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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No. 90 May 1972

The great tragedy of science:
the slaying of a beautiful theory
by an ugly fact.
- T. H. Huxley

AMERICAN NUCLEAR SOCIETY TO MEET IN LAS VEGAS, June 18-22

The American Nuclear Society will hold its annual meeting in Las Vegas, Nevada, June 18-22, 1972. Of special interest to shielders are sessions with the following titles: Track Etch Techniques (Mon. and Tues.), Shielding Cross Sections (Mon.), Dosimetry and Spectroscopy (Tues.), Dosimetry of Radioactive Effluents (Tues.), General Shielding (Tues. and Wed.), Radiation Transport: Neutrons (Wed.), Photons and Electrons (Thurs.), Preparation of Coupled Cross Sections for Transport Calculations (Thurs.).

EUROPEAN SHIELDING INFORMATION SERVICE ANNOUNCED

The creation of the European Shielding Information Service (ESIS), sponsored by EURATOM and located at Ispra, Italy, has been announced. We quote from the initial ESIS Newsletter:

"ESIS (European Shielding Information Service) is a service in the field of radiation shielding, intended for engineers engaged in design problems or research. More precisely, it is an analysis and information center: it compiles, analyses and circulates shielding information concerning reactors and accelerators; it is neither a documentation center, nor a shielding team concerned with specific shield projects. The ESIS staff consists of scientific personnel with an extensive experience in radiation shielding.

"The direct or indirect ESIS actions are:

- examination, analysis and occasionally evaluation of shielding information in periodicals, reports and books.

- assessment of shielding codes: study of selected shielding codes, from the point of view of efficiency, operability and accuracy; comparison between the results of similar codes and, where possible, with existing experimental results or with measurements executed *ad hoc* on the EURACOS facility. The ESIS code collection will contain the latest available version of each code. Major changes made by the originators or the users will be incorporated and published in the quarterly newsletters.

- maintenance of an information retrieval system allowing an efficient response to standing orders for specific items or requests for information accumulated over a long period; the system will be operated by the Information and Documentation Center +) CID at Luxembourg.

- preparation of state-of-the-art reports on some topical subject.

"The following services will be available:

- distribution of a quarterly newsletter, informing the shielding community of current research, new codes, publications etc.

- publication of bibliographies, with particular emphasis on European articles, in cooperation with the CID. We anticipate that the automatic computerized retrieval service SDI (Selective Dissemination of Information) for searches on special shielding topics will be available in some months.

- dispatching of tapes and decks of digital computer codes in cooperation with the ENEA ++) at Ispra; with each dispatch ESIS will provide information resulting from the code assessment activity.

- answer to technical inquiries on specific shielding topics.

- organization of workshops on digital computer codes or on specific shielding topics.

"Through extensive and frequent personal contacts ESIS should be in a position to know the efforts and needs in the field of shielding in Europe and to provide a panorama for the shielding community.

"Obviously, it is materially impossible to be aware of all worthwhile items. We are sure that there is now a general agreement on the need for cooperation and we feel confident that all our shielding colleagues will assist us promptly by the provision of useful information. We also hope that the services offered in the frame of ESIS may develop into a more extensive service in the future.

"For questions, information, requests for the Newsletter, proposals, or criticism, please contact us at the following addresses:

- Letters: ESIS
(European Shielding Information Service)
CCR Euratom
21020 Ispra (Varese)
Italy

- TELEX Euratom 38042

- Telephone: (0332) 780131

+) CID
(Centre d'Information et de Documentation)
29, rue Aldringer
Luxembourg

++) ENEA Computer Programme Library
Casella Postale No. 15
21020 Ispra (Varese), Italy"

We at RSIC offer our sincere congratulations to EURATOM, the ESIS staff, and the European shielding community. We anticipate a close working relationship between ESIS and RSIC to better serve both the European and North American shielding communities.

STATUS OF THE DNA WORKING CROSS SECTION LIBRARY

The availability of the DNA Working Cross Section Library was first announced in the February, 1972 RSIC Newsletter. Since then, changes have been made and a status report is in order.

The contents of the DNA Working Cross-Section Library as of May 1, 1972 is:

MATERIAL	EVALUATORS	MAT	MOD	DATE
Nitrogen	Young, Foster - LASL	4133	3	2-72
Oxygen	Young, Foster - LASL	4134	1	2-72
Aluminum	Foster, Young - LASL	4135	2	2-72
Lead	Fu, Perey - ORNL	4136	1	2-72
Hydrogen	Stewart, LaBauve, Young - LASL	4148	1	2-72
Silicon	Drake, Kinsey - BNL	4151	1	2-72

(continued)

MATERIAL	EVALUATORS	MAT	MOD	DATE
Calcium	Fu, Perey - ORNL	4152	1	2-72
Beryllium	Howerton, Perkins - LLL	4154	0	2-72
Sodium	Paik, Pitterle, Perey - WARD, ORNL	4156	0	2-72
Tantalum	Howerton, Perkins, MacGregor-LLL	4179	0	2-72
Iron	Penny, Kinney, Wright, Perey, Fu - ORNL	4180	0	3-72

A brief history of the modifications made to DNA evaluations is given below. (Details are found in the RSIC documentation of the DNA Library.)

1. Nitrogen - MAT 4133
   a. MOD 0* - February 1971
   b. MOD 1 - April 1971

   Minor clerical errors were corrected, elastic scattering Legendre coefficients were adjusted to agree with Wick's limit, normalization errors were corrected for the (n,2n) reaction, and some capture gamma-ray energies were corrected.

   c. MOD 2 - July 1971

   Minor clerical errors were corrected and information to designate the decay mode of inelastic levels was added to file 3.

   d. MOD 3 - February 1972

   Modification consisted of using the ENDF/B III version** of nitrogen (MAT 1133), as the current DNA version. In addition, RSIC added ENDF/B file 23 photon interaction data to the evaluation, using the RSIC data library DLC-7D.

2. Oxygen - MAT 4134

   a. MOD 0 - September 1971
   b. MOD 1 - February 1972

   Modified to be the same as ENDF/B-III oxygen (MAT 1134). Also, file 23 data added from DLC-7D.

3. Aluminum - MAT 4135

   a. MOD 0 - July 1971
   b. MOD 1 - July 1971

Information was added to designate the decay mode of inelastic levels and the threshold energy for the (n,n')p reaction was corrected.

c. MOD 2 - February 1972

Modified to conform to ENDF/B-III aluminum (MAT 1135). Also, file 23 data added from DLC-7D.

4. Lead - MAT 4136

a. MOD 0 - September 1971
b. MOD 1 - February 1972

Modified to conform to ENDF/B-III lead (MAT 1136).

5. Hydrogen - MAT 4148

a. MOD 0 - February 1971
b. MOD 1 - February 1972

Modified to conform to ENDF/B-III hydrogen (MAT 1148) and file 23 data added from DLC-7D.

6. Silicon - MAT 4151

a. MOD 0 - September 1971
b. MOD 1 - February 1972

Modified to conform to ENDF/B-III silicon (MAT 1151) and file 23 data added from DLC-7D.

7. Calcium - MAT 4152

a. MOD 0 - September 1971
b. MOD 1 - February 1972

Modified to conform to ENDF/B-III calcium (MAT 1152).

8. Beryllium-9 - MAT 4154

MOD 0 - February 1972. Note that this is the same as ENDF/B-III beryllium-9 (MAT 1154)

9. Sodium - MAT 4156

MOD 0 - February 1972. Note that this is the same as ENDF/B-III sodium (MAT 1156).

10. Tantalum-181 - MAT 4179

MOD 0 - February 1972. Note that this is <u>not</u> in ENDF/B-III. It became available after Version III was released.

11. Iron - MAT 4180

MOD 0 - March 1972. Note that this is the same as ENDF/B-III iron (MAT 1180). Note also that this supersedes DNA MAT 4124 iron, which has the following history.

MOD 0 - September 1970
MOD 1 - September 1971

Multilevel Breit-Wigner resonance parameters used for the energy range 1 to 60 keV, direct interaction reactions for inelastic scatter were corrected, and the number of energy points and angular distributions were reduced.

MOD 2 - December 1971. Note that this is essentially the same as DNA MAT 4180 MOD 0.

The minimum in the total cross section at 24 keV was reduced to 425 mb and the gamma-ray production data were made consistent with the data of Hoot and Orphan, GRT.

The Lawrence Livermore Laboratory evaluations for U-235 and U-238 are currently being processed in RSIC, as well as MOD 2 for ORNL evaluations of calcium and lead. It is not expected that the lead will undergo any more modification in the near future.

LASL evaluations for plutonium and tungsten are expected soon, as well as a modification to oxygen. Modifications to iron and silicon are also expected.

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*MOD 0 denotes the original version maintained by RSIC

**DNA evaluations were submitted to NNCSC and accepted by CSEWG for ENDF/B-III. However, NNCSC made minor adjustments to the data to conform to their special needs. For consistency, the corresponding DNA evaluations were modified to be the same as in ENDF/B-III.

ABSTRACTS OF THE DATA LIBRARY PACKAGES ISSUED

ABSTRACTS OF THE DATA LIBRARY PACKAGES ASSEMBLED BY THE RADIATION SHIELDING INFORMATION CENTER is now available as ORNL-RSIC-30. The volume of abstracts, edited by Robert W. Roussin, RSIC Data Coordinator, is intended to give to a potential data library user several criteria for deciding whether or not he wishes to obtain the data. The abstract format is similar to that used in ORNL-RSIC-13 to describe the computer code packages. The volume is available from NTIS. A limited number are available from RSIC upon request.

PERSONAL ITEMS

Effective July 1, *John A. Auxier* is appointed Director of the ORNL Health Physics Division, replacing former Director *Karl Z. Morgan* who is retiring this summer.

George Kear, formerly with Physics International, has accepted employment with the Research Laboratory of the Lockheed Missiles and Space Company at Sunnyvale, California. He is currently investigating information regarding biological and instrumental shielding calculations for a wide scope of applications in the space program.

Robert L. French recently separated from RRA and is now devoting full time to Avcon, a new independent company resulting largely from some projects initiated about two years ago through an affiliated company of RRA. The principal activities of Avcon are the development and marketing of vehicular route control systems and related computer based products. He will continue to do a limited amount of consulting on initial radiation problems. His title with Avcon is that of Vice President, R and D Production.

J. P. Drummond has recently changed his address from Duke Power Company, Charlotte, N. C., to Nuclear New Design Department, Atomic Power Division, Newport News Shipbuilding, Newport News, Virginia.

J. P. Millot has left CEA/CEN Cadarache to be associated with FRAMATOME, the Société Franco-Américaine de Constructions Atomiques, Courbevoie, France.

Harry E. P. Krug, Jr. is currently working in Control Data Corporate Headquarters as industry manager. His concern is with atomic and nuclear industry applications.

E. A. (Ed) Warman, until recently Manager of the Nuclear Science Section at the Aerojet Nuclear Systems Company,has joined Stone and Webster Engineering Corporation in Boston. He will be involved in radiation protection and licensing activities with the architect-engineering firm.

D. R. (Duke) Rogers is leaving Aerojet to join General Electric in San Jose, where he will be associated with the radiation aspects of the boiling water reactors programs.

B. A. Lindsey is leaving Aerojet to join Bechtel in San Francisco, where he will be involved in reactor startup activites.

VISITORS TO RSIC

Visitors to RSIC during the month of April were: Peter Bonanos, Ehud Greenspan, and William G. Price, Jr., Princeton University, New Jersey; A. L. Craig, AEC Technical Information Center, Oak Ridge, Tenn., Craig R. Heimbach, Harry Diamond Laboratory, U. S. Army, Washington, D. C.; Earl McDow, Oak Ridge Associated Universities, Oak Ridge, Tenn.; Joe Stockton, Computer Concepts Corp., Knoxville, Tenn.; F. P. Szabo, Defence Research Establishment, Ottawa, Ontario, Canada.

APRIL 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.

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