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Task 1.13 - Data Collection and Database Development for Clean Coal Technology By-Products Characteristics and Management Practices

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TASK 1.13 - DATA COLLECTION AND DATABASE DEVELOPMENT FOR CLEAN COAL TECHNOLOGY BY-PRODUCTS CHARACTERISTICS AND MANAGEMENT PRACTICES

INTRODUCTION

The U.S. Department of Energy Federal Energy Technology Center (DOE FETC [formerly DOE Morgantown Energy Technology Center, METC]) efforts in the areas of fossil fuels and clean coal technology have included involvement with both conventional and advanced process coal conversion by-products. In 1993, DOE submitted a report to Congress, "Barriers to the Increased Utilization of Coal Combustion/Desulfurization By-Products by Governmental and Commercial Sectors," that provided an outline of activities to remove the barriers identified in the report. Energy & Environmental Research Center (EERC) researchers had contributed significant background information in the preparation of this report. DOE charged itself with participation in this process, and the work proposed in this document facilitates DOE's response to its own recommendations for action. The work reflects DOE's commitment to the coal combustion by-product (CCB) industry, to the advancement of clean coal technology, and to cooperation with other government agencies.

Information from DOE projects and commercial endeavors in fluidized-bed combustion (FBC) and coal gasification is the focus of the task reported here. The primary goal is to provide an easily accessible compilation of characterization information on the by-products from these processes to government agencies and industry to facilitate sound regulatory and management decisions. Additional written documentation will facilitate the preparation of an updated final version of the DOE report to Congress on barriers to CCB utilization.

The information assembled will be valuable to the U.S. Environmental Protection Agency (EPA) in its upcoming decision on the waste status of FBC by-products and had to be submitted to EPA by April 1997. This effort facilitates interaction between DOE and industry regarding input to EPA. The effort of DOE FETC to provide this type of information to EPA is consistent with the recommendation in the DOE Report to Congress on ash barriers that a determination placing CCT by-products under RCRA Subtitle D for solid wastes is needed if these materials are to be utilized. Several DOE projects have already investigated utilization of these materials, so this is an opportunity to give this information the emphasis it deserves.

GOALS AND OBJECTIVES

The primary goal of this task is to provide an easily accessible compilation of characterization information on CCT by-products to government agencies and industry to facilitate sound regulatory and management decisions. Supporting objectives are 1) to fully utilize information from previous DOE projects; 2) to coordinate with industry and other research groups; 3) to focus on by-products from pressurized fluidized-bed combustion and gasification; and 4) to provide information relevant to the EPA evaluation criteria for the Phase II Bevill decision.

STATEMENT OF WORK

The statement of work is summarized as follows:

Subtask 1 - Collect Data on PFBC and Gasification Systems

Through literature, industrial and government contacts, and the research community, additional by-product and process data on pressurized fluidized-bed combustion (PFBC) systems and gasification systems will be collected and added to the database. Projects supported by DOE are expected to provide significant data for this subtask. It is anticipated that contacts, sources, and information will need to be developed through the performance of a literature search, through trade associations, and through personal contacts at utility and industrial plants with these systems in place.

Subtask 2 - Assemble CCT By-Product Management Information

Clean Coal Technology (CCT) by-products are relatively new to the CCB utilization industry, so the information collected in Subtask 1 may not include well-developed by-product management information. A specific effort will be made to collect and include management options for PFBC and gasification by-products. Using all contacts and sources developed in the previous subtasks, these options will be identified with the intent to collect specific information on by-product utilization examples, demonstrations, and commercial applications.

Subtask 3 - Finalize EERC Report on Barriers to CCB Utilization

The EERC assembled comprehensive information on CCB production, characteristics, and management options at the request of FETC prior to the submittal of DOE's Report to Congress on Barriers to the Increased Utilization of Coal Combustion/Desulfurization By-Products by Governmental and Commercial Sectors. The draft EERC report focuses on utilization of CCBs and will have broad applicability for regulatory agencies and CCB users. This report requires revision prior to its being published by FETC, and these revisions will be accomplished according to review comments previously received from FETC. Since this report was originally prepared in 1993, it is also proposed to add an update to the report. This addition to the report will summarize 1) current production and management statistics; 2) regulatory and legislative activities involving CCBs; 3) impacts of technology changes; and 4) new utilization options and standards and specifications.

Subtask 4 - Develop a CCT By-Product Workshop

Following the collection and submittal of the information on CCT by-products, the EERC will work with DOE and industry to develop a workshop designed to inform regulatory agencies and potential users about the properties and management options for CCT by-products.

ACCOMPLISHMENTS

This Subtask has been under way since late October 1996. In the last 6 months, the EERC has collected and reviewed technical documentation on the two CCT technologies of interest, PFBC and IGCC, and the associated by-products. A DOE representative and the EERC principal investigator visited a commercial-scale IGCC site in Florida. Information on the IGCC process and by-product management were provided by plant personnel during a tour of the plant site. Formal reports of process data and by-product data were obtained from two IGCC commercial-scale projects. Limited information was obtained through public documents on a third IGCC commercial-scale project. Extensive by-product characterization and management information was obtained on the Tidd Station PFBC commercial-scale demonstration project. The EERC principal investigator met with EPA and industry groups. EPA agreed to review the information on IGCC and PFBC by-products, with the request that a section of the report provide background information on these emerging technologies and that the commercial potential of these technologies be discussed in the report. Using the information collected from industry, DOE, and literature, the draft report to EPA was prepared and submitted to EPA for initial review on July 31, 1997. Copies of the draft report were also sent to DOE and industry representatives, who have agreed to review the document. The final version of the document is due at EPA on September 30, 1997, and the EERC will incorporate any required changes based on review comments into the final report and meet the EPA scheduled deadline. A copy of the Table of Contents is attached to this report for reference.

Review of database options was initiated, with a final decision to utilize an EERC database developed under the EERC Center for Air Toxic Metals which is an EPA-sponsored program. Development of changes required to accommodate the IGCC data was begun. PFBC data are already available in the CATM database, so this choice was cost-effective and would provide a similar way of viewing data to at least two different program areas of EPA.

Excellent cooperation has been extended by three of the CCT project partners in supplying key documentation about the commercial-scale by-product characteristics and management options. However, further contacts need to be made in order to obtain this type of information from one of the IGCC project partners. This will be undertaken in the next quarter in order to meet EPA deadlines for submittal of the final report.