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. 136 *April 1976*

Good judgment is the result of experience; Experience is the result of poor judgment.

...Prof. Dr. von Sandmeier

CONFERENCE ANNOUNCEMENT AND "CALL-FOR-PAPERS"

FIFTH INTERNATIONAL CONFERENCE ON REACTOR SHIELDING, KNOXVILLE, TENNESSEE, USA, APRIL 18–22, 1977

This conference is intended to be an international meeting focused on both the fundamental and applied aspects of nuclear reactor plant shielding and radiation protection. Emphasis will be on operating power reactor occupational exposure problems, practical aspects of shield design, and requirements for nuclear data.

Papers are invited for the above conference sponsored by ORNL, U.S. ERDA, IAEA, OECD-NEA, ANS, ORAU, and University of Tennessee. Topics for invited and contributed papers are:

1. Sensitivity analysis and data requirements for shielding.
2. Applications of new developments and improvements in radiation transport methods (e.g., S_N, finite elements, Monte Carlo, and others).
3. Integral shielding experiments for data and methods testing.
4. Shield design for fission and fusion power plants (including design criteria).
5. Neutron and gamma-ray streaming in operating facilities and their analysis.
6. Occupational radiation exposure (review of current experience, design to reduce exposures).
7. Contamination by activated corrosion products and fission products (experience, design to minimize, and methods to predict contamination levels).
8. Airborne radioactivity in nuclear plants (sources, detection equipment, ventilation systems, design of equipment to minimize airborne radioactivity).
9. In-plant radiation protection instrumentation (area radiation monitors, continuous air monitors, experience, design criteria, rationale for location of instruments).
10. Radiation damage (e.g., to reactor internals, electrical insulation, lubricants, gaskets, and seals).
11. Information resources and standards (efforts in material standards, penetration designs, and radiation zoning and monitoring).
12. Cost-benefit of shielding and radiation protection.

Deadline for summaries (4 copies in English, 300 words, no figures): postmarked August 20, 1976. Accepted summaries will appear in the program. Mail summaries to: S. A. W. Gerstl, Program Committee Chairman, Los Alamos Scientific Laboratory, T-1, P. O. Box 1663, MS-269, Los Alamos, New Mexico 87545, USA. Full papers, not to exceed eight pages, required by April 18, 1977, for publication in proceedings. Authors are requested to bring additional preprints for distribution at the conference. For further information contact: D. K. Trubey, General Chairman, Fifth Conference, Radiation Shielding Information Center, Oak Ridge National Laboratory, P. O. Box X, Oak Ridge, Tennessee 37830, USA.

SEMINAR-WORKSHOP ON TRIPOLI CODE

A seminar-workshop on the TRIPOLI multigroup Monte Carlo code sponsored by the European Shielding Information Service (ESIS) will be held at the Ispra (Italy) EURATOM Joint Research Laboratory, October 18–19, 1976. The seminar-workshop has been scheduled immediately following the Vienna meeting on **Data Requirements for Shielding Calculations** for the convenience of overseas participants. The official languages of the meeting are English and French with simultaneous translation provided. In addition to discussions of test cases, other Monte Carlo codes will be briefly discussed.

The TRIPOLI code, (available from RSIC as CCC-272), was developed at the CEA Saclay Center for Nuclear Studies and was made available through the OECD-NEA Computer Programme Library. The program for the seminar-workshop is available from ESIS or from RSIC upon request. Translation of the extensive documentation is underway and, when available, will be announced in this Newsletter.

HEALTH PHYSICS COURSE AVAILABLE AT LOUISIANA STATE UNIVERSITY IN MAY

The LSU Nuclear Science Center will offer a five-day course in basic health physics in Baton Rouge beginning on May 3, 1976. The registration fee of $240 includes all the required notes and materials.

The objective of this short course is to present the basic principles of health physics to engineers, scientists, managers, and other technical personnel. An educational background equivalent to a BS degree in science or engineering, or a high school diploma and several years' experience in a technical area should be sufficient.

All sessions will be conducted in the Nuclear Science Center on the Louisiana State University campus at Baton Rouge, Louisiana, 8:30 a.m. to 4:30 p.m., Monday through Friday. To provide maximum effectiveness in instruction, the class size is restricted to 15 students. Quotas will be filled on first-come, first-served basis.

Additional information may be obtained by contacting Dr. R. C. McIlhenny, or Dr. W. F. Curry, telephone (504-388-2163) or writing Nuclear Science Center, LSU, Baton Rouge, LA 70803.

ATOMICS INTERNATIONAL COURSE ON RADIATION SHIELDING IN SEPTEMBER

The Atomics International Division of Rockwell International offers a course at the Nuclear Training Center on Radiation Shielding, September 20–24, 1976. This course is intended to familiarize individuals of various engineering disciplines with the theory and practice of radiation shielding. Numerous problems will be presented and solved involving gamma rays and neutrons of various geometries and sources (e.g., reactors, mixed fission products, and radioisotopes). The biological effects of radiation and the effects on various materials will be discussed. Computer codes are reviewed. The fee is $495.

Additional information and application forms can be obtained from: C. A. Parker, Nuclear Training Center, Atomics International, P. O. Box 309, Canoga Park, California, Phone 213-341-1000, ext. 2811.

PERSONAL ITEMS

John C. Zink, formerly at the Nuclear Engineering Department, University of Oklahoma, is now with the Nuclear Power Division, Public Service Co. of Oklahoma, Tulsa.

The **Albuquerque office of Science Applications, Inc.**, has moved to No. 3, San Pedro Park, Suite 214, 2201 San Pedro N.E., Albuquerque, New Mexico 87110. The post office box remains the same—P. O. Box 3507.

The **Nuclear Services Corporation's** new address is 1700 Dell Avenue, Campbell, California 95008.

VISITORS TO RSIC

The following persons visited RSIC during the month of March: G. L. Simmons, Science Applications, Inc., La Jolla, California; Alan Doell, University of Lowell, Lowell, Massachusetts; R. N. Sinclair, Harwell, UKAEA, Didcot, Oxon, UK; J. C. Courtney, Louisiana State University, Baton Rouge, Louisiana; Doug Turner, Engineering Division, and Ron Young, Reactor Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

CHANGES IN THE CODE COLLECTION

PSR-63/AMPX-I

Persons receiving an AMPX package which included a tape list bearing a December 1975 date should check the first card of Subroutine LTRM (in LAPHANGAS). The part of the card which followed "Subroutine LTRM" was blank on the December update. The card should read: **Subroutine LTRM (XDAT,XL,XU,F,BOT,TOP,T,DENO,AN,E,X,NBT,INT,.** The current RSIC package reflects the above correction.

PSR-75/AXMIX

This ANISN auxiliary cross-section handling code was updated to correct an error discovered by RSIC and verified by ORNL, the contributor. Current users may correct their version as follows: In SUBROUTINE CRIT (within GIP), the statement "10 DO 20 I= 1,N" should read **10 DO 20 I=1,L**.

PSR-93/PUFF

This package for the generation of multigroup cross section covariance matrices, contributed originally by Oak Ridge National Laboratory (IBM 360 version), has been extended to include a new CDC-7600 version (PSR-93B) which was contributed by Los Alamos Scientific Laboratory.

CCC-217B/ORIGEN

The code package has been extended to include a CDC-6400 version of this isotope generation and depletion code (matrix exponential method) contributed by NUS Corporation, Rockville, Maryland. Oak Ridge National Laboratory was the original contributor (IBM 360 version). Reference: ORNL-4628. FORTRAN IV.

CCC-142/MERCURE-4

The three dimensional code for integrating multigroup line of sight attenuation kernels by Monte Carlo techniques was updated to correct an error called to RSIC attention by the code originator, C. Devillers, Centre d'Etudes Nucleaires de Saclay, France. The error occurs in calculations where an option detects source "cases" the centre of which is outside the source volume, producing an interruption with the message ="erreur geometrique". Known MERCURE-4 users have been notified. Others may contact RSIC for a statement of the correction.

CCC-276/DOT 3.5

A newly frozen version of the ORNL two-dimensional discrete ordinates transport code system development, said to be midway between versions III (CCC-209/DOT III) and IV, was contributed by Oak Ridge National Laboratory. It was developed to provide a test vehicle for several new ideas to be used in DOT IV, to facilitate checking between DOT III and DOT IV, and to make new developments available to the user on an interim basis until DOT IV is ready for general use. The most significant change is a marked improvement in convergence on deep-penetration problems. Reference: ORNL-TM-4280 with addendum. FORTRAN IV; IBM 360.

CCC-277/MORSE-SGC

This super-grouped cross section version of the MORSE code was contributed by Oak Ridge National Laboratory. MORSE-SGC reduces the core size requirements to solve problems with large cross-section storage requirements. The package includes an improved combinatorial geometry package and a KENO geometry package. Other changes are designed to make problem formulation more convenient. Reference: ORNL/CSD-7. FORTRAN IV; IBM 360.

CCC-274/TIMEX

This time-dependent explicit discrete ordinates program for the solution of multigroup transport equations with delayed neutrons in plane, cylindrical, spherical, and two-angle plane geometries was contributed by Los Alamos Scientific Laboratory, Los Alamos, New Mexico. FORTRAN IV; IBM 360 (A) and CDC 7600 (B). Reference: LA-6201-MS.

Version A of CCC-274 was announced in March Newsletter citing incorrect reference instead of that above.

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

ANL-75-34
An Analysis of (n,2n) Cross-Section Measurements for Nuclei Up to Mass 238.
Davey, W.G.; Goin, R.W.; Ross, J.R.
June 1975
NTIS $8.50

ANL/NDM-4
^{90}Zr and ^{92}Zr; Neutron Total and Scattering Cross Sections.
Guenther, P.; Smith, A.; Whalen, J.F.
July 1974
NTIS

ANL/NDM-7
Neutron Total and Scattering Cross Sections of Some Even Isotopes of Molybdenum and the Optical Model.
Smith, A.B.; Guenther, P.T.; Whalen, J.F.
June 1974
NTIS

ANL/NDM-8
Fast Neutron Capture and Activation Cross Sections of Niobium Isotopes.
Poenitz, W.P.
May 1974
NTIS

ANL-AP/CTR/TM-15
Measured and Evaluated Fast Neutron Cross Sections of Nickel and Cobalt.
Smith, A.; Guenther, P.; Smith, D.; Whalen, J.F.
April 1974
NTIS

BARC/I-341
A Code for Leakage Neutron Spectra Through Thick Shields.
Nagarajan, P.S.; Sethulakshmi, P.; Raghavendran, C.P.
1975
Bhabha Atomic Research Centre, Bombay, India

BARC-789
A Random Sampling Procedure for Anisotropic Distributions.
Nagarajan, P.S.; Sethulakshmi, P.; Raghavendran, C.P.; Bhatia, D.P.
1975
Bhabha Atomic Research Centre, Bombay, India

BNL-20769
Calculational Model and Data for CTR Neutronics and Photonics.
Maynard, C.
September 1974
Dep., NTIS $4.50

BNWL-1939-1
Pacific Northwest Laboratory Report on Controlled Thermonuclear Reactor Technology, January 1975 - September 1975.
Battelle Pacific Northwest Labs., Richland, Wash.
October 1975
Dep., NTIS $5.45

CONF-721204-2
Estimates of Dose from ^{133}Xe to Infants and Children for Immersion in an Infinite Cloud and for Medical Uses.
Hilyer, M.J.; Snyder, W.S.
1972
Dep., NTIS

CONF-741109-4
Physical Principles of Photon Dosimetry.
Snyder, W.S.; Ford, M.R.
November 1974
Dep., NTIS $4.00

CONF-751006-15
Theory of Radiation Induced Defect Production.
Robinson, M.T.
October 1975
NTIS

CONF-751125-61
Physics and Engineering Aspects of the Oak Ridge Experimental Power Reactor.
McAlees, D.G.; Bettis, E.S.; Huxford, T.J.; Marcus, F.B.
1975
Dep., NTIS $4.50

CONF-751125-70
Particle Emission from Polycrystalline and Monocrystalline Niobium Under 14.1 MeV Neutron Impact.
Kaminsky, M.; Das, S.K.
1975
NTIS

COO-2262-8
Finite Difference Solution of the Time Dependent Neutron Group Diffusion Equations.
Hendricks, J.S.; Henry, A.F.
August 1975
NTIS

EIR-271
"Mixed" Method, A Solution of the Transport Equation in Cylindrical Geometry Making Use of Both Its Integral and Differential Forms in High P_n Approximation.
Stepanek, J.; Ligou, J.; Maeder, C.
January 1975
Dep., NTIS (U.S. Sales Only) $5.50

FRNC-TH-561 (In French); Thesis (In French)
Monte Carlo Simulation of the Effect of Compensator Cones on the Energy and Spatial Spectra of a 25-MeV Photon Beam.
Jitao, S.
1975
Dep., NTIS (U.S. Sales Only) $6.00

IFA-FR-135-1975(Part II)
Use of Code DTF-4 for Determining the Coefficient of Back-Reflection of the Neutron Within the Thermonuclear Plasma of a Thermonuclear Reactor Controlled by the Rate of the Fission Reactions. Part II.
Cristea, G.
June 1975
Dep., NTIS (U.S. Sales Only) $3.50

INDC(CCP)-74/N
Critical Evaluation of Radioactive Decay Constants for 99-Mo, 144-Ce, 144-Pr and 144-Pm.
Grigoryan, Yu.I.; Sokolovskij, L.L.; Chukreev, F.E.
January 1976
IAEA Nuclear Data Section, Karntner Ring 11, A-1010 Vienna

INDC(CCP)-75/LN
The Evaluation of Nuclear Data.
Grigoryan, Yu.I.; Sokolovskij, L.L.; Chukreev, F.E.
January 1976
IAEA Nuclear Data Section, Karntner Ring 11, A-1010 Vienna

INT-32/1
Generalization of the Multigroup Approach for Calculating the Neutron Slowing Down Length.
Kreft, A.
November 1972
INIS

KFKI-75-62
Selecting from Three Probability Distributions for Reactor Calculations.
Lux, I.
1975
Dep., NTIS (U.S. Sales Only) $4.50

LA-5159
Projected Multiple Scattering Distributions.
Hutson, R.L.
January 1973
Dep., NTIS

LA-6024
Conceptual Design Study of a Scyllac Fusion Test Reactor.
Thomassen, K.I. (Comp.)
January 1976
NTIS $8.75

LA-6103
Monte Carlo Simulation of the Turbulent Transport of Airborne Contaminants.
Watson, C.W.; Barr, S.
January 1976
NTIS $4.00

NBS Spec. Pub.-425, pp.419-421; CONF-750303, pp.419-421
Tabular Cross Section File Generation and Utilization Techniques.
Cullen, D.E.; Ozer, O.; Weisbin, C.R.
October 1975
GPO

NBS Spec. Pub.-425, pp.455-458; CONF-750303, pp.455-458
Decay Heat Analysis for an LMFBR Fuel Assembly Using ENDF/B-IV Data.
Morrison, G.W.; Weisbin, C.R.; Kee, C.W.
October 1975
GPO

NEANDC (E) 168 "L"
An Evaluation of the Neutron-Induced Scattering, Reaction and Photon-Production Cross Sections of Carbon.
Lachkar, J.; Cocu, F.; Haouat, G.; Le Floch, P.L; Patin, Y.; Sigaud, J.
November 1975
NTIS

ORNL-5039
Expedient Shelter Construction and Occupancy Experiments.
Kearny, C.H.
March 1976
NTIS

ORNL-5114
Nuclear Decay Data for Selected Radionuclides.
Martin, M.J.(Ed.)
March 1976
NTIS $5.50

ORNL-TM-4827
Gamma-Radiation Effects in Geologic Formations of Interest in Waste Disposal: A Review and Analysis of Available Information and Suggestions for Additional Experimentation.
Jenks, G.H.
September 1975
NTIS $4.00

ORNL-TM-4994
Analyses of Neutron Scattering and Gamma-Ray Production Integral Experiments on Carbon for Neutron Energies from 1 to 15 MeV.
Cramer, S.N.; Oblow, E.M.
September 1974
NTIS

ORNL/TM-5035
Neutronic Scoping Studies for the Tokamak Experimental Power Reactor.
Santoro, R.T.; Bettis, E.S.; McAlees, D.G.; Watts, H.L.; Williams, M.L.
February 1976
NTIS $5.00

ORNL/TM-5160
Radiation-Damage Calculations: Primary Recoil Spectra, Displacement Rates, and Gas-Production Rates.
Gabriel, T.A.; Amburgey, J.D.; Greene, N.M.
March 1976
NTIS $4.50

ORNL/TM-5161
Calculated Nucleon Spectra at Several Angles from 192-, 500-, 700-, and 900-MeV Carbon-12 on Iron-56.
Bertini, H.W.; Santoro, R.T.; Hermann, O.W.
February 1976
NTIS $5.00

ORNL/TM-5164
The Application of Neutron Transport Codes to the Transport of Neutron Atoms in Plasmas.
Marable, J.H.; Oblow, E.M.
February 1976
NTIS $5.00

ORNL/TM-5198
Uncertainties in Calculated Heating and Radiation Damage in the Toroidal Field Coil of a Tokamak Experimental Power Reactor Due to Neutron Cross-Section-Errors.
Alsmiller, R.G.,Jr.; Barish, J.; Weisbin, C.R.
March 1976
NTIS $6.00

ORNL/TM-5220
Analysis of Neutron Scattering and Gamma-Ray Production Integral Experiments on Nitrogen for Neutron Energies from 1 to 15 MeV.
Cramer, S.N.; Oblow, E.M.
March 1976
NTIS $4.50

ORNL/TM-5223
SUR, A Program to Generate Error Covariance Files.
Difilippo, F.C.
March 1976
NTIS

ORNL/TM-5224
Iterative Solution of the Diffusion and P_1 Finite Element Equations.
Tomlinson, E.T.; Robinson, J.C.; Vondy, D.R.
February 1976
NTIS $6.50

ORNL/TM-5239; Thesis
Use of Variational Techniques for the Estimation of Neutron Detection Efficiency.
Lin, S.; Robinson, J.C.; Flanagan, G.F.
February 1976
NTIS $6.50

ORNL/TM-5249
Modification Number One to the Coupled 100N-21 Gamma Cross Section Library for EPR Calculations.
Ford, W.E.,III; Santoro, R.T.; Roussin, R.W.; Plaster, D.M.
March 1976
Dep., NTIS $5.00

ORNL/TM-5273
Preliminary Fission Product Energy Release Measurements for Thermal Neutron Fission of 235-U.
Dickens, J.K.; Love, T.A.; McConnell, J.W.; Emery, J.F.; Peelle, R.W.
March 1976
NTIS $4.00

ORNL/TM-5280
Suggestions for an Updated Fusion Power Program.
Clarke, J.F.
February 1976
NTIS

SAAS-184 (In German)
Integral Population Doses Due to Off-Gases from Nuclear Power Stations.
Krueger, F.W.
August 1975
Dep., NTIS (U.S. Sales Only) $3.50

STI/PUB-325, pp.1-7; CONF-711204, pp.1-7
Neutron Sources for Radiobiology - An Introductory Review.
Whetstone, S.L.
From Meeting on Radiobiological Applications of Neutron Irradiation - Vienna, Austria (6 December 1971)
December 1971
IAEA

STI/PUB-325, pp.239-251; CONF-711204, pp.239-251
Applications of Fast Neutron Beams in Radiation Therapy.
Fowler, J.F.
December 1971
IAEA

UCID-16979
DT Fusion Neutron Irradiation of BNL-LASL Superconductor Wires, WRDC Electron Microscopy, Samples, BPNL Molybdenum and Nickel Foils, and LLL Aluminum Tensile Specimens.
MacLean, S.C.
September 16, 1975
Dep., NTIS $4.00

UCID-16978
DT Fusion Neutron Irradiation of BNL-LASL Superconductor Wires and LLL-BPNL Aluminum Foils.
MacLean, S.C.
September 5, 1975
Dep., NTIS $4.00

UCID-16980
DT Fusion Neutron Irradiation of BNL-LLL Al-1%Cu Wires, and LLL Supracil.
MacLean, S.C.
September 10, 1975
Dep., NTIS $4.00

UCRL-76699
Precise Analyses by Gamma Spectrometry.
Gunnink, R.; Niday, J.B.
August 14, 1975
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Ann. Nucl. Energy, 2(6), 503-506
Radioactive Products from Boron CTR Reactions.
Peterson, R.J.; Zaidins, C.S.; Fritts, M.J.; Roughton, N.A.
July 1975

Health Phys., 29(1), 131-136
Dose Rates from Plane Sources of Gamma Rays.
Dickson, H.W.; Kerr, G.D.
July 1975

Health Phys., 29(1), 143-153
Standard Sources for Health Physics Instrument Calibration.
Kathren, R.L.
July 1975

Health Phys., 29(6), 839-851
Spectra and Dosimetry of Neutrons from Moderation of 235-U and 252-Cf Fission Sources in H_2O.
Ing, H.; Cross, W.G.
December 1975

Health Phys., 29(6), 853-860
Population Exposure from High-Energy Accelerators.
Stephens, L.D.; Thomas, R.H.; Thomas, S.B.
December 1975

Health Phys., 30(2), 167-171
Monte Carlo Simulated Irradiation in a Spatially Dependent Field.
Jones, T.D.; Dillman, L.T.
February 1976

J. Dent. Res., 51(5), 1369-1374
X-Radiation Spectra.
Rechtien, J.J.; Lautenschlager, E.P.; Norling, B.K.
1972

J. Nucl. Sci. Technol.(Tokyo), 10(4), 202-206
New Gamma Ray Exposure Estimation Method for Radiation Accidents.
Nakajima, T.; Fujimoto, K.; Hashizume, T.
April 1973

Meas. Tech.(USSR)(Engl. Transl.), 16(1), 5-12
Governmental Primary Standard for the Unit of Activity of Nuclides.
Karavaev, F.; Konstantinov, A.; Kochin, A.; Khol'nova, E.; Alekseev, V.; Drichko, A.; Kul'kova, L.
January 1973

Meas. Tech.(USSR)(Engl. Transl.), 16(3), 313-319
Governmental Primary Standard of the Unit of Power of Absorbed Dose of Photon Ionizing Radiation.
Bregadze, Y.; Isaev, B.; Tultaev, A.; Sil'chenko, A.; Korshikov, A.
March 1973

Med. Radiol., 17(7), 85-93
Dosimetry in Investigations on Neutron-Capture Therapy.
Ivanov, V.N.
July 1972

Nucl. Eng. Design, 26(2), 313-325
Neutron Embrittlement Surveillance of the Garigliano Reactor Vessel Steel.
Galliani, M.; Serpan, C.Z.
February 1974

Nucl. Instrum. Methods, 128(1), 125-139
An Experimental System for Providing Data to Test Evaluated Secondary Neutron and Gamma-Ray-Production Cross Sections Over the Incident Neutron Energy Range from 1 to 20 MeV.
Morgan, G.L.; Love, T.A.; Perey, F.G.
September 15, 1975

Nucl. Instrum. Methods, 128(1), 195-199
A General Solid Angle Calculation by a Monte Carlo Method.
Carchon, R.; Van Camp, E.; Knuyt, G.; Van de Vyver, R.; Devos, J.; Ferdinande, H.
September 15, 1975

Nucl. Instrum. Methods, 131(1), 133-141
Determination of Detector Efficiencies for Gamma-Ray Energies Up to 12 MeV. 1. Experimental Methods.
Waibel, E.; Grosswendt, B.
1976

Nucl. Instrum. Methods, 131(1), 143-156
Determination of Detector Efficiencies for Gamma-Ray Energies Up to 12 MeV. 2. Monte-Carlo Calculation.
Waibel, E.; Grosswendt, B.
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Gamma-Ray Buildup Factors for Finite Cylindrical Media.
Elias, E.; Segal, Y.; Notea, A.
December 24, 1975

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Mass Yields in the Fission of Uranium-235 and Plutonium-239 in the Neutron Spectrum of a Gas-Cooled Fast Reactor.
Rajagopalan, M.; Pruys, H.S.; Gruetter, A.; von Gunten, H.R.; Hermes, E.A.; Richmond, R.; Rossler, E.; Schmid, A.; Wydler, P.
December 1975

Nucl. Sci. Eng., 59(3), 215-230
A General Method for Generating Effective Resonance Cross Sections for Heterogeneous Media.
Kirby, K.D.; Karam, R.A.
March 1976

Nucl. Sci. Eng., 59(3), 237-245
Spectra of Bremsstrahlung Produced in Very Thick Lead Targets by 15-, 20-, and 25-MeV Electrons.
Nakamura, T.; Hirayama, H.
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Nucl. Sci. Eng., 59(3), 246-260
Moments Method Calculation of the Energy-Dependent Neutron Flux Due to a Point-Isotropic Fission Source in an Infinite Medium of Sodium.
Morris, E.E.
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Effect of Anisotropy in Scattering on Neutron Angular Flux Inside Slabs.
Rangaswamy, L.; Kothari, L.S.; Ahmed, F.
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Anisotropic Neutron Transport Without Legendre Expansions.
Odom, J.P.; Shultis, J.K.
March 1976

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Neutron Dosimetry in Humans.
Bewley, D.K.
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Relationship Between the X-Ray Pattern, Photon Energy, and Dose for a Simple Phantom.
Lerch, I.A.
November 1972

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Memorandum on ICRU Report 19, Radiation Quantities and Units.
Jennings, W.
September 1973

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SI Units in Radiation Measurement.
Jennings, W.
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Radiation Res., 63(1), 191-199
Comments on Fano's Theorem.
Spencer, L.V.
July 1975

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Cements and Concretes for Nuclear Radiation Shielding.
Baouman, A.C.
July 1973

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Calculation and Measurement of Time-of-Flight Distributions of Multi-Scattered Gamma Radiation.
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Univ. Frankfurt am Main, Frankfurt am Main
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Contribution of the Theory of the Two Phase Blowdown Phenomenon.
Hutcherson, M.N.
Reactor Analysis and Safety Division, Argonne National Laboratory, Argonne, Illinois
November 1975

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Reactor Operations, Informal Report.
Osborne, C.L.; Pitcher, D.G.; Zukas, M.; Floyd, J.J.; Brooks, M.H.; Phillips, J.E.
Brookhaven National Laboratory, Upton, New York
October 1975

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Alternatives for Radioactive Waste Management.
Bartlett, J.W.
Battelle Pacific Northwest Laboratories, Richland, Washington
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L. ENDF Program.
Beauge, R.
CEA Centre d'Etudes Nucleaires de Saclay, 91-Gif-sur-Yvette, France, Services des Piles.
October 1974
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Recent Trends in Reactor Shielding in the U.S.A.
Trubey, D.K.
Oak Ridge National Laboratory, Oak Ridge, Tennessee
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Post Treatment of High-Level Nuclear Fuel Wastes.
Berreth, J.R.; Cole, H.S.; Hoskins, A.P.; Lewis, L.C.; Samsel, E.G.
Aerojet Nuclear Company, Idaho Falls, Idaho
1975

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Fast Neutron Spectrum and Dosimetry Studies in the Coupled Fast Reactivity Measurements Facility.
Rogers, J.W.; Harker, Y.D.; Millsap, D.A.
Aerojet Nuclear Company, Idaho Falls, Idaho
1975

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