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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"Such things and deeds as are not written down are covered with darkness, and given over to the sepulchre of oblivion." .... Ivan Bunin

RSIC COMPUTER CODE COLLECTION: AN ENCLOSURE

This issue of the newsletter is accompanied by an enclosure which contains a list of the computer codes collected by RSIC. The enclosure also includes a list of reports on computer programs for shielding calculations which is supplemental to the list contained in the enclosure to RSIC Newsletter No. 3.

RECENT CONTRIBUTORS TO THE RSIC COMPUTER CODE COLLECTION

The following installations join those mentioned in RSIC Newsletter No. 3 as having contributed to the computer code collection:

ACF Industries, Albuquerque
Aerojet General Nucleonics, San Ramon
Aerospace Medical Research Laboratory, Wright-Patterson AFB, Ohio
Air Force Weapons Laboratory, Kirtland AFB, New Mexico
Astronuclear Laboratory, Westinghouse, Pittsburgh
Lawrence Radiation Laboratory, Livermore
CANEL, Pratt and Whitney, Middletown
US Army Nuclear Defense Laboratory, Edgewood Arsenal

JAERI'S SHIELDING RESEARCH REACTOR GOES CRITICAL

A new pool type reactor, the JRR-4, which will be used for shielding research, went critical on January 28, 1965, at the Tokai Research Establishment of the Japan Atomic Energy Research Institute (JAERI). The reactor has a critical mass of 1,987 g of ^{235}U and a nominal power of 1 Mw. It will probably be ready for regular operation in the fall of 1965.

SHIELDING EXPERIMENTS AT KAWASAKI DOCKYARD

The shielding research group at the Kawasaki Dockyard Company in Kobe, Japan, has completed a series of experiments on radiation streaming through ducts at their TRIGA-II experimental shielding facility. Experimental data were obtained for both neutrons and gamma rays. They have plans to use the new JRR-4 reactor (see above) to obtain shielding information for designing nuclear ship reactor shields.

HIGH-ENERGY RADIATION SHIELDING LITERATURE CATEGORIZED BY RSIC

The literature concerning shielding from radiation occurring in space and in the vicinity of accelerators is now being collected and categorized by methods similar to those used for the literature concerning shielding from radiation occurring near reactors. Consequently, the indexes to this body of literature will be similar to those compiled by RSIC in the past. In addition, the shielding community will be provided services of special literature searches and a selective dissemination of information relevant to high-energy radiation shielding.

U. S. TECHNICAL INFORMATION CLEARINGHOUSE ESTABLISHED

The U. S. Department of Commerce has recently established the Clearinghouse of Federal Scientific and Technical Information which has taken over the information services of the Office of Technical Services.

The Clearinghouse is a national center for the dissemination of unclassified information generated by government-sponsored research in science and technology. Its main services are: (1) supplying copies of technical reports resulting from federally sponsored research and development work; (2) supplying copies of translations of foreign technical reports; (3) publishing a number of semimonthly journals in which the above materials are announced; (4) literature searching.

For further information write: Clearinghouse, U. S. Department of Commerce, Springfield, Virginia 22151.

PREPARE FOR THE INEVITABLE MICROFICHE

The unitized micronegative, or microfiche, is now the basis for dissemination of report literature by several scientific agencies of the U. S. Government. Among these agencies are USAEC, NASA, and the U. S. Dept. of Commerce's Clearinghouse for Federal Scientific and Technical Information. This innovation will soon be felt by all scientists who wish to receive such report literature. Therefore, the scientists of the shielding community should prepare to deal with the microfiche by investigating the reading equipment that is now on the market.

INTERNATIONAL MEETING ON COMPUTING METHODS HELD AT ARGONNE NATIONAL LABORATORY

The Mathematics and Computations Division of the American Nuclear Society, the Argonne National Laboratory, and the European Nuclear Energy Agency are jointly sponsoring an international meeting on the subject "Applications of Computing Methods to Reactor Problems." The meeting will be held at ANL on May 17-19, 1965. One item of interest is a paper given jointly by M. Butler (ANL), J. Rosen (ENEA, Ispra), and Betty Maskewitz (RSIC-ORNL) on the subject "Activities of the ANL-ENEA Code Libraries and the ORNL Shielding Center."

THE SHIELDING COMMUNITY NEEDS YOUR INFORMATION

It is obviously impossible for RSIC to be aware of every piece of shielding literature or of available computer codes for shielding calculations. Therefore, to ensure that your information is made known to the shielding community through RSIC, we request that you assume the responsibility of informing us about it, either by mailing us a copy of your report or by advising us by letter.

MISCELLANEOUS POLICIES AND SERVICES OF RSIC

RSIC is not a documentation center. The literature selected by RSIC may be obtained in general elsewhere.

RSIC maintains files of preliminary or informal publications which generally are not selected to be placed in RSIC bibliographies. These publications include proceedings of symposia, transactions of societies, letters to the editor, progress reports, strictly internal reports, etc. Also, RSIC maintains an archival microfiche file of all the shielding literature (except classified literature) and files of full-size copies of the literature, although no attempt is made to ensure complete coverage since the microfiche file does ensure complete coverage.

FEBRUARY 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.

Reactor Shielding

Nuclear Structural Engineering, 1(1), 108-117 (January 1965)

A Gam-Neu Viewing Window Design
T. E. Northup

Nuclear Structural Engineering, 1(1), 118-126 (January 1965)

High Water Content Shielding Concrete with Iron and Bauxite Aggregates
Gy. Kunszt

Nuclear Structural Engineering, 1(1), 127-131 (January 1965) Translation requested

Quelques Experiences Relatives a La Protection Des Piles A Graphite Refroidies Au Gaz Et Comparaison Avec Le Calcul
P. LaFore

Nuclear Science and Engineering, 21(2), 194-200 (February 1965)

Backscattering of Gamma Rays from Point Sources by an Infinite-Plane Concrete Surface
A. B. Chilton

REIC Report No. 3

The Effect of Nuclear Radiation on Elastomeric and Plastic Materials
N. J. Broadway, M. A. Youtz, M. L. Zaring, and S. Palinck -- May 31, 1958

NARF-61-4T

The Angular Distribution of Gamma Rays Resulting from Neutron Capture in Air
R. E. Beissner -- April 14, 1961

NARF-56-40T

Analysis of Penetration of Co^{60} Gamma Rays Through Rubber Slabs
H. B. Vanfleet, F. B. House and M. L. Coffman -- November 1956

NARF-57-60T

Co^{60} Gamma Dose Measurements Inside Cylindrical Shields
D. G. Anderson -- December 1957

Health Physics, 1, 390-404 (1959)

Penetration of Weapons Radiation: Application to the Hiroshima-Nagasaki Studies
R. H. Ritchie and G. S. Hurst

Nuclear Science and Engineering, 4(4), 536-545 (October 1958)

Production Cross Section of N^{16} and N^{17}
Paul A. Roys and Kalman Shure

AWRE O-77/64

Neutron Cross Sections of Natural Titanium in the Energy Range 0.001 eV - 18 MeV -- Incorporation of United Nuclear Corporation Data in the UKAEA Nuclear Data Library
Susan M. Miller and K. Parker -- October 1964

AWRE O-37/64

Neutron Cross Sections of U-234 in the Energy Range 1 keV - 15 MeV
K. Parker -- July 1964

AN-1321

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

PSDC-TR-8

Expedient Community Fallout Shelter Wood Frame Semi-Buried
Protective Structures Development Center - December 30, 1964

RRA-T47

A Monte Carlo Study of Neutron Transport Through Aluminum, Polyethylene, and Carbon Slabs
M. B. Wells -- December 30, 1964

Bulletin 471 (University of Illinois Engineering Experiment Station)

Backscattering for Gamma Rays from a Point Source Near a Concrete Plane Surface
Arthur B. Chilton

USNCEL-R-354

Fast Neutron Streaming through Two-Legged Concrete Ducts
Y. T. Song -- February 2, 1965

NASA-TN-D-2549

Finite Geometry Corrections to Gamma-Ray Angular Correlation Measurements
Jag J. Singh and Chris Gross -- January 1965

ORNL-P-745

Radiation Dose Received by Passengers and Crew on Planes Carrying Radioisotope Shipments
H. H. Abee and D. M. David -- 1961

ORNL-3756

Neutron Flux Spectra in the Experimental Facilities of the Oak Ridge Research Reactor
C. D. Baumann -- January 1965

U. S. Patent 3,148,280

Nuclear Radiation Shields for Electronic Components
Eugene V. Kleber and Alfred R. Bobrowsky -- September 8, 1964

LA-3158-MS (C)

Radiation Heating Rate Estimates for a Phoebus Reactor
Clayton W. Watson and Donald M. Peterson -- May 1964

IFA-MR-24

Determination of the Hydrogen Content from Materials by Means of Neutron Sources
I. Apostol and M. Oncescu -- 1964

DLCS-3410122

Reactor Plant External Radiation Levels. Core 1. Seed 4. Test Evaluation
Duqueane Light Company -- August 25, 1964

AWRE O-91/64

Neutron Cross Sections of Pu-240 in the Energy Range 1 keV to 15 Mev.
A. C. Douglas -- January 1965

AWRE O-79/64

Neutron Cross Sections of Pu-239 in the Energy Range 1 keV to 15 Mev.
A. C. Douglas and J. F. Barry -- January 1965

BOOK

Nuclear Radiation Detectors (2nd Edition)
J. Sharpe

BOOK

The Propagation of Gamma Quanta in Matter (I. S. M. on Nuclear Energy, Division X: Reactor Design Physics)
O. I. Leipunskii, B. V. Novozhilov, and V. N. Sakharov

IEA-74

Calculation of the Neutron and Gamma-Ray Distribution in the EBWR Radial Shield at 100 MW Operation
Wilma Sonia Hehl -- November 1964

DCRL Report No. 310A

Gamma Dose in a Hole in a Uniformly Contaminated Plane: Contribution by Ground Penetration
C. E. Clifford

TRG-844

Measurement of Gamma Heating in D.F.R.
R. Dehn -- September 28, 1964

PWAC-445

Preliminary Design of the 2 Mwt Reactor and Shield (PWAR-20) for the SNAP-50/Spur Powerplant
H. J. Banach -- December 30, 1964

SAM-TDR-64-14

Scattered Radiation from a Cobalt-60 Source in a Brick Structure
Roger W. Cochran -- June 1964

P-157 (AD-603883)

Scattering and Absorption of Gamma Rays
M. S. Plesset and S. T. Cohen -- June 1, 1950

NP-14603

Data from Radiation Protection Programs, Vol. 2, No. 11
Dept. of National Health and Welfare, Ottawa, Canada -- November 1964

BNL-897

Neutron Cross Section Evaluation Group - Analysis of (n,2n) Cross Sections for Nuclei of Mass A > 30
S. Pearlstein -- December 1964

DASA-1251, Vol. II, Supplement (SECRET)

Local Fallout from Nuclear Test Detonation Volume II. Compilation of Fallout Patterns and Related Test Data. Supplement-Foreign Nuclear Tests
Manfred Morgenthau and Richard L. Showers -- October 1964

AFWL-TDR-64-85, Vol. I (SECRET)

Close-Up. A Computational Model to Determine the Nuclear Radiation Environment from Prompt Weapon and Fission Products Gammas, and Fast Neutrons, Volume I.
E. N. York, L. M. Contreras, et al. -- November 1964

AFWL-TDR-64-85, Vol. II (SECRET)

Close-Up. A Computational Model to Determine the Nuclear Radiation Environment from Prompt Weapon and Fission Product Gammas, and Fast Neutrons, Volume II -- Operator's Manual
E. N. York, N. D. Landay, et al. -- November 1964

NAVWEPS Report 8293

Basic Neutron Transport Computation for Determining Neutron Effects on Nuclear Weapons Systems
John L. Abbott and Robert L. Berger -- July 31, 1964

REIC Report No. 37

The Space-Radiation Environment and Its Interactions with Matter
E. R. Leach, B. P. Fairand, and L. H. Bettenhausen -- January 15, 1965

AFWL-TDR-64-95

Advanced Shielding Technology for NAP Applications
E. E. Jones, and F. O. Leopard -- December 1964

NDA-2117-1 (SECRET)

Design and Analysis of a Crew-Compartment Shield for a Radiation-Resistant Combat Vehicle. Final Report
D. Spielberg -- October 15, 1959

DP-Report 296

Final Shielding Report for the Dragon Reactor Experiment
D. B. Crawley and O. R. Owen -- September 1964

Health Physics, 5, 79-85 (1961)

Early Time Decay of Fission Product Mixtures -- II. γ-Energy Release and Ionization Rates Following Thermal Neutron Fission of U^{235}
P. Zigman and J. Mackin

TIM-884

Evaluation of Hot Laboratory Shielding Windows for SNAP-50/SPUR Fuel Assembly Examination
J. R. Smolen -- January 15, 1965

J. of Nuclear Energy, Parts A/B, 18 (12), 665-701 (December 1964)

Multiple Collision Method for Neutron Transport Problems
T. Asaoka, Y. Nakahara and K. Saito

Acta Radiol. Therapy, Phys., Biol. (N.S.), 2:353-64 (October 1964)

Scattering of Uncollimated Cobalt 60 Gamma Radiations by Concrete and Lead Barriers.
W. H. Henry and C. Garrett

British Patent 968, 216

Improvements in or Relating to Shielding Construction for Nuclear Reactors
Donald Young -- September 2, 1964

Jaderna Energie 10:281-7 (August 1964) Translation requested

Reactor Neutron Shield Without Hydrogen
Boris Rafailovic Bergelson

EUR-1888.d

Shielding Calculations for the OM-Ship-Reactor
H. Wagner and H. Henssen -- 1964

German Patent 1,176,289

Shielding Arrangement for Nuclear-Powered Vehicles
Harry N. Schludi -- August 20, 1964

Space Shielding

NAS-NRC-PUB-1133

Studies in Penetration of Charged Particles in Matter.
National Research Council. Committee on Nuclear Science -- 1964

Proceedings of the Sienna International Conference on Elementary Particles, Vol. I, p. 498-505 (1965)

Peripheral Effects in Photoproduction of Charged Pions in the 2-6 Bev Range
R. Blumenthal, W. Faissler, P. Joseph, L. Lanzerotti, F. Pipkin, D. Stairs, J. Ballam, H. DeStaebler, and A. Odian

CEAL 1012

Research with 6-Gev Cambridge Electron Accelerator
M. Stanley Livingston -- October 6, 1964

MIT-2098-79

Multiple Pion and Strange Particle Production in γ-Ray-Proton Reactions Between 0.5-4.8 Bev.
Y. Eisenberg, M. Widgoff, A. E. Brenner, L. Guerriero, G. E. Fishcher, et al. 1964

NASA-CR-56934

Some Remarks on Induced Radioactivity
M. Barbier -- February 1964

Trans. Am. Nucl. Soc. 7:322-3 (November 1964)

Electron Shielding for Space Vehicles
B. W. Mar

Am. Inst. Aeron. Astronaut., 2:1835-8 (October 1964)

Plasma Radiation Shielding
Richard H. Levy and G. Sargent Janes

Space Physics, p. 659-704

Cosmic Rays in Space
Alan Rose and Joseph L. Vogl -- 1964

International Conference on Cosmic Rays, Vol. I, p. 43-69

The Composition of Solar Particle Radiation
S. Biswas -- 1964

NASA-CR-148

Cosmic Ray Collisions in Space Part I - The Energy Spectra of Electrons from Pion-Muon-Electron Decays in Interstellar Space
Joseph H. Scanlon and S. N. Milford -- January 1965

NASA-CR-149

Cosmic Ray Collisions in Space Part II - High Energy Gamma Rays from Cosmic Ray Collisions in Space
M. Lieber, S. N. Milford, and M. S. Spergel -- January 1965

NASA-CR-150

Cosmic Ray Collisions in Space Part III - Low Energy Protons from Cosmic Ray Collisions in Space
M. Ferentz and S. N. Milford -- January 1965

NASA-CR-151

Cosmic Ray Collisions in Space Part IV - Cosmic Ray Hazards in the Solar System
S. N. Milford -- January 1965

BNL-8717

Small Angle Elastic Scattering of High Energy Protons from Hydrogen
K. J. Foley, R. S. Gilmore, R. S. Jones, S. J. Lindenbaum, W. A. Love, S. Ozaki, E. H. Willen, R. Yamada, and L. C. L. Yuan

UCID-2437

Summary of Shielding Calculations Based on Texas A & M University 88-inch Cyclotron Specifications
William W. Wadman -- December 14, 1964

UCID-10134

Strongly Interacting Particle Shielding
R. H. Thomas -- November 13, 1964

UCID-10135

Estimates of Particle Fluxes and Dose Rates in 200-Gev Machine Room
R. H. Thomas -- November 10, 1964

DESY-64/11 Translation requested

The Shielding of 4.8 Gev Bremsstrahlung with Heavy Concrete
G. Bathow, E. Freytag, and K. Tesch -- August 1964

UCRL-11331

Radiation Field Inside a Thick Concrete Shield for 6.2-Bev Incident Protons
Alan R. Smith, Joseph B. McCaslin and Michael A. Pick -- September 18, 1964

UCRL-10980 (Revised)

Primary and Secondary Proton Dose Rates in Spheres and Slabs of Tissue
Roger Wallace, Palmer G. Steward, and Charles Sondhaus -- July 30, 1964