# 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

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*A thousand-mile journey begins with but a single step.* ...CONFUCIUS

## FEEDBACK FROM SURVEY

On December 1, we made a survey mailing to all RSIC colleagues presumed to be serving the nuclear power industry. Aimed at ascertaining the information and computer code/data needs in the area of radiation analysis and protection, we asked for feedback by mid-month. We are pleased to report an overwhelming response ( ~ 90%) and wish to express our gratitude for the cooperation of this segment of our community of users.

We will attempt to organize the response in some meaningful fashion and report to the Electric Power Research Institute (EPRI), our sponsor. A surface review reveals several expressed needs for additional research and development shared in common by all those surveyed. We especially appreciate the suggestions and comments made for the improvement of RSIC information, procedures, and services.

Is there any interest in seeing the accumulated results of an industry-wide survey of information, nuclear data, methodology, and computer technology needs in the area of radiation analysis, protection, and shielding? We will welcome your letters of comment.

## SPECTRA UNFOLDING SEMINAR-WORKSHOP PLANS UNFOLD

Plans for the RSIC Seminar-Workshop on Radiation Energy Spectra Unfolding, April 12–13, 1976, at Oak Ridge National Laboratory are as follows:

The seminar portion of the meeting will consist of 1 1/2 days of contributed papers on theoretical and practical aspects of unfolding neutron and gamma-ray spectra. Subjects also will probably include detector response functions and relevant computer codes. Problems as diverse as incore reactor spectra and gamma-ray measurements by sodium iodide detectors will be discussed.

The final half-day will consist of two workshops. One workshop will treat in detail the code FORIST, a new unfolding code from the University of Illinois. It is a new development in the FERDOR series. The other workshop will be concerned with unfolding threshold foil measurements.

Speakers are asked to supply a title as soon as possible and an abstract by March 1. The full paper, five pages or less, is due at the time of the conference. Instructions for preparing the paper will be forwarded to prospective speakers.

Additional information on the program and registration for attendance will appear in the February Newsletter.

## SPECIAL MIRD NOTE

The December Newsletter listed availability of several publications of the Society of Nuclear Medicine's Medical Internal Radiation Dose (MIRD) Committee but failed to cite an address. They may be secured from: MIRD Committee, 404 Church Avenue, Suite 15, Maryville, Tennessee 37801.

## VOLUME II OF ENGINEERING COMPENDIUM NOW AVAILABLE

The third and final volume of the IAEA-sponsored **Engineering Compendium on Radiation Shielding** titled *Shielding Materials* is now available from the publisher, Springer-Verlag, Berlin, Heidelberg, and New York. This volume, Chapter 9, reviews nuclear, physical, and mechanical properties of shielding materials. A copy may be purchased in the USA from Springer-Verlag, 175 Fifth Avenue, New York, N. Y. 10010 for $137.60. Volume I, *Shielding Fundamentals and Methods* was published in 1968, and Volume III, *Shield Design and Engineering* was published in 1970.

## NUCLEAR STANDARDS NEWS

An ANSI-Call for Comments has been issued for BSR N676: *Determination of Thermal Energy Deposition Rates in Nuclear Reactors,* (ANS-19.3.4). Order from: ANS, price $3.00.

ANSI-Final Actions have been taken on N16.9: *Validation of Calculational Methods of Nuclear Criticality Safety* (new standard) and N412: *Determination of Neutron Reaction Rate Distributions and Reactivity of Nuclear Reactors* (new standard).

Recently published Part 45 of the 1975 Book of ASTM Standards now consists of 115 nuclear standards. About 35 of these nuclear standards are new, revised, or changed in status since the 1974 edition. Copies of this book are available from ASTM, 1916 Race St., Philadelphia, PA 19103. Price $27.00 in the U.S.; Canada and Mexico add 3% shipping charges; other countries add 5% shipping charges.

## PERSONAL ITEMS

The following changes of address have been noted: C. W. Craven, Jr. from Oak Ridge National Laboratory to Science Applications, Inc., WOKI Bldg., 114 Tulsa Rd., P. O. Box 843, Oak Ridge, Tennessee; **V. Sundara Raman** from BHABHA Atomic Research Centre, Bombay to Safety Research Laboratory, Reactor Research Centre, Kalpakkam, Tamil Nadu, India; **Thomas Oakes** from Babcock & Wilcox, Lynchburg, Virginia to Health Physics Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee; **Gerard P. Cavanaugh** from Oak Ridge National Laboratory to Combustion Engineering, Inc., 1000 Prospect Hill Rd., Windsor, Connecticut; and **Eric H. Ottewitte** from Eidg, Wurenlingen, Switzerland to Aerojet Nuclear Company, 550 Second Street, Idaho Falls, Idaho.

IRT corporation, San Diego, California, has named two new vice presidents to head the company's Physics and System Effects Divisions. **James A. Naber**, with IRT since 1965, is in charge of IRT's Physics Division. **Eric P. Wenaas**, with IRT since 1969, will head IRT's System Effects Division.

**Frank L. Bouquet** of the Jet Propulsion Laboratory, Pasadena, California, has recently transferred internally into the Materials and Processing Engineering Section, Applied Mechanics Division, and is currently interested in materials in connection with solar cells for space or terrestrial use. He writes that RSIC information has been of value in the evaluation and design of materials for use in the Mariner-Jupiter-Saturn spacecraft for 1977 launch.

## VISITORS TO RSIC

The following persons came during the month of December for an orientation visit and/or to use RSIC facilities: Mohamed Yousry Gohar, Nuclear Engineering Department, University of Wisconsin at Madison; Greg B. Smith, U.S. Civil Service Commission, Knoxville, Tennessee; M. Unis Shaikh, David Swain, and Duane C. Larson, Oak Ridge National Laboratory; and Pedro J. Otaduy, University of Florida.

## UPCOMING CONFERENCES

A conference will be held on March 1–4, 1976, on **Measurements for the Safe Use of Radiation**, at Gaithersburg, Md., sponsored by NBS, American Association of Physicists in Medicine, Conference of Radiation Control, and the Health Physics Society. Further information is available from James M. Wyckoff, National Bureau of Standards, Washington, D.C. 20234.

The Fifth International CODATA Conference will be held in Boulder, Colorado on June 27–July 1, 1976. The scope of the Conference will include all the disciplines represented in CODATA, i.e., the physical sciences, geosciences, astronomy, and the life sciences. Emphasis will be placed on problems and opportunities which are common to these various disciplines. The subjects expected to be highlighted at the Conference include **data needs in energy, environmental, and other major programs; methodology of data evaluation in various fields; statistical techniques; and computer applications to the storage, retrieval and dissemination of data**. Users of data, as well as those involved in data compilation and evaluation, are invited to submit papers on subjects within the scope of the Conference. Program information is available from the Chairman, David R. Lide, Jr., National Bureau of Standards, Washington, D.C. 20234, USA. Further details on the Conference may be secured from: CODATA Secretariat, 51 Boulevard Montmorency, 75016 Paris, France; or from Numerical Data Advisory Board, National Research Council, 2101 Constitution Avenue, Washington, D.C. 20418 USA.

An **International Meeting on Radiation Processing** will be held May 9–13, 1976, at the Cerromar Beach Hotel, Dorado Beach, Puerto Rico, under the sponsorship of the American Nuclear Society (Isotopes & Radiation Division), American Chemical Society

(Polymer Division), and the Society of Plastics Engineers (Electrical& Electronics Division). The main objective of this symposium is to permit an up-to-date accounting of the successful applications of radiation as a processing technique, and to look into the future to identify new areas for fruitful R&D. The symposium is structured so that the various major areas can be reviewed by an outstanding group of invited lecturers and also to allow active research and development groups to present their most recent accomplishments. Information on the program is available from Professor V. Stannett, Department of Chemical Engineering, North Carolina State University, Raleigh, North Carolina 27607.

An **International Meeting on Fast Reactor Safety and Related Physics** will be held October 5–8, 1976, at The Continental Plaza Hotel, Chicago, Illinois, sponsored by the American Nuclear Society (Chicago Section, Nuclear Reactor Safety Division, Reactor Physics Division), and by the European Nuclear Society. Papers are invited for the above meeting with emphasis placed on the evaluation of *safety-related design aspects and on licensing considerations for commercial-size plants.*

Sessions are scheduled in the following areas, as related to LMFBRs and GCFRs: **Safety-Related Design Aspects:** (1) safety evaluation of fuel, core and plant design options (e.g., pool and loop designs, etc.), (2) inherent safety characteristics and features, (3) instrumentation and protection systems (including alternate shutdown systems), (4) consequence- mitigating features and functions, (5) containment functions and design options, (6) core-debris-retention and post-accident-heat-removal options, (7) safety requirements for natural or man-made external phenomena (earthquakes, airplanes, etc.), (8) provisions for surveillance and in-service inspection; **Analysis and Experimentation:** (1) safety-related reactor physics (e.g., calculation and measurement of reactivity coefficients, evaluation of means for reducing positive sodium-void reactivity effects, space-time kinetics methods), (2) safety performance analysis for anticipated transients and design accidents, (3) core-disruptive accident analysis (including accident energetics), (4) coolant dynamics, (5) fuel failure limits, (6) cladding and fuel relocation, (7) molten-cladding/fuel-coolant interactions, (8) core- debris phenomenology, (9) structural dynamics, (10) analysis of containment performance, (11) aersol behavior, (12) sodium reactions and fires, (13) radiological source term determination, (14) evaluation of safety-related data needs; and **Safety-Related Design Bases, Acceptance Criteria, and Licensing Considerations:** (1) bounding limits on accidents, (2) reliability criteria, methodology, and evaluations, (3) probabilistic safety evaluations, (4) risk/ benefit evaluations, (5) trends in licensing.

Summaries in English up to 1000 words must be submitted before **April 5, 1976, to Dr. Robert Avery, Technical Program Chairman, Argonne National Laboratory, Bldg. 208, Argonne, IL 60439, U.S.A.**

The Department of Continuing Education, Georgia Institute of Technology, is offering a course on **Nuclear Power Safety** to be held February 23–27, 1976, in Atlanta. The course is intended to provide an overview of nuclear power safety and will cover such topics as *federal regulations, accident analysis, containment design, transportation, quality assurance and plant siting.* Emphasis will be placed upon the safety aspects of boiling water reactors, pressurized water reactors and high temperature gas-cooled reactors. Speakers include: **Harold Oslick**, Nuclear Licensing, Ebasco Service, Inc.; **Myer Bender**, Engineering, and **J. O. Blomeke**, Chemical Technology, Oak Ridge National Laboratory; **Paul Barton** System Operation and Maintenance, Duke Power Company; **Albert J. Goodjohn**, General Atomic; **James Zane**, Thermal Reactor Safety Division, Aerojet Nuclear Company; **Jack Rollins**, Nuclear Assurance Corporation; **Harold Collins**, Office of International and State Programs, **Hugh Dance**, Office of Inspection and Enforcement, **Darrell E. Eisenhut**, Office of Nuclear Reactor Regulations, **Joseph J. Duzy**, Operator Licensing Branch, Division of Reactor Licensing, **Robert Minogue**, Office of Standard Development, and **Stephen Hanauer**, Office of Technical Advisor Regulation, all with the Nuclear Regulatory Commission; and **Alfred Schneider, Roger Carlson, Lynn E. Weaver, Geoffrey G. Eicholz,** and **Karl Z. Morgan** on the staff of the Georgia Institute of Technology. Additional information is available from Dr. James H. Rust, School of Nuclear Engineering, Georgia Tech, Atlanta, Georgia 30332. Phone: (404) 894-3730.

## CHANGES IN THE CODE COLLECTION

The following changes were made during December in the RSIC Computer Code Collection.

### PSR-63/AMPX

The modular code system for generating coupled multigroup neutron-gamma-ray libraries from ENDF/B was updated to correct errors called to RSIC attention by the ORNL developers. The errors in LAPHNGAS, affecting problems having very fine thermal structure, are in two subroutines: XSEC and LTRM. Those interested in correcting their operating system may request these replacement subroutines only (453 and 200 records, respectively). An error in the XLACS module which gave bad results for some cases and group structures may be corrected as follows: a) As first executable statement, insert **NDB = 5000**; and the 3rd statement below statement No. 2 should now read **LNBT = LB+NDB**. The RSIC package now reflects these changes.

### PSR-64/DOMINO

The package containing the general purpose code for coupling discrete ordinates and Monte Carlo radiation transport calculations has been extended by the addition of a CDC-6400 version contributed by **NUS Corporation**, Rockville, Maryland. DOMINO, developed at ORNL, was tested on the IBM 360 using DOT and MORSE. Reference: ORNL-4853. FORTRAN IV; The CDC version (<4000 records) may be requested as **PSR-64 B.**

PSR-75/AXMIX

The package containing a cross section mixing code used to create data sets for ANISN and DOT III has been extended to include an *activity manipulation routine, AMP,* contributed by ORNL. The new routine alone, or the entire package, may be requested.

CCC-253/ANISN-PPL

The multigroup one-dimensional discrete ordinates transport code contributed by Princeton Plasma Physics Laboratory was updated to include helpful materials from the CCC-248/SWAN code package as follows: **ANISN Library Processor Output List**, and source statements, control cards, input data and an output listing for **LIBMAK**. Interested persons may request these five files only or the entire CCC-253 code package.

CCC-271/PUSHLD

A code package designed for the calculation of gamma radiation dose rates from three-dimensional plutonium source and shield geometries at various distances was contributed by **Hanford Engineering Development Laboratory**, Richland, Washington. Reference: HEDL-TME 73-89. FORTRAN IV, and Assembler language; CDC CYBER 74-18.

CCC-272/TRIPOLI

Three dimensional Monte Carlo multigroup neutron radiation transport code system was contributed by the CEA/CEN/Saclay, France, Shielding Group through the OECD Nuclear Energy Agency's Computer Program Library (NEA CPL), Ispra (Varese), Italy. FORTRAN IV, IBM 360. Reference: CEA document (French) now being translated.

CCC-273/DACRIN

This code package designed for airborne radionuclide inhalation organ dose calculations was contributed by Battelle Pacific Northwest Laboratory, Richland, Washington. References: BNWL-B-389 and Supplement. FORTRAN IV, CDC CYBER 74.

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**

AECL-5136
Managing Nuclear Wastes.
Dyne, P.J.
May 1975
Dep., NTIS (U.S. Sales Only)

ANL/CTR/TM-45
CTR Quarterly Progress Report - April-June, 1975.
Argonne National Laboratory
August 8, 1975
*Argonne National Laboratory*, Argonne, Illinois 60439

BNWL-1950(Pt.3), pp.22-24
Radionuclides from Nuclear Power Reactors.
Thomas, C.W.
In: Pacific Northwest Laboratory Annual Report for 1974 to the USAEC Division of Biomedical and Environmental Research. Part III. Atmospheric Sciences.
Battelle Pacific Northwest Labs., Richland, Wash.

CLM-R-136
Neutronics of Cellular Blankets for Fusion Reactors.
Constantine, G.; Bengston, J.J.; Samuelson, H.H.
1975
Dep., NTIS (U.S. Sales Only) $4.00; U.K. pounds 1.

COO-2280-22
Computational Complexity in Multidimensional Neutron Transport Theory Calculations. Progress Report, September 1, 1974 - August 31, 1975.
Bareiss, E.H.
1975
Dep., NTIS $4.00

FEI-464 (In Russian)
Calculation of Neutron Penetration in a Spherical Geometry, Part I.
Tsibulya, A.M.
1973
INIS

HASL-293
Total Neutron Cross Sections from 15 MeV to 25.5 GeV for Isotopes with Mass Numbers, 12 Less Than or Equal to a Less Than or Equal to 64.
Sanna, R.S.
April 1975
Dep., NTIS $4.00

IKE-6-88 (In German)
Treatment of Anisotropy in Inelastic Neutron Scattering.
Roller, D.
February 1975
INIS

LA-5983-MS
More 14-MeV, Neutron-Induced Gamma-Ray Production Cross Sections.
Drake, D.M.; Arthur, E.D.; Silbert, M.G.
July 1975
NTIS $4.00

LA-6021-MS
Gamma and Beta Decay Power Following 235-U and 239-Pu Fission Bursts.
England, T.R.; Schenter, R.E.; Whittemore, N.L.
July 1975
NTIS $4.00

MATT-1082
Princeton Reference Design Fusion Power Plant.
Price, W.G.,Jr.
November 1974
Dep., NTIS $4.00

MATT-1102
Neutron Wall Load Distributions in a Circular Cross Section Tokamak.
Price, W.G.,Jr.; Chapin, D.L.
January 1975
Dep., NTIS $5.25

NBS Spec. Pub. 425, Vols.I(pp.1-468) and II(pp.469-1003) CONF-750303, Vol.I(pp.1-468) and Vol.II.(pp.469-1003)
Nuclear Cross Sections and Technology - Proceedings of a Conference, Washington, D.C., March 3-7, 1975.
Schrack, R.A.; Bowman, C.D. (Eds.)
October 1975
U.S. Government Printing Office, Washington, D.C. 20402; $19.45 per 2 vol. set - sold in sets only.

NBS Spec. Pub. 425, pp.3-6; CONF-750303, pp.3-6
Neutron Cross-Section Needs.
Kouts, H.J.C.
October 1975
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NBS Spec. Pub. 425, pp.7-13; CONF-750303, pp.7-13
The Light Water Reactor Industry - Nuclear Data Needs.
Uotinen, V.O.; Robertson, J.D.; Tulenko, J.S.
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NBS Spec. Pub. 425, pp.14-20; CONF-750303, pp.14-20
Radioactive-Nuclide Decay Data in Science and Technology.
Reich, C.W.; Helmer, R.G.
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NBS Spec. Pub. 425, pp.21-28; CONF-750303, pp.21-28
Radioactive Decay Heat Analyses.
Schenter, R.E.; Schmittroth, F.
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Sensitivity of the Afterheat from 235-U and 239-Pu Thermal Fission to Errors in Fission Product Nuclear Data.
Devillers, C.; Nimal, B.; Fiche, C.; Noel, J.P.; Blachot, J.; de Tourreil, R.
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NBS Spec. Pub. 425, pp.149-155; CONF-750303, pp.149-155
Nuclear Models and Data for Gamma-Ray Production.
Young, P.G.
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NBS Spec. Pub. 425, pp.161-164; CONF-750303, pp.161-164
Integral Measurements to Test Shielding Cross Sections.
Harris, L.,Jr.; Young, J.C.; Lurie, N.A.; Steinman, D.K.; Friesenhahn, S.J.; Bryan, D.E.; Gober, W.E.; Schanzler, L.
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NBS Spec. Pub. 425, pp.165-168; CONF-750303, pp.165-168
Evaluation, Uncertainty Estimation and Adjustment of Capture Cross Sections for Fission Product Nuclei.
Gruppelaar, H.; Dragt, J.B.; Janssen, A.J.; Dekker, J.W.M.
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NBS Spec. Pub. 425, pp.169-172; CONF-750303, pp.169-172
Integral Test of Cross Sections Using Neutron Leakage Spectra from Spheres of Iron, Niobium, Beryllium, and Polyethylene.
Johnson, R.H.; Dorning, J.J.; Wehring, B.W.
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NBS Spec. Pub. 425, pp.177-183; CONF-750303, pp.177-183
Shielding Benchmark Experiments and Sensitivity Studies in Progress at Some European Laboratories.
Hehn, G.; Mattes, M.; Matthes, W.; Nicks, R.; Rief, H.
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NBS Spec. Pub. 425, pp.184-188; CONF-750303, pp.184-188
Assessment of Neutron Group Constants for Iron and Stainless Steel Through Measurements and Analyses of Energy and Space Distributions of Neutrons in Test Assemblies.
Kimura, I.; Kobayashi, K.; Hayashi, Shu A.; Yamamoto, S.; Nishihara, H.; Ando, M.; Kanazawa, S.; Nakagawa, M.
October 1975
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NBS Spec. Pub. 425, pp.193-198; CONF-750303, pp.193-198
Fission-Product Gamma-Ray and Photoneutron Spectra.
Stamatelatos, M.G.; England, T.R.
October 1975
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NBS Spec. Pub. 425, pp.250-253; CONF-750303, pp.250-253
Fission Spectrum Neutrons for Cross Section Validation and Neutron Flux Transfer.
Grundl, J.; Eisenhauer, C.M.
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NBS Spec. Pub. 425, pp.309-312; CONF-750303, pp.309-312
Computer-Readable "Nuclear Data Sheets".
Ewbank, W.B.
October 1975
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NBS Spec. Pub. 425, pp.313-316; CONF-750303, pp.313-316
Recent Evaluation for the German Nuclear Data Library KEDAK-3.
Goel, B.; Kusters, H.; Weller, F.
October 1975
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NBS Spec. Pub. 425, pp.332-334; CONF-750303, pp.332-334
Neutron Cross Sections and Their Uncertainties Obtained from Nuclear Systematics.
Pearlstein, S.
October 1975
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NBS Spec. Pub. 425, pp.385-388; CONF-750303, pp.385-388
Effects of Nuclear Data Uncertainties Upon LMFBR Fuel Cycle Characteristics.
McKnight, R.D.; LeSage, L.G.; Christenson, J.M.
October 1975
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NBS Spec. Pub. 425, pp.409-414; CONF-750303, pp.409-414
Neutron Attenuation in Normal and Ilmenite Concretes.
Adams, R.J.; Lokan, K.H.
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NBS Spec. Pub. 425, pp.422-425; CONF-750303, pp.422-425
Neutron Energy Spectrum Controlled Blanket for Fast Breeder Reactor.
Tang, L.H.
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NBS Spec. Pub. 425, pp.426-430; CONF-750303, pp.426-430
Use of Monte Carlo Method in the Estimation of Fast Neutrons Leaked Through a Concrete-Paraffin Shielding.
Chuang, L.S.; Wong, K.C.
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A Comparison of Air-Over-Ground Transport Calculations Using Different Cross Sections.
Saccenti, J.C.; Woolson, W.A.
October 1975
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NBS Spec. Pub. 425, pp.436-439; CONF-750303, pp.436-439
The Sensitivity of Neutron Air Transport to Nitrogen Cross Section Uncertainties.
Niiler, A.; Beverly, W.V.; Banks, N.E.
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NBS Spec. Pub. 425, pp.440-443; CONF-750303, pp.440-443
Monte Carlo Studies of the Effect of Cross Section Characteristics on Fast Neutron Penetration in Iron.
Ku, L.P.; Goldstein, H.
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A Two Dimensional Cross Section Sensitivity Analysis of Iron in a Concrete Shield.
Albert, T.E.; Simmons, G.L.
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Seth, S.; Heer, W.; Jermann, M.; McCombie, C.; Ottewitte, E.; Richmond, R.; Wydler, P.
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Biomedical Application of Shortlived Positron Emitting Isotopes.
Meyer, P.; Behrin, E.; Frank, R.; Holub, R.; McJilton, C.E.
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NBS Spec. Pub. 425, pp.496-499; CONF-750303, pp.496-499
Feasibility of Neutron-Gamma Techniques for Field Analysis of Fresh Concrete.
Taylor, M.C.; Rhodes, J.R.; Bernard, D.L.
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Cross Section Requirements for Industrial Gauging Applications.
Cho, B.Y.; Sheahen, T.P.
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NBS Spec. Pub. 425, pp.516-519; CONF-750303, pp.516-519
The Measurement of Thermal Neutron Constants of the Soil; Application to the Calibration of Neutron Moisture Gauges and to the Pedological Study of Soil.
Couchat, Ph.; Carre, C.; Marcesse, J.; Ho, J.Le
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Medical Uses of Nuclear Data.
Tilbury, R.S.; Bigler, R.E.; Zeitz, L.; Laughlin, J.S.
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NBS Spec. Pub. 425, pp.527-532; CONF-750303, pp.527-532
Medical Use of Fast Neutrons in Radiotherapy and Radiography.
Bewley, D.K.
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Biomedical Radiation Transport Calculations as an Application of Nuclear Data.
Alsmiller, R.G.,Jr.
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NBS Spec. Pub. 425, pp.646-650; CONF-750303, pp.646-650
Nuclear Data Needs for Fusion Reactor Design.
Steiner, D.
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NBS Spec. Pub. 425, pp.651-658; CONF-750303, pp.651-658
Model Calculations as One Means of Satisfying the Neutron Cross Section Requirements of the CTR Program.
Gardner, D.G.
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A Survey of Fast-Neutron Induced Reaction Cross-Section Data.
Qaim, S.M.
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A Quantitative Assessment of CTR Cross Section Needs.
Gerstl, S.A.W.; Dudziak, D.J.; Muir, D.W.
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A Sensitivity Study of Data Deficiencies, Weighting Functions, and 14 MeV Neutron Source Spectrum Effects in a 238-U Fueled Fusion-Fission Hybrid Blanket.
Leonard, B.R.,Jr.; Jenquin, U.P.; Lessor, D.L.; Newman, D.F.; Stewart, K.B.
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238-U Pulsed Measurements and CTR Fusion-Fission Blanket Calculations.
Wong, C.; Anderson, J.D.; Haight, R.C.; Hansen, L.F.; Komoto, T.
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Reactivities for Two-Component Fusion Calculations.
Miley, G.H.; Towner, H.H.
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Application of Bondarenko Formalism to Fusion Reactors.
Soran, P.D.; Dudziak, D.J.
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Background on Radiation Protection Standards.
In: Environmental Analysis and Environmental Monitoring for Nuclear Power Generation.
Rogers, L.
1974
California University, Berkeley, CA

ORNL-5000, Part 2
A Tabulation of Dose Equivalent per Microcurie-Day for Source and Target Organs of an Adult for Various Radionuclides.
Snyder, W.S.; Ford, M.R.; Warner, G.G.; Watson, S.E.
November 1975
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ORNL-RSIC-39
The Development of Radiation Shielding Standards in the American Nuclear Society.
Trubey, D.K.
November 1975
NTIS $4.00

ORNL-TM-4781
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Sweeton, F.H.
September 1975
NTIS $4.00

ORNL-TM-4823
Production of Low Energy Gamma Rays by Neutron Interactions with Fluorine for Incident Neutron Energies Between 0.1 and 20 MeV.
Morgan, G.L.; Dickens, J.K.
June 1975
Dep., NTIS $4.75

ORNL-TM-5081
Gamma-Ray Production Due to Neutron Interactions with Silver for Incident Neutron Energies Between 0.3 and 20 MeV: Tabulated Differential Cross Sections.
Dickens, J.K.; Love, T.A.; Morgan, G.L.
November 1975
NTIS $5.45

ORNL-TM-5118
Calculated Performance of a Segmented Pyramid-Shaped Calorimeter of Iron and Plastic.
Amburgey, J.D.; Gabriel, T.A.
November 1975
NTIS $4.00

ORNL-TM-5142; ENDF-224
Specification for
Pseudo-Composition-Independent Fine-Group and Composition-Dependent Fine- and Broad-Group LMFBR Neutron-Gamma Libraries at ORNL.
Weisbin, C.R.; Roussin, R.W.; White, J.E.; Wright, R.Q.
December 1975
Energy Research and Development Administration, Technical Information Center, P.O. Box 62, Oak Ridge, Tenn. 37830

PB-229747
Gamma Spectrum Catalog: RHINO I with Decay Schemes and Detection Efficiencies.
Training Inst., Environmental Control Administration, Rockville, Md.
1970
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