RSIC Newsletter

No. 283   *June 1988*

*There is but one bond of peace that is both permanent and enrich-
ing: The increasing knowledge of the world in which experiment
occurs.—Walter Lippman*

"Gandy Dancer" Roasted

Friends and colleagues gathered on May 7 to "roast the toast of RSIC." The occasion was the official
retirement party of Betty F. Maskewitz, who refers to globe-trotting activities on behalf of RSIC as
"gandy dancing." Roasters and well-wishers came to remark on Betty's remarkable career. And in the 35
years she has served in the Oak Ridge research complex, Betty has certainly supplied the material needed
for a roast.

Betty steered the RSIC ship through smooth and stormy seas. From its beginning when information
analysis centers sprang up like mushrooms after the release of the Weinberg Report, *Science, Govern-
ment, and Information,* through periods of government austerity, Betty and her staff sought to maintain
the unity RSIC has fostered in the international shielding community. Betty helped establish RSIC's in-
ternational reputation through personal contacts with foreign centers (thus the title "Gandy Dancer")
maintaining that the solution of radiation protection, shielding, and transport problems should know no
international boundaries. Domestic and foreign contributors/users have come to value this easy contact
with RSIC.

RSIC is one of the few remaining information analysis centers established in the early 60s. Its longevity
is largely due to the involvement of the RSIC staff in the radiation transport community and, in turn,
the willingness of the community to contribute to and support RSIC.

Betty's retirement plans include acting as a senior technical advisor to the Engineering Physics Infor-
mation Centers (EPIC), writing an archival history of RSIC, and traveling on behalf of EPIC.

Alice Rice

Betty Maskewitz, center, circled by some of the roasters: kneeling on the left is Keith Penny, the first RSIC Director, and at the right is Charles "Chuck" Weisbin, Roastmaster. From left to right: Lee Dodds, nuclear engineering professor at the University of Tennessee-Knoxville (UT); Bonnie Carroll, information scientist; Robert Peelle, a section head for Engineering Physics and Mathematics (EPM) at ORNL; Ernest Silver, Engineering Technology Division of Martin Marietta Energy Systems, Inc.; Lester Price, Dept. of Energy; William Hannum, TVA-Chattanooga, Tenn.; Marcia Katz, nuclear engineering professor at UT; Becky Rickman, former EPM division secretary; and François Kertesz, RSIC consultant.

CHANGES TO THE COMPUTER CODE COLLECTION

Four code systems were packaged and added to the computer code collection during the month. Three of the additions resulted from foreign contributions.

CCC-523/RADSHIP-2

This code system to analyze the environmental impact of the transportation of radioactive materials was contributed by the Institute of Nuclear Energy Research, Taiwan, Republic of China. The specific transport scheme, including land transport by truck and sea transport by ship or barge, was considered in the analysis for normal transport and transport accident conditions. Reference: INER-0618 (1986). Fortran 66; FACOM.

PSR-259/COMPLOT

Two computer programs, contributed by the International Atomic Energy Agency in Vienna, are designed to operate on any type of computer from large mainframes to IBM-PC-AT computers. X4TOC4 translates experimental data from the flexible EXFOR format to a more rigid "computation format" suitable for input to further computer processing. The PLOTC4 program plots both processed EXFOR data and ENDF data. The programs are available on magnetic tape. References: IAEA Informal Notes (April 1987), IAEA-NDS-79 and IAEA-NDS-80. Fortran 77; IBM.

PSR-263/SPECTER-ANL

A code system for performing neutron damage calculations was contributed by Argonne National Laboratory, Argonne, Illinois. Two codes are included in the package. SPECTER calculates spectral-averaged displacements, recoil spectra, gas production, and total damage energy for 41 pure elements using data included in this package: ENDF/B-V derived cross sections, MACKLIB Kerma total damage library based on ENDF/B-IV, and ENDF/B-V gas production data. SPECOMP determines displacement damage in compounds for alloys, insulators, and breeder materials. The codes run on the VAX under the VMS operating system and can be adapted to run on Cray or IBM computers. Reference: ABK/FPP/TM-197 (January 1985). Fortran 77; VAX.

PSR-264 MICRO/ACORNS

This code system for the analysis of correlations used in neutron spectrometry was contributed by the Budapest Technical University, Budapest, Hungary. ACORNS allows the user to verify whether the covariance and correlation matrices used in activation neutron spectrometry are positive definite, that is the eigenvalues of the matrix concerned are all positive. The program performs a diagonalization of the input covariance matrix to determine the eigenvalues of the system. The eigenvalues are then analyzed to determine the rank of the matrix. The program performs a complete factor analysis if the eigenvectors of the matrix are also calculated. The code runs on the PDP 11, IBM PC/XT or PC/AT. The IBM Professional Fortran Compiler, which requires a math co-processor, was used for the PC version. Two 5.25-inch DS/DD diskettes are needed to transmit the package. Reference: BME-TR-RES-2/82 (March 1982). Fortran 77; IBM PC/XT, AT or PDP 11/23.

CHANGES TO THE DATA LIBRARY COLLECTION

Two additions were made to the data library collection during the month.

DLC-137/COVFILS-2

This library of neutron data and covariances for sensitivity and uncertainty analysis was contributed by Los Alamos National Laboratory, Los Alamos, New Mexico. Like the earlier DLC-091/COVFILS 30-group library, COVFILS-2 was produced using modules of PSR-171/NJOY. This 74-group library includes multigroup neutron cross sections, scattering matrices, and covariances. It is largely based on ENDF/B-V evaluations; however, private Los Alamos evaluations are used in a few cases. Full (P0-P3) transfer matrices for all scattering reactions present in the library are also in-

cluded. To save space and simplify the application of these data to uncertainty analyses, redundant reactions are omitted. A Fortran 77 retrieval program, BOXR, reads the library and reconstructs the complete matrix for user-selected portions. Reference: *Fusion Technology* **10**(3) 1461–65 (Nov. 1986), LA-UR-86-3786-Rev (Nov. 1986), and LA-UR-87-219 (Jan. 1987). Fortran 77; CRAY, CDC, IBM.

DLC-138/COVFILS-2-I

This library of neutron data and covariances for sensitivity and uncertainty analysis was contributed by Los Alamos National Laboratory. It is a subset of COVFILS-2 and is available for international distribution. Reference: *Fusion Technology* **10**(3) 1461–65 (Nov. 1986), LA-UR-86-3786-Rev (Nov. 1986), and LA-UR-87-219 (Jan. 1987). Fortran 77; CRAY, CDC, IBM.

AAEC Changes Name, Emphasis

In April 1987 the Australian Atomic Energy Commission (AAEC) became the Australian Nuclear Science and Technology Organization (ANSTO). More mission oriented than the AAEC, the main thrust of the ANSTO will be to encourage and facilitate the utilization of, and benefits from, nuclear science and technology in medicine, industry, commerce, agriculture, science, and the community at large.

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.

LANL Names Four Fellows

Donald Dudziak, James Gordon, Darryl Holm, and Hamish Robertson, Los Alamos National Laboratory scientists, were selected as fellows in recognition of outstanding scientific and technological contributions.

Donald Dudziak, a recognized expert in radiation shielding, reactor physics, and fusion reactor technology, earned a doctorate in applied mathematics from the University of Pittsburgh. Dudziak joined the Los Alamos staff in 1965. He has served in several research and management positions, including leader of the Transport and Reactor Theory Group from 1978 to 1982. He now serves as deputy leader of the Systems Analysis Group and section leader for high-technology systems studies. Dudziak is a member of Sigma Xi honorary scientific society, the American Nuclear Society (ANS), and the New York Academy of Science.

James Gordon, a nuclear physicist noted for his expertise in evaluating nuclear-weapons effects and designing nuclear devices, was recognized in 1987 with the Department of Energy's E. O. Lawrence Award for outstanding contributions to national security. In addition, he has won two Los Alamos Distinguished Performance Awards and a DOE Award of Excellence for significant contributions to the nuclear weapons program. Gordon earned his doctorate in physics from the University of Kansas. He joined the Los Alamos Applied Theoretical Physics Division in 1974. He has been the leader of the Thermonuclear Applications Group since 1985.

Darryl Holm, a theoretical physicist, has made contributions in both theory and applications of fluid dynamics. His applied contributions include thermonuclear weapons design, introducing methods and materials which have become standard. His theoretical contributions include the identification of a universal mathematical property of non-dissipative fluid equations leading to improved numerical algorithms and to nonlinear stability conditions which guarantee the controllability of broad classes of fluid and plasma flows. Holm is the editor of the non-linear science section of *Physics Letters A*, and a founding member of the Lab's Center for Nonlinear Studies. The Dept. of Energy's National Award of Excellence for significant contributions to the nuclear weapons program and the Los Alamos Distinguished Performance Award are among the awards presented to Holm. He earned a doctorate in physics at the University of Michigan. He joined the laboratory staff 16 years ago and now serves as deputy leader of the Mathematical Modeling and Analysis Groups.

Hamish Robertson joined the Subatomic Research and Applications Group seven years ago. A renowned nuclear physicist and expert on neutrinos, his research on the properties of neutrinos has significantly added to the understanding of the composition of the universe. He earned his doctorate in physics from McMaster University in Canada and was a physics professor at Michigan State University. Robertson is a Fellow of the American Physical Society, a member of the Canadian Association of Physicists, and an associate member of the Institute of Physics in London.

Kato Named Department Head at Brookhaven

Walter Kato replaced Herbert Kouts as the chairman of the Department of Nuclear Energy at Brookhaven National Laboratory. The department oversees programs in nuclear safety, nuclear waste , SDI, advanced reactor analysis and development, and management of the nuclear data center.

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.

International Dose Control Workshop Planned

Brookhaven National Laboratory will be the site for the *International Workshop on New Developments in Occupational Dose Control and ALARA Implementation at Nuclear Power Plants and Similar Facilities* planned for September 18–21, 1989. The workshop is sponsored jointly by the U.S. Nuclear Regulatory Commission (NRC) and the Department of Energy (DOE) in cooperation with the Organization for Economic Cooperation and Development (OECD) Nuclear Energy Agency.

Invited and contributed papers and workshop discussions will be held on the following topics.

ALARA organization in design and operation, including design reviews and operational planning, overall plant optimization studies, results from the Nordic study, mock-up training, and training workers for self-monitoring

ALARA engineering in design and modifications, including cobalt reduction in nuclear plants, special shielding, cost-benefit analyses and other decision-aiding techniques, remote tooling and robotics, and control-rod drive rebuild facilities

System chemistry and water purification, including zinc injection, pH control, hydrogen water chemistry, ultra-fine filtration, and passivation of pipes and components

ALARA in operation, including maintenance work, system (and component) decontamination, remote inspections and surveillance, and start-up and shutdown procedures

Recommendations and regulations of groups such as ICRP/NCRP, IAEA, INPO, CEC, DOE, and NRC

Presentations and discussions on the OECD/NEA Occupational Exposure Information System.

For further information contact the BNL ALARA Center, Bldg. 703M, Brookhaven National Laboratory, Upton, NY 11973 (phone 516-282-4425 or fax 516-282-5810).

Calendar

Your attention is directed to the following events of interest.

June 1988

14th International Symposium on Effects of Radiation on Materials, June 27-29, 1988, Andover, Massachusetts, sponsored by the American Society for Testing and Materials. Contact: N. H. Packan, ORNL, P.O. Box 2008, Bldg. 5500, Oak Ridge, TN 37831-6376 (phone 615-574-5070 or FTS 624-5070).

July 1988

33rd Annual Meeting of the Health Physics Society, July 4–8, 1988, Boston. Contact: Health Physics Society, Suite 506, 1340 Old Chain Bridge Road, McLean, VA 22101 (phone 703-790-1745).

International Small Hydro Conference, July 4–9, 1988, Toronto, Canada, sponsored by the Ontario Ministry of Energy. Contact: Ontario Ministry of Energy, 56 Wellesley St. West, Toronto, Ontario, Canada M7A 2B7 (phone 416-965-6070).

25th Annual Conference on Nuclear and Space Radiation Effects, July 12–15, 1988, Portland, Oregon, sponsored by the Inst. of Electrical and Electronics Engineers. Contact: IEEE, 345 E. 47th St., New York, NY 10017 (phone 212-705-7895).

4th International Conference on Neutron Scattering (ICNS'88), July-12–15, 1988, Grenoble, France. Contact: J. Schweizer, ICNS'88, Centre d'Etudes Nucleaires, DRF/SPh-MDN, 85 X, F-38041 Grenoble Cedex, France (phone 33 76 88 36 97).

August 1988

Monte Carlo Analysis, Aug. 15–19, 1988, a short course sponsored by the University of Tennessee College of Engineering, Knoxville, Tennessee. Contact: T. W. Kerlin, Head, Nuclear Engineering Dept., The University of Tennessee, Knoxville, TN 37996-2000 (phone 615-974-2525).

Computational Methods in Reactor Analysis, Aug. 15–19, 1988, a short course sponsored by the University of Tennessee College of Engineering, Knoxville, Tennessee. Contact: T. W. Kerlin, Head, Nuclear Engineering Dept., The University of Tennessee, Knoxville, TN 37996-2000 (phone 615-974-2525).

International Reprocessing and Waste Management Symposium, Aug. 21–24, 1988, Denver, Colorado, sponsored by the American Inst. of Chemical Engineers. Contact: Wayne Freeby, Bechtel National, Inc., Fifty Beale St., San Francisco, CA 94119.

Annual DOE Low-Level Waste Management Conference, Aug. 30–Sept. 1, 1988, Denver, Colorado. Contact: Marjorie Clearwater, Idaho National Engineering Laboratory, P.O. Box 1625, Idaho Falls, ID 83415 (phone 208-526-9197 or FTS 583-9197).

September 1988

Industrial Radiation and Radioisotope Measurement Applications, Sept. 6–8, 1988, Pinehurst, North Carolina, a topical meeting sponsored by the Isotopes and Radiation Division of the ANS. Contact: Robin P. Gardner, General Chairman, or Kuruvilla Verghese, Tech. Program Chairman, North Carolina State Univ., School of Engineering, Box 7909, Raleigh, NC 27695-7909.

International Topical Meeting on Waste Management: SPECTRUM '88, Sept. 11–15, 1988, Pasco, Washington. Contact: Bill Bonner, Pacific Northwest Laboratory, P.O. Box 999, Richland, WA 99352 (phone 509-376-5451 or FTS 444-5451).

7th International Conference on Radiation Shielding (ICRS), Sept. 12–16, 1988, Bournemouth, United Kingdom, sponsored by the OECD Nuclear Energy Agency and the UK Atomic Energy Agency. Contact: A. K. McCracken, UKAEA Winfrith, Dorchester, Dorset, DT2 8DH, UK or Leo LeSage, Argonne National Laboratory (ANL), Argonne, IL 60439 (phone 312-972-6048).

International Reactor Physics Conference, Sept. 18–21, 1988, Jackson Hole, Wyoming, sponsored by the ANS. Contact: Mike Lineberry, ANL, P.O. Box 2528, Idaho Falls, ID 83403 (phone 208-526-7434).

11th International CODATA Conference, "Scientific and Technical Data in a New Era," Sept. 26–29, 1988, Karlsruhe, Fed. Rep. of Germany. Contact: DECHEMA, ATTN: CODATA Conference, P.O. Box 97 01 46, D-6000 Frankfurt/M. 97, Fed. Rep. of Germany (phone 069 7564 241/242/243; Telex: 412490 dcha d.).

October 1988

4th International Symposium on Radiation Physics (ISRP-4), Oct. 3–7, 1988, São Paulo, Brazil. Contact: Prof. Ivan Cunha Nascimento, ISRP-4 *(ISRP-4),* Oct. 3–7, 1988, São Paulo, Brazil. Contact: Prof. Ivan Cunha Nascimento, ISRP-4

Chairman of the Organizing Committee, Inst. de Fisica-Universidade de São Paulo, Caixa Postal 20516 (TELEX: 011-37920 IF SP -1498-São Paulo-SP-Brazil).

4th Annual DOE Model Conference, Oct. 3–7, 1988, Oak Ridge, Tennessee. Contact: Cynthia Kendrick, ORNL, P.O. Box 2008, Oak Ridge, TN 37831-6029 (phone 615-576-2632 or FTS 626-2632).

Fundamentals of Nondestructive Assay of Nuclear Material, Oct. 3–7, 1988, Los Alamos, New Mexico, sponsored by the U.S. Dept. of Energy. Contact: Linda Robinson, LANL, Los Alamos, NM 87545 (phone 505-667-5258 or FTS 843-5258).

International Symposium on the Feedback of Operational Safety Experience from Nuclear Power Plants, Oct. 3–7, 1988, Vienna, sponsored by the IAEA. Contact: IAEA, Conference Service Section, P.O. Box 100, A-1400 Vienna, Austria.

8th Topical Meeting on Technology of Fusion Energy, Oct. 9–13, 1988, Salt Lake City, Utah. Contact: Clyde R. Toole, EG&G Idaho, P.O. Box 1625 (WCB-W3), Idaho Falls, ID 83415.

IMechE International Conference on Decommissioning of Major Radioactive Facilities, Oct. 11–12, 1988, London, sponsored by the Institution of Mechanical Engineers. Contact: Conference Dept. C376, Inst. of Mechanical Engineers, 1 Birdcage Walk, Westminster, London SW1H 9JJ, United Kingdom.

12th International Conference on Plasma Physics and Controlled Nuclear Fusion Research, Oct. 12–19, 1988, Nice, France, sponsored by the IAEA. Contact: IAEA, P.O. Box 100 A-1400, Vienna, Austria.

5th National Conference on Biomedical Physics and Engineering, Oct. 15–17, 1988, Sofia, Bulgaria. Contact: M. Markov, Department of Biophysics, Biological Faculty, Sofia University, 8, Dragan Tzankov Blvd., Sofia 1000, Bulgaria.

Meeting of the American Nuclear Society, Oct. 30–Nov. 4, 1988, Washington, D.C. Contact: ANS, Meetings Department, 555 N. Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

TMI-2 Accident Materials Behavior, Oct. 30–Nov. 4, 1988, Washington, D. C., sponsored by the American Nuclear Society. Contact: Gregory R. Eidam, TMI Nuclear Plant, P.O. Box 480, Middeltown, PA 17057 (phone 717-948-8000).

2nd Conference on Radiation Protection and Dosimetry, Oct. 31–Nov. 3, 1988, Orlando, Florida, sponsored by ORNL. Contact: C. S. Sims, ORNL, P.O. Box 2008, Oak Ridge, TN 37831-6379.

November 1988

Gamma-Ray Assay of Nuclear Materials, Nov. 28–Dec. 2, 1988, Los Alamos, New Mexico, sponsored by the U.S. Dept. of Energy. Contact: Linda Robinson, LANL, Los Alamos, NM 87545 (phone 505-667-5258 or FTS 843-5258).

January 1989

6th Symposium on Space Nuclear Power Systems, Jan. 9–12, 1989, Albuquerque, New Mexico, sponsored by the Univ. of New Mexico. Contact: Mohamed El-Genk, The Inst. for Space Nuclear Power Studies, Univ. of New Mexico, 237 Farris Engineering Center, Albuquerque, NM 78131 (phone 505-277-2813).

June 1989

Annual Meeting of the American Nuclear Society, June 4–8, 1989, Atlanta, Georgia. Contact: ANS Meetings Dept., 555 N. Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

Packaging and Transportation of Radioactive Materials: PATRAM '89, June 11–16, 1989, Arlington, Virginia, sponsored by US-DOE. Contact: Larry Blalock, Chairman, US Organizing Comm., US Dept. of Energy, P.O. Box 2001, Oak Ridge, TN 37831-8765 (phone 615-576-0945 or FTS 626-0945).

MAY 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

AECL-7690(Rev.1), .. *Testing ENDF/B-V Data for Thermal Reactors.,* .. Craig, D.S., .. June 1984, .. Scientific Document Distribution Office, Atomic Energy of Canada Limited, Chalk River, Ontario, Canada K0J 1J0 $9.00 per copy

CEA-CONF-7952, .. *Complementarity of Monte Carlo and Deterministic Methods.,* .. Samba, G., .. April 1985, .. MF available from INIS.

CEA-CONF-7955, .. *Non Statistical Monte-Carlo.,* .. Mercier, B., .. April 1985, .. MF available from INIS.

DOE/RW-0184, Vol.1, .. *Characteristics of Spent Fuel, High-Level Waste, and Other Radioactive Wastes Which May Require Long-Term Isolation. Diskette Included in this Document.,* .. DOE, .. December 1987, .. USDOE Office of Civilian Radioactive Waste Management, Washington, DC

DOE/RW-0184, Vol.2, .. *Characteristics of Spent Fuel, High-Level Waste, and Other Radioactive Wastes Which May Require Long-Term Isolation. Appendix 1A: ORIGEN2 Overview. Appendix 1B: ORIGEN2 Library Data. Appendix 1C: ORIGEN2 Interpolation Functions.,* .. DOE, .. December 1987, .. USDOE Office of Civilian Radioactive Waste Management, Washington, DC

DOE/RW-0184, Vol.3, .. *Characteristics of Spent Fuel, High-Level Waste, and Other Radioactive Wastes Which May Require Long-Term Isolation. Appendix 2A: Physical Descriptions of LWR Fuel Assemblies.,* .. DOE, .. December 1987, .. USDOE Office of Civilian Radioactive Waste Management, Washington, DC

DOE/RW-0184, Vol.4, .. *Characteristics of Spent Fuel, High-Level Waste, and Other Radioactive Wastes Which May Require Long-Term Isolation. Appendix 2B: User's Guide to the LWR Assemblies Data Base. Appendix 2C: User's Guide to the LWR Radiological Data Base. Appendix 2D: User's Guide to the LWR Quantities Data Base.,* .. DOE, .. December 1987, .. USDOE Office of Civilian Radioactive Waste Management, Washington, DC

DOE/RW-0184, Vol.5, .. *Characteristics of Spent Fuel, High-Level Waste, and Other Radioactive Wastes Which May Require Long-Term Isolation. Appendix*

2E: *Physical Descriptions of LWR Nonfuel Assembly Hardware. Appendix 2F: User's Guide to the LWR Nonfuel Assembly Data Base.*, . . DOE, . . December 1987, . . USDOE Office of Civilian Radioactive Waste Management, Washington, DC

DOE/RW-0184, Vol.6, . . *Characteristics of Spent Fuel, High-Level Waste, and Other Radioactive Wastes Which May Require Long-Term Isolation. Appendix 3A: ORIGEN2 Decay Tables for Immobilized High-Level Waste. Appendix 3B: Interim High-Level Waste Forms. Appendix 3C: User's Guide to the High-Level Waste PC Data Base.*, . . DOE, . . December 1987, . . US-DOE Office of Civilian Radioactive Waste Management, Washington, DC

EPRI-NP-5526,Vol.1, . . *Radwaste Generation Survey Update. Volume 1: Boiling Water Reactors. Final Report.*, . . Daloisio, G.S.; Deltete, C.P., . . February 1988, . . Research Reports Center, P.O.Box 50490, Palo Alto, CA 94303

EPRI-NP-5526,Vol.2, . . *Radwaste Generation Survey Update. Volume 2: Pressurized Water Reactors. Final Report.*, . . Daloisio, G.S.; Deltete, C.P., . . February 1988, . . Research Reports Center, P.O.Box 50490, Palo Alto, CA 94303

IAEA-TC-392.3/29; CONF-860551,Vol.1, pp.457-476, . . *Overview of the United States Heavy-Ion Fusion Commercial Electric Power Systems Assessment Project.*, . . Dudziak, D.J.; Pendergrass, J.H.; Saylor, W.W., . . In: Fusion Reactor Design and Technology 1986---Proceedings held in Yalta, 26 May--6 June 1986., . . 1987, . . IAEA

INDC(NDS)-193/L, . . *Proceedings of the IAEA Research Coordination Meeting on Methods for the Calculations of Neutron Nuclear Data for Structural Materials in Co-Operation with the Centro di Calcolo Del ENEA, Bologna, Italy, 7-10 October 1986.*, . . Goulo, V., . . January 1988, . . International Atomic Energy Agency, Vienna, Austria

INDC(NDS)-197/LNA, . . *Report of the Nuclear Data Section to the International Nuclear Data Committee, March 1986 to August 1987.*, . . Lorenz, A., . . September 1987, . . International Atomic Energy Agency, Vienna, Austria

INIS-BR-492, pp.207-226(In Portuguese); CONF-8504355, pp.207-226(In Portuguese), . . *Application of Finite Element Method in the Solution of Transport Equation.*, . . Maiorino, J.R.; Vieira, W.J., . . 1985, . . MF available from INIS.

INIS-BR-492, pp.242-253(In Portuguese); CONF-8504355, pp.242-253(In Portuguese), . . *Calculation of Spatial Distribution of the EURACOS II Converter Source.*, . . Santo, A.C.F. de, . . 1985, . . MF available from INIS.

INIS-BR-492, pp.663-676(In Portuguese); CONF-8504355, pp.663-676(In Portuguese), . . *Nuclear Reactor Shielding Calculation Using the ANISN and SABINE-3 Nuclear Codes.*, . . Otto, A.C.; Pontedeiro, E.M.B.D.; Silva, R.C.O. da, . . 1985, . . MF available from INIS.

INIS-BR-492, pp.677-690(In Portuguese); CONF-8504355, pp.677-690(In Portuguese), . . *An Alternative Technique for Simulating Volumetric Cylindrical Sources in the MORSE Code Utilization.*, . . Vieira, W.J.; Mendonca, A.G., . . 1985, . . MF available from INIS.

JAERI-M-87-203 (In Japanese), . . *Fusion Neutron Shielding Benchmark Problems.*, . . Oka, Y.; Sasamoto, N.; Mori, S.; Ueki, K.; Kawai, M.; Ohishi, K.; Sakurai, K.; Shin, K.; Sekimoto, H.; Ohyama, Y.; Uwamino, Y.; Ikeda, Y.; Namito, Y., . . November 24, 1987, . . Information Division, Department of Technical Information, Japan Atomic Energy Research Institute, Tokai-mura, Naka-gun, Ibaraki-ken 319-311, Japan

JET-P-(87)50, . . *Photoneutron Production Accompanying Plasma Disruptions in JET.*, . . Jarvis, O.N.; Sadler, G.; Thompson, J.L., . . 1987, . . JET Joint Undertaking, Abingdon, Oxfordshire, UK

LA-UR-85-962, . . *Coupled Electron-Photon Transport Calculations Using the Method of Discrete Ordinates.*, . . Lorence, L.J.; Nelson, W.E.; Morel, J.E., . . 1985, . . Los Alamos National Lab., Los Alamos, New Mexico 87545

LA-UR-86-219, . . *Recent Joint Developments in Cross-Section Uncertainty Analysis at Los Alamos and EIR.*, . . Davidson, J.W.; Dudziak, D.J.; Muir, D.W.; Stepanek, J.; Higgs, C.E., . . 1986, . . Los Alamos National Lab., Los Alamos, New Mexico 87545

LBL-PUB-490, . . *X-Ray Data Booklet. Center for X-Ray Optics.*, . . Vaughan, D. (Ed.), . . October 1985, . . NTIS, PC A08/MF A01; MF available from INIS., . . Published in summary form only.

MIT-PFC/JA-88-3, . . *X-Ray Response of Silicon Surface Barrier Diodes at 8 and 17.5 keV: Evidence that the X-Ray Sensitive Depth is Not Generally the Depletion Depth.*, . . Wenzel, K.W.; Petrasso, R.D., . . March 1988, . . Plasma Fusion Center, Massachusetts Inst. of Technology, Cambridge, MA

NVO-224, pp.56-69, . . *Why the Plumbbob Gamma Decay (PGD) Curve is an Incorrect Model for External Gamma-Exposure Rate as a Function of Time: A Comment on Continental Close-In Fallout: Its History, Measurement, and Characteristics.*, . . Anspaugh, L.R., . . 1985, . . NTIS, PC A16/MF A01; MF available from INIS.

OKTAVIAN Report A-87-04 (In Japanese), . . *Preliminary Results of Fusion Neutron Streaming Benchmark Experiment of 1986 for Polyethylene Shield.*, . . Oka, Y.; Shin, K.; Sekimoto, H.; Sakamoto, S.; Takahashi, A.; Yamamoto, J., . . June 1987, . . Department of Nuclear Engineering, Osaka University, Yamadaoka 2-1, Suita, Osaka 565, Japan

ORNL-6438, . . *New Population and Agricultural Database Construction for the Computerized Radiolog-*

ical Risk Investigation System., . . Hively, L.M.; Bledsoe, J.L.; Sjoreen, A.L., . . May 1988, . . NTIS, PC A04/MF A01

ORNL-6439, . . *Agricultural and Population Data Base for Radiological Assessments Using the CRRIS.*, . . Sjoreen, A.L.; Bledsoe, J.L.; Hively, L.M.; Nyquist, J.E., . . April 1988, . . NTIS

ORNL-6462, . . *SCINFUL: A Monte Carlo Based Computer Program to Determine a Scintillator Full Energy Response to Neutron Detection for E_n Between 0.1 and 0 MeV: User's Manual and Fortran Program Listing.*, . . Dickens, J.K., . . March 1988, . . NTIS, PC A11/MF A01

ORNL/Sub-6-SA094/1, . . *Use of Transportable Storage Casks in the Nuclear Waste Management System.*, . . December 1987, . . H and R Technical Associates, Inc., Oak Ridge, TN; Johnson (E.R.) Associates, Inc., Oakton, VA

ORNL/Sub-6-SA094/2, . . *Use of Transportable Casks in the Nuclear Waste Management System. Appendices.*, . . December 1987, . . H and R Technical Associates, Inc., Oak Ridge, TN; Johnson (E.R.) Associates, Inc., Oakton, VA

ORNL/Sub-87-06604/1, . . *A Cask Fleet Operations Study.*, . . March 1988, . . Transnuclear, Inc., Hawthorne, NY

ORNL/TM-10773, . . *Comparison of Results Based on a Deterministic Versus a Statistical Uncertainty Analysis.*, . . Maerker, R.E., . . May 1988, . . NTIS, PC A05/MF A01

RIKEN-AF-NP-64, . . *Nuclear Structure Studies Using Beams of Radioactive Nuclei. Talks given at the 5th International Conference on Nuclei Far from Stability (Sept. 14-19, Rosseau Lake, Ontario, Canada) and the Riken-In2P3 Symposium on Heavy-Ion Collisions (Oct. 11-15, Shimoda, Japan).*, . . Tanihata, I., . . 1987, . . Riken Accelerator Facility, Institute of Physical and Chemical Research, Wako, Saitama, Japan

STUK-A61, . . *Radioactivity of Fresh Water Fish in Finland After the Chernobyl Accident in 1986.*, . . Saxen, R.; Rantavaara, A., . . June 1987, . . Finnish Centre for Radiation and Nuclear Safety, P.O. Box 268, SF-00101 Helsinki, Finland

Am. J. Phys., 54(3), 262-267, . . *Monte Carlo Simulation of Nonrelativistic Electron Scattering.*, . . Williamson, W.,Jr.; Duncan, G.C., . . 1985

Bull. Res. Lab. Nucl. React.(Tokyo Inst. Technol.), 10, 3-10, . . *Errors Due to Energy Grouping for Monte Carlo Method.*, . . Noura, T.; Sekimoto, H.; Yamamuro, N., . . March 1985

Chinese J. Nucl. Sci. Eng., 7(3,4), 254-259, . . *The Research of Deep Gamma-Gamma Method.*, . . Gao, G., . . December 1987

Chinese J. Nucl. Sci. Eng., 7(3,4), 260-265, . . *Neutronics Design for a Fusion Breeder.*, . . You, C.; Xiz, Z., . . December 1987

Chinese J. Nucl. Sci. Eng., 8(1), 79-88, . . *CNCSES---Computerized Nuclear Cross Section Evaluation System.*, . . Liu, T.; Liu, R.; Linxing, S.; Liang, Q., . . March 1988

Fusion Technology, 13(4), 594-615, . . *Radiological Dose Calculations for the Diode Region of the Light Ion Fusion Target Development Facility.*, . . Henderson, D.L.; Sawan, M.E.; Moses, G.A., . . May 1988

Fusion Technology, 13(4), 616-643, . . *Two-Dimensional Cross-Section Sensitivity and Uncertainty Analysis for Tritium Production Rate in Fusion-Oriented Integral Experiments.*, . . Ikeda, Y.; Youssef, M.Z., . . May 1988

Health Phys., 50(4), 493-507, . . *Dose Distribution from a Degraded 60-Co Gamma Field.*, . . Momeni, M.H., . . April 1986

Health Phys., 50(4), 543-547, . . *The Effect of the Choice of Response Matrix on Neutron Spectra Unfolded from Bonner Sphere Data.*, . . Lowry, K.A.; Johnson, T.L., . . April 1986

Health Phys., 50(4), 548-550, . . *Calculations of Effective Dose Equivalent, Ambient Dose Equivalent and Individual Dose Equivalent for a Set of Reference Neutron Spectra and Field Geometries.*, . . Bartlett, D.T.; Greenhalgh, J.R., . . April 1986

Health Phys., 54(5), 551-555, . . *Comparison of Neutron Dosimetric Quantities.*, . . Sims, C.S., . . May 1988

Health Phys., 54(5), 561-563, . . *Photon Transmission of Monoenergetic Broad Beams Through Gypsum Wallboard.*, . . Simpkin, D.J., . . May 1988

Med. Phys., 12(5), 592-597, . . *Energy and Angular Distributions of Photons from Medical Linear Accelerators.*, . . Mohan, R.; Chui, C.; Lidofsky, L., . . September 1985

Med. Phys., 12(5), 619-624, . . *Characteristics of the Photon Beam from a New 25-MV Linear Accelerator.*, . . Aldrich, J.E.; Andrew, J.W.; Michaels, H.B.; O'Brien, P.F., . . September 1985

Nucl. Safety, 29(1), 49-57, . . *Radiation Hormesis and Nuclear Safety.*, . . Congdon, C.C., . . January-March 1988

Nucl. Technology, 81(3), 370-380, . . *Determination of the End State of the Three Mile Island Unit 2 Accident Using Neutron Transport Analysis.*, . . Bandini, B.R.; Baratta, A.J., . . June 1988

Nucl. Technology, 81(3), 435-445, . . *Application of Neutron Radiography for Fluid Flow Visualization.*, . . Cimbala, J.M.; Hughes, D.E.; Levine, S.H.; Sathianathan, D., . . June 1988

BOOK, . . *NUCLEAR WASTE MANAGEMENT: A REPORT.*, . . American Society of Civil Engineers, . . 1982, . . New York, N.Y.: The Society

BOOK, . . *ABSORBED DOSE DETERMINATION IN PHOTON AND ELECTRON BEAMS: AN INTERNATIONAL CODE OF PRACTICE.*, . . Andreo, P., . . 1987, . . Vienna: International Atomic Energy Agency

BOOK, . . *A RADIATION MONITORING SYS-TEM FOR NUCLEAR POWER PLANTS: (WITH SPECIAL REFERENCE TO THE THREE MILE IS-LAND NUCLEAR POWER STATION).,* . . Berger, J., . . 1987, . . Philadelphia, Pa.: Three Mile Island Public Health Fund

BOOK, . . *NUCLEAR WASTE HANDLING AND STORAGE: PROCEEDINGS OF A SESSION.,* . . Kohl, R.A., . . 1986, . . New York, N.Y.: The Society

BOOK (Conference), . . *FAST NEUTRON PHYSICS.,* . . Miljanić, D.; Antolković, B.; Paić, G., . . Proceedings of the International Conference on Fast Neutron Physics, Dubrovnik, 26-31 May 1986., . . September 1986, . . Mrs. Zdenka Kuzmić, Ruder Boskovic Institute, FEP, P.O. Box 1016, 41001 Zagreb, Yugoslavia $25.00

BOOK, . . *THE FINITE ELEMENT METHOD AND ITS APPLICATIONS.,* . . Mori, M., . . 1986, . . New York: Macmillan

BOOK, . . *INTRODUCTION TO FUSION ENER-GY.,* . . Roth, J.R., . . 1986, . . Charlottesville, VA: Ibis Publishing

BOOK, . . *RADIATION EMBRITTLEMENT OF NUCLEAR REACTOR PRESSURE VESSEL STEELS: AN INTERNATIONAL REVIEW (SEC-OND VOL.): (SECOND) CONFERENCE.,* . . Steele, L.E., . . 1986, . . Philadelphia, PA: ASTM

COMPUTER CODES LITERATURE

ANL-PHY-86-1, pp. 477-486 . . . .
. . . . COUPLED-CHANNEL CODE
Simplified Coupled-Channel Code for Calculation of Fusion Cross Sections in Heavy Ion Reactions., . . Dasso, C.H.; Landowne, S., . . Niels Bohr Institute, Copenhagen, Denmark, . . 1986

CEA-CONF-9031, pp. 27-30 . . . . APOLLO II
APOLLO II: A User-Oriented Portable, Modular Code for Multigroup Transport Assembly Calculations., . . Sanchez, R.; Stankovsky, Z.; Cossic, A.; Mondot, J.; Zmijarevic, I., . . CEA CEN Saclay, 91 - Gif-sur-Yvette, France, . . April 1987, . . AVAIL: INIS (microfiche only)

ECN-202 . . . . .COVARIANCE COMPARISONS
Computer Programs for Calculating Group Cross-Section Covariances from Uncertainty Parameters in the ENDF/B-V Format., . . Nolthenius, H.J., . . Netherlands Energy Research Foundation, Petten, . . October 1987, . . AVAIL: INIS (microfiche only)

ENEA-RT-PAS-85-10 (In Italian) . . MERCURE IV
MERCURE IV Code Application the the External Dose Computation from Low and Medium Level Wastes., . . Tomassini, T., . . ENEA, Cassacia, Italy, . . 1985, . . AVAIL: INIS (microfiche only)

ENEA-RT-TIB-86-4 . . . . . EURLIB-4; VITAMIN-C
Comparison Between EURLIB-4 and VITAMIN-C Libraries with Respect to a Shielding Reference Problem., . . Borgia, M.G.; Panini, G.C.; Pescarini, M., . . ENEA, Bologna, Italy, . . 1986, . . AVAIL: INIS (microfiche only)

FEI-1843 (In Russian) . . . . MMKFK
Geometrical Module for Calculation of Systems with Zone Broken Line Boundaries Using Monte Carlo Method., . . Leont'ev, V.V.; Polevoj, V.B., . . Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Obninsk, . . 1987, . . AVAIL: INIS (microfiche only)

IEAv-013/87 . . . . .RGENDF
RGENDF---Programa Interface Entre o Código NJOY e Códigos Que Utilizam Seções de Choque Multigrupo., . . Chalhoub, E.S.; Anaf, J., . . Instituto de Estudos Avançados, São José dos Campos, Brazil, . . 1987

IEAv-014/87 . . . . .COMPAR
COMPAR: Sistema Para Comparar Secoes de Choque Multigrupo Geradas Por NJOY, GROUPIE, FLANGE-II, ETOG-3 e XLACS., . . Anaf, J.; Chalhoub, E.S., . . Instituto de Estudos Avançados, São José dos Campos, Brazil, . . November 1987

INIS-SU-431, p.250 (In Russian) . . . . TRACK
Calculation of Angular and Energy Distributions of Electrons, Passed Through Matter Layers by Monte Carlo Method., . . Zdesenko, Yu.G.; Tretyak, V.I., . . 1987, . . AVAIL: INIS (microfiche only)

LA-9303-M-Vol.3 . . . .
. . . . NJOY; GROUPR;GAMINR;MODER
The NJOY Nuclear Data Processing System: Volume 3, The GROUPR, GAMINR, and MODER Modules., . . MacFarlane, R.E.; Muir, D.W., . . Los Alamos National Lab., NM, . . October 1987, . . AVAIL: NTIS; INIS (microfiche only)

LBL-23939 . . . . LATTICE
LATTICE---A Beam Transport Program., . . Staples, J., . . Lawrence Berkeley Lab., CA, . . June 1987

NUREG/CR-4418 . . . . .VARSKIN
Dose Calculation for Contamination of the Skin Using the Computer Code VARSKIN., . . Traub, R.J.; Reece, W.D.; Scherpelz, R.I.; Sigalla, L.A., . . Pacific Northwest Lab., Richland, WA, . . August 1987, . . AVAIL: NTIS; INIS (microfiche only)

NUREG/CR-4653 .... GASPAR II
GASPAR II: Technical Reference and User Guide.,
. . Strenge, D.L.; Bander, T.J.; Soldat, J.K., . .
Pacific Northwest Lab., Richland, WA, . . March
1987, . . AVAIL: NTIS; INIS (microfiche only)

ORNL-6438 .... CRRIS
New Population and Agricultural Database
Construction for the Computerized Radiological
Risk Investigation System., . . Hively, L.M.;
Bledsoe, J.L.; Sjoreen, A.L., . . Oak Ridge National
Laboratory, TN, . . May 1988

ORNL-6439 .... CRRIS
Agricultural and Population Data Base for
Radiological Assessments Using the CRRIS., . .
Sjoreen, A.L.; Bledsoe, J.L.; Hively, L.M.; Nyquist,
J.E., . . Oak Ridge National Laboratory, TN, . .
April 1988

ORNL/TM-10773 .... UNCERTAINTY ANALYSIS
Comparison of Results Based on a Deterministic
Versus a Statistical Uncertainty Analysis., . .
Maerker, R.E., . . Oak Ridge National Laboratory,
TN, . . May 1988

SAND-83-0768 .... TRION; SEDTRAN
Analytic Models of Nuclide Transport in Saturated
Geologic Media., . . Klett, R.D.; Treadway, A.H.;
Hertel, E.S.; Garner, J.W., . . Sandia National Labs.,
Albuquerque, NM;G2vanTel Ltd., Albuquerque,
NM; Applied Physics, Inc., Albuquerque, NM, . .
May 1987, . . AVAIL: NTIS; INIS (microfiche only)

SAND-85-0008 .... TRACR3D
Sandia Implementation of the TRACR3D Flow and
Transport Code: Nevada Nuclear Waste Storage
Investigations Project., . . Prindle, N.K.; Foster, J.,
. . Technadyne Engineering Consultants,
Albuquerque, NM; Sandia National Labs.,
Albuquerque, NM, . . June 1987, . . AVAIL: NTIS;
INIS (microfiche only)