Radiation Safety Information Computational Center

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"In creating the only hard thing is to begin. A grass blade is no easier than an oak.
-- James Russell Lowell

Printable PDF file of this newsletter available at: **http://www-rsicc.ornl.gov/NEWSLETTER.html**.

Error in Beryllium Metal Cross-Section Data

A very significant error in the beryllium metal cross-section data contained in the 238- and 44-Group ENDF/B-V libraries was recently discovered by SCALE users at ORNL. Several critical experiments that involved beryllium metal as the reflector were found to have > 1% difference in calculated k-eff values between different versions of SCALE (4.3 vs. 4.4a). The Be metal data in SCALE 4.4 and 4.4a contain a factor of 2 scaling error in the Be thermal scattering transfer arrays. This error can result in non-conservative errors in calculated k-eff values of greater than 1%. Users should download the corrected data from the **SCALE Download** page and install according to the directions provided in the **README** file. This error is NOT present in SCALE 4.3. For more information, read the discussion on **page 395** of the SCALE Notebook. (Hard copy readers see: **http://www.ornl.gov/scale/scale-home.html**.)

NRC Codes Made Available

One U.S. Nuclear Regulatory Commission (NRC) software package transferred from the Energy Science and Technology Software Center, Oak Ridge, Tennessee, to RSICC was processed this month. Please browse the computer code abstract available at RSICC's web site for more information on this package.

CCC-499/PART61

Changes to the Computer Code and Data Collection

Four changes were made to the computer code collection this month: one new package, one addition/correction, one correction and one update.

CCC-371/ORIGEN2.2
OP SYS: Windows, Linux
Language: Fortran 77
Computers: Pentium, DEC Alpha
Format: tar & self-extracting compressed Windows

Oak Ridge National Laboratory, Oak Ridge, Tennessee, contributed a corrected version of the ORIGEN2 isotope generation and depletion code system. This is the first update to ORIGEN2 in over 10 years and was stimulated by a user discovering a discrepancy in the mass of fission products calculated using ORIGEN2 V2.1. Code modifications, as well as reducing the irradiation time step to no more than 100 days/step, reduced the discrepancy from ~10% to 0.16%. The bug does not noticeably affect the fission product mass in typical ORIGEN2 calculations involving reactor fuels because essentially all of the fissions come from actinides that have explicit fission product yield libraries. Thus, most previous ORIGEN2 calculations that were otherwise set up properly should not be affected. Additional details are included in the **transmittal memo**, which is included in the distribution.

ORIGEN is a computer code system for calculating the buildup, decay, and processing of radioactive materials. ORIGEN2 is a revised version of ORIGEN and incorporates updates of the reactor models, cross sections, fission product yields, decay data, and decay photon data, as well as the source code.

The code runs on Pentium personal computers under Windows and was compiled and linked with the Lahey F77L-EM/32 Fortran compiler version 5.20. The executables, which run under Windows 95, Windows NT 4 and later, are included in the package. The code was also tested on a Pentium III running RedHat Linux 6.1 with The Portland Group, Inc. (PGI) F77 compiler 3.1-3 & gcc. The PGI executables are also included in the Linux distribution. A Fortran 77 compiler is required all other computers. The package is transmitted on a CD which contains a self-extracting, compressed Windows file and a GNU compressed tar file. Reference: ORNL/TM-7175 (July 1980). Fortran; Pentium (C00371/ALLCP/03).

CCC-708/REBUS-PC 1.4
OP SYS: Linux & Windows
Language: Fortran 77
Computers: Pentium
Format: tar & self-extracting, compressed Windows

Argonne National Laboratory, Argonne, Illinois, contributed this code system for analysis of research reactor fuel cycles. REBUS-PC contains DIF3D 9.0/VARIANT9.0, a code system using variational nodal methods and finite difference methods to solve neutron diffusion and transport theory problems. REBUS-PC provides new capabilities beyond that of CCC-653, REBUS3/VARIANT8.0. Although REBUS-PC was developed for analysis of research reactor cores and fuel cycles, it remains generally useful for any reactor type.

REBUS-PC is a system of codes designed for the analysis of research reactor fuel cycles. It is based on an updated 9.0 version of DIF3D that is similar to RSICC Code Package CCC-653, REBUS-3/VARIANT 8.0 (which is intended for use on unix workstations). The full capabilities of the workstation version are retained and enhanced for use in a PC environment. Two basic types of analysis problems are solved: 1) the infinite-time, or equilibrium, conditions of a reactor operating under a fixed fuel management scheme, or 2) the explicit cycle-by-cycle, or non-equilibrium operation of a reactor under a specified periodic or non-periodic fuel management program. For the equilibrium type problems, the code uses specified external fuel supplies to load the reactor. Optionally, reprocessing may be included in the specification of the external fuel cycle and discharged fuel may be recycled into the reactor. For non-equilibrium cases, the initial composition of the reactor core may be explicitly specified or the core may be loaded from external feeds and discharged fuel may be recycled into the reactor as in equilibrium problems.

The code is written entirely in Fortran 77. REBUS-PC 1.4 executables are included with this package. The Windows executable was created on a Micron Pentium III machine running Windows 2000 using Lahey Fortran 95 V5.56. The Linux executable was created using the LAHEY/Fujitsu Fortran 95 Linux Pro V6.1 compiler under Red Hat Linux 7.2. Other advanced Fortran compilers could be used but would require changes in dynamic memory management calls and clock timer routines or anywhere else the particular Fortran dialect differs from Lahey Fortran 95. The operating system can be any of Windows 95/98/NT4.0/2000 or newer or any Linux variation such as Red Hat Linux 7.2 that is compatible. The package is distributed on a CD which contains a self-extracting, compressed Windows file and a GNU

compressed tar file. Approximately 331 MB is required for installation. Included in the distribution files are the source code, Windows and Linux executables, sample problem input and output, and code dependent BCD and binary card-image file descriptions. Reference: Argonne National Laboratory Report (December 21, 2001). Fortran 77, PC (C00708/PC586/00).

PSR-137/MARLOWE15a
OP SYS: Unix, Linux, Windows
Language: Fortran 77
Computers: Workstations & PC's
Format: tar & self-extracting compressed Windows

A minor change was made to version 15a of MARLOWE, which was developed at Oak Ridge National Laboratory, Oak Ridge, Tennessee. The value assigned to PI was corrected in the source/master/code.mmf file. The effect on any MARLOWE calculations would be exceedingly small (if anything) even if the code is run in double precision.

MARLOWE is a flexible, comprehensive, and highly portable program for simulating atomic collision processes in crystalline solids in the binary collision approximation. It is used to study phenomena governed by such collisions, including the sizes and shapes of displacement cascades, sputtering, ion ranges, ion reflection, and so on. The program has been used for many years on many different computers and is fully supported on UNIX, Linux, and Windows 95/98/ME/NT/2000/XP systems. Compilers are required on all computers. No executables are included. The GNU f77 compiler can be used on most systems. Fortran 90 and C; UNIX and Linux systems; Windows 95/98/NT PCs (P00137/MNYCP/07).

DLC-205/MCNPXDATA
OP SYS: Unix, Linux
Language: N/A
Computers: Workstations & PC's
Format: tar or self-extracting Windows

Los Alamos National Laboratory, Los Alamos, New Mexico, contributed two additions and a correction to this package of standard neutron, photon, electron, and proton data libraries. Additions include the LA150U photonuclear data and LA150H proton data tables. A modification was made to correct a small error in the original release of LA150N. The ZAID for Pb-208 was changed from 82208.24c to 82208.25c to differentiate from the earlier version. MCNPXDATA is for use with the MCNPX Monte Carlo code package and can be used with Version 4B, 4C and later of the MCNP transport code. These data provide a comprehensive set of cross sections for a wide range of radiation transport applications.

The LA150N neutron data library includes 42 isotopes: 1H, 2H, 9Be (100 MeV), natC, 14N, 16O, 27Al, 28Si, 29Si, 30Si, 31P, natCa, 50Cr, 52Cr, 53Cr, 54Cr, 54Fe, 56Fe, 57Fe, 58Ni, 60Ni, 61Ni, 62Ni, 64Ni, 63Cu, 65Cu, 93Nb, 182W, 183W, 184W, 186W, 196Hg, 198Hg, 199Hg, 200Hg, 201Hg, 202Hg, 204Hg, 206Pb, 207Pb, 208Pb, 209Bi.

The LA150U photonuclear library includes 12 isotopes: 12C, 16O, 27Al, 28Si, 40Ca, 56Fe, 63Cu, 181Ta, 184W, 206Pb, 207Pb, 208Pb.

LA150H proton data library (updated 11/20/01) includes 41 isotopes: 1H, 2H, 12C, 14N, 16O, 27Al, 28Si, 29Si, 30Si, 31P, 40Ca, 50Cr, 52Cr, 53Cr, 54Cr, 54Fe, 56Fe, 57Fe, 58Ni, 60Ni, 61Ni, 62Ni, 64Ni, 63Cu, 65Cu, 93Nb, 182W, 183W, 184W, 186W, 196Hg, 198Hg, 199Hg, 200Hg, 201Hg, 202Hg, 204Hg, 206Pb, 207Pb, 208Pb, 209Bi.

All data libraries are distributed in compressed mode. Expanded files are in ASCII format and can be used with MCNPX on all computer platforms supported by the code. The data are distributed in a GNU compressed tar file on CD which also includes the MCNPX 2.3.0 code package. Note that there is no Windows version of the MCNPX 2.3.0 code. The MCNPXDATA package is alternately available in a self-extracting, compressed Windows file for users who want the data but not the code package. Users must specify whether tar or Windows format on the request form. References: The following documents (and more) are distributed in electronic (PDF) form with the package: Revised Appendix G of the MCNP4C

manual, README (May 2002), LA-12891 (1994), X-6:HGH-93-77 (revised 1996), XTM:95-259 and LA-UR-96- 24 (1995), X-6:RCL-87-225 (1987), XCI-RN(U)98-041, LA-UR-98-5718 (December 1998), XTM:96-153 (April 1996), and XCI:CJW-99-25 (April 1999). (D00205/ALLCP/02).

Monthly Code Focus
DOSE Computation and Factors

As years have gone by many different codes and applications have been sent to RSICC for stewardship. We currently have over 1700 analytical code and data packages and distribute as many each year to 73 countries in the world. To help 'categorize' each package, we have developed a database of 'Main Categories' to attach applications to the packages at RSICC. Doing so requires investigation into each code package, user feedback from end use statements, and extensive RSICC staff experience and analysis so that we can deliver useful information each month on the 30 different categories we have devised thus far. Links to the package abstracts are embedded into the WWW version of the RSICC Newsletter. Feedback from our Newsletter community is very valuable so please direct your comments and/or suggestions to **PDC@ORNL.GOV**. Next month: **ENVIRONMENTAL TRANSPORT of RADIONUCLIDES.**

ACDOS3
ACRA-TRIT
ACRO
AGDATA
AIREM
AIRGAMMA
AIRSCAT
ALDOSE
ALGAM-97
ARC
ARRRG
ASTROS

BRHGAM
BUSH

CAMERA
CASKCODES
CDR
COMRADEX4
CONDOS-II
CRRIS

DACRIN
DECDC 1.0
DINT-YAEC
DISDOS
DISKTRAN
DKR
DOSDAT II-81
DOSE 1
DOSE-SGTR
DOSFACTER II
DOSFACTER-DOE
DOSDAT-DOE

DRALIST

EDISTR
EDMULT 3.11
EDNA
EDO
EFDOS
EGAD
ELBA
EMERALD
EMERALD-NORMAL
ESDORA
EXPRESS

FGR-DOSE
FISSP & CLOUD
FONTA
FOOD

GALE86
GASPAR
GENII 1.485
GENII-S
GRACE-II

HABIT 1.1
HADOC
HPPOS 1.5

I-R-MAN
IDC
INDOS
INGDOS
INREM II
INREM/EXREM
IODES
IRDAM
IRDF-90
IRDF82

KERNEL
KRONIC

LADTAP II
LEPRICON
LIONS
LOGNORML
LPGS
LSHINSE
LSVDC

MAGIK
MCFLARE
MESORAD 1.4
MILDOS
MILDOS-AREA
MRIPP 1.0

NRCDOSE
NUCCON
NUCDECAY
NUCDECAYCALC

ORION-II

PABLM
PCDOSE
PIEDEC
PLUDOS
PLUMEX

PRESTO-II
PUSHLD

QBF
QUINCE-PC

RABFIN,PARTS
RACER
RADDECAY 4.02
RADOS
RADRISK
RADSHIP-2
RADTRAN4
RBD
REBEL 3
REPC
RISKIND

SEECAL 2.0
SFACTOR
SHADRAC(G-30)
SHARDA
SHIELDOSE
SIGMA II
SKYIII-PC
SKYSHINE-KSU
SMART/MANYCASK
SMAUG-13
SNLRML
SOURCES-4B
SPACETRAN 1,2,3
STAY'SL
SUBDOSA-II

TIMED
TIRION 4
TRG-SGD

UDAD IX
UMIBIO
UNGER

VARSKIN2

WEERIE
WHATIF-AQ
WRAITH

ZYLIND-PC

CONFERENCES, COURSES, SYMPOSIA

RSICC 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 alphabetically. Should you be involved in the planning/organization of such events, feel free to send your announcements and calls for papers via email to **FINCHSY@ornl.gov** with "conferences" in the subject line by the **20th of each month**. Please include the announcement in its native format as an attachment to the message. If the meeting is on a website, please include the url.

Every attempt is made to ensure that the links provided in the Conference and Calendar sections of this newsletter are correct and live. However, the very nature of the web creates the possibility that the links may become unavailable. In that case, please call or mail the contact provided. Below is a condensed list of the conferences only. More details are listed after the table.

Condensed Table of Conferences

Name of Conference	Time and Place	Web Site	Date of Abstract/Paper Submission
48th Annual Radiobioassay and Radiochemical Measurements	Nov. 11-15, 2002 Knoxville, Tennessee	**www.bioassay.org/2002/**	July 15, 2002
ANS 15th Topical Meeting on Technology of Fusion Energy	Nov. 17-21, 2002 Washington, DC	**www.ans.org/meetings**	June 21, 2002
M&C 2003	Apr. 6-10, 2003 Gatlinburg, Tennessee	**meetingsandconferences.com/MC2003**	October 21, 2002
Advances in Nuclear Fuel Management III	Oct. 5-8, 2003 Hilton Head Island, South Carolina	**rpd.ans.org/nfm.htm**	March 15, 2003

The 11th International Conference on Fusion Reactor Materials (ICFRM-11)	Dec. 7-12, 2003 Kyoto, Japan	**icfrm.iae.kyoto-u.ac.jp**	April 30, 2003

2002 Criticality Safety Courses

The University of New Mexico announces their 2002 schedule for Criticality Safety Courses. Dates are: **July 9-11** for the Double Contingency & Criticality Safety Evaluation Workshop, **July 15-19** is the Short Course, and **July 23-25** is the Manager's Course.

For more detailed information about the 2002 Course offerings for Criticality Safety and online registration, check out the web page at **http://www-chne.unm.edu/crit/information.htm** or contact Cheryl Brozena at the University of New Mexico, Albuquerque (tel 505-277-2225, fax 505-277-5433, email **busch@unm.edu**).

The 11th International Conference on Fusion Reactor Materials (ICFRM-11)

The first announcement of "The 11th International Conference on Fusion Reactor Materials (ICFRM-11)," which will be held in Kyoto, Japan **Dec. 7-12, 2003**, is now available on the ICFRM-11 website at: **http://icfrm.iae.kyoto-u.ac.jp.** For further information, contact ICFRM-11 secretariat at **icfrm@iae.kyoto-u.ac.jp** or phone +81-774-38-3597, fax +81-774-38-3467.

Advances in Nuclear Fuel Management III - Call For Papers

Preparations for the American Nuclear Society's Advances in Nuclear Fuel Management III Topical Meeting to be held in Hilton Head Island, South Carolina, during the period of **October 5-8, 2003**, have now begun in earnest. You are invited to serve on the Meeting's Technical Program Committee (TPC). In this capacity your commitment will include:

1. Electronically submit one or more papers, and encourage colleagues to do the same
2. Help identify and organize special session(s) on timely topics you are interested in, and solicit participation
3. Electronically review papers assigned to you in a timely and professional manner

Please return the following information (name, affiliation, phone, alternative email if preferable, topics of interest) to Youssef A. Shatilla at **shatilya@westinghouse.com**.

Please remember that the success of this meeting depends on your active support and involvement. Finally, please bookmark the conference web site: **http://rpd.ans.org/nfm.htm** and visit it occasionally for news and updates. Comments and suggestions are most welcome.

American Nuclear Society 15th Topical Meeting on Technology of Fusion Energy

The American Nuclear Society, in cooperation with the U.S. Department of Energy and the Fusion Engineering Division of the Atomic Energy Society of Japan will hold the 15th Topical Meeting on Technology of Fusion Energy. This meeting will be held as an embedded topical of the American Nuclear Society 2002 winter meeting, held **November 17-21, 2002,** in Washington, DC.

The purpose of this meeting is to bring together specialists in the area of fusion energy to discuss current work and future challenges in the area of fusion technology. In addition to bringing together the varied expertise of this aggressive research area, special sessions are planned to focus on similarities and differences between the inertial and magnetic fusion energy concepts and the interface between materials and design communities. The technical program will include paper and poster presentations as well as invited speakers.

Co-sponsors of this meeting are INEEL, LLNL, NRL, ORNL, and Kyoto University. For more information, visit **www.ans.org/meetings**.

M&C 2003

To mark the beginning of the second century of nuclear science, the American Nuclear Society's Mathematics and Computation Division 2003 Topical Meeting is organized around the theme: Nuclear Mathematical and Computational Sciences: A Century in Review, A Century Anew. The conference will be held at the Park Vista Hotel, Gatlinburg, Tennessee, **April 6-10, 2003**. It is co-sponsored by the American Nuclear Society's Reactor Physics, and Radiation Protection and Shielding Divisions, as well as the ANS Oak Ridge/Knoxville Local Section, Oak Ridge National Laboratory's Radiation Safety Information Computational Center, the Nuclear Energy Agency of the OECD, Korean Nuclear Society, and the Canadian Nuclear Society.

The conference's web site is: **http://meetingsandconferences.com/MC2003/**. It will be updated with new information as it becomes available. Please bookmark and visit it occasionally for news and updates. Comments and suggestions are most welcome. Contact: Yousry Azmy 865-574-8069, **azmyyy@ornl.gov** or Bernadette Kirk 865-574-6176, **kirkbl@ornl.gov**. *(See announcement on SCALE 5 workshop, that will be held immediately before the M&C Conference.)*

MACCS Meeting

The Fourth Meeting of the International MACCS Users Group (IMUG) will be held on **September 6, 2002**, in the Principality of Monaco. The focus of the Fourth IMUG Meeting will be the exchange of technical information relating to the application of MACCS, MACCS2, and COSYMA codes to relevant problems involving atmospheric dispersion of radioactive materials and resulting consequences.

There is no fee to participate in the meeting; however, for planning purposes, advance registration is requested. Everyone, including COSYMA users, is invited to present a paper. Please visit the website **www.bnl.gov/est/IMUG2002/default.htm**, and **http://www.bnl.gov/est/IMUG2002/Latest_News.htm** to find out about IMUG, register for the meeting or request notification of web updates. The website will be updated as additional information becomes available.

Please make your hotel arrangements as soon as possible. There is a block of rooms being held at the Columbus Monaco Hotel for the meeting, but there is another large conference being held in Monaco the same week. The hotel registration form can be found by going to: **www.bnl.gov/est/IMUG2002/HotelRegistrationForm.PDF**.

MCNP Course Announcement for 2002 and 2003

Registration: **http://www-xdiv.lanl.gov/XCI/PROJECTS/MCNP/registration.html**
MCNP home page: **http://laws.lanl.gov/x5/MCNP/index.html**
LANL contact: **jfb@lanl.gov**
European contact: **sartori@nea.fr**

Along with the 2002 classes, the MCNP code developers announce the 2003 schedule.

2002

July 30-August 1	Variance reduction class	Los Alamos, NM
September 9-13	Introductory class	Stuttgart, Germany

2003

January 27-30	Introductory class	Mass. Inst. of Technology

February date TBA	TBD	North Carolina State University
May 12-16	Introductory class	Japan
June date TBA	Introductory class	Los Alamos National Laboratory
August date TBA	Advanced MCNP Topics	Los Alamos National Laboratory

The introductory class is for people who have little or no experience with MCNP. The intermediate to advanced class will be held for people who have used MCNP and want to extend their knowledge and understanding of the code system.

The classes will be based on MCNP5. The code and data package will be available through RSICC at a reduced rate to class participants. The new capabilities of version 5 will be covered.

The other capabilities on MCNP will also be covered, including: basic geometry and advanced geometry, source definitions, tallies, data, variance reduction, statistical analysis, criticality, plotting of geometry, and particle tracks, neutron/photon/electron physics.

All classes provide interactive computer learning. Time will be available to discuss individual questions and problems with MCNP experts or to pursue in more detail topics mentioned in the talks. Please note that other classes are offered based on MCNP. The classes mentioned here are the only ones that are taught by the people who develop and write MCNP.

MCNP Visual Editor Classes

The Visual Editor is a powerful visualization tool that can be used to rapidly create complex Monte Carlo N Particle (MCNP 4C2) geometry models, including lattices, universes, fills, and other geometrical transformations. The Visual Editor can:

Display MCNP 4C2 geometries in multiple plot windows
Create surfaces and cells to build a geometry
Create materials using the local xsdir file
Store commonly used materials in a material library
Sub-divide large cells into smaller cells
Create cells containing universes and lattices
Interactively set cell importances from the plot window
Display source points and collision points in the plot window

The class will be held **September 9-13, 2002**, in Richland, Washington. The class will focus on the use of the visual editor, with an overview of MCNP. The fifth day is optional and will focus on using the Visual Editor and MCNP to do some example problems.

Class will include computer demonstrations and exercises that will focus on creating and interrogating input files with the Visual Editor. Advanced visualization work using MCNP will also be demonstrated. The class will be taught on Pentium computers running the Linux operating system and Windows NT. Class attendees can use either the Linux or Windows version of the visual editor. Attendees are encouraged to bring their own input files for viewing and modifying in the visual editor. Further information on this class can be located at: **http://www.mcnpvised.com/train.html**, or by contacting Randy Schwarz (email **randyschwarz@mcnpvised.com**).

Two classes are scheduled for **2003**: **March 17-21** and **September 8-12**, both in Richland, Washington.

MCNPX Workshops for 2002 & 2003

Lead Teachers: Drs. John Hendricks, Gregg McKinney, Laurie Waters
Organizer: HQC Professional Services Contact: **bill@solutionsbyhqc.com**
More Information: **http://mcnpxworkshops.com** MCNPX homepage: **http://mcnpx.lanl.gov**

2002

July 8-12	Intermediate	Santa Fe/Los Alamos
August 13-16	Intermediate	Nashville, Tennessee
September 23-27	To be decided	San Diego, California
November 11-15	Intermediate	Tokyo, Japan

2003

January 13-17	To be decided	Orlando, Florida
February 17-21	To be decided	Las Vegas, Nevada
March 31-April 4	To be decided	Knoxville, Tennessee
May	To be decided	Los Alamos/Santa Fe
June	To be decided	Europe

MCNPX is the LANL all-particle, all-energy (eV-TeV) Monte Carlo transport code based on MCNP4C, LAHET, CEM, etc. MCNPX has been in active development since 1995, sponsored by the particle accelerator community. It has now become an accepted tool for a broad range of applications by nuclear engineers, physicists, and scientists. The MCNPX development effort has expanded the use of the Los Alamos tools to applications such as APT, waste transmutation, accelerator shielding and health physics, particle beam cancer therapy, space shielding and cosmic ray analysis, single event effects in semiconductors, radiography, and more detailed analysis of the effects of light and heavy ions in matter. In addition, the entire functionality of MCNP4C is retained. New variance reduction and data analysis techniques, many adapted from high energy accelerator methodologies, have also been added, such as the extensive 'mesh tally' capability which allows up to 3-d plotting of particle tracks, fluence and fluence-derived quantities, energy deposition, next event estimator generation contributions and particle sources.

The workshops include hands-on instruction, generally on PC Windows machines. Subject to participant export approval for the MCNPX beta test team, participants will be able to access the Fortran-90 version of MCNPX 2.4, the LA150 (150 MeV) cross-section data for over 40 isotopes for incident neutrons and protons, and 12 for photonuclear interactions, and a notebook of viewgraphs. Follow-up consultation for class participants will be provided.

Classes are taught by experienced MCNPX code developers and instructors. For more information on code versions and their capabilities, go to the MCNPX Workshops web site **http://mcnpxworkshops.com**.

Short Courses on Monte Carlo Analysis and Nuclear Criticality Safety

The Department of Nuclear Engineering at the University of Tennessee-Knoxville is offering two short courses for radiation transport and criticality safety specialists during Tennessee Industries Week (TIW-37), **August 12-16, 2002**.

Monte Carlo Analysis: Monte Carlo is often the method of choice to solve complex problems in nuclear criticality safety and radiation shielding. To use Monte Carlo effectively, the analyst must understand the theoretical and computational fundamentals of the method, as well as the computational options available in particular computer tools. Also, it is sometimes advantageous to create new special-purpose Monte Carlo programs to solve particular problems rather than use an existing program. The Monte Carlo course runs five days.

Nuclear Criticality Safety: Engineers, scientists, and technical managers who wish to increase their knowledge and understanding of nuclear criticality safety will be interested in the intensive five-day short course. The topics covered in the course are based primarily on the experience of the five instructors which totals over 120 years of nuclear criticality safety related experience. Such a wealth of experience needs to be shared with the criticality safety community including both new professionals in the field and experienced.

For additional information on all the courses offered during TIW-37, contact Kristin England at The University of Tennessee, phone (865) 974-5048, email **kengland@utk.edu,** url **www.engr.utk.edu/nuclear/TIW.html**.

Neutron Spectra Unfolding Training Course

Dates: **August 5-7, 2002** in Braunschweig, Germany
September 24-26, 2002 in Los Alamos, New Mexico
Contact: Burkhard Wiegel, PTB
Email: **Burkhard.Wiegel@ptb.de**
Web Site: **http://www.ptb.de/utc2002/**
Fee: 1200 Euro (course at PTB) and US $1100 (course at Los Alamos), which includes a CD with a complete set of notes and unfolding software, as well as refreshments and a dinner for the participants.

A training course on neutron spectra unfolding is being organized by the Neutron Dosimetry section of the Physikalisch-Technische Bundesanstalt (PTB), Braunschweig, Germany, in collaboration with the Health Physics Measurements Group (ESH-4) of the Los Alamos National Laboratory (LANL). Additional support is provided by the Helmholtz-Fonds e.V. The course will be given in August 2002 at PTB in Braunschweig, Germany, and in September 2002 in Los Alamos, New Mexico, USA.

Practical aspects of unfolding will be emphasized. The course is intended for those who do spectrometry in neutron or mixed neutron/photon fields and who need to analyze their data using unfolding procedures. The morning series of lectures will provide an introduction to unfolding as well as allow for discussions concerning the theory of unfolding. In the afternoon sessions the participants will work on specific examples at PC workplaces using unfolding software provided by PTB (the HEPRO package of unfolding codes and the MAXED code). We will focus on Bonner-sphere measurements for our discussion of few-channel unfolding, and liquid scintillation spectrometer (NE-213) measurements for our discussion of multi-channel unfolding.

The number of participants is restricted by the limited number of PC workplaces at our disposal at each of the training centers. We therefore encourage you to register as soon as possible. For online registration and further information please visit our web site at: **http://www.ptb.de/utc2002/**.

48th Annual Radiobioassay and Radiochemical Measurements Conference

The 48th Annual Radiobioassay and Radiochemical Measurements Conference will be held **November 11-15, 2002**, at the Marriott (formerly the Hyatt Regency) in Knoxville, Tennessee. This conference is a continuation of an informal conference with a long history. Over the past 47 years, the conference has also been known as:

Annual Bioassay and Analytical Chemistry Conference,

Annual Conference on Bioassay, Analytical, & Environmental Radiochemistry, and Annual Radiochemical Measurements Conference.

The objectives of the Conference (as adapted from the proceedings of the First Annual Bioassay and Analytical Chemistry Conference) are as follows:

1. To bring everyone up to date on some of the latest developments in the field of bioassay, analytical, and environmental radiochemistry;
2. To enable all persons actively engaged in the field of bioassay, analytical, and environmental radiochemistry to discuss mutual problems;
3. To standardize some of the procedures commonly used by the various laboratories;
4. To enable each laboratory to become familiar with procedures used elsewhere; and
5. To plan for future meetings.

For more information, please visit the web site at: **http://www.bioassay.org/2002/**.

Radiopharmaceutical Internal Dosimetry

This online course is designed to teach current techniques for calculating the radiation dose from radionuclides administered in nuclear medicine. Lectures include Internal Dose Assessment Techniques, Resources for Internal Dose Assessment in Nuclear Medicine, Kinetic Modeling, Standard Kinetic Models and Phantoms, Extrapolation of Animal Data, Bone Marrow Dosimetry, Study Design for Radiopharmaceutical Dose Assessment, Patient Specific Dosimetry, and Small Scale and Microdosimetry. Problem-solving exercises and a comprehensive online exam are included. Users completing the exam will receive a certificate of completion. Users may also interact with instructors by email about any aspect of the course. The cost of this course is $495; access to the course is through **www.internaldosimetry.com**.

For questions or comments contact either of the course instructors, Dr. Michael G. Stabin, (tel 615-322-3190, fax 615-322-3764, email **michael.g.stabin@vanderbilt.edu**) or Dr. Richard B. Sparks (tel 865-938-4949, fax 865-947-1550, email **rsparks@creativedevelopment.com**, url **http://www.creativedevelopment.com**, **http://www.internaldosimetry.com**).

SCALE Training Course Schedule for 2002

The SCALE staff at Oak Ridge National Laboratory (ORNL) will be offering two training courses this fall (**October 14-18 and October 21-25**) at ORNL. The courses will emphasize hands-on experience solving practical problems on PCs. There will be workgroups of two persons each. No prior experience in the use of SCALE is required to attend. The registration fee is $1800 for one course or $3000 for both courses ($300 discount if you register at least one month before the course). A copy of the SCALE software and manual on CD may be obtained for an additional fee of $700, and the KENO3D 3-D visualization tool on CD is available for $800 (single license). Registrations will be accepted on a first-come basis. Registration forms submitted directly from the Web are preferred. Registration via fax or email is also acceptable. The registration fee must be paid by check, travelers checks, bank transfer, or credit card (VISA or MasterCard only). The agenda and registration form are on the web page at **http://www.ornl.gov/scale/trcourse.html**. Contact: Kay Lichtenwalter (tel 865-574-9213, email **x4s@ornl.gov**).

SCALE 5 Workshop Announced

The first workshop on SCALE 5 is being planned in conjunction with the American Nuclear Society M&C 2003 Topical Meeting in Gatlinburg, Tennessee. The workshop will be hosted by Oak Ridge National Laboratory in nearby Oak Ridge, Tennessee. The course is scheduled for the week of **March 31 - April 4, 2003**, immediately before the M&C 2003 meeting.

The workshop will feature some of the new modules to be released in SCALE 5, such as the SEN3 3-D sensitivity/uncertainty sequence and the STARBUCS burnup credit sequence for criticality safety. The workshop will emphasize hands-on experience solving practical problems on PCs. There will be workgroups of two persons each. No prior experience in the use of SCALE is required to attend. The registration fee is

$1800 (there is a $300 early registration discount). You can register online at **www.ornl.gov/scale/register_scale5.html** or as part of your M&C 2003 registration. The early registration deadline is February 28, 2003. *(See announcement on M&C 2003 Conference)*.

CALENDAR

July 2002

Snowmass Fusion Summer Study, July 8-19, 2002, Snowmass Village, CO (url **http://fire.pppl.gov/snowmass02.html**).

MCNPX Intermediate Workshop, July 8-12, 2002, Santa Fe /Los Alamos, NM. Contact: Bill Hamilton (tel 505-662-9097, email **registrar@mcnpxworkshops.com,** url **http://mcnpxworkshops.com** for details).

August 2002

Spectrum 2002, Exploring Science-Based Solutions and Technologies, 9th Biennial International Conference on Nuclear and Hazardous Waste Management, Aug. 4-8, 2002, Reno, NV. Contact: Dr. Richard Jacobsen (email **jacor@inel.gov**, url **www.ans.org/spectrum**).

Neutron Spectra Unfolding Training Course, Aug. 5-7, 2002, in Braunschweig, Germany. Contact: Burkhard Wiegel, PTB (email **Burkhard.Wiegel@ptb.de,** url **http://www.ptb.de/utc2002/**).

MCNPX Intermediate Workshop, Aug. 12-16 2002, Nashville, TN. Contact: Bill Hamilton (tel 505-662-9097, email **registrar@ mcnpxworkshops.com,** url **mcnpxworkshops.com** for details).

11th International Symposium on Reactor Dosimetry, Aug. 18-23, 2002, Brussels, Belgium. Contact: J. Adams (tel 301-975-6205, fax 301-926-1604, email **james.adams@nist.gov**, url **www.sckcen.be/conf/isrd2002**).

September 2002

Fourth Meeting of the International MACCS Users Group (IMUG), Sept. 6, 2002, in the Principality of Monaco (url **http://www.bnl.gov/est/IMUG2002**).

22nd Symposium on Fusion Technology - SOFT, Sept. 8-13, 2002, Helsinki, Finland. Contact: Symposium Secretary Mrs. Merja Asikainen (tel +358 9 456 6854; fax +358 9 456 7002; email: **soft2002@vtt.fi**; url **http://www.vtt.fi/val/soft2002/**).

Visual Editor Class, Sept. 9-13, 2002, Richland, WA. Contact: Randy Schwarz (tel 509-372-4042, email **randy.schwarz@ mcnpvised.com**, url **mcnpvised.com /train.html**).

MCNPX Workshop, Sept. 23-27, 2002, San Diego, California. Contact: Bill Hamilton (tel 505-662-9097, email **registrar@mcnpxworkshops.com,** url **http://mcnpxworkshops.com** for details).

Neutron Spectra Unfolding Training Course, Sept. 24-26, 2002, in Los Alamos, NM. Contact: Burkhard Wiegel, PTB (email: **Burkhard.Wiegel@ptb.de**, url **http://www.ptb.de/utc2002/**).

YUNSC 2002 - The 4th International Conference of Yugoslav Nuclear Society, Sept.30-Oct.3, 2002, Belgrade, Yugoslavia. Contact (tel ++381 11 454-796; fax ++381 11 444-74-57; email **yuns@rt270.vin.bg. ac.yu**, url **www.vin.bg.ac.yu/YUNS**).

8th Annual Workshop on Monte Carlo Simulation of Radiotherapy Treatment Sources using the BEAM Code System, Sept. 30-Oct. 3, 2002, Ottawa, Canada. Contact: Blake Walters, Ionizing Radiation Standards, National Research Council of Canada, Ottawa, Canada, K1A 0R6 (tel 613-993-2715, fax 613-952-9865, e-mail **bwalters@irs.phy. nrc.ca**, url **www.irs.inms.nrc.ca/inms/irs/BEAM/beamhome.html**).

October 2002

2002 International Topical Meeting on Probabilistic Safety Assessment (PSA '02), Oct. 6-10, 2002, Detroit, MI. Contact: Rebecca Steinman (phone 734-930-7500, email **rls@adventengineering.com**, url **http://www-ners.engin.umich.edu/PSAConf/**).

PHYSOR 2002, Oct. 7-10, 2002, Seoul, Korea, sponsored by the American Nuclear Society and hosted by the Korean Nuclear Society. Contact: Prof. Nam Zin Cho (tel +82-42-869-3819, fax +82-42-869-5859, email **tpc@physor2002.kaist.ac.kr**, url **http://physor2002.kaist.ac.kr**).

SCALE Source Terms & Shielding Course, Oct. 14-18, 2002, Oak Ridge, TN. Contact: Kay Lichtenwalter (tel 865-574-9213, email **x4s@ornl.gov**, url **http://www.ornl.gov/ scale/trcourse.html**).

First Asian and Oceanic Congress for Radiation Protection (AOCRP-1), Oct. 20-24, 2002, Seoul, Korea, sponsored by the Korean Association for Radiation Protection (KARP). Contact: Dr. Myung-Jae Song (tel +82-42-870-0202, fax +82-42-870-0269, email **mjsong@khnp.co.kr**, url **www.aocrp-1.com**).

SCALE KENO V.a Criticality Course, Oct. 21-25, 2002, Oak Ridge, TN. Contact: Kay Lichtenwalter (tel 865-574-9213, email **x4s@ornl.gov**, url **http://www.ornl.gov/ scale/trcourse.html**).

November 2002

MCNPX Intermediate Workshop, Nov. 11-15, 2002,Tokyo, Japan. Contact: Bill Hamilton (tel 505-662-9097, email **registrar@mcnpxworkshops.com,** url **http://mcnpxworkshops.com** for details).

The 48th Annual Radiobioassay and Radiochemical Measurements Conference, Nov. 11-15, 2002, Knoxville, Tennessee. Contact Tom Rucker (tel 865-481-2993, email **ruckert@saic.com** url **http://www.bioassay.org/2002/**.)

15th ANS Topical Meeting on the Technology of Fusion Energy, Nov. 17-21, 2002, Washington, DC. (url **www.ans.org/**).

International Symposium on Standards and Codes of Practice in Medical Radiation Dosimetry, Nov. 25-28, 2002, IAEA, Vienna. Contact: Dr. Ken R. Shortt (tel +43 1 2600 21664, fax +43 1 26007 21662, email **Dosimetry@iaea.org**, url **www.iaea.org/worldatom/Meetings/2002/infcn96.shtml**).

January 2003

MCNPX Workshop, Jan.13-17, 2003, Orlando, Florida. Contact: Bill Hamilton (tel 505-662-9097, email **registrar@ mcnpxworkshops.com,** url **mcnpxworkshops.com** for details).

February 2003

MCNPX Workshop, Feb. 17-21, 2003, Las Vegas, Nevada. Contact: Bill Hamilton (tel 505-662-9097, email **registrar@mcnpxworkshops.com,** url **http://mcnpxworkshops.com** for details).

March 2003

MCNPX Workshop, Mar. 31-Apr. 4, 2003, Knoxville, Tennessee. Contact: Bill Hamilton (tel 505-662-9097, email **registrar@mcnpxworkshops.com** url **http://mcnpxworkshops.com** for details).

SCALE5 Workshop, Mar. 31-Apr. 4, 2003, Oak Ridge, Tennessee. Contact: Kay Lichtenwalter (email **x4s@ornl.gov**, **scalehelp@ornl.gov**, url **http://www.ornl.gov/scale/ workshop_mc2003.html**).

April 2003

ANS Topical Meeting, Nuclear Mathematical and Computational Sciences: A Century in Review, A Century Anew, Apr. 6-10, 2003, Gatlinburg, TN. Co-sponsored by the American Nuclear Society's Reactor Physics, and Radiation Protection and Shielding Divisions, as well as the ANS Oak Ridge/Knoxville Local Section, Oak Ridge National Laboratory's Radiation Safety Information Computational Center, the Nuclear Energy Agency of the OECD, the Korean Nuclear Society, and the Canadian Nuclear Society. Contacts: Yousry Azmy (tel 865-574-8069, email **azmyyy@ornl.gov**) or Bernadette Kirk (tel 865-574-6176, email **kirkbl@ornl.gov**, url **http://meetingsandconferences.com/ MC2003/index.html**).

May 2003

MCNPX Workshop, May 2003, Los Alamos/Santa Fe, New Mexico. Contact: Bill Hamilton (tel 505-662-9097, email **registrar@mcnpxworkshops.com,** url **http://mcnpxworkshops.com** for details).

June 2003

MCNPX Workshop, June 2003, Europe. Contact: Bill Hamilton (tel 505-662-9097, email **registrar@mcnpxworkshops.com,** url **http://mcnpxworkshops.com** for details).

September 2003

International Conference on Supercomputing in Nuclear Applications, SNA 2003, Sept. 22-24, 2003, Paris, France. Organizers: CEA, SFANS, co-organizer: OECD/NEA. (email **SNA-2003@cea.fr**, url **http://SNA-2003.cea.fr**).

October 2003

American Nuclear Society's Advances in Nuclear Fuel Management III Topical Meeting, Oct. 5-8, 2003, Hilton Head Island, South Carolina. Contact: Youssef A. Shatilla (email **shatilya@westinghouse.com**, url **http://rpd.ans.org/nfm.htm).**

December 2003

The 11th International Conference on Fusion Reactor Materials (ICFRM-11), Dec. 7-12, 2003, Kyoto, Japan. Contact ICFRM-11 secretariat (tel +81-774-38-3597, fax +81-774-38-3467, email **icfrm@iae.kyoto-u.ac.jp**., url **http://icfrm.iae.kyoto-u.ac.jp**.

ACCESSION of NUCLEAR SYSTEMS LITERATURE

The nuclear systems literature (shielding, safety, materials) cited below has been reviewed and placed in the RSICC Information Storage and Retrieval Information System (SARIS), now searchable on the RSICC web server (**http://www-rsicc.ornl.gov/SARIS.html**). This early announcement is made as a service to the nuclear sciences community. Copies of the literature are not distributed by RSICC. 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. For literature listed as available from INIS contact INIS Clearinghouse, International Atomic Energy Agency, P.O. Box 100, A-1400 Vienna.

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Ann. Nucl. Energy, 29, 2055-2069 . . . *Development of Severe Accident Management Advisor and Training Simulator (SAMAT).* . . . Jeong, K-S.; Kim, K-R.; Jung, W-D.; Ha, J-J. . . . November 2002 . . . KAERI, Daejon, South Korea.

Ann. Nucl. Energy, 29, 2071-2085 . . . *CHF Prediction in Nuclear Fuel Elements by Using Round Tube Data.* . . . Fortini, M.A.; Veloso, M.A. . . . November 2002 . . . Universidade Federal de Minas Gerais, Belo Horizonte, Brazil; Cidade Universitária, Belo Horizonte, Brazil.

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