PACKAGE ID - 000177D075000 TRAC

KWIC TITLE - Terrain-Responsive Atmospheric Code

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

COMPLETION DATE - 02/01/1992 **PUBLICATION DATE -** 02/14/1992

DESCRIPTION - The Terrain-Responsive Atmospheric Code (TRAC) is a real-time emergency response modeling capability designed to advise Emergency Managers of the path, timing, and projected impacts from an atmospheric release. TRAC evaluates the effects of both radiological and non-radiological hazardous substances, gases and particulates. Using available surface and upper air meteorological information, TRAC realistically treats complex sources and atmospheric conditions, such as those found in mountainous terrain. TRAC calculates atmospheric concentration, deposition, and dose for more than 25,000 receptor locations within 80 km of the release point. Human-engineered output products support critical decisions on the type, location, and timing of protective actions for workers and the public during an emergency.

PACKAGE CONTENTS - Media Directory; Software Abstract; RFP-4516; RFP-4516 Appendix B;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 CD Rom

METHOD OF SOLUTION - TRAC is a modified Gaussian puff atmospheric dispersion model which projects plume transport by developing three-dimensional wind fields, then transporting simulated puffs along independent, non-linear trajectories.

COMPUTER - DEC VAX11/750

OPERATING SYSTEMS - Written for operation under VMS on a DEC VAX 750.

PROGRAMMING LANGUAGES - FORTRAN 77

SOFTWARE LIMITATIONS - TRAC is a diagnostic model and cannot predict winds or weather. Errors in projections increase as the winds change following a real time model run. The model is limited in a real extent to a 160 km X 160 km study region, with a grid resolution of 1 km X 1 km. TRAC is restricted to evaluating impacts at approximately 35,000 fixed and user-supplied receptor locations.

SOURCE CODE AVAILABLE (Y/N) - Y

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UNIQUE FEATURES - TRAC realistically treats complex wind and meteorological fields, such as those found in mountainous terrain. This is particularly important in emergency response applications, where model accuracy is important for protection of the public. TRAC also treats the transport and dispersion of puffs more realistically than most other dispersion models. TRAC can be run in 'automatic' mode, continuously collecting and evaluating meteorological data so that up-to-date plume projections are always available. Customized output products can be linked with the core model to effectively communicate projections to emergency managers. Operating on a small system (e.g. a MicroVAX 3100), TRAC can complete a full model run and create multiple graphics outputs in approximately 7 minutes.

RELATED SOFTWARE - TRAC operates with several peripheral software packages to form a complete emergency response system. These supplementary packages should be developed on a site-specific basis. A real-time meteorological data acquisition system will automatically acquire meteorological data from remote weather monitoring stations, quality assure the information, and submit the data to the core model. An interactive User Interface will allow user input of source and other specific information. A graphics subsystem will develop color graphics and hard copy outputs customized to the needs of the particular site or application.

OTHER PROG/OPER SYS INFO - In the TRAC system, interactive user input information is stored in disk files with the extension '.INP'. All other data files use the extension '.DAT'. Other files created and used by the model follow the standard VAX/VMS naming conventions. No additional subroutines are required for operation of the core model. System management software must be written for coordination of and communication between the core model and the supplementary software applications described under Related and Auxiliary Software, above.

HARDWARE REQS - The TRAC model operates on DEC VAX computer systems running VMS. Approximately 6 mbytes of virtual memory are required for the executable code. Disk space requirements vary, but may extend to 1 gbyte.

TIME REQUIREMENTS - TRAC model run times vary with the complexity of the source, study region, and meteorological conditions. A typical calendar run-time of 1-2 minutes can be expected for the core transport and dispersion model. A turn-around time of 6 to 8 minutes can be expected for a fully-linked system, including meteorological data aquisition, the core model, and multiple graphics screen and hard copy outputs.

REFERENCES - Hodgin, C. Reed (1991), 'Terrain-Responsive Atmospheric Code (TRAC) - Transport and Dispersion: Features and Software Overview,' Rocky Flats Plant Report No. RFP-4516, EG&G Rocky Flats,

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REFERENCES -(CONT) Inc., Rocky Flats Plant, Golden, CO; Hodgin, C. Reed. (1984), 'A Model for Asymmetrical Plume Growth and Dispersion in Complex Terrain,' Proc. Fourth Joint Conference on Applcations of Air Pollution Meteorology, Portland, OR.

ABSTRACT STATUS - Submitted to ESTSC January 92.

SUBJECT CLASS CODE - RG

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T CODES
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EDB SUBJECT CATEGORIES -
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