

RSIC Newsletter



RADIATION SHIELDING INFORMATION CENTER

OAK RIDGE NATIONAL LABORATORY

OPERATED BY UNION CARBIDE CORPORATION FOR THE U.S. Department of Energy

POST OFFICE BOX X •
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They who give have all things; they who withhold have nothing. . . Hindu Proverb

RSIC STAFF MEMBERS RETIRE

Three staff members of the Radiation Shielding Information Center (RSIC) will retire on December 31, 1980: **Hemma E. Comolander**, **Jane Gurney**, and **Mildred W. Landay**. Each has made unique contributions to the organizational growth and effectiveness of the information analysis center (IAC) and, regardless of replacements, will be sorely missed. However, it is pleasing to be able to report that the philosophy and patterns of service to the international shielding community which each promulgated as members of the RSIC team will remain beyond their employment.

Hemma E. Comolander, associated as a founder and leader in all computer codes activities since May 1963, retires after more than 35 years employment with Union Carbide Nuclear Division (UCND) at Oak Ridge, TN. Involved in work related to mathematics and computation, she has used digital computers since her first acquaintance with the IBM 650 in the early 1950s. As coordinator of RSIC's code testing and packaging activities, she has worked with scientific programs developed for most of the major computer systems in use today, an experience in many ways unique to RSIC. The procedures she has developed to expedite the testing and packaging process, and the methods instituted to give quality assurance to RSIC computer products are her unique contributions to RSIC's good repute and continuing viability.

Jane Gurney, information analyst and data processing specialist in RSIC and related IAC activities since November 1965, retires from more than 36 years UCND employment. Jane was a leader in the development of the RSIC storage and retrieval of information system (SARIS), was responsible for its maintenance, and was lead author in the publication of bibliographies of the RSIC literature collection. From 1975-1979, she served as operations manager of the Biomedical Computing Technology Information Center (BCTIC) and assisted in its successful transfer into a medical environment at Vanderbilt University in Nashville, TN. She has most recently been involved in RSIC data testing and packaging activities. Of her many IAC contributions, the SARIS database management system remains a highly significant and useful tool used daily in RSIC service.

Mildred W. Landay will retire following 15 years UCND employment. As a re-entrant from long-term homemaker service, she entered RSIC as a consultant on office management procedures and information systems in early 1967 and remained as the RSIC executive secretary (1969 - present). Mildred's interface with the RSIC user community by telephone and correspondence, personal visits to RSIC, and in managing seminar-workshops and conferences has contributed much to RSIC's reputation for service, and her overall support to RSIC activities has been invaluable through the years.

Any interested RSIC participant who may wish to communicate good wishes to either or all of the retiring staff members with whom the participant has interacted in the past may do so by writing to that person at the RSIC address. The communications will be forwarded and will be most appreciated by the recipient. We who remain on the job salute each for a job well done and wish them contentment and happiness in retirement. We will miss them.

RSIC RECEIVES JAPANESE STUDY MISSION

RSIC was pleased to have 14 members of The Study Mission on "Shielding and Radiation Protection"

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visit us in November. Their agenda included presentations on ORNL current research activities in shielding, blanket and shield integral experiments and analysis program, neutronics associated with the fusion radiation damage program and Monte Carlo simulation of molecular flow in neutral beam injectors, Radiation Shielding Information Center products and services, ORELA facilities, and Tower Shielding facilities. The members and their affiliations are: Shunich Miyasaka, Head, Div. of Safeguards Information Treatment, Nuclear Material Control Center; Shun-ichi Miyakoshi, Deputy Manager, Nuclear Engineering Dept., Technology & Development Headquarters, Hitachi Shipbuilding & Engineering Co., Ltd.; Akio Yamaji, Senior Engineer, Reactor Engineering Section, Nuclear Engineering Dept., Japan Nuclear Ship Development Agency; Akira Yajima, Manager, Safety Engineering Section, Nuclear Engineering Dept., Toshiba Company; Ichiro Aoki, General Manager, Advance Nuclear Systems Engineering Dept., Mitsubishi Heavy Ind., Ltd.; Michio Sakakibara, Engineer, Consulting Engineering Dept., Hitachi Engineering Co., Ltd.; Kenichi Suzuki, Engineer, Nuclear Energy Dept., Mitsubishi Metal Co.; Seiji Mori, Engineer, Research & Development Dept., Nuclear Systems Division, Kawasaki Heavy Ind., Ltd. (Tokyo Engineering Office); Naoki Yamano, Researcher of Shielding, Division of Engineering, Sumitomo Atomic Energy Industries, Ltd.; Yoshinobu Fukano, Group Officer, Marketing and Sales Dept. No. 4, Century Research Center Corp.; Kishio Shimizu, Manager, Genshiryoku Daiko Co., Ltd. (Ibaragi District Office); Takashi Sukegawa, Chief, Sub Manager, Administration Section, Genshiryoku Daiko Co., Ltd.; Masatoshi Tsuji, Engineering Department, Nuclear Energy Systems Division, Machinery and Plant Engineering Headquarters, Mitsui Engineering & Shipbuilding Co., Ltd.; and John Tatematsu, Project Manager, Technology Transfer Institute.

CHANGES IN THE COMPUTER CODE COLLECTION

The following changes were made in November.

CCC-395/TIRION 4

A code system for use in calculating consequences of a release of radioactive material to the atmosphere was contributed by the Safety and Reliability Directorate of the United Kingdom Atomic Energy Authority, Warrington, England. In addition to its use for calculating consequences of releasing toxic gases to the atmosphere, TIRION can also be used to study the safety of chemical plants and of nuclear reactors. References: SRD R-63, -120, and -134. FORTRAN IV; IBM 3033.

CCC-396/QADM0D-G

A point-kernel gamma-ray shielding code system was contributed by Radiation Research Associates, Fort Worth, Texas. A modified version of the QAD P-5 point kernel code (CCC-48), QADM0D-G was designed to consider only gamma-ray sources. The code system includes new geometry routines, additional source routines and an internal data library to make the program easier to use when doing gamma-ray dose rate calculations in conjunction with radiation shield design for nuclear power plants. Gamma-ray dose rates, energy depositions, and uncollided fluxes may be calculated. Surfaces, defined by quadric equations, are used for a three-dimensional description of the physical configuration. Reference RRA-N7914. FORTRAN IV; IBM 3033.

CCC-397/GFX-GAM1X

A code system designed for the prediction of flux and dose in terrestrial gamma-radiation fields was contributed by Riso National Laboratory, Roskilde, Denmark through the OECD NEA Data Bank, Gif-sur-Yvette, France. The solution method is the double-P₁ approximation. The system handles the case of two adjacent media: one representing a natural ground with uniformly distributed potassium, uranium, and thorium gamma-ray emitters, and the other is usually air with no radioactive contaminants. Reference: Riso-R-392. FORTRAN IV; IBM 3033.

CHANGES IN THE DATA LIBRARY COLLECTION

The following change was made in November.

DLC-72/MONTUK

The original 100-group neutron activation cross-section data package for fusion reactor structure and coolant materials has been replaced by a newly frozen data library supplied by the UKAEA Nuclear Physics Division of the Atomic Energy Research Establishment at Harwell. This new version (B) incorporates multigroup data based on the Livermore point cross-section library, ACTL, such that wherever an overlap occurred, the ACTL data were used in preference to all other sources except ENDF/B-IV. Reference: AERE-R 9061 (Rev.)

PERSONAL ITEMS

The following changes of address have been noted: **C. E. Clifford** from Radiation Research Associates, Inc., Fort Worth, TX to Princeton Plasma Physics Laboratory, NJ; **Charles Shih** from Kaiser Engineers, Oakland, CA to Pacific Gas & Electric, San Francisco, CA; **Eugene Hochalter** from Idaho National Engineering Laboratory to EXXON Nuclear Idaho Corp., Idaho Falls; **David Gilai** from Ben Gurion University, Beer-Sheva, Israel to Engineering Physics Division, Oak Ridge National Laboratory, Oak Ridge, TN; and **Yigal Ronen** from Oak Ridge National Laboratory to Ben-Gurion University of the Negev, Beer-Sheva, Israel.

VISITORS TO EPIC

The following persons came for an orientation visit and/or to use EPIC facilities during the month of November.

D. Douglas Davis and **V. E. Hampel**, Lawrence Livermore National Laboratory, Livermore, CA; **Albert Fabry**, CEN-SCK, Mol, Belgium; **J.-M. Gomit** and **J. Planchard**, Electricite de France, Clamart, France; **Jan Gyurcsak**, Institute of Nuclear Physics and Techniques, Krakow, Poland; and the 14-member Japanese study mission described above.

PUBLICATION OF FOURTH TAYLOR LECTURE

The National Council on Radiation Protection and Measurements (NCRP) has announced the publication of the fourth Lauriston S. Taylor Lecture on Radiation Protection and Measurements: *From "Quantity of Radiation" and "Dose" to "Exposure" and "Absorbed Dose" - An Historical Review* by Harold O. Wyckoff. The Lecture was presented at the National Academy of Sciences, Washington, D.C. on April 2, 1980, on the occasion of the NCRP Annual Meeting. This Lecture, the first of the Taylor Lectures to deal with radiation measurements, presents an historical review of measurements of what might be termed "amount of radiation." The emphasis is on the measurement techniques associated with x and gamma rays that are used in medical applications. Some of the major events in the historical development of the concepts of "quantity of radiation," "dose," "exposure" and "absorbed dose" are summarized. Additionally, the Lecture considers the adequacy of present absorbed dose determinations and future development for the direct calorimetric determination of absorbed dose in water.

Copies of the Lecture can be purchased from NCRP Publications, P. O. Box 30175, Washington, D.C. 20014.

NCRP 1981 ANNUAL MEETING

The 1981 Annual Meeting of the National Council on Radiation Protection and Measurements (NCRP) will be held on April 8-9, 1981 in the Auditorium of the National Academy of Sciences, 2100 Block of C Street, N.W., Washington, D.C.

The Scientific Session scheduled for April 8 has as its theme critical issues in setting radiation dose limits. The topics and speakers for the session, to be chaired by Roger O. McClellan, include: A Risk System for Setting Radiation Dose Limits—Bo Lindell, An Extension of the Risk Approach—Victor P. Bond, Pitfalls of a Risk Approach—Roy C. Thompson, Establishing Risk Estimates for Whole-body Exposure—Gilbert Beebe, The Role of *In Vitro* Cell Studies in Low Dose Extrapolations—Eric Hall, The Role of Animal Studies in Low Dose Extrapolations—Michael Fry, Establishing Risk Estimates for Individual Organs—William J. Bair, Risk Estimates for Lung—Richard G. Cuddihy, Risk Estimates for Bone—Robert A. Schlenker, Risk Estimates for Breast—John Boice, and Risk Estimates for Liver—Charles W. Mays.

The April 8 program also includes the fifth Lauriston S. Taylor Lecture on Radiation Protection and Measurements which will be presented by Dr. James F. Crow at 5:00 p.m. A reception in honor of the Lecturer will be held in the Great Hall of the Academy immediately following the Lecture.

The tentative schedule for April 9, 1981 includes the NCRP Business Meeting and Scientific Briefings on Current Topics and on Current NCRP Committee Activities.

The thirty-five NCRP collaborating organizations, the persons serving on the Council's scientific committees, and all those interested in the subject matter of the meeting are invited to attend.

CONFERENCE ANNOUNCEMENTS AND CALL FOR PAPERS

The 1981 IEEE Annual Conference on Nuclear and Space Radiation Effects will be held July 21 through July 24 on the campus of the University of Washington, in Seattle, WA. The conference will cover nuclear and space radiation effects, and EMP effects on electronic devices, materials, circuits and systems, as well as processing technology and techniques for producing radiation-tolerant ("hardened") semiconductor devices, integrated circuits, LSI, VLSI, and memories; and radiation sources, simulation, energy deposition and dosimetry. Papers describing significant findings in these and related areas are solicited.

The program will consist of six to eight sessions of contributed papers, several invited papers, and a special VLSI session. A poster session is also planned. In addition, a *Short Course on Radiation Effects* will be offered on July 20.

For additional conference information write or call Itsu Arimura, Conference Chairman, c/o Boeing Aerospace Co., MS 2R-00, Box 3999, Seattle, WA 98124, (202) 655-3116. For information on paper submission write or phone Eric Wenaas, Technical Program Chairman, c/o JAYCOR, P. O. Box 85154, San Diego, CA 92138, (714) 453-6580. Deadline for submission of papers, March 2, 1981.

The conference is cosponsored by the IEEE/NPSS Radiation Effects Committee, Defense Nuclear Agency/DOD, Jet Propulsion Laboratory/NASA, and Sandia National Laboratories.

The Fifth Symposium on X- and Gamma-Ray Sources and Applications will be held June 10-12, 1981 at the University of Michigan in Ann Arbor. A call for papers has been issued with deadline for receipt of summaries: January 26, 1981.

The most recent in a series of symposia on X- and Gamma-Ray Sources and Applications was held in Ann Arbor in 1976. Sufficient technological advances have taken place since 1976 to warrant bringing together scientists, engineers, and other experts in this area to exchange information and to stimulate this field of science and technology.

The program will emphasize research and recent development in x- and gamma-ray sources and applications. Tentative session topics are: radiation-induced fluorescence, x- and gamma-ray spectroscopy, production and availability of radioisotope sources, data acquisition and analysis, secondary target sources, particle-induced x-ray emission, extended x-ray absorption fine structure, analytical standards, and detectors, with applications to energy technology, environmental technology, medical and biological

research, elemental analysis and materials research including non-destructive examination.

Summaries of contributed papers will be reviewed by the Program Committee for possible inclusion in the Symposium Program. Five copies of the summary must be received by January 26, 1981. Mail to: Cathy Lehman, Symposium Secretary, Phoenix Memorial Laboratory, The University of Michigan, Ann Arbor, MI 48109; Phone 313-764-6220. Each summary must include the paper title with the author's name, affiliation, mailing address, and telephone number. Tables and figures may be included, but each should be counted as 100 words toward a total of 300 to 500 words. Authors submitting summaries which are accepted for inclusion in the program must provide a copy of the full paper and a separate abstract. Abstracts must be received by April 6, 1981, and will appear in a program booklet available at the Symposium. Full papers are due May 11, 1981, and will be published as a special issue of *Nuclear Instruments and Methods*.

Symposium sponsors include: U.S. Department of Energy, National Bureau of Standards, Michigan Memorial-Phoenix Project of the University of Michigan, Henry Ford Hospital, General Motors Research Laboratories, Albion College, and Wayne State University.

George Washington University in Washington, D.C. announces a short course in Systems Analysis entitled *Application of Transport Calculations to Radiation Attenuation Studies* to be held February 4-6, 1981. This course is designed to enable the participant to understand the physical and mathematical concepts that underlie modern computer techniques for the solution of practical photon and neutron transport problems. It should be useful for those scientists and engineers who must design radiation shields to be used in conjunction with radiation sources such as particle accelerators, radio-nuclides, and nuclear reactors; and for those who must use computational methods to describe the radiation field in the space surrounding a given radiation source. Others who desire to use the strength of a radiation signal as a measurement technique or who need to predict the effect of radiation on components or systems may also benefit from the course.

The instructor, James H. Renken of the Theoretical Division at Sandia Laboratories, Albuquerque, will review the mechanisms by which photons and neutrons interact with matter. Arguments will be presented which lead to derivation of the fundamental equation that describes the macroscopic radiation field: the transport equation. Two widely used methods for generating general purpose solutions to the transport equation will be discussed. Finally, information about readily available computational tools for solution of radiation transport problems will be provided. Attention will be limited to the study of photon and neutron fields.

The course outline includes: Mechanisms for Neutron and Photon Interactions of Radiation with Matter; Propagation of Radiation Through Matter (Transport Equation); Solution of the Transport Equation by Discrete Ordinates and Monte Carlo Methods; Alternative Formulation of Transport Problems (Adjoint Transport Equation); and Available Computational Tools: Cross Section Data and Transport Computer Codes.

Further information may be secured from George Washington University, Continuing Engineering Education, Washington, D.C. 20052; Phone 202-676-6106 or 800-424-9773.

IUCr X-RAY ATTENUATION PROJECT

At the International Union of Crystallography Congress which was held in Warsaw in 1978, the Commission on Crystallographic Apparatus decided that there was a need to evaluate the techniques for the measurement of X-ray attenuation coefficients. A committee was set up to organize the project, and planning for the project is now well advanced.

It is the aim of the organizing committee to encourage the participation in the project of laboratories using a diverse range of techniques of measurement. For example, sources of incident X-ray beams which are to be used range from synchrotron radiation sources to radio-isotope sources. A diverse range of detection systems are also to be used.

All laboratories participating in the project will receive standard specimens from the project organizers and will be required to answer detailed questions about their equipment, techniques of measurement, and their analysis of the experimental results. The first specimen will be silicon. Later specimen sets will include germanium, magnesium and pyrolytic graphite.

Any laboratory interested in participating in the project should contact D. C. Creagh, Chairman, IUCr X-Ray Attenuation Project, Physics Department, Royal Military College, Duntroon, ACT 2600, Australia; or J. H. Hubbell, Project Secretary, X-Ray and Ionizing Radiation Data Center, National Bureau of Standards, Washington, D.C. 20234, U.S.A.

RSIC REPORTS AVAILABLE

The following reports are available in RSIC on a first-come, first-served basis. Please order by report number.

ORNL-RSIC-3—*A Comparison of First- and Last-Flight Expectation Values Used in an O5R Monte Carlo Calculation of Neutron Distributions in Water*—D. K. Trubey and M. B. Emmett (May 1965). (Microfiche only)

ORNL-RSIC-5 Vol. II, III, IV, V, and VI—*Bibliography, Subject Index, and Author Index of the Literature Examined by the Radiation Shielding Information Center (Reactor and Weapons Shielding)*. (Retrospective RECON search available)

ORNL-RSIC-7—*Tabulated Values of Scattered Gamma-Ray Fluxes in Iron Interpolated from Moments-Method Calculation*—D. K. Trubey (May 1965). (Microfiche only)

ORNL-RSIC-8—*Survey of Methods for Calculating Gamma-Ray Heating*—H. C. Claiborne (June 1965). (Microfiche only)

ORNL-RSIC-9—*A Comparison of Three Methods Used to Calculate Gamma-Ray Transport in Iron*—D. K. Trubey, S. K. Penny, and K. D. Lathrop (October 1965). (Microfiche only)

ORNL-RSIC-10—*A Survey of Empirical Functions Used to Fit Gamma-Ray Buildup Factors*—D. K. Trubey (February 1966). (Microfiche only) (Also Vol. 9, Sept. 1970) *Nucl. Appl. & Tech.* Article

ORNL-RSIC-11—*Bibliography, Subject Index, and Author Index of the Literature Examined by the Radiation Shielding Information Center (Space and Accelerator Shielding) Rev. II, (May 1970)*.

ORNL-RSIC-13, Vol. I, II, III, and IV—*Abstracts of Digital Computer Codes Assembled by the Radiation Shielding Information Center*—Betty F. Maskewitz, Betty L. McGill, Hemma E. Comolander, Marie Anthony, and Henrietta R. Hendrickson. (Vol. I and II, Microfiche only)

ORNL-RSIC-14—*The Exponential Transform as an Importance-Sampling Device - A Review*—Francis H. Clark (Jan. 1966). (Microfiche only)

ORNL-RSIC-16—*Use of ICRU-Defined Units in Shielding*—D. K. Trubey (October 1968).

ORNL-RSIC-17—*Comparisons of Results Obtained with Several Proton Penetration Codes*—W. Wayne Scott and R. G. Alsmiller, Jr. (July 1967). (Microfiche only)

ORNL-RSIC-18—*Estimates of Primary and Secondary Particle Doses Behind Aluminum and Polyethylene Slabs Due to Incident Solar-Flare and Van Allen Belt Protons*—W. Wayne Scott (July 1967).

ORNL-RSIC-19—*A Review of the Discrete Ordinates S_n Method of Radiation Transport Calculations*—D. K. Trubey and Betty F. Maskewitz (March 1968). (Also: Vol. 15, No. 2, Summer 1972, *Reactor Tech.* article)

- ORNL-RSIC-22**—*Comparisons of Results Obtained with Several Proton Penetration Codes – Part II*—W. Wayne Scott and R. G. Alsmiller, Jr. (June 1968). **(Microfiche only)**
- ORNL-RSIC-25**—*Shielding Benchmark Problems*—A. E. Profio, Editor. (With 2 supplements) **(Microfiche only)**
- ORNL-RSIC-28**—*Comparisons of the Results Obtained with Several Electron-Penetration Codes*—W. Wayne Scott (March 1970).
- ORNL-RSIC-30**—*Abstracts of the Data Library Packages Assembled by the Radiation Shielding Information Center*—R. W. Roussin (March 1972).
- ORNL-RSIC-31**—*Abstracts of Peripheral Shielding Code Packages Assembled by the Radiation Shielding Information Center*—Betty F. Maskewitz.
- ORNL-RSIC-32**—*Recent Developments in the Shielding of Neutron Sources*—H. Clyde Claiborne (June 1971). **(Microfiche only)**
- ORNL-RSIC-33**—*A Review of Calculations of Radiation Transport in Air – Theory, Techniques, and Computer Codes*—compiled by D. K. Trubey and H. E. Comolander (May 1972). **(Also suggested: document for CCC-194/SMAUG)**
- ORNL-RSIC-34, Vol. I**—*Defense Nuclear Agency Working Cross Section Library – Description and Contents*—R. W. Roussin (October 1972). **(More recent ENDF/B data is suggested)**
- ORNL-RSIC-35**—*Shielding of Manned Space Vehicles Against Protons and Alpha Particles*—R. G. Alsmiller, Jr., R. T. Santoro, J. Barish, H. C. Claiborne (Nov. 1972). **(Microfiche only)**
- ORNL-RSIC-36**—*Shielding Against Initial Radiations from Nuclear Weapons*—Lorraine S. Abbott (July 1973).
- ORNL-RSIC-37**—*(ENDF-296) VITAMIN-C: The CTR Processed Multigroup Cross-Section Library for Neutronics Studies*—R. W. Roussin, C. R. Weisbin, J. E. White, N. M. Greene, R. Q. Wright, and J. B. Wright (July 1980).
- ORNL-RSIC-38, Vol. I, II, III**—*Techniques for Efficient Monte Carlo Simulation*—E. J. McGrath, *et al.* (April 1975). **(Microfiche only)**
- ORNL-RSIC-39**—*The Development of Radiation Shielding Standards in the American Nuclear Society*—D. K. Trubey (November 1975). **(Microfiche only)**
- ORNL-RSIC-40**—*A Review of Radiation Energy Spectra Unfolding*—compiled by D. K. Trubey (July 1976). **Microfiche only**
- ORNL/RSIC-41**—*A Review of Multigroup Nuclear Cross-Section Processing, Proceedings of a Seminar-Workshop, Oak Ridge, Tennessee*—compiled by D. K. Trubey and H. R. Hendrickson (October 1978). **(Microfiche only)**
- ORNL/RSIC-42**—*A Review of the Theory and Application of Sensitivity and Uncertainty Analysis*—edited and compiled by C. R. Weisbin, R. W. Roussin, H. R. Hendrickson, and E. W. Bryant (August 1978). **(Microfiche only)**
- ORNL/RSIC-43**—*Radiation Streaming in Power Reactors, Proceedings of the Special Session, American Nuclear Society (ANS) Winter Meeting, Washington, D.C., November 15, 1978*—edited and compiled by Gerald P. Lahti, Robert R. Lee, and John C. Courtney (February 1979). **(Microfiche only)**

ORNL/RSIC-44—*A Review of the Theory and Application of Monte Carlo Methods, Proceedings of a Seminar-Workshop, Oak Ridge, Tennessee, April 21-23, 1980*—edited and compiled by D. K. Trubey and B. L. McGill (August 1980).

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 22151.

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.

REACTOR AND WEAPONS RADIATION SHIELDING LITERATURE

BNL-51,188
Proceedings of Brookhaven National Laboratory's Fusion/Synfuel Workshop, Held on August 27-29, 1979., Fillo, J.A.; *et al.*, 1980, NTIS

BNL-NCS-51250
Minutes of the Fourth Annual Meeting of the Panel on Reference Nuclear Data., Burrows, T.W.; Stewart, L.; Coyne, J.J., June 1980, NTIS \$10.00

CINDA 80 (1977-1980)
An Index to the Literature on Microscopic Neutron Data., IAEA, May 1980, International Atomic Energy Agency, Vienna

CONF-7811132, pp.91-100
Practical Design of Internal Shields for AGRs and the Demonstration of Their Effectiveness., Cripps, S.J.; Tayler, J.M., Conference on Radiation Protection in Nuclear Power Plants and the Fuel Cycle, Bristol, UK, 27 November - 1 December 1978., 1978, British Nuclear Energy Society, London

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SEXI - A Fast Diffusion Program Based on Exponential and Trigonometric Interpolation., Makai, M.; *et al.*, August 1980, Eidg. Institut fuer Reaktorschung Wurenlingen, Switzerland

EML-378

Exposure Rate Conversion Factors for Radionuclides Deposited on the Ground., Beck, H.L., July 1980, DOE, New York, N.Y., Environmental Measurements Laboratory

GA-A15451
Fort St. Vrain Refueling Equipment Calculations Versus Measurements., Engholm, B.A., August 1979, NTIS \$6.00

GA-A15569
Personnel Radiation Exposure in HTGR and LWR Plants., Engholm, B.A., September 1979, NTIS \$4.00

JAERI-1255
JAERI Fast Reactor Group Constants Set, Version II., Takano, H.; Hasegawa, A.; Nakagawa, M.; Ishiguro, Y.; Katsuragi, S., March 1978, Division of Technical Information, Japan Atomic Energy Research Institute, Tokai-mura, Naka-gun, Ibaraki-ken, Japan

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Japanese Evaluated Nuclear Data Library, Version-I, JENDL-I., Igarasi, S.; Nakagawa, T.; Kikuchi, Y.; Asami, T.; Narita, T., March 1979, Division of Technical Information, Japan Atomic Energy Research Institute, Tokai-mura, Naka-gun, Ibaraki-ken, Japan

JAERI-M-8135 (In Japanese)

A Study of the Neutron Transport Code Systems for Fusion Reactor Design., Ebisuya, M.; Mackawa, H.; Seki, Y.; Takahashi, A.; Yamamoto, J., 1979, Division of Technical Information, Japan Atomic Energy Research Institute, Tokai-mura, Naka-gun, Ibaraki-ken, Japan

INDC(CCP)-146/LJ

Cross Sections for the (n,p), (n,α) and (n,2n) Threshold Reactions., Bychkov, V.M.; Manokhin, V.N.; Pashchenko, A.B.; Plyaskin, V.I., July 1980, IAEA Nuclear Data Section, Wagramerstrasse 5, A-1400 Vienna

INDC(CCP)-150/LJH

Evaluation of Nuclear Data for ^{242}Pu in the 10^{-5} eV-15 MeV Neutron Energy Region., Krasin, A.K., July 1980, IAEA Nuclear Data Section, Wagramerstrasse 5, A-1400 Vienna

INDC(ROM)-12

Nuclear Data Evaluation for Pa-233., Vasilii, G.; Mateescu, S.; Rapeanu, S.; Avrigeanu, V.; Ciodaru, M.; Dragan, N.; Stadnicov, T.; Bujoreanu, O., May 1980, IAEA Nuclear Data Section, Wagramerstrasse 5, A-1400 Vienna

LA-8498-MS

SENSIT: A Cross-Section and Design Sensitivity and Uncertainty Analysis Code., Gerstl, S.A.W., August 1980, NTIS

NEANDC(E)-204"L"; INDC(FR)-34/L

Calculation of ^{232}Th Neutron Cross Sections from 0.3 MeV to 2.4 MeV Including a Fission Channel Analysis., Yehia, H.A.; Jary, J.; Trochon, J., March 1979, Service de Physique Nucleaire, Centre d'Etudes de Bruyeres-le-Chatel, B.P. n. 561, 92542 MONTROUGE CEDEX, France

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The Evaluation of Models Used for the Assessment of Radionuclide Releases to the Environment., Kanak, K.A.; Miller, C.W., April 1980, NTIS \$5.25

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Graphical Comparison of Calculated Internal Conversion Coefficients., Ewbank, W.B., November 1980, NTIS, PC A03/MF A01

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One-Dimensional Gamma Ray and Photoneutron Shielding Calculations for the EBT-P., Lillie, R.A.; Gabriel, T.A.; Bishop, B.L.; Baker, V.C., November 1980, NTIS, PC A03/MF A01

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Radiological Assessment of Residences in the Oak Ridge Area. Volume 1-Background Information for ORNL Environmental Impact Statement., Tsakeres, F.S.; Shank, K.E.; Chaudhry, M.Y.; Ahmad, S.; DiZillo-Benoit, P.M.; Oakes, T.W., October 1980, NTIS

ORNL/TM-7523; ENDF-302

Evaluation of Neutron and Gamma-Ray-Production Cross Sections for Natural Iron (ENDF/B-V Mat 1326), Fu, C.Y.; Perey, F.G., November 1980, NTIS, PC A04/MF A01

PPPL-1696

Neutron Flux Measurements Around PLT., Zank, G.; *et al.*, September 1980, Princeton University, New Jersey, Plasma Physics Laboratory

TRITA-PFU-80-09

Neutron Spectra from Beam-Heated Fusion Plasmas., Scheffel, J.; *et al.*, August 1980, Royal Institute of Technology, Stockholm, Sweden, Plasma Physics and Fusion Research

UCAR-10,042-80

The National Mirror Fusion Program Plan., Borchers, R.R.; *et al.*, January 1980, Lawrence Livermore Lab., Livermore, CA

UCRL-50400, Vol.17, Pt.D

Program GROUPIE (Version 79-1): Calculation of Bondarenko Self-Shielded Neutron Cross Sections and Multiband Parameters from Data in the ENDF/B Format., Cullen, D.E., July 4, 1980, NTIS \$7.00

UTNL-R-0075 (In Japanese)

Measurements of Neutron and Gamma-Ray Dose Rate Distribution in the Reactor Building of YAYOI., Oka, Y.; Hashikura, H.; Yanagisawa, I.; Akiyama, M.; An, S., 1979, Nuclear Engineering Research Laboratory, Faculty of Engineering, University of Tokyo

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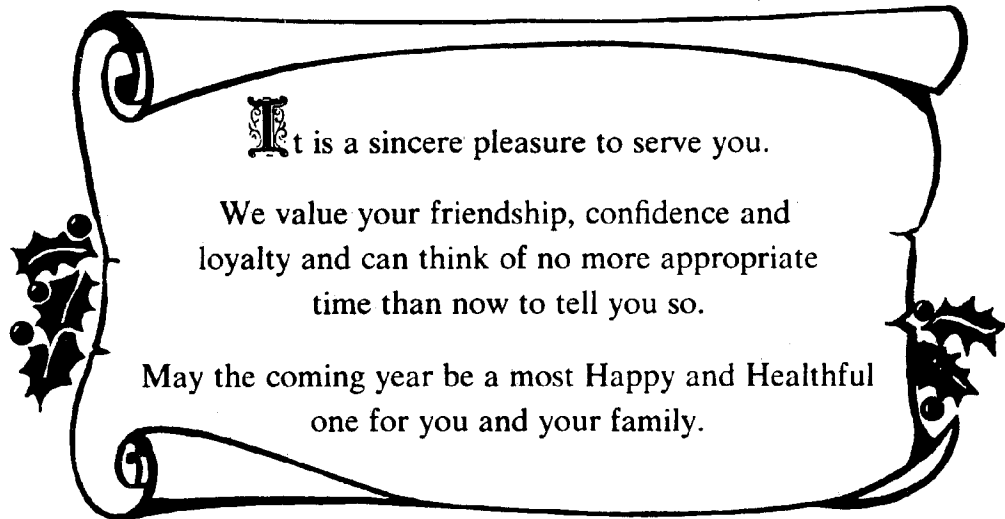
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