RSIC Newsletter

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FOR THE U.S. DEPARTMENT OF ENERGY

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(For RSIC TELEX Communication Only)

No. 273 *August 1987*

If you do not think about the future, you cannot have one.—John Galsworthy

CHANGES TO THE COMPUTER CODE COLLECTION

Five changes or additions were made to the computer code collection during the month. Two new code systems were added to the collection, an existing code package was replaced with a newly-frozen version, and the documentation for two existing code packages was updated. Three changes resulted from foreign contributions.

CCC-496/HETC-KFA

A newly-frozen version of this Monte Carlo high-energy nucleon-meson transport code was contributed by Kernforschungsanlage (KFA) Jülich GmbH, Institut f. Reaktorentwicklung, Jülich, Federal Republic of Germany. Based on CCC-178/HETC, the HETC-KFA package includes the code SIMPEL which is an analysis routine and a driver. HETC-KFA is a high energy transport code for neutrons, protons, pions, and muons. It can use combinatorial geometry and has enhanced evaporation, high energy fission, "light" heavy-ion beams, and other features. A means of coupling to low energy transport programs, such as CCC-203/MORSE-CG is also provided. Sample input and output are provided for this version. Reference: Jul-Spez-196. FORTRAN IV; IBM 3033.

CCC-506/GALE86

Output from running the sample problems for this code system for calculating routine radioactive releases in gaseous and liquid effluents from pressurized and boiling water reactors was provided by the contributors at the U.S. Nuclear Regulatory Commission. The printed output, included with the document, is a more legible version than that previously provided. No change was made to the source codes or sample problem input data. Users who have the earlier version of the output may request the updated edition. As we announced in the January 1987 *RSIC Newsletter*, RSIC still retains the original package (CCC-335/GALE) for the use of plants licensed with the technology in earlier versions. CCC-506/GALE86 will be sent to new requestors. References: NUREG-0016, Rev.1 (1979) and NUREG-0017, Rev.1 (1985) and errata pages. FORTRAN IV; CDC 7600.

CCC-507/SPEEDI

The Environmental Research Laboratory, Japan Atomic Energy Research Institute (JAERI), Tokai-mura, Japan, contributor of this suite of computer codes for predicting the dose to the public from a plume released in a nuclear accident, has provided a memo informing us that our version of SPEEDI was **not** used in the report *Application of the SPEEDI System to the Chernobyl Reactor Accident*, JAERI-M 86-142, by Chino, Ishikawa, Yamazawa, and Moriuchi. The distinction between the two versions is discussed in the memo, which has been added to the CCC-507/SPEEDI

documentation. References: JAERI 1297 (1985) and informal reports and memo. FACOM FORTRAN77/VP; FACOM M-380 and VP-100.

CCC-512/TIBSO-TC

This code system for the calculation of the production and migration of radionuclides in nuclear reactor systems was contributed by the Central Research Institute for Physics, Hungarian Academy of Sciences, Budapest, Hungary. TIBSO-TC calculates nuclide production, migration, and radiation characteristics as a function of time and space for a nuclear power plant. The reactor system is divided into containers, for which there is inflow, outflow, or a combination of inflow and outflow of isotopes. The production, decay, and transfer of radionuclides is described by first order linear differential equations which are solved by the Runge-Kutta method with the sole assumption that coefficients are piece-wise linear functions of time. Activities, doses, decay heat production, and gamma-ray sources intensities can be derived from the calculated abundances of isotopes. The system can use data libraries based on ENDF/B, ORIGEN-2, or DCHAIN-2 data. Libraries for structural, fission product, and actinide materials are provided as part of the package. Reference: KFKI-1984-44 (1984). FORTRAN IV and PL/I; ES-1040 (IBM-360).

CCC-514/ANISN/PC

This multigroup one-dimensional discrete ordinates transport code system with anisotropic scattering was contributed by EG&G Idaho, Inc., Idaho Falls, Idaho. The personal computer (PC) version follows a series of developmental efforts over a period of years (see CCC-254/ANISN-ORNL). It is a modification of the Westinghouse version (CCC-255/ANISN-W), which was based on the Oak Ridge National Laboratory (ORNL) work. For ANISN/PC the standard source iteration method, accelerated by up to two single scale factors, is used for outer iterations. Inner iterations are accelerated either by a stabilized variable-mesh rebalance scheme or by a linear diffusion synthetic scheme. A noniterative matrix inversion technique based on a reflection principle is used for diffusion theory inner iterations. Included in the package are APE, which interactively generates an input file for ANISN/PC, and LMOD, which selects materials from a master ASCII CCCC ISOTXS file and places them on an ANISN CCCC input file. FLUNGP, a 21-group photon cross section master library in CCCC ISOTXS format derived from DLC-86/FLUNG, is provided for convenience. The minimum hardware requirements for ANISN/PC are: an IBM PC or compatible, the 8087 math co-processor chip, a 10MB fixed disk, and 640K Random Access Memory. The Ryan McFarland IBM Professional Fortran compiler Version 1.0 was used to compile the programs under PC/DOS 3.1. The PLINK86-Plus Version 1.48 overlay linker was used to create an executable ANISN file of approximately 640K bytes. The PC/DOS Version 3.1 linker was used to link the APE32 and LMOD programs. The executable files are included. Reference: EGG-2500 (April 1987). FORTRAN 77, IBM PC. *Six diskettes are needed to transmit the package in DOS BACKUP/RESTORE format.*

CHANGES TO THE DATA LIBRARY COLLECTION

Two changes were made to the data library collection. A new data library was packaged and formal documentation was added to an existing data library package. One change resulted from a foreign contribution.

DLC-76/SAILOR

The documentation for this coupled, self-shielded, 47-neutron, 20-photon group cross-section library for light water reactor radiation transport studies was upgraded with the inclusion of a formal publication describing the development and use of the library for analyzing irradiation experiments at an operating reactor. The report, EPRI NP-3719, was written by the contributors, Science Applications International Corp., La Jolla, California, the Electric Power Research Institute, Palo Alto, California, and ORNL. FORTRAN IV; IBM-3033.

DLC-129/ANS643

This data library of ANS-6.4.3 geometric progression gamma-ray buildup factor coefficients was contributed by ORNL, Tokyo Institute of Technology, and JAERI, Japan. ANS643 is based on the 1985 buildup factor compilation of American Nuclear Society Standards Working Group ANS-6.4.3. The compilation consists of published and unpublished data from moments method calculations and other sources. The buildup factor coefficients were determined in Japan from the compilation of ANS-6.4.3 and used in CCC-493/QAD-CGGP. A FORTRAN program, Daniel, is provided to generate buildup factors from GP coefficients. It is a stand-alone version of the routines which process GP data in QAD-CGGP and will reproduce the buildup factor data of ANS-6.4.3 typically within a few percent in the energy range 15 keV to 15 MeV. Air and medium response data are provided for 19 elements and 3 mixtures (water, air and concrete). The basic compilation extends to 40 mean free paths, but the GP method is capable of interpolation in energy and extrapolation in thickness. References: *Proceedings of Theory and Practices in Radiation Protection and Shielding,* pp. 503–511, American Nuclear Society, ISBN: 0-89448-132-0 (April 1987) and Informal Notes (June 1987). Formatted card images, FORTRAN 77. DLC-129A for IBM-3033 and Data General Eclipse MV/family (on magnetic tape); DLC-129B MICRO for IBM PC (Microsoft Fortran 77 Version 4.0) (on one ds/dd 360 KB diskette).

PERSONAL ITEMS

In serving a specialized area of scientific endeavor, it seems important that we note significant changes in the activities of people concerned with radiation protection, transport, and shielding in the nuclear industry. We, therefore, continue to carry personal items as they are brought to our attention.

Robert E. Carter, formerly with the U.S. Nuclear Regulatory Commission Division of Licensing in Washington, has announced his retirement effective June 1987. He plans to continue consulting following retirement.

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.

ICCP Call for Papers

The Call for Papers has been issued for the *International Conference on Computational Physics (ICCP).* The conference will be held June 1–5, 1988, in Beijing. The conference sponsors, the Institute of Applied Physics and Mathematics (IAPCM), Beijing, and Drexel University, Philidelphia, solicit contributions in the following subjects:

- Computer science in computational physics
- Computer application to atomic and molecular physics
- Computer application to laser and plasma physics
- Computer application to non-equilibrium statistical mechanics
- Computer application to non-equilibrium dynamics and fluid mechanics
- Computer application to nuclear physics, particle theory, and particle transport theory
- Computer application to condensed matter
- Computer application to atmospheric science and astrophysics

Papers will be selected on the basis of a 1000-word abstract, in English, which must be received by **December 31, 1987.** Authors will be notified of acceptance or nonacceptance by February 1, 1988. Chinese participants may submit abstracts to Zhang Tianyuan, IAPCM, P.O. Box 8009, Beijing, China (PRC); others may submit abstracts to D. H. Feng, Department of Physics and Atmospheric Science, Drexel University, Philadephia, PA 19104 USA.

1988 Biomedical Physics Meet in Bulgaria

The Union of the Scientific Medical Societies and the National Society of Biomedical Physics and Engineering of Bulgaria have announced the organization of the *5th National Conference on Biomedical Physics and Engineering,* to be held October 15–17, 1988, in Sofia,

Bulgaria. Sponsors include the Ministry of Health, the Medical Academy, the National Scientific Technical Union, and the European Federation of the Organizations for Medical Physics.

The scientific program includes the following topics: Acquisition and processing of physiological and clinical information; Metrology and dosimetry of ionizing radiation in medicine and biology; Physics and engineering problems in medical applications of electromagnetic and mechanical factors; Physics and engineering problems in the estimation of and protection from harmful agents in the environment; Biophysical methods in medicine; Problems of education in biophysics and medical engineering; and Reliability, quality, and maintenance of electromedical equipment. The official languages are Bulgarian, English, and Russian. Both oral and poster presentations will be planned.

Registration and other information is available from Prof. M. Markov, Dept. of Biophyics, Biological Faculty, Sofia University, 8, Dragan Tzankov Blvd., Sofia 1000, Bulgaria.

Calendar

Your attention is directed to the following events of interest.

September 1987

Pacific Basin Nuclear Conference, Sept. 6–11, 1987, Beijing, People's Republic of China, sponsored by the Chinese Nuclear Society and the American Nuclear Society. Contact: Xu Honggui, Chinese Nuclear Society, P.O. Box 2125, Beijing, People's Republic of China, or ANS, 555 North Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

ANS/ENS International Conference on Fast Breeder Reactor Systems: Experience Gained and Path to Economical Power Generation, Sept. 13–17, 1987, Richland, Washington. Contact: M. C. Carelli, Westinghouse-AESD, P.O. Box 158, Madison, PA 15663 (phone 412-722-5284), or W. Marth, Kernforschungszentrum Karlsruhe, Postfach 3640, D-7500 Karlsruhe 1, F. R. Germany.

Monte Carlo Transport of Electrons and Photons Below 50 MeV, Sept. 24–Oct. 3, 1987, Trapani, Italy. Contact: David W. O. Rogers, Ionizing Radiation Standards, National Research Council of Canada, Ottawa, Ontario K1A OR6 Canada (phone 613-993-2715).

2nd International Conference on New Frontiers for Hazardous Waste Management, Sept. 27–30, 1987, Pittsburgh, Pennsylvania, sponsored by NUS Corp., National Science Foundation, American Academy of Environmental Engineers, and the U.S. Environmental Protection Agency. Contact: Lynn Casper, NUS Corp., Park West 2, Cliff Mine Road, Pittsburgh, PA 15275-1071 (phone 412-788-1080).

October 1987

Annual Congress of the Association for Radiation Protection, Oct. 6–9, 1987, Basel, Switzerland. Contact: Fachverband f. Strahlenschutz e.V., c/o H. Brunner, Abt. SU/81, Eidg. Institut f. Reaktorforschung (EIR), CH-5303 Würenlingen, Switzerland (phone 0041 56-99 2350).

2nd Minicourse on Fusion Plasma Engineering, in conjunction with the 12th Symposium on Fusion Engineering, Oct. 12, 1987, in Monterey, California. Contact: Chris Stalker, Fusion Studies Laboratory, Univ. of Illinois, 103 South Goodwin Ave., Urbana, IL 61801 (phone 217-333-3772).

12th Symposium on Fusion Engineering, Oct. 12–16, 1987, Monterey, California, sponsored by Inst. of Electrical and Electronics Engineers (IEEE), American Inst. of Aeronautics & Astronautics, U.S. Dept. of Energy, Lawrence Livermore National Laboratory, TRW, Inc., and Grumman Aerospace Corp. Contact: Donna Schreiber, L-644, Lawrence Livermore National Laboratory, P.O. Box 5511, Livermore, CA 94556.

6th Symposium on Neutron Dosimetry, Oct. 12–16, 1987, Neuherberg, F. R. Germany, sponsored by the Commission of the European Communities, Society for Radiation and Environmental Research, and the U.S. Department of Energy. Contact: Gesellschaft f. Strahlen- und Umweltforschung mbH, München, Dr. H. Schraube, Ingolstädter Landstr. 1, D-8042 Neuherberg, F. R. Germany.

12th Symposium on Fusion Engineering, Oct. 27–30, 1987, Princeton, New Jersey. Contact: IEEE, Technical Activities Dept., 345 E. 47th Street, New York, NY 10017 (phone 212-705-7895).

November 1987

Joint Meeting of the ANS and the Atomic Industrial Forum, Nov. 15–19, 1987, Los Angeles, California. Contact: Meetings Dept., ANS, 555 N. Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

January 1988

X-Ray and VUV Interaction Data Bases, Calculations, and Measurements, January 10–15, 1988, Los Angeles, California, sponsored by the International Society for Optical Engineering. Contact: SPIE Technical Program Committee/O-E/LASE'88, P.O. Box 10, Bellingham, WA 98227-0010 USA (206-676-3290).

February 1988

Waste Management '88: Symposium on Radioactive Waste Management, Feb. 26–Mar. 3, 1988, Tucson, Arizona, sponsored by the University of Arizona. Contact: M. Wacks, Dept. of Nuclear and Energy Engineering, University of Arizona, Tucson, AZ 85721 (phone 602-621-2475).

April 1988

Workshop on Non-ionising Radiation Biological Effects, Protection and Standards, Apr. 5–8, 1988, Melbourne, Australia. Contact: J. C. Button, Scientific Secretary, IRPA 7, Health and Safety Div., Australian Atomic Energy Commission, Private Mail Bag, Sutherland, NSW 2232 Australia.

Seventh International Congress of the International Radiation Protection Association (IRPA 7), Apr. 10–17, 1988, Sydney, Australia. Contact: J.C.E. Button, Scientific Secretary, IRPA 7, Health & Safety Div., Australian Atomic Energy Commission, Private Mail Bag, Sutherland, N.S.W. 2232, Australia (phone 61-2-543-3295) (Telex: AA.24562).

International Conference on Radiation Protection Principles in Nuclear Energy, Apr. 18–22, 1988, Sidney, Australia, sponsored by the IAEA. Contact: W. Porter, IE-13, U.S. Dept. of Energy, Forrestal, Washington, DC 20585 (phone 202-252-4573).

June 1988

American Nuclear Society Annual Meeting, June 12–17, 1988, San Diego, California. Contact: ANS, Meetings Dept., 555 North Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

September 1988

Industrial Radiation and Radioisotope Measurement Applications, Sept. 6–8, 1988, Pinehurst, North Carolina, a topical meeting sponsored by the Isotopes and Radiation Division of the ANS. Contact: Robin P. Gardner, General Chairman, or Kuruvilla Verghese, Tech. Program Chairman, North Carolina State Univ., School of Engineering, Box 7909, Raleigh, NC 27695-7909.

JULY 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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