Project Summary

Title: DE-FC26-03NT41730

Scale up and Demonstration of Fly Ash Ozonation Technology

PROJECT PARTICIPANTS

PPL Generation, LLC
Brown University
Electric Power Research Institute
Ener Combustion Products Management, Inc.gy and Environment Strategies
PCI-WEDECO Environmental Technologies, Inc.
F. L.Smidth, Inc./Fuller Bulk Handling Division

II. PROJECT DESCRIPTION

A. Objective(s)

The objectives of the project are: (1) to demonstrate fly ash ozonation technology on a utility site, with minimum modification to existing plant equipment and operations and to confirm the process effectiveness through a complete battery of technology performance and concrete quality tests;(2) to develop a plan for effective implementation of the technology at the PPL Montour station; and (3) for technology transfer to other U.S. coal-fired plants.

B. Background/Relevancy

One of the biggest challenges facing the fly ash utilization industry is the management of unburned carbon. Elevated carbon levels often accompany low NOx retrofits of coal fired power stations and can disqualify ash for its largest and most lucrative utilization market: as a pozzolanic additive in concrete. Ozone treatment of fly ash reduces surfactant absorbtivity, the cause of air entrainment problems in concrete, as illustrated in the attached figure. Efforts are underway to develop an ash beneficiation process based on this principle.

C. Period of Performance - December 2002 to June 2004

D. Project Summary

The work begins with the development, testing and demonstration of the fly ash ozonation/fluidization technology at Fuller Bulk Handling (FBH) test facility, followed by field deployment/testing at the Montour station where the technology will be integrated with existing ash handling systems. Technical and economic analyses will then be conducted for full-scale, commercial design of the technology.

III. PROJECT COSTS

A. DOE Costs - $594,641
B. Prime Contractor Cost Sharing - $70,000
C. Partner Cost Sharing - $249,800

IV. MAJOR ACCOMPLISHMENTS SINCE THE BEGINING OF THE PROJECT - Project just underway

V. MAJOR ACCOMLISHMENTS PLANNED DURING THE NEXT 6 MONTHS

Complete Task 1- Pilot-Scale Parametric Tests at Fuller's test facility (July 2004)

- **Design and fabricate 42-inch Air Merge blender and procure ozone generator.**
- **Deploy ash fluidization/ozonation system at Fuller facility and conduct parametric tests**

- **Conduct ash and concrete analyses (foam index, mortar air-entraining tests, petrography, trial batches for short and extended mixing times, and ready-mix plant testing)**

VI. MAJOR ACCOMPLISHMENTS PLANNED IN OUTYEARS (6 -18 MONTHS)

Complete Task 2 – Design/Deploy/Test system at Montour Station (January 2004)

- **Deploy optimized fluidization/ozone generator system at Montour station**
- **Interface with Montour ash handling systems (storage silos, dry ash loadout dry, etc.)**
- **Conduct parametric tests**
- **Conduct ash and concrete analyses, as above.**

Complete Task 3 - Design Scale-up for Montour Station and Develop Generic Design Guidelines (May 2004)

Complete Task 4 - Final Report (June 2004)

VI. ISSUES - none