Task 2.3 - Review and Assessment of Results From the Comprehensive Characterization of Toxic Emissions from Coal-Fired Power Plants

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**By
Stanley J. Miller**

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For
U.S. Department of Energy
Office of Fossil Energy
Morgantown Energy Technology Center
P.O. Box 880
Morgantown, West Virginia 26507-0880

By
Energy and Environmental Research Center
University of North Dakota
P. O. Box 9018
Grand Forks, North Dakota 58202-9018

MASTER

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TASK 2.3 - REVIEW AND ASSESSMENT OF RESULTS FROM THE COMPREHENSIVE CHARACTERIZATION OF AIR TOXIC EMISSIONS FROM COAL-FIRED POWER PLANTS

1.0 INTRODUCTION

To help meet the requirements of the 1990 Clean Air Act Amendments, the U.S. Department of Energy (DOE) sponsored a project entitled "Comprehensive Characterization of Toxic Emissions from Coal-Fired Power Plants." The Energy & Environmental Research Center was contracted to review reports discussing air toxic emissions from eight power plants as Phase I of the project. Additional field tests were planned as Phase II and are under way.

2.0 OBJECTIVES

The objective of the project is to provide an independent review of reports produced from the air toxic emissions study, evaluate the scientific validity of the conclusions, identify significant correlations between emissions and fuel or process parameters, compare the data with available results from Electric Power Research Institute (EPRI) studies, make recommendations for future studies, and complete a combined report that summarizes Phase I, Phase II, and EPRI findings.

3.0 SCOPE OF WORK AND RESULTS

Subtask 2 - Recommendations for Phase II Field Tests

The purpose of Subtask 2 was to provide guidance in the sampling, analysis, and reporting conducted under Phase II to assess hazardous air pollutant (HAP) emissions from coal-fired electric utility boilers. These recommendations were made based on a review of the Phase I reports and past EERC experience. This recommendation report was completed and submitted to the technical monitor, Tom Brown, of DOE Pittsburgh Energy Technology Center (PETC) in draft form in February 1995 and in final form in May 1995.

The EERC recommended that HAP field data be subjected to more stringent requirements before they are used to calculate emission factors. Specifically, quality assurance/quality control tests regarding field and lab blanks, internal and external spikes, detection limits, lower limits of quantitation, treatment of nondetects and outliers, and quantity of valid data points were targeted.

Subtask 3 - Summary Report of Phase I Tests

The purpose of Subtask 3 was to complete a summary report of final reports from nine sites of Phase I. A written draft version of this report was submitted to PETC in early July 1995, and highlights of the report were also presented at PETC in July. In this report, information is presented concerning the eight field sites at which sampling was completed, assessing nine system configurations; the round-robin coal analyses and individual site data; the emission factors for inorganic, organic, radionuclide, and acid gas-halogen species; the effects of coal characteristics

and process configurations on emission factors; and several special topics, including plume-simulating dilution sampling, the distribution of HAPs as a function of particle size, chromium sampling and speciation, the effect of sootblowing on metals emissions, and others.

Subtask 4 – Engineering Analysis of Combined DOE and EPRI Data

The objectives of Subtask 4 were to compare the trace element emission data from Phase I with the trace element emission data that are available from EPRI-sponsored field tests to identify potential relationships between stack emissions of trace element species and coal, operating, and process parameters. Such relationships may be useful for identifying factors that may affect the removal of hazardous air pollutants and for focusing future research toward a better understanding of these variables or processes. A written draft of this correlation report was submitted to DOE PETC in July 1995, and highlights of the report were also presented in July 1995.

Subtask 5 – Incorporation of DOE Data into Database

A summary of the database was presented at PETC in July 1995. Entry of the DOE data into the database is scheduled for completion by the end of July 1995.

Subtask 6 – Review of Phase II Reports

The EERC has received the first draft report of Phase II and is currently reviewing it. The discussion of the EERC review comments with DOE and the contractor is scheduled for the end of August 1995. Additional Phase II field tests have been delayed by DOE until 1996.

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