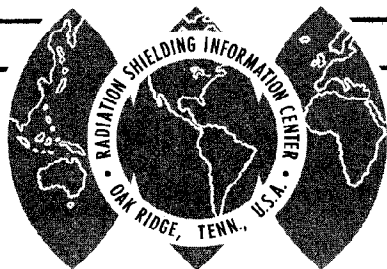


# RSIC Newsletter



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

No. 43

June, 1968

*I do not expect a man to know the answer to every question  
but if he does not know it, I expect him to know  
who does or where it can be found... Palmerston*

### PROFILE REVISION FOR REACTOR SHIELDING SDI

The personal interest profiles for the reactor shielding selective-dissemination-of-information (SDI) are now being revised. The entire profile list is being updated to reflect current interests and to be consistent with the revised list of subject categories. The new profile list will be used after approximately July 15 so all those wishing to participate should send their profile promptly. The list of categories and instructions for constructing a profile are available upon request.

### EVALUATED CROSS SECTION COMPILATION COMPILATION PUBLISHED

A compilation of neutron cross section evaluations arranged by nuclide has recently been issued as Newsletter No. 7 (March, 1968) by CCDN, the European Nuclear Energy Agency Neutron Data Compilation Centre. Inquiries should be addressed to CCDN, B.P.-9, 91-Gif-sur-Yvette, France.

### NEW CODE PACKAGES AVAILABLE

Operable, tested with a sample problem, and available for distribution are the following code packages:

CCC-100/K019

Proton Ionization Attenuation  
Program for Space Vehicles,  
contributed by NASA Manned  
Spacecraft Center, Houston,  
Texas, (MSC 3066)

NEW CODE PACKAGES AVAILABLE (CONT.)

CCC-101/NAP	Multigroup Time Dependent Neutron Activation Prediction Code, contributed by IIT Research Institute, Chicago, Illinois and the NASA George C. Marshall Space Flight Center, Huntsville, Alabama (IITRI-A6088-22, Vol. II)
CCC-102/SURF	Conical and Plane Surface Scattering Code, contributed by NMPO, General Electric Company, Cincinnati, Ohio (GEMP-582)

PERSONAL ITEMS

Robert (Bob) Karcher, formerly with Holmes and Narver, is now with TRW at Redondo Beach, California.

W. C. Loomis has left the Marshall Space Flight Center to join the U. S. Army Sentinal System Command at Redstone Arsenal, Alabama.

VISITORS TO RSIC

Visitors to RSIC during the month of May are: Dale R. Metcalf, University of Virginia, Charlottesville, Virginia; D. J. Hahn, University of Kentucky, Lexington, Kentucky; Daniel L. Hollis, University of Alabama, University, Alabama; Thomas E. Hicks, University of California, Los Angeles, California; and Murray Goldberg, National Neutron Cross Section Center, Brookhaven National Laboratory, Upton, New York.

JUNE 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

*AEW-M 802*

U.K.A.E.A. Nuclear Data Library, January, 1967  
D. S. Norton, J. S. Story  
February 1968

*AEW-M 676*

Lectures on Neutron Transport Theory  
D. A. Newmarch  
April, 1966

*BNL-12268*

Gamma Rays Following Neutron Capture in Iron, Sodium and Thorium  
O. A. Wasson, J. B. Garg, R. E. Chrien, M. R. Bhat  
March 4, 1968

*FTD-MT-65-160 (AD-663930, N68-17907)*

Dosimetry of Ionizing Radiations  
V. I. Ivanov  
April 12, 1967

*FTD-MT-65-370 (AD-663351, N68-17988)*

Radiation Physics. 1: Ion Crystals  
Measuring the Fluxes of Filtered Radiation of a Reactor  
K. K. Baltmugur and D. Ya. Gubatova

*GA-8454*

Density Scaling of the Boltzmann Equation and Its Application  
Tsahí Gozani, C. A. Stevens  
January 22, 1968

*GEMP-599*

Shield Kernel-Diffusion Analysis  
W. E. Edwards  
March 1968

*HNS-1229-17*

Calculated Activities of Long-Lived Fission Products Produced by  
Various Neutron-Induced Fission Processes  
D. C. Castagnola  
February 1967

*INP-565 PL (In Polish)*

The Calculations on an Angle from the Lab-System for an Angle in  
the CM-System and the Contrary Calculations the Programs for the  
Computer  
Jelonek Stanislaw  
1967

*JPRS-44390 (N68-17535)*

Soviet Atomic Energy Research  
B-2 Intermediate Neutron Beam Converter of the BR-5 Reactor  
A. D. Lupinov, V. P. Mashkovich, A. N. Nikolayev, Yu. N. Podsevalov,  
V. P. Polivanskiy, et al.  
February 15, 1968

*LA-3696 (UC-41, N68-16647)*

Radiation Characteristics of Plutonium-238  
G. M. Matlack, C. F. Metz  
October 11, 1967

*NAA-SR-12337, V. 1 (N68-16620)*

GRAMS: A Fortran Program to Solve Gamma Ray Penetration Problems in  
Multislabs Shields. Volume 1: Numerical Methods  
D. O'Reilly, R. C. Lewis  
June 22, 1967

*NAA-SR-12, 533*

Legendre Expansion Coefficients for Theoretical Angular Distribu-  
tions of Elastically Scattered Neutrons  
R. Campbell, H. Alter  
March 1, 1968

*NASA-TM-X-1490 (N68-17022)*

Experimental Determination of Gamma Exposure Rate in Plum-Brook  
HB-6 Facility  
J. M. Bozek  
February 1968

*NASA-TM-X-1512*

Activation of Sodium, Lithium, and Potassium in Compact Fast Reactors and Its Effect on Shielding  
Leonard Soffer  
April, 1968

*NRSS-2 (AD-637 125)*

Exposure Field from a Point Isotropic Source Located at the Surface of a Thick Concrete Slab  
A. B. Chilton  
July 1966

*NRSS-3 (AD-636 788)*

Monte Carlo Calculation of Self-Shielding by Encapsulated Gamma Ray Sources  
Kenneth Preiss  
August 1966

*OCD Work Unit No. 3231C (SRI Project No. MU-5806)*

An Analysis of Roof Washdown Versus Applied Shielding as a Fallout Countermeasure  
Hong Lee  
December 1966

*PSDC-TR-25*

A Preliminary Investigation of "IN-AND-DOWN" and "IN-AND-UP" Radiation Components  
J. Velletri  
October 1966

*SGAE-PH-59 (In German)*

Investigation of the Prompt Gamma Rays of the Fission Fragments on Spontaneous Fission of Cf-252  
H. P. Axmann, E. Ujlaki

*UCRL-18093*

Modular Neutron Shield  
Alexander Babin  
February 1968

*WAPD-T-2015 (Conf-671102-37, N68-16569)*

Spatial Distributions in a Zirconium Water Lattice of Accelerator for Source Neutrons  
R. W. Stooksberry, M. Goldsmith  
September 1967

*Astronaut Aeronaut*, 6, (A68-22428)

Nuclear Propulsion for Aircraft  
John M. Wild  
March 1968

*Astronaut Aeronaut* 6, (A68-22429)

Will the Nuclear-Powered Aircraft be Safe?  
Frank E. Rom, Patrick M. Finnegan  
March 1968

*Brit. J. Radiol.* 41(483), 235-236, March 1968

Measurements on the Attenuation of 4 MV X-Rays in Barytes Concrete  
P. L. Ormsby, G. C. Roberts

*Brit. J. Radiol.* 41,(483) 239-240, March 1968

An Analytical Expression for Back-Scatter Factors for Rectangular  
Cobalt-60 Fields  
William R. Hendee

*Hitachi Zosen Giho*, V. 27, (2), 72-78, 1966

(See Translation - N68-16175, February, 1967)

Foil Measurements of Neutron Flux Distributions and Spectra in Iron-  
Water Shields  
J. Miyakso, S. Kawamoto, T. Yamada, K. Tanaka, N. Kawamura

*Health Physics*, 11, 1163-1175, 1965

The Possible Role of Momentum in Radiation Dosimetry--II. Extension  
to Charged or Uncharged Particles and Implications  
J. E. Turner

*Health Physics*, 14, 331-338, April 1968

On the Buried-Source Model for Computing Fallout Ground Roughness  
Effects  
R. L. French

*J. Math. Phys.*, 8, 2096-108, October 1967

Complementary Variational Principles and Their Application to  
Neutron Transport Problems  
G. C. Pomraning

*J. Math. Phys.*, 8, 2137-42, October 1967

Invariant Imbedding Equations for the Dissipation Functions of an  
Inhomogeneous Finite Slab with Anisotropic Scattering  
R. Bellman, et al.

*K'o Hsueh Ta Chung*, No. 1, 9, January 1962 (In Chinese)

Use of Concrete in Nuclear Engineering  
Hsien-hsiung Lin

*Nucl. Eng. Design*, 6, 447-64, 1967

Analytical Evaluations for the Optimum Selection and Arrangement of  
Shielding Materials in Reactor Shields  
H. Schultz, S. Sasse

*Nucl. Sci. Eng.*, 32, 2, 166-177, May 1968

Gamma Radiation Fluxes near a Ground-Air Interface Using an Image  
Source Technique  
C. Eisenhauer

*Nucl. Sci. Eng.*, 32, 2, 178-183, May 1968

A Formalism for Calculation of Neutron Induced Gamma-Ray Production  
Cross Sections and Spectra  
R. J. Howerton, E. F. Plechaty

*Nucl. Sci. Eng.*, 32, 2, 184-194, May 1968

Calculation of the Penetration of Gamma Rays Through Slabs by the  
Method of Invariant Imbedding  
A. Shimizu

*Nucl. Sci. Eng.*, 32, 2, 225-232, May 1968

A New Method of Approximation of the Boltzmann Equation  
Pierre Benoist, Alain Kavenoky

*Soviet J. of At. Energy, English Transl.*, 22, 2, 101-103, February 1967

Calculations of Fast Neutron Penetration Through Graphite  
L. M. Shirkin

*Soviet J. of At. Energy, English Transl.*, 22, 2, 123, February 1967

On the Slowing Down of Neutrons in Hydrogenous Media  
Yu. A. Platovskikh

*Soviet J. At. Energy, English Transl.*, 22, 2, 130-131, February 1967

A Neutron Detector with Variable Preliminary Moderation and  
Directional Sensitivity  
Yu. A. Vakarin, L. N. Veselovskii, B. S. Gribov, et al.

*Soviet J. At. Energy, English Transl.*, 22, 2, 125-126, February 1967

The Shielding Properties of Stone Aggregate Concrete  
V. B. Dubrovskii, M. Ya. Kulakovskii, et al.

*Soviet J. of At. Energy, English Transl.*, 22, 2, 126-127, February 1967

The Shielding Properties of Boron-Containing Heat Resistant,  
Chromite Concretes  
D. L. Broder, V. B. Dubrovskii, et al.

*Soviet J. of At. Energy, English Transl., 22, 2, 127-128, February 1967*

Heat Generation in Concrete Shields Containing Boron Additives  
V. B. Dubrovskii, M. Ya. Kulakovskii, et al.

*Soviet J. of At. Energy, English Transl., 22, 2, 128-129, February 1967*

The Differential Albedo of a Thin Beam of Fast Neutrons From a  
Semi-Infinite Water Scatterer  
L. Ya. Gudkova, V. G. Zolotukhin, et al.

*Soviet J. of At. Energy, English Transl., 22, 2, 132, February 1967*

The KTK Facility for Shielding Studies  
V. P. Mashkovich, A. N. Nikolaev, V. K. Sakharov, et al.

*Soviet J. of At. Energy, English Transl., 22, 2, 143, February 1967*

Dose Rates for Capture Gammas in Air  
V. M. Mordashev

*Soviet J. of At. Energy, English Transl., 22, 4, 339-346, April 1967*

Steady State Transport of Monoenergetic Neutrons Through In-  
homogeneous Media  
A. V. Stepanov

*BOOK*

The Gamma Radiation of Radioactive Fallout (In Russian)  
Yu. A. Izrael, E. D. Stukin

SPACE AND ACCELERATOR SHIELDING

*AD-655364*

Radiation Belts of the Earth  
P. V. Vakulov, E. V. Gorchakov, Yu. I. Logachev  
(Translated from Kosmi, Luchi, No. 6, 1957-1959)

*CERN-67-25*

Radioactivity Induced in Building Materials  
M. Barbier  
September 15, 1967

*HASL-188*

The Neutron Shielding of the Los Alamos Meson Physics Facility  
Keran O'Brien  
November 1967



*IEEE Transactions on Nuclear Science, Vol. NS-14,*

The Internal Radiation Environment of Cylindrical Spacecraft  
Charles L. Mack  
December 1967

*LA-tr-68-8*

Measurement of the Quality Factor for High-Energy Neutrons in a  
Tissue-Equivalent Phantom  
M. Zelchinskii, M. M. Komochkov, B. S. Sychev, A. P. Cherevatenko  
(Translation of JINR-P16-3587)

*N67-14461 (NASA-TM-X-53531)*

A Preliminary Report on Energetic Space Radiation and Dose Rate  
Analysis  
M. O. Burrell, J. J. Wright, J. W. Watts  
October 31, 1966

*NASA SP-138 (N68-14952)*

Gemini Summary Conference - Article - Radiation Environment at  
High Orbital Altitudes  
Peter W. Higgins, Joseph C. Lill, Timothy T. White

*NASA TN D-2773*

X-Ray Spectra Produced when Thick Silicon Targets are Bombarded with  
1.05 and 1.25 Million Volts Electrons  
J. J. Singh, R. Adams, C. Gross  
December 1966

*NASA-TN-D-4404*

An Analysis of Energetic Space Radiation and Dose Rates  
M. O. Burrell, J. J. Wright, et al.  
February 1968

*ORNL-4211*

Shielding Calculations for a 400 MeV Linear Electron Accelerator  
R. G. Alsmiller, Jr., J. Barish, R. T. Boughner, W. W. Engle  
January 1968

*ORNL-TM-1892*

Nuclear Reaction Cross Sections for Spacecraft Shield Design  
R. W. Peelle  
June 16, 1967

*ORNL-TM-1996*

Preliminary Data From Intranuclear-Cascade Calculations of 0.75,  
1-, and 2-GeV Protons on Oxygen, Aluminum, and Lead, and 1-GeV  
Neutrons on the Same Elements.  
Hugo W. Bertini  
December 1967

ORNL-TM-2026

Dose Rate from High-Energy Electrons and Photons  
R. G. Alsmiller, Jr., and H. S. Moran  
October 20, 1967

ORNL-TM-2048

The Transport of 500-MeV/c Muons in Iron  
M. Leimdorfer  
November 7, 1967

ORNL-TM-2177

Monte Carlo Calculations of the Nucleon-Meson Cascade in Iron  
Initiated by 1- and 3-GeV Protons and Comparison with Experiment  
March 1, 1968

UCRL-18117

Radiation Shielding for High Energy Muons: The Case of a  
Cylindrically Symmetrical Shield and No Magnetic Fields  
D. Keefe, C. M. Noble  
March 1968

*Nucl. Sci. Eng. 32, 1, 56-61, April 1968*

The Validity of the Straightahead Approximation in Space-Vehicle  
Shielding Studies--Part II  
R. G. Alsmiller, Jr., D. C. Irving, H. S. Moran

*Nucl. Sci. Eng. 32, 1, 76-81, April 1968*

Mathematical Verification of a Certain Monte Carlo Sampling  
Technique and Applications of the Technique to Radiation Transport  
Problems  
W. A. Coleman

#### COMPUTER CODES LITERATURE

RRA-T76

December 1967

RRA-31

A Machine Procedure for Evaluating the Shielding Effectiveness of a  
Ship Against the Fast Neutrons Produced by a Nuclear Weapon  
J. J. Long, M. B. Wells  
FORTRAN II for IBM 704

RRA-T83

February 1968

COHORT

Inelastic Neutron and Capture-Gamma Ray Cross Section Libraries for  
the COHORT Monte Carlo Procedure  
J. D. Marshall

*AFWL-TR-65-171, Vol. IV*                      *January 1968*                      *PHOTRAN*  
PHOTRAN - A General Purpose Photon Transport Program in Complex  
Geometry - Volume IV - Modification I Program  
D. E. Ladd, J. Lenard, J. Agresta, F. L. Keller, revisions by  
Charles R. Marotta  
FORTRAN IV and MAP for IBM 7094

*OCD-PC 80-16*                                      *June 1965*                                      *EAST*  
Electronic Analysis of Structures for Fallout Gamma Radiation  
Shielding Prepared for Department of the Army, Office of the  
Secretary of the Army and the Office of Civil Defense  
FORTRAN II for IBM 7094

*UI-NRSS 6; NRDL TRC-68-6*                      *December 1967*                                      *COLLIMATOR*  
Monte Carlo Calculation of the Spectrum of Gamma Radiation from a  
Collimated Co-60 Source  
E. E. Morris, A. B. Chilton  
FORTRAN

*CANEL TIM 890*                                      *February 1965*                                      *TDC*  
User's Guide to FORTRAN TDC  
R. J. Rogers and P. S. Check  
FORTRAN 63 for CDC 1604

*UI-NRSS 3*    *August 1966*                                      *GASS*  
Monte Carlo Calculation of Self-Shielding by Encapsulated Gamma  
Ray Sources  
K. Preiss  
FORTRAN for IBM 7094