PACKAGE ID - 001088IBMPC00 SCM

KWIC TITLE - System Cost Model

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LIMITATION CODE -COPY **AUDIENCE CODE -** LIM

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DESCRIPTION - SCM is used for estimation of the life-cycle impacts (costs, health and safety risks) of waste management facilities for mixed low-level, low-level, and transuranic waste. SCM uses parametric cost functions to estimate life-cycle costs for various treatment, storage, and disposal modules which reflect planned and existing waste management facilities at Department of Energy (DOE) installations. SCM also provides transportation costs for intersite transfer of DOE wastes. SCM covers the entire DOE waste management complex to allow system sensitivity analysis including: treatment, storage, and disposal configuration options; treatment technology selection; scheduling options; transportation options; waste stream and volume changes; and site specific conditions.

PACKAGE CONTENTS - Media Directory; Software Abstract; INEL-95/0273 Revision 1; Media Includes Executable Modules, Sample Problem Input Data, Default Data;

SOURCE CODE INCLUDED? - No

MEDIA QUANTITY - 4 3.5 Diskettes

METHOD OF SOLUTION - SCM includes parametric cost algorithms defining the cost/capacity relationships for waste management facility; construction, equipment, operations and maintenance, and decontamination and decommissioning. These cost equations are based on pre-conceptual design and detailed cost estimate information which has been prepared for approximately 200 facility modules. The computational algorithms consist of linear and non-linear equations of a line that represent a best fit curve to three to four

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METHOD OF SOLUTION -(CONT) cost/capacity data points (per facility module). The initial cost/capacity data points are based on pre-conceptual designs of various waste management facilities. The pre-conceptual design packages include a process functional diagram (PFD) with mass flow rates, a scoping study layout (SSL), and a functional and operational requirements (F&OR). The PFD and SSL drawings were developed to the individual unit operations level. After unit operations were defined, major equipment lists and building square footage requirements were established for each unit operation.

COMPUTER - IBM PC

OPERATING SYSTEMS - Microsoft Windows 3.1

PROGRAMMING LANGUAGES - Microsoft FoxPro 2.6 Professional

SOFTWARE LIMITATIONS - SCM was developed as a stand-alone executable package, thus limiting each installation to one user. The run time performance of SCM is slow for very large cases involving multiple sites with detailed processing streams. SCM requires a trained user to operate the application. The human factors design and computational assumptions of SCM do not lend themselves to casual, non-technical users.

SOURCE CODE AVAILABLE (Y/N) - N

UNIQUE FEATURES - No other cost models have been created within DOE which can estimate waste management life-cycle costs. SCM includes the latest waste inventory data collected for the Mixed Waste Inventory Report 1995 (MWIR 95) for each of the DOE sites with mixed waste. SCM has been calibrated with site specific waste management planning including: waste volumes, treatment, storage, and disposal process flows; facility functional and operational information, scheduling information, rate structures, and cost factors. SCM core calculational processes can be accessed and run as a computional engine within other applications. SCM is currently providing analysis for three waste types (mixed low-level waste, low-level waste, and transuranic waste). Additional waste types can be easily added (spent nuclear fuel, hazardous wastes) to SCM to enhance the commerical applications. The SCM risk module includes a unique capability for calculating relative health and safety risk. The risk module includes: radiological inventories, hazardous waste volumes and toxicity, mobility, confinement capability, confinement stability, environmental transport, presence of receptors, and time in rest state.

RELATED SOFTWARE - Auxiliary software used by the development system include: Crystal Report (output reports), Microsoft Delta (development software cinfiguration management), CaseWare (released software configuration management), Graphics Server (graphical

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RELATED SOFTWARE -(CONT) output reports), and DynaZIP (for compressing case data).

OTHER PROG/OPER SYS INFO - An SCM icon is created within Microsoft Windows that allows user access. The data default data is represented in standard FoxPro or any dBASE tool that allows access to FoxPro databases. The majority of the error checking functionality is buit into the SCM user interface. Additional error checking is performed during the cost calculation execution. If an error occurs during calculation execution, information boxes are displayed with an error message. SCM can be installed in any directory specified by the user. The default directory is c:SCM with the additional default directories as specified: filename.dbf (default FoxPro database extension); (casename).scm (directory that holds the SCM case); C:SCMCurrent (directory that holds the current SCM case opened to the user); C:SCMdefault (directory that holds the SCM calibrated default data); C:SCMdata (directory that holds the SCM constant data).

HARDWARE REQS - The following configuration is recommended for adequate performance. Pentium microprocessor, 70 MHZ; 16-megabytes of RAM; 20-megabytes free hard disk space (in addition to the disk space required by the windows virtual memory); VGA color monitor; Mouse or equivalent pointing device.

TIME REQUIREMENTS - The user defined inputs, such as waste loads and the number of sites and combined with the size and speed of the computer hardware, will determine the performance expectations of the SCM. For example, a medium-case scenario would consist of MLLW waste loads for approximately ten sites. The calculation time for this case will take approximately five minutes using a 90-Mhz Pentium processor. A very large case including 49 sites could take approximately one hour to run. These calculation times do not include data entry or selection.

REFERENCES - K.M. Hsu, A.S. Lundeen, D.E. Shropshire, and B.Y. Wong, System Cost Model User's Manual Version 1.3, INEL-95/0273 Revision 1, February 1996.

ABSTRACT STATUS - Submitted 04/23/96. Released screened 8/27/96

SUBJECT CLASS CODE - H

KEYWORDS -
COMPUTER PROGRAM DOCUMENTATION
S CODES
RADIOACTIVE WASTE FACILITIES
ALPHA-BEARING WASTES
LOW-LEVEL RADIOACTIVE WASTES
RADIOACTIVE WASTE DISPOSAL
RADIOACTIVE WASTE PROCESSING

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RADIOACTIVE WASTES
LIFE-CYCLE COST
RISK ASSESSMENT
SAFETY
TRANSPORT
COST ESTIMATION
ALGORITHMS
BUDGETS
ENVIRONMENTAL IMPACTS
UNDERGROUND DISPOSAL
PARAMETRIC ANALYSIS
ECONOMIC ANALYSIS

EDB SUBJECT CATEGORIES -
990200

SPONSOR - DOE/EM

PACKAGE TYPE - SCREENED