RSIC Newsletter

RADIATION SHIELDING INFORMATION CENTER

OAK RIDGE NATIONAL LABORATORY

OPERATED BY UNION CARBIDE CORPORATION FOR THE ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

POST OFFICE BOX X •
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It is so, because I have considered it, and it must be so. . . . Galileo (Suggested by L. A. Hassler, B&W)

OVERVIEW OF RSIC CODE (RSC) DATA BASE

The RSC data base on the U.S. DOE/RECON system has recently been updated. The initial computerized files were created in 1972 when RSIC began using computer methods to publish its monthly newsletter. Prior to 1972, the data base was maintained on a manual index card system for internal use.

The scope of the center is rather broad, covering such areas as:

(1) Physics of Interaction of Radiation With Matter
(2) Radiation Sources and Radiation Transport
(3) Radiation Protection
(4) Radiation Detectors and Measurements
(5) Engineering Design of Shields
(6) Shielding Materials Properties
(7) Computer Codes Useful in Research and Design
(8) Nuclear Data Compilations

The majority of the literature in the RSC file describes computer codes which treat neutron and gamma radiation transport for a variety of applications and radiation sources. These applications include fission and fusion reactors, nuclear weapons radiation, radioisotopes, shipping casks, x-ray devices, neutron activation analysis, and others. Also included to a smaller extent, are radiation damage and biological effects, insofar as these topics would interest a radiation analyst. Some environmental literature describing radionuclide migration is also in the files. Many of the codes cited perform nuclear cross-section processing, and nuclear model codes which calculate cross sections are included.

The literature describes methods of solving the Boltzmann transport equation, especially Monte Carlo and discrete ordinates methods. Simpler, less rigorous methods, such as point-kernel integration, are included. Many of the references are users manuals, but applications articles are also included. These are especially useful in determining the validity or reliability of particular codes.

Not only is the data base indexed by keywords and author, but also by code name and by computer on which the code is operable. The programming language is also given in the record if it is known. The search can be limited by volume. Vol. 1 was entered in 1972–73, Vol. 2 in 1974–75, Vol. 3 in 1976–77, Vol. 4 in 1978, and Vol. 5 in 1979. Title words are also searchable using the LOOK command.

The names of the data elements in the RSC unit record are listed below.

RSC UNIT RECORD

	Searchable	Printable	Abbreviation	Example
Accession number	X	X	direct access	05R0000235
Author	X	X	AU	AU-SMITH, R.J.
Title		X		
Corporate source	X	X	CA	CA=Pacific Northwest Laboratory
Citation		X		
Publication date		X		
Availability		X		AVAIL.: NTIS
Keywords	X	X	IT	IT=MONTE CARLO
Code name	X	X	CN	CN=MORSE
Computer	X	X	CP	CP=IBM 360 65
Computer language		X		FORTRAN IV

Format 6 is required to print all of the data elements.

NEW VOLUME OF RSIC BIBLIOGRAPHY AVAILABLE SOON

Periodically a bibliography of the reactor and weapons radiation shielding literature entered into the RSIC information system is printed. The next volume of *Bibliography, Subject Index, and Author Index of the Literature Examined by the Radiation Shielding Information Center*, ORNL-RSIC-5, will be issued within the next two months. Most of the literature cited in this new Volume VI was published in the years 1978–1979.

As published literature comes to our attention, the citations are printed in the monthly newsletter. The same entries are later processed into the information system along with subject categories, keywords, and abstracts for retrospective searching. The primary searching system is the DOE RECON system which is available to remote terminals nationwide. The subject category and keyword list for RECON searching are available from RSIC upon request.

If you wish to reserve a copy of the Volume VI bibliography, fill out and return the form attached to the back of this newsletter.

NUCLEAR STANDARDS NEWS

We call attention to newly published standards as follows.

ANSI/ASTM, E704-79—Measuring Fast-Neutron Flux Density by Radioactivation of Uranium-238.

ANSI/ASTM, E705-79—Measuring Fast-Neutron Flux Density by Radioactivation of Neptunium-237.

(Both of the above may be ordered from ASTM for $4.00 each.)

ANSI/ANS-10.5-1979—"Guidelines for Considering User Needs in Computer Program Development," prepared by the ANS Standards Committee Working Group ANS-10.5 and approved August 29, 1979 by the American National Standards Institute, Inc. (ANSI). Price $12; American Nuclear Society.

SCALE SYSTEM CRITICALITY SAFETY SEQUENCES

Documentation and packaging are near completion on the SCALE system control modules, CSAS1 and CSAS2. These control modules have been developed by the Nuclear Engineering Applications Department of the Computer Sciences Division, Union Carbide Corporation Nuclear Division. Criticality Safety Analytical Sequence 1, CSAS1, performs problem dependent cross-section processing followed by a computation of the system multiplication factor with the one-dimensional discrete-ordinates program, XSDRNPM-S. CSAS2 performs a similar multidimensional analysis with the Monte Carlo program,

KENO-IV/S. Material specifications are made through selection from some 290 SCALE system standard compositions. Four neutron cross-section libraries including the 27- and 218-group ENDF/B-IV, the 16-group Hansen-Roach-Bondarenko, and the 123-group GAM-THERMOS are provided for use in CSAS1 and CSAS2. Also, the CESAR library of input specifications for approximately 130 critical experiments is being made available as part of the SCALE project.

An announcement of the release of these packages will be given within a few months.

CHANGES IN THE COMPUTER CODE COLLECTION

The following changes were made in March.

CCC-299/REBEL-3

REBEL-2, a code package for making adjoint Monte Carlo calculations of radiation in dwelling rooms, has been replaced with a newly-frozen version of the code, contributed by the Central Research Institute of Physics, Budapest, Hungary. This new version has been designated REBEL-3. It contains all the capabilities of REBEL-2 plus capabilities to calculate doses in the whole body, in the testicles, ovaries, red or yellow bone marrow, or in the lungs of an inhomogeneous phantom man. In this new version, the yields of both the source and the scattered photons are calculated by the adjoint technique. Reference: KFKI-1980-07. FORTRAN IV; R-40 computer (similar to IBM).

PSR-150/NE-SPEC

NE-SPEC, a code package for unfolding a pulse height distribution of neutrons measured by an NE-213 organic scintillator, was contributed by Japan Atomic Energy Research Institute (JAERI). The system consists of (1) the conversion code of pulse height distributions, (2) the code to generate response matrix and (3) unfolding codes. A constrained least-squares unfolding procedure and an iterative unfolding procedure are employed. Reference: JAERI-M-6952. FORTRAN IV; FACOM 230-75.

CHANGES IN THE DATA LIBRARY COLLECTION

The following change was made in March.

DLC-36/CLAW-IV

A new version of the 30-neutron, 12-gamma-ray group cross-section library, DLC-36 CLAW, is now available, a contribution of the Los Alamos Scientific Laboratory. The new version, denoted DLC-36B/CLAW-IV, was prepared from ENDF/B-IV using the NJOY (PSR-118) processing system. The library includes prompt and steady-state coupled sets for neutrons and photons in FIDO format, prompt and steady-state fission spectra for the fissionable isotopes, and a table of useful response functions including heating and gas production. These multigroup constants should be useful for a wide variety of problems where self-shielding is not important. Reference LA-7808-MS.

VISITORS TO EPIC

The following persons came for an orientation visit and/or to use EPIC facilities during the month of March.

Kiyoshi Asai, JAERI, Ibaraki, Japan; **Bernard A. Engolm**, General Atomic Co., San Diego, CA; **Bill Fillipone**, University of Lowell, Lowell, MA; **James Finucane**, U. S. Department of Energy, Energy Information Administration, Washington, D.C.; **Dick Malenfant**, Los Alamos Scientific Laboratory, Los Alamos, NM; **C. B. Mullins**, Engineering Technology Division, ORNL; **James A. Scott**, Control Data Corporation, Rockville, MD; **Michael Strayer**, Control Data Corporation, Eagan, MN; and **Tasushi F. Takeda**, Tohoku University, Sendai, Japan.

PERSONAL ITEMS

Richard W. Enz, former RSIC contract monitor for the Defense Nuclear Agency, writes, "I left the Air Force last year and became associated with Calspan Corporation, Dayton Technical Center at Wright-Patterson AFB, Ohio. We provide System Engineering Technical Assistance (SETA) to the Air

Force's Strategic Systems System Program Office of the Aeronautical Systems Division. I am involved in survivability/vulnerability assessments of aeronautical systems to nuclear weapons effects."

In announcing **D. E. Cullen's** address as IAEA, Vienna, Austria, in the March issue of the newsletter, we incorrectly named him "David." His name is "Dermott," but he is better known as "Red" Cullen.

1981 ANS M&C TOPICAL MEETING

The next American Nuclear Society M&C Division topical meeting will be held as an ANS/ENS International Topical Meeting in Munich, Federal Republic of Germany, on April 27–29, 1981. Co-sponsorship by the International Atomic Energy Agency (IAEA) and the OECD Nuclear Energy Agency Committee for Reactor Physics (NEACRP) is also being considered. Manfred Wagner (FRG, KWU) is Chairman of the Technical Program Committee, Henry Honeck (USA, SRL) is Co-Chairman, and Wolfgang Werner (FRG, GRF) is General Chairman.

The "call for papers" describing the meeting in detail should be available in the spring of 1980 with summaries due in the late summer or early fall of 1980. Tentative plans call for sessions in the traditional areas of transport theory, reactor analysis and dynamics, thermal hydraulics/fluid dynamics, as well as sessions in areas less commonly seen such as parallel processing, charged particle transport, and probabilistic systems analysis.

Additional information may be secured from: Mr. Manfred R. Wagner, Kraftwert Union AG, Dept. R 121, Postfach 3220, D-8520 Erlanger, Federal Republic of Germany; Dr. Henry C. Honeck, E. I. duPont de Nemours, Savannah River Laboratory, Aiken, SC 29801; or Dr. Wolfgang Werner, Gesellschaft fur Reaktorsicherheit, Forschungsgelande, D-8046 Garching, Federal Republic of Germany.

WASTE TRANSMUTATION CONFERENCE

An international conference on nuclear waste transmutation will be held on July 22–24, 1980 at the University of Texas at Austin. The purpose of the conference is to encourage the transfer of technical expertise in nuclear waste transmutation by providing detailed results and evaluations of recently completed, ongoing, and proposed future investigations in this area. The program will include assessment of near-term and advanced transmutation concepts with emphasis on both specific technological requirements and overall system analysis. Conference participants will receive a broad perspective on transmutation as a waste management alternative. In addition, the conference will provide insight into the future of transmutation research. The scope of the conference will include transmutation neutronics calculations and the associated cross-section data library requirements.

General topic areas to be covered are: a) Transmutation—Fission Reactors, Fusion Reactors, and Accelerators; b) Separations—Chemical and Isotopic; c) System Analysis—Fuel Cycle Impacts, Risk/Benefit, and Economics; and d) Cross Sections—Experiments and Computer Data Libraries.

Prospective speakers are invited to submit abstracts of papers in the general transmutation area. Full length papers are to be submitted at the time of the conference for publication in the proceedings. Abstracts of 400 words should be submitted by April 30, 1980 to: Dr. J. Wiley Davidson, The University of Texas at Austin, Taylor Hall 167, Austin, TX 78712.

UPCOMING MEETINGS

We call attention to the following additional meetings.

April

ANS Topical Meeting on Tritium Technology in Fission, Fusion, and Isotopic Applications, April 29–May 1, 1980, Stouffer's Dayton Plaza Hotel and/or the Dayton Convention Center, Dayton, Ohio.. Contact: Ms. Mary Ann Hale, Monsanto Research Corp., Mound Facility, P. O. Box 32, Miamisburg, Ohio 45342.

May

Radiation Protection Technology Course, May 5–9, 1980, Nuclear Training Center, Los Angeles, CA. Contact: C. A. Parker, Nuclear Training Center, Energy Systems Group, P. O. Box 309, Canoga Park, CA

91304; phone 213-341-1000, ext. 2811.

Environmental Regulation of the Nuclear Industry: A New Decade, May 18–21, 1980. St. Francis Hotel, San Francisco, CA. Contact: Howard J. Larson, Atomic Industrial Forum, Inc., 7101 Wisconsin Ave., Washington, D.C. 20014; phone 301-654-9260.

Radiation Protection Course, May 19–23, 1980, LaFonda Hotel, Santa Fe, NM. Contact: Engineering Technology, Inc., P. O. Box 9000, Waco, TX 76710; phone 817-772-0082.

June

Comprehensive Health Physics Course and *Power Reactor Health Physics Course*, June 2–13, 1980. Nuclear Training Center, Los Angeles, CA. Contact: C. A. Parker, Nuclear Training Center, Energy Systems Group, P. O. Box 309, Canoga Park, CA 91304; phone 213-341-1000, ext. 2811.

MARCH 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 22151.

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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