RSIC Newsletter

OAK RIDGE NATIONAL LABORATORY
POST OFFICE BOX X • OAK RIDGE, TENNESSEE 37831
OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE U.S. DEPARTMENT OF ENERGY

Phone No. 615-574-6176 or FTS 624-6176
EasyLink Mailbox: 62813374
Telex(Answer Back): 854467(ORNL EPIC UD)
(For RSIC TELEX Communication Only)

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All who have meditated on the art of governing mankind have been convinced that the fate of empires depends on the education of youth — Aristotle

CHANGES TO THE COMPUTER CODE COLLECTION

During the month six new computer code systems were added to the computer code collection. Four of the six resulted from foreign contributions.

CCC-487/CARMEN SYSTEM

Contributed by the Atomic Energy Commission, Madrid, Spain, through the OECD Nuclear Energy Agency (NEA) Data Bank, Gif-sur-Yvette, France, this system of programs was developed for the neutronic calculation of PWR cycles. It includes the whole chain of analysis from cell calculations to core calculations with burnup. The core calculations are based on diffusion theory with cross sections depending on the relevant space-dependent feedback effects which are present at each moment through the cycles. The CARMEN SYSTEM is able to make different calculation types: (1) multiplication factor by burnup step, with fixed boron concentration, (2) buckling and control rod insertion, (3) buckling search by burnup step, (4) boron search by burnup step, and (5) control rod insertion search by burnup step. Reference: J.E.N.515 (SpISSN 0081-3397) FORTRAN V; UNIVAC 1110.

CCC-489/EDO

This code system in FORTRAN V for the evaluation of dose during the normal operation of a nuclear power plant was contributed by the Calculation Center of the Politechnical University, Valencia, Spain, through the OECD NEA Data Bank, Gif-sur-Yvette, France. Radiation exposure for maximum individuals and population are estimated within 30 km from the nuclear plant. This area is divided into 160 circular trapezoids, to which computations are referred. Four age groups, seven organs for internal dose, and two organs for external dose have been considered. Reference: Informal report by Diago and Garcia. FORTRAN V; UNIVAC 1108.

CCC-493/QAD-CGGP

Contributed by Japan Atomic Energy Research Institute, Tokai-mura, Ibaraki-ken, Japan, with the Tokyo Institute of Technology, Tokyo, who provided buildup factor data, and RSIC who made some revisions to the package, QAD-CGGP is a revised version of CCC-307/QAD-CG. The most important difference is the use of the geometric progression (GP) fitting function for the gamma-ray buildup factor. This 5-parameter function is the only well-known function which can fit the buildup factor data within a few percent across the whole range of material and energy parameters. Attenuation coefficients and buildup factor coefficients are provided for 22 materials. The buildup factor data are derived from the compilation of American Nuclear Standards Group, ANS-6.4.3. The code has been modified by RSIC to be com-

patible with FORTRAN 77 compilers and has been tested on three machines. Reference: Informal notes and CCC-307/QAD-CG document. FORTRAN 77; IBM 3033 and Data General MV 4000 (A), IBM PC MICRO (B) (2 diskettes required).

CCC-494/G33-GP

This kernel integration code system for multigroup gamma-ray scattering calculations using the GP buildup factor was contributed by Japan Atomic Energy Research Institute, Tokai-mura, Japan. Based on CCC-75/G3-6ED, contributed by Los Alamos National Laboratory, Los Alamos, New Mexico, G33-GP estimates gamma-ray scattering from a point source to a series of point detectors. The output includes detector response due to each energy source, as well as a grouping by scattered energy in addition to a simple, uncollided result. Although G33 is basically a single-scatter calculation, it also includes a correction for multiple scattering by applying a buildup factor for the path segment between the point of scatter and the detector point. Results are recorded with and without buildup. Surfaces, defined by quadratic equations are used to provide a three-dimensional description of the physical geometry. It evaluates scattering effects in those situations where more exact techniques are not economical. Reference: LA-5176 and Informal Notes by D. K. Trubey (1986). FORTRAN 77; IBM 3033 and Data General MV 4000 (A), IBM PC (B) (2 diskettes required).

CCC-495/XSHLD

This code package, using a different algorithm from CCC-462MICRO/NCRP49, was contributed by John L. McClellan Memorial Veterans Hospital, Little Rock, Arkansas. XSHLD uses a unique method for performing diagnostic x-ray shielding calculations. The method computes exposure at the location to be shielded from multiple sources of radiation in the room and accounts for differences in transmission characteristics of leakage and primary/scatter radiation. The XSHLD algorithm determines shielding credit for existing common structural materials. One diskette is sufficient for transmittal. Reference: *Health Physics* **50**(1): 99–105 (Jan. 1986). BASIC; CP/M Computers, TRS-80 Model 4, and IBM PC.

CCC-497 (NRC 07)/ MESOI

Version 2 of this interactive mesoscale Lagrangian puff dispersion model with deposition and decay was contributed by Pacific Northwest Laboratory, Richland, Washington, and Oak Ridge National Laboratory, Oak Ridge, Tennessee. The model is capable of treating simultaneous releases from as many as four release points, which may be elevated or at ground-level. The advective puffs are defined in three dimensions. The wind field may be adjusted for expected topographic effects. The concentration distribution within the puffs is initially assumed to be Gaussian in the horizontal and vertical. However, the vertical concentration distribution is modified by assuming reflection at the ground and the top of the atmospheric mixing layer. Material is deposited on the surface using a source depletion, dry deposition model and a primary effluent species and the ingrowth and decay of a single daughter species using a first order decay process. Reference: NUREG/CR-3344 (PNL-4753). FORTRAN 77; VAX 11/780.

CHANGES TO THE DATA LIBRARY COLLECTION

The PC version of an existing data library was corrected.

DLC-88/TPASGAM

The DLC-88D MICRO/TPASGAM nuclide ordered, ASCII formatted library of gamma-ray spectra from radioactive decay, available on IBM PC diskettes (see June 1986 *RSIC Newsletter*) has been corrected. The initial downloading to diskette resulted in concatenation of the subsequent line to each line of 80 columns. Some software can accomodate the long lines, but FORTRAN programs generally cannot. Those who encounter problems using the nuclide-ordered table should provide one diskette (double sided, double density) for its replacement. The NUCLIDE ID program and the dBASE III files are not affected by this correction.

PERSONAL ITEMS

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

Ralph Balent died April 4, 1986. He was vice president of Pickard, Lowe and Garrick, Inc., of Newport Beach, Calif., and had formerly served as vice president and general manager of Rockwell International's Atomics International Division.

Kaye D. Lathrop, associate director of the technical division of Stanford Linear Accelerator Center, has been elected to membership in the National Academy of Engineering "for seminal work in developing neutron transport methods used worldwide."

Warren F. Miller of Los Alamos National Laboratory has been appointed deputy director for energy, research, and technology. Reporting to Miller are associate directors J. C. Browne, who oversees the research group, and J. T. Whetten, who was named head of the energy and research applications group.

Visitors to RSIC

During the month the following persons came for an orientation visit and/or to use RSIC facilities: *Elsie White* and *James W. Cooke,* Department of Energy, Oak Ridge Operations, Tenn.; *Sidney Lanier* and *Larry Williams,* Office of Scientific and Technical Information, Oak Ridge, Tenn.; *Ron Moore,* Integrated Systems, Inc., Oak Ridge, Tenn.; *Osamu Sato,* Mitsubishi Research Inst., Inc., Tokyo; and *Charles A. Sparrow,* Mississippi State Univ.

Standards Notes

American Nuclear Standards Institute standard ANSI/ANS-10.3, *Guidelines for the Documentation of Digital Computer Program* (revision and redesignation of ANSI N413-1974) was approved May 2, 1986.

American Nuclear Society standard ANS-HPSSC-6.8.2, *Selection of and Design Criteria for Continuous Process and Effluent Radiation Monitors for Light Water Nuclear Reactors,* has been submitted for public review and may be ordered from ANS for $7.50.

The ANS has published its *1985 Standards Committee Report of Activities,* and copies are available for $10.00. The report includes information on ANS standards projects under development, revision, or reaffirmation; a list of approved American National Standards published by ANS; scopes and rosters for groups whose projects are under development; and reports by subcommittee and working group chairmen.

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.

RP&S Sponsors Sessions at ANS Winter Meet

The Radiation Protection and Shielding Division of the ANS is sponsoring the following sessions in the ANS Winter Meeting in Washington, D. C.

14.1 Operational Radiation Protection,

14.2 Radiation Transport Methods and Data,

14.3 Neutronics and Shielding Applications,

14.4 Source Terms and Accident Analysis,

14.5 Radiation Measurement Techniques,

14.6 Applications of Personal Computers in RP&S,

14.7 Current Problems with Neutron Skyshine.

Questions regarding these technical sessions should be directed to Joe Cardito, Stone and Webster Engineering, P.O. Box 2325, Boston, MA 02107.

14th WRSM

The *14th Water Reactor Safety Information Meeting,* sponsored by the Nuclear Regulatory Commission (NRC), will be held October 27–31, 1986, in Washington, D. C. The 4½-day meeting will cover the results and plans of NRC's nuclear reactor safety and regulatory programs. Industry-sponsored safety research and regulatory programs in the U.S. and abroad will be presented with invited papers. Further information may be obtained from Allen J. Weiss, Meeting Coordinator, Brookhaven National Lab., Building 197-C, Upton, NY 11973 USA.

EGS4 Course Offered in Canada

A course designed for those who wish to use the EGS4 system for coupled electron-photon transport simulations is offered by the National Research Council of Canada, February 16–19, 1987, in Ottawa. The topics to be covered include: An overview of the history and structure of EGS, Principles of the Monte-Carlo method for electron & photon transport, Random number generators, Sources of cross-section data and PEGS4, EGS4

transport algorithms, EGS4 tutorial programs, EGS4 system considerations, A comparison of EGS and ETRAN, A survey of EGS applications (mostly radiation dosimetry and medical physics), Geometry packages — utility routines, Variance reduction techniques, Parameter selection/step size considerations, and Daily lab exercises (using a VAX or IBM 3090).

The lecturers include W. Ralph Nelson, Stanford Linear Accelerator Center, California, and David W. O. Rogers, NRCC, co-authors of the EGS4 system, and Alex F. Bielajew, NRCC. Registration is limited to 24 students and is required by January 16, 1987. Further information is available from David W. O. Rogers, Ionizing Radiation Standards, National Research Council of Canada, Ottawa, Ont. K1A 0R6 Canada (phone 613-993-2715).

International School of Radiation Damage and Protection

A course on *Monte Carlo Transport of Electrons and Photons Below 50 MeV* will be held September 24–October 3, 1987, in Trapani, Italy. The course is sponsored by the Italian Ministry of Education, the Italian Ministry of Scientific and Technological Research, and the Sicilian Regional Government. It is designed to define the current state of the art in coupled electron-photon Monte Carlo transport simulations. Participants should have a basic knowledge of electron and photon Monte Carlo techniques. Since registration is limited, participants will be selected by the Advisory Committee of the school. Those wishing to participate should submit their name; date and place of birth, and nationality; degrees and other academic qualifications; list of publications; and present position and employer (students should include a letter of recommendation from their research group leader or professor) to David W. O. Rogers, Ionizing Radiation Standards Section, Division of Physics, National Research Council of Canada, Montreal Road, Ottawa, Ontario, Canada K1A 0R6. The closing date for application is **July 24, 1987.**

Topics to be covered include the structure, physics, and limitations of the ETRAN, EGS4, and ITS Monte Carlo codes; electron cross-section and stopping power data; sampling theory, random number generators; PRESTA — a new electron transport algorithm; a comparison of ETRAN and EGS4; structure of a 20 MeV electron depth-dose curve; electron transport in an electric magnetic field; experimental benchmarks of Monte Carlo codes; boundary crossing algorithms; and applications.

Calls for Papers

4th Space Nuclear Power Systems

A call for papers has been issued for the *4th Symposium on Space Nuclear Power Systems,* to be held January 12–16, 1987, in Albuquerque, New Mexico. The symposium is sponsored by the Institute for Space Nuclear Power Studies, University of New Mexico, and co-sponsored by the American Nuclear Society, the Air Force, Sandia National Laboratories, Los Alamos National Laboratory, and the U.S. Dept. of Energy. Nineteen unclassified sessions, a poster session, a plenary session, and six classified sessions will cover the following topics: Space Nuclear Missions and Applications; Space Station Power Options; Radiation, Thermal, and Environmental Effects; Thermal Management; Space Nuclear Fuels; Nuclear Electric & Nuclear Propulsion; Radioisotope Power Systems; Nuclear Safety; Energy Conversion & Storage; Reactors and Shielding; Instrumentation and Control; Refractory Alloys and High Temperature Materials; Multi-Megawatt System Concepts; Slow & Pulsed Power Conditioning; Simulation/Modelling; Testing; Mission & System Requirements; Power Systems Concepts; Technology Development; Concepts Evaluation and System Integration; Missions/Survivability; and Platform/Systems Integration.

Presentations on and review of work performed as a result of funding provided by the Department of Energy and the Department of Defense for the SP-100 Project will also be included in the symposium.

The deadline for submitting papers is **August 15, 1986.** Details regarding submission of unclassified, classified, and SP-100 papers may be obtained from The Institute for Space Nuclear Power Studies, Chemical/Nuclear Engineering Department, University of New Mexico, Albuquerque, NM 87131.

Waste Management '87

The call for papers has been issued for the upcoming *Waste Management '87,* scheduled for March 1–5, 1987, in Tucson, Arizona. Sponsorship for the conference, one of a continuing series of symposia on waste management, is provided by the University of Arizona, ANS, the Electric Power Research Institute, the Radwaste System Committee of the American Society of Mechanical Engineers and other interested commercial institutions. Interested contributors are invited to submit extended summaries to the Technical Program Chairman, M. E. Wacks, Dept. of Nuclear and Energy Engineering, Univ. of Arizona, Tucson, AZ 85721 (phone 602-621-6160), by **September 10, 1986.** Invited and contributed papers on research, development, and operational experience in high- and low-level nuclear waste storage and disposal, national and international agreements and regulations, and environmental impact are solicited for the following topics: Productive Cooperation of International Nuclear Waste Disposal Programs, Status of U.S. Nuclear Waste Disposal Programs, Spent Fuel Storage, Waste Management Aspects of Environmental Surveillance, Geotech-

nical Characterization of HLW Repositories, Economics of the Fuel Cycle and Waste Management — Systems Analysis, LLW Compact Progress: Milestone Compliance, Transportation of Nuclear Waste: Technical Aspects, LLW Management by Utilities, Public Education on Nuclear Waste Management, Nuclear Waste Disposal Modeling, Nuclear Waste Disposal Quality Assurance, Technical Experts and Government Interface with Public/Institutional Interests, Transportation of Nuclear Waste: Institutional and Public Safety Aspects, Disposal of Decommissioned/Decontaminated/Special Case Wastes, Nuclear Waste Research By-Products and Other Technology Transfer Aspects, Legal and Liability Issues in Nuclear Waste Storage and Disposal, and Mixed Chemical/Radioactive Waste Disposal.

Calendar

Your attention is directed to the following additional events of interest to the radiation shielding and protection community.

August 1986

Occupational and Environmental Radiation Protection, Aug. 11–15, 1986, a course sponsored by Harvard School of Public Health, Boston, Massachusetts. Contact: Office of Continuing Education, Dept. A, Harvard School of Public Health, 677 Huntington Ave., Boston, MA 02115 (phone 617-732-1171).

Criticality Accident Dosimetry Training Course, Aug. 11–15, 1986, Oak Ridge, Tenn., sponsored by ORNL. Contact: C. S. Sims, ORNL, Bldg. 7710, P.O. Box X, Oak Ridge, TN 37831 (phone 615-574-5851).

19th DOE/NRC Nuclear Air Cleaning Conference, Aug. 13–15, 1986, Seattle, Washington. Contact: Melvin W. First, Conference Chairman, Harvard Air Cleaning Laboratory, 665 Huntington Ave., Boston, MA 02115-9957 (phone 617-732-1164).

International Nuclear Physics Conference, Aug. 25–30, 1986, Harrogate, United Kingdom. Contact: Inst. of Physics, 47 Belgrave Square, London SWIX 8QX (phone 01-235-6111).

8th International Conference on Solid State Dosimetry, Aug. 26–29, 1986, St. Catherine's College, Oxford, organized by the National Radiological Protection Board, U.K. Contact: Miss L. Ashby, National Radiological Protection Board, Chilton, Didcot, Oxfordshire, U.K.

September 1986

International Conference on Nuclear and Radiochemistry, Sept. 1–5, 1986, Beijing, sponsored by the Chinese Nuclear Society and Chinese Chemical Society. Contact: Prof. Liu Yuanfang, Dept. of Technical Physics, Beijing Univ., Beijing, People's Republic of China.

International Conference on Reliable Fuels for Liquid-Metal Reactors, Sept. 7–11, 1986, Tucson, Arizona, sponsored by ANS, AIME, and the U.S. Dept. of Energy. Contact: E. A. Aitken, Tech. Prog. Chairman, General Electric Co., Nuclear System Technology Div., 310 DeGuigne Dr., Sunnyvale, CA 94088 (phone 408-738-7237).

Annual Information Meeting of the Canadian Nuclear Fuel Waste Management Program, Sept. 7–12, 1986, Winnipeg, Canada. Contact: R. S. Dixon, Publicity Chairman, Nuclear Fuel Waste Management, Pinawa, Manitoba, Canada ROE 1LO.

International Conference on Radioactive Waste Management, Sept. 7–12, 1986, Winnipeg, Manitoba, Canada, sponsored by the Canadian Nuclear Society and ANS. Contact: Dr. T. S. Drolet, CFFTP, 2700 Lakeshore Rd. West, Mississauga, Ontario, Canada L5J 1K3 (phone 416-823-6654).

Conference on the Treatment and Containment of Radioactive Wastes and Disposal in Arid Environments (Radwaste '86), Sept. 7–13, 1986, sponsored by Atomic Energy Corp. of South Africa, Electricity Supply Commission of South Africa, and Nuclear Development Corp. of South Africa. Contact: Radwaste Conf. Secretariat, NUCOR, Private Bag X256, Pretoria 0001, South Africa (phone 27-12-21-3311 ext. 677).

14th SOFT—Symposium on Fusion Technology, Sept. 8–12, 1986, Avignon, France. Contact: A. Torossian, Dept. de Recherches sur la Fusion Controlee, Centre d'Études Nucleaires de Cadarache, B.P. No. 1, F-13108 Ste-Paul-lez Durance, France.

4th European congress and 13th Regional Congress of the International Radiation Protection Association and Technical Exhibition, Sept. 15–19, 1986, Salzburg, Austria, sponsored by the Austrian Association for Radiation Protection; Austrian Ministry of Health and Environmental Protection, Austrian Ministry of Science; and Austrian Research Centre. Contact: A. Hefner, Österreichischer Verband f. Strahlenschutz, A-2444 Seibersdorf, Austria (phone 02254 80-2509 or 2560).

Advances in Reactor Physics and Safety Meeting, Sept. 17–19, 1986, Saratoga Springs, N. Y., sponsored by ANS. Contact: Norman C. Francis, Knolls Atomic Power Lab., River Road, Schenectady, NY 12301, or Donald R. Harris, Rensselaer Polytechnic Inst., Troy, NY (phone 518-270-6407).

October 1986

American Physical Society Nuclear Physics Division Meeting, October 9–11, 1986, Vancouver, Canada. Contact: APS, 335 E. 45th St., New York, NY 10017 (phone 212-682-7341).

Nuclear Transportation Issues, Oct. 19–22, 1986, Charleston, South Carolina, sponsored by the Atomic Industrial Forum. Contact: Conference Office, AIF, 7101 Wisconsin Ave., Bethesda, MD 20814-4891 (phone 301-654-9260).

Hanford Life Sciences Symposium: Radiation Protection—A Look to the Future—Celebrating Four

Decades of Research at Hanford, Oct. 21–23, 1986, Richland, Washington, sponsored by the Dept. of Energy. Contact: William J. Bair, Environment, Health and Safety Research Program, Battelle, Pacific Northwest Laboratories, P.O. Box 999, Richland, WA 99352 (phone 509-375-2421).

November 1986

International Symposium on Nuclear Material Safeguards, Nov. 10–14, 1986, sponsored by IAEA. Contact: IAEA, Conf. Service Section, P.O. Box 100, A-1400 Vienna, Austria.

United Nations Conference for the Promotion of International Co-operation in the Peaceful Uses of Nuclear Energy, Nov. 10–28, 1986. Contact: Executive Secretary, UN Conf. for the Promotion of Internatl. Cooperation in the Peaceful Uses of Nuclear Energy, Vienna International Centre, P.O. Box 500, A-1400 Vienna, Austria.

International Symposium on Nuclear Material Safeguards, Nov. 10–14, 1986, Vienna, sponsored by the IAEA. Contact: IAEA, Conference Service Section, P.O. Box 100, A-1400 Vienna, Austria.

ANS and Atomic Industrial Forum Joint Meeting, Nov. 16–21, 1986, Washington, D. C. Contact: D. G. Pettengill, ANS, 555 N. Kensington Ave., La Grange Park, IL 60535 (phone 312-352-6611 ext. 257).

April 1987

23d Annual Meeting of the National Council on Radiation Protection and Measurements, Apr. 8–9, 1987, Washington, D. C. Contact: NCRP, 7910 Woodmont Ave., Suite 1016, Bethesda, MD 20814.

Theory and Practices in Radiation Protection and Shielding, Apr. 22–24, 1987, Knoxville, Tennessee, sponsored by the ANS Radiation Protection and Shielding Division. Contact: Robert T. Santoro, Chairman, Technical Program Committee, ANS Topical Conference, RP&S, P.O. Box X, Oak Ridge, TN 37831 (phone 615-574-6084).

August 1987

9th International Conference on Structural Mechanics in Reactor Technology (SMiRT-9), Aug. 17–21, 1987, Lausanne, Switzerland, sponsored by the International Association for Structural Mechanics in Reactor Technology, the Commission of the European Communities, and the École Polytechnique Fédérale de Lausanne. Contact: Folker H. Wittmann, École Polytechnique Fédérale de Lausanne, SMiRT-9, Chemin de Bellerive 32, CH-1007 Lausanne, Switzerland.

JUNE 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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