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Enclosed is a copy of the Quarterly Activity Report for the period April 3, 1978 through July 2, 1978 under Contract No. EW-78-C-02-4740 on the Operation, Modification and Maintenance of the 700 H.P. Combustion Test Facility.

David E. Jones
Project Manager

DEJ/jl

Enclosure

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Management and Technical Services Company

OPERATION, MODIFICATION, AND MAINTENANCE
OF
DOE/PETC 700 H.P. COMBUSTION TEST FACILITY
CONTRACT NO. EW-78-C-02-4740

QUARTERLY ACTIVITY REPORT
For the period
April 3, 1978 to July 2, 1978
Second Quarter

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Performed By
General Electric Company
Management and Technical Services Company
626 Cochrans Mill Road
Clairton, Pa. 15025

Prepared for the United States
Department of Energy

BACKGROUND

The General Electric Company (MATSCO) was awarded the contract to operate, modify, and maintain the DOE/PETC 700 H.P. Combustion Test Facility. The 700 H.P. Combustion Test Facility was designed and built by the Dept. of Energy at Pittsburgh Energy Research Center and its ultimate success is the responsibility of DOE/PETC. G. E. Co/MATSCO will provide support to assist in the goal of successful operation of this pilot plant facility. The primary objective of the DOE/PETC 700 H.P. CTF is to establish the practicality of coal oil slurry combustion as a technically, economically, and environmentally feasible retrofit technology.

WORKSCOPE SUMMARY

The Contractor shall provide all things necessary for the operation, modification, and maintenance of the plant as provided in the Operating/Maintenance Manual, and carry out the experimental and developmental operations in said plant as directed by the DOE Technical Project officer.

The operation, modification, and maintenance of the 700 H.P. CTF shall be in accordance with all applicable safety, health codes, standards, and regulations of DOE. The operation, modification, and maintenance shall include the following phases:

- a) Phase I - Preparatory Work - includes personnel staffing and training, preparation of detailed operating, maintenance, and safety manuals, purchase of tools, spare parts and initial operating supplies.
- b) Phase II - Start-Up and Adjustment Period - Check out and activation of all plant systems and subsystems including run-in adjustment and lubrication of all components, chemical cleaning and flushing of systems and lines, and any other activities necessary to achieve steady-state operating conditions.
- c) Phase III - Process Investigation Operations - Experimental establishment of the effect of applicable process variables and changes in configuration on plant parameters to determine optimum conditions and configuration for technical, economical and environmental analysis. This includes varying feed rates of consumables, varying temperatures and pressures, and accomplishing plant configuration changes necessary to investigate and all of the operating alternatives outlined in the Operating Manual as directed by DOE.

PROGRESS DURING THIS REPORTING PERIOD

Facility staffing at the end of April, 1978, was 52% complete; at the end of June, it was 90% complete.

Facility steam was used to simulate boiler steam production. Facility steam was used to check out the air cooled condenser, hot well tank, and the deaerator. The site steam reducing station was operationally checked. D.O.E. instrument section calibrated instrumentation associated with the boiler steam production loop while MATSCO was "steaming" the deaerator tank. House steam is supplied at 100 psig and the 700 H.P. CTF operating pressure will be 175 psig. However, the 100 psig house steam allowed the condenser, hotwell and deaerator to be operationally checked out.

The pulverizing room had inadequate water drainage. An additional sump pump has been installed in the below floor recess directly under the Williams Pulverizer. This additional pump should alleviate the standing water problem.

During system checkout, the 60 H.P. stack blower motor failed. A 40 H.P. motor was located, installed, and put into service as the driver for the stack blower. New sheaves were installed on the 40 H.P. motor to slow fan speed from 1542 RPM down to 1330 RPM. The 60 H.P. motor was repaired under warranty.

The COEN Company representative arrived on site on June 12, 1978, in preparation for boiler first fire. The boiler back door firebrick was removed, a complete boiler internal inspection was completed and back door firebrick and the back door were reinstalled. The forward steam drum manhole gasket was replaced. On June 15, 1978, first fire was ignited in the boiler. Stack gas damper control was not adequate for setting of boiler dampers and flame adjustment at this time.

Because of boiler pressure-vacuum draft control problems, the stack dampening valve was moved from between the bag house and stack blower to between the boiler and flue gas cooler. Several manometers were installed throughout the boiler air system to monitor pressure drops across several pieces of equipment.

Noise complaints were received while the stack blower was in service. After these complaints were received, the stack blower was insulated. A noise enclosure which will completely contain the stack blower is presently being constructed.

The sight glass blowdown, sight glass housing blowdown, water flow regulator blowdown, steam drum blowdown, water softener, steam heater, soot blower, and water feed pump gland drains were piped in.

Several new electrical heaters had to be installed in the Motor Control Center, the Air cooled Condenser Fan #1, Air Cooled Condenser Fan #2, Stack Blower, Sulfite Agitator, Phosphate Agitator, Sulfite Pump, Phosphate Pump, Boiler Water Feed Pump, Forced Draft Fan, Slurry Feed Pump, Flue Gas Cooler, and the #6 fuel oil pump have all been operated continuously, and are ready for first fire.

Because of restriction to flow and excessive pressure build up, the oval meters were replaced with Floco Meters in the fuel line feeding the boiler. After this change, #6 fuel oil recirculation was initiated.

Number six fuel oil was delivered on May 24 and 25th. Approximately 19,960 gallons of #6 fuel oil is presently stored in the tank. Four oil samples were turned over to Mr. John Smith. The fuel oil transfer pump was bump checked. A solenoid valve was installed in the steam line going to the #6 fuel oil heater. A support brace on the #6 fuel oil fill line was fabricated to support a overhanging gate and check valve. A check valve and a sampling port were installed in the #6 fuel oil tank fill line. Before #6 fuel oil was delivered, the tank was opened up, inspected internally, and all water removed.

Control Panel #1 was received at the jobsite during FW 20. MATSCO personnel helped in running conduit to this control panel and enclosing an area around the control panel. Seven instrument loops were calibrated for boiler first fire.

A platform on the flue gas duct near the sampling points has been fabricated.

The pulverizer preheater was moved to its center-line and anchor bolts were installed. A #2 fuel oil line and a natural gas line was run to the pulverizer preheater.

Piping for boiling out of the boiler was pre-fabricated. Boiler gage glasses and all COEW pre-packaged boiler control valving were ordered as spare parts. All boiler water testing equipment and supplies are on site.

A personnel handrail was installed on the baghouse.

A section of housing supporting the forced draft blower fan was found to contain water when it rained, a $\frac{1}{4}$ " drainage hole was installed to permit drainage and prevent the rusting of metal.

The building main sump pit alongside the boiler was drained and cleaned of all trash and sludge. The two sump pumps were installed and put into service.

MATSCO assisted DOE in the fabrication of thermocouples for the 700 H.P. CTF.

The slurry mixing tank was opened and inspected. The tank was found to contain dirt and metal washers and some small debris. The tank was cleaned out and resealed.

Various pumps-motors-blowers throughout the 700 H.P. CTF have been checked out for operation. The below listed pieces of equipment have been aligned, doweled, oiled, greased, leveled, belt tension checked, bumped checked, and certified for operation:

- Plant water pump
- Boiler water feed pump
- Air cooled condenser fan #1
- Air cooled condenser fan #2
- Coal slurry holding tank agitator
- #6 fuel oil pump
- Slurry feed pump
- Forced draft fan
- Flue gas cooler blower
- Stack blower

Seven Operating Procedures are finalized and approved by DOE and MATSCO for use. These seven are:

- Low Pressure Steam
- Natural Gas
- Plant Water
- High Pressure Condensate
- Boiler Water
- Fuel System
- Process Steam

All boiler tubes were checked for obstructions and found to be clear. A letter was received from Nebraska Boiler Company via Hoffman Engineering acknowledging gouges on outside of wall on several tubes. Nebraska pointed out that these gouges will not affect operation of the boiler.

Obtained vendor instruction manual on various pump-motors-blowers, etc. throughout plant. Proper oils and greases were obtained. Obtained coupling alignment checks on pumps-reducers-motors with couplings from H.K.S. MATSCO personnel will dowel these above mentioned pieces.

Basic inventory of tools has been purchased. Concentration of tool procurement has been toward items needed for start-up. All newly acquired items are marked with C.T.F. and a identifying number.

A Preventative Maintenance file has been started. Complete vendor specifications on each piece of equipment will be maintained in each file. Items needed like type of oil and tools required to pull preventive maintenance on each piece of equipment will be listed on that piece of equipment's individual file.

Periodically, group instruction has been conducted on various systems. Flow patterns, valves, temperatures, pressures, control, and particulars of each system is pointed out in these instruction sessions. Theoretical instruction is followed by actual "on sight" tracing of systems.

The 100 H.P. Coal Slurry unit has proved as an asset in training the 700 H.P. CTF personnel. Several times during this reporting period, 700 H.P. CTF personnel have witnessed runs by the 100 H.P. Coal Slurry facility.

A Proposed Safety Manual was turned over to Mr. George Bellas for his and DOE Safety Department approval. Approval has been received.

A complete set of Sepias were made from HKS Sepias. These new Sepias are remarked to reflect MATSCO's operational objective.

THIRD QUARTER 1978 FORECAST WORKLOAD

Startup and operation of the boiler and pulverizer is forecast for the third quarter. Coal slurry is forecast to be burned during the third quarter.

David E. Jones
Project Manager
700 H.P. CTF

DEJ/jl