

# RSIC Newsletter

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## 30 Years of Technology Exchange

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### Oak Ridge National Laboratory

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No. 343

June 1993

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*It is not at all likely that anyone ever had a totally original idea. ....Without many borrowed ideas there would be no inventions, new movements or anything else that is classed as new.—Dr. George Grier*

## RSIC ANNOUNCES PROGRAM — 30 YEARS AGO

"RSIC ANNOUNCES PROGRAM" was the page one headline of the first *r.s.i.c. newsletter*, issued as No. 1, June 1, 1963. It was a brave effort near the end of the first year of the newly established information analysis center, Radiation Shielding Information Center (RSIC). The issue was a little fancy, with word-processing enhanced by the Oak Ridge National Laboratory Publications Office. We proudly announced the completion of the first bibliography and the set up of the computer code section to collect and evaluate codes for shielding calculations. The program and services of the center were described and a request was made for shielding information.

A Board of Volunteer Coordinators was listed; 47 scientists and engineers represented a cross section of the international shielding community. The first meeting was called for June 18, 1963, during the summer meeting of the American Nuclear Society (ANS) in Salt Lake City, Utah. The concept of RSIC was welcomed and the groundwork was laid for cooperation throughout the nuclear industry. At some point the Board was dissolved as an entity, but the individual "volunteers" have continued to support RSIC through the years.

**S. K. Penny**, RSIC's first director, and **D. K. Trubey** received the full "blessings" of the ANS Shielding Division when they made a presentation to its executive committee during the 1963 sessions. **Betty F. Maskewitz** did not fare so well in a meeting with the executive committee of the Mathematics and Computation Division. They were skeptical that one could take computer codes designed for one computer environment, test them in another, and successfully transfer them into a third computer installation environment. Once it became known that RSIC was "doing the impossible", full cooperation was received.

The RSIC Seminar-Workshop as a means of transmitting a great deal of information to a large group of people at one time was initiated in 1965 when Monte Carlo methodology was explored and O5R was featured in a workshop. Each of the calculational methods of interest in shielding studies have been covered by RSIC through the years with benefits to all who participated. The latest effort planned (July 19–22, 1993) is an exploration (lectures and "hands-on" problem solving) of the several methods inherent in SCALE, the modular code system for performing Standardized Computer Analysis for Licensing Evaluation.

RSIC staff members were so involved in "stocking the store" in 1963 and 1964 that it was not until January 1965 that Issue No. 2 of the *RSIC Newsletter* was published. At the urging of the Volunteer Coordinators, the newsletter was issued monthly thereafter. This issue is No. 343. The newsletter has served as a communications medium through the years, seeking to keep the international shielding

community informed of the availability of information, seeking cooperation in efforts to advance the state of the art of shielding in general, and seeking to promote quality work and standardization. Perhaps its best role has been to serve as a mechanism for unifying the community it reaches in support of good science in our specialized field. We like to think so.

*Betty F. Maskewitz (Emerita)*

## CHANGES TO THE COMPUTER CODE COLLECTION

Three changes were made to the computer code collection during the month. Two 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-474/MORSE-CGA

Oak Ridge National Laboratory has contributed a newly frozen version of this general purpose Monte Carlo multigroup neutron and gamma-ray transport code system with array geometry capability. The new release, designated Version 2.0, includes many changes to minimize the differences in coding required for use on various computer system. A fatal geometry error fix-up has been implemented in order that users may recover useful results from computer runs that fail in this way. The collision density estimator is included in the standard package. All input data is in a free-form FIDO-type format. The PICTURE code, which makes printer plots of two dimensional slices through a combinatorial geometry mock-up, handles the MARS geometry capability. This new release has been run on many computers: IBM 3090 under MVX-XA, Cray under UNICOS, VAX under VMS, IBM RISC 6000 under AIX, and on 80386 personal computers (equipped with math coprocessors) under DOS using both Silicon Valley Software Version 2.8.2 and Microsoft Version 5 compilers and under OS/2 with the Wattcom compiler. The package is distributed in DOS format on 2 DS/HD diskettes. Since user-supplied Fortran routines are an integral part of the MORSE system, MORSE executable files are problem specific and are not included in the package. References: ORNL-6174 (April 1985, revised 1993). Fortran 77 and Assembler for IBM mainframe only; IBM 3090, Cray, VAX, IBM RISC 6000 and PC 386 (C00474/ALLCP/01).

### CCC-618/PTRAN

The National Institute of Standards, Bethesda, Maryland, contributed this code system to calculate the transport of proton beams through extended media. The PTRAN code uses 50 to 250 MeV beams through water phantoms. Multiple scattering and Coulomb interaction energy loss mechanisms are taken into account along with nonelastic nuclear interactions. PTRAN calculates deposition of energy as a function of depth and radial distance from the beam, energy spectra of the primary protons as function of depth. Both one- and three-dimensional calculations are available. PTRAN runs on PC386 or PC 486 computers. The executable codes included in the package were compiled and linked using Lahey F77L3/EM32 Version 5.01 compiler which requires an 80386 with an 80387 math coprocessor. The package is distributed on three DS/HD 5.25-in. (1.2 MB) diskette. Reference: NISTIR 5113 (1992). Fortran 77; PC 386 (C00618/PC386/00).

**NOTE: To those who will be attending the SCALE training course in July, there are no sessions on Friday, July 23.**

### PSR-332/PRE-ANISN

The National Accelerator Centre, Republic of South Africa, contributed this code system for automated preparation of multigroup source terms and response conversion factors for forward and adjoint multigroup radiation transport calculations. On personal computers PRE-ANISN prepares this data in a format suitable for direct importation into a number of codes, namely CCC-254/ANISN-ORNL, XSDRNPM from CCC-545/SCALE 4, PSR-

75/AXMIX and CCC-276/DOT 3.5. The executable included in the package was created on an 80386 personal computer with an 80387 math co-processor using the Lahey F77L-EM32 Version 5.01 compiler and Phar Lap DOS Extender and requires 4 MB

RAM under DOS 3.3 or newer. The package is transmitted on one DS/HD (1.2 MB) 5.25-in. diskette in DOS compressed format. Reference: NAC/91-06 (December 1991). Fortran 77; PC 386 (P00332/PC386/00).

## 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.

### RSIC Staff

**S. Noel Cramer** traveled to the CEA/CEN Saclay Laboratories in France to participate in the Seminar on Advanced Monte Carlo Computer Programs for Radiation Transport, April 27–29. The symposium, sponsored by the OECD Nuclear Energy Agency Data Bank, was attended by 90 people representing 20 countries. The seminar was a follow-up to a 1990 meeting in Budapest on the same subject.

Following the seminar Cramer made RSIC orientation visits to the CEA/CEN Saclay Shielding Laboratory and to the ENEA Research Center in Frascati, Italy.

**Robert W. Roussin** participated in the International Workshop on Nuclear Data for Fusion May 1–6, in Del Mar, California, and attended an executive committee meeting of the Cross section Evaluation Working Group (CSEWG).

**Mark E. Newman** has recently joined the RSIC staff. Mark's responsibilities include code testing and systems configuration and maintenance. Mark is nearing completion of an A. S. in Computer Science at Pellissippi State.

### Visitors to RSIC

During the month the following persons came for an orientation visit and/or to use RSIC facilities: *Dr. Evan Zsolnay*, Head of the Reactor Physics Department at the Institute of Nuclear Technology, Budapest, Hungary.

## 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.

### Nuclear Data for Science and Technology Call for Papers

The first call for papers has been issued by the organizers of the *International Conference on Nuclear Data for Science and Technology*. This is the next of a series of conferences that began in Harwell, The United Kingdom, in 1978; the last conference was held in Jülich, Germany, in 1991. The conference will be held May 9–13, 1994, in Gatlinburg, Tennessee. Oak Ridge National Laboratory (ORNL) is organizing the 1994 conference with cosponsorship provided by the University of Tennessee-Knoxville, the American Nuclear Society, the American Physical Society, and the U.S. Department of Energy. The International Atomic Energy Agency has agreed to cooperate and the OECD-Nuclear Energy Agency and the European Nuclear Society have been requested to cooperate.

The conference programs will include invited and contributed papers on a wide range of interdisciplinary studies dealing with measurement, calculations, evaluation, application and use of nuclear data. Both energy and

non-energy related data will be with emphasis on application-oriented numerical data. New applications (technology transfer) of nuclear data will be given special attention in the final program, which is still under development.

Those who wish to contribute a paper for the conference should submit an abstract of 350 words or less to the Conference Secretariat, Ann M. McCoy, Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN 37831-6356 (phone 615-574-6133) or the Chairman, J. K. Dickens at the same address. The topics suggested for the conference are:

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| <b>M</b> Fusion Reactors                 | <b>M</b> Nuclear Structure: (a) Beta Decay; (b) Model Calculations   |
| <b>M</b> Fission Reactors                | <b>M</b> Industrial Applications, for example, oil well logging, neutron radiography, or the Federal Aviation Administration (FAA) |
| <b>M</b> Nuclear Theory                  | <b>M</b> Transmutation of nuclear material   |
| <b>M</b> Facilities and Standards        | <b>M</b> Medical/Biomedical Applications   |
| <b>M</b> Radiation Damage and Activation |  |
| <b>M</b> Evaluation of Nuclear Data      |  |

Papers must be submitted by **October 15, 1993**; authors will notified of acceptance by January 15, 1994.

### Calendar

Your attention is directed to the following events of interest.

#### July 1993

*Planning for Radiation Emergencies*, a short course offered July 5–9, 1993, by John Lakey Associates in Guildford, Surrey, England. Contact: Prof. JRA Lakey, MOS Ltd., 17 Wrotham Road, Gravesend, Kent DA11 0PA, UK (phone 44(0)474-350580, Fax 44 (0)474-320042).

*Annual Meeting of the Health Physics Society*, July 11–15, 1993, Atlanta, Georgia. Contact: HPS, 800 Westpark Drive, Suite 400, McLean, VA 22102.

*Nuclear and Space Radiation Effects Conference*, July 19–23, 1993, Snowbird, Utah. Contact: P. V. Dressendorfer, Sandia National Laboratories, Division 2535, P.O. Box 5800, Albuquerque, NM 87185.

*Techniques in Nuclear Radiation Shield Analysis*, July 26–30, 1993, Austin, Texas, a short course offered by the College of Engineering, The University of Texas at Austin. Contact: The University of Texas at Austin, College of Engineering, Continuing Engineering Studies, ECJ 10.324, Austin, TX 78712 (phone 512-471-3506, Fax 512-471-0831).

#### August 1993

*SMiRT 12, Structural Mechanics in Reactor*

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

*16th Reactor Operations International Topical Meeting*, Aug. 16–19, 1993, Long Island, New York. Contact: Robert McNair, Brookhaven National Laboratory, Reactor Division, Bldg. 703, Upton, NY 11973 (phone 516-282-2270, Fax 516-282-3014).

*Occupational & Environmental Radiation Protection*, Aug. 16–20, 1993, Boston, Massachusetts, a short course offered by Harvard School of Public Health. Contact: Mary F. McPeak, Assoc. Dean for Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-432-1171; Fax 617-432-1969).

*10th National symposium on Radiation Physics (NSRP-10)*, Aug. 17–20, 1993, Kalpakkam, India. Contact: Dr. Baldev Raj, Head, DPEND, Indira Gandhi Centre for Atomic Research, Kalpakkam, Tamil Nadu 603 102, India.

*3rd European Space Power Conference*, Aug. 23–27, 1993, Graz, Austria. Contact: J. Sanchez-Michielsen, ESTED, Power and Energy Conversion Division, P.O. Box 299, NL-2200 AG Noordwijk, The Netherlands (Fax 31-1719-84994).

*8th ASTM-EURATOM Symposium on Reactor Dosimetry*, Aug. 29–Sept. 3, 1993, Vail, Colorado. Contact: Patrick J. Griffin, Div. 6522, Sandia National Laboratories, Albuquerque, New Mexico 87185 (phone 505-845-9121).

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

*3rd European Conference on Accelerators in Applied Research and Technology*, Aug. 31–Sept. 4, 1993, Orleans, France. Contact: J. L. Debrun, CNRS, Centre d'Etudes et de Recherches par Irradiation, 3A rue de la Ferrollerie, F-45071 Orleans Cedex 2, France (fax 38-63-0271).

### September 1993

*Environmental Transport and Dosimetry*, an ANS Topical Meeting, Sept. 1–3, 1993, Charleston, South Carolina. Contact: Roy Rathbun, P.O. Box 42, New Ellenton, SC 29809 (phone Roy at 803-644-6967 or Bill Hennessy at 803-641-0420).

*Computational and Experimental Validation of Nuclear Power Safety and Fuel Cycle Investigations*, Sept. 5–9, 1993, Moscow, Russia. Contact: Prof. V. V. Khromov, Moscow Engineering Physics Institute, Kashirskoe Shosse 31, Moscow, 115409, Russia (phone 095-324-7026, Fax 095-324-2111).

*Radiation Transport Calculations Using the EGS4 Monte Carlo System*, Sept. 6–10, 1993, a hands-on course offered by the National Physical Laboratory, Teddington, Middlesex, United Kingdom TW11 0LW (phone 081-977-3222, Fax 081-943-2155).

*2nd European Conference on Radiations and Their Effects on Devices and Systems*, Sept. 13–16, 1993, Saint-Malo, France. Contact: CEA-DAM, Service Electronique, BP 12, F-91680 Bruyeres, Le Chatel, France.

*Radiation Transport Calculations Using the EGS4 Monte Carlo System*, Sept. 6–10, 1993, sponsored by the National Physical Laboratory, Middlesex, United Kingdom. Contact: Dr. Simon Duane, Div. of Radiation Science and Acoustics, National Physical Laboratory, Queens Road, Teddington, Middlesex, UK TW11 0LW (phone 081-977-3222

Ext 6568, fax 081-943-6161).

*2nd International Conference on Computational Physics*, Sept. 13–17, 1993, Beijing. Contact: Prof. Tian-Yuan Zhang, IAPCM, P.O. Box 8009, Beijing, P.R. China 100088 (Fax 011-86-1-201-0108).

*Physics and Methods in Criticality Safety*, a topical meeting of the Nuclear Criticality Safety Division of the American Nuclear Society, Sept. 19–23, 1993, Nashville, Tennessee. Contact: R. Michael Westfall, Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN 37831-6370 (phone 615-576-3513), or Dennis Tollefson, Y-12 Plant, P.O. Box 2009, Oak Ridge, TN 37831-8221 (fax 615-574-2000).

*Radioactive Waste Volume Reduction*, Sept. 27–29, 1993, Chicago, Illinois. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

*Environmental Effects of Nuclear Power: Calculation and Control*, Sept. 28–Oct. 1, 1993, Chicago, Illinois. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

*Workshop on Data Analysis in Quality Control and in Radiation Protection of the Patient in Diagnostic Radiology and Nuclear Medicine*, Sept. 29–Oct. 1, 1993, Grado, Italy. Contact: Dr. G. Contento, Ospedale Santa Maria della Misericordia, Piazza Santa Maria della Misericordia 15, I-33100 la Loi 200, B-1049 Brussels, Belgium.

### October 1993

*12th International Conference on Non-Destructive Evaluation in the Nuclear and Pressure Vessel Industries*, Oct. 3–7, 1993, Philadelphia, Pennsylvania. Contact: ASM International, Materials Park, OH 44073 USA (phone 216-338-5151; Fax 216-338-4634).

*International Symposium on the Advanced Nuclear Power Systems: Design, Technology, and Strategies for Their Deployment*, Oct. 18–22, 1993, Seoul, Korea. Contact: Conference Service Section, IAEA, P.O. Box 100, A-1400, Vienna, Austria.

*Fall Meeting of the Division of Nuclear Physics of the American Physical Society*, Oct. 20–23, 1993,

Pacific Grove, California. Contact: D. V. R. Brown, Lawrence Livermore National Laboratory, Bldg. 181, L-288, P.O. Box 808, Livermore, CA 94550 (fax 510-423-8086).

*Radiation Protection Engineering*, Oct. 25–29, 1993, San Francisco, California. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

#### **November 1993**

*Nuclear Energy Forum*, Nov. 14–17, 1993, San Francisco, California. Contact: Conference Office, USCEA, 1776 I Street NW, Suite 400, Washington, DC 20006-3708 (phone 202-293-0770, Fax 202-785-4113).

*Air Sampling*, Nov. 16–19, 1993, Albuquerque, New Mexico. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

*Radiation Contamination Risk: Communicating with the Public*, Nov. 29–Dec. 3, 1993, Clearwater Beach, Florida. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

#### **January 1994**

*11th Symposium on Space Nuclear Power Systems*, Jan. 9–13, 1994, Albuquerque, New Mexico. Contact: Richard Johnson, Inst. of Space Nuclear Power Studies, University of New Mexico, Chemical and Nuclear Engineering Dept., Albuquerque, NM 87131-1341.

*Reactor Physics and Reactor Computations*, Jan. 23–26, 1994, Tel Aviv, sponsored by the Israel Nuclear Society and the European Nuclear Society. Contact: Dan Knassim Ltd., P.O. Box 57005, Tel Aviv 61570, Israel (phone 972-3-562-6470, Fax 972-3-561-2303).

#### **February 1994**

*Managing Radioactive and Mixed Waste*, Feb. 13–17, 1994, Albany, New York, sponsored by the Health Physics Society. Contact: John M Matusek, NENYHPS, P.O. Box 2249, Empire State Plaza Station, Albany, NY 12220-2249.

*1992 HEART Conference*, Feb. 14–18, 1994, Monterey, California. Contact: Logicon/RDA, ATTN: 1994 HEART Conference, Mr. Ed. Quinn, 2100 Washington Blvd., Arlington, VA 22204-

5706.

#### **March 1994**

*11th International Conference on the Use of Computers in Radiotherapy*, Mar. 20–24, 1994, Manchester, United Kingdom. Contact: J. M. Wilkinson, Christie Hospital, Withington, Manchester M20 9BX, GB.

#### **April 1994**

*Topical Meeting on Advances in Reactor Physics*, Apr. 11–14, 1994, Knoxville, Tennessee, sponsored by the American Nuclear Society. Contact: B. A. Worley, Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN 37831-6363 USA (phone 615-574-6106).

*ARS '94*, International Meeting on Advanced Reactor Safety, Apr. 17–20, 1994, Pittsburgh, Pennsylvania. Contact: D. Squarer, Westinghouse Electric Corp., Science and Technology Center, 1310 Beulah Road, Pittsburgh, PA 15235-5098 USA (phone 412-256-2063; fax 412-256-1348).

*RECOD '94*, 4th International Conference on Nuclear Fuel Reprocessing and Waste Management, Apr. 24–28, 1994, London. Contact: W. L. Wilkinson, RECOD '94 Steering Committee, British Nuclear Forum, 22 Buckingham Gate, London SW1E 6LB, United Kingdom. (phone 071-828-0116; fax 071-828-0110).

*42nd Annual Meeting of the Radiation Research Society*, Apr. 25–29, 1994, Nashville, Tennessee. Contact: Radiation Research Society, 1891 Preston White Drive, Reston, VA 22091.

#### **May 1994**

*9th Pacific Basin Nuclear Conference*, May 1–5, 1994, Sydney, Australia. Contact: Australian Nuclear Association, P.O. Box 445, Sutherland, NSW 2232, Australia.

*International Workshop on Implementation of ALARA at Nuclear Power Plants*, May 8–11, 1993, Long Island, New York. Contact: Dr. John W. Baum or Dr. T. A. Khan, Brookhaven National Laboratory, ALARA Center, Upton, Long Island, NY 11973 USA (phone 516-282-3228, Fax 516-282-5810).

*International Conference on Nuclear Data for Science and Technology*, May 9–13, 1994, Gatlinburg, Tennessee, USA. Contact: J. K. Dickens, Oak Ridge National Laboratory, P.O. Box 2008, Oak

Ridge, TN 37831-6356 USA (phone 615-574-6115).

*1994 Symposium on Radiation Measurements and Applications*, May 16–19, 1994, Ann Arbor, Michigan, the 8th in a series sponsored by the U.S. Department of Energy. Contact: Helen Lum, Symposium Secretary, 3034 Phoenix Memorial Laboratory, The University of Michigan, Ann Arbor, MI 48109-2100.

#### July 1994

*18th International Radiation Physics Society*, July 18–22, 1994, Rabat, Morocco. Contact: Pr. M. Berrada, Lab. de Physique Nucléaire, Faculté des Sciences, B. P. 1014 Rabat, Morocco (Fax 212-7-77-99-78).

#### March 1995

*5th Topical Meeting on Tritium Technology in Fission, Fusion, and Isotopic Applications*, Mar. 26–31, 1995, Augusta, Georgia, sponsored by the ANS. Contact: C. E. Murphy, Westinghouse SRC, Savannah River Lab., Aiken, SC 29808.

## 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

**Nucl. Sci. Eng.**, **114**, 1-11. . *Investigation of Radiation Effects in Hiroshima and Nagasaki Using a General Monte Carlo-Discrete Ordinates Coupling Scheme*. . Cramer, S.N.; Slater, C.O. . May 1993

**Nucl. Sci. Eng.**, **114**, 12-19. . *Asymptotically Exact Boundary Conditions for the PN Equations*. . Ganapol, B.D.; Kelley, C.T.; Pomraning, G.C. . May 1993

**Nucl. Sci. Eng.**, **114**, 36-41. . *The Combination of Data and Functional Partitioning to Parallelize Severe Accident Computer Codes*. . Tautges, T.J.; Moses, G.A.; Corradini, M.L. . May 1993

**Nucl. Sci. Eng.**, **114**, 55-63. . *A Unified Hauser-Feshbach and Exciton Model for Calculating Double-Differential Cross Sections of Neutron-Induced Reactions Below 20 MeV*. . Zhang, J. . May 1993

**Nucl. Sci. Eng.**, **114**, 64-75. . *A Combined Cross-Section Adjustment and Bias Factor Method for Accurate Prediction of Fast Breeder Reactor Core Performance Parameters*. . Takeda, T.; Matsumoto, K. . May 1993

**Nucl. Sci. Eng.**, **114**, 76-80. . *Absorbed-Dose Buildup Factors in Air for 10- to 100-MeV Photons*. . Faw, R.E.; Shultis, J.K. . May 1993

**Nucl. Sci. Eng.**, **114**, 81-85. . *Verification of the CASMO-3/SIMULATE-3 Pin Power Accuracy by Comparison with Operating Boiling Water Reactor Measurements*. . Uegata, T.; Saji, E.; Tanaka, H. . May

1993

**ANL/EP/CP-77800**. . *A Comparison of WIMS-D4 and WIMS-D4m Generated Cross-Section Data with Month Carlo*. . Woodruff, W. L.; Deen, J.R.; Costescu, C.I. . 1992

**BNL-48054**. . *Applicability of Trends in Nuclear Safety Analysis to Space Nuclear Power Systems*. . Bari, R.A. . October 1992

**EUR-1352-EN**. . *ESTER - A European Source Term Evaluation System*. . Jones, A.V.; Shepard, I. . 1992

**IAEA-TECDOC-678**. . *Application of Depletion Perturbation Theory to Improving Depletion Code BIPR5-AK Using Measured Performance Parameters*. . Korpas, L. . December 1992

**JAERI-M 92-117**. . *Power Distribution within Assemblies*. . Kugo, T.; Nakagawa, M.; Tsuchihashi, K. . August 1992

**KEK Preprint 92-175**. . *Implementation of Linearly-Polarized Photon Scattering into the EGS4 Code*. . Namito, Y.; Ban, S.; Hirayama, H. . January 1993

**KEK Report 92-17**. . *Accelerator Shielding Benchmark Problems*. . Hirayama, H.; Nakamura, T.; Ban, S.; Harima, Y.; Hayashi, K.; Ida, H.; . Ishikawa, T.; Kawabe, T.; Kawachi, K.; Kumagai, T.; Nakashima, H.; . Namito, Y.; Ohtani, N.; Sakurai, J.; Sasamoto, N.; Shimizu, M.; Tanaka, S.; Tanaka, S.; Terada, A.; Uwamino, Y.; Yamano, N. . January 1993

**Nucl. Technol.**, **102**, 196-209. . *Error Propagation for Gamma Spectroscopy and Neutron Coincidence*

*Counting for Plutonium-Bearing Materials.* . Lu, M.S.;  
Teichmann, T. . May 1993  
**ORNL/TM-12304.** . *Comments on the ENDF/B-VI*

*Evaluation for  $^{235}\text{U}$  in the Neutron Energy Region from 1  
to 20 eV.* . Moxon, M.C. . . February 1993