RSIC Newsletter

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There is but one bond of peace that is both permanent and enriching: The increasing knowledge of the world in which experiment occurs.—Walter Lippmann

LAST CALL FOR NEWSLETTER RENEWAL

The RSIC Periodic Distribution Query form is again appended to the back of this issue of the newsletter as a convenience for those persons who have not yet responded. If you wish to continue receiving the *RSIC Newsletter* it is essential that you fill out and mail the form immediately. All non-respondents as of the end of the calendar year will be deleted from the distribution directory.

RSIC Hosts French Visitors

Two senior program managers and a senior research staff member of the CEA Organization of Nuclear Energy Applications and Innovative Technology visited Oak Ridge National Laboratory on November 18–19 with RSIC acting as host. Under the CEA umbrella organization, Institute of Technological Research and Industrial Development (IRDI) headed by M. Rapin, *Jean Rastoin* directs the Division of Reactor (LWR & FBR) Research and Development (DEDR), *Bernard Tinturier* is a technical assistant to Rapin and directs CEA Non-Nuclear Development Programs, and *Alain Kavenoky* is on special assignment within DEDR.

Rastoin, an early shielding expert and long-term RSIC friend, serves as General Chairman of the 1987 ANS-sponsored International Topical Meeting on Advances in Reactor Physics, Mathematics, and Computation. Kavenoky is chairman of the technical program. The meeting is scheduled for April 27–30, 1987, in Paris. The call for papers and other information will be published in future issues of the newsletter.

RSIC DIRECTOR TRAVELS

Robert W. Roussin, RSIC Director, traveled to western Europe on a personal educational trip in September. He visited the University of Stuttgart Institute for Nuclear Energy (IKE), Fed. Rep. of Germany (FRG), and CEA/CEN/Saclay Shielding Laboratory (LEPF) and OECD Nuclear Energy Agency (NEA) Data Bank in France. The IKE, Stuttgart hosted a meeting of shielding specialists from the FRG, England, France, Italy, and Switzerland on September 5, providing an opportunity for information collection and discussions on RSIC's behalf. Roussin also attended the meeting of the European Radiation Dosimetry Group (EURADOS) Working Committee No. 4 (Numerical Dosimetry) hosted by IKE on September 6.

Near the end of the trip, orientation visits were made to the CEA/CEN/Saclay LEPF in France, where current work was reviewed, and to the OECD NEA Data Bank, where mutual problems of shielding information exchange were discussed.

CCC-467/ITS Note

John A. Halbleib of Sandia National Laboratories has called our attention to the need for some modifications to correct problems and provide enhancement to the code system as packaged by RSIC. A special mailing of this information was made to those persons known to have received the code system. In the event we did not reach all ITS users, we call attention to the availability of the material from RSIC.

ITS is the name given to the currently available *I*ntegrated *T*iger *S*eries of Coupled Electron/Photon Monte Carlo Codes developed at Sandia National Laboratories.

BUGLE-80 Alert

Some problems occur when using some DLC-75/BUGLE-80 cross sections with the CCC-203/MORSE-CG multigroup Monte Carlo code system. There are a couple of cross-section group-to-group transfers in Mn-55 and Na-23 that give rise to bad moments when processed by the MORSEC module of MORSE. These transfers are very small in magnitude and have no impact on results produced by discrete ordinates codes. This kind of problem occurs with some of the macroscopic cross sections provided with the code package due to the presence of Mn-55. The problems will be corrected at RSIC and a revised version will be announced in a future *RSIC Newsletter*.

CHANGES TO THE COMPUTER CODE COLLECTION

During the month six changes were made to the computer code collection. Five new code packages were added to the collection, and an existing code package was extended with an additional hardware version. All six changes resulted from foreign contributions.

CCC-319/DOT 3.5E

This two-dimensional discrete ordinates radiation transport code package with exponential supplementary equations was extended to include a UNIVAC (B) version contributed by Junta de Energia Nuclear (JEN), Madrid, Spain. Several subroutines allow the programmer to request main storage dynamically. IBM 360/370 (A), UNIVAC (B).

CCC-478/ACFA

ACFA, contributed by Institut für Reaktorentwicklung/L, Jülich, Federal Republic of Germany, calculates the neutron-induced activation, afterheat, transmutation, gas production, biological hazard potential, and activation gamma-ray spectra in the components of a nuclear system. The quantities of interest may be computed by spatial interval and zone or by zone only of the system considered. The code system uses a variable dimensioning technique to adapt the core data storage requirements to the particular problem considered and uses the FIDO system to read the input data. Numerical methods for establishing and solving decay chain equations are taken from the CCC-217/ORIGEN code package. Reference: ISSN 0366-0885. FORTRAN IV; IBM-3033.

PSR-216/SMOG

This code system for calculating neutron-nucleus interaction parameters by the optical model was contributed by Centro di Calcolo del CNEN, Bologna, Italy. For numerical integration the Fox-Goodwin's method is used. Reference: Informal notes by V. Benzi et al. FORTRAN IV; IBM 3033.

PSR-218/ALARM-B2

This modified version of ALARM-B1, a BWR blowdown analysis code, is a tool to analyze thermohydraulic phenomena of BWR during a postulated large break LOCA. It was contributed by Japan Atomic Energy Research Institute (JAERI), Tokyo, via the OECD NEA Data Bank, Gif-sur-Yvette, France. The major improvement provides a one-dimensional heat conduction equation, a heat transfer correlation package, and a point reactor kinetics equation to analyze the heat transfer phenomenon in the core region during a LOCA. ALARM-B2 calculates thermal hydraulics in the pressure vessel and the primary coolant loop during the transient of a large break of the recirculation line. Reference: JAERI-M 9655. FORTRAN IV; IBM 360/370.

PSR-220/X4ECS

This code system for comparing evaluated and experimental data by combining cross section data into EXFOR and/or ENDF/B-IV format was contributed by the Chinese Nuclear Data Center, Beijing, People's Republic of China, through the OECD NEA Data Bank, Gif-sur-Yvette, France. The data are converted to a uniform format required by other programs, for example, graphic software TELL-A-GRAF selects some data and plots curves on terminals and plotters for comparison. The program RECENT adds the contribution of resonances to the cross section. The program LINEAR can convert any interpolation mode to linear-linear. Reference: Informal Notes. FORTRAN 77; VAX 11.

PSR-221/F5TAB

This code system for converting energy distribution cross section data to tabulated data was contributed by the Chinese Nuclear Data Center, Beijing, through the OECD NEA Data Bank, Gif-sur-Yvette, France. It is assumed that the input data file is correctly coded in ENDF/B-IV format. Only file 5 is used; other files are copied onto the output file. Reference: Informal Notes. FORTRAN 77; VAX-11.

Standards Activity

The following newly published ASTM standards are available for $8 from ASTM, 1916 Race St., Philadelphia, PA 19103.

ASTM E720-85 *Guide for Selection of a Set of Neutron-Activation Foils for Determining Neutron Spectra Used in Radiation-Hardness Testing of Electronics* (revision of ASTM E720-80).

ASTM E763-85 *Method for Calculation of Absorbed Dose from Neutron Irradiation by Application of Threshold-Foil Measurement Data* (revision of ASTM E763-80).

The following ANSI/ASTM documents have been withdrawn as American National Standards because they have been discontinued or later editions have been published but not submitted to ANSI for approval.

E531-76 (1980) *Recommended Practice for Surveillance Testing of High Temperature Nuclear Component Materials.*

E720-80 *Selection of a Set of Neutron Activation Foils for Determining Neutron Spectra Used in Radiation-Hardness Testing of Electronics.*

E721-80 *Method for Determining Neutron Energy Spectra with Neutron Activation Foils for Radiation-Hardness Testing of Electronics.*

E763-80 *Calculation of Absorbed Dose from Neutron Irradiation by Application of Threshold-Foil Measurement Data.*

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. During the past month we have been informed of the following change.

Isaac Maya, formerly with GA Technologies, Inc., is now the Assistant Director of the Innovative Nuclear Space Power Institute (INSPI). The Institute is a recently formed national consortium of universities and industry chartered to innovate and advance nuclear reactors, power conversion systems, and related enabling components and procedures for space power systems applicable to the missions of the Strategic Defense Initiative.

We have been informed of the following changes in address: *Robert D. Wilson,* from Southern Oregon State College, to Highland Scientific, Ltd., Ashland, Oregon; *R. D. Neef,* from KFA-Jülich, FRG, to Los Alamos National Laboratory, New Mexico; and *Nolan Olson,* from Exxon Nuclear, to Westinghouse Idaho Nuclear Co., Idaho Falls, Idaho.

Visitors to RSIC

During the month the following persons came for an orientation visit and/or to use RSIC facilities: *Kiyoshi Sakurai,* Inst. of Nuclear Safety, Tokyo; *Naoki Kishimoto,* Japan Inst. of Nuclear Safety, Tokyo; *Itacil Chiari Gomes,* National Commission of Nuclear Energy, Rio de Janeiro; and *Huan-Tong Chen,* Inst. of Nuclear Energy, Lung-tan, Taiwan.

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.

ANS Fusion Calls for Papers

The 1986 Topical Meeting on the Technology of Fusion Energy has issued the call for papers for the meeting being held in conjunction with the American Nuclear Society (ANS) National Summer Meeting, June 15–19, 1986, in Reno, Nevada. Summaries, which will be published in the *Transactions*, are due to ANS by **January 10, 1986**. The topics include Next-Generation Devices, MFE&ICF; Material Radiation Damage; Refractory Metals; Reactor Designs, MFE&ICF; Special Materials Irradiation; Fusion/Fission Hybrids; Inertial Confinement Fusion Technology; Corrosion and Compatability; Nuclear Integrated Testing; Environment and Safety; Neutronics, MFE&ICF; Tritium Technology; Magnet Engineering; Plasma Heating and I-Drive-I; Plasma Heating and I-Drive-II; Magnet/Conducting Materials; Heavy Ion Fusion; Results from Current Devices MFE&ICT; and Fusion Economics and Power Conversion. Additional information may be obtained from the program chairman, C. D. Henning, Lawrence Livermore National Laboratory, P.O. Box 5511, L-644, Livermore, CA 94550 (phone 415-422-0235; FTS 532-0235).

Calendar

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

January 1986

3rd Symposium on Space Nuclear Power Systems, Jan. 13–16, 1986, in Albuquerque, New Mexico, sponsored by the Institute for Space Nuclear Power Studies, Chemical/Nuclear Engineering Department, University of New Mexico. Contact: Institute for Space Nuclear Studies, Chemical/Nuclear Engr. Dept., Univ. of New Mexico, Albuquerque, NM 87131.

February 1986

Health Physics Considerations in Decontamination and Decommissioning, 19th midyear topical symposium, Feb. 2–6, 1986, Knoxville, Tenn., sponsored by the Health Physics Society. Contact: T. W. Oakes, P.O. Box 30503, Knoxville, TN 37930-0503 (phone 615-574-6670).

Workshop on Applications in Nuclear Data and Reactor Physics, Feb. 17–Mar. 21, 1986, Miramare, Trieste, Italy, sponsored by the International Centre for Theoretical Physics. Contact: International Comm. for Theoretical Physics, Workshop on Appl. for Nucl. Data and Reactor Physics, P.O. Box 586, I-34100 Trieste, Italy (phone 040-224281-6).

National Symposium on Atomic Energy, Feb. 24–25, 1986, Tokyo, sponsored by the Atomic Energy Society of Japan. Contact: Minoru Masamoto, Atomic Energy Soc. of Japan, No. 1-13, 1-Chome, Shimbashi, Minato-ku, Tokyo 105, Japan (phone 03-508-1261).

March 1986

Waste Management '86, Mar. 2–6, 1986, Tucson, Arizona, sponsored by the Univ. of Arizona. Contact: Roy Post, Editor-NT, Univ. of Arizona, Nucl. Engr. Dept., Tucson, AZ 85721 (phone 602-621-6158).

China Energy '86, Mar. 18–22, 1986, Tinajin, People's Republic of China. Contact: Aideen Barrett, Industrial & Trade Fairs International Ltd., Radcliffe House, Blenheim Court, Solihull, West Midlands B91, 2BG, England (phone 011-021-705-6707).

33rd International Electronics, Energy and Space Exposition, Mar. 18–23, 1986, Rome. Contact: RIENA Secretariat, via Crescenzio, 9-00193 Rome, Italy (phone 06-656.93.43).

April 1986

2nd International Conference on Fusion Reactor Materials, (ICFRM-2), Apr. 13–17, 1986, Chicago, Illinois, sponsored by the U.S. Dept. of Energy, American Nuclear Society (ANS), Argonne National Laboratory, and Nuclear Metallurgy Committee of TMS/AIME and ASM. Contact: Dale Smith, Fusion Power Program, Argonne Natl. Lab., Bldg. 205, 9700 S. Cass Ave., Argonne, IL 60439, or A. Rowcliffe, ORNL, Metals and Ceramics Div., P.O. Box X, Oak Ridge, TN 37831 (phone 615-574-5057).

12th Personnel Dosimetry Intercomparison Study, Apr. 14–18, 1986, Oak Ridge, Tenn., sponsored by ORNL. Contact: C. S. Sims, ORNL, Bldg. 7710, P.O. Box X, Oak Ridge, TN 37831 (phone 615-574-5851).

May 1986

Conference on the Science and Technology of Fast Reactor Safety, May 12–16, 1986, Channel Islands, U. K. Contact: Inst. of Civil Engineers, Conference Office, 1-7 Great George St., London SW1P 3AA.

June 1986

4th European Nuclear Conference (ENC-86), June 1–6, 1986, sponsored by the European Nuclear Society. Contact: Dr. Peter Bucher, ENC-4 Conference Secretary, ENS, P.O. Box 2613, CH-3001 Berne, Switzerland.

ANS Annual Meeting, June 15–20, 1986, Reno, Nevada. Contact: D. G. Pettengill, ANS, 555 N. Kensington Ave., La Grange Park, IL 60535 (phone 312-352-6611 ext. 257).

July 1986

23rd International Conference on High-Energy Physics, July 16–23, 1986, Berkeley, California. Contact: S. C. Loken, 50-137 Lawrence Berkeley Lab., Univ. of California, Berkeley, CA 94720.

23rd Annual Conference on Nuclear and Space Radiation Effects, July 20–23, 1986, Providence, Rhode Island, sponsored by the Nuclear and Plasma Sciences Society and the Inst. of Electrical and Electronics Engineers. Contact: Sandra Grawet, Science Applications International Corp., 2615 Pacific Coast Highway, Hermosa Beach, CA 90254 (phone 213-318-2611).

August 1986

Criticality Accident Dosimetry Training Course, Aug. 11-15, 1986, Oak Ridge, Tenn., sponsored by ORNL. Contact: C. S. Sims, ORNL, Bldg. 7710, P.O. Box X, Oak Ridge, TN 37831 (phone 615-574-5851).

International Nuclear Physics Conference, August 25–30, 1986. Contact: Inst. of Physics, 47 Belgrave Square, London SW1X 8QX (phone 01-235-6111).

8th International Conference on Solid State Dosimetry Aug. 26–29, 1986, St. Catherine's College, Oxford, organized by the National Radiological Protection Board, U.K. Contact: Miss L. Ashby, National Radiological Protection Board, Chilton, Didcot, Oxfordshire, U.K.

September 1986

International Conference on Nuclear and Radiochemistry, Sept. 1–5, 1986, Beijing, sponsored by the Chinese Nuclear Society and Chinese Chemical Society. Contact: Prof. Liu Yuanfang, Dept. of Technical Physics, Beijing Univ., Beijing, People's Republic of China.

International Conference on Radioactive Waste Management, Sept. 7–12, 1986, Winnipeg, Manitoba, Canada, sponsored by the Canadian Nuclear Society and ANS. Contact: Dr. T. S. Drolet, CFFTP, 2700 Lakeshore Rd. West, Mississauga, Ontario, Canada L5J 1K3 (phone 416-823-6654).

Conference on the Treatment and Containment of Radioactive Wastes and Disposal in Arid Environments (Radwaste '86), Sept. 7–13, 1986, sponsored by Atomic Energy Corp. of South Africa, Electricity Supply Commission of South Africa, and Nuclear Development Corp. of South Africa. Contact: Radwaste Conf. Secretariat, NUCOR, Private Bag X256, Pretoria 0001, South Africa (phone 27-12-21-3311 ext. 677).

Advances in Reactor Physics and Safety Meeting, Sept. 17–19, 1986, sponsored by ANS. Contact: Norman C. Francis, Knolls Atomic Power Lab., River Road, Schenectady, NY 12301, or Donald R. Harris, Rensselaer Polytechnic Inst., Troy, NY (phone 518-270-6407).

November 1986

ANS and Atomic Industrial Forum Joint Meeting, Nov. 16–21, 1986, Washington, D. C. Contact: D. G. Pettengill, ANS, 555 N. Kensington Ave., La Grange Park, IL 60535 (phone 312-352-6611 ext. 257).

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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C. What are the project areas in which you are engaged?

Breeder/LM Reactor	___%	Waste Management	___%
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PART II

SURVEY OF RADIATION PROTECTION, SHIELDING AND TRANSPORT COMPUTING TECHNOLOGY
(Please answer each question, using additional paper as needed)

1. Do you compute radiation exposures or perform radiation transport calculations, (e.g., in-plant exposures, environmental studies, shield design)? Please describe.

2. Do you use computerized numerical data bases or cross section libraries?

3. What computing technology do you need (e.g., accurate, fast code to perform neutron streaming studies)?

4. What data libraries do you need? (e.g., radioactive decay nuclide data base, albedo data for MORSE for concrete elements)?

5. Describe your computer environment. What computers do you use?

6. What trends do you see — more computation on mini- and microcomputers, in-house or centralized computing facilities via remote terminal?

7. Do you have any outstanding shielding problem areas that should be addressed through additional R & D?

8. Have you obtained, and do you use, computer codes and data from RSIC? List; comment.

9. Have you developed computer codes and data libraries that you are willing to share through RSIC? Please list and cite documentation, if any exists.

10. Have you already placed your work in RSIC? ___. If yes, indicate below if it is time for an update. Do you have publications which you wish to contribute? Please comment:

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Please make any additional comments or suggestions.

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