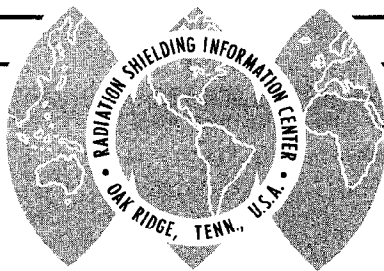


RSIC Newsletter



RADIATION SHIELDING INFORMATION CENTER

OAK RIDGE NATIONAL LABORATORY

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

POST OFFICE BOX X •
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*The rarest jewel has a price;
learning alone is priceless. - Chinese proverb.*

LISTS OF SHIELDING CONSULTANTS BEING COMPILED

Two efforts which will result in the preparation of lists of shielding consultants are under way. They are reported in the September 1969 issue of *Nuclear News*. Such lists would be of great value to those seeking service in the areas of shield design or calculation of radiation dose.

One list is being compiled by H. E. Hungerford, vice-chairman of the American Nuclear Society Shielding and Dosimetry Division. If you are a member of the Division and would like your name to be on the list of available shielding consultants, you may write Dr. Hungerford at the Department of Nuclear Engineering, Purdue University, Lafayette, Indiana 47907. For more information see page 94 of the September *Nuclear News*.

The other compilation is the *Nuclear News* Buyers' Guide. The 1969 Guide (February *Nuclear News*) had a number of categories of interest to shielders, and we would urge that shielding consultants make greater use of this compilation. For more information, write to *Nuclear News*, 244 East Ogden Avenue, Hinsdale, Illinois 60521.

DUAL TOPIC SEMINAR-WORKSHOP

HELD SEPTEMBER 30 - OCTOBER 3

*Multigroup Cross Section Preparation - Theory, Techniques,
and Computer Codes Seminar - XSDRN Workshop*

Two-Dimensional Discrete Ordinates Calculation Seminar - DOT Workshop

One hundred twenty-four participants from 57 separate installations, including seven foreign countries, attended the dual topic seminar-workshop held at the Oak Ridge National Laboratory over the four-day period, September 30 - October 3. The meeting was co-sponsored by RSIC and the Reactor Division at ORNL.

Eight papers on two-dimensional discrete ordinates calculations and 24 papers about multigroup cross section preparation were given during the 2½-day seminar. Half-day workshops on the computer codes XSDRN and DOT followed the seminar part of the meeting, and the remaining time was spent as an information question and answer session.

CORRECTION TO BINDING ENERGY GIVEN IN LAST ISSUE

In the table of thermal neutron capture gamma-ray spectra given in the last issue, there were data on the binding energy accounted for by Maerker and Muckenthaler. The footnote should have said, "Does not include small contribution below 1 MeV determined by others."

NEWLY TRANSLATED RUSSIAN BOOK ON SHIELDING ISSUED

The 353-page book *PHYSICS OF REACTOR SHIELDING* by Yu. A. Kazanskii et al. has recently been translated and is available from CFSTI as AEC-TR-6879. There are 279 references.

The authors have analyzed and correlated the mainly experimental data published up to the middle of 1964. This includes a detailed description of neutron and gamma-ray fields in shielding materials, the production of secondary gamma radiation (following capture, inelastic scattering, etc.) and the best methods for its suppression, and, finally, the most important properties of gamma quanta and neutrons, scattered in air and from the ground. The special set-ups, radiation detectors, and methods used in reactor-shielding research are described.

NEW PSR PACKAGE AVAILABLE

The following Peripheral Shielding Routine has been added to the list of PSR packages:

PSR-11/POPOP4: A Code for Converting Gamma-Ray Spectra to Secondary Gamma-Ray Production Cross Sections.
by W. E. Ford, III, and D. H. Wallace, Computing Technology Center, Union Carbide Corporation, Nuclear Division, CTC-12 (May 1969).

POPOP4 is a FORTRAN IV program which converts gamma-ray spectra from neutron-induced reactions to a required neutron-gamma-ray energy group structure. If the spectra are given in terms of gamma-ray intensity per reaction, POPOP4 will multiply the converted spectra by input reaction cross sections to produce secondary gamma-ray production cross

sections. The code will also convert secondary gamma-ray cross sections from a given neutron-gamma-ray energy group structure to a required group structure. POPOP4 will make, update, or read a hexadecimal library tape of spectral data.

Using another code, secondary gamma-ray production cross sections calculated by POPOP4 can be coupled with the P_0 components of the neutron and gamma-ray cross sections for the nuclides of interest. The coupled multigroup cross sections can then be used with multigroup transport codes such as ANISN, DOT, and MORSE.

PERSONAL ITEMS

Y. T. Song, formerly at the University of Tennessee, is now with the Tennessee Valley Authority, Chattanooga, Tenn.

* * * * *

Albert W. Starbird is now with Littleton Research and Engineering Corporation, Littleton, Mass. Previously, he was with the Flow Corp.

* * * * *

L. D. Stephenson, formerly with Westinghouse Astronuclear Laboratory, is now with Knolls Atomic Power Laboratory.

VISITORS TO RSIC

Visitors to RSIC during the month of September were: J. R. Beyster, La Jolla, Calif.; A. B. Chilton, University of Illinois, Urbana, Ill.; Major G. H. Connor, Jr., Edgewood Arsenal, Md.; Robert A. Costner, Jr. and J. H. Swanks, Operations Division, ORNL; R. K. Disney and S. A. Fody, Westinghouse Astronuclear Laboratory, Pittsburgh, Pa.; Major Richard W. Enz, DASA, and Capt. John E. Hormuth, Dept. of Defense, Washington, D.C.; James W. Haffner, North American Rockwell, Downey, Calif.; P. B. Hemmig, USAEC, Washington, D. C.; C. W. Hill, Lockheed-Georgia Co., Marietta, Ga.; Bertil Holmqvist, AB Atomenergi, Nyköping, Sweden; Harry E. Hootman, Savannah River Laboratory, Aiken, S. C.; C. M. Huddleston, Naval Ordnance Laboratory, Silver Spring, Md.; E. J. McGrath, TRW Systems, Redondo Beach, Calif.; Henry Smith, Brown Engineering Co., Huntsville, Ala.; Leonard Soffer, NASA Lewis Research Center, Cleveland, O.; Y. T. Song, TVA, Chattanooga, Tenn.; Patrick J. Stones, Rolls-Royce, Derby, England; Darrol H. Timmons, University of Missouri, Columbia, Mo.; Thomas P. Wilcox, Jr., Lawrence Radiation Laboratory, Livermore, Calif.

OCTOBER 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 (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 the 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

AEEW-M-833

July 1968

Monte Carlo Calculations of Neutron Age in Some Moderating Media
M. Veale

AEEW-M-863

May 1969

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M. F. James
Available: Winfrith Secretariat, Atomic Energy Establishment,
Winfrith, Dorchester, Dorset, England

AERE-R-6083

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UK 3s. 6d

APED-5398-A (Rev.)

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Summary of Fission Product Yields for U-235, U-238, Pu-239, and
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October 1968

Optical Model Analysis of the Elastic Scattering of Neutrons by the Lead Isotopes and Bismuth at 0.5, 1.0, and 2.5 MeV
S. O. Moore
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April 1969

Nuclear and Physical Properties of Californium-252
A. Prince
Available: CFSTI

EGG 1183-1436

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Experimental Evaluation of the Fallout Radiation Protection Provided by Structures in the Control Point Area of the Nevada Test Site
Z. G. Burson

FOA-4-4393 (In Swedish)

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Survey of Methods for Variance Reduction in Calculation of Uncharged Particles Transport by Monte Carlo Technique
R. Fraeki
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GEMP-1010, pp. 291-313

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Nuclear Reactor Neutron Detection and Measurement Devices
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Computer Program for Response Spectra. Description of Computer
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K. Schopp
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an Altitude of 50 Feet
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- ORNL-TM-2626 August 1969
Oak Ridge National Laboratory Tungsten-Shielding Cask
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Scattered Radiation. III. The Tissue-Air Ratio and the Depth
Dose Evolution at Gamma- and X-Radiations in the Range of 0.6
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Gaps in Concrete Shields
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Monte Carlo Study of Interior Partition Effects on Fallout Shielding
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A Compilation of Nuclear Data on the Thermal Fission Products of
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A Computerized Method of Predicting Electron Beam Bremsstrahlung
Radiation with Specific Application to High Voltage Flash X-Ray
T. H. Martin
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Anisotropic Multigroup Transport Theory
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High-Energy Neutron Spectroscopy with Activation Detectors, Incorporating
New Methods for the Analysis of Ge(Li) Gamma-Ray Spectra
and the Solution of Fredholm Integral Equations
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Construction of an Underground Whole-Body-Counter Shield
R. V. Griffith, A. I. Anderson
- UCRL-50174 Sec. II Rev. 1 May 1969
Compilation of X-Ray Cross Sections
W. H. McMaster, N. Kerr Del Grande, J. H. Mallet, J. Hubbell
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Method for Determining Scintillator Response Functions for Fast
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Dose Measurements of Gamma Radiation Streaming Through Concrete
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Interior Partition and Basement Shelter Experiments
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WANL-TME-1920

April 15, 1969

New Cross Sections for GAM, TNS, and BIT Libraries
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Tests of the GGC-3, GGC-4 Neutron Slowing Down Codes and Comparisons
with the Codes GAMBIT and TRANSFER
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Solution of the Equation of Transport by the Method of Moments
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SPACE AND ACCELERATOR SHIELDING

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Experimental Determination of the Transition Effect in Electromagnetic
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- JINR-P2-4509 (In Russian) *1969*
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Energy Dependence of the Interaction Cross Sections of pi-Mesons
with the Atomic Nuclei at Energies More Than 50 MeV.
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Photon Cross Sections, Attenuation Coefficients, and Energy
Absorption Coefficients from 10 KeV to 100 GeV
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An Experimental Study of Electron Transmission and Bremsstrahlung
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R. H. Rester
Available: CFSTI
- ORNL-tr-2199 (CEA-Conf-1087) (In French) *October 1968*
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1969

Inelastic Interactions of High-Energy Protons with Atomic Nuclei
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Calculation of the Radiation Dose Inside a Satellite with a Defined
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K. Wohlleben, R. Bauerlein, H. Riekert
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January 1969

Ionization Inside a Satellite Due to the Bremsstrahlung Produced
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R. Bauerlein
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T. M. Jenkins, W. R. Nelson

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W. C. Hall
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W. Schimmerling, M. Awschalom
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J. Llacer, E. L. Garwin

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W. S. Snyder, H. A. Wright, J. E. Turner, J. Neufeld

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K. O'Brien

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D. J. Forrest, E. L. Chupp

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S. C. Freden

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(A69-33387)

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Nucleus, on the Energy of the Interacting Particle
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V. I. Iakovlev

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The Measured Energy Loss of High-Energy Electrons in Aluminum
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INTERACTION CROSS SECTIONS OF ELEMENTARY PARTICLES

(Translation of *Secheniya Vzaimodeistvii Elementarnykh Chastits*,
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V. S. Barashenkov

Daniel Davey and Co., Inc., Hartford, Conn. 1969

423 pages \$21.50

THESIS

1968

Electron Transport Theory Using Methods of Invariant Imbedding
R. J. Barrett
Iowa State University, Ames, Iowa 77 pages

CONF-

June 1969

Conference on Radiation Protection in Accelerator Environments
Edited by G. R. Stevenson
Available: Mr. R. C. Pepperell, Conference Secretary
Rutherford Laboratory, Chilton, Didcot, Berks., England
Price £2 net (postage and packing extra) payable to the
Science Research Council

CONF-

June 1969

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D. R. Perry, D. M. Hargreaves
In: Proceedings - Conference on Radiation Protection in
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Avail.: See above

CONF-

June 1969

Article: Radioactivity Induced by High Energy Electrons
G. Saxon
In: Proceedings - Conference on Radiation Protection in
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Avail.: See above

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June 1969

Article: The External Radiation Field from Proton Synchrotrons
G. R. Stevenson, K. B. Shaw
In: Proceedings - Conference on Radiation Protection in
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Avail.: See above

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June 1969

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In: Proceedings - Conference on Radiation Protection in
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