INTEGRATED DRY NO$_2$/SO$_2$ EMISSIONS CONTROL SYSTEM

QUARTERLY REPORT NO. 6

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISCLAIMER</td>
<td>1</td>
</tr>
<tr>
<td>1.0 EXECUTIVE SUMMARY</td>
<td>2</td>
</tr>
<tr>
<td>2.0 INTRODUCTION</td>
<td>4</td>
</tr>
<tr>
<td>3.0 PROJECT DESCRIPTION</td>
<td>5</td>
</tr>
<tr>
<td>3.1 BACKGROUND</td>
<td>5</td>
</tr>
<tr>
<td>3.2 PROCESS DESCRIPTION</td>
<td>5</td>
</tr>
<tr>
<td>3.3 PARTICIPANTS</td>
<td>5</td>
</tr>
<tr>
<td>4.0 PROJECT STATUS</td>
<td>9</td>
</tr>
<tr>
<td>4.1 PHASE I - ENGINEERING AND DESIGN</td>
<td>9</td>
</tr>
<tr>
<td>4.2 PHASE IIA - PROCUREMENT</td>
<td>10</td>
</tr>
<tr>
<td>4.3 PHASE IIB - CONSTRUCTION AND STARTUP</td>
<td>11</td>
</tr>
<tr>
<td>5.0 PLANNED ACTIVITIES</td>
<td>15</td>
</tr>
<tr>
<td>6.0 SUMMARY</td>
<td>16</td>
</tr>
<tr>
<td>7.0 REPORT DISTRIBUTION</td>
<td>17</td>
</tr>
</tbody>
</table>
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1.0 EXECUTIVE SUMMARY

This Quarterly Report summarizes the Integrated Dry NO\textsubscript{x}/SO\textsubscript{2} Emissions Control System Project (DOE Agreement No. DE-FC22-91PC90550) progress for the months of April, May, and June 1992.

Public Service Company of Colorado ("PSCC") activities focused on construction of all systems for the project. The unit was off-line for installation of the project equipment from March 20, 1992 through May 30, 1992. A short summary of the items completed are listed below. Section 4.0 of this report contains additional details of the project status.

Low-NO\textsubscript{x} Burners and Overfire Air System

Construction activities centered on boiler modifications to install the new burners and the overfire air system. Construction began last quarter when the outage began on March 20, 1992. Construction proceeded exceptionally well for a first-of-its-kind modification. No major problems occurred during the period and the installation was completed two days ahead of schedule. A significant amount of tube welds was completed and quality assurance work found only a few of the hundreds of welds required repair. A major milestone was achieved when the boiler was successfully hydrotested on April 18, 1992. Gas burners were fired on May 27, 1992 and the unit was operating on coal May 30, 1992 at 50MWe.

Startup went was very smooth with only minor modifications required. Original startup testing did indicate that carbon carryover in the flyash was higher than expected, but with optimization of burner settings, carbon was reduced to levels comparable to the baseline testing. Initial NO\textsubscript{x} reductions are better than expected and are approximately 60%. Testing will be completed in phase III to fully document the combustion system modifications.

Dry Sorbent Injection System

Significant progress was made on construction of the dry sorbent injection system this quarter. All equipment has been set and most piping is complete. The system is approximately 90% erected. Work is slightly behind the original schedule as manpower was relocated to outage related activities to ensure their completion. The slight delay in construction will not affect the project as construction will be completed many months before the system is schedule to operate.

Humidification System

All work on the humidification system, other than painting and insulation, was completed this quarter. Due to manpower problems the seal air fan tie-in to the fabric filter dust collector was not completed during the outage. A one-day outage will be required to complete this tie-in before the system is operated. This will not affect the test schedule for this system.
Flyash Storage System

The majority of construction of the dry flyash collection and storage system was completed this quarter. The system was started up when the boiler was fired with coal on May 30, 1992 by diverting ash to the on-site storage ponds. All system equipment has now been operated and tested individually but dry collection has yet to be accomplished. The water system for the ash unloader is nearing completion and we expect operation in the next month.

Distributed Control System

All construction activities were completed this quarter and the distributed control system is operational. Other than minor modifications to logic, the startup proceeded without incident. Startup of the control system occurred with the boiler on May 30, 1992. Some minor punch list items remain and the auxiliary control system for the dry sorbent and humidification system will be tested when these systems are started. The continuous emissions monitor was started up in June of this quarter and is operational.

Miscellaneous

The continuation application was submitted and approved this quarter. The project will continue with Phase III work on schedule in late July, 1992. At the request of the DOE, the work scope was increased to measure air toxics on the project. An increase in total project funding of $934,000 (DOE to share 50%) was requested and approved as part of the continuation application to provide funding for the added work scope. No overrun funding was requested and the project remains on schedule and on budget for the original scope of work.
2.0 INTRODUCTION

According to the requirements of Cooperative Agreement No. DE-FC22-91PC90550 dated March 11, 1991, Public Service Company of Colorado has prepared the following quarterly report for Phases I, IIA, and IIB of the Integrated Dry NO₂/SO₂ Emissions Control System Project. This project includes low-NOₓ burners with NOₓ ports (overfire air injection), humidification and dry sorbent injection. This report covers the quarterly period April, May, and June, 1992. This report covers project activities for the sixth quarter of the project.

The subject of this report is the project progress during the quarter for Phase I - Engineering and Design, Phase IIA - Procurement, and Phase IIB - Construction and Startup.

Under Phase I, engineering and design for all systems within the project scope were completed. The majority of all work was previously completed but minor design and drawing changes were completed during the quarter in support of construction. A formal project review meeting was held on May 6, 1992 with the DOE and other project team member to discuss the design details of the system. The continuation application to allow funding of Phase III was submitted and approved by the DOE.

Under Phase IIA, minor purchasing activities continued throughout the quarter in support of the field construction. Much of the equipment for the various systems arrived this quarter and was installed. Although a few delivery problems occurred on the project, no construction delays were caused by a lack of material.

Under Phase IIB, a majority of the construction was completed this quarter. The new low-NOₓ burners and overfire air system were installed and started up. All construction for the dry flyash storage system was completed and we are 90% complete on construction of the dry sorbent injection system and the humidification system. The unit was brought back online on May 30, 1992, two days ahead of the original schedule. The combustion modifications are operating better than expected and preliminary NOₓ reduction of approximately 60% has been obtained with no significant operating problems.
3.0 PROJECT DESCRIPTION

3.1 BACKGROUND

The goal of this project is to demonstrate the removal up to 70% of the \( \text{NO}_x \) and 70% of the \( \text{SO}_2 \) emissions from coal fired utility boilers. It will establish an alternative emissions control technology integrating a combination of several processes, while minimizing capital expenditures and limiting waste production to dry solids that are handled with conventional ash removal equipment. These processes include low-\( \text{NO}_x \) burners, \( \text{NO}_x \) ports (overfire air), and urea injection for \( \text{NO}_x \) control, sodium or calcium based sorbent injection for \( \text{SO}_2 \) control, and flue gas humidification to enhance the reactivity of the \( \text{SO}_2 \) control compound.

The low-\( \text{NO}_x \) burners reduce \( \text{NO}_x \) formation by a combination coal/air combustion staging and the use of \( \text{NO}_x \) ports. Urea injection downstream of the burners reacts chemically with \( \text{NO}_x \) to form nitrogen and water.

Sodium and calcium based reagents react with the \( \text{SO}_2 \) in the flue gas to form sulfites and sulfates, lowering the emissions of \( \text{SO}_2 \). Humidification of the flue gas increases the reactivity of the calcium reactants. The solid reacted sorbent is removed with the flyash in the existing fabric filter.

A sodium based injection system can convert nitrogen oxide ("NO") to nitrogen dioxide ("\( \text{NO}_2 \)") which is one form of \( \text{NO}_x \), and is visible in the stack plume under certain conditions. Ammonia, from the urea injection, reduces the \( \text{NO}_2 \) concentration by reacting with the \( \text{NO}_2 \). Thus, system integration may alleviate a potential undesirable side effect of \( \text{SO}_2 \) removal.

The demonstration program is directed at down-fired boilers, but the process can be utilized on other types of boilers. This project will be the first United States application of low-\( \text{NO}_x \) burners to a down-fired boiler.

The project objectives also include demonstrating the cost effectiveness of the process and determining any possible negative effects on normal boiler operation or creation of any other unwanted releases of gaseous or solid emissions.

3.2 PROCESS DESCRIPTION

The Integrated Dry \( \text{NO}_x/\text{SO}_2 \) Emissions Control System is a multi-part process in which low-\( \text{NO}_x \) burners, \( \text{NO}_x \) ports, and urea injection is used to control \( \text{NO}_x \). Sodium based sorbent injection or calcium based sorbent injection, combined with in-duct humidification is used for \( \text{SO}_2 \) removal.
The total $\text{NO}_x$ formed during the combustion of fossil fuels, consists of $\text{NO}_x$ formed from fuel bound nitrogen, thermal $\text{NO}_x$ and prompt $\text{NO}_x$. $\text{NO}_x$ formed from fuel bound nitrogen results from the oxidation of nitrogen which is bonded to the fuel molecules. Thermal $\text{NO}_x$ forms when nitrogen in the combustion air dissociates and oxidizes at flame temperatures in excess of 2800°F. Prompt $\text{NO}_x$ forms during the combustion process when hydrocarbon radicals dissociate atmospheric nitrogen, which then oxidizes.

The B&W DRB-XCL™ burner achieves increased $\text{NO}_x$ reduction effectiveness by incorporating fuel staging along with air staging. Most of low-$\text{NO}_x$ burners reduce $\text{NO}_x$ by the use of air staging. Air staging reduces the amount of combustion air during the early stages of combustion. Fuel staging involves the introduction of the fuel downstream of the flame under fuel-rich conditions, causing hydrocarbon radicals to be generated. These radicals reduce $\text{NO}_x$ levels. This is accomplished by the coal nozzle/flame stabilizing ring design of the burner. In addition, combustion air is accurately measured and regulated to each burner to provide balanced air and fuel distribution for optimum $\text{NO}_x$ reduction and combustion efficiency. Further, the burner assembly is equipped with adjustable burner vanes to provide swirl for flame stabilization and fuel/air mixing.

**NO$_x$ Ports**

NO$_x$ ports are used in conjunction with low-NO$_x$ burners to increase the effectiveness of air staging. NO$_x$ ports provide the final air necessary to ensure complete combustion. Conventional single jet NO$_x$ ports are not capable of providing adequate mixing across the entire furnace. The B&W dual zone NO$_x$ ports, however, incorporates a central zone which produces an air jet that penetrates across the furnace and a separated outer zone that diverts and disperses the air in the area of the furnace near the NO$_x$ port. The central zone is provided with a manual air control disk for flow control and the outer zone incorporates manually adjustable spin vanes for air swirl control.

The combined use of the B&W DRB-XCL™ burners and dual zone NO$_x$ ports is expected to reduce NO$_x$ emissions by up to 70%.

**Urea Injection**

NO$_x$ reduction in utility boilers can also be accomplished by injecting urea into the furnace. The urea reacts with the NO$_x$ and oxygen in the gases and forms nitrogen, carbon dioxide and water. A urea injection system is capable of removing 40% to 50% of the remaining NO$_x$ from the combustion process.

The optimum urea injection reaction temperature range is between 1700°F and 1900°F. At lower temperatures, side reactions can occur, resulting in the undesirable formation of ammonia. At higher temperatures, additional NO$_x$ is formed.
The urea is generally injected into the boiler as an aqueous solution through atomizers. The atomizing medium can be either air or steam. The urea and any additive are stored as a liquid and pumped into the injection atomizers.

**Dry Sorbent Injection**

The dry sorbent injection system consists of equipment for storing, conveying, pulverizing, and injecting sodium based products into the flue gas between the air heater and the particulate removal equipment or calcium products between the economizer and the air heater. The SO₂ formed during the combustion reacts with the sodium or calcium based reagents to form sulfates and sulfites. These reaction products are collected in the particulate removal equipment together with the flyash and the unreacted reagent and removed for disposal. The system is expected to remove up to 70% SO₂ while using sodium based products and maintaining high sorbent utilization.

Dry sorbent injection systems reduce SO₂ emissions. However, NO₂ formation has been observed in some applications. NO₂ is a red/brown gas. A visible plume may form as the NO₂ in flue gas exits the stack. Previous tests have shown that when ammonia based compounds are present during the SO₂/sodium chemical reaction, the amount of NO₂ emitted from the stack is reduced. Thus by combining dry sorbent injection with urea boiler injection it is expected that both NO₂ and NH₃ emissions will be reduced substantially from those emissions that would occur if the two systems are operated separately.

In certain areas of the country, it may be more economically advantageous to use calcium based reagents, rather than sodium based reagents, for SO₂ removal. SO₂ removal using calcium based reagents involves the dry injection of the reagent into the furnace at a point where the flue gas temperature is approximately 1000°F. Calcium based materials can also be injected into the flue gas ductwork downstream of the air heater, but at reduced SO₂ removal effectiveness.

**Humidification**

In addition to the selection of the proper injection point, the effectiveness of the calcium based reagent in reducing SO₂ emissions can be increased by flue gas humidification. Flue gas conditioning by humidification involves injecting water into the flue gas stream downstream of the air heater and upstream of any particulate removal equipment. The water is injected into the duct by dual fluid atomizers which produce a fine spray that can be directed downstream and away from the duct walls. The subsequent evaporation causes the flue gas to cool, thereby decreasing its volumetric flow rate and increasing its absolute humidity. It is important that the water be injected in such a way as to prevent it from wetting the duct walls and to ensure complete evaporation before the gas enters the particulate removal equipment or contacts the duct turning vanes. Since calcium-based reagents are not as reactive as sodium-based reagents, the presence of water in the flue gas,
which contains unreacted reagent, provides for additional SO\textsubscript{2} removal. Up to 50% SO\textsubscript{2} removal is expected when calcium reagents are used in conjunction with flue gas humidification.

### 3.3 PARTICIPANTS

Public Service Company of Colorado is the Project Manager for the project, and is responsible for all aspects of project performance. PSCC will engineer the dry sorbent injection system and the modifications to the flyash system, provide the host site, train the operators, provide selected site construction services, provide start-up services and maintenance and assist in the testing program.

Babcock & Wilcox is responsible for engineering, procurement, fabrication, installation, and shop testing of the DRB-XCL\textsuperscript{TM} burners, NO\textsubscript{x} ports, humidification equipment, and associated controls, will assist in the testing program, and will provide for the commercialization of the technology. Noell, Inc. is responsible for the engineering, procurement and fabrication of the urea system. Fossil Energy Research Corp. will conduct the testing program. Western Research Institute will characterize the waste materials and recommend disposal options. Colorado School of Mines will provide research in the areas of bench scale chemical kinetics for the NO\textsubscript{x} formation reaction. Stone & Webster Engineering Corporation will assist PSCC with the engineering efforts. Coastal Chemical, Inc. will supply the urea for the project.
4.0 PROJECT STATUS

This project Quarterly Report Number 6 covers the period for April, May, and June, 1992. This report discusses progress by task for Phases I, IIA and IIB. The numbers after the task descriptions below have been assigned by PSCC for accounting purposes and relate to the original scope of work for the project.

4.1 PHASE I - ENGINEERING AND DESIGN

4.1.1 Flyash System 1211: The road design was completed and drawings were issued on April 16, 1992 for the road that will be installed to the ash silo. Two new rail crossing designs were completed and issued for bid. The specification for a weight scale for the ash system was prepared and released for bids in late June. This task is now complete.

4.1.2 Dry Sorbent Injection System 1212: A vacuum system was designed and specified for the Dry Sorbent Injection building in May, 1992. All other design work for this system was completed last quarter. Minor work was completed throughout the quarter making required field design changes. This task is now complete.

4.1.3 Humidification System 1213: SWEC issued the mechanical and electrical drawings for the humidification system the week of April 13, 1992. The foundation design and drawings for the humidification seal air fan were completed in late April, 1992. Minor design work was completed throughout the quarter making required field design changes to support construction. This task is now complete.

4.1.4 Urea Injection System 1220: The original scope of work for this task is complete, however, PSCC is currently evaluating a proposal from Noell, Inc to add equipment to allow conversion of urea into aqueous ammonia.

4.1.5 Burners and NOx Ports 1230: Design modifications were completed the week of April 6, 1992 to reroute two coal pipes. A field interference was discovered during the installation. The cooling system design for the 6th floor was completed and a specification for the ventilation system was issued on May 11, 1992. Other minor design modifications were made as required to support construction. This task is now complete.

4.1.6 Continuous Emissions Monitor 1241: Investigation into a flow monitor was completed and a specification was begun. The specification has not been completed or issued as we are waiting for final regulations from the Environmental Protection Agency. Wiring drawings for the Continuous Emissions monitor were issued in late June to connect the monitor into the distributed control system.
4.1.7 Distributed Control System 1242: The electric design and drawings for the new coal feeder variable speed drives were issued April 24, 1992. Installation drawings for the feeders were issued the week of April 13, 1992. An air lock vestibule was designed and specified to help keep dust and dirt from entering the Engineering Control Building. All burner wiring design drawings and cable schedules for the burners were issued by SWEC the week of April 13. All boiler turbine generator wiring drawings were issued in mid April. All graphic programs relating to the boiler and burner management system were completed during this quarter. Checkout of the distributed control system continued throughout the period and the system was ready for startup on May 27, 1992. Only minor modifications were required during startup. The logic that controls the Jordon drives that move the sleeve damper on the burner was modified as the original logic did not work correctly.

4.1.8 Project Management 1251: Public Service worked completing the various reporting requirements throughout the quarter. Modifications were made to the Cooperative Agreement to provide more consistent reporting requirements. A formal design review meeting was held in Denver on May 6, 1992 with the DOE and the other project team members. The continuation application was prepared and submitted on May 28, 1992 requesting approval to proceed with the second budget period for the project. A request to increase total project funding by $934,000 (DOE to share 50%) was made to increase the scope of work by adding air toxic testing to the program. The change in work scope was requested by the DOE. The application was approved by the DOE on June 24, 1992. The project remains on budget and no overrun funding was requested.

4.1.9 Consulting 1252: This task is complete.

4.1.10 Engineering Research 1260: This task is complete.

4.2 PHASE IIA - PROCUREMENT

4.2.1 Flyash System 1311: Minor procurement of items required for construction of the flyash conversion system continued. The ash water pump was received the week of May 25, 1992. Two scales were bid to weigh trucks before and after loading at the ash silo. After further investigation it was decided one central scale would be more cost effective and the scale was rebid. A contract was released on June 15, 1992 to enclose the silo unloader floor. Bids were prepared and issued to complete all painting work on the ash system in mid June, 1992.

4.2.2 Dry Sorbent Injection System 1312: The majority of work on this task includes the arrival of much of the major equipment that was previously ordered. The silo vent filters arrived on April 2, 1992. The screw feeders and isolation gates arrived on May 1, 1992. The control panel for the DSI system arrived on site the week of May 4, 1992.
After numerous delays by the manufacturer the splitters were received on May 14, 1992 and the air lock on May 22, 1992. The material delay did not affect the construction of the system.

4.2.3 Humidification System 1313: Work on this task included receipt of equipment ordered in previous periods. The seal air damper was received on April 16, 1992. The seal air fan arrived on site on May 13, 1992. The humidification water pump was received on May 25, 1992. After numerous delays by the manufacturer, the two humidification air compressors arrived on site nearly three months after the scheduled date during the week of June 1, 1992. Although these delays required some rescheduling, they will not affect the testing program schedule.

4.2.4 Urea Injection System 1320: This task is complete except for minor procurement required for a restroom that will be added in the urea injection building. A proposal to add equipment to allow urea to be converted to aqueous ammonia was received from Noell. PSCC is considering the modifications.

4.2.5 Burners and NOₓ Ports 1330: All major procurement is complete and work included receiving goods previous ordered. PSCC Quality Assurance Department visited B&W's Paris, Texas plant and inspected the new DRB-XCL™ low-NOₓ burners before shipment. Some minor manufacturing problems with the burners developed that delayed shipment by approximately two weeks. The burners were received in three shipments by April 17, 1992. The delayed shipment did not cause any construction delays. Some modifications to the coal piping were received on April 27, 1992. Various minor material was purchased to support construction requirements.

4.2.6 Continuous Emissions Monitor 1341: The Continuous Emission Monitor system was received on May 21, 1992 and calibration gases were obtained for the monitor.

4.2.7 Distributed Control System 1342: All major items have been ordered and received in previous quarters. Some minor procurement was completed to support construction activities. A fire alarm system specification for the new buildings added as part of the project was issued for bid on June 8, 1992.

4.3 PHASE IIB - CONSTRUCTION AND STARTUP:

4.3.1 Flyash System 1411: The silo was erected the week of April 13, 1992 and the contractor began the piping modification work. The construction was essentially complete before startup of the combustion modifications and ash was sent to the on-site holding pond without problem. Equipment was operated and tested June 3 through June 12, 1992 with the assistance of the manufacturer's startup engineer. Construction of the ash silo and associated piping was essentially completed and the contractor moved off site the
last week of June, 1992. PSCC Construction department added a platform for the access to the ash system bypass valves the week of June 22, 1992. The water system is nearly complete but dry ash has not yet been loaded to the silo. The road to the silo was completed on June 12, 1992 except for paving. Construction of all items is complete although punch list items remain.

4.3.2 Dry Sorbent Injection System 1412: Significant progress was made throughout the quarter on construction of the Dry Sorbent Injection System. The sorbent pulverizers and blowers were set on April 6, 1992. All outage related items for the system including the boiler and duct injection ports was completed by May 15, 1992. The two platforms for the calcium injection splitters were completed on May 15, 1992. All silo piping was completed on May 18, 1992. All equipment is set and piped except final piping to the injection nozzles. Construction is approximately 90% complete, which is slightly behind the schedule. The system is not required to operate until January, 1993 and the slight delay will not affect the project test schedule.

4.3.3 Humidification System 1413: The majority of the outage related construction of the humidification system was completed ahead of schedule. The humidification air compressor building was completed on April 17, 1992. The foundation for the seal air fan was installed on May 1, 1992. The humidifier lances and associated piping were installed and the required platform modifications were completed by April 13, 1992. All construction is complete except the seal air fan system. The fan and piping is complete but a short outage will be required to tie the fan into the FFDC outlet duct before the system is operated in January 1993.

4.3.4 Urea Injection System 1420: This task was completed last quarter.

4.3.5  Burners and NOx Ports 1430: Essentially all burner and NOx port modifications were begun and completed during this quarter. Construction proceeded well ahead of schedule and under the projected budget throughout the period. B&W Construction reduced to single shift operation three weeks into the outage as construction was proceeding ahead of schedule. A second shift was added the last three weeks of the outage due more to space limitation than schedule requirements. All asbestos on the boiler roof was removed and the 6th floor was release to B&W construction on April 1, 1992 to begin demolition of the old burners and boiler roof. The NOx port boiler tube panels were set and welding was completed on April 4, 1992. All roof tubes were removed, replaced, and welded. A successful hydro-test of all tubes was completed on April 18, 1992. All burners were installed by May 4, 1992. All coal and gas piping was completed by May 18, 1992. Sturgeon completed all wiring to the burner deck on May 18, 1992. Startup of the burner system began May 25, 1992. A training class was provided by B&W on May 27, 1992 for all plant operators. The first coal mill was started on May 29, 1992 and the unit was at 50MWe on May 30, 1992, two day ahead of schedule. Insulation work continued through June 12, 1992 and B&W Construction moved off site on June 22, 1992. B&W Startup worked on optimization of the burners throughout the month of June. Initial results
indicated that carbon carryover was higher than expected but this problem was corrected through burner adjustment. NO\textsubscript{x} reductions are greater than expected and are in the range of 60%. Carbon carryover was reduced to the baseline conditions. The system is ready to begin phase III operations and testing.

4.3.6 Continuous Emissions Monitor 1441: The monitor was installed and operational on June 10, 1992. The factory startup engineer for the monitor was on site this week to initiate operation. FERCO was also on site to assist in the monitor startup and to gain operating experience. The monitor is working well and all construction activities are completed. Tie in to the distributed control system is scheduled for next quarter.

4.3.7 Distributed Control System 1442: The construction of the distributed control system (DCS) was completed this quarter and the system was started up by May 30, 1992. PSCC Substation's Department and Sturgeon Electric worked together throughout the quarter completing the wiring and equipment installation. The boiler turbine generator (BTG) board was extensively modified for the DCS system and new gauges and switches installed and wired by April 18, 1992. Asbestos insulated wiring was discovered in the panel and this was removed according to State requirements and disposed of. The operator console became operational in the control room on April 25, 1992. The new variable speed coal feeders were installed and wired on May 8, 1992. A training class was held for all plant operators on the new control system three weeks before startup of the system. The uninterruptable power supply for the DCS was installed and checked out by May 18, 1992. Startup activities began in earnest on May 11, 1992 and were completed with the successful unit startup on May 30, 1992. PSCC Substation's completed all work and were off-site by June 12, 1992. PSCC Results Department worked with Westinghouse, the DCS supplier, throughout the month of June tuning control loops on the control system.

4.3.8 Project Management 1451: PSCC worked throughout the quarter coordinating the construction activities, tracking budgets, and completing the required reporting. The project remains on budget for construction.

4.3.9 Consulting 1452: No consulting activities to report this quarter.

4.3.10 Construction Management 1453: PSCC has stationed one full-time engineer on site to coordinate the day-to-day construction activities. Three other engineers are on site as required to coordinate items in their specialty. PSCC Quality Assurance Department was on site during the welding and radiographed 100% of the boiler tube welding.

4.3.11 Engineering Research 1460: Colorado School of Mines (CSM) continues work on the batch reactor vessel for NO\textsubscript{x} formation research. They have run some test runs of the system with simulated flue gas but are having difficulty with the gas chromatograph for NO measurements. Some minor design changes have been made and work is progressing on schedule.
4.3.12 Testing 1471: Fossil Energy Research Corporation (FERCO) worked on analyzing data and writing the final report for the urea injection testing. They also completed the test plan for Phase III work and submitted it on May 28, 1992. FERCO also completed construction of the dry gas test equipment for the monitoring for the third phase of the project.

4.3.13 Operations and Maintenance 1472: No activities to report this quarter.
5.0 PLANNED ACTIVITIES

The planned activities for the next quarter, July, August and September, 1992, include the following:

1. PSCC will complete the construction of the dry sorbent injection and humidification systems and begin startup and checkout of the equipment. The flyash system will be started up and the system will be unloading dry ash. Installation of a weigh scale for the flyash system will begin. All construction punch list items will be essentially completed. Fire alarms will be added to all new buildings for the project and lighting will be installed in the new construction area. Startup activities will continue and any required modification will be performed as required. A contract will be released to complete paving in the construction areas. Testing will be conducted to determine the accuracy of the continuous emissions monitor. Bids will be received and evaluated to perform air toxics testing.

2. Phase III of the project will begin. The testing will begin with the optimization and data analysis for the combustion modifications.
6.0 SUMMARY

Phase I - Engineering and Design: Engineering and design for this project is basically complete. Minor design work will continue as required to support either construction or operating problems and also to support completion of the punch list items. Major items that require completion are the dry sorbent injection system construction, humidification system construction, and startup of the dry ash system. A proposal has been submitted to expand the urea system to include equipment that will allow conversion of urea to aqueous ammonia. It is believed that this addition would significantly improve operation of the urea injection system at low loads. PSCC is strongly considering this modification and may proceed, within the existing budget, to implement these modifications. If PSCC proceeds with this modification, additional engineering will be completed to support this activity.

Phase IIA - Procurement: All major material have been delivered and paid. All material was on site to support the construction completed this quarter. Some minor procurement will occur to support punch list construction items.

Phase IIB - Construction and Startup: A significant amount of the construction for the project was completed this quarter. The burners and overfire air ports were installed and the boiler was started up on May 30, 1992. The contractor has moved off-site and is complete. The system was operated through June without major problem. Preliminary NOx reduction of approximately 60% are very encouraging, but will require further testing in Phase III to document the NOx reduction and any operational constraints. The dry sorbent injection system construction is 90% complete and the humidification system is complete except the seal air fan inlet ductwork. Construction of the dry flyash storage system is complete, but dry ash has not been collected. The continuous emissions monitor was installed this quarter and is currently operational. Future plans are to complete the construction of the remaining items and to compile and complete a punch list of items that require modifications.
7.0 REPORT DISTRIBUTION

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