



Project Summary

A User-Friendly Data Entry Routine for the ESP Model

M. G. Faulkner

All versions of the EPA/Southern Research Institute (SRI) electrostatic precipitator (ESP) performance model have very exacting format requirements for the input data sets. SRI has written an interactive program for EPA which greatly simplifies the creation and modification of ESP model data files, thereby eliminating one of the major sources of error in the use of the model. This program is written for IBM PC-compatible computers.

This Project Summary was developed by EPA's Air and Energy Engineering Research Laboratory, Research Triangle Park, NC, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Introduction

The computer model of electrostatic precipitator (ESP) performance written by Southern Research Institute (SRI) for the EPA has undergone three revisions since it was first introduced. All versions of the ESP model require input data sets which are very exacting in the amount of data the user must furnish, the correctness of that data, and the rigidity of the format in which the data sets must be written. The data are arranged in a very compact and nearly illegible pattern. An error in the location of a data item may make the data unreadable for the program, or worse, cause the model to

read the data incorrectly and predict efficiency based on incorrect numbers.

Since the accuracy of the modeling depends on the quality of the data, little can be done to simplify the task of gathering good quality data for modeling. However, the task of putting that data into the required format can be made user-friendly. SRI has written a program for IBM PC-compatible micro-computers which allows easy data entry and modification.

This report is a user's manual for the data entry program. It describes each step that the user must follow in order to create data files successfully. A complete description of the ESP model input data is included as an appendix. Forms for organizing data before using the data entry program are included in another appendix.

Features of the Program

This program has the following features:

- The data are displayed in a set of menu-driven data forms.
- Each data item is entered by typing the correct number in the space provided. Pressing an arrow moves the cursor to another item, pressing the return key moves the cursor to the next item, and pressing the escape key moves to another menu.
- Each data item is identified by description (e.g., gas temperature). In



addition, many of the data are identified by the variable name used in the model for reference to the input data instructions in Appendix A.

- Data may be read from existing data files and either corrected or merged with other data to form a new data file.
- When changing textual data, the operator may enter data in either the letter replacement mode or the letter insertion mode, as in a word processor.
- The data files written by the program are in the standard ESP model data format and may be used by any SRI ESP model.

- Some data items, which previously required calculation or reference to tabulated data, are calculated by the program.

- When the program begins, a set of ESP data will be displayed as a guide in selecting values of data for the application at hand. The data are for a hypothetical four-section ESP having 9 in. plate spacing, a plate area of 27,000 ft² per section, and an SCA of 320 ft²/kacfm. The particle size distribution is typical of ash created by burning pulverized bituminous coal. The electrical conditions were obtained from an SRI-EPRI correlation of operating conditions. The start-up data file is named INITIAL.DAT. If a different start-up data set is desired, it is

only necessary to name the file INITIAL.DAT to make the change.

Conclusions

This report describes the operation of a program that greatly simplifies the creation and modification of data files for use with the ESP model. This program displays the data in a series of menus and allows the user direct access to the displayed data. After the user has typed the data into the menus, the program will make any necessary calculations and then store the data in a file in the correct format for reading by the ESP model. This program will also read existing ESP model files so that data files may be corrected, modified, or combined. Data files written by this program on a microcomputer may be transferred to a main-frame computer without changes.

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The complete report, entitled "A User-Friendly Data Entry Routine for the ESP Model," (Order No. PB90-256 785/AS; Cost: \$17.00, subject to change) will be available only from:

National Technical Information Service

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Springfield, VA 22161

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The EPA Project Officer can be contacted at:

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