

PACKAGE ID - 001311IBMPC00 IECM

KWIC TITLE - Integrated Environmental Control Model

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LIMITATION CODE -UNL **AUDIENCE CODE** - UNL

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DESCRIPTION - IECM is a powerful multimedia engineering software program for simulating an integrated coal-fired power plant. It provides a capability to model various conventional and advanced processes for controlling air pollutant emissions from coal-fired power plants before, during, or after combustion. The principal purpose of the model is to calculate the performance, emissions, and cost of power plant configurations employing alternative environmental control methods. The model consists of various control technology modules, which may be integrated into a complete utility plant in any desired combination. In contrast to conventional deterministic models, the IECM offers the unique capability to assign probabilistic values to all model input parameters, and to obtain probabilistic outputs in the form of cumulative distribution functions indicating the likelihood of different costs and performance results. A Graphical Use Interface (GUI) facilitates the configuration of the technologies, entry of data, and retrieval of results.

PACKAGE CONTENTS - Media Directory; Software Abstract; Media Includes Object Library, User's Guide, Executable, Auxiliary Material,

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PACKAGE CONTENTS - (CONT) Sample Problem Input and Output Data,
Installation Instructions;

SOURCE CODE INCLUDED? - No

MEDIA QUANTITY - 1 CD Rom

METHOD OF SOLUTION - IECM has a graphical user interface (GUI) using object oriented programming techniques. The GUI interfaces with a Microsoft Access 97 database, a dynamic link library (DLL) of the fundamental engineering technology modules, and a DLL of the stochastic calculation engine. The software is constructed in a modular manner for easy upgrade and support. The user configures a power plant using standard and advanced technologies, modifies preset input parameters for each technology, and views the results in graph, table or diagram format.

COMPUTER - IBM PC

OPERATING SYSTEMS - Windows 95/98/NT4

PROGRAMMING LANGUAGES - Visual C++ (75%) Fortran 90 (24%) Veggy (1%)

SOFTWARE LIMITATIONS - Requires a 32-bit operating system. Disk space may be an issue for a large number of sessions or saved results. A session may only be opened by one user at a time.

SOURCE CODE AVAILABLE (Y/N) - N

UNIQUE FEATURES - The ability to characterize uncertainties explicitly is a feature unique to this model. As many as one hundred input parameters can be assigned probability distributions. When input parameters are uncertain, an uncertainty distribution of results is returned. Such results distributions give the likelihood of a particular value, in contrast to conventional single-value estimates. IECM is also unique in its ability to characterize an entire power plant in an integrated fashion. Interaction and tradeoffs between technologies can be effectively characterized. In addition, the individual component technology modules are unique in their design, and the coupling of engineering performance models with economic cost models.

RELATED SOFTWARE - The previous version of IECM was implemented on a Macintosh computer and required separate licensing of the underlying engineering model. The current IECM continues the development effort to provide improved model capabilities, including new software developments to facilitate model use and new technical capabilities for analysis of environmental control technologies and integrated environmental control systems. The software installation program includes several copyrighted software additions which require no separate licensing; Spread 2.5

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RELATED SOFTWARE - (CONT) copyrighted 1996, Farpoint Technologies, Inc. ARR; Tab Pro 2.0 copyrighted 1996 Farpoint Technologies, Inc. ARR.; Graphics Server 4.5 copyrighted 1996, Bits Per Second Ltd. and Pinnacle Publishing, INC ARR.; Microsoft Data Access Components 1.5 copyrighted 1997, Microsoft Corporation ARR.; Integrated Environmental Control Model Interface 3.1 copyrighted 199, Carnegie Mellon University ARR>; Median Latin Hypercube and Hammersley Sequence Sampling, copyrighted 1997, Urmila Diwekar, Carnegie Mellon University, ARR.

OTHER PROG/OPER SYS INFO - Microsoft Access 97 database files .mdb are stored in the intdb and sessdb directories. All user session data inputs, configuration info, and outputs are stored in the sessdb directory. Online help files are included with the IECM, but are not yet context sensitive. They can be accessed from the operating system and program menus.

HARDWARE REQS - Pentium or compatible computer running Windows 95 or better or Windows NT 4.0 or better operating system; any SVGA or better display at a resolution of 800x600 or more pixels; at least 20 Megabytes of free hard diskp; at least 16 Megabytes of total memory.

TIME REQUIREMENTS - Run time requirements depend highly on the speed of the computer, the amount of total memory, and the uncertainty sample size. Input results are instantaneous, while results are computed for the first screen and appear instataneous for subsequent screens. The result calculation is on the order of 1 minute for a Pentium-I 233 MHz computer using a sample size of 100.

ABSTRACT STATUS - Released AS-IS 9/24/1999.

SUBJECT CLASS CODE - Z

KEYWORDS -

COMPUTER PROGRAM DOCUMENTATION
I CODES
POLLUTANTS
COAL

EDB SUBJECT CATEGORIES -
990200

SPONSOR - DOE/DP

PACKAGE TYPE - AS - IS