RSIC Newsletter

RADIATION SHIELDING INFORMATION CENTER

OAK RIDGE NATIONAL LABORATORY

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

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The palest ink is better than
the most retentive memory.
- Chinese Proverb

REACTOR SHIELDING WORKSHOP IN ITALY

Following the Fourth International Conference on Reactor Shielding to be held in Paris on 9th - 13th October, 1972, the OECD Nuclear Energy Agency (NEA -formerly ENEA) Computer Programme Library is organizing a Shielding Workshop on 17th and 18th October, 1972 at CCR-Ispra, Italy.

Participation of NEA member countries, EURATOM and the United States is expected. Applications to attend this meeting should be made to the NEA Computer Programme Library at the following address: OECD Nuclear Energy Agency, Casella Postale No. 15; 21027-ISPRA (Va), Italy.

ANS GROUP-FARE TO PARIS SHIELDING CONFERENCE

Plans are being made for American Nuclear Society members and families to travel as a group to the Paris International Shielding Conference. The low group-fare of $244 per person, New York-Paris round trip, will be possible only if 40 or more persons travel together. Therefore, it is essential that you let us know immediately if you are interested.

A block of seats has been reserved with TWA to leave New York Saturday, October 7 at 7:30 P.M. to arrive in Paris at 7:30 A.M. The return flight will leave Paris Friday October 20 at 11:20 A.M. and arrive in New York at 2:15 P.M. A 10% deposit will be required by September 1, full payment by September 15.

Further information will be sent to those who inquire. You may call or write to

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REORGANIZATION OF ANS-6
RADIATION SHIELDING STANDARDS SUBCOMMITTEE

Following a meeting held in June in Las Vegas, Nevada, D. K. Trubey, Chairman of ANS-6, a subcommittee of the American Nuclear Society (ANS) Standards Committee, announced that a reorganization of the working groups was underway. Meeting with the Chairman were: N. M. Schaeffer, RRA, P. L. Hoffman, HEDL, G. L. Simmons, B&W, J. H. Hubbell, NBS, M. E. Battat, LASL, B. A. Engholm, GGA, E. A. Straker, SAI, and A. E. Profio, UC-Santa Barbara.

ANS-6, sponsored by the ANS Shielding and Dosimetry Division, is part of the ANS Standards Committee Section 3 which is now headed by W. E. Kreger of Physics International. The purpose of the subcommittee is to establish standards in connection with radiation shields, to provide shielding information to other standards groups, and to prepare recommended sets of shielding data and test problems.

The working groups within ANS-6, and each group's current status, are as follows:

ANS-6.1, Shielding Cross Section Standards (M. E. Battat, LASL, Chairman) plans no particular current action except to keep abreast of developments of ENDF, ASTM, etc., and to bring attention to reference data available.

ANS-6.2, Benchmark Problems (G. L. Simmons, Babcock & Wilcox, Chairman) has noted that no reactor-type problems are yet available in ORNL-RSIC-25, the benchmark problem book, last updated in March of 1970. Former chairman, A. E. Profio, reported that he has some material on hand with which he has been working. E. A. Straker will be giving a paper at the Kiamesha Lake meeting in September on benchmark calculations. Other benchmark-type work will also be reported there.

ANS-6.3, Shield Performance Evaluation (P. J. Persiani, ANL, Chairman) reports that balloting on the standard ANS-6.3 "Program for Testing Biological Shielding in Nuclear Reactor Plants," was completed by the American National Standards Institute (ANSI) committee N18 for the second time in December 1971. There were no negative ballots. It was submitted to ANSI by ANS as a proposed standard and now is in Board of Standards Review and is identified as N18.9. The draft was slightly revised by ANS-6 in May in response to N18 comments and forwarded to ANS. Further efforts of the working group will be to encourage use of the standard and consider future revisions.

ANS-6.4, Shield Materials (B. A. Engholm, GGA, Chairman, concrete) expresses the need for reference data compilations associated with materials. Several rather old compilations were cited such as the British Standard 4094: Part I: 1966, Recommendation for Data on Shielding from Ionizing Radiation, Part 1, Shielding from Gamma Radiation. Compilation of standard response functions and capture gamma-ray spectra were cited as needed data.

The chairman of ANS-6 expressed a desire to form a working group on both lead and concrete, two of the most used shielding materials. The group on lead (chairman not yet selected) would consider the British

Standard 3909: 1965, Specification for Ingot Lead for Radiation Shielding as a starting point. B. A. Engholm was asked to head the group on concrete. The draft standard ANS 11.13, "Concrete Radiation Shields," provides a starting point, but it has almost no information on shielding effectiveness or analysis. A standard produced by this group would be supplementary to ANS 11.13.

ANS-6.5, Shielding Nomenclature (H. E. Hungerford, Purdue University, Chairman) has worked as part of ANS-9, Nuclear Terminology and Units. It was decided to further review the list of terms suggested by the group with the possibility of action by ANS-6.

John Hubbell reported on the meeting held by ANS-16, Isotopes and Radiation. The ANS-16 group had a long list of possible standards projects but determined that most were being worked on elsewhere.

CODE DISCUSSION CORNER

DEMONSTRATION NEUTRON MONTE CARLO CODE AVAILABLE

In conjunction with the preparation of the forthcoming book, *Reactor Shielding for Nuclear Engineers*, Norman M. Schaeffer, editor, a neutron Monte Carlo transport code has been developed. The all-FORTRAN code, called DEMON, and packaged by RSIC as CCC-181, is meant to be used for demonstration purposes in courses teaching radiation transport. It was contributed by Radiation Research Associates, Fort Worth, Texas.

The problem treated has a point, monoenergetic, cosine current source on the face of a homogeneous, semi-infinite slab composed of a light element of atomic weight A. Only capture and isotropic (CM) scattering are allowed. Cross sections are assumed to be linear between the input values. Leakage and absorption data are computed.

For easy checkout on various computers, a simple random number generator is included which returns values from a table. The RSIC package also includes a FORTRAN random number generator designed for use on IBM 360 computers.

ADDITION TO THE DNA WORKING CROSS SECTION LIBRARY

Evaluations for U-235 (MAT 4188) and U-238 (MAT 4187) by Howerton and MacGregor of Lawrence Livermore Laboratory have been added to the DNA Working Cross-Section Library. The evaluations, which contain gamma-ray production data, are available from RSIC.

ADDITIONS TO THE COMPUTER CODE COLLECTION

The following code packages are announced as available. As a general rule, one reel of magnetic tape should accompany a request for these code packages.

CCC-179B/ATR — The IBM 360 version of the ATR code has been successfully run and packaged (see announcement in June Newsletter). ATR,representing models of radiation transport in air, is a contribution from Science Applications, Inc., La Jolla, California. Reference: DNA 2860T (SAI-72-511-LJ).

CCC-180/TDA — Time-Dependent Multigroup One Dimensional Discrete Ordinates Code, contributed by Los Alamos Scientific Laboratory. Reference: LA-4557 (ORNL-4662) (SAI-70-125). Original programming of this time-dependent version of ANISN (CCC-82) was done by ORNL's W. W. Engle. Contributions were made to the work at the Naval Weapons Evaluation Facility at Albuquerque, New Mexico (S. A. Dupree) and by H. A. Sandmeier and G. E. Hansen at LASL. Written in FORTRAN IV, versions are available for the CDC 6600 and for the IBM 360.

CCC-182/CDR — NWEF Constant Dose Range Code and LASL-NWEF Neutron-Gamma-Ray Air Flux Data Library for Air Transport Calculations, contributed by the Naval Weapons Evaluation Facility, Albuquerque, and the Los Alamos Scientific Laboratory, New Mexico. Reference: NWEF Report 1090 (April 1972). CDR is currently available only for the CDC 6600.

CCC-183/ESDORA — Fission Product Inventory and Gamma Ray Dose Rate from a Radioactive Cloud Code System, contributed by Junta de Energia Nuclear, Madrid, Spain. Reference: II-SS/01/71 (March 1971). FORTRAN IV, UNIVAC 1108.

CCC-184/TASK — Generalized One Dimensional Radiation Transport and Diffusion Kinetics Code, contributed by Neutron Physics Division, Oak Ridge National Laboratory. Reference: ORNL-TM-3811. FORTRAN IV, IBM 360.

PSR-40/GENRD — Free-Format Card Input Processor in ANSI Standard FORTRAN IV - a programming tool to read, process, and store free-format numeric and Hollerith input data from cards. It was secured as an aid to RSIC codes activities and is packaged and made generally available. Contributor: Theoretical Division, Los Alamos Scientific Laboratory. Reference: LA-4793 (January 1972).

IEEE SCIENCE GROUP CHAPTER COVERS SHIELDING TOPICS

Of interest to Los Angeles area 'shielders' is the formation of a Chapter of the IEEE Science Group which plans bimonthly evening meetings to consider a central topic developed by at least three well-known speakers. Diverse topics are under consideration such as Reactor Power, Radiation Transport Applications, EMP and Novel Applications of Nuclear Instrumentation. A flyer is available for those who request it. E. L. Noon, JPL, is Chairman of the Chapter. Serving with him are R. W. Campbell, JPL, Vice-Chairman, Carol Marcus, USC, Treasurer, Don Toomb, Aerojet, Secretary, Peter Held, Autonetics, Publicity and Tom Jordan, ART, Membership.

RSIC STAFF NEWS

Walter Zobel, an ORNL research staff member since receiving his PhD in Physics from Purdue University in 1954, joined the RSIC technical team on July 1. Working as an experimentalist in the Neutron Physics Division since its inception, principally in neutron and gamma-ray spectroscopy, he has written numerous papers and reports. He is remembered by former ORSORT students as a shielding instructor and by LTSF (lid tank) experimentalists as group leader of the facility. In support of basic RSIC functions, Walt will use his extensive experience with computers to give technical support to the Code Section activities. In addition, he will assist in the technical literature selection and review for the RSIC Storage and Retrieval Information System (SARIS) and the technical development functions which will allow us to better serve the industry.

PERSONAL ITEMS

Hans J. Hennecke, Wright-Patterson Air Force Base, Ohio, reports that he has transferred from the USAF Aerospace Research Laboratories (ARL) to the USAF Avionics Laboratory, where he is engaged in a program for radiation hardness assurance for avionics systems and devices. The ARL program for fast neutron cross section measurements (5-10 MeV), with which he was formerly involved, has been cancelled.

Jerry Cavanaugh, a student in the University of Illinois Nuclear Engineering program, is spending several weeks as a guest of the Neutron Physics Division and RSIC to perform analytical studies of neutron and secondary gamma-ray albedos for concrete.

We have received a change of address for *Steven J. Nathan*, senior nuclear engineer, who is leaving Burns & Roe, Inc. to join the staff of Ralph M. Parsons Co., Los Angeles, Calif.

Victor E. Staggs, presently a consultant at Physics International, plans to spend full time in graduate studies beginning this fall.

Thomas E. C. Hughes, V.P.I. doctoral candidate, writes that he is now employed by Singer Simulation Products, working on problems relating to Boiling Water Reactor and BWR power plant simulators.

Dr. Syed M. Kabir reports a change of address from the University of Aston, Birmingham, England to the Department of Physics, Queen's University, Belfast, Ireland.

VISITORS TO RSIC

Visitors to RSIC during the past month were: Thomas A. Jaeger, Bundesanstalt für Material Prüfung, Berlin, Germany; I. M. Karp, NASA Lewis Research Center, Cleveland, O.; M. H. MacGregor, Lawrence Livermore Laboratory, Livermore, Calif.; P. Y. Soong and R. P. Sullivan, NUS Corp., Rockville, Md.; Thomas R. Harris, Oak Ridge, Tenn.

NOTE: NAME CHANGE

RSIC has been informed that as a result of the participation of Japan, the title of the European Nuclear Energy Agency (ENEA) has been changed to OECD Nuclear Energy Agency (NEA).

AUGUST 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 are available on request. Naturally, we cannot fill requests for literature which is copyrighted (such as books or journal articles) or whose distribution is restricted.

Special bibliographies and selected computer-printed abstracts of the literature in the RSIC system are available upon request. The Selective Dissemination of Information (SDI) Service is available by submitting a list of subject categories defining the recipient's interests.

REACTOR AND WEAPONS SHIELDING

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SPACE AND ACCELERATOR SHIELDING

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