RSIC Newsletter

RADIATION SHIELDING INFORMATION CENTER

OAK RIDGE NATIONAL LABORATORY

OPERATED BY UNION CARBIDE CORPORATION • FOR THE U.S. ATOMIC ENERGY COMMISSION

POST OFFICE BOX X •
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PRIDE
'Tis pleasant, sure, to see
one's name in print;
A book's a book, although
there's nothing in 't.

-- Lord Byron (1809)

TRAVELING WITH RSIC

Robert W. Roussin represented RSIC at the DASA Cross Section Working Group Meeting held at Los Alamos Scientific Laboratory on January 20-21, following which he made RSIC installation visits as indicated below.

A visit was made to the N2 Group of the Nuclear Propulsion Division at Los Alamos Scientific Laboratory. Current work involves computation of models of the PEWEE nuclear rocket systems to determine radiation heating. The calculations are integrated with the experimental testing program. Computational tools include the NU and MCG Monte Carlo codes for neutron transport and capture gamma source determination, QAD for core and capture gamma-ray transport, and the DTF and TWOTRAN discrete ordinates codes for traverses of the system. Personnel in the group include Glen Graves, Dick Malenfant, Don Peterson, Bob Streetman, and Clay Watson.

The trip extended to the Air Force Weapons Laboratory, Albuquerque, to visit the members of the Analysis and the Radiation Divisions. The work involves radiation transport calculations of interest to the Air Force Systems. Computational tools include ANISN, DOT, SAM-C, and MORSE for neutron and gamma-ray transport, PHOTRAN for X-ray transport, and POET, BETTY J and ETRAN for electron transport. Personnel in the groups include Majors Brody and Enz, Captain Knutsen, Lt. Picarelli, Airman Dominic, and Harry Murphy. An effort is under way to coordinate the radiation transport work throughout the laboratory.

BENCHMARK CONTRIBUTORS WANTED

The following article appeared in the November 1970 issue of Nuclear News. We think it important and repeat it here for emphasis.

The value of benchmark problems has been widely recognized, but success of this project depends upon contributions from the shielding community. We would like to join the Benchmark Problems Group, led by A. E. Profio, University of California, Santa Barbara, in making an appeal to all those in radiation transport work to assist by developing new data for current problems or proposing additional problems. Procedures and guidelines are given in the Problem book.

Supplement 1 of "Shielding Benchmark Problems," ORNL-RSIC-25 (ANS-SD-9), A. E. Profio, editor, has recently been issued. Compiling and publishing shielding benchmark problems is a joint project of the American Nuclear Society Shielding Standards Sub-committee (ANS-6), the ANS Shielding and Dosimetry Division, and RSIC. The supplement was distributed to Division members and is available upon request from RSIC or NTIS.

Supplement 1 provides an additional Monte Carlo solution to a problem issued previously, "Fast Neutron Spectrum from a Point Fission Source in Infinite Graphite." The solution was contributed by S. N. Cramer, Computing Technology Center, Union Carbide Corporation, V. R. Cain and E. A. Straker, Oak Ridge National Laboratory. The supplement also presents a new problem, "The Nucleon-Meson Cascade in Iron Induced by 1- and 3-GeV Protons," contributed by T. W. Armstrong and R. G. Alsmiller, Jr., Oak Ridge National Laboratory - J. R. Beyster (Sci. Apps., Inc.), Vice Chairman, ANS Shielding and Dosimetry Division.

IS YOUR SDI PROFILE UP-TO-DATE?

An opportunity to revise Reactor SDI Profiles is now being offered to subscribers. Early in February, an RSIC mailing included a new list of Reactor-Weapons Categories with instructions for submitting a new or revised profile. When available, a current individual profile was included in the letter to each subscriber. A number of new categories have been added and are denoted on the list with an asterisk (*). A few categories have been changed and are denoted by an X. Each subscriber is urged to review the list and submit any changes desired.

RESPONSE TO BIBLIOGRAPHY QUESTIONNAIRE

We are grateful to the 58 RSIC subscribers who answered our query as to "Shall RSIC Publish Another General Shielding Bibliography?" published in the December 1970 Newsletter. Of those who answered, 71% gave an emphatic YES with supporting arguments. The 29% thought that the SDI Service was adequate for their needs or that only a small part of their work had to do with shielding. One NO responded with "I am not frequently in need of the information, but when I need it, feel that 'a book on the shelf is worth two in the computer'."

Conclusion: we shall put the publication of an update to the shielding bibliography on our list of priorities - with a limited distribution.

To the 29% who answered NO and to those who did not and have little use for the bibliographies: how about returning to RSIC your copies for further distribution? We particularly would like to have copies of ORNL-RSIC-5, Vol. I, as the RSIC supply is exhausted.

CURRENT WORK AND PROBLEMS

In 1966 and 1967 the RSIC Newsletter regularly carried a feature, Current Work and Problems, initiated by Frank Clark and edited by him. The series covered such items as measurements and calculations related to shields and peripheral matters such as cross section measurements and instrument development. The feature articles were received with interest, but we were unable to aggressively pursue the information when Frank left the Center.

We will be pleased to publish such articles from time-to-time if the working shielding groups will write and send them to us. For this purpose we are including a concluding page to the Newsletter as a reminder and a guide. We will appreciate the cooperation of the shielding community in this effort to continue a progressive feature of the RSIC Newsletter.

FORTRAN CHAD WANTED

RSIC has received a request for an all-FORTRAN version of the differential angular transformation code CHAD. The forwarding of information concerning the existence of such a version will be appreciated by RSIC.

CORRECTIONS TO CCC-127/MORSE CODE PACKAGE

C. E. Burgart of Neutron Physics Division, ORNL, has called attention to corrections which should be made in the MORSE documentation and in the source card decks of MORSE and of the SAMBO analysis routines. A copy of these corrections has been mailed to those who have received the code package since the October 1970 update. Any MORSE user who has not received this material may have it by contacting RSIC. The changes have been made in the master decks on file at RSIC and will be reflected in any new distribution.

PSR-11/POPOP4 DOCUMENT CORRECTION

Walter E. Ford III has asked that a correction be made to document CTC-12, "POPOP4 - A Code for Converting Gamma-Ray Spectra to Secondary Gamma-Ray Production Cross Sections," as follows: on PAGE 37, the third line under section 5b should read "....lowest gamma group first."

CORRECTION TO DASH - IN CCC-89C/DOT CODE PACKAGE

Duaine G. Lindstrom of AGC, Sacramento, California, and Richard Soltesz of WANL, Pittsburgh, Pennsylvania, have notified RSIC of a correction to be made to a subroutine in the DASH code. The error left the variable LIN in Subroutine FIT undefined. It may be corrected as follows:

Remove cards #8600 through 8720.

Change card #8510 to read:

```
      IF (I2.GT.IMF2) GØ TØ 12
```

CORRECTION TO CCC-129B/TWOTRAN

K. D. Lathrop of LASL and R. A. Archibald of GE&ES have called to RSIC's attention an error in subroutine TESTS in CCC-129B/TWOTRAN. The error affects only problems with input normalization factor NØRM = 0.0.

Correction may be made in subroutine TESTS as follows:

Cards 36 and 37

Replace:

```
      T = NØRM
     IF (NØRM.EQ.0.0)T = 1.0
```

With one card:

```
      T = FG(IGP)
```

Card 123

Replace: 140 TA = NØRM/T

With two cards: 140 IF (NØRM.EQ.0.0) GØ TØ 170
TA - NØRM/T

NEW 99-GROUP LIBRARY AVAILABLE

A new edition of DLC-2/99G, the 99-group, P_8, neutron cross section library for use with ANISN, DOT, DTF-IV, and MORSE is now available. The library is designated DLC-2C and it is based on ENDF/B Version II. Data is available for the same nuclides that were in earlier editions of DLC-2/99G and the new nuclides included are He, 63-Cu, 65-Cu, Cu, 185-Re, 187-Re, 232-Th, and 233-U. Data for 6-Li, 7-Li, and 14-N (not in ENDF/B-II) are the same as those in the earlier DLC-2 editions. The library was produced with SUPERTOG by R. Q. Wright of the ORNL Mathematics Division and J. B. Wright of RSIC. Requesters should send three full reels of magnetic tape (to be written 7-track, unblocked) or one full reel (to be written 9-track, blocked) to obtain the entire library.

NEW XSDRN MULTIGROUP LIBRARY BASED ON ENDF/B VERSION II

A new 123-group, P_3, neutron cross section library, produced by R. Q. Wright of the ORNL Mathematics Division for use in the XSDRN code, is now available. It is designated as DLC-16/COBB and was placed with RSIC by Ron Cobb of the ORNL Reactor Division. The library contains data for H, D, He, 9-Be, 10-B, 12-C, 16-O, 23-Na, Mg, 27-Al, Ti, V, Cr, 55-Mn, Fe, Ni, Cu, 63-Cu, 65-Cu, 93-Nb, Mo, 135-Xe, 149-Sm, 151-Eu, 153-Eu, Gd, 164-Dy, 175-Lu, 176-Lu, 182-W, 183-W, 184-W, 186-W, 185-Re, 187-Re, 197-Au, 233-U, 234-U, 235-U, 236-U, 238-U, 237-Np, 238-Pu, 239-Pu, 240-Pu, 241-Pu, 242-Pu, 241-Am, 243-Am, and 244-Cm. The 93 neutron group (GAM-II group structure) above 1.86 eV was produced by "1/E" weighting with SUPERTOG. Below 1.86 eV, cross sections for 30 groups in the THERMOS group structure are generated with SUPERTOG, using a 293° K temperature Maxwell-Boltzmann distribution for weighting for E<0.125 eV and a "1/E" weighting for neutron energies up to 1.86 eV. Then the THERMOS tapemaker program combines the 30 thermal group SUPERTOG data with room temperature free gas kernel information to complete the description of the thermal region. Retrieval programs for manipulating the data were written by N. M. Greene of the ORNL Mathematics Division and are available with the data library packages. Requesters of DLC-16/COBB should send four full reels of magnetic tape (to be written 7-track, unblocked) or one full reel (to be written 9-track, blocked) to obtain the entire library and retrieval programs.

ADDITIONS TO THE COMPUTER CODE COLLECTION

Operable, tested with a sample problem, and available for distribution are the following code packages.

PSR-28/AMUSE Gamma-Ray Spectra Unfolding Code contributed by the Los Alamos Scientific Laboratory. Reference: LA-4030. The code is written in FORTRAN and is operable on the CDC 6600.

CCC-140/DIPHO Photon Scattering Code - Monoenergetic Isotropic Point Source - Infinite Medium, contributed by the Central Laboratory and Schools of Armament, Ministry of the Army, France. Reference: ORNL-tr-2349. FORTRAN IV, IBM 360/75/91.

CCC-151/DOT2DB Two-Dimensional Multigroup Discrete Ordinates Transport/ Diffusion Code with Anisotropic Scattering, contributed by GE Nuclear Energy Division, Sunnyvale, California. The code is written in FORTRAN IV, designed for the GE-635 computer. Reference: GEAP-13537.

CCC-152/ALGAM Monte Carlo Estimation of Internal Dose from Gamma-Ray Sources in a Phantom Man, contributed by the Oak Ridge National Laboratory, Oak Ridge, Tennessee. FORTRAN IV, IBM 360/75/91. References: ORNL-TM-2250 and ORNL-4584.

CCC-153/ASFIT Neutron and Gamma-Ray Transport Code for One-Dimensional Finite Systems, contributed by the Bhabha Atomic Research Centre, Bombay, India. Reference: Informal Notes. FORTRAN, CDC 3600.

CCC-154/ANDYMG3 Monte Carlo Time-Dependent Particle and Photon Transport Code - General Geometry, contributed by the Los Alamos Scientific Laboratory, Los Alamos, New Mexico. FORTRAN IV, CDC 6600 and UNIVAC 1108. Reference: LA-4539.

JOURNALS REVIEWED FOR SHIELDING LITERATURE

In January 1965 the RSIC Newsletter reported a list of 33 Journals being scanned by the RSIC reviewers. The list has increased to a total of 121 as of January 1971. The following journals are scanned for shielding articles and the tabulation includes the number of articles accepted into the reactor system (R) and into the space system (S) and the total for each journal.

JOURNALS	R	S	Tot
Soviet J. At. Energy (English Transl.)	153	15	168
Nucl. Sci. Eng.	205	19	224
Health Phys.	51	14	65
Nucl. Instr. Methods	19	30	49
J. Nucl. Sci. Technol. (Tokyo)	34	1	35
J. Nucl. Energy	17	1	18
Phys. Rev.	8	9	17
J. Geophys. Research		4	4
Nucl. Eng. Design	16	1	17
Nucl. Appl. Tech.	19		19
Nukleonik	9		9
Acta Radiol.	1		1
Advan. Astronaut. Sci.		1	1
AIAA J.		4	4
Am. J. Phys.	1		1
Am. J. Roentgenol	1		1
Am. Ind. Hyg. Assoc. J.	1		1
Am. Inst. Aeron. Astronaut. J.	1		1
Ann. Math. Stat.	1		1
Am. Soc. Civil Eng., Aero-Space Transport Div. J.			
Ann. Occup. Hyg.		1	1
Ann. Phys. (NY)	1		1
Ann. Rev. Nucl. Sci.		3	3
Arkiv Fysik	4		4
ASCE Journal			
Astronaut. ACTA		1	1
At. Energy Rev.		1	1
At. Energ. USSR			0
At. Energy (Australia)	1		1
Atomkernenergie	10		10
Battelle Tech. Rev.	1		1
Brit. J. Appl. Phys. (J. Phys. D)	3		3
Brit. J. Radiol.	7		7
Bull. Acad. Sci. USSR, Phys. Ser. (English Transl.)		13	13
Bull. Inform. Sci. Tech.	3		3
Bull. Inst. Chem. Res.	1		1
Can. J. Phys.	3	3	6
Cosmic Res.		4	4
Energa Nucl. Milan	1		1
Forest Sci.	1		1
Ho Tsu K O Hsueh	1		1
IEEE Trans. Nucl. Sci.		6	6
Intern. J. Appl. Radiation Isotopes	4		4
Iva Medd.		1	1
Indian J. Pure Appl. Phys.	3		3
J. Am. Concrete Inst.	5		5
J. Appl. Phys.	8	2	10
J. Assn. Comput. Mach.	3		3
J. Astron. Sci.		2	2

JOURNALS (Continued)	R	S	Tot
J. Brit. Nucl. Energy Soc.	1		1
J. Comp. Phys.	1	1	2
J. Math. Phys.	7		7
J. Nucl. Mater.	1		1
J. Nucl. Med., MIRD	3		3
J. Opt. Soc. Am.	1		1
J. Phys. A.	1		1
J. Phys. Soc. Japan		1	1
J. Radioanal. Chem.	1		1
J. Res. Nat. Bur. Std., A	2		2
J. Res. Nat. Bur. Std., B	2		2
J. Spacecraft		3	3
J. Spacecraft Rockets		3	3
J. Struct. Div. Am. Soc. Civil Eng.	3		3
Jad. Energ. (Czech)	1		1
Jap. J. Appl. Phys.		1	1
Kerntechnik	11	2	13
Mag. Concrete Res.	2		2
Mater. Res. Std.	3		3
Nuclear Data A	5	1	6
Nuclear Data B	1		1
Nucl. Energy	2		2
Nucl. Eng.	2		2
Nucl. Eng. Bull.	1		1
Nucl. Phys.	1	1	2
Nucl. Safety	1	1	2
Nucl. Struct. Eng.	13		13
Nucleonics	36	1	37
Osaka Furitsu Hoshasen Chuo Kenkyujo			
Nuovo Cimento A			
Nuovo Cimento B	4		4
Pakistan J. Sci. Ind. Res.	1		1
Phys. Lett.	1	1	2
Phys. Med. Biol.	6		6
Phys. Rev. Letters	1		1
Powder Met.	1		1
Proc. Cambridge Phil. Soc.	1		1
Proc. Conf. Hot Lab. Equip. 9th			
Proc. Math. Phys. Soc.			
Progr. Theoret. Phy. (Kyoto)		1	1
Radiation Res.	6	3	9
Radiology	6		6
Rentgenol. Radiol.			
Rev. Sci. Instr.	5		5
Science		3	3
Sci. Papers Inst. Phys. Chem. Res. (Tokyo)	1		1
Siam Review	1		1
Solar Phys.		1	1
Soviet J. Nucl. Phys. English Transl.		2	2
Soviet Phys. JETP English Transl.		4	4

JOURNALS (Continued)	R	S	Tot
Soviet Phys.-Tech. Phys. English Transl.		1	1
Space/Aeronaut.		2	2
Mem. Fac. Eng. (Kyoto Univ.)	2	1	3
Trans. Am. Nucl. Soc.		3	3
Trans. Chalmers Univ. Technol., Gothenborg			
Zh. Vychisl. Mat. Mat. Fiz.	1		1
Bull. Am. Phys. Soc.		1	1
ARS J.			
Space Sci. Rev.		2	2
JETP Letters		1	1
Geophys. Space Data Bull.		1	1
Ann. Rev. Astrdn. Astrophys.		1	1
Proc. Acad. Sci. USSR (Phys. Sect.)		1	1
Res. Rev. (Office Aerosp. Rev.)		1	1
Proc. Phys. Soc. London	1		1
Biophysik		1	1
J. Eng. Phys.	1		1
J. Res. Nat. Bur. Std., C	3		3
ACTA Polytech. Scand. Ser. CI	1		1
Radioprotection (in French)	1		1
Aerospace Med.			
J. Mater.	2		2
Total No. of Articles Accepted	745	182	927
% of total scanned - 3 highest	55%	35%	
% of total scanned - 10 highest	76%	65%	

Those indicating no action may be in the review process or may have been reviewed with no articles accepted into the system. One journal in the Russian language is reviewed for the Russian file only; the English translation is normally reviewed. Journals which have a low probability of containing shielding articles are routinely scanned in Nuclear Science Abstracts, in Scientific and Aerospace Technical Reports (STAR), and in International Aerospace Abstracts (IAA); therefore, articles in obscure publications should be called to the attention of the RSIC staff.

PERSONAL ITEM

A. B. Chilton of the University of Illinois Nuclear Engineering Program recently spent several days with RSIC and the Neutron Physics Division personnel. The purpose of the visit was to study discrete ordinates calculational techniques. He will spend the 1971 spring semester on sabbatical leave with the National Bureau of Standards in Washington, D.C.

VISITORS TO RSIC

Visitors to RSIC during the month of January were: A. Buhl, I&C Div., ORNL; A. B. Chilton, University of Illinois, Urbana, Ill.; W. Coleman, Science Applications, Inc., La Jolla, Calif.; G. P. Lahti, NASA Lewis Research Center, Cleveland, O.; B. McGregor, Australian Atomic Energy Commission, Sydney, Australia, who will be at ORNL for approximately 1 year; J. Robinson, University of Tennessee, Knoxville, Tenn.

FEBRUARY ACCESSION LIST OF LITERATURE

RSIC maintains a microfiche file of literature entered into its information system. Computer searches of this system (which produces a special bibliography) and duplicate microfiche copies of the literature in our file are available upon request. Naturally, we cannot supply copies of literature which is copyrighted (such as books or journal articles) or whose distribution is restricted.

REACTOR AND WEAPONS SHIELDING

AAEC LIB Bib-254 — September 1970

Radiation Treatment of Sewage
E. A. Newland

AERE-R-6377 — June 1970

Wholesomeness of Irradiated Food: The Question of Induced Activity.
F. Rogers, B. Whittaker
Avail.: Dep., NTIS (U.S. Sales only). UK 4s.

AERE-R-6498 — October 1970

Nuclear Accident Dosimetry Systems; UK Measurements at the First I.A.E.A. Inter-Comparison at Valduc, France, June 1970
J. A. Dennis, H. J. Delafield, P. D. Holt, S. J. Boot
Avail.: Dep. NTIS (U.S. Sales only). UK 4s.

AFML-TR-70-120 (AD-708737; N70-40579) May 1970

The Electronic Properties Information Center (EPIC) Technical Report, 1 Feb. - 28 Feb. 1970
S. J. Welles
Avail.: NTIS

ANL-7689 June 1970

On the Multiple Scattering of Gamma Radiation
P. J. Brockwell, H. Greenspan
Avail.: NTIS

AWRE-O-45-70 August 1970

Elastic and Inelastic Scattering of Neutrons in the Energy Range 2 to 5 MeV by B-10 and B-11
D. Porter, R. E. Coles, K. Wyld

BNWL-1307 (Pt. 2), pp. 50-51 1969

Radiation Dosimetry
L. A. Braby, D. M. Fleming, W. A. Glass, L. L. Nichols, W. C. Roesch, L. H. Toburen, M. L. West, W. E. Wilson
(From Pacific Northwest Laboratory annual report for 1969, Vol. II, Pt. 2)

BNWL-SA-2954 (CONF-691102-26) August 1970

Design for Material Radiation Damage in the FFTF
L. M. Finch
Avail.: Dep.; NTIS

BNWL-SA-3424 (CONF-701106-2) 1969

Reasons for Differences in Calculated Estimates of the "Cloud Dose"
M. M. Hendrickson, D. L. Strenge
Avail.: Dep.; NTIS

BNWL-SA-3495 (CONF-700819-5) August 1970

Fundamental Materials Problems in Nuclear Reactors
A. L. Bement
Avail.: Dep.; NTIS

CEA-R-3918 (In French; English summary) February 1970

Study of the Fallout of Artifical Iron-55: Application to the Evaluation of the Fallout of Natural Iron of Stratospheric Origin
Chi Trach Hoang (Ph.D. Thesis, Paris Univ., March 5, 1969)
Avail.: NTIS as N70-37007

CEX-69.5 October 1970

Experimental Evaluation of the Fallout-Radiation Protection Provided by Structures in the Control Point Area of the Nevada Test Site
Z. G. Burson
Avail.: Dep.; NTIS

CERN-70-10 (In French) March 19, 1970

Action of Ionizing Radiation on Epoxy Resins
M. H. Van de Voorde

CLM-R-103 March 1970

Radiation Damage Effects in the Containment Vessel of a Thermonuclear Reactor
D. G. Martin
Avail.: Dep.; NTIS (U.S. Sales only). UK 8s, 0d.

DP-1231 September 1970

Fast Neutron Radiography for Clinical Diagnosis
P. B. Parks, M. Brown

DP-1237 May 1970

Savannah River Laboratory Cobalt-60 Power and Heat Sources
C. L. Angerman, C. P. Ross
Avail.: NTIS

DP-Report-261 February 1964

The New Cross Section Library of the Dragon Project.
Project Dragon
U. Nyffenegger, J. Schloesser
Avail.: NTIS

GA-8574-Vol-2 (N70-38546) April 1970

Cesium Sorption in Materials for Thermionic Converters, Volume 2.
M. K. Yates, G. O. Fitzpatrick
Avail.: NTIS

GA-9530-Vol. 2 (AD-703664, DASA-2392-2) September 1969

Theoretical and Computational Radiation Hydrodynamics. Vol. II.
H. L. Wilson, W. B. Lindley

GA-9853-Pt-2 (AD-706127; AFML-TR-68-334-Pt-2; N70-37614) March 1970

Mechanisms of Degradation of Polymeric Thermal Control Coatings. Part 2: Effects of Radiation on Selected Pigments. Final Report, 1-Sept. 1968 - 30 Nov. 1969
T. E. Firle, T. M. Flanagan

GEAP-13591 April 1970

239-Pu Unresolved Resonance Data for ENDF/B, Version II
J. T. Hitchcock, B. A. Hutchins
Avail.: NTIS

GEMP-723 (N70-38770) February 1970

Fast Breeder Reactor Control, Shield, and Reflector Materials Development
R. Van Houten
Avail.: NTIS

IN-1261 March 1970

Catalogue of Semiconductor Alpha-Particle Spectra
R. N. Chanda, R. A. Deal
Avail.: NTIS

IN-1449 December 1970

Release of Radioiodine from Open Pools
W. A. Yuill, V. F. Baston et al

JPRS-51660 1969

Biomedical Problems of Space Flight
Yu. G. Grigor'ev, I. M. Khazen, F. P. Kosmolinskii, V. D. Yablochkin, R.A. Belitskaya, E. P. Evsyukov, A. I. Ushanov
Avail.: NTIS

LA-4287 June 1970

Bibliography on Neutral Particle Transport Theory
W. L. Hendry, K. D. Lathrop, S. Vanderwoort, J. Wooten (comps.)
Avail.: Dep.; NTIS

LA-4341 (N70-41605) April 1970

Energy Dependence of Albedo Neutron Dosimeters Placed on the Head
D. E. Hankins
Avail.: NTIS

LA-4554 December 1970

Transport Theory: Discrete Ordinates Quadrature Over the Unit Sphere
B. G. Carlson
Avail.: NTIS

NASA-TM-X-53913 September 16, 1969

Statistical Theory of Inelastic Neutron Energy Spectra
B. J. Henderson, C. E. Wuller, Jr.
Avail.: NTIS as N70-38168

NBS-TN-533 June 1970

14-MeV Neutron Generators in Activation Analysis: A Bibliography
G. J. Lutz (ed.)
Avail.: GPO $1.00

NLL-CE-Trans-5226 (N70-38810) April 2, 1970

Radiation Creep of Uranium and Graphite
P. A. Platonov
(Transl. into English from Russian Conf. Paper Presented at IAEA Symp. on Radiation Damage in Reactor Mater., Vienna, 2-6 June 1969)
Avail.: Natl. Lending Library, Boston Spa, England: 2 NLL photocopy coupons

NRL-MR-2107 (AD-703616) March 1970

Coincident Neutron Equipment
C. V. Strain; R. J. Omohundro

NRL-MR-2127 (AD-707706) May 1970

Potential and Limitations of Several Neutron Coincidence Equipments
C. V. Strain

MMM-3691-62 May 1970

Deep Sea Radioisotope-Fueled Thermoelectric Generator Power Supply System. Snap-21 Program, Phase II. 10-Watt System; Final Summary Report
F. Fox, R. Pannemann, R. Wickenberg (eds.)
Avail.: Dep.; NTIS

NCL-70-13R (AD-707080, HDL-69-39-1, N70-38598) March 1970

Radiation Effects in Silicon and Germanium. Final Report
O. L. Curtis, Jr., J. R. Srour, R. F. Bass, E. G. Wikner
Avail.: NTIS

NP-tr-1922 1967

Nuclear Physics Research in the USSR (Collected Abstracts). No. 5
Avail.: Dep.; NTIS (U.S. Sales only)

NP-tr-1923 1968

Nuclear Physics Research in the USSR (Collected Abstracts). No. 6
Avail.: Dep.; NTIS (U.S. Sales only)

NP-tr-1924 1967

Nuclear Physics Research in the USSR (Volume of Abstracts). No. 4
Avail.: Dep.; NTIS (U.S. Sales only)

NP-tr-1925 1966

Nuclear Physics Research in the USSR (Volume of Abstracts). No. 3
Avail.: Dep.; NTIS (U.S. Sales only)

ORNL-TM-2822 (Rev.) November 1970

Preliminary Appraisal of the Hazards Problems of a D-T Fusion Reactor Power Plant
A. P. Fraas, H. Postma

ORNL-TM-3187 October 1, 1970

Some Techniques for Estimating the Results of the Emission of Radioactive Effluent from ORNL Stacks
F. T. Binford, T. P. Hamrick

ORNL-TM-3192 December 1970

Safety Analysis of Building 3028
R. W. Schaich

ORNL-TM-3225 December 1970

A Multipurpose Building for Processing Alpha, Beta, Gamma, and Neutron Emitters
R. W. Schaich

ORNL-TM-3233, Rev. January 1971

Nuclear Fusion Resonance Reactions of Possible CTR Interest
J. R. McNally, Jr.

ORNL-TM-3251 December 1970

Activities of the ANS-6 Subcommittee on Radiation Shielding Standards
H. C. Claiborne, D. J. Dudziak, N. M. Schaeffer

PB-194749 June 1969

The Nuclear Method of Soil-Moisture Determination at Depth
Clarence J. Ehlers, Lymon C. Reese, and James N. Anagnos
Avail.: NTIS

SAI 70-113 (DASA-2572) November 1970

Multifrequency and Multidimensional Aspects of X-Ray Transport
R. J. Latko, G. C. Pomraning
(Science Applications, Inc., P.O. Box 2351, La Jolla, Calif. 92037)

SC-R-70-4351 December 1970

Application of Neutron Damage Models to Semiconductor Device Studies
B. L. Gregory, C. W. Gwyn
Avail.: Dep.; NTIS

SRI-EUG-8013 July 1970

Beta Dosimetry for Fallout Hazard Evaluation. Final Report
S. L. Brown, W. B. Lane et al

STI/DOC-10/112 1970

Technical Report Series No. 112
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