

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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CURRENT WORK AND PROBLEMS

In our July Newsletter we carried in this space a report on the June 1966 meeting of the Cross Section Evaluation Working Group. Since then, there have been developments in the area of "evaluated" cross sections which should be of special interest to the shielding community.

At its November meeting the CSEWG established a subcommittee (with F. Clark of RSIC as chairman) to consider the specialized cross section and related data needs of the shielding community. Shortly thereafter the Defense Atomic Support Agency (DASA) designated M. H. Kalos of N. Y. U. to form a working group to insure that the cross section and related data needs of DASA contractors are adequately met. We are happy to report that good working relations have been established between the two working groups.

The first named group is now studying general questions related to kinds of data to be collected, formats, service routines, etc. A priority list is now being established for bringing shielding materials into the data system. If any of our readers would like to offer suggestions for this priority listing they can be sent to

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Radiation Shielding Information Center
Oak Ridge National Laboratory
P. O. Box X
Oak Ridge, Tennessee 37830

For any such suggestions to be considered fully they should specify the material, process, energy range, the problem for which the data are needed, and the date by which that problem must be solved.

The DASA working group has concerned itself initially with establishing effective interagency cooperation and with ways and means of bringing most expeditiously into available format existing useful data compilations. DASA supported agencies are doing most of the gamma ray compilation work now being carried on.

Approximately fifty isotopes have been evaluated and their data tentatively compiled for the ENDF/B system. They will not be available for general distribution by the center until they have passed certain tests and have been approved.

NUCLEAR SCIENCE AND ENGINEERING BLIZARD MEMORIAL ISSUE PUBLISHED

Congratulations are in order to the American Nuclear Society and to Dixon Callihan and Jess Greenborg (Shielding Division Publications Chairman) who edited the recently published issue of Nuclear Science and Engineering. This issue, entirely devoted to shielding papers, was published as a memorial to Everitt P. Blizard who served as editor of NS&E from 1960 to 1965. In addition to 38 papers and technical notes there is a tribute to "Bliz" written by Herbert Goldstein. The table of contents is as follows:

Nucl. Sci. Eng., 27(2), Feb. 1967

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NEW FEDERAL CLEARINGHOUSE PRICE POLICY

Effective January 1, 1967, the Clearinghouse for Federal Scientific and Technical Information changed its pricing policy for document sales from a sliding price scale based on document size to a single price for documents sold. The new document price for a paper copy (hard copy - HC) is \$3.00. The new price for a microfiche (MF) copy is \$.65 per document. These prices also apply to documents announced prior to January 1, 1967. The single price does not apply to multiple copy orders of a single document. Quotations on quantity purchases of a single title are available on request.

The Clearinghouse sells coupons for the purchase of documents which simplify ordering and handling by both the Clearinghouse and its customers permitting the Clearinghouse to give faster service on document requests.

Coupons for paper copy (HC) documents are available at \$3.00 each or in books of 10 coupons for \$30.00. Coupons for microfiche copies of Clearinghouse documents are available in books of 50 coupons for \$32.50.

RECENT VISITORS TO RSIC

The following people visited RSIC during the month of February 1967: F. Dyer, Chemical Technology Division, ORNL; James Ferguson, USNRDL, San Francisco; Raphael LaBauve and Maurice Battat, Los Alamos Scientific Laboratory, Los Alamos, New Mexico; Wm. Edwards, General Electric, Cincinnati; Sol Pearlstein, Brookhaven National Laboratory, Upton, N. Y.; Mal Kalos, New York University, N. Y.; A. E. Profio, General Atomic, San Diego; Kal Shure, Westinghouse-Bettis, West Mifflin, Pa.; S. K. Penny and Arnold Glick, Union Carbide Corp., White Plains, N. Y.; R. R. Coveyou, Neutron Physics Division, ORNL; Conrad Lennon, NASA/Lewis Research Center, Cleveland, Ohio; and R. E. Davids, Australian Atomic Energy Commission, Sutherland, Australia.

FEBRUARY 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-tr-1513 (Translated from ABS-THH-1005a - Appendix to ABS-THH-1005)

"Application of the Dagmar Model Calculation" Determination of the Flux Density Correction Factor Determined by the Geometry in a Model Test in Geesthacht
C. W. Wunke

ORNL-tr-1519 (Translated from ABS-THH-1015)

Neutron Flux Measurements in the Mock-up of a Power Reactor Shield in the Large Irradiation Channel of the Geesthacht Research Reactor
G. Stiller

DASA Report Number 1820-1

Time Dependent Neutron Transport from a Point Isotropic Source at an
Altitude of (24.384 KM) 80,000 ft
James P. George and Albert Lavagnino - June 28, 1966

DASA Report Number 1820-2

Time Dependent Neutron Transport from a Point Isotropic Source at an
Altitude of (9.144 KM) 30,000 ft
James P. George and Albert Lavagnino - October 12, 1966

DASA Report Number 1820-3

Time Dependent Neutron Transport from a Point Isotropic Source at an
Altitude of (9.144 KM) 30,000 ft
James P. George and Albert Lavagnino - October 12, 1966

ORNL-tr-1516 (Translated from ABS-THH-1008)

Approximate Calculation of Build-up Factors of Gamma-Radiation in Ordinary
Concrete
S. Sasse and C. D. Wunke

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

Jad. Energ., 12, 296-8 (1966) (Czech)

Equivalent Material Thicknesses for Gamma Radiation Attenuation
A. Honig

Atomkernenergie, 11(9-10), p. 373 (1966)

Calculation of the Shielding of a Nuclear Reactor by Multiple Layers of
Iron and Water
R. A. Rashed

Sov. J. Atomic Energy, 18(2), 151 (Feb. 1965)

The Attenuation of Reactor Radiation by Means of Serpentine Concrete
G. A. Basil'ev, A. P. Veselkin, Y. A. Egorov, V. A. Kucheryaev, and Y. V.
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Sov. J. Atomic Energy, 18(2), 133 (Feb. 1965)

Angular and Energy Characteristics of the Neutrons Emitted in U-235 Fission
M. V. Blinov, N. M. Kazarinov, and A. N. Protopopov

Sov. J. Atomic Energy, 18(1), 83 (Jan. 1965)

Dependence of the Density of Radiation Damage to the Reactor Vessel on
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K. K. Popkov and S. M. Rubanov

Sov. J. Atomic Energy, 18(1), 80 (January 1965)

Reduction of the Capture γ -Radiation from the Reactor's Structural Materials
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B. F. Gromov, D. V. Pankratov, M. A. Solodyankin, and M. M. Sokolov

Sov. J. Atomic Energy, 18(1), 78 (January 1965)

Spatial Distribution of Neutrons with Energies of 3 and 15 MeV in Beryllium
S. P. Belov, V. A. Dulin, Y. A. Kazanskii and S. G. Tsypin

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Determination of γ -Ray and Neutron Absorbed Dose in Polymers
F. A. Makhlis and I. M. Kolpakov

Sov. J. Atomic Energy, 18(6), 791 (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, 18(6), 752 (June 1965)

Measurement of Neutron Spectra in Nickel, Iron, and Stainless Steel
I. I. Bondarenko, V. G. Liforov, V. N. Morozov, M. N. Nikolaev, V. A.
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The Shape of the Spectrum of Moderated Neutrons in Absorbing Media
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ANL-7157

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T. W. Eckels and A. Smaardyk - July 1966

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Fission Products, in the Hazards Evaluation of Nuclear Reactors
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Transplutronics: Promising Neutron Sources for Research
R. L. Stetson

- Sov. J. Atomic Energy, 18(4), 442 (April 1965)
Transmission of Neutron Radiation from a Reactor through Hydrogen-Free Media
S. G. Tsy-pin, B. I. Sinitsyn, and V. K. Daruga
- Sov. J. Atomic Energy, 18(3), 352 (March 1965)
Resonance Structure of the Cross Sections and its Influence on the Scattering Anisotropy for Fast Neutrons and Their Transmission in Iron
A. P. Suvorov, A. G. Guseinov, and M. N. Nikolaev
- Sov. J. Atomic Energy, 18(3), 315 (March 1965)
Spatial Distribution of the Dose Rate of Air-Scattered Neutrons from a Unidirectional Point Source
S. F. Degtyarev and V. I. Kukh'tevich
- Oyo Butsuri, 35, 417-23 (June 1966) Japanese
Dose Calculation of ^{60}Co Slab Irradiator
Y. Oshima
- Sov. J. Atomic Energy, 18(3), 313 (March 1965)
Angular and Energy Distribution of Scatter γ -Radiation Near an Isotropic Source in an Infinite Air Medium
Y. I. Kolevatov, V. I. Kukh'tevich, E. S. Matusevich, and O. A. Trykpv
- Sov. J. Atomic Energy, 18(3), 311 (March 1965)
Spatial and Energy Distribution of Scattered γ -Radiation from a Unidirectional Source in an Infinite Air Medium
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- Sov. J. Atomic Energy, 18(3), 302 (March 1965)
A Stainless Steel with High Capture Cross Section for Thermal Neutrons
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- Sov. J. Atomic Energy, 18(3), 290 (March 1965)
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Application of the Yvon Mertens Method for Solving Albedo Problems in the Neutron Diffusion Theory
Y. N. Kazachenkov and V. V. Orlov
- Sov. J. Atomic Energy, 18(3), 279 (March 1965)
Concerning the Emission Times of γ -Quanta as a Result of Fission
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- Sov. J. Atomic Energy, 18(2), 219 (Feb. 1965)
Angular Distribution of Collimated Radiation
E. F. Fomushkin
- Sov. J. Atomic Energy, 18(2), 167 (Feb. 1965)
Experimental Investigations of Shields on the Riz Stand
S. P. Belov, V. A. Dulin, Y. A. Kazanskii, V. I. Popov, and S. G. Tsypin
- Nucl. Eng. Design, 3(3), 476-477 (1966)
Lead-Concrete - First Extra-High-Density Shielding Suitable for Installation by Mass Production Methods
W. C. Hall
- Nucl. Energy, 189-94 (July-Aug. 1966)
The Installation of a 14-MeV Neutron Generator
K. G. Darrall and G. Oldham
- Nucl. Eng. Design, 3(1), 74-82 (1966)
Analysis, Calculations and Measurements Concerning the Moisture Measuring by the Neutron Method
S. Kasi and H. Koskinen
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Energy Distributions of Inelastically and Elastically Slowed Down Fast Neutrons
C. Syros
- Ark. Fys., 33(3) (1966)
Fast Neutron Capture γ -Ray Spectra in Rb, Sr, Y, Zr and Nb
B. Lundberg, et al.
- J. Atomic Energy Soc. Japan 8(8), 424-30 (Aug. 1966)
Dose Buildup Factor Measurements with a Long Ionization Chamber
Y. Kanemori
- Nukleonik, 8(7), 383-6 (Sept. 1966)
Multi-Dimensional Spherical Harmonics Method for Energy Dependent Problems
K. M. Dede
- Japan J. Appl. Phys., 903-909 (Oct. 1966)
Application of Different Orthonormal Expansion Methods to Neutron Measurements. I. Analysis of Spectra
H. Ryufuku
- Japan J. Appl. Phys. 910-913 (Oct. 1966)
Application of Different Orthonormal Expansion Methods to Neutron Measurements. II. Estimation of Dose Equivalent Rates
H. Ryufuku

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Application of Different Orthonormal Expansion Methods to Neutron Measurements. III. Actual Measurements of Spectra and Dose Equivalent Rates
H. Ryufuku et al.

Japan J. Appl. Phys., 900-2 (October 1966)

On Calculations for Gamma-Ray Scattering in Density Gauge
T. Uemura

Health Phys., 12(11), 1601 (Nov. 1966)

Application of Computers to Radiation Protection Problems
F. V. Cipperley

Health Phys., 12, 1715 (1966)

Gamma-Radiation Characteristics - Angular Distribution over a Desert Terrain
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A. L. Frank

ORNL-tr-1518 (Translated from ABS-THH-1012)

Calculation of Energy Spectra from Continuous Pulse Height Spectra -
Part II
W. Futtermenger and C. D. Wuncke

ORNL-tr-1520 (Translated from ABS-THH-1016)

Determination of Fast Neutron Spectra with Threshold Detectors
G. Stiller

ORNL-tr-1521 (Translated from ABS-THH-1016a)

Determination of the Fast Neutron Flux Spectrum with Threshold Detectors
G. Stiller

LA-3622

Test Cell C Shielding Study: KIWI B4D-202
A. J. Ahlquist, J. E. Dummer - November 1966

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Shielding Calculations for Irradiated FTR Fuel
W. L. Bunch - December 1966

AAEC-E-155

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

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A Standardized Method for Making Neutron Fluence Measurements by Fission
Fragment Tracks in Plastics
S. Petre, E. Tochilin et al.

UCRL-14955

Fast Neutron Cross Sections Inferred from Charged-Particle Data and from
the Application of Nuclear Models
J. D. Anderson and H. F. Lutz - June 13, 1966

IITRI-1193-53 (Vols. 1 and 2)

Prompt Gamma Rays from Radiative Capture of Thermal Neutrons
R. C. Greenwood and J. H. Reed - Oct. 14, 1965

LA-3583-MS

Radiation Measurements of the Effluent from the NRX-A-4 Reactor
Oliver W. Larson, A. John Ahlquist, et al. - December 1966

C00-1226-12

Development of a Fast Neutron Dosimetry System - Final Report
B. H. Chase, W. G. Closser, R. R. Speers, J. M. Swartz, and M. O.
Thurston - Oct. 1, 1966

AD-637700 (AFOSR 66-1014)

Variational Methods for Scattering Problems
Marius Kolsrud - Dec. 22, 1965

AD 632281 (HI-518 RR)

Environmental Effects of Nuclear Weapons, Vol. 3
Robert U. Ayres - Dec. 1, 1954

AD 637165 (RM-5070 PR)

Time Dependent Diffuse Reflection from Slabs with Multiple Scattering
R. E. Bellman, et al. - July 1966

NP-16408

Nuclear Power Stations Throughout the World a Report Compiled on
Questionnaire Survey Results - December 1966

JAERI-1113

Inelastic Scattering of Neutrons
September 1966

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Nuclear Reactions in the Low and Intermediate Energy Ranges
I. M. Frank

KAPL-P-3175

The Effect of Self-Shielding Corrections of Calculated Temperature Dis-
tributions Using Various Self-Shielding Schemes
W. K. Anderson, E. C. Hansen, E. F. Koenig, and G. L. Lechliter -
September 1966

GA-7287

Differential Neutron Thermalization
W. L. Whittemore - July 22, 1966

GEAP-4472

User Requirements for Cross Sections in the Energy Range from 100 eV to 100 keV
P. Greebler and B. A. Hutchins - June 1966

GA-7215

Neutron Thermalization in Light Water
J. C. Young, G. D. Trimble, J. M. Neill, G. K. Houghton, D. H. Houston,
J. R. Beyster - June 30, 1966

WAFD-T-1938

Error Bounds for Approximate Solutions of the Neutron Group Diffusion Equations
J. B. Yasinsky - August 1966

FZK-313

Dose Rate from 14.7-MeV Neutrons and 1.25-MeV Gamma Rays Transmitted through Special Optical Materials
J. R. Williams and C. S. Stevens - December 2, 1966

FZK-314

Radiological Armor Program Reflection and Transmission of 14.6-MeV Neutrons Incident on Shield Materials
R. J. Prevost - December 15, 1966

Rept. of Ship Research Institute, 3(4), 161-343 (July 1966)

A Study on the Methods for Analyzing Multilayered Gamma-Ray Shields
Iwao Kataoka

Space and Accelerator Shielding

RFP-R-2

Neutron Dosimetry Methods and Experience on the 7 GeV Proton Synchrotron, NIMROD
D. R. Perry - 1966

Nucl. Instr. Methods, 42, 141-53 (1966) (RHEL/R-106)

The Measurement of Radiation Absorbed by Particle Accelerator Structural Components
C. E. Chapman and R. Sheldon

CERN-66-28

Induced ^{24}Na Activity in the Concrete Shielding of High-Energy Accelerators
D. Nachtigall, S. Charalambus - Sept. 16, 1966

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Additional Stopping Power and Range Tables for Protons, Mesons, and
Electrons
M. J. Berger and S. M. Seltzer - 1966

NASA TT F-356

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V. G. Bobkov, V. P. Demin, I. B. Keirim-Marukus, Y. Y. Kovalev, A. V.
Larichev, V. A. Sakovich, L. N. Smirennyy and M. A. Sychkov - May 1966

ORNL-tr-1250 (Translated from ST-1)

Dose Rate and Maximum Permissible Flux of High Energy Electrons and Gamma-
Rays
K. Tesch - 1965

Progr. Theoret. Phys. (Kyoto), 34: 912-41 (Dec. 1965)

A Study of Electron-Photon Showers by the Monte Carlo Method
M. Tamura

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Measurements on Electromagnetic Cascades at 6.3 GeV Energies, and
Subsequently Produced Neutrons
G. Bathow, E. Freytag and K. Tesch

Advances in Astronautical Sciences, 13, 90-103 (1963)

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T. Foelsche

Shielding Computer Codes

ISS 66/26

July 1966

MSE

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FWAC-446

November 1964

TDP

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by W. J. Fader
FLOCO for IBM 7090

ORNL-3855

December 1965

NNAPNC

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by R. G. Alsmiller, Jr. and J. Barish

XDC-59-3-80

January 1959

PROGRAM GAMMA

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FORTRAN for IBM 704

GAMD-6775 (microfiche)

December 1965

MUSCAT

MUSCAT: A FORTRAN IV View Factor Shielding Code
by Mary J. Gerber and Bernard W. Roos
FORTRAN IV for IBM 7044