



# RSIC Newsletter

## OAK RIDGE NATIONAL LABORATORY

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OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.  
FOR THE U.S. DEPARTMENT OF ENERGY

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*The great object of science is to ameliorate the condition of man, by adding to the advantages which he naturally possesses.—Elements of Natural Philosophy, 1808*

## RSIC INTERACTION WITH CONTRIBUTOR/USER COMMUNITY

Since its organization RSIC has sought continuing interaction with those individuals and institutions that contribute to our store of radiation protection, transport and shielding information. Though we maintain lively correspondence with the shielding community, an RSIC staff member sometimes has the opportunity to meet RSIC supporters face-to-face.

Such an opportunity came last month as *Betty F. Maskewitz* traveled through France and Italy on her way to participate in the 9th International CODATA Conference in Jerusalem. Enroute she accepted invitations to visit with RSIC participants at CEA/CEN/Saclay in France, the ENEA Energy Research Center in Italy, and the Soreq Nuclear Research Center in Israel.

Periodic personal visits to nuclear installations are an important element in meeting RSIC objectives. The personal contact within foreign nuclear installations is especially important since distance makes personal communication more complex and less frequent than with domestic contributors/users.

The meetings and discussions revealed new information and technology of interest to RSIC's subject coverage which will be collected, analyzed, and packaged as feasible. Of particular interest were the reviews of current work and progress within the French (CEA) and the Italian (ENEA, *et al*) shielding programs.

The French meeting included an overview of LEPP (Shielding & Reliability) activities by *J. C. Nimal*, description of novel cross-section data processing code development (THEMIS-4) by *J. Gonnord*, a discussion of progress on fission product evaluation by *B. Duchemin*, a presentation on the development of TRIPOLI 3 by *G. De Jonghe*, a paper on R&D results of studies of TORE SUPRA shield design by *C. Diop*, and a demonstration of the dynamic on-line interactivity provisions of THEMIS-4 by *T. Robert*.

The Italian meeting was a seminar on Shielding Calculations for Nuclear Reactors hosted by Franco Casali, ENEA Director of Reactor Physics and Scientific Calculations, held at the Bologna ENEA Energy Research Center. Thirty shielding specialists attended the seminar, representing: ENEA centers at Bologna, Rome (regulatory), Cassacia (fast reactors), and Frascati (fusion); the National Electric Company (ENEL-CRTN) from Pisa, Rome, and Milan; the University of Pisa; a society (CISE SPA); Nuclear Institute for Advanced Reactors (NIRA); ANSALDO-IMPIANTI (AI) of Genoa; and the National Institute for Nuclear Physics (INFN-CNAF) in Bologna.

Papers were presented on shielding development and applications at ENEL by Barbucci and Di Pasquantonio and at the University of Pisa by Cerullo and Bufalino. Two papers described calculations for the Montalto de Castro (ALTO LAZIO)

nuclear power plant under construction: shielding studies by Neuhold (AI) and sensitivity studies by Casali (ENEA). Shielding calculations for the PEC reactor were presented by Burn and Padovani (ENEA) and neutronics studies for Tokamaks (VINIA 3 DIAMTC COMPLEX) by Rado and Robuch (ENEA). Recent development of a shielding calculational model was described by Premuda (ENEA) and a paper on the implementation of the SCALE 2 modular code system was given by Gualdrini (ENEA). Rief of CCR/Ispira presented

shielding activities at JRC-Ispira.

There was considerable exchange of information in the French and Italian sessions described above, new RSIC relationships were formed and those in place were strengthened.

Maskewitz gave an invited paper entitled "Overview of the Role of Data for Energy Systems" and participated in the CODATA Conference held in Israel. Following the conference, she met and held discussions with members of the Israeli Nuclear Society and made an RSIC orientation visit to the Soreq Nuclear Research Center.

## ESIS TO CLOSE

Support for the European Shielding Information Service (ESIS), sponsored by CCR Euratom at the Joint Research Site in Ispira, Italy, is being discontinued, according to its director *Herbert Rief* in an announcement made at the Italian seminar on shielding in Bologna, Italy, on June 21. Members of the ESIS staff will remain at the Euratom Ispira Establishment to work on other projects, mainly related to nuclear safety. The *ESIS Newsletter*, a quarterly publication, may continue with coverage of the new programs.

ESIS was founded in 1972 to give a service to the European community in the field of radiation shielding, "intended for engineers engaged in design problems or research." It has supported collaborative work on shielding benchmarks and related activities sponsored by the OECD Nuclear Energy Agency Committee on Reactor Physics (NEACRP) and has cooperated in other areas to promote the state of the art of shielding methodology. The founding ESIS director was *Rudolf Nicks*, who assumed administrative responsibility for JRC-Ispira information science, systems studies, and data banks in 1976. Rief has led the center since then.

RSIC has always maintained a close working relationship with ESIS and its staff members, depended on ESIS literary coverage of European shielding publications, and frequently consulted with ESIS personnel on matters of mutual interest.

In conclusion, since 1972 ESIS has served as a catalyst for European shielding activities promoting information transfer across linguistic and national barriers. At the same time it made the JRC-Ispira a focal point in the domain of radiation protection research. We regret the passing of ESIS, but hope to retain its shielding experts as RSIC participants.

## CHANGES TO THE COMPUTER CODES COLLECTION

During the month five changes were made to the computer codes collection. Three existing code packages were updated with software enhancements or corrections, one package was extended to add an additional hardware version, and one package was replaced with a newly frozen version.

### CCC-350/BRHGAM

This code system for Monte Carlo estimation of absorbed dose from x-ray sources in phantom man was updated to make the code package calculate in double precision. The change in precision corrects

a minor effect in the calculation of the Compton scattering cross sections at low energies. The originators of the code at Oak Ridge National Laboratory contributed the change. FORTRAN IV and Assembler language; IBM 360/370.

### CCC-428/ONEDANT

The VAX (C) version of this one-dimensional, multigroup diffusion-accelerated, transport code package is a contribution of Los Alamos National Laboratory, Los Alamos, New Mexico. The input module is compatible with TWODANT (CCC-456). The user can now combine modules from these versions to make a 1D/2D code system. FORTRAN IV; CDC (A), IBM (B), and VAX (C).

### CCC-429/DOT 4.3

The CDC version (B) of this one- and two-dimensional discrete ordinates radiation code system was updated to make corrections and improvements supplied by Arnie Aronson, Brookhaven National Laboratory, Upton, N. Y. and approved by W. A. Rhoades of Oak Ridge National Laboratory. Users should request the update directives, available on cards, floppy disc, or magnetic tape, from RSIC. The directives remove many problems users experienced in implementing the package on CDC hardware. FORTRAN IV; IBM 3033 (A), CDC (B), and CRAY (C).

### CCC-451/FEMWASTE

This two-dimensional, finite-element model of waste transport through porous saturated-

unsaturated media is a contribution of the U.S. Nuclear Regulatory Commission. FEMWASTE is concerned with the transport of dissolved constituents. The FEMWASTE documentation contains useful mathematical development and provides information to help the user understand and run the CDC 7600 version distributed by RSIC. The FEMWATER portion of the package is a finite-element model of water flow through saturated-unsaturated porous media. The work is an extensive revision of the original work by Duguid and Reeves (ORNL-4928, 1976). The document also contains experiences of a training course conducted for NRC. References: NUREG/CR-2705, ORNL-5567, NUREG/CR-2706. FORTRAN IV; CDC 7600. IBM 360/370.

### PSR-137/MARLOWE

Oak Ridge National Laboratory is the contributor of a newly frozen version of this simulation of atomic-displacement cascades in solids in the binary-collision approximation. The new version deals with crystals of any structure. It simulates targets with different spatial regions each with a different structure, and maximum impact parameters in the collection no longer have lower boundaries. Reference: Informal User's Manual. FORTRAN IV; IBM-3033, CRAY-1, CDC, UNIVAC, and TI.

### VISITORS TO RSIC

During the month the following people came to visit/use RSIC facilities: *George Goebel* and *Denise Roth*, Rockwell International, Rocky Flats Plant, Golden, Colorado; *James C. Robinson*, Technology for Energy Corporation, Knoxville, Tennessee; *Diane Markoff*, Argonne National Laboratory, Illinois; *Enzo Menapace*, ENEA, Bologna, Italy; *Huan-Tong Chen*, University of Tennessee, Knoxville; *Min F. Su*, INER, Taiwan, Republic of China; and *Michael Wright*, Atom Sciences, Oak Ridge, Tennessee.

### New ICRU Reports Available

The International Commission on Radiation Units and Measurements (ICRU) has announced the publication of three new reports.

Report 35, *Radiation Dosimetry: Electron Beams with Energies Between 1 and 50 MeV*, replaces ICRU

Report 21, *Radiation Dosimetry: Electrons with Initial Energies Between 1 and 50 MeV*, published in 1972. The report explains how the concepts and definitions of quantities established by the ICRU can be determined for electrons with initial energies between 1 and 50 MeV. Though it is primarily concerned with well-established quantities and methods useful in standardization, where methods do not exist an attempt is made to suggest quantities and methods which may fill the gaps. Major sections in the report include interaction of electron beams with matter, characteristics of clinical electron beams, determination of absorbed dose, absorbed dose measurement techniques, absorbed dose in a phantom irradiated with an electron beam, determination of absorbed dose distribution in a patient, electron beam monitors, tests of constancy of performance parameters, and radiobiological aspects.

Report 36, *Microdosimetry*, is an exposition of the concepts which relate some principal features of the ab-

sorption of ionizing radiation in matter to the size and, perhaps, the nature of the structures affected, particularly for those routinely encountered in radiation protection activities. Major sections of the report include microdosimetric quantities and distributions, primary interactions of radiations with matter, particle tracks and energy deposition, experimental evaluation of microdosimetric spectra, calculation of microdosimetric spectra and their averages, phenomenological presentation of single and multiple event spectra, employment of microdosimetric concepts, and techniques. Appendixes treat relationships between microdosimetric quantities, graphical presentations of distributions, composition and material constants of tissue equivalent compounds and mixtures, principal technical features of proportional counters used in microdosimetry, details of methods of calculation, and mean values.

Report 37, *Stopping Powers for Electrons and Positrons*, is the first in a series of Commission efforts concerned with stopping power. The report reviews topics pertinent to the evaluation of stopping powers for any charged particle, such as shell corrections and the determination of mean excitation energies. It focuses on topics pertinent to electrons, including radiative stopping power due to the emission of bremsstrahlung, refined estimates of the density effect, and the information on electron collision stopping power at energies below 10 keV. Tables present the stopping power, range, and radiation yield for a large number of elements and compounds with the energy range 10 to 1000 keV. The report treats formulas for collision stopping power, methods for estimating mean excitation energies, selection of mean excitation energies for elements and compounds, density effect, restricted collision stopping power, electron collision stopping powers at low energies, radiative stopping power, ranges, and radiation yields.

Information for placing an order for these publications may be obtained from ICRU Publications, 7910 Woodmont Ave., Suite 1016, Bethesda, Maryland 20814 USA.

## CONFERENCES, COURSES, AND SYMPOSIA

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

### ISPRA Offers Monte Carlo Course

ISPRA is offering *Monte Carlo Methods in Nuclear Reactor Analysis*, October 8–12, 1984. The course will be held at the Joint Research Centre of the Commission of the European Communities at Ispra, Italy. The fee is Lit. 420,000 and includes lecture notes and lunches.

Both newcomers and experts to Monte Carlo methodology will benefit from a comprehensive review of the basic principles which is then extended to more ad-

vanced topics. The course program will include Basic Concepts of Monte Carlo, Estimators and Error Analysis, The Forward and Adjoint Equation, Variance Reducing Methods, Multiplying System and the Different Models Leading to Eigenvalue Estimates, Monte Carlo Codes and Proto-Typical Examples of Their Application [KENO-V, MCNP, MONK-V, MORSE, TRIPOLI (TRIMARAN)], Graphical Display of Geometries, Perturbation and Differential Monte Carlo, Nuclear Data Preparation for Monte Carlo Transport Codes, Coupling of Monte Carlo with Deterministic Transport Codes (ANISN, DOT), and Workshop.

More detailed information about the course may be obtained from ISPRA Courses Secretariat, Centro Comune di Ricerca, 21020 ISPRA (Varese) Italy (phone 0332/789839-789819-781128; telex 380042-380058 EURI).

### ISRP-3

The 3rd International Symposium on Radiation Physics (ISRP-3) is planned for September 30–October 4, 1985, at Ferrara University in Ferrara, Italy. The International Radiation Protection Society (IRPS) Protem Committee proposed the symposium which will be organized by the radiation physics group of the university. Topics will cover basic radiation physics and its advanced applications. If you have an interest in attending or contributing a paper to this symposium contact ISRP-3 OC Chairman, Istituto di Fisica Generale dell'Università di Ferrara, Via Paradiso, 12, I-44100 Ferrara, Italy.

Watch this newsletter for the announcement of the call for papers.

## Calls for Papers

### Israel Nuclear Society

The Israel Nuclear Society has issued a call for papers for the annual meeting to be held February 6–7, 1985, in Beer-Sheva, Israel. The main topic is Nuclear Power Alternatives for Israel. Papers are requested on that topic and on the following topics: Reactor Theory, Fusion Theory and Applications, Reactor Technology, Siting, Reactor Cooling, Radiation Protection, Radiation Applications, and Nuclear Medicine. Abstracts of 500–1000 words on any of the topics should be sent by November 1, 1984, to Alex Galperin, Dept. of Nuclear Engineering, Ben-Gurion Univ., Beer-Sheva, Israel.

### 6th Topical on Fusion Technology

The call for papers has been issued for the 6th Topical Meeting on the Technology of Fusion Energy to be held March 3–7, 1985, in San Francisco, California. The theme is "Fusion: Breakeven and Beyond." Sessions will

have both invited and contributed oral and poster presentations in the following topics: Plasma Engineering; Impurity Control and Vacuum Technology; Materials Engineering; ICF Drivers; Blanket and First-Wall Engineering; Environment, Siting, and Safety; Alternative Fuels; Next-Generation Devices; Alternative Fusion Concepts; Nuclear Technology Development Strategy; Power Reactor Studies; Fusion Breeder Studies; Plasma Heating; Neutronics and Shielding; Magnet Engineering; and Operations and Maintenance.

Papers accepted for presentation at the meeting will be published in a special issue of *Fusion Technology*. Summaries for invited and contributed papers are due by October 2, 1984. The summary must not exceed two typed pages using prestige elite type and single spacing. Figures and tables will be counted as 150 words and must not exceed half of the total word count. Submit four copies of the summary to D. P. Schreiber, L-644, Lawrence Livermore Laboratory, P.O. Box 5511, Livermore, CA 94550 (phone 415-423-1405).

### Nuclear Data for Basic and Applied Science

The *International Conference on Nuclear Data for Basic and Applied Science* will be held May 13-17, 1985, in Sante Fe, New Mexico. The conference is a continuation of a series which began in 1966 to provide a forum in which experimentalists, theorists, and evaluators involved in basic nuclear activities can communicate with scientists using the data in energy, shielding, medical, space, and other areas of technology. It is being hosted by Los Alamos National Laboratory in cooperation with the University of New Mexico, the International Atomic Energy Agency, and the NEA Nuclear Data Committee. Sponsors of the conference are the U.S. Department of Energy, the American Physical Society, and the American Nuclear Society, with pending sponsorship from the International Union of Pure and Applied Physics.

Invited talks, 25 or 40 minutes in length, and contributed presentations, 12 minutes in length, and poster sessions will place major emphasis on nuclear data measurement, analysis, calculation, and evaluation and on the requirements of the various applied areas for nuclear data. Time has also been reserved in the schedule for special 25-min. talks to be selected from contributed papers.

Contributions to the conference are solicited in the following topics: Differential and Integral Nuclear Data for Fission Reactors; Differential and Integral Nuclear Data for Fusion Reactors; Basic Nuclear Physics with Neutrons; Facilities, Instruments, and Methods for Nuclear Measurements; Nuclear Data Analysis and Evaluation; Nuclear Standards and Metrology; Theory of Nuclear Reactions; Nuclear Model Calculations and Systematics; Nuclear Structure and Decay Data for Ap-

plications; Nuclear Data for Biomedical and Industrial Applications; Nuclear Data for Astrophysics; and Physics and Chemistry of Fission.

Abstracts for both invited and contributed papers are due no later than **January 15, 1985**. Contributed papers to be considered for a special 25-min presentation must be received by **November 15, 1984**.

Additional information for attendance of the conference and details for submission of abstracts may be obtained from Phillip G. Young, Mail Stop B243, Los Alamos National Laboratory, Los Alamos, NM 87545 USA.

### Calendar

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

#### September 1984

*Topical Conference on Neutron-Nucleus Collisions: A Probe of Nuclear Structure*, September 5-8, 1984, Glouster, OH 45732 (phone 614-594-6928).

*International Meeting on Thermal Nuclear Reactor Safety*, September 9-13, 1984, Karlsruhe, Fed. Rep. Germany, sponsored by the European Nuclear Society, ANS, and German Nuclear Technology Society. Contact: H. Rininsland, Kernforschungszentrum Karlsruhe GmbH, Postfach 3640, D-7500 Karlsruhe, F. R. Germany.

*5th International Symposium on Capture Gamma Ray Spectroscopy and Related Topics*, September 10-14, 1984, Oak Ridge, Tennessee. Contact: S. Raman, Physics Division, ORNL, P.O. Box X, Oak Ridge, Tennessee 37831-2008 USA.

*Handling of Radiation Accidents by Emergency Personnel*, September 11-14, 1984, a course sponsored by DOE. Contact: Robert C. Ricks, REAC/TS, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37831 (phone 615-576-3131).

*10th International Conference of Plasma Physics and Controlled Nuclear Fusion Research*, September 12-19, 1984, London, United Kingdom, sponsored by the IAEA. Contact: IAEA, P.O. Box 100, Vienna International Centre, A-1400 Vienna, Austria.

*ANS Topical Meeting on Physics and Shielding*, September 17-19, 1984, Chicago, Illinois. Contact: Leo LeSage, Argonne National Laboratory, Applied Physics Div., 9700 South Cass Ave., Argonne, Illinois 60439 USA (phone 312-972-6045).

*Health Physics in Radiation Accidents*, September 17-21, 1984, a course sponsored by DOE. Contact: Robert C. Ricks, REAC/TS, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37831 (phone 615-576-3131).

*5th Symposium on Neutron Dosimetry*, September 17-21, 1984, in Neuherberg, F. R. Germany, sponsored by the Commission of European Communities; Society for Radiation and Environmental Research, Muenchen; and U.S.-DOE. Contact: G. Burger, Gesellschaft für Strahlen und Umweltforschung mbH Muenchen, Institut für Strahlenschutz, Ingolstädter Landstrasse 1, D-8042 Oberschleissheim, F. R. Germany.

*International Seminar on the Behaviour of Radionuclides in Estuaries*, September 17-21, 1984, Renesse, The Netherlands. Contact: Commission of the European Communities, C. Myttenaere, DG XII/F/1, Rue de la Loi 200, B-1049 Brussels, Belgium.

*5th ASTM-EURATOM Symposium on Reactor Dosimetry*, September 24–28, 1984, Geesthacht, Fed. Rep. of Germany, sponsored by Commission of the European Communities, ASTM, U.S.-DOE, and U.S.-NRC. Contact: E. B. Norris, Southwest Research Institute, P.O. Drawer 28510, San Antonio, Texas 78284 (for Japanese and US authors); H. Röttger, Joint Research Centre, Petten Establishment, HFR Div., Postbus 2, 1755 ZG Petten (N. H.), Netherlands (all other authors).

*13th Symposium on Fusion Technology*, September 24–28, 1984, Varese, Italy. Contact: 13th SOFT, Joint Research Centre, Ispra Establishment, I-21020 Ispra, Varese, Italy (phone 0332-789988/780131).

*Neutron Scattering From Aqueous Systems*, September 27–28, 1984, Bristol, United Kingdom, sponsored by the Institute of Physics and the Royal Society of Chemistry. Contact: G. W. Neilson, H. H. Wills Physics Laboratory, Univ. of Bristol, Tyndall Ave., Bristol BS8 1TL, UK.

#### October 1984

*Conference on Radiation Protection: Standards and Regulatory Issues*, October 7–10, 1984, Orlando, Florida, sponsored by Atomic Industrial Forum. Contact: Conference Office, Atomic Industrial Forum, Inc., 7101 Wisconsin Ave., Bethesda, Maryland 20814 (phone 301-654-9260).

*International Symposium on High-Dose Dosimetry*, October 8–12, 1984, Vienna, sponsored by the IAEA. Contact: Conference Service Section, IAEA, P.O. Box 100, A-1400, Vienna, Austria.

*International Conference on Nuclear and Radiochemistry*, October 8–12, 1984, Lindau, Bodensee, F. R. Germany. Contact: Gesellschaft Deutscher Chemiker, Abt. Tagungsorganisation, Postfach 900440, D-6000 Frankfurt-am-Main 90, F. R. Germany.

*International Conference on Occupational Radiation Safety in Mining*, October 15–18, 1984, Toronto, Ontario, Canada, sponsored by the Canadian Nuclear Assoc., Canadian Dept. of Energy, Mines, and Resources, and the Atomic Energy Control Board. Contact: Internatl. Conf. on Occupational Radiation Safety in Mining, Canadian Nuclear Assoc., 111 Elizabeth St., 11th Floor, Toronto, Ontario, Canada M5G 1P7.

*Symposium on Radiation Dosimetry*, October 15–18, 1984, Knoxville, Tennessee, sponsored by ORNL. Contact: R. T. Greene, ORNL, P.O. Box X, Bldg. 7710, Oak Ridge, TN 37831-2008 USA.

*Meeting of the Nuclear Physics Div. of the American Physical Society*, October 18–20, 1984, Nashville, Tenn. Contact: American Physical Society, 335 E. 45th St., New York, NY 10017 USA.

*Clinical Radiophysics*, a symposium sponsored by the Clinical Radiophysics Section of the Society for Medical Radiology of the German Democratic Republic, October 28–November 1, 1984, Binz (island Rügen, German Democratic Republic). Contact: Dr. sc. techn. Manfred Tautz, 1115 Berlin-Buch, Wiltbergstrasse 50, Städtisches Klinikum Buch, Spezialabteilung Strahlenphysik, German Democratic Republic.

*International Symposium on the Implementation of the IAEA Codes of Practice and Safety Guides for Nuclear Power Plants*, October 29–November 2, 1984, Vienna. Contact: Conf. Svc. Sect., IAEA, P.O. Box 100, A-1400 Vienna, Austria.

*Nuclear Power Systems Symposium*, October 31–November 2, 1984, Orlando, Florida, sponsored by the Institute of Electrical and Electronics Engineers. Contact: D. Louis Costrell, National Bureau of Standards, C333 Radiation Physics, Washington, DC 20234 (phone 301-921-2518).

*Nuclear Science Symposium*, October 31–November 2, 1984, Orlando, Florida. Contact: L. C. Oakes, Oak Ridge National Lab., P.O. Box X, Oak Ridge, TN 37831 (phone 615-574-5527).

#### November 1984

*National Conference on Biomedical Physics and Engineering* November 3–4, 1984, in Sofia, Bulgaria, sponsored by the Bulgarian National Society of Biomedical Physics and Engineering. Contact: Chair of Physics and Biophysics, c/o eng. Peter Trindev, Medical Academy - Base No. 1, 1431 Sofia / 1 Boul. G.Sofiski, Bulgaria.

*Inter-Regional Seminar on Practical Problems Encountered in the Safe Transport of Radioactive Materials*, November 5–8, 1984, Vienna. Contact: Conf. Svc. Sect., IAEA, P.O. Box 100, A-1400 Vienna, Austria.

*Joint Meeting of the American Nuclear Society, the Atomic Industrial Forum, and the European Nuclear Society*, November 11–16, 1984, Washington. Contact: George W. Cunningham, Nuclear Studies, Mitre Corp., 1820 Dolly Madison Blvd., McLean, Virginia 22102 USA.

*Safety of Radioactive Waste Management*, November 12–13, 1984, Cologne, F. R. Germany, sponsored by the Society for Reactor Safety. Contact: Gesellschaft für Reaktorsicherheit (GRS) mbH, Schwertnergasse 1, Postfach 10 16 50, D-5000 Köln 1, F. R. Germany.

*8th Conference on the Applications of Accelerators in Research and Industry*, November 12–14, 1984, Denton, Texas, sponsored by North Texas State University. Contact: Accelerator Conference, Physics Dept., North Texas State Univ., Box 5368, Denton, TX 76203-5368.

*Criticality Accident Dosimetry*, November 12–16, 1984, a course conducted at the Dosimetry Applications Research Facility at the Oak Ridge National Laboratory, Oak Ridge, Tennessee. Contact: R. E. Swaja or C. S. Sims, ORNL, P.O. Box X, Bldg. 7710, Oak Ridge, TN 37831 (phone 615-574-5851).

*International Conference on Power Plant Simulation*, November 19–21, 1984, Cuernavaca, Mexico, sponsored by the Instituto de Investigaciones Eléctricas, Mexico, with the sponsorship of the Nuclear Regulatory Commission (NRC). Contact: for USA and Canada; David Hetrick, Dept. of Nuclear and Energy Engineering, Univ. of Arizona, Tucson, AZ 85721; and for other countries, Dra. elia Méndez, Instituto de Investigaciones Eléctricas, Depto. de Simulación, Leibnitz 14, 3er piso, Co. Anzures, 11590, Mexico, D. F.

*International Conference on Fusion Reactor Materials*, November 19–22, 1984, Tokyo, Japan, sponsored by the Atomic Energy Society of Japan, Iron and Steel Institute of Japan, Japan Institute of Metals, and Japan Society of Applied Physics. Contact: R. R. Hasiguti, Science Univ. of Tokyo, Faculty of Engineering, Kagurazaka, Shinjuku-ku, Tokyo 162 Japan.

*International Symposium on Assessment of Radioactive Contamination in Man*, November 19–23, 1984, Paris, sponsored by the International Atomic Energy Agency. Contact: Conf. Svc. Sect., IAEA, P.O. Box 100, A-1400 Vienna, Austria.

*Conference on Radioactive Waste Management*, November 27–29, 1984, London, sponsored by the British Nuclear Energy Society. Contact: The Secretariat, British Nuclear Energy Society, at the Institution of Civil Engineers, 1-7 Great George St., London SW1P 3AA, UK.

## December 1984

*1st International Conference on Fusion Reactor Materials (ICFRM-1)*, December 3-6, 1984, Tokyo, sponsored by Atomic Energy Society of Japan, Iron and Steel Institute of Japan, Japan Institute of Metals, Japan Society of Applied Physics, the American Nuclear Society, and others. Contact: R. R. Hasiguti, The Science University of Tokyo, Faculty of Engineering, Kagurazaka, Shinjuku-ku, Tokyo 162, Japan.

*Executive Conference: There Are Dollars and Sense in Good Radiation Protection Management*, December 9-12, 1984, San Diego, California, sponsored by the American Nuclear Society. Contact: Carl Giesler, General Chairman, Wisconsin Public Service Co., 700 N. Adams, Box 1200, Green Bay, WI 54305 (phone 414-433-1306) or W. C. Hopkins, Technical Program Chairman, Bechtel Power, 15740 Shady Grove Rd., Gaithersburg, MD 20760 (phone 301-258-3000).

## January 1985

*Environmental Radiation*, (18th Mid-Year Topical Meeting of the Health Physics Society), January 7-10, 1985, Colorado Springs, Colorado. Contact: R. J. Burk, Jr., Health Physics Society, 4720 Montgomery Lane, Suite 506, Bethesda, MD 20014.

*International Symposium on Radioactivity*, January 8-12, 1985, Pune, India, to commemorate the 50th anniversary of the discovery of artificial radioactivity. Contact: H. J. Arnkar, Convenor, ISR, Chemistry Dept., Univ. of Poona, Pune 411 007, India.

*2nd Symposium on Space Nuclear Power Systems*, January 14-16, 1985, Albuquerque, New Mexico. Contact: Mohamed S. El-Genk, 2nd Symp. Space Nuclear Power Systems, Chem/Nucl. Engr. Dept., FEC 239, Univ. of New Mexico Campus, Albuquerque, NM 87131.

*Radiological Protection Measurements and Their Traceability*, meeting and exhibition, January 22, 1985, London, sponsored by the Society for Radiological Protection. Contact: J. H. Martin, Dept. of Medical Biophysics, Blackness Lab., Univ. of Dundee, Dundee DD1 4HN, Scotland, UK.

## February 1985

*International ANS/ENS Topical on Probabilistic Safety Methods and Applications*, February 24-28, 1985, San Francisco. Contact: Chauncey Starr, EPRI, 3412 Hillview Ave., Palo Alto, CA 94303 (phone 415-855-2121).

## March 1985

*Symposium on Radioactive Waste Management 85*, March 24-28, 1985, Tucson, Arizona, sponsored by Univ. of Arizona,

U.S.-DOE, ANS, Electric Power Research Institute, American Society of Mechanical Engineers. Abstract deadline is September 20, 1984. Contact: Roy G. Post, General Chairman, Waste Management 85, College of Engineering, Univ. of Arizona, Tucson, AZ 85721.

*Annual Meeting of the Atomic Energy Society of Japan*, March 28-30, 1985, Tokyo. Contact: Minoru Masamoto, Secretary General, Atomic Energy Society of Japan, No. 1-1-13 Shimbashi, Minato-ku, Tokyo 105 Japan.

## April 1985

*International Meeting on Advances in Nuclear Engineering and Computational Methods*, April 9-11, 1985, Knoxville, Tennessee, sponsored by ANS, European Nuclear Society (ENS), Atomic Energy Society of Japan. Contact: H. L. Dodds, 12629 Red Fox Drive, Knoxville, TN 37922 (phone 615-974-2525) or R. M. Westfall, ORNL, P.O. Box X, Oak Ridge, TN 37831 (phone 615-574-5267).

*Fast Reactor Safety*, April 21-24, 1985, Knoxville, Tennessee, sponsored by the ANS, ENS. Contact: George Flanagan, Oak Ridge National Laboratory, P.O. Box X, Bldg. 6025, Oak Ridge, TN 37831 (phone 615-574-6155).

*General Meeting of the American Physical Society*, April 25-27, 1985, Washington. Contact: The American Physical Society, 335 East 45th St., New York, NY 10017.

*Tritium Technology in Fission, Fusion and Isotopic Applications*, April 30-May 2, 1985, Dayton, Ohio. Contact: H. F. Anderson, Process Engr. Eval. & Control, Monsanto Mound Facility, P.O. Box 32, Miamisburg, OH 45342 (phone 513-865-4020).

## June 1985

*25th Annual International Conf. of the Canadian Nuclear Association and 6th Annual Conf. of the Canadian Nuclear Society*, June 2-5, 1985, Ottawa, Ontario, Canada. Contact: J. A. Weller, General Manager, Canadian Nuclear Association, 111 Elizabeth St., 11th Floor, Toronto, Ontario, Canada M5G 1P7.

*Annual Meeting of the American Nuclear Society*, June 9-14, 1985, Boston, Massachusetts. Contact: David G. Pettenigill, ANS Meeting Manager, American Nuclear Society, 555 North Kensington Ave., La Grange Park, IL 60535.

## August 1985

*SMIRT-8*, August 19-23, 1985, Brussels, Belgium. Contact: Sergio Finzi, CEC - Directorate Gen., X11-JRC, Brussels, Belgium.

## JULY 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 Re-

trieval Information System (SARIS). This early announcement is made as a service to the shielding community. Copies of the literature are not dis-

tributed 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.**

### RADIATION SHIELDING LITERATURE

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