

RSIC Newsletter



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Within the next few years—a decade perhaps—we should be in a position to unlock new knowledge about life and matter so great that wholly new concepts of human life will follow in the wake of this new knowledge.—David E. Lilienthal

CHANGES TO THE COMPUTER CODE COLLECTION

Eight changes were made to the computer code collection during the month. One new code system was packaged and added to the collection; two code packages were replaced with newly frozen versions; two code packages were extended with additional hardware versions; and three code packages were updated to make corrections or enhance the operation of the code system. Five changes resulted from foreign contributions.

CCC-275/E-DEP-1

A newly frozen version of the E-DEP-1 code system for calculation of the energy distribution of energy deposited in collisions of heavy ions was contributed by the Naval Research Laboratory, Washington, D.C. The present version uses the elastic stopping power of Wilson, Haggmark, and Biersak and the inelastic stopping power phenomenological fit of Land and Brennan. In addition, some minor corrections were made and the range was extended to higher energies. Reference: NRL Report 8859. FORTRAN 77; VAX.

CCC-288/SCALE-0

This modular code system for performing standardized computer analyses for licensing evaluation was updated with the addition of ORIGIN-S, directives for the CDC Update utility, and JCL, all provided by Empresa Nacional del Uranio, S. A., Madrid, Spain. The ORIGIN-S source was converted from CCC-424/SCALE-1 to run on the CYBER 830 using FORTRAN-5 under NOS 2.3. Other modules run on the CYBER 176

FORTRAN-5 compiler under NOS/BE. RSIC added appropriate libraries for ORIGIN-S and the updated SCALE.X27 neutron library from CCC-466/SCALE-3.1. Reference: NUREG/CR-0200 (ORNL/NUREG/CSD-2), Vol. 1,2,3. FORTRAN 77; CDC CYBER (B).

CCC-357/AIRDOS-EPA

Some suggested changes to this code system for estimating environmental concentrations and dose to man from airborne releases of radionuclides were contributed by the Institut za Elektroprivredu, Zagreb, Yugoslavia; Argonne National Laboratory (ANL), Illinois; and the Institute for Nuclear Energy Research, Lung-Tan, Taiwan. The corrections were verified by the contributors at Oak Ridge National Laboratory (ORNL) and the Environmental Protection Agency (EPA). The changes are available upon request to those who wish to update their copy of CCC-357/AIRDOS-EPA. We recommend, however, that current and new users obtain RSIC package CCC-476/CAAC; the version of AIRDOS-EPA in that package will be maintained. RSIC will distribute CCC-476/

CAAC to future requesters of AIRDOS-EPA. Reference: ORNL-5532 (1979). FORTRAN IV; IBM 3033.

CCC-371/ORIGEN2

A UNIVAC version of this isotope generation and depletion code was contributed by Sargent and Lundy, Chicago, Illinois. The UNIVAC version works the same as the original IBM version from ORNL with two exceptions. First, all references to logical unit 50 were changed to logical unit 20 to conform to UNIVAC ASCII FORTRAN limits. Second, an additional parameter on the OUT command allows photon spectra to be saved on a disk file. The data libraries and MAIN routines from the IBM version are included. References: Informal notes, ORNL/TM-7175, and *Nucl. Technol.* **62**, 334-52 (1983). UNIVAC ASCII FORTRAN; UNIVAC 1100 (B).

CCC-380/PALLAS1D(VII)

A newly frozen version of this one-dimensional, direct-integration method transport code system was contributed by the Japan Atomic Energy Research Institute (JAERI), Tokai-Mura, Japan. This version can treat neutron as well as primary and secondary photon transport, including those from bremsstrahlung and annihilation photons. Slab and spherical geometries can be accommodated. Reference: JAERI-M 84-214. FORTRAN IV; FACOM M-380.

CCC-501/SUSD

This cross-section sensitivity and uncertainty code system, which includes the effects of secondary neutron energy (SED) and angular distributions (SAD), was contributed by the University of Tokyo. SUSD uses first order perturbation theory to calculate sensitivity coefficients for one- and two-dimensional problems. The system includes

additional modules for the PSR-171/NJOY system to prepare partial cross sections for SAD sensitivity analysis (GROUPSR) and group covariance matrices for SAD/SED uncertainty analysis (SEADR). The code was not tested at RSIC. Reference: An English translation of UTNL-R 0185. FORTRAN 77; HITACHI-M Series.

CCC-506/GALE86

The PWR-GALE part of this code system for calculating routine radioactive releases in gaseous and liquid effluents from pressurized and boiling water reactors was updated to incorporate newer operating data and in-plant measurement program results. The corresponding document (NUREG-0017) was updated with Rev.1. The BWR-GALE part had minor revisions. RSIC will retain the current package (CCC-335/GALE) for the use of plants licensed with the technology contained in earlier versions. CCC-506/GALE86 will be sent to new requesters. References: NUREG-0016, Rev.1 (1979) and NUREG-0017, Rev.1 (1985) and errata pages. FORTRAN IV; CDC 7600.

PSR-112/MAME

A CYBER 205 collection of AMPX modules was contributed by Purdue University, West Lafayette, Indiana. The modules were taken from PSR-112A/MAME which consists primarily of AMPX modules that operate on CDC machines. The MAME package allows non-IBM users to process the data in DLC-41/VITAMIN-C and DLC-113/VITAMIN-E. The modules in this version, denoted PSR-112C, include AIM, AJAX, BONAMI, COLGATE, CONTAC, DIAL, MALOCS, NITAWL, RADE, and XSDRNPM. The ANISN and GIP routines needed to execute the VITAMIN-C and -E sample problems are also included. Instructions and notes for running the modules are included as comment cards in the source codes. Reference: Informal notes. FORTRAN 77; CYBER.

CHANGES TO THE DATA LIBRARY COLLECTION

Two new data libraries, both contributed by Japan, were added to the data library collection during the month.

DLC-122/JENDL2

This library of evaluated neutron data in ENDF/B-IV format was contributed by the JAERI, Tokai-Mura, Japan. It is the second version of the general purpose library and is denoted JENDL-2 (Rev. 1). Data for 89 materials are provided in two forms. One has the evaluated data represented, where applicable, with resonance parameters. The other, a pointwise form, was generated using PSR-215/RESEDD. A tape written at 6250 bpi is needed to hold the entire library. Any code that reads ENDF/B-IV formats can be used to process the data. Reference: JAERI-M 84-103. 1,115,709 card image records; FACOM-M380.

DLC-123/DDXLIB

This library of neutron multigroup, doubly differential cross sections was contributed by the JAERI. The 124-group data were produced from ENDF/B-IV using the PROF-DD processing code. The data in DDXLIB have a direct representation of energy-angle correlation instead of a conventional Legendre expansion method and are in the format used by the Monte Carlo code MORSE-DD. The materials included are H, ^6Li , ^7Li , ^{12}C , ^9Be , ^{14}N , ^{16}O , ^{23}Na , Mg, ^{27}Al , Si, K, Ca, Cr, Fe, Ni, ^{55}Mn , Cu, Mo, and Pb. No retrieval program or sample run is provided. Reference: Informal notes and *Proc. 6th Intl. Conf. Rad. Shld.*, 171-79 (1983). Records are 120 characters in length; FACOM-M380.

ANS RP&S Division News

The paper entitled "Neutron and Gamma-Ray Flux Calculations for the VENUS PWR Engineering Mockup" by Arnold H. Fero of Westinghouse NTD was selected as the Best Paper presented at the ANS RP&S technical sessions at the November 1986 Winter Meeting in Washington, D.C. A certificate and \$300 will be presented at a future RP&S Division business meeting.

PERSONAL ITEM

Long-term RSIC friend and supporter, **Yutaka Furuta**, retired from the JAERI in 1986. He accepted an appointment to teach in a computer college in Nagoya-shi for the coming year.

Visitors to RSIC

During the month the following persons came for an orientation visit and/or to use RSIC facilities: *Sümer Sahin*, Erciyes Univ., Kayseri, Turkey; *Irving I. L. Wang*, Taiwan Power Co., Taipei; *Patti Austin*, Science Applications International Corp., Oak Ridge, Tennessee; and *Antonio Valero*, Univ. of Zaragoza, Spain.

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.

Space Conference Set for July

The 24th Annual Conference on Nuclear and Space Radiation Effects in Electronics will be held July 28-31, 1987, in Snowmass Village, Colorado. Invited and contributed papers, panel discussions, and a poster session will treat the impact of hazardous and extreme environments on electronic devices, materials, circuits, and systems. Papers describing significant findings in the following or related areas are solicited: Basic radiation effects mechanisms in materials and devices; Spacecraft charging; Radiation transport, energy deposition, dosimetry, and simulation facilities; Design, manufacture, and testing of radiation-hardened electronic devices; Electromagnetic pulse phenomena (IEMP, SGEMP, SREMP); Single-event upset and damage phenomena; Dose rate upset, snap-back, latchup, and burnout; Hardness and quality assurance; Combined radiation, shock, temperature, and pressure environmental effects on electronics; Advanced substrate technologies; and Analytical simulation and modeling of environmental effects. Authors must submit for review ten copies of a factual abstract and an informative summary that furnishes sufficient details and clearly indicates the purpose of the work, the significant results, and how it advances the state of the art. The summary must be in the hands of the Technical Program Chairman, Sherra

Diehl, North Carolina State Univ., Box 7911, Dept. of Electrical and Computer Engineering, Raleigh, NC 27695-7911, no later than **February 9, 1987**. Details may be obtained from Sherra Diehl by writing the address given above or telephone 919-737-2336 or 919-737-2066.

Calendar

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

March 1987

Radioactive Waste Management (WM 87), Mar. 1-5, 1987, Tucson, Arizona, sponsored by the Univ. of Arizona. Contact: Technical Program Chairman, WM 87, Dept. of Nuclear and Energy Engineering, College of Engineering and Mines, Univ. of Arizona, Tucson, AZ 85721 (602-621-2475).

International Conference on Radiation Dosimetry and Safety, Mar. 2-4, 1987, Taipei, Taiwan, Rep. of China, sponsored by Nuclear Energy Society of the Rep. of China and ANS. Contact: C. J. Tung, Inst. of Nuclear Science, National Tsing Hua University, Hsinchu 30043, Rep. of China, or C. S. Sims, Health & Safety Research Div., ORNL, P.O. Box X, Oak Ridge, TN 37831.

Annual Meeting of the Atomic Energy Society of Japan, Mar. 26-28, 1987, Nagoya, Japan. Contact: Minoru Masamoto, Secretary General, Atomic Energy Society of Japan, No. 1-13, 1-chome, Shimbashi, Minato-ku, Tokyo 105, Japan (phone 03 508-1261).

Occupational and Environmental Radiation Protection, Mar. 30-Apr. 3, 1987, Boston, Massachusetts, a course sponsored by the Harvard School of Public Health. Contact: Dade W. Moeller, Office of Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-732-1171).

Meeting on Practical Radiation Protection, Mar. 31-Apr. 1, 1987, London. Contact: J. H. Martin, Bldg. 15, Park Wynd, University of Dundee, Dundee DD1 4HN, Scotland, UK (phone 23181 ext. 4438).

Conference on Health Effects of Low Dose Ionizing Radiation: Recent Advances and Their Implications, Mar. 31-Apr. 3, 1987, sponsored by the British Nuclear Energy Society. Contact: P. J. Ross, BNES, Institution of Civil Engineers, 1-7 Great George St., Westminster, London SW1P 3AA, United Kingdom (phone 01-222-7722 ext. 283).

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).

6th Annual Conference on Incineration of Mixed and Low-Level Radioactive Wastes, Apr. 22-25, 1987, St. Charles, Illinois, sponsored by the University of California, U.S. Dept. of Energy, and the American Society of Mechanical Engineers. Contact: J. B. Tripodes, Mgr., Health Physics, EH and S, Univ. of California, Irvine, CA 92717.

Advances in Reactor Physics, Mathematics and Computation, Apr. 27-30, 1987, sponsored by the European Nuclear Society, French Nuclear Energy Society, Commission of the European Communities, French Atomic Energy Commission, Electricité de France, ANS, Nuclear Energy Agency, Organisation for Economic Co-operation and Development. Contact: R. Alcouffe, Los Alamos National Laboratory, P.O. Box 1663, MS-B226, Los Alamos, NM 87545.

May 1987

Control of Occupational Exposures in Nuclear Power Plants, May 11-15, 1987, Boston, Massachusetts, a course sponsored by the Harvard School of Public Health. Contact: Dade W. Moeller, Office of Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-732-1171).

6th Symposium on Reactor Dosimetry, May 31-June 5, 1987, Jackson Hole, Wyoming, sponsored by the American Society for Testing and Materials, and the Commission of the European Communities in co-operation with the International Atomic Energy Agency. Contact: G. R. Lamaze, National Bureau of Standards, Bldg. 235, Gaithersburg, MD 20899 (phone 301-921-2767) or H. Röttger, Joint Research Centre, Petten Establishment, HFR Div., Postbus 2, 1755 ZG Petten, The Netherlands.

June 1987

American Nuclear Society Annual Meeting, June 6-12, 1987, Dallas, Texas. Contact: ANS, Meeting Dept., 555 N. Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

Application of Computer Technology to Radiation Protection, June 22-26, 1987, Bled, Yugoslavia, sponsored by the IAEA. Contact: Conference Service Section, IAEA, P.O. Box 100, A-1400 Vienna.

July 1987

32nd Annual Meeting of the Health Physics Society, July 5-9, 1987, Salt Lake City, Utah. Contact: John W. Poston, Sr., Dept. of Nuclear Engr., Texas A&M Univ., College Station, TX 77843-3133 (phone 409-845-4161).

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.

International Conference on Nuclear Fuel Reprocessing and Waste Management, Aug. 24–28, 1987, Paris, sponsored by the American Nuclear Society and the European Nuclear Society. Contact: Lloyd McClure, Westinghouse Idaho Nuclear Co., Idaho Chemical Processing Plant, P.O. Box 4000, Idaho Falls, ID 83401.

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. The closing date for application has been extended to May 15, 1987 (see July 1986 *RSIC Newsletter* for details). Contact: David W. O. Rogers, Ionizing Radiation Standards, National Research Council of Canada, Ottawa, Ontario K1A 0R6 Canada (phone 613-993-2715).

October 1987

Annual Congress of the Association for Radiation Protection, Oct. 6–9, 1987, Basle, 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).

April 1988

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).

September 1988

Industrial Radiation and Radioisotope Measurement Applications, Sept. 25–28, 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.

DECEMBER 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.

RADIATION SHIELDING LITERATURE

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