RSIC Newsletter

RADIATION SHIELDING INFORMATION CENTER

OAK RIDGE NATIONAL LABORATORY

OPERATED BY UNION CARBIDE CORPORATION FOR THE DEPARTMENT OF ENERGY

POST OFFICE BOX X • OAK RIDGE, TENNESSEE 37830

No. 154 *October 1977*

What is called science today consists of a haphazard heap of information, united by nothing. . . . *Leo Tolstoy*

ANSI STANDARD FLUX-TO-DOSE-RATE FACTORS PUBLISHED

The ANSI standard ANSI/ANS-6.1.1–1977, "Neutron and Gamma-Ray Flux-to-Dose-Rate Factors" has been published and is available from the American Nuclear Society, 555 North Kensington Avenue, La Grange Park, Ill. 60525 USA for $12. The standard was produced by the ANS-6.1.1 working group of the ANS Standards Committee led by Morris E. Battat of Los Alamos Scientific Laboratory.

The standard provides guidance to shield designers for the calculation of whole body dose equivalent from a computed flux spectrum. The recommended data are based mainly on NCRP Report No. 38 for neutrons and Claiborne–Trubey and Wells–Livesay for gamma rays. Interpolation guidance is given in the form of polynomial coefficients for computer applications.

AMERICAN NUCLEAR SOCIETY MEETS IN SAN FRANCISCO NOV. 27–DEC. 2

Sessions of the American Nuclear Society at San Francisco Nov. 27–Dec. 2 of special interest to shielding analysts include:

Radiation Protection and Shielding

Occupational Exposure Reduction (Mon. p.m.); Radiation Transport and Shielding Applications (Tues. a.m.); Radiation Protection Applications (Wed. p.m.); University Goals and Technical Community Needs in Radiation Protection (Thurs. a.m.); Fusion Reactor Neutronics and Shielding (Fri. a.m.).

Reactor Physics

Nuclear Data (Mon. p.m.); Data Adjustment: An Attempt to Achieve Consistency Between Differential and Integral Measurements (Tues. a.m.); Measurement and Calculation of Reactor Parameters–I (Tues. p.m.); Physics of Thermal Reactors (Wed. a.m.); Gaseous Core Reactors and Nuclear-Pumped Lasers (Wed. a.m.); Measurement and Calculation of Reactor Parameters–II (Wed. p.m.); Increased Availability of Power Stations Through Advanced Surveillance (Thurs. a.m.); Reactor Theory and Applications (Thurs. p.m.); Thorium Fuel Cycle Potential in a Breeder Economy (Fri. a.m.).

Mathematics and Computation

Computational Methods in Transport Theory (Mon. p.m.); Kinetics and Control Methods (Tues. a.m.); Monte Carlo Methods–I (Tues. p.m.); Monte Carlo Methods–II (Wed. a.m.); Diffusion Theory and Parameters (Thurs. a.m.).

Environmental Sciences

Environmental Surveillance and Modeling (Mon. p.m.); Characteristics of Airborne Radioactive Pollutants (Tues. a.m.); Human Health Effects of Inhaled Radioactive Aerosol (Tues. p.m.); Environmental Impact of the Nuclear Fuel Cycle (Wed. a.m.); Environmental Sciences—General (Wed. p.m.); Low-Level Waste Disposal: An Industry/Utility and Government Dialogue (Thurs. a.m.); Standards for Environmental Releases from Mining and Milling of Uranium (Thurs. p.m.); Geologic Aspects of Siting Nuclear Facilities (Fri. a.m.).

Isotopes and Radiation

Nuclear Techniques in Geology (Mon. p.m.); Nuclear Medicine (Tues. a.m.); Nuclear Techniques in Hydrology (Tues. p.m.); Nuclear Safeguards Technology (Wed. a.m.); Safeguards: Measurements,

Accountability Systems Analysis (Wed. p.m.); Radiation Backgrounds in Space–I: Environment Definition (Thurs. a.m.); Radiation Backgrounds in Space–II: Calculation/Experimental Methods and Effects (Thurs. p.m.); Radiation Techniques (Fri. a.m.).

CURRENT WORK AND PROBLEMS

Sümer Sahin writes that the University of EGE Faculty of Engineering, Bornova-Izmir-Turkey, has an IBM 370/125 computer system with a virtual memory of 650 KB, two tape and two disc drive units. He offers the following information concerning the work in which he is involved.

> "We have successfully run DTF-IV, ANISN, DOT-II and DOT-III using the DLC-2/100-group data library. DOT requires 7 tape units and ANISN also requires several. Through the following trick we are able to use the full capacity of the codes. On one disc drive we can define up to 8 different fields as an independent auxiliary unit and we can provide them with their own unit number. In this way DOT assumes 7 different tape units, although all of them are on the same disc unit.
>
> We are working on several doctoral theses with the help of this system. One lieutenant of the Turkish Air Force has finished his thesis successfully. Three assistants of our Faculty have reached the last phase of their calculations. Two new assistants and a young researcher from the Turkish Electrical Authority have begun their doctoral work by using the above transport codes.
>
> Our research area covers spacecraft, thermionic reactors, and commercial plutonium. One extensive journal article about thermionic reactors resulting from the calculations at our computer system is in preparation.
>
> We are able over our system to do shielding research over a wide spectrum." —S. Sahin

From **Ferenc Hajnal** we learned that effective September 1, the ERDA Health and Safety Laboratory in New York has been named the Environmental Measurements Laboratory of the Department of Energy.

Craig O. Brown writes that at present, Exxon Nuclear is primarily a supplier of nuclear fuels. The company has also expanded into nuclear energy systems such as spent fuel storage racks, reprocessing facilities, spent fuel transportation systems, etc. He presently is working in the Quality Assurance and Licensing Department at ENC in the area of criticality safety, performing associated reactivity calculations.

T. L. Yang states that in regard to the activities at Ebasco Services, two of his colleagues, Dr. L. C. Pwu and Mr. V. C. Baker (now at ORNL) are going to present a paper on "Neutron Streaming Study on the TFTR (Tokamak Fission Test Reactor) Diagnostic Penetrations" at the ANS winter meeting, San Francisco, November 1977. He is writing a paper on neutron streaming through the reactor cavity and its shielding design to be submitted to the ANS meeting, Washington, D.C., May 1978. Some of his group are working on the activity study of TFTR.

PERSONAL ITEMS

Leland L. Carter has joined the Radiation and Shield Analysis group at HEDL. Dr. Carter was formerly at LASL where he was Alternate Group Leader for TD-6, Monte Carlo, Vulnerability, and Weapons Data. In addition to being associated with the Fast Flux Test Facility at HEDL, he will be involved in solving problems associated with the design and operation of the High Flux Neutron Source.

MEET THE NUCLEAR DATA SECTION OF IAEA

The Nuclear Data Section (NDS) of the International Atomic Energy Agency provides cost-free data center services to a defined service area [Eastern Europe (except the USSR), Africa, Asia (except Japan), and South America, Australia and New Zealand]. NDS, together with the three other regional centers [NEA Neutron Data Compilation Centre, Saclay (France); USSR Nuclear Data Centre, Obninsk (USSR); National Nuclear Data Center at Brookhaven (USA)] cooperates in a systematic world-wide collection, compilation, analysis, dissemination and exchange of neutron data and related information.

NDS keeps abreast of the needs for nuclear data measurements and techniques of importance to peaceful nuclear applications programs of the IAEA and its Member States. In particular, topics for reviews and surveys are selected for their economic and scientific importance in national and international nuclear programs. The NDS also functions as the Secretariat to the International Nuclear Data Committee (INDC), which promotes international cooperation in all phases of nuclear data activity, and advises the Director General of the IAEA in this field.

Within the framework of the IAEA nuclear data program, NUCLEAR DATA means numerical and associated information pertinent to measured, deduced or calculated parameters of nuclear reactions induced by neutrons, charged particles and photons, as well as nuclear structure and decay data, used in fundamental and applied nuclear sciences. In general NDS maintains a coordinated system of neutron nuclear data compilation, analysis and dissemination, and functions for all nuclear data as a referral center serving fundamental and applied nuclear scientists in IAEA Member States.

The particular functions of NDS include the following:

(1) Maintenance and development of its own computerized data storage and retrieval systems in support of its participation in the inter-regional neutron data exchange system EXFOR;
(2) Contributions to the CINDA compilation, and arrangement for IAEA publication of CINDA on behalf of the four regional neutron data centers;
(3) Performing surveys and reviews of selected nuclear data important for applied nuclear programs and giving these reports wide distribution;
(4) Organization of several scientific meetings every year ranging from small experts meetings on special topics to large international conferences on nuclear data;
(5) Coordination of the compilation of WRENDA, the world request list for nuclear data measurements needed for the development of fission and fusion reactors and of nuclear materials safeguards and publishing it annually to stimulate and guide the measurements of required nuclear data;
(6) Soliciting requests and providing assistance in the supply of accelerator targets and samples needed for nuclear data measurements in developing countries;
(7) Surveying the requirements for nuclear data in applied and fundamental fields and maintaining information files on existing, projected and required compilations and evaluations of nuclear data;
(8) Record keeping of existing experimental nuclear physics facilities (linear accelerators, cyclotrons, betatrons, research reactors, etc.) used for the measurement of nuclear data and for other applications; and
(9) Maintenance of the INDC file of nuclear data correspondents and serving as a distribution point for reports and documents on nuclear data.

Upon request NDS supplies free of charge experimental and evaluated neutron data in any computer medium; selective retrievals from the CINDA and WRENDA master files; reports on nuclear data surveys and reviews; and answers to inquiries on the existence and status of nuclear data activities, and on the availability of nuclear data compilations and evaluations.

For further information write to Nuclear Data Section, International Atomic Energy Agency, P. O. Box 590, A-1011 Vienna, Austria; Telex 01-2645; Cable – Inatom Vienna; Telephone – (0043 222)52 45 11.

IAEA PUBLICATIONS ON NUCLEAR DATA

CINDA —An index to the printed literature and to computerized data libraries in the field of microscopic neutron data, published twice a year by the IAEA on behalf of USA National Neutron Cross-Section Center, USSR Nuclear Data Centre, NEA Neutron Data Compilation Centre, and IAEA Nuclear Data Section. (1974) Price: US $36; £ 16; F.Fr. 187; DM 100; AS 750.

HANDBOOK ON NUCLEAR ACTIVATION CROSS-SECTIONS—(Technical Report Series No. 156 - STI/DOC/10/156). Contents: 2200 m/s neutron activation cross-sections; Infinite-dilution resonance integrals; Tables and graphs of cross-sections for (n,p), (n,α) and (n,2n) reactions in the neutron energy region 1-37 MeV; Cross-sections for fission neutron spctrum induced reactions; Excitations in light elements at low projectile energies; Photonuclear cross-sections. (In English) (1974). Price: US $26; £ 10.80; F.Fr. 126; DM 64; AS 475.

NEUTRON STANDARDS REFERENCE DATA—(Panel Proceedings Series STI/PUB/371). The Proceedings contain detailed reports on the status of neutron flux-measurements techniques and on data for the acknowledged neutron standards – the cross sections for elastic scattering of neutrons on hydrogen and for the reactions ^{3}He(n,p)T, ^{6}Li(n,α)^{7}Li, ^{197}Au(n,γ)^{198}Au and ^{235}U(n,f); ν, the average number or neutrons emitted in spontaneous fission of ^{252}Cf; the fission neutron spectra of ^{252}Cf and ^{234}U; the thermal parameters on the fissile isotopes. (1974). Price: US $20; £8.60; F.Fr. 96; DM 53; AS 375.

FISSION PRODUCT NUCLEAR DATA (IAEA-169)—Proceedings of a panel held by the IAEA in Bologna, 26-30 November 1973, (1974). Microfiche copies available from INIS Microfiche Clearing House on prepayment of US $0.65.

NUCLEAR DATA IN SCIENCE AND TECHNOLOGY (STI/PUB/343)—Proceedings of a Symposium held by the IAEA in Paris, 12-16 March 1973, Vol. I and Vol. II (1973). Price per volume: US $26; £10; F.Fr. 30; DM 19; AS 138.

PROMPT FISSION NEUTRON SPECTRA (STI/PUB/329)—Proceedings of a consultants' meeting convened by the IAEA in Vienna, 25-27 August 1971, (1972). Price: US $6; £2.50; F.Fr. 30; DM 19; AS 138.

NEUTRON NUCLEAR DATA EVALUATION (STI/DOC/10/146) – Summary of a panel convened by the IAEA in Vienna 30 August - 3 September 1971, (1973). Price: US $5; £2; F.Fr. 22.80; DM 14.20; AS 105.

NUCLEAR DATA FOR REACTORS—1970 (STI/PUB/259)—Proceedings of the second international conference on the subject convened by the IAEA, Helsinki, 15 - 19 June 1970, (1970). Price: Vol. I: US $21; £ 8.75; F.Fr. 116.60; DM 76.90; AS 543. Vol. II: US $24; £10; F.Fr. 136.20; DM 87.80; AS 620.

To order IAEA publications write to: Publishing Section, International Atomic Energy Agency, Kartner Ring 11, P. O. Box 590, A-1011 Vienna, Austria. In the United Kingdon write to: Her Majesty's Stationery Office, P. O. Box 569, London SE 1 9NH. In the United States write to: UNIPUB, Inc., P. O. Box 433, Murray Hill Station, New York, N.Y. 10016.

VISITORS TO RSIC

The following persons came for an orientation visit and/or to use RSIC facilities during the month of September:

David Auton, Defense Nuclear Agency, Washington, D.C.; Kin-Sheng Joe Chang, Fluor Pioneer, Inc., Chicago, Ill.; Sen-I Chang, Institute of Nuclear Research, Taiwan, R.O.C.; R. A. Lewis, and Bert J. Toppel, Argonne National Laboratory, Argonne, Ill.; G. Ronald Dalton, University of Florida, Gainesville, Florida; Roger G. Perkins, General Atomic Company, San Diego, California; and Steven W. Serles and Hans Wittendel, Princeton University, Princeton, New Jersey.

CHANGES IN THE COMPUTER CODE COLLECTION

The following changes were made in the computer code collection during the month of September.

CCC-179/ATR

The code package (models of radiation transport in air) has been extended to include a version operable on the TR-440 Telefunken computer, a contribution of the FRG Weapons Science Service Center. The new hardware version is designated CCC-179C.

CCC-276/DOT 3.5

This two-dimensional discrete ordinates radiation transport code package was updated by a replacement of the DOQ program with the new version, *DOQDP*, contributed by the Oak Ridge National Laboratory. DOQDP represents a major modification of the DOQ code and, it is believed, a major improvement. It is faster, more versatile, and more accurate than its predecessor. It affords more flexibility with four possible output combinations. DOQDP was packaged also as a stand-alone routine (see description under PSR-110, which follows).

CCC-304/AIRDOS II

This estimation of radiation doses caused by airborne radionuclides in areas surrounding nuclear facilities was contributed by the Oak Ridge National Laboratory. Atmospheric dispersion and surface deposition of released radionuclides are estimated as a function of direction and distance from a nuclear power plant or fuel-cycle facility, and doses to man through inhalation, air immersion, exposure to contaminated ground, food ingestion, and water immersion are estimated in the surrounding area. The location of the highest individual doses for each reference organ estimated for the area is specified in the output data. Reference: ORNL-5245. FORTRAN IV; IBM 360.

PSR-110/DOQDP

This discrete ordinates quadrature generator code package was contributed by Oak Ridge National Laboratory. DOQDP is a major modification of the DOQ code which it replaces. It grew out of a need for a standard collection of quadrature sets which were supported by documentation concerning their origin and derivation. The package contains a library (in standard interface format) which includes many of the quadratures as well as the processing code. DOQDP is expected to be useful to users of codes like ANISN, DOT, and ONETRAN (CCC-252, -253, -254, -255, -273), and has been incorporated into the CCC-276/DOT 3.5 package, replacing its predecessor, DOQ. Reference: J. P. Jenal, P J. Erickson, W. A. Rhoades, D. B. Simpson, M. L. Williams, *The Generation of A Computer Library for Discrete Ordinates Quadrature Sets*, ORNL/TM-6023 (September 1977). FORTRAN IV; IBM 360.

PSR-111/APPLE

This plotter package, developed to plot the spatial distribution of the energy spectra of multigroup neutron flux obtained from the one-dimensional discrete ordinates transport code, ANISN, was contributed by the Japan Atomic Energy Research Institute, Tokyo, Japan. With some modifications in the input format of reading fluxes, the code can be applied to any form of neutron flux obtained from the use of other one-dimensional calculation codes. Also, with little modifications, it can be applicable to plotting gamma-ray flux or angular neutron flux. Reference: JAERI-memo 7194. FORTRAN IV; FACOM 630-75.

CHANGES IN THE DATA LIBRARY COLLECTION

The data library collection was changed during the month as follows.

DLC-49/AIRFEWG

The compilation of results of ANISN multigroup calculations of gamma-ray, neutron, and secondary gamma-ray transport in infinite homogeneous air using DLC-31/(DPL-1/FEWG1) cross sections has been

provided by Air Force Weapons Laboratory, Kirtland Air Force Base, New Mexico. Results are provided for 37 neutron and 21 gamma-ray groups for ranges up to 8400 meters. Two sets of neutron cross sections were used, "1/E" weighted and "fission spectrum" weighted. The results have also been fitted and coefficients for the empirical function are also provided. In addition, a retrieval code, EDT303, is included to obtain edits of the results. Transmittal requires two full reels of magnetic tape. Reference: AFWL-TR-75-303, Vol. I and II. IBM 360.

SEPTEMBER 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.

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

AD-A-027196; R-7-76
A Preliminary Study of a Hybrid Fusion Reactor at Moderate Temperature. Technical Report.
Liboff, R.L.
July 21, 1976
NTIS

AD-A-035843; Thesis
Finite Element Solution of the Nonlinear Coupled Neutronic-Energy Equations for a Fast Reactor Fuel Cell.
Kasdorf, R.E.
December 1976
NTIS

AERE-R-8520
Nuclear Accident Dosimetry: Report on the Fourth IAEA Intercomparison Experiment at Harwell, UK - 7th-8th April 1975. Part 1. Description of the Experiment and Participants' Results.
Gibson, J.A.B.; Delafield, H.J.; Reading, A.H.
December 1976
Dep., NTIS (U.S. Sales Only)

AERE-R-8521
Nuclear Accident Dosimetry: Report on the Fourth IAEA Intercomparison Experiment at Harwell, UK - 7th-8th April 1975. Part 2. Systems Used by Participants at the Experiment.
Gibson, J.A.B.
December 1976
Dep., NTIS (U.S. Sales Only)

AFTAC-TR-77-6, Volume II
Monte Carlo Studies on the Time-Dependent Transport of Optical and Infrared Radiation in the Atmosphere. Volume II. Thermal Radiation Transport. Final Report, July 1, 1975 - September 30, 1976.
Collins, D.G.; Well, M.B.
March 1977
Air Force Technical Applications Center, Headquarters United States Air Force, Patrick Air Force Base, Florida 32925

ANL/FPP/TM-81
Important Aspects of Radiation Shielding for Fusion Reactor Tokamaks.
Abdou, M.A.
April 30, 1977
NTIS

ANL/NDM-24
Fast Neutron Cross Sections of Vanadium and an Evaluated Neutronic File.
Guenther, P.; Havel, D.; Howerton, R.; Mann, F.; Smith, D.; Smith, A.; Whalen, J.
May 1977
NTIS

ANL/NDM-33
Comments on the Energy-Averaged Total Neutron Cross Sections of Structural Materials.
Smith, A.B.; Whalen, J.F.
June 1977
NTIS

ANL/NDM-34
Graphical Representation of Neutron Differential Data for Reactor Dosimetry Applications.
Smith, D.L.
June 1977
NTIS

BRL-MR-2768
Neutron Damage in Silicon from Neutrons with Energy Near 1-MeV.
Youngblood, J.E.; Hollandsworth, C.E.; Van Antwerp, W.R.
July 1977
NTIS

CEA-CONF-3772; CONF-7610107-1
Control of Corrosion Product Movement and Deposited Activities in Reactor Circuits.
Rozenberg, J.; Dolle, L.; Darras, R.
1976
Dep., NTIS (U.S. Sales Only)

COO-2458-14; CONF-770611-14
Evaluation of Continuous Slowing Down Theory Parameters in Highly Absorbing Media.
Parvez, A.; Becker, M.
1977
Dep., NTIS

CONF-760533-3
Kerma Factors for Tissue Compositions, Compounds and Mixtures.
Caswell, R.S.; Coyne, J.J.; Randolph, M.L.
1976
NTIS $3.50

CONF-770401-15
Fast Reactor Shield Sensitivity Studies for Steel-Sodium-Iron Systems.
Oblow, E.M.; Weisbin, C.R.
1977
NTIS

CONF-770449
X-Ray, Neutron, and Electron Scattering. Materials Sciences Workshop on X-Ray, Neutron, and Electron Scattering, Oak Ridge National Laboratory, April 13-15, 1977.
Wilkinson, M.K.; Bienenstock, A.; Blume, M.; Clinton, W.L.; Rush, J.J.; Rowe, J.M. (Organizing Committee)
August 1977
U.S. GPO: 1977-748-189/177

CONF-770611-11
Evaluated Nuclear Structure Data File (ENSDF) for Basic and Applied Research.
Ewbank, W.B.
1977
Dep., NTIS

ERDA-tr-267
Comparison of the Radiation Hazard of Fission and Fusion Reactors.
Sivintsev, Yu.V.
1975
Dep., NTIS

EPRI-NP-380-SR
Power Reactor Pressure Vessel Benchmarks: An Overview.
Rahn, F.J.
April 1977
NTIS

FEI-507 (In Russian)
Some Methods for Neutron Spectra Restoration Using Multisphere Spectrometer. Part I. Analysis for Spectra Restorations Methods. Results of Numerical Experiment.
Semenov, V.P.; Trykov, L.A.; Tyufyakov, N.D.
1974
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Obninsk
Fiziko-Ehnergetichskij Inst.

GA-A-14,159
SIGMA - A Code for Generating Multi-Group, Neutral Plasma Cross Sections.
Pfeiffer, W.
January 1977
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HEDL-TME-76-70
Displacement Cross Sections and PKA Spectra: Tables and Applications.
Doran, D.G.; Graves, N.J.
December 1976
Dep., NTIS $6.00

HEDL-TME-76-88
Measurement and Calculation of Neutron Spectra in the FTR Engineering Mockup Critical.
Nelson, J.V.; Lippincott, E.P.; Bennett, R.A.; McElroy, W.N.; Daughtry, J.W.
February 1977
NTIS $4.50

HEDL-TME-77-17
High 240-Pu FTR/EMC Experiments and Analysis: Cross Section Preparation.
Ombrellaro, P.A.
March 1977
ERDA, TIC, P.O. Box 62, Oak Ridge, Tenn. 37830

IAEA-TC-82/5; CONF-7604120-8
INIS, CINDA, the EXFOR Data and the World Information Flow.
Tubbs, N.
1976
ERDA, TIC, P.O. Box 62, Oak Ridge, Tenn. 37830

IAEA-TC-82/6; CONF-7604120-5
Comments on the Use of INIS by Nuclear Data Information Centers.
Pearlstein, S.
1976
Dep. NTIS (U.S. Sales Only)
Published in Summary Form Only

IKE-4-55 (In German); Thesis (In German)
System for the Optimal Use of the Finite Element Method for the Calculation of Problems in Reactor Physics.
Sapper, E.
Stuttgart Univ., (Germany, F.R.)
May 1976

INDC(NDS)-86/G+P
Progress in Fission Product Nuclear Data.
Lammer, G.
May 1977
IAEA Nuclear Data Section, Karntner Ring 11, A-1010 Vienna

INDC(SEC)-54/L+Dos
IAEA Program on Benchmark Neutron Fields Applications for Reactor Dosimetry.
Vlasov, M. (Ed.)
July 1976
Dep., NTIS (U.S. Sales Only)

INIS-mf-3249, p.58 (In Russian)
Determining Shielding Thickness of Gamma Installations with Flat Cesium and Cobalt Irradiators Using Nomogram Method.
Solo'ev, A.M.; Terent'ev, B.M.
1974
INIS
Published in Summary Form Only

INIS-mf-3249, p.60 (In Russian)
Method for Measuring Reactor Gamma Spectra. 2. Experimental Apparatus.
Briskman, B.A.; Bondarev, V.D.; Novgorodtsev, R.B.
1974
INIS
Published in Summary Form Only

INIS-mf-3249, p.62 (In Russian)
On Errors in Determining the Neutron Radiation Dose.
Atkoshuc, V.B.; Bertulis, V.A.; Kershulis, V.I.
1974
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INIS-mf-3249, pp.62-63 (In Russian)
Spectral Parameter of Reactor Gamma Radiation.
Tsoglin, Yu.L.; Ogorodnik, S.S.
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JAERI-M-6348 (In Japanese)
Neutron Energy-Dependent Kerma Factors for Nuclides.
Tanaka, S.; Takeuchi, K.
December 1975
Japan Atomic Energy Research Inst., Tokyo

JAERI-M-6354
Nuclear Reactions and Subsequent Radioactive Decays Induced by 14-MeV Neutrons.
Tsukada, K.
January 1976
Japan Atomic Energy Research Inst., Tokyo

LA-UR-77-731
Associated Gamma-Ray Technique for Neutron Fluence Measurements.
Brandenberger, J.D.
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LA-UR-77-1123; CONF-770816-2
Rejection Methods for Sampling from the Normal Distribution.
Tadikamalla, P.R.R.; Johnson, M.E.
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LA-UR-76-1887; CONF-770401-1
Monte Carlo Hodoscope Calculations.
Cashwell, E.D.; Everett, C.J.; Macdonald, J.L.; Schrandt, R.; Soran, P.D.
1977
Dep., NTIS $3.50

LA-UR-76-1897; CONF-770401-2
Calculation of Toroidal Fusion Reactor Blankets by Monte Carlo.
Macdonald, J.L.; Cashwell, E.D.; Everett, C.J.
1977
Dep., NTIS $3.50

NASA-CR-120672; SAI-76-558-HU; N-75-29818
Monte Carlo Variance Reduction Study.
Byrn, N.R.
July 31, 1975
NTIS $7.25

NRPD-R-4
Dose Rates and Depth-Dose Distributions for Beta Particles Emitted by Commercially Available 90-Sr/90-Y, 204-Tl, 147-Pm and ^{63}Ni Sources.
Francis, T.M.; Seymour, R.
October 1972
ERDA, TIC, P.O. Box 62, Oak Ridge, Tenn. 37830

ORNL-5158
Computation System for Nuclear Reactor Core Analysis.
Vondy, D.R.; Fowler, T.B.; Cunningham, G.W.; Petrie, L.M.
April 1977
Dep., NTIS

ORNL-5178
TSF Measurements of Neutron Transmission Through an Al-LMFBR Lower Axial Shield Mockup.
Clifford, C.E.; Muckenthaler, F.J.; Stevens, P.N.
August 1977
ERDA, TIC, P.O. Box 62, Oak Ridge, Tenn. 37830 $6.00

ORNL-5315
Radiological Impact of Airborne Effluents of Coal-Fired and Nuclear Power Plants.
McBride, J.P.; Moore, R.E.; Witherspoon, J.P.; Blanco, R.E.
August 1977
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ORNL/NUREG/TM-102
Nuclear Decay Data for Radionuclides Occurring in Routine Releases from Nuclear Fuel Cycle Facilities.
Kocher, D.C.
August 1977
NTIS $5.50

ORNL/TM-5228
The FANG Angular Folding Code for Channel Theory Analysis.
Williams, M.L.; Sadler, F.B.
August 1977
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ORNL/TM-5901
A Measurement of the Neutron Streaming in a CRBR Phototypic Coolant Pipe Chaseway.
Muckenthaler, F.J.; Clifford, C.E.
August 1977
ERDA, TIC, P.O. Box 62, Oak Ridge, Tenn. 37830

ORNL/TM-5956
Calculated Irradiation Response of Materials Using a Fusion-Reactor First-Wall Neutron Spectrum.
Gabriel, T.A.; Bishop, B.L.; Wiffen, F.W.
June 1977
NTIS $3.50

ORNL-tr-4225
Nondestructive Control and Periodic Examination of Primary Reactor Circuits.
Prot, A.C.; Saglio, R.
1975
From the French, "Reliability of Nuclear Power Plants", pp.533-550, International Atomic Energy Agency, Vienna

PNC-J-213-75-01 (In Japanese)
Application of a Neutron-Gamma Ray Coupled Cross Section Set to Fast Reactor Systems.
Higashihara, Y.; Takemura, M.; Suzuki, T.
July 1975
Power Reactor and Nuclear Fuel Development Corp., Tokyo

PPPL-1344
Cost of Tritium Bred in a Critical Fission Reactor.
Price, W.G., Jr.
April 1977
NTIS

RD/B/N-3862
Relationship Between Doses to Human Body Organs and Exposure in a Cloud of Gamma Emitting Nuclides.
Clarke, R.H.
October 1976
Dep., NTIS (U.S. Sales Only)

SAND-77-0369
Neutron and Gamma-Rays Sources in LWR High-Level Nuclear Waste.
Dupree, S.A.
June 1977
NTIS $3.50

UCID-17530
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