RSIC Newsletter

No. 289   December 1988

*The first great gift we can bestow on others is a good
example.—Morell*

CHANGES IN TAPE WRITING POLICY

Due to software changes and security concerns at the ORNL computing center, the use of non-labeled tapes is being discouraged and may be eliminated. **Please request labeled tapes whenever possible. Effective December 1988, we will begin writing IBM standard-labeled tapes unless users request** otherwise. We can also write ANSI-labeled tapes which can be read under VAX VMS using the "COPY" command. The operating system retrieves the file attributes from the label and minimizes user responses. The printer output from writing tapes is always mailed with requests and can be used to determine the exact file attributes and data set names. Please include in your request information which identifies your computing environment so we can write tapes you can read with greater ease. Use of 6250-bpi tapes is also encouraged since this reduces the number of tapes required to fill a request and results in savings on postal charges.

Jennie L. Bartley

CHANGES TO THE COMPUTER CODE COLLECTION

Four changes were made to the computer code collection during the month. Two new code systems were packaged and added to the collection, an existing code package was extended with an additional hardware version, and update bulletins were added to the documentation of an existing code package.

CCC-400/DOSFACTER-II

This code system for calculating dose rate conversion factors for external exposure to photons and electrons emitted by radionuclides in the environment was extended to run on VAX computers using information supplied by Duquesne Light, Shippingport, Pennsylvania. Minor changes were made to the FORTRAN program, and a command file was added to the package to assign logical names for input/output files. The VAX FORTRAN compiler, Version 4.6, was used on the VAX 8600 to compile and execute the code under VMS. Reference: ORNL/NUREG-79, NUREG/CR-1918 (August 1981) and Informal Documentation (1980). FORTRAN IV; IBM 3033 (A) and VAX (B).

CCC-484/DORT

This two-dimensional discrete ordinates transport code system, contributed by Oak Ridge

National Laboratory (ORNL) under Defense Nuclear Agency (DNA) sponsorship, is based on the earlier DOT codes. The code was installed on the local Cray running CTSS and on the ORNL IBM 3033 running OS/VS2. RSIC and the contributors in the Engineering Physics and Mathematics Division at ORNL acknowledge and appreciate the feedback related to running the code system on various computers provided by several installations. The Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio, installed DORT under COS. Both Knolls Atomic Power Laboratory, Schenectady, New York, and Idaho National Engineering Laboratory, Idaho Falls, ran DORT under UNICOS. The IBM version was run at Columbia University, New York, and at the U. S. Army Foreign Sciences and Technology Center, Charlottesville, Virginia. DORT determines the flux or fluence of particles throughout one- or two-dimensional geometric systems due to sources either generated as a result of particle interaction with the medium or incident upon the system from extraneous sources. The principal application is to the deep-penetration transport of neutrons and photons. Criticality (k-type and search) problems can also be solved. The Boltzmann transport equation is solved, using either the method of discrete ordinates or diffusion theory.

The programming standards described in American Nuclear Society (ANS) STD.3-1971 are used. Although the code is written predominantly to FORTRAN 66 standards, the CRAY version now includes some new FORTRAN 77 features. It is fully compatible with CRAY CFT compilers through version 1.14 and was implemented successfully on both CRAY X-MP and CRAY 2 computers using CFT77 version 2. The program can be operated with 100% FORTRAN language on CRAY computers. Optional CAL routines can be used to enhance execution speed on both CRAY 1 and X-MP computers. The IBM version was developed on the IBM 3033 under OS/VS2 using the FORTRAN H-Extended Enhanced compiler and ASMF assembler. The IBM version requires standard library routines written in assembler. Other assembler routines are optional to enhance execution speed. Several related programs are included in the package: DOS DRIVER, GIP, RTFLUM, BNDRYS, and GRTUNCL. The source file is available in update form, including comment files and documentation updates, implementation instructions, and description of sample problem cases. References: ORNL-5851 (April 1982), ORNL/TM-8362 (September 1982), and Informal Notes (1988). FORTRAN and CAL, CRAY (A); FORTRAN and ASSEMBLER, IBM 3033 (B).

CCC-536/DOSFACTER-DOE

This code system for calculating dose rate conversion factors for external exposure to photons and electrons emitted by radionuclides in the environment was contributed by ORNL. The results give the dose-equivalent rate per unit concentration for a particular mode of exposure: immersion in a contaminated atmospheric cloud, immersion in contaminated water, or exposure to contaminated ground surface. The present code differs from the previous version, CCC-400/DOSFACTER II, as follows: no body surface factors are calculated, "total body" factors are replaced by "effective" (weighted) factors, electron dose factors for the skin are calculated for several depths, and the output format differs. Reference: DOE/EH-0070 (July 1988). FORTRAN IV; IBM 3033.

PSR-137/MARLOWE

Update Bulletins for this code for the simulation of atomic-displacement cascades in solids in the binary collision approximation are provided periodically by the contributors at ORNL. Update Bulletin 5, dated November 8, 1988, describes cumulative changes recommended for Version 12 of MARLOWE and is available upon request from RSIC. References: Informal User's Guide; *Phys. Rev. B*, **9** (12), p 5008 (1974).

lems. Notable among his many achievements are methods for analyzing structure shielding against fallout radiation, approximate calculational techniques for protection against nuclear radiation from weapons, the development of moment methods codes for gamma ray and neutron radiation, the creation of benchmark results for neutron and gamma ray radiation fields, practical methods for estimating radiation streaming through ducts, and the development of extensive and widely-used gamma ray buildup factor compilations.

*From his many research efforts, the nature of radiation behavior in many different and specialized applications is better understood. He is the coauthor of the book, **Structure Shielding Against Fallout Gamma Rays from Nuclear Detonations**, and has contributed to the understanding of radiation behavior through numerous technical monographs, reports, and journal publications.*

Besides his many technical accomplishments, Charlie is a respected leader in the shielding community who is always eager to help his colleagues. Those fortunate enough to have worked with him have always found it a rewarding and pleasant experience.

On behalf of the American Nuclear Society, the Radiation Protection and Shielding Division is pleased to present to

Dr. W. Reed Johnson

its award for Distinguished Service by virtue of the following contributions:

In addition to the busy schedule involved with serving on the faculty of the Nuclear Engineering Department of the University of Virginia, Reed has devoted the extra time required to serve on numerous professional committees and in various public service areas. Particularly noteworthy is his membership on the Atomic Safety and Licensing Appeal Board Panel since 1974. He is very interested in standards development and was an active member of ANS 6.4 Standards Working Group (Concrete Shielding Standard) from 1972–1977, and ANS 33.3 Standards Working Group (Hydrogen Control) from 1973–1974.

Reed became a Fellow of the American Nuclear Society in 1980. He served as chairman of the Shielding and Dosimetry Division during 1973–1974. His service on the executive committee of the division emcompassed many responsibilities, including chairman of the nomination committee.

The technical contributions that Reed has made are extensive. He has authored and coauthored dozens of technical reports and journal articles, and has written portions of two book reviews. Our thanks that an individual of this professional stature has also taken time to serve in so many important areas of responsibility that are beyond normal job requirements.

Several prominent shielding specialists were also selected as ANS Fellows:

Felix C. Difilipo for outstanding contributions to the field of nuclear engineering through his internationally recognized work in neutron cross section technology and his original development of stochastic methods for the study of reactor kinetics and subcriticality surveillance.

Ward W. Engle, Jr. for his significant contributions in the field of radiation transport and shielding, and for his singular efforts in the development of the one-dimensional discrete ordinates neutron transport code, ANISN, that is used worldwide for shielding and related radiation effects studies for fission and fusion reactors, high energy accelerators, and space radiation research and design applications. Engle is presently assigned to the OECD Nuclear Energy Agency Data Bank to provide additional support in the area of reactor safety.

Robert L. Ritzman for pioneering work on radioactive release determinations during accidents at nuclear reactors; also for developing transport and consequence analysis tools for use in probabilistic risk assessments of thermal and fast reactors.

Yigal Ronen for his contributions in organizing and systematizing nuclear design theory and practice into recognized archival textbooks; for promoting international cooperation in the nuclear field; and for the furtherance of international cooperation as co-founder and current president of the Israel Nuclear Society.

Massimo Salvatores for his numerous contributions to fast reactor analysis and the application of generalized perturbation theory to data validation.

Francis B. K. Kam, received the American Society for Testing and Materials (ASTM) Award of Merit at ceremonies hosted by the ASTM Committee E-10 on Nuclear Technology and Applications in June. He was honored for meritorious services in the committee during the development of standards related to nuclear radiation metrology.

Visitors to RSIC

During the month the following persons came for an orientation visit and/or to use RSIC facilities: *Johnny Rosén*, NEA Data Bank, Paris, France, and *Jean Gonnord*, CEA, Gif-sur-Yvette, France.

CONFERENCES, COURSES, SYMPOSIA

RSIC attempts to keep its users/contributors advised of conferences, courses, and symposia in the field of radiation protection, transport, and shielding through this section of the newsletter. Should you be involved in the planning/organization of such events, feel free to send your announcements and calls for papers to RSIC.

ATR5 Workshop Planned

The ATR (Air Transport of Radiation) code system is the DNA standard model for the analysis of initial radiation environments produced by atmospheric nuclear bursts. The Defense Nuclear Agency has released ATR5, a new version of ATR that contains significant improvements over the earlier versions. These improvements include: (1) entire replacement of the free field radiation data bases for neutrons, secondary gamma rays, and prompt gamma rays; (2) complete overhaul of the air-over-ground correction factors that improves the accuracy of the dose correction factors and provides the two dimensional energy-angular fluence for coupled forward-adjoint shielding calculations; (3) treatment of the influence of atmospheric moisture on the radiation transport; (4) modifications to the delayed radiation model including empirical corrections based on nuclear test measurements and the provision to specify individual fissile isotopes; and (5) additional commands to facilitate specification of the atmospheric conditions.

An unclassified workshop will be held in January 1989 in the Washington, D.C. area, to review the state of initial radiation assessment, to discuss the revisions to ATR embodied in ATR5 and in planned future versions, and to provide hands-on training in using ATR5 to solve problems of interest to the DOD community. Attendance for the workshop is by invitation only and is limited to U.S. and NATO Defense Department Agencies and their contractors. Requests for invitations should be forwarded by **January 6, 1989,** to William Woolson, Science Applications International Corp., 10260 Campus Point Dr., San Diego, CA 92121 (phone 619-546-6224; FAX 619-546-6872).

The Canadian Radiation Protection Association has issued a second call for papers for its *10th Annual Meeting,* to be held April 30–May 3, 1989, in Victoria, British Columbia. Contributed papers are solicited in the areas of Radiation Dosimetry, Radiation Instrumentation, Radiation Protection in Medicine, Radiation Protection in Industry, Health Physics of the Nuclear Fuel Cycle, Non-Ionizing Radiation, Radiation Safety Training, Emergency Planning, Waste Management, Radiation Safety Program Organization, and Public Information. Abstracts of no more than 250 words should be submitted to Lutz E. Moritz, TRIUMF, 4004 Wesbrook Mall, Vancouver, B. C., Canada V6T 2A3 (phone 604-222-1047; Telex (0)-4508503; FAX 604-222-1047), by **January 15, 1989.**

MCNP Tutorial Offered

A two-day tutorial on the Monte Carlo Neutron-Photon Transport Code (MCNP) developed at Los Alamos National Laboratory will be offered the week of the June 1989 ANS Meeting. The sessions will be presented jointly by the Radiation Transport Group (X-6) and the Nuclear Criticality Safety Group (HSE-6) of Los Alamos National Laboratory. The first day will cover the basic capabilities of MCNP and SABRINA, with emphasis on general utility and applications of the codes. The second day will focus on criticality safety applications of MCNP. Details about the tutorial may be obtained from Robert C. Little, Group X-6, Mail Stop B226, Los Alamos National Laboratory, P.O. Box 1663, Los Alamos, NM 87545 (phone 505-667-4189; FTS 843-4189).

Calendar

Your attention is directed to the following events of interest.

January 1989

6th Symposium on Space Nuclear Power Systems, Jan. 9–12, 1989, Albuquerque, New Mexico, sponsored by the Univ. of New Mexico. Contact: Mohamed El-Genk, The Inst. for Space Nuclear Power Studies, Univ. of New Mexico, 237 Farris Engineering Center, Albuquerque, NM 78131 (phone 505-277-2813).

February 1989

WATTec '89, Feb. 14–17, 1989, Knoxville, Tennessee. Contact: WATTec, P.O. Box 629, Oak Ridge, TN 37831-0629.

April 1989

25th Annual Meeting of the National Council on Radiation Protection and Measurements, Apr. 5–6, 1989, in Washington, D.C. Contact: W. Roger Ney, Executive Director, NCRP, 7910 Woodmont Ave., Suite 800, Bethesda, MD 20814.

Advances in Nuclear Engineering Computation and Radiation Shielding, Apr. 9–13, 1989, Santa Fe, New Mexico, a topical meeting sponsored by the ANS M&C and RP&S Divisions. Contact: E. W. Larsen, Technical Program Chairman, Group X-6, MS B226, Los Alamos National Laboratory, Los Alamos, NM 87545 USA (phone 313-936-0124)

7th International Meeting on Radiation Processing, April 23–28, 1989, Leeuwenhorst Congres Center, Noordwijkerhout, The Netherlands, a biennial conference dedicated to the dissemination and advancement of the technology of industrial radiation processing. Contact: E. Franken, 7th Internatl. Meeting on Radiation Processing, P.O. Box 4240, 6710 EE Ede, The Netherlands (phone AA 31 8380 37476; Telex 37030; FAX AA 31 8380 39643).

Fifty Years With Nuclear Fission, Apr. 26–28, 1989, Gaithersburg, Maryland, sponsored by the U.S. National Bureau of Standards. Contact: Jan Hauber, Room B109, Bldg. 245, National Bureau of Standards, Gaithersburg, MD 20899.

10th Annual Meeting of the Canadian Radiation Protection Association, Apr. 30–May 3, 1989, in Victoria, British Columbia. Contact: Lutz E. Moritz, TRIUMF, 4004 Wesbrook Mall, Vancouver, B. C., Canada V6T 2A3 (phone 604-222-1047; Telex (0)-4508503; FAX 604-222-1047).

June 1989

Annual Meeting of the American Nuclear Society, June 4–8, 1989, Atlanta, Georgia. Contact: ANS Meetings Dept., 555 N. Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

Packaging and Transportation of Radioactive Materials: PATRAM '89, June 11–16, 1989, Arlington, Virginia, sponsored by US-DOE. Contact: Larry Blalock, Chairman, US Organizing Comm., US Dept. of Energy, P.O. Box 2001, Oak Ridge, TN 37831-8765 (phone 615-576-0945 or FTS 626-0945).

July 1989

26th IEEE Annual Conference on Nuclear and Space Radiation Effects, July 24–28, 1989, Marco Island, Florida. Contact: Dante M. Tasca, General Electric Co., Room M1211, Bldg. 100, P.O. Box 8555, Philadelphia, PA 19101 (phone 215-354-4132).

September 1989

International Workshop on New Developments in Occupational Dose Control and ALARA Implementation at Nuclear Power Plants and Similar Facilities, Sept. 18–21, 1989, Brookhaven National Laboratory, Upton, New York. Contact: Dr. John W. Baum, BNL ALARA Center, Bldg. 703M, Upton, NY 11973 (phone 516-282-4214).

NOVEMBER ACCESSION OF LITERATURE

The following literature cited has been ordered for review, and that selected as suitable will be placed in the RSIC Information Storage and Retrieval Information System (SARIS). This early announcement is made as a service to the shielding community. Copies of the literature are not distributed by RSIC. They may generally be obtained from the author or from a documentation center such as the National Technical Information Service (NTIS), Department of Commerce, Springfield, Virginia 22161.

RSIC maintains a microfiche file of the literature entered into SARIS, and duplicate copies of out-of-print reports may be available on request. Naturally, we cannot fill requests for literature which is copyrighted (such as books or journal articles) or whose distribution is restricted.

This Literature is on order. It is not in our system. Please order from NTIS or other available source as indicated.

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