Lignite Fuel Enhancement

Quarterly Technical Progress Report:

Period: July 9th, 2004 to September 30th, 2004
DOE Award Number: DE-FC26-04NT41763
Date: October 29, 2004

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GREAT RIVER ENERGY

Lignite Fuel Enhancement

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Abstract

This 1st quarterly Technical Progress Report for the Lignite Fuel Enhancement Project explains what has transpired since Great River Energy was selected to negotiate the Cooperative agreement in February of 2003. The report will summarize Pre-award activities and any other activity since signature of the contract on July 9th of this year. It also summarizes the subsequent purchasing activity and final dryer/process design up to September 30th of 2004.

Acknowledgement

The authors wish to acknowledge the contributions and support provided by various project managers: Dr. Sai Gollakota (DOE), Matt Coughlin (Barr) Dave Rian (Barr), John Wheeldon (EPRI), Tony Armor (EPRI0 and Mark Ness (GRE).

Table of Contents

GREAT RIVER ENERGY

Executive Report

Progress:

After Cooperative Agreement signature on July, 9th plans to hold project kick-off meetings were made. That meeting and presentations were conducted on August 17th in the NETL, Morgantown facility. Presentations by Dr. Sai Gollakota, Charles Bullinger, and Dave Rian (Barr) were given which provided update/progress on the project since fact-finding began in February 2003.

During fact-finding the Repayment Plan, Commercialization Plan, Schedule, and Budget were all finalized. The Environmental Impact Volume was completed. The Hazardous Substance Plan was completed.

During the Pre-award period, Project Definition and Pre-Design activities took place. The technical team consisting of members from GRE, Barr, Lehigh University, and EPRI discussed data and knowledge obtained through feasibility studies and Pilot work in an effort to layout a preliminary process diagram and list of equipment. Barr's responsibilities at this time were for overall process design; conveyance in and out of the dryer, bag house; and, dampers and valves for air and water to and from the dryer. Heyl & Patterson was brought on board to assist the team in the design of a fluidized bed dryer. The team had visited the Gilberton, PA, plant and looked at a dryer that paralleled what was needed for GRE. It was drying anthracite fines, which typically have higher sulfur content than the North Dakota lignite; so, erosion testing at Foster-Wheeler was completed in an effort to quantify the erosion characteristic differences between anthracite and North Dakota lignite. Results were quite promising in that the lignite proved 5 times less erosive than the anthracite. This gave the team the information it needed to specify the in-bed coil materials as well as dryer proper.

Heyl-Patterson presented their preliminary design and drawings to the team in late August. The fluidized bed elevation view was circumnavigated by the team. All process inlet/outlet requirements were discussed. Expected flow ranges for all elements given and material selections made. Bag house connections were sized; number and size of air locks in and out determined; finalized the air distributor design based on Pilot successes; the two stage design approved.

Dr. Sai Gollakota came to the Coal Creek Station site in mid-September. He reviewed our plans and the actual construction location. He also helped us establish the earned value spreadsheet and explained the methodology required.

Problems Encountered:

Two problems have arisen in this quarter. It became apparent to the team that the design of the dryer was taking longer than first estimated. Details with the design and new information revealed during Pilot testing needed to be incorporated in the final Prototype dryer. The second problem involved Lehigh University issues with their latest budget (26% higher than they'd estimated) and intellectual property rights on previous work they'd completed for GRE: University's policy versus Great River Energy's signed contract.

Plans for the next reporting period:

Dryer design should be finalized in the next Quarter. Procurement of all materials should be completed as well. Construction will begin; most of the demolition and structural steel installed.

Prospects for future progress:

The prospects are quite good that all the next Quarter deliverables will be met. Dryer procurement delays may hinder longer range start-up/system checkout.

Experimental Apparatus:

Details of the dryer and system, P&ID's, schematics, and drawings contain "Limited Rights" information which cannot be disclosed at this particular time.

Experimental & Operating Data:

Demolition and Construction phase currently ongoing therefore no data to report at this time.

Data Reduction:
No data

Hypothesis & Conclusions:

Hypothesis remains the same. We will be able to dry lignite an increment to benefit the performance of and reduce emissions from a coal burning electric power generating station.