RSIC Newsletter

No. 222   May 1983

*The pursuit of truth shall set you free — even if you never catch up
with it. ... Clarence Darrow*

NUCLEAR CRITICALITY INFORMATION SYSTEM ORGANIZED AT LLNL

A nuclear criticality information system (NCIS) was established at the Lawrence Livermore National Laboratory in 1981 and expanded in late 1982. NCIS is set up on the Technical Information System (TIS) operational at LLNL since 1975. Textual and numeric information is selected and made available interactively via TIS, and portions of the data base will also be distributed in standard published form. TIS will be used to locate, transfer, and manipulate criticality safety information and make it available to the community of users concerned with criticality safety.

NCIS will also be made available nationwide by telephone dial-up, TYMNET, and ARPANET.

A bibliographic data base of 687 *American Nuclear Society Transactions* has been completed and is being published as UCRL-53369. This publication provides an overview of nearly three decades of criticality safety work and a reference compendium for those requiring quick review of the pertinent literature. A data base of criticality safety personnel (444 individuals currently) is being established. Designed to facilitate communication among criticality safety specialists, this data base will be on line on TIS.

A personnel directory, a general criticality data base of pertinent literature, a news data base, and a critical experiments data base will be included in NCIS. A classified criticality literature file will also be included.

Additional information concerning NCIS or TIS may be secured from **Brian L. Koponen**, Criti-cality Safety Office, Lawrence Livermore National Laboratory, P. O. Box 808, Livermore, California 94550; telephone 415-422-0799 or FTS 532-0799.

ENEA Codes/Data Laboratory Organized

The Energia Nucleare e delle Energie Alternative (ENEA), Center of Energy Research (Ezio Clemental), Bologna, Italy, has announced the organization of a new Nuclear Data and Computing Codes Laboratory whose purpose is:

a. management and documentation concerning the ENEA Library of computing codes and nuclear data; and

b. nuclear data evaluation and processing.

E. *Menapace* is the head of the new laboratory.

Progress on Basic Radiation Protection Criteria Emphasized by NCRP

The 1982 Annual Report of the National Council on Radiation Protection and Measurements (NCRP) stresses completed studies and progress on development of new basic radiation protection criteria. Five NCRP studies were completed during 1982 with the results of two of these published during the year and three others in press at the close of the year. In addition, three other documents were published. Those released in 1982 include the following:

Preliminary Evaluation of Criteria for the Disposal of Transuranic Contaminated Waste;

Critical Issues in Setting Radiation Dose Limits (Proceedings No. 3 of the 1981 Annual Meeting);

The Control of Exposure of the Public to Ionizing Radiation in the Event of Accident or Attack (Proceedings of a Symposium);

Nuclear Medicine — Factors Influencing the Choice and Use of Radionuclides in Diagnosis and Therapy, NCRP Report No. 70; and

Ethics, Trade-offs and Medical Radiation, Taylor Lecture No. 6, by Eugene L. Saenger.

In press at the close of 1982 were: *Operational Radiation Safety — Training,* NCRP Report No. 71; *Radiation Protection and Measurements for Low-Voltage Neutron Generators,* NCRP Report No. 72; and *Protection in Nuclear Medicine and Ultrasound Diagnostic Procedures in Children,* NCRP Report No. 73.

The annual report also stresses progress made on development of new basic radiation protection criteria. A draft report on this subject describes a radiation protection system based on risk which should simplify the treatment of different kinds of radiation exposures and, in fact, facilitate summation of hazards attributable to various other toxic agents. The report is intended to supersede the Council's recommendations on basic radiation protection criteria published in 1971 (NCRP Report No. 39). Scientific Committee 1 expects to put the draft report before the Council members for review by July 1, 1983.

While important progress is being made in all NCRP activities, of particular importance are efforts concerned with radon and daughters and compensation for radiation injury. Two reports on radon are in an advanced stage of preparation. One, from Scientific Committee 73, deals with radon levels in homes and suggests an interim level for remedial action. The other, from a task group of Scientific Committee 57, discusses risks from radon and radon daughters. Substantial progress has been achieved in developing a report that proposes probability of causation as a means of dealing with claims for compensation for radiation injury.

New activities initiated recently extend the Council's program into new areas such as space radiation hazards and protection.

CHANGES TO THE COMPUTER CODES COLLECTION

During the month five changes were made to the RSIC Codes Collection. Two existing code packages were extended with additional code systems or data files; two code packages were replaced with newly frozen versions; and a new code package was added. Three of the contributions came from foreign installations — two from the Federal Republic of Germany and one from Japan.

CCC-254/ANISN

This multigroup one-dimensional discrete-ordinates transport code package with anisotropic scattering has been extended to include the ANIPLO-D50 code system. ANIPLO-D50, contributed by Gesellschaft für Kernenergieverwertung in Schiffbau and Schiffahrt mbH, Geesthacht, Federal Republic of Germany, is used to plot the locally-dependent scalar flux which has been calculated with the ANISN code system. ANIPLO-D50 is capable of plotting the distribution of the flux and the dose rate. If the dose rate is plotted for the individual energy groups, then the sum of the dose rates over all energy groups is also represented. Reference: OLS-83-12. FORTRAN IV; IBM 360/370.

CCC-269/RSYST

This integrated modular code package for shielding and reactor physics calculations was replaced by a newly frozen version contributed by the Institute für Kernenergetik (IKE), University of Stuttgart, the Federal Republic of Germany, through the OECD NEA Data Bank, Gif-sur-Yvette, France. RSYST consists of a data base, a data base manager, a driver routine, and many modules grouped into five categories: 1) general service routines, 2) mathematical operations, 3) group cross section generating routines (from ENDF/B-III) for reactor shielding or reactor calculations, 4) shielding — one/two-dimensional S_n and three-dimensional Monte Carlo shielding or reactor calculations, and 5) reactor static and burnup-diffusion, first collision and more elaborate transport theory, with options for S_n and Monte Carlo. Reference: IKE R No 4-35 (ORNL-tr-2970) Vol I and II. FORTRAN IV and assembler language: IBM 360/370.

CCC-365/IODES

This code package for calculating the estimation of dose to the world population from releases of Iodine-129 to the environment has been replaced by a newly frozen version. The new version, furnished by the original contributors of the code, Oak Ridge National Laboratory, contains the following changes:

(1) The inventory of stable iodine in the surface soil region was decreased by a factor of 2.5. This increased all transfer coefficients from this compartment to the ocean-mixed layer and the shallow and deep subsurface regions by the same factor.

(2) The inventory of stable iodine in the terrestrial biosphere compartment and all fluxes to and from this compartment were increased by a factor of 3.

(3) The inventories of stable iodine in the shallow and deep subsurface regions were decreased by a factor of about 300 and 100, respectively, as the result of using a more appropriate model for the transport of iodine in groundwater.

These changes increased the transfer coefficient from these compartments to the ocean-mixed layer by the same factors. Reference: NUREG-CR-0717 (ORNL/NUREG-59). FORTRAN IV; IBM 3033.

CCC-370/DCHAIN2

This one-point depletion code package which solves the coupled equations of radioactive growth and decay for a large number of nuclides was extended to add two data files: 1) JNDC FP Decay Data File in DCHAIN input format with *cumulative* fission yields and 2) JNDC JP Decay Data File with independent fission yields. These two data files were contributed by the Japan Atomic Energy Research Institute, Tokai-mura, Ibaraki-ken, Japan, as was the original code package. References: JAERI-M 9715, JAERI-M 9357, and JAERI-M 8727. FORTRAN IV; FACOM-M 230-75.

CCC-431/MORSE-C

This Monte Carlo multigroup neutron code system for the solution of criticality problems was contributed by Lawrence Livermore National Laboratory, Livermore, California. Based on the original ORNL versions of CCC-127/MORSE and CCC-261/MORSE-L, MORSE-C is restricted to criticality problems. It offers improvements in energy resolution of cross sections, upscatter in the thermal region, and an improved cross section library. Only time-dependent problems are treated in the packaged version. Reference: UCID-18993. FORTRAN IV; CDC 7600.

CHANGES TO THE DATA LIBRARY COLLECTION

During the month an existing data library was extended and a new data library was added.

DLC-54/LAFPX-E

This data library of 154-neutron group cross sections for fission products was extended to include a library of 154-neutron group cross sections for fission products based on ENDF/B-V. This package extension was contributed by the Electric Power Research Institute, Palo Alto, California, and Los Alamos National Laboratory, Los Alamos, New Mexico. Beginning with ENDF/B-V cross sections, the extension represents 237-fission-product and actinide nuclides being processed at infinite dilution into 154-neutron-energy groups at temperatures of 300, 900, and 1200 K. Additional 154-group self-shielded actinide cross sections were calculated with Bondarenko background σ_0 values as small as 1 barn. The multigroup cross sections were produced using a typical light-water reactor spectrum. The group structure is sufficiently fine that collapse to few groups using an appropriate spectrum (e.g., LMFBR, CTR, etc.) is also accurate for alternate applications. Three versions of the library are now available. The original, based on ENDF-IV data, is designated DLC-54A. A second, based on ENDF/B-V data and available only within the United States, is designated DLC-54B. A third, based on data from ENDF/B-V which is not limited to U.S. distribution, is designated DLC-54C. References: LA-7174-MS (NRC-1) and EPRI NP-2345. FORTRAN IV; CDC.

DLC-103/ENDL 82

This neutron library in transmittal format was contributed by Lawrence Livermore National Laboratory, Livermore, California. Four main data libraries, (1) ENDL (Evaluated Neutron Data Library), (2) ECPL (Evaluated Charged-Particle Data Library), (3) ACTL (Evaluated Neutron-Induced Activation Cross-Section), and (4) EGDL (Evaluated Photon Interaction Data Library), are included in the package. The first three libraries deal with nuclear processes induced by neutrons or light charged particles (Z≤2, A≤4). The fourth (EGDL) contains the data appropriate to photons with energies between 100 eV and 100 MeV that interact with atoms of the elements in their ground state, i.e., "cold targets." EGDL does not contain data for photonuclear reactions. References: UCRL-50400 Vol. 4 Rev. 1 describes the evaluated nuclear data library and its format; UCRL-50400 Vol. 4 Rev. 1 Appendix C gives the contents of ENDL 82.

PERSONAL ITEMS

In serving a specialized area of scientific endeavor, it seems important that we take note of the movement of people concerned with radiation protection, transport, and shielding in the nuclear industry. We, therefore, continue to carry personal items as they are brought to our attention. During the past month we have been informed of the following changes: *Isaac Maya*, from General Atomic Co., to GA Technologies, Inc., San Diego, California; *Francis W. Seymore*, from Nuclear Energy Services, to TLG Engr., Inc., Brookfield, Connecticut; *H. F. Kerschner*, from Los Alamos National Laboratory, to Puget Sound Naval Shipyard, Bremerton, Washington; *Jin B. Sun*, from Babcock & Wilcox, to Florida Power & Light Co., Miami, Florida; *John R. Genser*, from Ridihalgh, Eggers & Assoc., to Nuclear Structures, Inc., Atlanta, Georgia; *William A. Reupke*, from Los Alamos National Laboratory, to Computer Sciences Corporation, Silver Spring, Maryland; *Mendel Beer*, from MAGI, to Long Island Lighting Co., Hicksville, New York; *K. D. George*, Medi-Physics, Puerto Rico, to Medi-Physics, Boonton, New Jersey; *W. L. Dunn*, from Research Triangle Inst., to Applied Research Assoc., Inc., Raleigh, North Carolina; and *Conrad J. Lennon*, from Holmes & Narver, Inc., to Solutions Unlimited, Torrance, California.

VISITORS TO RSIC

During the month of April the following persons came to visit/use RSIC facilities: *S. A. Jones*, Goodyear Atomic Corp., Piketon, Ohio; *Stan Cantor*, ORNL, Oak Ridge, Tenn.; *Brian E. Clancy*, Australian AEC, Lucas Heights, Australia; *Dean C. Kaul*, Science Applications, Inc., Schaumburg, Illinois; and *G. P. de Beer*, NUCOR, South Africa.

UPCOMING CONFERENCES, COURSES, AND SEMINARS

Note the following events of interest to the radiation shielding community.

June 1983

Thermophysics Conference, June 1-3, 1983, Montreal, Quebec, Canada, sponsored by the American Institute of Aeronautics and Astronautics. Contact: Dr. J. A. Roux, Mechanical Engr. Dept., Univ. of Mississippi, University, MS 38677, USA.

Radiation Protection, a course offered by Engineering Technology, Inc., June 6-10, 1983, in Las Vegas, Nevada, and October 3-7, 1983, in Dallas, Texas. Additional information may be obtained from Engineering Technology, Inc., P.O. Box 9000, Waco, TX 76714 (phone 817-772-0082).

Association for Radiation Protection, annual meeting, June 8-10, 1983, Aachen, Federal Republic of Ger-

many. Contact: Schweizerische Vereinigung für Atomenergie, Case postale 2613, Bärenplatz 2, CH-3001 Berne, Switzerland.

23rd Annual International Conference of the Canadian Nuclear Association, and *4th Annual Conference of the Canadian Nuclear Society*, June 12-15, 1983, Montreal, Quebec, Canada. Contact: J. A. Weller, General Manager, Canadian Nuclear Assoc., 111 Elizabeth St., 11th Floor, Toronto, Ontario, Canada M5G 1P7.

Annual National Meeting of the American Nuclear Society, June 12-16, 1983, Detroit, Michigan, USA. Contact: Walter J. McCarthy, Jr., Chairman and Chief Executive Officer, Detroit Edison, 2000 Second Ave., Detroit, MI 48226, USA.

People Interaction — The Key to Technology Transfer (8th Annual Meeting and International Symposium of the Technology Transfer Society), June 20-22, 1983, ITT Research Institute, Chicago, Illinois. Contact: Bob Levi, General Meeting Chairman, ITT Research Institute, 10 W. 35th St., Chicago, IL 60616 USA (phone 312-567-4609).

July 1983

7th International Congress of Radiation Research, July 3-8, 1983, Amsterdam, the Netherlands, sponsored by the International Association for Radiation Research. Contact: J. J. Broerse, Secretary General, 7th Inter. Cong. of Radiation Research, c/o Radiobiological Institute TNO, P.O. Box 5815, 2280 HV Rijswijk, Netherlands.

Institute of Nuclear Materials Management, annual meeting, July 10-13, 1983, Denver, Colorado, USA. Contact: M. Yadron, Institute of Nuclear Materials Management, 2400 E. Devon Ave., Des Plaines, IL 60018 USA.

August 1983

Nuclear Accident Dosimetry, Technical Committee workshop, August 8-19, 1983, Oak Ridge, Tennessee, sponsored by the International Atomic Energy Agency. Contact: F. N. Flakus, Div. of Nuclear Safety, IAEA, P.O. Box 100, A-1400 Vienna, Austria.

8th Annual Conference of the Australian Radiation Protection Society, August 15-18, 1983, Adelaide, Australia. Contact: J. Fitch, Convenor, 1983 ARPS Conf., Private Bag 97, Glenside, S. A. 5065, Australia.

September 1983

International Conference on Numerical Methods in Nuclear Engineering, September 6-9, 1983, Montreal, Quebec, Canada, sponsored by the Nuclear Science and Engineering Division, Canadian Nuclear Society. Contact: Riccardo A. Bonalumi, Nuclear Studies & Safety Dept., H16 H17, Ontario Hydro, 700 University Ave., Toronto, Ontario, Canada M5G 1X6.

11th Regional Congress of the International Radiation Protection Association: Recent Developments and

Trends in Radiation Protection, September 20-24, 1983, Vienna, Austria, co-sponsored by the Austrian Association for Radiation Protection. Contact: A. Hefner, Congress Secretary, c/o Österreichischer Verband für Strahlenschutz, Lenaugasse 10, A-1082 Vienna, Austria.

Fall Meeting of the Atomic Energy Society of Japan, September 28–30, 1983, Hokkaido, Japan. Contact: M. Masamoto, Secretary General, Atomic Energy Society of Japan, No. 1-5-4 Ohte-machi, Chiyoda-ku, Tokyo, 100 Japan.

October 1983

Environmental Transfer to Man of Radionuclides Released from Nuclear Installations, a seminar October 17–21, 1983, Brussels, Belgium, sponsored by the International Atomic Energy Agency, Contact: Conference Service Section, IAEA, P.O. Box 100, A-1400 Vienna, Austria.

Transport of Radioactive Materials by Post, a seminar October 24–27, 1983, in Vienna, Austria, sponsored by the International Atomic Energy Agency. Contact: Conference Service Section, IAEA, P.O. Box 100, A-1400 Vienna, Austria.

November 1983

Radiation Protection in Exploration, Mining and Milling of Radioactive Ores for Developing Countries in Africa, a seminar, November 14–25, 1983, in Gabon, sponsored by the International Atomic Energy Agency. Contact: Conference Service Section, IAEA, P.O. Box 100, A-1400 Vienna, Austria.

Technical Committee on Decontamination of Nuclear Facilities to Permit Plant Decommissioning, Modification or Maintenance, November 28–December 2, 1983, Vienna, Austria, sponsored by the International Atomic Energy Agency. Contact: S. Mukai, Div. of Nuclear Fuel Cycle, IAEA, P.O. Box 100, A-1400 Vienna, Austria.

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 22161.

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.

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