

RSIC Newsletter

Oak Ridge National Laboratory

POST OFFICE BOX 2008 ! OAK RIDGE, TENNESSEE 37831-6362
MANAGED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE U.S. DEPARTMENT OF ENERGY

Phone No. 615-574-6176 or FTS 624-6176

FAX 615-574-9619

EasyLink Mailbox 62813374

Telex (Answer Back): 854467 (ORNL EPIC UD)

BitNet: PDC@ORNLSTC • Internet: PDC@EPIC.EPM.ORNL.GOV

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If we want to utilize in the proper way and to the fullest extent the products of man's intellect, we must develop that part of man's being that is his heart and spirit.) Ferdinand Pecora

NEW RSIC REGISTRATION FORM IN USE

As we did last month, a new version of the RSIC registration form is appended as the last page of this newsletter. Most of you reading this will have already completed and sent an earlier version but you should complete and return the new one to provide additional detail to your funding profile. First we have greatly expanded and refined the funding categories of various sponsor groups to reflect the current composition of the various organizations. Second, at the request of several sponsors, we have been asked to collect agency project category numbers and agency personal contacts. A section at the bottom of page 1 of the registration form is provided for this additional information. Please examine the new form to determine what additional information would be required to bring your current profile up to date. Your cooperation will be appreciated.

An example of the type of information required is offered below.

John Q. User spends 50% of his time on work for DOE-Nuclear Energy, Civilian Reactors (Sponsor No. 1), 30% on Defense Nuclear Agency, Radiation Sciences Directorate (Sponsor No. 34), and 20% on NRC/Regulatory, Research (Sponsor No. 50). The completed section might look as follows:

<u>Sponsor No.</u>	<u>Project Category</u>	<u>Project Contact</u>
<u>1</u>	<u>AF 20 50 10 0</u>	<u>Dr. A. B. Reactor</u>
<u>34</u>	<u>91-804</u>	<u>Maj. R. Defense</u>
<u>50</u>	<u>L1991</u>	<u>Dr. Q. Research</u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>

In the above, the AF number is a DOE Budget and Reporting (B&R) code, the 91-804 is a DNA IACRO number, and the L1991 is an NRC FIN number. Other types of numbers (project categories) would be more appropriate for other agencies. The type of information sought is intended to help RSIC make connections on behalf of users at the sponsor level in the terminology most familiar to them.

R. W. Roussin

CHANGES TO THE COMPUTER CODE COLLECTION

Eighteen additions or changes were made to the computer code collection during the month. Ten new code systems were packaged and added to the collection, three existing code packages were extended with additional hardware versions, and five packages were updated or corrected. Eight changes resulted from foreign contributions.

CCC-254/ANISN-ORNL

Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee, contributed a Cray version of ANISN under the CTSS operating system in 1989. The code has now been adapted to run under the UNICOS operating system. ANISN-ORNL is a one-dimensional discrete ordinates transport code system with anisotropic scattering. ANISN solves the one-dimensional Boltzmann transport equation for neutrons or gamma rays in slab, sphere, or cylinder geometry. The Cray version uses the CFT compiler with FORTLIB under CTSS; under UNICOS, the CFT77 compiler is used. The Cray version (B) is available on one DS/HD 5.25-inch diskette (1.2 MB). Reference: K-1693; ORNL-TM-3049; NAA-SR-10951; *Trans. Am. Nucl. Soc.*, II-1, (June 1968); Informal Notes; (May 1973); ORNL Informal Notes (July 1988). ANISN-ORNL runs on the IBM 3033 (A), Cray X-MP-2 (B), VAX family (C) or DEC-10, DEC-20 (G) computers. FORTRAN IV, IBM 3033, VAX family, DEC-10; FORTRAN 77, Cray X-MP.

CCC-331/EGS4

The National Research Council of Canada, Ottawa, co-authors of the EGS4 code system, added 15 files that relate to PRESTA to the existing tape. EGS4 is a Monte Carlo simulation of the coupled transport of electrons and photons. A modified version of PEGS4 was also added to accommodate density effect correction for the collision stopping power and the use of ICRU-37 radiative stopping powers. The code is written in FORTRAN IV, FORTRAN 77, and MORTRAN (a compiler developed at Stanford) and runs on the IBM 3081 under the VM operating system and on the VAX 11/750 under the VAX/VMS operating system. Reference: Errata, Informal note; SLAC-265; PRESTA Info, Informal Notes; SLAC TN-87-4. FORTRAN IV,

FORTRAN 77, IBM 3081, VAX 11/750.

CCC-396/QADMOD-G

The September 1984 *RSIC Newsletter* announced a correction to the value for nitrogen 1.3 MeV cross section in the point kernel gamma-ray shielding code, QADMOD-G. The correction is in the BLOCK DATA subprogram in the statement: DATA CSECT/....., line 4 of the continued statements. The correct value is .0566. Sometime thereafter, the value was changed to .0559. Users who have gotten the code with a value of .0559 should change it to .0566. The current update contains the corrected value. QADMOD-G is now available on one DS/DD 5.25-inch diskette. Reference: RRA-N7914. FORTRAN IV, IBM 3033, IBM 3083.

CCC-459/BOLD VENTURE

The University of Cincinnati, Ohio, contributed a modified version of VENTURE-PC for the IBM PC (CCC-459B). In addition, a new version for the PC 386 is also available (CCC-459C). CCC-459B is a 16-bit version which runs on the IBM PC/XT and IBM PC/AT; CCC-459C is a 32-bit version which runs on the PC 386 or PC 486.

The changes in CCC-459B, the IBM PC version are enhancements to the code and include: (1) subroutine RBL1 was moved from FO3 to OUT in the overlay structure; (2) subroutine DIFF was altered to save flux arrays on disk files between indirect search iterations; (3) DOPC was altered to prevent files from defaulting to core; (4) subroutine KMOT in the KOM overlay was changed to allow the editing of as many intervals required.

The PC version (B) requires about 4 megabytes of disk storage, to hold the executable files and files generated by the code. It also requires 640K of memory and a math coprocessor. The PC 386

version (C) requires 4 megabytes of memory and a math coprocessor. The PC executable for the 16-bit version (B) was created under DOS 3.1 using the Lahey FORTRAN 77 compiler (Version 2.22) and PLINK86 Plus multilevel overlay linker from Phoenix Software. The PC executable for the 32-bit version (C) was created using the Lahey FORTRAN 77 compiler F77L-EM/32, version 3.01. The code is transmitted on 5 DS/HD 5.25-inch diskettes (1.2 MB). Reference: Informal Notes; EGG-2582. FORTRAN IV, FORTRAN 77; IBM mainframes (A), IBM PC/XT and IBM PC/AT (B), PC 386 and PC 486 (C).

CCC-483/FINELM

Eidg. Institut f. Reaktorforschung Würenlingen, Switzerland, through the OECD Nuclear Energy Agency (NEA) Data Bank, Gif-sur-Yvette, France, provided an updated version of FINELM. The code, originally written in FORTRAN IV, was converted to FORTRAN 77, and runs on the VAX 8810, Cray X-MP, and Sun workstations. FINELM solves the neutron diffusion equation in X-Y, R-Z, R-theta, X-Y-Z and R-theta-Z geometries. The code is transmitted on one DS/HD 5.25-inch diskette (1.2 MB). Reference: FINELM Draft Manual; Informal Notes; EIR-Bericht Nr. 459. FORTRAN 77, VAX 8810, Cray X-MP and Sun workstations.

CCC-491/ORION-II

Tokai Works, Power Reactor and Nuclear Fuel Development Corporation, Tokai-mura, Ibaraki-ken, Japan, through the NEA Data Bank, France, contributed ORION-II, originally written in FORTRAN IV for the IBM 370, IBM 308X family, IBM 43XX family, and FACOM M-series computers. The NEA Data Bank adapted the code to run on an IBM 3090, using the IBM VS FORTRAN Version 2 compiler. ORION-II was developed to estimate environmental concentration and dose due to airborne release of radioactive material from multiple sources of the nuclear fuel cycle facilities. ORION-II is an updated version of ORION and is applicable to the sensitivity study of dose assessment at nuclear fuel cycle facilities. The modified Gaussian plume model is applied to calculate atmospheric dispersion. The code is transmitted on one DS/HD 5.25-inch

diskette (1.2 MB). Reference: PNCT N8410 87-17-Tr. FORTRAN 77; IBM 3090; FACOM M-780.

CCC-501/SUSD

The NEA Data Bank, France, contributed an IBM 3090 and VAX 8810 version of SUSD, designated as CCC-501B. The original version (CCC-501) contributed by the University of Tokyo, Japan, runs on the Hitachi-M Series. SUSD calculates sensitivity coefficients for one- and two-dimensional transport problems. Variance and standard deviation of detector responses or design parameters can be obtained using cross-section covariance matrices. On the IBM 3090, VS FORTRAN 2.1.1 was used under the MVS/XA operating system. On the VAX 8810, VAX FORTRAN 5.0-1 was used under the VMS operating system. The new version is distributed on one DS/HD 5.25-inch diskette (1.2 MB). Reference: ORNL/TR-88/18. FORTRAN 77, Hitachi-M series (A), IBM 3090, VAX 8810 (B).

CCC-539/INTRUDE-ANS

Associated Nuclear Services, Surrey, England, through the NEA Data Bank, France, contributed the code INTRUDE. RSIC added the extension ANS for Associated Nuclear Services to differentiate it from the INTRUDE code appearing in CCC-455/DEIS and CCC-499/PART61. INTRUDE-ANS is written in FORTRAN 77 for the VAX 8810, under the VAX/VMS operating system. The compiler used is VAX FORTRAN Version 5.0-1. INTRUDE-ANS was developed to calculate the risks associated with the possibility of intrusion into a repository containing radioactive waste based on three routes of exposure: inhalation of active material by the intruder, external exposure of the intruder, and distribution of active material around the intrusion region leading to long term exposure pathways. The time dependent activity by each nuclide is calculated by means of an analytic solution to the Bateman equation. The code is transmitted on one DS/DD 5.25-inch diskette. Reference: ANS Report No. 595-4, ANS Report No. 595-5 (May 1986), Surrey, England, ANS Report No. 595-6. FORTRAN 77, VAX 8810.

CCC-584/CHAIN-MC

CHAIN-MC is a two-dimensional model for analyzing contaminant transport in a fractured porous medium, contributed by Battelle Pacific Northwest Laboratories, Richland, Washington. CHAIN-MC is a modified version of the original CHAIN code, which runs on PRIME computers under the PRIMOS operating system. The conceptual modeling approach is based on representing the space domain by a vertical cross section. The mathematical model embodied by CHAIN is based on the physical law of conservation of mass. Physical processes accounted for in the model include advection, diffusion, dispersion, and retardation along with mass decay and production/injection. The code is written in FORTRAN 77 and runs on the Cray computers. The CFT compiler was used on the Cray under the CTSS operating system. The code is transmitted on one DS/DD 5.25-inch diskette. Reference: RHO-BW-CR-144 P. FORTRAN 77, Cray X-MP.

CC-585/RHEIN

Zentralinstitut f. Kernforschung, Rossendorf, Dresden, Germany, through NEA Data Bank, France, contributed RHEIN, originally written for the ES-1055 computer in FORTRAN IV. The Data Bank converted the code to run on the IBM 3090 under the MVS/XA operating system using the VS FORTRAN compiler with the FORTRAN 66 option. RHEIN is a modular reactor code system for neutron physics calculation. The calculation routines can be used for the following problems: calculation of cross section sets for infinite medium; zero-dimensional spectrum calculation in diffusion, P1 or B1 approximation; one-dimensional calculation in diffusion, P1 or collision probability approximation; two-dimensional diffusion calculation; cell calculation; zonewise homogenized group collapsing within zero, one or two-dimensional model. The code is transmitted on one DS/HD 5.25-inch diskette (1.2 MB). Reference: ZfK-668. FORTRAN IV, IBM 3090, ES-1055.

PSR-75/AXMIX

A Cray X-MP version of AXMIX which runs under the UNICOS operating system with the use of

the CFT77 compiler was contributed by ORNL. AXMIX provides a fast, simple, and economical tool for creating cross-section data sets for ANISN and DOT from cross-section sets already available on cards, nuclide-organized libraries, and group-independent data sets. The Cray version (C) is available on one DS/HD 5.25-inch diskette (1.2 MB). Reference: ORNL/TM-5295 (December 2, 1974), ORNL/TM-5296, Informal Notes. FORTRAN IV, IBM 360/370 (A), Cyber-73 (B); FORTRAN 77, Cray X-MP (C).

PSR-231/GRESS 1.1

A newly frozen version of this gradient enhanced software system was contributed by ORNL. It is recommended that all users of GRESS 1.0 request this new version designated GRESS 1.1. This release includes a correction to an error in the implementation of the chain option. GRESS utilizes a FORTRAN precompiler to enhance FORTRAN 77 programs by adding derivative-taking capabilities. GRESS calculates and reports normalized sensitivities of selected results with respect to input data. Both forward chaining by application of the calculus chain rule, and back solving by application of adjoint sensitivity methods are available as options. The package is distributed on one DS/DD 5.25-inch diskette. Reference: ORNL/M-1121 (April 1990), ORNL/TM-10835 (October 1988), ORNL/TM-11261 (Nov. 1989), and ORNL/TM-11037 (May 1989). FORTRAN 77 and C; VAX.

PSR-248/ABAREX

The Indira Gandhi Centre for Atomic Research, Kalpakkam, India, through the OECD NEA Data Bank, France, contributed ABAREX, written in FORTRAN IV for the IBM PC/AT under the DOS 3.1 operating system. The compiler used is IBM Professional FORTRAN Version 1.0. ABAREX is an optical-statistical model program developed for the calculation of energy-averaged neutron induced nuclear reaction cross sections. The program uses the spherical-optical model algorithm of ABACUS and the statistical model method of NEARREX with many improvements and modifications. Only neutron interaction cross sections are calculated. Transmission factors are to be supplied externally if

fission cross sections are to be calculated. The IBM Professional FORTRAN Version 1.0 was used by RSIC in the creation of the executable file under the DOS 3.3 operating system. The code requires a math coprocessor. ABAREX is transmitted on one DS/HD 5.25-inch diskette (1.2 MB). Reference: IGCAR/NDS-19, Workshop Notes (Feb. 18 - March 18, 1988), Trieste, Italy; Informal Notes. FORTRAN IV, IBM PC/AT.

PSR-302/COMNUC3B

Los Alamos National Laboratory (LANL), New Mexico, contributed COMNUC3B. The original program was called COMNUC and was developed at Atomics International (North American Rockwell). The Los Alamos version is written in FORTRAN IV for the Cray X-MP under the CTSS operating system. COMNUC3B analyzes compound nucleus interactions, for which the incident particle is a neutron. Two types of reactions are considered when the outgoing particle is a neutron. The individual channel model is described by the known levels of the target nucleus. The continuum inelastic neutron calculation requires a model for the nuclear level density and a set of spin, parity, and energy dependent transmission coefficients. As with emerging neutrons, the fission component is separated into two parts: a part due to discrete channels and a part due to fission through a continuum of states. COMNUC3B is transmitted on one DS/HD 5.25-inch diskette (1.2 MB). Reference: TI-707-130-013; Informal Notes. FORTRAN IV, Cray X-MP.

PSR-303/OFFSCALE

OFFSCALE is an offline PC input processor for the SCALE criticality sequences contributed by ORNL. The code is written in Microsoft BASIC (version 7.1) for the IBM PC under the DOS operating system. OFFSCALE is designed to assist a SCALE user in preparing an input deck for any of IBM PC/AT under the DOS 3.3 operating system. EXIFON-GAMMA predicts emission spectra for neutrons, protons, alphas, and photons including equilibrium, pre-equilibrium, and direct as well as multiple particle emission processes. The model is based on random matrix physics using Green's

the criticality sequences contained in the CSAS4 criticality control module of CCC-545/SCALE-4. OFFSCALE features a pulldown menu system with sophisticated data screens containing context-sensitive help messages. The menu system organizes the major command categories as menu titles and pulldown commands. The program performs extensive error checking for each input screen. The code is interactive and response time is quick. The code is transmitted on one DS/HD 5.25-inch diskette (1.2 MB). Reference: Informal Report, ORNL. BASIC, IBM PC and compatibles.

PSR-304/GIRAFFE

GIRAFFE stands for General Isotope Release Analysis for Failed Elements. Written in FORTRAN IV for the IBM 3033 under the VM operating system, it was contributed by Argonne National Laboratory (ANL), Argonne, Illinois. The code can easily be adapted to run on other computers. GIRAFFE provides parameter estimates of the nonlinear discrete measurement models that govern the transport and decay of delayed neutron precursors in a liquid metal fast breeder reactor (LMFBR). GIRAFFE incorporates the physical model for isotopic transport and decay into a systematic regression algorithm that enables the user to determine the values of the transport and release parameters. The code also computes the values of several descriptive statistics that provide additional diagnostic information for interpreting the delayed neutron signals and characterizing the condition of breach. The code is transmitted on one DS/DD 5.25-inch diskette. Reference: ANL-80-55. FORTRAN IV, IBM 3033.

PSR-305/EXIFON-GAMMA

Technische Universität Dresden, Germany, through NEA Data Bank, France, contributed EXIFON-GAMMA, written for the IBM PC/XT or function formalism. All calculations are performed without any free parameters. Results are presented for bombarding energies below 30 MeV. The code was written in FORTRAN 77 and uses Ryan-MacFarland FORTRAN Version 2.42 or Microsoft FORTRAN Version 4.01. The executable program

as packaged requires a math coprocessor. The code is transmitted on one DS/HD 5.25-inch diskette (1.2 MB). Reference: INDC(GDR)-601L. FORTRAN 77, IBM PC/XT, IBM PC/AT.

PSR-306/KAOS-V

KAOS-V is an evaluation tool for neutron kerma factors and other nuclear responses contributed by ANL. The code is written in FORTRAN 77 under the CTSS operating system on the Cray computers with the use of the CFT compiler. The plotting routines require the DISSPLA graphics system. KAOS-V accurately evaluates the neutron fluence-to-kerma factors from microscopic nuclear data.

Two basic methods for computing kerma factors, kinematics and energy balance, are implemented in KAOS-V using data from the evaluated nuclear data files ENDF/B-V. Auxiliary nuclear data bases, such as the Japanese evaluated nuclear data library (JENDL-2), can be used as a source of isotopic cross sections. These are needed to estimate average quantities such as effective Q-values for the natural element. For resonance treatment, the code has the ability to access NJOY and NPTXS interface files in formatted or binary forms. The code is transmitted on one DS/DD 5.25-inch diskette. Reference: ANL/FPP/TM-240. FORTRAN 77, Cray computers.

CHANGES TO THE DATA LIBRARY COLLECTION

Five changes were made to the collection during the month. Four new data libraries were added and an existing data library was updated. Four changes resulted from foreign contributions.

DLC-129/ANS643

ANS643 was contributed by ORNL, the Tokyo Institute of Technology, and Japan Atomic Energy Research Institute. This package of geometric progression (GP) gamma-ray buildup factor and attenuation coefficients, based on the compilation of American Nuclear Society Standards Working Group ANS-6.4.3, was updated with significant changes.

The earlier versions of DLC-129 supplied only the G-P coefficients and not the buildup factors as given in the ANS-6.4.3 standard. However, since some users like to interpolate in tables rather than using a fitting function, the buildup factors were added to the package in March 1991. The buildup factors are given in 4 new files: tables of buildup factors from moments method results; tables of buildup factors from PALLAS results; moments method data for FORTRAN input; PALLAS data for FORTRAN input.

Corrections were made in the following files: GP.COE, HIGHZ.GP, and TAYLOR.643. This package is available on tape or 1 DS/HD (1.2 MB) diskette. The Daniel retrieval program was compiled with the Microsoft FORTRAN compiler,

Version 4.01. References: Informal notes (1988, 1990, 1991), ISBN:089448-132-0 (April 1987), and ANSI/ANS-6.4.3 Draft (June 1990). FORTRAN 77; Data General MV/family, IBM 3033 (A) and IBM PC (B).

DLC-157/VITAMIN-J/COVA

The NEA Data Bank, France, contributed VITAMIN-J/COVA, a neutron cross-section covariance data library in multigroup form. The library comes with the program ANGELO2 which expands or collapses the cross-section covariance matrices from the energy group structure of the input library into the form required by the user. The modules in the NJOY89 system (PSR-171/NJOY89) are also useful. The library, designed for radiation shielding applications, contains the multigroup relative covariance matrix data for 11 materials: H-1, Li-6, Li-7, Be-9, C, N-14, O-16, Na-23, Cr, Fe, and Ni. In general, the covariances for the total, elastic, inelastic, and nonelastic scattering cross sections and for the cross sections making a significant contribution to the total absorption cross sections are included.

The multigroup covariance data are based on:

JEF-1, ENDF/B-IV, ENDF/B-V and other evaluations. They were extracted from EURLIB (DLC-35), BABEL (DLC-104), PROPANE, VITAMIN-J, COVFILS (DLC-91), COVFILS-2-I (DLC-138) and SUSL (CCC-501). The data from COVFILS were read off the graph and are therefore approximate. For each material, the energy group structure, relative standard deviations, and relative covariance matrices for different reactions are provided. The programs provided in the package are written in FORTRAN 77 for the VAX 8810 and IBM 9377. On the VAX 8810, the VAX/VMS operating system was used with the VAX FORTRAN compiler. The library is transmitted on one DS/HD 5.25-inch diskette (1.2 MB). Reference: NEA-1264. FORTRAN 77, VAX 8810, IBM 9377.

DLC-158/GEAF-1

Stichting Energieonderzoek, Centrum Nederland, The Netherlands, through NEA Data Bank, France, contributed GEAF-1 (European Activation File - 1). The data library is based on several sources: JEF-1, ENDF/B-V, ACTL (DLC-069), THRESH, JENDL-2 (DLC-122), EFF-2, and is designed for use in fusion reactor technology. The library contains 100-group (GAM2) cross sections for neutron activation and transmutation reactions. It contains cross sections for almost all stable and unstable nuclides with half lives exceeding one day. A new cross section data file for ^{178}Hf , contributed by Harwell, is also included. The data library is transmitted on one DS/HD 5.25-inch diskette (1.2 MB). Reference: NEA 1255/04. VAX 8810.

DLC-159/IRAN-LIB

IRAN-LIB is a P-3 coupled neutron-gamma cross section library in ISOTXS format for use with ANISN/PC (CCC-514) contributed by the Instituto de Pesquisas Energéticas Nucleares, São Paulo, Brazil, through the NEA Data Bank, France. LMOD, which selects materials from a master

ASCII CCCC ISOTXS file and places them on a CCCC file for input to ANISN/PC, is the required data retrieval program for IRAN-LIB.

To solve a realistic shielding problem for either a neutron or gamma source, it is necessary to generate cross sections using AMPX-II (PSR-063) with the VITAMIN-4C (DLC-53) master library on a mainframe, then copy the generated cross section onto the ANISN/PC 'array 14 **'. IRAN-LIB was created to overcome the difficulty of this very cumbersome procedure. IRAN-LIB stands for Improved Range of ANISN/PC Library. The cross sections were taken from the VITAMIN-4C master library using the AMPX-II system and the ENDF/B-IV, ENDF/B-V and JENDL/3 master libraries using the NJOY (PSR-171) code. The data library is transmitted on one DS/HD 5.25-inch diskette (1.2 MB). Reference: IAEA 1215/01; NEADB Informal Notes. IBM PC.

DLC-160/KAOS/LIB-V

KAOS/LIB-V, a library of nuclear response functions, was contributed by ANL. The library is designed for fusion and fission applications and includes neutron kerma factors, gas production, tritium breeding cross sections, and all important reaction cross sections. The library was generated with the KAOS-V code (PSR-306) employing basic nuclear data from ENDF/B-V. Auxiliary nuclear data bases, such as the Japanese library JENDL-2, were used as a source of isotopic cross sections when these data were not provided in ENDF/B-V files for a natural element. KAOS/LIB-V employs the VITAMIN-E weighting function and energy group structure of 174 neutron groups. RETRIEVE is an interactive program written in FORTRAN 77 to retrieve selected responses and perform group collapsing from the VITAMIN-E 174-group values. The data library is transmitted on one DS/HD 5.25-inch diskette (1.2 MB). Reference: ANL/FPP/TM-241. FORTRAN 77, Cray computers.

PERSONAL ITEMS

In serving a specialized area of scientific endeavor, it seems important that we note significant changes in the activities 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.

Staff Member Returns

With a sigh of relief we welcome the return of **Jennie Manneschmidt** (formerly Bartley) on a part-time basis. Jennie took leave in November for the birth of twins. Anna Katrina and Emily Clare arrived on December 1, 1990. Jennie is the Packaging Coordinator for RSIC. In this role, Jennie assures that the material comprising an RSIC package (tapelist, sample problem input and output, documentation, abstract, and newsletter announcement) is as useful to potential users as possible.



The Manneschmidt twins, Emily and Anna, at 10 weeks.

Visitors to RSIC

During the month the following persons came for an orientation visit and/or to use RSIC facilities: *Mark Fornwall*, *Pam Gorman*, *Bill Buchanan*, and *Don Holz*, U.S. Department of Energy, Oak Ridge, Tennessee; *Maj. R. Kehlet*, Defense Nuclear Agency, Alexandria, Virginia; *C. Ward*, U.S. Army Foreign Intelligence Service, Charlottesville, Virginia; *Dean C. Kaul* and *Stephen D. Egbert*, SAIC, San Diego, California; *Calvin D. Manning*, Advanced Nuclear Fuels, Richland, Washington; *Harry Webb*, Nuclear Fuels, Erwin, Tennessee; and *Warren Cox*, World Energy, Marietta, Georgia.

CONFERENCES, COURSES, SYMPOSIA

RSIC attempts to keep its users/contributors advised of conferences, courses, and symposia in the field of radiation protection, transport, and shielding through this section of the newsletter. Should you be involved in the planning/organization of such events, feel free to send your announcements and calls for papers to RSIC.

Calendar

Your attention is directed to the following events of interest.

April 1991

27th Annual Meeting of the National Council on Radiation Protection and Measurements, Apr. 2! 4, 1991, Washington, D.C. Contact: NCRP, 7910

Woodmont Ave., Suite 800, Bethesda, MD 20814
(phone 301-657-2652).

Workshop on Welding Criteria for Shipping Containers, Apr. 3! 4, 1991, San Francisco, sponsored by the U.S. Department of Energy. Contact: Merry Carter, Lawrence Livermore National Laboratory, Welding Criteria Workshop, P.O. Box 808, L-196, Livermore, CA 94551.

35th International Conference on Transport and Diffusion in Turbulent Fields: Modelling and Measurement Techniques, Apr. 22! 26, 1991, Eilat, Israel, sponsored by the Israel Inst. for Biological Research. Contact: Israel Inst. for Biological Research, P.O. Box 19, 70450 Ness-Ziona, Israel.

Advances in Mathematics, Computations, and Reactor Physics, Apr. 28! May 1, 1991, Pittsburgh, Pennsylvania, an international topical meeting sponsored by the ANS, Mathematics & Computation Division and the Reactor Physics Division. Contact: J. E. Olhoeft, Westinghouse Electric Corp., P.O. Box 355, WEC-E205, Pittsburgh, PA 15230-0355 USA (phone 412-374-5704).

1991 International High-Level Radioactive Waste Management Conference, Apr. 28! May 3, 1991, Las Vegas, Nevada, sponsored by the ANS and the American Society of Civil Engineers. Contact: Dillard B. Shipler, Technical Program Chair, American Nuclear Society, 555 N. Kensington Ave., La Grange Park, IL 60525 USA.

Conference on Occupational Radiation Protection, Apr. 29! May 3, 1991, Guernsey, United Kingdom, sponsored by the British Nuclear Energy Society. Contact: British Nuclear Energy Society, Secretariat, 1-7, Great George St., London SW1P 3AA U.K.

May 1991

Simulation of Subsurface Flow and Contaminant Transport by Finite Element and Analytical Methods, May 6! 10, 1991, a short course offered by Penn State at University Park, Pennsylvania. Contact: Barbara Impellitteri, Penn State, 410 Keller Conference Center, University Park, PA 16802 (Fax 814-865-3749).

Radiopharmaceutical Dosimetry Symposium, May 7! 10, 1991, in Oak Ridge, Tennessee, sponsored by the Radiopharmaceutical Internal Dose Information Center. Contact: Audrey T. Schlafke-Stelson, Program Committee, 5th International Dosimetry Symposium, Radiopharmaceutical Internal Dose Information Center, Medical Sciences Division, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37831-0117 USA (phone 615-576-3450).

Practical Radiation Shielding, May 13! 17, 1991, Atlanta, Georgia, a course sponsored by Shonka Research Associates, Inc., and the Georgia

Institute of Technology. Contact: Georgia Tech Continuing Education-R, Georgia Institute of Technology, Atlanta, GA 30332-0385 (phone 404-894-2400, 800-325-5007).

Advanced Occupational and Environmental Radiation Protection, May 13! 17, 1991, Boston, Massachusetts, a short course offered by Harvard School of Public Health. Contact: Mary F. McPeak, Assoc. Dean for Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-432-3515; Fax 617-432-1969).

Workshop on SCANS, Version 2 (Shipping Cask Analysis System), May 21! 23, 1991, Gaithersburg, Maryland, sponsored by the U.S. Nuclear Regulatory Commission and the U.S. Department of Energy. Contact: Merry Carter, Lawrence Livermore National Laboratory, SCANS Workshop, P.O. Box 808, L-196, Livermore, CA 94551.

ICRM '91, May 27! 31, 1991, Madrid, Spain, sponsored by CIEMAT. Contact: J. M. Los Arcos, ICRM '91 Secretariat, CIEMAT, Investigación Básica, Avenida Complutense, 22, 28040-Madrid, Spain (phone 34-1-3466225, Fax 34-1-3466005).

June 1991

ANS Annual Meeting, June 2! 6, 1991, Orlando, Florida. Contact: General Chair John A. DeMastry, Florida Power & Light Co., P.O. Box 14000, Juno Beach, FL 33408 (phone 407-694-3613).

5th International Symposium on Radiation Physics, June 10! 14, 1991, Dubrovnik, Yugoslavia. Contact: Dr. Ante Ljubijif, ISRP-5 Chairman, Ruder Boskovif Inst., P.O. Box 1016, 41001 Zagreb, Yugoslavia (phone 41 425-563 or 41 434-467, Telex 21383 irbzg yu, Fax 41 425-497).

Planning for Nuclear Emergencies, June 10! 14, 1991, Boston, Massachusetts, a short course offered by Harvard School of Public Health. Contact: Mary F. McPeak, Assoc. Dean for Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-432-3515; Fax 617-432-1969).

38th Annual Meeting of the Society of Nuclear Medicine, June 11! 14, 1991, Cincinnati, Ohio. Contact: Society of Nuclear Medicine, 136 Madison Ave., 8th Floor, New York, NY 10016 (phone 212-889-0717).

International Conference on Emerging Nuclear Energy Systems (ICENES'91), June 16! 21, 1991, Monterey, California. Contact: C. D. Henning, LLNL L-644, P.O. Box 808, Livermore, CA 94551.

A Joint Symposium on Radiation Protection, June 16! 23, 1991, in Winnipeg, Canada. Contact: Danny Buksak, Conference Chairman, The University of Manitoba, 191 Frank Kennedy Bldg., Winnipeg, Manitoba, R3J 2N2, Canada (phone 204-474-6633).

Techniques in Nuclear Radiation Shield Analysis, June 24! 28, 1991, Ft. Worth, Texas, a short course offered by the University of Texas at Austin. Contact: Continuing Engineering Studies, College of Engineering, ECJ 10.324, The Univ. of Texas at Austin, Austin, TX 78712 (phone 512-471-3506; Fax 512-471-0831).

In-Place Filter Testing Workshop, June 24! 28, 1991, Boston, Massachusetts, a short course offered by Harvard School of Public Health. Contact: Mary F. McPeak, Assoc. Dean for Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-432-3515; Fax 617-432-1969).

July 1991

2d International Symposium on Biophysical Aspects of Auger Processes, July 5! 6, 1991, University of Massachusetts, Amherst, Massachusetts, sponsored by the American Association of Physicists in Medicine. Contact: Roger W. Howell, Dept. of Radiology, Div. of Radiation Research, M.S.B. F-451, Univ. of Medicine & Dentistry of NJ, 185 South Orange Ave., Newark, NJ 07103 USA (phone 201-456-5067).

28th Annual International Nuclear and Space Radiation Effects Conference and Short Course, July 15! 19, 1991, San Diego, sponsored by the Institute of Electrical and Electronics Engineers, Inc. Contact: Ronald L. Pease, Mission Research Corp., 1720 Randolph Rd., SE, Albuquerque, NM 87106 (phone 505-768-7639).

Management and Disposal of Radioactive Wastes, July 15! 19, 1991, Boston, Massachusetts, a short course offered by Harvard School of Public Health. Contact: Mary F. McPeak, Assoc. Dean for Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-432-3515; Fax 617-432-1969).

Health Physics Society Annual Meeting, July 21! 26, 1991, Washington, D.C. Contact: Nancy E. Newman, NIH Bldg. 21, Rm. 236, 9000 Rockville Pike, Bethesda, MD 20892 (phone 301-496-5774).

International Illinois Low Level Radioactive Waste (LLWM) Symposium: The Quiet Revolution) Innovations in Low-Level Waste Management, July 29! Aug. 1, 1991, Chicago, Illinois, sponsored by the Illinois Dept. of Nuclear Safety. Contact: Ms. P. Burnett, Illinois Dept. of Nucl. Safety, 1035 Outer Park Drive, Springfield, IL 62704 USA.

August 1991

Occupational and Environmental Radiation Protection, Aug. 12! 16, 1991, Boston, Massachusetts, a short course offered by Harvard School of Public Health. Contact: Mary F. McPeak, Assoc. Dean for Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-432-3515; Fax 617-432-1969).

In-Place Filter Testing Workshop, Aug. 26! 30, 1991, Boston, Massachusetts, a short course offered by Harvard School of Public Health. Contact: Mary F. McPeak, Assoc. Dean for Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-432-3515; Fax 617-432-1969).

September 1991

Risk Assessment In Occupational and Environmental Health, Sept. 4! 6, 1991, Boston, Massachusetts, a short course offered by Harvard School of Public Health. Contact: Mary F. McPeak, Assoc. Dean for Continuing Education, 677 Huntington Ave., Boston, MA 02115 (phone 617-432-3515; Fax 617-432-1969).

ICNC '91, Sept. 9! 13, 1991, Christ Church, Oxford, England, sponsored by AEA Technology, the OECD Nuclear Energy Agency, with cooperation from IAEA. Contact: John Bentley, 062/A32, AEA Technology Winfrith, Dorchester, Dorset DT2 8DH, England (phone 0305 203316; Fax 0305 202122).

INEL Computing Symposium, Sept. 10! 12, 1991, Idaho Falls, Idaho, sponsored by the Idaho National Engineering Laboratory. Contact: Teri Williams, EG&G Idaho, Inc., P.O. Box 1625, Idaho Falls, ID 83415-2602 (phone 208-526-9728, FTS 583-9728).

Brazilian Meeting on Reactor Physics and Thermal

Hydraulics, Sept. 17! 20, 1991, São Paulo, Brazil.
Contact: José Rubens Maiorino, IPEN-CNEN/SP,
Caixa Postal 11049 (Pinheiros), 05499-São Paulo-SP-
Brazil (phone 011 211-6011 Ext. 270; Telex 11 83592-
IPEN-BR).

October 1991

7th Symposium on Neutron Dosimetry, Oct. 14! 18,
1991, Berlin, Fed. Rep. of Germany, sponsored by
the Commission of the European Communities.
Contact: Dr. R. Jarh, Physikalisch-Technische
Bundesanstalt, Abt. 7, Bundesallee 100, 3300
Braunschweig, FRG.

*1991 Joint International Waste Management Confer-
ence*, Oct. 21! 26, 1991, Seoul, Korea. Contact: Mr.
Larry C. Oyen, Sargent & Lundy, 55 East Monroe
St., Chicago, IL 60603 (phone 312-269-6750, Fax 312-
269-3475, Telex 280603).

November 1991

Nuclear Energy Forum, Nov. 10! 13, 1991, San Fran-
cisco, California. Contact: Conference Office, U.S.
Council for Energy Awareness, 1776 I Street, N. W.,
Suite 400, Washington, DC 20006-2495 USA.

*International Conference on Fusion Reactor Materi-
als*, Nov. 17! 22, 1991, Clearwater, Florida. Contact:
P. J. Maziasz, Metals and Ceramics Division, Oak
Ridge National Laboratory, P.O. Box 2008, Oak
Ridge, TN 37831-6376.

March 1992

Radiation Transport Calculations Using EGS4, Mar.
9! 12, 1992, a four-day, 80386 microcomputer-based
course to be held in Seattle, Washington,
sponsored by Inst. of Applied Physics and
Medicine. Contact: Susan Walker, IAPM, 701 16th
Ave., Seattle, WA 98122 (phone 206-553-7330).

April 1992

New Horizons in Radiation Protection and Shielding,
Apr. 26! May 1, 1992, Pasco, Washington, a topical
meeting of the ANS Radiation Protection and
Shielding Division. Contact: Wilbur Bunch, HO-
36, Westinghouse Hanford Co., P.O. Box 1970,
Richland, WA 99352 (phone 509-376-6313).

MARCH 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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Book. . *The IRPA Guidelines on Protection Against Non-Ionizing Radiation.* . Duchene, A.S; Lakey, J.R.A.; Repacholi, M.H. . 1991. . Pergamon Press. . ISBN: 0-08-0360971, \$39.50

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JAERI-M 91-015; CONF-9010. . *Proceedings of the Sixth Seminar on Software in Nuclear Energy Research.* .

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Health Phys., **60**, 411-426. . *Calculation of Effective Does-equivalent Responses for External Exposure from Residual Photon Emitters in Soil.* . Chen, S.Y. . Mar. 1991

Health Phys., **60**, 439-442. . *Significance of Neutrons from the Atomic Bomb at Hiroshima for Revised Radiation Risk Estimates.* . Brenner, D.J. . Mar. 1991

J. Nucl. Sci. Technol., **28**, 74-84. . *Development of New Gamma-Ray Buildup Factor and Application to Shielding Calculations.* . Harima, Y.; Tanaka, S.; Sakamoto, Y.; Hirayama, H. . Jan. 1991

J. Res. Natl. Inst. Stand. Technol., **95**, 689-699. . *Survey of Industrial, Agricultural, and Medical Applications of Radiometric Gauging and Process Control.* . Hubbell, J.H. . Nov.-Dec. 1990

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Nucl. Instrum. Methods, **A295**, 99-101. . *Calculated Neutron Spectrum in the TEVATRON Tunnel and Comparison with Experimental Data.* . Alsmiller, R.G. Jr.; Alsmiller, F.S.; Gabriel, T.A.; Hermann, O.W.; Barnes, J.M. . 1990

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