Radiation Safety Information Computational Center

When the character of a man is not clear to you, look at his friends. —Japanese Proverb

Changes to the Computer Code and Data Collection

PSR-333/CHENDF 7.02

The National Nuclear Data Center, Brookhaven National Lab., Upton, New York, contributed a newly frozen version of this code system for handling ENDF/B-V and ENDF/B-VI data. Version 7.02 of the ENDF Utility Codes corrects all bugs reported to NNDC as of April 1, 2005, and supersedes all previous releases. It can process all ENDF-6 formats approved up to and including the November 2004 CSEWG meeting except for the Generalized R-Matrix resonance region format and the generalized format for covariances (file 30) and the new "trial" formats for resonance parameters and their covariances. The programs will also process ENDF-5 formatted files.

CHECKR	format checking program
FIZCON	procedures and simple physics checking program
INTER	calculates selected cross sections and integrals
PSYCHE	more complicated physics checking program
STANEF	creates directory, adds tape label and converts numeric fields

The programs conform to the Fortran 95 standard and should operate on any computer with sufficient memory and a Fortran compiler conforming to this standard. The source files can be converted to run on various platforms by using the SETMDC code. Three codes CHECKR, STANEF, and INTER were actually ported from the 7.01 release without any change (therefore, they will identify themselves as 7.01 in the output).

NNDC provided executables that were created with Compaq Visual Fortran 6.6 for Windows and Lahey/Fujitsu Pro 6.2 for Linux. These are included in the package. The codes can be run in either batch or interactive mode.

The package is transmitted on a CD in a WinZip file which includes the source codes, executables, documentation and test cases. Reference: NNDC Informal report (May 31, 2005). Fortran 95; PC and workstations (P00333/MNYCP/05).

PSR-526/ERROR-J, Version 2.2

Sumitomo Atomic Energy Ind., LTD, Tokyo, Japan, and Japan Nuclear Cycle Development Institute, Ibaraki, Japan, contributed a newly frozen version of ERRORJ. In the new Version 2.2 release non-diagonal elements of covariance matrices are calculated in the resonance energy region. An option for high-speed calculation is implemented and the perturbation amount is optimized in a sensitivity calculation. The effect of the resonance self-shielding on covariance of multigroup cross sections can be considered.

ERRORJ produces multigroup covariance matrices from ENDF/B-6 format and is based mainly on the methods of the ERRORR module in NJOY94.105. Thus all the functions of ERRORR are available in ERRORJ. which produces a COVFIL format file to store multigroup covariance data which is then converted to a COVERX format file by the conversion program NJOYCOVX. A COVERX format is proposed as a standard file of multigroup covariance data in the FORSS system.

ERRORJ was developed on HP 9000/735 and was tested on DEC and Sun Unix workstations. A Fortran 77 compiler is required to compile the codes; no executables are included with the package. RSICC tested ERRORJ 2.2 on the following systems: DEC alpha using Compaq Fortran V5.5 1877-48BBF and Sun Sparc Station under Solaris 6.9 with Sun WorkShop 6 2000/04/07 Fortran 77 5.2. The package is distributed on a CD in a GNU compressed Unix tar file which includes source code, data files for sample cases, test input and output. References: JNC TJ 9440 99 003 and JNC TJ 9440 99 003 (1999) [English translation]. Fortran 77; HP, DEC Alpha, and Sun SparcStation (P00526MNYCP01).

DLC-222/FENDL2.1

The IAEA Nuclear Data Section, Vienna, Austria, contributed an updated version of FENDL-2 termed FENDL-2.1. All evaluated nuclear data files from FENDL/E-2.1 were processed for fusion applications using the NJOY-99.90 code system to create new FENDL/MC-2.1 and FENDL/MG-2.1 libraries.

FENDL/MC-2.1 contains continuous energy data files in ACE format (output of NJOY module ACER) for MCNP calculations. All the files were created at 300K and probability tables (PT) were generated for those materials with unresolved resonance data.

FENDL/MG-2.1 contains neutron-photon coupled multigroup cross section data in GENDF and MATXS formats (output of the NJOY modules GROUPR, GAMINR and MATXSR). These data can be easily processed by the code TRANXS (PSR-317/TRANSX 2.15) for further use in deterministic transport codes such as DANTSYS, ANISN, DORT and TORT. The Vitamin-J energy structure was used for neutrons as well as photons to give 175 energy groups between 0.00001 eV and 19.64 MeV for neutrons, and 42 groups between 1 keV and 50 MeV for photons.

The use of isotopic evaluations for Cl, Ti, Mo and W increases the number of materials from 57 in FENDL-2.0 to 71 in FENDL-2.1.

H-1, H-2, H-3, He-3, He-4, Li-6, Li-7, Be-9, B-10, B-11, C-12, N-14, N-15, O-16, F-19, Na-23, Mg-nat, Al-27, Si-28, Si-29, Si-30, P-31, S-nat, Cl-35, Cl-37, K-nat, Ca-nat, Ti-46, Ti-47, Ti-48, Ti-49, Ti-50, V-nat, Cr-50, Cr-52, Cr-53, Cr-54, Mn-55, Fe-54, Fe-56, Fe-57, Fe-58, Co-59, Ni-58, Ni-60, Ni-61, Ni-62, Ni-64, Cu-63, Cu-65, Ga-nat, Zr-nat, Nb-93, Mo-92, Mo-94, Mo-95, Mo-96, Mo-97, Mo-98, Mo-100, Sn-nat, Ta-181, W-182, W-183, W-184, W-186, Au-197, Pb-206, Pb-207, Pb-208, Bi-209

The ACEDOP code (SIGACE package), which is included in the distribution, allows Doppler broadening of resolved resonances in the ACE-formatted files except for the energy region described by

unresolved resonance representation in the original ENDF-formatted files. For the sake of completeness, NJOY inputs to generate ACE, MATXS and GENDF files are supplied on the CD. The ASCII data libraries can be used on any computer platform and are distributed in ZIP files. References: INDC(NDS)-467 (December 2004) and INDC(NDS)-451 (November 2003). (D00222MNYCP00)

CONFERENCES, COURSES, SYMPOSIA

RSICC attempts to keep its users and 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 via email to riceaf@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 chronological list of the conferences. More details (if available) are provided following the table.

Fall 2005 SCALE Training Courses at ORNL

Date	Title	Registration Fee*	Description
October 17–21, 2005	**SCALE Source Terms and Shielding Course**	$1800	SCALE shielding and depletion/decay sequences (including ORIGEN-ARP)
October 24–28, 2005	**KENO V.a Criticality Safety Course**	$1800	CSAS/KENO V.a (including KENO3D and GeeWiz)
October 31– November 3, 2005	**TSUNAMI Sensitivity/Uncertainty Tools** (Experienced KENO users only)	$1500	1-D and 3-D sensitivity/uncertainty analysis using XSDRNPM and KENOV.a

*A late fee of $300 will be applied after September 17, 2005. A discount of $600 per each additional week will be applied for registration to multiple courses. Course descriptions can be found at http://www.ornl.gov/sci/scale/training.htm.

SCALE Source Terms and Shielding Course

The SCALE Source Terms and Shielding Course covers SAS2 and ORIGEN-ARP (depletion/source-term generation), SAS1/XSDRNPM (1-D neutron/gamma shielding), SAS4/MORSE-SGC (3-D Monte Carlo neutron/gamma shielding), and QADS/QAD-CGGP (3-D point kernel gamma shielding). The course will feature the use of SCALE Windows GUIs: OrigenArp for Windows, ORIGEN-S plotting utility PlotOPUS, and the ESPN shielding input processor for SAS4.

KENO V.a Criticality Safety Course

The SCALE KENO V.a Criticality Course focuses on KENO V.a and associated criticality analysis sequences in CSAS. KENO V.a is a widely used 3-D multigroup Monte Carlo criticality safety code that has been in use for 20 years. It is a fast, easy-to-use code that allows one to build complex geometry models using basic geometrical bodies of cuboids, spheres, cylinders, hemispheres, and hemicylinders. Two-dimensional color plots of the geometry model can be generated in KENO V.a or the model may be viewed using the KENO3D 3-D visualization tool.

TSUNAMI Sensitivity/Uncertainty for Criticality Safety Course

Sensitivity coefficients produced by TSUNAMI sequences predict the relative changes in a system's calculated k-eff value due to changes in the neutron cross-section data. TSUNAMI produces sensitivity data on a groupwise basis for each region defined in the system model. First-order perturbation theory is used to compute sensitivity coefficients from both cross-section and flux data. TSUNAMI folds sensitivity data with cross-section covariance data to calculate the uncertainty in the calculated k-eff value due to tabulated uncertainties in cross-section data. The applicability of benchmark experiments to the criticality validation of a given application can be assessed using S/U-based integral indices that can quantify system similarity. Attendees must have attended a KENO course or be experienced KENO users.

Introduction to MCNP

This introductory class will be held September 26–30, 2005, at Los Alamos National Laboratory for people who have never used MCNP or have very limited experience with the code and will include interactive computer sessions. Time will be available to discuss individual questions and problems with MCNP experts or to pursue in more detail topics mentioned in the talks. Topics to be covered include:

- New features in MCNP5
- Basic geometry and advanced geometry
- Source definitions
- Tallies
- Data
- Variance reduction
- Statistical analysis
- Criticality
- Plotting of geometry, tallies, and particle tracks
- Neutron/photon/electron physics

The class will use the newly released MCNP5. You are expected to have little or no experience with MCNP. A manual will be provided for use in the classroom. Address all correspondence regarding this class to Cheryl Royer, croyer@lanl.gov, phone: 505-665-2154. Detailed information and registration is available at http://laws.lanl.gov/x5/MCNP/aug05var.html.

MCNPX Workshops

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

2005 Schedule

Oct. 31–Nov. 4	Intermediate	Santa Fe, NM
2006 Schedule		
January 9–13	Introductory	Las Vegas, NV
March 27–31	Intermediate	Capetown, South Africa
June 12–16	Introductory	Santa Fe, NM

The Santa Fe workshop this fall is presently the ONLY Intermediate workshop on the U.S. schedule for the next 9 months. If you have some experience with MCNPX and related codes, you will benefit from this workshop. We will introduce you to the latest features of MCNPX along with nuances of the features with which you are already somewhat familiar.

MCNPX is packed with new and exciting plotting features, including numerous mesh tally options which can be superimposed on your geometry plot and plotted within the MCNPX run, eliminating the need for post-processing and costly additional plotting package(s). You can plot particle flux, tracks, dosage, and energy deposition as well as source points and many others.

Other capabilities which will be featured in the workshop include:

* Pulse-height tallies with variance reduction
* Radiography tallies and 2D contour plots
* MPI and PVM multiprocessing
* Criticality calculations 100 x faster
* Geometry plots have 64-colors, can shade by different cell quantities, and can label i,j,k indices
* The ability to use physics models when cross section tables are missing
* Physics models include Bertini, Dresner, ISABEL, CEM2k, and INCL/ABLA
* Photonuclear and proton plots
* Light-ion recoil
* 3-He coincidence tallies
* Default (built in) dose functions
* Multi-particle sources
* Positron sources
* Spontaneous fission sources
* Fission multiplicity
* Coincidence capture tallies
* Anticoincidence pulse-height tallies

There are still places available in this workshop. The early payment deadline is Friday, September 30.

The workshops include hands-on instruction, generally on PC Windows machines. Subject to participant export approval from 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.

The classes are taught by experienced MCNPX code developers and instructors. More information on code versions and capabilities is available at MCNPX Workshops web site http://mcnpxworkshops.com.

TRAINING COURSE ON NEUTRON SPECTRA UNFOLDING

This two-day training course on neutron spectra unfolding will be held April 7–8, 2006, in Cape Town, South Africa. The training course is organized by the Neutron Radiation department of the Physikalisch-Technische Bundesanstalt (PTB), Braunschweig, Germany. Additional support is provided by

EURADOS. The course is intended for those who do spectrometry in neutron or mixed neutron/photon fields and need to analyze their data using unfolding procedures; emphasis is on practical aspects of unfolding.

A series of lectures in the morning sessions will provide an introduction to unfolding as well as allow for discussions on the theory of unfolding. In the afternoon sessions participants will work on specific examples at PC-workplaces using the UMG software package provided by PTB (UMG: Unfolding with GRAVEL and MAXED, currently distributed by NEA as code package NEA-1665 and by RSICC as code package PSR-529). We will focus on Bonner sphere measurements for our discussion of few-channel unfolding, and on liquid scintillation spectrometer (NE213) measurements for our discussion of multi-channel unfolding.

The number of participants will be restricted due to the limited number of PC-workplaces available. Therefore, you should register as soon as possible. For on-line registration and further information please visit the website at: http://www.ptb.de/utc2006/. Contact: Burkhard Wiegel, PTB, email Burkhard.Wiegel@ptb.de The fee for the course is 800 Euro and includes a CD with a complete set of notes and unfolding software, as well as refreshments.

11th International Topical Meeting on Nuclear Reactor Thermal Hydraulics

NURETH is the foremost international technical meeting on nuclear thermal hydraulics. The French Section of the American Nuclear Society is very proud to organize and announce that the Eleventh NURETH Topical Meeting will be held in Avignon, France, on October 2–6, 2005, in the historic Palace of the Popes.

The main topics covered by the NURETH 11 meeting will be devoted to the thermal-hydraulics of existing and future nuclear power plants as foreseen by the Generation IV worldwide initiative. Normal operation and accidental situations are relevant topics of the conference. Topics encompass modeling, experiments, instrumentation and numerical simulations related to flow and heat transfer in nuclear reactors with a special emphasis on the advances of multiphase CFD methods.

For more information please go to http://nureth11.com/.

Radiation Process Simulation and Modeling User Group Annual Meeting

The Radiation Process Simulation and Modeling User Group (RPSMUG) will meet November 17–18, 2005, in Arlington, Virginia, at the Hilton Garden Inn, Arlington Courthouse Plaza. The two-day meeting has two distinct themes: Day 1 is intended for everyone, particularly individuals interested in process simulation and modeling and how it can be applied to radiation processing; Day 2 will consist of more detailed technical presentations. Both days will consist of round-table discussions and informational sessions related to the use of mathematical models and simulation in radiation processing (gamma, electron beam, and X-ray). If you have a topic that you would like discussed, please submit it to questions@rpsmug.org. Watch for updates and additional information at www.rpsmug.org.

Submitted by Michael C. Saylor, Special Process Services, L.C., 703-207-0159 or mcs@his.com.

ANS RP&S Division Biennial Topical Meeting

The American Nuclear Society Radiation Protection and Shielding Division Biennial Topical Meeting will be held April 3–6, 2006, at the Pecos River Village in Carlsbad, New Mexico. The conference will open with a keynote address by Dr. Glenn Knoll. Other outstanding plenary speakers will include Dr. Kenneth Shultis, Dr. Cassiano de Oliveira and other special speakers.

Workshops will be offered on April 2 and 6, both morning and afternoon. These continuing education classes with the time and location are listed in the conference website.

There will be no charge to those registered for the conference for any of the workshops, although pre-registration is requested. Attendance at the conference will provide continuing education credits for various technical certifications depending on the degree of participation by the attendee.

Tours will be offered of the Waste Isolation Pilot Plant (WIPP), a licensed and operating deep geological repository for transuranic waste. The actual number of visitors WIPP can accommodate will depend on operational conditions and the work schedule of the facility. The WIPP site is a federal facility and advance notice will be required for a site visit so early registration is strongly encouraged.

The Trinity Site is also available to the general public independent of the conference on Saturday, April 1, 2006. The Trinity Site is the location of the world's first detonation of a nuclear weapon.

The call for papers, program and contact information for the conference can be found at http://www.ans-rpsw-carlsbad.com/.

PHYSOR 2006

The Canadian Nuclear Society has announced that the ANS Reactor Physics Topical PHYSOR-2006, "Advances in Nuclear Analysis and Simulation," will be held in Vancouver, BC, Canada, Sept. 10–14, 2006. The meeting is sponsored by the Reactor Physics Division of the ANS and co-sponsored by a host of international societies. The conference will be held at the Hyatt Regency in downtown Vancouver.

You are invited to visit the meeting website at http://www.cns-snc.ca/physor2006/ to obtain updated information and to download a copy of the call for papers. The conference chair is Benjamin Rouben, FCNS Manager, Reactor Core Physics Branch, AECL Sheridan Park (phone 905-823-9060 x 4550, fax: 905-822-0567, email: roubenb@aecl.ca). The technical program co-chair is Ken Kozier, Atomic Energy of Canada Limited (AECL), Chalk River Laboratories, Chalk River, Ontario, Canada K0J 1J0 (Phone: +1-613-584-8811 + ext.5059, email: physor2006@aecl.ca).

CALENDAR

September 2005

2005 NCSD Topical Meeting, Sept. 19–22, 2005, Knoxville, TN. For more information: http://meetingsandconferences.com/ncsd2005/.

Introduction to MCNP, Sept. 27–30, 2005, Los Alamos National Laboratory. Contact: Cheryl Royer, croyer@lanl.gov (phone: 505-665-2154, http://laws.lanl.gov/x5/MCNP/aug05var.html).

October 2005

11th International Topical Meeting on Nuclear Reactor Thermal Hydraulics, Oct. 2–6, 2005, Avignon, France. For more information: http://nureth11.com, nureth11@cea.fr.

10th Workshop on Monte Carlo Simulation of Radiotherapy Treatment Sources using the BEAM Code System, Oct. 3–6, 2005, Ottawa, Canada. Contact: Dave Rogers, Physics Department, Carleton University, 1125 Colonel By Drive, Ottawa, Ontario, Canada, K1S 5B6 (tel 613-520-2600x4374, fax 613-520-4061, email drogers@physics.carleton.ca, url www.physics.carleton.ca/~drogers/BEAM/course/brochure.html).

SCALE Source Terms and Shielding Course, Oct. 17–21, 2005, Oak Ridge National Laboratory, Oak Ridge, TN. Contact: http://www.ornl.gov/sci/scale/training.htm.

KENO V.a Criticality Safety Course, Oct. 24–28, 2005, Oak Ridge National Laboratory, Oak Ridge, TN. Contact: http://www.ornl.gov/sci/scale/training.htm.

TSUNAMI Sensitivity/Uncertainty Tools, Oct. 31–Nov. 3, 2005, Oak Ridge National Laboratory, Oak Ridge, TN. Contact: http://www.ornl.gov/sci/scale/training.htm.

MCNPX Intermediate Workshop, Oct. 31–Nov. 4, 2005, Santa Fe, NM. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com, url http://mcnpxworkshops.com).

November 2005

ANS Winter Meeting and Nuclear Technology Expo, "Talk About Nuclear Differently: A Good Story Untold," November 13–17, 2005, Washington, D.C. Contact: http://www.ans.org/meetings/.

Radiation Process Simulation and Modeling User Group (RPSMUG), Nov. 17–18, 2005, Arlington, Virginia. Contact: Michael C. Saylor (phone 703-207-0159; email mcs@his.com; web www.rpsmug.org).

January 2006

MCNPX Introductory Workshop, Jan. 9–13, 2006, Las Vegas, NV. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com, url http://mcnpxworkshops.com).

March 2006

HEART Conference, March 6–10, 2006, Santa Clara, CA. Contact: Technical Program Chair, Dennis Breuner (phone 858-720-7072, email dbreuner@titan.com).

MCNPX Intermediate Workshop, Mar. 27–31, 2006, Capetown, South Africa. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com, url http://mcnpxworkshops.com).

April 2006

14th Biennial Topical Meeting of the ANS Radiation Protection and Shielding Division, April 3–6, 2006, Carlsbad, New Mexico. Contact: http://www.ans-rpsw-carlsbad.com/.

Two-day training course on neutron spectra unfolding, April 7–8, 2006, Cape Town, South Africa. Contact: Burkhard Wiegel, PTB, email Burkhard.Wiegel@ptb.de or http://www.ptb.de/utc2006/.

June 2006

ANS Annual Meeting, "A Brilliant Future: Nexus of Public Support in Nuclear Technology," June 4–8, 2006, Reno, Nevada. Contact: http://www.ans.org/meetings/index.cgi?c=n.

MCNPX Introductory Workshop, June 12–16, 2006, Santa Fe, NM. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com, url http://mcnpxworkshops.com).

EXRS 2006–European Conference on X-Ray Spectrometry, June 19–23, 2006, Paris, France. Contact: exrs2006@cea.fr, http://www.nucleide.org/exrs2006/.

September 2006

PHYSOR-2006, "Advances in Nuclear Analysis and Simulation," Sept. 10–14, 2006, Vancouver, BC, Canada. Contact: Ken Kozier, Technical Program Co-Chair, Atomic Energy of Canada Limited (AECL), Chalk River Laboratories, Chalk River, Ontario, Canada K0J 1J0 (Phone: +1-613-584-8811 + ext.5059, email: physor2006@aecl.ca, web http://www.cns-snc.ca/physor2006/).

November 2006

ANS Winter Meeting and Nuclear Technology Expo, "Securing the Future in Times of Change," Nov. 12–16, 2006, Albuquerque, NM. Contact: http://www.ans.org/meetings/index.cgi?c=n.

September 2007

ICENES2007, Istanbul. Contact: http://www.icenes2007.org/