RSIC Newsletter

Oak Ridge National Laboratory
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No. 349 *December 1993*

We of the human race are so bound together and so interdependent that it behooves us all to live for the good of the whole.—W. Earl Waldrop, D.D.

ANS Names Fellows at Winter Meeting

New ANS Fellows were formally recognized during the Honors and Awards Luncheon at the 1993 ANS Winter Meeting in San Francisco. Of the fourteen cited several have been active in the radiation shielding, protection, and transport community represented by the readership of the *RSIC Newsletter*. They were cited as follows:

I. K. Abu-Shumays for "contributions to theoretical aspects of transport theory and development of mathematical methods and computational algorithms implemented in mapr production computer programs for diffusion theory, neutron transport, reactor deep penetration radiation shielding, and for solving very large linear systems and eigen-systems which arise in shell analysis and shock and vibration studies."

Samit K. Bhattacharyya for "significant contributions to the physics, safety and design of advanced reactors for terrestrial and space applications. His work has spanned the range from critical experiments and analysis, design of test and advanced reactors, and inreactor testing. He is an internationally recognized expert on space nuclear power systems."

Leland L. Carter "a leader in early development of the Monte Carlo methodology, with major contributions to the development and practical application of the MCNP computer code. His book in the ERDA Critical Review Series enhanced the practical use of Monte Carlo, permitting significantly improved calculational accuracy for many geometries."

Russell D. Mosteller for "over 25 years of leadership in the development of reactor physics and safety analysis methodology. Methods that he has developed are currently in use today as standards and benchmarks for the industry."

R. W. Roussin "for his world-wide recognition in the development of nuclear data for radiation transport analysis by virtue of his vision and leadership in the production of the VITAMIN-series of nuclear data libraries, for his leadership positions within the Cross Section Evaluation Working Group (CSEWG), and for his directorship of the Radiation Shielding Information Center (RSIC)."

CHANGES TO THE COMPUTER CODE COLLECTION

Six changes were made to the computer code collection during the month. One new code system was packaged and added to the collection, three existing code packages were replaced with newly frozen versions, one code package was extended with an additional hardware version, and one code package updated.

CCC-200/MCNP4A

OP SYS: UNIX, DOS

Language: Fortran 77 and C

Computers: UNIX workstations, PC 386, Cray, Vax, IBM

Format: tar, DOS

Los Alamos National Laboratory (LANL) contributed this newly frozen version of MCNP, a general purpose Monte Carlo code for calculating the time-dependent, continuous-energy transport of neutrons, photons, and/or electrons in three-dimensional geometries. Both fixed source and k_{eff} criticality problems can be solved and a number of output tally options are available. Data representations can be either fully or partially continuous or multigroup. The code is rich in variance reduction techniques that improve the efficiency of difficult calculations. MCNP4A works on a wider variety of platforms, is better documented, and is designed to be an even more valuable tool for users. MCNP4A is designed for MS-DOS PCs, UNIX (Sun, HP, IBM RS/6000, SGI, DEC), Cray (UNICOS, COS, CTSS), and DEC (VMS). The MCNP manual has been entirely rewritten. The principal focus of MCNP4A development has been first on quality and second on value. Nonetheless, the new features list is extensive.

Software Enhancements

- **M** *X-Windows Graphics:* MCNP geometry and tally plotting work with X-Window systems (e.g., Open Windows, Motif, etc.) in addition to GKS, CGS, DISSPLA, Lahey, and PLOT10.
- **M** *PVM Multiprocessing:* MCNP4A runs in parallel on a cluster of workstations using PVM3.1 software.
- **M** *MS-DOS:* MCNP4A is the first MCNP version supported by LANL on MS-DOS PCs. A Lahey F77L-EM/32 compiler is required.
- **M** *Dynamic Memory on UNIX Systems:* MCNP4A can adjust its size as required.
- **M** *Color Graphics:* MCNP4A geometry and tallies can be plotted in color with X-Windows or GKS graphics.

Mathematics/Physics

- **M** *A New Means of Assessing Tally Quality:* MCNP4A features a new, exclusive error analysis in addition to the usual estimate of tally variance.
- **M** In MCNP4A the following have been added:
  - — a k_{eff} summary page that produces the best final k_{eff} result.
  - — a check to determine if each cell with fissionable material had tracks entering, collisions, and fission source points to assess problem sampling.
  - — tests for normality of the active k_{eff} values for each estimator. We believe that this normality check is the first in any major criticality production code.

- — a table of k_{eff} and confidence intervals assuming the largest value of k_{eff} for each estimator would occur on the next cycle.
- — a fission neutron lifetime estimate.
- — a table of k_{eff} and its variance as it would have been calculated with a different number of k_{eff} cycles per batch and with different numbers of settling cycles.
- — two printed plots of the average k_{eff} by active cycle and the number of active cycles skipped.

M *Extended Photon Libraries:* Photons now go to 1000 MeV.

M *Improved Electron Physics:* Variable substep sizes are allowed. The density-effect correction to electron stopping power can be calculated differently for gasses than for solids and liquids.

Only data needed to run the sample problems is included in MCNP4A. All users require the DLC-105 package to which no changes have been made since the release of MCNP 4.2. MCNP is available in UNIX tar format on cartridge tape or on 12 DS/HD (1.44 MB) diskettes in self-extracting compressed DOS files. In addition to the source files, executables are included for personal computer users. These were created on a PC/486 under DOS 6.0 using the Lahey Fortran F77L3-EM/32 Version 5.10 compiler. Reference: LA-12625 (1993). Fortran 77 and C; UNIX workstations, PC 386, Cray, Vax, IBM (C00200/ALLCP/01).

CCC-545/SCALE4.2

OP SYS: AIX, MVS

Language: Fortran 77

Computers: IBM, Workstations

Format: tar

Oak Ridge National Laboratory contributed a newly frozen version of this modular code system for performing standardized computer analyses for licensing evaluation. In its present form, the system performs criticality, shielding, and heat transfer analyses using well established functional modules tailored to the SCALE system. SCALE 4.2 incorporates minor changes to correct errors or deficiencies in SCALE4.1 and has been fully tested on both IBM mainframes under MVS and IBM RISC 6000 workstations under AIX. Significant improvements in SCALE-4.2 include:

SAS4 Added an option to input axial source profiles for both radial and axial dose calculations. Also added an option to calculate point-detector estimates from collisions in both halves of the geometry for axial dose calculations.

ORIGEN-S, SAS2, COUPLE Modified programs to accept the new updated and expanded decay data and fission-product yield libraries and to use combined binary libraries that include multi-cycle cross sections.

ORIGEN-S LIBRARIES Replaced the six standard ORIGEN-S card image libraries with two new libraries, END6DEC and XSECTPHO. END6DEC contains the updated and expanded decay data library based on ENDF/B-VI data. XSECTPHO contains the basic cross-section and photon spectra data and updated fission-product yield data based on ENDF/B-V data. In addition, the BASICLWR binary library has been replaced with a binary library that has updated cross sections from the ENDF/B-IV and -V 27BURNUPLIB for all nuclides in that library.

HEATING7, HTAS1, OCULAR Version 7.2 of HEATING, which operates on both UNIX and IBM/MVS operating systems, was added. HTAS1 and OCULAR were updated to run with this new version.

A program to convert the source files between IBM mainframe and workstations, is included to facilitate code conversion. Language flags are also included to allow some of the source codes to compile on DEC/Ultrix and CRAY/Unicos systems. Suggestions are provided for Vax/VMS, Sun, HP and ALPHA users. The IBM mainframe version was compiled under OS/VS2 using the IBM VS compiler (Level 2.5.0) and Assembler level H on an IBM 3090 computer. The workstation version was compiled using XLF Fortran, Version 2.3.16 on an IBM RISC 6000 Model 580 under AIX Version 3.2.3. The source codes, data libraries, JCL, and script files are transmitted on a DC 6150 cartridge tape in tar format. These files are configured for the workstation. All files are in lower case, and all sources are tailored for AIX. Soon we will release a version tailored for the mainframe, which will be distributed in fixed block format on three 9-track round tapes. The developers have prepared some notes to recipients which are available to users upon request in order to review the changes. References: NUREG/CR-200, ORNL/NUREG/CSD-2/R4 Volumes 1, 2, and 3 (Draft Nov. 1993). Fortran 77 and Assembler for IBM 3090 and Fortran 77 and C for workstations (C00545/IRISC/01).

CCC-610/CALOR89

OP SYS: AIX

Language: Fortran 77

Computers: IBM RISC 6000

Format: tar

Oak Ridge National Laboratory (ORNL) contributed this Monte Carlo code system designed to evaluate and analyze different types of calorimeter systems used in many high-energy physics experiments to determine the energy and direction of incident hadrons, leptons, and photons. CALOR89 includes HETC88, SPECT89, EGS4, and MORSE. The system is written in Fortran 77 and runs on an IBM RISC 6000 under AIX. One 8 mm cartridge tape in tar format is required for transmittal. References: ORNL/TM-11185 (1192) and ORNL M-1090 (June 1992). Fortran 77; IBM RISC 6000 (C00610/IRISC/00).

CCC-619/SCALE-PC (4.1)

OP SYS: DOS

Language: Fortran 77

Computers: PC 386/486

Format: DOS

Oak Ridge National Laboratory contributed a corrected version of this SCALE modular code system for performing computer analyses for licensing evaluation. CSAS was updated by correcting the Dancoff correction factor calculation for cylindrical cells and for a multiregion slab cell with vacuum boundaries. In KENO-V.a corrections were made to type three variables from single to double precision that caused a problem with a very small number density to fail with an arithmetic overflow. All modules were relinked with a new version of ALOCAT that dynamically allocates the requested memory for a module when it is called by the SCALE driver. This personal computer release performs criticality safety analyses using well established functional modules tailored to the SCALE system. SCALE-PC includes functional modules BONAMI, NITAWL-II, XSDRNPM, ICE, and KENO-V.a, as well as the CSAS control module. The modules are functionally equivalent to those in the CCC-545/SCALE 4.1 release. The OFFSCALE program is included to assist in preparing an input file for any of the criticality sequences contained in the CSAS4

module. SCALE-PC runs on either 80386 or 80486 personal computers equipped with a math coprocessor and 4 MB extended memory, however, a 486 PC with at least 8 MB of extended memory is recommended. Nominal hard disk requirements are around 40 MB to install the executables and data files and run the sample cases; another 50 MB required to compile and link the source files. The executables included in the package were created with the Lahey F77L/EM32 Fortran compiler, Version 5.01, and the Phar Lap Dos Extender and virtual memory manager under DOS 6.0. The package is transmitted on seven DS/HD 3.5-in. 1.44 MB diskettes written in self-extracting compressed DOS files. Fortran 77; PC 386 or 486 (C00619/PC486/02).

PSR-242/SABRINA

OP SYS: UNIX, ULTRIX, UNICOS

Language: Fortran 77 and C

Computers: Vax, Cray, Workstations

Format: tar

Los Alamos National Laboratory contributed a newly frozen version of this interactive, three-dimensional, geometry-modeling code system, primarily for use with CCC-200/MCNP 4A. SABRINA's capabilities include creation, visualization, and verification of three-dimensional geometries specified by either surface- or body-base combinatorial geometry; display of particle tracks as calculated by MCNP; and volume fraction generation. This new release, designated Version 3.54, runs on IBM, SUN, DEC, Apollo, Hewlett Packard, and Silicon Graphics work-stations running UNIX operating systems, Vax computers running ULTRIX, and Cray computers running UNICOS. Both Fortran 77 and ANSI C compilers are required. A graphics display with X-Window capability is required. The package is distributed in tar format on one 8 mm tape. Reference: LA-UR-93-3696 (October 1993). Fortran 77 and C; IBM, SUN, DEC, Apollo, Hewlett Packard, and Silicon Graphics work-stations; Vax; and Cray (P00242/MFMWS/01).

PSR-243/CGS

OP SYS: UNIX

Language: Fortran 77 and C

Computers: Cray, IBM RISC 7000, DEC, Sun, Vax

Format: DOS, tar

Format: tar, DOS

Los Alamos National Laboratory contributed a new hardware version of CGS 11.4 for VAX computers running VMS. The Common Graphics System (CGS) is a library of Fortran-callable subroutines that provide general-purpose 2D graphics for all devices in the Los Alamos Integrated Graphics System. CGS also runs on most UNIX based computers including Cray, IBM RISC 6000, Sun SparcStations, DEC, and Hewlett Packard workstations. The X11 window system is required to install this system. X11 is available free of charge from MIT but is not included in this package. Fortran 77 and C compilers are required. CGS is transmitted on one DS/HD 3.5-in. diskette in either DOS or tar format. References: LANL reports CIC #144 (1990), CIC # 145 (1990), and CIC #902 (1992). Fortran 77 and C; Cray, IBM RISC 6000, Dec, Sun, and Vax (P00243MFMWS02).

CHANGE TO THE DATA LIBRARY COLLECTION

An existing data library was updated during the month.

DLC-130/DABL69

Oak Ridge National Laboratory has updated this broad-group neutron/photon cross-section library for defense nuclear applications by replacing the original kerma factor data derived from DLC-060/MACKLIB-IV with that from DLC-160/KAOS-LIB-V. This ANISN

OP SYS: DOS

Language: Fortran

Computers: All

Format: DOS, tar

format data file and BCBN Fortran retrieval code are transmitted either on two DS/HD diskettes in self-extracting compressed DOS files or on 8 mm cartridge tape or two 3.-in diskettes in tar format. Reference: ORNL/TM-10568 (June 1989). Fortran; All computers (D00130/I00360/01.)

Visitor to RSIC

During the month the following person came for an orientation visit and/or to use RSIC facilities: *Victoria McLane*, Brookhaven National Laboratory, Upton, New York.

Calendar

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.

Effluent and Environmental Monitoring, Jan. 10–14, 1994, Denver, Colorado. Contact: Technical Management Services, Inc., P.O. Box 226, New Hartford, CT 06057 (phone 203-738-2440; fax 203-738-9322).

Health Physics for Uranium Users, Jan. 17–21, 1994, Salt Lake City, Utah. Contact: Technical Management Services, Inc., P.O. Box 226, New Hartford, CT 06057 (phone 203-738-2440; fax 203-738-9322).

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).

Improving HP Audits and Appraisals, Jan. 24–26, 1994, San Diego, California. Contact: Technical Management Services, Inc., P.O. Box 226, New Hartford, CT 06057 (phone 203-738-2440; fax 203-738-9322).

How to Write Effective Health Physics Procedures, Jan. 24–26, 1994, San Diego, California. Contact: Technical Management Services, Inc., P.O. Box 226, New Hartford, CT 06057 (phone 203-738-2440; fax 203-738-9322).

Measurement and Detection of Radiation, Jan. 31–Feb. 4, 1994, Orlando, Florida. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

February 1994

Calibration of Nuclear Instruments, Feb. 7–11, 1994, New Orleans, Louisiana. Contact: Technical Management Services, Inc., P.O. Box 226, New Hartford, CT 06057 (phone 203-738-2440; fax 203-738-9322).

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.

Radiation Detection & Measurement, Feb. 21–25, 1994, Orlando, Florida. Contact: Technical Management Services, Inc., P.O. Box 226, New Hartford, CT 06057 (phone 203-738-2440; fax 203-738-9322).

Principles of Health Physics (C.H.P. Park 1 Exam Study), Feb. 27–Mar. 4, 1994. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

March 1994

Implementation of the Radiological Control Manual,

Mar. 3–4, 1994, Tucson, Arizona. Contact: Technical Management Services, Inc., P.O. Box 226, New Hartford, CT 06057 (phone 203-738-2440; fax 203-738-9322).

Internal Dosimetry, Mar. 14–18, 1994. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

The Nuclear Fuel Cycle, Mar. 14–18, 1994, a short course sponsored by Continuing Education, University of Missouri-Rolla, 103 Mechanical Engineering Annex, Rolla, MO 65402-0249 (phone 314-341-4200, fax 314-341-60610.

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

30th Annual Meeting of the National Council on Radiation Protection and Measurements, Apr. 6–7, 1994, Arlington, Virginia. Contact: National Council on Radiation Protection and Measurements, 7910 Woodmont Ave., Suite 800, Bethesda, MD 30814-3095 (phone 301-657-2652).

Methods and Applications of Radioanalytical Chemistry (MARC III), Apr. 10–16, 1994, Kona, Hawaii, an International Topical Conference of the American Nuclear Society. Contact Prof. Roy H. Filby, Technical Program Chairman, Department of Chemistry, Washington State University, Pullman, WA 99164-4630 (phone 509-335-3331, fax 509-335-8867).

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).

High Performance Computing `94: Grand Challenges in Computer Simulation, Apr. 11–15, 1994, La Jolla, California, sponsored by the Society for Computer Simulation. Contact: Dr. Adrian Tetner, Argonne National Laboratory, 9700 S. Cass Ave., Argonne, IL 60439 (phone 708-252-8454).

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).

8th International Conference on Radiation Shielding, Apr. 24–27, 1994, Arlington, Texas, sponsored by the American Nuclear Society with cooperation from several international and professional societies. Contact: Dr. R. M. Rubin, TU Electric, 400 N. Olive St., LB81 24 SLIC, Dallas, TX 75201, or Nolan Hertel, Georgia Tech, Atlanta, Georgia 30332-0405 USA. R. W. Roussin is the International Liaison.

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.

Advanced Health Physics (C.H.P. Part 2 Exam Study), May 1–6, 1994. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

International Workshop on Implementation of ALARA at Nuclear Power Plants, May 8–11, 1994, 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.

Radioactive Materials Transport and Radwaste Disposal, May 16–20, 1994. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

June 1994

Radiation Safety Officer Training, June 13–17, 1994. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

July 1994

First International Congress of Environmental Geotechnics: Geotechnical and Related Aspects of Waste Management Associated with Municipal, Mine, Industrial and Nuclear Wastes, July 10–15, 1994, Edmonton, Canada. Contact: D. C. Sego, University of Alberta, Dept. of Civil Engineering, Sego, Edmonton, TG6 2G7, Canada.

Environmental Health Physics, July 11–15, 1994. Contact: Woodson Assoc., Inc., P.O. Box 2665, Gaithersburg, MD 20886 (phone 301-990-0751, Fax 301-990-6153).

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).

27th International Conference on High Energy Physics, July 21–27, 1994, Glasgow, United Kingdom. Contact: Institute of Physics, 47 Belgrave Square, London SW1X 8OX, UK.

October 1994

European Nuclear Conference and Exhibition, Oct. 2–6, 1994, Lyon, France. Contact: P. Fuez, European Nuclear Society, P.O. Box 5032, CH-3001 Berne, Switzerland (phone 41-31-21-61-11; fax 41-31-22-92-03).

Meeting of the American Society for Theraputic Radiology and Oncology, Oct. 3–7, 1994, Philadelphia, Pennsylvania. Contact: ASTRO, 1101 Market St., 14th Floor, Philadelphia, PA 19107-2990 (phone 215-574-3180).

Fourth Conference on Radiation Protection and Dosimetry, Oct. 24–26, 1994, Orlando, Florida, sponsored by the Oak Ridge National Laboratory. Contact: J. S. Bogard, ORNL, P.O. Box 2008, Oak Ridge, TN 37831-6379 (phone 625-574-5851, fax 615-574-9174).

November 1994

2nd Radiation Physics Conference, Nov. 20–24, 1994, Sadaat City, Egypt, sponsored by the Atomic Energy Authority, Menoufia University. Contact: Prof. M. A. Gomaa, Atomic Energy Authority, 101. Kasr El-Aini Street, Cairo, Egypt (phone 02-355-8269/8264, fax 02-354-0982).

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 1995

Particle Accelerator Conference, May 1–5, 1995, Dallas, Texas. Contact: Richard Briggs, SSC Laboratory, 2550 Beckleymeade Avenue, Dallas, TX 75237.y

NOVEMBER 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. For literature listed as available from INIS contact INIS Clearinghouse, International Atomic Energy Agency, P.O. Box 100, A-1400 Vienna.

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., 115, 273-278. . *The Influence of Burnup-Dependent Fission Spectra on Reactor*

Pressure Vessel Irradiation . . Wasastjerna, F. . 11/93

Health Phys. 65, 535-538. . *A Factorization Procedure for Calculations of Gamma Exposure from Radioactive Clouds* . . Tarasov, V.I. . 1993

Nucl. Sci. Eng., 115, 219-232. . *Numerical Divergence Effects of Equivalence Theory in the Nodal Expansion Method* . . Zika, M.R.; Downar, T.J. . 11/93

Nucl. Sci. Eng., 115, 233-243. . *Variational Nodal Transport Methods with Anisotropic Scattering* . . Palmiotti, G.; Carrico, C.B.; Lewis, E.E. . 11/93

Nucl. Sci. Eng., 115, 253-264. . *A Two-Grid Acceleration Scheme for the Multigroup Sn Equations with Neutron Upscattering* . . Adams, B.T.; Morel, J.E. . 11/93

Nucl. Sci. Eng., 115, 265-272. . *Cell-Centered Imposed Diffusion Synthetic Acceleration for Weighted Difference Transport Methods* . . Azmy, Y.Y. . 11/93

. . *The Time-of-Flight Four-Beam Neutron Reflectometer REFLEX at the High Flux Pulsed Reactor IBR-2 and Some Possible Applications* . . Aksenov, V.L.; Korneev, D.A.; Chernenko, L.P. . 1993

. . *Comparison of Gaseous and Semiconductor Detectors for Medical Imaging* . . Zanevsky, Yu.V. . 1993

ABB-ATOM-RM-91-293. . *Decommissioning of Nuclear Reactors - Verification of a Calculation Model for Induced Activity in Structural Materials - Calculations and Final Report* . . Elkert, J. . 04/92. . OSTI; NTIS; INIS

AEA-RS-1214. . *SNAP - A Three Dimensional Neutron Diffusion Code* . . McCallien, C.W.J. . 02/93. . OSTI; NTIS (US sales only); INIS

CONF-921005-33. . *Small, Annular, Double-Contained 252Cf Fission Chamber for Source-Driven Subcriticality Measurements* . . Chiles, M.M.; Mihalczo, J.T.; Fowler, C.E. . 1992. . OSTI; NTIS; INIS; GPO

DOE/LLW-171. . *Characterization of Decommissioned Reactor Internals: Monte Carlo Analysis Technique* . . Reid, B.D.; Love, E.F.; Luksic, A.T. . 03/93. . OSTI; NTIS; INIS; GPO

FEI-2211. . *Multigroup Calculation of Heterogeneous Cells and Reactors by the SDn Method with the SOKRATOR Constant System in Subgroup Approximation and with Thermalization. SANS-ANISN Code.* . . Bezborodov, A.A.; Klinov, D.A.; Koryagin, S.L.; Savos'kin, M.M. . 1991. . OSTI; NTIS (US sales only); INIS

NUREG/CR-3469-Vol. 7. . *Occupational Dose Reduction at Nuclear Power Plants: Annotated Bibliography of Selected Readings in Radiation Protection and ALARA* . . Kaurin, D.G.; Khan, T.A.; Sullivan, S.G.; Baum, J.W. . 07/93. . OSTI; INIS; NTIS; GPO

NUREG/CR-5894. . *Radionuclide Characterization of Reactor Decommissioning Waste and Neutron-Activated Metals* . . Robertson, D.E.; Thomas, C.W.; Wynhoff, N.L.; Haggard, D.L. . 06/93. . OSTI; NTIS; INIS; GPO

..... . **Nucl. Technol. 103, 187-198**. . *Preliminary Neutronics Calculations for Conversion of the Tehran Research Reactor Core from HEU to LEU Fuel* . . Nejat, S.M.R. . 08/93

COMPUTER CODES LITERATURE

Philippines Nucl. J., 8; 21-25 . . . . . JACS; MULTI-KENO; MGCL-B-1V; MGCL-J3; MAIL3.0
Validation of JACS Computer Code System Using Criticality Data from Experiments Performed with Neutron Flux Traps Containing Voids.. . . Petrache, C.A.; Okuno, H.; Komuro, Y.. . . 1991. . . none listed

NUREG-0713-Vol.13 . . . . . OCCUPATIONAL; RADIATION
Occupational Radiation Exposure at Commercial Nuclear Power Reactors and Other Facilities, 1991.. . . Raddatz, C.T.; Hagemeyer, D.. . . 07/93. . . OSTI; NTIS; INIS; GPO. . . Nuclear Regulatory Commission, Washington, DC; Science Applications International Corp., Oak Ridge, Tennessee

Tech. Rpts. of the Osaka Univ. 43: No. 2124-2141 WKB
A WKB Solution to the Neutron Diffusion Equation.. . . Nishigori, T.. . . 04/93. . . none listed

WSRC-TR-91-372, Rev. 2 . . . . . GAM-HEAT
GAM-HEAT: A Computer Code to Compute Heat Transfer in Complex Enclosures.. . . Cooper, R.E.; Taylor, J.R.. . . 12/92. . . OSTI; NTIS; GPO. . . Westinghouse Savannah River Co., Aiken, South Carolina

WSRC-TR-92-344 . . . . . TWO-D-VIEW; GAM HEAT; INF-LAT
TWO-D-VIEW: A Computer Code for Two Dimensional View Factors.. . . Taylor, J.R.; Cooper, R.E.. . . 12/92. . . Westinghouse Savannah River Co., Aiken, South Carolina