RSIC Newsletter

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No. 217 *December 1982*

It is never too late to give up your prejudices—Henry David Thoreau

RSIC Requests Information

We have appended to this issue of the *RSIC Newsletter* an extended version of the periodic distribution query. As heretofore, the query informs us of your current R&D interests and whether or not you wish to continue to receive the monthly newsletter. We also ask questions, as promised in the November issue, designed to assess your thinking on the state of the art of radiation production, protection, transport, and shielding.

The survey questions are mainly stated in terms of computing technology (codes and data). Feel free to comment beyond and outside them, as they are basically posed as guidelines.

Please review the lead article in the November issue (No. 216). If you have not yet "philosophized" for us as requested, please do so and return your contribution with the attached survey.

We regret the inconvenience the query causes our readers. Since we do not levy a subscription fee for the newsletter, the query is the only method we have of keeping our distribution within manageable limits. We also depend on the information contained in your response to evaluate our usefulness to you and to our sponsors.

We ask that you turn now to the last page of this issue; detach the page; fill it out using additional paper as needed, and mail immediately. March 1st is the final deadline; do not delay returning your response.

Your cooperation is deeply appreciated.

Betty F. Maskewitz

7th Taylor Lecturer Named

Merril Eisenbud, a distinguished environmental scientist from New York, has been named the 1983 Taylor Lecturer for the Annual Meeting of the National Council on Radiation Protection and Measurements (NCRP). The lecture, entitled, "The Human Environment — in Retrospect and Prospect," is a featured presentation of the NCRP Annual Meeting and is scheduled for 5 PM on April 6, 1983, in the auditorium of the National Academy of Sciences in Washington, D.C.

Merril Eisenbud, a Professor and Director of the Laboratory for Environmental Studies of the Institute of Environmental Medicine, New York University Medical Center, is a renowned expert on environmental radioactivity, radiation measurement, and environmental protection. Dr. Eisenbud has been a member and Director of the NCRP, has served on numerous governmental and international advisory committees and panels, and has had published a substantial bibliography of material, including *Environmental Radioactivity* which has served the scientific community for nearly 20 years as *the* reference text on the subject and *The Environment, Technology and Health*, which places human ecology in historical perspective. He is a graduate of the New York University College of Engineering and has received honorary doctorate degrees from Fairleigh Dickinson University and the Catholic University of Rio de Janeiro.

The two-day meeting of the NCRP will be held on April 6–7 and is open to those who are interested in radiation protection and measurement.

New ICRU Report on Dosimetry of Pulsed Radiation

The International Commission of Radiation

Units and Measurements (ICRU) has announced the publication of ICRU Report 34, *The Dosimetry of Pulsed Radiation*. The report provides guidance on the special procedures to be followed in measuring the radiation dose from sources such as linear accelerators, betatrons, synchotrons, or field-emission impulsed generators. It also provides information on certain precautions and the selection of calibration constants needed to permit the use of methods of dosimetry employed for measuring continuous radiation from constant potential x-ray sources or from gamma-ray sources. Treated are measurements using ionization chambers, chemical dosimeters, calorimeters, and solid state devices. The aim of the report is to guide those who have to measure pulsed radiation to the most convenient and accurate system for their particular problem. The report may be secured from: ICRU Publications, 7910 Woodmont Avenue, Suite 1016, Bethesda, Maryland 20814 USA. The price for a single copy is $15.

ASTM Standards Actions

The revised ASTM standards (the revisions include change of title) listed below have been approved by ASTM Society ballot and the Committee of Standards. They may be ordered from ASTM at $4.00 per copy. For telephone orders, call 212-299-5450.

E 263-82 Determining Fast-Neutron Flux Density by Radioactivation of Iron.

E 264-82 Determining Fast Neutron Flux Density by Radioactivation of Nickel.

E 265-82 Determining Fast-Neutron Flux Density by Radioactivation of Sulfur.

E 266-82 Determining Fast-Neutron Flux Density by Radioactivation of Aluminum.

E 482-82 Guide for Application of Neutron Transport Methods for Reactor Vessel Surveillance.

E 523-82 Determining Fast Neutron Flux Density by Radioactivation of Copper.

E 526-82 Determining Fast Neutron Flux Density by Radioactivation of Titanium.

CHANGES TO THE COMPUTER CODES COLLECTION

During the month six changes were made to the RSIC collection, three of which resulted from contributions from Finland, Israel, and Japan.

CCC-248/SWAN

The CDC version (B) of the SWAN code package was updated to correct an error of omission made in the original packaging of the code system. Information for making the correction was supplied by the contributor of the code package, Nuclear Research Centre-Negev, Beer-Sheva, Israel.

CCC-385/LPGS

The LPGS computer code package, developed to calculate the radiological impacts resulting from radioactive releases to the hydrosphere, was contributed by the U.S. Nuclear Regulatory Commission through the ORNL/EPIC Technical Data Management Center (TDMC). The name LPGS was derived from the Liquid Pathway Generic Study for which the original code development was used primarily as an analytic tool in the assesssment process. The mathematical modeling evaluates the time dependent radiation impact arising from the population utilizing water associated pathways. The exposure modes considered are (if pathway exists): (1) consumption of drinking water, (2) consumption of aquatic foods, and (3) recreational exposure through swimming and shoreline activities. Reference: NUREG/CR-2974 (ORNL/TDMC-2). FORTRAN IV: IBM 3033.

CCC-424/SCALE

The latest development of this modular code system for performing standardized computer analyses for licensing evaluation has been packaged, a contribution of the Nuclear Engineering Applications Department of the Computer Sciences Division, Union Carbide Corporation Nuclear Division at the Oak Ridge National Laboratory. This new package is a follow-on to, and obsoletes, a prior release of 1980. The SCALE system was developed to satisfy a need for a standardized method of analysis for the evaluation of nuclear fuel facility and package designs and has the capability of performing criticality, shielding, and heat transfer analysis. Criticality safety analyses can be performed on one-dimensional and multi-dimensional problems. Control modules allow automatic cross-section preparation from any of three standard criticality cross-section sets followed by a criticality calculation via a one-dimensional discrete ordinates code or a Monte

Carlo code. Also, multi-dimensional shielding and heat transfer problems can be treated in a similar fashion. Other problems that can be solved by modules of the SCALE system include depletion calculations, spent fuel inventory, and afterheat calculations. Reference: NUREG/CR-0200(ORNL/NUREG/CSD-2) Vols. I, II, and III. FORTRAN IV and IBM ASSEMBLER; IBM 3033.

CCC-436/KENO-IVCRC

This revised multigroup Monte Carlo criticality code system contributed by Century Research Center Corporation in Tokyo, Japan was converted to run on the CRAY-1 computer from the IBM 360 version of KENO-IV which was contributed by the Oak Ridge National Laboratory. KENO-IV solves nuclear criticality eigenvalue problems. The results calculated by KENO-IV include k-effective, lifetime and generation time, region-dependent fluxes and region-dependent fission densities. Criticality searches can be made on unit dimensions or on the number of units in an array. KENO-IVCRC has several added features which include a neutron balance edit, PICTURE routines to check the input geometry, and a random number sequencing subroutine written in FORTRAN IV for CRAY-1.

PSR-107/THERMOS-OTA

This multigroup integral transport code package for thermal lattice calculations (using collision probability method for slabs and cylinders) was extended to include a CYBER 173 version (B). The new version was contributed by the Nuclear Engineering Laboratory, Technical Research Center of Finland. References: NEL-10 (January 1974) and NEL-7 (September 1973). FORTRAN IV and V; UNIVAC-1108 and CYBER 173.

PSR-151/CHENDF

The collection of handling codes for ENDF/B-V data has been augmented by the addition of LIST-FC, which was contributed by Oak Ridge National Laboratory, and the replacement of FIZCON with the version used at ORNL. The current code package contains RIGEL5, STNDRD, CRECT, CHECK5, FIZCN, INTEND, and RESEND5. The codes were originally developed at Brookhaven National Laboratory and were made operational and, in some cases, improved and upgraded at ORNL. References: User Input Instructions, informal notes. Earlier versions are documented in ENDF-110, *Description of the ENDF/B Processing Codes and Retrieval Subroutines.* IBM-370/3033.

PERSONAL ITEMS

Charles E. Newlon, formerly head of criticality safety at Union Carbide Nuclear Division's Oak Ridge Gaseous Diffusion Plant, is now associated with H & R Technical Associates, Oak Ridge, Tennessee as a staff consultant.

N. R. (Rick) Byrn, formerly of Science Applications, Inc., Huntsville, Alabama, is now Vice President of Research and Corporate Development of Nichols Research Corporation (NRC), Huntsville, Alabama. NRC is an optical analysis research and development company which has a major responsibility to maintain a nuclear weapons effects data base for the Ballistic Missile Defense Advanced Technology Center (BDMATC).

Prof. Walter Meyer has been appointed Niagara Mohawk Energy Professor at L. C. Smith College of Engineering at Syracuse University, Syracuse, New York. He was formerly head of the Department of Nuclear Engineering at University of Missouri-Columbia.

H. E. (Gene) Hungerford is retiring from Purdue University. After February 1, 1983, he will assume the post of Vice President of Nuclear Management, Inc., Vero Beach, Florida.

VISITORS TO RSIC

The following persons came to RSIC during the month of November to visit and/or to use RSIC facilities: *N. Ricky Byrn,* Nichols Research Corporation, Huntsville, Alabama; *Gary P. Schwaiger,* Georgia Tech, Atlanta; *Larry Bell,* Nuclear Regulatory Commission; *George Killough,* and *Rowena Chester,* ORNL; *Soju Suzuki,* Tokyo, Japan; *Tom Jordan,* JPL, Pasadena, California; and *Kojiro Nishina,* Nagoya University, Japan.

UPCOMING MEETINGS

Please note the following information about upcoming meetings.

1983 IEEE Call for Papers

A final call for papers has been issued for the

1983 IEEE 20th Annual Conference on Nuclear and Space Radiation Effects, to be held at the Sheraton Gatlinburg Hotel in Gatlinburg, Tennessee, July 18–21, 1983. The conference is sponsored by IEEE/NPSS Radiation Effects Committee and co-sponsored by the Defense Nuclear Agency/ the Department of Defense Jet Propulsion Laboratory/NASA, Sandia National Laboratories, Department of Energy/and Oak Ridge National Laboratory, Department of Energy. In addition to a program consisting of eight to ten sessions of contributed papers, several invited papers, and a poster session (July 19–21), a short course on radiation effects will be offered on July 18.

The conference will cover nuclear and space radiation effects and electromagnetic pulse effects on electronic devices, materials, circuits, and systems, as well as semiconductor processing technology and techniques for producing radiation-tolerant (hardened) devices, integrated circuits, and memories.

Papers describing significant findings in the following or related areas are solicited:

- Basic Radiation Effects Mechanisms for Materials and Devices
- Radiation Effects and Spacecraft Charging in Satellites
- Radiation Transport, Energy Deposition, Dosimetry, and Radiation Facilities
- Design Methods and Manufacturing Technology for Radiation-Hardened Electronic Devices, Integrated Circuits, and Systems
- Radiation Effects on Electronic Devices, Components, Integrated Circuits and Systems
- Single Event, Upset and Latchup Phenomena
- Hardness Assurance Technology and Testing Techniques
- Electromagnetic Pulse Phenomena (EMP, IEMP, SGEMP)
- Radiation-Hardened Instruments for Nuclear Power Plants
- New Developments and New Technologies of Interest to the Nuclear and Space Radiation Effects Community

For additional information contact E. F. Hartman, Div. 9336, 1983 NSRE Publicity Chairman, Sandia National Laboratories, Albuquerque, New Mexico 87185, USA; telephone 505-846-1749.

3rd Topical Meeting on Fusion Reactor Materials

The call for papers has been issued for the Third Topical Meeting on Fusion Reactor Materials to be held September 19–22, 1983, in Albuquerque, New Mexico.

Papers pertaining to materials understanding and applications are solicited. Areas of interest include: applications, behavior, degradation, modeling safety, properties, fabrication, compatibility, special purpose, handling, design trade-offs, plasma interactions, analytical studies, operational experience, and environmental impact. Abstracts describing new and original work are solicited. The abstract should indicate the relationship of the work to materials interest. Proceedings of the conference will be published. The meeting is intended to disseminate information, encourage exchange of ideas, and provide a forum for peer interaction. Papers will be in the form of invited oral presentations and poster presentations. The following schedule is set: suggestions for invited oral presentation to Committee, January 1, 1983; abstracts, camera-ready format, April 15, 1983.

An international Technical Program Committee is chaired by *D. M. Mattox* of Sandia National Laboratories, 505-844-7777 and the General Chairman is *M. J. Davis*, telephone 505-844-4164.

The meeting co-sponsors are the Office of Fusion Energy of the U.S. Department of Energy, the American Nuclear Society, the Nuclear Metallurgy Committee of the TMS/AIME, and the ASM.

Additional information may be secured from Mark J. Davis, Department 1830, Sandia National Laboratories, P.O. Box 5800, Albuquerque, New Mexico 87185 USA.

WATTec 10

WATTec will be held February 23–25, 1983, at the Hyatt Regency Hotel in Knoxville, Tennessee. The theme for WATTec 10th Annual Energy Conference & Exhibition is "Energy for the Future: A Call for Leadership." The American Nuclear Society, one of 29 national technical and professional societies sponsoring the conference, is using the program theme "Nuclear Energy Leadership — A Global Perspective," with speakers who are members of the nuclear community in various countries. Concurrent technical sessions will be featured throughout the three-day program except

for one afternoon which is dedicated to a public awareness symposium on the subject of Energy and the Economy, to be presented by speakers from government, academia, and the private sector. After each has given a report of his own country's nuclear program, all will participate in a panel discussion that should give an interesting insight into the role of nuclear energy in the world's energy future.

For more about ANS-WATTec contact:

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  Knoxville, Tennessee 37902 USA
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- Lillian T. Mashburn
  Public Information Chairman
  Public Relations Associations
  238 Peters Rd., Suite 101
  Knoxville, Tennessee 37923 USA
  Telephone 615-693-0485

Calendar Items

We call your attention to the following meetings.

January 1983

Sixteenth Midyear Topical Meeting of the Health Physics Society on Epidemiology Applied to Health Physics, January 9–13, 1983, Albuquerque, New Mexico. Contact: Albuquerque Convention and Visitors Bureau, Pat Logan, P.O. Box 26866, Albuquerque, New Mexico 87125.

February 1983

International Symposium on Beta Dosimetry and Measurement, February 15–17, 1983, Washington, D.C., sponsored by the U.S. Department of Energy, the Nuclear Regulatory Commission, the Institute of Nuclear Power Operations, and the American Health Physics Society. Contact: Thomas F. Gesell, Radiological and Environmental Sciences Lab., USDOE 550 2nd Street, Idaho Falls, Idaho 83401 USA; telephone 208-526-2270.

March 1983

Topical Meeting on Advances in Reactor Computations, March 28–31, 1983, Salt Lake City, Utah, sponsored by the American Nuclear Society. Contact: ANS, 555 N. Kensington Ave., La Grange Park, Illinois 60525; telephone 312-352-6611.

May 1983

7th International Symposium on Packaging and Transportation of Radioactive Materials (PATRAM), May 15–20, 1983, New Orleans, Louisiana, sponsored by Sandia National Laboratories, U.S. Department of Energy, and the Oak Ridge National Laboratory. Contact: R. B. Pope or G. C. Allen, Transportation Technology Center, Dept. 4780, Sandia National Laboratories, P.O. Box 5800, Albuquerque, New Mexico 87185 USA; telephone 505-844-3310.

6th International Conference on Radiation Shielding sponsored by Japan Atomic Energy Research Institute, May 16–20, 1983, Japan. Contact: Hiroshi Ishikawa, Tokai Research Establishment, Japan Atomic Energy Research Institute, Tokai-mura, Naka-gun, Ibaraki-ken, Japan 319-11.

June 1983

ANS Annual Meeting, June 12–17, 1983, Detroit, Michigan, sponsored by the American Nuclear Society. Contact: Walter J. McCarthy, Jr., Detroit Edison Co., 2000 2nd Ave., Detroit, Michigan 48226; 313-237-8800.

May 1984

International Radiation Protection Association (6th Congress and exhibition), Berlin (West), Federal Republic of Germany, May 7–12, 1984. Contact: R. Neider, Bundesanstalt für Materialprüfung (BAM), Unter den Eichen 87, D-1000 Berlin 45.

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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RADIATION SHIELDING INFORMATION CENTER
PART I
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The *RSIC Newsletter* carries information about RSIC products and services. Do you wish to continue to receive it? ____. If so, please fill out the form below as completely as possible and mail it immediately. We will remove from the distribution list the names of those not responding on or before March 1, 1983. Please print or type the name and mailing address. Use additional paper as necessary.

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

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D. Organization/institution type: For United States installation, please indicate your source of financial support; if more than one sponsor, indicate proportionate fraction of time spent on each. This information is essential.

DOE - Breeder	___%	Defense Nuclear Agency	___%	NRC	___%
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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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