

RSIC Newsletter



RADIATION SHIELDING INFORMATION CENTER

OAK RIDGE NATIONAL LABORATORY

OPERATED BY UNION CARBIDE CORPORATION • FOR THE U.S. ENERGY RESEARCH
AND DEVELOPMENT ADMINISTRATION

POST OFFICE BOX X •
OAK RIDGE, TENNESSEE 37830

no. 139

July 1976

Maturity of man goes from cocksure ignorance to thoughtful uncertainty.

...Prof. Dr. von Sandmeier

DEATH OF AN OLD FRIEND

It is always with a sense of loss that we contemplate the death of old friends. In this case, it is not merely a publication but an institution which has died. Since 1950 *Nuclear Science Abstracts* (NSA) has been the prime organizer of information in the world of nuclear science and engineering. Since RSIC started in 1962, the resources provided by NSA (abstracts, indices, SDI, accession lists) have been the main resource for the RSIC literature information system and information on computer codes and data. Many people have been helpful in providing copies of their reports and articles, or notifying us of their publication, but most of the time we have had to rely on our own efforts in searching NSA and other sources to make our files as complete as possible.

Fortunately, we are not left without an abstract journal in nuclear science; there is reason to expect INIS *Atomindex*, published by IAEA, to fill the void. In fact, *Atomindex* contains abstracts now for most entries. However, so far, we have not learned to find the shielding abstracts in *Atomindex* as successfully as in NSA. Therefore, **we earnestly request that authors remember to place us on their distribution list** for material that may be within our scope. If all authors did this, we could provide an improved information service to directly benefit each researcher who inquires.

ORNL/RSIC-13, VOL. IV AVAILABLE

The "Abstracts of Digital Computer Code Packages Assembled by the Radiation Shielding Information Center" by Betty McGill, Betty F. Maskewitz, C. Marie Anthony, Hemma E. Comolander, and Henrietta R. Hendrickson, ORNL/RSIC-13, Vol. IV (169-263, January 1976) is currently being mailed to those who reserved copies. A limited number of copies are still available from RSIC. Volume IV is also available from NTIS, Springfield, Virginia for \$7.75/printed copy and \$2.25/microfiche.

HANDBOOK AVAILABLE

The "Handbook of Radiation Shielding Data" edited by Jack Courtney will be available from the Louisiana State University Bookstore after July 1, 1976. This 200-page document in loose-leaf format is made up of contributions on units and conversions, neutron and photon attenuation, and radiation protection. It was sponsored by LSU and the Shielding and Dosimetry Division of the American Nuclear Society. It carries the document number ANS/SD-76/14. The cost is \$7.00 postpaid for single copies, with library and bookstore discounts available. It may be ordered by title or number from: LSU Bookstore, Union Building, Baton Rouge, Louisiana 70893.

CHANGES IN THE DATA COLLECTION

THE DNA WORKING CROSS SECTION LIBRARY

The Ta-181 evaluation was modified and the new version is designated DNA MAT 4285 Mod 1. The changes are summarized as follows:

Ta-181 MAT 4285 LLL Mod 1 December 1975

Corrections were made to total elastic, and inelastic scattering as well as to the photon and electron production cross sections.

IF YOU CHANGE YOUR ADDRESS, please notify us (including Building and Room No. where needed). *Third Class Mail* is returned to us at our expense if the addressee has moved. If your mail is returned, your name will be deleted from our distributions until we hear from you.

DLC-31/(DPL-1/FEWG1)

The Defense Nuclear Agency Group Cross Section Library has recently been updated with additional data sets, sources, and responses. The 37 neutron, 21 gamma-ray group, P3, cross section data in ANISN format, produced with AMPX and tested at ORNL, are particularly suited to solving problems of basic interest to the defense community. The sources of the data are the DNA Working Cross Section Library and ENDF/B-IV. Multigroup cross sections are provided for H, H-3, Li-6, Li-7, Be-9, B-10, B-11, C-12, N, O, F, Na, Mg, Al, Si, Cl, K, Ca, V, Cr, Mn, Fe, Ni, Cu, Mo, Ta-181, W-182, W-183, W-184, W-186, Pb, U-235, U-238, Pu-239, and Pu-240. In addition to the cross section data, a rather extensive set of commonly used sources and response functions are included.

The updated version is designated DLC-31/(DPL-1D/FEWG1). Requests should be accompanied by a full reel of magnetic tape. Reference: ORNL/TM-4840.

CHANGES TO THE CODE COLLECTION**CCC-279/RAFFLE**

This general purpose Monte Carlo code with mixed zone geometry option was contributed by Aerojet Nuclear Co., Idaho Falls, Idaho. References: ANCR-1022 and ANCR-1206. FORTRAN IV and Assembler Language, IBM-360.

CCC-278/SPOOR

The June Newsletter referenced CCC-278/SPOOR erroneously as LA-6130. The correct reference number is LA-6103.

RSIC STAFF CHANGES

Diana Humphreys has joined the RSIC secretarial team, replacing Martha C. Abrams who has returned to the University of Tennessee as a fulltime student. Ms. Humphreys, a graduate of Draughon's Business College, Knoxville, was formerly associated with the University's School of Business Administration as a bookkeeper.

Betty L. McGill, formerly part-time, is now giving full time to coordinating activities associated with the RSIC codes collection.

ANS SHIELDING GROUP NEWS

The *Shielding and Dosimetry Division* of the American Nuclear Society has received approval from the Society for a name change to *Radiation Protection and Shielding Division (RP&S)* according to an announcement made by Chairman E.A. Straker on June 17th during the ANS Toronto meeting.

The 1976-1977 Chairman, Fred Mynatt, named the following persons to lead in committee responsibilities for the coming year: A. B. Chilton, Honors and Awards; R. W. Roussin, Membership; D. E. Bartine, Program; G. P. Lahti, Publications; Betty F. Maskewitz, Representative to Professional Divisions Committee; and D. K. Trubey, Nominations.

Four members of the Division were elevated to fellow grade of the Society: A. (Tony) Foderaro, W. E. (Bill) Kreger, E. A. (Ed) Straker, and D. K. (Dave) Trubey.

A special session on Radiation Protection Aspects of the Fuel Cycle is planned for the ANS Washington meeting, November 1976. Three special sessions are planned for the ANS meeting in New York, June 1977:

- 1) Recent Developments in Radiation Transport for Shielding—H. Goldstein, organizer;
- 2) Radiation Protection and Shielding Aspects in Reactor Safety Analyses—P. Soran and G. Lahti, organizers; and
- 3) Nuclear Data Assessment and Processing for Shielding Applications—D. Bartine, R. McFarland and C. Weisbin, organizers.

The Division co-sponsoring with the Las Vegas Local ANS Chapter a topical meeting on *Aerial Techniques for Environmental Monitoring*, March 7-11, 1977 in Las Vegas, Nevada. Further information will appear later in *Nuclear News*.

ANS-6 REPORT

D. K. Trubey, Chairman, ANS-6 Shielding Standards Sub-Committee reports progress

The ANS Standards Steering Committee in action at Toronto approved a change in name for ANS-6 from *Shielding* to *Radiation Protection and Shielding*. In addition the committee approved a revised scope which reads as follows:

The purpose of this committee is to establish standards in connection with radiation shields, radiation analysis, and radiation protection insofar as it affects design of structures or equipment containing or near radiation sources, to

provide shielding information to other standards groups, and to prepare and make available recommended related nuclear data and test problem solutions.

Reports of the Working Groups:

ANS-6.1.1

The "flux-dose-rate" standard (N666) has been balloted by N17 and resolution of the comments is being made. The proposed standard is being processed by the ANSI Board of Standards Review and formal submittal is scheduled for August.

ANS-6.1.2

Additional members of the group charged to select reference cross section data (N410), Don Harris, Chairman, have been recruited. The group met for the first time at Toronto.

ANS-6.3

The group revising ANSI 18.9-1972 (testing of reactor shields) has a draft ready for ANS-6 preliminary review.

ANS-6.4

The proposed standard on concrete shields (N403) has been sent to N17 for balloting.

ANS-6.5

Additional members of the group preparing the shielding glossary (N404) have been recruited. The group met in Toronto for intense work on the present draft.

ANS-6.6

The group preparing the proposed standard on direct and scattered radiation in nuclear plants met in March. The latest draft was ready for ANS-6 preliminary review at the Toronto meeting.

ANS-6.7

Work continues within the committee on the preliminary draft of the proposed standard on radiation zoning of plants.

ANS-6.8

The working group on radiation area monitoring has been in communication with other groups to assure no overlap of proposed standards. The new scope was presented to the Standards Steering Committee in Toronto for approval.

The *Ad Hoc* Committee on SI Units is preparing guidelines to assist ANS-6 standards writers in the use of SI units.

FIFTH INTERNATIONAL CONFERENCE ON REACTOR SHIELDING

Time is growing short for submitting an abstract to the Technical Program Committee of the Fifth International Conference on Reactor Shielding. The deadline is August 20. The abstract, less than 300 words in English, should be sent to S.A.W. Gerstl, Technical Program Committee, T-1, MS-269, LASL, P.O. Box 1663, Los Alamos, New Mexico 87545.

The conference scope, listed in detail in the April issues of *Nuclear News* and the *RSIC Newsletter* covers radiation shielding: analysis, design, data, measurements, damage and radiation protection: exposure, sources, activation, instrumentation.

The Technical Program Committee met in Toronto in June to continue their planning. Invited speakers are being sought to review the major technical areas.

An information pamphlet on the conference is being prepared and will be sent to all who express interest in the conference. If you are interested in attending, please send your name and address to D. K. Trubey, Chairman Fifth Conference, RSIC, Oak Ridge National Laboratory, P.O. Box X, Oak Ridge, Tennessee 37830.

VIENNA MEETING ON SHIELDING DATA

A jointly sponsored (International Atomic Energy Agency *IAEA* and OECD Nuclear Energy Agency *NEA*) Technical Committee Meeting on "Differential and Integral Nuclear Data Requirements for Shielding Calculations" will be held at IAEA headquarters in Vienna, Austria on October 12-16, 1976. Invitations have been issued to governments, and attendees must be nominated through official channels. Information for participation may be secured from J. E. Ammons, IAEA Branch Chief, ERDA Office of International Program Implementation (IP1) (for U.S. citizens) or from IAEA, P.O. Box 590, A-1011 Vienna, Austria. Participation will be limited to about 40 specialists in the field. Costs of participation will be paid by each attendee.

The objectives of the meeting are:

- 1) to review the overall requirements for basic nuclear data as indicated by the results of the sensitivity studies on typical shielding problems;
- 2) to ascertain whether these requirements are met by existing evaluations of differential data; if not, whether:
 - a) adjustment of the existing differential data utilizing integral benchmark information will suffice to meet these requirements in practice,
 - b) new differential measurements or new evaluations of existing measurements will be required, in which case a preliminary request list should be compiled;
- 3) to review the methodology of sensitivity analysis for shields of complicated geometry and to initiate further studies of practical generic designs that highlight this aspect of the problem;
- 4) to review new developments in the continuing program of benchmark experiments, including intercomparison of results; and
- 5) to communicate with nuclear data evaluators and measurers via the existing committee structure for the modifications to be subsequently made to the preliminary request list.

The agenda will include papers on the following subjects:

1. Review of NEA sensitivity benchmark calculations: PWR—Two-dimensional model, FBR—One-dimensional model, and new developments in methodology of sensitivity analysis.
2. Sensitivity studies on practical shield designs including consideration of target accuracies and their implications: fast, reactors, water reactors (PWR and BWR), pressure tube reactors, high temperature reactors, fusion reactors and experimental CTR assemblies.
3. Shielding benchmark experiments: results in NEA standard format, other experimental results, analyses of experiments and their implications with respect to existing nuclear data.
4. Status of existing data files: neutron total cross sections, neutron inelastic scattering cross sections including angular distributions, capture and activation cross sections, gamma-ray production data including fissile and fertile materials, and error files in ENDF/B.
5. Preliminary considerations leading to a revised data request list for shielding: format, review of accuracy requirements, and possible routes for meeting these requirements: a) utilization of existing data with bias factors or coarse-group adjustments based on integral experiment for design applications, b) re-analysis of existing benchmark experiments to validate latest available data, c) design and execution of new integral benchmark experiments, d) requests for new evaluations of existing differential data and/or error files, and e) request for new differential measurements.
6. Common ground between fission reactor requirements and those for fusion reactors including experimental CTR assemblies: calculational techniques, multigroup data sets, and materials and cross-section parameters of common interest.

Participants wishing to present papers should submit 3 copies of a 300-word summary, in English, *before 23 July 1976* to: Mr. A. H. Spano, IAEA, or to Dr. N. Tubbs, OECD Nuclear Energy Agency, 38 Boulevard Suchet, F-75016 Paris, France.

The summary should indicate the *session category of the paper* (see above). All summaries received by the deadline will be promptly forwarded to the Program Committee for consideration. Authors of accepted papers are requested to send *before 17 September 1976* 60 copies of the final, full text of their paper, plus a photo-ready master copy for use in the publication of the proceedings, to the IAEA Secretariat. The copies of the papers received will be made available for distribution to the participants at the beginning of the meeting. All papers presented for discussion at the meeting will be included in the proceedings to be published by the IAEA.

ORNL THERMONUCLEAR DIVISION ANNUAL INFORMATION MEET

An overview, summary of programs, and several invited talks will comprise the agenda as the Oak Ridge National Laboratory Thermonuclear Division convenes for its annual information meeting on July 14-16 in Oak Ridge. As in prior years, a poster board will feature highlights of the several programs.

J. F. Clarke will give the overview and the following subjects will be covered: "Plasma Theory" by J. D. Callen, "ORMAK" by L. A. Berry, "EBT" by R. A. Dandl, "Plasma Heating and Fueling" by L. D. Stewart,

"Magnetics and Superconductivity" by M.S. Lubell, "Large Coil Program" by P.N. Haubenreich, "Fusion Reactor Technology" by D. Steiner, and "EPR-TNS" by M. Roberts. Invited papers are as follows: "Neutral Injection Results in ORMAK" by J. N. Lyon, "Experimental Measurement of Heat Diffusivity in a Tokamak" by G. L. Jahns, "High Beta Flux Conserving Tokamak Equilibrium and Poloidal Magnetic Field Systems" by Y-K. M. Peng, "TNS Plasma Engineering Studies" by D. G. McAlees, "Analytic Aspects of Impurity Diffusion and Trapped Electron Modes" by K. T. Tsang, and "High-Energy Neutron Damage Studies" by R. B. Roberto.

RADIATION PHYSICS CONFERENCE HELD IN INDIA

The Indian National Symposium on Radiation Physics inaugurated by Dr. R. Ramanna, Director, Bhabha Atomic Research Center (BARC), was held on June 10-12, 1976 at Manasagangotri, University of Mysore, Mysore. There were 5 papers presented in the Symposium under the following categories: Accelerators, Basic Interactions, Radiation Transport, Radiation Dosimetry, Radiation Instrumentation and Standardization, and Planning of Radiation Laboratories.

In addition there was a Panel Meeting on Small Accelerators—Their Problems and Prospects. Twelve universities and national laboratories participated in the Symposium.

In Summing-up, Dr. A.K. Ganguly, Director, Chemical Group, BARC emphasized that Accelerator Centers should try to be self-supporting by expanding their activities to the industrial applications, and there is a clear need for better measurement and evaluation of the cross-sections of low energy photons (0.1 to 50 keV).

One of the Symposium highlights was the inauguration of the *Indian Society for Radiation Physics* to provide a forum for persons working in different aspects of radiation physics to communicate effectively with each other and through this process advance the science of radiation physics.

Manasagangotri, which is on the outskirts of the garden city of Mysore, provided a very good environment, and Prof. B. Sanjeevaiah and his team made excellent arrangements for the Symposium.

UPCOMING MEETING

The 2nd ANS International Topical Meeting, *The Technology of Controlled Nuclear Fusion*, will be held September 21, 22, 23, 1976 in Richland, Washington. The program consists of invited and contributed papers on technological engineering and environmental topics. The Sponsors include: Richland Section and Controlled Nuclear Fusion Division of the American Nuclear Society, Energy Research and Development Administration and Electric Power Research Institute. Further information is available from R. G. Clark, Battelle-Northwest, P.O. Box 999, Richland, Washington 99352; (509) 946-2529.

Fourth International Congress of the International Radiation Protection Association, April 24-30, 1977. Paris, France. Topics will include all aspects of radiological protection. These include biological effects of radiations, radioecology, radiotoxicology, dosimetry, instrumentation, radiation protection engineering, and protection standards in relationship to the generation of nuclear power, medical, commercial and research uses of ionizing and non-ionizing radiation and radioactive materials. Contributions dealing with comparison of the methods and results of radiation protection with those relative to other modern hazards will be included. Emphasis will be given to topics of current interest. Deadline for 300-word abstracts: July 1, 1976. Four-page papers: February 15, 1977. Contact: Mr. Gilbert Bresson, General Secretary, IRPA IVth International Congress, B.P. no. 33-92260, Fontenay aux Roses, France.

PERSONAL ITEMS

Jack Courtney of Louisiana State University Department of Nuclear Engineering is spending the summer working on shielding a neutron radiographic facility and on air monitoring problems at ANL-W, Idaho Falls.

James West, formerly with Babcock and Wilcox, Lynchburg, Virginia is now a member of the UCND Computer Science Division, Oak Ridge National Laboratory.

A. G. Holmes-Siedle has informed RSIC of his association with Fulmer Research Institute Ltd., Stoke Pages, Slough, Buckinghamshire, England. He is interested in radiation hardening in general and the Institute is specifically involved in the assessment of radiation effects.

The following changes of address have been noted: Lewis T. Smith from GE, Philadelphia to Electronics Division, Northrop Corporation, Hawthorne, California; Robert D. Wilson from University of Virginia, Charlottesville to Bendix Field Engineering Corporation, Grand Junction, Colorado; Martin M. Dresser from TRW, Redondo Beach to Science Applications Inc., La Jolla, California.

RSIC GRAB BAG

We offer the following extra copies of documents on a first-come basis. We will honor requests until the supply is exhausted. If you want to add to your reference shelf, please order by report number.

ORNL-TM-3941, *Verification of a New Method for Calculating and Measuring Generation Time in a Subcritical Fast Reactor*, A. R. Buhl and J. C. Robinson.

ORNL-TM-3957 (ENDF-176), *SDT6. Experiment on Secondary Gamma-Ray Production Cross Sections Arising from Thermal-Neutron Capture in Iron, Stainless Steel, Nitrogen, and Sodium*, R. E. Maerker.

ORNL-TM-3960, *The ORNL Benchmark Experiment for Neutron Transport in Thick Sodium*, R. E. Maerker, F. J. Muckenthaler, and C. E. Clifford.

ORNL-TM-3961, *Calculations of Neutron Flux Spectra Induced in the Earth's Atmosphere by Galactic Cosmic Rays*, T. W. Armstrong, K. C. Chandler, and J. Barish.

ORNL-TM-3974 (ENDF-177), *SDT7. Experiment on Secondary Gamma-Ray Production Cross Sections Averaged Over a Fast-neutron Spectrum for Iron, Stainless Steel, Oxygen, and Sodium*, R. E. Maerker.

ORNL-TM-5203 (ENDF-227), *SB2. Experiment on Secondary Gamma-Ray Production Cross Sections Arising from Thermal-Neutron Capture in Each of 14 Different Elements Plus a Stainless Steel*, R. E. Maerker.

ORNL-TM-4222 (ENDF-188), *SDT 11. The ORNL Benchmark Experiment for Neutron Transport Through Iron and Stainless Steel, Part I*, R. E. Maerker.

ORNL-TM-4223 (ENDF-189), *SDT 12. The ORNL Benchmark Experiment for Neutron Transport Through Sodium*, R. E. Maerker.

ORNL-TM-3984, *The Calculated Response of Albedo-Neutron Dosimeters to Neutrons with Energies < 400 MeV*, R. G. Alsmiller, Jr. and J. Barish.

ORNL-TM-3985, *Pion Dose Calculations*, T. W. Armstrong.

ORNL-TM-3989, *Report to the U.S. Nuclear Data Committee*, F. G. Perey.

ORNL-TM-4589, *Report to the U.S. Nuclear Data Committee*, F. G. Perey.

ORNL-TM-4007, *A Re-Evaluation of Vanadium Neutron and Gamma-Ray Production Cross Sections*, S. K. Penny and L. W. Owen.

ORNL-TM-4010, *The Absolute Neutron Spectrum Emerging Through a 15-1/4-in. Collimator from the TSR-II Reactor at the Tower Shielding Facility*, R. E. Maerker and F. J. Muckenthaler.

ORNL-TM-4032 (ENDF-180), *The Testing of Photon Production Data from ENDF/B-III Material 1135 (Aluminum)*, W. E. Ford, III.

ORNL-TM-4072, *Monte Carlo Calculations and Sensitivity Studies of the Time-Dependent Neutron Spectra Measured in the LLL Pulsed Sphere Program*, S. N. Cramer, R. W. Roussin, and E. M. Oblow.

ORNL-TM-4149, *Monte Carlo Analysis of an NE213 Detector*, S. N. Cramer.

ORNL-TM-4658, *Fast Reactor Experimental Shielding Progress Report for March 1974*, C. E. Clifford, F. J. Muckenthaler, and P. N. Stevens.

ORNL-TM-4462, *Calculated Particle-Production Spectra from π^- Captures in Tissue, Tissue-Equivalent Plastic, Silicon, and Germanium*, T. W. Armstrong and K. C. Chandler.

ORNL-TM-4499, *Calculations on Tissue Equivalence for Stopping π^- Mesons*, T. W. Armstrong and K. C. Chandler.

ORNL-TM-4530, *Calculations Related to the Application of Silicon Detectors in Pion Radiobiology*, Tony W. Armstrong and Kay C. Chandler.

ORNL-TM-4538, *Gamma-Ray Production Due to Neutron Interactions with Fluorine and Lithium for Incident Neutron Energies Between 0.55 and 20 MeV: Tabulated Differential Cross Sections*, J. K. Dickens, T. A. Love, and G. L. Morgan.

ORNL-TM-4544, *Gamma-Ray Production Due to Neutron Interactions with Magnesium for Incident Neutron Energies Between 0.8 and 20 MeV: Tabulated Differential Cross Sections*, J. K. Dickens, T. A. Love, and G. L. Morgan.

ORNL-TM-4464, *Gamma-Ray Production Due to Neutron Interactions with Zinc for Incident Neutron Energies Between 0.85 and 20 MeV: Tabulated Differential Cross Sections*, J. K. Dickens, T. A. Love, and G. L. Morgan.

ORNL-TM-4590, *Calculation of Residual Nuclei Production by a Beam of Negatively-Charged Pions Incident on a Tissue Phantom*, T. W. Armstrong and K. C. Chandler.

ORNL-TM-4614, *Calculation of the Response of Silicon Detectors of Finite Radius to π^- Mesons Stopping in Tissue*, Tony W. Armstrong and Kay C. Chandler.

ORNL-TM-4619, *Shielding Design Calculations for Ormak — F/BX*, T. A. Gabriel, R. T. Santoro, and W. W. Engle, Jr.

ORNL-TM-4638, *Comparisons of Predictions from Two Intranuclear-Cascade Models with Measured Secondary Proton Spectra at Several Angles from 62- and 39- MeV Protons on Various Elements*, H. W. Bertini, G. D. Harp, and F. E. Bertrand.

ORNL-TM-4696, *Comparison of the Cross-Section Sensitivity of the Tritium Breeding Ratio in Various Fusion-Reactor Blankets*, R. G. Alsmiller, Jr., R. T. Santoro, J. Barish, and T. A. Gabriel.

ORNL-TM-4754, *Shielding calculations for a 200-MeV Proton Accelerator and Comparisons with Experimental Data*, R. G. Alsmiller, Jr., R. T. Santoro, and J. Barish.

ORNL-TM-4762, *A Radiological Assessment of Radionuclides in Liquid Effluents of Light Water Nuclear Power Stations*, R. S. Booth, S. V. Kaye, and P. S. Rohwer.

ORNL-TM-5215, *The $\text{Cu}(n,x,\gamma)$ Reaction Cross Section for Incident Neutron Energies Between 0.2 and 20.0 MeV*, G. T. Chapman.

ORNL-TM-5224, *Iterative Solution of the Diffusion and Pl Finite Element Equations*, E. T. Tomlinson, J. C. Robinson, and D. R. Vondy.

ORNL-TM-5223, *SUR, A Program to Generate Error Covariance Files*, F. C. Difilippo.

ORNL-TM-4611, *Fast Reactor Experimental Shielding Progress Report for February 1974*, C. E. Clifford, F. J. Muckenthaler, and P. N. Stevens.

ORNL-TM-4550, *Critical Experiments and the 2200 m/sec Neutron Parameters*, R. Gwin.

ORNL-TM-4400, *Fast Reactor Analytical Shielding Progress report for March and April 1973*, F. R. Mynatt.

ORNL-TM-4482, *Fast Reactor Analytical Shielding Progress Report for September and October 1973*, F. R. Mynatt.

ORNL-TM-4442, *Calculations Pertaining to the Use of Fast (≤ 50 MeV) Neutrons in Cancer Radiotherapy*, R. G. Alsmiller, Jr. and J. Barish.

ORNL-TM-4459, *Experimentally Determined Neutron and Gamma-Ray Spectra from an Encapsulated Cm^{203} Power Source*, R. M. Freestone, Jr.

JUNE 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 of out-of-print reports may be 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))) di Service is available by submitting a list of subject categories defining the recipient's interests.

THIS LITERATURE IS ON ORDER. IT IS NOT IN OUR SYSTEM. PLEASE ORDER FROM NTIS OR OTHER AVAILABLE SOURCE AS INDICATED.

REACTOR AND WEAPONS RADIATION SHIELDING LITERATURE

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| <p>AEC-tr-7314, pp.1-8
Application of Monte Carlo Method in the Calculation of the Passage of Charged Particles Through Matter.
Mingaleev, G.S.; Terent'ev, B.M.
May 1975
Dep., NTIS \$10.60 complete document</p> | <p>AEC-tr-7314, pp.93-98
Investigation of the Form of Neutron Beams from Isotopic Neutron Sources.
Ponomarev, E.G.; Tyufyakov, N.D.; Shtan, A.S.; Yaskevich, V.S.
May 1975
Dep., NTIS</p> |
| <p>AEC-tr-7314, pp.9-14
Calculation of Absorbed Energy and Spectral Angular Distributions of Electrons for Passage Through a Plane Layer of the Irradiated Material by Electronic Computer.
Mingaleev, G.S.; Terent'ev, B.M.
May 1975
Dep., NTIS</p> | <p>AEC-tr-7314, pp.106-110
Sensitivity of Activation Analysis Using a Neutron Reaction with Neutron Energy of 14 MeV.
Shtan, A.S.; Nikolaenko, O.K.; Galstyan, I.N.; Sidorov, A.V.; Filippov, V.V.
May 1975
Dep., NTIS</p> |
| <p>AEC-tr-7314, pp.17-22
Problem of the Use of Multiple Scattering of Beta-Radiations in the Measurement of Film Thickness.
Mashinin, V.A.; Pravikov, A.A.
May 1975
Dep., NTIS</p> | <p>AEC-tr-7314, pp.209-217
Extended Source of Gamma-Radiation for Radiography.
Karavaev, S.P.; Sul'kin, A.G.; Firstov, V.G.; Yakshin, V.V.
May 1975
Dep., NTIS</p> |
| <p>AEC-tr-7314, pp.22-26
Measurement of Film Thickness by Combined Sources.
Pravikov, A.A.
May 1975
Dep., NTIS</p> | <p>AEC-tr-7314, pp.237-245
Graph-Analytical Method for Defining the Form of a Collimator for Convergent Irradiation on a Short Range Gamma-Therapeutic Apparatus.
Galina, L.S.
May 1975
Dep., NTIS</p> |

AEC-tr-7314, pp.246-255

Effect of the Radiation Source Size on the Shaping of the Dose Field in Remote Gamma-Therapy.

Galina, L.S.; Sul'kin, A.G.

May 1975

Dep., NTIS

AEC-tr-7315, pp.13-22

Radiation Shielding of Energy Generators Based on Beta- and Gamma-Emitting Isotopes.

Zharkov, V.A.; Rodionov, Yu.A.; Filatov, L.A.

1971

Dep., NTIS \$7.60 complete report

AECL-5177

Solution of Reactor Kinetics Problems Using Sparse Matrix Techniques in an Ode Integrator for Stiff Equations. Part I. Integration of Large Sets of Stiff Ordinary Differential Equations. Part II. Application to Reactor Kinetics Problems.

Carver, M.B.; Baudouin, A.P.

January 1976

NTIS (U.S. Sales Only)

AECL-5259

The Use of Averages and Other Summation Quantities in the Testing of Evaluated Fission Product Yield and Decay Data. Applications to ENDF/B(IV).

Walker, W.H.

January 1976

Dep., NTIS (U.S. Sales Only)

AECL-5388

Reducing Radiation Exposure in Candu Power Plants.

Legg, G.G.

January 1976

Dep., NTIS (U.S. Sales Only)

ANCR-1299

Status of Beta- and Gamma-Decay and Spontaneous Fission Data from Transactinium Isotopes.

Reich, C.W.

April 1976

Dep., NTIS

ANL/CTR/TM-64

Prototype Experimental Power Reactor Preliminary Considerations.

Stacey, W.M., Jr.; Bolta, C.C.; Kustom, R.L.; Maroni, V.A.; Mills, F.E.; Wang, S.T.

April 1, 1976

CTR Program, Argonne National Laboratory, Argonne, Ill.

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