# RSIC Newsletter

No. 268                                                                                     *March 1987*

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*Sunshine is delicious, rain is refreshing, wind braces up, snow is exhilarating; there is no such thing as bad weather, only different kinds of good weather.—Ruskin*

## OCRWM SEEKS READER HELP IN FINDING TECHNICAL CODES

The Department of Energy Office of Civilian Radioactive Waste Management (OCRWM), a new sponsor of the Radiation Shielding Information Center (RSIC), is performing a survey of the technical computer codes being used for OCRWM activities. The *RSIC Newsletter* is being used as a vehicle to help gather the information needed. The following article gives more details about the survey. The last page of this issue contains the questionnaire on one side and definitions and explanations of the questions on the other side.

If you are involved in OCRWM activities, please complete and return the questionnaire to J. W. Roddy of ORNL at the address provided. You are encouraged to copy and distribute copies to your colleagues as appropriate. Your cooperation will be appreciated.

*Robert W. Roussin*

### COMPUTER CODE QUESTIONNAIRE
(Office of Civilian Radioactive Waste Management, DOE)

The Program to site, design, construct, operate, and eventually decommission a system which will safely move nuclear waste material from current sources to their ultimate burial in mined geological repositories represents a major technical effort that has been assigned to the Office of Civilian Radioactive Waste Management (OCRWM), within DOE. Because of the extended organizational structure and schedules and licensing considerations imposed on OCRWM by the Nuclear Waste Policy Act of 1982 (NWPA), there is a need to make available timely information on the nature and status of technical codes (those codes with an engineering or physical basis) that have been developed and/or are being used in associated design, analytical and/or licensing-related activities of the Program.

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This need for timely and comprehensive technical code information transfer, identified by the Waste Systems Integration team within the Office of Storage and Transportation Systems (OSTS), OCRWM, has been subsequently reinforced by the Technical Code Coordination Group (TCCG). The TCCG membership unanimously agreed on the need for a comprehensive compendium of technical code information to be made available to OCRWM Program participants. The Oak Ridge National Laboratory (ORNL) has been asked to prepare this technical code compendium. The attached questionnaire is the instrument by which this needed information will be collected. The questionnaire is to be completed by that person (or persons) within your organization most knowledgeable regarding technical codes.

We have limited the requested information in an attempt to minimize respondent burden of completing the questionnaire. Where possible, questions are posed in a yes/no or check-off format. A separate sheet should be completed for each technical code available and used by your organization for OCRWM activities. Please return the completed questionnaire to J. William Roddy.

The returned questionnaires will be collated and verified to generate an informative technical code compendium. When completed, the compendium will be made available to each organization participating in the OCRWM Program on a no-charge basis. It is planned to also develop a computerized version of the compendium, including provision for keyword searches and remote retrieval. The compendium will subsequently be updated on a regular basis. Space has been provided in the questionnaire for comments regarding the nature, format, contents, etc., of the questionnaire.

Additional questions or comments may also be addressed to J. William Roddy (ORNL) at FTS: 626-8348 (commercial: 615/576-8348) or to Harold Steinberg (DOE/Headquarters) at FTS: 252-5616 (commercial: 202/252-5616).

## CHANGES TO THE COMPUTER CODE COLLECTION

Six changes or additions were made to the computer code collection during the month. Two new code systems were packaged, two existing code packages were replaced with a newly frozen versions, and two existing code packages were updated. One change resulted from a foreign contribution.

### CCC-200/MCNP

A newly frozen version of this general purpose Monte Carlo neutron and gamma-ray transport code system was provided by the contributor, Los Alamos National Laboratory, Los Alamos, New Mexico. This edition, denoted MCNP, Version 3A, is accompanied by new documentation and an enhanced set of cross-section libraries, including some based on the special purpose dosimetry and activation files from ENDF/B and the Livermore ACTL library. Several hardware versions can be extracted from the package using a routine, PRPR, provided for that purpose. A minimum of two full 2400 ft reels of magnetic tape written at 1600 bpi are required to hold the entire package. An upgraded version of DLC-105/MCNPDAT (data for MCNP based on ENDF/B-V) will be available soon. References: LA-7396-M, Rev. 2 (September 1986) and informal notes. FORTRAN 77; CDC 7600, CRAY 1, IBM 3033, VAX 11.

## CCC-288/SCALE-0

The CDC version of this modular code system for performing standardized computer analyses for licensing evaluation was updated with the addition of the SCALE.X27SHLD, 27-group neutron shielding cross-section library based on ENDF/B-IV, a library needed by ORIGEN-S. The contributors at Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee, suggested the update to bring the package in line with the other enhancements announced in the January 1987 *RSIC Newsletter*. Reference: NUREG/CR-0200 (ORNL/NUREG/CSD-2), Vol. 1,2,3. CDC FTN 5 FORTRAN; CDC CYBER(B).

## CCC-429/DOT 4.3

The UPDATE directives for the CDC version of this two-dimensional discrete ordinates code were revised by the U. S. Army Foreign Science and Technology Center, Charlottesville, Virginia, to make the system operable on the University of Virginia CDC NOS 2.4.1. The changes are available upon request. References: ORNL-5851 (1982), ORNL/TM-8362 (1982), Informal Notes. FORTRAN IV; CDC (B).

## CCC-508/RADTRAN-III

This system for analyzing the radiological impact of the transportation of radioactive materials was contributed by Sandia National Laboratories, Albuquerque, New Mexico. It can be used to analyze both "incident-free" and vehicular "accident" situations for transportation by road, airplane, and rail. The methodology uses material, transportation, population distribution, and health effects models for incident-free cases and adds accident severity and package release, meteorological dispersion, and economic models to handle vehicular accident cases. References: SAND84-0036 (1986), SAND82-2681 (1983), and informal notes. FORTRAN 77; IBM 3033 (A), CDC 7600 (B).

## PSR-146/ALICE/85/300

A newly frozen version of this code system for statistical model calculations with fission competition was contributed by the Lawrence Livermore National Laboratory, Livermore, California. The system was upgraded to allow variable energy mesh size and excitation energies up to 300 MeV. Several other improvements in calculational approaches have been made. References: UCID-20169 (September 1984), UCID-19614 (November 1982), and informal notes. FORTRAN IV; CDC CYBER 7600.

## PSR-241/GERES

This code for producing cross-section libraries for CCC-254/ANISN based on heterogeneous fast reactor cell calculations using $MC^2II$ data was contributed by the ENEA Departimento Technologie Intersettoriali di Base, Centro Ricerche Energia "Ezio Clementel", Bologna, Italy. GERES performs fast reactor cell calculations producing a multigroup cross-section set for each zone of a heterogeneous cell for subsequent use in the CCC-254/ANISN discrete ordinates code. Multiple slabs or two-region cylindrical cells can be treated. Several unformatted libraries produced by $MC^2II$ are provided in the package. Reference: RT/TIB/85/26 (1985). FORTRAN IV, Assembler (Timing routines), MVS Operating System; IBM 370/168.

# CHANGE TO THE DATA LIBRARY COLLECTION

A new data library was added to the collection.

## DLC-126/PVE

This 38-group, $P_8$, library of photon interaction cross sections in discrete ordinates form was contributed by ORNL. The data can be used in most discrete ordinates codes and in the CCC-203/MORSE-CG multigroup Monte Carlo code for photon radiation transport calculations. It was derived from the photon interaction data in DLC-113/VITAMIN-E using the NITAWL and ALPO modules of the PSR-63/AMPX-II system. The original VITAMIN-E data were generated from DLC-99/HUGO using the SMUG module of AMPX-II. Data are provided for elements with atomic number in the range Z=1 to 100. A program called BCBN is provided in the package to convert the PVE data from ANISN card image to binary form. Ref: Informal Notes, 1987; Card images.

## Revised ANSI Standards Published

The American National Standard, "Guidelines for Considering User Needs in Computer Program Development," has recently been published as ANSI/ANS-10.5, a revision of the 1979 version. This standard provides guidelines to programmers to consider users' needs during program development.

The ANSI standard, "Guidelines on the Nuclear Analysis and Design of Concrete Radiation Shielding for Nuclear Power Plants," has been revised. This standard, ANSI/ANS-6.4-1985, contains data and design practices useful for design of concrete radiation shields. It replaces the 1977 version.

Both of the above standards are available from the American Nuclear Society, 555 N. Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

## RSIC Bibliography Available

Volume 7 of the *Bibliography, Subject Index, and Author Index of the Literature Examined by the Radiation Shielding Information Center,* ORNL/RSIC-5/V7, published in 1983, is in good supply. This indexed bibliography of open literature selected by RSIC since the previous volume was published in 1980 is presented in the area of radiation transport and shielding against radiation from nuclear reactors (fission and fusion), x-ray machines, radioisotopes, nuclear weapons (including fallout), and low energy accelerators (e.g., neutron generators). The bibliography is indexed by category and author. Most of the literature indexed was published in the years 1977–1981. Call or write if you wish to obtain a copy.

## 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.

**Clarke Appointed NRPB Director** The National Radiological Protection Board (NRPB), United Kingdom, has appointed the current Secretary of the Board, **Roger H. Clarke,** as its next Director. His tenure begins July 17, 1987, upon the retirement of **John Dunster.**

**Ed Czapek** recently retired after 36 years with General Dynamics/Electric Boat Div. Czapek, one of the contributors to the Rockwell *Reactor Shielding Design Manual,* was chief of the Radiation Analysis Section. He worked on radar development at the wartime MIT Radiation Laboratory prior to entering the shielding field, and taught for a number of years at the University of Connecticut.

## 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.

### 12th Fusion Symposium Call for Papers

A call for papers has been issued for the *12th Symposium on Fusion Engineering* to be held October 12–16, 1987, in Monterey, California. The symposium is jointly sponsored by the Inst. of Electrical and Electronics Engineers (IEEE), the American Inst. of Aeronautics & Astronautics, U.S. Dept. of Energy, Lawrence Livermore National Laboratory, TRW, Inc., and Grumman Aerospace Corp. Prospective participants are invited to submit 400-word abstracts on the following subjects: Magnet Engineering; Superconducting Development; Electrical Power Systems; Vacuum and First-Wall Technology; Controls, Instrumentation, and Data Handling; Next Generation Fusion Devices; Experimental and Diagnostics System Design; Energetic Plasma and Particle Sources; Plasma Heating and Fueling Systems; Robotic Systems; Tritium and Chemical Systems; Driver/Target Technology for Inertial Confinement Fusion; Photon and Charged Particle Beam Transport Systems; Plasma Engineering; Fusion Reactors; Quality Assurance and Reliability; Health, Safety, and the Environment; Cryogenic Systems; and Structural Systems. The abstract and three clean copies must be submitted before the deadline, **June 1, 1987.** Guidance for preparation of the abstracts may be obtained from Donna Schreiber, L-644, Lawrence Livermore National Laboratory, P.O. Box 5511, Livermore, CA 94556.

### International Neutron Physics Conference Announced

The next in a series of Soviet national conferences on neutron physics will be convened as an international conference in Kiev, September 21–25, 1987. The confer-

ence titled, *International Conference on Neutron Physics,* is sponsored by the USSR State Committee on Utilization of Atomic Energy with support from the Academy of Sciences of the USSR and the Academy of Sciences of the Ukrainian SSR.

Modern neutron physics problems will be covered by the conference with attention focussed on the fundamental problems of neutron physics and nuclear data for nuclear technology and other branches. The principal topics include: Neutron and fundamental problems of physics; Theory of neutron reactions; Experimental research; Neutron processes in reactors; Neutron sources; and Open problems in neutron physics.

All correspondence concerning participation in the conference should be sent to the scientific secretary of the Organization Committee: M. F. Vlasov, USSR, 252028, Kiev-28, Prospekt Nauki 119, Institute for Nuclear Research of the Ukr. SSR Academy of Sciences (phone 653619).

## Calendar

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

### April 1987

*23d Annual Meeting of the National Council on Radiation Protection and Measurements,* Apr. 8–9, 1987, Washington, D. C. Contact: NCRP, 7910 Woodmont Ave., Suite 1016, Bethesda, MD 20814.

*Theory and Practices in Radiation Protection and Shielding,* Apr. 22–24, 1987, Knoxville, Tennessee, sponsored by the ANS Radiation Protection and Shielding Division. Contact: Robert T. Santoro, Chairman, Technical Program Committee, ANS Topical Conference, RP&S, P.O. Box X, Oak Ridge, TN 37831 (phone 615-574-6084).

*6th Annual Conference on Incineration of Mixed and Low-Level Radioactive Wastes,* Apr. 22–25, 1987, St. Charles, Illinois, sponsored by the University of California, U.S. Dept. of Energy, and the American Society of Mechanical Engineers. Contact: J. B. Tripodes, Mgr., Health Physics, EH and S, Univ. of California, Irvine, CA 92717.

*Advances in Reactor Physics, Mathematics and Computation,* Apr. 27–30, 1987, sponsored by the European Nuclear Society, French Nuclear Energy Society, Commission of the European Communities, French Atomic Energy Commission, Electricité de France, ANS, Nuclear Energy Agency, Organisation for Economic Co-operation and Development. Contact: R. Alcouffe, Los Alamos National Laboratory, P.O. Box 1663, MS-B226, Los Alamos, NM 87545.

### May 1987

*4th International Hazardous Waste Symposium on Environmental Aspects of Stabilization-Solidification*

*of Hazardous and Radioactive Wastes,* May 3–6, 1987, Atlanta, Georgia, sponsored by ASTM Committee-34 on Waste Disposal, Environment Canada, and ORNL. Contact: T. Michael Gilliam, Bldg. 3017, ORNL, Oak Ridge, TN 37831 USA (phone 615-574-6820); or Pierre Cote, Environmental Canada, Wastewater Technology Centre, P.O. Box 5050, Burlington, Ontario L7R4A6 (phone 416-336-4605).

*Control of Occupational Exposures in Nuclear Power Plants,* May 11–15, 1987, Boston, Massachusetts, a course sponsored by the Harvard School of Public Health. Contact: Dade W. Moeller, Office of Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-732-1171).

*Advanced Course on Optimization of Radiation Protection,* May 17–22, 1987, Brookhaven National Laboratory, Upton, New York, sponsored by Brookhaven National Laboratory ALARA Center, the U.S. Nuclear Regulatory Commission, and the Commission of European Communities. Contact: John W. Baum, Brookhaven National Laboratory, Bldg. 535A, Upton, NY 11973 (phone 516-282-4214); or Marie Cooney (phone 516-282-7716).

*6th Symposium on Reactor Dosimetry,* May 31–June 5, 1987, Jackson Hole, Wyoming, sponsored by the American Society for Testing and Materials, and the Commission of the European Communities in co-operation with the International Atomic Energy Agency. Contact: G. R. Lamaze, National Bureau of Standards, Bldg. 235, Gaithersburg, MD 20899 (phone 301-921-2767) or H. Röttger, Joint Research Centre, Petten Establishment, HFR Div., Postbus 2, 1755 ZG Petten, The Netherlands.

### June 1987

*Techniques in Nuclear Radiation Shield Analysis,* June 1–5, 1987, Dallas, Texas, a course sponsored by the University of Texas at Austin. Contact: Mike Jackson, Continuing Engineering Studies, Office of the Dean, ECJ 10.234, College of Engineering, The University of Texas at Austin, Austin, TX 78712.

*American Nuclear Society Annual Meeting,* June 7–12, 1987, Dallas, Texas. Contact: ANS, Meeting Dept., 555 N. Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

*27th Annual International Conference of the Canadian Nuclear Association and 8th Annual Conference of the Canadian Nuclear Society,* Saint John, New Brunswick, Canada. Contact: CNA, 111 Elizabeth St., 11th Floor, Toronto, Ont., Canada M5G 1P7 (phone 416-977-6152).

*Application of Computer Technology to Radiation Protection,* June 22–26, 1987, Bled, Yugoslavia, sponsored by the IAEA. Contact: Conference Service Section, IAEA, P.O. Box 100, A-1400 Vienna.

**July 1987**

*32nd Annual Meeting of the Health Physics Society,* July 5–9, 1987, Salt Lake City, Utah. Contact: John W. Poston, Sr., Dept. of Nuclear Engr., Texas A&M Univ., College Station, TX 77843-3133 (phone 409-845-4161).

*Advanced Workshop on Occupational & Environmental Radiation Protection,* July 13–17, 1987, Boston, Massachusetts,a course sponsored by the Harvard School of Public Health. Contact: Dade W. Moeller, Office of Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-732-1171).

*8th International Congress of Radiation Research,* July 19–24, 1987, Edinburgh, United Kingdom, sponsored by the International Association for Radiation Research. Attendance is by application and invitation. Contact: E. Martin Fielden, IARR, Div. Radioprotezione CSN Casaccia, Rome, Italy.

**August 1987**

*Occupational and Environmental Radiation Protection,* Aug. 10-14, 1987, Boston, Massachusetts, a course sponsored by the Harvard School of Public Health. Contact: Dade W. Moeller, Office of Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-732-1171).

*9th International Conference on Structural Mechanics in Reactor Technology (SMiRT-9),* Aug. 17–21, 1987, Lausanne, Switzerland, sponsored by the International Association for Structural Mechanics in Reactor Technology, the Commission of the European Communities, and the École Polytechnique Fédérale de Lausanne. Contact: Folker H. Wittmann, École Polytechnique Fédérale de Lausanne, SMiRT-9, Chemin de Bellerive 32, CH-1007 Lausanne, Switzerland.

*International Conference on Nuclear Fuel Reprocessing and Waste Management,* Aug. 24–28, 1987, Paris, sponsored by the American Nuclear Society and the European Nuclear Society. Contact: Lloyd McClure, Westinghouse Idaho Nuclear Co., Idaho Chemical Processing Plant, P.O. Box 4000, Idaho Falls, ID 83401.

*Seminar on the Adoption, Application and Implementation of the Agency's Regulations for the Safe Transport of Radioactive Materials,* Aug. 31–Sept. 4, 1987, Vienna, sponsored by the International Atomic Energy Agency. Contact: Conference Service Section, IAEA, P.O. Box 100, A-1400, Vienna, Austria.

**September 1987**

*Pacific Basin Nuclear Conference,* Sept. 6–11, 1987, Beijing, People's Republic of China, sponsored by the Chinese Nuclear Society and the American Nuclear Society. Contact: Xu Honggui, Chinese Nuclear Society, P.O. Box 2125, Beijing, People's Republic of China, or ANS, 555 North Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

*ANS/ENS International Conference on Fast Breeder Reactor Systems: Experience Gained and Path to Economical Power Generation,* Sept. 13–17, 1987, Richland, Washington. Contact: M. C. Carelli, Westinghouse-AESD, P.O. Box 158, Madison, PA 15663 (phone 412-722-5284), or W. Marth, Kernforschungszentrum Karlsruhe, Postfach 3640, D-7500 Karlsruhe 1, F. R. Germany.

*Monte Carlo Transport of Electrons and Photons Below 50 MeV,* Sept. 24–Oct. 3, 1987, Trapani, Italy. The closing date for application has been extended to May 15, 1987 (see July 1986 *RSIC Newsletter* for details). Contact: David W. O. Rogers, Ionizing Radiation Standards, National Research Council of Canada, Ottawa, Ontario K1A OR6 Canada (phone 613-993-2715).

**October 1987**

*Annual Congress of the Association for Radiation Protection,* Oct. 6–9, 1987, Basel, Switzerland. Contact: Fachverband f. Strahlenschutz e.V., c/o H. Brunner, Abt. SU/81, Eidg. Institut f. Reaktorforschung (EIR), CH-5303 Würenlingen, Switzerland (phone 0041 56-99 2350).

*6th Symposium on Neutron Dosimetry,* Oct. 12–16, 1987, Neuherberg, F. R. Germany, sponsored by the Commission of the European Communities, Society for Radiation and Environmental Research, and the U.S. Department of Energy. Contact: Gesellschaft f. Strahlen- und Umweltforschung mbH, München, Dr. H. Schraube, Ingolsta—dter Landstr. 1, D-8042 Neuherberg, F. R. Germany.

*12th Symposium on Fusion Engineering,* Oct. 27–30, 1987, Princeton, New Jersey. Contact: IEEE, Technical Activities Dept., 345 E. 47th Street, New York, NY 10017 (phone 212-705-7895).

**November 1987**

*Joint Meeting of the ANS and the Atomic Industrial Forum,* Nov. 15–19, 1987, Los Angeles, California. Contact: Meetings Dept., ANS, 555 N. Kensington Ave., La Grange Park, IL 60525 (phone 312-352-6611).

**February 1988**

*Waste Management '88: Symposium on Radioactive Waste Management,* Feb. 26–Mar. 3, 1988, Tucson, Arizona, sponsored by the University of Arizona. Contact: M. Wacks, Dept. of Nuclear and Energy Engineering, University of Arizona, Tucson, AZ 85721 (phone 602-621-2475).

**April 1988**

*Workshop on Non-ionising Radiation Biological Effects, Protection and Standards,* Apr. 5–8, 1988, Melbourne, Australia. Contact: J. C. Button, Scientific Secretary, IRPA 7, Health and Safety Div., Australian Atomic Energy Commission, Private Mail Bag, Sutherland, NSW 2232 Australia.

*Seventh International Congress of the International Radiation Protection Association (IRPA 7),* Apr. 10–17, 1988, Sydney, Australia. Contact: J.C.E. Button, Scientific Secretary, IRPA 7, Health & Safety Div., Australian Atomic Energy Commission, Private Mail Bag, Suther-land, N.S.W. 2232, Australia (phone 61-2-543-3295) (Telex: AA.24562).

*International Conference on Radiation Protection Principles in Nuclear Energy,* Apr. 18–22, 1988, Sidney, Australia, sponsored by the IAEA. Contact: W. Porter, IE-13, U.S. Dept. of Energy, Forrestal, Washington, DC 20585 (phone 202-252-4573).

# FEBRUARY 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-8961,** . . *RAHAB Calculation of Lattice Parameters for Candu-Type Lattices Using Monte Carlo Calculations for Resolved Resonance Capture.,* . . Craig, D.S.; Festarini, G.L., . . July 1986, . . Scientific Document Distribution Office, Atomic Energy of Canada Limited, Chalk River, Ontario, Canada KOJ1JO

**ANSI N13.11-1983,** . . *American National Standard for Dosimetry—Personnel Dosimetry Performance—Criteria for Testing.,* . . American National Standard, . . 1983, . . American National Standards Institute, 1430 Broadway, New York, New York 10018

**CFFTP-B-86002,** . . *Irradiation of Lithium-Based Ceramics for Fusion Blanket Application, Presented at Seventh Annual Conference of the Canadian Nuclear Society, Toronto, Ontario, 1986 June 8-11.,* . . Hastings, I.J.; Miller, J.M.; Verrall, R.A., . . June 1986, . . Chalk River Nuclear Labs., Atomic Energy of Canada Ltd., Ontario

**CFFTP-B-86003,** . . *The Fusion Blanket Program at Chalk River.,* . . Hastings, I.J., . . March 1986, . . Chalk River Nuclear Labs., Atomic Energy of Canada Ltd., Ontario

**DOE/ER/52125-2,** . . *UW MCNP Source Patch for the EPFL Haefely Source. EPFL (Swiss) Fusion-Fission Hybrid Experiment.,* . . McKinney, G.; Woodruff, G.L., . . June 1986, . . NTIS, PC A02/MF A01; GPO

**EPRI-NP-4593,** . . *Comparison of COBRA-SFS Calculations with Data from Simulated Sections of Unconsolidated and Consolidated BWR Spent Fuel.,* . . Cuta, J.M.; Creer, J.M., . . August 1986, . . Research Reports Center, Box 50490, Palo Alto, CA 95303

**EPRI-NP-4619,** . . *Decay Heat Measurements and Predictions of BWR Spent Fuel.,* . . McKinnon, M.A.; Heeb, C.M.; Creer, J.M.; Doman, J.W., . . June 1986, . . Research Reports Center, Box 50490, Palo Alto, CA 95303

**EPRI-NP-4735,** . . *Radiation Effects on Lubricants.,* . . Bolt, R.O., . . August 1986, . . Research Reports Center, Box 50490, Palo Alto, CA 95303

**EPRI-NP-4753,** . . *PWR Radiation Control: Once-Through Steam Generator Studies.,* . . Stagg, W.R.; Cunnane, J.C., . . September 1986, . . Research Reports Center, Box 50490, Palo Alto, CA 95303

**EPRI-NP-4806,** . . *Validation of Cell Analysis Capability Using ENDF/B-V Nuclear Data. Final Report.,* . . Williams, M.L.; Worley, B.A.; Wright, R.Q., . . September 1986, . . Research Reports Center, Box 50490, Palo Alto, CA 95303

**INDC(CPR)-009/L,** . . *Fission Cross Section Measurements Around 14 MeV.,* . . Academia Sinica, Beijing, China, Inst. of Atomic Energy, . . August 1986, . . IAEA Nuclear Data Section, Wagramerstrasse 5, A-1400 Vienna

**INIS-BR-492, pp.265-277 (In Portuguese); CONF-8504255, pp.265-277 (In Portuguese),** . . *Neutronic Comparative Study of Some Structural Materials for Fusion Reactors.,* . . Santos, R.dos; Azevedo, E.M.de; Silva, R.C.O.da, . . 1985, . . NTIS (U.S. Sales Only), PC A99/MF A01

**LA-10842-MS,** . . *Calculation of Fast-Neutron Induced-Fission Multiplication in Large $PuO_2$ Samples.,* . . Menlove, H.O.; Rinard, P.M., . . December 1986, . . NTIS

**LA-10858,** . . *Body-Oriented Coordinates Applied to the Finite-Element Method.,* . . Cook, W.A., . . October 1986, . . NTIS

**LA-10861,** . . *Equivalent One-Dimensional Hydrodynamic Dispersion in a Tube with Radioactive Decay and Adsorption.,* . . Partom, I., . . October 1986, . . NTIS

**LA-10898,** . . *Los Alamos National Laboratory Computer Benchmarking 1986.,* . . Simmons, M.L.; Wasserman, H.J., . . January 1987, . . NTIS

**NRPB-R-171, Add.,** . . *The Risks of Leukaemia and Other Cancers in Seascale from Radiation Exposure.,* . . Stather, J.W.; Wionian, J.; Brown, J., . . April 1986, . . HMSO

**NRPB-R-192,** . . *Doses in Radiation Accidents Investigated by Chromosome Aberration Analysis. XV: A Review of Cases Investigated, 1985.,* . . Lloyd, D.C.; Edwards, A.A.; Prosser, J.S., . . April 1986, . . HMSO

**NRPB-R-193,** . . *Assessment of Intakes of Radionuclides: A Summary of Investigations, 1981-1985.,* . . Fry, F.A., . . April 1986, . . HMSO

**NUREG-0713, Vol.6,** . . *Occupational Radiation Exposure at Commercial Nuclear Power Reactors and Other Facilities 1984. Sevententh Annual Report.,* . . Brooks, B.G., . . October 1986, . . NRC; NTIS; GPO

**NUREG-1101, Vol.3,** . . *Onsite Disposal of Radioactive Waste: Estimating Potential Groundwater Contamination.,* . . Goode, D.J.; Neuder, S.M.; Pennifill, R.A., . . November 1986, . . NTIS; GPO; NRC

**NUREG-1210, Vol.1,** . . *Severe Reactor Accident Incident Response Training Manual. Overview and Summary of Major Points.,* . . Martin, J.A.,Jr.; McKenna, T.J.; Miller, C.W.; Hively, L.M.; Sharpe, R.W.; Giitter, J.G.; Watkins, R.M., . . September 1986, . . NTIS; GPO; NRC

**NUREG/CR-2907, Vol.1; BNL-NUREG-51581, Vol.1,** . . *Radioactive Materials Released from Nuclear Power Plants. Annual Report 1980.,* . . Tichler, J.; Benkovitz, C., . . January 1983, . . NTIS

**NUREG/CR-2907, Vol.2; BNL-NUREG-51581, Vol.2,** . . *Radioactive Materials Released from Nuclear Power Plants. Annual Report 1981.,* . . Tichler, J.; Benkovitz, C., . . June 1984, . . NTIS

**NUREG/CR-2907, Vol.4; BNL-NUREG-51581, Vol.4,** . . *Radioactive Materials Released from Nuclear Power Plants. Annual Report 1983.,* . . Tichler, J.; Norden, K., . . August 1986, . . NTIS

**NUREG/CR-4543,** . . *First Results from Electron-Photon Damage Equivalence Studies on a Generic Ethylene-Propylene Rubber.,* . . Buckalew, W.H., . . April 1986, . . NTIS; GPO; NRC

**NUREG/CR-4629,** . . *Independent Verification of Radioactive Release Calculations for Selected Accident Scenarios.,* . . Khatib-Rahbar, M.; Divadeenam, M.; Cazzoli, E., . . July 1986, . . NTIS; GPO NRC

**NUREG/CR-4614,** . . *VISA-II Sensitivity Study of Code Calculations: Input and Analytical Model Parameters.,* . . Simonen, E.P.; Johnson, K.I.; Simonen, F.A., . . November 1986, . . NTIS; GPO; NRC

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## COMPUTER CODE QUESTIONAIRE

A separate "Computer Code Questionnaire" should be completed by the "custodian" for each unique technical code used or likely to be used by your organization for OCRWM-supported activities between 1984 and 1987. While each organization participating in this effort has been sent several dozen forms for this purpose, additional forms may be copied where technical code usage exceeds the number of forms sent. For definitions of "technical code," "custodian," and "organization," as well as specific instructions for each of the questions below see the reverse side of this questionnaire.

1. CODE NAME AND VERSION: _____

2. OUTDATED OR MINOR CODE VARIANTS: _____

3. RESPONDENT (CUSTODIAN) NAME: _____

   ORGANIZATION: _____

   PHONE #: _____

4. FEDERAL WASTE MANAGEMENT PROGRAM USAGE:

   A. LICENSING RELATED:

   _____ EA          _____ SCP          _____ EIS          _____ SAR/LA

   _____ OTHER (DESCRIBE) _____

   B. APPLICABILITY:

   _____ DESIGN          _____ WASTE PACKAGE          _____ SITE MEDIUM

   _____ MRS          _____ TRANSPORTATION          _____ INTERIM STORAGE

   _____ REPOSITORY PRECLOSURE          _____ REPOSITORY POSTCLOSURE

   _____ OTHER (DESCRIBE) _____

5. TYPE OF CODE:

   _____ RA          _____ PA          _____ LOGISTICS          _____ TRANSPORTATION

   _____ TSLCC          _____ CRITICALITY          _____ OPERATIONS          _____ THERMAL/HEAT TRANSFER

   _____ SOURCE TERM          _____ SYSTEM LOGIC          _____ SHIELDING          _____ STRUCTURAL

   _____ GEOCHEMISTRY          _____ GEOSPHERE TRANSPORT          _____ DOSE TO MAN/WORKER          _____ DOSE TO MAN/PUBLIC

   _____ SURFACE HYDROLOGY          _____ GROUNDWATER HYDROLOGY          _____ ROCK MECHANICS          _____ AIR DISPERSION

   _____ BIOSPHERE TRANSPORT          _____ ISOTOPE MIGRATION          _____ SPENT FUEL/WASTE PROJECTIONS

   _____ OTHER (DESCRIBE) _____

6. LANGUAGE(S)/VERSION:

   _____ BASIC          _____ FORTRAN          _____ PL/1          _____ PASCAL          _____ "C"

   _____ OTHER (IDENTIFY) _____

7. COMPUTER(S) USED FOR CODE:

   _____ MAINFRAME:          _____ IBM          _____ CDC          _____ CRAY          _____ UNIVAC

   _____ MINI:          _____ VAX          _____ OTHER (IDENTIFY) _____

   _____ PERSONAL COMPUTER:          _____ IBM COMPATIBLE          _____ OTHER (IDENTIFY) _____

8. DOCUMENTED ASSESSMENT(S):

   _____ QA          _____ VERIFICATION          _____ VALIDATION          _____ TECHNICAL REVIEW

   _____ INDEPENDENT PEER REVIEW          _____ NONE          _____ OTHER (DESCRIBE) _____

9. INTERFACES WITH OTHER TECHNICAL CODES:          _____ YES          _____ NO

   IF "YES," SUPPLY MODE AND NAME(S): _____          _____ PRE, CODE NAME(S) _____

   _____          _____ POST, CODE NAME(S) _____

10. ARE EXTERNAL TECHNICAL DATA FILES/BASES REQUIRED TO RUN CODE? _____ YES          _____ NO

    IF YES, SUPPLY NAMES _____

11. CODE AVAILABILITY:

    _____ YES, NONPROPRIETARY          _____ YES, BUT USAGE FEE REQUIRED          _____ YES, BUT RUN ACCESS ONLY

    _____ NO, PROPRIETARY          _____ NO, INCOMPLETE

    _____ OTHER (DESCRIBE) _____

12. DOCUMENTATION AVAILABLE:

    _____ TECHNICAL REFERENCE MANUAL          _____ USER'S GUIDE          _____ PROGRAMMER'S GUIDE

    _____ OTHER (DESCRIBE) _____

13. BRIEF DESCRIPTION OF CODE: _____

    _____

    _____

    _____

14. ANY COMMENTS REGARDING CONTENTS, FORMAT, SCOPE, ETC., OF THIS TECHNICAL CODE QUESTIONNAIRE

    _____

    _____

15. KEYWORDS: _____

## DEFINITIONS

- *Technical Code*: An organized set of programming instructions that models a physical system or process. If multiple variants of a technical code exist, the respondent need only describe in separate forms, those major variants currently in use or which are likely to see future usage. Outdated variants or variants which differ only inconsequentially from the code listed in Question #1 which still reside at your site can be listed in Question #2. Administrative data base management codes or support software (e.g., compilers, assemblers, editors, testing programs, word processors, simple pre- or post-processor, etc.) are not considered "technical" codes for purposes of this questionnaire.

- *Custodian*: Preferrably, the person within the organization most knowledgeable regarding the "technical code" described.

- *Organization*: The general organization by whom the respondent is employed.

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## EXPLANATION OF INDIVIDUAL QUESTIONS

1. List complete technical code name and acronym (if applicable).

2. List code variation as described above.

3. Give the name, telephone #, and general organizational affiliation of the respondent. The respondent should be the individual in the listed organization most knowledgeable about the code listed in response to Question #1.

4. Is/has the code (been) used for licensing-related activities? For which major OCRWM program area(s) has the code been used?

5. Check the appropriate box(es) for type of code. Note: "RA/PA" refers to risk- or performance-assessment codes.

6. Code is available in this/these language(s) in your organization.

7. Code is run on this/these computer(s) in your organization.

8. Check each applicable box: QA—developed/used/maintained under a QA program; Verification—software performs as intended; Validation—model is correct representation of physical process; Peer Review—a "Technical Review" of a novel-approach code or results from a code that involve a degree of subjective judgment.

9. If yes, please specify other major technical code(s) to which pre- or post-linkages have been effected. Do not list simple pre- or post-processor software that are not technical codes as defined above.

10. Are external data bases/files needed to run the related code?

11. Is code available for distribution, or is it proprietary or only available for a fee?

12. List documentation prepared for use with or adjunct to the code:

    "Technical Reference Manual" a document that describes the logic of the code and discusses its assumptions. Assessment activities performed on the code may also be described.

    "User's Guide" Documentation that supplies application information and facilitates the preparation of input data and interpretation of output.

    "Programmer's Guide" A document intended to assist a programmer to understand the flow and logic of the code, thereby permitting its modification and/or enhancement.

13. Please summarize in 50 words or less, the basic use(s) and logic of the code.

15. Please supply appropriate keywords for use with the compendium.

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All questions or comments regarding this questionnaire should be addressed to J. William Roddy (ORNL) at FTS: 626-8348 (commercial: 615/576-8348) or to Harold Steinberg (DOE/Headquarters) at FTS: 252-5616 (commercial: 202/252-5616).

Mail responses to:

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Oak Ridge, TN 37831