RSIC Newsletter

Oak Ridge National Laboratory
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Nothing in progression can rest on its original plan. We might as well think of rocking a grown man in the cradle of an infant.—Burke

Presenting...

Periodically the newsletter introduces the Radiation Shielding Information Center (RSIC) staff to our readers. As a result several of our clients have commented that they find it useful when talking to a staff member. Below is a photograph of the current staff taken for use in a history of the division.

The RSIC staff, standing from left to right: Jennie Manneschmidt, John E. White, Betty McGill, Barbara Snow, R. W. Roussin, Sheila Taylor, Noel Cramer; seated: Nancy Hatmaker, Bernadette (Bernie) Kirk, Carol Coker, Alice Rice, and Betty F. Maskewitz.

R. (Bob) W. Roussin has been RSIC director since 1983. In April 1988, he became director of the Engineering Physics Information Centers (EPIC), the umbrella organization under which RSIC functions. Roussin first joined the RSIC staff in 1968 to coordinate data activities and was largely responsible for the development of the Data Library Collection (DLC). One of Bob's hobbies is running, an activity he puts to good use chasing down sponsors.

Barbara J. Snow has taken care of RSIC's secretarial needs since joining our staff in 1991. She had previously worked in the Atmospheric Sciences Section of the Energy Division.

Nancy A. Hatmaker assists Bob with personnel and administrative responsibilities. In addition she coordinates incoming and outgoing requests for information and incoming contributions.

Jennie Manneschmidt coordinates the flow of incoming technical contributions during testing and packaging. She also responds to troubleshooting inquiries related to packaged computing technology. Jennie is currently working on a part-time basis.

Bernadette L. Kirk does some codes testing and troubleshooting in addition to coordinating overall systems and applications programming in the constantly changing computing environment.

Sheila Y. Taylor coordinates the acquisition and reproduction of the codes/data library documentation and maintains our literature data bases.

Alice F. Rice serves as the editor of the *RSIC Newsletter* and several other periodic and non-routine publications.

Carol P. Coker is the person most responsible for computer code/data transmittal activities.

John E. White is responsible for applied nuclear data development. He works closely with CSEWG.

S. Noel Cramer is on loan from RSIC to the Safety Analysis Report for Packaging Project. He is frequently called upon to use his expertise in Monte Carlo techniques, especially with the MORSE and MCNP transport code systems.

Betty McGill is the Martin Marietta Energy Systems, Inc., coordinator for the ESTSC. She is attached administratively to RSIC. Before assuming her duties as ESTSC coordinator she had worked for RSIC in various capacities.

ORAU Facilities Given New Name

In order to provide a clear distinction between the management and operating (M&O) contractor and the facility managed, the Oak Ridge Associated Universities facility has been renamed Oak Ridge Institute for Science and Education (ORISE). All activities funded through the M&O contract will be conducted under the ORISE name. Dr. James Drewry will oversee its five division as well as the University Isotope Separator at Oak Ridge (UNISOR).

Dr. Jon Veigel continues to direct Oak Ridge Associated Universities. ORAU's responsibilities include ensuring that ORISE operations meet the letter and spirit of the M&O contract with the U.S. Department of Energy, managing the activities ORAU carries out with and for its university consortium members, and managing all other corporate activities.

Founded in 1946 as the Oak Ridge Institute of Nuclear Studies, ORAU's mandates were clear: to train university researchers in the use of radioisotopes and to act as liaison between the southern universities and what has become the Oak Ridge National Laboratory. These original tasks continue along with an expanded list of programs and capabilities. ORAU has grown from its original 14 southern institutions to include 62 doctorate-granting colleges and universities. The corporation and university consortium continues to offer educational and research opportunities, and coordinates collaborative alliances in science and technology.

ORISE offers an integrated, scientific approach to basic research, applied research, and analysis, technical assistance and assessment, education and training, and program management. In addition to its Oak Ridge operations, ORAU has offices in Washington, Grand Junction, Colorado, and Aiken, South Carolina. The combined annual budget for both ORAU and ORISE is more than $65 million and the staff numbers almost 700.

CHANGES TO THE COMPUTER CODE COLLECTION

Seven changes or additions were made to the computer code collection. Four new code systems were packaged and added, two existing code packages were replaced with newly frozen versions, and one code package was replaced with a corrected version.

CCC-200/MCNP 4.2

The personal computer version of this general purpose Monte Carlo neutron and gamma-ray transport code system was replaced by Experimental and Mathematical Physics Consultants (EMPC), Gaithersburg, Maryland. MCNP 4.2 executables were created using the limited NDP stack (/Q1) compiler switch because the default infinite NDP stack (/nQ1 switch used in the previous release) caused some 486 PCs to hang or produce erroneous answers on MCNP4 photon/electron calculations. A break capability and other minor improvements were made in this release.

This release requires an 80486 or 80386 computer with an 80387 coprocessor. It runs under DOS or in the DOS box of Windows 3.0 and 3.1. Executables can also run in background under Windows. The Lahey Fortran Compiler F77L-EM/32, Version 5.0 with the PharLap DOS extender were used to create executables for 4, 8, and 16 Mbyte memory configurations.

The personal computer version is distributed on 20 DS/HD (1.2 MB) diskettes. The mainframe version (A) of MCNP 4.2 is written in Fortran 77

and runs on Cray computers, IBM mainframes, UNIX workstations, VAX computers and all computers in general with at least 90 megabytes of hard disk space. The mainframe package is available on either one 6250 9-track tape or one DC 6150 cartridge tape (150 MB). References: Command Summary (Sept. 1991), LA-7396-M, Rev. 2 (September 1986, Revised April 1991), MCNP3B Newsletter (July 1988), MCNP4 Newsletter (April 1991), and informal notes. Fortran 77; Cray, IBM, UNIX workstations, VAX (A); PC 386 (B).

CCC-602/SMART MICRO

Brookhaven National Laboratory, Upton, Long Island, New York, contributed the SMART code system, developed under sponsorship of the U. S. Nuclear Regulatory Commission. SMART calculates early offsite consequences from nuclear reactor accidents. Once the air and ground concentrations of the radionuclide are estimated, the early dose to an individual is calculated via three pathways: cloudshine, short-term groundshine, and inhalation. The model predicts time-integrated air concentration of each radionuclide at any location from release as a function of time-integrated source strength using the Gaussian plume model. The solution procedure involves direct analytic integration of air concentration equations over time and position.

CCC-419/CRAC2 and CCC-546/MACCS are currently used to calculate severe accident risk by the U. S. Nuclear Regulatory Commission and their contractors. SMART also provides the capability to address modeling and health consequence assumptions in the various models. SMART performs dose calculations in the same manner as either CRAC2 or MACCS. The health effects models from both CRAC2 and MACCS are included for calculating early fatalities, and the MACCS health effects model for early injuries is also included. The computing time requirements for a typical calculation on a mainframe computer using this model are two orders of magnitude lower than those of CRAC2 and MACCS codes, thus providing a valuable tool for sensitivity and uncertainty studies.

SMART runs on IBM PC or compatible computers under DOS and VAX mainframe computers running VMS. The program is interactive. The executable included in the package was created with the IBM PROFORT compiler. The Microsoft Version 4.01 compiler was used for testing at RSIC. The source, executable, data files and sample output are distributed on one DS/HD (1.2 or 1.44 MB) diskette. Reference: NUREG/CR-5164, BNL-NUREG-52153 (July 1988). Fortran 77; IBM PC and VAX.

CCC-604/CHAINS

General Electric Corp., Cincinnati, Ohio, under sponsorship of DOE-NE and National Energy Software Center, Argonne, Illinois, through the DOE Energy Science and Technology Software Center, Oak Ridge, Tennessee, contributed this code system to analyze radioactive decay chains. CHAINS computes the atom density of members of a single radioactive decay chain. The linearity of the Bateman equation allows tracing of interconnecting chains by manually accumulating results from separate calculations of single chains. Reentrant loops can be treated as extensions of a single chain. Losses from the chain are also tallied. CHAINS runs on IBM PC or compatible computers under DOS. The executable included in the package was created with the Lahey F77L compiler. The source, executable, sample input and output are distributed on one DS/DD diskette. Reference: GEMP-490 (March 1967). Fortran 77; IBM PC.

CCC-609/SIXTUS-3

The Paul Scherrer Institüt, Villigen, Switzerland, and Osaka University, Japan, contributed this

three dimensional nodal diffusion code system in hex-z geometry. SIXTUS-3 is a 3D extension of SIXTUS-2 and is based on a response matrix nodal model. The code offers a fast and accurate analysis of critical systems in the regular hex-z geometry with the multigroup cross section representation including arbitrary upscattering. SIXTUS-3 runs on VAX/VMS, Cray/ UNICOS and SUN/UNIX computers. Either UPDATE, HISTORIAN or PSR-245/UPEML is required. RSIC used UPEML to create the Fortran 77 source for Sun workstations and included it in the package. The package is distributed on one DS/HD (1.2 or 1.44 MB) diskette. References: Swiss PSI Report 102 (1991) and PSI Memo TM-40-90-06/Rev. (1991). Fortran 77; VAX, Cray and Sun.

PSR-171/NJOY91.38

Los Alamos National Laboratory, Los Alamos, New Mexico, has contributed a newly frozen version of this code system for producing pointwise and multigroup cross sections from ENDF/B evaluated nuclear data, including ENDF/B-VI. NJOY91 can work with neutrons, photons, and charged particles and can produce libraries for a wide variety of particle transport and reactor analysis codes. This new release, designated NJOY91.38, includes bug fixes, improvements in several modules, and some new capabilities. Information on the changes is included in the README file.

Two major changes in this release include update 15, which was required to calculate the correct cross section value at the center of a resonance for ENDF/B-VI evaluations of iron, nickel, and chrome and update 31, which was required to calculate correct photon heating factors. UPD, Version 1.2, a portable version-control program, is included in the package to implement and maintain NJOY91.

The code runs on Cray/UNICOS, Cray/CTSS, IBM, VAX/VMS, and Sun workstations. The package is transmitted on either 1 DC 6150 (150 MB) cartridge tape in TAR format or on 5 DS/HD (1.2 MB) diskettes in compressed mode to be read by DOS. References: Unpublished document (February 1991), LA-12057-MS (March 1991), LANL Memo T-2-L-10991 (June 1987), LA-9303-M (ENDF-324), Vol. I (May 1982), Vol. II (May 1982), Vol. III (October 1987), Vol. IV (December 1985), LA-UR 89-2057 (June 1989), LANL Memo T-2-L-10991 (June 1987), and Informal documents (April 1992 and May 1992). Fortran 77; Cray (CTSS & UNICOS), VAX/VMS, SUN/UNIX.

PSR-313/INFLTB

The Cleveland Clinic Foundation, Cleveland, Ohio, ORNL, and the National Institute of Standards and Technology (NIST), Gaithersburg, Maryland, contributed this code system to calculate gamma-ray absorption coefficients. INFLTB calculates mass energy transfer and mass energy absorption coefficients between 1 keV and 100 MeV for 29 elements and 14 mixtures and compounds of general dosimetric interest. Corrections are included for in-flight positron annihilation, previously not applied in NIST calculations for energies above 10 MeV. INFLTB is written in Fortran 77 and runs on a PC 386 with a math coprocessor and on the Vax family of computers under the VMS operating system. The PC executable included in the package was created with the Microsoft Version 5.0 compiler. The package is distributed on 1 DS/HD (1.2 MB) diskette. References: NISTIR 4812 (March 1992). Fortran 77; VAX and PC.

PSR-315/AMPX77

A newly frozen version of this modular code system for generating multigroup or pointwise cross-section libraries was contributed by the Computing and Telecommunications Division of

Oak Ridge National Laboratory under sponsorship of DOE-NE, DOE-AT, and the Defense Nuclear Agency (DNA). Starting with ENDF/B-IV or ENDF/B-V formatted nuclear data files, or with previously generated, pseudo problem-independent fine-group, problem dependent fine- or broad-group, or pointwise cross-section libraries, the system includes a full range of features needed to: (1) produce multigroup neutron, gamma-ray production, and/or gamma-ray interaction cross-section data, (2) resonance self-shield, (3) spectrally collapse, (4) convert cross-section libraries from one format to another format, (5) execute a one-dimensional (1-D) discrete-ordinates calculation, and (6) perform miscellaneous cross section operations. AMPX-produced cross sections can be used with radiation transport codes such as ANISN, TORT-DORT, FORSS, KENO-V.a, MORSE, SCALE, SWANLAKE, XSDRN, and VENTURE.

A program to convert the source files between IBM and Cray is included to facilitate code conversion. The IBM version was compiled under OS/VS2 using the IBM VS compiler (Level 2.2.0) and Assembler level H on an IBM 3090 computer. The Cray version was tested using CFT77 on a Cray X-MP under UNICOS version 6 and is written in Fortran 77, with the exception of one C routine.

The package requires 4 HD diskettes for transmittal. These files are configured to run on the IBM. Alternately the files are available on a DC 6150 cartridge tape in tar format for Cray users. These files have already been processed by the conversion program for Cray use. References: ORNL/CSD/TM-283 (Draft July 1992). Fortran 77 and Assembler for IBM and Fortran 77 and C for Cray.

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.

Butler Named Outstanding Woman Leader — *Margaret Butler*, who recently retired from Argonne National Laboratory, was named Outstanding Woman Leader of DuPage County, Illinois, in the area of science, technology, and health care by the YWCA DuPage District on May 14, 1992. Butler, the first woman to be named an ANS Fellow, was director of the National Energy Software Center at Argonne when she retired.

John W. Landis was awarded the American National Standards Institute's Howard Coonley Medal on March 30 in recognition of his service to the nation as the driving force behind the development of consensus standards for the application and regulation of nuclear power. Landis, an ANS Fellow and past president, has been active for many years in voluntary standards development for the energy industry. He has served ANSI as its director, its chair, chair of its Nuclear Standards board and its Nuclear Standards

Visitors to RSIC

During the month the following persons came for an orientation visit and/or to use RSIC facilities: *Moshe Goldstein*, Nuclear Research Center-Negev, Beer-Sheva, Israel, *Paige Zielinski* and *W. Culbreth*, from the University of Nevada-Las Vegas; and *Joe Geneczko*, U.S. Department of Energy, Washington.

Policy Committee. Landis is senior vice president and a director of Stone & Webster Engineering Corporation.

S. Tanaka Heads Shielding Lab at JAERI — *Dr. Tomo-o Suzuki* has informed RSIC that upon his retirement from the Japanese Atomic Energy Research Institute on April 1, 1992, **Dr. Shun-ichi Tanaka**, accepted an appointment as head of the Shielding Laboratory.

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.

REAC/TS Offers Radiation-Accident Courses

The **R**adiation **E**mergency **A**ssistance **C**enter/**T**raining **S**ite (REAC/TS) in Oak Ridge, Tennessee, offers several courses in the handling of radiation accidents. A brief description of the courses follows.

Handling of Radiation Accidents by Emergency Personnel is a 3½-day course designed for emergency room nurses and physicians who may need to administer initial hospital aid to a radiation accident victim. Lectures, complemented by demonstrations, laboratory exercises, and a simulated radiation accident drill, will emphasize the handling of the victim. Discussions include the fundamentals of radiation, detection and measurement, prevention of the spread of contamination, dose reduction for the victim and attending personnel, and the role of the medical physicist in caring for contaminated accident victims.

Occupational Health in Nuclear Facilities is a 4½-day course for nurses, physicians, and others who provide occupational health care to employees of government nuclear facilities. Information will be given on basic radiation sciences, health surveillance and evaluation, on-site emergency management of injuries, and medical implications of chemical, physical, biological, social, and psychological stresses on the ability to work. Inter-departmental relationships and medical, legal, and ethical issues will also be discussed.

Health Physics in Radiation Accidents is a 4½-day course for health physicists and radiation protection technologists who may be called upon to respond to accidents involving radioactive materials and injury to personnel. The major topics are radiological emergency procedures and the role of the health physicist in a medical environment.

Medical Planning and Care in Radiation Accidents, a 4½-day course designed for physicians, presents an advanced level of information on diagnosis and treatment of acute local and total body radiation exposure, internal and external contamination, combined injuries, and multi-casualty incidents involving ionizing radiation.

The dates the courses will be offered and registration information may be obtained from Pat Cooley, Registrar, REAC/TS, Oak Ridge Inst. for Science and Technology, P.O. Box 117, Oak Ridge, TN 37831-0117 (phone 615-576-3131, FTS 626-3131).

Calendar

Your attention is directed to the following events of interest.

August 1992

Spectrum 92: ANS Topical Meeting on Nuclear and Hazardous Waste Management, Aug. 23–27, 1992, Boise, Idaho. Contact: Technical Program Chair Dieter Knecht, WINCO, P.O. Box 4000, MS-5213, Idaho Falls, ID 83403 (phone 208-526-3627).

Low Level Radioactive Waste Management, Aug. 31–Sept. 4, 1992, Atlanta, a short course sponsored by Georgia Tech Continuing Education. Contact: Dept. of Continuing Education, Georgia Institute of Technology, Atlanta, GA 30332-0385 (phone 404-894-2547).

September 1992

IRRMA '92, Topical Meeting on Industrial Radiation and Radioisotope Measurement Applications, Sept. 8–11, 1992, Raleigh, North Carolina. Contact: William F. Troxler, Troxler Electronic Laboratories, Inc., P.O. Box 12057, Research Triangle Park, NC 27709 (phone 919-549-8661).

Risk Analysis in Occupational & Environmental Health, Sept. 9–11, 1992, Boston, Massachusetts, a short course offered by Harvard School of Public Health. Contact: Mary F. McPeak, Assoc. Dean for Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-432-1171; Fax 617-432-1969).

8th International Meeting on Radiation Processing, Sept. 14–19, 1992, Beijing, China, sponsored by the International Atomic Energy Agency. Contact: International Meeting on Radiation Processing, P.O. Box 1012 (30), Beijing 100 822, China.

Introduction to Radiation Protection, Sept. 21–25, 1992, Cambridge, Massachusetts, a short course sponsored by Arthur D. Little, Inc. Contact: Paul H. Jones, Jr. or David J. Allard, Arthur D. Little, Inc., 20 Acorn Park, Cambridge, MA 02140-2390 (phone 617-864-5770).

6th Annual INEL Computing Symposium, Sept. 22–24, 1992, Idaho Falls. Contact: Teri Williams, EG&G Idaho, Inc., P.O. Box 1625, Idaho Falls, ID 83415-2602 (phone 208-526-9728).

Regulatory Control of Radioactive Effluents, Sept. 22–25, 1992, Portland, Oregon, a technical short course. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751; Fax 301-990-6153)

Emergency Planning for Fixed Nuclear Facilities, Sept. 29–Oct. 2, 1992, Cambridge, Massachusetts, a short course sponsored by Arthur D. Little, Inc. Contact: Paul H. Jones, Jr. or David J. Allard, Arthur D. Little, Inc., 20 Acorn Park, Cambridge, MA 02140-2390 (phone 617-864-5770).

14th International Conference on Plasma Physics and Controlled Nuclear Fusion Research, Sept. 30–Oct. 7, 1992, Wuerzburg, Germany, sponsored by the International Atomic Energy Agency. Contact: IAEA, Conference Service Section, P.O. Box 100, A-1400 Vienna, Austria.

October 1992

International Symposium on Nuclear Data Evaluation Methodology, Oct. 12–16, 1992, Upton, New York, sponsored by Brookhaven National Laboratory. Contact: C. L. Dunford, Brookhaven National Laboratory, NNDC/197D, Upton, New York 11973.

Radioactive Waste Management, Oct. 19–23, 1992, Kansas City, Missouri, a technical short course. Contact: Woodson Assoc., Inc., P.O.

Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751; Fax 301-990-6153).

MicroShield, MicroSkyshine, RadDecay Workshop, Oct. 21–23, 1992, Rockville, Maryland, sponsored by Grove Engineering. Contact: Diane Snee, Grove Engineering, Inc., 15215 Shady Grove Road, Rockville, MD 20850 (phone 301-258-2727; Fax 301-330-5462).

Selection and Preparation of Witnesses for Environmental Litigation, Oct. 22–23, 1992, a course sponsored by the University of Texas at Austin. Contact: Continuing Engineering Studies, The University of Texas at Austin, College of Engineering, ECJ 10.324, Austin, TX 78712 (phone 512-471-3506, Fax 512-471-0831).

Analysis of Radioactive Environment Samples, Oct. 27–30, 1992, Atlanta, a short course sponsored by Georgia Tech Continuing Education. Contact: Dept. of Continuing Education, Georgia Institute of Technology, Atlanta, GA 30332-0385 (phone 404-894-2547).

November 1992

Radiation Physics Conference, Nov. 14–18, 1992, Kena, Egypt. Contact: Prof. A. H. El-Kamel, Vice President-Assit University, Kena Branch, Kena, Egypt (Fax 096-327-706).

1992 ANS/ENS International Meeting, Nov. 15–20, 1992, Chicago. Contact: General Chair James D. Shiffer, Pacific Gas & Electric Co., 77 Beale St., San Francisco, CA 94106 (phone 415-973-4684).

14th Low-Level Radioactive Waste Management Conference, Nov. 18–20, 1992, Phoenix, Arizona. Contact: Kathleen Asbell, EG&G Idaho, Inc., P.O. Box 1625, Idaho Falls, ID 83415-3960 (phone 208-526-8330; Fax 208-526-9165).

Basic Radiation Safety & Management, Nov. 19–20, 1992, Chicago, Illinois, a seminar presented by Stan A. Huber Consultants, Inc. Contact: Stan A. Huber Consultants, Inc., 200 N. Cedar Road, New Lenox, IL 60451 (phone 815-485-6161; Fax 815-485-4433).

February 1993

HEART, Feb. 1–5, 1993, Naval Training Center, Orlando, Florida, sponsored by the Department of Defense and the Department of Energy. Contact: Arne Kalma, S-Cubed, 3020 Callen Road, San Diego, CA 92121 (phone 619-450-2439).

March 1993

Occupational and Environmental Radiation Protection, Mar. 22–26, 1993, Boston, Massachusetts, a short course offered by Harvard School of Public Health. Contact: Mary F. McPeak, Assoc. Dean for Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-432-1171; Fax 617-432-1969).

April 1993

29th Annual Meeting of the National Council on Radiation Protection and Measurements, Apr. 7–8, 1993, Arlington, Virginia. Contact: NCRP, 7910 Woodmont Avenue, Suite 800, Bethesda, MD 20814.

Joint International Conference on Mathematical Methods and Supercomputing in Nuclear Applications, Apr. 19–23, 1993, Karlsruhe, Germany. Contact: H. Kuesters, KFK/INR, Postfach 3640 D-W-7500 Karlsruhe 1, Germany, or W. Werner, GRS, D-W-8046 Garching, Germany.

International High-Level Radioactive Waste Management Conference, Apr. 25–29, 1993, Las Vegas, Nevada, sponsored by the ANS, the U.S. Dept. of Energy, and the American Society of Civil Engineers. Contact: Billy Cole, E. R. Johnson Assoc., 10461 White Granite Drive, Suite 204, Oakton, VA 22124

(phone 703-359-8355; Fax 703-359-0842).

4th Topical Symposium on Emergency Preparedness and Response, to be held April 26–29, 1993, in Long Island, New York. Contact: Brant Aidikoff, Technical Program Chairman, LIANS, Box 436, Upton, New York 11973 (phone 516-436-4256).

May 1993

Advanced Workshop on Occupational and Environmental Radiation Protection, May 10–14, 1993, Boston, Massachusetts, a short course offered by Harvard School of Public Health. Contact: Mary F. McPeak, Assoc. Dean for Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-432-1171; Fax 617-432-1969).

Management and Disposal of Radioactive Waste, May 24–28, 1993, Boston, Massachusetts, a short course offered by Harvard School of Public Health. Contact: Mary F. McPeak, Assoc. Dean for Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-432-1171; Fax 617-432-1969).

June 1993

Safewaste '93: The Final Disposal of Nuclear Waste, June 14–18, 1993, Avignon, France, sponsored by the ANS and the European Nuclear Society. Contact: Pierre Tanguy, EDF, Direction Generale 32, Rue de Monceau, 75384 Paris Cedex 08, France.

August 1993

SMiRT 12, Structural Mechanics in Reactor Technology, Aug. 15–20, 1993, Stuttgart, Germany. Contact: Prof. Karl Kussmaul, SMiRT 12, Stätliche Materialprüfungsanstalt (MPA), University of Stuttgart, Pfaffenwaldring 32, 7000 Stuttgart 80 Germany (phone 49-711-685-3582; Fax 49-711-685-3144 or 2635).

Topical Meeting on Environmental Transport and Dosimetry, Aug. 31–Sept. 3, 1993, Charleston, South Carolina, sponsored by the ANS. Contact: Robert Addis, Savannah River Laboratory, Environmental Transport Group, Bldg. 773-A, Box 616, Aiken, SC 29808 (phone 803-725-3325).