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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It is wise to get knowledge and learning from every source -- from a sot, a pot, a fool, a winter-mitten, or an old slipper---Rabelais

PACKAGING OF RADIOACTIVE MATERIALS MEETING AT GATLINBURG

The Second International Symposium on the Packaging and Transportation of Radioactive Materials will be held October 14-18 in Gatlinburg, Tennessee (near Oak Ridge). The meeting is sponsored by the Union Carbide Corporation Nuclear Division and the U. S. Atomic Energy Commission.

Some 54 papers are being presented of which 15 are from foreign participants. This is indicative of the widespread interest in transportation safety and attests to its importance in the expanding nuclear economy.

Topics to be discussed will cover all aspects of shipment of radioactive material. For further information please contact L. B. Shappert, Symposium Chairman, Oak Ridge National Laboratory, P. O. Box X, Oak Ridge, Tennessee, 37830.

EDITORIAL

Fortran Listings in Reports?

We are convinced that it is a waste of effort, paper, and shelf storage space to reproduce the source program (e.g., FORTRAN) listings in reports describing codes. The probability of obsolescence, incompleteness, and error is so great that it is routine for code centers, such as RSIC, to remove these from the reports when assembling code package material for distribution. Up-to-date listings are obtained from cards or tape when necessary.

Recently the American Nuclear Society published the ANS standard, ANS-STD. 2-1967, "A Code of Good Practices for the Documentation of Digital Computer Programs." We would like to point out that this code does not recommend that listings be given in a program report but rather recommends presenting "an over-all view of the logical flow of the program either in schematic flow chart or descriptive form.* Incidentally, we urge that all those involved in preparing code documentation be familiar with the recommended practices. The document is available from the American Nuclear Society, Hinsdale, Illinois, 60521, for $1.50.

* Extracted from American Nuclear Society Standard, ANS STD. 2-1967, with the permission of the publisher.

PERSONAL ITEMS

Wade Selph is now with Gulf General Atomic at San Diego. He was formerly with Radiation Research Associates.

J. K. Warkentin, formerly with Phillips Petroleum Co., Idaho Falls, is now with Radiation Research Associates.

Marshall Grotenhuis is now Supervisor, Central Shops at Argonne National Laboratory. His work in shielding at Argonne goes back many years.

Don Dudziak, of Los Alamos, will be at the University of Virginia, Charlottesville, for approximately a year working on ENDF/B matters among other things.

R. A. (Dick) Blaine has left Atomics International and is now at the IBM Scientific Center, Palo Alto, California. Dick has been AI codes coordinator and installation representative.

J. W. (Wally) Webster has recently joined the RSIC staff. His most recent work has included criticality studies in the ORNL Neutron Physics Division.

VISITORS TO RSIC

Visitors to RSIC during the month of August were: Pierre Maillet, European Economic Community, Brussels, Belgium; W. L. Thompson, Nuclear Engineering, University of Virginia, Charlottesville, Virginia.

SEPTEMBER 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 TM-454

Tables of Mass Absorption Coefficients for Use in X-Ray Spectrochemical Analysis
K. P. Champion, H. J. Hurst, R. N. Whittem
April 1968

AD-662192 (USNCEL TR 551)

Estimating Strengths of Individual Radioisotopes in a Multiple-Isotope Source
M. L. Eaton, et al.
November 1967

AD-663563 (USNCEL TR 558)

Neutron and Gamma-Ray Streaming Through a Two-Legged Thickwall Steel Duct
L. B. Gardner
January 1968

AED-C-33-04

Bibliographies in Nuclear Science and Technology. Section 33. Shielding of Radioactive Radiation in Nuclear Physics
Anton Schmidt
March 1968

AEEW-M 824

The UKAEA Nuclear Data Library, February, 1968
D. S. Norton
May 1968

CEA-R-3424 (In French)

Fundamental Relationships Between Linear Energy Transfer, Absorbed Dose, Kerma, and Exposure. Application to Changes of Mediums
Henri Jofffre, Lucien Pages
February 1968

COO-1549-9

Fast Neutron Dose from a PuBe Source
R. A. Shader, H. B. Eldridge
June 17, 1968

DASA-1892-3 (AD-666973)

Weapons Radiation Shielding Handbook. Chapter 3: Methods for Calculating Neutron and Gamma Ray Attenuation
Paul N. Stevens, D. K. Trubey
March 1968

GMAD-3078-8, Vol. II (EDR-3950,)(Vol. 2)

MCR Preliminary Design Report, Shield
General Motors Corporation, Allison Division
July 31, 1964

JPRS-45331 (Book)

Soviet Atomic Science and Engineering
K. I. Shchelkin
Translation of Sovetskaya Atomnaya Nauka i Keknika, Atomizdat, Moscow, 1967

K-DP-3105 (CONF-680601-20)

A Comparison at Two Methods of Inner Iteration Covergence Acceleration in Discrete Ordinates Codes
W. W. Engle, Jr.; F. R. Mynatt

K-DP-3106 (CONF-680601-24)

Angle Dependent Spectra Emergent from Slab Shields-Comparison of Two Dimensional Discrete Ordinates Calculations with Experiment
F. R. Mynatt, F. J. Muckenthaler, P. N. Stevens

LA-3944

The Scattering of Gamma Rays in an Exponential Atmosphere
E. D. Cashwell, C. Longmire, et al.
April 1968

NASA-TM-X-63205 (X-641-68-157)

Distribution of Moderated and Unmoderated 14-MeV Neutrons in a Semi-Infinite Sample Along an Air-Ground Interface
Eden, J. I. Y. Trombka, F. Senftle

NASA TN D-4684

Fission Neutron Attenuation in Lithium-6, Natural Lithium Hydride, and Tungsten
Gerald Lahti
August 1968

NBS-Report 9868

Neutron Flux from a Point Isotropic Source in Carbon Calculated by the Moments Method
C. Eisenhauer and L. V. Spencer
July 1968

NBS Tech. Note 442

An Empirical Formula of the Coherent Scattering Cross Section of Gamma Rays
A. Nath and A. M. Ghose
April 1968

NDA-2143-9

Military Compact Reactor Program: An Investigation of High Energy Capture Gamma Radiation
R. Schamberger
May 30, 1961

NDA-2143-15

Military Compact Reactor Program Studies in the Synthesis of Minimum Weight Shields
E. S. Troubetzkoy, M. H. Kalos
August 7, 1961

ORNL-4249

Calculated Fe-56 Neutron Scattering and Gamma-Ray Production Cross Sections from 1.0 to 7.6 MeV.
W. E. Kinney, F. G. Perey
August 1968

ORNL-TM-2183

Calibration of an Organic Scintillator for Neutron Spectrometry
V. V. Verbinski, W. R. Burrus, T. A. Love, W. Zobel, N. W. Hill, R. Textor
June 10, 1968

ORNL-TM-2221

Neutron Flux and Neutron and Gamma-Ray Spectra Measurements at the HFIR
T. V. Blosser, G. E. Thomas, Jr.
June 24, 1968

SC-DC-67-2399 (CONF-680607-7)

Analytical Expressions for Bremsstrahlung Spectra Emitted by Highly Filtered, Thick High-Z Targeted X-Ray Devices from 2 to 20 MeV
J. C. Golden, Jr.
April 1968

USNRDL-TR-68-62

Ground Roughness Effects in Fallout Radiation Fields--Problems of Analysis of Measurements
R. L. Mather
March 29, 1968

USNRDL TRC-68-7

Radiation Distribution Within a Multistory Structure
C. McDonnell and J. Velletri
February 1967

Am.J. Roentgenol., 102, 662-672, March 1968

The M. D. Anderson Method for the Computation of Isodose Curves Around Interstitial and Intracavitary Radiation Sources.
R. J. Shalek, Marilyn Stovall

Brit. J. Radiol., 41, 222-6, March 1968

Measurements of 6 MV X Rays. II. Characteristics of Secondary Radiation
C. J. Karzmark, Tatiana Capone

Brit. J. Radiol., 41, 227-30, March 1968

Measurements of 6 MV X Rays. III. Characteristics of Leakage Radiation
Tatiana Capone, C. J. Karzmark

Dopov. Akad. Nauk Ukr. RSR Ser. A, No.2, 135-8, Feb.1968,(in Ukranian)

Neutron Propagation in Reinforced Plastics
G. A. Van Fo Fi

Health Phys. , 14, 5, 522-523 May 1968

The Relationship Between Effective-Energy and Rad/R Conversion Factors in Heterogeneous Photon-Energy Fields
H . D. Maillie, A. M. Dutton, H . Mermagen

J. Math. Phys., 9, 81-9, January 1968

Green's Functions for the One-Speed Transport Equation in Spherical Geometry
R. C. Erdmann, C. E. Siewert

J. Nucl. Energy, 22, 4, 231-249 April 1968

Activite Des Produits De Fission De U-235 et Pu-239
R. de Tourreil

J. Nucl. Energy, 22, 5, 267-281, May 1968

Neutron Capture Between 5 KeV and 3 MeV
D. C. Stupegia, M. Schmidt, C. R. Keedy, A. A. Madson

Nucl. Appl. 5, 2, 79-84, August 1968

Gamma-Ray Shielding Studies with Monoenergetic Gamma Rays From Positron Annihilation
J. A. Lonergan, D. F. Herring,

Nucl. Eng. Design, 7, 2, 152-158, February 1968

Mockup Experiments for the Irregular Shield of the First Nuclear Shield of Japan
I. Umeda, H. Yamaki, Y. Toyoda, Y. Nakano, T. Fuse, T. Miura and Y. Furuta

Phys. Letters, Vol. 27B, 65-8, June 10, 1968

Average Number and Energy of Prompt Neutron From Fission
Gy. Kluge et al.

Zh. Vychisl. Mat. Mat. Fiz., 8, 467-71, March-April, 1968, (In Russian)

Evaluation of Functionals Arising in Monte Carlo Solution of Conjugated Equations for Radiation Transport
A. I. Khisamutdinov

BOOK

Concrete in Shielding of Nuclear Installations
D. L. Broder, L. N. Zaitsev, M. M. Komochkov, V. V. Mal'kov, B. S. Sychev,

SPACE AND ACCELERATOR SHIELDING

HASL-192

A Monte Carlo Procedure for Calculation of the Extranuclear Cascade
B. G. Bennett, H. L. Beck, K. O'Brien
June 1968

ORNL-TR-1538-A (Translated from JINR-P-2393)

Inelastic Particle Interaction at High Energies
V. S. Barashenkov, V. M. Maltsev, E. Patera, V. D. Toneev

Phys. Rev., 2nd Series Vol. 162, 976-982 (October 20, 1967)
ORNL-TM-1652, A67-42731

Secondary Particle Spectra from the Interactions of 30-to 340 MeV Protons on Complex Nuclei: Experimental Data and Comparison with Theory
Hugo W. Bertini

J. of Spacecraft and Rockets 5 5, 570, 577, May 1968

Plasma Radiation Shield - Concept and Applications to Space Vehicles
R. H. Levy, F. W. French

Nucl. Eng. and Design, 4 (4) 423-28, 1966

Radiation Shielding at the NRL Linac Facility
G. W. Simmer, K. M. Murray

Trans. Amer. Nucl. Soc. 9: 333-4 (Oct.- Nov. 1966)

Testing of Electron Shields for Spacecraft
Walter K. Stomquist

Trans. Amer. Nucl. Soc. 9: 334-5, (Oct. Nov. 1966)

Mission Dose Probabilities Due to Solar-Proton Events
J. W. Haffner

Trans. Amer. Nucl. Soc., 9: 354-5 (October- November 1966)

High-Energy Accelerator Shield Leakage Neutron Spectra
Keran O'Brien, Robert Sanna, Mary Alberg, James McLaughlin

COMPUTER CODES LITERATURE

NBS 9836 *June 1968* *DATAPAC 4*

Electron and Photon Transport Programs - I. Introduction and Notes on Program DATAPAC 4
by M. J. Berger and S. M. Seltzer
FORTRAN for UNIVAC 1108 and IBM 360/91

NBS 9837 *June 1968* *ETRAN 15*

Electron and Photon Transport Programs - II. Notes on Program ETRAN 15
by M. J. Berger and S. M. Seltzer
FORTRAN V for UNIVAC 1108 and IBM 360/91

EURFNR-461; KFK 653 *September 1967* *MUNDO*

MUNDO - A Digital Code for Computing Accident Dose Rates in Reactor Environs
by F. Heller, W. Schikarski, and A. Wickenhauser
FORTRAN

Phys. Rev., Vol. 166 (BNL-11653) *August 1967* *VEGAS*

VEGAS - A Monte Carlo Simulation of Intranuclear Cascades
by K. Chen, Z. Fraenkel, G. Friedlander, J. R. Grover, J. M. Miller, and Y. Shimamoto
FORTRAN for IBM 7094; FORTRAN 66 for CDC 6600

MAGI-6701 *August 1967* *MAGIC - SAM-C*

A Geometric Description Technique Suitable for Computer Analysis of Both the Nuclear and Conventional Vulnerability of Armored Military Vehicles
by Walter Guber, Roger Nagel, Robert Goldstein, Phillip S. Mittleman, and Malvin H. Kalos
FORTRAN for CDC 6600 and BRL-BRLESC

NDL-TM-43 *June 1968* *NGM*

A Fortran Source-Energy Integration Program for the NGM Code Output
by William B. Beverly and Joseph Lacetera
FORTRAN for GE 225

EUR-3915.e (mf) *February 1968* *DOPPELAS, SOREX 1*

Analysis of Accidents in Pulsed Fast Reactors - Computer Programmes DOPPELAS and SOREX 1
by J. Randles
FORTRAN IV for IBM 7090, 360/65

IN-1109 *April 1968* *PMC*

PMC - A General Purpose Three-Dimensional Monte Carlo Code for the IBM 7040 Computer
by R. A. Grimesey, C. W. Berner, and S. Tong
MAP for IBM 7040

ORNL-4181 *July 1968* *QAD-P5A*

Modifications of the Point-Kernel Code QAD-P5A - Conversion to the IBM 360 Computer and Incorporation of Additional Geometry Routines
by E. Solomito and J. Stockton
FORTRAN IV for IBM 360/75

RRA-T78; NRDL-TRC 68-11 *December 1967* *GREAT*

GREAT - A Monte Carlo Procedure for Calculating Gamma-Radiation Environments Above Terrain
by J. H. Price
1130 FORTRAN for IBM 1130

RRA-T79; NRDL TRC-68-10 *December 1967* *GRASS*

GRASS - A Monte Carlo Procedure for Calculating Gamma-Ray Attenuation of Simple Structures
by J. H. Price
1130 FORTRAN for IBM 1130

RRA-T81; NRDL TRC-68-5 *January 1965* *GREAT*

Ground Roughness Effects on Fallout Shielding
by R. L. French, J. H. Price and K. W. Tompkins
FORTRAN for IBM 1130

RRA-M84 *June 1968* *GREAT*
GRASS

Monte Carlo Programming for Small Computers
by J. H. Price
IBM 1130

HASL-192 *June 1968* *EXCAS*

A Monte Carlo Procedure for Calculation of the Extranuclear Cascade
by H. L. Beck, B. G. Bennett, and K. O'Brien

JAERI-1140 (mf) *April 1967* *ACOF*

Orthonormal Expansion Code ACOF for Analysis of Neutron Spectra and Dose Equivalent Rates
by Hiroshi Ryufuku
FORTRAN for IBM 7044

TIM-847 *September 1964* *TDC*

The TDC Code
by W. J. Fader, R. J. Rogers, F. R. Mynatt, and R. E. Lawrence
FLOCO II for IBM 7090

AEEW-R-498 (mf) *September 1967* *MARK 2*

The Winfrith DSN Programme, MARK 2
by C. Greene
KDF9

WANL-TME-1680 (mf) *September 1967* *DOT*

Status Report on the Conversion for a CDC 6600 Computer of the Two Dimensional Transport Program DOT
by G. Collier, G. Gibson, and R. G. Soltesz
FORTRAN for CDC 6600

NUS-329 (mf) *November 1966* *EXGAM*

Users Manual for Code EXGAM. A Code to Calculate Gamma Photon Dose from an Airborne Radioactive Release
by Julian J. Steyn and Y. S. Kim
FORTRAN IV for CDC 3600

KAPL-M-6741 (mf) *December 1967* *05R*

05R Users Manual
by C. L. Ellis and D. B. MacMillan
FORTRAN for CDC 6600