

RSIC Newsletter



RADIATION SHIELDING INFORMATION CENTER

OAK RIDGE NATIONAL LABORATORY

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Truth as old as the hills is bound up in the Latin proverb, "Necessity is the mother of invention." It is surprising what a man can do when he has to, and how little most men will do when they don't have to.

... Walter Linn

PROCEEDINGS OF FIFTH INTERNATIONAL CONFERENCE ON REACTOR SHIELDING AVAILABLE

The Proceedings of the Fifth International Conference on Reactor Shielding is scheduled to be off the press early in December. A copy will be mailed directly to each participant by the publisher and should be received in the USA by the end of December. The document, published in soft cover and approximately 1000 pages in length, contains a total of 105 papers on shielding and radiation protection.

Copies may be ordered from Science Press, 8 Brookstone Drive, Princeton, New Jersey 08540, USA, for \$60. (RSIC Newsletter subscribers will be offered a 25% discount by the publisher).

ESIS NEWSLETTER HAS NEW LOOK

The readers of the ESIS Newsletter, published by the European Shielding Information Service (ESIS) since 1972, have been pleased with the new format of the publication. It came following a recent reorganization (see *Personal Items*) which brought in a new editor, Helmut W. M. Braun. Coverage includes descriptions of shielding groups and their work and problems, news from the European Communities, conferences and meetings, and analyses of current literature on shielding.

As a part of the ESIS-RSIC collaboration, we excerpt from and use digests of each other's newsletters in a complementary fashion. For those who might want to see the ESIS Newsletter firsthand, we refer you to the editor, Joint Research Center - Ispra Establishment, 21020 Ispra (VA), Italy, for information.

READERS COMMENT ON PROPOSED RSIC SEMINAR WORKSHOPS

Approximately 80 responses were received as a result of the RSIC Newsletter query to get an indication of interest and need in each of two specific areas: multigroup cross sections and sensitivity and uncertainty methodology. The RSIC "seminar-workshop" was conceived as an educational tool for disseminating state-of-the-art expertise. This survey sampling of the RSIC user community indicates there is sufficient interest for holding both proposed sessions in FY 1978. Several conclusions may be drawn from the responses received.

Seminar-Workshop I, Multigroup Cross Sections

Approximately half the respondents indicated an interest in attending a session on multigroup cross sections and all stated that it was needed at this time.

Three options were offered for the workshop to be included along with the seminar: a workshop on a multigroup generating code system, a workshop on multigroup library manipulation and retrieval, and a combination of the above two choices. Eight percent favored the workshop on a multigroup generating code system, thirty-two percent favored the data handling workshop idea, and forty-six percent preferred a combination. In general, the responses indicate a need for a seminar-workshop in this area. The question of the form of the workshop to be held will be studied to determine the feasibility of designing one to be a combination of both multigroup generation and multigroup library manipulation.

IF YOU CHANGE YOUR ADDRESS, please notify us (including Building and Room No. where needed). *Third Class Mail* is returned to us at our expense if the addressee has moved. If your mail is returned, your name will be deleted from our distributions until we hear from you.

Seminar-Workshop II, Sensitivity and Uncertainty Methodology

About 40 respondents directed their attention to this possibility. In general the comments may be summarized as follows.

- a. There seems to be substantial interest in the user community, spanning a wide range of interests including propagation of uncertainties, cross-section unfolding, development of covariance files, cross-section accuracy requirements, data adjustment, channel theory, etc.
- b. Aside from the "pros", the user community appears to have a need to know the very basics of what we are talking about, giving the indication that the seminar should be brief and very fundamental with emphasis on education to the newcomer in the field. Their comments further indicate that the workshop should be central to the meeting, presenting enough examples and use of methods to educate the novice in current capability. If the seminar becomes "high level", the workshop (at least) should be very basic and simple, e.g., J. F. Scales, KAPL, would like a discussion of how the general user can make sensitivity and uncertainty checks, including the availability of calculational benchmarks and corresponding experimental data.

Two respondents urged that the seminar workshops be scheduled back-to-back in order for interested attendees to more easily participate in both. C. R. Weisbin, ORNL Neutron Physics Division, who carries the lead for the Sensitivity and Uncertainty Methodology (Seminar-Workshop II), feels that this would be impractical and states, "This subject (SW-II) by itself is enormous and would be difficult to convey if the period of time were reduced or people got tired." He further feels that the subject should not be restricted to "shielding"; that it warrants wider treatment; and that a wider audience should be reached. Your comments, in writing or by telephone, will be appreciated.

We will direct our efforts towards giving more detailed information in the next issue of the newsletter, including the dates for each seminar-workshop. For those requiring long leadtime in preparing travel arrangements, tentative dates selected are late March 1978 (I) and July-August 1978 (II).

NEWS OF UPCOMING CONFERENCES

ASIS-78: The 41st Annual Conference of the American Society for Information Science (ASIS) will be held in New York City, November 13-17, 1978. A Call for Papers has been issued for: *The Information Age in Perspective* for sessions on I Collection, Generation, and Analysis of Information; II Dissemination of Information; and III Information for Decision Making and Control. Detailed information may be secured from the ASIS-78 Technical Program Chairman, Everett H. Brenner, American Petroleum Institute, 275 Madison Ave., New York, N.Y. 10016.

ANS Topical: A National Topical Meeting on "Probabilistic Analysis of Nuclear Reactor Safety," will be held May 8-10, 1978, in Los Angeles, California, USA. The meeting is sponsored by the ANS Nuclear Reactor Safety Division and the Los Angeles Section of the ANS in conjunction with the European Nuclear Society. Papers will be given on the following topics: methodology for probabilistic analysis; data bases for probabilistic analysis; interpretation of actual events; meaning of ultra-low probabilities; human factors; common mode and multiple cause correlated failures; external events including natural phenomena; applications of methodology to specific systems; applications of methodology in design; probabilistic treatment of accident analysis; probabilistic treatment of accident consequences; risk-acceptance criteria in society; risk from alternative energy systems; cost-benefit comparisons of alternate approaches to nuclear safety; and probabilistic safety analysis in the nuclear fuel cycle. It is anticipated that Special Sessions will be held on the following: Use of Probabilistic Methods in Reactor Licensing, Non-Nuclear Risks, and Socio-Psycho-Economic Views of Risk-Benefit. For additional information, contact General Chairman,

Eugene N. Cramer, Southern California Edison, Box 800-Room 447, Rosemead, CA 91770, USA, (213-572-2784); or Technical Program Chairman, David Okrent, 5532 Boelter Hall, University of California, Los Angeles, CA 90024, USA, (213-825-3259).

The Fifth International Symposium on Packaging and Transportation of Radioactive Materials will be held on May 7-12, 1978, Las Vegas, Nevada, USA, under the sponsorship of Sandia Laboratories, Albuquerque, New Mexico, and the U.S. Department of Energy. Papers are expected to be given on major topics in packaging and transportation technology including: local, national, and international regulations; regulatory requirements and licensing experience; accident experience; safeguards and safety; economics, risk assessment and risk benefit analysis; traffic management and transportation insurance; systems studies, projections, and innovations; environmental impact; public acceptance and assessment; isotope, unirradiated fuel, spent fuel, and waste packaging and transportation systems; technology development, research, testing, and new concepts in structures, impact, heat transfer, *shielding*, criticality, quality assurance, and nondestructive evaluation. Further information may be secured from Program Chairman, Ronald B. Pope, Transportation Safety Technology Division (5433), Sandia Laboratories, Albuquerque, NM 87115, USA.

The First Topical Meeting on Fusion Reactor Materials will be held at the Americana of Bal Harbour, Miami Beach, Florida, January 29-31, 1979, under sponsorship by the American Nuclear Society, the Division of Magnetic Fusion Energy of the U.S. Department of Energy (DOE), the Electric Power Research Institute (EPRI), and the Nuclear Metallurgy Committee of AIME and ASM. The opening session of the conference will consist entirely of invited papers and will be devoted to "Design Reviews and Systems Studies." The remaining conference sessions will be composed of invited and contributed papers in subject areas: Systems Studies—materials comparisons and the impact of material properties on power generation; Plasma-Material Interface—the behavior of surfaces facing the plasma, including such special protective components as curtains, coatings, etc.; Blanket Structural Materials—radiation effects structural properties, physical properties, compatibility with coolant or breeding fluids; Special Purpose Materials—insulators, breeders, neutron multipliers, tritium barriers, laser and beam-transmission materials, fuel pellets, materials for hybrid systems; Magnet Materials—conductors, stabilizers, structures and insulators for magnet systems; and Analytical Studies and Modeling—materials response in fusion systems. Papers will be stimulated and selected to insure full coverage of these important materials topics, with emphasis on the reporting of new results. The conference language is English. The conference proceedings will be published for timely distribution of the presented papers. Authors' tentative titles must be submitted by May 1, 1978. Additional information may be secured from Technical Program Chairman, J. L. Scott, Oak Ridge National Laboratory, P. O. Box X, 4500SM, S178, Oak Ridge, TN 37830, USA.

PERSONAL ITEMS

William A. Anders, most recently U.S. ambassador to Norway and former U.S. Nuclear Regulatory Commission Chairman and astronaut, has been named general manager of the Nuclear Energy Products Division of the General Electric Company. He will be responsible for BWR fuel, reactor equipment, and control and instrumentation manufacturing at both Wilmington, N.C., and San Jose. Since early in his career (15 years ago) he was the RSIC installation coordinator at the Air Force Weapons Laboratory in New Mexico, we take a special interest in his activities.

Rodolphe Nicks, an experienced shielding specialist and founder of the European Shielding Information Service (ESIS) which was established at the Euratom Joint Research Centre—Ispra, Italy in March 1972, has recently enlarged his activities, but shielding continues as part of his work. As director of the Division of Information Analysis and Data Management, he is responsible for Scientific and Administrative Data Management (Data Base Systems), Pattern Recognition and Image Processing, Applied Mathematics, Nuclear Codes and Data Evaluation (which includes ESIS). **Herbert Rief** manages ESIS and **Helmut W. M. Braun** is responsible for the ESIS Newsletter. **Giusseppe Perlini**, shielding experimentalist, is head of the

ESIS shielding data bank. **Hans Penkuhn** deals with photon transport problems and with ESIS group cross section libraries.

Anthony R. (Tony) Buhl has left the Oak Ridge Clinch River Breeder Reactor Project (CRBRP) to direct the Division of Probabilistic Analyses, Office of Nuclear Regulatory Research of the U. S. Nuclear Regulatory Commission. This is a new division established to promote the analysis of risks in the operations of nuclear reactors. Buhl was involved in radiation transport studies early in his career.

CHANGES IN THE COMPUTER CODE COLLECTION

The following changes were made in the computer code collection during the month of November.

CCC-203/MORSE

The IBM version (CCC-203C) of the general purpose Monte Carlo multigroup neutron and gamma-ray transport code system was updated to include improvements related to running albedo problems and to increase calculational speed for complicated geometric models. These changes were suggested by the ORNL contributors. Details of the update are available from RSIC.

CCC-217/ORIGEN

In September 1977 Newsletter, in the change noted for ORIGEN, within quotes which open at the beginning of the 5th line of the paragraph, "(I)" which is found at the end of the quote should read "(L)". The corrected line reads "XDOTI = D(L)*XTEM(L)." This error was brought to RSIC attention by Charles Kee of ORNL.

CHANGES IN THE DATA LIBRARY COLLECTION

A change was made to the following data packages.

DLC-31/(DPL-1/FEWG1)

A data set for barium was added to the 37 neutron, 21 gamma-ray group (DNA Few Group Cross Sections) library in ANISN format. In addition, some corrections were made to the neutron thermal group kerma factors for individual elements as well as for the neutron free-in-air tissue kerma. (These kerma values are contained on a "dummy" material which also includes some other response functions). We are grateful to D. Kaul, SAI—Chicago, for pointing out the problem with the thermal group kermas and to J. Pace of ORNL for making the corrections. The new version is designated DLC-31/(DPL-1F).

DLC-41/VITAMIN-C

The 171 neutron, 36 gamma-ray group cross section library has been updated by Oak Ridge National Laboratory to correct some cross sections and add data for some additional materials. Neutron cross sections in AMPX interface format for Mo, Pu-238, Pu-239, and Am-241 were recalculated to improve the cross sections generated for the resonance region. Neutron cross sections for twenty-five additional materials were added to the library. In addition to the above, a gamma-ray production data set for Sn was corrected and gamma-ray interaction cross sections for Cl and Ba were added.

VITAMIN-C was generated from data in ENDF/B-IV and the LENDL libraries using the ORNL version of MINX for neutron cross sections and self-shielding factors and the AMPX system for gamma-ray production and interaction cross sections. The materials included in the library are H-1, H-2, H-3, He-3, He-4, Li-6, Li-7, Be-9, B-10, B-11, C-12, N-14, O-16, F, Na-23, Mg, Al-27, Si, P-31, S-32, Cl, K, Ca, Ti, V, Cr, Mn-55, Fe, Co-59, Ni, Cu, Zr, Zirc-z, Nb-93, Mo, Ag-107, Ag-109, Cd, Sn, Ba-138, Eu-151, Eu-153, Ta-181, W-182, W-183, W-184, W-186, Pb, Th-232, U-233, U-234, U-235, U-236, U-238, Np-237, Pu-238, Pu-239, Pu-240, Pu-241, Pu-242, and Am-241.

This updated version is designated DLC-41B. Transmittal of the data package can be made on four reels of magnetic tape written 9-track, 800 bpi. Requesters having different tape-writing requirements should contact RSIC to discuss transmittal.

Sample problems are provided in the data package. The library utilizes various modules from the AMPX system, but these are no longer packaged as part of DLC-41. It is recommended that modules from the new version (AMPX-II) be used with DLC-41B. Many improvements to modules such as AIM, BONAMI, and MALOCS have been made and these new versions will be a part of AMPX-II, scheduled for release in December 1977. A subset of AMPX-II, containing various modules for manipulating multigroup libraries in AMPX interface format, will also be packaged in December. References: ORNL-RSIC-37, ORNL/TM-3706. Watch the January issue of the RSIC Newsletter for announcement of availability of these code packages.

VISITORS TO RSIC

The following persons came for an orientation visit and/or to use RSIC facilities during the month of November:

H. G. F. Behrens, Zentralstelle für Atomkernenergie Dokumentation, Karlsruhe, FR Germany; Felix E. Chukreev, Kurchatov's Atomic Energy Institute, Moscow, USSR; Thomas E. Eaton, University of Kentucky, Lexington, KY; R. L. Haese, Nuclear Data Projects, ORNL; I. A. Kondurov, Leningrad Nuclear Physics Institute, Leningrad, USSR; A. B. McIntyre, Bureau of Radiological Health, Derwood, MD; Robert E. Miles, Louisiana State University, Baton Rouge, LA; Raymond L. Murray, North Carolina State University, Raleigh, NC; G. Reffo, Centro Di Calcolo del CNEN, Bologna, Italy; Leonid L. Sokolovskij, IAE, Moscow, USSR; Jehudah Wagschal, Hebrew University, Jerusalem, Israel; and Samuel M. Zivi, Institute for Energy Analysis, Oak Ridge, TN.

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 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.

REACTOR AND WEAPONS RADIATION SHIELDING LITERATURE

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