RSIC Newsletter

RADIATION SHIELDING INFORMATION CENTER

OAK RIDGE NATIONAL LABORATORY

OPERATED BY UNION CARBIDE CORPORATION • FOR THE U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

POST OFFICE BOX X • OAK RIDGE, TENNESSEE 37830

No. 142 *October 1976*

All good ideas have already been thought; the point is to try and think of them again. *...Goethe*

NEWS ON FIFTH INTERNATIONAL CONFERENCE ON REACTOR SHIELDING (APRIL 1977)

The Technical Program Committee (TPC) met in Knoxville, Tennessee, September 27-28 and arranged the program which will consist of eleven invited and approximately 100 contributed papers of which more than half are from non-USA contributors. Dr. Fred Maienschein, Director of the ORNL Neutron Physics Division, will be the keynote speaker. Dr. Norman Rasmussen, Director of the famous reactor safety study, has consented to speak at the banquet.

The Organizing Committee and the TPC met jointly on September 29 with the following in attendance: Chris Devillers (CEA-Saclay, France), Gopi Gopinath (RRC, India), Gary Vivian (Ontario Hydro, Canada), Sig Gerstl (LASL), Gerry Lahti (Sargent and Lundy), Gil Stone (TVA), Paul Stevens (University of Tennessee), and ORNL personnel: Dave Trubey (General Chairman), Betty Maskewitz (Deputy General Chairman), Jim Turner and Jim Vath (Public Conference on Radiation), Betty McGill and Jane Gurney (Guest Program), Bob Roussin and Dave Bartine (Proceedings), Claude Long (Comptroller), Wendy Martin (Conference Coordinator), Ed Aebischer (Public Information), Lorraine Abbott and Lawanda Klohe (Exhibits and Technical Tours), and Mildred Landay (Registration).

Further information, including participation forms are available from D. K. Trubey, General Chairman, at RSIC, Oak Ridge National Laboratory, P. O. Box X, Oak Ridge, Tennessee 37830. A list of possible participants is being prepared to assist in planning and persons on the list will receive all future announcements.

MONTE CARLO ANALYSIS COURSE OFFERED

Due to a good response to the Monte Carlo course entitled "An Engineering Approach to Monte Carlo Analysis" presented during the 1975 and the 1976 Tennessee Industries Weeks, the University of Tennessee will make a special offering of the same 5-day course during the week of Dec. 13-17, 1976. The staff includes P. N. Stevens of the U.T. Department of Nuclear Engineering, S. K. Fraley of ORNL, and R. W. Roussin and D. K. Trubey of RSIC.

This course is designed specifically for the practicing engineer engaged in shield design and does not presume any prior knowledge of Monte Carlo methods. An understanding of the basics of Monte Carlo methods is emphasized along with their specialized application to practical shielding problems. The versatile Monte Carlo computer code MORSE will be described. Workshop sessions are planned to enable participants to acquire some practical experience. Acquisition of the correct Monte Carlo code and/or the appropriate cross section data for your application will also be discussed.

Participants need not be familiar with the Monte Carlo method. However, some understanding of radiation-transport physics and computer programming (FORTRAN) is desirable.

The following topics will be covered: Fundamental Concepts of Monte Carlo; Statistical Uncertainty; Evaluation of Integrals—Theory and Workshop; Random Walk Simulation and Routine Biasing; Theory of Monte Carlo Estimation; Random Walk Simulation—Workshop; Monte Carlo Computer Codes; The MORSE Computer Code; Source Particle Generation—Workshop; Analysis of Monte Carlo Histories Description and Checkout of Complex Geometries; Complex Geometry Shield Mockup—Workshop;

Computation Time Reduction Techniques; State-of-the-Art Biasing; and Special Topics.

The fee for the course is $375. Registration deadline is November 19th. Other information may be secured from Dr. F. N. Peebles, Dean of Engineering, the University of Tennessee, Knoxville, Tennessee 37916, telephone 615-974-5321.

LOUISIANA STATE UNIVERSITY OFFERS HEALTH PHYSICS COURSE

The LSU Nuclear Science Center will offer a five-day course in basic health physics in Baton Rouge beginning on December 13, 1976. The registration fee of $240 includes all the required notes and materials.

The objective of this short course is to present the basic principles of health physics to engineers, scientists, managers, and other technical personnel. An educational background equivalent to a BS degree in science or engineering, or a high school diploma and several years' experience in a technical area should be sufficient. The use of advanced mathematics will be minimized since the emphasis will be on solutions to practical problems.

All sessions will be conducted in the Nuclear Science Center on the Louisiana State University campus at Baton Rouge, Louisiana, 8:30 a.m. to 4:30 p.m., Monday through Friday. To provide maximum effectiveness in instruction, the class size is restricted to 15 students. Quotas will be filled on first-come first-served basis.

Rooms are available in LSU's Pleasant Hall which is reserved for persons attending education conferences, short courses, and similar meetings on the campus.

Additional information may be obtained by contacting Dr. John C. Courtney, Dr. R. C. McIlhenny, or Dr. W. F. Curry at 504-388-2163. Please write or telephone as soon as possible if you would like to attend.

HELP US TRANSFER COMPUTING TECHNOLOGY EFFICIENTLY!

RSIC computer specialists take pride in being able to process contributed computing technology into RSIC collections efficiently and correctly. We take even more pride in giving the fastest possible turn-around time in filling your requests. In both instances, improvement can be made with your cooperation. With such technology transfer, the first problem to be faced is that there is seldom enough information identifying how a tape is written, or how it should be written by RSIC. Occasionally, we receive a reel of magnetic tape with no information at all, including ownership.

We have several suggestions for your cooperation in helping us to improve our performance. First, identify ownership with a pasted label on the reel itself so that we cannot lose your tape.

When sending codes/data to RSIC on a reel of tape, put a label on the reel and repeat in your cover letter the following information:

1. Number of files written on the tape and, in the transmittal letter, identify each file by describing the information written therein; specify mode; number of records; and DCB parameters (RECFM,BLKSIZE,LRECL) if they change with each file.

2. Tell how the tape is written: number of tracks (7 or 9); what density (556, 800, or 1600); is tape labeled or unlabeled; is it blocked (and if so, what block size and LRECL). Whenever possible, we prefer unlabeled tapes, written 9-track, and 800 bits/inch. However, we can handle other possibilities. If you prepared the material on unique hardware, describe it.

3. When transmitting computer programs, describe the machine configuration on which they have been operating.

When requesting code or data packages, tell us how your tape should be written for efficient retrieval. Give us the information in terms suggested by item 2 above and tell us something about the computers on which you plan to implement the code or use the data.

Follow the above guidelines and note our increased performance!

THE NATIONAL STANDARD REFERENCE DATA SYSTEM

The National Standard Reference Data System is a nation-wide program to provide to the U. S. technical community optimum access to the quantitative data of physical science, critically evaluated and presented in formats convenient to different user groups. It was established in 1963 by action of the President's Office of Science and Technology; responsibility for administering this effort was given to the National Bureau of Standards. The Office of Standard Reference Data was set up within NBS to manage and coordinate the program. Congress later strengthened the program by passing PL 90-396, The Standard Reference Data Act, which was signed into law July 11, 1968. The Act states: "It is the policy of the Congress to make critically evaluated data readily available to scientists, engineers, and the general public...The Secretary [of Commerce] is authorized and directed to provide or arrange for the collection, compilation, critical evaluation, publication, and dissemination of standard reference data."

WHY IS THERE AN NSRDS?

The scientist or engineer seeking specific data is often confronted with a number of difficulties.

WHERE CAN THE DATA BE FOUND
ARE THEY COMPLETE
ARE THEY COMPATIBLE WITH OTHER SOURCES
most important...HOW RELIABLE ARE THEY

Each year his problem becomes greater. As the volume of information expands he finds even more difficulty in trying to keep abreast of the literature relevant to his field. The NSRDS, by providing a central source of critically evaluated data, helps to solve this problem in communication, thus reducing the cost of research, development, and engineering design by eliminating waste of technical manpower, duplication of effort, and delay in the application of scientific and technological advances.

WHAT ARE STANDARD REFERENCE DATA?

Most scientific and engineering work requires dependable numerical values for the various properties of the materials involved. When these values are associated with a well-defined property of a well-defined substance or system, and when they have been critically evaluated by experts in the field to assure maximum reliability, such numbers may be classed as Standard Reference Data.

HOW DOES THE NSRDS OPERATE?

The system is composed of a network of data centers located in government agencies, academic institutions, and non-governmental laboratories throughout the nation. While the Office of Standard Reference Data does not operate or directly supervise the activities of these data centers, it does provide financial support and centralized coordination for the technical programs of the system.

Each NSRDS Data Center is composed of individuals or groups of scientific experts working on the systematic collection and evaluation of data in a specific technical area. While the outputs of these data centers are used in a wide variety of applications, *the centers are grouped into four program areas:*

DATA FOR ENERGY AND ENVIRONMENTAL APPLICATIONS
DATA FOR INDUSTRIAL PROCESS DESIGN
MATERIALS UTILIZATION DATA
PHYSICAL SCIENCE DATA

WHAT ARE THE NSRDS PRODUCTS?

The basic products of the NSRDS data centers are compilations of critically evaluated data, critical reviews of the state of quantitative knowledge in specialized areas, computations of useful functions derived from reference data, and

bibliographies. The principal publication outlet for these data is the Journal of Physical and Chemical Reference Data (JPCRD) published quarterly for NBS by the American Chemical Society (ACS) and the American Institute of Physics (AIP). Subscriptions, reprints, and supplements are available from ACS, 1155 Sixteenth Street N. W., Washington, D. C. 20056. In addition, the NBS formal publication program includes the National Standard Reference Data Series, published by the National Bureau of Standards through the U.S. Government Printing Office.

WHERE CAN MORE INFORMATION ON NSRDS BE OBTAINED?

The NSRDS NEWS, the program's newsletter, is published on a bimonthly basis and is available upon request. Inquiries or requests for further information should be addressed to:

OFFICE OF STANDARD REFERENCE DATA, NATIONAL BUREAU OF STANDARDS,
WASHINGTON, D.C. 20234, OR CALL (301-921-2228).

VISITORS TO RSIC

The following persons came for an orientation visit and/or to use RSIC facilities:

Fred Welfare, Babcock and Wilcox Research Center, Lynchburg, Virginia; Norman E. Banks, Ballistics Research Lab, APG, Maryland; George J. Klem, Ballistics Research Lab, APG, Maryland; R. M. Schwenk, Ballistics Research Lab, APG, Maryland; Richard A. Libby and Marvin A. Lewallen, Battelle Northwest Laboratory, Richland, Washington; T. K. Shen, Bechtel Power Corporation, Norwalk, California; Kenneth K. Hammann, Bechtel Power Corporation, San Francisco, California; W. C. Hopkins, Bechtel Power Corporation, Gaithersburg, Maryland; Allen T. Vieira, Bechtel Power Corporation, Gaithersburg, Maryland; Frank Y. Chen, Bechtel Power Corporation, Ann Arbor, Michigan; Charles D. Swanson, Control Data Corporation, Minneapolis, Minnesota; D. O. Harton, Control Data Corporation, Knoxville, Tennessee; K. Y. Cheung, Brown and Root, Inc., Houston, Texas; David L. Auton, Defense Nuclear Agency, Washington, D.C.; Bill Gardner, IBM Corporation, Knoxville, Tennessee; Yuchien Yuan, Fluor Pioneer Inc., Chicago, Illinois; John Cleveland, Oak Ridge National Laboratory, Oak Ridge, Tennessee; Hsin H. Hsu, United Engineers and Constructors, Inc., Philadelphia, Pennsylvania; Max Salvatores, Teoria a Calcolo Reattori, C.S.N. Casaccia CNEN, Rome, Italy.

PERSONAL ITEMS

D. V. Gopinath, Head of the Safety Research Laboratory, Reactor Research Center, Kalpakkam, India is on a one-month assignment to RSIC.

M. O. (Marty) Cohen has recently been promoted to Manager of MAGI's Nuclear Division in Elmsford, N.Y.

V. R. (Vic) Cain has recently joined the Oak Ridge office of Science Applications, Inc.

Zolin Burson has returned to EG and G in Las Vegas, Nevada from a year's assignment with ERDA in Washington.

The name of Reactor Centrum Laboratory in Petten, the Netherlands, is now **Netherlands Energy Research Foundation.**

CHANGES IN THE COMPUTER CODE COLLECTION

The following changes were made in October.

CCC-176/CASCADE

This Monte Carlo simulation of the transport of high energy electrons and photons in matter, contributed originally by ERDA Health and Safety Laboratory, New York, N.Y., was extended to include an IBM 360 version of the code contributed by Calspan Corporation, Buffalo, New York.

CCC-179/ATR

This package of parametric models of radiation transport in air has been replaced by the new Version 3. The original code and Version 3 were contributed by Science Applications, Incorporated. The new version was converted to IBM 360 by RSIC. FORTRAN IV; IBM 360 (A), UNIVAC 1108 (B).

CCC-187/SAM-CE

This Monte Carlo time-dependent three-dimensional complex geometry (combinatorial) code system was extended to include Revision D of SAM-F, which is the forward Monte Carlo component of SAM-CE. MAGI, Elmsford, N.Y., contributed the original SAM-CE and SAM-F, Rev. D. FORTRAN IV; CDC 6600. Rev. D of SAM-F is being converted and will be included in the IBM 360 version of SAM-CE. It's availability will be announced in a future issue of the Newsletter.

CCC-203C/MORSE-CG

The IBM version of this general purpose Monte Carlo multigroup neutron and gamma-ray transport code system was updated to remove 3 cards from subroutine STORE. The 3 cards, STO 1480, STO 1490, and STO 1500 appeared twice in subroutine STORE. This error was called to RSIC's attention by the contributors at Oak Ridge National Laboratory. FORTRAN IV; IBM 360 (C).

CCC-203B/MORSE-CG

The CDC 6600 version of MORSE-CG, contributed by Mathematical Applications Group, Incorporated, Elmsford, N.Y., was updated to correct an error called to RSIC's attention by Magdi M. Ragheb of the University of Wisconsin and verified by the code originators. In MAINI, the statement COMMON/FISBNK/MFISTP was corrected to read: COMMON/FISBNK/MFISTP.

CCC-204/SWANLAKE

This computer code which utilizes ANISN radiation transport calculations for cross section sensitivity analysis was extended to include fission options. The main program and subroutines CONTRL, PERT, and RESULT were replaced by revisions and new routines added by the Oak Ridge National Laboratory SWANLAKE developers. Reference: ORNL-TM-3809. FORTRAN IV; IBM 360.

CCC-214/DOPEX-1D2C

This one-dimensional, two-constraint radiation shield optimization code was updated to correct one card in Subroutine WEIGHT: DO 6 J=1,NR should be changed to DO 6 J=1,NREG. Jack Courtney, LSU, discovered and Gerry Lahti, Sargent and Lundy, the code contributor, verified the need for the correction. FORTRAN IV; IBM 360.

CCC-217/ORIGEN

This isotope generation and depletion code was updated to make file 17 (DD cards) refer correctly to files 2 and 13. The change was suggested by the ORNL code contributor. FORTRAN IV; IBM 360.

CCC-221/SLDN

The code package for shielding calculations by the method of invariant imbedding was extended to include the FACOM 230-75 version (CCC-221 B), contributed by JAERI Code Center, Ibaraki, Japan. The NAIG Nuclear Research Laboratory, Kawasaki and Tokyo Shibaura Electric Company, Ltd., was the original contributor (GE 635/685 version, CCC-221 A). References: J 201 71-06-12. FORTRAN IV; GE 635/685 and FACOM 230-75.

CCC-275/E-DEP-1

This heavy ion energy deposition code package, (Version P1.09) was extended to include version P1.11. Both versions were contributed by Naval Research Laboratory, Washington, D. C. FORTRAN IV; CDC 3800.

CCC-276/DOT 3.5

This two-dimensional discrete ordinates radiation two-dimensional transport code package was extended to include SORREL, which generates a two-dimensional power distribution for DOT x-y, r-theta and r-z calculations. SORREL was contributed by Babcock and Wilcox, Lynchburg, Virginia. Reference: ORNL-4280 and unpublished "SORREL" by J. T. West, Babcock and Wilcox, (November 1975). FORTRAN IV; IBM 360.

PSR-63/AMPX-I

Both IBM and CDC versions of this modular code system for generating coupled multigroup neutron-gamma-ray libraries from ENDF/B were updated to make the assembler language routines in the IBM version (PSR-63A) EBCDIC and the assembler language routines in the CDC version BCD. This mixed character condition was called to RSIC attention by Eric Ottewitte, Aerojet Nuclear, and verified by N. M. Greene, ORNL.

PSR-93/PUFF

The IBM version of this code for the study of cross section and method uncertainties: the application of sensitivity analysis to study their relationship in radiation transport benchmark problems was updated to make corrections suggested by D. W. Muir, Los Alamos Scientific Laboratory, and verified by C. R. Weisbin, ORNL. A list of corrections or the complete package may be requested from RSIC. FORTRAN IV; IBM 360 (A).

PSR-99/SPEC-4

This code for calculating recoil proton energy distributions from monoenergetic and continuous spectrum neutrons was contributed by Atomic Weapons Research Establishment, Aldermaston, England, and Oak Ridge National Laboratory, Oak Ridge, Tennessee. Reference: AWRE 09/68. FORTRAN IV; IBM 360.

PSR-100/GRETEL

This analyzer and processor of Ge(Li) gamma-ray spectrometric data was contributed by Joint Nuclear Research Centre, Ispra Establishment (EURATOM) and OECD Nuclear Energy Agency Computer Programme Library, Ispra, Italy. Reference: EUR 5117e. FORTRAN IV; IBM 370.

CHANGES TO THE DATA COLLECTION

DLC-35/EURLIB

This 100-group neutron cross section library for use in the European Shielding Benchmark Program was contributed by the European Shielding Information Service (ESIS), Ispra, Italy. The data, which are in the same card image format as for DLC-2, is a P_3 expansion library with a group structure designed for transport in iron. Data are included for ^{1}H, ^{2}H, ^{12}C, ^{16}O, Mg, ^{27}Al, Si, Ca, Cr, ^{55}Mn, Fe, Ni, ^{63}Cu, ^{65}Cu, ^{235}U, and ^{238}U. The retrieval program converts to ANISN binary form. One full reel of magnetic tape is required for transmittal. Reference: ESIS Newsletter No. 12, January 1975.

RSIC GRAB BAG

We offer the following extra copies of documents on a first-come basis. We will honor requests until the supply is exhausted. If you want to add to your reference shelf, please order by report number.

ORNL-TM-3667, *Monte Carlo Calculations of High-Energy Nucleon-Meson Cascades and Comparison with Experiment,* T. W. Armstrong, R. G. Alsmiller, Jr., K. C. Chandler, and B. L. Bishop.

ORNL-TM-3669, *A High Resolution Spectrometer System with Particle Identification for 1- Through 60-MeV Hydrogen and Helium Particles,* F. E. Bertrand, W. R. Burrus, N. W. Hill, T. A. Love, and R. W. Peelle.

ORNL-TM-3674, *Level Structure of ^{54}Mn,* J. K. Dickens.

ORNL-TM-3696, *Simultaneous Measurements of the Neutron Fission and Capture Cross Sections for ^{235}U for Neutron Energies from 8 eV to 10 keV,* R. B. Perez, G. de Saussure, E. G. Silver, R. W. Ingle, and H. Weaver.

ORNL-TM-3702, *Gamma-Ray-Production Cross Sections of Tantalum and Carbon for Incident Neutron Energies Between 0.007 and 20.0 MeV,* G. L. Morgan, T. A. Love, J. K. Dickens and F. G. Perey.

ORNL-TM-3707, *Multilevel Analyses of the ^{235}U Fission and Capture Cross Sections,* G. de Saussure, R. B. Perez, and W. Kolar.

ORNL-TM-3737,*The $^{23}Na(n,x\gamma)$ Reaction for $4.85 < E_n < 7.5$ MeV,* J. K. Dickens.

ORNL-TM-3739, *Monte Carlo Calculations of the Response Functions of Bonner Ball Neutron Detectors,* C. E. Burgart and M. B. Emmett.

ORNL-TM-3758, *Calculation of the Absorbed Dose and Dose Equivalent from Neutrons and Protons in the Energy Range from 3.5 GeV to 1.0 TeV,* T. W. Armstrong and K. C. Chandler.

ORNL-TM-3778, *A General Formalism for Computing the Transition Matrix of Nuclear Reaction Theory, and its Application to the Treatment of the Coupled Channel Equations,* R. B. Perez.

ORNL-TM-3833, *Neutron Cross-Section Measurements of Reactor Interest with the Oak Ridge Electron Linear Accelerator (ORELA),* F. C. Maienschein.

ORNL-TM-3850, *Neutron-Induced Gamma-Ray Production in Iron for the Energy Range 0.8 $< E_n <$ 20 MeV,* J. K. Dickens, G. L. Morgan, F. G. Perey.

ORNL-TM-3853, *Fast Forward Neutron Production in the $^{7}Li(p,n)^{7}Be$ Reaction for 41- and 64-MeV Protons,* J. W. Wachter, R. T. Santoro, T. A. Love, W. Zobel.

ORNL-TM-3877, *Measurement of the Neutron Energy Spectrum at 9 g/cmA2 Residual Atmosphere,* W. Zobel, T. A. Love, J. T. DeLorenzo, C. O. McNew, R. H. Baldry, H. W. Parker.

ORNL-TM-3913, *Elastic and Inelastic Scattering of 12-MeV Protons from ^{92}Mo, ^{94}Mo, ^{96}Mo, and ^{100}Mo: Tabulated Differential Cross Sections,* J. K. Dickens, E. Eichler, R. J. Silva, I. R. Williams.

ORNL-TM-4157, *Integral Neutron Scattering Measurements on Carbon from 1 to 20 MeV,* G. L. Morgan, T. A. Love, F. G. Perey.

ORNL-TM-4193, *Integral Neutron Scattering Measurements on Iron from 1 to 20 MeV,* G. L. Morgan, T. A. Love, F. G. Perey.

ORNL-TM-4216, *Is There Still a Nitrogen Cross-Section Discrepancy?,* F. G. Perey, J. K. Dickens.

ORNL-TM-4232, *Gamma-Ray Production Due to Neutron Interactions with Aluminum for Incident Neutron Energies Between 0.85 and 20 MeV: Tabulated Differential Cross Sections,* J. K. Dickens, T. A. Love, G. L. Morgan.

ORNL-TM-4667, *Relativistic Angular Momentum Relationships for High-Energy Heavy-Ion Reactions,* H. W. Bertini, N. M. Larson.

ORNL-4798, *Gamma-Ray Production Due to Neutron Interactions with Iron for Incident Neutron Energies Between 0.8 and 20 MeV: Tabulated Differential Cross Sections,* J. K. Dickens, G. L. Morgan, and F. G. Perey.

ORNL-TM-4822, *The $Pb(n,x\gamma)$ Reaction for Incident Neutron Energies Between 0.6 and 20.0 MeV,* G. T. Chapman, G. L. Morgan.

ORNL-TM-4823, *Production of Low Energy Gamma Rays by Neutron Interactions with Fluorine for Incident Neutron Energies Between 0.1 and 20 MeV,* G. L. Morgan, J. K. Dickens.

ORNL-4846, *Gamma-Ray Production Due to Neutron Interactions with Copper for Incident Neutron Energies Between 1.0 and 20 MeV: Tabulated Differential Cross Sections*, J. K. Dickens, T. A. Love, G. L. Morgan.

ORNL-4847, *Gamma-Ray Production Due to Neutron Interactions with Tungsten for Incident Neutron Energies Between 1.0 and 20 MeV: Tabulated Differential Cross Sections*, J. K. Dickens, T. A. Love, G. L. Morgan.

ORNL-4864, *Gamma-Ray Production Due to Neutron Interaction with Nitrogen for Incident Neutron Energies Between 2.0 and 20 MeV: Tabulated Differential Cross Sections*, J. K. Dickens, T. A. Love, G. L. Morgan.

ORNL-TM-4881, *Gamma-Ray Transitions in ^{181}Ta Observed in $^{181}Ta(n,n'\gamma)$ Reactions*, J. K. Dickens, G. G. Slaughter.

ORNL-4933, *Energy Deposition by 45-GeV Photons in H, Be, Al, Cu, and Ta*, R. G. Alsmiller, Jr. and J. Barish.

ORNL/TM-5416, *A Re-Measurement of the Neutron-Induced Gamma-Ray Production Cross Sections for Iron in the Energy Range 850 keV $< E_n <$ 20.0 MeV*, G. T. Chapman, G. L. Morgan, F. G. Perey.

JULY 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.

Special bibliographies and selected computer-printed abstracts of the literature in the RSIC system are available upon request. The Selective Dissemination of Information (SDI) Service is available by submitting a list of subject categories defining the recipient's interests.

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

AECL-4444
Properties of Douglas Point Generating Station Heat Transport Corrosion Products.
Montford, B.; Rummery, T.E.
September 1975
Dep., NTIS (U.S. Sales Only) $4.00

AEEW-M-1324
WIMS 69-Group Library Tape 166259.
Taubman, C.J.
July 1975
Dep., NTIS (U.S. Sales Only) $4.50

AI-ERDA-13164
Swelling and Mechanical Property Changes in Neutron-Irradiated Cold-Rolled Type 316 Stainless Steel.
Garr, K.R.; Pard, A.G.
October 1975
NTIS $4.00

ANL/CTR-76-3, Vol.I
Tokamak Experimental Power Reactor Conceptual Design. Vol.I.
Bury, C.S. (Comp.)
August 1976
NTIS $16.25

ANL/CTR-76-3, Vol.II
Tokamak Experimental Power Reactor Conceptual Design. Vol.II.
Bury, C.S. (Comp.)
August 1976
NTIS $9.25

ANL/NDM-19
Remark on the Prompt-Fission-Neutron Spectrum of ^{252}Cf.
Guenther, P.; Havel, D.; Stoblom, R.; Smith, A.
March 1976
Dep., NTIS $3.50

BMI-1942
Evaluating Strength and Ductility of Irradiated *Zircaloy*.
Bauer, A.A.; Lowry, L.M.; Perrin, J.S.
December 1975
NTIS $5.00

BNWL-1961
Some Experimental Considerations Regarding Ion Beam Simulation of Neutron Irradiation for Mechanical Property Measurements.
Styris, D.L.; Jones, R.H.; Harling, O.K.; Kulcinski, G.L.; Marshall, R.P.
1975
Dep., NTIS $5.50

BNWL-SA-5652; CONF-760811-1; SM-209/35
Radiological Design of Hot Laboratories.
Unruh, C.M.
April 1976
Dep., NTIS $3.50

BRL-1795; AD-A-013354
Neutron Cross Sections for Small-Angle Elastic Scattering from Nitrogen and Oxygen. Final Report.
Bucher, W.P.; Hollandsworth, C.E.; Youngblood, J.E.
July 1975
NTIS $3.25

COO-2458-9; CONF-760622-6
Sensitivity of Uranium Spectra to Inelastic Matrix Perturbation.
Parvez, A.; Becker, M.
1976
Dep., NTIS $3.50

CONF-751006-P1 and P2
Fundamental Aspects of Radiation Damage in Metals. Vols.1 and 2.
Proceedings of an International Conference Held in Gatlinburg, Tenn., U.S.A., October 6-10, 1975.
Robinson, M.T.; Young, F.W.,Jr. (Eds.)
December 1975
Dep., NTIS $16.25 per volume

CONF-760631-5
Radiation Transport and Shielding Information, Computer Codes, and Nuclear Data for Use in CTR Neutronics Research and Development.
Santoro, R.T.; Maskewitz, B.F.; Roussin, R.W.; Trubey, D.K.
1976
Dep., NTIS $3.50

CONF-760622-39
Two- and Three-Dimensional Reactor Benchmark Problems.
Vondy, D.R.; Fowler, T.B.; Cunningham, G.W.; Selby, D.B.
June 1, 1976
Dep., NTIS $3.50

CONF-760806-5
Source Terms for Airborne Effluents.
Blomeke, J.O.; Perona, J.J.
1976
Dep., NTIS $4.00

DP-1394
A Consistent Set of Heavy Actinide Multigroup Cross Sections.
Benjamin, R.W.; McCrosson, F.J.; Gorrell, T.C.; Vandervelde, V.D.
December 1975
NTIS $5.50

DP-MS-76-8; CONF-760622-34
ENDF/B-IV Thermal Data Testing: Methods, Results, and Recommendations.
McCrosson, F.J.
1976
Dep., NTIS $4.00

ECOM-4323; AD-A-010334
Aluminum Threshold Dosimetry at the ECOM 14-MeV Neutron Irradiation Facility. Technical Report.
Kronenberg, S.; Berkowitz, H.; Pfeffer, R.; Lux, R.A.
May 1975
NTIS $3.25

EPRI-NP-167
Evaluation of the Neutron Cross Sections of ^{235}U in the Thermal Energy Region. Final Report.
Leonard, B.R.,Jr.; Kottwitz, D.A.; Thompson, J.K.
February 1976
Battelle, Pacific Northwest Laboratories

EPRI-NP-180
^{235}U Fission Product Decay Heat from 1 to 10^5 Seconds. Final Report. (Research Project 392-1)
Friesenhahn, S.J.; Lurie, N.A.; Rogers, V.C.; Vagelatos, N.
February 1976
IRT Corporation

ERDA-1548
Intense Neutron Source Facility. Los Alamos Scientific Laboratory, Los Alamos, New Mexico. Final Environmental Statement.
Energy Research and Development Administration, Los Alamos
July 1976
NTIS $9.25

FERMILAB-Conf-76/20-THY/EXP
My Perspectives on Particle Physics: Summary of Orbis Scientiae, 1976.
Lee, B.W.
February 1976
NTIS

HASL-305
Determination of ^{16}N Gamma Radiation Fields at BWR Nuclear Power Stations.
Lowder, W.M.; Raft, P.D.; de Planque Burke, G.
May 1976
ERDA, Health and Safety Laboratory

HEDL-SA-928-S; CONF-750607-51
Nuclear Data for Calculation of Radioactivity Effects.
Schenter, R.E.; England, T.R.
February 20, 1975
Dep., NTIS $3.50

HEDL-SA-973; CONF-751101-81
Evaluation of Neutron Yields from Spontaneous Fission of Transuranic Isotopes.
Johnson, D.L.
1975
Dep., NTIS $3.50

IAEA-169(Vol.1), pp.9-27
List of Compilations, Evaluations and Computer Codes of Fission Product Nuclear Data.
Valente, S.
1974
INIS

IAEA-169(Vol.1), pp.285-352
Status of Fission Product Yield Data for Thermal Reactors.
Walker, W.H.
1974
INIS

IAEA-169(Vol.2), pp.115-162
Residual Power Due to Fission Products.
Lott, M.
1974
INIS

INDC(CCP)-71/U
Anisotropy of Elastic Scattering of Neutrons: Survey of Experimental Data and Their Analysis.
Mikolaev, M.N.; Bazazyants, N.O.
January 1976
NTIS

KFK-2211 (In German)
Measurement of the Energy Distribution of the Gamma Field in a Fast Reactor.
Korn, H.E.
November 1975
Dep., NTIS (U.S. Sales Only) $5.00

LA-6285-MS
Use of Multiple 4 Pi Radiation Sources for Quasi-Uniform Irradiation of Circular Surfaces.
Freiwald, D.A.; Hafer, J.F.
March 1976
Dep., NTIS $3.50

LA-6344-MS
The STEEP4 Code for Computation of Specific Thermonuclear Reaction Rates from Pointwise Cross Sections.
Harris, D.R.; Dei, D.E.; Husseiny, A.A.
June 1976
NTIS

LA-6409-MS
Production of a Narrow Band of 0.511-MeV Radiation by Use of the Phermex Bremsstrahlung Spectrum.
Stroscio, M.A.
July 1976
NTIS $3.50

LA-6430-MS; ENDF-240
The Influence of Pairing on the Distribution of Independent Yield Strengths in Neutron-Induced Fission.
Madland, D.G.; England, T.R.
July 1976
NTIS $3.50

LA-6445-MS; ENDF-242
Beta-Energy Averaging and Beta Spectra.
Stamatelatos, M.G.; England, T.R.
August 1976
NTIS $3.50

LA-tr-76-5
Cross Sections for Creation Damage.
Lott, M.; Genthon, J.P.; Gervaise, F.; Mas, P.; Mougniot, J.C.; Van Doan, N.
1976
Dep., NTIS $4.00

LA-UR-76-1298; CONF-760558-4
Nature of Radiation Damage in Ceramics.
Bunch, J.M.
1976
Dep., NTIS $3.50

LA-UR-76-1383; CONF-760647-1
What Happens to the Fission Process Above the 2nd- and 3rd-Chance Fission Thresholds.
Stewart, L.; Howerton, R.J.
1976
Dep., NTIS $3.50

LBL-4662; Thesis
Numerical Solution of Boltzmann's Equation.
Sod, G.A.
April 1976
Dep., NTIS $5.50

MR-7021-Rev-C; AD-A-011847
SAM-CE: A Three Dimensional Monte Carlo Code for the Solution of the Forward Neutron and Forward and Adjoint Gamma Ray Transport Equations. Revision C.
Cohen, M.O.; Troubetzkoy, E.; Lichtenstein, E.; Steinberg, H.; Beer, M.
July 31, 1974
NTIS $10.50

NUREG-75/099
Evaluation of Fission Product After-Heat. Annual Report, May 1, 1974 - June 30, 1975.
Spinard, B.I.
1975
NTIS $5.50

ORNL-5191
A Chord Simulation for Insult Assessment to the Red Bone Marrow.
Jones, T.D.
September 1976
NTIS $4.00

ORNL/TM-5049
Assessment of the Radiological Impact of ^{232}U and Daughters in Recycled ^{233}U HTGR Fuel.
Till, J.E.
February 1976
NTIS $5.50

ORNL/TM-5244
Status and Potential of Europium-Based Fast Neutron Absorber Materials.
Pasto, A.E.; Morgan, C.S.
February 1976
ERDA, TIC, P.O. Box 62, Oak Ridge, Tenn. 37830

ORNL/TM-5271
Summary of Neutronics Information for Irradiation Experiments in the Oak Ridge Research Reactor.
Allen, E.J.; Kerr, H.T.
May 1976
NTIS

ORNL/TM-5453
Mathematical Description of a Newborn Human for Use in Dosimetry Calculations.
Hwang, J.M.L.; Shoup, R.L.; Poston, J.W.
September 1976
NTIS $4.50

ORNL/TM-5467
The Concept of Spatial Channel Theory Applied to Reactor Shielding Analysis.
Williams, M.L.; Engle, W.W., Jr.
July 1976
ERDA, TIC, P.O. Box 62, Oak Ridge, Tenn. 37830 $4.00

ORNL-tr-4085
TRIPOLI I: Energy-Dependent Three-Dimensional Monte Carlo Program. Volume I. Conception and Presentation of the TRIPOLI I System.
Katz, S.; Nimal, J.C.
November 1974
Dep., NTIS $9.25

PEM-49
Some Considerations in Shielding of Spacecraft Against the Effects of EMP.
Sheppard, T.J.
May 1976
Dep., NTIS $3.50

SAND-76-0139
Neutronics Analysis for a Subcritical Nuclear Laser Driver Excited by a Fast Pulse Reactor.
Schmidt, T.R.; McArthur, D.A.
April 1976
NTIS

SAND-76-5153
Radioactive Material Shipping Container Testing.
Bonzon, L.L.
1976
NTIS

TGL-25296/06 (In German)
Radiation Protection. Radioactive Wastes Terms and Definitions. Cleaning of Exhaust Gas.
December 1974
NTIS (U.S. Sales Only)

UCID-17021
DT Fusion Neutron Irradiation of BNL-LASL Superconductor Wires, UW-LLL Metallic Foils, and LLL Copper Tensile Specimens.
MacLean, S.C.
October 3, 1975
NTIS

UCRL-77539; CONF-760703-6
Comparative Study of Certain Finite-Element and Finite-Difference Methods in Advection-Diffusion Simulations.
Lee, R.L.; Gresho, P.M.; Sani, R.L.
March 15, 1976
Dep., NTIS $3.50

UCRL-78036; CONF-760816-3
Review of Heat Transfer Problems Associated with Magnetically-Confined Fusion Reactor Concepts.
Hoffman, M.A.; Werner, R.W.; Carlson, G.A.; Cornish, D.N.
April 1, 1976
Dep., NTIS $4.00

UCRL-Trans-10771; CONF-721203-13
Estimate of the Contribution by Neutrons Scattered in Enclosed Rooms to a Total Radiation Dose.
Savinskii, A.K.; Filyushkin, I.V.
September 1974
Dep., NTIS $3.50

Health Phys., 31(1), 41-46
Analysis of the Thermoluminescence Response of LiF Powder to Thermal Neutron and Gamma Ray Exposures.
Kitahara, A.; Saitoh, M.; Harasawa, S.
July 1976

Health Phys., 31(1), 62-66
Neutron Shielding of Cyclotron Targets.
Butler, H.M.; Fulmer, C.B.; Wallace, K.M.
July 1976

Health Phys., 31(1), 71-73
Gamma-Ray Emitters in Concrete.
Lloyd, R.D.
July 1976

Health Phys., 31(1), 78-80
A Shielding Maze at a Neutron Radiotherapy Facility.
Attix, F.H.; Rank, E.X.; August, L.S.; Miller, G.E.; Shapiro, P.
July 1976

IEEE Trans. Nucl. Sci., NS-22(6), 2326-2329
Silicon Ionization and Displacement Kerma for Neutrons from Thermal to 20 MeV.
Rogers, V.C.; Harris, L.,Jr.; Steinman, D.K.; Bryan, D.E.
December 1975

IEEE Trans. Nucl. Sci., NS-22(6), 2330-2335
Neutron Spectral Distribution from a Godiva Type Critical Assembly.
Meason, J.L.; Wright, H.L.; Hogan, J.C.; Harvey, J.T.
December 1975

IEEE Trans. Nucl. Sci., NS-22(6), 2356-2361
Coupled Electron/Photon Transport in Static External Magnetic Fields.
Halbleib, J.A.,Sr.; Vandevender, W.H.
December 1975

J. Korean Nucl. Soc., 7(4), 277-284
Relative Dose Distribution in the Biological Irradiation Facility at TRIGA Mark-III Reactor.
Kim, B.S.; Ha, C.W.; Lee, C.K.
December 1975

J. Test Eval., 3(3), 238-243
Dosimetry Related to Controlled Thermo-Nuclear Research.
Dudey, N.D.
May 1975

Med. Phys., 3(1), 52
Communications.
Liden, P.K.
January 1976

Nucl. Instrum. Methods, 136(1), 109-117
Absolute Calibration of a Well-Type NaI-Detector to an Accuracy of 0.3-0.1%.
Mannhart, W.; Vonach, H.
July 1, 1976

Nucl. Sci. Eng., 60(4), 337-345
Application of Walsh Functions to Neutron Transport Problems - I. Theory.
Seed, T.J.; Albrecht, R.W.
August 1976

Nucl. Sci. Eng., 60(4), 346-356
Application of Walsh Functions to Neutron Transport Problems - II. Analysis.
Seed, T.J.; Albrecht, R.W.
August 1976

Nucl. Sci. Eng., 60(4), 357-368
Neutron Transport and Diffusion in Inhomogeneous Media. II.
Larson, E.W.
August 1976

Nucl. Sci. Eng., 60(4), 405-420
Measured and Calculated Neutron Albedo for Concrete and Iron.
Meyer, W.; Leighty, J.W.; Thiesing, J.W.; Timmons, D.H.
August 1976

Nucl. Sci. Eng., 60(4), 461-463
The Monte Carlo Nonuniform Sampling Technique Applied to the Klein-Nishina Probability Density Function.
Horowitz, Y.S.; Dubi, A.; Mordechai, S.
August 1976

Nucl. Sci. Eng., 60(4), 471-477
Neutron Thermalization in Light Water - Measurement and Calculation of Spectra.
Abbate, M.J.; Lolich, J.V.; Parkinson, T.F.
August 1976

Nucl. Sci. Eng., 60(4), 481-482
An Estimate of the Yield of Photoneutrons from Beryllium Using a Linac as the X-Ray Source.
Khandelwal, G.S.; Pritchard, W.M.; Singh, J.J.
August 1976

Nucl. Sci. Eng., 61(1), 21-32
Radiation-Damage Calculation: Primary Knock-On Atom Spectra, Displacement Rates, and Gas Production Rates.
Gabriel, T.A.; Amburgey, J.D.; Greene, N.M.
September 1976

Nucl. Sci. Eng., 61(1), 33-39
Neutron Spectrum from a Uranium-235 Sphere Bombarded by 14-MeV Neutrons.
Ragan, C.E.,III; Auchampaugh, G.F.; Hemmendinger, A.; Silbert, M.G.
September 1976

Nucl. Sci. Eng., 61(1), 40-52
Cross Sections for the Production of 8- to 20-MeV Photons.
Longo, G.; Saporetti, F.
September 1976

Nucl. Sci. Eng., 61(1), 53-59
Reaction Rates in a Uranium Pile Surrounding a 14-MeV Neutron Source: Calculations of the Weale Experiment.
Haight, R.C.; Lee, J.D.; Maniscalco, J.A.
September 1976

Nucl. Sci. Eng., 61(1), 72-77
Neutron Transport in Two Dissimilar Media with Anisotropic Scattering.
Burkart, A.R.; Ishiguro, Y.; Siewert, C.E.
September 1976

Nucl. Sci. Eng., 61(1), 90-97
The Application of Neutron Transport Codes to the Transport of Neutrals in Plasmas.
Marable, J.H.; Oblow, E.M.
September 1976

Nucl. Sci. Eng., 61(1), 98-106
Analysis of the Coarse-Mesh Rebalancing Effect on Chebyshev Polynomial Iterations.
Nakamura, S.
September 1976

Nucl. Sci. Eng., 61(1), 117-118
A Two-Dimensional Time-Dependent Neutron Transport Calculation Using One-Dimensional Equations. (Tech. Note)
Boring, M.; Roach, W.H.
September 1976

Soviet J. At. Energy(English Transl.), 38(2), 101-103
Spectra of Resonance Neutrons in Media Containing ^{23}Na.
Platonov, A.P.
February 1975

Soviet J. At. Energy(English Transl.), 38(2), 135-136
Natural Coordinate System for the Transport Equation in Cylindrical Geometry.
Smelov, V.V.; Shmurygin, P.A.
February 1975

Z. Angew. Math. Phys., 25(6), 735-741
Exact Solution of P_1 Time-Dependent Equations with Time-Dependent Cross Sections for 2D and 3D Geometry.
Lemanska, M.
November 25, 1974

Thesis
Neutron Transport with Highly Anisotropic Scattering.
Odom, J.P.
Kansas State University, Manhattan, KS
1975
University Microfilms Order No.75-25,054

BOOK
EXPERIMENTAL REACTOR PHYSICS.
Profio, A.E.
1976
John Wiley and Sons, Inc., New York

COMPUTER CODES LITERATURE

AFCRL-TR-76-0023
..... INVIMB; OOSII; FROHLM; MCTRN
An Invariant Imbedding, Orders-of-Scattering Approach to Particle Transport in a Slab.
Garth, J.C.; Woolf, S.
Air Force Cambridge Research Labs, Hanscom Air Force Base, Massachusetts
January 1976

ANL-8040 (Suppl. 3) ..... ERDA PROGRAMS
USERDA Computer Program Summaries. Numbers 177-239.
Argonne National Laboratory, Argonne, Illinois
October 1975
AVAIL: NTIS

Atomkernenergie, 26(3), 185-189
..... RSYST I-III
RSYST I-III: Experience and Further Development.
Ruhle, R.
1975

BAW-10112 ..... ETOGM
ETOGM: Epithermal Cross Section Generation Code Using ENDF/B Data.
Wittkopf, W.A.; Tilford, J.M.; Kirschner, G.
Babcock and Wilcox, Lynchburg, Virginia
December 1975

BNL-20700; CONF-751220-1
..... NUCLEAR MODELS
Role and Use of Nuclear Theories and Models in Practical Evaluation of Neutron Nuclear Data Needed for Fission and Fusion Reactor Design and Other Nuclear Applications.
Prince, A.
Brookhaven National Laboratory, Upton, New York
1975
AVAIL: NTIS

BNWL-1855 ..... BMC; PUSHLD
Shielding Calculational System for Plutonium.
Zimmerman, M.G.; Thomsen, D.H.
Battelle Northwest Laboratories, Richland, Washington
August 1975

CEA-CONF-3098 ... NEPTUNE; APOLLO; BILAN; TRIDENT
NEPTUNE: A Modular Scheme for the Calculation of Light Water Reactors.
Kavenoky, A.
CEA Centre d'Etudes Nucleaires de Saclay, 91-Gif-sur-Yvette, France
April 1975

CONF-73117-P1, 145-148
..... RADIONUCLIDE KINETICS
Application of Computers for Heuristics and Simulation of Transport of Radionuclides.
Kindler, E.
Charles University, Prague
November 1973

CONF-741001-, pp. 64-71 ..... CSAAS
Analysis of Cavity Stability by the Finite Element Method.
Anderson, C.A.
Los Alamos Scientific Laboratory, Los Alamos, New Mexico
1974

Kernenergie, 19(2), 55-59 ..... DIFFUSION APPROXIMATION
A Variational Method for the Solution of Multidimensional Multigroup Problems in Diffusion Approximation.
Cermak, J.; Tinka, I.; Tinkova, E.
Ustav Jaderneho Vyzkumu, Rez, Czechoslovakia
1976

LA-6015-T
..... PATTERN RECOGNITION TECHNIQUES
Investigation of Pattern Recognition Techniques for the Identification of Splitting Surfaces in Monte Carlo Particle Transport Calculations.
Macdonald, J.L.
Los Alamos Scientific Laboratory, Los Alamos, New Mexico
August 1975

LA-6168-MS ..... SIMMER
Cross-Section Methodology in SIMMER.
Soran, P.D.
Los Alamos Scientific Laboratory, Los Alamos, New Mexico
November 1975
AVAIL: NTIS

LA-6344-MS STEEP4
The STEEP4 Code for Computation of Specific Thermonuclear Reaction Rates from Pointwise Cross Sections.
Harris, D.R.; Dei, D.E.; Husseiny, A.A.; Sabri, Z.A.; Hale, G.M.
Los Alamos Scientific Laboratory, Los Alamos, New Mexico
June 1976

Newsl. ENEA Comput. Programme Libr., 18, pp. 25-30 ..... ANISN; MC2
Operating Experiences on Code Utilization.
Palmiotti; Salvatores; Engle, W.W.,Jr.
CNEN, Italy
April 1975

Nucl. Instrum. Methods, 114 ..... CD-N
A Monte Carlo Simulation of the Capture and Detection of Neutrons with Large Liquid Scintillators.
Poitou, J.; Signare'eux, C.
Departement de Physique Nucleaire, CEN Saclay, BP 2, 91190, Gif-sur-Yvette, France
1974
FORTRAN IV IBM 360/90; CDC 6600

ORNL-4938 ..... KENO IV
KENO IV: An Improved Monte Carlo Criticality Program.
Petrie, L.M.; Cross, N.F.
Oak Ridge National Laboratory, Oak Ridge, Tennessee
November 1975

ORNL-5062 ..... VENTURE
VENTURE: A Code Block for Solving Multigroup Neutronics Problems Applying the Finite-Difference Diffusion-Theory Approximation to Neutron Transport.
Vondy, D.R.; Fowler, T.B.; Cunningham, G.W.
Oak Ridge National Laboratory, Oak Ridge, Tennessee
October 1975

ORNL/CSD-11 ..... LAVA
A User's Guide for LAVA as Issued with MORSE-SGC.
Fraley, S.K.
Oak Ridge National Laboratory, Oak Ridge, Tennessee
June 1976

ORNL-TM-4660 ..... KENO
16 and 123 Group Weighting Functions for KENO.
Knight, J.R.; Petrie, L.M.
Oak Ridge National Laboratory, Oak Ridge, Tennessee
November 1975

ORNL-tr-2971; IKE-4-25 ..... FEM2D
FEM2D: Program for Solving the Two-Dimensional Diffusion Equation by the Method of Finite Elements.
Franke, H.P.; Schmidt, F.A.R.
July 1974
AVAIL: NTIS

RCN-75-156 ..... SELFS; SAND-II
Neutron Selfshielding of Activation Detectors Using Total Cross Section Values from the ENDF/B-IV Library.
Barsky, A.M.; Nolthenius, H.J.
Reactor Centrum Nederland, Petten, the Netherlands
November 1975

RCN-75-157 ..... SAND-II CROSS SECTIONS
Cross Section Library ENDF/B-IV BNL (in the SAND-II format).
Rieffe, H.Ch.; Nolthenius, H.J.
Reactor Centrum Nederland, Petten, the Netherlands
December 1975

RD/B/N-3178; FREDSWG/P-(75)9; RPC/Sh/P-(75)11; FRCMWG/P-(75)163 <3> SPARTAN
User's Manual for the Three-Dimensional Monte Carlo Transport Code SPARTAN. (SPARTAN Development Report 3).
Bending, R.C.; Heffer, P.J.H.
Central Electricity Generating Board, Berkeley, United Kingdom, Berkeley Nuclear Labs
September 1975
AVAIL: NTIS (U.S. Sales Only)

RD/B/N3693 ..... WARP2F
The Numerical Integration of a Stiff System of Linear Differential Equations.
Harte, G.A.
Central Electricity Generating Board, Research Department, Berkeley Nuclear Laboratories, England
June 1976

WCAP-7757-A ..... PANDA
PANDA Code.
Altomare, S.; Minton, G.
Westinghouse Electric Corporation, Pittsburgh, Pennsylvania, Nuclear Energy Systems Division
February 1975
FORTRAN IV CDC 6600

WCAP-7758-A ..... TURTLE
TURTLE 24.0 Diffusion Depletion Code.
Altomare, S.; Barry, R.F.
Westinghouse Electric Corporation, Pittsburgh, Pennsylvania, Nuclear Energy Systems Division
September 1971
FORTRAN IV CDC 6600