FY00-XXXVI-101
LIGNITE FUEL ENHANCEMENT
INCREMENTAL MOISTURE REDUCTION PROJECT PHASE I

CONTRACTOR: The Falkirk Mining Company
The Coteau Properties Company
Great River Energy

PRINCIPAL INVESTIGATOR: Dennis J. James
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PARTICIPANTS

Sponsor	Cost Share
Industry	
The Falkirk Mining Company	$60,833
Great River Energy	$80,833
The Coteau Properties Company	$20,000
ND Industrial Commission	$161,000
Total Project Costs	$322,666

Project Schedule - 33 Months
Contract Date – 3/17/00
Start Date – 5/9/00
Completion Date – 12/15/01

Project Deliverables
Status Report – 6/15/00 ✓
Status Report – 8/10/00 ✓
Final Report – 12/15/01 ✓

OBJECTIVE / STATEMENT OF WORK

The objective of this project is to develop a process that uses waste heat to reduce the amount of moisture in lignite prior to combustion. The goal of the project is to increase power plant efficiency. The moisture content in the fuel impacts unit operations throughout the power plant. A decrease in moisture content results in reduced material handling, increased heat content (Btu/lb), reduced moisture/steam in the combustion gas in the boiler, and reduced moisture/steam in the downstream environmental control system, thereby improving efficiency and reducing costs. In addition the recovery of waste heat to the lignite fuel results in increased heat recovery resulting in improved plant efficiency.

STATUS

It was shown that it is possible to incrementally dry lignite with relatively low temperature air (85°F to 120°F). Incrementally dried lignite (~ 6% moisture reduction) was produced and burned at Coal Creek Station (CCS). Test burns with the incrementally dried lignite yielded the following advantages:

- Boiler efficiency increased by approximately 2%,
- Fan horsepower requirements decreased significantly,
- Horsepower for the pulverizers decreased 20%,
- Nitrous oxide (NO_x) emissions were reduced 10%, and
- Sulfur dioxide (SO_2) emissions were reduced 34%.

Estimates based on preliminary test results indicate incremental moisture reduction costs of less than $0.50 per ton. Further demonstration of incremental drying and boiler operations are required to establish benefits and costs.