

RSIC Newsletter



Oak Ridge National Laboratory
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*Ideas are the mightiest influence on earth. One great thought
breathed into a man may regenerate him.—Channing*

ENDF/B-VI Overview

The following is excerpted from a summary entitled "Overview of the Contents of ENDF/B-VI," by Charles L. Dunford and Sol Pearlstein of Brookhaven National Laboratory.

"The sixth release of the Evaluated Nuclear Data File (ENDF/B-VI) is now being prepared for general distribution. This data file serves as the primary source of nuclear data for nuclear applications in the United States and Canada and in many other countries of the world. The data library is maintained and distributed by the National Nuclear Data Center at Brookhaven National Laboratory from evaluations provided by members of the Cross Section Evaluation Working Group (CSEWG). Unlike its predecessor, ENDF/B-V, this file will be available to all requesters without restrictions.

"Most of the important light element, structural, fissile, and fertile material evaluations

have been extensively revised. For the first time, some light nuclide charged-particle evaluations will be included, as will two ^{56}Fe (incident neutrons and protons) evaluations up to 1 GeV. Isotopic evaluations of the major structural materials, including lead, are now part of the ENDF/B-VI data library. . . . A significant effort was devoted to a simultaneous evaluation of the neutron standard cross sections and other data, such as $^{239}\text{Pu}(n,f)$, $^{238}\text{U}(n,\gamma)$, and $^{235}\text{U}(n,f)$, which are highly correlated with the standards. This improved set of standards formed the basis for establishing consistency for the separate material evaluators."

All evaluated data for $Z \leq 83$ will be released by the National Nuclear Data Center at Brookhaven National Laboratory in January 1990. The three major evaluations (U-235, U-238, and Pu-238) will be released later in the year. Data testing of ENDF/B-VI will proceed during the 1990-1991 time frame.

Registration Deadline Approaches

January 1, 1990, is the deadline for receipt of the RSIC User Registration Form distributed with the last two issues of the newsletter. We wish to thank you for your prompt response to this necessary request for updated information from our user community. More than 25% of the recipients had responded by the end of the first month. We also wish to thank those who offered shielding software developed or modified in their working groups, or those who suggested that we acquire shielding code systems developed by others. The necessary

steps for follow-up on these requests have been initiated, and you will be seeing those code systems and data libraries which fall within the scope of RSIC added to the computer code and data library collections during the next year.

Beginning January 1990 RSIC will no longer fill requests nor mail the *RSIC Newsletter* to those who have not responded to the registration form. The form is again appended to the newsletter for your convenience.

Alice Rice, Editor

CHANGE TO THE COMPUTER CODE COLLECTION

Two changes were made to the computer code collection during the month. A new code system was packaged and added to the computer code collection and an existing code package was extended with an additional hardware version. Both changes resulted from foreign contributions.

CCC-516/GRENADE

A new hardware version of this Green's function nodal algorithm for the diffusion equation was contributed by ECS Power Systems Inc., Ottawa, Canada. The code system 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. The new version was converted to run on a MICROVAX-II running VMS and was tested on a VAX 11/780. The package is distributed on one DS/DD (360K), 5.25-in. diskette. Reference: Informal Report, 1985. Cyber 170/720 (A) and VAX (B).

PSR-276/THRUSH

Century Research Center Corporation, Tokyo, Japan, contributed this code system to compute the thermal neutron scattering kernel using the phonon expansion method for both coherent and incoherent scattering processes. The calculation of the coherent part is suitable for calculating the scattering kernel for heavy water. To evaluate the scattering kernel from the double differential scattering cross section, it is necessary to perform angular integration over scattering angle. This integration is performed analytically in the THRUSH code. A generalized spectral density is used from which the coherent as well as the incoherent scattering effect can be calculated. The Sjoelander expansion or short time expansion is used to overcome the poor convergence at high incident neutron energy or high temperature. The code runs on CRAY computers under COS using the CFT compiler. The package is transmitted on one 5.25-in. DS/DD (360K) diskette. Reference: JAERI-M 8927 (June 1980). FORTRAN IV; CRAY.

CHANGE TO THE DATA LIBRARY COLLECTION

One new data library was added to the collection during the month.

DLC-93/SKYPORT

These skyshine importance functions for neutrons and gamma rays were contributed by ORNL and the Continuous Electron Beam Accelerator Facility, Newport News, Virginia. The data are from calculations performed at ORNL in support of the 400-GeV proton accelerator program at Brookhaven National Laboratory in the early

1980s. The DOT and GRTUNCL codes were used to generate the data. The importance functions are used to calculate the skyshine dose by integrating the product of the source and importance over source direction and energy. The source may be a function of energy and polar angle but must have azimuthal symmetry. Typical sources are accelerators. The neutron data are presented in 4 tables for neutrons up to 400 MeV at distances from 11 m to 1005 m. The photon data are given at the same distances for photons up to 14 MeV. The data are transmitted on 1 DS/DD (360K) 5.25-in. diskette. Reference: ORNL/TM-7512 (Oct. 1980).

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.

Schaeffer Associates has been formed on the foundation of Radiation Research Associates, Inc., which was dissolved after 27 years of service to the nuclear and defense industries.

Visitors to RSIC

During the month the following persons came for an orientation visit and/or to use RSIC facilities: *Enzo Menapace*, Head, Nuclear Data and Codes Laboratory, ENEA, Bologna, Italy; *Huan-Tong Chen*, Institute of Nuclear Energy Research, Lung-Tan, Taiwan; *Feng-Tsan Huang*, CTCI Corp., Lung-Tan, Taiwan; and *Ronald A. Schrack*, National Institute of Standards and Technology, Gaithersburg, Maryland.

Standards Notes

The following standards have recently been approved or newly published.

ANSI N42.17B-1989, *Performance Specifications for Health Physics Instrumentation—Occupational Airborne Radioactivity Monitoring Instrumentation*, (new standard), approved 9/7/89, available from ANSI.

IEC 846:1989, *Beta, X and Gamma Radiation Dose Equivalent and Dose Equivalent Rate Meters for*

Use in Radiation Protection, available from ANSI for \$86.

The following standards are available from ANSI, Standards Department, 555 N. Kensington Ave., La Grange Park, IL 60525.

ANSI/ANS-2.9-1980(R1989), *Evaluation of Ground Water Supply for Nuclear Power Sites*, reaffirmed 10/3/89.

ANSI/ANS-2.17-1989(R1989), *Evaluation of Radio-nuclide Transport in Ground Water for Nuclear Power Sites*, reaffirmed 10/3/89.

ANSI/ANS-18.5-1982(R1989), *Surveys of Terrestrial Ecology Needed to License Thermal Power Plants*, reaffirmed 10/3/89.

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.

Recent Advances in Multidisciplinary Analysis and Optimization Call for Papers

The call for papers has been issued for the third conference on *Recent Advances in Multidisciplinary Analysis and Optimization* to be held September 24–26, 1990, in San Francisco. Three copies of a 500-word abstract on the following topics should be submitted by

January 2, 1990: Design optimization; Sensitivity analysis; Aeroelasticity; Structures; Large engineering systems; Control of flexible structures; Engineering system design; Shape optimization; Optimization methods; Optimization software; Rotocraft dynamics; and Artificial intelligence. Send the abstract to Dr. V. B. Venkayya, WRDC/FIBRA, WPAFB, OH 45433-6553 (phone 513-255-7191 or 513-255-6992). The conference is sponsored by the U.S. Air Force and NASA and brings together engineers and scientists from government, industry, and the universities to present and discuss the progress in multidisciplinary analysis and optimization.

ANS M&C/RP Topical Call for Papers

The International Topical Meeting on *Advances in Mathematics, Computations, and Reactor Physics* sponsored by the American Nuclear Society Mathematics and Computation (M&C) and the Reactor Physics (RP) Divisions will be held April 28–May 1, 1991, in Pittsburgh, Pennsylvania. Contributions are solicited from potential participants in the following subject areas:

- **Computers and Computing**—to include Advances in Supercomputers; Networks and Communications; Distributed Computing; Parallel Processing and Vectorization; Computing Practices/Software Engineering; Graphics and Animation; High Speed Computing Applied to Reactor Operation; Real-time Systems/Simulation Models; Artificial Intelligence and Expert Systems; and Neural Networks
- **Mathematics and Computations**—to include Advances in Computational Methods; Solution of Linear and Nonlinear Systems; Numerical Solutions of Differential Equations; Deterministic and Stochastic Transport Methods; Numerical Methods for Radiative, Neutral, and Charged Particle Transport; Diffusion Theory and Kinetics; Numerical Methods in Fluid Dynamics, Structural Mechanics, and Thermal Hydraulics; Computational and Mathematical Problems of Reactor Dynamics and Safety Analysis; Computational Aspects of Power Distribution, Control, and Optimization; and Methods of Probabilistic Risk Assessment
- **Reactor Physics**—to include Reactor Physics, Theory, and Analysis Methods; Advanced Reactor Concepts/Designs; Space Reactor and Research Reactor Physics; Physics and Safety Aspects of Core Design; Reactor Design Validation and Operating Experience; Physics of Reactor Operation; Physics of Criticality Safety; Point and Space-Time Core Models for Tran-

sient Analysis; Nuclear Plant Analyzers, Data Bases and Code Systems; Improvement and Validation of Plant Simulation Codes; Instrumentation, Control, and Monitoring; Fuel Cycle and Fuel Management; Shielding and Core Management; Nuclear Data; Integral Experiments—Measurements and Analysis; Reactor Physics Calculations Versus Measurements; Sensitivity Theory and Data Adjustment Techniques for Reactor Analysis; and Physics and Computational Aspects of Fusion

In addition to the topics listed above, there will be paper and poster sessions on Methods, Algorithms, and Computer Performance Benchmarks, and a poster session on Computer Programs which offer new or improved methods or options. Submit a 1000-word summary to the Technical Program Chair, I. K. Abu-Shumays, RT-Mathematics, 34F, Bettis Atomic Power Laboratory, P.O. Box 79, West Mifflin, PA 15122-0079 USA (phone 412-476-6469, FTS 721-6469, FAX 412-476-5151).

Nuclear Data for Science and Technology

The first announcement of the *International Conference on Nuclear Data for Science and Technology* has been issued by the organizing agency, Kernforschungsanlage, Jülich GmbH, Fed. Rep. of Germany. The conference will be held May 13–17, 1991, in Jülich, Fed. Rep. of Germany, and will include a wide range of interdisciplinary studies dealing with measurement, calculations, evaluation, and application of nuclear data in various fields. Those who wish to be included on the mailing list for subsequent announcements and the call for papers should make a written request to KFA Jülich GmbH, Conference Service, ATTN: Ms. Renate Mengels, P.O. Box 1913, D-5170 Jülich, F. R. Germany (phone 02461 61-3833, FAX 02461-61-4666, telex 833556-0 kf d). The *RSIC Newsletter* will publicize the call for papers as soon as it is available.

Supercomputing in Nuclear Applications

The Japan Atomic Energy Research Institute (JAERI) is the sponsor for the *International Conference on Supercomputing in Nuclear Applications*, which will be held in Mito City, Ibaraki, Japan, March 12–16, 1990. A technical program of invited and contributed papers will report research and development in supercomputing technologies with regard to nuclear applications. Scientists and engineers engaging in high-speed computations and advanced information processing, such as artificial intelligence and robotics in nuclear applications, will have a forum in which to report results and experiences, to exchange information, and to suggest future direction. Those in the U. S. wishing to ob-

tain more information may contact RSIC by mail or by phone. Interested persons outside the United States may obtain additional information by writing Kiyoshi Asai, Conference Secretariat, Computing Center, JAERI, Tokai-mura, Naka-gun, Ibaraki 319-11 Japan.

Course: Respiratory Protection at Nuclear Facilities

Radiation Safety Associates, Inc., is presenting a course on *Respiratory Protection at Nuclear Facilities* April 23-27, 1990, in Atlanta, Georgia. The course is designed for anyone associated with a respiratory protec-

tion program at any USNRC or Agreement State-licensed facility. The objectives of the program are to learn or review the current regulations, evaluate the impact of proposed regulations, demonstrate proficiency in the operational aspects of a respiratory protection program, solve specific operational and procedural problems, provide an open forum for discussion with others in the industry, operate a wide variety of respiratory protection equipment, learn how to evaluate various respiratory hazards, and evaluate viable options to respirator use.

Further information may be obtained from Radiation Safety Associates, Inc., P.O. Box 107, Hebron, CT 06248 (phone 203-228-0487).

Calendar

Your attention is directed to the following events of interest.

January 1990

7th Symposium on Space Nuclear Power Systems, Jan. 7-11, 1990, Albuquerque, New Mexico. Contact: Inst. for Space Nuclear Power Studies, 7th Symposium, Chemical & Nuclear Engineering Dept., University of New Mexico, Albuquerque, NM 87131 (phone 505-377-2813, FAX 505-277-0813).

19th International Symposium on Radioactive Isotopes in Clinical Medicine and Research, Jan. 9-12, 1990, Bagastein, Austria. Contact: R. Hoefer, Abt. f. Nuklearmedizin, 2. Medizinische Univ. Klinik, Garnisogasse 13, A-1090 Vienna, Austria (phone 0222 4800/2141 or 2142).

Recent Advances in Physics, Jan. 15-19, 1990, Dhaka, Bangladesh. Contact: Dr. M. A. Mannan, P.O. Box 158, Dhaka-1000, Bangladesh (Cable: BANGLATOM; Telex 632203 BATOM BJ; phone 502600).

February 1990

HEART Conference, Feb. 12-16, 1990, Monterey, California. Contact: Thomas A. Tumolillo, Kaman Sciences Corp., P.O. Box 7463, Colorado Springs, CO 80933 (phone 719-599-1718).

WATtec '90 Technical Conference and Exhibition, Feb. 20-23, 1990, Knoxville, Tennessee. Contact: WATtec, P.O. Box 629, Oak Ridge, TN 37831-0629.

Waste Management '90, Feb. 25-Mar. 1, 1990, Tucson, Arizona, sponsored by the University of Arizona

and the American Nuclear Society. Contact: Dr. Morton E. Wacks, Dept. NEE, University of Arizona, Tucson, AZ 85721 (phone 602-621-6160).

March 1990

7th Pacific Basin Conference, Mar. 4-8, 1990, San Diego, California, sponsored by the ANS. Contact: ANS Meetings Department, 555 N. Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

International Conference on Supercomputing in Nuclear Applications, Mar. 12-16, 1990, Mito City, Japan, sponsored by JAERI. Contact: Kiyoshi Asai, Computing Center, JAERI, Tokai-mura, Naka-gun, Ibaraki 319-11, Japan (phone 0292(82)5611; Fax 0292(82)6070).

April 1990

26th Annual Meeting of the National Council on Radiation Protection and Measurement, Health and Ecological Implications of Radioactively Contaminated Sites, Apr. 4-5, 1990, Washington, D.C. Contact: NCRP, 7910 Woodmont Ave., Suite 800, Bethesda, MD 20814.

International Conference for High-Level Radioactive Waste Management, April 8-12, 1990, Las Vegas, Nevada. Contact: Dean William Wells, Howard Hughes College of Engineering, UNLV, Las Vegas, NV 89154 (phone 702-739-3699).

3rd International Seminar on Finite Element and Allied Methods in Radiation Transport, Shielding, Reactor Physics and Geophysics Applications, Apr. 19-20, 1990, at the Imperial College of Science, Technology, and Medicine, in London. Contact:

Prof. A.J.H. Goddard, Nuclear Power Section, Mechanical Engineering Department, Imperial College, London, SW7 2BX, U.K. (phone 01-589 5111 Ext. 6248/9, Fax 1 823 8845).

Physor '90, Apr. 23-26, 1990, Marseille, France. Contact: Yuri Orechwa, Engineering Physics Division, Bldg. 208, Argonne National Laboratory, 9700 S. Cass Ave., Argonne, IL 60439 USA.

Respiratory Protection at Nuclear Facilities, a course offered Apr. 23-27, 1990, in Atlanta. Contact: Radiation Safety Assoc., Inc., P.O. Box 107, Hebron, CT 06248 (phone 203-228-0487).

May 1990

International Symposium on Radiation Protection Infrastructure, May 7-11, 1990, Munich, Fed. Rep. of Germany, sponsored by the IAEA. Contact: Conference Service Section, IAEA, P.O. Box 100, A-1400, Vienna, Austria.

7th Symposium on Radiation Measurements and Applications, May 21-24, 1990, the University of Michigan, Ann Arbor. Contact: Helen Lum, Symposium Secretary, 3034 Phoenix Memorial Laboratory, The University of Michigan, Ann Arbor, MI 48109-2100 (phone 313-764-6214; Fax 313-763-4540).

June 1990

American Nuclear Society Annual Meeting, June 10-15, 1990, Nashville, Tennessee. Contact: Mary Keenan, Meetings Manager, ANS, 555 N. Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

15th Symposium on Effects of Radiation on Materials, June 17-21, 1990, Nashville, Tennessee, sponsored by the American Society for Testing and Materials. Contact: Conferences, ASTM, 1916 Race St., Philadelphia, PA 19103 (phone 215-299-5400).

17th European Conference on Controlled Fusion and Plasma Heating, June 25-29, 1990, Amsterdam, The Netherlands. Contact: F. C. Schuller, FOM-Instituut voor Plasmafysica "Rijhuizen," Postbus 1207, NL-3430 BE Nieuwegein.

July 1990

27th Annual International Nuclear and Space Radiation Effects Conference and Short Course, July 16-20, 1990, Reno, Nevada, sponsored by the Institute of Electrical and Electronics Engineers, Inc. Contact: Joseph R. Srouf, Northrop Corp., M.S. X400/N5, 2301 West 120th St., P.O. Box 5032, Hawthorne, CA 90251-5032 (phone 213-600-4151).

August 1990

International Topical Meeting on Fast Reactor Safety, Aug. 12-16, 1990, Snowbird, Utah, sponsored by the ANS. Contact: Wayne K. Letho, Argonne National Laboratory, P.O. Box 2528, Idaho Falls, ID 83403-2528 (phone 208-526-7369).

Operational Radiation Protection, Aug. 20-22, 1990, Idaho Falls, Idaho, sponsored by the ANS. Contact: Jack Liebenthal, EG&G Idaho, Inc., P.O. Box 1625, Idaho Falls, ID 83415-3515 (phone 208-526-1252).

7th ASTM-EURATOM Symposium on Reactor Dosimetry, Aug. 27-31, 1990, Strasbourg, France. Contact: G. Tsotridis, Joint Research Centre, Petten Establishment, HFR Div., Postbus 2, NL-1755 ZG, Petten, The Netherlands (phone 02246 5122, Telex REACP NL 57211, Fax 02246 1449) or G. P. Lamaze, National Inst. of Standards and Technology, Bldg. 235, Gaithersburg, MD 20899 USA (phone 301-975-6202, Telex 197 674 NBS UT, Fax 301-921-9847).

September 1990

16th Symposium on Fusion Technology, Sept. 3-7, 1990, London. Contact: JET Joint Undertaking, Conference Office, Abingdon, Oxon, OX14 3EA, United Kingdom.

Symposium on Recent Advances in Multidisciplinary Analysis and Optimization, Sept. 24-26, 1990, San Francisco, sponsored by the U.S. Air Force and NASA. Contact: V. B. Venkayya, WRDC/FIBRA, WPAFB, OH 45433-6553 (phone 513-255-7191 or 513-255-6992).

International Conference on Monte Carlo Methods for Neutron and Photon Transport Calculations, Sept. 25-28, 1990, Budapest, Hungary. Contact: Dr. Lázló Koblinger, Central Research Inst. for Physics, P.O. Box 49, H-1525 Budapest, Hungary.

October 1990

Spectrum '90: Radioactive Waste Technologies, Decontamination, Decommissioning and Hazardous Wastes, Oct. 3-5, 1990, Knoxville, Tennessee, sponsored by ANS. Contact: Thomas H. Row, ORNL, P.O. Box 2008, 4500N MS6198, Oak Ridge, TN 37831-6198 (phone 615-574-5974 or FTS 624-5974).

9th Topical Meeting on Technology of Fusion Energy, Oct. 8-12, 1990, Chicago, sponsored by the American Nuclear Society. Contact: Dr. Charles Baker, Argonne National Laboratory, 9700 S. Cass Ave., Argonne, IL 60439 (phone 312-972-4836, FTS 972-4836).

International Conference on Monte Carlo Methods in Neutron and Photon Transport, Oct. 9-12, 1990, in Budapest, Hungary. Contact: Dr. I. Lux, Hungarian Academy of Sciences, Central Research Institute for Physics, P.O. Box 49, H-1525 Budapest, Hungary.

November 1990

American Nuclear Society Winter Meeting, Nov. 11-16, 1990, Washington, D.C. Contact: Mary Keenan, Meetings Manager, ANS, 555 N. Kensington Ave., La Grange Park, IL 60525.

NOVEMBER 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.

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Happy Holidays

Miss Rice

Mali gay ang Pasko!
Bernadette L. Kirk

Merry Christmas!
Brenda Taylor

Hoof Chamer

Holiday Greetings!
David Imber

Linn Austin
Robert W. Korman

Nancy Halmaier

Janifer Baithy



Carol Coker

Constance Marie Anthony

John White

Betty McGill

From all of us

Betty F. Maskewitz