RSIC Newsletter

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To be persuasive, we must be believable. To be believable, we must be credible. To be credible, we must be truthful.—Edward R. Murrow

Hubbell Receives Professional Excellence Award

John H. Hubbell, a long-time friend and participant in RSIC activities, was awarded the American Nuclear Society Radiation Protection and Shielding Division's Award for Professional Excellence. The citation reads as follows:

American Nuclear Society
Radiation Protection and Shielding Division

CITATION

On behalf of the American Nuclear Society, the Radiation Protection and Shielding Division is pleased to present to

JOHN H. HUBBELL

the Award for Professional Excellence for his sustained record of technical achievement by virtue of the following contributions:

He has worked for nearly 40 years in the field of radiation physics. His efforts have included the measurement of x-ray diffraction patterns, the development of analytical methods of computing radiation transport, and the measurement and analysis of photon back-scattering transport and of detector responses. He has also stimulated and supervised cross section research in developing countries such as India. But his monumental achievements, attracting international recognition from the many branches of physics and engineering disciplines that require photon cross sections, have been his sustained collection and critical evaluation of experimental and theoretical cross section data and his compilations of attenuation and energy-absorption coefficients and related quantities. These invaluable compilations are widely used, and two of them have been identified as "citation classics."

John Hubbell directed the National Institute of Standards and Technology X-Ray and Ionizing Radiation Data Center for 18 years, providing a world-wide resource without peer. He has been active in the Health Physics Society and the American Nuclear Society, serving on standards committees and working groups in both societies as well as on committees of the ANS Isotopes and Radiation Division. He is a Fellow of the ANS and of the Health Physics Society, and received the ANS Radiation Industry Award in 1985. He is also a founding member of, and has played a leading role in, the International Radiation Physics Society.

In summary, the Radiation Protection and Shielding Division membership is indebted to John H. Hubbell for his career-long contributions to our knowledge of radiation physics.

CHANGES TO THE COMPUTER CODE COLLECTION

During the month four changes were made to the computer code collection. Three new code systems were packaged and added to the collection, and an existing code package was replaced with a newly frozen version. One change resulted from a foreign contribution.

CCC-547/TWODANT-SYS

Los Alamos National Laboratory, Los Alamos, New Mexico, contributed this one- and two-dimensional, multigroup, discrete-ordinates transport code system. There are three major codes in TWODANT-SYS. ONEDANT solves the one dimensional multigroup transport equation in plane, cylindrical, spherical and two-angle plane geometries. TWODANT solves the two-dimensional multigroup transport equation in *x-y, r-z,* and *r*-theta geometries. TWOHEX solves the two-dimensional multigroup transport equation on equilateral triangular meshes in the *x, y* plane. ONEDANT and TWODANT use discrete ordinates approximation for treating the angular variation of the particle distributions. The diamond difference scheme is used for phase space discretization. Both inner and outer iterations are accelerated using the diffusion synthetic acceleration method. TWOHEX uses the discrete ordinates form for treating the angular variation of the particle distribution, and a nodal scheme is used for phase space discretization. Both inner and outer iterations are accelerated using the Chebyshev acceleration method.

This new release replaces all previously released versions, including CCC-428/ONEDANT, CCC-456/TWODANT, and CCC-469/TWOHEX. Users are urged to replace the old, outdated codes with the new package. Three versions are available; the CRAY version runs under UNICOS; the VAX version runs under VMS; and the SUN/SPARC workstation version runs under UNIX. Each package is available on 9-track magnetic tape. References: Informal notes (Feb. 1990), LA-9184-M (Dec. 1989), LA-10258-M (Dec. 1989), LA-10049-M (Feb. 1990). FORTRAN 77; CRAY (A), VAX (B), and UNIX workstation (C).

CCC-548/KENO5A-PC

This Monte Carlo criticality program with supergrouping was implemented on a personal computer and contributed by EG&G Idaho, Inc., Idaho Falls, Idaho. The package was converted from the CCC-475/SCALIAS 3.1 package developed at Oak Ridge National Laboratory (ORNL). KENO5A-PC solves the three-dimensional Boltzmann transport equation for neutron multiplying systems. The primary purpose is to determine k-effective. Other calculated quantities include lifetime and generation time, energy-dependent leakages, energy- and region-dependent absorptions, fissions, fluxes, and fission densities. Included are Hansen-Roach cross sections in AMPX working format, KENO5 albedo data and KENO5 weight library. AWL, MAL and WGT programs are included for converting the libraries. No other SCALE utilities or libraries are included. On IBM PC-AT class equipment, run times range from about an hour for simple unmoderated systems to 10-12 hours for complex moderated systems. These times are shortened by a factor of approximately 8 on IBM PS2-class systems using extended memory. The minimum hardware configuration is an IBM XT or compatible with a math coprocessor, 1Mb RAM, and a 20 Mb fixed disk. KENO5A-PC has successfully executed on IBM PC and PS/2 equipment, a Compaq SLT 286, and an Alliant FX8. It has no intentional machine dependencies other than the time and date subroutines. Two DS/HD (1.2Mb) 5.25-in. diskettes are required for transmittal of the code system. Reference: NUREG/CR-0200 Rev. 2 (ORNL/NUREG/CSD-2/R2) Volume 2, Section F11 (December 1984). FORTRAN 77; IBM PC.

CCC-549/PRESTO

This code system designed to calculate slab shields for gamma-ray sources of complex and time-dependent energy spectra was contributed by the Zentralinstitut f. Kernforschung, Dresden, German Democratic Republic and the OECD Nuclear Energy Agency Data Bank NEADB), Gif-sur-Yvette, France. PRESTO I treats cylinder sources with shields at the side, such as pipelines or containers in radioactive facilities. PRESTO II is the analogous code for spherical sources. The programs consider volume sources or a combination of volume and surface sources. The solution method is based on the point kernel integration, extended by the "self absorption distance" concept. The approximation reduces the spatial flux calculation to a plane problem. The dose build-up factor is taken into account by Taylor's equation. PRESTO calculates required shield thicknesses for a given dose rate level or the allowed activity concentration of the source for a given shield thickness. The contribution to the dose rate by single nuclides is also calculated. The codes were developed on the BESM-6 computer and converted to run on the VAX 8810 under VMS at the NEADB. The document is written in German. Reference: "PRESTO—A Program System for Shielding Calculations of Cylindrical and Spherical Gamma Sources" (1984). FORTRAN; VAX 8810.

PSR-231/GRESS 1.0

A newly frozen version of this gradient enhanced software system was contributed by ORNL. It is recommended that all users of GRESS 0.1 request this new version, designated GRESS 1.0. The major improvement is the addition of matrix reduction algorithms for the ADGEN application. The GRESS FORTRAN precompiler and run-time library are used to enhance conventional FORTRAN programs with analytic differentiation of arithmetic statements. A majority of ANSI X3.9-1978 standard FORTRAN 77 is accepted. The enhanced code will calculate partial derivatives for real variables on the left-hand side with respect to real variables on the right-hand side for each equation. The user inserts application-dependent subroutine calls to process the partial derivatives. By calling GRESS run-time routines, derivatives can be propagated through the code via the chain rule or written to disk for adjoint matrix generation. After the user has inserted the appropriate calls, the enhanced code is compiled, linked, and executed. GRESS is operable on the VAX family of computers running the VMS operating system. The package is distributed on one DS/DD diskette. Reference: ORNL/M-1121 (April 1990), ORNL/TM-10835 (October 1988), ORNL/TM-11261 (Nov. 1989), and ORNL/TM-11037 (May 1989). FORTRAN 77 and C; VAX.

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.

Charles B. Meinhold was named president-elect of the National Council on Radiation Protection and Measurements (NCRP) at its Annual Meeting in April 1990. Meinhold is recognized as an authority on radiation protection. He is currently chief of the Radiological Sciences Division, Department of Nuclear Energy at Brookhaven National Laboratory. He is a member of the International Commission on Radiological Protection, vice president of the International Radiation Protection Association, and a past president of the Health Physics Society.

The NCRP also announced the results of the regular membership elections. Newly elected members of the Council are: *B. Gordon Blaylock*, ORNL; *Paul L. Carson*, University Hospital, Ann Arbor, Michigan; *Carl H. Durney*, University of Utah, Salt Lake City; *Keith F. Eckerman*, ORNL; *Harold L. Kundel*, University of Pennsylvania Hospital, Philadelphia; *John W. Poston*, Texas A&M University, College Station; *Genevieve S. Roessler*, University of Florida, Gainesville; and *Ralph H. Thomas*, Lawrence Berkeley Laboratory, California.

Visitors to RSIC

During the month the following persons came for an orientation visit and/or to use RSIC facilities: *John DeClue*, Ralph M. Parsons Co., Oak Ridge, Tennessee; *Warner Blyckert*, Mohr and Associates, Oak Ridge; *Randall Wallace*, Delta Data Systems,

Inc., Nashville, Tennessee; and *Rob Tayloe*, Battelle Columbus Laboratories, Columbus, Ohio.

ALARA Workshop Proceedings Available

The Proceedings of the International Workshop on New Developments in Occupational Dose Control and ALARA Implementation at Nuclear Power Plants and Similar Facilities is now available as NUREG/CP-0110 from the Superintendent of Documents, U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7082. The workshop was held September 18-21, 1989, at Brookhaven National Laboratory, Upton, Long Island, New York. The report includes 39 papers and 42 discussion summaries on such topics as ALARA organization, ALARA engineering, ALARA in operations, system chemistry, decontamination, robotics, and water purification.

Video cassettes of various workshop sessions can be purchased by writing or calling the BNL ALARA Center, Brookhaven National Laboratory, Building 703M, Upton, Long Island, New York 11973 (phone 516-282-4425).

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.

Reactor Analysis, Radiation Transport Short Courses

The Department of Nuclear Engineering at the University of Tennessee-Knoxville is offering two five-day short courses of interest to radiation transport specialists during Tennessee Industries Week (TIW-25), August 13-17, 1990.

Computational Methods in Reactor Analysis will familiarize the course participant with computational methods and computer codes currently used to describe the neutronic behavior of nuclear fission reactors. Emphasis will be placed on "understanding" the neutronic models and associated numerical methods currently employed in codes. A good understanding of the models and methods is essential for the successful use of the codes in designing new reactors and/or improving the performance and safety of existing reactors. Areas to be covered include multi-dimensional diffusion theory methods and perturbation theory methods for applications in reactor statics, space-dependent kinetics, and fuel depletion; transport theory methods including the discrete ordinates method, integral transport theory, and the Monte Carlo method; and cross section generation and processing utilizing the AMPX and SCALE systems developed at ORNL. The first day of the course will cover the fundamentals of reactor physics beginning with the fission process and proceeding through development of the Boltzmann transport equation and the diffusion approximation of the transport equation. This material will provide a good foundation for the non-nuclear engineer for study of the more advanced material to be presented Tuesday through Friday. For the participant with some nuclear background, the first day would be a review of basic nuclear engineering.

Monte Carlo Analysis is designed specifically for the practicing engineer engaged in shield design and does not presume any prior knowledge of Monte Carlo methods. However, some understanding of radiation transport physics is desirable. A wide range of topics will be presented that will lead to a good understanding of the basics of Monte Carlo analysis and the specialized applications of Monte Carlo methods to practical shielding problems. Many advanced topics will be included that will promote the best use of existing computer code systems. Special attention will be paid to the understanding and Monte Carlo implementation of the adjoint analysis. Advantages and disadvantages of the adjoint mode versus the forward mode of analysis will be described including several practical applications of the adjoint mode of Monte Carlo analysis. Variance reduction techniques will be developed in a comprehensive fashion for both forward and adjoint calculations. The versatile computer code system, MORSE, will be described to illustrate the general features of Monte Carlo computer programs. The relationships of the Monte Carlo methods to other methods of solving radiation transport problems, such as discrete ordinates, will be described, as well as computational advantages and disadvantages

of Monte Carlo versus the other methods. This course will cover, in depth, the theory and mathematics a user must have in order to understand and use the Monte Carlo method effectively to solve difficult problems in radiation transport.

The registration fee is $895 per person for each course. The deadline for registration in these two courses is July 30, 1990. For additional information contact T. W. Kerlin, Head of the Dept. of Nuclear Engineering, University of Tennessee, Knoxville, TN 37996 (phone 615-974-2525).

Yugoslavia to Host ISRP-5

The first announcement has been issued for the *Fifth International Symposium on Radiation Physics (ISRP-5)*, to be held June 10–14, 1991, in Dubrovnik, Yugoslavia. This is the fifth of a series of symposia which began in Calcutta in 1974. The meeting will be organized by the Ruder Bošković Institute, in Zagreb, Yugoslavia, under the auspices of the International Radiation Physics Society.

This series of symposia is designed to encourage communication between scientists from universities, research centers, medical facilities, and industry working in the science of the physical aspects of the interaction of ionizing radiation with matter. Oral sessions of invited speakers and poster sessions with contributed papers are planned for the following topics:

- Fundamental Processes in Radiation Physics
- Radiation Sources and Detectors
- Use of Radiation in Fundamental Research
- Radiation in the Medical, Environmental and Earth Sciences
- Radiation in Technology
- Radiation in Astrophysics and Cosmology

Those who wish to submit an abstract should do so by **April 15, 1991**. If you wish to be placed on the mailing list for further information, submit your request to the technical organizer—ATLAS, Congress Dept., ISRP-5, Lastovska 23, 41000 Zagreb, Yugoslavia (phone 41 525-333 or 41 231-555, Fax 41 335-977, Telex 22413 atlcon yu).

1991 IWMC

The call for papers has been issued for the *1991 Joint International Waste Management Conference (IWMC)*. The conference will be held October 21–26, 1991, in Seoul, Korea. Joint sponsorship by the American Society of Mechanical Engineers and the Korean Nuclear Society will provide the international background for the exchange of information in high- and low-level radioactive waste management activity.

The conference is divided into two sections. Papers are solicited for topics in High-Level Waste Management to cover Fuel Reprocessing/Waste Management Issues; Back-End Fuel Cycle Economics; International High-Level Waste Vitrification Technology; Spent Fuel Storage and Experience; Spent Fuel Conditioning and Rod Consolidation; Repository Issues; Transportation of HLW and Spent Fuel; and Dry Cask Development. Topics in the area of Low- and Intermediate-Level Waste Management include: Low-Level Waste Disposal—An International View; Public Acceptance of Disposal Facilities; Liquid Radwaste Processing Experience; Waste Solidification and Waste Form; Incineration—Development and Experience; Dry Active Waste Processing; Recent Radwaste Processing Technology Development; Low-Level Waste Management Trends; Intermediate-Level Waste Management; Decommissioning and Decontamination; Waste Characterization and Performance Modeling; Gaseous Waste Handling; and Waste Management in Developing Countries.

Three copies of a 600–800-word summary are due to the Technical Program Chairmen by **September 12, 1990**. Papers on high-level waste should be sent to S. C. Slate, Battelle Pacific Northwest Laboratories, P.O. Box 999, Mail Stop K6-27, Richland, Washington 99352 USA (phone 509-376-5957, Fax 509-376-1867, Telex 15-2874). Papers on low- and intermediate-level waste should be submitted to Mr. J. M. Tuohy, Burns and Roe, 800 Kinderkamack Road, Oradell, NJ 07649 USA (phone 201-265-2000, Fax 201-265-2934).

Calendar

Your attention is directed to the following events of interest.

June 1990

30th Annual Conference of the Canadian Nuclear Association and the 11th Annual Conference of the Canadian Nuclear Society, June 3–7, 1990, Toronto, Ont., Canada. Contact: CNA (phone 416-977-6152).

Emerging Technologies for Hazardous Waste Treatment, June 4-7, 1990, Atlantic City, New Jersey, sponsored by the American Chemical Society. Contact: D. William Tedder, Symposium Chair, School of Chemical Engg., Georgia Inst. of Technology, Atlanta, GA 30332-0100 (phone 404-894-2856 or 404-973-3826).

American Nuclear Society Annual Meeting, June 10-15, 1990, Nashville, Tennessee. Contact: Mary Keenan, Meetings Manager, ANS, 555 N. Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

15th Symposium on Effects of Radiation on Materials, June 17-21, 1990, Nashville, Tennessee, sponsored by the American Society for Testing and Materials. Contact: Conferences, ASTM, 1916 Race St., Philadelphia, PA 19103 (phone 215-299-5400).

17th European Conference on Controlled Fusion and Plasma Heating, June 25-29, 1990, Amsterdam, The Netherlands. Contact: F. C. Schuller, FOM-Institut voor Plasmafysica "Rujihuizen," Postbus 1207, NL-3430 BE Nieuwegein.

July 1990

3rd International Workshop on Respiratory Tract Dosimetry, July 1-3, 1990, Albuquerque, N. M., sponsored by the U.S. Dept. of Energy, CEC, and the Inhalation Toxicology Research Institute. Contact: Raymond A. Guilmette, Workshop Co-chairman, Inhalation Toxicology Research Inst., P.O. Box 5890, Albuquerque, NM 87185 (phone 505-844-5835).

5iémes Journées d'Etudes sur la Chimie sous Rayonnement, July 1-6, 1990, Sherbrooke, Québec. Contact: Jean-Paul Jay-Gerin, JECR-90, Département de médecine nucléaire et de radiobiologie, Faculté de médecine, Univ. de Sherbrooke, Sherbrooke, Québec, Canada J1H 5N4 (phone 819-563-5555, ext. 4682, Fax 819-564-5445; Bitnet S015@UDESVM). The conference language is French.

27th Annual International Nuclear and Space Radiation Effects Conference and Short Course, July 16-20, 1990, Reno, Nevada, sponsored by the Institute of Electrical and Electronics Engineers, Inc. Contact: Joseph R. Srour, Northrop Corp., M.S. X400/N5, 2301 West 120th St., P.O. Box 5032, Hawthorne, CA 90251-5032 (phone 213-600-4151).

12th International CODATA Conference: Data for Discovery, July 17-19, 1990, Columbus, Ohio, sponsored by the National Academy of Sciences. Contact: Columbus Local Organizing Committee, P.O. Box 23, Amlin, OH 43002.

Practical Radiation Shielding, July 17-20, 1990, Atlanta, Georgia, a course offered by the Georgia Inst. of Technology and Shonka Research Assoc., Inc., of Marietta, Georgia. Contact: Education Extension-R, Georgia Inst. of Technology, Atlanta, GA 30332-0385 (phone 404-894-2400).

August 1990

International Topical Meeting on Fast Reactor Safety, Aug. 12-16, 1990, Snowbird, Utah, sponsored by the ANS. Contact: Wayne K. Letho, Argonne National Laboratory, P.O. Box 2528, Idaho Falls, ID 83403-2528 (phone 208-526-7369).

Computational Methods in Reactor Analysis, August 13-17, 1990, Knoxville, Tennessee. Contact: T. W. Kerlin, Head of the Dept. of Nuclear Engg., University of Tennessee, Knoxville, TN 37996 (phone 615-974-2525).

Monte Carlo Analysis, August 13-17, 1990, Knoxville, Tennessee. Contact: T. W. Kerlin, Head of the Dept. of Nuclear Engg., University of Tennessee, Knoxville, TN 37996 (phone 615-974-2525).

Operational Radiation Protection, Aug. 20-22, 1990, Idaho Falls, Idaho, sponsored by the ANS. Contact: Jack Liebenthal, EG&G Idaho, Inc., P.O. Box 1625, Idaho Falls, ID 83415-3515 (phone 208-526-1252).

7th ASTM-EURATOM Symposium on Reactor Dosimetry, Aug. 27-31, 1990, Strasbourg, France. Contact: G. Tsotridis, Joint Research Centre, Petten Establishment, HFR Div., Postbus 2, NL-1755 ZG, Petten, The Netherlands (phone 02246 5122, Telex REACP NL 57211, Fax 02246 1449) or G. P. Lamaze, National Inst. of Standards and Technology, Bldg. 235, Gaithersburg, MD 20899 USA

(phone 301-975-6202, Telex 197 674 NBS UT, Fax 301-921-9847).

September 1990

16th Symposium on Fusion Technology, Sept. 3-7, 1990, London. Contact: JET Joint Undertaking, Conference Office, Abingdon, Oxon, OX14 3EA, United Kingdom.

ENC '90, The World Conference and Exhibition, Looking Into Nuclear's Future in the 21st Century, Sept. 23-28, 1990, Geneva, Switzerland, organized by the European Nuclear Society in collaboration with the American Nuclear Society and the European Atomic Forum, Foratom. Contact: ENC '90 Secretariat, c/o ENS, P.O. Box 5032, CH-3001 Berne, Switzerland.

Symposium on Recent Advances in Multidisciplinary Analysis and Optimization, Sept. 24-26, 1990, San Francisco, sponsored by the U.S. Air Force and NASA. Contact: V. B. Venkayya, WRDC/FIBRA, WPAFB, OH 45433-6553 (phone 513-255-7191 or 513-255-6992).

Radiation Transport Calculations Using EGS4: A Four-Day Hands-on Course, Sept. 24-27, 1990, Ottawa, Canada. Contact: Dr. A. F. Bielajew, Div. of Physics, National Research Council of Canada, Ottawa, Canada, K1A 0R6 (phone 613-993-2715, Bitnet BLF@NRCVM01).

International Conference on Monte Carlo Methods for Neutron and Photon Transport Calculations, Sept. 25-28, 1990, Budapest, Hungary. Contact: Dr. László Koblinger, Central Research Inst. for Physics, P.O. Box 49, H-1525 Budapest, Hungary (Fax 36-1-15552530).

The Safety, Status and Future of Non-Commercial Reactors and Irradiation Facilities, Sept. 30-Oct. 4, 1990, Boise, Idaho, ANS Topical Meeting, sponsored by the Idaho Section and co-sponsored by The Commission of the European Communities (CEC), Atomic Energy Society of Japan, and the Nuclear Reactor Safety Division of the ANS. Contact: Dr. Romney B. Duffey, General Chairman, The Safety, Status and Future of Non-Commercial Reactors and Irradiation Facilities, P.O. Box 51218, Idaho Falls, ID 83405-1218 (phone 208-526-9804).

October 1990

Spectrum '90: Radioactive Waste Technologies, Decontamination, Decommissioning and Hazardous Wastes, Oct. 3-5, 1990, Knoxville, Tennessee, sponsored by ANS. Contact: Thomas H. Row, ORNL, P.O. Box 2008, 4500N MS6198, Oak Ridge, TN 37831-6198 (phone 615-574-5974 or FTS 624-5974).

9th Topical Meeting on Technology of Fusion Energy, Oct. 8-12, 1990, Chicago, sponsored by the American Nuclear Society. Contact: Dr. Charles Baker, Argonne National Laboratory, 9700 S. Cass Ave., Argonne, IL 60439 (phone 312-972-4836, FTS 972-4836).

November 1990

Nuclear Energy Forum, Nov. 11-14, 1990, Washington, D. C., sponsored by the U.S. Council for Energy Awareness. Contact: Conference Office, U.S. Council for Energy Awareness, 1776 I Street NW, Suite 400, Washington, DC 20006-2495 (phone 202-293-0770).

American Nuclear Society Winter Meeting, Nov. 11-16, 1990, Washington, D.C. Contact: Mary Keenan, Meetings Manager, ANS, 555 N. Kensington Ave., La Grange Park, IL 60525.

International Symposium on High-Dose Dosimetry for Radiation Processing, Nov. 12-16, 1990, Vienna, sponsored by IAEA. Contact: Conference Service Section, IAEA, P.O. Box 100, A-1400 Vienna, Austria.

June 1991

5th International Symposium on Radiation Physics, June 10-14, 1991, Dubrovnik, Yugoslavia. Contact: Dr. Ante Ljubičić, ISRP-5 Chairman, Ruder Bošković Inst., P.O. Box 1016, 41001 Zagreb, Yugoslavia (phone 41 425-563 or 41 434-467, Telex 21383 irbzg yu, Fax 41 425-497).

September 1991

ICNC '91, International Conference on Nuclear Criticality Safety, September 1991, Oxford, United Kingdom. Contact: ICNC '91 Secretariat, Publicity Office, AEA Technology, Winfrith, Dorchester, Dorset DT2 8DH, United Kingdom (phone 0305 251888 ext 2739, Fax 0305 202122, Telex 41231).

October 1991

1991 Joint International Waste Management Conference, Oct. 21-26, 1991, Seoul, Korea. Contact: Mr. Larry C. Oyen, Sargent & Lundy, 55 East Monroe St., Chicago, IL 60603 (phone 312-269-6750, Fax 312-269-3475, Telex 280603).

APRIL 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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