RSIC Newsletter

OAK RIDGE NATIONAL LABORATORY
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Wonder rather than doubt is the root of knowledge — Abraham Joshua Heschel

WELCOME MARTIN MARIETTA

The Department of Energy has announced that the Martin Marietta Corporation will replace Union Carbide Corporation at Oak Ridge, Tennessee and Paducah, Kentucky on April 1, 1984. Union Carbide Nuclear Division has been in Oak Ridge since 1943 serving as the contractor for the operation of the Oak Ridge National Laboratory, the Y-12 Plant, and the gaseous diffusion plants at Oak Ridge and Paducah.

CHANGES TO THE COMPUTER CODES COLLECTION

We call attention to the removal of restrictions on the distribution of CCC-320/DOT 4.2 code package.

During the month of December, seven changes were made to the RSIC computer codes collections. Two new code packages were added to the collection, an existing code package was extended with an additional hardware version, two existing code packages were enhanced with additional software, and two existing code packages were updated to correct errors. Three changes resulted from foreign contributions—two from France and one from the Federal Republic of Germany.

CCC-200/MCNP

This general purpose, continuous-energy, generalized geometry, time-dependent, coupled neutron-photon Monte Carlo transport code package was extended to include a uniquely packaged IBM 3033 version, designated (B), which runs in batch mode rather than interactively. The original (A) version has a FORTRAN source and a preprocessor that will derive versions that operate on CRAY1, VAX11, CDC, or IBM 3033 (interactively). All source data came from the previously packaged generalized version of MCNP (A) announced in the August 1983 *RSIC Newsletter*. One may request the IBM 3033 only (B) version, or the generalized (A) version.

CCC-274/TIMEX

The CDC 7600 (B) and the UNIVAC (C) versions of this one dimensional time-dependent multigroup explicit discrete ordinates code system were updated to correct a number of minor errors identified over the last few years by the contributors at Los Alamos National Laboratory in New Mexico. Details of the changes may be requested from RSIC. FORTRAN IV; IBM 360/370 (A), CDC 7600 (B) and UNIVAC 1106 (C).

CCC-320/DOT 4.2

The original package of this two-dimensional discrete ordinates radiation transport code system (DOT 4.2) has been replaced by an enhanced version contributed by CEA/CEN/Saclay/SERMA/LEPF. The new version runs on IBM 3033 under MVS - OSVS-2 operating system. The H-extended enhanced compiler was used for packaging.

CCC-343/LEOPARD

This spectrum-dependent non-spatial fuel depletion code system was extended to include the routine SPOTS4. SPOTS4, contributed by Oak Ridge National Laboratory, is a group data library and processing code which prepares ENDF/B-IV data for input to LEOPARD. Reference: IAEA-NDS-36, Rev. 0.

CCC-363/LADTAP II

The CDC 7600 version of this code system for calculating radiation exposure to man from routine release of nuclear reactor liquid effluents was updated to correct an error in Subroutine WHY. Details of the update may be requested from RSIC. The error was called to RSIC attention by Larry R. Eyberger, National Energy Software Center, Argonne National Laboratory, Argonne, Illinois, and Oak Ridge National Laboratory.

PSR-200/VSOP

This computer code system for reactor physics and fuel cycle simulation was contributed by Berichte der Kernforschungsanlage Jülich, Federal Republic of Germany, through the OECD Nuclear Energy Agency (NEA) Data Bank, Gif-sur-Yvette, France. Termed "Very Superior Old Programs," VSOP is a system of codes linked together for the simulation of reactor life histories. It comprises neutron cross section libraries and processing routines, repeated neutron spectrum evaluation, 2-D diffusion calculation based on neutron flux synthesis with depletion and shut-down features, in-core and out-of-pile fuel management, fuel cycle cost analysis, and thermal hydraulics (at present restricted to Pebble-Bed HTRs). Reference: Jul-1649 (March 1980). IBM 3033.

PSR-201/ESTIMA

This code system for calculating average parameters from sets of resolved resonance parameters was contributed by CEA/CEN/Cadarache, Saint-Paul-Lez-Durance, France, through the OECD NEA Data Bank, Gif-sur-Yvette, France. ESTIMA calculates level spacing and neutron strength function of a mixed sequence of s- and p-wave resonances given a set of neutron widths as input parameters. Reference: Informal draft by E. Fort and J. P. Doat. FORTRAN IV; IBM 3033.

CHANGE TO THE DATA LIBRARY COLLECTION

A new data library, a contribution of the United Kingdom, was packaged during the month.

DLC-107/UKNDL-81

This evaluated neutron cross-section library was contributed by United Kingdom Atomic Energy Agency, Winfrith, Dorchester, Dorset, England, through the OECD NEA Data Bank, Gif-sur-Yvette, France. An earlier version, UKNKDL-73, is packaged as DLC-39. The new package contains 3 parts: NDL1, a general purpose neutron cross section library for 82 materials; NDL2, neutron cross sections for 192 fission product nuclides; and NDL3, neutron cross section data for 63 reactions, primarily for activation purposes. The contents of UKNDL-81 are described in informal notes. Reference: AWRE 0-70/63. IBM 3033.

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STANDARDS ACTIONS

The following standards activities have recently taken place.

Newly Published The following standards may be ordered from ANS.

ANSI/ANS-8.10-1983 Criteria for Nuclear Criticality Safety Controls in Operations with Shielding and Confinement (revision of N16.8-1975); $15.00.

ANSI/ANS-57.2-1983 Design Requirements for Light Water Reactor Spent Fuel Storage Facilities at Nuclear Power Plants (revision of N210-1976); $35.00.

The following standards may be purchased from ASTM for $8.00 each (unless otherwise specified) or call 215-299-5585.

E 900-83 Guide for Predicting Neutron Radiation Damage to Reactor Vessel Materials.

E 910-82 Method of Application and Analysis of Helium Accumulation Fluence Monitors for Reactor Vessel Surveillance.

NRC Guide Issued Guide 5.38, *Nondestructive Assay of High-Enrichment Uranium Fuel Plates by Gamma Ray Spectrometry* (revision 1), may be obained from NRC, Attn: Director, Div. of Technical Information & Document Control, Washington, DC 20555.

PERSONAL ITEMS

In serving a specialized area of scientific endeavor, it seems important that we take note of the movement 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.

George T. Chapman, after 32 years with Oak Ridge National Laboratory, has retired to join the physics faculty of Roane State College, Harriman and Oak Ridge, Tennessee. His contributions to radiation transport technology range from measured removal cross sections, used to design mobile reactor systems in the 1950s, to benchmark transport experiments used to design magnetic fusion reactor systems in the 1980s.

During the past month we have been informed of the following change of address: *L. John Perkins*, from the University of Wisconsin to Lawrence Livermore National Laboratory.

Visitors to RSIC

During the month of December the following persons came to visit/use RSIC facilities: *L. T. Dillman*, Ohio Wesleyan University; *M. Moghari*, Control Data Corp., Rockville, Maryland; *Vic Cain*, Science Applications, Inc., Oak Ridge, Tennessee; *Graham Stevenson*, CERN, Geneva, Switzerland; and *G. Ronald Dalton*, and *Michael T. Gamble*, University of Florida, Gainesville, Florida.

LITERARY NOTES

The following publications may be of interest to the radiation shielding, transport, and protection community.

Principles of Radiation Shielding, by Arthur B. Chilton, J. Kenneth Shultis, and Richard E. Faw, is intended to be a beginner's text for shielding against penetrating ionizing radiation, principally neutrons and photons. Topics include characterization of radiation fields and sources, interaction of radiation with matter, common radiation sources encountered in shield design, detector response functions, basic concepts in neutral particle penetration, special techniques in photon and neutron attenuation, approximate techniques under special geometric conditions, the transport description of radiation penetration, and materials and structural considerations in shield design. The book is published by and is available from Printice-Hall, Inc., Englewood Cliffs, NJ 07632, for $39.95.

When RSIC obtains a copy of the book, it will be reviewed more extensively by RSIC staff members.

Riyadh Conference Published Although most of the papers presented at the *International Symposium on Applications and Technology of Ionizing Radiation*, held in Riyadh, Saudi Arabia, March 12–17, 1983, are out of our scope, we would like to announce that the published proceedings are available. Ray Barrall, now at Stanford University, was a member of the Executive Committee which organized the conference. Other members were A. M. A. Al-Soraya, M. A. Farouk, and H. A. M. Al-Samawi, all of the King Saud University. The three-volume proceedings was published by the King Saud University Libraries, P.O. Box 22480, Riyadh, Saudi Arabia.

The papers are organized by the following topics: medical applications, radiation biology, radiation protection, gamma irradiation, radiation chemistry, radioisotope production, industrial and agricultural applications, and dosimetry.

UPCOMING MEETINGS, CONFERENCES, AND COURSES

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

Harvard Offers Continuing Education in Radiation Protection Three courses related to radiation protection are offered by the Harvard School of

Public Health, Office of Continuing Education, during 1984. All three courses earn 3.5 units for Continuing Education Credits for the Council on the Continuing Education Unit (CEU) and all have pending or approved units for the American Board of Industrial Hygiene and the American Board of Health Physics. The fee for each one-week course is $800 and includes lectures, laboratory materials, breaks, and daily luncheons.

Lectures will be presented by regular faculty members of the School or outside experts for coverage of special topics. The courses will have lecture and discussion sessions with selected courses using the case method and others including the laboratory session.

Information may be obtained from the Office of Continuing Education, Dept. A, Harvard School of Public Health, 677 Huntington Ave., Boston, MA 02115. A brief description of the courses offered follows.

Occupational and Environmental Radiation Protection is offered March 26–30 and August 20–24, 1984. The course is designed to provide the fundamentals necessary for working safely with radiation in nuclear facilities, industrial installations, medical and educational insitutions, and research laboratories. The course uses both lecture and laboratory demonstration sessions with coverage of standards, Federal laws and regulatory guides, monitoring equipment, and control procedures for radiation exposure.

Radiation Protection Instrumentation is offered April 9–13, 1984. Lectures, supplemented with panel discussions, will cover the fundamentals of radiation protection instruments; essentials for making external measurements of high energy gammas, beta particles, and neutrons; assessment of airborne radionuclides, including radon, other noble gases, and radioiodine; procedures for the selection and evaluation of hand and foot counters and portal monitors; multichannel analyses and whole body counting; liquid monitoring systems; instrumentation for low-level environmental measurements; quality control; and new developments and research needs.

Control of Occupational Exposures in Nuclear Power Plants is offered April 30–May 4, 1984. Experts from the Harvard School of Public Health, the U. S. Nuclear Regulatory Commission, the Electric Power Research Institute, domestic and foreign nuclear utilities, and major reactor vendors will lead discussions which address the problem of increasing occupational exposure in commerical nuclear power plants. Some of the topics to be discussed are control and distribution of radioactive materials in nuclear power plants, techniques for removal of contamination should control not prove effective, and application of sound radiation protection procedures to minimize the accompanying occupational doses.

Calendar

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

January 1984

General Meeting of the American Physical Society, January 30–February 2, 1984, San Antonio, Texas. Contact: The American Physical Society, 335 East 45th St., New York, NY 10017, USA.

February 1984

Computer Applications in Health Physics, 17th Midyear Topical Meeting of the Health Physics Society, February 5–9, 1984, Pasco, Washington. Contact: Edwin C. Watson, Columbia Chapter, Health Physics Society, P.O. Box 564, Richland, Washington 99352 (phone 509-375-6919).

Radiation Protection and Measurements Short Course, February 13–15, 1984, Albuquerque, New Mexico, sponsored by Technical Seminars, Inc. Contact: Program Administrator, TSI, 425 Northern Blvd., Great Neck, NY 11021 (phone 516-829-3787).

11th Annual Conference of the Indian Association for Radiation Protection, February 13–16, 1984, Jodhpur, Rajasthan, India. Contact: J. V. Ramana Rao, (Secretary, Organising Committee, XI IARP Conf.), Deputy Director, Ratanada Palace, Jodhpur, Rajasthan 324 001, India.

Conference on Industry's Role in the Development of Fusion Power, February 26–29, 1984, Washington, D. C. Contact: Atomic Industrial Forum, Inc., 7101 Wisconsin Ave., Bethesda, MD 20814 (phone 301-624-9260).

March 1984

General Meeting of the American Physical Society, March 26–30, 1984, Detroit, Michigan. Contact: American Physical Society, 335 East 45th St., New York, NY 10017, USA.

April 1984

5th International Conference on Nuclear Methods in Environmental and Energy Research, April 2–6, 1984, Mayaguez, Puerto Rico, USA, sponsored by the ANS; American Chemical Society; U.S.-DOE; Univ. of Puerto Rico-Recinto; Univ. of Mayaguez; and the Univ. of Missouri. Contact: James R. Vogt, Univ. of Missouri, 214 Research Reactor, Columbia, Missouri 65211, USA (phone 314-882-4211).

20th Annual Meeting of the National Council on Radiation Protection and Measurements, April 4–5, 1984, Washington, sponsored by the National Council on Radiation Protection and Measurements. Contact: NCRP, 7910 Woodmont Ave., Suite 1016, Bethesda, Maryland 20814.

Financial and Economic Bases for Nuclear Power Topical Meeting, April 8–11, 1984, Washington, D. C., sponsored by the ANS. Contact: James Phelps, Registration Chairman, 819 Sycamore Court, Herndon, VA 22070.

Annual Meeting of the Radiation Research Society, April 8–12, 1984, Orlando, Florida. Contact: American College of Radiology, 925 Chestnut St., Philadelphia, Pennsylvania 19107, USA.

5th Annual Conference of the Canadian Radiation Protection Association, April 30–May 3, 1984, Banff, Alberta, Canada. Contact: Stuart E. H. Hunt, Local Arrangements Chairman, C-7 Civil Electrical Engr. Bldg., Univ. of Alberta, Edmonton, Alberta, Canada T6G 2G7 (phone 403-432-5655).

May 1984

6th Congress of the International Radiation Protection Association, and *Exhibition,* May 7–12, 1984, Berlin, West Germany. Contact: R. Neider, Bundesanstalt für Materialprüfung (BAM), Unter den Eichen 87, D-1000 Berlin 45.

Nuclear Technology Exhibit, May 11–19, 1984, Bejing, China, sponsored by the ANS. Contact: P. Pollock, Exhibit Manager, ANS, 555 N. Kensington Ave., La Grange Park, Illinois 60525 USA (phone 800-323-3044).

6th Annual Symposium on Safeguards and Nuclear Material Management, May 14–18, 1984, Venice, Italy, sponsored by the European Safeguards Research and Development Association (ESARDA) and the Commission of the European Communities. Last date for abstracts and summaries is November 30, 1983. Contact: L. Stanchi, Commission of the European Communities Joint Research Centre, I-21020 Ispra (Varese), Italy.

June 1984

24th Annual International Conference of the Canadian Nuclear Association, June 3–6, 1984, Saskatoon, Saskatchewan, Canada. Contact: J. A. Weller, General Manager, Canadian Nuclear Association, 111 Elizabeth Street, 11th Floor, Toronto, Ontario, Canada M5G 1P7.

29th Annual Meeting of the Health Physics Society, June 3–7, 1984, New Orleans, Louisiana. Contact: Richard J. Burk, Jr., Executive Secretary, Health Physics Society, 4720 Montgomery Lane, Suite 506, Bethesda, Maryland 20014, USA.

ANS Annual Meeting, June 3–8, 1984, New Orleans, Lousiana. Contact: Thomas H. Row, ORNL, Bldg. 4500, MS-S-178, Oak Ridge, TN 37831-2008 USA.

July 1984

Topical Meeting on Fission Product Behaviour and Source Term Research, July 15–19, 1984, Snowbird, Utah, sponsored by ANS; Electric Power Research Institute (EPRI); Canadian Nuclear Society; and the Atomic Energy Society of Japan. Contact: W. J. Quapp, EG & G Idaho, Inc., P.O. Box 1625, Idaho Falls, Idaho 83415, USA (phone 208-526-9606).

September 1984

5th International Symposium on Capture Gamma Ray Spectroscopy and Related Topics, September 10–14, 1984, Oak Ridge, Tennessee. Contact: S. Raman, Physics Division, Oak Ridge National Laboratory, P.O. Box X, Oak Ridge, Tennessee 37831-2008 USA.

ANS Topical Meeting on Physics and Shielding, September 17–19, 1984, Chicago, Illinois. Contact: Leo LeSage, Argonne National Laboratory, Applied Physics Div., 9700 South Cass Ave., Argonne, Illinois 60439 USA (phone 312-972-6045).

5th ASTM-EURATOM Symposium on Reactor Dosimetry, September 24–28, 1984, Geesthacht, Fed. Rep. of Germany, sponsored by Commission of the European Communities, ASTM, U.S.-DOE, and U.S.-NRC. Contact: E. B. Norris, Southwest Research Institute, P.O. Drawer 28510, San Antonio, Texas 78284 (for Japanese and US authors); H. Rottger, Joint Research Centre, Petten Establishment, HFR Div., Postbus 2, 1755 ZG Petten (N. H.), Netherlands (all other authors). Last date for abstracts is December 1, 1983.

October 1984

International Conference on Occupational Radiation Safety in Mining, October 15–18, 1984, Toronto, Ontario, Canada, sponsored by the Canadian Nuclear Assoc., Canadian Dept. of Energy, Mines, and Resources, and the Atomic Energy Control Board. Last date for abstracts is January 1, 1984. Contact: Internatl. Conf. on Occupational Radiation Safety in Mining, Canadian Nuclear Assoc., 111 Elizabeth St., 11th Floor, Toronto, Ontario, Canada M5G 1P7 (general information) and R. D. Gillespie, c/o MacLaren Engr., Inc., 33 Yonge St., Toronto, Ontario, Canada M5E 1E7 (for abstracts).

Symposium on Radiation Dosimetry, October 15–18, 1984, Knoxville, Tennessee, sponsored by Oak Ridge National Laboratory. Contact: R. T. Greene, ORNL, P.O. Box X, Bldg. 7710, Oak Ridge, TN 37831-2008 USA.

Meeting of the Nuclear Physics Div. of the American Physical Society, October 18–20, 1984, Nashville, Tenn. Contact: American Physical Society, 335 E. 45th St., New York, NY 10017 USA.

Clinical Radiophysics, a symposium sponsored by the Clinical Radiophysics Section of the Society for Medical Radiology of the German Democratic Republic, October 28–November 1, 1984, Binz (island Rügen, German Democratic Republic). Contact: Dr. sc. techn. Manfred Tautz, 1115 Berlin-Buch, Wiltbergrstrasse 50, Städtisches Klinikum Buch, Spezialabteilung Strahlenphpysik, German Democratic Republic.

International Symposium on the Implementation of the IAEA Codes of Practice and Safety Guides for Nuclear Power Plants, October 29–November 2, 1984. Contact: Conf. Svc. Sect., IAEA, P.O. Box 100, A-1400 Vienna, Austria.

November 1984

National Conference on Biomedical Physics and Engineering November 3–4, 1984, in Sofia, Bulgaria, sponsored by the Bulgarian National Society of Biomedical Physics and Engineering. Contact: Chair of Physics and Biophysics, c/o eng. Peter Trindev, Medical Academy - Base No. 1, 1431 Sofia / 1 Boul. G.Sofiiski, Bulgaria.

Inter-Regional Seminar on Practical Problems Encountered in the Safe Transport of Radioactive Materials, November 5–8, 1984, Vienna. Contact: Conf. Svc. Sect., IAEA, P.O. Box 100, A-1400 Vienna, Austria.

Joint Meeting of the American Nuclear Society, the Atomic Industrial Forum, and the European Nuclear Society, November 11–16, 1984, Washington. Contact: George W. Cunningham, Nuclear Studies, Mitre Corp., 1820 Dolley Madison Blvd., McLean, Virginia 22102 USA.

International Symposium on Assessment of Radioactive Contamination in Man, November 19–23, 1984, Paris, sponsored by the International Atomic Energy Agency. Contact: Conf. Svc. Sect., IAEA, P.O. Box 100, A-1400 Vienna, Austria.

Conference on Radioactive Waste Management, November 27–29, 1984, London, sponsored by the British Nuclear Energy Society. Contact: The Secretariat, British Nuclear Energy Society, at the Institution of Civil Engineers, 1-7 Great George St., London SWIP 3AA, UK.

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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