# RSIC Newsletter

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*No. 248* *July 1985*

*No man can do anything well who does not esteem his work to be of importance. . . Ralph Waldo Emerson*

## MORSE-CGA WORKSHOP BIG SUCCESS

Seventy-two people participated in an RSIC-sponsored workshop held at the Holiday Inn, Oak Ridge, June 17–20, to learn about the multigroup Monte Carlo code, MORSE-CGA. This newly-frozen version of MORSE-CG features an array geometry capability which eases the representation of complicated geometric configurations with repeating patterns. The technical topics presented were summarized in the April 1985 *RSIC Newsletter*. *M. B. Emmett*, and *J. S. Tang* of the Computing and Telecommunications Division, Martin Marietta Energy Systems, Inc., at ORNL, *S. N. Cramer*, of the Engineering Physics and Mathematics Division, and *R. W. Roussin*, RSIC Director, presented the workshop material.

Attendees represented 36 installations in the United States and 6 in countries with interests covering a wide range of possible applications. Responses to a survey indicated that 88% of the respondents received what they were expecting, all felt their knowledge of MORSE was increased, and 90% felt the workshop to be of considerable value. All encouraged RSIC to sponsor additional workshops in the future.

## Shielders Honored With Awards

Several persons in the international radiation protection, transport, shielding, and neutronics communities were honored during the recent June 1985 meeting of the American Nuclear Society (ANS), by the Society of Nuclear Medicine (SNM) at their annual meeting, and by the International Commission on Radiation Units and Measurements.

### ANS RSPD Awards for Professional Excellence

The Radiation Shielding and Protection Division presented their awards for Professional Excellence to Tony A. Gabriel and Richard K. Disney. The citations read as follows:

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

**Tony A. Gabriel**

*its award for Professional Excellence by virtue of the following contributions.*

*He is cited for his many contributions to high energy accelerator shielding and for the design of calorimeters for physics experiments. He has developed analytic and numerical methods which have advanced the state-of-the-art in shielding and calorimeter design that have been adopted world wide. He is a recognized au-*

*thority and he has served as an advisor to high energy physics research laboratories and institutions in the United States and Europe. His contributions to neutron-antineutron, spallation, and neutrino research facilities are noteworthy. His work is documented by publication in respected journals and by contributed and invited papers presented at national and international scientific meetings.*

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

**Richard K. Disney**

*its award for Professional Excellence by virtue of the following contributions.*

*He is cited for his research and development of advanced reactor shielding design and his advancement of radiation protection criteria. He has made significant contributions to the liquid-metal reactor program including the development of radiation standards for fusion product, actinide, and structural radioisotope inventories, decay energy release, and radioactive source terms. He further is recognized for his coordination of analytical and experimental program(s) in support of LMFBR shielding designs. Since 1971, he has been an active member of the RPSD having served as Chairman of the Program Committee, as Division Secretary, and served on the Executive Committee.*

### SNM Makes Aebersold Award

**John Hubbell**, National Bureau of Standards, has won the *Paul C. Aebersold Award for Outstanding Achievement in Basic Science Applied to Nuclear Medicine*. The prestigious award was presented at the Annual Meeting of the Society of Nuclear Medicine in Houston in June. We add our congratulations to John on the occasion of this award and acknowledge his significant contribution to radiation transport technology. His evaluations and compilations of gamma-ray interaction data over many years have provided the base for not only radiation transport technology but nuclear medicine, crystallography, and other whole scientific disciplines as well.

### Rossi Receives 5th Gray Medal

The International Commission on Radiation Units and Measurements (ICRU) has announced that the fifth recipient of the *L. H. Gray Medal* is **Harold H. Rossi**, a professor of radiology at Columbia University. The award will be presented to Dr. Rossi in July at the XVIth International Congress of Radiology in Honolulu. The Gray Medal is awarded for outstanding contributions in scientific fields of interest to ICRU in honor of the late *Luis Harold Gray*, former member and Vice Chairman of the Commission.

Dr. Rossi receives this award based on his pioneering work in fundamental radiobiology and radiochemistry and on his creative work in founding the field of microdosimetry.

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### RSIC Placed on LLNL TIS System

As part of our increasing use of telecommunications, we have been granted a user name (RSIC) and mailbox on the Lawrence Livermore National Laboratory Technology Information System (TIS). There are a number of user groups on this system, such as the DOE Nuclear Criticality Information Systems and the Air Force Logistics Command. One feature of the system is access to BitNet. We would like to hear from RSIC users who have access to the TIS system or to BitNet.

We are also involved in the American Nuclear Society (ANS) effort to establish an ANS nuclear industry network. Such a network, including foreign users, would be useful for RSIC communications.

D. K. Trubey

## CHANGES TO THE COMPUTER CODES COLLECTION

During the month two changes were made to the computer codes collection. A previously existing code package was replaced with a newly-frozen version, and a new code package was added to the collection.

## PSR-199/HEATING6

This multidimensional heat conduction analysis code system with the finite-difference formulation has been replaced by the HEATING6 code system from the CCC-466/SCALE-3 code package. HEATPLOT-S (a temperature distribution plotting program) and REGPLOT6 (a plotting program to verify HEATING6 input data) have been added to the package. The new material was contributed by Oak Ridge National Laboratory. Users who wish to know more about the changes in the package may inquire of RSIC. Reference: NUREG/CR-200/Vol.2, ORNL/NUREG/CSD-2/V2/R2. FORTRAN IV; IBM 3033.

## PSR-211/EVALPLOT 83.2

This code system to plot data in the Evaluated Nuclear Data File/Version B format was contributed by Lawrence Livermore National Laboratory, Livermore, California, through the International Atomic Energy Agency (IAEA), Vienna. The system is designed to plot cross sections in the ENDF/B format if the data are linearly interpolated. The output is in the form of FR80 plot files. Reference: UCRL-50400, Vol. 17, Part E. FORTRAN IV; IBM 3081.

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## PERSONAL ITEMS

In serving a specialized area of scientific endeavor, it seems important that we take note of the movement or recognition 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.

### ANS Annouces RI Award

**John Hubbell** will receive the American Nuclear Society *Radiation Industry Award* for 1985. The award will be presented at the ANS Winter Meeting in San Francisco in November. The award is made annually to a scientist or engineer who has made a significant contribution to the application of radiation technology to industry.

### RP&S Division Names 85-86 Officers

The Radiation Protection and Shielding Division of the ANS has elected the new officers to serve 1985–1986. They are: Chair—*Richard K. (Kep) Disney,* Westinghouse Electric Corp.; Vice Chair/Chair Elect—*Robert W. Roussin,* RSIC, Oak Ridge National Laboratory; Secretary—*Nick Tsoulfanidis,* University of Missouri-Rolla; Treasurer—*William J. Johnson,* Sargent and Lundy Engineers; Executive Committee— *Thomas B. Albert,* Science Applications International Corp., *Jeff Boorboor,* United Engineers and Constructors, Inc., and *Richard A. Weller,* U.S. Nuclear Regulatory Commission.

### Visitors to RSIC

During the past two months the following persons came for an orientation visit and/or to use RSIC facilities: *Kunihiko Shinohara,* a visiting scholar at the Univ. of North Carolina, from Power Reactor and Nuclear Fuel Development Corp., Tokyo, Japan; *Joseph C. Lochamy,* Scientific Ecology Group, Oak Ridge, Tenn.; *Elaine B. Morris,* Nuclear Regulatory Commission, Washington; *George Evangelides,* Science & Engineering Research Council, Warrington, United Kingdom; *Jack Courtney,* Louisiana State Univ., Baton Rouge; *Robert Tayloe,* Goodyear Atomic Corp., Piketon, Ohio; and *Moshe Goldstein,* Nuclear Research Centre-Negev, Beer-Sheva, Israel.

### Standards Activities

The following standards have recently been approved or reaffirmed.

ANSI N42.13–1985, *Calibration and Usage of "Dose Calibrator" Ionization Chambers for the Assay of Radionuclides* (revision of ANSI N42.13–1978) date: April 4, 1985.

ANSI/IEEE 498–1985, *Standard Requirements for the Calibration and Control of Measuring Equipment Used in Nuclear Facilities,* (new standard) date: May 3, 1985.

ANSI N42.4–1971 (R1985), *High Voltage Connectors for Nuclear Instruments* (reaffirmation).

ANSI N42.6–1980(R1985), *Interrelationship of Quartz-Fiber Electrometer Type Exposure Meters and Companion Exposure Meter Charters* (reaffirmation).

ANSI N42.12–1980(R1985), *Calibration and Usage of Sodium Iodide Detector Systems* (reaffirmation).

ANSI N42.14–1978(R1985), *Calibration and Usage of Germanium Detectors for Measurement of Gamma-Ray Emission of Radionuclides* (reaffirmation).

ANSI N42.18–1974(R1985), *Specification and Performance of On-Site Instrumentation for Continuously Monitoring Radioactivity in Effluents* (reaffirmation).

ANSI N317–1980(R1985), *Performance Criteria for Instrumentation Used for Inplant Plutonium Monitoring* (reaffirmation).

ANSI N544–1968(R1985), *Signal Connectors for Nuclear Instruments* (reaffirmation).

ANSI/IEEE 680–1978(R1985), *Techniques for Determination of Germanium Semi-conductor Detector Gamma-Ray Efficiency Using a Standard Marinelli (Reentrant) Beaker Geometry* (reaffirmation).

ANSI/N 42.15–1980(R1985), *Performance Verification of Liquid-Scintillation Counting Systems* (reafffirmation).

ANSI/IEEE 309–1970(R1985) *Test Procedure for Geiger-Muller Counters* (reaffirmation).

The following draft standard has been submitted for review and may be ordered from ANS.

NS-10.3, *Guidelines for the Documentation of Digital Computer Programs* (revision of N413–1974); $10.

## 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.

### Radiation Transport and Reactor Analysis 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-20), September 9–13, 1985.

**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 employed in reactor analysis codes is essential for the successful use of the codes in designing new reactors 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 $695 per person for each course. The deadline for registration in these two courses is August 23, 1985. For additional information contact P. F. Pasqua, Head of the Dept. of Nuclear Engineering, University of Tennessee, Knoxville, TN 37996.

### Fusion Energy Short Course

The Department of Electrical Engineering at the University of Tennessee-Knoxville is also offering a five-day short course during Tennessee Industries Week (TIW-20), September 9–13, 1985.

**Fusion Energy** is intended for engineers, managers, planners, university faculty members, and others wishing to obtain a broad overview of magnetic fusion research. The history, development, and basic concepts of fusion research will be covered on the first day. Fundamental limits on fusion reactors and engineering prob-

lems of fusion research will be discussed on the second and third days. This discussion will provide background for a survey of mainline approaches to magnetic fusion being funded as part of the Department of Energy Program. Alternate fusion reactor concepts, including the Stellarator, RFP, OHTE, and hybrid reactors will also be covered. The final session of the course will cover the public policy issues of fusion energy. The course level is directed to working engineers who have had only the usual physics and math courses required for an undergraduate engineering degree. Necessary basic material will be reviewed or presented as needed. The text for the course, *Introduction to Fusion Energy,* by J. R. Roth, will be provided. The course will be noncredit, and no homework or examinations will be given.

The fee for the course is $625 per person and includes registration, materials, and coffee breaks. For further information contact J. Reece Roth, 409 Ferris Hall, Univ. of Tennessee, Knoxville, TN 37996-2100 (phone 615-974-4446). Registration deadline is August 26, 1985.

## Calls for Papers

*Packaging and Transportation of Radioactive Materials* is a seminar sponsored by the Institute of Nuclear Materials Management with a presentation by the American National Standards Institute (ANSI) N-14 Standards Committee focusing on recently approved standards, standards under development, and the use of such standards. The seminar will take place September 16–18, 1985, in Washington, D. C. For further information contact Beth Perrym, INMM, 8600 W. Bryn Mawr Ave., Chicago, IL 60631 (phone 312-693-0990).

*Waste Management '86* will be held in Tucson, Arizona, March 2–6, 1986. The co-sponsors, the University of Arizona, the American Nuclear Society, the Electric Power Research Institute, and the Radwaste Systems Committee of the American Society of Mechanical Engineers, have issued a call for papers on the following topics: International Progress in Waste Storage and Disposal; Concerns Over Waste Management—Public, Government, and Industry; Waste Transportation; Public Information and Interaction; Implementation of the Low Level Radioactive Waste Policy Act of 1980 and the National Waste Policy Act of 1982; Waste Storage and Disposal Technology (Including Defense and TRU); Risk Assessment of Disposal Methodologies; Spent Fuel Processing, Reprocessing, Storage and Disposal; Alternatives to Shallow Land Burial for LLW; On-Site Storage of LLW—Consequences of Compact Status; Power Plant Experience and Plans for New Treatment Systems; Radwaste Systems Operations and Maintenance; Radwaste Engineering Economics; Economics of Storage/Disposal; Mixed Chem/Bio Hazard—Radioactive Wastes; Compacts Process Produced Problems with LLW Disposal; QCQA; and General. Those interested in submitting their work for consideration should send three copies of an extended summary to the Technical Program Chairman, M. E. Wacks, Dept. of Nuclear and Energy Engr., Univ. of Arizona, Tucson, AZ 85721, by **September 6, 1985**. Authors will notified of acceptance of their work by November 15, 1985.

*International Symposium on the Packaging and Transport of Radioactive Materials (PARTRAM '86),* June 16–20, 1986, Davos, Switzerland. This symposium is being organized by the International Atomic Energy Agency and hosted by the government of Switzerland, Federal Department of Energy with the coordination of the Federal Institute for Reactor Reactor Research in cooperation with the U. S. government. Papers are solicited for the following topics: regulations and regulatory issues; codes and standards; radiation protection—justification, optimization, dose limitation; risk assessment; research and development in transport safety; package design; package testing and test requirements; transport experience and statistics—normal conditions, accident conditions; emergency response planning and preparedness; quality assurance; compliance assurance; education and training; and administration issues. Six copies of each paper submitted for consideration should be received by the IAEA by **October 1, 1985**. Participants in the symposium must be designated by the government of a member state of the IAEA or by an organization invited to participate by the IAEA. Participation and paper submission forms may be obtained from the IAEA or from the appropriate national authority. For further information contact IAEA, P.O. Box 100, A-1400, Vienna, Austria.

## Calendar

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

### August 1985

*22nd Nuclear Accident Dosimetry Intercomparison Study,* August 9–13, 1985, Oak Ridge, Tennessee, sponsored by the Oak Ridge National Laboratory. Contact: C. S. Sims, ORNL, Bldg. 7710, P.O. Box X, Oak Ridge, TN 37831 (phone 615-574-5851).

*Conference on Radiation Hormesis,* August 14–16, 1985, Oakland, California, sponsored by Electric Power Research Inst., American Nuclear Society, and the Health Physics Society. Contact: William Herlihy, Conference on Radiation Hormesis, 816 Abbie St., Pleasanton, CA 94566 (phone 415-846-4966).

*Australian Radiation Protection Society Annual Meeting,* August 19–21, 1985, Melbourne, Victoria, Australia. Contact: T. H. Gan, Australian Radiation Laboratory, Lower Plenty Road, Yallambie, Victoria 3085, Australia.

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

*Occupational and Environmental Radiation Protection,* August 19–23, 1985, Boston, Massachusetts, sponsored by the Harvard School of Public Health, Office of Continuing Education. Contact: Office of Continuing Education, Harvard School of Public Health, 677 Huntington Ave., Boston, MA 02115 (phone 617-732-1171).

*Medical Planning and Care in Radiation Accidents Course,* August 19–23, 1985, Oak Ridge, Tennessee, sponsored by DOE. Contact: Robert C. Ricks, Director, REAC/TS, ORAU, P.O. Box 117, Oak Ridge, Tenn. 37831-0117 (phone 615-576-3131).

*International Seminar on Containment of Nuclear Reactors,* August 26–27, 1985, Brussels, Belgium. Contact: Rolf Krieg, Inst. fur Reaktorentwicklung, Kernforschungzentrum, Karlsruhe GmbH, Postfach 3640, D-7500 Karlsruhe 1, F. R. Germany or Algirdas H. Marchertas, Reactor Analysis and Safety Div., Argonne National Laboratory, Argonne, IL 60439 USA.

**September 1985**

*17th Japan Conference on Radiation and Radioisotopes,* September 2–4, 1985, Tokyo, sponsored the the Japan Atomic Industrial Forum, Inc. Contact: Section for Industrial Programs and Technology, Japan Atomic Industrial Forums, Inc., Toshin Bldg., 1-13 Shimbashi, 1-chome, Minato-ku, Tokyo 105, Japan.

*ANS Topical on Criticality Safety and the Storage of Fissile Material,* Sept. 9–12, Jackson, Wyoming. Contact: Robert E. Wilson, Idaho Chem Processing Plant, P.O. Box 4000, (CPP-668), Idaho Falls, ID 83403 (phone 208-526-1361).

*Handling of Radiation Accidents by Emergency Personnel Course,* Sept. 10–13, 1985, Oak Ridge, Tenn., sponsored by DOE. Contact: Robert C. Ricks, Director, REAC/TS, ORAU, P.O. Box 117, Oak Ridge, Tenn. 37831-0117 (phone 615-576-3131).

*International Seminar on Finite Element and Allied Methods for Reactor Physics and Shielding Calculations,* September 18–20, 1985, London, England. Contact: A. J. H. Goddard, Mechanical Engr. Dept., Imperial College of Science and Technology, Exhibition Road, London SW7 2BX.

*Health Physics in Radiation Accidents Course,* Sept. 23–27, 1985, sponsored by DOE. Contact: Robert C. Ricks, Director, REAC/TS, ORAU, P.O. Box 117, Oak Ridge, Tenn. 37831-0117 (phone 615-576-3131).

*ANS Topical Meeting on High Level Nuclear Waste Disposal — Technology and Engineering,* Sept. 24–26, 1985, in Pasco, Washington. Contact: Edward B. Ash, Rockwell Hanford, P.O. Box 800, Richland, WA 99352 (phone 509-376-6846).

*3rd International Symposium on Radiation Physics (ISRP-3),* September 30–October 4, 1985, Ferrara, Italy. Contact: ISRP-3 OC Chairman, Istituto de Fisica Generale dell 'Università de Ferrara, Via Paradiso 12, I-44100 Ferrara, Italy.

**October 1985**

*Meeting on Nuclear Data, Cross Section Libraries and Application in Nuclear Energy,* October 1–2, 1985, Bonn, Fed. Rep. of Germany, sponsored by the German Nuclear Technology Society and the European Nuclear Society. Contact: Dieter Emendörfer, Stuttgart University (IKE), Pfaffenwaldring 31, D-7000 Stuttgart 80, Fed. Rep. of Germany.

*TMI-2: A Learning Experience,* ANS Executive Conference, October 13–16, 1985, Hershey, Pennsylvania. Contact Franklin Coffman, General Chairman,IT Corp., Federal State Remedial Div., 600 Maryland Ave., SW, Suite 302, Washington, DC 20024 (phone 202-484-7100).

*18th Annual Meeting of the Radiation Protection Association: Population Radiation Exposure,* October 6–10, 1985, Luebeck-Travemuende, Fed. Rep. of Germany. Contact: Dipl.-Phys. K. Henning, GKSS-Forschungszentrum, Geesthacht GmbH, Postfach 1160, D-2054 Geesthacht, Fed. Rep. of Germany.

*3rd International Conference on Nuclear Technology Transfer,* October 14–19, 1985, Madrid, Spain, sponsored by the Spanish Nuclear Society, the American Nuclear Society, and the European Nuclear Society. Contact: Myron Kratzer, International Energy Associates, Suite 600-600, New Hampshire Ave., Washington, DC 20036 (phone 202-342-6752) or Pierre Grau, Framatome, Tour Fiat, CEDEX 16, 92084 Paris, France (phone 796 04 06).

*Technical Committee on the Assessment of the Radiological Impact from the Transport of Radioactive Materials,* October 21–25, 1985, Vienna, Austria, sponsored by the International Atomic Energy Agency. Contact: R. B. Pope, Division of Nuclear Safety, IAEA, P.O. Box 100, A-1400 Vienna, Austria.

*3rd International Topical Meeting on Reactor Thermal Hydraulics,* October 15–18, 1985, Newport, Rhode Island, sponsored by the ANS, American Society of Mechanical Engineers, and the American Institute of Chemical Engineers. Contact: 3rd Internatl. Top. Meeting on Reactor Thermal Hydraulics, c/o H. Shaffer, 1671 Worcester Road, Framingham, MA 01701 USA.

*12th Annual Meeting and International Conference on Nuclear Energy,* October 20–23, 1985, Boston, Massachusetts, sponsored by the World Nuclear Fuel Market. Contact: Donna P. Cason, Administrative Director, WNFM, 5720 Peachtree Parkway, Norcross, GA 30092 (phone 404-447-1144).

*Nuclear Science Symposium,* October 23–25, 1985, San Francisco, California, sponsored by the Inst. for Electrical and Electronics Engineers. Contact: R. S. Larsen, Stanford Linear Accelerator Center, Stanford Univ., P.O. Box 4349, Stanford, CA 94305 (phone 415-854-9300 ext. 2726; FTS 461-9300 ext. 2726).

*International Symposium on Source Term Evaluation for Accident Conditions,* October 28–November 1, 1985, Columbus, Ohio. Participation must be through designation by the Government of a Member State of the IAEA or by an organization invited to participate. Contact: Secretariat, c/o International Atomic Energy Agency, Vienna International Centre, P.O. Box 100, A-1400, Vienna, Austria.

**November 1985**

*Joint Meeting of the American Nuclear Society and the Atomic Industrial Forum,* November 11–15, 1985, San Francisco. Contact: Meetings Dept., ANS, 555 North Kensington Ave., La Grange Park, IL 60525, or James R. Sasso, General Electric–MC-871, San Jose, CA 95125 (phone 408-925-1195).

*11th Symposium on Engineering Problems in Fusion Research,* November 18–22, 1985, Austin, Texas. Contact: Ward Harris, Fusion Research Center, Univ. of Texas at Austin, RLM 11.1222, Austin, TX 78712 (phone 512-471-4576 or 4698).

*Technical Committee on Procedures for Assessing the Reliability of Transfer Models,* November 18–22, 1985, Vienna, Austria, sponsored by the International Atomic Energy Agency. Contact: I. Savolainen, Division of Nuclear Fuel Cycle, IAEA, P.O. Box 100, A-1400 Vienna, Austria.

*1st International Conference on Fusion Reactor Materials,* November 19–22, 1985, Tokyo, Japan. Contact: R. R. Hasiguti, Science University of Tokyo, Kagurazaka, Shinjuku-ku, Tokyo, Japan 162.

**December 1985**

*Technical Committee on Computer Codes in Fusion Research,* December 3–5, 1985, Lausanne, Switzerland, sponsored by the International Atomic Energy Agency. Contact: M. Leiser, Head, Physics Section, Division of Research and Laboratories, IAEA, P.O. Box 100, A-1400 Vienna, Austria.

**January 1986**

*3rd Symposium on Space Nuclear Power Systems,* January 13–16, 1986, in Albuquerque, New Mexico, sponsored by the Institute for Space Nuclear Power Studies, Chemical/Nuclear Engineering Department, University of New Mexico. Contact: Institute for Space Nuclear Studies, Chemical/Nuclear Engr. Dept., Univ. of New Mexico, Albuquerque, NM 87131.

**August 1986**

*8th International Conference on Solid State Dosimetry* organized by the National Radiological Protection Board, U.K., 26–29 August, 1986, St. Catherine's College, Oxford. Further details from: Miss L. Ashby, National Radiological Protection Board, Chilton, Didcot, Oxfordshire, U.K.

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# JUNE 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.**

## RADIATION SHIELDING LITERATURE

**ANL/FPP-84-1-Vol.1,** . . *Blanket Comparison and Selection Study. Final Report. Volume 1.,* . . Argonne National Lab., IL, . . September 1984, . . NTIS, PC A24/MF A01; GPO Dep. File No.DE85005869

**ANL/FPP-84-1-Vol.2,** . . *Blanket Comparison and Selection Study. Final Report. Volume 2.,* . . Argonne National Lab., IL, . . September 1984, . . NTIS, PC A99/MF A01; GPO Dep. File No.DE85005867

**ANL/FPP-84-1-Vol.3,** . . *Blanket Comparison and Selection Study. Final Report. Volume 3.,* . . Argonne National Lab., IL, . . September 1984, . . NTIS, PC A22/MF A01; GPO Dep. File No.DE85005868

**ARL/TR-043(V.1), pp.1-25,** . . *The Physical Principles of Radiation Protection.,* . . Lokan, K.H., .

. In: Radiation Protection in the Mining and Milling of Radioactive Ores. Boas, J.F.(Ed.), . . January 1982, . . MF available from INIS.

**CEA-CONF-5970,** . . *Status of Integral Transport Theory.,* . . Kavenoky, A., . . April 1981, . . MF available from INIS.

**CEA-CONF-5972,** . . *New Finite Element Representation for 3 D Reactor Calculations.,* . . Lautard, J.J., . . April 1981, . . MF available from INIS.

**CONF-790912, pp.329-353,** . . *Review of Fusion-Fission (Hybrid) Reactor Studies.,* . . Casini, G., . . 1979, . . Culham, England; UKAEA Culham Laboratory, . . Ninth European Conference on Controlled Fusion and Plasma Physics, Oxford, 17-21 September 1979.

**CONF-810808, pp.114-118,** . . *Fusion Fundamentals.,* . . Dean, S.O., . . From: Energy in the Man-Built Environment: The Next Decade Specialty Conference; Vail, CO (3 Aug. 1981), . . 1981, . . American Society of Civil Engineers, New York, NY

**CONF-811046-Vol.1, pp.65-78; IAEA/TC-392/39,** . . *Integral Experiments on Lithium Oxide Spherical Assembly with Graphite Reflector and on Duct Streaming.,* . . Nakamura, T.; Maekawa, H.; Tanaka, S.; Seki, Y.; Ikeda, Y.; Oyama, Y.; Iguchi, T., . . 1983, . . IAEA, Vienna, Austria

**CONF-811046-Vol.1, pp.79-94; IAEA-TC-392/40,** . . *Neutronics Design of the Next Tokamak. (Swimming Pool Type).,* . . Seki, Y.; Iida, H.; Kitamura, K.; Minato, A.; Sako, K.; Kawasaki, H.; Mori, S.; Nishida, H., . . 1983, . . International Atomic Energy Agency, Vienna, Austria

**CONF-811046-Vol.1, pp.175-190; IAEA-TC-392/47,** . . *Neutronics in ICF Reactor -SENRI-I-.,* . . Nakai, S.; Ido, S.; Yamanaka, C.; Oomura, H., . . 1983, . . International Atomic Energy Agency, Vienna, Austria

**CONF-811046-Vol.1, pp.581-591; IAEA-TC-392/34,** . . *Nuclear Performance of Fusion-Fission Hybrid Reactors.,* . . Oka, Y.; Hattori, H.; An, S.; Kondo, S., . . 1983, . . International Atomic Energy Agency, Vienna, Austria

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