9	875.9	932.0	854.4	8 24
RH PEND IN LEG 9	10-004	942.4	950.9	945.3	939.0	947.5	870.8	945.0	945.7	871.7	936.1	848.4	8 25
RH PEND IN LEG 10	10-005	918.6	904.5	905.5	912.2	921.7	855.8	884.0	885.8	855.5	897.0	823.7	8 26
RH INTM HND HOLE R	10-038	939.5	949.5	944.6	936.6	946.7	868.8	939.1	944.1	873.0	929.1	848.8	8 27
RH INTM HND HOLE L	10-039	862.8	857.6	853.2	854.7	863.9	804.0	833.1	835.5	802.5	833.8	773.7	8 28
PSH OUT LEG T	09-017	762.9	787.7	771.6	773.5	778.5	736.1	799.4	808.3	740.5	738.4	730.7	14 11
PSH OUT LEG T	09-018	765.9	802.2	784.5	777.5	791.6	736.1	806.0	811.4	740.9	740.7	731.1	14 12
PSH OUT LEG T	09-019	726.4	752.0	735.2	733.0	743.6	708.0	752.0	769.4	710.9	686.8	704.6	14 13
PSH OUT LEG T	09-020	737.8	768.9	752.3	743.4	759.5	717.6	771.2	787.6	720.1	701.4	714.9	14 14
PSH OUT LEG T	09-021	754.1	768.1	758.2	761.7	760.4	728.3	786.7	797.5	730.6	729.0	724.1	14 15
PSH OUT LEG T	09-022	764.2	777.9	764.9	775.2	769.7	737.8	796.0	803.6	741.4	741.8	730.7	14 16
PSH OUT LEG T	09-023	740.5	781.3	762.0	752.4	771.6	717.9	782.5	790.6	721.8	712.7	714.1	14 17
PSH OUT LEG T	09-024	778.8	805.5	792.7	788.5	796.1	743.9	814.3	818.7	748.1	754.7	737.4	14 18
PSH OUT LEG T	09-025	746.5	789.6	771.9	756.1	779.5	719.7	789.3	796.7	723.2	721.4	716.7	14 19
PSH OUT LEG T	09-026	770.7	794.6	780.1	781.2	787.1	739.5	805.2	808.1	743.9	752.4	730.3	14 20
PSH OUT LEG T	09-027	778.3	808.9	791.8	788.6	800.5	744.2	815.8	818.1	748.4	763.1	734.3	14 21

DATA PAGE NO. 10 FUEL FEED DATA - PLANT

CYC A COAL FLOW KLB	05-104	21.79	21.69	21.69	21.69	21.55	23.01	23.11	23.01	23.05	22.98	16.81	10 1
CYC B COAL FLOW KLB	07-110	21.79	21.70	21.69	21.68	21.54	-.01	-.01	-.01	-.01	-.01	-.01	10 2
CYC C COAL FLOW KLB	09-110	21.81	21.71	21.71	21.70	21.56	22.99	23.10	22.98	23.07	23.00	16.82	10 3
CYC A SEC AIR FLOW %	06-170	206.7	201.4	201.1	205.6	199.8	207.9	215.4	214.0	210.5	214.8	156.5	10 16
CYC B SEC AIR FLOW %	08-170	206.1	198.5	198.1	203.7	195.6	3.0	3.6	2.6	1.7	2.2	1.0	10 17
CYC C SEC AIR FLOW %	10-170	206.8	201.8	201.9	205.4	200.1	207.7	215.6	213.7	210.5	215.5	157.1	10 18
CYC A SEC AIR T	20-002	508.2	540.7	549.4	509.0	558.4	478.7	510.0	525.1	491.8	493.3	472.7	11 1
CYC B SEC AIR T	20-003	557.2	571.5	592.2	561.6	599.1	511.2	537.2	554.2	534.3	564.5	498.0	11 2

TEST NO.	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10	11
DATE	09/28/92	09/28/92	09/28/92	09/29/92	09/29/92	09/30/92	09/30/92	09/30/92	10/01/92	10/02/92	10/03/92
TIME START	1446	1057	1920	1333	1708	1235	1713	2005	2245	0210	0523
TIME END	1702	1302	2104	1545	1913	1429	1846	2138	0039	0354	0707
LOAD MW	77	110	110	77	110	52	83	82	54	82	37

DATA PAGE NO. 10 FUEL FEED DATA - PLANT

CYC C SEC AIR T	20-004	522.5	513.6	538.5	529.7	543.0	488.9	509.8	522.6	512.8	536.3	475.9	11	3
PULV COAL FLOW KLB	06-314	.08	29.04	29.02	.07	28.95	.07	24.24	24.17	.07	24.10	.08	10	4
PULV PA FLOW	06-275	0.00	61.04	61.00	.43	60.96	1.22	55.03	54.92	1.50	54.85	0.00	10	19
PULV INLET T	09-034	128.5	525.2	535.2	99.3	548.5	101.6	497.4	514.5	105.9	516.1	142.4	11	7
PULV OUTLET T	09-040	130.8	151.8	154.3	116.8	158.9	109.2	145.9	160.2	113.8	156.4	135.1	11	8

DATA PAGE NO. 11 POWER & ELECTRICAL SYSTEM DATA

PULV DIFF P IN WG	06-274	-.02	13.78	12.97	-.05	13.80	-.01	13.18	13.93	-.01	11.91	-.02	11	9
PULV AMPS	06-276	-.1	278.0	266.6	-.1	274.9	-.1	261.9	264.2	-.1	248.3	0.0	11	10
PULV PA FAN AMPS	06-277	-.05	85.26	84.06	.07	86.97	-.10	63.24	65.86	.06	61.58	.03	11	11
ROT CLASS AMPS	06-278	.03	44.85	44.68	12.91	45.98	.03	46.42	46.28	.03	44.60	.03	11	12
ROT CLASS RPM	06-270	-.2	155.8	156.6	43.7	159.4	-.3	163.1	163.2	-.3	162.2	-.2	11	13
ROT CLASS DP IN WG	06-345	.0043	.4882	.4847	.1224	.5139	.0051	.5386	.5243	.0041	.5069	.0041	11	14
COAL SILO LEVEL	06-310	80.95	66.26	79.35	93.23	68.82	92.98	82.52	53.89	93.63	83.16	13.08	11	15
FLAME INTENSITY #1 %	06-279	24.4	105.5	105.8	22.5	106.2	1.6	106.1	106.1	1.8	106.0	.7	11	16
FLAME INTENSITY #2 %	06-295	3.6	104.7	105.0	4.0	105.5	1.0	105.7	105.5	1.0	105.3	.9	11	17
FLAME INTENSITY #3 %	06-296	3.6	105.7	105.9	4.6	106.2	.8	106.1	106.1	1.1	106.1	.8	11	18
FLAME INTENSITY #4 %	06-297	4.9	105.0	105.1	5.3	105.8	1.2	105.9	105.7	1.5	105.3	.8	11	19

DATA PAGE NO. 12 OPERATOR POSITIONS

RH SP VLV POS	15-077	-5.00	15.10	20.62	-5.00	-4.31	-5.00	-5.00	-5.00	-4.94	-5.00	-5.00	12	1
SH SP VLV POS R	13-190	35.09	31.39	28.63	45.93	29.83	0.00	42.32	51.15	0.00	0.00	0.00	12	3
SH SP VLV POS L	13-191	32.38	33.65	32.35	38.91	32.54	0.00	41.27	42.56	0.00	0.00	0.00	12	4
GR DMPR DEMAND	16-044	85.9	-5.0	11.2	64.4	-3.5	105.0	60.1	60.1	105.0	40.1	100.1	12	9
RECIRC AIR DMPR POS	12-176	17.30	43.10	89.26	17.41	76.92	13.31	16.13	16.75	11.05	19.64	10.65	12	13
SH PASS DMPR POS	14-180	11.9	100.0	83.1	12.1	100.0	0.0	36.2	39.1	0.0	10.0	0.0	12	15
RH PASS DMPR POS	14-180	100.0	33.0	100.0	100.0	36.2	100.0	100.0	100.0	100.0	100.0	100.0	12	16
OVRFIRE AIR DMPR POS	06-115	5.00	47.97	52.32	5.00	52.75	5.00	37.07	37.15	5.00	37.58	5.00	12	17
BRN SEC AIR DMPR POS	06-286	1.27	22.59	23.25	20.72	23.59	18.65	21.22	21.96	19.59	22.60	18.49	12	18
HOT PRI AIR DMPR POS	06-556	0.00	99.73	99.38	0.00	99.54	0.00	99.64	99.50	0.00	99.70	0.00	12	19
BRN GAS REC DMPR POS	06-324	0.00	34.84	36.00	0.00	24.79	0.00	29.96	29.98	0.00	28.88	0.00	12	20

DATA PAGE NO. 15 MISCELLANEOUS DATA

GAS LVG SH PASS 1A	08-003	-391.9	-484.7	-467.3	-379.4	-486.2	-318.8	-380.8	-395.9	-289.9	-336.1	-293.1	15	1
GAS LVG SH PASS 1B	08-004	585.5	674.0	689.1	587.3	701.1	524.8	602.6	619.2	517.2	566.0	516.7	15	2
GAS LVG SH PASS 1C	08-005	591.7	697.0	704.1	596.2	721.8	527.3	611.2	635.0	520.2	581.4	525.3	15	3
GAS LVG SH PASS 1D	08-006	624.0	728.3	754.8	624.2	756.2	543.6	642.5	669.4	539.5	602.4	540.5	15	4
GAS LVG SH PASS 2A	08-017	553.2	627.4	631.7	556.2	644.0	504.8	567.5	581.1	494.6	537.9	495.0	15	5
GAS LVG SH PASS 2B	08-018	567.7	647.5	652.0	570.0	664.9	515.7	588.5	597.8	502.0	551.6	504.2	15	6

TEST NO.		F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
TEST SEQ. NO.		1	2	3	4	5	6	7	8	9	10	11
DATE		09/28/92	09/28/92	09/28/92	09/29/92	09/29/92	09/30/92	09/30/92	09/30/92	10/01/92	10/02/92	10/03/92
TIME START		1446	1057	1920	1333	1708	1235	1713	2005	2245	0210	0523
TIME END		1702	1302	2104	1545	1913	1429	1846	2138	0039	0354	0707
LOAD MW		77	110	110	77	110	52	83	82	54	82	37

DATA PAGE NO. 15 MISCELLANEOUS DATA

GAS LVG SH PASS	2C	08-019	564.9	660.2	663.7	571.0	678.2	512.1	587.1	604.1	503.8	555.8	503.4	15 7
GAS LVG SH PASS	2D	08-020	602.0	707.0	708.7	604.6	726.9	538.0	628.5	648.0	532.7	593.2	533.3	15 8
GAS LVG SH PASS	3A	08-021	587.0	683.8	677.0	591.1	688.3	530.9	601.9	621.4	524.4	561.6	523.0	15 9
GAS LVG SH PASS	3B	08-022	590.4	676.1	681.2	599.0	700.3	528.9	602.2	616.9	520.5	565.2	525.1	15 10
GAS LVG SH PASS	3C	08-023	578.5	664.4	663.3	589.5	679.4	523.4	597.0	612.2	516.3	565.3	517.4	15 11
GAS LVG SH PASS	3D	08-024	-505.7	-647.9	-631.7	-491.1	-620.8	-412.4	-515.9	-543.0	-415.0	-479.3	-412.9	15 12
GAS LVG RH PASS	4A	08-033	639.6	626.4	669.7	645.9	661.9	574.4	603.5	615.1	592.3	659.5	542.8	15 13
GAS LVG RH PASS	4B	08-034	651.6	634.2	686.4	656.5	672.8	583.9	618.1	632.4	604.2	672.9	549.8	15 14
GAS LVG RH PASS	4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15
GAS LVG RH PASS	4D	08-036	659.5	657.3	719.4	667.3	696.4	589.6	649.8	678.1	615.0	699.8	584.5	15 16
GAS LVG RH PASS	5A	08-049	627.5	615.2	647.7	637.1	650.1	567.5	598.1	604.6	581.9	632.0	534.8	15 17
GAS LVG RH PASS	5B	08-050	637.1	627.0	669.5	647.2	657.4	577.5	612.9	620.4	593.4	655.2	540.5	15 18
GAS LVG RH PASS	5C	08-051	643.1	636.1	675.6	651.8	678.8	582.7	621.1	639.3	597.5	667.5	553.7	15 19
GAS LVG RH PASS	5D	08-052	631.9	629.1	666.7	642.4	663.3	569.7	615.9	638.6	585.3	656.8	548.6	15 20
GAS LVG RH PASS	6A	08-053	633.6	620.8	654.0	641.5	654.3	575.2	607.4	618.1	591.9	647.7	547.2	15 21
GAS LVG RH PASS	6B	08-054	645.8	648.9	678.0	657.0	671.7	589.7	629.9	640.2	603.0	666.1	560.2	15 22
GAS LVG RH PASS	6C	08-055	637.0	638.0	667.5	650.6	663.8	578.2	620.0	632.7	594.9	659.2	556.6	15 23
GAS LVG RH PASS	6D	08-056	648.0	656.4	684.9	661.4	679.8	583.0	636.6	648.6	596.1	660.1	561.8	15 24
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W			107.0	108.0	109.0	110.0	111.0	112.0	113.0	114.0	115.0	116.0	117.0	15 28

RB-369 21 Oct 1992 10:15:40

TEST NO.	F12	F12	F14	F15	F16	F17	F18	F19	FFB	FMB	FLB
TEST SEQ. NO.	12	13	14	15	16	17	18	19	20	21	22
DATE	10/02/92	10/03/92	10/03/92	10/04/92	10/04/92	10/05/92	10/05/92	10/05/92	09/28/92	09/30/92	10/03/92
TIME START	2248	0126	2127	0056	2025	0004	0243	2205	1814	1600	0434
TIME END	0043	0310	2322	0254	2220	0200	0427	0000	1828	1610	0440
LOAD MW	58	58	38	59	38	59	59	110	110	82	58
FUEL	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
ALPHA1											
ALPHA2											

F12 AVG SCANS 10-->20 : 58 MW : W/RBN
F12 AVG SCANS 25-->34 : 58 MW : W/RBN
F14 AVG SCANS 5-->15 : 40 MW : CYC SAME AS 58 MW W/REBURN
F15 AVG SCANS 25-->31 : 58 MW : W/RBN
F16 AVG SCANS 6-->16 : LOWEST REBURN LOAD : 180 RPM CLASS SPEED
F17 AVG SCANS 27-->37 : 58 MW : REBURN WITH 1 CYCLONE OPERATION
F18 AVG SCANS 42-->51 : 58 MW : REBURN WITH 2 CYC. HIGH AIR
F19 AVG SCANS 154-->164 : 110 MW : NO REBURN
FFB SINGLE SCAN : 110 MW : PRE-REBURN BASE
FMB SINGLE SCAN : 82 MW : PRE-REBURN BASE
FLB SINGLE SCAN : 58 MW : PRE-REBURN BASE

DATA PAGE NO. 2 FLOWS MLB/HR

LOAD MW	20-005	58.1	57.6	37.7	59.3	38.0	59.2	58.8	110.3	109.8	82.3	57.9	2	1
MAIN STEAM FLOW	03-033	381.3	383.0	263.5	392.9	269.1	390.7	385.4	776.2	776.2	567.4	384.9	2	2
1ST STG STM FLW	CALC	379.5	380.6	247.8	392.4	253.4	389.7	383.9	772.6	772.3	546.4	382.7	2	23
FW FLOW	12-170	391.5	396.8	273.9	406.2	277.6	400.6	395.6	785.7	791.7	556.5	396.1	2	3
BLOW DOWN FLOW	EST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	4
RH SPRAY FLOW	14-192	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.05	0.00	0.00	2	5
SH SPRAY FLOW L	17-052	3.34	0.00	0.00	1.64	0.00	2.99	1.29	12.53	12.39	10.05	0.00	2	7
SH SPRAY FLOW R	17-056	0.00	0.00	0.00	0.00	0.00	10.18	0.00	14.89	14.66	11.11	0.00	2	8
GR FAN AMPS A	16-181	40.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.81	-.02	0.00	2	12
GR FAN AMPS B	16-183	.06	42.45	44.71	42.72	36.12	40.70	39.24	.06	.06	39.77	42.76	2	13
GR FAN BUS VOLT	EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2	14
TOTAL GR FLOW	CALC	242.6	263.7	266.9	267.5	168.2	243.5	226.0	0.0	55.1	240.1	271.4	2	24
GR TO SEC AIR	06-932	12.97	13.03	3.48	12.96	12.99	13.02	13.00	.69	2.00	2.42	3.08	2	25
GR TO SEC AIR	CALC	12.34	11.87	2.84	12.26	12.17	12.49	12.16	35.00	1.68	2.15	2.42	2	26
GR TO FURN	CALC	230.9	251.8	264.1	255.3	156.0	231.0	213.8	0.0	53.4	238.1	269.0	2	27
OFA AIR FLOW	06-931	97.4	90.1	28.1	95.6	81.0	104.0	117.5	28.0	31.5	31.4	26.2	2	28
TMP AIR FLOW	CALC	37.44	25.88	69.95	26.34	36.54	13.40	57.82	59.56	40.48	7.94	29.87	14	10
SEC AIR FLOW	06-320	42.83	42.84	31.23	42.89	44.00	43.31	43.22	31.21	31.18	31.21	31.41	2	29
1st STG PRESS	18-128	513.6	515.1	325.5	532.0	333.5	528.1	519.9	1075.2	1074.7	752.0	518.1	2	19
OIL FLOW 2A	05-100	.0017	.0017	.0017	.0029	.0017	.0017	.0033	.0019	.0017	.0017	.0021	2	20
OIL FLOW 2B	07-100	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0017	.0026	.0017	.0017	2	21
OIL FLOW 2C	09-100	.0016	.0016	.0016	.0016	.0030	.0028	.0016	.0016	.0016	.0016	.0016	2	22
% PWDR RVR BASN COAL	USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	30

TEST NO.			F12	F12	F14	F15	F16	F17	F18	F19	FFB	FMB	FLB	
TEST SEQ. NO.			12	13	14	15	16	17	18	19	20	21	22	
DATE			10/02/92	10/03/92	10/03/92	10/04/92	10/04/92	10/05/92	10/05/92	10/05/92	09/28/92	09/30/92	10/03/92	
TIME START			2248	0126	2127	0056	2025	0004	0243	2205	1814	1600	0434	
TIME END			0043	0310	2322	0254	2220	0200	0427	0000	1828	1610	0440	
LOAD MW			58	58	38	59	38	59	59	110	110	82	58	
DATA PAGE NO. 2		**FLOWS MLB/HR**												
CYCLONE STOIC		CALC	1.0545	1.0695	1.0405	1.0697	1.0661	1.1099	1.0564	1.0908	1.1031	1.1507	1.1005	4 20
REBRN WB STOIC		CALC	.6	.6	100.0	.6	.7	.7	.7	100.0	100.0	100.0	100.0	4 21
REBRN STOIC		CALC	.9312	.9352	1.2007	.9264	.9439	.8996	.9353	1.1406	1.1243	1.1228	1.1259	4 22
LVG FURN STOIC		CALC	1.1587	1.1473	1.2925	1.1469	1.2093	1.1396	1.2060	1.1759	1.1633	1.1765	1.1877	4 23
LVG ECON STOIC		CALC	1.1752	1.1639	1.3158	1.1629	1.2324	1.1557	1.2220	1.1852	1.1729	1.1883	1.2043	4 24
DATA PAGE NO. 3		**FLUID TEMPERATURES F - PLANT**												
SSH OUT T	L	15-152	998.8	971.6	943.0	971.9	942.5	986.2	1000.2	999.7	1000.2	1011.5	959.6	3 1
SSH OUT T	R	15-150	997.2	977.1	941.8	995.0	954.8	1003.9	999.6	999.9	993.1	998.4	986.2	3 2
SSH OUT AVE T		13-160	998.1	975.1	939.5	985.7	952.2	998.8	1002.8	998.9	997.3	1003.1	970.5	14 1
LVG SH ATTMP T	L	13-164	699.3	715.5	721.8	716.0	683.1	729.3	717.7	743.9	727.5	741.3	733.7	3 8
LVG SH ATTMP T	R	13-162	744.6	732.9	734.2	740.5	700.3	683.3	753.7	740.0	722.6	733.8	742.4	3 9
PRI SH OUT T	L	HW	726.1	711.3	720.4	714.6	682.4	732.6	728.4	786.3	770.4	794.2	729.5	3 10
PRI SH OUT T	R	HW	747.2	729.8	732.7	745.9	700.5	761.9	758.3	794.5	778.1	798.5	739.5	3 11
ECON H2O OUT T	L	HW	488.6	481.0	466.3	486.8	442.0	488.3	491.3	507.6	511.6	492.7	485.0	3 27
ECON H2O OUT T	R	HW	453.9	448.6	441.0	452.5	418.5	455.0	454.6	520.2	517.2	500.8	452.5	3 28
ECON H2O IN T		20-007	396.7	395.9	354.6	398.4	355.8	398.8	397.9	459.5	459.0	428.9	396.3	3 5
RH SPRAY H2O T		HW	271.1	268.8	267.9	274.5	264.9	269.9	269.5	316.8	317.2	293.3	273.4	3 7
LVG RH T		14-150	979.0	943.3	916.0	955.1	890.7	971.0	998.7	1001.3	985.7	991.4	939.8	3 12
ENT RH T		CALC	635.3	615.1	540.1	628.5	545.5	640.4	643.6	705.5	687.3	677.7	608.2	3 16
COLD RH T		20-006	647.4	627.1	543.6	634.8	552.0	647.8	651.0	745.4	741.6	687.3	619.8	3 18
DATA PAGE NO. 4		**FLUID TEMPERATURES F - B&W**												
AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 18

TEST NO.		F12	F12	F14	F15	F16	F17	F18	F19	FFB	FMB	FLB		
TEST SEQ. NO.		12	13	14	15	16	17	18	19	20	21	22		
DATE		10/02/92	10/03/92	10/03/92	10/04/92	10/04/92	10/05/92	10/05/92	10/05/92	09/28/92	09/30/92	10/03/92		
TIME START		2248	0126	2127	0056	2025	0004	0243	2205	1814	1600	0434		
TIME END		0043	0310	2322	0254	2220	0200	0427	0000	1828	1610	0440		
LOAD MW		58	58	38	59	38	59	59	110	110	82	58		
DATA PAGE NO. 4	**FLUID TEMPERATURES F - B&W**													
GAS LVG AH P	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	19
DATA PAGE NO. 5	**FLUID PRESSURES PSIG**													
TURB THROT P	03-170	1450.0	1449.9	1450.0	1450.2	1450.0	1456.7	1450.3	1450.2	1449.8	1447.9	1449.4	5	1
SEC SH OUT P	CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5	2
DRUM PRESS	04-013	1487.1	1488.0	1466.7	1492.1	1466.9	1496.6	1489.7	1604.0	1606.0	1528.3	1489.7	5	3
LVG RH PRESS	15-102	210.3	210.9	130.3	217.1	132.1	216.1	214.0	429.5	430.9	304.9	212.5	5	4
ENT RH PRESS	15-100	221.9	222.0	135.2	228.2	136.5	227.1	224.4	457.7	455.8	323.5	223.2	5	5
FW HTR E EXT P	20-035	213.6	213.5	127.0	219.8	128.4	219.3	216.5	439.4	439.2	310.5	214.4	5	6
FW HTR E EXT P	TRANS	214.8	215.1	127.8	221.3	129.5	220.6	218.1	440.2	441.0	311.9	216.1	5	7
SEC SH OUT P (T)	TRANS	1447.6	1448.0	1442.3	1449.4	1442.6	1455.8	1448.8	1483.4	1483.8	1459.2	1449.4	5	17
DRUM PRESS (T)	TRANS	1453.9	1455.0	1433.8	1459.8	1434.6	1463.8	1457.1	1572.0	1573.1	1494.8	1456.6	5	18
LVG RH-1 P (T)	TRANS	212.7	213.1	131.4	219.0	133.2	218.1	215.7	433.3	434.4	307.3	213.9	5	19
ENT RH-1 P (T)	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	452.6	0.0	0.0	5	20
DATA PAGE NO. 6	**AIR & GAS DATA - PLANT**													
AMBIENT AIR DB TEMP	TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6	1
AIR ENT FD FAN T	HW	114.9	106.0	107.1	103.8	104.6	103.6	102.4	100.8	82.0	98.1	102.0	6	4
AIR LVG FD FAN T A	09-028	141.6	141.5	145.1	139.9	143.5	138.4	135.9	128.2	114.0	132.4	139.7	7	2
AIR LVG FD FAN T B	09-029	140.5	139.5	148.2	138.5	148.6	138.4	136.5	128.6	111.8	133.6	139.0	7	3
AIR ENT AH T RA	20-017	157.3	166.2	176.9	179.9	181.0	178.3	173.0	128.4	154.3	158.4	169.2	6	2
AIR ENT AH T RB	20-018	161.2	165.9	182.5	168.2	186.1	169.2	163.8	132.8	137.0	152.2	162.8	6	3
AIR ENT AH T LA	20-025	182.6	189.7	200.2	202.0	202.7	199.4	196.1	139.2	179.0	162.2	193.9	13	25
AIR ENT AH T LB	20-029	168.0	179.5	184.8	200.9	189.7	197.6	192.3	132.2	156.0	146.6	185.7	13	26
AIR LVG AH T R	HW	540.2	532.0	495.0	528.9	0.0	0.0	0.0	635.7	0.0	577.0	533.5	6	6
AIR LVG AH T L	HW	548.5	532.6	501.2	528.7	480.2	535.3	549.3	591.6	569.4	540.3	533.2	6	7
BRN SEC AIR T	08-002	548.1	536.0	490.3	528.9	440.6	491.7	548.3	578.0	545.1	536.3	533.8	14	2
BRN SA/GR T	08-001	543.3	532.6	475.6	524.9	450.7	504.1	544.9	546.0	521.5	511.8	517.8	14	3
OFA TEMP	09-002	520.9	508.8	438.7	498.2	434.0	478.3	517.9	511.1	477.7	441.8	482.8	14	4
GAS LVG AH T RA	20-019	293.1	284.2	273.5	270.9	269.4	272.2	277.5	332.0	296.5	286.7	281.6	6	10
GAS LVG AH T RB	20-020	277.6	267.5	251.3	257.0	247.3	256.3	263.3	314.0	282.8	274.2	268.3	6	11
GAS LVG AH T LA	20-027	277.4	274.1	263.1	266.4	258.6	265.4	271.2	304.1	275.5	264.0	274.2	13	27
GAS LVG AH T LB	20-024	285.2	281.6	270.9	274.9	266.5	274.0	280.6	310.4	289.2	270.0	282.4	13	28
GAS LVG RH PS T	AVE	606.3	593.2	548.1	595.0	527.1	614.0	623.7	673.2	663.4	624.5	605.9	13	17
GAS LVG SH PS T	AVE	543.3	541.7	499.9	544.6	481.6	555.6	559.0	705.2	690.3	643.5	559.8	13	19
GR GAS TEMP A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14	8
GR GAS TEMP B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14	9
O2 LVG ECON R	11-172	3.5270	3.4310	4.9802	3.2591	3.9536	2.4963	4.2329	3.1776	3.2600	3.3306	3.5503	6	20
O2 LVG ECON L	11-170	3.0336	2.8028	5.2252	2.8761	4.0965	3.1390	3.7311	3.6174	3.2567	3.4920	3.7016	6	21
O2 IN SEC AIR	06-254	16.89	16.84	19.40	16.83	17.13	16.79	17.06	20.62	19.93	19.73	19.45	13	29
ACCUREX NOX PPM	06-553	294.4	309.9	488.0	288.0	337.8	278.7	301.3	561.6	555.1	493.7	426.5	13	9

TEST NO.	F12	F12	F14	F15	F16	F17	F18	F19	FFB	FMB	FLB
TEST SEQ. NO.	12	13	14	15	16	17	18	19	20	21	22
DATE	10/02/92	10/03/92	10/03/92	10/04/92	10/04/92	10/05/92	10/05/92	10/05/92	09/28/92	09/30/92	10/03/92
TIME START	2248	0126	2127	0056	2025	0004	0243	2205	1814	1600	0434
TIME END	0043	0310	2322	0254	2220	0200	0427	0000	1828	1610	0440
LOAD MW	58	58	38	59	38	59	59	110	110	82	58

DATA PAGE NO. 6 AIR & GAS DATA - PLANT

ACCUREX SOX	PPM	06-555	1194.3	1211.9	1036.4	1186.8	1119.2	1262.7	1211.6	1133.5	1238.2	1083.4	1094.7	13 10
ACCUREX CO	PPM	06-425	56.85	73.63	32.51	62.12	44.09	58.49	52.70	12.56	12.26	21.80	43.08	13 11
ACCUREX O2	%	06-554	3.0471	2.9548	5.1425	3.0968	4.3363	2.9627	3.7598	3.3579	3.0454	3.1463	3.5508	13 12
BRN SEC AIR P	IN WG	06-250	12.34	12.07	5.61	12.43	7.99	11.99	12.83	21.82	19.32	12.41	9.10	14 5
BRN GAS REC P	IN WG	06-252	11.96	11.72	5.41	12.10	7.56	11.60	12.39	21.66	19.28	12.28	9.00	14 6
FURNACE GAS P	IN WG	08-100	8.12	8.04	5.54	8.43	4.63	8.01	8.53	21.16	18.94	12.10	8.86	14 7
BAROMETRIC P	IN HG	PB	29.09	29.07	29.19	29.21	29.39	29.41	29.43	29.48	29.55	29.40	29.06	6 29
REL HUMIDITY	%	TST	13.98	17.32	13.66	11.02	10.69	10.67	11.33	11.95	14.71	12.99	18.84	6 30

DATA PAGE NO. 7 AIR & GAS DATA - B&W

AMBIENT AIR TEMP		TC	115.3	112.0	103.2	100.4	100.8	99.0	97.9	105.3	104.2	116.2	109.5	7 1
AIR LVG FD FAN T	A	TC	143.8	143.6	146.6	141.5	145.0	139.9	137.5	129.8	116.0	134.5	141.8	7 6
AIR LVG FD FAN T	B	TC	142.8	141.6	149.6	140.0	149.9	140.0	138.1	130.2	113.8	134.9	140.7	7 7
AIR ENT AH	(T)	GRID	168.7	175.9	186.1	188.0	190.2	186.4	182.3	133.7	157.3	163.5	179.8	7 4
GAS LVG AH	(T)	GRID	275.3	270.5	261.4	262.7	258.0	262.8	267.8	303.6	280.0	265.4	269.7	7 10
GAS LVG ECON	(T) L	GRID	622.1	608.0	565.0	610.6	540.5	625.9	639.9	701.9	685.9	642.7	621.1	7 14
GAS LVG ECON	(T) R	GRID	567.6	564.6	524.3	566.1	502.9	579.2	583.5	704.3	693.6	652.6	583.7	7 15
GAS TEMP LVG GR FAN		GRID	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 7
O2 LVG ECON	(T) L	GRID	3.0838	2.8675	5.4034	3.1160	4.4214	3.2272	3.8750	3.8343	3.3727	3.5216	3.8412	7 20
O2 LVG ECON	(T) R	GRID	3.4930	3.3484	5.0860	3.0430	4.1016	2.3959	4.0065	2.7927	3.0038	3.1945	3.5631	7 21
CO LVG ECON	(T) L	GRID	94.8	110.8	67.5	139.5	84.7	126.1	136.6	180.8	91.8	74.0	81.5	13 5
CO LVG ECON	(T) R	GRID	64.6	97.7	45.9	99.1	90.0	105.1	123.9	235.8	190.9	121.0	76.9	13 6
CO2 LVG ECON	(T) L	GRID	16.41	16.51	13.66	15.81	15.04	15.72	15.38	15.62	15.29	15.49	15.92	7 22
CO2 LVG ECON	(T) R	GRID	14.23	14.33	13.23	14.64	14.41	15.76	14.34	15.13	15.80	15.66	14.20	7 23
NOX LVG ECON	(T) L	GRID	309.7	337.7	522.2	298.4	357.5	289.7	316.7	584.0	586.0	522.9	459.5	7 24
NOX LVG ECON	(T) R	GRID	333.2	340.9	525.6	333.6	386.9	296.3	344.6	566.5	557.4	510.4	462.0	7 25
O2 LVG AH	(T)	GRID	4.9601	4.7696	7.2471	4.9076	6.4838	4.8221	5.6134	4.5968	4.3737	4.6586	5.3967	13 1
CO2 LVG AH	(T)	GRID	161.9	192.1	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	13 3
O2 LVG GR FAN	(T)	GRID	10.09	17.73	0.00	0.00	0.00	1.81	0.00	0.00	0.00	4.57	0.00	13 4
DRY BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27

DATA PAGE NO. 8 FW HTR TEMPERATURES F - PLANT

FW HTR E EXT T		HW	644.8	625.3	542.0	633.2	549.6	645.6	649.0	743.2	741.1	683.9	616.9	8 1
FW HTR E LVG T		HW	394.6	394.2	353.5	397.6	354.3	396.8	396.2	457.1	457.5	425.7	394.3	8 5
FW HTR E ENT T		HW	334.4	333.6	302.2	336.7	302.5	337.3	336.2	384.3	384.7	359.2	334.2	8 7
FW HTR E DRN T		HW	349.0	349.1	310.9	349.0	312.1	347.7	348.4	405.1	406.5	374.2	347.8	8 13

TEST NO.		F12	F12	F14	F15	F16	F17	F18	F19	FFB	FMB	FLB	
TEST SEQ. NO.		12	13	14	15	16	17	18	19	20	21	22	
DATE		10/02/92	10/03/92	10/03/92	10/04/92	10/04/92	10/05/92	10/05/92	10/05/92	09/28/92	09/30/92	10/03/92	
TIME START		2248	0126	2127	0056	2025	0004	0243	2205	1814	1600	0434	
TIME END		0043	0310	2322	0254	2220	0200	0427	0000	1828	1610	0440	
LOAD MW		58	58	38	59	38	59	59	110	110	82	58	
DATA PAGE NO. 9	**FW HTR TEMPERATURES F - B&W**												
SSH PEND IN LEG 1	10-017	853.1	839.6	848.0	832.6	813.5	810.6	846.2	861.7	847.9	858.7	875.9	9 17
SSH PEND IN LEG 2	10-018	875.6	862.4	866.8	868.0	849.8	846.3	873.3	876.3	863.1	876.0	889.5	9 18
SSH PEND IN LEG 3	10-019	876.6	866.7	856.4	887.1	872.2	868.5	882.7	872.7	863.4	866.5	878.6	9 19
SSH PEND IN LEG 4	10-020	892.0	880.8	854.9	907.1	894.3	886.5	900.3	877.9	871.6	869.3	881.9	9 20
SSH PEND IN LEG 5	10-021	866.1	857.1	817.4	881.5	869.1	862.3	873.7	841.7	840.7	831.2	846.6	9 21
SSH PEND IN LEG 6	10-033	891.4	889.1	844.4	905.4	897.3	905.0	901.5	874.9	871.8	880.0	872.6	9 22
SSH PEND IN LEG 7	10-034	876.1	885.1	842.8	890.7	885.5	920.9	888.2	881.3	878.5	887.8	866.7	9 23
SSH PEND IN LEG 8	10-035	871.4	871.8	845.8	874.9	868.1	895.1	877.0	877.8	871.9	883.5	859.5	9 24
SSH PEND IN LEG 9	10-036	871.0	861.0	857.0	861.1	853.1	870.0	868.9	880.3	874.4	892.6	862.1	9 25
SSH PEND IN LEG 10	10-037	835.5	823.3	845.1	818.3	807.9	831.3	833.1	865.6	857.4	870.7	841.1	9 26
RH PEND IN LEG 1	09-049	923.3	893.6	859.1	904.9	834.5	921.5	947.7	940.7	925.0	929.1	888.8	8 17
RH PEND IN LEG 2	09-050	912.4	887.7	845.2	900.5	831.5	928.2	941.0	930.6	915.5	921.7	882.3	8 18
RH PEND IN LEG 3	09-051	917.1	888.9	853.1	900.8	832.0	921.3	942.7	935.0	919.0	925.5	884.4	8 19
RH PEND IN LEG 4	09-052	912.8	886.2	847.8	899.2	830.2	922.9	939.7	931.5	915.9	922.7	881.8	8 20
RH PEND IN LEG 5	09-053	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8 21
RH PEND IN LEG 6	10-001	947.9	916.5	874.8	930.1	852.2	937.9	972.3	960.6	945.3	949.0	907.9	8 22
RH PEND IN LEG 7	10-002	922.9	886.2	857.0	902.2	822.9	894.0	942.0	933.3	918.1	924.8	883.9	8 23
RH PEND IN LEG 8	10-003	925.0	879.7	873.6	893.4	820.7	881.9	942.6	937.8	920.8	931.5	891.6	8 24
RH PEND IN LEG 9	10-004	924.0	894.0	859.0	906.7	835.1	922.9	948.8	940.9	925.5	931.8	890.6	8 25
RH PEND IN LEG 10	10-005	875.1	835.1	854.9	840.5	791.7	852.9	883.1	920.2	898.3	899.3	858.2	8 26
RH INTM HND HOLE R	10-038	918.6	892.2	857.8	894.7	832.5	918.6	942.6	940.3	924.7	927.9	883.9	8 27
RH INTM HND HOLE L	10-039	819.0	791.2	794.5	792.2	745.5	810.0	828.1	877.2	854.1	850.3	805.9	8 28
PSH OUT LEG T	09-017	754.1	737.1	737.6	740.1	698.8	763.0	762.1	793.5	777.7	800.0	744.8	14 11
PSH OUT LEG T	09-018	755.4	737.6	739.8	749.8	701.9	766.4	763.9	806.3	786.2	807.6	744.0	14 12
PSH OUT LEG T	09-019	703.9	693.4	704.0	692.0	671.0	708.0	701.1	795.2	773.1	792.2	717.0	14 13
PSH OUT LEG T	09-020	718.9	705.9	718.4	705.2	682.6	722.6	716.5	799.7	780.5	804.9	725.6	14 14
PSH OUT LEG T	09-021	742.8	728.0	727.8	728.7	695.0	754.2	750.7	783.8	769.7	794.6	742.1	14 15
PSH OUT LEG T	09-022	756.3	739.3	738.0	743.8	700.2	764.5	766.4	784.0	770.4	792.5	749.6	14 16
PSH OUT LEG T	09-023	727.4	713.1	723.4	722.3	684.3	736.9	731.4	790.3	769.4	794.1	724.4	14 17
PSH OUT LEG T	09-024	766.9	748.7	745.2	765.5	710.4	781.7	780.3	810.1	791.4	810.9	756.9	14 18
PSH OUT LEG T	09-025	732.7	719.3	723.3	732.9	695.0	749.5	741.3	794.2	775.4	794.2	727.9	14 19
PSH OUT LEG T	09-026	758.0	740.6	738.7	752.9	710.6	773.5	770.9	793.9	778.2	794.5	747.6	14 20
PSH OUT LEG T	09-027	765.4	748.1	741.8	760.1	716.7	783.7	781.0	804.4	787.2	802.4	753.5	14 21
DATA PAGE NO. 10	**FUEL FEED DATA - PLANT**												
CYC A COAL FLOW KLB	05-104	16.47	16.57	16.91	17.35	.04	.04	17.07	31.37	31.85	35.20	25.20	10 1
CYC B COAL FLOW KLB	07-110	-.01	-.01	-.01	-.01	19.55	35.15	-.01	31.36	31.84	-.01	-.01	10 2
CYC C COAL FLOW KLB	09-110	16.48	16.58	16.92	17.36	.01	.01	17.05	31.34	31.86	35.18	25.20	10 3
CYC A SEC AIR FLOW %	06-170	149.2	149.7	158.8	158.0	1.5	2.1	156.9	287.6	297.1	337.1	235.3	10 16
CYC B SEC AIR FLOW %	08-170	2.0	1.9	1.0	1.3	194.0	329.6	1.6	291.3	299.1	5.5	2.4	10 17
CYC C SEC AIR FLOW %	10-170	149.5	150.2	158.7	158.0	.6	2.1	156.5	290.5	300.6	337.5	236.7	10 18
CYC A SEC AIR T	20-002	497.5	489.2	463.4	478.0	414.4	440.8	490.9	569.3	558.9	540.4	496.0	11 1
CYC B SEC AIR T	20-003	537.2	524.8	491.6	513.4	472.5	517.0	536.5	604.9	574.5	531.6	525.7	11 2

TEST NO.		F12	F12	F14	F15	F16	F17	F18	F19	FFB	FMB	FLB	
TEST SEQ. NO.		12	13	14	15	16	17	18	19	20	21	22	
DATE		10/02/92	10/03/92	10/03/92	10/04/92	10/04/92	10/05/92	10/05/92	10/05/92	09/28/92	09/30/92	10/03/92	
TIME START		2248	0126	2127	0056	2025	0004	0243	2205	1814	1600	0434	
TIME END		0043	0310	2322	0254	2220	0200	0427	0000	1828	1610	0440	
LOAD MW		58	58	38	59	38	59	59	110	110	82	58	
DATA PAGE NO. 10 FUEL FEED DATA - PLANT													
CYC C SEC AIR T	20-004	514.2	500.4	472.1	488.9	430.4	462.2	508.1	559.8	524.7	507.9	503.1	11 3
PULV COAL FLOW KLB	06-314	17.51	17.67	.07	17.51	15.50	17.10	17.21	.08	.07	.08	.08	10 4
PULV PA FLOW	06-275	48.04	48.08	0.00	48.03	48.00	47.99	48.08	1.75	0.00	0.00	0.00	10 19
PULV INLET T	09-034	498.6	487.7	97.1	473.0	432.0	475.5	491.3	164.0	101.5	105.7	173.2	11 7
PULV OUTLET T	09-040	173.8	167.9	96.3	153.6	162.5	165.6	171.4	154.7	119.3	108.2	147.0	11 8
DATA PAGE NO. 11 POWER & ELECTRICAL SYSTEM DATA													
PULV DIFF P IN WG	06-274	6.5932	6.4165	-.0125	6.1625	5.9951	6.2333	6.2270	-.0201	-.1571	-.0831	-.0188	11 9
PULV AMPS	06-276	206.0	203.8	-.1	205.0	200.2	201.7	200.5	0.0	-.1	-.1	0.0	11 10
PULV PA FAN AMPS	06-277	50.78	50.10	-.06	47.34	44.46	49.25	49.84	-.06	-.12	-.08	-.06	11 11
ROT CLASS AMPS	06-278	40.93	41.01	.03	40.47	43.46	40.23	40.17	.03	42.77	30.29	.03	11 12
ROT CLASS RPM	06-270	163.9	163.9	-.2	155.7	181.3	160.6	160.6	-.3	158.0	98.9	-.2	11 13
ROT CLASS DP IN WG	06-345	.3211	.3270	.0068	.3132	.3854	.2930	.2904	.0035	.4278	.2687	.0037	11 14
COAL SILO LEVEL	06-310	38.32	25.48	95.35	82.91	72.46	55.76	43.20	40.09	93.93	93.19	13.02	11 15
FLAME INTENSITY #1 %	06-279	106.1	106.2	.8	106.2	106.1	106.2	106.2	3.6	4.4	8.8	4.7	11 16
FLAME INTENSITY #2 %	06-295	105.6	105.5	1.0	105.5	105.7	105.6	105.5	4.3	4.1	6.7	1.7	11 17
FLAME INTENSITY #3 %	06-296	0.0	105.0	.8	106.1	106.1	106.1	106.1	3.5	3.4	1.4	1.7	11 18
FLAME INTENSITY #4 %	06-297	105.7	105.7	.9	105.6	105.8	104.0	105.5	3.2	3.2	2.8	1.4	11 19
DATA PAGE NO. 12 OPERATOR POSITIONS													
RH SP VLV POS	15-077	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	21.21	28.20	-5.00	-5.00	12 1
SH SP VLV POS R	13-190	23.34	20.26	0.00	27.67	0.00	58.98	24.50	47.58	41.68	49.18	0.00	12 3
SH SP VLV POS L	13-191	38.67	0.00	0.00	0.00	0.00	18.58	33.15	45.02	40.78	46.24	0.00	12 4
GR DMPR DEMAND	16-044	65.3	67.3	104.0	74.1	40.9	61.2	57.2	-5.0	-.7	70.8	100.1	12 9
RECIRC AIR DMPR POS	12-176	9.88	11.36	10.19	16.15	11.18	15.92	16.00	.06	30.36	12.91	13.41	12 13
SH PASS DMPR POS	14-180	.1	0.0	0.0	.1	.2	2.4	0.0	100.0	100.0	72.4	0.0	12 15
RH PASS DMPR POS	14-180	100.0	100.0	100.0	100.0	100.0	100.0	100.0	43.9	98.9	100.0	100.0	12 16
OVRFIRE AIR DMPR POS	06-115	26.46	25.34	5.00	25.97	23.26	26.75	29.12	5.00	5.00	5.00	5.92	12 17
BRN SEC AIR DMPR POS	06-286	36.47	35.76	18.05	35.56	32.88	35.27	36.88	23.72	22.31	19.89	19.79	12 18
HOT PRI AIR DMPR POS	06-556	99.39	99.63	0.00	99.52	99.60	99.33	99.33	0.00	0.00	0.00	0.00	12 19
BRN GAS REC DMPR POS	06-324	33.38	34.04	0.00	38.80	23.53	32.05	31.34	0.00	0.00	0.00	0.00	12 20
DATA PAGE NO. 15 MISCELLANEOUS DATA													
GAS LVG SH PASS 1A	08-003	-307.7	-309.7	-275.6	-304.7	-263.2	-313.5	-314.4	-475.0	-507.5	-454.4	-332.3	15 1
GAS LVG SH PASS 1B	08-004	543.3	542.2	498.1	540.8	477.0	548.3	551.4	708.4	688.1	649.1	558.8	15 2
GAS LVG SH PASS 1C	08-005	551.9	550.6	505.4	554.9	482.5	562.6	567.8	739.0	709.8	651.5	567.4	15 3
GAS LVG SH PASS 1D	08-006	569.3	565.2	519.3	568.9	501.7	586.4	592.6	769.3	760.2	684.2	583.8	15 4
GAS LVG SH PASS 2A	08-017	518.6	519.8	479.2	517.9	460.9	522.7	527.4	664.0	648.0	614.5	533.7	15 5
GAS LVG SH PASS 2B	08-018	527.3	524.0	488.5	529.0	466.3	536.9	540.5	673.6	665.2	621.1	541.7	15 6

TEST NO.			F12	F12	F14	F15	F16	F17	F18	F19	FFB	FMB	FLB	
TEST SEQ. NO.			12	13	14	15	16	17	18	19	20	21	22	
DATE			10/02/92	10/03/92	10/03/92	10/04/92	10/04/92	10/05/92	10/05/92	10/05/92	09/28/92	09/30/92	10/03/92	
TIME START			2248	0126	2127	0056	2025	0004	0243	2205	1814	1600	0434	
TIME END			0043	0310	2322	0254	2220	0200	0427	0000	1828	1610	0440	
LOAD MW			58	58	38	59	38	59	59	110	110	82	58	

DATA PAGE NO. 15 MISCELLANEOUS DATA

GAS LVG SH PASS	2C	08-019	528.4	526.3	486.0	534.7	468.8	543.1	545.9	682.2	673.3	621.6	544.5	15 7
GAS LVG SH PASS	2D	08-020	559.6	557.9	509.3	565.0	496.2	589.4	588.8	728.8	712.2	658.0	577.9	15 8
GAS LVG SH PASS	3A	08-021	544.6	542.4	507.2	543.8	483.7	555.3	556.3	697.3	695.0	655.4	557.8	15 9
GAS LVG SH PASS	3B	08-022	550.1	550.3	505.5	546.2	493.6	556.5	560.8	702.5	685.6	647.4	574.2	15 10
GAS LVG SH PASS	3C	08-023	539.4	538.6	500.9	544.3	485.5	555.0	558.8	686.8	665.6	632.5	557.9	15 11
GAS LVG SH PASS	3D	08-024	-439.7	-441.8	-379.6	-442.7	-365.7	-460.0	-466.7	-639.8	-631.2	-549.1	-459.7	15 12
GAS LVG RH PASS	4A	08-033	587.0	572.8	546.1	578.1	518.0	593.5	609.9	661.9	654.1	619.1	591.4	15 13
GAS LVG RH PASS	4B	08-034	610.1	587.1	553.8	589.6	526.3	598.7	622.2	669.5	667.3	623.3	601.3	15 14
GAS LVG RH PASS	4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15
GAS LVG RH PASS	4D	08-036	640.6	633.0	558.4	622.0	542.3	655.1	663.0	719.5	703.1	649.5	642.2	15 16
GAS LVG RH PASS	5A	08-049	583.6	566.6	536.8	572.2	511.2	585.8	593.4	652.8	639.1	602.9	583.8	15 17
GAS LVG RH PASS	5B	08-050	600.2	580.2	542.4	584.7	519.9	596.6	610.0	663.2	655.9	610.6	593.8	15 18
GAS LVG RH PASS	5C	08-051	613.6	599.8	544.8	599.9	525.5	621.5	631.6	678.8	662.5	626.2	608.5	15 19
GAS LVG RH PASS	5D	08-052	600.4	595.9	537.7	592.3	519.9	614.3	619.2	669.3	655.9	613.9	607.1	15 20
GAS LVG RH PASS	6A	08-053	595.1	582.7	545.7	584.5	523.2	600.4	613.7	661.6	650.3	619.6	600.4	15 21
GAS LVG RH PASS	6B	08-054	618.7	603.2	556.8	606.9	539.6	629.6	638.7	680.1	670.1	638.0	612.1	15 22
GAS LVG RH PASS	6C	08-055	609.8	601.0	550.1	605.8	537.3	628.8	631.7	667.6	660.4	624.7	609.2	15 23
GAS LVG RH PASS	6D	08-056	610.0	602.9	555.9	609.5	535.1	629.5	627.7	680.7	678.3	642.1	514.9	15 24
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W			118.0	119.0	120.0	121.0	122.0	123.0	124.0	125.0	126.0	127.0	128.0	15 28

APPENDIX NO. 11

Summary of W Series Western Fuel Test Data

SUMMARY OF W SERIES WESTERN FUEL TESTS

	TEST MW	DATE MO DAY YEAR	LOAD MW	STEAM FLOW KLB/HR	SH OUT TEMP	RH OUT TEMP	SH SPRAY FLOW KLB/HR	RH SPRAY FLOW KLB/HR	CYCLONE COAL FLOW KLB/HR	% OF MAX CYCLONE INPUT	CYC IN SERV	REBURN INPUT %	REBURN INPUT KLB/HR	ROTARY CLASS. RPM	EXCESS AIR %	REBURN STOICH	CYCLONE STOICH	ACTUAL FLYASH SPLIT %	ADJUSTED FLYASH SPLIT %
1	W1	11 16 92	109	769.10	999	1001	56.10	19.50	112.10	98.33	3	0.00	0.00	0	18.90	1.1380	1.0470	14.70	14.70
2	W4	11 19 92	110	775.70	999	1000	68.30	14.90	117.10	102.72	3	0.00	0.00	0	20.30	1.1520	1.0680	42.61	42.61
3	W12	12 1 92	109	773.00	999	991	57.10	23.90	118.70	104.12	3	0.00	0.00	0	19.90	1.1420	1.0550	59.33	59.33
4	W15	12 2 92	108	765.90	1000	996	52.92	23.10	117.10	102.72	3	0.00	0.00	0	20.10	1.1550	1.0540	0.00	0.00
5	W22	12 4 92	109	775.00	1003	997	57.50	26.70	116.80	102.46	3	0.00	0.00	0	22.10	1.1620	1.0490	0.00	0.00
6	W28	12 7 92	110	778.20	999	999	71.56	0.00	112.80	98.95	3	0.00	0.00	0	19.90	1.1360	1.0720	0.00	0.00
7	W23	12 4 92	118	850.70	999	1003	54.30	31.00	90.87	79.71	3	28.62	36.43	160	16.70	0.8740	1.0640	80.72	80.72
8	W3	11 17 92	110	780.70	999	1003	45.80	14.90	82.37	72.25	3	29.96	35.25	160	16.10	0.8520	1.0460	31.55	31.55
9	W5	11 19 92	110	776.50	1000	1002	70.40	31.30	85.43	74.94	3	29.22	35.27	160	15.80	0.9490	1.0980	34.85	34.85
10	W13	12 1 92	110	775.90	1002	1001	58.20	27.80	84.32	73.96	3	29.50	35.28	160	18.30	0.8600	1.0800	45.06	45.06
11	W16	12 2 92	109	772.40	999	1000	67.40	31.20	82.42	72.30	3	31.14	37.28	160	16.50	0.8470	1.0710	51.05	51.05
12	W17	12 2 92	109	772.80	997	993	52.20	30.40	89.31	78.34	3	25.20	30.09	160	17.70	0.9050	1.0680	51.58	51.58
13	W27	12 7 92	110	780.00	996	995	43.60	4.70	77.48	67.96	3	31.86	36.22	160	18.20	0.9210	1.0750	0.00	0.00
14	W28	12 7 92	110	773.10	1002	1004	54.90	5.80	79.33	69.59	3	30.28	34.34	160	20.70	0.8930	1.1150	0.00	0.00
15	W18	12 3 92	110	780.00	998	993	56.30	24.70	117.20	102.81	3	0.00	0.00	0	19.80	1.1400	1.0740	0.00	0.00
16	W19	12 3 92	111	784.80	999	1000	54.60	25.70	118.80	104.20	3	0.00	0.00	0	20.20	1.1460	1.0420	0.00	0.00
17	W20	12 3 92	110	786.50	999	996	39.30	30.30	83.56	73.30	3	29.78	35.44	155	18.50	0.9190	1.1100	0.00	0.00
18	W21	12 3 92	110	782.90	999	996	31.20	27.60	83.26	73.04	3	29.86	35.44	155	18.80	0.9220	1.0580	0.00	0.00
19	W2	11 16 92	78	517.10	1000	1001	12.40	0.00	78.80	69.12	3	0.00	0.00	0	20.40	1.1330	1.0820	30.31	30.31
20	W11	11 30 92	83	555.00	999	996	20.40	0.00	86.10	75.53	3	0.00	0.00	0	19.20	1.1440	1.1010	71.03	71.03
21	W6	11 19 92	83	549.50	999	1002	35.70	0.00	59.52	78.32	2	32.13	28.18	163	16.50	0.8770	1.0840	34.77	34.77
22	W8	11 20 92	81	536.60	999	1000	30.70	0.00	57.86	76.13	2	32.80	28.24	170	14.80	0.8380	1.0920	36.40	36.40
23	W10	11 30 92	83	549.90	1000	1000	23.60	0.00	63.21	83.17	2	25.98	22.19	160	20.80	0.9870	113.1000	48.44	48.44
24	W25	12 5 92	61	404.90	1000	986	4.80	0.00	64.10	84.34	2	0.00	0.00	0	19.70	1.1310	1.0480	37.11	37.11
25	W14	12 1 92	56	368.10	999	998	1.40	0.00	60.30	79.34	2	0.00	0.00	0	19.90	1.1100	1.0360	74.29	74.29
26	W7	11 20 92	61	394.40	999	999	24.80	0.00	43.80	57.63	2	32.62	21.20	175	14.30	0.9530	1.0820	40.13	40.13
27	W29	12 7 92	60	394.30	1001	999	12.30	0.00	37.56	49.42	2	40.19	25.24	174	15.60	0.9160	1.0440	69.86	69.86
28	W30	12 7 92	60	395.90	999	1000	6.40	0.00	41.05	54.01	2	34.00	21.15	174	20.50	0.9300	1.0460	42.04	42.04
29	W24	12 4 92	59	389.50	1004	976	11.20	0.00	36.96	48.63	2	40.48	25.14	174	14.90	0.2130	1.0140	52.03	52.03
30	W9	11 20 92	42	278.40	1001	981	11.50	0.00	28.43	74.82	1	39.38	18.47	170	20.40	0.8380	1.0920	17.88	17.88

SUMMARY OF W SERIES WESTERN FUEL TESTS

	TEST MW	ACTUAL UBC LB/ 100LB	ADJUSTED UBC LB/ 100LB	UBC EFF LOSS %	GAS WT. WITHOUT RECIRC. MLB/HR	TOTAL GR MLB/HR	GR TO REBURN MLB/HR	AS TESTED EFF %	CORR. EFF %	ACT. FEGT	TOTAL SEC NF	SEC IN NF	SEC OUT NF	PTI NF	RH NF	ECON NF	DRY GAS LOSS %	EXIT GAS TEMP CORR
1	W1	0.05	0.05	0.08	1043.0	0.0	0.0	86.70	88.24	2177	0.89	0.87	0.92	0.92	1.13	0.74	4.42	320.80
2	W4	0.33	0.33	0.52	1038.0	0.0	0.0	86.29	87.91	2166	1.01	0.98	1.04	0.97	1.35	0.74	4.18	312.50
3	W12	0.15	0.15	0.24	1057.0	0.0	0.0	86.13	87.93	2179	0.92	0.89	0.95	0.91	0.99	0.72	4.46	323.40
4	W15	0.00	0.14	0.22	1046.0	0.0	0.0	86.59	88.21	2153	0.93	0.95	0.90	0.97	1.09	0.79	4.10	310.00
5	W22	0.00	0.14	0.22	1060.0	0.0	0.0	86.75	88.40	2148	1.02	0.99	1.05	1.01	1.24	0.90	4.21	308.40
6	W28	0.00	0.18	0.28	1024.0	0.0	0.0	86.65	88.02	2177	1.05	1.03	1.08	0.94	1.09	0.77	4.26	314.80
7	W23	0.42	0.42	0.63	1105.0	97.4	23.1	86.64	87.59	2116	0.95	0.88	1.02	0.97	1.21	0.80	3.93	306.90
8	W3	0.06	0.06	0.09	1063.0	112.0	30.3	86.76	87.96	2074	0.93	0.88	0.98	0.91	1.15	0.65	4.26	324.70
9	W5	0.06	0.06	0.10	1063.0	0.0	0.0	85.86	88.14	2212	0.90	0.85	0.96	0.96	1.21	0.70	4.31	323.80
10	W13	0.05	0.05	0.08	1055.0	94.5	28.7	86.45	87.82	2125	0.88	0.81	0.95	0.88	1.02	0.67	4.32	321.60
11	W16	0.26	0.26	0.41	1038.0	93.8	42.3	86.35	87.65	2153	0.85	0.83	0.88	0.90	1.15	0.73	4.14	319.70
12	W17	0.28	0.28	0.44	1043.0	91.8	45.0	86.37	87.64	2089	0.94	0.88	1.00	0.97	1.12	0.71	4.13	318.90
13	W27	0.00	0.14	0.22	1021.0	0.0	0.0	86.69	88.12	2119	1.00	0.95	1.05	0.92	1.20	0.75	4.28	320.50
14	W28	0.00	0.14	0.22	1037.0	82.6	12.3	86.71	87.79	2085	0.95	0.91	0.98	0.87	1.12	0.69	4.28	317.90
15	W18	0.00	0.18	0.28	1072.0	73.4	1.0	86.76	88.15	2075	1.08	1.09	1.07	0.97	1.17	0.79	4.02	301.10
16	W19	0.00	0.18	0.28	1092.0	0.0	0.0	86.32	88.08	2144	0.98	0.98	0.99	0.95	1.16	0.77	4.42	320.90
17	W20	0.00	0.14	0.22	1080.0	70.1	2.1	86.75	88.15	2057	0.97	0.95	1.00	1.01	1.17	0.77	4.09	309.20
18	W21	0.00	0.14	0.22	1080.0	0.0	0.0	86.40	88.04	2105	0.88	0.84	0.92	0.99	1.11	0.75	4.40	322.70
19	W2	0.05	0.05	0.08	728.0	61.6	2.7	87.16	88.90	1886	0.96	0.93	0.99	1.15	1.24	0.81	3.55	294.80
20	W11	0.13	0.13	0.21	756.0	66.5	2.1	86.94	88.49	1925	0.89	0.85	0.92	1.02	1.14	0.73	3.64	300.30
21	W6	0.24	0.24	0.39	765.0	74.6	11.2	86.03	88.35	1961	1.03	0.94	1.11	0.96	1.35	0.68	3.74	299.50
22	W8	0.19	0.19	0.31	732.0	101.3	54.3	86.50	88.51	1925	0.98	0.92	1.04	1.04	1.30	0.78	3.32	297.40
23	W10	0.29	0.29	0.46	734.0	76.7	9.7	87.28	88.26	1916	0.91	0.84	0.97	0.99	1.20	0.74	3.56	297.90
24	W25	0.14	0.14	0.22	571.0	268.5	1.8	86.97	88.63	1600	1.17	1.15	1.19	1.19	1.20	0.77	3.48	288.50
25	W14	0.13	0.13	0.21	536.0	248.6	2.0	86.51	88.68	1567	0.99	0.94	1.02	1.33	1.28	0.82	3.52	299.20
26	W7	0.30	0.30	0.48	563.0	204.8	11.2	86.12	88.48	1719	1.03	0.94	1.11	1.16	1.37	0.83	3.16	294.80
27	W29	0.37	0.37	0.58	551.0	231.2	13.0	86.52	88.22	1677	1.00	1.00	1.01	1.07	1.27	0.75	3.57	308.20
28	W30	0.06	0.06	0.11	568.0	207.4	13.2	87.03	88.62	1663	0.96	0.88	1.02	1.07	1.21	0.72	3.45	298.50
29	W24	0.56	0.56	0.88	531.0	276.6	12.4	86.25	87.92	1612	1.03	1.00	1.05	1.08	1.32	0.80	3.47	303.10
30	W9	0.04	0.04	0.06	430.0	223.4	12.0	86.42	88.72	1558	1.04	1.10	0.98	1.25	1.39	0.77	3.26	299.60

RB-369 25 Jan 1993 09:59:47

TEST NO.	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10
DATE	11/16/92	11/16/92	11/17/92	11/19/92	11/19/92	11/19/92	11/20/92	11/20/92	11/20/92	11/30/92
TIME START	0900	1403	1136	0823	1223	1541	1354	1753	2022	1403
TIME END	1127	1559	1329	1017	1407	1725	1558	1904	2107	1515
LOAD MW	109	78	110	110	110	83	61	81	42	83
FUEL	ON	ON	ON	ON	ON	ON	ON	ON	OFF	LAMR
ALPHA1										
ALPHA2										

W1 AVG SCANS 8 -->21 : 110 MW : NO REBURN : SLM
W2 AVG SCANS 37-->47 : 78 MW : NO REBURN : SLM
W3 AVG SCANS 10-->18 : 110 MW : W/ REBURN : SLM : .86 STOICH
W4 AVG SCANS 31-->41 : 110 MW : NO REBURN : SLM
W5 AVG SCANS 54-->63 : 110 MW : W/ REBURN : SLM : NO GR
W6 AVG SCANS 73-->82 : 82 MW : W/ REBURN : SLM
W7 AVG SCANS 9 -->20 : 60 MW : W/ REBURN : 2 CYCLONES : SLM
W8 AVG SCANS 32-->37 : 82 MW : W/ REBURN : 2 CYCLONES : SLM
W9 AVG SCANS 38-->40 : 40 MW : W/ REBURN : 1 CYCLONE : SLM
W10 AVG SCANS 6 -->12 : 82 MW : W/ REBURN : 2 CYCLONE : SLM

DATA PAGE NO. 2 FLOWS MLB/HR

LOAD MW		20-005	108.7	78.2	110.1	110.0	110.0	82.8	60.6	81.4	41.9	82.7	2	1
MAIN STEAM FLOW		03-033	756.0	519.0	760.0	764.0	756.0	561.1	387.0	546.6	275.6	562.3	2	2
1ST STG STM FLW		CALC	749.9	505.9	754.7	759.2	750.1	540.9	386.0	529.1	261.0	542.2	2	23
FW FLOW		12-170	771.1	519.1	782.7	777.7	778.5	551.5	396.4	538.6	280.4	551.9	2	3
BLOW DOWN FLOW		EST	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2	4
RH SPRAY FLOW		14-192	19.46	0.00	29.31	14.87	31.33	0.00	0.00	0.00	0.00	0.00	2	5
SH SPRAY FLOW	L	17-052	22.77	3.47	19.62	28.27	32.92	17.81	10.86	13.49	5.06	10.64	2	7
SH SPRAY FLOW	R	17-056	23.86	4.24	19.88	29.69	26.72	13.31	9.01	12.28	10.83	9.11	2	8
GR FAN AMPS	A	16-181	0.00	24.40	0.00	0.00	0.00	25.37	37.75	28.19	39.55	-.02	2	12
GR FAN AMPS	B	16-183	.06	.06	28.07	.06	.06	.06	.06	.06	.06	25.53	2	13
GR FAN BUS VOLT		EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2	14
TOTAL GR FLOW		CALC	0.0	61.6	112.0	0.0	0.0	74.6	204.8	101 3	223.4	76.7	2	24
GR TO SEC AIR		06-932	.55	3.08	32.94	.70	.85	11.72	11.52	51.36	12.45	9.71	2	25
GR TO SEC AIR		CALC	35.00	2.72	30.26	35.00	35.00	11.21	11.19	54.26	11.99	9.67	2	26
GR TO FURN		CALC	0.0	58.8	81.8	0.0	0.0	63.4	193.6	47.0	211.5	67.1	2	27
OFA AIR FLOW		06-931	32.6	34.7	250.4	28.5	166.1	163.4	92.9	189.4	92.1	141.8	2	28
TMP AIR FLOW		CALC	99.09	56.11	76.74	88.97	32.71	32.99	28.05	34.73	44.58	49.14	14	10
SEC AIR FLOW		06-320	31.31	29.80	19.36	31.23	37.50	32.19	36.91	19.42	43.15	30.48	2	29
1st STG PRESS		18-128	1042.7	694.2	1049.6	1056.0	1043.1	744.2	522.9	727.2	344.2	746.0	2	19
OIL FLOW 2A		05-100	.0017	0.0000	.0017	.0017	.0017	0.0000	-.0017	-.0017	.0017	.0017	2	20
OIL FLOW 2B		07-100	.0020	.0017	.0017	.0019	.0017	.0017	.0017	.0017	.0017	.0017	2	21
OIL FLOW 2C		09-100	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0025	.0016	2	22
% PWDR RVR BASN COAL		USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	30
CYCLONE STOIC		CALC	1.0469	1.0819	1.0460	1.0681	1.0979	1.0843	1.0825	1.0917	1.0667	1.1309	4	20

TEST NO.	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10
DATE	11/16/92	11/16/92	11/17/92	11/19/92	11/19/92	11/19/92	11/20/92	11/20/92	11/20/92	11/30/92
TIME START	0900	1403	1136	0823	1223	1541	1354	1753	2022	1403
TIME END	1127	1559	1329	1017	1407	1725	1558	1904	2107	1515
LOAD MW	109	78	110	110	110	83	61	81	42	83

DATA PAGE NO. 2 FLOWS MLB/HR

REBRN WB STOIC		CALC	100.0	100.0	.3	100.0	.5	.4	.6	.4	.7	.5	4 21
REBRN STOIC		CALC	1.1379	1.1326	.8521	1.1518	.9490	.8774	.9529	.8383	.9422	.9872	4 22
LVG FURN STOIC		CALC	1.1776	1.1938	1.1493	1.1866	1.1469	1.1520	1.1618	1.1638	1.2257	1.2259	4 23
LVG ECON STOIC		CALC	1.1874	1.2065	1.1588	1.1964	1.1567	1.1641	1.1780	1.1760	1.2480	1.2381	4 24

DATA PAGE NO. 3 FLUID TEMPERATURES F - PLANT

SSH OUT T	L	15-152	999.1	999.7	999.3	999.1	999.4	999.3	998.9	999.4	984.2	999.8	3 1
SSH OUT T	R	15-150	999.2	1000.6	999.3	999.0	1000.1	999.3	999.4	999.2	1018.3	1000.4	3 2
SSH OUT AVE T		13-160	1000.9	1000.8	1000.4	1000.9	1002.0	999.6	1000.0	1001.1	1002.7	1002.5	14 1
LVG SH ATTMP T	L	13-164	734.6	741.4	742.8	719.8	705.8	696.2	710.8	709.4	774.7	733.7	3 8
LVG SH ATTMP T	R	13-162	737.3	736.1	753.8	721.5	734.4	722.8	727.7	733.4	678.2	756.2	3 9
PRI SH OUT T	L	HW	827.0	762.8	817.0	828.9	832.9	785.6	796.6	781.0	774.7	789.6	3 10
PRI SH OUT T	R	HW	832.9	774.7	830.8	835.8	838.3	794.7	810.9	807.3	791.2	813.5	3 11
ECON H2O OUT T	L	HW	510.0	489.6	513.4	505.6	508.6	485.1	486.2	489.7	469.7	488.3	3 27
ECON H2O OUT T	R	HW	524.1	472.3	520.4	523.2	521.0	486.5	473.8	487.7	447.4	492.1	3 28
ECON H2O IN T		20-007	458.7	422.0	460.6	460.3	461.2	428.7	399.4	426.5	361.7	428.4	3 5
RH SPRAY H2O T		HW	314.6	288.9	313.8	312.0	312.3	290.1	273.6	291.9	263.8	294.4	3 7
LVG RH T		14-150	1000.5	1000.6	1003.1	1000.1	1002.2	1001.7	999.5	1000.3	981.3	1000.2	3 12
ENT RH T		CALC	608.3	665.8	569.4	648.0	561.8	672.7	643.7	673.8	586.5	679.2	3 16
COLD RH T		20-006	743.5	671.8	746.7	745.1	747.1	683.3	650.3	681.4	595.2	686.6	3 18

DATA PAGE NO. 4 FLUID TEMPERATURES F - B&W

AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 18
GAS LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 19

TEST NO.	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10
DATE	11/16/92	11/16/92	11/17/92	11/19/92	11/19/92	11/19/92	11/20/92	11/20/92	11/20/92	11/30/92
TIME START	0900	1403	1136	0823	1223	1541	1354	1753	2022	1403
TIME END	1127	1559	1329	1017	1407	1725	1558	1904	2107	1515
LOAD MW	109	78	110	110	110	83	61	81	42	83

DATA PAGE NO. 5 FLUID PRESSURES PSIG

TURB THROT P		03-170	1450.3	1450.0	1450.0	1449.8	1449.9	1449.9	1450.2	1450.3	1449.9	1449.9	5 1
SEC SH OUT P		CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 2
DRUM PRESS		04-013	1596.8	1521.4	1599.2	1601.1	1595.7	1529.3	1491.8	1526.2	1470.5	1529.9	5 3
LVG RH PRESS		15-102	424.2	284.3	430.3	427.9	429.5	303.6	216.4	297.4	139.5	303.3	5 4
ENT RH PRESS		15-100	451.2	301.9	458.9	454.0	456.7	321.2	229.1	315.8	145.6	321.4	5 5
FW HTR E EXT P		20-035	433.5	289.9	440.5	437.0	439.3	309.7	220.4	303.6	137.3	309.4	5 6
FW HTR E EXT P		TRANS	434.1	290.5	440.9	438.2	440.0	311.0	220.7	304.4	137.9	310.7	5 7
SEC SH OUT P	(T)	TRANS	1481.4	1458.1	1482.5	1483.1	1481.9	1461.2	1450.5	1460.1	1442.7	1458.5	5 17
DRUM PRESS	(T)	TRANS	1564.3	1487.4	1563.9	1567.2	1561.3	1495.6	1455.6	1490.4	1433.3	1494.1	5 18
LVG RH-1 P	(T)	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 19
ENT RH-1 P	(T)	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 20

DATA PAGE NO. 6 AIR & GAS DATA - PLANT

AMBIENT AIR DB TEMP		TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 1
AIR ENT FD FAN T		HW	90.8	100.3	109.9	95.8	98.0	99.1	112.7	108.7	112.5	95.0	6 4
AIR LVG FD FAN T	A	09-028	116.4	132.9	128.0	114.6	117.6	120.6	145.3	138.7	151.3	130.4	7 2
AIR LVG FD FAN T	B	09-029	121.8	135.3	129.9	124.7	128.1	131.9	147.4	141.8	154.4	130.9	7 3
AIR ENT AH T	RA	20-017	123.1	136.4	132.0	127.0	130.3	135.4	148.1	141.9	158.2	139.6	6 2
AIR ENT AH T	RB	20-018	123.9	137.3	132.4	129.4	133.1	137.7	149.6	144.1	157.2	147.9	6 3
AIR ENT AH T	LA	20-025	120.3	135.5	130.8	129.2	129.6	134.7	147.3	141.3	153.5	177.5	13 25
AIR ENT AH T	LB	20-029	119.9	136.1	131.3	119.3	122.0	126.1	148.3	142.2	154.2	151.3	13 26
AIR LVG AH T	R	HW	660.4	558.1	684.8	645.2	0.0	0.0	552.4	599.5	540.2	597.8	6 6
AIR LVG AH T	L	HW	593.2	561.3	618.9	571.2	593.5	566.0	552.0	566.7	545.8	567.0	6 7
BRN SEC AIR T		08-002	590.5	528.3	624.4	577.1	605.5	580.4	554.6	570.3	511.5	574.1	14 2
BRN SA/GR T		08-001	554.6	505.3	627.5	545.7	578.6	552.1	539.8	569.2	512.7	538.6	14 3
OFA TEMP		09-002	339.9	362.7	599.8	514.0	596.6	564.9	509.5	543.4	485.5	555.8	14 4
GAS LVG AH T	RA	20-019	346.1	311.9	354.6	338.0	351.8	329.3	309.7	318.1	312.4	311.0	6 10
GAS LVG AH T	RB	20-020	323.0	295.1	329.8	313.6	329.5	310.1	289.5	300.1	280.2	294.8	6 11
GAS LVG AH T	LA	20-027	301.0	284.2	305.5	289.4	301.0	278.9	282.2	283.6	279.9	285.1	13 27
GAS LVG AH T	LB	20-024	303.8	287.4	309.7	293.9	306.4	286.2	286.1	286.5	286.2	295.4	13 28
GAS LVG RH PS T		AVE	663.6	625.1	698.4	644.7	668.9	630.3	598.1	627.4	591.0	637.7	13 17
GAS LVG SH PS T		AVE	721.1	593.5	743.4	712.8	729.2	653.9	587.8	637.6	537.4	655.9	13 19
GR GAS TEMP	A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 8
GR GAS TEMP	B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 9
O2 LVG ECON	R	11-172	3.4556	3.2262	3.1188	3.3533	3.0288	3.1240	2.1118	2.4454	3.1238	3.4176	6 20
O2 LVG ECON	L	11-170	3.4816	3.7418	2.9939	3.8851	3.2984	2.8931	3.2090	2.7324	3.3575	3.5119	6 21
O2 IN SEC AIR		06-254	20.70	19.31	9.69	20.62	20.60	16.19	16.63	7.62	17.10	16.76	13 29
ACCUREX NOX	PPM	06-553	443.1	414.4	215.1	539.0	286.8	211.3	207.9	183.4	173.0	275.5	13 9
ACCUREX SOX	PPM	06-555	209.7	292.0	309.5	288.8	214.4	198.2	217.5	241.6	207.2	198.0	13 10
ACCUREX CO	PPM	06-425	30.4	38.2	99.7	48.9	46.4	65.7	69.8	161.3	64.7	60.5	13 11
ACCUREX O2	%	06-554	3.3341	3.4079	2.8172	3.6108	3.0249	2.9658	2.8721	2.9170	3.9362	3.3725	13 12
BRN SEC AIR P	IN WG	06-250	23.87	12.91	27.54	23.86	23.20	14.57	10.47	16.46	9.33	14.36	14 5
BRN GAS REC P	IN WG	06-252	23.63	12.76	27.61	23.63	22.91	14.41	10.16	16.56	8.92	14.36	14 6

TEST NO.	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10	
DATE	11/16/92	11/16/92	11/17/92	11/19/92	11/19/92	11/19/92	11/20/92	11/20/92	11/20/92	11/30/92	
TIME START	0900	1403	1136	0823	1223	1541	1354	1753	2022	1403	
TIME END	1127	1559	1329	1017	1407	1725	1558	1904	2107	1515	
LOAD MW	109	78	110	110	110	83	61	81	42	83	

DATA PAGE NO. 6 AIR & GAS DATA - PLANT

FURNACE GAS P	IN WG	08-100	23.19	12.75	21.40	23.37	21.87	12.71	8.10	12.59	6.04	13.24	14 7
BAROMETRIC P	IN HG	PB	29.20	29.10	29.37	29.49	29.41	29.35	28.98	28.95	28.90	29.14	6 29
REL HUMIDITY	%	TST	10.11	9.50	9.28	9.40	9.97	9.68	10.41	11.03	10.27	8.54	6 30

DATA PAGE NO. 7 AIR & GAS DATA - B&W

AMBIENT AIR TEMP		TC	94.5	109.2	111.0	102.1	104.2	99.2	111.3	109.6	113.4	112.7	7 1
AIR LVG FD FAN T	A	TC	118.1	134.8	129.6	116.6	119.7	122.2	146.9	140.4	153.1	132.4	7 6
AIR LVG FD FAN T	B	TC	123.1	136.8	131.5	126.3	129.5	133.4	148.9	143.4	156.0	132.8	7 7
AIR ENT AH	(T)	GRID	122.3	136.9	132.2	126.3	129.4	134.6	149.1	143.2	156.8	154.9	7 4
GAS LVG AH	(T)	GRID	306.6	284.2	315.8	298.6	311.0	290.3	282.4	287.0	283.6	288.0	7 10
GAS LVG ECON	(T) L	GRID	693.1	639.9	723.4	677 8	700.1	652.9	615.5	649.0	609.7	658.6	7 14
GAS LVG ECON	(T) R	GRID	724.5	605.1	755.0	719.8	732.5	663.2	601.1	644.4	562.8	662.8	7 15
GAS TEMP LVG GR FAN		GRID	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 7
O2 LVG ECON	(T) L	GRID	3.5407	3.9921	3.0224	3.9720	3.1099	2.9795	3.3427	3.1985	4.2081	3.9483	7 20
O2 LVG ECON	(T) R	GRID	3.2158	3.2112	2.8616	3.1926	2.7163	3.0534	2.0000	2.3000	3.0000	3.3000	7 21
CO LVG ECON	(T) L	GRID	18.5	46.1	139.9	28.0	30.8	52.3	27.4	26.0	20.9	0.0	13 5
CO LVG ECON	(T) R	GRID	99.8	41.6	148.6	97.1	104.2	60.7	61.0	232.4	78.2	30.4	13 6
CO2 LVG ECON	(T) L	GRID	15.94	15.40	16.92	15.97	16.62	16.61	16.00	16.04	15.89	15.20	7 22
CO2 LVG ECON	(T) R	GRID	15.90	16.00	15.86	15.92	16.36	15.94	16.01	15.89	14.75	15.06	7 23
NOX LVG ECON	(T) L	GRID	505.8	467.3	251.9	604.3	327.4	241.0	261.3	223.5	196.8	313.8	7 24
NOX LVG ECON	(T) R	GRID	467.8	459.3	217.4	564.5	289.6	226.6	207.9	196.6	200.1	290.9	7 25
O2 LVG AH	(T)	GRID	4.8184	4.9483	3.9187	5.0702	4.2942	4.1587	4.4935	4.1928	5.8233	4.8410	13 1
CO2 LVG AH	(T)	GRID	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	13 3
O2 LVG GR FAN	(T)	GRID	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 4
DRY BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27

DATA PAGE NO. 8 FW HTR TEMPERATURES F - PLANT

FW HTR E EXT T		HW	740.6	669.1	741.6	738.0	740.0	676.6	646.9	678.2	590.4	684.2	8 1
FW HTR E LVG T		HW	455.7	419.4	455.2	452.8	453.4	421.8	396.2	422.9	357.6	426.1	8 5
FW HTR E ENT T		HW	383.4	354.7	382.6	380.1	381.2	356.2	336.8	357.7	305.3	360.2	8 7
FW HTR E DRN T		HW	403.0	371.2	402.3	401.0	401.2	371.3	347.4	371.9	320.1	374.5	8 13

DATA PAGE NO. 9 FW HTR TEMPERATURES F - B&W

SSH PEND IN LEG	1	10-017	855.2	861.9	851.3	845.7	843.5	840.2	836.1	833.7	823.8	846.9	9 17
SSH PEND IN LEG	2	10-018	868.6	878.0	870.6	860.6	862.3	862.5	856.7	859.6	852.4	868.6	9 18
SSH PEND IN LEG	3	10-019	865.9	874.2	871.5	859.7	858.0	857.0	856.2	865.4	868.6	870.7	9 19
SSH PEND IN LEG	4	10-020	872.0	880.3	879.8	865.5	862.8	860.3	865.1	875.9	884.7	885.4	9 20
SSH PEND IN LEG	5	10-021	838.9	844.0	844.8	832.7	833.9	825.8	837.4	848.0	854.4	855.4	9 21

TEST NO.		W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	
TEST SEQ. NO.		1	2	3	4	5	6	7	8	9	10	
DATE		11/16/92	11/16/92	11/17/92	11/19/92	11/19/92	11/19/92	11/20/92	11/20/92	11/20/92	11/30/92	
TIME START		0900	1403	1136	0823	1223	1541	1354	1753	2022	1403	
TIME END		1127	1559	1329	1017	1407	1725	1558	1904	2107	1515	
LOAD MW		109	78	110	110	110	83	61	81	42	83	
DATA PAGE NO. 9	FW HTR TEMPERATURES F - B&W											
SSH PEND IN LEG	6	10-033	872.0	878.7	874.3	869.2	868.1	853.5	875.5	878.4	908.3	890.2	9 22
SSH PEND IN LEG	7	10-034	872.7	881.7	869.1	869.2	860.9	848.6	870.5	867.2	934.5	880.4	9 23
SSH PEND IN LEG	8	10-035	868.0	876.9	866.2	863.2	857.1	852.4	867.4	864.3	914.3	874.3	9 24
SSH PEND IN LEG	9	10-036	872.5	879.9	873.4	864.3	855.1	859.1	865.8	864.3	896.6	871.4	9 25
SSH PEND IN LEG	10	10-037	861.3	865.9	863.2	853.7	829.3	839.3	833.9	837.8	878.0	844.1	9 26
RH PEND IN LEG	1	09-049	938.0	941.5	942.4	933.5	940.4	934.7	939.5	936.6	928.8	941.8	8 17
RH PEND IN LEG	2	09-050	925.7	930.1	931.2	921.1	933.6	919.1	929.2	925.3	923.4	931.9	8 18
RH PEND IN LEG	3	09-051	930.4	934.9	935.4	926.0	934.1	926.7	933.7	929.8	924.2	935.6	8 19
RH PEND IN LEG	4	09-052	926.1	930.8	931.1	921.6	931.0	921.2	929.7	926.1	921.5	931.9	8 20
RH PEND IN LEG	5	09-053	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8 21
RH PEND IN LEG	6	10-001	961.9	960.8	966.2	956.8	967.4	955.4	961.7	956.5	948.8	964.9	8 22
RH PEND IN LEG	7	10-002	928.7	932.9	928.0	926.7	921.4	933.8	937.9	933.2	910.2	935.6	8 23
RH PEND IN LEG	8	10-003	929.3	939.9	933.6	928.6	917.4	946.1	936.6	940.1	903.2	935.0	8 24
RH PEND IN LEG	9	10-004	937.8	941.8	942.7	933.4	940.5	934.7	940.1	936.9	929.0	942.4	8 25
RH PEND IN LEG	10	10-005	909.1	920.1	923.9	909.2	876.8	909.5	884.4	897.3	875.4	896.2	8 26
RH INTM HND HOLE	R	10-038	937.2	940.1	941.4	933.1	939.3	932.9	936.8	934.1	927.9	939.3	8 27
RH INTM HND HOLE	L	10-039	864.2	865.0	853.7	863.4	829.4	846.8	828.9	833.8	820.7	845.1	8 28
PSH OUT LEG T		09-017	830.7	780.4	833.1	837.6	843.8	804.8	822.3	807.0	797.3	811.5	14 11
PSH OUT LEG T		09-018	847.2	784.1	844.5	854.9	855.6	811.0	823.7	818.9	799.1	825.5	14 12
PSH OUT LEG T		09-019	836.5	752.4	801.8	844.5	831.3	772.5	765.2	750.0	740.7	765.6	14 13
PSH OUT LEG T		09-020	840.9	761.5	826.6	846.0	849.2	795.5	791.8	777.6	764.0	788.4	14 14
PSH OUT LEG T		09-021	815.9	767.7	821.3	816.4	834.7	794.8	807.5	791.2	788.4	795.0	14 15
PSH OUT LEG T		09-022	819.9	777.8	824.2	825.5	834.5	799.0	818.2	799.9	802.0	803.9	14 16
PSH OUT LEG T		09-023	834.3	764.4	826.1	840.8	838.7	791.4	802.5	796.4	779.1	805.5	14 17
PSH OUT LEG T		09-024	848.8	789.3	849.2	854.3	858.0	813.1	825.7	823.9	808.8	830.8	14 18
PSH OUT LEG T		09-025	835.1	762.5	832.6	840.2	842.9	793.5	799.9	799.7	782.1	808.7	14 19
PSH OUT LEG T		09-026	826.8	779.5	833.9	830.0	836.3	798.2	811.1	808.9	799.0	812.3	14 20
PSH OUT LEG T		09-027	832.6	787.3	836.4	835.7	842.9	801.6	816.2	812.5	801.5	817.5	14 21
DATA PAGE NO. 10	FUEL FEED DATA - PLANT											
CYC A COAL FLOW KLB		05-104	37.53	26.08	26.11	38.03	27.41	29.83	21.99	28.48	.04	33.17	10 1
CYC B COAL FLOW KLB		07-110	37.54	26.10	26.12	38.01	27.40	-.01	-.01	0.00	25.04	-.01	10 2
CYC C COAL FLOW KLB		09-110	37.55	26.11	26.13	38.04	27.43	29.85	22.00	28.51	.02	33.17	10 3
CYC A SEC AIR FLOW %		06-170	283.8	206.8	206.8	289.4	216.0	216.9	158.3	212.4	4.3	246.5	10 16
CYC B SEC AIR FLOW %		08-170	288.9	206.6	206.6	293.8	217.5	3.6	3.4	4.1	205.6	3.7	10 17
CYC C SEC AIR FLOW %		10-170	287.0	206.9	208.0	292.3	215.6	216.9	158.2	208.3	1.2	246.6	10 18
CYC A SEC AIR T		20-002	595.5	524.9	629.2	589.7	592.8	573.2	532.6	557.7	482.5	555.2	11 1
CYC B SEC AIR T		20-003	612.4	556.6	645.0	599.7	627.8	573.1	541.9	562.0	534.8	562.4	11 2
CYC C SEC AIR T		20-004	559.2	528.5	578.5	542.4	559.4	537.3	522.1	534.8	492.2	535.0	11 3
PULV COAL FLOW KLB		06-314	.05	.06	35.23	.08	35.27	28.18	21.20	28.24	18.47	22.19	10 4
PULV PA FLOW		06-275	3.57	3.55	61.12	1.21	60.75	55.25	48.75	54.86	50.42	51.64	10 19
PULV INLET T		09-034	100.1	108.7	587.1	99.1	588.9	534.8	491.2	527.0	438.0	525.7	11 7
PULV OUTLET T		09-040	95.5	103.5	141.2	80.5	136.2	132.0	131.5	136.4	133.3	127.3	11 8

TEST NO.	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10
DATE	11/16/92	11/16/92	11/17/92	11/19/92	11/19/92	11/19/92	11/20/92	11/20/92	11/20/92	11/30/92
TIME START	0900	1403	1136	0823	1223	1541	1354	1753	2022	1403
TIME END	1127	1559	1329	1017	1407	1725	1558	1904	2107	1515
LOAD MW	109	78	110	110	110	83	61	81	42	83

DATA PAGE NO. 11 POWER & ELECTRICAL SYSTEM DATA

PULV DIFF P IN WG	06-274	-.01	-.01	14.97	-.01	15.77	13.58	9.51	15.05	7.82	7.36	11 9
PULV AMPS	06-276	-.1	-.1	312.5	-.1	328.5	283.2	231.1	302.6	216.7	213.2	11 10
PULV PA FAN AMPS	06-277	11.7	-0.0	104.9	.1	106.8	73.2	62.3	74.0	35.1	71.1	11 11
ROT CLASS AMPS	06-278	.04	.03	46.57	.03	49.19	47.60	46.70	50.72	43.73	42.30	11 12
ROT CLASS RPM	06-270	-.2	-.3	156.6	-.2	160.4	163.0	174.8	169.9	171.4	160.5	11 13
ROT CLASS DP IN WG	06-345	.0211	.0202	.6259	.0224	.6917	.6491	.6050	.7510	.4879	.4085	11 14
COAL SILO LEVEL	06-310	81.47	96.34	75.39	93.06	75.29	75.21	43.51	27.79	13.17	93.09	11 15
FLAME INTENSITY #1 %	06-279	4.5	5.5	106.1	4.8	106.2	106.2	106.1	106.2	106.1	106.1	11 16
FLAME INTENSITY #2 %	06-295	14.6	20.3	105.7	5.0	105.4	105.5	105.9	105.9	105.9	105.6	11 17
FLAME INTENSITY #3 %	06-296	4.5	5.1	106.1	23.8	106.1	106.1	102.8	106.2	0.0	106.1	11 18
FLAME INTENSITY #4 %	06-297	5.6	3.8	105.7	6.6	105.6	105.7	106.1	106.2	106.1	105.7	11 19

DATA PAGE NO. 12 OPERATOR POSITIONS

RH SP VLV POS	15-077	25.02	-5.00	45.23	22.50	59.28	-5.00	-5.00	-5.00	-5.00	-5.00	12 1
SH SP VLV POS R	13-190	70.94	38.82	60.98	74.78	71.59	53.41	48.63	45.95	45.61	46.98	12 3
SH SP VLV POS L	13-191	67.90	35.90	59.48	74.26	81.61	65.10	52.15	48.67	29.38	50.04	12 4
GR DMPR DEMAND	16-044	-5.00	10.10	-5.00	-5.00	-5.00	1.90	56.28	8.70	63.61	-5.00	12 9
RECIRC AIR DMPR POS	12-176	0.00	0.00	0.00	.06	.03	.05	0.00	0.00	0.00	14.70	12 13
SH PASS DMPR POS	14-180	100.0	23.7	93.8	100.0	100.0	63.1	26.5	47.0	.1	97.6	12 15
RH PASS DMPR POS	14-180	40.2	100.0	92.9	30.5	47.8	100.0	100.0	100.0	100.0	100.0	12 16
OVRFIRE AIR DMPR POS	06-115	9.00	9.00	48.47	9.00	41.84	40.73	28.23	44.10	27.78	36.65	12 17
BRN SEC AIR DMPR POS	06-286	37.01	34.26	28.46	36.80	41.46	36.81	39.80	45.83	43.50	35.25	12 18
HOT PRI AIR DMPR POS	06-556	0.0	0.0	99.6	0.0	99.7	99.5	81.2	99.6	58.6	100.0	12 19
BRN GAS REC DMPR POS	06-324	0.00	17.39	55.10	0.00	0.00	20.83	19.74	40.12	21.07	21.06	12 20

DATA PAGE NO. 15 MISCELLANEOUS DATA

GAS LVG SH PASS 1A	08-003	-555.4	-366.7	-522.1	-585.2	-571.4	-450.4	-353.4	-412.2	-306.5	-450.7	15 1
GAS LVG SH PASS 1B	08-004	731.2	595.2	769.3	724.3	754.0	669.0	595.0	647.1	538.5	663.6	15 2
GAS LVG SH PASS 1C	08-005	750.8	608.0	787.6	734.3	770.2	673.3	603.2	661.6	544.7	680.6	15 3
GAS LVG SH PASS 1D	08-006	775.4	638.6	818.2	759.2	791.6	710.7	628.1	690.3	570.9	713.1	15 4
GAS LVG SH PASS 2A	08-017	677.6	556.6	690.1	679.0	686.9	618.1	553.3	594.1	504.7	608.8	15 5
GAS LVG SH PASS 2B	08-018	691.2	569.7	713.2	685.9	702.0	634.5	568.2	613.0	515.8	630.7	15 6
GAS LVG SH PASS 2C	08-019	695.1	567.0	718.9	687.4	698.4	628.5	564.2	613.9	517.6	635.1	15 7
GAS LVG SH PASS 2D	08-020	730.2	602.6	753.0	716.7	730.5	660.6	591.5	644.9	551.5	667.8	15 8
GAS LVG SH PASS 3A	08-021	723.8	605.8	728.2	719.9	723.9	650.6	594.6	641.6	545.7	652.6	15 9
GAS LVG SH PASS 3B	08-022	720.7	601.9	727.6	720.4	720.5	654.6	596.7	638.7	548.8	658.3	15 10
GAS LVG SH PASS 3C	08-023	714.6	589.2	727.8	701.5	714.3	638.8	583.1	630.5	535.5	648.5	15 11
GAS LVG SH PASS 3D	08-024	-673.4	-490.5	-651.1	-661.0	-658.8	-558.8	-474.0	-539.5	-410.3	-570.1	15 12
GAS LVG RH PASS 4A	08-033	656.7	622.2	703.4	643.8	653.1	629.4	589.6	625.8	584.8	629.4	15 13
GAS LVG RH PASS 4B	08-034	667.4	634.2	718.3	650.9	679.4	643.9	604.4	635.4	591.2	647.1	15 14
GAS LVG RH PASS 4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15

TEST NO.		W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
TEST SEQ. NO.		1	2	3	4	5	6	7	8	9	10
DATE		11/16/92	11/16/92	11/17/92	11/19/92	11/19/92	11/19/92	11/20/92	11/20/92	11/20/92	11/30/92
TIME START		0900	1403	1136	0823	1223	1541	1354	1753	2022	1403
TIME END		1127	1559	1329	1017	1407	1725	1558	1904	2107	1515
LOAD MW		109	78	110	110	110	83	61	81	42	83

DATA PAGE NO. 15 MISCELLANEOUS DATA

GAS LVG RH PASS	4D	08-036	695.7	649.2	761.0	669.5	728.7	678.5	631.7	675.0	623.1	675.8	15 16
GAS LVG RH PASS	5A	08-049	642.0	602.9	669.6	622.3	631.3	602.0	570.3	601.7	563.2	613.3	15 17
GAS LVG RH PASS	5B	08-050	651.1	610.0	683.1	630.2	653.4	619.4	583.6	612.5	573.5	624.9	15 18
GAS LVG RH PASS	5C	08-051	663.3	622.7	702.3	643.4	683.9	635.6	600.5	628.5	600.8	640.9	15 19
GAS LVG RH PASS	5D	08-052	652.8	611.7	697.7	634.0	669.0	623.5	589.3	619.9	584.9	627.0	15 20
GAS LVG RH PASS	6A	08-053	654.3	617.5	670.6	637.3	643.2	613.1	587.7	615.2	580.4	624.8	15 21
GAS LVG RH PASS	6B	08-054	674.4	639.6	689.7	656.8	670.7	637.4	610.4	631.6	600.5	647.2	15 22
GAS LVG RH PASS	6C	08-055	665.8	629.7	689.5	651.5	672.4	629.2	605.0	626.4	602.9	642.7	15 23
GAS LVG RH PASS	6D	08-056	675.9	635.8	697.3	652.1	672.7	621.3	606.8	629.2	595.7	641.9	15 24
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W			1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	15 28

RB-369 25 Jan 1993 10:02:20

TEST NO.	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20
TEST SEQ. NO.	11	12	13	14	15	16	17	18	19	20
DATE	11/30/92	12/01/92	12/01/92	12/01/92	12/02/92	12/02/92	12/02/92	12/03/92	12/03/92	12/03/92
TIME START	1627	0839	1129	1449	0821	1059	1357	0926	1212	1642
TIME END	1729	1004	1230	1602	0831	1223	1521	1008	1314	1736
LOAD MW	83	109	110	56	108	109	109	110	111	110
FUEL	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR
ALPHA1										
ALPHA2										

W11 AVG SCANS 20-->25 : 82 MW : NO REBURN : 3 CYCLONE : SLM
W12 AVG SCANS 7 -->14 : 110 MW : NO REBURN : 3 CYCLONE : SLM
W13 AVG SCANS 23-->28 : 110 MW : W/ REBURN : 3 CYCLONE : SLM
W14 AVG SCANS 42-->48 : 52 MW : NO REBURN : 2 CYCLONE : SLM
W15 AVG SCANS 1 -->2 : 110 MW : NO REBURN : BASE FOR Nox
W16 AVG SCANS 17-->22 : 110 MW : W/ REBURN : 19 TPH : SLM
W17 AVG SCANS 34-->41 : 110 MW : W/ REBURN : 15 TPH : SLM
W18 AVG SCANS 8 -->11 : 110 MW : NO REBURN : W/ GR : IRS & IKWLS
W19 AVG SCANS 24-->29 : 110 MW : NO REBURN : NO GR : IRS & IKWLS
W20 AVG SCANS 47-->51 : 110 MW : W/ REBURN : W/ GR : IRS & IKWLS

DATA PAGE NO. 2 FLOWS MLB/HR

LOAD MW	20-005	83.1	108.9	109.9	56.1	108.1	109.5	108.9	109.7	110.6	110.5	2	1
MAIN STEAM FLOW	03-033	567.3	757.0	758.2	363.0	748.5	752.1	752.1	761.3	766.3	765.3	2	2
1ST STG STM FLW	CALC	545.8	751.0	752.8	358.6	741.0	746.0	745.4	756.3	761.8	760.3	2	23
FW FLOW	12-170	557.0	775.0	777.9	370.1	765.9	774.4	774.8	782.0	786.6	788.5	2	3
BLOW DOWN FLOW	EST	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2	4
RH SPRAY FLOW	14-192	0.00	23.90	27.81	0.00	23.07	31.16	30.39	24.70	25.67	30.27	2	5
SH SPRAY FLOW L	17-052	7.33	21.42	23.84	1.13	21.94	28.59	21.56	22.98	24.12	16.15	2	7
SH SPRAY FLOW R	17-056	9.70	24.86	24.36	0.00	20.86	27.53	22.16	22.23	20.44	16.61	2	8
GR FAN AMPS A	16-181	-.0206	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-.0206	0.0000	2	12
GR FAN AMPS B	16-183	24.42	.06	26.21	41.05	.06	26.35	26.34	24.71	.06	24.31	2	13
GR FAN BUS VOLT	EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2	14
TOTAL GR FLOW	CALC	66.5	0.0	94.5	248.6	0.0	93.8	91.8	73.4	0.0	70.1	2	24
GR TO SEC AIR	06-932	2.39	.52	30.26	2.31	.45	43.20	45.96	1.26	.49	2.18	2	25
GR TO SEC AIR	CALC	2.12	35.00	28.72	1.99	35.00	42.31	44.96	1.04	35.00	2.06	2	26
GR TO FURN	CALC	64.4	0.0	65.8	246.7	0.0	51.5	46.9	72.4	0.0	68.2	2	27
OFA AIR FLOW	06-931	33.2	36.4	259.8	35.1	37.8	256.0	215.7	36.3	36.1	213.8	2	28
TMP AIR FLOW	CALC	51.3	99.8	68.0	58.7	112.0	60.7	72.5	82.9	115.1	37.5	14	10
SEC AIR FLOW	06-320	31.16	31.22	21.87	31.60	31.06	18.36	19.31	31.36	31.36	34.66	2	29
1st STG PRESS	18-128	751.1	1044.3	1046.8	483.8	1030.1	1037.1	1036.3	1051.9	1059.7	1057.5	2	19
OIL FLOW 2A	05-100	0.0000	.0017	.0017	.0017	.0017	.0017	.0017	0.0000	.0017	.0017	2	20
OIL FLOW 2B	07-100	.0017	.0017	.0019	.0017	.0017	.0017	.0017	.0017	.0019	.0029	2	21
OIL FLOW 2C	09-100	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	2	22
% PWDR RVR BASN COAL	USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	30
CYCLONE STOIC	CALC	1.1013	1.0551	1.0798	1.0356	1.0544	1.0713	1.0677	1.0735	1.0424	1.1190	4	20

TEST NO.			W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	
TEST SEQ. NO.			11	12	13	14	15	16	17	18	19	20	
DATE			11/30/92	12/01/92	12/01/92	12/01/92	12/02/92	12/02/92	12/02/92	12/03/92	12/03/92	12/03/92	
TIME START			1627	0839	1129	1449	0821	1059	1357	0926	1212	1642	
TIME END			1729	1004	1230	1602	0831	1223	1521	1008	1314	1736	
LOAD MW			83	109	110	56	108	109	109	110	111	110	
DATA PAGE NO. 2		**FLOWS MLB/HR**											
REBRN WB STOIC		CALC	100.0	100.0	.3	100.0	100.0	.3	.4	100.0	100.0	.4	4 21
REBRN STOIC		CALC	1.1437	1.1417	.8598	1.1097	1.1553	.8471	.9050	1.1396	1.1465	.9187	4 22
LVG FURN STOIC		CALC	1.1992	1.1857	1.1712	1.1942	1.2015	1.1542	1.1652	1.1834	1.1894	1.1737	4 23
LVG ECON STOIC		CALC	1.2113	1.1955	1.1810	1.2116	1.2114	1.1639	1.1750	1.1931	1.1992	1.1834	4 24
DATA PAGE NO. 3		**FLUID TEMPERATURES F - PLANT**											
SSH OUT T	L	15-152	999.6	998.9	1000.5	998.7	1000.8	999.5	998.2	998.2	998.8	998.7	3 1
SSH OUT T	R	15-150	998.6	999.4	1002.5	998.5	999.0	999.5	996.7	998.1	998.9	998.9	3 2
SSH OUT AVE T		13-160	998.7	1000.0	1003.1	996.1	1001.4	1001.6	998.4	1000.5	1000.9	1002.9	14 1
LVG SH ATTMP T	L	13-164	753.3	731.4	740.4	763.7	728.3	730.9	733.7	720.8	719.5	741.2	3 8
LVG SH ATTMP T	R	13-162	740.3	724.7	747.5	783.2	738.8	747.0	745.0	732.3	741.3	759.4	3 9
PRI SH OUT T	L	HW	791.1	818.5	838.0	774.0	818.1	849.6	818.3	811.6	812.5	801.8	3 10
PRI SH OUT T	R	HW	798.2	824.1	848.2	783.2	825.2	862.6	834.4	821.5	822.8	826.0	3 11
ECON H2O OUT T	L	HW	488.9	514.1	515.3	489.6	513.8	513.7	514.1	517.1	517.1	514.0	3 27
ECON H2O OUT T	R	HW	487.6	521.4	529.6	460.6	520.1	532.4	518.1	522.6	521.8	519.2	3 28
ECON H2O IN T		20-007	429.2	459.4	460.5	392.2	458.2	460.3	459.4	460.2	460.9	460.5	3 5
RH SPRAY H2O T		HW	295.3	316.7	316.4	266.4	315.9	315.9	315.5	316.7	316.5	316.8	3 7
LVG RH T		14-150	996.4	990.6	1000.6	997.7	996.5	1000.2	992.7	993.0	1000.0	996.3	3 12
ENT RH T		CALC	677.0	586.1	577.7	633.5	587.0	567.9	564.3	586.2	584.7	574.1	3 16
COLD RH T		20-006	684.5	744.3	748.6	640.8	741.4	746.3	743.1	745.7	747.5	749.7	3 18
DATA PAGE NO. 4		**FLUID TEMPERATURES F - B&W**											
AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 18
GAS LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 19

TEST NO.			W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	
TEST SEQ. NO.			11	12	13	14	15	16	17	18	19	20	
DATE			11/30/92	12/01/92	12/01/92	12/01/92	12/02/92	12/02/92	12/02/92	12/03/92	12/03/92	12/03/92	
TIME START			1627	0839	1129	1449	0821	1059	1357	0926	1212	1642	
TIME END			1729	1004	1230	1602	0831	1223	1521	1008	1314	1736	
LOAD MW			83	109	110	56	108	109	109	110	111	110	
DATA PAGE NO. 5	FLUID PRESSURES PSIG												
TURB THROT P		03-170	1450.0	1449.9	1449.5	1450.0	1450.4	1450.7	1450.5	1450.7	1450.0	1450.0	5 1
SEC SH OUT P		CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 2
DRUM PRESS		04-013	1530.8	1596.4	1595.9	1487.2	1594.2	1594.4	1594.3	1599.6	1600.4	1599.5	5 3
LVG RH PRESS		15-102	305.3	425.7	429.3	200.1	421.1	427.4	425.6	429.2	433.0	432.4	5 4
ENT RH PRESS		15-100	324.1	451.9	455.8	210.2	447.9	455.0	453.6	456.2	460.8	461.1	5 5
FW HTR E EXT P		20-035	311.7	434.7	438.6	202.6	430.6	437.6	435.5	438.6	442.7	442.1	5 6
FW HTR E EXT P		TRANS	312.7	435.4	439.1	203.4	430.7	437.7	435.9	438.9	443.0	442.5	5 7
SEC SH OUT P	(T)	TRANS	1459.7	1479.2	1478.8	1446.6	1479.9	1480.3	1480.6	1481.5	1481.6	1481.4	5 17
DRUM PRESS	(T)	TRANS	1496.3	1561.3	1560.9	1451.8	1559.0	1559.2	1559.4	1564.4	1565.8	1566.3	5 18
LVG RH-1 P	(T)	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 19
ENT RH-1 P	(T)	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 20
DATA PAGE NO. 6	AIR & GAS DATA - PLANT												
AMBIENT AIR DB TEMP		TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 1
AIR ENT FD FAN T		HW	96.7	87.7	90.0	100.5	93.2	92.7	93.8	88.8	90.4	92.4	6 4
AIR LVG FD FAN T	A	09-028	131.2	119.2	122.2	137.1	121.5	123.1	125.2	117.8	122.8	120.3	7 2
AIR LVG FD FAN T	B	09-029	131.8	120.4	122.5	139.2	[illegible]	127.1	128.3	123.0	123.4	127.2	7 3
AIR ENT AH T	RA	20-017	133.1	121.0	122.9	141.8	126.2	127.2	128.6	123.0	123.9	127.6	6 2
AIR ENT AH T	RB	20-018	136.7	123.0	125.0	141.6	128.5	129.8	131.1	125.5	126.3	129.6	6 3
AIR ENT AH T	LA	20-025	149.6	122.6	125.3	139.7	125.1	126.6	128.5	121.4	125.6	124.4	13 25
AIR ENT AH T	LB	20-029	138.8	123.0	125.6	140.7	125.3	126.4	128.7	121.5	126.2	124.3	13 26
AIR LVG AH T	R	HW	599.0	665.3	695.6	555.8	636.9	690.4	662.5	639.2	650.3	643.2	6 6
AIR LVG AH T	L	HW	578.9	622.0	631.5	562.4	589.3	613.3	611.2	586.8	594.7	595.7	6 7
BRN SEC AIR T		08-002	551.0	603.9	626.3	552.0	574.6	619.6	597.3	572.2	586.5	586.7	14 2
BRN SA/GR T		08-001	530.2	569.8	584.1	530.4	543.9	596.8	607.1	543.2	555.5	561.6	14 3
OFA TEMP		09-002	518.9	290.9	600.7	394.8	304.9	594.9	581.0	288.3	292.9	563.0	14 4
GAS LVG AH T	RA	20-019	317.6	346.5	350.4	318.4	332.9	354.8	353.9	332.1	347.7	339.7	6 10
GAS LVG AH T	RB	20-020	298.3	321.0	325.5	292.5	309.4	329.2	330.1	309.9	323.7	318.9	6 11
GAS LVG AH T	LA	20-027	287.5	306.2	308.3	286.8	294.2	301.1	302.6	287.1	300.4	296.2	13 27
GAS LVG AH T	LB	20-024	295.2	311.2	313.1	290.6	295.7	306.1	307.4	290.2	306.4	300.6	13 28
GAS LVG RH PS T		AVE	647.2	700.9	708.6	615.1	668.8	677.4	686.7	665.7	673.3	677.3	13 17
GAS LVG SH PS T		AVE	651.4	724.6	760.1	557.9	698.9	752.7	719.1	700.1	706.6	699.2	13 19
GR GAS TEMP	A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 8
GR GAS TEMP	B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 9
O2 LVG ECON	R	11-172	3.2323	3.3676	3.6111	3.6969	3.3728	3.1500	3.1018	3.1890	3.1283	3.1366	6 20
O2 LVG ECON	L	11-170	3.5582	3.8225	3.0320	3.3846	3.7427	2.4445	2.9160	3.7691	3.9493	2.9776	6 21
O2 IN SEC AIR		06-254	19.74	20.71	10.77	19.81	20.75	8.24	8.31	20.32	20.73	19.94	13 29
ACCUREX NOX	PPM	06-553	432.6	454.6	198.1	419.6	495.5	208.8	276.5	526.3	527.1	280.2	13 9
ACCUREX SOX	PPM	06-555	209.4	204.6	207.5	204.4	251.3	236.3	373.8	299.5	289.3	371.0	13 10
ACCUREX CO	PPM	06-425	62.8	60.2	66.2	86.1	71.6	100.4	72.0	83.6	80.2	73.7	13 11
ACCUREX O2	%	06-554	3.3679	3.4612	3.1116	3.4258	3.3520	2.6312	2.7036	2.9846	3.2239	2.7988	13 12
BRN SEC AIR P	IN WG	06-250	14.08	24.03	27.22	9.05	23.19	25.49	24.31	22.60	23.35	23.20	14 5
BRN GAS REC P	IN WG	06-252	13.98	23.66	27.00	8.79	22.89	25.56	24.38	22.23	23.16	23.04	14 6

TEST NO.		W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	
TEST SEQ. NO.		11	12	13	14	15	16	17	18	19	20	
DATE		11/30/92	12/01/92	12/01/92	12/01/92	12/02/92	12/02/92	12/02/92	12/03/92	12/03/92	12/03/92	
TIME START		1627	0839	1129	1449	0821	1059	1357	0926	1212	1642	
TIME END		1729	1004	1230	1602	0831	1223	1521	1008	1314	1736	
LOAD MW		83	109	110	56	108	109	109	110	111	110	
DATA PAGE NO. 6	**AIR & GAS DATA - PLANT**											
FURNACE GAS P	IN WG	08-100	13.62	23.50	23.78	8.86	22.60	22.74	21.29	22.19	23.02	22.30	14 7
BAROMETRIC P	IN HG	PB	29.15	29.00	28.91	28.85	29.04	29.14	29.19	29.36	29.33	29.24	6 29
REL HUMIDITY	%	TST	8.4388	8.8074	8.8646	8.2860	8.4964	8.3620	8.3275	8.4543	8.7133	8.5294	6 30
DATA PAGE NO. 7	**AIR & GAS DATA - B&W**											
AMBIENT AIR TEMP		TC	114.0	101.6	106.1	113.5	106.4	110.6	113.2	102.3	108.0	106.4	7 1
AIR LVG FD FAN T	A	TC	133.1	120.9	124.2	139.0	123.3	124.8	127.0	119.6	124.8	122.1	7 6
AIR LVG FD FAN T	B	TC	133.5	121.8	124.0	140.9	127.0	128.5	129.7	124.3	125.2	128.5	7 7
AIR ENT AH	(T)	GRID	139.9	123.0	125.5	141.8	126.9	128.5	130.3	123.7	126.6	127.3	7 4
GAS LVG AH	(T)	GRID	289.5	309.5	312.9	286.6	296.5	311.0	311.3	292.9	307.7	302.2	7 10
GAS LVG ECON	(T) L	GRID	667.8	726.4	746.1	632.9	687.2	716.2	719.1	686.7	693.2	700.0	7 14
GAS LVG ECON	(T) R	GRID	657.2	728.6	767.3	585.3	706.6	765.9	757.2	707.6	714.1	701.5	7 15
GAS TEMP LVG GR FAN		GRID	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 7
O2 LVG ECON	(T) L	GRID	3.7349	3.8317	3.2874	3.3512	3.9351	2.8480	3.1524	3.8196	3.9989	3.2258	7 20
O2 LVG ECON	(T) R	GRID	3.1000	3.2000	3.2723	3.7000	3.1647	3.1519	3.2208	3.1547	3.1499	3.4084	7 21
CO LVG ECON	(T) L	GRID	5.16	35.17	43.01	24.04	10.49	60.22	30.15	69.36	78.35	59.74	13 5
CO LVG ECON	(T) R	GRID	27.2	82.7	134.7	48.7	61.1	125.3	80.8	77.7	91.1	87.4	13 6
CO2 LVG ECON	(T) L	GRID	15.36	15.92	16.15	15.70	15.81	16.82	16.57	15.66	15.49	16.00	7 22
CO2 LVG ECON	(T) R	GRID	15.53	15.98	15.85	14.72	16.00	16.00	15.93	15.82	15.75	15.42	7 23
NOX LVG ECON	(T) L	GRID	492.4	483.9	209.1	476.1	592.6	244.0	314.0	580.9	596.9	321.1	7 24
NOX LVG ECON	(T) R	GRID	440.8	519.7	211.8	441.7	532.3	214.0	276.8	539.0	551.6	279.7	7 25
O2 LVG AH	(T)	GRID	4.7410	4.9282	4.2050	5.1380	5.0407	3.9611	4.0301	4.4252	4.9456	4.1099	13 1
CO2 LVG AH	(T)	GRID	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	3.7795	3.7792	3.7777	13 3
O2 LVG GR FAN	(T)	GRID	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.61	15.29	8.12	13 4
DRY BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27
DATA PAGE NO. 8	**FW HTR TEMPERATURES F - PLANT**											
FW HTR E EXT T		HW	682.2	742.3	745.5	638.0	739.5	742.9	739.6	742.8	744.7	746.8	8 1
FW HTR E LVG T		HW	427.0	457.3	457.4	390.3	456.2	456.9	456.1	457.4	457.5	457.5	8 5
FW HTR E ENT T		HW	361.0	385.0	385.1	331.6	384.1	384.8	383.9	385.0	385.0	384.9	8 7
FW HTR E DRN T		HW	380.6	403.8	403.9	341.4	402.8	403.6	402.8	403.9	404.1	404.4	8 13
DATA PAGE NO. 9	**FW HTR TEMPERATURES F - B&W**											
SSH PEND IN LEG	1	10-017	860.8	849.1	850.3	896.3	861.0	847.3	843.8	852.6	857.6	848.7	9 17
SSH PEND IN LEG	2	10-018	878.1	863.6	869.4	905.0	874.8	867.7	864.7	866.7	871.0	870.0	9 18
SSH PEND IN LEG	3	10-019	871.9	859.4	866.1	890.9	873.8	869.2	865.3	866.2	867.7	875.1	9 19
SSH PEND IN LEG	4	10-020	878.9	866.8	874.1	894.0	883.9	879.4	874.3	874.8	876.7	888.0	9 20
SSH PEND IN LEG	5	10-021	841.1	831.7	839.3	853.3	848.4	845.1	837.0	840.4	842.7	859.3	9 21

TEST NO.	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	
TEST SEQ. NO.	11	12	13	14	15	16	17	18	19	20	
DATE	11/30/92	12/01/92	12/01/92	12/01/92	12/02/92	12/02/92	12/02/92	12/03/92	12/03/92	12/03/92	
TIME START	1627	0839	1129	1449	0821	1059	1357	0926	1212	1642	
TIME END	1729	1004	1230	1602	0831	1223	1521	1008	1314	1736	
LOAD MW	83	109	110	56	108	109	109	110	111	110	

DATA PAGE NO. 9 FW HTR TEMPERATURES F - B&W

SSH PEND IN LEG 6	10-033	881.2	866.8	871.9	882.9	880.7	876.3	866.1	871.4	872.8	891.7	9	22
SSH PEND IN LEG 7	10-034	886.3	871.3	871.1	877.9	877.8	871.4	863.8	867.9	864.4	882.8	9	23
SSH PEND IN LEG 8	10-035	880.3	865.2	867.4	881.8	872.6	866.3	862.4	863.9	863.4	876.7	9	24
SSH PEND IN LEG 9	10-036	882.2	867.6	870.1	893.9	874.5	868.3	869.1	867.9	870.0	873.9	9	25
SSH PEND IN LEG 10	10-037	869.9	856.0	850.4	893.2	863.9	850.3	854.8	854.2	854.9	848.4	9	26
RH PEND IN LEG 1	09-049	936.1	925.7	940.0	942.5	935.4	941.0	933.0	931.6	938.3	944.1	8	17
RH PEND IN LEG 2	09-050	925.8	916.0	929.2	924.6	924.0	930.2	921.4	921.8	928.1	939.0	8	18
RH PEND IN LEG 3	09-051	930.2	918.8	932.6	934.0	927.9	933.5	925.4	924.7	931.5	938.5	8	19
RH PEND IN LEG 4	09-052	926.5	915.3	928.3	927.6	923.7	929.1	920.7	920.9	927.5	936.1	8	20
RH PEND IN LEG 5	09-053	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8	21
RH PEND IN LEG 6	10-001	955.3	948.9	966.1	963.5	961.7	969.7	959.5	956.6	964.3	970.2	8	22
RH PEND IN LEG 7	10-002	927.0	912.1	926.7	941.2	924.9	925.4	921.0	918.5	924.0	927.0	8	23
RH PEND IN LEG 8	10-003	933.8	911.7	925.8	958.1	925.6	923.4	923.2	916.1	920.9	917.6	8	24
RH PEND IN LEG 9	10-004	936.8	925.4	939.7	942.8	935.6	940.7	932.7	931.6	938.3	944.1	8	25
RH PEND IN LEG 10	10-005	914.7	895.7	895.6	945.0	911.2	896.0	893.6	896.9	902.2	873.0	8	26
RH INTM HND HOLE R	10-038	933.2	925.5	939.7	936.5	932.6	940.6	932.8	931.2	938.4	943.7	8	27
RH INTM HND HOLE L	10-039	860.6	849.4	837.0	875.7	865.3	832.7	837.4	851.8	857.9	827.7	8	28
PSH OUT LEG T	09-017	801.6	822.1	844.8	793.3	822.1	861.5	839.8	819.6	822.6	824.9	14	11
PSH OUT LEG T	09-018	807.0	835.9	858.1	792.4	835.8	878.6	853.8	833.3	834.9	839.7	14	12
PSH OUT LEG T	09-019	786.2	822.8	823.9	761.5	822.7	833.8	800.6	812.9	813.4	781.3	14	13
PSH OUT LEG T	09-020	799.4	828.4	846.1	771.5	824.6	858.7	819.8	818.5	818.6	799.3	14	14
PSH OUT LEG T	09-021	792.6	809.6	831.8	780.2	807.0	843.3	818.8	804.3	806.1	806.1	14	15
PSH OUT LEG T	09-022	796.4	813.0	835.8	793.3	813.4	849.2	827.7	810.8	814.7	814.9	14	16
PSH OUT LEG T	09-023	790.4	820.9	843.2	770.4	819.2	863.4	831.4	816.0	816.7	817.8	14	17
PSH OUT LEG T	09-024	812.9	838.2	861.9	798.6	841.2	881.2	854.7	837.8	839.7	844.1	14	18
PSH OUT LEG T	09-025	795.7	823.2	848.4	766.7	820.9	866.0	831.3	818.4	819.3	822.7	14	19
PSH OUT LEG T	09-026	800.4	817.2	839.8	787.3	818.1	853.9	828.9	815.4	818.5	825.4	14	20
PSH OUT LEG T	09-027	804.7	821.4	844.4	791.3	822.4	857.4	831.5	820.1	823.1	830.8	14	21

DATA PAGE NO. 10 FUEL FEED DATA - PLANT

CYC A COAL FLOW KLB	05-104	28.86	39.07	27.86	29.62	38.15	27.30	28.38	38.27	39.29	26.80	10	1
CYC B COAL FLOW KLB	07-110	28.89	39.07	27.87	-.01	38.15	27.30	28.37	38.32	39.33	26.85	10	2
CYC C COAL FLOW KLB	09-110	28.86	39.08	27.88	29.63	38.16	27.28	28.35	38.26	39.28	26.79	10	3
CYC A SEC AIR FLOW %	06-170	220.5	289.2	213.5	217.6	284.0	204.4	219.7	294.2	289.3	219.3	10	16
CYC B SEC AIR FLOW %	08-170	224.4	292.4	214.0	2.2	289.8	202.8	222.5	298.8	293.3	222.5	10	17
CYC C SEC AIR FLOW %	10-170	220.8	291.9	213.0	218.3	287.8	205.4	219.5	297.5	293.0	218.3	10	18
CYC A SEC AIR T	20-002	561.5	598.0	630.1	532.2	583.7	634.5	615.6	598.3	598.7	587.2	11	1
CYC B SEC AIR T	20-003	578.2	628.5	651.8	549.3	598.4	639.5	628.4	596.7	610.7	615.1	11	2
CYC C SEC AIR T	20-004	543.4	584.9	589.3	534.9	552.9	572.0	572.1	550.6	560.7	557.6	11	3
PULV COAL FLOW KLB	06-314	.07	.07	35.28	.08	.08	37.28	30.09	.08	.08	35.44	10	4
PULV PA FLOW	06-275	1.65	1.10	59.46	1.54	0.00	64.28	58.27	1.56	1.29	62.86	10	19
PULV INLET T	09-034	144.6	86.4	593.6	201.6	97.9	586.5	570.7	88.3	92.7	556.0	11	7
PULV OUTLET T	09-040	124.3	87.0	131.4	130.9	95.2	133.3	138.3	93.1	89.6	134.5	11	8

TEST NO.	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20
TEST SEQ. NO.	11	12	13	14	15	16	17	18	19	20
DATE	11/30/92	12/01/92	12/01/92	12/01/92	12/02/92	12/02/92	12/02/92	12/03/92	12/03/92	12/03/92
TIME START	1627	0839	1129	1449	0821	1059	1357	0926	1212	1642
TIME END	1729	1004	1230	1602	0831	1223	1521	1008	1314	1736
LOAD MW	83	109	110	56	108	109	109	110	111	110

DATA PAGE NO. 11 POWER & ELECTRICAL SYSTEM DATA

PULV DIFF P IN WG	06-274	-.01	-.04	17.72	-.01	-.14	17.30	13.94	-.01	-.01	15.10	11 9
PULV AMPS	06-276	-.1	-.1	351.2	-0.0	-.1	350.3	291.4	-.1	-.1	318.3	11 10
PULV PA FAN AMPS	06-277	0.0	-.1	105.6	.1	.1	103.3	71.8	.1	0.0	88.0	11 11
ROT CLASS AMPS	06-278	.03	8.57	49.38	.03	44.47	49.38	46.75	.03	.03	46.48	11 12
ROT CLASS RPM	06-270	-.3	28.7	159.9	-.2	159.3	159.6	161.1	-.2	-.2	154.5	11 13
ROT CLASS DP IN WG	06-345	.0199	.1134	.6826	.0196	.4673	.6647	.6043	.0220	.0222	.5807	11 14
COAL SILO LEVEL	06-310	93.50	94.53	72.33	67.49	66.82	35.96	88.02	96.84	91.11	68.56	11 15
FLAME INTENSITY #1 %	06-279	5.9	57.9	106.2	1.1	13.2	106.2	106.1	65.5	57.7	106.1	11 16
FLAME INTENSITY #2 %	06-295	2.7	5.9	105.5	1.0	19.5	105.7	105.8	67.0	46.7	105.7	11 17
FLAME INTENSITY #3 %	06-296	5.1	7.0	106.1	.8	11.1	0.0	106.1	68.1	63.5	106.1	11 18
FLAME INTENSITY #4 %	06-297	4.1	6.1	105.6	4.3	6.7	105.7	105.8	6.8	6.8	105.8	11 19

DATA PAGE NO. 12 OPERATOR POSITIONS

RH SP VLV POS	15-077	-5.00	35.70	42.70	-5.00	34.94	67.28	65.31	38.00	39.72	46.36	12 1
SH SP VLV POS R	13-190	47.87	67.97	66.40	19.95	64.00	74.84	63.50	60.78	56.85	48.42	12 3
SH SP VLV POS L	13-191	41.47	59.97	65.73	32.67	64.97	77.39	60.76	62.13	63.93	49.13	12 4
GR DMPR DEMAND	16-044	-5.00	-5.00	-5.00	90.37	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	12 9
RECIRC AIR DMPR POS	12-176	2.0785	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	12 13
SH PASS DMPR POS	14-180	43.7	100.0	100.0	0.0	100.0	100.0	93.1	99.8	83.0	59.5	12 15
RH PASS DMPR POS	14-180	100.0	66.7	46.4	100.0	80.9	36.0	87.9	88.1	100.0	100.0	12 16
OVRFIRE AIR DMPR POS	06-115	9.00	9.00	65.40	9.00	9.00	63.23	50.00	9.00	9.00	48.80	12 17
BRN SEC AIR DMPR POS	06-286	35.85	37.32	30.90	35.19	36.64	25.82	26.88	36.59	36.89	39.32	12 18
HOT PRI AIR DMPR POS	06-556	0.0	0.0	100.0	0.0	0.0	100.0	100.0	0.0	0.0	90.2	12 19
BRN GAS REC DMPR POS	06-324	0.00	0.00	38.62	0.00	0.00	38.67	38.67	0.00	0.00	0.00	12 20

DATA PAGE NO. 15 MISCELLANEOUS DATA

GAS LVG SH PASS 1A	08-003	-442.1	-586.7	-598.9	-329.6	-542.8	-569.6	-495.2	-528.8	-549.4	-471.1	15 1
GAS LVG SH PASS 1B	08-004	653.7	732.1	785.9	558.1	706.0	779.1	732.9	710.4	719.0	706.7	15 2
GAS LVG SH PASS 1C	08-005	663.6	754.9	811.1	559.4	717.7	790.8	751.6	720.5	729.0	722.7	15 3
GAS LVG SH PASS 1D	08-006	703.0	787.5	831.1	598.1	765.6	815.7	788.8	763.0	768.5	772.2	15 4
GAS LVG SH PASS 2A	08-017	616.0	681.7	706.9	525.0	658.1	703.6	671.2	661.4	672.4	647.1	15 5
GAS LVG SH PASS 2B	08-018	630.0	700.5	729.9	538.4	675.6	723.4	692.7	675.1	679.5	669.0	15 6
GAS LVG SH PASS 2C	08-019	629.1	701.5	736.4	536.3	672.3	727.4	692.0	673.2	677.5	673.5	15 7
GAS LVG SH PASS 2D	08-020	660.6	739.8	773.4	561.8	711.1	758.6	726.4	712.8	715.3	714.1	15 8
GAS LVG SH PASS 3A	08-021	661.2	723.4	742.8	570.2	703.7	745.1	717.1	705.2	714.2	701.7	15 9
GAS LVG SH PASS 3B	08-022	656.7	718.9	746.3	571.2	689.0	747.7	716.5	696.5	705.3	694.0	15 10
GAS LVG SH PASS 3C	08-023	640.4	706.0	737.5	560.3	689.9	735.6	702.1	682.8	685.0	690.7	15 11
GAS LVG SH PASS 3D	08-024	-550.8	-665.3	-679.7	-443.3	-618.4	-659.8	-610.0	-607.9	-604.9	-611.5	15 12
GAS LVG RH PASS 4A	08-033	646.2	693.6	703.9	617.6	663.7	677.1	678.0	652.0	655.9	651.1	15 13
GAS LVG RH PASS 4B	08-034	656.6	708.0	723.3	623.2	671.7	690.5	704.6	668.8	678.4	681.6	15 14
GAS LVG RH PASS 4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 15

TEST NO.	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20
TEST SEQ. NO.	11	12	13	14	15	16	17	18	19	20
DATE	11/30/92	12/01/92	12/01/92	12/01/92	12/02/92	12/02/92	12/02/92	12/03/92	12/03/92	12/03/92
TIME START	1627	0839	1129	1449	0821	1059	1357	0926	1212	1642
TIME END	1729	1004	1230	1602	0831	1223	1521	1008	1314	1736
LOAD MW	83	109	110	56	108	109	109	110	111	110

DATA PAGE NO. 15 MISCELLANEOUS DATA

GAS LVG RH PASS	4D	08-036	682.7	745.8	767.5	635.3	712.5	737.4	754.2	706.6	722.7	747.8	15 16
GAS LVG RH PASS	5A	08-049	629.9	678.5	677.4	597.7	640.9	643.6	654.7	637.8	638.1	631.8	15 17
GAS LVG RH PASS	5B	08-050	636.9	689.2	695.4	604.1	653.2	658.2	674.4	656.2	663.6	655.4	15 18
GAS LVG RH PASS	5C	08-051	647.5	711.4	722.7	607.7	665.5	680.7	693.4	673.4	689.9	696.3	15 19
GAS LVG RH PASS	5D	08-052	634.4	695.2	705.7	597.0	658.2	672.4	687.2	660.8	672.9	689.3	15 20
GAS LVG RH PASS	6A	08-053	638.0	683.1	683.0	613.9	655.3	653.8	659.8	647.1	649.1	647.4	15 21
GAS LVG RH PASS	6B	08-054	657.5	704.4	707.5	628.2	677 1	676.6	683.8	671.2	675.6	673.9	15 22
GAS LVG RH PASS	6C	08-055	647.4	702.0	707.6	620.4	673.7	679.4	681.2	670.4	677.3	681.1	15 23
GAS LVG RH PASS	6D	08-056	641.7	698.9	700.5	620.6	685.5	681.8	682.6	678.8	683.4	694.4	15 24
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W			11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	15 28

RB-369 25 Jan 1993 10:03:24

TEST NO.	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30
TEST SEQ. NO.	21	22	23	24	25	26	27	28	29	30
DATE	12/03/92	12/04/92	12/04/92	12/04/92	12/05/92	12/07/92	12/07/92	12/07/92	12/07/92	12/07/92
TIME START	1859	0934	1120	1441	1157	0839	0954	1140	1337	1533
TIME END	1953	0944	1244	1502	1300	0850	1015	1201	1501	1625
LOAD MW	110	109	118	59	61	110	110	110	60	60
FUEL	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR	LAMR
ALPHA1										
ALPHA2										

W21 AVG SCANS 60-->64 : 110 MW : W/ REBURN : NO GR : IRS & IKWLS
W22 SINGLE SCAN : BASELINE FOR Nox
W23 AVG SCANS 13-->20 : 119 MW : W/ REBURN : MAX LOAD : SLM
W24 AVG SCANS 31-->32 : 60 MW : W/ REBURN : ABORTED PART OF SLM
W25 AVG SCANS 152-->157 : 60 MW : NO REBURN : SLM
W26 SINGLE SCAN : 110 MW : Nox BASELINE
W27 AVG SCANS 10-->11 : 110 MW : W/ REBURN : 18 TPH : NO SLM
W28 AVG SCANS 20-->21 : 110 MW : W/ REBURN : 17 TPH : NO SLM
W29 AVG SCANS 30-->36 : 60 MW : W/ REBURN : 12.5 TPH : SLM
W30 AVG SCANS 41-->45 : 60 MW : W/ REBURN : 10.5 TPH : SLM

DATA PAGE NO. 2 FLOWS MLB/HR

LOAD MW	20-005	110.0	109.3	118.1	58.8	61.5	110.0	109.9	110.1	60.3	60.4	2 1
MAIN STEAM FLOW	03-033	763.4	757.0	834.0	380.5	395.8	768.0	769.5	768.0	386.6	387.2	2 2
1ST STG STM FLW	CALC	758.2	751.7	826.5	378.7	394.9	763.9	764.9	763.7	385.1	385.5	2 23
FW FLOW	12-170	784.9	775.0	852.7	391.5	406.9	778.2	782.0	775.1	396.3	397.9	2 3

BLOW DOWN FLOW	EST	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2	4
RH SPRAY FLOW	14-192	27.61	26.68	31.00	0.00	0.00	0.00	4.68	5.84	0.00	0.00	2	5
SH SPRAY FLOW L	17-052	13.28	24.24	21.76	5.63	1.22	27.49	17.81	22.74	5.38	4.14	2	7
SH SPRAY FLOW R	17-056	12.49	22.31	23.11	0.00	0.00	31.72	18.30	25.12	5.48	0.00	2	8
GR FAN AMPS A	16-181	0.00	0.00	-.02	0.00	0.00	0.00	0.00	25.10	39.34	37.54	2	12
GR FAN AMPS B	16-183	.06	.06	26.93	42.89	42.18	.06	.06	.06	.06	.06	2	13
GR FAN BUS VOLT	EST	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	4160.0	2	14
TOTAL GR FLOW	CALC	0.0	0.0	97.4	276.6	268.5	0.0	0.0	82.6	231.2	207.4	2	24
GR TO SEC AIR	06-932	.62	.54	24.00	12.25	2.00	.44	.61	12.15	13.07	13.79	2	25
GR TO SEC AIR	CALC	35.00	35.00	23.09	12.39	1.79	35.00	35.00	12.34	13.02	13.21	2	26
GR TO FURN	CALC	0.0	0.0	74.3	264.2	266.8	0.0	0.0	70.5	218.2	194.2	2	27
OFA AIR FLOW	06-931	213.3	37.5	253.2	117.0	33.7	36.8	202.1	246.8	116.8	116.2	2	28
TMP AIR FLOW	CALC	90.6	123.1	74.1	65.5	64.0	80.4	69.5	59.9	51.2	57.0	14	10
SEC AIR FLOW	06-320	34.58	31.18	25.86	36.72	31.14	31.41	42.35	31.00	37.10	36.37	2	29
1st STG PRESS	18-128	1054.6	1045.2	1152.2	512.4	535.6	1062.7	1064.2	1062.4	521.6	522.1	2	19
OIL FLOW 2A	05-100	.0017	.0017	.0017	.0017	.0017	.0017	.0018	.0017	.0024	.0027	2	20
OIL FLOW 2B	07-100	.0028	.0026	.0017	.0017	.0032	.0031	.0033	.0033	.0031	.0027	2	21
OIL FLOW 2C	09-100	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	2	22
% PWDR RVR BASN COAL	USER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	30
CYCLONE STOIC	CALC	1.0584	1.0488	1.0635	1.0140	1.0485	1.0723	1.0752	1.1147	1.0438	1.0462	4	20

TEST NO.	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30	
TEST SEQ. NO.	21	22	23	24	25	26	27	28	29	30	
DATE	12/03/92	12/04/92	12/04/92	12/04/92	12/05/92	12/07/92	12/07/92	12/07/92	12/07/92	12/07/92	
TIME START	1859	0934	1120	1441	1157	0839	0954	1140	1337	1533	
TIME END	1953	0944	1244	1502	1300	0850	1015	1201	1501	1625	
LOAD MW	110	109	118	59	61	110	110	110	60	60	

DATA PAGE NO. 2 FLOWS MLB/HR

REBRN WB STOIC		CALC	.5	100.0	.4	.5	100.0	100.0	.6	.4	.5	.6	4 21
REBRN STOIC		CALC	.9216	1.1618	.8741	.9133	1.1313	1.1364	.9214	.8928	.9156	.9296	4 22
LVG FURN STOIC		CALC	1.1768	1.2070	1.1560	1.1797	1.2057	1.1820	1.1711	1.1990	1.1774	1.1907	4 23
LVG ECON STOIC		CALC	1.1866	1.2168	1.1657	1.1960	1.2217	1.1919	1.1808	1.2087	1.1935	1.2069	4 24

DATA PAGE NO. 3 FLUID TEMPERATURES F - PLANT

SSH OUT T	L	15-152	999.5	1001.8	999.0	1004.3	1000.0	998.6	994.8	1001.7	1000.8	1000.8	3 1
SSH OUT T	R	15-150	999.4	1004.0	998.5	1003.9	1000.0	999.7	997.6	1001.6	1001.1	997.9	3 2
SSH OUT AVE T		13-160	1002.2	1004.6	1000.0	1005.7	999.6	1000.1	999.1	1003.9	1003.1	1000.2	14 1
LVG SH ATTMP T	L	13-164	749.1	718.3	746.6	751.5	749.9	721.9	728.5	744.8	729.0	740.7	3 8
LVG SH ATTMP T	R	13-162	763.8	733.1	752.9	774.2	752.2	709.4	744.0	753.2	759.0	773.8	3 9
PRI SH OUT T	L	HW	798.6	814.1	825.6	793.7	763.8	832.3	795.5	833.2	770.6	771.5	3 10
PRI SH OUT T	R	HW	815.3	823.3	838.6	812.6	769.0	831.9	815.3	853.9	800.9	786.3	3 11
ECON H2O OUT T	L	HW	512.7	517.2	520.9	480.9	493.9	510.0	505.0	507.5	483.6	483.1	3 27
ECON H2O OUT T	R	HW	516.2	522.9	532.8	478.9	462.4	528.0	521.7	533.9	467.6	465.4	3 28
ECON H2O IN T		20-007	459.9	459.4	467.8	396.7	400.5	460.2	459.1	459.7	398.5	398.6	3 5
RH SPRAY H2O T		HW	317.6	316.5	322.2	271.9	273.8	317.2	316.2	316.0	273.3	273.8	3 7
LVG RH T		14-150	996.1	996.5	1003.1	975.9	986.3	999.0	995.1	1003.6	998.8	1000.1	3 12
ENT RH T		CALC	578.0	581.5	599.2	643.2	641.2	702.4	698.6	699.4	643.2	641.4	3 16
COLD RH T		20-006	748.3	747.1	761.9	651.9	648.3	744.8	744.5	748.0	652.0	649.7	3 18

DATA PAGE NO. 4 FLUID TEMPERATURES F - B&W

AIR ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 1
AIR LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 2
CYC A TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 3
CYC A PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 4
CYC A TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 5
CYC B TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 6
CYC B PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 7
CYC B TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 8
CYC C TA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 9
CYC C PA DIFF P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 10
CYC C TOT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 11
LVG SSH PLAT P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 12
ENT PSH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 13
LVG PSH P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 14
LVG PSH P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 15
LVG ECON P	R	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 16
LVG ECON P	L	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 17
GAS ENT AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 18
GAS LVG AH P		PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4 19

TEST NO.			W21	W22	W23	W24	W25	W26	W27	W28	W29	W30	
TEST SEQ. NO.			21	22	23	24	25	26	27	28	29	30	
DATE			12/03/92	12/04/92	12/04/92	12/04/92	12/05/92	12/07/92	12/07/92	12/07/92	12/07/92	12/07/92	
TIME START			1859	0934	1120	1441	1157	0839	0954	1140	1337	1533	
TIME END			1953	0944	1244	1502	1300	0850	1015	1201	1501	1625	
LOAD MW			110	109	118	59	61	110	110	110	60	60	
DATA PAGE NO. 5		**FLUID PRESSURES PSIG**											
TURB THROT P		03-170	1449.7	1451.9	1450.4	1450.8	1449.9	1450.7	1452.9	1450.0	1449.7	1449.6	5 1
SEC SH OUT P		CALC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 2
DRUM PRESS		04-013	1600.3	1596.6	1626.1	1490.3	1495.1	1600.8	1605.3	1600.5	1489.9	1490.2	5 3
LVG RH PRESS		15-102	430.5	426.9	468.5	210.3	220.2	427.8	427.6	427.6	215.2	215.5	5 4
ENT RH PRESS		15-100	458.5	453.5	498.0	220.3	230.0	456.0	455.3	455.6	227.2	227.9	5 5
FW HTR E EXT P		20-035	439.7	436.3	478.7	213.1	222.6	438.2	437.2	437.7	218.5	218.9	5 6
FW HTR E EXT P		TRANS	439.9	437.2	479.2	214.4	224.2	438.5	437.4	438.2	219.3	219.8	5 7
SEC SH OUT P	(T)	TRANS	1480.8	1482.5	1489.9	1447.9	1448.8	1483.1	1484.1	1480.7	1447.2	1446.7	5 17
DRUM PRESS	(T)	TRANS	1566.1	1563.3	1591.3	1456.0	1462.2	1566.1	1569.5	1565.2	1453.9	1453.8	5 18
LVG RH-1 P	(T)	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 19
ENT RH-1 P	(T)	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5 20
DATA PAGE NO. 6		**AIR & GAS DATA - PLANT**											
AMBIENT AIR DB TEMP		TC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 1
AIR ENT FD FAN T		MW	90.6	87.7	87.2	94.3	87.5	90.2	90.5	92.3	98.4	101.5	6 4
AIR LVG FD FAN T	A	09-028	121.3	115.5	118.3	133.0	125.3	118.9	122.1	122.8	137.4	139.3	7 2
AIR LVG FD FAN T	B	09-029	125.7	119.7	121.4	137.8	130.6	122.3	124.5	126.1	141.2	142.0	7 3
AIR ENT AH T	RA	20-017	126.2	120.5	121.7	140.4	131.6	122.9	125.0	126.3	143.2	143.1	6 2
AIR ENT AH T	RB	20-018	128.5	123.0	124.5	140.0	132.5	125.3	127.4	129.0	143.4	144.1	6 3
AIR ENT AH T	LA	20-025	124.6	119.7	121.7	135.6	127.9	122.0	125.4	126.7	140.2	142.1	13 25
AIR ENT AH T	LB	20-029	124.8	119.5	121.7	136.3	128.4	122.1	125.7	126.3	140.7	142.9	13 26
AIR LVG AH T	R	MW	651.1	620.8	657.9	579.3	571.1	656.5	660.9	691.9	579.5	580.9	6 6
AIR LVG AH T	L	MW	602.1	599.6	596.3	555.1	574.1	594.2	592.8	605.0	581.8	581.8	6 7
BRN SEC AIR T		08-002	598.5	558.8	590.7	564.2	563.9	584.6	598.9	620.6	585.7	585.2	14 2
BRN SA/GR T		08-001	571.5	531.4	568.2	557.5	534.0	554.3	578.1	574.0	573.7	574.2	14 3
OFA TEMP		09-002	571.3	295.3	568.3	525.6	374.7	301.3	552.5	590.2	537.4	534.1	14 4
GAS LVG AH T	RA	20-019	348.9	332.5	337.7	323.6	305.3	337.2	349.3	350.1	328.2	313.7	6 10
GAS LVG AH T	RB	20-020	329.2	311.4	314.6	293.1	280.5	315.9	328.7	326.9	300.0	289.4	6 11
GAS LVG AH T	LA	20-027	306.4	290.9	291.2	282.4	275.5	299.7	306.6	299.6	289.1	284.6	13 27
GAS LVG AH T	LB	20-024	312.1	294.1	295.8	287.4	278.4	301.8	310.3	306.1	295.5	288.6	13 28
GAS LVG RH PS T		AVE	681.0	644.0	670.2	598.5	634.7	666.6	660.3	677.1	627.6	635.6	13 17
GAS LVG SH PS T		AVE	702.5	680.9	724.5	607.7	572.2	722.9	719.5	763.1	599.4	593.9	13 19
GR GAS TEMP	A	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 8
GR GAS TEMP	B	BV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 9
O2 LVG ECON	R	11-172	3.1433	3.4035	3.3166	2.4253	3.6039	3.3874	2.9675	3.6871	2.5465	3.2818	6 20
O2 LVG ECON	L	11-170	3.0648	4.3089	2.7752	2.9929	3.3788	3.6773	2.9066	3.0172	3.1603	3.9055	6 21
O2 IN SEC AIR		06-254	20.69	20.71	12.38	16.44	19.94	20.76	20.74	15.98	16.27	16.21	13 29
ACCUREX NOX	PPM	06-553	267.2	487.6	258.6	154.6	404.4	659.0	328.1	282.4	181.2	216.7	13 9
ACCUREX SOX	PPM	06-555	409.1	361.5	417.2	405.3	383.0	707.1	806.7	499.3	412.0	469.6	13 10
ACCUREX CO	PPM	06-425	73.0	83.3	89.0	107.1	74.1	71.4	192.5	110.3	117.6	92.1	13 11
ACCUREX O2	%	06-554	3.0145	3.2799	2.5723	2.8670	3.2899	3.0375	2.6614	3.0512	2.9778	3.5146	13 12
BRN SEC AIR P	IN WG	06-250	23.33	22.77	28.59	10.39	10.07	24.07	23.89	27.79	11.51	11.73	14 5
BRN GAS REC P	IN WG	06-252	23.04	22.56	28.42	10.08	9.88	23.68	23.40	27.55	11.26	11.59	14 6

TEST NO.			W21	W22	W23	W24	W25	W26	W27	W28	W29	W30	
TEST SEQ. NO.			21	22	23	24	25	26	27	28	29	30	
DATE			12/03/92	12/04/92	12/04/92	12/04/92	12/05/92	12/07/92	12/07/92	12/07/92	12/07/92	12/07/92	
TIME START			1859	0934	1120	1441	1157	0839	0954	1140	1337	1533	
TIME END			1953	0944	1244	1502	1300	0850	1015	1201	1501	1625	
LOAD MW			110	109	118	59	61	110	110	110	60	60	
DATA PAGE NO. 6	AIR & GAS DATA - PLANT												
FURNACE GAS P	IN WG	08-100	22.54	22.65	24.54	8.00	10.05	23.59	22.00	24.35	8.51	8.66	14 7
BAROMETRIC P	IN HG	PB	29.23	29.34	29.35	29.36	29.61	29.36	29.37	29.36	29.36	29.38	6 29
REL HUMIDITY	%	TST	8.7370	8.1438	8.1540	7.9192	8.0352	8.6100	8.6745	8.4024	8.1079	7.9568	6 30
DATA PAGE NO. 7	AIR & GAS DATA - B&W												
AMBIENT AIR TEMP		TC	107.9	101.3	105.0	109.2	101.4	100.2	107.0	110.9	115.6	117.2	7 1
AIR LVG FD FAN T	A	TC	123.1	117.7	120.4	134.8	127.2	120.6	124.0	124.9	139.4	141.3	7 6
AIR LVG FD FAN T	B	TC	127.1	121.5	123.3	139.6	132.3	123.7	126.0	127.8	142.8	143.6	7 7
AIR ENT AH	(T)	GRID	126.9	121.5	123.5	139.1	131.2	123.7	126.6	128.1	142.8	143.9	7 4
GAS LVG AH	(T)	GRID	311.4	295.6	299.8	287.6	275.5	301.4	310.4	309.3	293.2	284.8	7 10
GAS LVG ECON	(T) L	GRID	702.8	661.8	702.4	619.8	653.7	698.2	694.4	723.5	649.9	657.1	7 14
GAS LVG ECON	(T) R	GRID	725.7	685.1	726.8	643.2	596.2	725.4	718.0	769.3	614.1	620.3	7 15
GAS TEMP LVG GR FAN		GRID	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 7
O2 LVG ECON	(T) L	GRID	3.3691	4.3215	2.9779	3.2147	3.3783	3.8515	3.2098	3.4224	3.1681	3.8973	7 20
O2 LVG ECON	(T) R	GRID	3.3625	3.3550	3.0985	2.3000	3.6000	3.1930	3.3263	3.8619	2.5500	3.3174	7 21
CO LVG ECON	(T) L	GRID	64.94	65.94	74.66	61.36	12.77	36.79	99.22	84.01	97.02	34.20	13 5
CO LVG ECON	(T) R	GRID	90.6	44.2	70.0	81.0	42.2	57.3	91.0	118.4	76.5	58.8	13 6
CO2 LVG ECON	(T) L	GRID	15.89	15.27	16.39	15.87	16.07	15.69	16.22	16.02	16.19	15.61	7 22
CO2 LVG ECON	(T) R	GRID	15.51	15.80	15.94	15.36	14.38	15.56	15.42	14.97	15.25	15.59	7 23
NOX LVG ECON	(T) L	GRID	313.9	568.1	286.0	184.6	457.3	541.5	294.4	254.0	214.0	243.2	7 24
NOX LVG ECON	(T) R	GRID	257.7	502.5	261.7	161.1	427.5	524.1	248.7	230.9	203.7	231.7	7 25
O2 LVG AH	(T)	GRID	4.5412	5.1928	3.8482	4.7425	5.1466	4.9235	4.3443	4.5501	4.7512	5.3751	13 1
CO2 LVG AH	(T)	GRID	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	3.7801	3.7765	3.7801	3.7801	13 3
O2 LVG GR FAN	(T)	GRID	6.38	6.33	0.00	0.00	0.00	9.91	11.94	2.99	20.87	35.10	13 4
DRY BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 26
WET BULB TEMP	(T)	TST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 27
DATA PAGE NO. 8	FW HTR TEMPERATURES F - PLANT												
FW HTR E EXT T		HW	745.0	745.7	759.5	648.7	644.7	742.8	741.8	745.2	648.6	646.6	8 1
FW HTR E LVG T		HW	456.9	457.7	464.9	394.1	397.1	458.1	456.4	456.8	396.0	396.2	8 5
FW HTR E ENT T		HW	384.1	385.0	390.8	334.2	336.6	385.6	384.0	384.3	336.1	336.3	8 7
FW HTR E DRN T		HW	403.5	405.3	412.3	351.2	354.0	405.0	403.5	405.1	349.2	348.4	8 13
DATA PAGE NO. 9	FW HTR TEMPERATURES F - B&W												
SSH PEND IN LEG	1	10-017	853.7	854.0	849.4	856.2	887.4	846.8	845.6	851.9	846.3	860.6	9 17
SSH PEND IN LEG	2	10-018	874.9	868.7	868.4	883.1	896.9	859.7	867.1	870.8	875.8	878.4	9 18
SSH PEND IN LEG	3	10-019	879.1	866.0	867.1	891.4	881.3	856.7	868.5	875.1	888.8	879.6	9 19
SSH PEND IN LEG	4	10-020	890.0	873.8	874.8	904.8	881.5	860.8	877.3	884.7	904.9	892.1	9 20
SSH PEND IN LEG	5	10-021	856.3	839.7	838.6	873.6	840.9	824.0	846.2	851.5	872.4	862.2	9 21

TEST NO.	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30
TEST SEQ. NO.	21	22	23	24	25	26	27	28	29	30
DATE	12/03/92	12/04/92	12/04/92	12/04/92	12/05/92	12/07/92	12/07/92	12/07/92	12/07/92	12/07/92
TIME START	1859	0934	1120	1441	1157	0839	0954	1140	1337	1533
TIME END	1953	0944	1244	1502	1300	0850	1015	1201	1501	1625
LOAD MW	110	109	118	59	61	110	110	110	60	60

DATA PAGE NO. 9 FW HTR TEMPERATURES F - B&W

SSH PEND IN LEG	6	10-033	886.0	869.2	874.9	911.4	874.6	860.2	875.4	884.6	900.8	893.7	9 22
SSH PEND IN LEG	7	10-034	879.5	863.8	876.6	905.3	877.9	869.2	865.1	883.3	886.0	883.7	9 23
SSH PEND IN LEG	8	10-035	876.7	861.4	873.4	897.1	880.2	865.9	860.0	878.9	881.2	881.6	9 24
SSH PEND IN LEG	9	10-036	878.5	866.7	874.7	889.9	891.0	869.4	864.1	877.5	877.9	880.1	9 25
SSH PEND IN LEG	10	10-037	857.7	853.9	853.4	857.8	886.0	858.6	846.9	853.5	845.4	850.9	9 26
RH PEND IN LEG	1	09-049	942.0	933.2	946.5	924.2	929.7	933.4	933.4	946.9	945.0	946.3	8 17
RH PEND IN LEG	2	09-050	933.5	923.5	939.2	914.3	913.5	920.4	920.4	935.5	930.7	931.1	8 18
RH PEND IN LEG	3	09-051	935.5	925.7	940.6	918.4	921.8	926.0	926.0	939.4	937.6	938.6	8 19
RH PEND IN LEG	4	09-052	932.2	922.3	937.4	914.4	916.1	921.5	921.1	935.5	932.6	932.9	8 20
RH PEND IN LEG	5	09-053	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8 21
RH PEND IN LEG	6	10-001	968.0	959.1	972.0	945.3	951.1	953.7	954.6	971.4	967.3	970.6	8 22
RH PEND IN LEG	7	10-002	932.1	919.7	933.1	919.9	927.9	926.6	929.7	942.0	944.8	946.7	8 23
RH PEND IN LEG	8	10-003	927.4	917.1	928.3	917.3	941.3	931.4	931.7	939.0	951.3	953.5	8 24
RH PEND IN LEG	9	10-004	942.2	933.4	946.7	924.1	930.3	933.1	933.0	947.0	945.2	946.7	8 25
RH PEND IN LEG	10	10-005	881.5	897.2	885.2	858.9	921.0	915.3	897.8	897.4	892.3	898.1	8 26
RH INTM HND HOLE	R	10-038	940.0	930.0	947.3	929.9	922.7	934.0	936.0	945.2	942.2	943.3	8 27
RH INTM HND HOLE	L	10-039	828.5	851.4	832.4	809.8	856.6	870.5	848.2	848.6	832.0	837.0	8 28
PSH OUT LEG T		09-017	819.5	820.9	837.8	824.1	780.5	832.8	817.1	848.7	801.9	798.1	14 11
PSH OUT LEG T		09-018	826.6	833.5	851.8	830.9	778.6	847.7	831.6	868.2	812.6	796.7	14 12
PSH OUT LEG T		09-019	775.5	814.7	811.5	762.3	749.5	844.3	782.7	819.4	735.2	737.4	14 13
PSH OUT LEG T		09-020	795.5	819.3	829.3	790.5	759.9	846.3	799.5	838.9	758.3	762.2	14 14
PSH OUT LEG T		09-021	802.8	807.0	822.0	805.6	770.9	817.2	790.8	824.7	783.1	785.8	14 15
PSH OUT LEG T		09-022	811.9	813.3	826.0	818.6	783.2	821.5	804.4	836.5	801.6	799.0	14 16
PSH OUT LEG T		09-023	805.1	817.7	833.7	811.3	757.5	837.0	814.7	855.0	787.5	773.5	14 17
PSH OUT LEG T		09-024	831.9	837.9	853.2	834.2	788.1	846.5	830.8	871.1	821.9	803.7	14 18
PSH OUT LEG T		09-025	811.8	819.5	836.7	811.2	756.4	834.8	817.0	863.0	788.8	772.5	14 19
PSH OUT LEG T		09-026	814.2	818.3	829.9	810.6	776.2	820.0	810.5	845.9	804.2	790.5	14 20
PSH OUT LEG T		09-027	818.5	823.0	836.8	812.5	779.2	825.3	816.9	849.3	807.5	795.9	14 21

DATA PAGE NO. 10 FUEL FEED DATA - PLANT

CYC A COAL FLOW KLB	05-104	26.57	38.07	29.16	17.70	31.36	36.95	25.63	25.95	18.04	19.67	10 1
CYC B COAL FLOW KLB	07-110	26.62	38.06	29.13	-.01	-.01	36.94	25.62	25.92	-.01	-.01	10 2
CYC C COAL FLOW KLB	09-110	26.55	38.04	29.14	17.68	31.35	36.96	25.61	25.93	18.02	19.64	10 3
CYC A SEC AIR FLOW %	05-170	207.3	288.0	226.7	128.9	239.6	285.2	199.8	211.3	139.0	154.3	10 16
CYC B SEC AIR FLOW %	08-170	206.3	291.7	232.3	2.6	2.3	290.3	196.9	213.3	3.2	2.5	10 17
CYC C SEC AIR FLOW %	10-170	207.1	291.2	226.0	134.7	239.3	289.0	199.5	212.8	138.8	153.9	10 18
CYC A SEC AIR T	20-002	579.8	569.7	599.0	546.0	537.3	594.9	589.3	626.8	544.0	536.9	11 1
CYC B SEC AIR T	20-003	625.3	580.5	616.1	557.9	559.2	607.6	619.3	642.2	572.3	567.0	11 2
CYC C SEC AIR T	20-004	566.2	536.7	554.7	527.6	542.5	560.9	557.1	567.0	549.5	547.3	11 3
PULV COAL FLOW KLB	06-314	35.44	.08	36.43	25.14	.08	.07	36.22	34.34	25.24	21.15	10 4
PULV PA FLOW	06-275	62.78	0.00	63.69	55.35	1.18	2.07	64.34	63.74	56.11	52.68	10 19
PULV INLET T	09-034	573.3	96.4	565.7	520.1	272.8	99.3	563.6	580.9	534.1	523.2	11 7
PULV OUTLET T	09-040	135.0	99.6	136.4	136.9	131.4	74.8	130.3	141.5	139.1	137.0	11 8

TEST NO.	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30
TEST SEQ. NO.	21	22	23	24	25	26	27	28	29	30
DATE	12/03/92	12/04/92	12/04/92	12/04/92	12/05/92	12/07/92	12/07/92	12/07/92	12/07/92	12/07/92
TIME START	1859	0934	1120	1441	1157	0839	0954	1140	1337	1533
TIME END	1953	0944	1244	1502	1300	0850	1015	1201	1501	1625
LOAD MW	110	109	118	59	61	110	110	110	60	60

DATA PAGE NO. 11 POWER & ELECTRICAL SYSTEM DATA

PULV DIFF P IN WG	06-274	15.40	-.16	17.51	14.11	-.03	-.01	16.36	16.43	13.51	10.98	11	9
PULV AMPS	06-276	324.4	-.1	358.2	275.8	83.1	-.1	312.3	317.7	262.4	234.5	11	10
PULV PA FAN AMPS	06-277	90.14	-.12	98.44	58.88	41.79	.11	98.39	96.19	61.80	40.08	11	11
ROT CLASS AMPS	06-278	46.66	44.28	49.68	49.91	.03	.03	47.95	49.18	49.80	47.58	11	12
ROT CLASS RPM	06-270	154.6	160.5	160.8	174.5	-.2	-.2	158.5	161.1	173.8	173.9	11	13
ROT CLASS DP IN WG	06-345	.5793	.4711	.6937	.7023	.0197	.0238	.6193	.6382	.6669	.5940	11	14
COAL SILO LEVEL	06-310	40.25	94.15	68.99	82.13	94.98	97.00	96.90	51.22	66.08	79.14	11	15
FLAME INTENSITY #1 %	06-279	106.1	50.7	106.2	106.2	1.8	3.7	106.0	106.2	106.2	106.1	11	16
FLAME INTENSITY #2 %	06-295	105.8	67.4	105.5	105.7	.9	21.9	105.8	105.6	105.8	105.8	11	17
FLAME INTENSITY #3 %	06-296	0.0	63.2	106.1	106.2	1.0	5.2	0.0	106.2	106.1	0.0	11	18
FLAME INTENSITY #4 %	06-297	105.7	6.6	105.6	105.7	4.0	5.0	105.8	105.9	105.7	106.0	11	19

DATA PAGE NO. 12 OPERATOR POSITIONS

RH SP VLV POS	15-077	42.34	41.09	56.73	-5.00	-5.00	6.20	10.80	13.70	-5.00	-5.00	12	1
SH SP VLV POS R	13-190	41.74	67.95	62.39	37.52	30.38	84.42	55.76	72.92	40.06	30.63	12	3
SH SP VLV POS L	13-191	44.05	69.33	58.36	43.79	33.08	77.88	55.22	66.58	42.57	38.08	12	4
GR DMPR DEMAND	16-044	-5.00	-5.00	-5.00	77.02	89.31	-5.00	-5.00	-5.00	61.68	55.03	12	9
RECIRC AIR DMPR POS	12-176	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12	13
SH PASS DMPR POS	14-180	53.1	100.0	100.0	38.2	.1	100.0	100.0	100.0	28.0	23.8	12	15
RH PASS DMPR POS	14-180	100.0	92.3	46.2	100.0	100.0	31.2	30.8	3.3	100.0	100.0	12	16
OVRFIRE AIR DMPR POS	06-115	49.28	9.00	58.73	32.53	9.00	9.00	46.43	60.18	32.53	32.36	12	17
BRN SEC AIR DMPR POS	06-286	39.59	36.18	34.23	39.89	35.02	36.85	44.32	38.62	41.00	40.49	12	18
HOT PRI AIR DMPR POS	06-556	90.2	0.0	99.5	99.6	0.0	0.0	90.2	90.2	100.0	100.0	12	19
BRN GAS REC DMPR POS	06-324	0.00	0.00	39.12	25.07	0.00	0.00	0.00	32.55	25.08	25.08	12	20

DATA PAGE NO. 15 MISCELLANEOUS DATA

GAS LVG SH PASS 1A	08-003	-499.4	-529.3	-546.0	-371.7	-369.4	-567.4	-556.9	-552.7	-341.7	-349.8	15	1
GAS LVG SH PASS 1B	08-004	710.7	[illegible]	744.3	614.1	568.9	734.2	737.0	789.5	595.8	594.7	15	2
GAS LVG SH PASS 1C	08-005	728.8	[illegible]	759.7	622.6	574.2	743.6	753.7	812.0	611.8	607.5	15	3
GAS LVG SH PASS 1D	08-006	776.4	740.7	785.1	657.5	609.6	770.9	775.9	824.5	652.7	649.5	15	4
GAS LVG SH PASS 2A	08-017	651.9	644.6	672.6	568.6	540.6	686.3	670.5	703.6	556.4	555.9	15	5
GAS LVG SH PASS 2B	08-018	667.7	654.3	691.3	589.0	556.7	697.3	690.1	730.8	574.4	571.5	15	6
GAS LVG SH PASS 2C	08-019	677.8	656.5	704.7	590.4	554.9	703.2	699.1	746.7	579.1	574.5	15	7
GAS LVG SH PASS 2D	08-020	718.3	691.1	741.2	616.0	584.3	726.1	725.6	775.3	612.4	606.5	15	8
GAS LVG SH PASS 3A	08-021	701.7	687.5	716.7	604.4	577.4	730.2	714.9	743.3	595.9	591.6	15	9
GAS LVG SH PASS 3B	08-022	703.7	687.0	718.7	611.9	584.1	722.3	719.7	750.0	600.9	597.4	15	10
GAS LVG SH PASS 3C	08-023	688.1	667.0	710.9	602.2	572.0	714.9	709.0	755.6	590.7	589.4	15	11
GAS LVG SH PASS 3D	08-024	-604.7	-589.5	-645.6	-499.8	-475.4	-643.0	-624.0	-673.7	-481.8	-475.7	15	12
GAS LVG RH PASS 4A	08-033	651.3	635.4	655.4	581.1	631.1	663.3	657.5	672.4	616.0	621.8	15	13
GAS LVG RH PASS 4B	08-034	689.7	641.0	670.5	600.6	645.1	672.7	670.7	688.7	643.1	647.2	15	14
GAS LVG RH PASS 4C	08-035	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15	15

TEST NO.		W21	W22	W23	W24	W25	W26	W27	W28	W29	W30
TEST SEQ. NO.		21	22	23	24	25	26	27	28	29	30
DATE		12/03/92	12/04/92	12/04/92	12/04/92	12/05/92	12/07/92	12/07/92	12/07/92	12/07/92	12/07/92
TIME START		1859	0934	1120	1441	1157	0839	0954	1140	1337	1533
TIME END		1953	0944	1244	1502	1300	0850	1015	1201	1501	1625
LOAD MW		110	109	118	59	61	110	110	110	60	60

DATA PAGE NO. 15 MISCELLANEOUS DATA

GAS LVG RH PASS	4D	08-036	760.0	682.1	728.3	644.0	658.8	699.7	697.6	718.3	670.1	680.1	15 16
GAS LVG RH PASS	5A	08-049	638.2	618.2	637.4	565.4	619.6	647.5	638.4	650.8	599.8	604.0	15 17
GAS LVG RH PASS	5B	08-050	659.2	630.3	653.6	580.8	629.5	654.4	649.5	664.3	615.8	623.1	15 18
GAS LVG RH PASS	5C	08-051	699.6	646.9	677.4	609.1	638.3	665.0	660.6	680.5	635.4	645.7	15 19
GAS LVG RH PASS	5D	08-052	697.4	640.8	676.0	602.0	622.4	653.6	651.3	669.3	623.8	629.6	15 20
GAS LVG RH PASS	6A	08-053	650.6	628.1	645.2	581.4	625.9	659.4	648.8	660.3	614.9	621.7	15 21
GAS LVG RH PASS	6B	08-054	675.7	649.2	667.6	604.3	642.4	674.5	666.2	681.9	637.1	641.8	15 22
GAS LVG RH PASS	6C	08-055	678.8	648.4	672.0	605.3	636.2	669.4	662.7	681.8	634.0	641.7	15 23
GAS LVG RH PASS	6D	08-056	690.2	663.9	688.3	609.3	632.5	672.7	660.8	680.2	627.7	635.5	15 24
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 27
RIGHT = A = W			21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00	15 28

APPENDIX NO. 12

Air Heater Performance Calculations

SEC AH
TEST 5P : 05/18/92 : 1050-1406 : 110 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1018	AIR WT LVG -	923	919	MOIST -	5.1
GAS TEMP ENT -	676	661	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		7.44	GAS TEMP LVG -		297	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	540		

SEC AH
TEST 5P : 05/18/92 : 1050-1406 : 110 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1020	AIR WT LVG -	923	921	MOIST -	5.1
GAS TEMP ENT -	676	661	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		7.44	GAS TEMP LVG -		297	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	540		

SEC AH
TEST 6P : 05/19/92 : 0922-1212 : 110 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1010	AIR WT LVG -	923	912	MOIST -	5.1
GAS TEMP ENT -	676	662	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		8.14	GAS TEMP LVG -		296	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	540		

SEC AH
TEST 6P : 05/19/92 : 0922-1212 : 110 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1013	AIR WT LVG -	923	915	MOIST -	5.1
GAS TEMP ENT -	676	662	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		8.14	GAS TEMP LVG -		296	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	540		

SEC AH
TEST 8P : 05/20/92 : 0932-1238 : 109 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	990	AIR WT LVG -	923	894	MOIST -	5.1
GAS TEMP ENT -	676	648	GAS TEMP LVG -	315	304	EXCL. LKG	
AH LKG, %		9.00	GAS TEMP LVG -		290	INCL. LKG	
			AVE COLD END -	220	215		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	530		

SEC AH
TEST 8P : 05/20/92 : 0932-1238 : 109 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	994	AIR WT LVG -	923	898	MOIST -	5.1
GAS TEMP ENT -	676	648	GAS TEMP LVG -	315	304	EXCL. LKG	
AH LKG, %		9.00	GAS TEMP LVG -		290	INCL. LKG	
			AVE COLD END -	220	215		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	530		

SEC AH
TEST 1P : 05/16/92 : 1056-1311 : 80 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	729	AIR WT LVG -	923	658	MOIST -	5.1
GAS TEMP ENT -	676	604	GAS TEMP LVG -	315	280	EXCL. LKG	
AH LKG, %		6.87	GAS TEMP LVG -		270	INCL. LKG	
			AVE COLD END -	220	203		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	505		

SEC AH
TEST 1P : 05/16/92 : 1056-1311 : 80 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	727	AIR WT LVG -	923	656	MOIST -	5.1
GAS TEMP ENT -	676	604	GAS TEMP LVG -	315	279	EXCL. LKG	
AH LKG, %		6.87	GAS TEMP LVG -		270	INCL. LKG	
			AVE COLD END -	220	203		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	505		

SEC AH
TEST 7P : 05/19/92 : 1429-1721 : 82 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	739	AIR WT LVG -	923	667	MOIST -	5.1
GAS TEMP ENT -	676	625	GAS TEMP LVG -	315	287	EXCL. LKG	
AH LKG, %		7.22	GAS TEMP LVG -		276	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	522		

SEC AH
TEST 7P : 05/19/92 : 1429-1721 : 82 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	738	AIR WT LVG -	923	667	MOIST -	5.1
GAS TEMP ENT -	676	625	GAS TEMP LVG -	315	287	EXCL. LKG	
AH LKG, %		7.22	GAS TEMP LVG -		276	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	522		

SEC AH
TEST 9P : 05/20/92 : 1435-1642 : 82 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	735	AIR WT LVG -	923	664	MOIST -	5.1
GAS TEMP ENT -	676	622	GAS TEMP LVG -	315	286	EXCL. LKG	
AH LKG, %		8.24	GAS TEMP LVG -		274	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	519		

SEC AH
TEST 9P : 05/20/92 : 1435-1642 : 82 MW : FINAL PERFORMANCE TESTS
JDR-071392

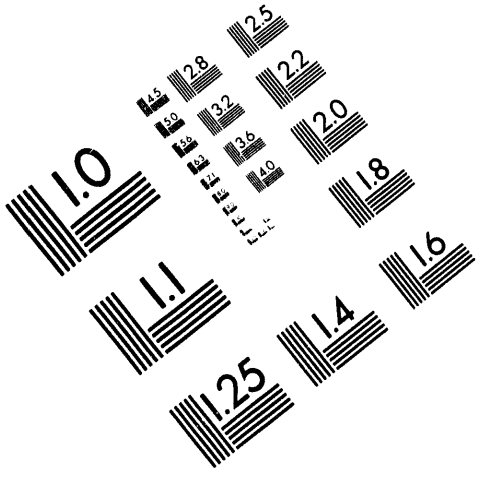
	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	743	AIR WT LVG -	923	671	MOIST -	5.1
GAS TEMP ENT -	676	622	GAS TEMP LVG -	315	286	EXCL. LKG	
AH LKG, %		8.24	GAS TEMP LVG -		274	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	519		

SEC AH
TEST 2P : 05/16/92 : 1608-1844 : 58 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	533	AIR WT LVG -	923	482	MOIST -	5.1
GAS TEMP ENT -	676	573	GAS TEMP LVG -	315	261	EXCL. LKG	
AH LKG, %		7.58	GAS TEMP LVG -		252	INCL. LKG	
			AVE COLD END -	220	193		
AIR EMP ENT -	126	126	AIR TEMP LVG -	552	488		

SEC AH
TEST 2P : 05/16/92 : 1608-1844 : 58 MW : FINAL PERFORMANCE TESTS
JDR-071392

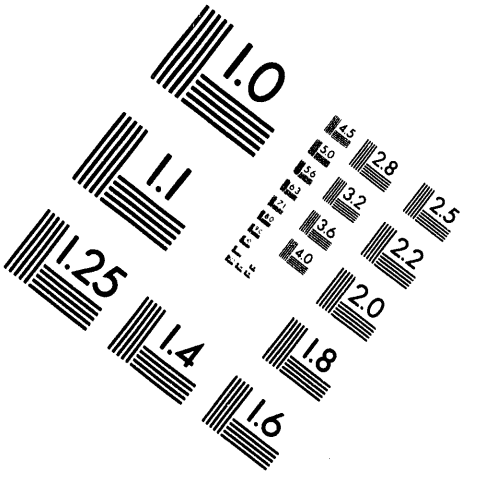
	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	541	AIR WT LVG -	923	489	MOIST -	5.1
GAS TEMP ENT -	676	573	GAS TEMP LVG -	315	261	EXCL. LKG	
AH LKG, %		7.58	GAS TEMP LVG -		252	INCL. LKG	
			AVE COLD END -	220	193		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	488		



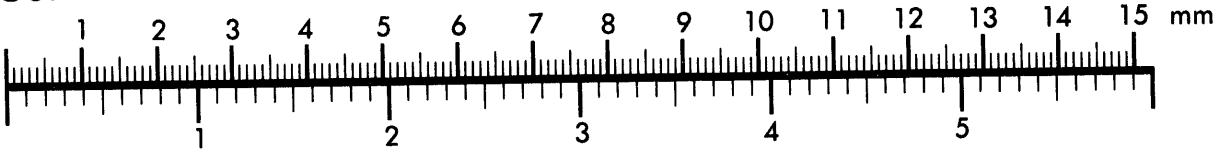
Association for Information and Image Management

1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910

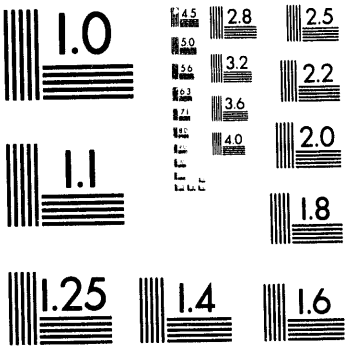
301/587-8202

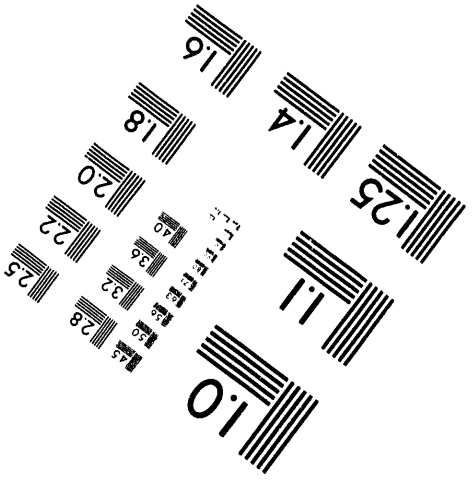


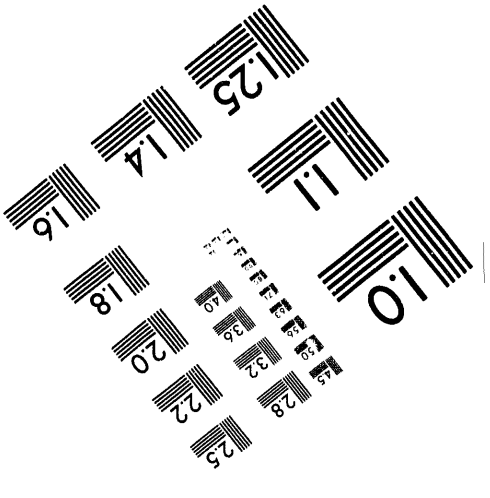
Centimeter



Inches







MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

7 of 9

SEC AH
TEST 3P : 05/17/92 : 0933-1127 : 58 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	526	AIR WT LVG -	923	475	MOIST -	5.1
GAS TEMP ENT -	676	574	GAS TEMP LVG -	315	261	EXCL. LKG	
AH LKG, %		7.91	GAS TEMP LVG -		251	INCL. LKG	
			AVE COLD END -	220	193		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	490		

SEC AH
TEST 3P : 05/17/92 : 0933-1127 : 58 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	534	AIR WT LVG -	923	482	MOIST -	5.1
GAS TEMP ENT -	676	574	GAS TEMP LVG -	315	261	EXCL. LKG	
AH LKG, %		7.91	GAS TEMP LVG -		252	INCL. LKG	
			AVE COLD END -	220	193		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	489		

SEC AH
TEST 4P : 05/17/92 : 1419-1650 : 58 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	526	AIR WT LVG -	923	475	MOIST -	5.2
GAS TEMP ENT -	676	565	GAS TEMP LVG -	315	258	EXCL. LKG	
AH LKG, %		7.48	GAS TEMP LVG -		249	INCL. LKG	
			AVE COLD END -	220	192		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	482		

SEC AH
TEST 4P : 05/17/92 : 1419-1650 : 58 MW : FINAL PERFORMANCE TESTS
JDR-071392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	536	AIR WT LVG -	923	484	MOIST -	5.2
GAS TEMP ENT -	676	565	GAS TEMP LVG -	315	259	EXCL. LKG	
AH LKG, %		7.48	GAS TEMP LVG -		250	INCL. LKG	
			AVE COLD END -	220	192		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	482		

SEC AH
TEST F1 : 09/28/92 : 1446-1702 : 77 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	698	AIR WT LVG -	923	630	MOIST -	5.1
GAS TEMP ENT -	676	631	GAS TEMP LVG -	315	287	EXCL. LKG	
AH LKG, %		8.03	GAS TEMP LVG -		276	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	529		

SEC AH
TEST F1 : 09/28/92 : 1446-1702 : 77 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	697	AIR WT LVG -	923	629	MOIST -	5.1
GAS TEMP ENT -	676	631	GAS TEMP LVG -	315	287	EXCL. LKG	
AH LKG, %		8.03	GAS TEMP LVG -		276	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	529		

SEC AH
TEST F2 : 09/28/92 : 1057-1302 : 110 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	993	AIR WT LVG -	923	897	MOIST -	5.1
GAS TEMP ENT -	676	671	GAS TEMP LVG -	315	312	EXCL. LKG	
AH LKG, %		6.15	GAS TEMP LVG -		302	INCL. LKG	
			AVE COLD END -	220	219		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	548		

SEC AH
TEST F2 : 09/28/92 : 1057-1302 : 110 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	996	AIR WT LVG -	923	900	MOIST -	5.1
GAS TEMP ENT -	676	671	GAS TEMP LVG -	315	312	EXCL. LKG	
AH LKG, %		6.15	GAS TEMP LVG -		302	INCL. LKG	
			AVE COLD END -	220	219		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	548		

SEC AH
TEST F3 : 09/28/92 : 1920-2104 : 110 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1002	AIR WT LVG -	923	905	MOIST -	5.1
GAS TEMP ENT -	676	697	GAS TEMP LVG -	315	322	EXCL. LKG	
AH LKG, %		6.41	GAS TEMP LVG -		310	INCL. LKG	
			AVE COLD END -	220	224		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	569		

SEC AH
TEST F3 : 09/28/92 : 1920-2104 : 110 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1005	AIR WT LVG -	923	908	MOIST -	5.1
GAS TEMP ENT -	676	697	GAS TEMP LVG -	315	322	EXCL. LKG	
AH LKG, %		6.41	GAS TEMP LVG -		311	INCL. LKG	
			AVE COLD END -	220	224		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	569		

SEC AH
TEST F4 : 09/29/92 : 1333-1545 : 77 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	699	AIR WT LVG -	923	631	MOIST -	5.1
GAS TEMP ENT -	676	639	GAS TEMP LVG -	315	290	EXCL. LKG	
AH LKG, %		8.39	GAS TEMP LVG -		277	INCL. LKG	
			AVE COLD END -	220	208		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	535		

SEC AH
TEST F4 : 09/29/92 : 1333-1545 : 77 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	696	AIR WT LVG -	923	629	MOIST -	5.1
GAS TEMP ENT -	676	639	GAS TEMP LVG -	315	289	EXCL. LKG	
AH LKG, %		8.39	GAS TEMP LVG -		277	INCL. LKG	
			AVE COLD END -	220	208		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	535		

SEC AH
TEST F5 : 09/29/92 : 1708-1913 : 110 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	994	AIR WT LVG -	923	898	MOIST -	5.1
GAS TEMP ENT -	676	699	GAS TEMP LVG -	315	322	EXCL. LKG	
AH LKG, %		6.35	GAS TEMP LVG -		311	INCL. LKG	
			AVE COLD END -	220	224		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	571		

SEC AH
TEST F5 : 09/29/92 : 1708-1913 : 110 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	998	AIR WT LVG -	923	901	MOIST -	5.1
GAS TEMP ENT -	676	699	GAS TEMP LVG -	315	322	EXCL. LKG	
AH LKG, %		6.35	GAS TEMP LVG -		311	INCL. LKG	
			AVE COLD END -	220	224		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	571		

SEC AH
TEST F6 : 09/30/92 : 1235-1429 : 52 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	497	AIR WT LVG -	923	449	MOIST -	5.1
GAS TEMP ENT -	676	573	GAS TEMP LVG -	315	259	EXCL. LKG	
AH LKG, %		10.67	GAS TEMP LVG -		247	INCL. LKG	
			AVE COLD END -	220	192		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	490		

SEC AH
TEST F6 : 09/30/92 : 1235-1429 : 52 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	496	AIR WT LVG -	923	448	MOIST -	5.1
GAS TEMP ENT -	676	573	GAS TEMP LVG -	315	259	EXCL. LKG	
AH LKG, %		10.67	GAS TEMP LVG -		247	INCL. LKG	
			AVE COLD END -	220	192		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	490		

SEC AH
TEST F7 : 09/30/92 : 1713-1846 : 83 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	740	AIR WT LVG -	923	668	MOIST -	5.1
GAS TEMP ENT -	676	626	GAS TEMP LVG -	315	287	EXCL. LKG	
AH LKG, %		7.00	GAS TEMP LVG -		277	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	522		

SEC AH
TEST F7 : 09/30/92 : 1713-1846 : 83 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	741	AIR WT LVG -	923	669	MOIST -	5.1
GAS TEMP ENT -	676	626	GAS TEMP LVG -	315	287	EXCL. LKG	
AH LKG, %		7.00	GAS TEMP LVG -		277	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	522		

SEC AH
TEST F8 : 09/30/92 : 2005-2138 : 82 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	739	AIR WT LVG -	923	668	MOIST -	5.1
GAS TEMP ENT -	676	643	GAS TEMP LVG -	315	293	EXCL. LKG	
AH LKG, %		7.06	GAS TEMP LVG -		282	INCL. LKG	
			AVE COLD END -	220	209		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	536		

SEC AH
TEST F8 : 09/30/92 : 2005-2138 : 82 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	741	AIR WT LVG -	923	669	MOIST -	5.1
GAS TEMP ENT -	676	643	GAS TEMP LVG -	315	293	EXCL. LKG	
AH LKG, %		7.06	GAS TEMP LVG -		282	INCL. LKG	
			AVE COLD END -	220	209		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	536		

SEC AH
TEST F9 : 10/01/92 : 2245-0039 : 54 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	507	AIR WT LVG -	923	458	MOIST -	5.1
GAS TEMP ENT -	676	581	GAS TEMP LVG -	315	262	EXCL. LKG	
AH LKG, %		10.33	GAS TEMP LVG -		250	INCL. LKG	
			AVE COLD END -	220	194		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	496		

SEC AH
TEST F10 : 10/02/92 : 0210-0354 : 82 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	746	AIR WT LVG -	923	674	MOIST -	5.1
GAS TEMP ENT -	676	635	GAS TEMP LVG -	315	290	EXCL. LKG	
AH LKG, %		6.87	GAS TEMP LVG -		280	INCL. LKG	
			AVE COLD END -	220	208		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	529		

SEC AH
TEST F10 : 10/02/92 : 0210-0354 : 82 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	745	AIR WT LVG -	923	673	MOIST -	5.1
GAS TEMP ENT -	676	635	GAS TEMP LVG -	315	290	EXCL. LKG	
AH LKG, %		6.87	GAS TEMP LVG -		280	INCL. LKG	
			AVE COLD END -	220	208		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	529		

SEC AH
TEST F11 : 10/03/92 : 0523-0707 : 37 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	377	AIR WT LVG -	923	340	MOIST -	5.1
GAS TEMP ENT -	676	555	GAS TEMP LVG -	315	247	EXCL. LKG	
AH LKG, %		12.05	GAS TEMP LVG -		234	INCL. LKG	
			AVE COLD END -	220	186		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	482		

SEC AH
TEST F11 : 10/03/92 : 0523-0707 : 37 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	383	AIR WT LVG -	923	346	MOIST -	5.1
GAS TEMP ENT -	676	555	GAS TEMP LVG -	315	247	EXCL. LKG	
AH LKG, %		12.05	GAS TEMP LVG -		234	INCL. LKG	
			AVE COLD END -	220	186		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	482		

SEC AH
TEST F12 : 10/02/92 : 2248-0043 : 58 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	530	AIR WT LVG -	923	478	MOIST -	5.1
GAS TEMP ENT -	676	595	GAS TEMP LVG -	315	267	EXCL. LKG	
AH LKG, %		9.36	GAS TEMP LVG -		256	INCL. LKG	
			AVE COLD END -	220	197		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	507		

SEC AH
TEST F12 : 10/02/92 : 2248-0043 : 58 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	538	AIR WT LVG -	923	486	MOIST -	5.1
GAS TEMP ENT -	676	595	GAS TEMP LVG -	315	268	EXCL. LKG	
AH LKG, %		9.36	GAS TEMP LVG -		256	INCL. LKG	
			AVE COLD END -	220	197		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	507		

SEC AH
TEST F13 : 10/03/92 : 0126-0310 : 58 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	538	AIR WT LVG -	923	486	MOIST -	5.1
GAS TEMP ENT -	676	586	GAS TEMP LVG -	315	265	EXCL. LKG	
AH LKG, %		9.19	GAS TEMP LVG -		254	INCL. LKG	
			AVE COLD END -	220	195		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	499		

SEC AH
TEST F13 : 10/03/92 : 0126-0310 : 58 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	536	AIR WT LVG -	923	484	MOIST -	5.1
GAS TEMP ENT -	676	586	GAS TEMP LVG -	315	265	EXCL. LKG	
AH LKG, %		9.19	GAS TEMP LVG -		254	INCL. LKG	
			AVE COLD END -	220	195		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	499		

SEC AH
TEST F14 : 10/03/92 : 2127-2322 : 38 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	386	AIR WT LVG -	923	348	MOIST -	5.1
GAS TEMP ENT -	676	545	GAS TEMP LVG -	315	244	EXCL. LKG	
AH LKG, %		13.25	GAS TEMP LVG -		231	INCL. LKG	
			AVE COLD END -	220	185		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	473		

SEC AH
TEST F14 : 10/03/92 : 2127-2322 : 38 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	385	AIR WT LVG -	923	347	MOIST -	5.1
GAS TEMP ENT -	676	545	GAS TEMP LVG -	315	244	EXCL. LKG	
AH LKG, %		13.25	GAS TEMP LVG -		231	INCL. LKG	
			AVE COLD END -	220	185		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	473		

SEC AH
TEST F15 : 10/04/92 : 0056-0254 : 59 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	543	AIR WT LVG -	923	490	MOIST -	5.1
GAS TEMP ENT -	676	588	GAS TEMP LVG -	315	266	EXCL. LKG	
AH LKG, %		10.18	GAS TEMP LVG -		254	INCL. LKG	
			AVE COLD END -	220	196		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	501		

SEC AH
TEST F15 : 10/04/92 : 0056-0254 : 59 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	551	AIR WT LVG -	923	498	MOIST -	5.1
GAS TEMP ENT -	676	588	GAS TEMP LVG -	315	267	EXCL. LKG	
AH LKG, %		10.18	GAS TEMP LVG -		254	INCL. LKG	
			AVE COLD END -	220	196		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	500		

SEC AH
TEST F16 : 10/04/92 : 2025-2220 : 38 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	385	AIR WT LVG -	923	348	MOIST -	5.1
GAS TEMP ENT -	676	522	GAS TEMP LVG -	315	238	EXCL. LKG	
AH LKG, %		13.84	GAS TEMP LVG -		225	INCL. LKG	
			AVE COLD END -	220	182		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	453		

SEC AH
TEST F17 : 10/05/92 : 0004-0200 : 59 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	545	AIR WT LVG -	923	492	MOIST -	5.1
GAS TEMP ENT -	676	603	GAS TEMP LVG -	315	271	EXCL. LKG	
AH LKG, %		11.13	GAS TEMP LVG -		257	INCL. LKG	
			AVE COLD END -	220	198		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	512		

SEC AH
TEST F17 : 10/05/92 : 0004-0200 : 59 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	548	AIR WT LVG -	923	495	MOIST -	5.1
GAS TEMP ENT -	676	603	GAS TEMP LVG -	315	271	EXCL. LKG	
AH LKG, %		11.13	GAS TEMP LVG -		257	INCL. LKG	
			AVE COLD END -	220	198		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	512		

SEC AH
TEST F18 : 10/05/92 : 0243-0427 : 59 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	549	AIR WT LVG -	923	496	MOIST -	5.1
GAS TEMP ENT -	676	612	GAS TEMP LVG -	315	274	EXCL. LKG	
AH LKG, %		9.81	GAS TEMP LVG -		261	INCL. LKG	
			AVE COLD END -	220	200		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	520		

SEC AH
TEST F18 : 10/05/92 : 0243-0427 : 59 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	548	AIR WT LVG -	923	495	MOIST -	5.1
GAS TEMP ENT -	676	612	GAS TEMP LVG -	315	274	EXCL. LKG	
AH LKG, %		9.81	GAS TEMP LVG -		261	INCL. LKG	
			AVE COLD END -	220	200		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	520		

SEC AH
TEST F19 : 10/05/92 : 2205-0000 : 110 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	999	AIR WT LVG -	923	902	MOIST -	5.1
GAS TEMP ENT -	676	703	GAS TEMP LVG -	315	324	EXCL. LKG	
AH LKG, %		7.03	GAS TEMP LVG -		311	INCL. LKG	
			AVE COLD END -	220	225		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	574		

SEC AH
TEST F19 : 10/05/92 : 2205-0000 : 110 MW

JDR-102792

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1004	AIR WT LVG -	923	907	MOIST -	5.1
GAS TEMP ENT -	676	703	GAS TEMP LVG -	315	324	EXCL. LKG	
AH LKG, %		7.03	GAS TEMP LVG -		311	INCL. LKG	
			AVE COLD END -	220	225		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	574		

SEC AH
TEST W1 : 11/16/92 : 0900-1127 : 109 MW

JDR-121692

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1010	AIR WT LVG -	923	912	MOIST -	5.0
GAS TEMP ENT -	676	709	GAS TEMP LVG -	315	326	EXCL. LKG	
AH LKG, %		7.92	GAS TEMP LVG -		312	INCL. LKG	
			AVE COLD END -	220	226		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	578		

SEC AH
TEST W1 : 11/16/92 : 0900-1127 : 109 MW

JDR-121692

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1012	AIR WT LVG -	923	914	MOIST -	5.0
GAS TEMP ENT -	676	709	GAS TEMP LVG -	315	326	EXCL. LKG	
AH LKG, %		7.92	GAS TEMP LVG -		312	INCL. LKG	
			AVE COLD END -	220	226		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	578		

SEC AH
TEST W2 : 11/16/92 : 1403-1559 : 78 MW

JDR-121692

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	703	AIR WT LVG -	923	635	MOIST -	5.0
GAS TEMP ENT -	676	622	GAS TEMP LVG -	315	284	EXCL. LKG	
AH LKG, %		7.46	GAS TEMP LVG -		274	INCL. LKG	
			AVE COLD END -	220	205		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	521		

SEC AH
TEST W2 : 11/16/92 : 1403-1559 : 78 MW

JDR-121692

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	700	AIR WT LVG -	923	632	MOIST -	5.0
GAS TEMP ENT -	676	622	GAS TEMP LVG -	315	284	EXCL. LKG	
AH LKG, %		7.46	GAS TEMP LVG -		274	INCL. LKG	
			AVE COLD END -	220	205		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	521		

SEC AH
TEST W3 : 11/17/92 : 1136-1329 : 110 MW

JDR-121692

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1036	AIR WT LVG -	923	936	MOIST -	5.1
GAS TEMP ENT -	676	739	GAS TEMP LVG -	315	338	EXCL. LKG	
AH LKG, %		5.07	GAS TEMP LVG -		328	INCL. LKG	
			AVE COLD END -	220	232		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	602		

SEC AH
TEST W3 : 11/17/92 : 1136-1329 : 110 MW

JDR-121692

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1042	AIR WT LVG -	923	941	MOIST -	5.1
GAS TEMP ENT -	676	739	GAS TEMP LVG -	315	338	EXCL. LKG	
AH LKG, %		5.07	GAS TEMP LVG -		328	INCL. LKG	
			AVE COLD END -	220	232		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	602		

SEC AH
TEST W4 : 11/19/92 : 0823-1017 : 110 MW

JDR-121692

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1005	AIR WT LVG -	923	908	MOIST -	5.1
GAS TEMP ENT -	676	699	GAS TEMP LVG -	315	322	EXCL. LKG	
AH LKG, %		8.28	GAS TEMP LVG -		308	INCL. LKG	
			AVE COLD END -	220	224		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	571		

SEC AH
TEST W4 : 11/19/92 : 0823-1017 : 110 MW

JDR-121692

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1012	AIR WT LVG -	923	914	MOIST -	5.1
GAS TEMP ENT -	676	699	GAS TEMP LVG -	315	323	EXCL. LKG	
AH LKG, %		8.28	GAS TEMP LVG -		308	INCL. LKG	
			AVE COLD END -	220	224		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	570		

SEC AH
TEST W5 : 11/19/92 : 1223-1407 : 110 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1032	AIR WT LVG -	923	932	MOIST -	5.1
GAS TEMP ENT -	676	716	GAS TEMP LVG -	315	330	EXCL. LKG	
AH LKG, %		7.27	GAS TEMP LVG -		316	INCL. LKG	
			AVE COLD END -	220	228		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	583		

SEC AH
TEST W5 : 11/19/92 : 1223-1407 : 110 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1036	AIR WT LVG -	923	936	MOIST -	5.1
GAS TEMP ENT -	676	716	GAS TEMP LVG -	315	330	EXCL. LKG	
AH LKG, %		7.27	GAS TEMP LVG -		316	INCL. LKG	
			AVE COLD END -	220	228		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	583		

SEC AH
TEST W6 : 11/19/92 : 1541-1725 : 83 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	737	AIR WT LVG -	923	666	MOIST -	5.1
GAS TEMP ENT -	676	658	GAS TEMP LVG -	315	298	EXCL. LKG	
AH LKG, %		5.97	GAS TEMP LVG -		288	INCL. LKG	
			AVE COLD END -	220	212		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	549		

SEC AH
TEST W6 : 11/19/92 : 1541-1725 : 83 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	738	AIR WT LVG -	923	667	MOIST -	5.1
GAS TEMP ENT -	676	658	GAS TEMP LVG -	315	298	EXCL. LKG	
AH LKG, %		5.97	GAS TEMP LVG -		288	INCL. LKG	
			AVE COLD END -	220	212		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	549		

SEC AH
TEST W7 : 11/20/92 : 1354-1558 : 61 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	548	AIR WT LVG -	923	495	MOIST -	5.1
GAS TEMP ENT -	676	608	GAS TEMP LVG -	315	273	EXCL. LKG	
AH LKG, %		9.69	GAS TEMP LVG -		260	INCL. LKG	
			AVE COLD END -	220	199		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	517		

SEC AH
TEST W8 : 11/20/92 : 1753-1904 : 81 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	722	AIR WT LVG -	923	652	MOIST -	5.1
GAS TEMP ENT -	676	647	GAS TEMP LVG -	315	293	EXCL. LKG	
AH LKG, %		7.54	GAS TEMP LVG -		282	INCL. LKG	
			AVE COLD END -	220	209		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	540		

SEC AH
TEST W9 : 11/20/92 : 2022-2107 : 42 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	406	AIR WT LVG -	923	367	MOIST -	5.0
GAS TEMP ENT -	676	586	GAS TEMP LVG -	315	258	EXCL. LKG	
AH LKG, %		12.98	GAS TEMP LVG -		243	INCL. LKG	
			AVE COLD END -	220	192		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	507		

SEC AH
TEST W9 : 11/20/92 : 2022-2107 : 42 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	405	AIR WT LVG -	923	366	MOIST -	5.0
GAS TEMP ENT -	676	586	GAS TEMP LVG -	315	258	EXCL. LKG	
AH LKG, %		12.98	GAS TEMP LVG -		243	INCL. LKG	
			AVE COLD END -	220	192		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	507		

SEC AH
TEST W10 : 11/30/92 : 1403-1515 : 83 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	736	AIR WT LVG -	923	665	MOIST -	5.1
GAS TEMP ENT -	676	661	GAS TEMP LVG -	315	298	EXCL. LKG	
AH LKG, %		6.69	GAS TEMP LVG -		288	INCL. LKG	
			AVE COLD END -	220	212		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	551		

SEC AH
TEST W10 : 11/30/92 : 1403-1515 : 83 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	738	AIR WT LVG -	923	667	MOIST -	5.1
GAS TEMP ENT -	676	661	GAS TEMP LVG -	315	298	EXCL. LKG	
AH LKG, %		6.69	GAS TEMP LVG -		288	INCL. LKG	
			AVE COLD END -	220	212		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	551		

SEC AH
TEST W11 : 11/30/92 : 1627-1729 : 83 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	744	AIR WT LVG -	923	672	MOIST -	5.1
GAS TEMP ENT -	676	663	GAS TEMP LVG -	315	299	EXCL. LKG	
AH LKG, %		7.21	GAS TEMP LVG -		288	INCL. LKG	
			AVE COLD END -	220	213		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	552		

SEC AH
TEST W12 : 12/01/92 : 0839-1004 : 109 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1014	AIR WT LVG -	923	916	MOIST -	5.1
GAS TEMP ENT -	676	728	GAS TEMP LVG -	315	333	EXCL. LKG	
AH LKG, %		7.79	GAS TEMP LVG -		318	INCL. LKG	
			AVE COLD END -	220	229		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	593		

SEC AH
TEST W12 : 12/01/92 : 0839-1004 : 109 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1020	AIR WT LVG -	923	921	MOIST -	5.1
GAS TEMP ENT -	676	728	GAS TEMP LVG -	315	333	EXCL. LKG	
AH LKG, %		7.79	GAS TEMP LVG -		319	INCL. LKG	
			AVE COLD END -	220	229		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	593		

SEC AH
TEST W13 : 12/01/92 : 1129-1230 : 110 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1027	AIR WT LVG -	923	928	MOIST -	5.0
GAS TEMP ENT -	676	757	GAS TEMP LVG -	315	343	EXCL. LKG	
AH LKG, %		4.87	GAS TEMP LVG -		334	INCL. LKG	
			AVE COLD END -	220	235		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	616		

SEC AH
TEST W13 : 12/01/92 : 1129-1230 : 110 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1035	AIR WT LVG -	923	935	MOIST -	5.0
GAS TEMP ENT -	676	757	GAS TEMP LVG -	315	344	EXCL. LKG	
AH LKG, %		4.87	GAS TEMP LVG -		334	INCL. LKG	
			AVE COLD END -	220	235		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	616		

SEC AH
TEST W14 : 12/01/92 : 1449-1602 : 56 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	517	AIR WT LVG -	923	467	MOIST -	5.1
GAS TEMP ENT -	676	609	GAS TEMP LVG -	315	271	EXCL. LKG	
AH LKG, %		9.01	GAS TEMP LVG -		260	INCL. LKG	
			AVE COLD END -	220	198		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	519		

SEC AH
TEST W14 : 12/01/92 : 1449-1602 : 56 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	516	AIR WT LVG -	923	466	MOIST -	5.1
GAS TEMP ENT -	676	609	GAS TEMP LVG -	315	271	EXCL. LKG	
AH LKG, %		9.01	GAS TEMP LVG -		259	INCL. LKG	
			AVE COLD END -	220	198		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	519		

SEC AH
TEST W15 : 12/02/92 : 0821-0831 : 108 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1006	AIR WT LVG -	923	909	MOIST -	5.1
GAS TEMP ENT -	676	697	GAS TEMP LVG -	315	322	EXCL. LKG	
AH LKG, %		8.28	GAS TEMP LVG -		307	INCL. LKG	
			AVE COLD END -	220	224		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	569		

SEC AH
TEST W15 : 12/02/92 : 0821-0831 : 108 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1010	AIR WT LVG -	923	912	MOIST -	5.1
GAS TEMP ENT -	676	697	GAS TEMP LVG -	315	322	EXCL. LKG	
AH LKG, %		8.28	GAS TEMP LVG -		307	INCL. LKG	
			AVE COLD END -	220	224		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	569		

SEC AH
TEST W16 : 12/02/92 : 1059-1223 : 109 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1024	AIR WT LVG -	923	924	MOIST -	5.1
GAS TEMP ENT -	676	741	GAS TEMP LVG -	315	338	EXCL. LKG	
AH LKG, %		4.98	GAS TEMP LVG -		328	INCL. LKG	
			AVE COLD END -	220	232		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	604		

SEC AH
TEST W16 : 12/02/92 : 1059-1223 : 109 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1033	AIR WT LVG -	923	933	MOIST -	5.1
GAS TEMP ENT -	676	741	GAS TEMP LVG -	315	338	EXCL. LKG	
AH LKG, %		4.98	GAS TEMP LVG -		329	INCL. LKG	
			AVE COLD END -	220	232		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	603		

SEC AH
TEST W17 : 12/02/92 : 1357-1521 : 109 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1021	AIR WT LVG -	923	922	MOIST -	5.1
GAS TEMP ENT -	676	738	GAS TEMP LVG -	315	337	EXCL. LKG	
AH LKG, %		4.39	GAS TEMP LVG -		328	INCL. LKG	
			AVE COLD END -	220	231		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	602		

SEC AH
TEST W17 : 12/02/92 : 1357-1521 : 109 MW

JDR-122192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1030	AIR WT LVG -	923	931	MOIST -	5.1
GAS TEMP ENT -	676	738	GAS TEMP LVG -	315	337	EXCL. LKG	
AH LKG, %		4.39	GAS TEMP LVG -		329	INCL. LKG	
			AVE COLD END -	220	231		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	601		

SEC AH
TEST W18 : 12/03/92 : 0926-1008 : 110 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1023	AIR WT LVG -	923	923	MOIST -	5.1
GAS TEMP ENT -	676	697	GAS TEMP LVG -	315	322	EXCL. LKG	
AH LKG, %		5.03	GAS TEMP LVG -		313	INCL. LKG	
			AVE COLD END -	220	224		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	568		

SEC AH
TEST W18 : 12/03/92 : 0926-1008 : 110 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1026	AIR WT LVG -	923	927	MOIST -	5.1
GAS TEMP ENT -	676	697	GAS TEMP LVG -	315	323	EXCL. LKG	
AH LKG, %		5.03	GAS TEMP LVG -		314	INCL. LKG	
			AVE COLD END -	220	224		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	568		

SEC AH
TEST W19 : 12/03/92 : 1212-1314 : 111 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1032	AIR WT LVG -	923	932	MOIST -	5.1
GAS TEMP ENT -	676	704	GAS TEMP LVG -	315	325	EXCL. LKG	
AH LKG, %		7.59	GAS TEMP LVG -		312	INCL. LKG	
			AVE COLD END -	220	225		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	573		

SEC AH
TEST W19 : 12/03/92 : 1212-1314 : 111 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1036	AIR WT LVG -	923	936	MOIST -	5.1
GAS TEMP ENT -	676	704	GAS TEMP LVG -	315	325	EXCL. LKG	
AH LKG, %		7.59	GAS TEMP LVG -		312	INCL. LKG	
			AVE COLD END -	220	225		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	573		

SEC AH
TEST W20 : 12/03/92 : 1642-1736 : 110 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1039	AIR WT LVG -	923	938	MOIST -	5.1
GAS TEMP ENT -	676	701	GAS TEMP LVG -	315	324	EXCL. LKG	
AH LKG, %		4.16	GAS TEMP LVG -		317	INCL. LKG	
			AVE COLD END -	220	225		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	571		

SEC AH
TEST W20 : 12/03/92 : 1642-1736 : 110 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1043	AIR WT LVG -	923	942	MOIST -	5.1
GAS TEMP ENT -	676	701	GAS TEMP LVG -	315	324	EXCL. LKG	
AH LKG, %		4.16	GAS TEMP LVG -		317	INCL. LKG	
			AVE COLD END -	220	225		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	571		

SEC AH
TEST W21 : 12/03/92 : 1859-1953 : 110 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1032	AIR WT LVG -	923	932	MOIST -	5.1
GAS TEMP ENT -	676	714	GAS TEMP LVG -	315	329	EXCL. LKG	
AH LKG, %		6.34	GAS TEMP LVG -		317	INCL. LKG	
			AVE COLD END -	220	227		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	582		

SEC AH
TEST W21 : 12/03/92 : 1859-1953 : 110 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1037	AIR WT LVG -	923	937	MOIST -	5.1
GAS TEMP ENT -	676	714	GAS TEMP LVG -	315	329	EXCL. LKG	
AH LKG, %		6.34	GAS TEMP LVG -		317	INCL. LKG	
			AVE COLD END -	220	227		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	582		

SEC AH
TEST W22 : 12/04/92 : 0934-0944 : 109 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1021	AIR WT LVG -	923	922	MOIST -	5.1
GAS TEMP ENT -	676	673	GAS TEMP LVG -	315	314	EXCL. LKG	
AH LKG, %		7.62	GAS TEMP LVG -		301	INCL. LKG	
			AVE COLD END -	220	220		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	549		

SEC AH
TEST W22 : 12/04/92 : 0934-0944 : 109 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1022	AIR WT LVG -	923	923	MOIST -	5.1
GAS TEMP ENT -	676	673	GAS TEMP LVG -	315	314	EXCL. LKG	
AH LKG, %		7.62	GAS TEMP LVG -		301	INCL. LKG	
			AVE COLD END -	220	220		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	549		

SEC AH
TEST W23 : 12/04/92 : 1120-1244 : 118 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1106	AIR WT LVG -	923	999	MOIST -	5.1
GAS TEMP ENT -	676	715	GAS TEMP LVG -	315	332	EXCL. LKG	
AH LKG, %		4.18	GAS TEMP LVG -		324	INCL. LKG	
			AVE COLD END -	220	229		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	579		

SEC AH
TEST W23 : 12/04/92 : 1120-1244 : 118 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1118	AIR WT LVG -	923	1010	MOIST -	5.1
GAS TEMP ENT -	676	715	GAS TEMP LVG -	315	332	EXCL. LKG	
AH LKG, %		4.18	GAS TEMP LVG -		324	INCL. LKG	
			AVE COLD END -	220	229		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	579		

SEC AH
TEST W24 : 12/04/92 : 1441-1502 : 59 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	536	AIR WT LVG -	923	484	MOIST -	5.1
GAS TEMP ENT -	676	632	GAS TEMP LVG -	315	279	EXCL. LKG	
AH LKG, %		10.78	GAS TEMP LVG -		265	INCL. LKG	
			AVE COLD END -	220	202		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	537		

SEC AH
TEST W24 : 12/04/92 : 1441-1502 : 59 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	540	AIR WT LVG -	923	488	MOIST -	5.1
GAS TEMP ENT -	676	632	GAS TEMP LVG -	315	279	EXCL. LKG	
AH LKG, %		10.78	GAS TEMP LVG -		265	INCL. LKG	
			AVE COLD END -	220	202		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	537		

SEC AH
TEST W25 : 12/05/92 : 1157-1300 : 61 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	561	AIR WT LVG -	923	507	MOIST -	5.1
GAS TEMP ENT -	676	625	GAS TEMP LVG -	315	278	EXCL. LKG	
AH LKG, %		9.28	GAS TEMP LVG -		266	INCL. LKG	
			AVE COLD END -	220	202		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	530		

SEC AH
TEST W25 : 12/05/92 : 1157-1300 : 61 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	561	AIR WT LVG -	923	506	MOIST -	5.1
GAS TEMP ENT -	676	625	GAS TEMP LVG -	315	278	EXCL. LKG	
AH LKG, %		9.28	GAS TEMP LVG -		266	INCL. LKG	
			AVE COLD END -	220	202		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	530		

SEC AH
TEST W26 : 12/07/92 : 0839-0850 : 110 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	988	AIR WT LVG -	923	892	MOIST -	5.1
GAS TEMP ENT -	676	712	GAS TEMP LVG -	315	326	EXCL. LKG	
AH LKG, %		7.75	GAS TEMP LVG -		312	INCL. LKG	
			AVE COLD END -	220	226		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	582		

SEC AH
TEST W26 : 12/07/92 : 0839-0850 : 110 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	993	AIR WT LVG -	923	897	MOIST -	5.1
GAS TEMP ENT -	676	712	GAS TEMP LVG -	315	326	EXCL. LKG	
AH LKG, %		7.75	GAS TEMP LVG -		313	INCL. LKG	
			AVE COLD END -	220	226		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	581		

SEC AH
TEST W27 : 12/07/92 : 0954-1015 : 110 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	998	AIR WT LVG -	923	901	MOIST -	5.1
GAS TEMP ENT -	676	706	GAS TEMP LVG -	315	325	EXCL. LKG	
AH LKG, %		5.73	GAS TEMP LVG -		314	INCL. LKG	
			AVE COLD END -	220	225		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	577		

SEC AH
TEST W27 : 12/07/92 : 0954-1015 : 110 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1002	AIR WT LVG -	923	905	MOIST -	5.1
GAS TEMP ENT -	676	706	GAS TEMP LVG -	315	325	EXCL. LKG	
AH LKG, %		5.73	GAS TEMP LVG -		314	INCL. LKG	
			AVE COLD END -	220	225		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	577		

SEC AH
TEST W28 : 12/07/92 : 1140-1201 : 110 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	995	AIR WT LVG -	923	899	MOIST -	5.1
GAS TEMP ENT -	676	746	GAS TEMP LVG -	315	339	EXCL. LKG	
AH LKG, %		4.91	GAS TEMP LVG -		329	INCL. LKG	
			AVE COLD END -	220	232		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	609		

SEC AH
TEST W28 : 12/07/92 : 1140-1201 : 110 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1003	AIR WT LVG -	923	906	MOIST -	5.1
GAS TEMP ENT -	676	746	GAS TEMP LVG -	315	339	EXCL. LKG	
AH LKG, %		4.91	GAS TEMP LVG -		329	INCL. LKG	
			AVE COLD END -	220	232		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	609		

SEC AH
TEST W29 : 12/07/92 : 1337-1501 : 60 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	548	AIR WT LVG -	923	495	MOIST -	5.1
GAS TEMP ENT -	676	632	GAS TEMP LVG -	315	280	EXCL. LKG	
AH LKG, %		10.30	GAS TEMP LVG -		266	INCL. LKG	
			AVE COLD END -	220	203		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	537		

SEC AH
TEST W29 : 12/07/92 : 1337-1501 : 60 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	549	AIR WT LVG -	923	496	MOIST -	5.1
GAS TEMP ENT -	676	632	GAS TEMP LVG -	315	280	EXCL. LKG	
AH LKG, %		10.30	GAS TEMP LVG -		266	INCL. LKG	
			AVE COLD END -	220	203		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	537		

SEC AH
TEST W30 : 12/07/92 : 1533-1625 : 60 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	553	AIR WT LVG -	923	500	MOIST -	5.1
GAS TEMP ENT -	676	639	GAS TEMP LVG -	315	282	EXCL. LKG	
AH LKG, %		10.05	GAS TEMP LVG -		268	INCL. LKG	
			AVE COLD END -	220	204		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	542		

SEC AH
TEST W30 : 12/07/92 : 1533-1625 : 60 MW

JDR-011193

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	552	AIR WT LVG -	923	499	MOIST -	5.1
GAS TEMP ENT -	676	639	GAS TEMP LVG -	315	282	EXCL. LKG	
AH LKG, %		10.05	GAS TEMP LVG -		268	INCL. LKG	
			AVE COLD END -	220	204		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	542		

SEC AH
TEST 4 : 04/03/92 : 0902-1131 : 110 MW : NO REBURN : B&W TRAVERSE
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1004	AIR WT LVG -	923	906	MOIST -	5.1
GAS TEMP ENT -	676	745	GAS TEMP LVG -	315	338	EXCL. LKG	
AH LKG, %		6.64	GAS TEMP LVG -		326	INCL. LKG	
			AVE COLD END -	220	232		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	608		

SEC AH
TEST 4 : 04/03/92 : 0902-1131 : 110 MW : NO REBURN : B&W TRAVERSE
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1010	AIR WT LVG -	923	913	MOIST -	5.1
GAS TEMP ENT -	676	745	GAS TEMP LVG -	315	339	EXCL. LKG	
AH LKG, %		6.64	GAS TEMP LVG -		326	INCL. LKG	
			AVE COLD END -	220	232		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	608		

SEC AH
TEST 4A : 04/03/92 : 1205-1401 : 111 MW : NO REBURN :ACCUREX TRAV
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1021	AIR WT LVG -	923	922	MOIST -	5.0
GAS TEMP ENT -	676	782	GAS TEMP LVG -	315	352	EXCL. LKG	
AH LKG, %		6.89	GAS TEMP LVG -		338	INCL. LKG	
			AVE COLD END -	220	239		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	637		

SEC AH
TEST 4A : 04/03/92 : 1205-1401 : 111 MW : NO REBURN :ACCUREX TRAV
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1031	AIR WT LVG -	923	931	MOIST -	5.0
GAS TEMP ENT -	676	782	GAS TEMP LVG -	315	353	EXCL. LKG	
AH LKG, %		6.89	GAS TEMP LVG -		339	INCL. LKG	
			AVE COLD END -	220	239		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	637		

SEC AH
TEST 4AA : 04/29/92 : 0928-0945 : 110 MW : REPEAT OF TEST 4A
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1024	AIR WT LVG -	923	925	MOIST -	5.0
GAS TEMP ENT -	676	665	GAS TEMP LVG -	315	311	EXCL. LKG	
AH LKG, %		7.36	GAS TEMP LVG -		299	INCL. LKG	
			AVE COLD END -	220	219		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	543		

SEC AH
TEST 4AA : 04/29/92 : 0928-0945 : 110 MW : REPEAT OF TEST 4A
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1022	AIR WT LVG -	923	923	MOIST -	5.0
GAS TEMP ENT -	676	665	GAS TEMP LVG -	315	311	EXCL. LKG	
AH LKG, %		7.36	GAS TEMP LVG -		299	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	543		

SEC AH
TEST 26T : 02/21/91 : 1057-1303 : 110 MW : 12.2 TPH REBURN
JDR-071092

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	989	AIR WT LVG -	923	893	MOIST -	5.1
GAS TEMP ENT -	676	619	GAS TEMP LVG -	315	294	EXCL. LKG	
AH LKG, %		7.77	GAS TEMP LVG -		282	INCL. LKG	
			AVE COLD END -	220	210		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	507		

SEC AH
TEST 26T : 02/21/91 : 1057-1303 : 110 MW : 12.2 TPH REBURN
JDR-071092

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	994	AIR WT LVG -	923	898	MOIST -	5.1
GAS TEMP ENT -	676	619	GAS TEMP LVG -	315	294	EXCL. LKG	
AH LKG, %		7.77	GAS TEMP LVG -		283	INCL. LKG	
			AVE COLD END -	220	210		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	507		

SEC AH
TEST 27T : 02/21/91 : 1407-1706 : 110 MW : 12.2 TPH : LOWER STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	983	AIR WT LVG -	923	887	MOIST -	5.1
GAS TEMP ENT -	676	643	GAS TEMP LVG -	315	302	EXCL. LKG	
AH LKG, %		5.65	GAS TEMP LVG -		293	INCL. LKG	
			AVE COLD END -	220	214		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	527		

SEC AH
TEST 27T : 02/21/91 : 1407-1706 : 110 MW : 12.2 TPH : LOWER STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	991	AIR WT LVG -	923	895	MOIST -	5.1
GAS TEMP ENT -	676	643	GAS TEMP LVG -	315	303	EXCL. LKG	
AH LKG, %		5.65	GAS TEMP LVG -		294	INCL. LKG	
			AVE COLD END -	220	214		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	527		

SEC AH
TEST 20B : 05/01/92 : 1005-1217 : 110 MW : 13 TPH : HIGH STOIC
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	994	AIR WT LVG -	923	898	MOIST -	5.1
GAS TEMP ENT -	676	655	GAS TEMP LVG -	315	307	EXCL. LKG	
AH LKG, %		3.06	GAS TEMP LVG -		302	INCL. LKG	
			AVE COLD END -	220	216		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	536		

SEC AH
TEST 20B : 05/01/92 : 1005-1217 : 110 MW : 13 TPH : HIGH STOIC
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	999	AIR WT LVG -	923	902	MOIST -	5.1
GAS TEMP ENT -	676	655	GAS TEMP LVG -	315	307	EXCL. LKG	
AH LKG, %		3.06	GAS TEMP LVG -		302	INCL. LKG	
			AVE COLD END -	220	216		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	536		

SEC AH
TEST 2 : 04/01/92 : 0741-0752 : 109 MW : PRE-REBURN BASE
JDR060192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1011	AIR WT LVG -	923	913	MOIST -	5.1
GAS TEMP ENT -	676	722	GAS TEMP LVG -	315	331	EXCL. LKG	
AH LKG, %		5.96	GAS TEMP LVG -		320	INCL. LKG	
			AVE COLD END -	220	228		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	589		

SEC AH
TEST 2 : 04/01/92 : 0741-0752 : 109 MW : PRE-REBURN BASE
JDR060192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1015	AIR WT LVG -	923	917	MOIST -	5.1
GAS TEMP ENT -	676	722	GAS TEMP LVG -	315	331	EXCL. LKG	
AH LKG, %		5.96	GAS TEMP LVG -		320	INCL. LKG	
			AVE COLD END -	220	228		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	589		

SEC AH
TEST 2A : 04/01/92 : 1912-2117 : 110 MW : 13 TPH:140 RPM: HIGH STOICH
JDR060192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	997	AIR WT LVG -	923	900	MOIST -	5.1
GAS TEMP ENT -	676	758	GAS TEMP LVG -	315	343	EXCL. LKG	
AH LKG, %		6.14	GAS TEMP LVG -		331	INCL. LKG	
			AVE COLD END -	220	234		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	619		

SEC AH
TEST 2A : 04/01/92 : 1912-2117 : 110 MW : 13 TPH:140 RPM: HIGH STOICH
JDR060192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1009	AIR WT LVG -	923	912	MOIST -	5.1
GAS TEMP ENT -	676	758	GAS TEMP LVG -	315	343	EXCL. LKG	
AH LKG, %		6.14	GAS TEMP LVG -		331	INCL. LKG	
			AVE COLD END -	220	234		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	618		

SEC AH
TEST 2AA : 04/29/92 : 1040-1123 : 110 MW : REPEAT OF TEST 2A
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	990	AIR WT LVG -	923	894	MOIST -	5.1
GAS TEMP ENT -	676	663	GAS TEMP LVG -	315	309	EXCL. LKG	
AH LKG, %		3.97	GAS TEMP LVG -		303	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	542		

SEC AH
TEST 2AA : 04/29/92 : 1040-1123 : 110 MW : REPEAT OF TEST 2A
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	996	AIR WT LVG -	923	899	MOIST -	5.1
GAS TEMP ENT -	676	663	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		3.97	GAS TEMP LVG -		303	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	542		

SEC AH
TEST 3 : 04/02/92 : 0735-0837 : 110 MW : PRE-REBURN BASE

JDR071092

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1033	AIR WT LVG -	923	933	MOIST -	5.1
GAS TEMP ENT -	676	679	GAS TEMP LVG -	315	316	EXCL. LKG	
AH LKG, %		5.83	GAS TEMP LVG -		306	INCL. LKG	
			AVE COLD END -	220	221		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	553		

SEC AH
TEST 3A : 04/02/92 : 1158-1400 : 110 MW :13 TPH: 140RPM: MED STOIC
JDR060192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	991	AIR WT LVG -	923	895	MOIST -	5.1
GAS TEMP ENT -	676	717	GAS TEMP LVG -	315	328	EXCL. LKG	
AH LKG, %		6.11	GAS TEMP LVG -		317	INCL. LKG	
			AVE COLD END -	220	227		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	586		

SEC AH
TEST 3A : 04/02/92 : 1158-1400 : 110 MW :13 TPH: 140RPM: MED STOIC
JDR060192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	998	AIR WT LVG -	923	901	MOIST -	5.1
GAS TEMP ENT -	676	717	GAS TEMP LVG -	315	329	EXCL. LKG	
AH LKG, %		6.11	GAS TEMP LVG -		317	INCL. LKG	
			AVE COLD END -	220	227		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	586		

SEC AH
TEST 3AA : 04/29/92 : 1133-1204 : 110 MW : REPEAT OF TEST 3A
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	998	AIR WT LVG -	923	901	MOIST -	5.1
GAS TEMP ENT -	676	657	GAS TEMP LVG -	315	308	EXCL. LKG	
AH LKG, %		4.21	GAS TEMP LVG -		300	INCL. LKG	
			AVE COLD END -	220	217		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	537		

SEC AH
TEST 3AA : 04/29/92 : 1133-1204 : 110 MW : REPEAT OF TEST 3A
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1003	AIR WT LVG -	923	906	MOIST -	5.1
GAS TEMP ENT -	676	657	GAS TEMP LVG -	315	308	EXCL. LKG	
AH LKG, %		4.21	GAS TEMP LVG -		301	INCL. LKG	
			AVE COLD END -	220	217		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	537		

SEC AH
TEST 3B : 04/02/92 : 1503-1659 : 110 MW : 13 TPH : MED STOIC:HIGH OFA
JDR060192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	996	AIR WT LVG -	923	900	MOIST -	5.1
GAS TEMP ENT -	676	738	GAS TEMP LVG -	315	336	EXCL. LKG	
AH LKG, %		6.56	GAS TEMP LVG -		323	INCL. LKG	
			AVE COLD END -	220	231		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	602		

SEC AH
TEST 3B : 04/02/92 : 1503-1659 : 110 MW : 13 TPH : MED STOIC:HIGH OFA
JDR060192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1002	AIR WT LVG -	923	905	MOIST -	5.1
GAS TEMP ENT -	676	738	GAS TEMP LVG -	315	336	EXCL. LKG	
AH LKG, %		6.56	GAS TEMP LVG -		323	INCL. LKG	
			AVE COLD END -	220	231		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	602		

SEC AH
TEST 6 : 04/07/92 : 0825-0835 : 110 MW : PRE-REBURN BASE
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1029	AIR WT LVG -	923	929	MOIST -	5.0
GAS TEMP ENT -	676	705	GAS TEMP LVG -	315	325	EXCL. LKG	
AH LKG, %		7.40	GAS TEMP LVG -		312	INCL. LKG	
			AVE COLD END -	220	226		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	574		

SEC AH
TEST 6 : 04/07/92 : 0825-0835 : 110 MW : PRE-REBURN BASE
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1031	AIR WT LVG -	923	931	MOIST -	5.0
GAS TEMP ENT -	676	705	GAS TEMP LVG -	315	325	EXCL. LKG	
AH LKG, %		7.40	GAS TEMP LVG -		312	INCL. LKG	
			AVE COLD END -	220	226		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	574		

SEC AH
TEST 6A : 04/07/92 : 1057-1302 : 110 MW : 13 TPH: 140 RPM: LOW STOIC
JDR-060392

	BASE	NEW		BASE	NEW		
G.'S WT ENT -	1022	997	AIR WT LVG -	923	900	MOIST -	5.1
GAS TEMP ENT -	676	710	GAS TEMP LVG -	315	326	EXCL. LKG	
AH LKG, %		6.95	GAS TEMP LVG -		314	INCL. LKG	
			AVE COLD END -	220	226		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	580		

SEC AH
TEST 6A : 04/07/92 : 1057-1302 : 110 MW : 13 TPH: 140 RPM: LOW STOIC
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1007	AIR WT LVG -	923	909	MOIST -	5.1
GAS TEMP ENT -	676	710	GAS TEMP LVG -	315	327	EXCL. LKG	
AH LKG, %		6.95	GAS TEMP LVG -		314	INCL. LKG	
			AVE COLD END -	220	226		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	580		

SEC AH
TEST 8 : 04/09/92 : 0804-0814 : 110 MW : PRE-REBURN BASE
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1017	AIR WT LVG -	923	919	MOIST -	5.0
GAS TEMP ENT -	676	671	GAS TEMP LVG -	315	313	EXCL. LKG	
AH LKG, %		8.05	GAS TEMP LVG -		300	INCL. LKG	
			AVE COLD END -	220	219		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	547		

SEC AH
TEST 8 : 04/09/92 : 0804-0814 : 110 MW : PRE-REBURN BASE
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1016	AIR WT LVG -	923	918	MOIST -	5.0
GAS TEMP ENT -	676	671	GAS TEMP LVG -	315	313	EXCL. LKG	
AH LKG, %		8.05	GAS TEMP LVG -		300	INCL. LKG	
			AVE COLD END -	220	219		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	547		

SEC AH
TEST 8A : 04/09/92 : 1100-1247 : 110 MW : 13 TPH: 160 RPM: MED STOIC
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1005	AIR WT LVG -	923	908	MOIST -	5.1
GAS TEMP ENT -	676	664	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		5.92	GAS TEMP LVG -		300	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	542		

SEC AH
TEST 8A : 04/09/92 : 1100-1247 : 110 MW : 13 TPH: 160 RPM: MED STOIC
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1009	AIR WT LVG -	923	911	MOIST -	5.1
GAS TEMP ENT -	676	664	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		5.92	GAS TEMP LVG -		300	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	542		

SEC AH
TEST 7 : 04/08/92 : 0820-0830 : 109 MW : PRE-REBURN BASE

JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1024	AIR WT LVG -	923	925	MOIST -	5.0
GAS TEMP ENT -	676	679	GAS TEMP LVG -	315	316	EXCL. LKG	
AH LKG, %		7.22	GAS TEMP LVG -		304	INCL. LKG	
			AVE COLD END -	220	221		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	554		

SEC AH
TEST 7A : 04/08/92 : 1128-1330 : 110 MW : 13 TPH: 160 RPM: LOW STOIC
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1007	AIR WT LVG -	923	909	MOIST -	5.1
GAS TEMP ENT -	676	665	GAS TEMP LVG -	315	311	EXCL. LKG	
AH LKG, %		7.36	GAS TEMP LVG -		299	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	543		

SEC AH
TEST 7A : 04/08/92 : 1128-1330 : 110 MW : 13 TPH: 160 RPM: LOW STOIC
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1008	AIR WT LVG -	923	910	MOIST -	5.1
GAS TEMP ENT -	676	665	GAS TEMP LVG -	315	311	EXCL. LKG	
AH LKG, %		7.36	GAS TEMP LVG -		299	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	543		

SEC AH
TEST 9 : 04/10/92 : 0759-0810 : 110 MW : PRE-REBURN BASE
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1040	AIR WT LVG -	923	940	MOIST -	5.0
GAS TEMP ENT -	676	654	GAS TEMP LVG -	315	308	EXCL. LKG	
AH LKG, %		1.89	GAS TEMP LVG -		305	INCL. LKG	
			AVE COLD END -	220	217		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	533		

SEC AH
TEST 9 : 04/10/92 : 0759-0810 : 110 MW : PRE-REBURN BASE
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1038	AIR WT LVG -	923	937	MOIST -	5.0
GAS TEMP ENT -	676	654	GAS TEMP LVG -	315	308	EXCL. LKG	
AH LKG, %		1.89	GAS TEMP LVG -		305	INCL. LKG	
			AVE COLD END -	220	217		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	533		

SEC AH
TEST 9A : 04/10/92 : 1029-1331 : 110 MW : 13 TPH: 100 RPM: MED STOIC
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1005	AIR WT LVG -	923	907	MOIST -	5.1
GAS TEMP ENT -	676	675	GAS TEMP LVG -	315	314	EXCL. LKG	
AH LKG, %		6.16	GAS TEMP LVG -		304	INCL. LKG	
			AVE COLD END -	220	220		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	552		

SEC AH
TEST 9A : 04/10/92 : 1029-1331 : 110 MW : 13 TPH: 100 RPM: MED STOIC
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1011	AIR WT LVG -	923	913	MOIST -	5.1
GAS TEMP ENT -	676	675	GAS TEMP LVG -	315	314	EXCL. LKG	
AH LKG, %		6.16	GAS TEMP LVG -		304	INCL. LKG	
			AVE COLD END -	220	220		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	552		

SEC AH
TEST 10 : 04/13/92 : 0827-0838 : 110 MW : PRE-REBURN BASE
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1031	AIR WT LVG -	923	931	MOIST -	5.0
GAS TEMP ENT -	676	660	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		7.42	GAS TEMP LVG -		297	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	538		

SEC AH
TEST 10 : 04/13/92 : 0827-0838 : 110 MW : PRE-REBURN BASE
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1029	AIR WT LVG -	923	929	MOIST -	5.0
GAS TEMP ENT -	676	660	GAS TEMP LVG -	315	309	EXCL. LKG	
AH LKG, %		7.42	GAS TEMP LVG -		297	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	538		

SEC AH
TEST 10A : 04/13/92 : 1031-1256 : 110 MW : 13 TPH: 100 RPM: LOW STOIC
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	997	AIR WT LVG -	923	900	MOIST -	5.1
GAS TEMP ENT -	676	672	GAS TEMP LVG -	315	313	EXCL. LKG	
AH LKG, %		6.54	GAS TEMP LVG -		302	INCL. LKG	
			AVE COLD END -	220	219		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	549		

SEC AH
TEST 10A : 04/13/92 : 1031-1256 : 110 MW : 13 TPH: 100 RPM: LOW STOIC
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1003	AIR WT LVG -	923	906	MOIST -	5.1
GAS TEMP ENT -	676	672	GAS TEMP LVG -	315	313	EXCL. LKG	
AH LKG, %		6.54	GAS TEMP LVG -		302	INCL. LKG	
			AVE COLD END -	220	219		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	549		

SEC AH
TEST 16A : 04/24/92 : 1110-1311 : 111 MW: CONTROLS IN AUTOMATIC
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1005	AIR WT LVG -	923	908	MOIST -	5.1
GAS TEMP ENT -	676	670	GAS TEMP LVG -	315	312	EXCL. LKG	
AH LKG, %		4.69	GAS TEMP LVG -		304	INCL. LKG	
			AVE COLD END -	220	219		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	547		

SEC AH
TEST 16A : 04/24/92 : 1110-1311 : 111 MW: CONTROLS IN AUTOMATIC
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1014	AIR WT LVG -	923	916	MOIST -	5.1
GAS TEMP ENT -	676	670	GAS TEMP LVG -	315	313	EXCL. LKG	
AH LKG, %		4.69	GAS TEMP LVG -		305	INCL. LKG	
			AVE COLD END -	220	219		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	547		

SEC AH
TEST 21B : 05/05/92 : 1039-1200 : 110 MW : 13 TPH : LOW STOIC
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1004	AIR WT LVG -	923	907	MOIST -	5.1
GAS TEMP ENT -	676	662	GAS TEMP LVG -	315	309	EXCL. LKG	
AH LKG, %		5.35	GAS TEMP LVG -		301	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	541		

SEC AH
TEST 21B : 05/05/92 : 1039-1200 : 110 MW : 13 TPH : LOW STOIC
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1009	AIR WT LVG -	923	911	MOIST -	5.1
GAS TEMP ENT -	676	662	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		5.35	GAS TEMP LVG -		301	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	541		

SEC AH
TEST 3T : 02/13/91 : 1710-1741 : 110 MW : 13.7 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	990	AIR WT LVG -	923	894	MOIST -	5.1
GAS TEMP ENT -	676	669	GAS TEMP LVG -	315	312	EXCL. LKG	
AH LKG, %		5.95	GAS TEMP LVG -		302	INCL. LKG	
			AVE COLD END -	220	219		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	547		

SEC AH
TEST 3T : 02/13/91 : 1710-1741 : 110 MW : 13.7 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	993	AIR WT LVG -	923	897	MOIST -	5.1
GAS TEMP ENT -	676	669	GAS TEMP LVG -	315	312	EXCL. LKG	
AH LKG, %		5.95	GAS TEMP LVG -		302	INCL. LKG	
			AVE COLD END -	220	219		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	547		

SEC AH
TEST 4T : 02/13/91 : 1915-2008 : 110 MW : 13.7 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	988	AIR WT LVG -	923	892	MOIST -	5.1
GAS TEMP ENT -	676	666	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		5.90	GAS TEMP LVG -		301	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	545		

SEC AH
TEST 4T : 02/13/91 : 1915-2008 : 110 MW : 13.7 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	995	AIR WT LVG -	923	898	MOIST -	5.1
GAS TEMP ENT -	676	666	GAS TEMP LVG -	315	311	EXCL. LKG	
AH LKG, %		5.90	GAS TEMP LVG -		301	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	545		

SEC AH
TEST 10B : 04/13/92 : 1524-1647 : 110 MW : 14 TPH: 140 RPM
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1017	AIR WT LVG -	923	918	MOIST -	5.1
GAS TEMP ENT -	676	684	GAS TEMP LVG -	315	318	EXCL. LKG	
AH LKG, %		6.35	GAS TEMP LVG -		307	INCL. LKG	
			AVE COLD END -	220	222		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	558		

SEC AH
TEST 10B : 04/13/92 : 1524-1647 : 110 MW : 14 TPH: 140 RPM
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1020	AIR WT LVG -	923	921	MOIST -	5.1
GAS TEMP ENT -	676	684	GAS TEMP LVG -	315	318	EXCL. LKG	
AH LKG, %		6.35	GAS TEMP LVG -		307	INCL. LKG	
			AVE COLD END -	220	222		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	558		

SEC AH
TEST 10C : 04/13/92 : 1822-1914 : 111 MW : 14 TPH : 160 RPM
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1021	AIR WT LVG -	923	922	MOIST -	5.1
GAS TEMP ENT -	676	678	GAS TEMP LVG -	315	316	EXCL. LKG	
AH LKG, %		6.14	GAS TEMP LVG -		305	INCL. LKG	
			AVE COLD END -	220	221		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	553		

SEC AH
TEST 10C : 04/13/92 : 1822-1914 : 111 MW : 14 TPH : 160 RPM
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1023	AIR WT LVG -	923	924	MOIST -	5.1
GAS TEMP ENT -	676	678	GAS TEMP LVG -	315	316	EXCL. LKG	
AH LKG, %		6.14	GAS TEMP LVG -		305	INCL. LKG	
			AVE COLD END -	220	221		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	553		

SEC AH
TEST 5T : 02/14/91 : 1408-1604 : 111 MW : 14 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	991	AIR WT LVG -	923	895	MOIST -	5.1
GAS TEMP ENT -	676	663	GAS TEMP LVG -	315	309	EXCL. LKG	
AH LKG, %		6.77	GAS TEMP LVG -		298	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	542		

SEC AH
TEST 5T : 02/14/91 : 1408-1604 : 111 MW : 14 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	997	AIR WT LVG -	923	900	MOIST -	5.1
GAS TEMP ENT -	676	663	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		6.77	GAS TEMP LVG -		298	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	542		

SEC AH
TEST 7T : 02/15/91 : 1009-1024 : 111 MW : 14 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	995	AIR WT LVG -	923	898	MOIST -	5.1
GAS TEMP ENT -	676	644	GAS TEMP LVG -	315	303	EXCL. LKG	
AH LKG, %		6.57	GAS TEMP LVG -		293	INCL. LKG	
			AVE COLD END -	220	214		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	527		

SEC AH
TEST 7T : 02/15/91 : 1009-1024 : 111 MW : 14 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	998	AIR WT LVG -	923	901	MOIST -	5.1
GAS TEMP ENT -	676	644	GAS TEMP LVG -	315	303	EXCL. LKG	
AH LKG, %		6.57	GAS TEMP LVG -		293	INCL. LKG	
			AVE COLD END -	220	214		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	527		

SEC AH
TEST 18T : 02/18/91 : 0919-0929 : 109 MW : 14 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	968	AIR WT LVG -	923	874	MOIST -	5.1
GAS TEMP ENT -	676	637	GAS TEMP LVG -	315	299	EXCL. LKG	
AH LKG, %		5.82	GAS TEMP LVG -		290	INCL. LKG	
			AVE COLD END -	220	213		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	522		

SEC AH
TEST 18T : 02/18/91 : 0919-0929 : 109 MW : 14 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	971	AIR WT LVG -	923	877	MOIST -	5.1
GAS TEMP ENT -	676	637	GAS TEMP LVG -	315	300	EXCL. LKG	
AH LKG, %		5.82	GAS TEMP LVG -		290	INCL. LKG	
			AVE COLD END -	220	213		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	522		

SEC AH
TEST 22T : 02/19/91 : 1132-1513 : 110 MW : 14 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW	
GAS WT ENT -	1022	995	AIR WT LVG -	923	898	MOIST - 5.1
GAS TEMP ENT -	676	615	GAS TEMP LVG -	315	293	EXCL. LKG
AH LKG, %		6.54	GAS TEMP LVG -		283	INCL. LKG
			AVE COLD END -	220	209	
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	504	

SEC AH
TEST 22T : 02/19/91 : 1132-1513 : 110 MW : 14 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW	
GAS WT ENT -	1022	1000	AIR WT LVG -	923	903	MOIST - 5.1
GAS TEMP ENT -	676	615	GAS TEMP LVG -	315	293	EXCL. LKG
AH LKG, %		6.54	GAS TEMP LVG -		283	INCL. LKG
			AVE COLD END -	220	209	
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	504	

SEC AH
TEST 24T : 02/20/91 : 0951-1012 : 110 MW : 140 RPM : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	992	AIR WT LVG -	923	896	MOIST -	5.1
GAS TEMP ENT -	676	607	GAS TEMP LVG -	315	290	EXCL. LKG	
AH LKG, %		5.86	GAS TEMP LVG -		281	INCL. LKG	
			AVE COLD END -	220	208		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	497		

SEC AH
TEST 6T : 02/14/91 : 1604-1903 : 111 MW : 140 RPM : MED STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	991	AIR WT LVG -	923	895	MOIST -	5.1
GAS TEMP ENT -	676	671	GAS TEMP LVG -	315	312	EXCL. LKG	
AH LKG, %		5.37	GAS TEMP LVG -		303	INCL. LKG	
			AVE COLD END -	220	219		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	549		

SEC AH
TEST 6T : 02/14/91 : 1604-1903 : 111 MW : 140 RPM : MED STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	997	AIR WT LVG -	923	901	MOIST -	5.1
GAS TEMP ENT -	676	671	GAS TEMP LVG -	315	313	EXCL. LKG	
AH LKG, %		5.37	GAS TEMP LVG -		303	INCL. LKG	
			AVE COLD END -	220	219		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	549		

SEC AH
TEST 15T : 02/17/91 : 1044-1103 : 110 MW : 14.5 TPH : MED STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	987	AIR WT LVG -	923	892	MOIST -	5.1
GAS TEMP ENT -	676	629	GAS TEMP LVG -	315	297	EXCL. LKG	
AH LKG, %		6.46	GAS TEMP LVG -		287	INCL. LKG	
			AVE COLD END -	220	212		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	515		

SEC AH
TEST 15T : 02/17/91 : 1044-1103 : 110 MW : 14.5 TPH : MED STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	990	AIR WT LVG -	923	894	MOIST -	5.1
GAS TEMP ENT -	676	629	GAS TEMP LVG -	315	297	EXCL. LKG	
AH LKG, %		6.46	GAS TEMP LVG -		287	INCL. LKG	
			AVE COLD END -	220	212		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	515		

SEC AH
TEST 10T : 02/15/91 : 1614-1809 : 110 MW : 140 RPM : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	984	AIR WT LVG -	923	889	MOIST -	5.1
GAS TEMP ENT -	676	666	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		6.71	GAS TEMP LVG -		299	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	545		

SEC AH
TEST 10T : 02/15/91 : 1614-1809 : 110 MW : 140 RPM : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	990	AIR WT LVG -	923	894	MOIST -	5.1
GAS TEMP ENT -	676	666	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		6.71	GAS TEMP LVG -		299	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	545		

SEC AH
TEST 8T : 02/15/91 : 1143-1204 : 110 MW : 140 RPM : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	985	AIR WT LVG -	923	890	MOIST -	5.1
GAS TEMP ENT -	676	655	GAS TEMP LVG -	315	306	EXCL. LKG	
AH LKG, %		5.86	GAS TEMP LVG -		297	INCL. LKG	
			AVE COLD END -	220	216		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	536		

SEC AH
TEST 8T : 02/15/91 : 1143-1204 : 110 MW : 140 RPM : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	990	AIR WT LVG -	923	894	MOIST -	5.1
GAS TEMP ENT -	676	655	GAS TEMP LVG -	315	307	EXCL. LKG	
AH LKG, %		5.86	GAS TEMP LVG -		297	INCL. LKG	
			AVE COLD END -	220	216		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	536		

SEC AH
TEST 19T : 02/18/91 : 1045-1644 : 110 MW : 140 RPM : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	983	AIR WT LVG -	923	888	MOIST -	5.1
GAS TEMP ENT -	676	641	GAS TEMP LVG -	315	302	EXCL. LKG	
AH LKG, %		6.61	GAS TEMP LVG -		291	INCL. LKG	
			AVE COLD END -	220	214		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	525		

SEC AH
TEST 19T : 02/18/91 : 1045-1644 : 110 MW : 140 RPM : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	987	AIR WT LVG -	923	891	MOIST -	5.1
GAS TEMP ENT -	676	641	GAS TEMP LVG -	315	302	EXCL. LKG	
AH LKG, %		6.61	GAS TEMP LVG -		291	INCL. LKG	
			AVE COLD END -	220	214		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	525		

SEC AH
TEST 23T : 02/19/91 : 1658-1854 : 110 MW : 140 RPM : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	992	AIR WT LVG -	923	896	MOIST -	5.1
GAS TEMP ENT -	676	649	GAS TEMP LVG -	315	304	EXCL. LKG	
AH LKG, %		6.15	GAS TEMP LVG -		295	INCL. LKG	
			AVE COLD END -	220	215		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	531		

SEC AH
TEST 23T : 02/19/91 : 1658-1854 : 110 MW : 140 RPM : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	996	AIR WT LVG -	923	900	MOIST -	5.1
GAS TEMP ENT -	676	649	GAS TEMP LVG -	315	305	EXCL. LKG	
AH LKG, %		6.15	GAS TEMP LVG -		295	INCL. LKG	
			AVE COLD END -	220	215		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	531		

SEC AH
TEST 16T : 02/17/91 : 1142-1245 : 110 MW : 14.5 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	985	AIR WT LVG -	923	889	MOIST -	5.1
GAS TEMP ENT -	676	640	GAS TEMP LVG -	315	301	EXCL. LKG	
AH LKG, %		6.21	GAS TEMP LVG -		291	INCL. LKG	
			AVE COLD END -	220	213		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	524		

SEC AH
TEST 16T : 02/17/91 : 1142-1245 : 110 MW : 14.5 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	988	AIR WT LVG -	923	892	MOIST -	5.1
GAS TEMP ENT -	676	640	GAS TEMP LVG -	315	301	EXCL. LKG	
AH LKG, %		6.21	GAS TEMP LVG -		292	INCL. LKG	
			AVE COLD END -	220	214		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	524		

SEC AH
TEST 9T : 02/15/91 : 1513-1542 : 109 MW : 14 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	988	AIR WT LVG -	923	892	MOIST -	5.1
GAS TEMP ENT -	676	662	GAS TEMP LVG -	315	309	EXCL. LKG	
AH LKG, %		6.00	GAS TEMP LVG -		299	INCL. LKG	
			AVE COLD END -	220	217		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	542		

SEC AH
TEST 9T : 02/15/91 : 1513-1542 : 109 MW : 14 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	994	AIR WT LVG -	923	897	MOIST -	5.1
GAS TEMP ENT -	676	662	GAS TEMP LVG -	315	309	EXCL. LKG	
AH LKG, %		6.00	GAS TEMP LVG -		299	INCL. LKG	
			AVE COLD END -	220	217		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	541		

SEC AH
TEST 17T : 02/17/91 : 1658-1812 : 110 MW : 14.5 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	985	AIR WT LVG -	923	889	MOIST -	5.1
GAS TEMP ENT -	676	641	GAS TEMP LVG -	315	302	EXCL. LKG	
AH LKG, %		6.64	GAS TEMP LVG -		291	INCL. LKG	
			AVE COLD END -	220	214		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	525		

SEC AH
TEST 17T : 02/17/91 : 1658-1812 : 110 MW : 14.5 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	988	AIR WT LVG -	923	892	MOIST -	5.1
GAS TEMP ENT -	676	641	GAS TEMP LVG -	315	302	EXCL. LKG	
AH LKG, %		6.64	GAS TEMP LVG -		291	INCL. LKG	
			AVE COLD END -	220	214		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	525		

SEC AH
TEST 23B : 05/07/92 : 1444-1517 : 110 MW : 14 TPH

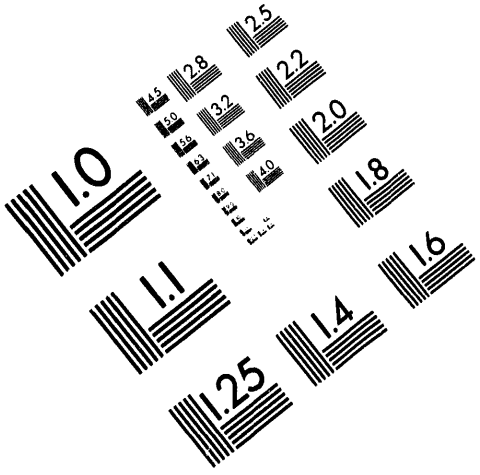
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1016	AIR WT LVG -	923	917	MOIST -	5.1
GAS TEMP ENT -	676	655	GAS TEMP LVG -	315	307	EXCL. LKG	
AH LKG, %		6.45	GAS TEMP LVG -		297	INCL. LKG	
			AVE COLD END -	220	217		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	535		

SEC AH
TEST 23B : 05/07/92 : 1444-1517 : 110 MW : 14 TPH

JDR-060492

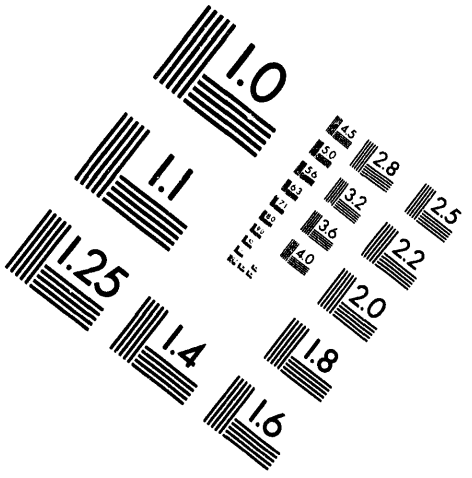
	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1019	AIR WT LVG -	923	921	MOIST -	5.1
GAS TEMP ENT -	676	655	GAS TEMP LVG -	315	307	EXCL. LKG	
AH LKG, %		6.45	GAS TEMP LVG -		297	INCL. LKG	
			AVE COLD END -	220	217		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	534		



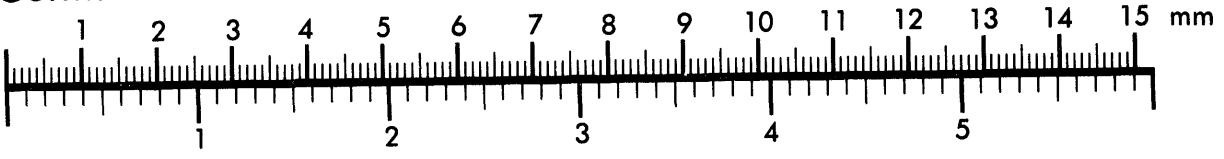
Association for Information and Image Management

1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910

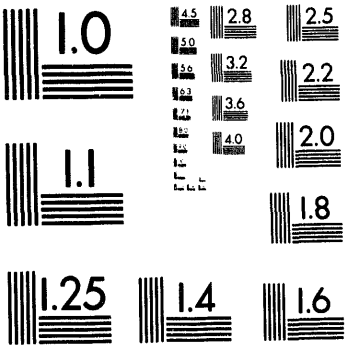
301/587-8202

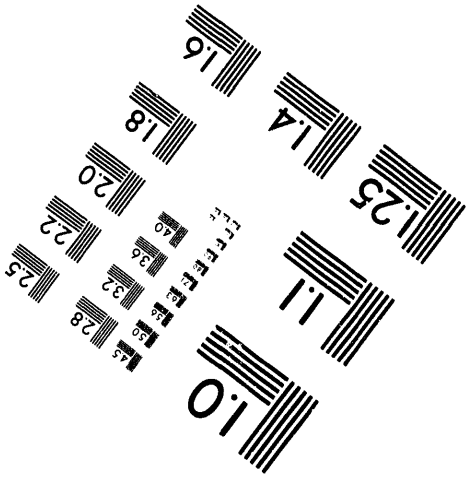


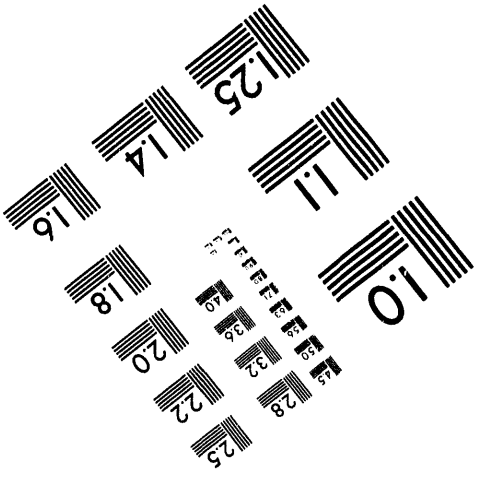
Centimeter



Inches







MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

8 of 9

SEC AH
TEST 50T : 03/05/91 : 1030-1112 : 110 MW : 14 TPH : LOW STOICH 150 RP
MJDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	990	AIR WT LVG -	923	894	MOIST -	5.1
GAS TEMP ENT -	676	664	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		6.31	GAS TEMP LVG -		299	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	543		

SEC AH
TEST 50T : 03/05/91 : 1030-1112 : 110 MW : 14 TPH : LOW STOICH 150 RP
MJDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	991	AIR WT LVG -	923	895	MOIST -	5.1
GAS TEMP ENT -	676	664	GAS TEMP LVG -	315	310	EXCL. LKG	
AH LKG, %		6.31	GAS TEMP LVG -		299	INCL. LKG	
			AVE COLD END -	220	218		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	543		

SEC AH
TEST 25T : 02/20/91 : 1248-1447 : 111 MW : 16 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	994	AIR WT LVG -	923	898	MOIST -	5.1
GAS TEMP ENT -	676	613	GAS TEMP LVG -	315	292	EXCL. LKG	
AH LKG, %		6.35	GAS TEMP LVG -		283	INCL. LKG	
			AVE COLD END -	220	209		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	502		

SEC AH
TEST 25T : 02/20/91 : 1248-1447 : 111 MW : 16 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	995	AIR WT LVG -	923	899	MOIST -	5.1
GAS TEMP ENT -	676	613	GAS TEMP LVG -	315	292	EXCL. LKG	
AH LKG, %		6.35	GAS TEMP LVG -		283	INCL. LKG	
			AVE COLD END -	220	209		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	502		

SEC AH
TEST 31T : 02/24/91 : 1057-1226 : 111 MW : 16 TPH : MED STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1001	AIR WT LVG -	923	904	MOIST -	5.1
GAS TEMP ENT -	676	622	GAS TEMP LVG -	315	295	EXCL. LKG	
AH LKG, %		6.12	GAS TEMP LVG -		286	INCL. LKG	
			AVE COLD END -	220	211		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	509		

SEC AH
TEST 31T : 02/24/91 : 1057-1226 : 111 MW : 16 TPH : MED STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1003	AIR WT LVG -	923	905	MOIST -	5.1
GAS TEMP ENT -	676	622	GAS TEMP LVG -	315	296	EXCL. LKG	
AH LKG, %		6.12	GAS TEMP LVG -		286	INCL. LKG	
			AVE COLD END -	220	211		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	509		

SEC AH
TEST 32T : 02/24/91 : 1504-1702 : 111 MW : 16 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	992	AIR WT LVG -	923	896	MOIST -	5.1
GAS TEMP ENT -	676	638	GAS TEMP LVG -	315	301	EXCL. LKG	
AH LKG, %		5.98	GAS TEMP LVG -		291	INCL. LKG	
			AVE COLD END -	220	213		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	522		

SEC AH
TEST 32T : 02/24/91 : 1504-1702 : 111 MW : 16 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	995	AIR WT LVG -	923	899	MOIST -	5.1
GAS TEMP ENT -	676	638	GAS TEMP LVG -	315	301	EXCL. LKG	
AH LKG, %		5.98	GAS TEMP LVG -		291	INCL. LKG	
			AVE COLD END -	220	213		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	522		

SEC AH
TEST 17A : 04/27/92 : 1130-1400 : 110 MW : 15 TPH : 160 RPM
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1001	AIR WT LVG -	923	904	MOIST -	5.1
GAS TEMP ENT -	676	698	GAS TEMP LVG -	315	322	EXCL. LKG	
AH LKG, %		5.33	GAS TEMP LVG -		312	INCL. LKG	
			AVE COLD END -	220	224		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	570		

SEC AH
TEST 17A : 04/27/92 : 1130-1400 : 110 MW : 15 TPH : 160 RPM
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	1007	AIR WT LVG -	923	909	MOIST -	5.1
GAS TEMP ENT -	676	698	GAS TEMP LVG -	315	322	EXCL. LKG	
AH LKG, %		5.33	GAS TEMP LVG -		313	INCL. LKG	
			AVE COLD END -	220	224		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	570		

SEC AH
TEST 18A : 04/28/92 : 1636-1820 : 90 MW : 11 TPH : 3 CYCLONES
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	813	AIR WT LVG -	923	734	MOIST -	5.1
GAS TEMP ENT -	676	641	GAS TEMP LVG -	315	295	EXCL. LKG	
AH LKG, %		8.34	GAS TEMP LVG -		283	INCL. LKG	
			AVE COLD END -	220	210		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	531		

SEC AH
TEST 18A : 04/28/92 : 1636-1820 : 90 MW : 11 TPH : 3 CYCLONES
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	816	AIR WT LVG -	923	737	MOIST -	5.1
GAS TEMP ENT -	676	641	GAS TEMP LVG -	315	295	EXCL. LKG	
AH LKG, %		8.34	GAS TEMP LVG -		283	INCL. LKG	
			AVE COLD END -	220	211		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	531		

SEC AH
TEST 45T : 03/02/91 : 1605-1658 : 86 MW : 12 TPH : MED STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	756	AIR WT LVG -	923	683	MOIST -	5.1
GAS TEMP ENT -	676	629	GAS TEMP LVG -	315	289	EXCL. LKG	
AH LKG, %		6.48	GAS TEMP LVG -		279	INCL. LKG	
			AVE COLD END -	220	207		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	524		

SEC AH
TEST 45T : 03/02/91 : 1605-1658 : 86 MW : 12 TPH : MED STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	763	AIR WT LVG -	923	689	MOIST -	5.1
GAS TEMP ENT -	676	629	GAS TEMP LVG -	315	289	EXCL. LKG	
AH LKG, %		6.48	GAS TEMP LVG -		279	INCL. LKG	
			AVE COLD END -	220	207		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	524		

SEC AH
TEST 5A : 04/06/92 : 1300-1506 : 82 MW : NO REBURN : ACCUREX TRAV
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	734	AIR WT LVG -	923	663	MOIST -	5.1
GAS TEMP ENT -	676	688	GAS TEMP LVG -	315	307	EXCL. LKG	
AH LKG, %		6.77	GAS TEMP LVG -		296	INCL. LKG	
			AVE COLD END -	220	217		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	574		

SEC AH
TEST 5A : 04/06/92 : 1300-1506 : 82 MW : NO REBURN : ACCUREX TRAV
JDR-060392

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	737	AIR WT LVG -	923	666	MOIST -	5.1
GAS TEMP ENT -	676	688	GAS TEMP LVG -	315	307	EXCL. LKG	
AH LKG, %		6.77	GAS TEMP LVG -		296	INCL. LKG	
			AVE COLD END -	220	217		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	573		

SEC AH
TEST 11A : 04/15/92 : 2130-2339 : 82 MW : 11.5 TPH: 160 RPM: LOW STOI
CJDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	738	AIR WT LVG -	923	666	MOIST -	5.1
GAS TEMP ENT -	676	623	GAS TEMP LVG -	315	286	EXCL. LKG	
AH LKG, %		8.12	GAS TEMP LVG -		274	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	520		

SEC AH
TEST 11A : 04/15/92 : 2130-2339 : 82 MW : 11.5 TPH: 160 RPM: LOW STOI
CJDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	740	AIR WT LVG -	923	668	MOIST -	5.1
GAS TEMP ENT -	676	623	GAS TEMP LVG -	315	286	EXCL. LKG	
AH LKG, %		8.12	GAS TEMP LVG -		275	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	520		

SEC AH
TEST 11B : 04/16/92 : 0042-0215 : 82 MW : 11.5 TPH : 160 RPM
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	738	AIR WT LVG -	923	667	MOIST -	5.1
GAS TEMP ENT -	676	621	GAS TEMP LVG -	315	286	EXCL. LKG	
AH LKG, %		8.45	GAS TEMP LVG -		274	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	518		

SEC AH
TEST 11B : 04/16/92 : 0042-0215 : 82 MW : 11.5 TPH : 160 RPM
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	743	AIR WT LVG -	923	671	MOIST -	5.1
GAS TEMP ENT -	676	621	GAS TEMP LVG -	315	286	EXCL. LKG	
AH LKG, %		8.45	GAS TEMP LVG -		274	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	518		

SEC AH
TEST 11C : 04/16/92 : 0236-0327 : 82 MW : 11.5 TPH: 160 RPM: HIGH OFA
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	735	AIR WT LVG -	923	664	MOIST -	5.1
GAS TEMP ENT -	676	616	GAS TEMP LVG -	315	284	EXCL. LKG	
AH LKG, %		8.45	GAS TEMP LVG -		272	INCL. LKG	
			AVE COLD END -	220	205		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	514		

SEC AH
TEST 11C : 04/16/92 : 0236-0327 : 82 MW : 11.5 TPH: 160 RPM: HIGH OFA
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	739	AIR WT LVG -	923	667	MOIST -	5.1
GAS TEMP ENT -	676	616	GAS TEMP LVG -	315	284	EXCL. LKG	
AH LKG, %		8.45	GAS TEMP LVG -		272	INCL. LKG	
			AVE COLD END -	220	205		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	514		

SEC AH
TEST 12A : 04/16/92 : 2047-2229 : 83 MW : 11.5 TPH: 160 RPM: MED STOI
CJDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	742	AIR WT LVG -	923	670	MOIST -	5.1
GAS TEMP ENT -	676	622	GAS TEMP LVG -	315	286	EXCL. LKG	
AH LKG, %		7.99	GAS TEMP LVG -		275	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	519		

SEC AH
TEST 12A : 04/16/92 : 2047-2229 : 83 MW : 11.5 TPH: 160 RPM: MED STOI
CJDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	747	AIR WT LVG -	923	675	MOIST -	5.1
GAS TEMP ENT -	676	622	GAS TEMP LVG -	315	286	EXCL. LKG	
AH LKG, %		7.99	GAS TEMP LVG -		275	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	519		

SEC AH
TEST 13A : 04/21/92 : 2202-2304 : 82 MW :11.5 TPH: 160 RPM: HIGH STOI
CJDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	735	AIR WT LVG -	923	664	MOIST -	5.1
GAS TEMP ENT -	676	663	GAS TEMP LVG -	315	299	EXCL. LKG	
AH LKG, %		7.80	GAS TEMP LVG -		287	INCL. LKG	
			AVE COLD END -	220	212		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	553		

SEC AH
TEST 13A : 04/21/92 : 2202-2304 : 82 MW :11.5 TPH: 160 RPM: HIGH STOI
CJDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	743	AIR WT LVG -	923	671	MOIST -	5.1
GAS TEMP ENT -	676	663	GAS TEMP LVG -	315	299	EXCL. LKG	
AH LKG, %		7.80	GAS TEMP LVG -		287	INCL. LKG	
			AVE COLD END -	220	213		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	552		

SEC AH
TEST 24B : 05/07/92 : 1723-1803 : 82 MW : 11.5 TPH

JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	741	AIR WT LVG -	923	669	MOIST -	5.1
GAS TEMP ENT -	676	628	GAS TEMP LVG -	315	288	EXCL. LKG	
AH LKG, %		9.62	GAS TEMP LVG -		274	INCL. LKG	
			AVE COLD END -	220	207		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	524		

SEC AH
TEST 24B : 05/07/92 : 1723-1803 : 82 MW : 11.5 TPH

JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	744	AIR WT LVG -	923	672	MOIST -	5.1
GAS TEMP ENT -	676	628	GAS TEMP LVG -	315	288	EXCL. LKG	
AH LKG, %		9.62	GAS TEMP LVG -		274	INCL. LKG	
			AVE COLD END -	220	207		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	524		

SEC AH
TEST 11T : 02/16/91 : 0814-0814 : 81 MW : SINGLE SCAN NO REBURN BASE
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	718	AIR WT LVG -	923	649	MOIST -	5.1
GAS TEMP ENT -	676	598	GAS TEMP LVG -	315	277	EXCL. LKG	
AH LKG, %		7.50	GAS TEMP LVG -		267	INCL. LKG	
			AVE COLD END -	220	201		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	500		

SEC AH
TEST 11T : 02/16/91 : 0814-0814 : 81 MW : SINGLE SCAN NO REBURN BASE
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	722	AIR WT LVG -	923	652	MOIST -	5.1
GAS TEMP ENT -	676	598	GAS TEMP LVG -	315	277	EXCL. LKG	
AH LKG, %		7.50	GAS TEMP LVG -		267	INCL. LKG	
			AVE COLD END -	220	202		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	500		

SEC AH
TEST 12T : 02/16/91 : 1229-1457 : 82 MW : 11.5 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	725	AIR WT LVG -	923	655	MOIST -	5.1
GAS TEMP ENT -	676	611	GAS TEMP LVG -	315	282	EXCL. LKG	
AH LKG, %		6.37	GAS TEMP LVG -		273	INCL. LKG	
			AVE COLD END -	220	204		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	510		

SEC AH
TEST 12T : 02/16/91 : 1229-1457 : 82 MW : 11.5 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	730	AIR WT LVG -	923	659	MOIST -	5.1
GAS TEMP ENT -	676	611	GAS TEMP LVG -	315	282	EXCL. LKG	
AH LKG, %		6.37	GAS TEMP LVG -		273	INCL. LKG	
			AVE COLD END -	220	204		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	510		

SEC AH
TEST 13T : 02/16/91 : 1508-1759 : 82 MW : 11.5 TPH : LOW STOIC 147 RP
MJDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	725	AIR WT LVG -	923	655	MOIST -	5.1
GAS TEMP ENT -	676	619	GAS TEMP LVG -	315	284	EXCL. LKG	
AH LKG, %		6.44	GAS TEMP LVG -		275	INCL. LKG	
			AVE COLD END -	220	205		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	517		

SEC AH
TEST 13T : 02/16/91 : 1508-1759 : 82 MW : 11.5 TPH : LOW STOIC 147 RP
MJDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	731	AIR WT LVG -	923	660	MOIST -	5.1
GAS TEMP ENT -	676	619	GAS TEMP LVG -	315	284	EXCL. LKG	
AH LKG, %		6.44	GAS TEMP LVG -		275	INCL. LKG	
			AVE COLD END -	220	205		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	517		

SEC AH
TEST 14T : 02/16/91 : 1814-2004 : 82 MW : 11.5 TPH : LOW STOIC 160 RP
MJDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	721	AIR WT LVG -	923	651	MOIST -	5.1
GAS TEMP ENT -	676	624	GAS TEMP LVG -	315	286	EXCL. LKG	
AH LKG, %		6.66	GAS TEMP LVG -		276	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	521		

SEC AH
TEST 14T : 02/16/91 : 1814-2004 : 82 MW : 11.5 TPH : LOW STOIC 160 RP
MJDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	727	AIR WT LVG -	923	656	MOIST -	5.1
GAS TEMP ENT -	676	624	GAS TEMP LVG -	315	286	EXCL. LKG	
AH LKG, %		6.66	GAS TEMP LVG -		276	INCL. LKG	
			AVE COLD END -	220	206		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	521		

SEC AH
TEST 33T : 02/24/91 : 2158-2209 : 83 MW : SINGLE SCAN NO REBURN BASE
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	737	AIR WT LVG -	923	666	MOIST -	5.1
GAS TEMP ENT -	676	598	GAS TEMP LVG -	315	278	EXCL. LKG	
AH LKG, %		7.58	GAS TEMP LVG -		267	INCL. LKG	
			AVE COLD END -	220	202		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	499		

SEC AH
TEST 33T : 02/24/91 : 2158-2209 : 83 MW : SINGLE SCAN NO REBURN BASE
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	735	AIR WT LVG -	923	663	MOIST -	5.1
GAS TEMP ENT -	676	598	GAS TEMP LVG -	315	278	EXCL. LKG	
AH LKG, %		7.58	GAS TEMP LVG -		267	INCL. LKG	
			AVE COLD END -	220	202		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	499		

SEC AH
TEST 34T : 02/24/91 : 2250-2306 : 83 MW : 11.5 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	727	AIR WT LVG -	923	657	MOIST -	5.1
GAS TEMP ENT -	676	608	GAS TEMP LVG -	315	281	EXCL. LKG	
AH LKG, %		6.44	GAS TEMP LVG -		272	INCL. LKG	
			AVE COLD END -	220	203		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	508		

SEC AH
TEST 34T : 02/24/91 : 2250-2306 : 83 MW : 11.5 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	732	AIR WT LVG -	923	661	MOIST -	5.1
GAS TEMP ENT -	676	608	GAS TEMP LVG -	315	281	EXCL. LKG	
AH LKG, %		6.44	GAS TEMP LVG -		272	INCL. LKG	
			AVE COLD END -	220	203		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	508		

SEC AH
TEST 28T : 02/22/91 : 1101-1257 : 83 MW : 11.5 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	731	AIR WT LVG -	923	660	MOIST -	5.1
GAS TEMP ENT -	676	612	GAS TEMP LVG -	315	282	EXCL. LKG	
AH LKG, %		6.24	GAS TEMP LVG -		273	INCL. LKG	
			AVE COLD END -	220	204		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	511		

SEC AH
TEST 28T : 02/22/91 : 1101-1257 : 83 MW : 11.5 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	736	AIR WT LVG -	923	664	MOIST -	5.1
GAS TEMP ENT -	676	612	GAS TEMP LVG -	315	282	EXCL. LKG	
AH LKG, %		6.24	GAS TEMP LVG -		274	INCL. LKG	
			AVE COLD END -	220	204		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	511		

SEC AH
TEST 29T : 02/22/91 : 1504-1610 : 83 MW : 11.5 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	740	AIR WT LVG -	923	668	MOIST -	5.1
GAS TEMP ENT -	676	618	GAS TEMP LVG -	315	284	EXCL. LKG	
AH LKG, %		6.29	GAS TEMP LVG -		275	INCL. LKG	
			AVE COLD END -	220	205		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	516		

SEC AH
TEST 29T : 02/22/91 : 1504-1610 : 83 MW : 11.5 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	745	AIR WT LVG -	923	673	MOIST -	5.1
GAS TEMP ENT -	676	618	GAS TEMP LVG -	315	285	EXCL. LKG	
AH LKG, %		6.29	GAS TEMP LVG -		276	INCL. LKG	
			AVE COLD END -	220	205		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	515		

SEC AH
TEST 46T : 03/03/91 : 1038-1202 : 83 MW : 11.5 TPH : NO GR TO BNRS
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	,30	AIR WT LVG -	923	659	MOIST -	5.1
GAS TEMP ENT -	676	616	GAS TEMP LVG -	315	284	EXCL. LKG	
AH LKG, %		6.11	GAS TEMP LVG -		275	INCL. LKG	
			AVE COLD END -	220	205		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	515		

SEC AH
TEST 46T : 03/03/91 : 1038-1202 : 83 MW : 11.5 TPH : NO GR TO BNRS
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	738	AIR WT LVG -	923	666	MOIST -	5.1
GAS TEMP ENT -	676	616	GAS TEMP LVG -	315	284	EXCL. LKG	
AH LKG, %		6.11	GAS TEMP LVG -		275	INCL. LKG	
			AVE COLD END -	220	205		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	514		

SEC AH
TEST 47T : 03/03/91 : 1333-1426 : 82 MW : 11.5 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	723	AIR WT LVG -	923	653	MOIST -	5.1
GAS TEMP ENT -	676	621	GAS TEMP LVG -	315	285	EXCL. LKG	
AH LKG, %		6.15	GAS TEMP LVG -		276	INCL. LKG	
			AVE COLD END -	220	205		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	519		

SEC AH
TEST 47T : 03/03/91 : 1333-1426 : 82 MW : 11.5 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	729	AIR WT LVG -	923	659	MOIST -	5.1
GAS TEMP ENT -	676	621	GAS TEMP LVG -	315	285	EXCL. LKG	
AH LKG, %		6.15	GAS TEMP LVG -		276	INCL. LKG	
			AVE COLD END -	220	205		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	519		

SEC AH
TEST 49T : 03/04/91 : 1101-1154 : 82 MW : 12.8 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	724	AIR WT LVG -	923	654	MOIST -	5.1
GAS TEMP ENT -	676	609	GAS TEMP LVG -	315	281	EXCL. LKG	
AH LKG, %		6.79	GAS TEMP LVG -		272	INCL. LKG	
			AVE COLD END -	220	203		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	509		

SEC AH
TEST 49T : 03/04/91 : 1101-1154 : 82 MW : 12.8 TPH : LOW STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	727	AIR WT LVG -	923	657	MOIST -	5.1
GAS TEMP ENT -	676	609	GAS TEMP LVG -	315	281	EXCL. LKG	
AH LKG, %		6.79	GAS TEMP LVG -		272	INCL. LKG	
			AVE COLD END -	220	203		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	509		

SEC AH
TEST 12B : 04/16/92 : 2321-0103 : 83 MW :10.5 TPH: 160 RPM: HIGH STOI
CJDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	744	AIR WT LVG -	923	672	MOIST -	5.1
GAS TEMP ENT -	676	636	GAS TEMP LVG -	315	291	EXCL. LKG	
AH LKG, %		8.20	GAS TEMP LVG -		279	INCL. LKG	
			AVE COLD END -	220	208		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	530		

SEC AH
TEST 12B : 04/16/92 : 2321-0103 : 83 MW :10.5 TPH: 160 RPM: HIGH STOI
CJDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	746	AIR WT LVG -	923	674	MOIST -	5.1
GAS TEMP ENT -	676	636	GAS TEMP LVG -	315	291	EXCL. LKG	
AH LKG, %		8.20	GAS TEMP LVG -		279	INCL. LKG	
			AVE COLD END -	220	208		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	530		

SEC AH
TEST 37T : 02/25/91 : 2058-2127 : 70 MW : SINGLE SCAN NO REBURN BASE
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	622	AIR WT LVG -	923	562	MOIST -	5.1
GAS TEMP ENT -	676	595	GAS TEMP LVG -	315	272	EXCL. LKG	
AH LKG, %		6.16	GAS TEMP LVG -		264	INCL. LKG	
			AVE COLD END -	220	199		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	502		

SEC AH
TEST 42T : 02/27/91 : 0044-0301 : 71 MW : 11 TPH : MED STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	617	AIR WT LVG -	923	557	MOIST -	5.1
GAS TEMP ENT -	676	602	GAS TEMP LVG -	315	274	EXCL. LKG	
AH LKG, %		6.61	GAS TEMP LVG -		265	INCL. LKG	
			AVE COLD END -	220	200		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	508		

SEC AH
TEST 42T : 02/27/91 : 0044-0301 : 71 MW : 11 TPH : MED STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	624	AIR WT LVG -	923	563	MOIST -	5.1
GAS TEMP ENT -	676	602	GAS TEMP LVG -	315	274	EXCL. LKG	
AH LKG, %		6.61	GAS TEMP LVG -		265	INCL. LKG	
			AVE COLD END -	220	200		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	508		

SEC AH
TEST 38T : 02/25/91 : 2230-2302 : 70 MW : 11.5 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	617	AIR WT LVG -	923	557	MOIST -	5.1
GAS TEMP ENT -	676	596	GAS TEMP LVG -	315	272	EXCL. LKG	
AH LKG, %		6.16	GAS TEMP LVG -		264	INCL. LKG	
			AVE COLD END -	220	199		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	503		

SEC AH
TEST 38T : 02/25/91 : 2230-2302 : 70 MW : 11.5 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	623	AIR WT LVG -	923	563	MOIST -	5.1
GAS TEMP ENT -	676	596	GAS TEMP LVG -	315	272	EXCL. LKG	
AH LKG, %		6.16	GAS TEMP LVG -		264	INCL. LKG	
			AVE COLD END -	220	199		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	503		

SEC AH
TEST 35T : 02/25/92 : 0029-0132 : 70 MW : 11.5 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	614	AIR WT LVG -	923	554	MOIST -	5.1
GAS TEMP ENT -	676	590	GAS TEMP LVG -	315	270	EXCL. LKG	
AH LKG, %		5.70	GAS TEMP LVG -		263	INCL. LKG	
			AVE COLD END -	220	198		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	499		

SEC AH
TEST 35T : 02/25/92 : 0029-0132 : 70 MW : 11.5 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	620	AIR WT LVG -	923	560	MOIST -	5.1
GAS TEMP ENT -	676	590	GAS TEMP LVG -	315	270	EXCL. LKG	
AH LKG, %		5.70	GAS TEMP LVG -		263	INCL. LKG	
			AVE COLD END -	220	198		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	498		

SEC AH
TEST 39T : 02/26/91 : 0005-0201 : 70 MW : 11.5 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	617	AIR WT LVG -	923	557	MOIST -	5.1
GAS TEMP ENT -	676	596	GAS TEMP LVG -	315	272	EXCL. LKG	
AH LKG, %		5.88	GAS TEMP LVG -		264	INCL. LKG	
			AVE COLD END -	220	199		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	503		

SEC AH
TEST 39T : 02/26/91 : 0005-0201 : 70 MW : 11.5 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	623	AIR WT LVG -	923	563	MOIST -	5.1
GAS TEMP ENT -	676	596	GAS TEMP LVG -	315	272	EXCL. LKG	
AH LKG, %		5.88	GAS TEMP LVG -		265	INCL. LKG	
			AVE COLD END -	220	199		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	503		

SEC AH
TEST 1A : 03/31/91 : 1435-1642 : 68 MW : NO REBURN

JDR060192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	601	AIR WT LVG -	923	542	MOIST -	5.1
GAS TEMP ENT -	676	656	GAS TEMP LVG -	315	290	EXCL. LKG	
AH LKG, %		6.93	GAS TEMP LVG -		280	INCL. LKG	
			AVE COLD END -	220	208		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	554		

SEC AH
TEST 1A : 03/31/91 : 1435-1642 : 68 MW : NO REBURN

JDR060192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	604	AIR WT LVG -	923	545	MOIST -	5.1
GAS TEMP ENT -	676	656	GAS TEMP LVG -	315	290	EXCL. LKG	
AH LKG, %		6.93	GAS TEMP LVG -		280	INCL. LKG	
			AVE COLD END -	220	208		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	554		

SEC AH
TEST 19B : 05/01/92 : 0115-0157 : 60 MW : 8 TPH : .944 RBN STOIC
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	542	AIR WT LVG -	923	489	MOIST -	5.2
GAS TEMP ENT -	676	607	GAS TEMP LVG -	315	272	EXCL. LKG	
AH LKG, %		14.20	GAS TEMP LVG -		254	INCL. LKG	
			AVE COLD END -	220	199		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	516		

SEC AH
TEST 19B : 05/01/92 : 0115-0157 : 60 MW : 8 TPH : .944 RBN STOIC
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	552	AIR WT LVG -	923	498	MOIST -	5.2
GAS TEMP ENT -	676	607	GAS TEMP LVG -	315	272	EXCL. LKG	
AH LKG, %		14.20	GAS TEMP LVG -		255	INCL. LKG	
			AVE COLD END -	220	199		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	516		

SEC AH
TEST 22B : 05/06/92 : 1636-1809 : 60 MW : AFTER RAMP DOWN IN AUTO
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	559	AIR WT LVG -	923	505	MOIST -	5.2
GAS TEMP ENT -	676	592	GAS TEMP LVG -	315	268	EXCL. LKG	
AH LKG, %		9.66	GAS TEMP LVG -		256	INCL. LKG	
			AVE COLD END -	220	197		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	503		

SEC AH
TEST 22B : 05/06/92 : 1636-1809 : 60 MW : AFTER RAMP DOWN IN AUTO
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	549	AIR WT LVG -	923	496	MOIST -	5.2
GAS TEMP ENT -	676	592	GAS TEMP LVG -	315	268	EXCL. LKG	
AH LKG, %		9.66	GAS TEMP LVG -		256	INCL. LKG	
			AVE COLD END -	220	197		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	504		

SEC AH
TEST 22B : 05/06/92 : 1636-1809 : 60 MW : AFTER RAMP DOWN IN AUTO
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	559	AIR WT LVG -	923	505	MOIST -	5.2
GAS TEMP ENT -	676	592	GAS TEMP LVG -	315	268	EXCL. LKG	
AH LKG, %		9.66	GAS TEMP LVG -		256	INCL. LKG	
			AVE COLD END -	220	197		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	503		

SEC AH
TEST 15A : 04/23/92 : 2241-0045 : 59 MW : 8 TPH: 160 RPM: LOW STOIC
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	531	AIR WT LVG -	923	479	MOIST -	5.1
GAS TEMP ENT -	676	584	GAS TEMP LVG -	315	264	EXCL. LKG	
AH LKG, %		10.01	GAS TEMP LVG -		252	INCL. LKG	
			AVE COLD END -	220	195		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	498		

SEC AH
TEST 15A : 04/23/92 : 2241-0045 : 59 MW : 8 TPH: 160 RPM: LOW STOIC
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	538	AIR WT LVG -	923	486	MOIST -	5.1
GAS TEMP ENT -	676	584	GAS TEMP LVG -	315	265	EXCL. LKG	
AH LKG, %		10.01	GAS TEMP LVG -		252	INCL. LKG	
			AVE COLD END -	220	195		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	498		

SEC AH
TEST 44T : 02/27/91 : 2103-2124 : 66 MW :10 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	582	AIR WT LVG -	923	525	MOIST -	5.1
GAS TEMP ENT -	676	587	GAS TEMP LVG -	315	267	EXCL. LKG	
AH LKG, %		6.22	GAS TEMP LVG -		260	INCL. LKG	
			AVE COLD END -	220	197		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	497		

SEC AH
TEST 44T : 02/27/91 : 2103-2124 : 66 MW :10 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	589	AIR WT LVG -	923	532	MOIST -	5.1
GAS TEMP ENT -	676	587	GAS TEMP LVG -	315	268	EXCL. LKG	
AH LKG, %		6.22	GAS TEMP LVG -		260	INCL. LKG	
			AVE COLD END -	220	197		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	497		

SEC AH
TEST 48T : 03/03/91 : 2206-2349 : 57 MW : 7.9 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	503	AIR WT LVG -	923	454	MOIST -	5.2
GAS TEMP ENT -	676	565	GAS TEMP LVG -	315	257	EXCL. LKG	
AH LKG, %		6.22	GAS TEMP LVG -		250	INCL. LKG	
			AVE COLD END -	220	191		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	484		

SEC AH
TEST 48T : 03/03/91 : 2206-2349 : 57 MW : 7.9 TPH : HIGH STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	511	AIR WT LVG -	923	461	MOIST -	5.2
GAS TEMP ENT -	676	565	GAS TEMP LVG -	315	257	EXCL. LKG	
AH LKG, %		6.22	GAS TEMP LVG -		250	INCL. LKG	
			AVE COLD END -	220	192		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	483		

SEC AH
TEST 30T : 02/23/91 : 0859-0930 : 56 MW : NO REBURN

JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	503	AIR WT LVG -	923	454	MOIST -	5.1
GAS TEMP ENT -	676	575	GAS TEMP LVG -	315	260	EXCL. LKG	
AH LKG, %		1.13	GAS TEMP LVG -		259	INCL. LKG	
			AVE COLD END -	220	193		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	492		

SEC AH
TEST 30T : 02/23/91 : 0859-0930 : 56 MW : NO REBURN

JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	504	AIR WT LVG -	923	455	MOIST -	5.1
GAS TEMP ENT -	676	575	GAS TEMP LVG -	315	260	EXCL. LKG	
AH LKG, %		1.13	GAS TEMP LVG -		259	INCL. LKG	
			AVE COLD END -	220	193		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	492		

SEC AH
TEST 43T : 02/27/91 : 0420-0532 : 55 MW : 8 TPH : MED STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	488	AIR WT LVG -	923	440	MOIST -	5.2
GAS TEMP ENT -	676	566	GAS TEMP LVG -	315	257	EXCL. LKG	
AH LKG, %		6.70	GAS TEMP LVG -		249	INCL. LKG	
			AVE COLD END -	220	191		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	485		

SEC AH
TEST 43T : 02/27/91 : 0420-0532 : 55 MW : 8 TPH : MED STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	497	AIR WT LVG -	923	449	MOIST -	5.2
GAS TEMP ENT -	676	566	GAS TEMP LVG -	315	257	EXCL. LKG	
AH LKG, %		6.70	GAS TEMP LVG -		249	INCL. LKG	
			AVE COLD END -	220	191		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	485		

SEC AH
TEST 40T : 02/26/91 : 0535-0552 : 55 MW : 8.4 TPH : HIGH CYC STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	485	AIR WT LVG -	923	438	MOIST -	5.2
GAS TEMP ENT -	676	588	GAS TEMP LVG -	315	263	EXCL. LKG	
AH LKG, %		6.31	GAS TEMP LVG -		255	INCL. LKG	
			AVE COLD END -	220	194		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	503		

SEC AH
TEST 40T : 02/26/91 : 0535-0552 : 55 MW : 8.4 TPH : HIGH CYC STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	494	AIR WT LVG -	923	446	MOIST -	5.2
GAS TEMP ENT -	676	588	GAS TEMP LVG -	315	263	EXCL. LKG	
AH LKG, %		6.31	GAS TEMP LVG -		255	INCL. LKG	
			AVE COLD END -	220	195		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	503		

SEC AH
TEST 41T : 02/26/91 : 0559-0610 : 55 MW : 8.4 TPH : LOW CYC STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	480	AIR WT LVG -	923	434	MOIST -	5.2
GAS TEMP ENT -	676	589	GAS TEMP LVG -	315	263	EXCL. LKG	
AH LKG, %		6.29	GAS TEMP LVG -		255	INCL. LKG	
			AVE COLD END -	220	194		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	505		

SEC AH
TEST 41T : 02/26/91 : 0559-0610 : 55 MW : 8.4 TPH : LOW CYC STOICH
JDR-050192

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	489	AIR WT LVG -	923	442	MOIST -	5.2
GAS TEMP ENT -	676	589	GAS TEMP LVG -	315	264	EXCL. LKG	
AH LKG, %		6.29	GAS TEMP LVG -		256	INCL. LKG	
			AVE COLD END -	220	195		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	505		

SEC AH
TEST 14A : 04/22/92 : 2232-0036 : 55 MW : 8 TPH : 160 RPM: HIGH STOIC
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	507	AIR WT LVG -	923	458	MOIST -	5.1
GAS TEMP ENT -	676	566	GAS TEMP LVG -	315	257	EXCL. LKG	
AH LKG, %		13.18	GAS TEMP LVG -		243	INCL. LKG	
			AVE COLD END -	220	192		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	484		

SEC AH
TEST 14A : 04/22/92 : 2232-0036 : 55 MW : 8 TPH : 160 RPM: HIGH STOIC
JDR-060492

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	515	AIR WT LVG -	923	465	MOIST -	5.1
GAS TEMP ENT -	676	566	GAS TEMP LVG -	315	258	EXCL. LKG	
AH LKG, %		13.18	GAS TEMP LVG -		243	INCL. LKG	
			AVE COLD END -	220	192		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	483		

SEC AH
TEST 19A : 04/29/92 : 1745-1859 : 82 MW : CONTROLS AUTO WITH CASCADE
JDR-070292

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	734	AIR WT LVG -	923	663	MOIST -	5.1
GAS TEMP ENT -	676	646	GAS TEMP LVG -	315	293	EXCL. LKG	
AH LKG, %		9.04	GAS TEMP LVG -		280	INCL. LKG	
			AVE COLD END -	220	210		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	539		

SEC AH
TEST 19A : 04/29/92 : 1745-1859 : 82 MW : CONTROLS AUTO WITH CASCADE
JDR-070292

	BASE	NEW		BASE	NEW		
GAS WT ENT -	1022	744	AIR WT LVG -	923	672	MOIST -	5.1
GAS TEMP ENT -	676	646	GAS TEMP LVG -	315	294	EXCL. LKG	
AH LKG, %		9.04	GAS TEMP LVG -		281	INCL. LKG	
			AVE COLD END -	220	210		
AIR TEMP ENT -	126	126	AIR TEMP LVG -	552	538		

APPENDIX NO. 13

1990 Baseline Test Data Summary
Re-evaluation with Revised Gas Recirculation Flows

1990 BASELINE TEST DATA SUMMARY

	TEST MW	DATE MO DAY YEAR	LOAD MW	STEAM FLOW KLB/HR	SH OUT TEMP	RH OUT TEMP	SH SPRAY FLOW KLB/HR	RH SPRAY FLOW KLB/HR	CYCLONE COAL FLOW KLB/HR	% OF MAX CYCLONE INPUT	CYC IN SERV	REBURN INPUT %	REBURN INPUT KLB/HR	ROTARY CLASS. RPM	EXCESS AIR %	REBURN STOICH	CYCLONE STOICH	ACTUAL FLYASH SPLIT %	ADJUSTED FLYASH SPLIT %
1	1	5 7 90	111	791.40	999	1000	60.07	26.50	95.70	99.69	3	0.00	0.00	0	24.30	0.0000	0.0000	0.00	0.00
2	2A	5 8 90	111	790.80	999	1000	62.81	25.75	96.80	100.83	3	0.00	0.00	0	23.50	0.0000	0.0000	5.37	5.37
3	2	5 8 90	111	784.20	999	1001	56.84	20.25	94.50	98.44	3	0.00	0.00	0	21.80	0.0000	0.0000	0.00	0.00
4	3A	5 9 90	112	797.00	999	1000	58.75	25.50	96.30	100.31	3	0.00	0.00	0	22.00	0.0000	0.0000	5.69	5.69
5	3	5 9 90	113	807.30	1003	1002	65.56	16.25	96.40	100.42	3	0.00	0.00	0	21.30	0.0000	0.0000	0.00	0.00
6	4-1	5 10 90	111	789.90	999	1005	38.21	10.65	93.90	97.61	3	0.00	0.00	0	12.10	0.0000	0.0000	0.00	0.00
7	4A	5 10 90	112	793.90	999	1001	41.50	15.03	95.00	98.96	3	0.00	0.00	0	12.20	0.0000	0.0000	5.79	5.79
8	4-2	5 10 90	111	792.80	1000	1000	16.14	10.91	94.50	98.44	3	0.00	0.00	0	12.20	0.0000	0.0000	0.00	0.00
9	5A	5 11 90	112	793.00	999	1002	26.88	7.00	93.40	97.29	3	0.00	0.00	0	10.00	0.0000	0.0000	5.22	5.22
10	5	5 11 90	112	801.20	998	999	20.74	7.50	94.10	98.02	3	0.00	0.00	0	9.90	0.0000	0.0000	0.00	0.00
11	6A	5 14 90	111	786.50	998	999	27.59	11.18	93.10	96.98	3	0.00	0.00	0	10.40	0.0000	0.0000	10.60	10.60
12	6	5 14 90	112	797.70	998	1000	31.25	12.09	94.10	98.02	3	0.00	0.00	0	9.70	0.0000	0.0000	0.00	0.00
13	7A	5 15 90	111	780.10	998	1002	41.15	14.73	93.10	96.98	3	0.00	0.00	0	17.30	0.0000	0.0000	6.82	6.82
14	7	5 15 90	110	780.50	998	999	43.83	15.43	93.30	97.19	3	0.00	0.00	0	17.20	0.0000	0.0000	0.00	0.00
15	8A	5 16 90	111	781.40	999	1001	49.33	19.01	93.70	97.60	3	0.00	0.00	0	16.80	0.0000	0.0000	6.33	6.33
16	8A1	5 16 90	110	777.10	999	1001	48.14	20.72	93.70	97.60	3	0.00	0.00	0	17.10	0.0000	0.0000	0.00	0.00
17	8	5 16 90	110	777.90	999	1002	42.71	15.17	93.20	97.08	3	0.00	0.00	0	17.10	0.0000	0.0000	0.00	0.00
18	9A	5 17 90	110	780.00	999	1002	43.34	24.02	94.30	98.23	3	0.00	0.00	0	17.00	0.0000	0.0000	8.79	8.79
19	9	5 17 90	110	781.40	999	1000	51.28	26.21	94.70	98.65	3	0.00	0.00	0	17.10	0.0000	0.0000	0.00	0.00
20	10A	5 18 90	81	535.70	998	1003	10.61	0.00	66.10	68.85	3	0.00	0.00	0	17.30	0.0000	0.0000	8.92	8.92
21	10	5 18 90	81	533.50	998	1002	4.73	0.00	65.90	68.65	3	0.00	0.00	0	16.70	0.0000	0.0000	0.00	0.00
22	11A	5 21 90	82	537.70	998	999	8.42	0.00	66.40	69.17	3	0.00	0.00	0	15.10	0.0000	0.0000	9.48	9.48
23	11	5 21 90	82	541.10	999	1003	6.53	0.00	66.90	69.69	3	0.00	0.00	0	15.00	0.0000	0.0000	0.00	0.00
24	12A	5 22 90	82	542.40	998	997	19.19	0.00	66.70	69.48	3	0.00	0.00	0	14.70	0.0000	0.0000	11.53	11.53
25	12	5 22 90	82	540.60	998	1000	28.14	0.00	66.80	69.58	3	0.00	0.00	0	16.90	0.0000	0.0000	0.00	0.00
26	13A	5 23 90	53	339.30	998	978	1.98	0.00	43.90	68.59	2	0.00	0.00	0	15.90	0.0000	0.0000	28.27	28.27
27	13	5 23 90	53	340.50	995	983	3.79	0.00	44.00	68.75	2	0.00	0.00	0	15.90	0.0000	0.0000	0.00	0.00
28	14A	5 24 90	53	341.90	981	955	1.84	0.00	43.80	68.44	2	0.00	0.00	0	15.90	0.0000	0.0000	26.32	26.32
29	14	5 24 90	53	342.90	976	956	1.62	0.00	43.80	68.44	2	0.00	0.00	0	16.00	0.0000	0.0000	0.00	0.00
30	15A	5 25 90	53	343.30	975	950	2.16	0.00	43.90	68.59	2	0.00	0.00	0	15.80	0.0000	0.0000	23.54	23.54
31	16	5 30 90	110	785.80	1000	1001	31.18	14.55	93.80	97.71	3	0.00	0.00	0	17.30	0.0000	0.0000	0.00	0.00
32	17	5 30 90	110	782.80	999	1001	25.39	11.96	93.10	96.98	3	0.00	0.00	0	13.80	0.0000	0.0000	0.00	0.00
33	18	5 30 90	110	779.40	1000	1001	12.70	0.00	91.40	95.21	3	0.00	0.00	0	10.70	0.0000	0.0000	0.00	0.00
34	19	5 30 90	111	787.60	1001	1001	20.64	10.74	93.20	97.08	3	0.00	0.00	0	9.40	0.0000	0.0000	0.00	0.00
35	20	5 30 90	111	789.80	999	999	22.99	13.05	63.80	66.46	3	0.00	0.00	0	9.10	0.0000	0.0000	0.00	0.00
36	21	5 30 90	111	796.00	999	1000	26.48	16.60	94.70	98.65	3	0.00	0.00	0	8.90	0.0000	0.0000	0.00	0.00
37	22	5 30 90	112	797.20	1002	1001	35.83	18.37	95.00	98.96	3	0.00	0.00	0	8.80	0.0000	0.0000	0.00	0.00
38	23	5 30 90	112	799.00	1001	1002	43.88	21.24	95.70	99.69	3	0.00	0.00	0	8.70	0.0000	0.0000	0.00	0.00
39	24	5 30 90	112	800.30	1000	1000	45.83	23.10	96.00	100.00	3	0.00	0.00	0	8.70	0.0000	0.0000	0.00	0.00
40	25	5 30 90	112	803.00	1000	998	52.28	25.80	96.50	100.52	3	0.00	0.00	0	8.40	0.0000	0.0000	0.00	0.00

1990 BASELINE TEST DATA SUMMARY

	TEST MW	DATE MO DAY YEAR	LOAD MW	STEAM FLOW KLB/HR	SH OUT TEMP	RH OUT TEMP	SH SPRAY FLOW KLB/HR	RH SPRAY FLOW KLB/HR	CYCLON COAL FLOW KLB/HR	% OF MAX CYCLON INPUT	CYC IN SERV	REBURN INPUT %	REBURN INPUT KLB/HR	ROTARY CLASS. RPM	EXCESS AIR %	REBURN STOICH	CYCLONE STOICH	ACTUAL FLYASH SPLIT %	ADJUSTED FLYASH SPLIT %
41	26	5 30 90	112	807.00	995	997	64.83	26.71	96.20	100.21	3	0.00	0.00	0	12.80	0.0000	0.0000	0.00	0.00
42	27	5 31 90	110	783.70	999	999	54.08	19.76	94.10	98.02	3	0.00	0.00	0	17.00	0.0000	0.0000	0.00	0.00
43	28	5 31 90	101	696.90	1000	1002	37.89	11.72	85.00	88.54	3	0.00	0.00	0	16.20	0.0000	0.0000	0.00	0.00
44	29	5 31 90	69	449.40	995	1002	3.14	0.00	57.10	59.48	3	0.00	0.00	0	17.40	0.0000	0.0000	0.00	0.00
45	30	6 1 90	101	702.90	999	997	34.45	8.82	84.60	88.13	3	0.00	0.00	0	16.80	0.0000	0.0000	0.00	0.00
46	31	6 1 90	100	685.30	998	997	21.45	0.00	82.80	86.25	3	0.00	0.00	0	9.90	0.0000	0.0000	0.00	0.00
47	32	6 1 90	100	696.70	997	996	15.74	0.00	83.00	86.46	3	0.00	0.00	0	7.30	0.0000	0.0000	0.00	0.00
48	33A	6 5 90	111	786.80	997	1000	54.32	26.54	120.50	105.70	3	0.00	0.00	0	16.20	0.0000	0.0000	0.00	0.00
49	34A	6 6 90	111	784.40	997	1001	56.89	26.78	120.30	105.53	3	0.00	0.00	0	15.70	0.0000	0.0000	0.00	0.00
50	34	6 6 90	111	785.30	997	1001	51.78	26.72	120.20	105.44	3	0.00	0.00	0	16.10	0.0000	0.0000	0.00	0.00
51	35	6 7 90	110	786.30	997	999	56.48	27.00	121.00	106.14	3	0.00	0.00	0	15.10	0.0000	0.0000	0.00	0.00

1990 BASELINE TEST DATA SUMMARY

	TEST MW	ACTUAL UBC LB/ 100LB	ADJUSTED UBC LB/ 100LB	UBC EFF LOSS %	GAS WT. WITHOUT RECIRC. MLB/HR	TOTAL GR MLB/HR	GR TO REBURN KLB/HR	AS TESTED EFF %	CORR. EFF %	ACT. FEGT	TOTAL SEC NF	SEC IN NF	SEC OUT NF	PTI NF	RH NF	ECON NF	DRY GAS LOSS %	EXIT GAS TEMP CORR
1	1	0.00	0.00	0.11	1113.0	0.00	0.0	87.58	88.36	2212	0.99	1.07	0.91	0.92	1.22	0.86	4.27	320.30
2	2A	0.03	0.03	0.11	1119.0	0.00	0.0	87.35	88.03	2249	0.88	0.93	0.83	0.89	1.00	0.78	4.57	333.90
3	2	0.00	0.00	0.11	1076.0	0.00	0.0	87.42	87.98	2248	0.93	1.06	0.81	0.85	0.95	0.75	4.62	336.30
4	3A	0.04	0.04	0.12	1102.0	0.00	0.0	87.55	88.27	2239	0.94	1.02	0.87	0.93	1.01	0.84	4.34	323.50
5	3	0.00	0.00	0.12	1098.00	0.00	0.0	87.37	88.11	2253	1.03	1.15	0.94	0.94	0.89	0.81	4.49	330.40
6	4-1	0.00	0.00	0.15	990.0	0.00	0.0	87.58	88.26	2265	0.98	1.08	0.88	0.86	0.99	0.79	4.32	322.70
7	4A	0.04	0.04	0.15	1003.0	0.00	0.0	87.32	87.99	2302	0.89	0.97	0.83	0.81	0.92	0.74	4.57	333.80
8	4-2	0.00	0.00	0.15	996.0	0.00	0.0	87.27	87.98	2232	0.84	0.88	0.79	0.78	0.91	0.75	4.58	334.20
9	5A	0.07	0.07	0.27	967.0	0.00	0.0	87.92	88.32	2221	0.94	1.01	0.86	0.93	1.16	0.85	4.15	315.10
10	5	0.00	0.00	0.27	973.0	0.00	0.0	87.97	88.29	2210	0.96	1.04	0.87	0.90	1.10	0.82	4.19	316.80
11	6A	0.12	0.12	0.26	969.0	0.00	0.0	88.02	88.45	2217	1.00	1.10	0.90	0.96	1.10	0.85	4.04	309.90
12	6	0.00	0.00	0.26	976.0	0.00	0.0	88.22	88.43	2239	0.97	1.09	0.86	0.97	1.04	0.86	4.07	311.40
13	7A	0.06	0.06	0.18	1026.0	0.00	0.0	87.98	88.39	2208	0.99	1.07	0.92	0.94	1.07	0.83	4.17	315.80
14	7	0.00	0.00	0.18	1027.0	0.00	0.0	87.75	88.28	2221	0.93	1.01	0.86	0.95	1.00	0.80	4.27	320.30
15	8A	0.06	0.06	0.21	1029.0	0.00	0.0	87.89	88.35	2239	1.01	1.12	0.92	0.95	1.07	0.85	4.19	316.80
16	8A1	0.00	0.00	0.21	1032.0	0.00	0.0	87.74	88.24	2240	0.97	1.08	0.89	0.92	1.04	0.85	4.28	320.80
17	8	0.00	0.00	0.21	1026.0	0.00	0.0	87.61	88.06	2237	0.96	1.07	0.86	0.86	0.96	0.79	4.44	328.00
18	9A	0.08	0.08	0.20	1033.0	0.00	0.0	87.87	88.40	2239	0.92	0.98	0.87	0.97	1.09	0.87	4.15	315.10
19	9	0.00	0.00	0.20	1039.0	0.00	0.0	87.87	88.47	2250	0.88	0.93	0.84	1.05	1.09	0.91	4.09	312.30
20	10A	0.07	0.07	0.18	727.0	72.00	0.0	88.04	88.81	1978	1.10	1.20	1.00	1.19	0.98	0.80	3.50	285.10
21	10	0.00	0.00	0.18	721.0	90.00	0.0	88.11	88.67	1936	1.02	1.09	0.95	1.12	0.93	0.75	3.62	290.80
22	11A	0.09	0.09	0.21	717.0	75.00	0.0	87.94	88.73	1950	0.96	1.02	0.90	0.99	1.14	0.79	3.54	287.10
23	11	0.00	0.00	0.21	723.0	78.00	0.0	87.82	88.55	1966	0.91	0.97	0.85	0.91	1.06	0.72	3.72	295.50
24	12A	0.13	0.13	0.27	718.0	143.00	0.0	87.98	88.62	1912	1.10	1.24	0.98	0.96	1.23	0.75	3.60	289.80
25	12	0.00	0.00	0.27	732.0	162.00	0.0	87.68	88.42	1925	1.16	1.32	1.03	0.90	1.12	0.72	3.78	298.00
26	13A	0.25	0.25	0.40	477.0	369.00	0.0	87.45	88.45	1463	1.25	1.35	1.17	1.20	1.23	0.82	3.09	267.10
27	13	0.00	0.00	0.40	479.0	357.00	0.0	87.51	88.51	1480	1.26	1.35	1.19	1.12	1.37	0.85	3.04	264.50
28	14A	0.19	0.19	0.32	477.0	374.00	0.0	87.21	88.73	1421	1.46	1.59	1.34	1.39	1.41	0.91	2.91	258.60
29	14	0.00	0.00	0.32	478.0	364.00	0.0	87.41	88.71	1429	1.34	1.53	1.19	1.29	1.40	0.91	2.93	259.60
30	15A	0.24	0.24	0.46	477.0	320.00	0.0	87.17	88.58	1463	1.38	1.56	1.22	1.15	1.48	0.86	2.92	259.20
31	16	0.00	0.00	0.20	1029.0	0.00	0.0	87.98	88.42	2187	0.97	1.04	0.90	1.00	1.00	0.87	4.13	314.00
32	17	0.00	0.00	0.23	994.0	0.00	0.0	87.97	88.36	2193	0.94	1.02	0.87	0.99	1.00	0.87	4.15	315.20
33	18	0.00	0.00	0.23	951.0	0.00	0.0	88.09	88.30	2178	0.91	0.99	0.84	0.91	1.00	0.83	4.20	317.40
34	19	0.00	0.00	0.23	959.0	92.00	0.0	88.28	88.17	2131	1.00	1.10	0.90	0.92	1.01	0.78	4.33	232.20
35	20	0.00	0.00	0.23	655.0	91.00	0.0	87.83	88.07	2146	0.98	1.08	0.89	0.90	1.00	0.77	4.08	312.00
36	21	0.00	0.00	0.23	970.0	104.00	0.0	88.25	88.00	2161	0.96	1.07	0.87	0.87	1.00	0.76	4.49	330.70
37	22	0.00	0.00	0.23	974.0	153.00	0.0	88.17	87.87	2148	0.99	1.09	0.90	0.85	1.01	0.73	4.61	335.80
38	23	0.00	0.00	0.23	980.0	216.00	0.0	88.07	87.79	2107	1.03	1.15	0.93	0.88	1.04	0.69	4.68	339.30
39	24	0.00	0.00	0.23	983.0	232.00	0.0	88.00	87.74	2114	1.01	1.14	0.90	0.83	0.99	0.73	4.73	341.30
40	25	0.00	0.00	0.23	987.0	246.00	0.0	87.94	87.65	2135	0.99	1.12	0.89	0.81	0.96	0.72	4.81	345.20

1990 BASELINE TEST DATA SUMMARY

	TEST MW	ACTUAL UBC LB/ 100LB	ADJUSTED UBC LB/ 100LB	UBC EFF LOSS %	GAS WT. WITHOUT RECIRC. MLB/HR	TOTAL GR MLB/HR	GR TO REBURN KLB/HR	AS TESTED EFF %	CORR. EFF %	ACT. FEGT	TOTAL SEC NF	SEC IN NF	SEC OUT NF	PTI NF	RH NF	ECON NF	DRY GAS LOSS %	EXIT GAS TEMP CORR
41	26	0.00	0.00	0.23	1019.0	220.00	0.0	87.69	87.55	2157	0.97	1.11	0.85	0.81	0.93	0.73	4.90	349.20
42	27	0.00	0.00	0.20	1033.0	0.00	0.0	87.80	88.31	2254	0.91	0.98	0.85	0.99	1.01	0.84	4.24	319.20
43	28	0.00	0.00	0.20	927.0	0.00	0.0	87.46	88.07	2251	0.80	0.84	0.77	0.84	0.86	0.74	4.37	324.70
44	29	0.00	0.00	0.22	628.0	120.00	0.0	87.32	88.57	1836	0.89	0.94	0.84	1.01	0.98	0.69	3.51	286.00
45	30	0.00	0.00	0.20	931.0	0.00	0.0	87.90	88.48	2172	0.95	1.01	0.87	0.97	0.99	0.84	3.99	307.50
46	31	0.00	0.00	0.20	862.0	0.00	0.0	87.97	88.48	2182	0.89	0.96	0.83	0.94	0.97	0.81	3.97	306.60
47	32	0.00	0.00	0.20	845.0	0.00	0.0	88.08	88.51	2189	0.87	0.93	0.82	0.92	0.99	0.79	3.96	306.30
48	33A	0.00	0.00	0.37	1076.0	0.00	0.0	85.59	87.94	2231	0.86	0.94	0.79	0.95	1.01	0.79	4.41	327.30
49	34A	0.00	0.00	0.50	1070.0	0.00	0.0	85.44	87.77	2236	0.88	0.98	0.80	0.95	0.98	0.72	4.45	329.20
50	34	0.00	0.00	0.50	1072.0	0.00	0.0	85.66	87.78	2227	0.85	0.95	0.77	0.96	1.00	0.75	4.44	328.80
51	35	0.00	0.00	0.43	1071.0	0.00	0.0	85.55	87.73	2257	0.81	0.87	0.77	0.87	1.08	0.74	4.55	333.80

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 2A

TOTAL COAL FLOW	KLB/HR	96.80
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	96.80
ASH IN FUEL	%	4.96
CARBON IN FLYASH	%	8.65
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.14
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	1119.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 259.57
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 22.45

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4801.28

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4564.16
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 9.13

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4832.86

FLYASH % = 5.37
BOTTOM ASH % = 94.63

MASS ASH FROM CYCLONES = 4801.28
% CYCLONE ASH AS BOTTOM ASH = 95.25
% CYCLONE ASH AS FLYASH = 4.75

WEIGHT AVG C IN ASH = .65
UNBURNED CARBON % = .03

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 3A

TOTAL COAL FLOW	KLB/HR	96.30
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	96.30
ASH IN FUEL	%	4.96
CARBON IN FLYASH	%	9.77
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.15
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	1102.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 273.91
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 26.76

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4776.48

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4529.33
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 9.06

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4812.30

FLYASH % = 5.69
BOTTOM ASH % = 94.31

MASS ASH FROM CYCLONES = 4776.48
% CYCLONE ASH AS BOTTOM ASH = 95.02
% CYCLONE ASH AS FLYASH = 4.98

WEIGHT AVG C IN ASH = .74
UNBURNED CARBON % = .04

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 4A

TOTAL COAL FLOW	KLB/HR	95.00
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	95.00
ASH IN FUEL	%	4.96
CARBON IN FLYASH	%	12.15
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.17
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	1003.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 275.39
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 33.46

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4712.00

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4470.07
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 8.94

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4754.40

FLYASH % = 5.79
BOTTOM ASH % = 94.21

MASS ASH FROM CYCLONES = 4712.00
% CYCLONE ASH AS BOTTOM ASH = 95.06
% CYCLONE ASH AS FLYASH = 4.94

WEIGHT AVG C IN ASH = .89
UNBURNED CARBON % = .04

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 5A

TOTAL COAL FLOW	KLB/HR	93.40
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	93.40
ASH IN FUEL	%	4.96
CARBON IN FLYASH	%	21.57
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.15
MOLE RATIO DRY/WET GAS		.90
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	967.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 245.00
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 52.85

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4632.64

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4440.49
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 8.88

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4694.37

FLYASH % = 5.22
BOTTOM ASH % = 94.78

MASS ASH FROM CYCLONES = 4632.64
% CYCLONE ASH AS BOTTOM ASH = 96.04
% CYCLONE ASH AS FLYASH = 3.96

WEIGHT AVG C IN ASH = 1.32
UNBURNED CARBON % = .07

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 6A

TOTAL COAL FLOW	KLB/HR	93.10
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	93.10
ASH IN FUEL	%	4.96
CARBON IN FLYASH	%	20.16
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.31
MOLE RATIO DRY/WET GAS		.90
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	969.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 500.91
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 100.98

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4617.76

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4217.83
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 8.44

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4727.18

FLYASH % = 10.60
BOTTOM ASH % = 89.40

MASS ASH FROM CYCLONES = 4617.76
% CYCLONE ASH AS BOTTOM ASH = 91.52
% CYCLONE ASH AS FLYASH = 8.48

WEIGHT AVG C IN ASH = 2.32
UNBURNED CARBON % = .12

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 7A

TOTAL COAL FLOW	KLB/HR	93.10
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	93.10
ASH IN FUEL	%	4.96
CARBON IN FLYASH	%	13.99
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.19
MOLE RATIO DRY/WET GAS		.90
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	1026.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 318.76
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 44.59

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4617.76

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4343.60
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 8.69

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4671.04

FLYASH % = 6.82
BOTTOM ASH % = 93.18

MASS ASH FROM CYCLONES = 4617.76
% CYCLONE ASH AS BOTTOM ASH = 94.25
% CYCLONE ASH AS FLYASH = 5.75

WEIGHT AVG C IN ASH = 1.14
UNBURNED CARBON % = .06

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 8A

TOTAL COAL FLOW	KLB/HR	93.70
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	93.70
ASH IN FUEL	%	4.96
CARBON IN FLYASH	%	16.81
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.18
MOLE RATIO DRY/WET GAS		.90
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	1029.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 297.97
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 50.09

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4647.52

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4399.64
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 8.80

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4706.41

FLYASH % = 6.33
BOTTOM ASH % = 93.67

MASS ASH FROM CYCLONES = 4647.52
% CYCLONE ASH AS BOTTOM ASH = 94.86
% CYCLONE ASH AS FLYASH = 5.14

WEIGHT AVG C IN ASH = 1.25
UNBURNED CARBON % = .06

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 9A

TOTAL COAL FLOW	KLB/HR	94.30
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	94.30
ASH IN FUEL	%	4.96
CARBON IN FLYASH	%	15.80
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.24
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	1033.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 417.58
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 65.98

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4677.28

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4325.68
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 8.65

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4751.91

FLYASH % = 8.79
BOTTOM ASH % = 91.21

MASS ASH FROM CYCLONES = 4677.28
% CYCLONE ASH AS BOTTOM ASH = 92.67
% CYCLONE ASH AS FLYASH = 7.33

WEIGHT AVG C IN ASH = 1.57
UNBURNED CARBON % = .08

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 10A

TOTAL COAL FLOW	KLB/HR	66.10
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	66.10
ASH IN FUEL	%	4.96
CARBON IN FLYASH	%	14.13
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.25
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	727.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 296.58
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 41.91

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3278.56

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3023.88
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 6.05

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3326.52

FLYASH % = 8.92
BOTTOM ASH % = 91.08

MASS ASH FROM CYCLONES = 3278.56
% CYCLONE ASH AS BOTTOM ASH = 92.42
% CYCLONE ASH AS FLYASH = 7.58

WEIGHT AVG C IN ASH = 1.44
UNBURNED CARBON % = .07

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 11A

TOTAL COAL FLOW	KLB/HR	66.40
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	66.40
ASH IN FUEL	%	4.96
CARBON IN FLYASH	%	16.19
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.27
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	717.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 317.74
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 51.44

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3293.44

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3027.14
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 6.05

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3350.94

FLYASH % = 9.48
BOTTOM ASH % = 90.52

MASS ASH FROM CYCLONES = 3293.44
% CYCLONE ASH AS BOTTOM ASH = 92.10
% CYCLONE ASH AS FLYASH = 7.90

WEIGHT AVG C IN ASH = 1.72
UNBURNED CARBON % = .09

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 12A

TOTAL COAL FLOW	KLB/HR	66.70
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	66.70
ASH IN FUEL	%	4.96
CARBON IN FLYASH	%	21.23
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.33
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGH.	KLB/HR	718.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 391.76
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 83.17

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3308.32

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2999.73
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 6.00

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3397.49

FLYASH % = 11.53
BOTTOM ASH % = 88.47

MASS ASH FROM CYCLONES = 3308.32
% CYCLONE ASH AS BOTTOM ASH = 90.85
% CYCLONE ASH AS FLYASH = 9.15

WEIGHT AVG C IN ASH = 2.62
UNBURNED CARBON % = .13

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 13A

TOTAL COAL FLOW	KLB/HR	43.90
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	43.90
ASH IN FUEL	%	4.96
CARBON IN FLYASH	%	16.38
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.82
MOLE RATIO DRY/WET GAS		.90
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	477.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 646.38
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 105.88

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2177.44

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1636.94
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 3.27

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 2286.59

FLYASH % = 28.27
BOTTOM ASH % = 71.73

MASS ASH FROM CYCLONES = 2177.44
% CYCLONE ASH AS BOTTOM ASH = 75.33
% CYCLONE ASH AS FLYASH = 24.67

WEIGHT AVG C IN ASH = 4.77
UNBURNED CARBON % = .25

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 14A

TOTAL COAL FLOW	KLB/HR	43.80
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	43.80
ASH IN FUEL	%	4.96
CARBON IN FLYASH	%	13.11
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.76
MOLE RATIO DRY/WET GAS		.90
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	477.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 593.09
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 77.75

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2172.48

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1657.15
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 3.31

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 2253.55

FLYASH % = 26.32
BOTTOM ASH % = 73.68

MASS ASH FROM CYCLONES = 2172.48
% CYCLONE ASH AS BOTTOM ASH = 76.43
% CYCLONE ASH AS FLYASH = 23.57

WEIGHT AVG C IN ASH = 3.60
UNBURNED CARBON % = .19

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 15A

TOTAL COAL FLOW	KLB/HR	43.90
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	43.90
ASH IN FUEL	%	4.96
CARBON IN FLYASH	%	18.69
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.68
MOLE RATIO DRY/WET GAS		.90
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	477.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 537.11
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 100.39

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2177.44

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1740.72
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 3.48

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 2281.31

FLYASH % = 23.54
BOTTOM ASH % = 76.46

MASS ASH FROM CYCLONES = 2177.44
% CYCLONE ASH AS BOTTOM ASH = 80.10
% CYCLONE ASH AS FLYASH = 19.90

WEIGHT AVG C IN ASH = 4.55
UNBURNED CARBON % = .24

APPENDIX NO. 14

Ash Split and Carbon Loss Calculations

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 5P

TOTAL COAL FLOW	KLB/HR	95.00
REBURN COAL FLOW	KLB/HR	28.27
CYCLONE COAL FLOW	KLB/HR	66.73
ASH IN FUEL	%	6.31
CARBON IN FLYASH	%	13.91
CARBON IN BOTTOM ASH	%	.01
ACUREX FLYASH CATCH	GR/DSCF	2.0700
MOLE RATIO DRY/WET GAS		.8981
BASE DENSITY OF GAS	LB/CFT	.0781
GAS WEIGHT	KLB/HR	1008.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 3427.73
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 476.80

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5994.50

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3043.57
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .30

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6471.60

FLYASH % = 52.97
BOTTOM ASH % = 47.03

MASS ASH FROM CYCLONES = 4210.66
% CYCLONE ASH AS BOTTOM ASH = 72.29
% CYCLONE ASH AS FLYASH = 27.71

WEIGHT AVG C IN ASH = 7.37
UNBURNED CARBON % = .50

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 6P

TOTAL COAL FLOW	KLB/HR	94.10
REBURN COAL FLOW	KLB/HR	28.39
CYCLONE COAL FLOW	KLB/HR	65.71
ASH IN FUEL	%	6.13
CARBON IN FLYASH	%	14.93
CARBON IN BOTTOM ASH	%	.26
ACUREX FLYASH CATCH	GR/DSCF	1.3400
MOLE RATIO DRY/WET GAS		.9076
BASE DENSITY OF GAS	LB/CFT	.0786
GAS WEIGHT	KLB/HR	1003.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2217.07
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 331.01

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5768.33

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3882.27
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 10.09

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6109.43

FLYASH % = 36.29
BOTTOM ASH % = 63.71

MASS ASH FROM CYCLONES = 4028.02
% CYCLONE ASH AS BOTTOM ASH = 96.63
% CYCLONE ASH AS FLYASH = 3.37

WEIGHT AVG C IN ASH = 5.58
UNBURNED CARBON % = .36

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 8P

TOTAL COAL FLOW	KLB/HR	92.60
REBURN COAL FLOW	KLB/HR	28.14
CYCLONE COAL FLOW	KLB/HR	64.46
ASH IN FUEL	%	6.13
CARBON IN FLYASH	%	14.29
CARBON IN BOTTOM ASH	%	.51
ACUREX FLYASH CATCH	GR/DSCF	2.3800
MOLE RATIO DRY/WET GAS		.9073
BASE DENSITY OF GAS	LB/CFT	.0786
GAS WEIGHT	KLB/HR	981.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 3850.14
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 550.18

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5676.38

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2376.43
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 12.12

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6238.68

FLYASH % = 61.71
BOTTOM ASH % = 38.29

MASS ASH FROM CYCLONES = 3951.40
% CYCLONE ASH AS BOTTOM ASH = 60.45
% CYCLONE ASH AS FLYASH = 39.55

WEIGHT AVG C IN ASH = 9.01
UNBURNED CARBON % = .61

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F1

TOTAL COAL FLOW	KLB/HR	66.90
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	66.90
ASH IN FUEL	%	6.65
CARBON IN FLYASH	%	13.20
CARBON IN BOTTOM ASH	%	.77
ACUREX FLYASH CATCH	GR/DSCF	.9872
MOLE RATIO DRY/WET GAS		.9101
BASE DENSITY OF GAS	LB/CFT	.0784
GAS WEIGHT	KLB/HR	710.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1162.35
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 153.43

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4448.85

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3439.93
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 26.49

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4628.77

FLYASH % = 25.11
BOTTOM ASH % = 74.89

MASS ASH FROM CYCLONES = 4448.85
% CYCLONE ASH AS BOTTOM ASH = 77.92
% CYCLONE ASH AS FLYASH = 22.08

WEIGHT AVG C IN ASH = 3.89
UNBURNED CARBON % = .27

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F4

TOTAL COAL FLOW	KLB/HR	66.70
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	66.70
ASH IN FUEL	%	6.48
CARBON IN FLYASH	%	3.73
CARBON IN BOTTOM ASH	%	.04
ACUREX FLYASH CATCH	GR/DSCF	1.0675
MOLE RATIO DRY/WET GAS		.9198
BASE DENSITY OF GAS	LB/CFT	.0787
GAS WEIGHT	KLB/HR	711.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1267.24
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 47.27

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4322.16

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3102.19
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 1.24

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4370.67

FLYASH % = 28.99
BOTTOM ASH % = 71.01

MASS ASH FROM CYCLONES = 4322.16
% CYCLONE ASH AS BOTTOM ASH = 71.80
% CYCLONE ASH AS FLYASH = 28.20

WEIGHT AVG C IN ASH = 1.11
UNBURNED CARBON % = .07

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F2

TOTAL COAL FLOW	KLB/HR	95.50
REBURN COAL FLOW	KLB/HR	29.04
CYCLONE COAL FLOW	KLB/HR	66.46
ASH IN FUEL	%	6.65
CARBON IN FLYASH	%	10.83
CARBON IN BOTTOM ASH	%	1.09
ACUREX FLYASH CATCH	GR/DSCF	1.6251
MOLE RATIO DRY/WET GAS		.9183
BASE DENSITY OF GAS	LB/CFT	.0788
GAS WEIGHT	KLB/HR	983.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2659.46
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 288.02

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 6350.75

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3979.31
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 43.37

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6682.14

FLYASH % = 39.80
BOTTOM ASH % = 60.20

MASS ASH FROM CYCLONES = 4419.59
% CYCLONE ASH AS BOTTOM ASH = 91.02
% CYCLONE ASH AS FLYASH = 8.98

WEIGHT AVG C IN ASH = 4.97
UNBURNED CARBON % = .35

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F3

TOTAL COAL FLOW	KLB/HR	96.10
REBURN COAL FLOW	KLB/HR	29.02
CYCLONE COAL FLOW	KLB/HR	67.08
ASH IN FUEL	%	6.65
CARBON IN FLYASH	%	8.67
CARBON IN BOTTOM ASH	%	.07
ACUREX FLYASH CATCH	GR/DSCF	1.4645
MOLE RATIO DRY/WET GAS		.9166
BASE DENSITY OF GAS	LB/CFT	.0787
GAS WEIGHT	KLB/HR	996.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2426.92
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 210.41

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 6390.65

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4174.14
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 2.92

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6603.99

FLYASH % = 36.75
BOTTOM ASH % = 63.25

MASS ASH FROM CYCLONES = 4460.82
% CYCLONE ASH AS BOTTOM ASH = 93.64
% CYCLONE ASH AS FLYASH = 6.36

WEIGHT AVG C IN ASH = 3.23
UNBURNED CARBON % = .22

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F5

TOTAL COAL FLOW	KLB/HR	95.20
REBURN COAL FLOW	KLB/HR	28.95
CYCLONE COAL FLOW	KLB/HR	66.25
ASH IN FUEL	%	6.48
CARBON IN FLYASH	%	8.80
CARBON IN BOTTOM ASH	%	.02
ACUREX FLYASH CATCH	GR/DSCF	1.3950
MOLE RATIO DRY/WET GAS		.9164
BASE DENSITY OF GAS	LB/CFT	.0788
GAS WEIGHT	KLB/HR	985.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2282.82
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 200.89

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 6168.96

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4087.03
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .82

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6370.67

FLYASH % = 35.83
BOTTOM ASH % = 64.17

MASS ASH FROM CYCLONES = 4293.00
% CYCLONE ASH AS BOTTOM ASH = 95.22
% CYCLONE ASH AS FLYASH = 4.78

WEIGHT AVG C IN ASH = 3.17
UNBURNED CARBON % = .21

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 1P

TOTAL COAL FLOW	KLB/HR	67.80
REBURN COAL FLOW	KLB/HR	22.34
CYCLONE COAL FLOW	KLB/HR	45.46
ASH IN FUEL	%	6.24
CARBON IN FLYASH	%	22.63
CARBON IN BOTTOM ASH	%	.02
ACUREX FLYASH CATCH	GR/DSCF	2.8100
MOLE RATIO DRY/WET GAS		.9084
BASE DENSITY OF GAS	LB/CFT	.0786
GAS WEIGHT	KLB/HR	717.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 3326.46
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 752.78

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4230.72

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1657.04
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .33

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4983.83

FLYASH % = 66.75
BOTTOM ASH % = 33.25

MASS ASH FROM CYCLONES = 2836.70
% CYCLONE ASH AS BOTTOM ASH = 58.43
% CYCLONE ASH AS FLYASH = 41.57

WEIGHT AVG C IN ASH = 15.11
UNBURNED CARBON % = 1.11

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 7P

TOTAL COAL FLOW	KLB/HR	68.60
REBURN COAL FLOW	KLB/HR	22.93
CYCLONE COAL FLOW	KLB/HR	45.67
ASH IN FUEL	%	6.13
CARBON IN FLYASH	%	13.60
CARBON IN BOTTOM ASH	%	.02
ACUREX FLYASH CATCH	GR/DSCF	1.2900
MOLE RATIO DRY/WET GAS		.9075
BASE DENSITY OF GAS	LB/CFT	.0786
GAS WEIGHT	KLB/HR	731.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1555.37
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 211.53

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4205.18

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2861.34
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .57

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4417.28

FLYASH % = 35.21
BOTTOM ASH % = 64.79

MASS ASH FROM CYCLONES = 2799.57
% CYCLONE ASH AS BOTTOM ASH = 102.23
% CYCLONE ASH AS FLYASH = -2.23

WEIGHT AVG C IN ASH = 4.80
UNBURNED CARBON % = .31

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 9P

TOTAL COAL FLOW	KLB/HR	69.80
REBURN COAL FLOW	KLB/HR	23.52
CYCLONE COAL FLOW	KLB/HR	46.28
ASH IN FUEL	%	6.13
CARBON IN FLYASH	%	23.80
CARBON IN BOTTOM ASH	%	.02
ACUREX FLYASH CATCH	GR/DSCF	2.8200
MOLE RATIO DRY/WET GAS		.9072
BASE DENSITY OF GAS	LB/CFT	.0786
GAS WEIGHT	KLB/HR	733.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 3408.28
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 811.17

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4278.74

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1681.63
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .34

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5090.25

FLYASH % = 66.96
BOTTOM ASH % = 33.04

MASS ASH FROM CYCLONES = 2836.96
% CYCLONE ASH AS BOTTOM ASH = 59.29
% CYCLONE ASH AS FLYASH = 40.71

WEIGHT AVG C IN ASH = 15.94
UNBURNED CARBON % = 1.16

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F7

TOTAL COAL FLOW	KLB/HR	71.00
REBURN COAL FLOW	KLB/HR	24.24
CYCLONE COAL FLOW	KLB/HR	46.76
ASH IN FUEL	%	6.40
CARBON IN FLYASH	%	16.78
CARBON IN BOTTOM ASH	%	.02
ACUREX FLYASH CATCH	GR/DSCF	1.5838
MOLE RATIO DRY/WET GAS		.9052
BASE DENSITY OF GAS	LB/CFT	.0783
GAS WEIGHT	KLB/HR	736.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1925.14
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 323.04

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4544.00

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2941.90
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .59

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4867.63

FLYASH % = 39.55
BOTTOM ASH % = 60.45

MASS ASH FROM CYCLONES = 2992.64
% CYCLONE ASH AS BOTTOM ASH = 98.32
% CYCLONE ASH AS FLYASH = 1.68

WEIGHT AVG C IN ASH = 6.65
UNBURNED CARBON % = .46

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F8

TOTAL COAL FLOW	KLB/HR	71.00
REBURN COAL FLOW	KLB/HR	24.17
CYCLONE COAL FLOW	KLB/HR	46.83
ASH IN FUEL	%	6.40
CARBON IN FLYASH	%	16.55
CARBON IN BOTTOM ASH	%	.02
ACUREX FLYASH CATCH	GR/DSCF	1.5017
MOLE RATIO DRY/WET GAS		.9141
BASE DENSITY OF GAS	LB/CFT	.0787
GAS WEIGHT	KLB/HR	735.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1831.43
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 303.10

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4544.00

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3015.67
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .60

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4847.71

FLYASH % = 37.78
BOTTOM ASH % = 62.22

MASS ASH FROM CYCLONES = 2997.12
% CYCLONE ASH AS BOTTOM ASH = 100.64
% CYCLONE ASH AS FLYASH = -.64

WEIGHT AVG C IN ASH = 6.26
UNBURNED CARBON % = .43

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F10

TOTAL COAL FLOW	KLB/HR	71.20
REBURN COAL FLOW	KLB/HR	24.10
CYCLONE COAL FLOW	KLB/HR	47.10
ASH IN FUEL	%	5.93
CARBON IN FLYASH	%	12.89
CARBON IN BOTTOM ASH	%	.01
ACUREX FLYASH CATCH	GR/DSCF	1.1988
MOLE RATIO DRY/WET GAS		.9043
BASE DENSITY OF GAS	LB/CFT	.0783
GAS WEIGHT	KLB/HR	738.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1459.67
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 188.15

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4222.16

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2950.64
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .30

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4410.61

FLYASH % = 33.09
BOTTOM ASH % = 66.91

MASS ASH FROM CYCLONES = 2793.03
% CYCLONE ASH AS BOTTOM ASH = 105.65
% CYCLONE ASH AS FLYASH = -5.65

WEIGHT AVG C IN ASH = 4.27
UNBURNED CARBON % = .26

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F6

TOTAL COAL FLOW	KLB/HR	47.80
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	47.80
ASH IN FUEL	%	6.40
CARBON IN FLYASH	%	11.67
CARBON IN BOTTOM ASH	%	.12
ACUREX FLYASH CATCH	GR/DSCF	1.7998
MOLE RATIO DRY/WET GAS		.9102
BASE DENSITY OF GAS	LB/CFT	.0783
GAS WEIGHT	KLB/HR	516.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1542.24
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 179.98

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3059.20

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1696.94
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 2.04

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3241.22

FLYASH % = 47.58
BOTTOM ASH % = 52.42

MASS ASH FROM CYCLONES = 3059.20
% CYCLONE ASH AS BOTTOM ASH = 55.54
% CYCLONE ASH AS FLYASH = 44.46

WEIGHT AVG C IN ASH = 5.62
UNBURNED CARBON % = .38

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F9

TOTAL COAL FLOW	KLB/HR	49.10
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	49.10
ASH IN FUEL	%	5.93
CARBON IN FLYASH	%	13.42
CARBON IN BOTTOM ASH	%	.02
ACUREX FLYASH CATCH	GR/DSCF	2.0458
MOLE RATIO DRY/WET GAS		.9068
BASE DENSITY OF GAS	LB/CFT	.0782
GAS WEIGHT	KLB/HR	526.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1782.61
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 239.23

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2911.63

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1368.25
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .27

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3151.13

FLYASH % = 56.57
BOTTOM ASH % = 43.43

MASS ASH FROM CYCLONES = 2911.63
% CYCLONE ASH AS BOTTOM ASH = 47.00
% CYCLONE ASH AS FLYASH = 53.00

WEIGHT AVG C IN ASH = 7.60
UNBURNED CARBON % = .49

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 2P

TOTAL COAL FLOW	KLB/HR	50.90
REBURN COAL FLOW	KLB/HR	16.36
CYCLONE COAL FLOW	KLB/HR	34.54
ASH IN FUEL	%	6.24
CARBON IN FLYASH	%	31.53
CARBON IN BOTTOM ASH	%	.03
ACUREX FLYASH CATCH	GR/DSCF	2.9200
MOLE RATIO DRY/WET GAS		.9082
BASE DENSITY OF GAS	LB/CFT	.0786
GAS WEIGHT	KLB/HR	533.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2569.04
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 810.02

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3176.16

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1417.14
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .43

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3986.60

FLYASH % = 64.44
BOTTOM ASH % = 35.56

MASS ASH FROM CYCLONES = 2155.30
% CYCLONE ASH AS BOTTOM ASH = 65.77
% CYCLONE ASH AS FLYASH = 34.23

WEIGHT AVG C IN ASH = 20.33
UNBURNED CARBON % = 1.59

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 3P

TOTAL COAL FLOW	KLB/HR	51.50
REBURN COAL FLOW	KLB/HR	16.03
CYCLONE COAL FLOW	KLB/HR	35.47
ASH IN FUEL	%	6.59
CARBON IN FLYASH	%	34.46
CARBON IN BOTTOM ASH	%	.01
ACUREX FLYASH CATCH	GR/DSCF	2.6300
MOLE RATIO DRY/WET GAS		.8979
BASE DENSITY OF GAS	LB/CFT	.0780
GAS WEIGHT	KLB/HR	542.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2344.18
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 807.80

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3393.85

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1857.48
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .19

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4201.84

FLYASH % = 55.79
BOTTOM ASH % = 44.21

MASS ASH FROM CYCLONES = 2337.47
% CYCLONE ASH AS BOTTOM ASH = 79.47
% CYCLONE ASH AS FLYASH = 20.53

WEIGHT AVG C IN ASH = 19.23
UNBURNED CARBON % = 1.57

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 4P

TOTAL COAL FLOW	KLB/HR	52.00
REBURN COAL FLOW	KLB/HR	16.59
CYCLONE COAL FLOW	KLB/HR	35.41
ASH IN FUEL	%	6.59
CARBON IN FLYASH	%	28.27
CARBON IN BOTTOM ASH	%	.01
ACUREX FLYASH CATCH	GR/DSCF	3.6900
MOLE RATIO DRY/WET GAS		.8985
BASE DENSITY OF GAS	LB/CFT	.0780
GAS WEIGHT	KLB/HR	548.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 3327.61
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 940.72

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3426.80

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1039.91
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .10

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4367.62

FLYASH % = 76.19
BOTTOM ASH % = 23.81

MASS ASH FROM CYCLONES = 2333.52
% CYCLONE ASH AS BOTTOM ASH = 44.57
% CYCLONE ASH AS FLYASH = 55.43

WEIGHT AVG C IN ASH = 21.54
UNBURNED CARBON % = 1.81

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F12

TOTAL COAL FLOW	KLB/HR	52.60
REBURN COAL FLOW	KLB/HR	17.51
CYCLONE COAL FLOW	KLB/HR	35.09
ASH IN FUEL	%	6.36
CARBON IN FLYASH	%	35.06
CARBON IN BOTTOM ASH	%	.02
ACUREX FLYASH CATCH	GR/DSCF	2.5595
MOLE RATIO DRY/WET GAS		.9038
BASE DENSITY OF GAS	LB/CFT	.0783
GAS WEIGHT	KLB/HR	545.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2300.19
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 806.45

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3345.36

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1851.62
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .37

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4152.18

FLYASH % = 55.40
BOTTOM ASH % = 44.60

MASS ASH FROM CYCLONES = 2231.72
% CYCLONE ASH AS BOTTOM ASH = 82.98
% CYCLONE ASH AS FLYASH = 17.02

WEIGHT AVG C IN ASH = 19.43
UNBURNED CARBON % = 1.53

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F13

TOTAL COAL FLOW	KLB/HR	51.30
REBURN COAL FLOW	KLB/HR	17.67
CYCLONE COAL FLOW	KLB/HR	33.63
ASH IN FUEL	%	6.36
CARBON IN FLYASH	%	11.66
CARBON IN BOTTOM ASH	%	.02
ACUREX FLYASH CATCH	GR/DSCF	.8162
MOLE RATIO DRY/WET GAS		.9036
BASE DENSITY OF GAS	LB/CFT	.0783
GAS WEIGHT	KLB/HR	537.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 722.58
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 84.25

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3262.68

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2624.35
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .52

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3347.46

FLYASH % = 21.59
BOTTOM ASH % = 78.41

MASS ASH FROM CYCLONES = 2138.87
% CYCLONE ASH AS BOTTOM ASH = 122.72
% CYCLONE ASH AS FLYASH = -22.72

WEIGHT AVG C IN ASH = 2.53
UNBURNED CARBON % = .17

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F15

TOTAL COAL FLOW	KLB/HR	53.70
REBURN COAL FLOW	KLB/HR	17.51
CYCLONE COAL FLOW	KLB/HR	36.19
ASH IN FUEL	%	6.54
CARBON IN FLYASH	%	36.00
CARBON IN BOTTOM ASH	%	.02
ACUREX FLYASH CATCH	GR/DSCF	2.5058
MOLE RATIO DRY/WET GAS		.9066
BASE DENSITY OF GAS	LB/CFT	.0784
GAS WEIGHT	KLB/HR	549.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2272.59
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 818.13

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3511.98

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2057.52
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .41

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4330.52

FLYASH % = 52.48
BOTTOM ASH % = 47.52

MASS ASH FROM CYCLONES = 2366.83
% CYCLONE ASH AS BOTTOM ASH = 86.95
% CYCLONE ASH AS FLYASH = 13.05

WEIGHT AVG C IN ASH = 18.90
UNBURNED CARBON % = 1.52

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F14

TOTAL COAL FLOW	KLB/HR	37.10
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	37.10
ASH IN FUEL	%	6.36
CARBON IN FLYASH	%	12.35
CARBON IN BOTTOM ASH	%	.02
ACUREX FLYASH CATCH	GR/DSCF	.7568
MOLE RATIO DRY/WET GAS		.9151
BASE DENSITY OF GAS	LB/CFT	.0782
GAS WEIGHT	KLB/HR	434.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 549.08
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 67.81

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2359.56

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1878.29
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .38

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 2427.75

FLYASH % = 22.62
BOTTOM ASH % = 77.38

MASS ASH FROM CYCLONES = 2359.56
% CYCLONE ASH AS BOTTOM ASH = 79.62
% CYCLONE ASH AS FLYASH = 20.38

WEIGHT AVG C IN ASH = 2.81
UNBURNED CARBON % = .18

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F11

TOTAL COAL FLOW	KLB/HR	37.60
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	37.60
ASH IN FUEL	%	6.36
CARBON IN FLYASH	%	26.14
CARBON IN BOTTOM ASH	%	.01
ACUREX FLYASH CATCH	GR/DSCF	2.8318
MOLE RATIO DRY/WET GAS		.9140
BASE DENSITY OF GAS	LB/CFT	.0781
GAS WEIGHT	KLB/HR	434.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2054.70
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 537.10

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2391.36

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 873.76
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .09

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 2928.55

FLYASH % = 70.16
BOTTOM ASH % = 29.84

MASS ASH FROM CYCLONES = 2391.36
% CYCLONE ASH AS BOTTOM ASH = 36.54
% CYCLONE ASH AS FLYASH = 63.46

WEIGHT AVG C IN ASH = 18.34
UNBURNED CARBON % = 1.43

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F16

TOTAL COAL FLOW	KLB/HR	37.30
REBURN COAL FLOW	KLB/HR	15.50
CYCLONE COAL FLOW	KLB/HR	21.80
ASH IN FUEL	%	6.54
CARBON IN FLYASH	%	21.07
CARBON IN BOTTOM ASH	%	.02
ACUREX FLYASH CATCH	GR/DSCF	1.4288
MOLE RATIO DRY/WET GAS		.9117
BASE DENSITY OF GAS	LB/CFT	.0782
GAS WEIGHT	KLB/HR	411.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 978.05
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 206.07

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2439.42

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1667.45
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .33

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 2645.83

FLYASH % = 36.97
BOTTOM ASH % = 63.03

MASS ASH FROM CYCLONES = 1425.72
% CYCLONE ASH AS BOTTOM ASH = 116.98
% CYCLONE ASH AS FLYASH = -16.98

WEIGHT AVG C IN ASH = 7.80
UNBURNED CARBON % = .55

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F17

TOTAL COAL FLOW	KLB/HR	52.70
REBURN COAL FLOW	KLB/HR	17.10
CYCLONE COAL FLOW	KLB/HR	35.60
ASH IN FUEL	%	6.54
CARBON IN FLYASH	%	26.61
CARBON IN BOTTOM ASH	%	.01
ACUREX FLYASH CATCH	GR/DSCF	1.7475
MOLE RATIO DRY/WET GAS		.9056
BASE DENSITY OF GAS	LB/CFT	.0784
GAS WEIGHT	KLB/HR	537.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1548.51
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 412.06

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3446.58

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2310.13
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .23

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3858.87

FLYASH % = 40.13
BOTTOM ASH % = 59.87

MASS ASH FROM CYCLONES = 2328.24
% CYCLONE ASH AS BOTTOM ASH = 99.23
% CYCLONE ASH AS FLYASH = .77

WEIGHT AVG C IN ASH = 10.68
UNBURNED CARBON % = .78

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F18

TOTAL COAL FLOW	KLB/HR	52.50
REBURN COAL FLOW	KLB/HR	17.21
CYCLONE COAL FLOW	KLB/HR	35.29
ASH IN FUEL	%	6.54
CARBON IN FLYASH	%	3.58
CARBON IN BOTTOM ASH	%	.01
ACUREX FLYASH CATCH	GR/DSCF	1.7950
MOLE RATIO DRY/WET GAS		.9104
BASE DENSITY OF GAS	LB/CFT	.0783
GAS WEIGHT	KLB/HR	571.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1702.44
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 60.95

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3433.50

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1792.00
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .18

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3494.63

FLYASH % = 48.72
BOTTOM ASH % = 51.28

MASS ASH FROM CYCLONES = 2307.97
% CYCLONE ASH AS BOTTOM ASH = 77.65
% CYCLONE ASH AS FLYASH = 22.35

WEIGHT AVG C IN ASH = 1.75
UNBURNED CARBON % = .12

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # F19

TOTAL COAL FLOW	KLB/HR	96.00
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	96.00
ASH IN FUEL	%	6.54
CARBON IN FLYASH	%	16.61
CARBON IN BOTTOM ASH	%	.01
ACUREX FLYASH CATCH	GR/DSCF	.9036
MOLE RATIO DRY/WET GAS		.9077
BASE DENSITY OF GAS	LB/CFT	.0784
GAS WEIGHT	KLB/HR	1010.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1509.47
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 250.72

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 6278.40

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 5019.65
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .50

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6529.63

FLYASH % = 23.12
BOTTOM ASH % = 76.88

MASS ASH FROM CYCLONES = 6278.40
% CYCLONE ASH AS BOTTOM ASH = 79.96
% CYCLONE ASH AS FLYASH = 20.04

WEIGHT AVG C IN ASH = 3.85
UNBURNED CARBON % = .26

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W1

TOTAL COAL FLOW	KLB/HR	112.10
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	112.10
ASH IN FUEL	%	4.63
CARBON IN FLYASH	%	3.30
CARBON IN BOTTOM ASH	%	.80
B&W FLYASH CATCH	LB/KLB	.7399
GAS WEIGHT	KLB/HR	1043.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 771.72
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 25.47

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5190.23

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4443.98
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 35.55

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5251.25

FLYASH % = 14.70
BOTTOM ASH % = 85.30

MASS ASH FROM CYCLONES = 5190.23
% CYCLONE ASH AS BOTTOM ASH = 86.31
% CYCLONE ASH AS FLYASH = 13.69

WEIGHT AVG C IN ASH = 1.17
UNBURNED CARBON % = .05

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W2

TOTAL COAL FLOW	KLB/HR	78.80
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	78.80
ASH IN FUEL	%	4.52
CARBON IN FLYASH	%	2.65
CARBON IN BOTTOM ASH	%	.32
B&W FLYASH CATCH	LB/KLB	1.4983
GAS WEIGHT	KLB/HR	728.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1090.76
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 28.91

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3561.76

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2499.90
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 8.00

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3598.66

FLYASH % = 30.31
BOTTOM ASH % = 69.69

MASS ASH FROM CYCLONES = 3561.76
% CYCLONE ASH AS BOTTOM ASH = 70.41
% CYCLONE ASH AS FLYASH = 29.59

WEIGHT AVG C IN ASH = 1.03
UNBURNED CARBON % = .05

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W3

TOTAL COAL FLOW	KLB/HR	117.60
REBURN COAL FLOW	KLB/HR	35.23
CYCLONE COAL FLOW	KLB/HR	82.37
ASH IN FUEL	%	4.43
CARBON IN FLYASH	%	4.15
CARBON IN BOTTOM ASH	%	.01
B&W FLYASH CATCH	LB/KLB	1.5669
GAS WEIGHT	KLB/HR	1063.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1665.61
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 69.12

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5209.68

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3613.19
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .36

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5279.16

FLYASH % = 31.55
BOTTOM ASH % = 68.45

MASS ASH FROM CYCLONES = 3648.99
% CYCLONE ASH AS BOTTOM ASH = 99.03
% CYCLONE ASH AS FLYASH = .97

WEIGHT AVG C IN ASH = 1.32
UNBURNED CARBON % = .06

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W4

TOTAL COAL FLOW	KLB/HR	117.10
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	117.10
ASH IN FUEL	%	4.25
CARBON IN FLYASH	%	16.88
CARBON IN BOTTOM ASH	%	.18
B&W FLYASH CATCH	LB/KLB	2.2040
GAS WEIGHT	KLB/HR	1038.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2287.75
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 386.17

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4976.75

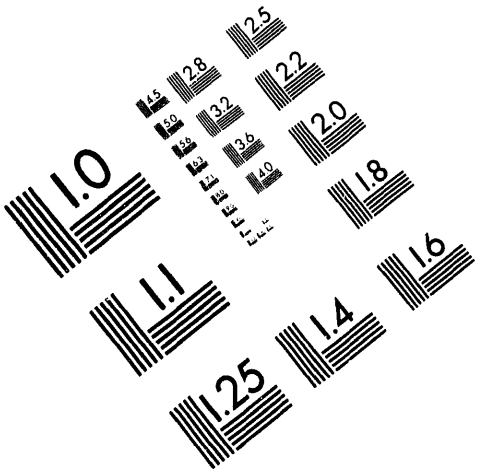
MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3075.17
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 5.54

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5368.46

FLYASH % = 42.61
BOTTOM ASH % = 57.39

MASS ASH FROM CYCLONES = 4976.75
% CYCLONE ASH AS BOTTOM ASH = 61.90
% CYCLONE ASH AS FLYASH = 38.10

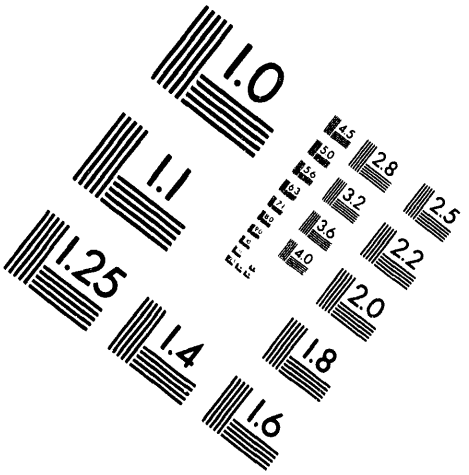
WEIGHT AVG C IN ASH = 7.30
UNBURNED CARBON % = .33

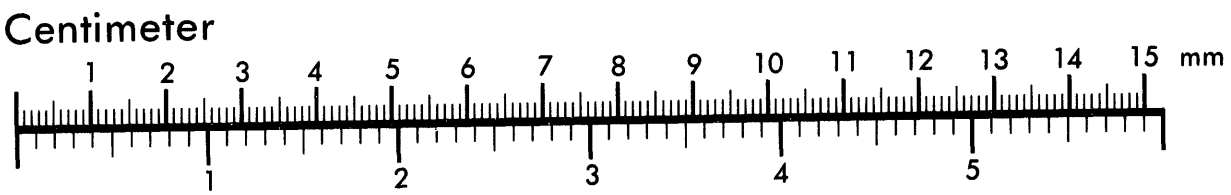


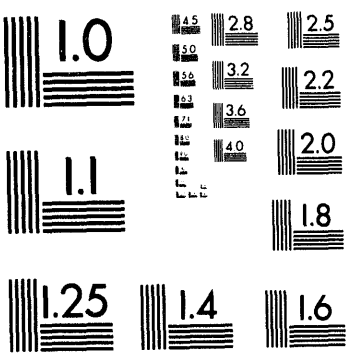
Association for Information and Image Management

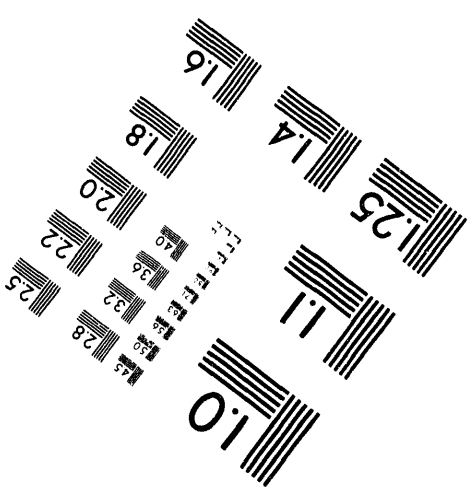
1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910

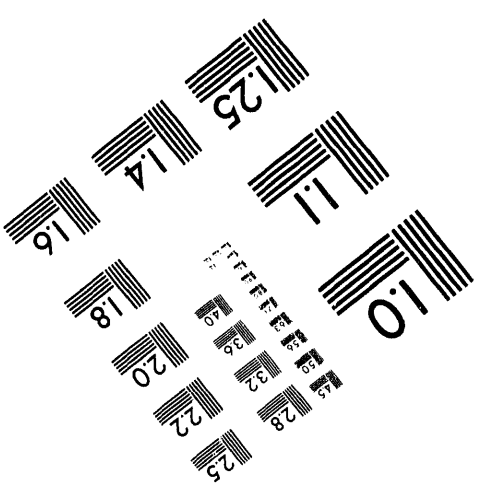
301/587-8202











MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W5

TOTAL COAL FLOW	KLB/HR	120.70
REBURN COAL FLOW	KLB/HR	35.27
CYCLONE COAL FLOW	KLB/HR	85.43
ASH IN FUEL	%	4.08
CARBON IN FLYASH	%	4.41
CARBON IN BOTTOM ASH	%	.02
B&W FLYASH CATCH	LB/KLB	1.64
GAS WEIGHT	KLB/HR	1063.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1743.32
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 76.88

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4924.56

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3258.12
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .65

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5002.09

FLYASH % = 34.85
BOTTOM ASH % = 65.15

MASS ASH FROM CYCLONES = 3485.54
% CYCLONE ASH AS BOTTOM ASH = 93.49
% CYCLONE ASH AS FLYASH = 6.51

WEIGHT AVG C IN ASH = 1.55
UNBURNED CARBON % = .06

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W6

TOTAL COAL FLOW	KLB/HR	87.70
REBURN COAL FLOW	KLB/HR	28.18
CYCLONE COAL FLOW	KLB/HR	59.52
ASH IN FUEL	%	4.43
CARBON IN FLYASH	%	14.91
CARBON IN BOTTOM ASH	%	.02
B&W FLYASH CATCH	LB/KLB	1.86
GAS WEIGHT	KLB/HR	765.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1425.12
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 212.49

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3885.11

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2672.48
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .53

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4098.13

FLYASH % = 34.77
BOTTOM ASH % = 65.23

MASS ASH FROM CYCLONES = 2636.74
% CYCLONE ASH AS BOTTOM ASH = 101.38
% CYCLONE ASH AS FLYASH = -1.38

WEIGHT AVG C IN ASH = 5.20
UNBURNED CARBON % = .24

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W7

TOTAL COAL FLOW	KLB/HR	65.00
REBURN COAL FLOW	KLB/HR	21.20
CYCLONE COAL FLOW	KLB/HR	43.80
ASH IN FUEL	%	4.03
CARBON IN FLYASH	%	17.37
CARBON IN BOTTOM ASH	%	.02
B&W FLYASH CATCH	LB/KLB	2.01
GAS WEIGHT	KLB/HR	563.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1130.22
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 196.32

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2619.50

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1685.60
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .34

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 2816.16

FLYASH % = 40.13
BOTTOM ASH % = 59.87

MASS ASH FROM CYCLONES = 1765.14
% CYCLONE ASH AS BOTTOM ASH = 95.51
% CYCLONE ASH AS FLYASH = 4.49

WEIGHT AVG C IN ASH = 6.98
UNBURNED CARBON % = .30

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W8

TOTAL COAL FLOW	: KLB/HR :	86.10
REBURN COAL FLOW	: KLB/HR :	28.24
CYCLONE COAL FLOW	: KLB/HR :	57.86
ASH IN FUEL	: % :	3.84
CARBON IN FLYASH	: % :	12.75
CARBON IN BOTTOM ASH	: % :	.01
B&W FLYASH CATCH	: LB/KLB :	1.72
GAS WEIGHT	: KLB/HR :	732.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1261.97
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 160.90

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3306.24

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2205.17
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .22

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3467.36

FLYASH % = 36.40
BOTTOM ASH % = 63.60

MASS ASH FROM CYCLONES = 2221.82
% CYCLONE ASH AS BOTTOM ASH = 99.26
% CYCLONE ASH AS FLYASH = .74

WEIGHT AVG C IN ASH = 4.65
UNBURNED CARBON % = .19

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W9

TOTAL COAL FLOW	: KLB/HR :	46.90
REBURN COAL FLOW	: KLB/HR :	18.47
CYCLONE COAL FLOW	: KLB/HR :	28.43
ASH IN FUEL	: % :	4.27
CARBON IN FLYASH	: % :	5.23
CARBON IN BOTTOM ASH	: % :	.01
B&W FLYASH CATCH	: LB/KLB :	.84
GAS WEIGHT	: KLB/HR :	430.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 361.46
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 18.90

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2002.63

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1660.08
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .17

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 2021.70

FLYASH % = 17.88
BOTTOM ASH % = 82.12

MASS ASH FROM CYCLONES = 1213.96
% CYCLONE ASH AS BOTTOM ASH = 136.76
% CYCLONE ASH AS FLYASH = -36.76

WEIGHT AVG C IN ASH = .94
UNBURNED CARBON % = .04

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W10

TOTAL COAL FLOW	: KLB/HR :	85.40
REBURN COAL FLOW	: KLB/HR :	22.19
CYCLONE COAL FLOW	: KLB/HR :	63.21
ASH IN FUEL	: % :	4.10
CARBON IN FLYASH	: % :	7.24
CARBON IN BOTTOM ASH	: % :	5.88
B&W FLYASH CATCH	: LB/KLB :	2.4681
GAS WEIGHT	: KLB/HR :	734.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1811.59
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 131.16

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3501.40

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1820.97
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 107.07

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3739.63

FLYASH % = 48.44
BOTTOM ASH % = 51.56

MASS ASH FROM CYCLONES = 2591.61
% CYCLONE ASH AS BOTTOM ASH = 74.40
% CYCLONE ASH AS FLYASH = 25.60

WEIGHT AVG C IN ASH = 6.54
UNBURNED CARBON % = .29

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W11

TOTAL COAL FLOW	KLB/HR	86.10
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	86.10
ASH IN FUEL	%	4.07
CARBON IN FLYASH	%	4.18
CARBON IN BOTTOM ASH	%	.40
B&W FLYASH CATCH	LB/KLB	3.3973
GAS WEIGHT	KLB/HR	756.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2568.36
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 107.36

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3504.27

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1043.27
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 4.17

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3615.80

FLYASH % = 71.03
BOTTOM ASH % = 28.97

MASS ASH FROM CYCLONES = 3504.27
% CYCLONE ASH AS BOTTOM ASH = 29.89
% CYCLONE ASH AS FLYASH = 70.11

WEIGHT AVG C IN ASH = 3.08
UNBURNED CARBON % = .13

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W12

TOTAL COAL FLOW	KLB/HR	118.70
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	118.70
ASH IN FUEL	%	4.02
CARBON IN FLYASH	%	6.08
CARBON IN BOTTOM ASH	%	.02
B&W FLYASH CATCH	LB/KLB	2.7787
GAS WEIGHT	KLB/HR	1057.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2937.09
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 178.57

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4771.74

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2013.23
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .40

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4950.72

FLYASH % = 59.33
BOTTOM ASH % = 40.67

MASS ASH FROM CYCLONES = 4771.74
% CYCLONE ASH AS BOTTOM ASH = 42.20
% CYCLONE ASH AS FLYASH = 57.80

WEIGHT AVG C IN ASH = 3.62
UNBURNED CARBON % = .15

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W13

TOTAL COAL FLOW	KLB/HR	119.60
REBURN COAL FLOW	KLB/HR	35.28
CYCLONE COAL FLOW	KLB/HR	84.32
ASH IN FUEL	%	4.02
CARBON IN FLYASH	%	2.68
CARBON IN BOTTOM ASH	%	.01
B&W FLYASH CATCH	LB/KLB	2.0786
GAS WEIGHT	KLB/HR	1055.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2192.92
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 58.77

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4807.92

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2673.77
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .27

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4866.96

FLYASH % = 45.06
BOTTOM ASH % = 54.94

MASS ASH FROM CYCLONES = 3389.66
% CYCLONE ASH AS BOTTOM ASH = 78.89
% CYCLONE ASH AS FLYASH = 21.11

WEIGHT AVG C IN ASH = 1.21
UNBURNED CARBON % = .05

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W14

TOTAL COAL FLOW	KLB/HR	60.30
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	60.30
ASH IN FUEL	%	4.10
CARBON IN FLYASH	%	4.14
CARBON IN BOTTOM ASH	%	.01
B&W FLYASH CATCH	LB/KLB	3.5354
GAS WEIGHT	KLB/HR	536.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1894.97
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 78.45

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2472.30

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 655.78
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .07

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 2550.82

FLYASH % = 74.29
BOTTOM ASH % = 25.71

MASS ASH FROM CYCLONES = 2472.30
% CYCLONE ASH AS BOTTOM ASH = 26.53
% CYCLONE ASH AS FLYASH = 73.47

WEIGHT AVG C IN ASH = 3.08
UNBURNED CARBON % = .13

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W16

TOTAL COAL FLOW	KLB/HR	119.70
REBURN COAL FLOW	KLB/HR	37.28
CYCLONE COAL FLOW	KLB/HR	82.42
ASH IN FUEL	%	4.27
CARBON IN FLYASH	%	11.24
CARBON IN BOTTOM ASH	%	.01
B&W FLYASH CATCH	LB/KLB	2.6671
GAS WEIGHT	KLB/HR	1038.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2768.45
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 311.17

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5111.19

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2653.91
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .27

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5422.63

FLYASH % = 51.05
BOTTOM ASH % = 48.95

MASS ASH FROM CYCLONES = 3519.33
% CYCLONE ASH AS BOTTOM ASH = 75.42
% CYCLONE ASH AS FLYASH = 24.58

WEIGHT AVG C IN ASH = 5.74
UNBURNED CARBON % = .26

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W17

TOTAL COAL FLOW	KLB/HR	119.40
REBURN COAL FLOW	KLB/HR	30.09
CYCLONE COAL FLOW	KLB/HR	89.31
ASH IN FUEL	%	4.33
CARBON IN FLYASH	%	11.64
CARBON IN BOTTOM ASH	%	.14
B&W FLYASH CATCH	LB/KLB	2.7218
GAS WEIGHT	KLB/HR	1043.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2838.84
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 330.44

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5170.02

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2661.62
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 3.73

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5504.19

FLYASH % = 51.58
BOTTOM ASH % = 48.42

MASS ASH FROM CYCLONES = 3867.12
% CYCLONE ASH AS BOTTOM ASH = 68.92
% CYCLONE ASH AS FLYASH = 31.08

WEIGHT AVG C IN ASH = 6.07
UNBURNED CARBON % = .28

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W23

TOTAL COAL FLOW	KLB/HR	127.30
REBURN COAL FLOW	KLB/HR	36.43
CYCLONE COAL FLOW	KLB/HR	90.87
ASH IN FUEL	%	4.60
CARBON IN FLYASH	%	11.15
CARBON IN BOTTOM ASH	%	.01
B&W FLYASH CATCH	LB/KLB	4.1725
GAS WEIGHT	KLB/HR	1105.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 4610.61
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 514.08

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5855.80

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1759.27
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .18

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6370.06

FLYASH % = 72.38
BOTTOM ASH % = 27.62

MASS ASH FROM CYCLONES = 4180.02
% CYCLONE ASH AS BOTTOM ASH = 42.09
% CYCLONE ASH AS FLYASH = 57.91

WEIGHT AVG C IN ASH = 8.07
UNBURNED CARBON % = .40

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W24

TOTAL COAL FLOW	KLB/HR	62.10
REBURN COAL FLOW	KLB/HR	25.14
CYCLONE COAL FLOW	KLB/HR	36.96
ASH IN FUEL	%	4.60
CARBON IN FLYASH	%	20.74
CARBON IN BOTTOM ASH	%	.01
B&W FLYASH CATCH	LB/KLB	3.1380
GAS WEIGHT	KLB/HR	531.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1666.28
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 345.59

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2856.60

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1535.91
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .15

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3202.34

FLYASH % = 52.03
BOTTOM ASH % = 47.97

MASS ASH FROM CYCLONES = 1700.16
% CYCLONE ASH AS BOTTOM ASH = 90.35
% CYCLONE ASH AS FLYASH = 9.65

WEIGHT AVG C IN ASH = 10.80
UNBURNED CARBON % = .56

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W25

TOTAL COAL FLOW	KLB/HR	64.10
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	64.10
ASH IN FUEL	%	4.60
CARBON IN FLYASH	%	7.82
CARBON IN BOTTOM ASH	%	.01
B&W FLYASH CATCH	LB/KLB	1.9740
GAS WEIGHT	KLB/HR	571.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1127.15
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 88.14

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2948.60

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1909.59
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .19

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3036.93

FLYASH % = 37.11
BOTTOM ASH % = 62.89

MASS ASH FROM CYCLONES = 2948.60
% CYCLONE ASH AS BOTTOM ASH = 64.77
% CYCLONE ASH AS FLYASH = 35.23

WEIGHT AVG C IN ASH = 2.91
UNBURNED CARBON % = .14

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W29

TOTAL COAL FLOW	KLB/HR	62.80
REBURN COAL FLOW	KLB/HR	25.24
CYCLONE COAL FLOW	KLB/HR	37.56
ASH IN FUEL	%	4.74
CARBON IN FLYASH	%	10.40
CARBON IN BOTTOM ASH	%	.01
B&W FLYASH CATCH	LB/KLB	4.0700
GAS WEIGHT	KLB/HR	551.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2242.57
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 233.23

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2976.72

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 967.38
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .10

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3210.04

FLYASH % = 69.86
BOTTOM ASH % = 30.14

MASS ASH FROM CYCLONES = 1780.34
% CYCLONE ASH AS BOTTOM ASH = 54.34
% CYCLONE ASH AS FLYASH = 45.66

WEIGHT AVG C IN ASH = 7.27
UNBURNED CARBON % = .37

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # W30

TOTAL COAL FLOW	KLB/HR	62.20
REBURN COAL FLOW	KLB/HR	21.15
CYCLONE COAL FLOW	KLB/HR	41.05
ASH IN FUEL	%	4.71
CARBON IN FLYASH	%	3.17
CARBON IN BOTTOM ASH	%	.01
B&W FLYASH CATCH	LB/KLB	2.1980
GAS WEIGHT	KLB/HR	568.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1248.46
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 39.58

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2929.62

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1720.73
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = .17

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 2969.37

FLYASH % = 42.04
BOTTOM ASH % = 57.96

MASS ASH FROM CYCLONES = 1933.46
% CYCLONE ASH AS BOTTOM ASH = 89.01
% CYCLONE ASH AS FLYASH = 10.99

WEIGHT AVG C IN ASH = 1.34
UNBURNED CARBON % = .06

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 4A

TOTAL COAL FLOW	KLB/HR	95.90
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	95.90
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	3.34
CARBON IN BOTTOM ASH	%	.10
ACUREX FLYASH CATCH	GR/DSCF	.55
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	1092.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1000.88
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 33.43

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5897.85

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4930.40
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 4.93

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5936.21

FLYASH % = 16.86
BOTTOM ASH % = 83.14

MASS ASH FROM CYCLONES = 5897.85
% CYCLONE ASH AS BOTTOM ASH = 83.68
% CYCLONE ASH AS FLYASH = 16.32

WEIGHT AVG C IN ASH = .65
UNBURNED CARBON % = .04

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 26T

TOTAL COAL FLOW	: KLB/HR :	97.40
REBURN COAL FLOW	: KLB/HR :	24.57
CYCLONE COAL FLOW	: KLB/HR :	72.83
ASH IN FUEL	: % :	6.15
CARBON IN FLYASH	: % :	25.43
CARBON IN BOTTOM ASH	: % :	.50
B&W FLYASH CATCH	: LB/KLB :	3.21
GAS WEIGHT	: KLB/HR :	998.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 3203.58
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 814.67

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5990.10

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3601.19
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 18.01

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6822.78

FLYASH % = 46.95
BOTTOM ASH % = 53.05

MASS ASH FROM CYCLONES = 4479.05
% CYCLONE ASH AS BOTTOM ASH = 80.80
% CYCLONE ASH AS FLYASH = 19.20

WEIGHT AVG C IN ASH = 12.21
UNBURNED CARBON % = .86

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 27T

TOTAL COAL FLOW	KLB/HR	96.70
REBURN COAL FLOW	KLB/HR	24.58
CYCLONE COAL FLOW	KLB/HR	72.12
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	27.54
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	4.04
GAS WEIGHT	KLB/HR	994.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 4012.78
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 1105.12

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5947.05

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3039.39
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 15.20

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 7067.37

FLYASH % = 56.78
BOTTOM ASH % = 43.22

MASS ASH FROM CYCLONES = 4435.38
% CYCLONE ASH AS BOTTOM ASH = 68.87
% CYCLONE ASH AS FLYASH = 31.13

WEIGHT AVG C IN ASH = 15.85
UNBURNED CARBON % = 1.16

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 21A

TOTAL COAL FLOW	KLB/HR	93.80
REBURN COAL FLOW	KLB/HR	26.11
CYCLONE COAL FLOW	KLB/HR	67.69
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	11.32
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	1.36
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.79
GAS WEIGHT	KLB/HR	1042.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 233.74
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 26.46

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5768.70

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 5561.42
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 11.12

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5806.28

FLYASH % = 4.03
BOTTOM ASH % = 95.97

MASS ASH FROM CYCLONES = 4162.93
% CYCLONE ASH AS BOTTOM ASH = 133.86
% CYCLONE ASH AS FLYASH = -33.86

WEIGHT AVG C IN ASH = .65
UNBURNED CARBON % = .04

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 2A

TOTAL COAL FLOW	KLB/HR	97.40
REBURN COAL FLOW	KLB/HR	26.25
CYCLONE COAL FLOW	KLB/HR	71.15
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	12.37
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	1.90
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	1014.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 3201.52
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 396.03

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5990.10

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3184.61
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 6.37

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6392.50

FLYASH % = 50.08
BOTTOM ASH % = 49.92

MASS ASH FROM CYCLONES = 4375.73
% CYCLONE ASH AS BOTTOM ASH = 72.92
% CYCLONE ASH AS FLYASH = 27.08

WEIGHT AVG C IN ASH = 6.30
UNBURNED CARBON % = .41

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 3A

TOTAL COAL FLOW	KLB/HR	96.20
REBURN COAL FLOW	KLB/HR	26.33
CYCLONE COAL FLOW	KLB/HR	69.87
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	10.80
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	2.48
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	990.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 4050.95
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 437.50

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5916.30

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2302.86
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 4.61

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6358.41

FLYASH % = 63.71
BOTTOM ASH % = 36.29

MASS ASH FROM CYCLONES = 4297.01
% CYCLONE ASH AS BOTTOM ASH = 53.70
% CYCLONE ASH AS FLYASH = 46.30

WEIGHT AVG C IN ASH = 6.95
UNBURNED CARBON % = .46

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 6A

TOTAL COAL FLOW	KLB/HR	93.90
REBURN COAL FLOW	KLB/HR	26.22
CYCLONE COAL FLOW	KLB/HR	67.68
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	6.24
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.62
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	1003.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1029.33
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 64.23

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5774.85

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4809.75
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 9.62

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5848.70

FLYASH % = 17.60
BOTTOM ASH % = 82.40

MASS ASH FROM CYCLONES = 4162.32
% CYCLONE ASH AS BOTTOM ASH = 115.79
% CYCLONE ASH AS FLYASH = -15.79

WEIGHT AVG C IN ASH = 1.26
UNBURNED CARBON % = .08

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 8A

TOTAL COAL FLOW	KLB/HR	94.50
REBURN COAL FLOW	KLB/HR	26.48
CYCLONE COAL FLOW	KLB/HR	68.02
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	13.96
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	1.72
MOLE RATIO DRY/WET GAS		.92
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	1019.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2923.03
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 408.05

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5811.75

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3296.78
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 6.59

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6226.40

FLYASH % = 46.95
BOTTOM ASH % = 53.05

MASS ASH FROM CYCLONES = 4183.23
% CYCLONE ASH AS BOTTOM ASH = 78.97
% CYCLONE ASH AS FLYASH = 21.03

WEIGHT AVG C IN ASH = 6.66
UNBURNED CARBON % = .44

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 7A

TOTAL COAL FLOW	KLB/HR	94.30
REBURN COAL FLOW	KLB/HR	26.31
CYCLONE COAL FLOW	KLB/HR	67.99
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	8.09
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	.97
MOLE RATIO DRY/WET GAS		.92
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	1011.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1635.51
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 132.31

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5799.45

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4296.25
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 8.59

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5940.36

FLYASH % = 27.53
BOTTOM ASH % = 72.47

MASS ASH FROM CYCLONES = 4181.38
% CYCLONE ASH AS BOTTOM ASH = 102.95
% CYCLONE ASH AS FLYASH = -2.95

WEIGHT AVG C IN ASH = 2.37
UNBURNED CARBON % = .15

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 9A

TOTAL COAL FLOW	KLB/HR	94.90
REBURN COAL FLOW	KLB/HR	26.28
CYCLONE COAL FLOW	KLB/HR	68.62
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	20.97
CARBON IN BOTTOM ASH	%	.50
ACUREX FLYASH CATCH	GR/DSCF	1.33
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	1017.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2238.56
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 469.43

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5836.35

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4067.21
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 20.34

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6326.11

FLYASH % = 35.39
BOTTOM ASH % = 64.61

MASS ASH FROM CYCLONES = 4220.13
% CYCLONE ASH AS BOTTOM ASH = 96.86
% CYCLONE ASH AS FLYASH = 3.14

WEIGHT AVG C IN ASH = 7.74
UNBURNED CARBON % = .52

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 10A

TOTAL COAL FLOW	KLB/HR	94.20
REBURN COAL FLOW	KLB/HR	26.26
CYCLONE COAL FLOW	KLB/HR	67.94
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	19.90
CARBON IN BOTTOM ASH	%	.50
ACUREX FLYASH CATCH	GR/DSCF	2.82
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	1009.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 4718.46
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 938.97

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5793.30

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2013.81
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 10.07

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6742.34

FLYASH % = 69.98
BOTTOM ASH % = 30.02

MASS ASH FROM CYCLONES = 4178.31
% CYCLONE ASH AS BOTTOM ASH = 48.44
% CYCLONE ASH AS FLYASH = 51.56

WEIGHT AVG C IN ASH = 14.08
UNBURNED CARBON % = 1.01

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 16A

TOTAL COAL FLOW	KLB/HR	95.30
REBURN COAL FLOW	KLB/HR	26.06
CYCLONE COAL FLOW	KLB/HR	69.24
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	30.70
CARBON IN BOTTOM ASH	%	.50
ACUREX FLYASH CATCH	GR/DSCF	1.34
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	1018.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2273.86
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 698.08

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5860.95

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4285.16
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 21.43

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6580.45

FLYASH % = 34.55
BOTTOM ASH % = 65.45

MASS ASH FROM CYCLONES = 4258.26
% CYCLONE ASH AS BOTTOM ASH = 101.13
% CYCLONE ASH AS FLYASH = -1.13

WEIGHT AVG C IN ASH = 10.94
UNBURNED CARBON % = .76

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 1BM

TOTAL COAL FLOW	KLB/HR	94.30
REBURN COAL FLOW	KLB/HR	25.99
CYCLONE COAL FLOW	KLB/HR	68.31
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	16.01
CARBON IN BOTTOM ASH	%	.20
B&W FLYASH CATCH	LB/KLB	1.28
GAS WEIGHT	KLB/HR	1003.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1284.84
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 205.70

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5799.45

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4720.31
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 9.44

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6014.59

FLYASH % = 21.36
BOTTOM ASH % = 78.64

MASS ASH FROM CYCLONES = 4201.07
% CYCLONE ASH AS BOTTOM ASH = 112.58
% CYCLONE ASH AS FLYASH = -12.58

WEIGHT AVG C IN ASH = 3.58
UNBURNED CARBON % = .23

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 3T

TOTAL COAL FLOW	KLB/HR	96.30
REBURN COAL FLOW	KLB/HR	27.79
CYCLONE COAL FLOW	KLB/HR	68.51
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	10.74
CARBON IN BOTTOM ASH	%	.20
B&W FLYASH CATCH	LB/KLB	4.38
GAS WEIGHT	KLB/HR	1014.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 4441.32
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 477.00

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5922.45

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1958.13
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 3.92

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6403.36

FLYASH % = 69.36
BOTTOM ASH % = 30.64

MASS ASH FROM CYCLONES = 4213.37
% CYCLONE ASH AS BOTTOM ASH = 46.57
% CYCLONE ASH AS FLYASH = 53.43

WEIGHT AVG C IN ASH = 7.51
UNBURNED CARBON % = .50

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 4T

TOTAL COAL FLOW	KLB/HR	97.00
REBURN COAL FLOW	KLB/HR	27.71
CYCLONE COAL FLOW	KLB/HR	69.29
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	22.85
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	2.62
GAS WEIGHT	KLB/HR	1026.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2688.12
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 614.24

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5965.50

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3891.62
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 19.46

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6599.19

FLYASH % = 40.73
BOTTOM ASH % = 59.27

MASS ASH FROM CYCLONES = 4261.33
% CYCLONE ASH AS BOTTOM ASH = 91.78
% CYCLONE ASH AS FLYASH = 8.22

WEIGHT AVG C IN ASH = 9.60
UNBURNED CARBON % = .65

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 10B

TOTAL COAL FLOW	KLB/HR	95.80
REBURN COAL FLOW	KLB/HR	28.40
CYCLONE COAL FLOW	KLB/HR	67.40
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	7.60
CARBON IN BOTTOM ASH	%	.20
B&W FLYASH CATCH	LB/KLB	1.64
GAS WEIGHT	KLB/HR	1024.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1677.31
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 127.48

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5891.70

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4341.86
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 8.68

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6027.86

FLYASH % = 27.83
BOTTOM ASH % = 72.17

MASS ASH FROM CYCLONES = 4145.10
% CYCLONE ASH AS BOTTOM ASH = 104.96
% CYCLONE ASH AS FLYASH = -4.96

WEIGHT AVG C IN ASH = 2.26
UNBURNED CARBON % = .14

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 10C

TOTAL COAL FLOW	KLB/HR	96.20
REBURN COAL FLOW	KLB/HR	28.37
CYCLONE COAL FLOW	KLB/HR	67.83
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	7.60
CARBON IN BOTTOM ASH	%	.20
B&W FLYASH CATCH	LB/KLB	1.48
GAS WEIGHT	KLB/HR	1026.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1520.53
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 115.56

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5916.30

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4511.33
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 9.02

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6040.88

FLYASH % = 25.17
BOTTOM ASH % = 74.83

MASS ASH FROM CYCLONES = 4171.55
% CYCLONE ASH AS BOTTOM ASH = 108.36
% CYCLONE ASH AS FLYASH = -8.36

WEIGHT AVG C IN ASH = 2.06
UNBURNED CARBON % = .13

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 22T

TOTAL COAL FLOW	KLB/HR	98.10
REBURN COAL FLOW	KLB/HR	28.25
CYCLONE COAL FLOW	KLB/HR	69.85
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	27.54
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	4.04
GAS WEIGHT	KLB/HR	1004.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 4053.15
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 1116.24

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 6033.15

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3096.24
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 15.48

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 7164.87

FLYASH % = 56.57
BOTTOM ASH % = 43.43

MASS ASH FROM CYCLONES = 4295.78
% CYCLONE ASH AS BOTTOM ASH = 72.44
% CYCLONE ASH AS FLYASH = 27.56

WEIGHT AVG C IN ASH = 15.80
UNBURNED CARBON % = 1.15

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 23T

TOTAL COAL FLOW	KLB/HR	97.60
REBURN COAL FLOW	KLB/HR	28.29
CYCLONE COAL FLOW	KLB/HR	69.31
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	31.92
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	3.16
GAS WEIGHT	KLB/HR	1001.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 3160.16
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 1008.72

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 6002.40

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3850.97
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 19.25

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 7030.38

FLYASH % = 44.95
BOTTOM ASH % = 55.05

MASS ASH FROM CYCLONES = 4262.57
% CYCLONE ASH AS BOTTOM ASH = 90.80
% CYCLONE ASH AS FLYASH = 9.20

WEIGHT AVG C IN ASH = 14.62
UNBURNED CARBON % = 1.05

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 17T

TOTAL COAL FLOW	KLB/HR	96.50
REBURN COAL FLOW	KLB/HR	29.24
CYCLONE COAL FLOW	KLB/HR	67.26
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	24.43
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	3.49
GAS WEIGHT	KLB/HR	1001.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 3497.49
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 854.44

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5934.75

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3291.69
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 16.46

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6805.65

FLYASH % = 51.39
BOTTOM ASH % = 48.61

MASS ASH FROM CYCLONES = 4136.49
% CYCLONE ASH AS BOTTOM ASH = 79.97
% CYCLONE ASH AS FLYASH = 20.03

WEIGHT AVG C IN ASH = 12.80
UNBURNED CARBON % = .90

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 3BM

TOTAL COAL FLOW	KLB/HR	95.30
REBURN COAL FLOW	KLB/HR	27.98
CYCLONE COAL FLOW	KLB/HR	67.32
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	16.29
CARBON IN BOTTOM ASH	%	.20
B&W FLYASH CATCH	LB/KLB	1.59
GAS WEIGHT	KLB/HR	1008.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1603.02
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 261.13

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5860.95

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4519.06
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 9.04

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6131.12

FLYASH % = 26.15
BOTTOM ASH % = 73.85

MASS ASH FROM CYCLONES = 4140.18
% CYCLONE ASH AS BOTTOM ASH = 109.37
% CYCLONE ASH AS FLYASH = -9.37

WEIGHT AVG C IN ASH = 4.41
UNBURNED CARBON % = .28

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 50T

TOTAL COAL FLOW	KLB/HR	95.70
REBURN COAL FLOW	KLB/HR	28.21
CYCLONE COAL FLOW	KLB/HR	67.49
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	11.13
CARBON IN BOTTOM ASH	%	.20
B&W FLYASH CATCH	LB/KLB	2.11
GAS WEIGHT	KLB/HR	999.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2103.89
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 234.16

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5885.55

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 4015.82
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 8.03

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6127.75

FLYASH % = 34.33
BOTTOM ASH % = 65.67

MASS ASH FROM CYCLONES = 4150.64
% CYCLONE ASH AS BOTTOM ASH = 96.95
% CYCLONE ASH AS FLYASH = 3.05

WEIGHT AVG C IN ASH = 3.95
UNBURNED CARBON % = .25

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 25T

TOTAL COAL FLOW	KLB/HR	97.60
REBURN COAL FLOW	KLB/HR	32.08
CYCLONE COAL FLOW	KLB/HR	65.52
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	26.71
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	2.95
GAS WEIGHT	KLB/HR	1006.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2966.69
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 792.40

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 6002.40

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3828.11
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 19.14

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6813.94

FLYASH % = 43.54
BOTTOM ASH % = 56.46

MASS ASH FROM CYCLONES = 4029.48
% CYCLONE ASH AS BOTTOM ASH = 95.48
% CYCLONE ASH AS FLYASH = 4.52

WEIGHT AVG C IN ASH = 11.91
UNBURNED CARBON % = .83

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 32T

TOTAL COAL FLOW	KLB/HR	97.20
REBURN COAL FLOW	KLB/HR	32.07
CYCLONE COAL FLOW	KLB/HR	65.13
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	25.18
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	3.50
GAS WEIGHT	KLB/HR	995.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 3477.53
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 875.64

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5977.80

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3375.92
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 16.88

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6870.32

FLYASH % = 50.62
BOTTOM ASH % = 49.38

MASS ASH FROM CYCLONES = 4005.50
% CYCLONE ASH AS BOTTOM ASH = 84.70
% CYCLONE ASH AS FLYASH = 15.30

WEIGHT AVG C IN ASH = 12.99
UNBURNED CARBON % = .92

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 17A

TOTAL COAL FLOW	KLB/HR	93.80
REBURN COAL FLOW	KLB/HR	31.17
CYCLONE COAL FLOW	KLB/HR	62.63
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	12.40
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	1.49
MOLE RATIO DRY/WET GAS		.90
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	989.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2415.24
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 299.49

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 5768.70

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3652.95
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 7.31

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 6075.50

FLYASH % = 39.75
BOTTOM ASH % = 60.25

MASS ASH FROM CYCLONES = 3851.75
% CYCLONE ASH AS BOTTOM ASH = 95.03
% CYCLONE ASH AS FLYASH = 4.97

WEIGHT AVG C IN ASH = 5.05
UNBURNED CARBON % = .33

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 18A

TOTAL COAL FLOW	KLB/HR	76.40
REBURN COAL FLOW	KLB/HR	22.78
CYCLONE COAL FLOW	KLB/HR	53.62
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	18.95
CARBON IN BOTTOM ASH	%	.50
ACUREX FLYASH CATCH	GR/DSCF	1.40
MOLE RATIO DRY/WET GAS		.90
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	812.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1864.88
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 353.39

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4698.60

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3187.12
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 15.94

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5067.93

FLYASH % = 36.80
BOTTOM ASH % = 63.20

MASS ASH FROM CYCLONES = 3297.63
% CYCLONE ASH AS BOTTOM ASH = 97.13
% CYCLONE ASH AS FLYASH = 2.87

WEIGHT AVG C IN ASH = 7.29
UNBURNED CARBON % = .48

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 45T

TOTAL COAL FLOW	KLB/HR	74.20
REBURN COAL FLOW	KLB/HR	24.29
CYCLONE COAL FLOW	KLB/HR	49.91
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	25.73
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	3.33
GAS WEIGHT	KLB/HR	771.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2567.43
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 660.60

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4563.30

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2656.47
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 13.28

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5237.18

FLYASH % = 49.02
BOTTOM ASH % = 50.98

MASS ASH FROM CYCLONES = 3069.47
% CYCLONE ASH AS BOTTOM ASH = 86.98
% CYCLONE ASH AS FLYASH = 13.02

WEIGHT AVG C IN ASH = 12.87
UNBURNED CARBON % = .91

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 5A

TOTAL COAL FLOW	KLB/HR	68.80
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	68.80
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	7.94
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	1.11
MOLE RATIO DRY/WET GAS		.92
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	784.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1451.34
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 115.24

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4231.20

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2895.10
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 5.79

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4352.23

FLYASH % = 33.35
BOTTOM ASH % = 66.65

MASS ASH FROM CYCLONES = 4231.20
% CYCLONE ASH AS BOTTOM ASH = 68.56
% CYCLONE ASH AS FLYASH = 31.44

WEIGHT AVG C IN ASH = 2.78
UNBURNED CARBON % = .18

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 11A

TOTAL COAL FLOW	KLB/HR	69.50
REBURN COAL FLOW	KLB/HR	23.32
CYCLONE COAL FLOW	KLB/HR	46.18
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	16.44
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	1.23
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	744.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1524.96
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 250.70

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4274.25

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3000.00
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 6.00

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4530.95

FLYASH % = 33.66
BOTTOM ASH % = 66.34

MASS ASH FROM CYCLONES = 2840.07
% CYCLONE ASH AS BOTTOM ASH = 105.84
% CYCLONE ASH AS FLYASH = -5.84

WEIGHT AVG C IN ASH = 5.67
UNBURNED CARBON % = .37

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 11B

TOTAL COAL FLOW	KLB/HR	69.80
REBURN COAL FLOW	KLB/HR	23.31
CYCLONE COAL FLOW	KLB/HR	46.49
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	15.74
CARBON IN BOTTOM ASH	%	.20
B&W FLYASH CATCH	LB/KLB	1.91
GAS WEIGHT	KLB/HR	756.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1441.69
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 226.92

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4292.70

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3077.93
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 6.16

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4525.78

FLYASH % = 31.86
BOTTOM ASH % = 68.14

MASS ASH FROM CYCLONES = 2859.14
% CYCLONE ASH AS BOTTOM ASH = 107.87
% CYCLONE ASH AS FLYASH = -7.87

WEIGHT AVG C IN ASH = 5.15
UNBURNED CARBON % = .33

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 11C

TOTAL COAL FLOW	KLB/HR	69.60
REBURN COAL FLOW	KLB/HR	23.30
CYCLONE COAL FLOW	KLB/HR	46.30
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	10.61
CARBON IN BOTTOM ASH	%	.20
B&W FLYASH CATCH	LB/KLB	1.64
GAS WEIGHT	KLB/HR	786.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 1287.47
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 136.60

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4280.40

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3129.53
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 6.26

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4423.26

FLYASH % = 29.11
BOTTOM ASH % = 70.89

MASS ASH FROM CYCLONES = 2847.45
% CYCLONE ASH AS BOTTOM ASH = 110.13
% CYCLONE ASH AS FLYASH = -10.13

WEIGHT AVG C IN ASH = 3.23
UNBURNED CARBON % = .21

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 12A

TOTAL COAL FLOW	KLB/HR	70.20
REBURN COAL FLOW	KLB/HR	23.19
CYCLONE COAL FLOW	KLB/HR	47.01
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	14.69
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	1.64
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	756.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2062.93
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 303.04

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4317.30

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2557.42
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 5.11

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4625.46

FLYASH % = 44.60
BOTTOM ASH % = 55.40

MASS ASH FROM CYCLONES = 2891.12
% CYCLONE ASH AS BOTTOM ASH = 88.63
% CYCLONE ASH AS FLYASH = 11.37

WEIGHT AVG C IN ASH = 6.66
UNBURNED CARBON % = .44

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 13A

TOTAL COAL FLOW	KLB/HR	69.70
REBURN COAL FLOW	KLB/HR	23.24
CYCLONE COAL FLOW	KLB/HR	46.46
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	15.15
CARBON IN BOTTOM ASH	%	.20
ACUREX FLYASH CATCH	GR/DSCF	1.82
MOLE RATIO DRY/WET GAS		.92
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	760.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2307.28
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 349.55

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4286.55

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2328.82
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 4.66

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4640.76

FLYASH % = 49.72
BOTTOM ASH % = 50.28

MASS ASH FROM CYCLONES = 2857.29
% CYCLONE ASH AS BOTTOM ASH = 81.67
% CYCLONE ASH AS FLYASH = 18.33

WEIGHT AVG C IN ASH = 7.63
UNBURNED CARBON % = .51

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 4BM

TOTAL COAL FLOW	KLB/HR	69.80
REBURN COAL FLOW	KLB/HR	22.98
CYCLONE COAL FLOW	KLB/HR	46.82
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	18.58
CARBON IN BOTTOM ASH	%	.20
B&W FLYASH CATCH	LB/KLB	1.14
GAS WEIGHT	KLB/HR	743.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 845.16
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 157.03

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4292.70

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 3604.57
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 7.21

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4456.94

FLYASH % = 18.96
BOTTOM ASH % = 81.04

MASS ASH FROM CYCLONES = 2879.43
% CYCLONE ASH AS BOTTOM ASH = 125.43
% CYCLONE ASH AS FLYASH = -25.43

WEIGHT AVG C IN ASH = 3.69
UNBURNED CARBON % = .24

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 13T

TOTAL COAL FLOW	KLB/HR	71.80
REBURN COAL FLOW	KLB/HR	23.35
CYCLONE COAL FLOW	KLB/HR	48.45
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	37.54
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	4.33
GAS WEIGHT	KLB/HR	747.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 3234.51
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 1214.24

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4415.70

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2395.43
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 11.98

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5641.91

FLYASH % = 57.33
BOTTOM ASH % = 42.67

MASS ASH FROM CYCLONES = 2979.67
% CYCLONE ASH AS BOTTOM ASH = 80.79
% CYCLONE ASH AS FLYASH = 19.21

WEIGHT AVG C IN ASH = 21.74
UNBURNED CARBON % = 1.71

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 14T

TOTAL COAL FLOW	KLB/HR	71.20
REBURN COAL FLOW	KLB/HR	23.38
CYCLONE COAL FLOW	KLB/HR	47.82
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	33.10
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	3.76
GAS WEIGHT	KLB/HR	739.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2777.90
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 919.49

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4378.80

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2520.38
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 12.60

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5310.89

FLYASH % = 52.31
BOTTOM ASH % = 47.69

MASS ASH FROM CYCLONES = 2940.93
% CYCLONE ASH AS BOTTOM ASH = 86.13
% CYCLONE ASH AS FLYASH = 13.87

WEIGHT AVG C IN ASH = 17.55
UNBURNED CARBON % = 1.31

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 28T

TOTAL COAL FLOW	KLB/HR	72.20
REBURN COAL FLOW	KLB/HR	23.14
CYCLONE COAL FLOW	KLB/HR	49.06
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	35.52
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	4.05
GAS WEIGHT	KLB/HR	747.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 3026.84
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 1075.13

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4440.30

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2488.59
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 12.44

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5527.88

FLYASH % = 54.76
BOTTOM ASH % = 45.24

MASS ASH FROM CYCLONES = 3017.19
% CYCLONE ASH AS BOTTOM ASH = 82.89
% CYCLONE ASH AS FLYASH = 17.11

WEIGHT AVG C IN ASH = 19.68
UNBURNED CARBON % = 1.51

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 46T

TOTAL COAL FLOW	KLB/HR	72.30
REBURN COAL FLOW	KLB/HR	23.21
CYCLONE COAL FLOW	KLB/HR	49.09
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	33.83
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	3.31
GAS WEIGHT	KLB/HR	734.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2427.34
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 821.17

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4446.45

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2840.28
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 14.20

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5281.82

FLYASH % = 45.96
BOTTOM ASH % = 54.04

MASS ASH FROM CYCLONES = 3019.03
% CYCLONE ASH AS BOTTOM ASH = 94.55
% CYCLONE ASH AS FLYASH = 5.45

WEIGHT AVG C IN ASH = 15.82
UNBURNED CARBON % = 1.16

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 47T

TOTAL COAL FLOW	KLB/HR	71.40
REBURN COAL FLOW	KLB/HR	23.21
CYCLONE COAL FLOW	KLB/HR	48.19
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	30.03
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	3.08
GAS WEIGHT	KLB/HR	732.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2251.63
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 676.17

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4391.10

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2815.63
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 14.08

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5081.34

FLYASH % = 44.31
BOTTOM ASH % = 55.69

MASS ASH FROM CYCLONES = 2963.69
% CYCLONE ASH AS BOTTOM ASH = 95.48
% CYCLONE ASH AS FLYASH = 4.52

WEIGHT AVG C IN ASH = 13.59
UNBURNED CARBON % = .97

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 49T

TOTAL COAL FLOW	KLB/HR	71.50
REBURN COAL FLOW	KLB/HR	25.86
CYCLONE COAL FLOW	KLB/HR	45.64
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	22.51
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	3.04
GAS WEIGHT	KLB/HR	759.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2311.15
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 520.24

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4397.25

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2606.34
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 13.03

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4930.52

FLYASH % = 46.87
BOTTOM ASH % = 53.13

MASS ASH FROM CYCLONES = 2806.86
% CYCLONE ASH AS BOTTOM ASH = 93.32
% CYCLONE ASH AS FLYASH = 6.68

WEIGHT AVG C IN ASH = 10.82
UNBURNED CARBON % = .75

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 12B

TOTAL COAL FLOW	KLB/HR	70.00
REBURN COAL FLOW	KLB/HR	21.20
CYCLONE COAL FLOW	KLB/HR	48.80
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	16.72
CARBON IN BOTTOM ASH	%	.20
B&W FLYASH CATCH	LB/KLB	3.01
GAS WEIGHT	KLB/HR	759.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2287.63
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 382.49

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4305.00

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2399.87
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 4.80

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4692.29

FLYASH % = 48.75
BOTTOM ASH % = 51.25

MASS ASH FROM CYCLONES = 3001.20
% CYCLONE ASH AS BOTTOM ASH = 80.12
% CYCLONE ASH AS FLYASH = 19.88

WEIGHT AVG C IN ASH = 8.25
UNBURNED CARBON % = .55

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 42T

TOTAL COAL FLOW	KLB/HR	61.30
REBURN COAL FLOW	KLB/HR	22.26
CYCLONE COAL FLOW	KLB/HR	39.04
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	34.04
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	4.56
GAS WEIGHT	KLB/HR	641.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2921.04
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 994.32

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3769.95

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1843.23
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 9.22

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4773.49

FLYASH % = 61.19
BOTTOM ASH % = 38.81

MASS ASH FROM CYCLONES = 2400.96
% CYCLONE ASH AS BOTTOM ASH = 77.15
% CYCLONE ASH AS FLYASH = 22.85

WEIGHT AVG C IN ASH = 21.02
UNBURNED CARBON % = 1.64

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 39T

TOTAL COAL FLOW	KLB/HR	61.60
REBURN COAL FLOW	KLB/HR	23.25
CYCLONE COAL FLOW	KLB/HR	38.35
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	38.12
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	4.10
GAS WEIGHT	KLB/HR	627.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2570.70
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 979.95

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3788.40

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2197.65
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 10.99

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4779.34

FLYASH % = 53.79
BOTTOM ASH % = 46.21

MASS ASH FROM CYCLONES = 2358.53
% CYCLONE ASH AS BOTTOM ASH = 93.64
% CYCLONE ASH AS FLYASH = 6.36

WEIGHT AVG C IN ASH = 20.73
UNBURNED CARBON % = 1.61

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 1A

TOTAL COAL FLOW	KLB/HR	58.30
REBURN COAL FLOW	KLB/HR	0.00
CYCLONE COAL FLOW	KLB/HR	58.30
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	23.46
CARBON IN BOTTOM ASH	%	.50
ACUREX FLYASH CATCH	GR/DSCF	1.09
MOLE RATIO DRY/WET GAS		.91
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	649.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1175.54
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 275.78

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3585.45

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2685.69
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 13.43

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3874.66

FLYASH % = 30.34
BOTTOM ASH % = 69.66

MASS ASH FROM CYCLONES = 3585.45
% CYCLONE ASH AS BOTTOM ASH = 75.28
% CYCLONE ASH AS FLYASH = 24.72

WEIGHT AVG C IN ASH = 7.47
UNBURNED CARBON % = .50

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 20A

TOTAL COAL FLOW	KLB/HR	52.30
REBURN COAL FLOW	KLB/HR	16.43
CYCLONE COAL FLOW	KLB/HR	35.87
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	34.94
CARBON IN BOTTOM ASH	%	.50
ACUREX FLYASH CATCH	GR/DSCF	2.63
MOLE RATIO DRY/WET GAS		.90
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	572.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2478.86
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 866.11

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3216.45

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1603.70
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 8.02

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4090.58

FLYASH % = 60.60
BOTTOM ASH % = 39.40

MASS ASH FROM CYCLONES = 2206.01
% CYCLONE ASH AS BOTTOM ASH = 73.06
% CYCLONE ASH AS FLYASH = 26.94

WEIGHT AVG C IN ASH = 21.37
UNBURNED CARBON % = 1.67

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 15A

TOTAL COAL FLOW	KLB/HR	52.30
REBURN COAL FLOW	KLB/HR	16.51
CYCLONE COAL FLOW	KLB/HR	35.79
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	20.33
CARBON IN BOTTOM ASH	%	.50
ACUREX FLYASH CATCH	GR/DSCF	2.69
MOLE RATIO DRY/WET GAS		.92
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	546.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2462.67
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 500.66

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3216.45

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1254.44
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 6.27

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3723.38

FLYASH % = 66.14
BOTTOM ASH % = 33.86

MASS ASH FROM CYCLONES = 2201.09
% CYCLONE ASH AS BOTTOM ASH = 57.28
% CYCLONE ASH AS FLYASH = 42.72

WEIGHT AVG C IN ASH = 13.62
UNBURNED CARBON % = .97

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 48T

TOTAL COAL FLOW	KLB/HR	50.20
REBURN COAL FLOW	KLB/HR	15.95
CYCLONE COAL FLOW	KLB/HR	34.25
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	35.85
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	4.43
GAS WEIGHT	KLB/HR	513.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2273.62
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 815.09

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3087.30

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1628.78
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 8.14

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3910.54

FLYASH % = 58.14
BOTTOM ASH % = 41.86

MASS ASH FROM CYCLONES = 2106.38
% CYCLONE ASH AS BOTTOM ASH = 77.71
% CYCLONE ASH AS FLYASH = 22.29

WEIGHT AVG C IN ASH = 21.05
UNBURNED CARBON % = 1.64

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 43T

TOTAL COAL FLOW	KLB/HR	48.90
REBURN COAL FLOW	KLB/HR	16.03
CYCLONE COAL FLOW	KLB/HR	32.87
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	33.86
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	5.30
GAS WEIGHT	KLB/HR	505.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2674.98
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 905.75

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3007.35

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1238.11
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 6.19

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3919.29

FLYASH % = 68.25
BOTTOM ASH % = 31.75

MASS ASH FROM CYCLONES = 2021.51
% CYCLONE ASH AS BOTTOM ASH = 61.55
% CYCLONE ASH AS FLYASH = 38.45

WEIGHT AVG C IN ASH = 23.27
UNBURNED CARBON % = 1.86

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 2BM

TOTAL COAL FLOW	KLB/HR	53.30
REBURN COAL FLOW	KLB/HR	17.26
CYCLONE COAL FLOW	KLB/HR	36.04
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	41.20
CARBON IN BOTTOM ASH	%	.50
B&W FLYASH CATCH	LB/KLB	3.81
GAS WEIGHT	KLB/HR	578.00

B&W FLYASH MASS (LB/HR) = CATCH * GAS WEIGHT = 2204.49
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 908.25

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 3277.95

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1981.71
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 9.91

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 4196.11

FLYASH % = 52.54
BOTTOM ASH % = 47.46

MASS ASH FROM CYCLONES = 2216.46
% CYCLONE ASH AS BOTTOM ASH = 89.86
% CYCLONE ASH AS FLYASH = 10.14

WEIGHT AVG C IN ASH = 21.88
UNBURNED CARBON % = 1.72

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 14A

TOTAL COAL FLOW	KLB/HR	48.50
REBURN COAL FLOW	KLB/HR	16.23
CYCLONE COAL FLOW	KLB/HR	32.27
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	20.01
CARBON IN BOTTOM ASH	%	.50
ACUREX FLYASH CATCH	GR/DSCF	2.05
MOLE RATIO DRY/WET GAS		.92
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	515.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 1763.13
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 352.80

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 2982.75

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 1572.42
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 7.86

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 3343.41

FLYASH % = 52.73
BOTTOM ASH % = 47.27

MASS ASH FROM CYCLONES = 1984.61
% CYCLONE ASH AS BOTTOM ASH = 79.63
% CYCLONE ASH AS FLYASH = 20.37

WEIGHT AVG C IN ASH = 10.79
UNBURNED CARBON % = .74

ASH SPLIT & CARBON LOSS CALCULATIONS FOR TEST # 19A

TOTAL COAL FLOW	KLB/HR	69.00
REBURN COAL FLOW	KLB/HR	22.51
CYCLONE COAL FLOW	KLB/HR	46.49
ASH IN FUEL	%	6.15
CARBON IN FLYASH	%	32.37
CARBON IN BOTTOM ASH	%	.50
ACUREX FLYASH CATCH	GR/DSCF	1.96
MOLE RATIO DRY/WET GAS		.90
BASE DENSITY OF GAS	LB/CFT	.08
GAS WEIGHT	KLB/HR	765.00

ACUREX FLYASH MASS (LB/HR) = CATCH*RATIO*GSWT/(PBASE*7) = 2468.02
MASS C FLYASH = C FLYASH % * MASS FLYASH / 100 = 798.90

TOTAL ASH FROM FUEL = TOTAL COAL FLOW * ASH IN FUEL / 100 = 4243.50

MASS BOTTOM ASH = TOTAL ASH - (FLYASH - C IN FLYASH) = 2574.38
MASS C BOTTOM ASH = BOTTOM ASH * C IN BOTTOM ASH / 100 = 12.87

TOTAL REFUSE = TOTAL ASH + C IN FLYASH + C IN BOTTOM ASH = 5055.27

FLYASH % = 48.82
BOTTOM ASH % = 51.18

MASS ASH FROM CYCLONES = 2859.14
% CYCLONE ASH AS BOTTOM ASH = 90.49
% CYCLONE ASH AS FLYASH = 9.51

WEIGHT AVG C IN ASH = 16.06
UNBURNED CARBON % = 1.18

DATE
FILMED
8/23/94

END