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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All fact-collectors, who have no aim beyond their facts, are one-story men. Two-story men compare, reason, generalize, using the labors of the fact-collectors as well as their own. Three-story men idealize, imagine, predict; their best illumination comes from above, through the skylight.

...Oliver Wendell Holmes (1872)

INTERNATIONAL SYMPOSIUM ON RADIATION PHYSICS (1974)
FIRST ANNOUNCEMENT

An International Symposium on Radiation Phvsics will be held at Bose Institute, Calcutta, India, from November 30 to December 4, 1974.

The developments of radiation physics in recent times and its application in various fields are proposed to be discussed in the symposium to serve as a forum of intercommunication between physicists specializing in a variety of subjects like neutron and gamma ray physics, reactor physics, accelerator physics, etc.

Intending participants are requested to contribute papers on the following topics:

Topics:

To realize the above objectives, the following are proposed to be discussed in the symposium:

a) Primary interactions of gamma rays with matter.
b) Transport of gamma rays through shields.
c) Interactions of fast and slow neutrons with matter.
d) Neutron transport through thick shields; Skyshine.
e) Charged particle interactions with special reference to the production of fast neutrons.
f) Recent trends in fast and slow reactor technology.
g) Shielding of low and medium energy accelerators.
h) Radiation shielding materials.
i) Instrumentation in radiation physics.

A number of invited review papers on the subject matter proper of the symposium, along with a few semi-technical lectures on related areas are proposed to be delivered during the sessions.

Submission of papers:

Abstracts of papers, preferably written in English, should be sent before May 31, 1974. Complete papers should reach Calcutta latest by July 31, 1974.

The authors will be informed about the acceptance of their papers for presentation at the Symposium before October, 1974. The abstracts should be limited to 600 (six hundred) words.

Address for correspondence and submission of papers : Prof. A. M. Ghose
Head, Dept. of Physics
93/I, Acharya Prafulla Chandra Road
Calcutta - 700 009, INDIA

CHANGES TO THE CODE COLLECTION

The following changes were made to the code collection during March. Changes to existing code packages are described, as well as new additions. Unless otherwise noted, requests should be accompanied by a full reel of magnetic tape.

CCC-231/FRCRL2 — Calculation of Fission-Product Release in Reactor Accident Analyses. The code calculates the cumulative fractional release of fission products from nuclear fuel under postulated loss-of-coolant accident conditions. Battelle Columbus Laboratories. Reference: BMI-1913. FORTRAN IV, CDC 6400.

CCC-82C/ANISN
CCC-82D/ANISN-W — W. W. Engle, Oak Ridge National Laboratory, has contributed subroutine FFPUN which punches arrays of floating point data in a form suitable for free form FIDO input. CCC-82C, IBM 360; CCC-82D, CDC 6600.

DATA LIBRARY COLLECTION CHANGES

DLC-23/CASK — 40-Group Coupled Neutron and Gamma-Ray Cross Section Library has been updated to correct an error in the neutron group 9 iron data. The change was recommended by Jim West, Babcock and Wilcox. In addition, new data sets were generated using AMPX and more recent data for Ni and Cr to replace the ones that were originally in the library. The new version is designated DLC-23D.

DLC-29/MACKLIB — 100-Group Neutron Kerma Factor and Reaction Cross Section Library for Many Materials of Interest in CTR Neutronics. Generated by PSR-52/MACK from data in ENDF format. SUPREM program edits or converts MACKLIB data to forms suitable for input to ANISN or DTF-IV. Contributed by University of Wisconsin and Oak Ridge National Laboratory.

DLC-30/DECAYREM Radioactive Decay Data in EXREM Format. Decay constant, decay chain branching, beta-ray, photon, positron, conversion and Auger electron energies and emission probabilities are the data compiled for nearly 200 nuclides of interest when assessing nuclear power plant and fuel cycle environmental impact. Oak Ridge National Laboratory, contributor. Ref. ORNL-TM-4322 and informal notes.

CHANGES TO THE DNA WORKING CROSS SECTION LIBRARY

A gamma-ray production cross section evaluation has been supplied for fluorine and modifications have been made to four tungsten isotopes, to copper, and to silicon.

Fu and Perey of ORNL have supplied a partial evaluation containing gamma-ray production data only for fluorine. It is designated MAT 4509 MOD 0 F.

The changes to the other evaluations are summarized below.

Tungsten 182 MAT 4582 LASL

MOD 2 March 1974

Capture gamma-ray multiplicites and spectra below 0.5 eV were changed to agree with Jurney's thermal measurement.

Tungsten 183 MAT 4583 LASL

MOD 2 March 1974

Tungsten 184 MAT 4584 LASL

MOD 2 March 1974

Tungsten 186 MAT 4586 LASL

MOD 2 March 1974

Same as for MAT 4582.

Copper MAT 4529 SAI

MOD 2 March 1974

Excitation functions for inelastic scattering to the 0.962 MeV level in Cu-63 and to the 1.115 MeV level in Cu-65 were increased in the incident energy range 3.5 to 10 MeV to better agree with new ORNL data of Kinney et al. The elastic cross section was adjusted to accommodate this change.

Legendre coefficients for elastic scattering were added at 5.5 and 8.5 MeV based on above reference.

Photon production data were incorporated based on ORNL results by Dickens et al., ORNL-4846. In file 13, all photon production is given under MT=3. In files 12 and 15, below 1.25 MeV, photon production from radiative capture is retained separately under MT=102. At higher neutron energies, all photon production is given in file 15 under MT=3.

Silicon MAT 4151 ORNL

MOD 3 February 1974

Inelastic scattering files were revised based on recent data, Hauser-Feshbach, and direct interaction models.

The tertiary reactions (n,np), (n,pn),(n,nα), and (n,αn) have been included and the energy distributions for outgoing neutrons and charged particles are given.

Cross sections, angular distributions, and energy distributions have been given for charged particles from the (n,p) and (n,α) reactions.

The gamma-ray production files have been revised using calculations based on recent data of Dickens et al. at ORNL.

PERSONAL ITEMS

K. L. (Kevin) Rooney, R. S. (Bob) Hubner, E. (Gene) Normand, and *G. P. (Gerry) Lahti*, with Nuclear Safeguards and Licensing Division, Sargent and Lundy, have moved to 55 E. Monroe Street, Chicago, Illinois 60603.

Christian Devillers, formerly at Fontenay-aux- Roses, near Paris, France, is now at Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette.

Jess Greenborg is now with Battelle Pacific Northwest Laboratories, Richland, Washington. He formerly was at the Donald W. Douglas Laboratories.

John R. Uglum is now with Simulation Physics, Inc., Burlington, Massachusetts 01803.

Capt. Ronald E. Schaffer is now Chief, Training Division, U. S. Army Engineer Power Group, Ft. Belvoir, Virginia.

Austin O'Dell, formerly with Mission Research, is now employed in the Special Projects Division "Z", Lawrence Livermore Laboratory.

FOURTH SYMPOSIUM ON THE SHARING OF COMPUTER PROGRAMS AND TECHNOLOGY IN NUCLEAR MEDICINE
May 10-11, Oak Ridge, Tennessee

Sponsored by the Society of Nuclear Medicine, Oak Ridge National Laboratory, Vanderbilt University, and Oak Ridge Associated Universities, the Symposium will feature discussions on the present status of work in various laboratories on selected topics such as (1) Brain, (2) Heart, (3) Kidney, (4) Thyroid, (5) Lung, (6) Inventory Control, and (7) Study Report Generation. Participants will discuss what they have found useful, problems encountered, and unsolved problems. The Proceedings will be published. For further information and for instructions for prospective authors, please write to SNM Computer Committee, Radiation Shielding Information Center, Oak Ridge National Laboratory, P. O. Box X, Oak Ridge, Tennessee 37830, or call 615-483-8611, extension 3-6944; (for FTS 615-483-6944).

VISITORS TO RSIC

Visitors to RSIC during the month of March were: P. M. Anselone, Oregon State University, Corvallis; G. Foster and P. Young, Los Alamos Scientific Laboratory, Los Alamos, N.M.; H. W. Morton, Nuclear Fuel Services, Inc., Rockville, Md.; G. G. Thern, CNEA, Buenos Aires, Argentina; L. Schanzler, The Proving Ground #53, Muenster, Germany; J. J. Shonka, Georgia Institute of Technology graduate student, at present with Health Physics Division, ORNL.

MARCH ACCESSION OF LITERATURE

The following literature cited has been ordered for review, and that selected as suitable will be placed in the RSIC Information Storage and Retrieval Information System (SARIS). This early announcement is made as a service to the shielding community. Copies of the literature are not distributed by RSIC. They may generally be obtained from the author or from a documentation center such as the National Technical Information Service (NTIS), Department of Commerce, Springfield, Virginia 22151.

RSIC maintains a microfiche file of the literature entered into SARIS, and duplicate copies are available on request. Naturally, we cannot fill requests for literature which is copyrighted (such as books or journal articles) or whose distribution is restricted.

Special bibliographies and selected computer-printed abstracts of the literature in the RSIC system are available upon request. The Selective Dissemination of Information (SDI) Service is available by submitting a list of subject categories defining the recipient's interests.

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Application of Jacobi Polynomial Methods to the One-Speed Transport Equation.
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Role of Electrically Produced Neutrons in Nuclear Power Generation.
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Derivative of the Scatter-Air Ratio in Dose Calculations for Filtered Cobalt-60 Fields.
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Design of a Suitable Shield for a 14.3 MeV Neutron Generator.
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Implications of Commission Recommendations that Doses be Kept as Low as Readily Achievable. A Report of ICRP Committee 4 Adopted by the Commission in April,1973.
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Nitrogen Neutron Elastic and Inelastic Scattering Cross Sections from 4.34 to 8.56 MeV.
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Concrete Radiation Shields for Nuclear Power Plants.
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Understanding Resonance Self-Shielding Effects with the Help of a Simplified Cross-Section Model.
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