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. 6 May 12, 1965

RECENT VISITORS TO RSIC

Recent visitors to the Center included: David Naliboff, the LINAC, General Atomics, San Diego, California; Ted W. DeVries, NARF, General Dynamics, Fort Worth, Texas; and Dave Jasper, CEIR, Washington, D. C.

STAFF MEMBERS VISIT IN STATE OF WASHINGTON

Dr. R. G. Alsmiller, Jr., and Mrs. Betty F. Maskewitz attended a Symposium on Space Radiation Environment and Shielding Codes in Seattle, Washington, at the invitation of the Nuclear and Space Physics Groups, Aero-space Division, The Boeing Company. Under discussion were several codes, developed by The Boeing Company under contract to the Air Force Weapons Laboratory, Kirtland Air Force Base, Albuquerque, New Mexico.

Mrs. Maskewitz later visited Battelle-Northwest Laboratories, Richland, Washington, to discuss shielding calculations and computer codes with the Nuclear Engineering, Physics and Chemistry groups there. Jess Greenborg, RSIC coordinator, sponsored the visit.

CORRECTIONS TO COHORT CODE

Ted DeVries, one of the originators of the COHORT code, made some corrections to the code. Any current user of the COHORT code may secure these corrections by contacting RSIC, attention: Mrs. Betty F. Maskewitz.

NEW CODES RECEIVED FOR COMPUTER CODE COLLECTION

The following codes have been received and are being processed:

P-20 MARTY-N and MARTY-G
NUCLEAR RADIATION TRANSFER AND HEAT DEPOSITION RATES IN LIQUID HYDROGEN, contributed by NASA, George C. Marshall Space Flight Center, Huntsville, Alabama.
FORTRAN, IBM 7090
(Reference: NASA TN D-1115)
IN RSIC process.

P-21 NAGTRAN
NEUTRON AND GAMMA-RAY TRANSPORT IN ATMOSPHERE — Monte Carlo Code, contributed by United Nuclear Corporation, White Plains, New York.
IBM 7090
(Reference: UNC-5031)
Binary code operating; sub-routines missing from source decks.

P-23 LIGHT (space)
INELASTIC GAMMA PRODUCTION CODE, contributed by Lockheed Nuclear Products, Lockheed-Georgia Company and NASA, George C. Marshall Space Flight Center, Huntsville, Alabama.
FORTRAN, IBM 7090
(Reference: ER-6643)
In RSIC process.

P-26 TGRMM
GAMMA-RAY TRANSPORT MOMENTS METHOD CODE, contributed by KAMAN Nuclear, Colorado Springs, Colorado.
FORTRAN, IBM-1620
(Reference: KN-63-76(R))
In RSIC process

P-30 TRIKL-S
GAMMA ENERGY DEPOSITION IN INFINITE SOURCE MEDIA, contributed by Lawrence Radiation Laboratory, Livermore, California.
FORTRAN, IBM 7090
(Reference: UCRL-6891)
In RSIC process.

P-31 OGRE
MONTE CARLO GAMMA-RAY TRANSPORT CODE, contributed by Oak Ridge National Laboratory, Neutron Physics Division.
FORTRAN, IBM-7090
(Reference: ORNL-3805, to be published)
Waiting for formal document to be published.

P-32 BREMRAD
EXTERNAL AND INTERNAL BREMSSTRAHLUNG CODE, contributed by Chemical Laboratory, Battelle-Northwest Laboratories, Richland, Washington.
FORTRAN, IBM 7090
(Reference: HW-83784)
In RSIC process.

P-33 EMPIRE
MULTIGROUP DISCRETE ORDINATE TRANSPORT CODE IN SLAB GEOMETRY, contributed by Westinghouse Corporation, Bettis Atomic Power Laboratory, Pittsburgh.
FORTRAN, PHILCO-2000
(Reference: WAPD-TM-436)
Being made operable on IBM-7090.

P-34 GAMMA-P
GAMMA-RAY PRODUCTION CROSS SECTION CODE, contributed by Nuclear Materials Propulsion Operation, General Electric, Cincinnati.
FORTRAN, IBM-7090
(Reference: XDC-60-11-138)
In RSIC process.

P-35 MIST
MULTIGROUP INTERNUCLEAR SLAB TRANSPORT CODE, contributed by Phillips Petroleum Company, Atomic Energy Division, Idaho Falls, Idaho.
FORTRAN, IBM 7090
(Reference: IDO-16856)
In RSIC process

APRIL ACCESSION LIST OF LITERATURE

The following accession list consists of literature which the RSIC obtained through its usual scanning procedures. This literature will be examined for assignment to various files or for possible rejection. The accession list is divided into the three fields of (1) reactor and weapons shielding, (2) space and accelerator shielding, and (3) shielding computer codes.

Reactor and Weapons Shielding

ORNL-3704

High-Density Concrete for Gamma and Neutron Attenuation
T. E. Northrup – March 1965

SC-RR-64-1757

Radiation Flux Map Report – Sandia Engineering Reactor Facility
C. B. Bechere – January 1965

NDL-TM-15

A Point-Source Circulation System for Simulating Fallout Gamma Radiation
R. E. Rexroad, M. A. Schmoke, and M. J. Schmuchyk – December 1964

EUR-2161-F

Experimental Study of Monoenergetic Neutrons Propagation in Water
R. Nicks, N. Paphehl, H. Penkuhn, C. Manduchi, and C. Zago – 1964

WL-TR-64-136

Analysis of Radiation Streaming Through Single-Bend Ducts
J. D. Marshall – January 1965

WL-TR-64-152

Analysis of ASTR Radiation Heating in Aerospace Structural Materials
I. C. Roberts and D. A. Goodwin – February 1965

TID-21629

Angular Distribution Coefficients for Elastic Scattering of Neutrons
C. P. Altamirano and S. T. Perkins – December 1964

NAA-SR-MEMO-10584

Results of the Analysis of Experiments on Fast Neutron Transmission in LiH
R. S. Hubner – November 4, 1964

AD-605502

Air Filter Shielding for Emergency Shelters
N. Oldson, C. A. Dittus, and W. R. Nehlsen

HW-SA-3769

Radionuclide Generation Calculations
H. H. Van Tuyl – October 20, 1964

GA-6087

Neutron Cross Sections for U^{238}
G. D. Joanou and C. A. Stevens – January 22, 1965

EGG-1183-2009

Linac Adaptation for Weapons Simulation. AEC R and D Quarterly Progress Report
W. George, N. Norris, and K. Hanst – January 1965

RRA-T45

A Comparative Study of Radioactive Source Arrangements for Simulating Fallout Gamma Radiation Fields
R. L. French – June 15, 1964

TRG-Report-873

Neutron Flux in the D.F.R. Rotating Shield. Measurements and Calculations
J. Adamson, A. M. Judd, and N. I. McNair – October 14, 1964

NAA-SR-MEMO-10559

Analysis of Shield Test Facility Experiments Using the Two-Component Method
W. B. Green – October 13, 1964

HW-82659

Measurement of Gamma Heating in PRTR. Final Report Test 82.
G. A. Fick – June 8, 1964

PM-100-1 and Supplement No. 1

Design and Review of Structures for Protection from Fallout Gamma Radiation
Department of Defense – Office of Civil Defense – February 1965

UCRL-11760

An Improved Method of Neutron Spectroscopy Using Threshold Detectors
Arthur D. Kohler, Jr. – December 11, 1964

CLOR-29

Reports of the Central Laboratory on Radiobiological Protection
J. Pensko – 1964

NP-14774

Calculating ERD During a Prolonged Exposure in a Fallout Environment
Joseph Battle – June 8, 1964

AWRE-O-101/64

Neutron Cross Sections of Pu-241 in the Energy Range 1 Kev to 15 Mev
A. C. Douglas – February 1965

AERE-R-4831

Neutron Flux and Energy Measurements
J. A. Dennis – January 1965

AERE-R-4832

Radiation Units: A Review and Criticism
J. A. Dennis – July 1964

HASL-157

The Boundary Effect on Gamma-Ray Transport from a Point Source
Keran O'Brien and James E. McLaughlin – January 1965

Proc. Phys. Soc. (London), 84: 1032-4 (December 1964)

Gamma-Ray Absorption Coefficients
R. C. Murty

ORNL-TM-973

A Calculation of the Neutron Dose in Ordinary Concrete Due to Air-Scattered Neutrons from a Point Fission Source
D. K. Trubey – March 15, 1965

ORNL-TM-1087

Measured Neutron Source Spectra for Angular Scattering Experiments with Small Cylinders
J. C. Courtney and V. V. Verbinski – April 9, 1965

Space and Accelerator Shielding

Nuclear Instr. and Methods, 31, 45-54 (1964)

Residual Radiation Studies for Meson Factories
C. B. Fulmer, K. S. Toth, and M. Barbier

AIAA J., 2: 3198-201 (December 1964)

Mass and Magnetic Dipole Shielding Against Electrons of the Artificial Radiation Belt
A. Bhattacharjie and I. Michael

Phys. Rev. Letters, 13: 783-5 (December 28, 1964)

Measurement of Low-Energy Primary Cosmic-Ray Protons on IMP-1 Satellite
F. B. McDonald and G. H. Ludwig

Phys. Med. Biol., 10: 17-24 (1965)

Determination of the Energy Absorbed in Water from Relativistic Cosmic Ray Particles Using the Cerenkov Effect
S. C. Lillicrap

J. Geophysical Res. 70, 240-242 (January 1, 1965)

Time Decay of the Artificial Radiation Belt
C. O. Bostrom and D. J. Williams

International Symposium on Bioastronautics and the Exploration of Space, 3rd, San Antonio, Texas, November 16-18, 1964, Paper

Solar Flares and Prediction
John Firor and Carl Lilliequist

DESY-64/12

Differential Cross Section for Electron Pair Production by High Energy Photons
Gustav Sommer – October 1964

Nucl. Instr. and Methods, 32, 45-69 (1965)

Shielding Studies in Steel with 10 and 20 GeV/c Protons
Parts I - IV

J. Spacecraft Rockets, 1: 310-16 (May-June 1964)

Radiation Shielding Considerations in Manned Spacecraft Design
Sidney L. Russak

Elec. Export Rev., 3: 73 (July-Sept. 1964)

7-Gev Proton Synchrotron Now Fully Operational

NAS-NRC-PUB-1133 (p. 69-98)

Multiple-Scattering Corrections for Proton Range Measurements
Martin J. Berger and Stephen M. Seltzer

NAS-NRC-PUB-1133 (p. 187-203)

Energy Loss Straggling of Protons and Mesons: Tabulation of the Vavilov Distribution
Stephen M. Seltzer and Martin J. Berger

Nuovo Cimento, 35(1), 216-26 (January 1, 1965)

Large-Angle Cross-Sections $p + p \rightarrow A + B$ and $\pi + p \rightarrow A + B$ at High Energies Predicted by the Statistical Model
R. Hagedorn

N65-15482

Velocity Dependence and Source Spectra of Solar Proton Events
Frank B. McDonald

TID-21282

A Final Report on the Design of a Very High-Intensity Proton Linear Accelerator as a Meson Factory at an Energy of 750 MeV
October 1964

AD-443485

Cosmic Radiation: An Annotated Bibliography
Peter R. Stromer and Helen B. McCormick – May 1963

Dokl. Akad. Nauk. Arm. SSE, 38: 101-4 (1964) (Translation requested)

The Change in High-Energy Nucleons with Altitude in the Atmosphere
Kh. P. Babayan, N. L. Grigorov, E. A. Mamidzhanyan, and V. Ya. Shestoperov

Kosmich. Issled., 2: 147-9 (Jan. - Feb. 1964) (Translation requested)

Measurements of the Total Radiation Dose in Vostok-5 and Vostok-6
I. A. Savenko, N. F. Pisarenko, P. I. Shavrin, and V. E. Nesterov

Kosmich Issled., 2: 150-3 (January - February 1964)(Translation requested)

Measurements of Soft Radiation in the Pre-Equatorial Latitude by Kosmos-4
I. A. Savenko, P. I. Shavrin, N. F. Pisarenko, V. E. Nesterov, M. V. Tel'tsov and V. N. Erofeeva

Nukleonika, 9: 277-90 (1964) (Translation requested)

Propagation of High Energy Nucleons Through Atmosphere and Meson Production
L. T. Baradzei, V. I. Rubtsov, Yu. A. Smorodin, and M. V. Soloev

Vestn. Mosk. Univ., Ser. III., Fiz. Astron., No. 3, 28-37 (May-June 1964) (Translation requested)

Equations for One-Dimensional Cascade Theory of Electron-Photon Showers at Arbitrary Boundary Conditions and Appearance of Source Functions
A. K. Bakhtadze

Nukleonika, 9: 233-44 (1964) (Translation requested)

Momentum Spectrum of π-Mesons Produced in Interactions of Nucleons with Energy of the Order of Several Hundred Gev.
N. A. Dobrotin, N. G. Zelevinskaya, V. M. Maksimenko, V. S. Puchkov, and S. A. Slavantinskii

RIFP-40

A Monte Carlo Analysis of Electromagnetic Cascade Showers
Atsuko Adachi, Yoichi Fujimonto, Naofumi Ogita, Shuji Takago and Akira Ueda – October 1964

NASA-CR-60785

Results on Gamma-Ray Astronomy from Explorer XI
G. W. Clark and W. L. Kraushaar (1964)

NASA TN D-2646

The Orbiting Geophysical Observatories
George H. Ludwig – March 1965

Shielding Computer Codes

ER-6643 January 1964

Computer Programs for Shielding Problems in Manned Space Vehicles
by C. W. Hill, C. C. Douglas, Jr., W. B. Ritchie and K. M. Simpson, Jr.

WL TDR-64-71, Vol. I August 1964

Computer Codes for Space Radiation Environment and Shielding
by J. A. Barton, B. W. Mar, G. L. Keister, et al.

WAPD-TM-396 September 1963 CTS-3

A Multi-Group Transport Program for Infinite Cylinders
by J. H. Bennett
Philco-2000 Computer

EAD-140 March 1964 QAD-PR
(AN-COMP-197)

A Program Used to Compute Fast Neutron and Gamma Ray Penetration Through Shielding Assemblies and Materials
by J. K. Witthaus
FORTRAN for IBM-7090-4

WANL-TNR-063 September 1962 ACT I

Activation Source Strength Program for the IBM-7090 Computer
by P. C. Heiser and L. O. Ricks
FORTRAN for IBM-7090

UCRL-11647

FORTRAN-Subroutine Range: Calculating the Range-Energy Relation for Charged Particles in Chemical Elements
W. Peter Trower – September 3, 1964

TID-21338 (p. 146-67)

A Program to Calculate the Energy Loss of Charged Particles Passing through Matter
D. A. Goldberg