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Enclosed is a copy of the Quarterly Activity Report for the period July 3, 1978 to October 1, 1978 under Contract No. EW-78-C-02-4740 on the Operation, Modification and Maintenance of the 700 H.P. Combustion Test Facility and the 100 H.P. Firetube Boiler Test Facility.

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Enclosure

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BACKGROUND

The General Electric Company (MATSOC) was awarded the contract to operate, modify, and maintain the DOE/PETE 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/PETE. G. E. Co/MATSOC will provide support to assist in the goal of successful operation of this pilot plant facility. The primary objective of the DOE/PETE 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.
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
July 3, 1978 to October 1, 1978
THIRD QUARTER

Performed By
General Electric Company
Management and Technical Services Company
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Prepared for the United States
Department of Energy

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PROGRESS DURING THIS REPORTING PERIOD
700 H.P. COMBUSTION TEST FACILITY

The 700 H.P. Combustion Test Facility is in Phase II—Start Up and Adjustment Period.

Pulverizing Equipment

By the end of the first week of August, the pulverizer control panel wiring was completed. All pulverizer area motors, pumps, etc. were then checked for lubrication and proper rotation. The pulverizer dust collector nitrogen piping was completed. Mr. Dave Lambeth and Mr. Carl Rahmer from Williams Pulverizer Company and Mr. Lawrence Burk from QUODAM Controls arrived on the jobsite on Monday, August 14, 1978, for start up of the pulverizing system. During the course of the week, several problems were encountered and modifications were made. A coupling was installed in the coal hopper to pulverizer screw feeder to add water to bring coal moisture up to 7%. Several couplings were installed in the duct work at several locations to obtain pressure differential readings. The oval meter in the ambient air heater was inoperable, so a new one was installed. The refractory in the ambient air heater was cured. The dust collector nitrogen regulator was inoperable and was replaced. The dust collector was getting too much flow from the pulverizer main fan blower, so a damper valve was fabricated and installed. The gravimetric feeder was put into service so coal samples could be obtained from the sample port below it. The explosion square on the dust collector was reinstalled after it blew from overpressurization from the main fan blower. The three rupture discs were not installed by the building contractor; MATSCO installed them on 8/17/78. On Friday, 8/18/78, coal was pulverized and a sample was taken. However, during pulverizing, seal hoses and a bushing in the pulverizer were damaged. Further tests were scheduled for the last week in August to allow replacement parts arrival. These replacement parts were lost by an air carrier, so pulverizer acceptance was delayed until September. The pulverizer passed acceptance test by D.O.E. and MATSCO during the second week of September. Mr. Dave Lambeth of Williams Pulverizer Company arrived at the jobsite on Monday, September 11, 1978, and the pulverizing unit was qualified by Tuesday afternoon, September 12, 1978. At a spinner speed of 715 R.P.M., 92% pulverized coal went through 325 mesh. At a spinner speed of 600 R.P.M., 98.6% pulverized coal went through 200 mesh. A pulverizer familiarization course was conducted for MATSCO before Williams Co. left the jobsite.

Boiler

The 700 H.P. CTF boiler was operated on #6 fuel oil during the first week of August. During the second week of August, the screw settings on the fuel control valve were checked with a micrometer and these settings were recorded. Joe Ellershaw from CORN had originally set these ten pins. The boiler was fired many times during this week and damper and fuel control valve pin settings were adjusted to bring boiler outlet oxygen level into proper range. Mr. Chuck McCain of the Department of Energy provided guidance during boiler tuning. During the third week of August, the boiler
was operated on #6 fuel oil on Monday, Tuesday, Wednesday, and Thursday. On Friday, a COM run was attempted using 25% COM and 50% boiler load. A short duration run was accomplished after several shutdowns. Later, an inline filter going to the nozzle and the slurry feed pump filter were found plugged. Larger mesh filters have been reinstalled. Tank recirculation and agitation for 8 hours before running is now normal procedure. During the last week in August, noise problems were encountered from the Moyno slurry feed pump. Both the boiler fuel oil filter and the slurry feed pump discharge filter plugged up during runs. The fuel solenoid valve on the boiler fuel train plugged up during one run. The fuel control valve plugged up during several slurry runs.

Before the Contractors Review Meeting of September 8, 1978, the decision was made to canabalize the fuel oil train and slurry feed pump from the 100 H.P. Coal Slurry to assure 700 H.P. boiler operation during the meeting. After the Viking pump and its Minarik controller were installed, heat problems were encountered with the Minarik controller. The wiring between the controller and the pump was replaced, and cooling vent air was applied to the Minarik controller. A successful run during the Contractors Review Meeting was obtained and the equipment obtained from the 100 H.P. unit was returned. Once canabalized equipment was returned to the 100-H.P., its testing schedule was resumed.

Two one foot square windows have been cut in the CTF north wall behind the boiler rear observation windows. These two holes will allow probes to be inserted into the aft end through the boiler observation windows. A penetration into the main steam outlet is completed and a steam calorimeter has been installed. Steam quality can be calculated from readings obtained from the calorimeter. Two 0-300 psi gauges were installed on the copes drum level controller sense lines. The boiler atomizing steam line has been re-plumbed to provide 175 psig steam instead of 100 psig. Boiler produced steam is used instead of plant steam. Insulation of the new atomizing steam line is complete. George Marker and Sons started installation of sight glasses into the boiler during the last week of September. The boiler was hydrostatically tested at 262.5 psi and passed. The main steam control valve started leaking steam during boiler operation, gaskets on this valve were replaced, and an operation check was performed with good results.

Additional jobs completed on the boiler during this time period are:
- Ten outside skin temperature thermocouples have been installed on the boiler.
- A drip pan has been fabricated for the front of the boiler.
- The boiler outside has been prime painted and finish painted in light tan.
- Top decking and handrails have been installed on top of the boiler.
- A water cooler has been built for boiler water sampling.

**Stack Blower**

The original 60 H.P. stack blower motor has been received back at the job site. It is serving as a spare for the 40 H.P. motor now in service.

Because of off site and on site noise complaints, sound insulation has been installed on the stack blower.
Baghouse

One hundred and twenty bags were installed in the bag house in July.

Black combustion smoke was observed coming from the stack each time the baghouse bag pulsers were cycled. The bag house was opened and all bag clamps were re-tightened during September.

Condenser

Pressure gauges were installed on the inlet and outlet of the air cooled condenser during September. All blades on both condenser fans were pitch checked and verified at approximately 8°.

Boiler Feed Pump

After continued operation of the facility on OOM and #6 fuel oil, boiler feed pump water pump seal leakage was observed. The teflon rings on both inboard and outboard seals were replaced and pump leakage was minimized.

Slurry Hold Tank

Installation of the relief valve for the steam jacket around the slurry hold tank is complete. Its vent to atmosphere is complete.

So that tank level could be easily monitored, a sight glass was installed on the slurry hold tank.

Slurry Feed Pump

In order to decrease pump speed, new Browning pulleys were received and installed on the slurry feed pump driver and driven shafts in Sept.

Hotwell Tank

So that more data could be gathered from the hotwell, a pressure gauge was installed atop the hotwell tank, and a thermometer has been installed on the hotwell tank inlet line.

Deaerator Tank

Installation of a deaerator tank relief is complete. Its vent to atmosphere is also complete.

Control Room

The new two story aluminum control room panels were received during September. The temporary wooden control room walls were disassembled and erection of the permanent control room is 60% complete.

Other

Six more fire extinguishers were installed permanently in the facility.

Filler plates for high bay area vent fans were fabricated and installed.
A beam trolley was installed on a structural beam just inside of the CTF south side double doors. This beam trolley will expedite large material receiving through the CTF double doors.

A personnel safety shower and personnel safety eyewash have been installed in the CTF.

The fuel oil metering valve measuring #6 fuel oil going into the proportioning feeder tank was received and installed by the building contractor. During calibration and startup of this metering valve, it was discovered that an internal cogwheel installed at the factory was incorrect. New gears and push buttons were airfreighted to the jobsite and installed. After calibration and checkout, the fuel metering valve operated correctly with less than a 1% error.

Several tours of the facility were conducted during this quarter. On Friday, September 8, 1978, 30% COM was operated in the boiler continuously from 8:55A.M. to 11:10 A.M. During this period of time, a tour of the facility was conducted for the COM Contractors Review Meeting. Also, on Friday, September 30, 1978, Mr. J. R. Brill Director of PETC and several D.O.E. personnel were given a tour of the facility.

Fourth Quarter Forecast Workload


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