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TECHNICAL PROGRESS REPORT 6

JULY - SEPTEMBER, 1995

INSTALLATION OF A STOKER-COAL PREPARATION PLANT  
IN  
KRAKOW, POLAND

By  
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Cooperative Agreement No.  
DE-FC22-94PC94114

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IN

KRAKOW, POLAND

Technical Progress Report 6

July - September, 1995

Work Performed Under Cooperative Agreement DE-FC22-94PC94114

EFH Coal Company

Wilkes-Barre, PA

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**INSTALLATION OF A STOKER COAL PREPARATION PLANT  
IN  
KRAKOW, POLAND**

**EXECUTIVE SUMMARY**

This report describes the progress made during this reporting period of a project to demonstrate that the air pollution from a traveling-grate stoker being used to heat water at one of MPEC's central heating plants in Krakow, Poland can be reduced significantly by (1) substituting the unwashed, unsized coal currently being used with a mechanically cleaned, double-sized stoker fuel and by (2) optimizing the operating parameters of the stoker. It is anticipated that these improvements will prove to be cost-effective and hence will be adopted by the other central heating plants in Krakow and, ideally, throughout Eastern European cities where coal continues to be the primary source of fuel.

EFH Coal Company has formed a partnership with two Polish institutions -- MPEC, a central heating company in Krakow, and Naftokrak-Naftobudowa, preparation plant designers and fabricators--for the execution of this effort.

The terms of a long-term contract for the procurement of 750,000 tons of 20 mm. x 0 raw coal for the new plant have been negotiated with the Katowice Holding Company. This draft contract currently is still under legal review. The negotiated price is near that of the Polish government's established price of \$32/ton.

Biprostal, an engineering firm located in Krakow, continued performing the many environmental and permitting activities that are required by the various levels of the Polish government before the plant can be constructed and operated.

The search for markets for utilizing surplus production from the new plant continues.

Because of the unanticipated delays encountered during the onset of the project with forming the EFH Coal/Polish partnership and in negotiating long-term raw coal supply contracts, a third 90-day, no-cost time extension was requested.

## **INTRODUCTION**

The work being performed under this Cooperative Agreement between the United States Department of Energy (DOE) and EFH Coal Company (Participant) is one part of the assessment program in the Support for Eastern European Democracy (SEED) Act of 1989 (P.L. 101-179).

In October 1991, a Memorandum of Understanding (MOU) titled "Collaboration on the Krakow Clean Fossil Fuels and Energy Efficiency Program, A Project of Elimination of Low Emission Sources in Krakow" was signed by the DOE and the Ministry of Environmental Protection, Natural Resources and Forestry of the Republic of Poland, that describes the cooperation that is being undertaken by the respective governments to accomplish the goals of this program.

The DOE has selected eight U.S. companies to work with the government of Poland to improve the country's air quality, particularly around the historic city of Krakow. Although the program is focused on Krakow, it is intended to serve as a model for similar pollution control programs throughout Poland and, hopefully, much of Eastern Europe. The total cost of the SEED program is \$31 million with the DOE funding about half that amount.

Low emission sources in the Krakow area include 100,000 home stoves, 227 traveling grate (stoker-fired) boilers and more than 2,000 hand-fired boilers -- all coal fired.

## **PURPOSE**

The purpose of the U.S./Polish Memorandum of Understanding is to encourage the formation of commercial ventures by providing project development support, resources, and services to reduce low-emission sources in Krakow, Poland.

These commercial ventures can take the form of contracts, joint ventures, partnerships, and other commercially-feasible arrangements to achieve the purposes of this statute.

## **OBJECTIVE**

The specific objective of the work to be performed by EFH Coal under the terms of this Cooperative Agreement is to improve the quality of stack gas emissions from low-stack boilers in the Krakow area of Poland.

This objective will be accomplished by designing, constructing, and operating a beneficiation facility that will produce a low-ash, double-sized stoker coal for burning in a typical traveling-grate stoker commonly in use throughout this area. The low-ash, uniformly sized, quality stoker coal when burned properly in existing boilers will increase combustion efficiency, reduce stoker maintenance, and reduce significantly carbon monoxide, sulfur dioxide, and particulate levels in the stack gas emissions.

To facilitate the achievement of the stated objective, EFH Coal has executed an agreement with MPEC (a district heating company in Krakow) and Naftokrak/Naftobudowa (a construction and maintenance enterprise) to design, construct and operate a 300 mtph coal cleaning facility. EFH Coal has also subcontracted with the Pennsylvania State University to characterize two candidate Polish coals and to perform combustion tests on washed sublots of these Polish coals in their combustion simulator facility.

## **WORK STATEMENT**

It is projected that a two-year effort will be needed to accomplish the objectives of this Cooperative Agreement, consisting of two budget periods and including the following nine tasks:

### Budget Period I

- Task 1 - Polish Coal Washability and Combustion Performance Evaluation
- Task 2 - Raw Coal Supply Contracts
- Task 3 - Specification of Major Preparation Plant Components
- Task 4 - Preparation Plant Flowsheet Design
- Task 5 - Cost Evaluations
- Task 6 - Securing Stoker Coal Supply Contracts
- Task 7 - Final Economic Evaluation and Risk Assessment

### Budget Period II

- Task 8 - Plant Construction
- Task 9 - Plant Startup and Demonstration

## **PROGRESS DURING THIS PERIOD**

Task 1.0 - Polish Coal Washability and Combustion Performance

Subtask 1.1 - Washability Characteristics

No Activity

Subtask 1.2 - Stoker Combustion Performance Evaluation

No Activity

Subtask 1.3 - Training Program

No Activity

### **Task 2.0 - Raw Coal Supply Contracts**

The terms of a long-term supply contract for purchase of the raw coal to be processed in the new 300 mtpd coal preparation plant have been negotiated with Katowice Holding Company's Brzesze mine; the draft contract currently is still under legal review. This contract, once executed, will guarantee the delivery of 750,000 metric tons per year of minus 20 mm. raw coal to the plant at a price near the Polish government's established price of \$32 per ton.

### **Task 3.0 - Specification of Major Preparation Plant Components**

This task is completed.

### **Task 4.0 - Preparation Plant Flowsheet Design**

This task is completed.

### **Task 5.0 - Cost Evaluations**

Biprostal, an engineering firm located in Krakow which has been sub-contracted to perform the many environmental and permitting activities that are required by the various levels of the Polish government before the plant site and refuse disposal areas can be prepared and the plant erected and operated, is compiling information for obtaining local, state, and federal permits for surface facilities, water usage, refuse disposal, raw coal storage, clean coal stockpiling and ground water protection.

### **Task 6.0 - Securing Stoker Coal Supply Contracts**

Negotiations continued with a number of potential customers for any stoker coal that might be produced in excess of that of demonstration boiler's needs. Current efforts are focused on three potential consumers: Nova Huta; Skwina; and MPEC.

### **Task 7.0 - Final Economic Evaluation and Risk Analysis**

Progress continued under this task during the reporting period.

Estimates of the income are being refined as data on the plant recovery, plant utilization, product quality, and respective selling prices of the washed (20 by 0.5 mm.) stoker coal, the semi-washed (combined 20 by 0.5 mm. washed coal and the 0.5 mm. unwashed fines) utility coal, and the unwashed (0.5 mm. by 0) utility coal are developed.

## DIFFICULTIES ENCOUNTERED

The extended delay in negotiating raw coal supply contracts has precluded the washability testing of the raw coal and the simulations of the combustion performance of burning the washed stoker coal in traveling-grate boilers.

The inability to execute a lease agreement for an acceptable site has delayed progress on the final design and initiation of plant construction.

## FUTURE WORK

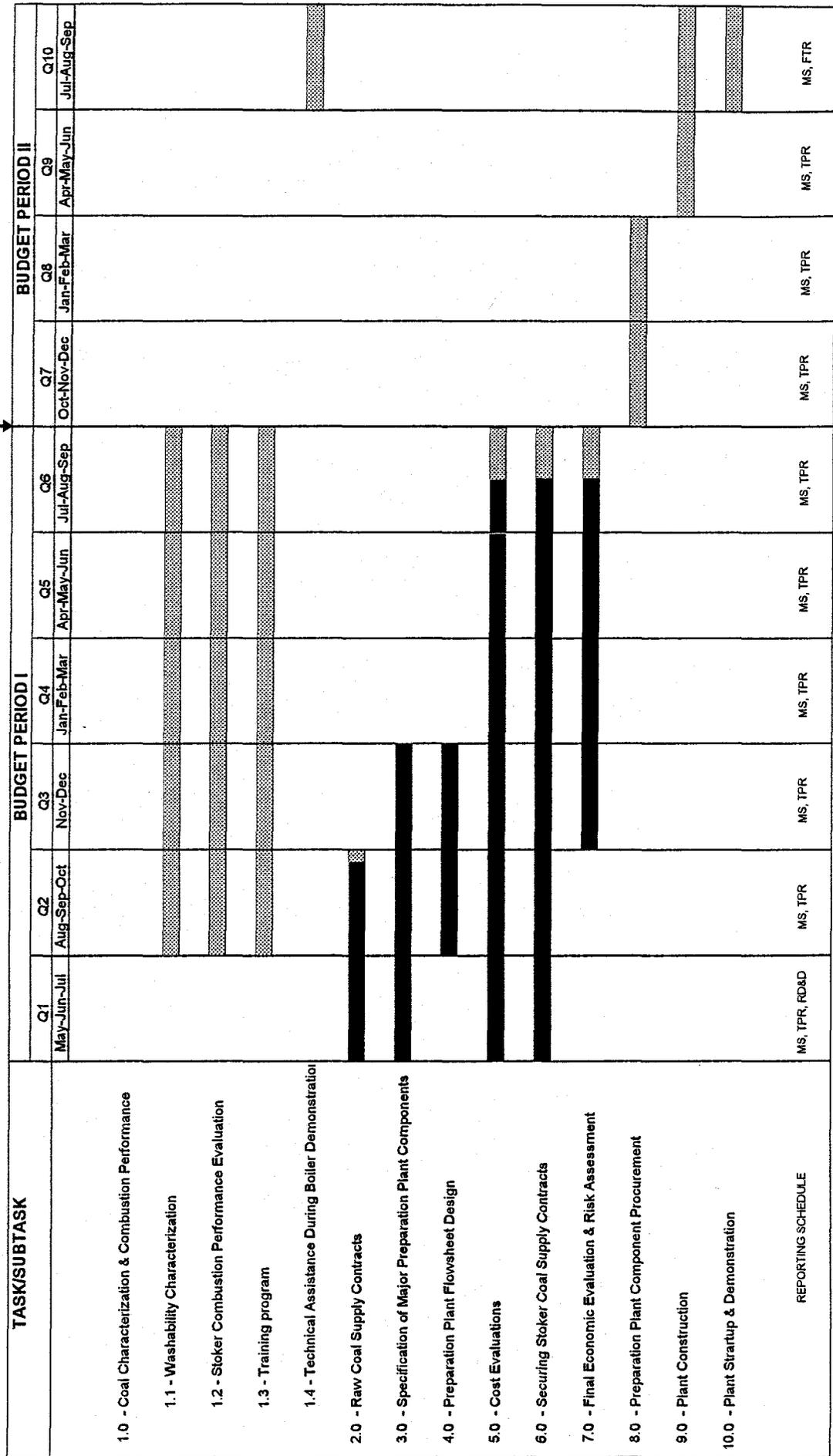
- Complete the legal review of the draft contract for a 750,000 metric-ton-per-year coal supply contract with the Katowice Holding Company and execute the contract.
- Collect a sample of raw coal from the Brzesze mine, ship this sample to Penn State, and initiate the washability testing of raw coal and the boiler performance simulations on samples of the washed coal.
- Continue to negotiate with Nova Huta Steel, Skwina, and MPEC for coal sales agreements.
- Continue to collect and compile additional income and outlay information so that the "pro forma" for the project can be finalized.

Because of the inordinately long time it has taken to negotiate long-term raw-coal supply contracts with Polish coal producers, a third 90-day no-cost time extension was requested from the Department of Energy for Budget Period I.

The revised Gantt Chart shown in Figure 1 illustrates the status of the project at the end of this reporting period (September, 1995).

Figure 1 - GANTT CHART (REVISION II)  
**KRAKOW CLEAN FOSSIL FUELS AND ENERGY EFFICIENCY PROGRAM**  
**INSTALLATION OF A STOKER COAL PREPARATION PLANT IN KRAKOW, POLAND**

09/30/95



Report Legend:  
 MS - Federal Assistance Management Summary  
 TPR - Technical Progress Report  
 RD&D - Notice of Energy RD&D Project  
 FTR - Final Technical Report

Performance Legend:  
 PLANNED  
 ACTUAL