RSIC Newsletter

OAK RIDGE NATIONAL LABORATORY
POST OFFICE BOX X • OAK RIDGE, TENNESSEE 37831-6362
OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.
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Phone No. 615-574-6176 or FTS 624-6176
EasyLink Mailbox: 62813374
Telex(Answer Back): 854467(ORNL EPIC UD)
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In the final analysis, there is no other solution to a man's problems but the day's honest work, the day's honest decisions, the day's generous utterance, and the day's good deed.—Clare Booth Luce

Maskewitz to Participate in Review of 7th ICRS Papers and South African Meetings

Betty F. Maskewitz will participate in the paper review for the program of the 7th International Conference on Radiation Shielding (7th ICRS) on February 25–26, 1988, in London. The 7th ICRS will convene in Bournemouth, England, September 12–16, 1988. Further information on the 7th ICRS is available from RSIC.

Maskewitz will then travel to South Africa (SA) to give an invited paper on "Computers and Interactions Between Physicians and Health Physicists" and to participate on a panel in the Summer School on Computers in Medical Research, in Capetown February 29–March 1. The Summer School is sponsored by the SA Medical Research Council in collaboration with the SA Association of Physicists in Medicine and Biology (SAAPMB) and the SA Biomedical Engineering Society. She will present two additional papers in the SAAPMB Congress on March 2–4, also in Capetown.

Following the Capetown meetings Maskewitz is invited for RSIC orientation visits to several nuclear institutions in Bloemfontein, Johannesburg, Pretoria, and Durban. Her plans are to return to the U.S. in mid-March.

CHANGES IN THE COMPUTER CODE COLLECTION

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

CCC-496/HETC-KFA

This Monte Carlo high-energy nucleon-meson transport code was updated by Oak Ridge National Laboratory (ORNL) with the addition of local assembler language routines which are needed when the general geometry option is used. We

thank the Massachusetts Institute of Technology, Lincoln Laboratory, Lexington, Massachusetts, for pointing out this need. Reference: Jul-Spez-196. FORTRAN IV; IBM 3033.

CCC-513/MKENO-DAR

This direct angular representation Monte Carlo code system for criticality safety analysis was contributed by the Japan Atomic Energy Research Institute (JAERI), Tokai Research Establishment, Tokai-mura, Naka-gun, Ibaraki-ken, Japan. MKENO-DAR calculates the effective neutron multiplication factor and neutron flux distribution in a three-dimensional media, solving multigroup neutron transport equations with a precise angular distribution function for neutron scattering. It was developed from CCC-492/MULTI-KENO which was based on KENO-IV. MULTI-KENO introduced the system of SUPER BOXES and MKENO-DAR improves the representation of scattering angle over that in its predecessors. Separate routines are provided for data pool initialization, double-differential data pooling, data pool management, cross-section preparation and condensation, double-differential data format conversion, and data pool tree structure visualization. The card-image form of the double differential data used in MKENO-DAR (MKENO-DAR-LIB) is also included as part of the package. The cross section data in DLC-118/MGCLIB are compatible with MKENO-DAR. **The package requires 5 full reels of magnetic tape written at 6250 bpi** to transmit the source codes, sample problem input and output, as well as binary data libraries used in the sample runs. The card image form of the double differential data (MKENO-DAR-LIB) is included and requires 4 of the tapes. References: JAERI-M 86-107 (August 1986) and JAERI-M 84-061 (March 1984). FORTRAN IV, Assembler, FACOM OS/F4 operating system; FACOM M-380/M200.

CCC-520 MICRO/DCTDOS

This code system for neutron and gamma-ray penetration in composite duct systems was contributed by the National Bureau of Standards, Gaithersburg, Maryland. It can be used to estimate neutron and gamma-ray fluence rate (flux density), dose, and spectral features due to penetration through a series of straight and bent duct segments in arbitrary combinations. The resulting composite can include computations for a room at the end, if there is one. This method was developed for the rapid estimates needed for analysis of protection problems against nuclear weapons, but the concepts are more generally applicable. The method, called "orders of reflection," involves several steps which combine results of a sequence of calculations and draws on an extensive base of neutron and gamma-ray albedo data. References: NBSIR 87-3534 (Feb. 1987) and a README.DOC file. FORTRAN 77; IBM PC or compatible with 2 floppy drives and 640K Random Access Memory is required; an 8087 math coprocessor is desirable. Microsoft Version 3.31 was used to compile the programs under PC/DOS 3.1. The Microsoft linker LINK.EXE was used to create two executable files. One (160K bytes) requires the 8087 coprocessor and the other (277K bytes) does not. The executable files are included in the package. Three 5.25-in., DS/DD diskettes are needed to transmit the package.

CCC-521/SHARDA

This code system for sample heat, activity, reactivity, and dose calculations for the safety analysis of irradiations in a research reactor was contributed by the Reactor Services Division, Bhabha Atomic Research Centre (BARC), Bombay, India, through the OECD NEA Data Bank, Gif-sur-Yvette, France. SHARDA is a program for assessing sample heating rates, activities produced, and reactivity load caused while irradiating a small sample in a well thermalized research reactor like CIRUS at BARC. It estimates the sample cooling or lead shielding requirements to limit the gamma-ray dose rates due to the irradiated sample. The code was developed for the evaluation of pile irradiation requests at the CIRUS reactor and has much built-in data specifically for that facility. The code can be used for most analyses, except thermal reactivity load, for other thermal research reactors by giving as input the absolute value of the irradiating thermal neutron flux. Reference: BARC-1259 (1985). FTN5.1A650, NOS 2.5.1; CDC CYBER 740.

PSR-194/FEDGROUP-C86

A newly-frozen version of this code system for processing evaluated nuclear data in ENDF/B,

KEDAK or UKNDL formats was contributed by J. Stefan Institute, E. Kardelj University, Ljubljana, Yugoslavia. FEDGROUP-C (for CDC) was initially derived from the IBM-type PSR-123/FEDGROUP-3 package developed at the Central Research Institute for Physics, Budapest, Hungary. FEDGROUP calculates group constants for any user-specified group structure and averaging spectrum. This version was released because of an increased interest in the use of FEDGROUP-C as an evaluated data processing code and a link to the WIMS library. The calculational part of FEDGROUP-C is divided into nine blocks which calculate infinite dilution group averages, Greuling-Goertzel slowing-down-theory quantities, inelastic scatter transfer matrices, group-averaged values of products of two quantities, resonance-screened cross sections from resolved and unresolved resonance parameters, group-averaged energy-dependent quantities from evaluated data or input data, and group-averaged elastic scattering data. The calculation of inelastic scattering matrices for the thermal region is performed with FLANGE. Auxiliary programs perform a variety of cross-section library manipulations, including the updating of a WIMS library. Some limitations are present. FEDGROUP-C cannot calculate the elastic scattering matrix when elastic scattering is given only by resonance parameters, cannot provide resonance screening for scattering matrices, and cannot provide higher moments for inelastic scattering matrices.

A VAX version can be generated by processing the source file with the CVRT routine. References: IJS-DP-4368 (August 1986) and INDC(YUG)-9/GV (April 1984). FORTRAN IV Extended compiler, NOS/BE 1.4 operating system; CDC CYBER-72. The VAX version uses VMS.

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.

ANSI Honors Callihan

The American National Standards Institute (ANSI) has honored **Dr. A. D. Callihan** with its Meritorious Service Award for "exceptional leadership at all levels of voluntary standardization in the nuclear field." L. J. Sas, Chairman of the Institute's Nuclear Standards Board (NSB) announced the award in October. The award was formally presented November 17, 1987, at the ANS Steering Committee meeting by A. J. Christie, Steering Committee Chairman.

Callihan has been a member or served as an officer of the NSB since its inception in 1957. The award cites him as a "prime mover in shaping and directing coordinated national and international programs that satisfy needs for consensus standards" in this field and recognizes major contributions to the standards activities of the ANS and other groups. He has served on the ANS Standards Committee since 1957 and on the SSC since its beginning. He is serving as chairman of N16, Nuclear Criticality Safety, and is chairman of Subcommittee ANS-1. Callihan began his career at New York University in 1933, later worked on the Manhattan project, and retired from Oak Ridge National Laboratory as associate director of the Neutron Physics Division and director of the critical experiments facility. He is presently serving as an administrative judge with the U.S. Nuclear Regulatory Commission. Callihan counts among his many honors and awards ANS Fellow, APS Fellow, the David V. P. Williams Memorial Award, and an honorary doctorate from Marshall University (Marshall endowed a scholarship in his name in 1982).

E. Gail DePlanque is the new director of the U.S. Department of Energy's Environmental Measurements Laboratory (EML). She succeeds *Herbert L. Volchok* who died in April. DePlanque has served as EML's deputy director since 1982.

Herbert Inhaber has been appointed to NUS Corporation's Consulting Division reliability and risk assessment staff, which identifies new areas to which reliability and risk assessment can be applied.

Lynn E. Weaver, former Dean of Engineering at Auburn University, has been elected president of the Florida Institute of Technology, in Melbourne.

Said I. Abdel-Khalik has been selected a Georgia Power Distinguished Professor of nuclear engineering in the Nuclear Engineering and Health Physics Programs at the Georgia Institute of Technology.

Anthony R. Buhl has been elected to serve as senior vice president and officer of the International Technology Corporation, Oak Ridge, Tennessee. Buhl has served as program manager of the Industry Degraded Core

Rulemaking (IDCOR) Program and as technical director of the U.S. Department of Energy's Advanced LWR Severe Accident Program (ARSAP).

Visitors to RSIC

During the month the following persons came for an orientation visit and/or to use RSIC facilities: *Charles E. Roessler* and *Wesley E. Bolch*, University of Florida, Gainesville; *Luisa Maria Torres Gomes*, *Itacil C. Gomes*, and *Paul N. Stevens*, University of Tennessee, Knoxville; *Vinicio C. Boffi*, University of Bologna, Italy; and *Walter E. Nicoloff*, Ecology and Environment, Inc., Buffalo, New York.

Standards and Publications

The following standards and draft standards are available as indicated:

ANSI/ANS-15.11, 1987, *Radiological Control at Research Reactor Facilities* (revision of ANSI/ANS-15.11, 1977); approved Dec. 2, 1987, available from ANS.

45B (Central Office) 80, *Portable or Installed X or Gamma Radiation Ratemeters for Environmental Monitoring—Part 1: Assemblies to Measure Air Kerma Rates;* $24 from International Electrotechnical Committee 1, rue de Varembe, 1211 Geneva 20, Switzerland, or ANSI International Sales Dept. 1430 Broadway, New York, NY 10018.

ISO 4038/DAD2, *X and γ Reference Radiation for Calibrating Dosemeters and Dose Ratemeters and for Determining Their Response as a Function of Photon Energy—Addendum 2: Photon Reference Radiations for Determining the Response Protection Level Dosemeters and Dose Ratemeters at Photon Energies Between 4 and 9 MeV;* $12 from International Organization for Standardization, Case Postale 56, CH-1211, Geneva 20 Switzerland, or from ANSI (see above).

HPSSC Seeks Members

The Health Physics Society (HPS) Standards Committee is seeking members for a new working group to review and update ANSI N13.5-1972, *Performance Specifications for Direct Reading and Indirect Reading Pocket Dosimeters for X and Gamma Radiation.* Those interested in serving in this group should send a one-page summary of qualifications and relevant experience to the chairman of the HPSSC Instrumentation Section, Ken Swinth, Battelle Northwest, P.O. Box 999, Richland, WA 99352. Information on the operation and structure of the group may be obtained from its chairman, Lowell L. Nichols, also from Battelle Northwest.

New NCRP Publications

The following publications are now available from NCRP Publications, 7910 Woodmont Ave., Suite 1016, Bethesda, MD 20814:

NCRP Report No. 89 *Genetic Effects from Internally Deposited Radionuclides* surveys the information available from animal and cellular experiments that relate genetic effects to deposited radioactivity and dose from internal emitters.

NCRP Report No. 90 *Neptunium: Radiation Protection Guidelines* is an addition to the series of reports that treat radiation protection concerns in connection with individual radionuclides. The gastrointestinal absorption of neptunium by humans has become an important issue and considerable attention is directed to the understanding that might be gained from careful review of the animal studies on metabolic behavior of neptunium.

NCRP Report No. 91 *Recommendations on Limits for Exposure to Ionizing Radiation* is a revision of the basic radiation protection criteria recommended by the council in 1971. The exposure limits recommended by the NCRP are intended to apply to all man-made radiation sources except medical procedures and cover exposure of members of the public and workers. The report recognizes that neutron radiation is biologically more potent than previously thought, and the NCRP urges the assignment of a 20-fold factor in comparing neutron exposures to exposures from x rays or gamma rays, rather than the 10-fold factor previously used. The report introduces the concept of a risk level so low as to be negligible and to require no attention or action. This Negligible Individual Risk Level corresponds to a radiation exposure of 0.01 millisievert or 0.001 rem per year.

Biological Effects of Nonionizing Radiations: Cellular Properties and Interactions by Herman P. Schwan is the tenth lecture in the Lauriston S. Taylor series presented at the NCRP's annual meeting.

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.

ISRP-4 Call for Papers

The Fourth International Symposium on Radiation

Physics (ISRP-4) will be held October 3–7, 1988, in São Paulo, Brazil, hosted by the University of São Paulo. The chairman of the Local Organizing Committee is Prof. Ivan C. Nascimento, Director of the Institute of Physics of the University. The International Program Committee chairman is D. B. Isabelle, CERI-CNRS, 3A rue de la Ferollerie, 45071 Orleans, CEDEX, France.

Potential participants are invited to submit papers on the following topics: Fundamental Processes in Radiation Physics; Radiation Sources and Detectors; Uses of Radiation in Fundamental Research; Radiation in Biomedicine and Environmental Science; Radiation in Technology; and Radiation in Energy Research. Contributions may be submitted to Prof. Ivan C. Nascimento, University of São Paulo, Caixa Postal 20516, Zip Code 01498, São Paulo, Brazil, by **May 15, 1988**. The U.S. contact for the conference is Richard Pratt, Dept. of Physics, University of Pittsburgh, Pittsburgh, PA 15260 (phone 412-624-9052).

Calendar

Your attention is directed to the following events of interest.

February 1988

Radioative Waste Management Conference, Feb. 25–26, 1988, London. Contact: Louise Marriott, IBC Technical Services Ltd., 3rd Floor, Bath House, 56 Holborn Viaduct, London EC1A 2EX, U.K. (phone 01-236-4080).

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).

March 1988

24th Annual Meeting of the National Council on Radiation Protection and Measurements, Mar. 30–31, 1988, Washington, D.C. The principal session is "Radon." Contact: NCRP, 7910 Woodmont Ave., Suite 1016, Bethesda, MD 20814.

April 1988

Annual Meeting of the Atomic Energy Society of Japan, Apr. 4–6, 1988, Tokyo. Contact: Minoru Masamoto, Secretary General, AESJ, No. 1-13, 1-chome, Shimbashi, Minato-ku, Tokyo 105, Japan.

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 Symposium on Fusion Nuclear Technology, Apr. 10–19, 1988, Tokyo. Contact: Kenzo Miya, Nuclear Engineering Research Lab., University of Tokyo, Tokai-mura, Ibaraki Prefecture, 319-1 Japan (phone 011-813-812-211 ext 7421) or Mohamed Abdou, University of California-Los Angeles (phone 213-206-1228).

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

May 1988

Safety of Next Generation Power Reactors, May 1–6, 1988, Seattle, Washington, sponsored by the ANS Reactor Physics, Reactor Operations, Human Factors, and Fuel Cycle and Waste Management Divisions, and the U.S. DOE. Contact: Robert Ferguson, Ferguson & Assoc., 7601 W. Clearwater, Suite 450, Kennewick, WA 99336 (phone 509-783-1446).

3rd Topical Meeting on Tritium Technology in Fission, Fusion, and Isotopic Applications, May 1–6, 1988, Toronto, Canada, sponsored by the Canadian Nuclear Society and the American Nuclear Society. Contact: C. D. Burnham, CFFTP, 2700 Lakeshore Road, West, Mississauga, Ontario, Canada, L5J 1X3 (phone 416-823-6364) or Harold Anderson, Monsanto Research Corp., P.O. Box 32, Miamisburg, OH 45342 (phone 513-865-3062).

International Conference on Incineration of Hazardous and Radioactive Waste, May 3–6, 1988, San Francisco, sponsored by the American Nuclear Society. Contact: Jim Tripodes, Univ. of California, EG&S Trailer Complex 407, Irvine, CA 92717 USA (phone 714-856-6200).

International Symposium on the Management of Low and Intermediate Level Radioactive Wastes, May 16–20, 1988, Stockholm, Sweden, sponsored by the International Atomic Energy Agency. Contact: Conference Service Section, IAEA, P.O. Box 100, A-1400 Vienna, Austria.

NATO Advanced Workshop on "Noise and Nonlinear Phenomena in Nuclear Systems," May 23–27, 1988, Valencia, Spain. Contact: Felix C. Difilippo, Oak Ridge National Laboratory, P.O. Box X, Oak Ridge, TN 37831-6363 US (phone 615-574-6188) or Jose L. Muñoz-Cobo, Departmento de Ingeniería Química y Nuclear, Universidad Politécnica de Valencia, Apdo. 22012, 46071 Valencia, Spain (phone 361-5051).

International Conference on Nuclear Data for Science and Technology, May 30–June 3, 1988, Mito, Japan, sponsored by the Japan Atomic Energy Research Institute. Contact: Sin-iti Igarasi, Conference Secretariat, Nuclear Data Center, JAERI, Tokai-mura, Nakagun, Ibaraki-ken 319-11 Japan (phone 0292-82-5480).

June 1988

International Conference on Computational Physics (ICCP), June 1–5, 1988, Beijing, sponsored by the Institute of Applied Physics and Mathematics, Beijing, and Drexel University, Pennsylvania. Contact: Zhang Tianyuan, IAPCM, P.O. Box 8009, Beijing, China (PRC) or D. H. Feng, Department of Physics and Atmospheric Science, Drexel University, Philadelphia, PA 19104 USA.

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.

International Topical Meeting on Waste Management, Sept. 11–15, 1988, Pasco, Washington. Contact: Bill Bonner, Pacific Northwest Laboratory, P.O. Box 999, Richland, WA 99352 (phone 509-376-5451 or FTS 444-5451).

7th International Conference on Radiation Shielding (ICRS), Sept. 12–16, 1988, Bournemouth, United Kingdom, sponsored by the OECD Nuclear Energy Agency and the UK Atomic Energy Agency. Contact: A. K. McCracken, UKAEA Winfrith, Dorchester, Dorset, DT2 8DH, UK or Leo LeSage, Argonne National Laboratory, Argonne, IL 60439 (phone 312-972-6048).

International Reactor Physics Conference, Sept. 18–21, 1988, Jackson Hole, Wyoming, sponsored by the ANS. Contact: Mike Lineberry, Argonne National Laboratory, P.O. Box 2528, Idaho Falls, ID 83403 (phone 208-526-7434).

11th International CODATA Conference, "Scientific and Technical Data in a New Era," Sept. 26–29, 1988, Karlsruhe, Fed. Rep. of Germany. Contact: DECHEMA, ATTN: CODATA Conference, P.O. Box 97 01 46, D-6000 Frankfurt/M. 97, Fed. Rep. of Germany (phone 069 7564 241/242/243; Telex: 412490 dcha d.).

October 1988

4th International Symposium on Radiation Physics (ISRP-4), Oct. 3–7, 1988, São Paulo, Brazil. Contact: Prof. Ivan Cunha Nascimento, ISRP-4 Chairman of the Organizing Committee, Inst. de Fisica-Universidade de São Paulo, Caixa Postal 20516 (TELEX: 011-37920 IF SP -1498-São Paulo-SP-Brazil).

12th International Conference on Plasma Physics and Controlled Nuclear Fusion Research, Oct. 12–19, 1988, Nice, France, sponsored by the International Atomic Energy Agency (IAEA). Contact: IAEA, P.O. Box 100 A-1400, Vienna, Austria.

5th National Conference on Biomedical Physics and Engineering, Oct. 15–17, 1988, Sofia, Bulgaria. Contact: M. Markov, Department of Biophysics, Biological Faculty, Sofia University, 8, Dragan Tzankov Blvd., Sofia 1000, Bulgaria.

JANUARY 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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