RSIC Newsletter

RADIATION SHIELDING INFORMATION CENTER

OAK RIDGE NATIONAL LABORATORY

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

POST OFFICE BOX X •
OAK RIDGE, TENNESSEE 37831

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CURRENT WORK AND PROBLEMS

Work is continuing with all deliberate speed at ORNL (R. R. Coveyou, D. C. Irving, E. C. Long) in the development of the 06R Monte Carlo system for the IBM 360/75 machine. The first step, a transliteration of 05R, is essentially complete. Either the special ORNL compiler or the IBM FORTRAN IV level H compiler may be used. These versions are available from RSIC. Eight byte (64 bit) words were used for all arithmetic in order to avoid the possibility of significant round-off error. Data items (such as cross sections) are stored with 4 byte words to conserve storage capacity and minimize tape reading time. The next step in 06R development will be an extensive revision of the cross section handling procedures to use the ENDF/B format.

RECENT VISITORS TO RSIC

The following people visited RSIC during the month of March 1967: Lt. George Repasy, AFWL, Kirtland Air Force Base, New Mexico; Capt. R. W. Enz, DASA, Washington, D. C.; R. M. S. Hall, Office of Scientific and Technical Information, London, England; Duane R. Marr, Battelle-Northwest, Richland, Washington; and W. C. Hall, Chemtree, Inc. Central Valley, New York.

MARCH 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

ORNL-3967, Vol. I

Differential Neutron Current Albedos for Concrete in the Incident Energy Range 0.5 eV to 200 keV. I. Description of Monte Carlo Calculation and TSF Experiment and Comparison of Calculated and Experimental Results
W. A. Coleman, R. E. Maerker, and F. J. Muckenthaler - March 1967

Kansas Engineering Experiment Station Special Report No. 72

Scattering of Fallout Radiation from Ceilings of Protective Structures
W. R. Kimel, R. E. Faw, J. A. Baran, J. O. Mingle, R. M. Rubin, R. C. Iotti, and W. T. Urban - July 1966

J. Nucl. Sci. Technol., 4(1), 11-20 (1967)

Gamma-Rays and Neutrons Streaming about a Cylindrical Duct by the Ray Analysis Method
M. Kitazume, A. Tsuruo, and M. Shindo

J. Nucl. Energy, A/B, 20, 1011-1018 (1966)

Dose-Rate Field of an Irradiator with Used Fuel Elements as Source of Gamma Radiation
V. E. Drozdov, I. M. Zakharov, S. P. Dobrovol

J. Nucl. Energy, A/B, 20, 1031-1038 (1966)

Use of Concrete for Shielding High-Temperature Reactors
V. B. Dubrovsk, N. V. Krasnoya, M. Y. Kulakovs, B. K. Pergamen, M. S. Pinkhasi, and V. I. Savitski

PNE-225F (Final Report)

PROJECT SEDAN - Part I. Characteristics of Fallout from a Deeply Buried Nuclear Detonation from 7 to 70 Miles from Ground Zero
Harold M. Mork, K. H. Larson, B. W. Kowalewsky, R. A. Wood, D. E. Paglia, W. A. Rhoads
Part II. Aerial Radiometric Survey
R. B. Guillou - July 1966

Phys. Med. Biol., 11(3), 405-9 (1966)

Parameters Describing the Microscopic Distribution of Radiation Dose
John S. Bevan

Health Phys., 12(12), 1715-1731 (December 1966)

Gamma-radiation Characteristics--Angular Distribution over a Desert Terrain Fallout Field
A. L. Frank

Nucl. Appl., 3, 46-52 (January 1967)

Shipboard Reactor Shield Optimization Using Optimum Gradient Method
W. B. Terney and H. Fenech

NP-16445

Studies of Slowing Down Neutrons in Substances
Hans Gerard Kaper - 1965

BOOK

Neutron Detectors
Compiled by V. Atonescu - 1966 (International Atomic Energy Agency - Publisher)

BOOK

Radiation Measurements in Nuclear Power Conference Proceedings
Berkeley Nuclear Laboratories - Gloucestershire September 12-16, 1966

NDL-TR-53

Initial Gamma Data from Nuclear Weapons Tests 1948 through 1962
R. J. Smith, R. E. Benck, and E. E. Lissak - July 1965

BMwF-FBK-66-21

Neutron Spectra in Infinite, Homogeneous Arbitrary Moderators
G. Rietschel - July 1966

AFWL-TR-66-120

Measurement and Analysis of Nuclear Radiation Heating in Selected Shielding Materials
I. C. Roberts - January 1967

IN-1032

Mathematical and Experimental Analysis of Heat Dissipation from Cylindrical Sources Buried in Soil
D. E. Black and B. R. Dickey - December 1966

AWRE-O-40/66

The Multigroup Neutron Transport Perturbation Program--DUNDEE
Pamela C. E. Hemment, E. D. Pendlebury, et al. - Oct. 1966

AD-643754 (NDL-TR-82)

Attenuation of Nitrogen-Capture Gamma Rays in Concrete
W. Reed Johnson - November 1966

GE-TM-66-6-7

Nuclear Heating Calculations in a Fast-Spectrum, Refractory-Metal Reactor Assembly
W. E. Edwards, J. E. McDonald, C. S. Robertson, Jr. - June 20, 1966

AEC-TR-6712

Photographic Dosimetry of Ionizing Radiations
V. F. Kozlov - 1966

AEC-TR-6719

Dosimetry and Radiation Protection - Collection No. 4
L. R. Kimel, Editor - 1965

ORNL-TR-1517 (Translated from ABS-THH-1010)

Calculation of Secondary Gamma-Radiation for a Mockup of a Power Reactor Shield for the Geesthacht Research Reactor (FRG) with the GRACE I Computer Program
S. Sasse and H. Schubart

ORNL-TR-1525 (Translated from ABS-THH-1023)

Weight Optimization for Radiation Shields of Large Nuclear Reactors
S. Sasse

ORNL-TR-1554(Translated from Phys. of Fast and Intermediate Reactors, Vol. I)

Long-Range Neutron Flux Transport in Fast Reactors
A. Kania, R. Pasquet, P. Pepin, J. Rastoin and M. Solanes

ORNL-TR-1522 (Translated from ABS-THH-1017)

Planning and Performance of a Shielding Mockup Experiment in the Large Irradiation Channel in the Geesthacht Research Reactor (FRG)
H. Schultz

ORNL-TR-1505 (Translated from CEA R 2926)

Determination of a Base for the Proper Function and of the Corresponding Norm for the Boltzmann Integral-Differential Equation at a Given Velocity and in a Spherical Configuration
P. LaFore - 1965

Sov. J. Atomic Energy, 17, 1249-1255 (1964)

Neutron Angular and Energy Distribution at the Boundary of Two Media
V. A. Dulin, V. G. Dvukhsherstnov, Yu. A. Kazanskii, and I. V. Shugar

Sov. J. Atomic Energy, 17, 1279-1281 (1964)

Use of the Monte Carlo Method for Calculating the Penetration of γ-Radiation Through Matter
L. M. Shirkin

Sov. J. Atomic Energy, 18(6), 791-92 (June 1965)

Dose Rate from a Unidirectional Source of Gamma Quanta Close to the Ground-Air Interface
Y. I. Bublik, S. M. Ermakov, B. A. Efimenko, V. G. Zolotukhin and E. E. Petrov

Sov. J. Atomic Energy, 19(1), 911-913 (1965)

Distribution of Neutrons in a Straight Cylindrical Channel
E. A. Kramer-Ageev, V. N. Markov, V. P. Mashkovich, V. K. Sakharov, and V. M. Sakharov

Sov. J. Atomic Energy, 19(1), 947-949 (1965)

The Problem of γ-Ray Penetration through Shields
S. M. Ermakov and E. E. Petrov

Sov. J. Atomic Energy, 19(2), 1072-1073 (1965)

Angular and Energy Distributions of Gamma Radiation at Surface of Volume Source
B. F. Gromov, S. M. Ermakov, E. E. Kazarnikova, and M. A. Solodyankin

Sov. J. Atomic Energy, 19(2), 1107-1108 (1965)

Linear Attenuation Factors of Alloys for Gamma Rays from Co-60 and Cs-137
V. I. Kutovoi and V. I. Stetsenko

Sov. J. Atomic Energy, 19(3), 1204-1205 (1965)

Use of Monte Carlo Method to Analyze the Passage of Fast Neutrons through Hydrogen
L. M. Shirkin

Sov. J. Atomic Energy, 19(4), 1283-1289 (1965)

Attenuation of Pile Radiations in Serpentinite Sand
G. A. Vasil'ev, A. P. Veselkin, Yu. A. Egorov, G. G. Moiseev, and Yu. V. Pankrat'ev

Sov. J. Atomic Energy, 19(4), 1301-1306 (1965)

A Study of the Dose-Rate Field in an Irradiator with γ-Ray Source Consisting of Spent Reactor Fuel Elements
V. E. Drozdov, I. M. Zakharova, and S. P. Dobrovol'skii

Sov. J. Atomic Energy, 19(4), 1320 (1965)

Reducing Capture γ-Radiation and Radiative Heat Emission in a Reactor Vessel by Blocking and Boronizing the Thermal Shield
E. N. Goryanina, K. K. Popkov, S. M. Rubanov, and S. A. Tsvetkova

Sov. J. Atomic Energy, 19(4), 1335-1337 (1965)

Back-scattering of γ-Rays from a Spherical Surface
N. F. Andryushin and B. P. Bulatov

Sov. J. Atomic Energy, 19(4), 1338-1339 (1965)

Angular-Distribution of the Intensity of γ-Radiation Scattered by Lead and Water
L. M. Shirkin

Sov. J. Atomic Energy, 19(4), 1340-1341 (1965)

Angular Distribution of γ-Rays from a Point Source, Scattered in Shielding
A. V. Larichev

Sov. J. Atomic Energy, 19(4), 1342-1343 (1965)

Angular Distribution of Neutron Dose Close to the Air-Ground Boundary
I. V. Goryachev

Sov. J. Atomic Energy, 19(4), 1344-1347 (1965)

Spectral Distribution in the Surface Atmosphere of γ-Rays from a Point Source of Co-60 Shielded by Aluminum
V. A. Ionov

Sov. J. Atomic Energy, 19(5), 1408 (1965)

Certain Methods for Reducing the Fluxes of Penetrating Secondary γ-Radiation
D. L. Broder, A. P. Kondrashov, and A. V. Kudryavtseva

Sov. J. Atomic Energy, 19(5), 1419-1420 (1965)

Coefficients of Secondary γ-Radiation for Aluminum, Copper, and Tungsten
S. P. Belov, V. P. Demin, Yu. A. Kazanskii, A. P. Lobakov, and V. I. Popov

Sov. J. Atomic Energy, 19(5), 1434-1436 (1965)

Changes in Fast-Neutron Spectra after Penetrating Aluminum, Paraffin, and Water
G. G. Doroshenko, V. A. Fedorov, and E. S. Leonov

Sov. J. Atomic Energy, 20(1), 8-17 (Jan. 1966)

Scattering of Medium-Energy Neutrons
I. A. Korzh, M. V. Pasechnik, and I. A. Totskii

Sov. J. Atomic Energy, 20(1), 99-100 (Jan. 1966)

Optimal Neutron and γ-Dose Ratio Outside Reactor Shielding
L. N. Veselovskii, V. G. Kuznetsov, and V. A. Sakovich

Sov. J. Atomic Energy, 20(1), 104-106 (Jan. 1966)

On the Determination of Shielding for Radiation from Cylindrical Sources
E. E. Kovalev and D. P. Osanov

Sov. J. Atomic Energy, 20(1), 118-119 (Jan. 1966)

New Design for Heavy Protective Windows
G. I. Lukishov and O. A. Chelyuk

Space and Accelerator Shielding

AFWL-TR-65-150 (AD-643837)

Calculations of Energy Loss, Range, Pathlength, Straggling, Multiple Scattering, and the Probability of Inelastic Nuclear Collisions for 0.1- to 1000-MeV Protons
J. F. Janni - September 1966

ORNL-TR-1368 (Translated from CEA-R-2975)

Study of the Radiation Around a High Energy Accelerator Production and Scattering of Cascade Neutrons
Philippe Tardy-Joubert - 1966

SID-64-1297

The Role of Alpha Particles in Shielding Against Solar Event Radiation
J. W. Haffner - July 15, 1964

Proceedings of the International Council of the Aeronautical Sciences, Congress, 3rd, Stockholm, Sweden, August 27-31, 1962, pp. 235-244

Particle Populations in Space
Carl E. Fichtel and Frank B. MacDonald

Shielding Computer Codes

ANL-7221 June 1966 SNARG-1D

SNARG-1D, A One-Dimensional, Discrete-Ordinate, Transport-Theory Program for the CDC 3600
by G. J. Duffy, H. Greenspan, S. D. Sparck, J. V. Zapatka, and M. K. Butler
FORTRAN for CDC 3600

ABS-THH-1001 (ORNL-TR-1509) July 1963 DAGMAR

Circular Plane Radiation Source before an Absorbing Half-Space
by H. Schultz and C. D. Wuneke
ZUSE Z 22 R

ABS-THH-1005 (ORNL-TR-1512) May 1964 DAGMAR

Application of the Model Calculation DAGMAR
by C. D. Wuneke
Siemens MZFR

HW-71984 December 1961 ACTICAY

ACTICAY Fission Product Decay Program
by D. L. Johnson
FORTRAN for IBM 7090

USNRDL-TR-1079 September 1966 POBS

A Computer Code for Estimating the Protection Offered by Ships Against Fallout, Base Surge, or Water Pool Radiation
by J. M. Ferguson
FORTRAN II

USNRDL-TR-1038 May 1966 MONACO

Monte Carlo Technique Applied to the Calculation of Gamma-Ray Transport in Compartmented Structures
by L. G. Haggmark
FORTRAN II for IBM 704

ABS-THH-1007 (ORNL-TR-1515) April 1964 SEETZEN and GRACE I

Instructions for the Use of Computer Programs Available at the Working Group of Radiation Protection in Construction I. SEETZEN Program and GRACE I
by S. Sasse
SEETZEN written for Z 22 R; GRACE I written for IBM 704 or 709 in FORTRAN

NARF-DC Memo-1.115 December 1966 RAID

Monte Carlo Procedure for Analysis of Radiation in Ducts (RAID)
by J. A. Moore, J. B. Eggen, and F. O. Leopard
FORTRAN IV for CDC-6600

RRA-T62-1 September 1966 COHORT

A Monte Carlo Program for Calculation of Radiation Heating and Transport, Volume I, Modification and Verification of Improved Version of COHORT
by D. G. Collins and M. B. Wells
FORTRAN IV for IBM 7090

RRA-T62-2 September 1966 COHORT

A Monte Carlo Program for Calculation of Radiation Heating and Transport. Volume II, Utilization Instructions for S01, S02, and C01 Routines
by D. G. Collins and M. B. Wells
FORTRAN IV for IBM 7090

RRA-T62-3 September 1966 COHORT

A Monte Carlo Program for Calculation of Radiation Heating and Transport, Volume III, Utilization Instructions for H01 and Juggle Routines
by D. G. Collins and M. B. Wells
FORTRAN IV for IBM 7090

RRA-T62-4 September 1966 COHORT

A Monte Carlo Program for Calculation of Radiation Heating and Transport, Volume IV, Utilization Instructions for A01 and A02 Analysis Routines
by D. G. Collins and M. B. Wells
FORTRAN IV for IBM 7090

K-1693 March 1967 ANISN

A Users Manual for ANISN
by Ward W. Engle, Jr.
FORTRAN IV for IBM 7090/7094