RSIC Newsletter

RADIATION SHIELDING INFORMATION CENTER

OAK RIDGE NATIONAL LABORATORY

OPERATED BY UNION CARBIDE CORPORATION • FOR THE U.S. ATOMIC ENERGY COMMISSION

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"Such things and deeds as are not written down are covered with darkness, and given over to the sepulchre of oblivion." ... Ivan Bunin

CURRENT WORK AND PROBLEMS

The matter of tabulation of cross sections in language and detail appropriate for shielding cross sections has been a matter of some pre-occupation with portions of the shielding community for several months. The shielding subcommittee of the CSEWG met February 6 in Oak Ridge (see March newsletter) and again on April 7 in San Francisco. Out of these meetings has come a draft of an amplified ENDF/B format to accommodate additional reactions having special interest for shielding. These include secondary gamma ray production, gamma ray interaction, and several charged particle interaction cross sections. Other recommendations were made concerning materials priorities and service routines. It was strongly urged that steps be taken to make data transfer between the ENDF/B and the Aldermaston formats simple. It was further urged that every effort be made to insure cooperation between the CSEWG and other groups engaged in acquisition of data of this sort.

During the same period a DASA committee has been considering DoD cross section data needs (the committee met March 1 and May 3 in New York City). Notable accomplishments of this group include (1) recommendation that DASA avail itself of the cross section library services of the BNL/ENDF group for its contractors, (2) review of recent General Atomic tabulation of cross section data for five nuclides, (3) undertaking to determine cross section measurement needs (for DASA shielding calculations) and availability of facilities which might meet these needs.

QAD SEMINAR-WORKSHOP

Fifty participants from 25 separate installations were in attendence at the QAD Seminar-Workshop held at the Oak Ridge National Laboratory April 17-19. QAD IV and QAD P-5 were presented by Richard Malenfant, QAD B was presented by Donald Peterson, and QAD V by Robert Streetman, all of the N-2 Division, Los Alamos Scientific Laboratory. Gerald Lahti of the NASA Lewis Research Center presented QAD HD. All of these versions of the QAD codes were placed in the RSIC Computer Codes Collection and will soon be available for distribution.

Following the formal code presentations special applications of QAD were discussed by L. S. Burns, Jr. of NMPO, General Electric, Cincinnati, Ohio, by Lester Clemmons, NASA Lewis Research Center, Cleveland, Ohio, by A. D. Wilcox, Aerojet General Corporation, Sacramento, California, and by Milo Solomito of ORNL. A Panel Discussion on "Kernel Integration as a Method To Do Shielding Calculations" completed the three day meeting. Moderated by Clyde Claiborne of Neutron Physics Division, ORNL, the Panel consisted of John MacDonald of GE, Knolls Atomic Power Laboratory, Schenectady, New York, Richard Malenfant, LASL, Leonard Soffer, NASA Lewis Research Center, and D. K. Trubey of RSIC, ORNL.

A special feature of the meeting was an evening presentation of "Quick and Dirt Cheap: Projects from Peaceful Nuclear Explosives" by J. W. Landry of the Chemical Technology Division, ORNL.

SEND US YOUR REPRINTS

It is a great help to us when authors send us their reports and reprints of their published work. We are very grateful to those who do this. This procedure will not only assure that the work comes to our attention but saves us the often considerable effort of obtaining documents when we encounter titles in abstract journals, accession lists, and bibliographies. It is particularly helpful if we are placed on routine distribution lists so we receive copies automatically.

We would also welcome brief contributions to the "Current Work and Problems" section. Tell us what you are working on.

RSIC TRAVELS

Betty F. Maskewitz and Henrietta R. Hendrickson displayed the RSIC Exhibit and participated in informal discussions on nuclear codes with attendees at the International Conference on the Utilization of Research Reactors and Reactor Mathematics and Computation held May 2-4 in Mexico City. The Conference was arranged jointly by the Reactor Group of the Centro Nuclear de Mexico and the Mathematics and Computation Division of the American Nuclear Society and sponsored by the Comision Nacional de Energia Nuclear de Mexico.

A meeting of the information center operators associated with the National Standard Reference Data System at the National Bureau of Standards (April 6-7) was attended by D. K. Trubey. Although RSIC is not a member of this sytem, our interests are closely related.

Francis H. Clark met with the ENDF CSEWG shielding subcommittee at USNRDL (San Francisco) April 7 and the DASA committee on neutron cross sections in New York May 3.

APRIL ACCESSION LIST OF LITERATURE

The RSIC is now aware of the literature cited in the following list. This literature has either been obtained by RSIC or has been placed on order. When received, this material will be examined and assigned to various files if suitable

for our information system. The accession list is divided into three fields of (1) reactor and weapons shielding, (2) space and accelerator shielding, and (3) shielding computer codes. These titles are announced before processing and indexing so that there will be no delay and can serve as a prompt announcement of current literature.

RSIC is not a documentation center. Copies of the literature cited must generally be obtained from the author or from a documentation center such as the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

RSIC maintains a microfiche file of literature entered into its information system. Computer searches of this system (which produces a special bibliography) and duplicate microfiche copies of literature in our file are available upon request. Naturally we cannot supply copies of literature which is copyrighted (such as books or journal articles) or whose distribution is restricted. Neither service is yet available for the codes literature.

Reactor and Weapons Shielding

AAEC-E-155

Synthetic Kernels of Neutron Slowing-Down Theory and a Related Expansion
C. A. Wilkins and A. Keane - June 1966

AD-644051

Use of Electronic Computers to Calculate Radiation Disturbances in Metals
A. N. Orlov - 1962

AE-261

Attenuation of Neutrons and Photons in a Duct Filled with a Helical Plug
E. Aalto, and A. Krell - Dec. 1966

ANL-7131

Stochastic Problems in Transport Theory
P. J. Brockwell - August 1966

ANL-Trans-168 (Translated from the Russian)

Bulletin of the Information Center on Nuclear Data
April 1967

BRL-R-1284

A Method for Calculating Secondary Gamma Ray Transmission through Single-Material Slabs
A. J. Budka - April 1965

BRL-MR-1586

Predicted Radiation Dose Levels for the Aberdeen Pulsed Reactor Facility
J. E. Watson, Jr. - June 1964

CEX-62.12

Energy and Angular Distribution of Neutrons and Gamma Rays -- Operation BREN
J. H. Thorngate, J. A. Auxier, et al. - Feb. 1967

DASA-1875 (NRSS 4)

The Water Content of Hardened Concrete
H. Holsdorf - Feb. 1967

GA-7309 (NASA-CR-72143)

Measurement of Neutron Spectra in Liquid Hydrogen - Final Report
G. D. Trimble, G. K. Houghton, and A. E. Profio - July 17, 1966

Health Phys., 13(3), 296-297 (March 1967)

Importance of Epithermal Neutrons Relative to Thermal Neutrons in Absorbed Doses
F. H. Clark

ISS-66-27 (Italian)

Introduction to Radiation Physics. Chapter IV
U. Amaldi, Jr. - July 28, 1966

JAERI-1110

Construction and Arrangement of Monitoring Caves
Japan Atomic Energy Research Inst., Tokyo
Oct. 1966

KAPL-P-3185

A Two-Dimensional Application of an Iterative Method for Solving the Neutron Transport Equation with Anisotropic Scattering
B. W. Crawford and J. P. Friedman - 1966

KAPL-P-3189

The Use of Infinite Medium Spectra in Gamma Ray Heating Calculations
T. E. Dudley, M. R. Mendelson, and N. E. Holden - 1966

KFK-120, Pt. 1

Neutron Cross Sections for Fast Reactor Materials. Part I: Evaluation
J. J. Schmidt - Feb. 1966

KFK-457

Principals and Problems in Neutron Nuclear Data Evaluation
J. J. Schmidt - Oct. 1966

LA-3619

Effective Two-Group Gamma-Ray Spectra for Thermal Neutron Capture and Prompt Fission
D. J. Dudziak - Feb. 10, 1967

LA-3558-MS Vol. I and II

Calculations of Neutron Cross Sections Using a Local Optical Potential with Average Parameters
F. P. Agee and L. Rosen - Sept. 6, 1966

NP-16296 (TM-5-805-12)

X-Ray Shielding
Department of Army, Washington, D. C. - Aug. 1966

NP-16499 (French)

Neutronic Anisotropy of a Block of Inhomogeneous Graphite
M. A. Paihes - November 1965

NYO-3266-1

Malibu Nuclear Plant Unit No. 1 Preliminary Hazards - Summary Report
Dept. of Water and Power, Los Angeles, California - May 1965

ORNL-TM-349, Rev. 1

A Safety Analysis of the Oak Ridge Critical Experiments Facility
ORNL - Feb. 1967

ORNL-TR-1529 (Translated from ABS-THH-1027)

Tables of Shielding Constants for the Components of Typical Shielding Materials
S. Sasse

ORNL-TR-1528 (Translated from ABS-THH-1031)

Possibilities of Application of Ion Accelerators in Shielding Experiments
H. Schultz

ORNL-4093

Adjoint and Importance in Monte Carlo Application
R. R. Coveyou and V. R. Cain, et al. - April 1967

ORNL-4101

Dose-Estimation Studies Related to Proposed Construction of an Atlantic-Pacific Interoceanic Canal with Nuclear Explosives: Phase I
K. E. Cowser, S. V. Kaye, P. S. Rohwer, W. S. Snyder, and E. G. Struxness
March 1967

ORNL-TM-1758

Calculations, Using the Albedo Concept, of Thermal-Neutron Fluxes Along the Center Lines of One-, Two-, and Three-Legged Square Concrete Open Ducts Arising from Thermal Neutrons Entering Duct Mouths: Comparison with Experiments
R. E. Maerker and F. J. Muckenthaler - February 13, 1967

ORNL-TM-1656, Rev.

Measurements of the Spectra of Uncollided Fission Neutrons Transmitted through Thick Samples of Nitrogen, Oxygen, Carbon, and Lead: Investigation of the Minima in Total Cross Sections
C. E. Clifford, E. A. Straker, et al. - March 3, 1967

BOOK

Radiation Dosimetry
Edited by F. W. Spiers and G. W. Reed - 1964
(Publisher - Academic Press)

RISO Report No. 136

Nuclear Particle Transport with Emphasis on Monte Carlo and Shielding Calculations
Peter Kirkegaard - June 1966

RISO-M-528

Comparison between γ-Shielding Calculations, Using Build-up Methods and Monte Carlo Methods, Respectively
Peter Kirkegaard - Feb. 1967

SC-DC-67-1302

Legendre Polynomial Expansion for the Klein-Nishina Formula
J. H. Renken - January 1967

SC-RR-66-452

Analytical Approximation for X-Ray Cross Sections
Sandia Corporation - Feb. 1967

TID-23647

Fast Reactor Technology: Plant Design
J. G. Yevick (Editor) - 1966
(Publisher - MIT Press)

USNCEL-N-882

Shielding Considerations in the Design of Hardened Structures
C. M. Huddleston and D. R. Doty - March 1967

USNRDL-Tech. Manual No. 67-1

The NRDL Manual Gamma-Ray Ship-Shielding Calculational Method - Appendix I and II
E. Laumets and C. A. Young - December 30, 1966

USNRDL-TR-906

A Semi-Empirical Determination of Dose Rates within an Aircraft Carrier Enveloped by a Cloud of Co-60
W. G. Miller
Sept. 15, 1965

USNRDL-TR-1106

Exposure Rates from the Products of Fast Neutron Fission of U^{235} and U^{238} at Selected Times after Fission
L. R. Bunney and D. Sam - Oct. 1966

UCRL-50178

Photon Cross Sections 1.0 keV to 15.0 MeV
E. F. Plechaty, and J. R. Terrall - Sept. 20, 1966

UCRL-50164

Available Disintegration Energy of all Radionuclides (for Use in Dosimetry Problems). I. Half-Lives 12 Hours or Greater
C. A. Burton and J. H. Maxwell - Dec. 15, 1966

WAPD-TM-617

A Method of Including Epithermal Neutron Scattering by Bound Protons in Combined Slowing-Down Thermal Calculations
N. R. Candelore, and R. C. Gast - Oct. 1966

Shielding Computer Codes

RISO 136 — June 1966 — REMTHERM, PRIGAM, SEGAM I and II, REMDIFF

Nuclear Particle Transport with Emphasis on Monte-Carlo and Shielding Calculations
by Peter Kirkegaard
FORTRAN for IBM 7090; ALGOL for GIER

GEMP 392 — November 1965 — GAMMA-P

Operating Instructions for the Fortran IV Version of Program GAMMA-P, (NMP 468)
by C. S. Robertson and M. R. Edwards
FORTRAN IV

NASA E-3810 — April 1967 — QADHD

QADHD Point-Kernel Radiation Shielding Computer Code to Evaluate Propellant Heating and Dose to Crew During Engine Operation
by Gerald P. Lahti
FORTRAN IV for IBM 7090/7094

LA-3573 — April 1967 — QAD

QAD: A Series of Point-Kernel General-Purpose Shielding Programs
by Richard E. Malenfant
FORTRAN for IBM 7090/7094

USNRDL-TR-67-9 January 1967 MOMGEN
MOMDIS

A Moments Method Computer Code for Reconstructing Scattered Gamma Ray Distributions
by C. V. Smith
FORTRAN II for IBM 704

BNWL-236-Suppl March 1967 ISOSHLD-II

ISOSHLD-II: Code Revision to Include Calculation of Dose Rate from Shielded Bremsstrahlung Sources
by G. L. Simmons, J. J. Regimbal, J. Greenborg, E. L. Kelly, Jr., and H. H. Van Tuyl
FORTRAN IV for IBM 7090