RSIC Newsletter

OAK RIDGE NATIONAL LABORATORY
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FOR THE U.S. DEPARTMENT OF ENERGY

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(For RSIC TELEX Communication Only)

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The greatest thing this generation can do is to lay a few stepping-stones for the next generation.—Charles F. Kettering

RSIC FY 1987 ACTIVITY LEVEL SHOWS SIGNIFICANT INCREASE

The following report of RSIC contributor/user statistics shows a significant increase in activity for fiscal year 1987 (32% over FY 1986). These contributor/user statistics were compiled from the Automatic Data Entry System (ADES).

USER STATISTICS

Information dissemination activities for the fiscal year were as follows:

A total of 3782 separate letters/telephone calls (about 15.1 each working day) requesting a variety of products and services (12881 total) were processed. These activities, averaged over the total number of workdays in FY 1987, give an indication of a typical RSIC workday.

Activities/Working Day

7.2 Code/data packages were shipped to requesters.
3.3 Shielding documents (RSIC reports, handbooks, code and data documents in addition to those included in above packages) were mailed.
40.9 Responses to inquiries for information; citing possible solutions to problems; recommendations of calculational methods, computer codes, nuclear data sets, or literature for study; troubleshooting problems when requester had difficulties using RSIC materials; and miscellaneous consultation and advising services.
0.1 Special retrospective bibliographic searches.
51.5 Separate activities required to satisfy the 3782 letters of request.

In addition to the above daily activities, the following special products or services were given.

The *RSIC Newsletter* was mailed each month to a peak of 1470 people. Maintenance of the RSIC directory resulted in 451 changes during the year.

Seventy-eight people (44 foreign, 34 domestic) came for an orientation visit and/or to use the Center's facilities during the year.

INFORMATION INFLOW

Information collection, analysis, and processing activities continued routinely. Staff members reviewed 1207 reports and other documents, bringing the shielding data base to 16,662 bibliographic citations with abstracts and more than 6580 computer code descriptions. The RSIC literature data bases were updated several times. New books of special interest were reviewed and added to the reference library.

Technology Contributed

RSIC participants contributed their publications and 109 separate transmissions of technology as follows:

39 New computer programs and data libraries (25 USA; 14 foreign: 5, Japan; 3, France; 2, Austria; and 1 each from Australia, Hong Kong, South Korea, and The Netherlands).
20 Replacements of existing code packages with newly-frozen versions [13 USA; 7 foreign: 3, France; 2, Japan; and 1 each from the Federal Republic of Germany (FRG) and Austria].

17 New hardware versions or extensions of existing code or data packages (9 USA; 8 foreign: 5, Hong Kong; 2, Yugoslavia; and 1 from Taiwan).
18 Updates to improve existing code/data packages (14 USA; 4 foreign: 2, Japan; and 1 each from Bulgaria and Poland).
21 Corrections to fix errors in existing code/data packages (17 USA; 4 foreign: 1 each from Canada, FRG, the German Democratic Republic, and South Africa).

Technology Processed

Announcement of availability was made for 87 transportable, tested packages of new or revised computer code systems and data libraries, including contributions received in the previous fiscal year.

36 New code packages or data libraries (19 USA; 17 foreign: 5, Japan; 4, France; and 1 each Finland, Hungary, India, Italy, The Netherlands, Poland, Rumania, and Taiwan).
18 Replacements of existing code/data packages with newly-frozen versions (11 USA; 7 foreign: 4, Japan; 2, France; and 1 from FRG).
6 New hardware versions (5 USA; 1 Spain).
14 Updates to improve or extend existing packages (10 USA; 4 foreign: 1 each from Bulgaria, France, Japan, and Poland).
13 Corrections to fix errors in existing packages (11 USA; 2 foreign: 1 each from the German Democratic Republic and Taiwan).

It should be noted that the same evaluation, computer testing, and packaging must be followed for updates to existing code packages as for new technology.

We continue to give first priority to responding to user requests and will process new information into transportable, tested code packages as feasible. We appreciate the continuing cooperation and collaboration of our contributors/users in seeking to keep pace with advances in the state of the art and with the international shielding community's efforts to ensure competence in shielding design and radiation protection.

CHANGES TO THE COMPUTER CODE COLLECTION

Seven changes were made to the computer code collection (CCC) during the month. Four new code systems were packaged and added to the collection; an existing code package was replaced with a newly-frozen version, and updates were made to two existing code packages to enhance or extend the software or documentation. Four changes came as a result of foreign contributions.

CCC-307/QAD-CG and CCC-493/QAD-CGGP

The documentation for these point kernel code systems for shielding calculations was modified to clarify the neutron source normalization. The proper units for the source strength (input parameter ASO, Card C, first entry) is watts. We thank Nutech Engineers, San Jose, California for pointing out this problem. This correction applies to both the CCC-307/QAD-CG and CCC-493/QAD-CGGP code packages. References: Bechtel Report NE007 (1977) and informal notes.

CCC-490/PRIMEDANA

This system of codes for neutron physics calculations of fast reactors was updated with the addition of the output from running the three segments of the system: MED, ANALIT, and PRIDAN. The contributor is the Institute for Nuclear Research and Nuclear Energy, Bulgarian Academy of Sciences, Sofia, Bulgaria. Reference: Informal notes. FORTRAN IV; EC 1040.

CCC-500/UTMTOX

A newly-frozen version of this unified transport model for toxic materials was contributed by Oak Ridge National Laboratory, Oak Ridge, Tennessee. UTMTOX combines hydrologic, atmospheric, and sediment transport in one computer code sys-

tem and extends the scope to predict the transport of not only trace metals but also many chemical compounds, including organics. This version is operable on the Vax 8600 computer under the VMS Version 4.5 Operating System and compiles using the Fortran Version 4.6 Compiler with the default /F77 and /Optimize switches. Reference: ORNL-6064 (December 1984).

CCC-516/GRENADE

This Green's function nodal algorithm for the diffusion equation was contributed by the Institute for Nuclear Power Reactors, Pitesti, Romania. It solves the static diffusion equation for neutrons in multidimensional problems assuming Cartesian geometry. The program yields flux and power distributions and the effective neutron multiplication factor. Reference: Informal Report (1985). Cyber 170/720; FORTRAN IV; NOS1P4 552/552 operating system.

PSR-245/UPEML

This machine-portable CDC UPDATE emulator was contributed by Sandia National Laboratories, Albuquerque, New Mexico. It is capable of emulating a significant subset of the standard CDC UPDATE functions, including program library creation and subsequent modification. UPEML was written primarily to facilitate the use of CDC-based scientific packages on alternate computers such as the VAX 11/780, IBM 3081, Cray and others. Version 2.0 includes enhanced error checking, full ASCII character support, a program library audit capability, and a partial update option. Version 1.0 was originally packaged as part of CCC-467/ITS. It was felt that a stand-alone package would be useful; hence PSR-245, containing Version 2.0 of UPEML, was developed. Version 2.0 of ITS, announced in the September 1987 *RSIC Newsletter*, uses PSR-245/UPEML. Reference: SAND87-0679 (August 1987). FORTRAN 77; VAX, Cray, IBM, CDC.

PSR-246/GROUPXS

This code system for processing double-differential cross sections in the new ENDF-6 format was contributed by the Netherlands Energy Research Foundation (ECN), Petten, The Netherlands, via the OECD NEA Data Bank, Gif-sur-Yvette, France. GROUPXS treats the energy-angle data that are supposed to be represented by a Legendre-polynomial expansion in the center-of-mass system and can convert MF6 data from center-of-mass system to the laboratory system, convert Legendre-polynomial representation into point-wise angular data, convert data from MF6 into MF4 A MF5 (ENDF-5 format), and calculate group constants, scattering matrices and transfer matrices for arbitrary group structures with a fusion micro-flux weighting spectrum (PN-approximation). The code treats only continuum reaction types stored in the MF6 format with the restrictions specified for the European Fusion File (EFF1). These restrictions are not inconvenient for the purpose of fusion neutronics calculations and they facilitate relatively simple processing. Numerical integration methods are used (DCADRE routine from the IMSL library). Reference: ECN-182 (April 1986). FORTRAN (FORTRAN 77 under the CDC operating system NOS/BE); Cyber 170/855.

PSR-247/ABLEIT-TRANS

This code system for error propagation analysis for burnup calculations was contributed by the Institut f. Elektrische Anlagen und Energiewirtschaft, Rheinisch-Westfalische Technische Hochschule Aachen, Lehrauftrag Leistungsreaktoren, Federal Republic of Germany, via the OECD NEA Data Bank, Gif-sur-Yvette, France. The probability density functions of the nuclide concentrations are characterized by their first four moments. These moments are calculated from the density functions of the statistically independent random data (nuclear cross sections and decay constants). The calculation uses Taylor series expansion for the nuclide concentrations up to a user-specified order of n, constructed from generalized burnup equations. The derivatives are also used for the computation of sensitivity coefficients. Reference: Informal Report (1983) (In German). CDC-CYBER 175; FORTRAN 5.1 compiler, OPT=2.

CHANGES TO THE DATA LIBRARY COLLECTION

Two changes were made to the data library collection (DLC). A new data library was packaged and added to the collection and an existing data library was updated to improve its performance. One change resulted from a contribution from The Netherlands.

DLC-80/DRALIST

A simple correction was made to this data library of radioactive decay data for application to radiation dosimetry and radiological assessments. The branching fraction for decay of Os-191m to Os-191 was added to the decay branching file. We thank Grove Engineering, Washington Grove, Maryland, for pointing out the omission, which was verified by the ORNL contributor. References: DOE/TIC-11026 (1981) and Informal Notes. IBM-3033.

DLC-131/DOSDAM84

This library of multigroup cross sections in SAND-II format for spectral, integral, and damage analyses was contributed by the Netherlands Energy Research Foundation, Petten (N.H.), Netherlands. This 640-group set of data of the CCC-112/SAND-II type is an updated and extended version of the RSIC package DLC-97/DOSDAM81. DOSDAM84 forms a convenient source of evaluated energy dependent cross section sets which may be used in the determination of neutron spectra by means of adjustment (or unfolding) procedures or which can be used for the determination of integral parameters (such as damage-to-activation ratio) useful in characterizing the neutron spectra. It contains data from the ENDF/B-V file and its Revisions supplemented with information from the ENDF/B-IV and from the INDL/V. References: ECN-160 (October 1984) and ECN-159 (October 1984). EBCDIC records of length 135 characters.

Visitors to RSIC

During the month the following persons came for an orientation visit and/or to use RSIC facilities: *Raquel Paviotti-Corcuera,* Centro Techico Aeroespacial, Brazil; *H. Peter Alesso,* Lawrence Livermore National Laboratory, Livermore, California; and *Luiz Carlo Leal,* University of Tennessee.

Standards News

The following standards are available from the American Nuclear Society for the price indicated.

ANSI/ANS-6.3.1-1987, *Program for Testing Radiation Shields in Light Water Reactors (LWR),* $30, describes a test program to be used in evaluating biological radiation shielding in nuclear reactor facilities under normal operating conditions.

ANSI/ANS-6.6.1-1987, *Calculation and Measurement of Direct and Scattered Gamma Radiation from LWR Nuclear Power Plants* (revision of ANSI/ANS-6.6.1-1979), $60, defines calculational requirements and discusses measurement techniques for estimates of dose rates near light water reactor (LWR) nuclear power plants due to direct and scattered gamma-rays from contained sources onsite. The standard includes normal operation and shutdown conditions but does not address accident or normal operations transient conditions.

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.

HPS Call for Papers

Members of the Health Physics Society (HPS) and other scientists are invited to participate in the 33rd Annual Meeting July 4–8, 1988, Boston Massachusetts. Contributed papers are requested for either the Technical or Special sessions in the following subject areas: Risk Assessment; RCRA, CERCLA, and Mixed Waste; The Female in the Workplace; Summary of IRPA Meeting; Computers/Microprocessors; Education, Training, and Public Information; Emergency Planning and Mon-

itoring; Environmental; External Dosimetry; Indoor Radon; Instrumentation; Internal Dosimetry and Bioassay; Medical Health Physics; Natural Radioactivity; Nonionizing Radiation; Operational Health Physics; Radiation Bioeffects; Radioactivity Measurements; Radionuclide Metabolism; Reactor Health Physics; and Waste Management/Decommissioning.

Abstracts (original plus 12 copies) must be received by **January 15, 1988**. Mail the abstract to L. Max Scott, Center for Energy Studies, East Fraternity Circle, Louisiana State University, Baton Rouge, LA 70803.

Three awards will be given to the best papers in a Student Session. The abstract for the paper must be submitted by **February 19, 1988**, with a letter indicating faculty concurrence.

General information about the HPS Annual Meeting may be obtained from the HPS Secretariat, 8000 Westpark Drive, Suite 400, McLean, VA 22102 (703-790-1745).

Calendar

Your attention is directed to the following additional events of interest.

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.

3rd Oak Ridge Model Conference on Waste Problems, Oct. 13–16, 1987, Oak Ridge, Tennessee, sponsored by the U.S. Department of Energy. Contact: E. Aebischer, Public Relations, Martin Marietta Energy Systems, Inc., P.O. Box Y, Oak Ridge, TN 37831 (phone 615-574-4166).

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

Radionuclides in the Food Chain, Nov. 2–5, 1987, Laxenburg, Austria, sponsored by the American Academy of Arts and Sciences, the International Radiation Protection Association, Presidium of the Academy of Sciences of the USSR, and the Commission of the European Communities. Contact: Lili C. Merritt, International Life Sciences Institute, 1126 Sixteenth Street NW, Washington, DC 20036 (phone 202-659-0074).

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).

International Waste Management Conference, Nov. 30–Dec. 5, 1987, Kowloon, China, sponsored by the U.S. Department of Energy and the Commission of the European Communities. Contact: J. Sinnaeve, DG XII-D-4, SDM 2/64, Rue de la Loi, 200 B-1049, Brussels, Belgium (phone 02-235.52.11).

December 1987

4th International Symposium on the Natural Radiation Environment, Dec. 7–11, 1987, Lisbon, Portugal, sponsored by the U.S. Dept. of Energy and the Commission of the European Communities. Contact: J. Sinnaeve, DG XII-D-4, SDM 264, Rue de la Loi, 200 B-1049, Brussels, Belgium (phone 02-235-5211).

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).

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

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, Sidney, 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 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.

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, Naka-gun, Ibaraki-ken 319-11 Japan (phone 0292-82-5480). See the July issue of the *RSIC Newsletter* for additional information.

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).

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).

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.

SEPTEMBER 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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