Radiation Safety Information Computational Center

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No. 628 September 2017

"Failure is the opportunity to begin again more intelligently."
--Henry Ford

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CHANGES TO THE RSICC CODE AND DATA COLLECTION

There is one update to the RSICC catalog for those individuals that may be interested.

PSR-610/GADRAS-DRF-18.7.2

The Gamma Detector Response and Analysis Software‑Detector Response Function (GADRAS‑DRF-18.7.2) update was contributed by Sandia National Laboratories, Albuquerque, NM and Livermore, California. GADRAS‑DRF-18.7.2 contains a suite of capabilities related to radiation detection. Its primary function is the simulation of gamma‑ray and neutron detector signals to radiation sources. It also contains limited analysis functionality. GADRAS‑DRF-18.7.2 is the public version of the full version of GADRAS with capabilities such as radiation transport and advanced analyses removed. Features in a gamma‑ray detector spectrum; such as photo-peaks and the Compton continuum are derived from first‑principles calculations based on interaction cross sections. Neutron detector response is computed by interpolating on a pre‑computed database of thermal (3He) detector responses. For both gamma‑ray and neutron detectors, the response to radiation that scatters into the detector from the surrounding environment is determined by a combination of first‑principle calculations and empirical modeling. For new detectors, known detector parameters such as size and resolution are all that is necessary to compute an initial response function. This response function may be refined by measuring calibration sources and fitting the detector's parameters to match the data.

The package contains setup executable, user manual, runtime libraries, and data files and is transmitted on one CD. Windows (P00610PCX8602).

END USE STATEMENT

Customers are strongly encouraged to provide full and complete information regarding the intended end use of the software being requested. End use statements that specify that the code is for research, training or educational activities are not sufficient. RSICC's regulators need to know explicitly for what purpose you intend to use the codes and detail needs to be provided. Requests that lack sufficient detail will be rejected.

REGISTRATION REQUIREMENTS

RSICC does not permit individuals to “pre-register” or “pre-order” software for use at a temporary or alternate location. The single user license and export control agreements are specific to the individual’s end use and the location at which the software will be used. During the registration process, individuals are required to provide the name of the institution at which they will use the software, an institutional mailing address and an institutional e-mail address. As an example, students that work at a location other than their university are required to update their registration with RSICC and submit a new request for any software that they intend to use after they have begun work at the new location.

SINGLE-USER LICENSE AGREEMENT REVISED

The single-user license agreement has been revised to address concerns regarding changes in end-use and employment changes of individuals that have received packages from RSICC. In some instances, individuals obtain approvals from our Federal regulators for use of software packages for very specific purposes or while employed or associated with specific organizations. To address this concern, the single-user license agreement has been modified to indicate that the license is only valid for the end-use as stated in the Licensee's request and only while associated with the organization under which the request is being made. After February 1, 2015, the individual's single-user license would no longer be valid if they change their end-use or are no longer associated with the organization for which they obtained the original license. In these cases, the individual would need to submit a new request to RSICC for the package for the new end-use or the new affiliation.

SCIENCE EDUCATION PROGRAMS AT OAK RIDGE NATIONAL LABORATORY

Looking for an internship or post-graduate opportunity at Oak Ridge National Laboratory? The Science Education Programs at Oak Ridge National Laboratory provide paid opportunities for undergraduates, grad students, recent graduates, and faculty to participate in high-quality research alongside world-class scientists to solve real-world problems. Opportunities are available for internships and co-ops, research appointments, and sabbaticals.

You can access all available opportunities through the website at http://www.orau.org/ornl. The Talent and Opportunity System allows you to create a profile, and then answer only 5 or 6 questions for each program or job posting for which you apply.

All levels of participants from undergraduates to faculty are encouraged to publish research papers with their mentors. Please browse through the Research Profiles on the different participants and their research experiences at the right-hand side of the bottom of the web site listed above. Also, there is a video of research participants at ORNL sharing their thoughts on how access to world-class research facilities and staff has catapulted their careers in science and technology. You can find it on YouTube at http://ow.ly/2EQLz.

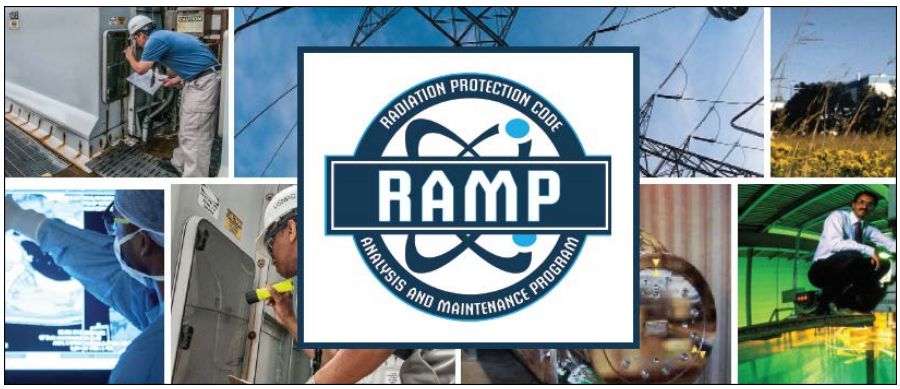
CONFERENCES, TRAINING COURSES, SYMPOSIA

RSICC attempts to keep its customers 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 walkersy@ornl.gov with "**Conferences for RSICC Newsletter**" in the subject line by the 15th of each month. Please include the announcement in its native format as an attachment to the message. Please provide a website address for the event if one is available.

Every attempt is made to ensure that the links provided in the Conference and Calendar sections of this newsletter are correct; however, if the links become unavailable, please call the point of contact for the event.

CONFERENCES

RAMP Fall User Meeting



The Radiation Protection Computer Code Analysis and Maintenance Program (RAMP) Fall User Group Meeting will be held **October 16-20, 2017** at the United States Nuclear Regulatory Commission (NRC) near Washington DC. The first VARSKIN Technical meeting will be held concurrently with the RAMP meeting. Training and discussion sessions are planned for RASCAL, VARSKIN, MILDOS, RESRAD-BIOTA, RADTRAD, GALE, PIMAL, and the Atmospheric Codes. In addition, Morning Primer Sessions with presentations on HABIT, Radiological Toolbox, DCFPAK, GENII, and partnering with other US. Federal Agencies will be held. For more information, please see the website at: http://www.usnrc-ramp.com.

VARSKIN Technical Meeting

The U.S. Nuclear Regulatory Commission is holding the first VARSKIN Technical Meeting in **October 16-18, 2017** in the Washington D.C. area. This meeting will run concurrently with the Radiation Protection Computer Code Analysis and Maintenance program (RAMP) meeting. The Technical Meeting will feature presentations from domestic and international users from federal agencies, universities, and the private sector on how VARSKIN is being used. Role out and training on the update to VARSKIN 6.0 will be given by the code developer, Dr. David Hamby of Oregon State University. Full agenda for the meeting can be found at the U.S. NRC RAMP website www.usnrc-ramp.com.

RAMP User Meeting

The Radiation Protection Code Analysis and Maintenance Program will be **October 16-20, 2017**, at the United States Nuclear Regulatory Commission in Rockville, Maryland. The purpose of RAMP is to support efforts to obtain a well-thought-out view of the accuracy and validity of USNRC radiation protection/dose assessment (RP/DA) computer codes over their range of applicability, while suggesting possible improvements, as needed, to the codes. For more information about RAMP and to register for the meeting, please visit https://www.usnrc-ramp.com/.

PIMAL Training - RAMP Fall User Meeting

The PIMAL Training will be held **October 19, 2017** at the United States Nuclear Regulatory Commission, near Washington, D.C. The objectives of this course are to: (1) review the history and

capabilities of computational phantoms; (2) explore using the reference adult computational phantoms in dose estimation; (3) conduct rudimentary real-life problems and applications; and (4) provide in-person resources and support to navigate specific user needs.

Participants should register for the PIMAL (Phantom with Moving Arms and Legs) training course on the U. S. Nuclear Regulatory Commission Radiation Protection Computer Code Analysis and Maintenance Program website (https://www.usnrc-ramp.com). Participants are responsible for obtaining their own license for MCNP® from RSICC at https://rsicc.ornl.gov.

The American Nuclear Society Reactor Physics Division Topical Meeting, PHYSOR 2018, will be held at the Marriott Casa Magna Hotel, Cancun, Mexico, on **April 22 - 26, 2018**. PHYSOR 2018 will be a venue focusing on both modeling/simulation and experimental aspects of reactor physics, where common aspects and requirements of these two focus areas will be explored. The meeting will also include plenary discussions, technical tours, workshops, and sessions in other topics relevant to the physics of nuclear reactor systems.

Papers are solicited in the following topics:

1. Reactor Analysis Methods
2. Deterministic Transport Theory
3. Monte Carlo Methods
4. Fuel Cycle and Nuclear Criticality Safety
5. Reactor Physics Experiments and Nuclear Data
6. Reactor Concepts and Designs
7. Reactor Operation and Safety
8. Transient and Safety Analysis
9. Education, Research Reactors and Spallation Sources
10. Radiation Applications and Nuclear Safeguards

Deadline for full paper submissions has been extended to October 31, 2017. For more information about PHYSOR 2018, please visit http://www.physor2018.mx/.

BEPU 2018

The Best Estimate Plus Uncertainty International Conference will be held **May 13-19, 2018**, in Lucca, Italy. The objective of the Conference is to provide a forum to exchange experience and views among professionals in the nuclear industry in the development and use of Best Estimate Plus Uncertainty (BEPU) methods in safety analyses and design of nuclear installations. Please see the website for more information www.nineeng.com/bepu.

TRAINING COURSES

LANL MCNP6 Class Schedule

Website: https://laws.lanl.gov/vhosts/mcnp.lanl.gov/classes/classinformation.shtml

Nov 28-Dec 1, 2017 Los Alamos, NM	Using NJOY to Create MCNP® ACE Files & Visualize Nuclear Data Non-US citizens must register by 2017-09-25 | Tues 10:00 - Thur 5:00	$1500 or $1200*
Dec 4-8, 2017 Los Alamos, NM	Introduction to MCNP6 Non-US citizens must register by 2017-10-02 | Mon 10:30 - Fri 12:00	$1800 or $1500*

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MCNP6 Training

For more information, see the website: http://mcnpvised.com/train_mcnp.html

Current Classes (tuition for all US classes is $2800 with an early payment discount of $300)			
Date (Click Date for Info)	**Class**	**Course Content**	**Location**
October 1-5, 2018	**Intermediate MCNP6 Workshop**		**Seattle, WA**

Beginning/Advanced Visual Editor Training

For more information, see the website: http://mcnpvised.com/train.html

October 2-6, 2017	**Beginning Visual Editor. The NEA handles registration for this course.**		**Detailed Description**	**Paris, France**
November 6-10, 2017	**Using Nucwiz for Rapid Geometry Development and Advanced Analysis**		**About Nucwiz**	**Richland, WA**
January 8-12, 2018	**Beginning Visual Editor**		**Detailed Description**	**Las Vegas, NV**
February 19-23, 2018	**Intermediate Visual Editor for Shielding Calculations**		**Detailed Description**	**Barcelona, Spain**
February 26 - March 2, 2018	**Intermediate Visual Editor for Criticality Calculations**		**Detailed Description**	**Barcelona, Spain**

April 9-13, 2018	**Beginning Visual Editor**		**Detailed Description**	**Las Vegas, NV**
April 16-20, 2018	**Using Nucwiz for Rapid Geometry Development and Advanced Analysis**		**About Nucwiz**	**Las Vegas, NV**
April 23-27, 2018	**Advanced Visual Editor with Applications in Mesh Tallies and Variance Reduction**		**Detailed Description**	**Las Vegas, NV**
June 4-8, 2018	**Using Nucwiz for Rapid Geometry Development and Advanced Analysis**		**About Nucwiz**	**Prague, Czech Republic**
June 11-15, 2018	**Advanced Visual Editor with Applications in Mesh Tallies and Variance Reduction**		**Detailed Description**	**Prague, Czech Republic**
August 13-17, 2018	**Using Nucwiz for Rapid Geometry Development and Advanced Analysis**		**About Nucwiz**	**Las Vegas, NV**
August 20-24, 2018	**Beginning Visual Editor**		**Detailed Description**	**Las Vegas, NV**
August 27-31, 2018	**Advanced Visual Editor with Applications in Mesh Tallies and Variance Reduction**		**Detailed Description**	**Las Vegas, NV**

NEA Nuclear Energy Agency

We are pleased to inform you that the NEA Data Bank is co-organising the following workshop / training course:

Date	Class	Course content	Price	Location
2-6 October 2017	Beginning Visual MCNP6	Course description To register, click here	2200 EUR	Paris, France
9-13 October 2017	MCNP6 intermediate	Course description To register, click here	2200 EUR	Paris, France
16-20 October 2017	MCNP6 intermediate, on the RSICC e-Cloud using the NUCWIZ	Course description To register, click here	2200 EUR	Paris, France

Class sizes are limited and workshops may be cancelled if minimum enrollment is not obtained one month prior to the workshop. Workshop fees paid are refundable up to one month before each class.

Please note that all attendees must be registered users. Should you be interested in attending, information is available at:

http://www.oecd-nea.org/dbprog/trainingcourses.htm or contact: programs@oecd-nea.org

SCALE Training Courses – Fall 2017

Training is delivered by developers and expert users from the SCALE team. Courses provide a review of theory, description of capabilities and limitations of the software, and hands-on experience running problems of varying levels of complexity.

All attendees MUST be licensed SCALE 6.2.1 users. SCALE 6.2.1 is available from ORNL/RSICC in the USA, the OECD/NEA Data Bank in France, and the RIST/NUCIS in Japan. All currently scheduled SCALE Courses are described below.

Date	Course Name and Description	Location	Cost
October 2-6, 2017	**SCALE/TRITON Lattice Physics and Depletion Course** SCALE supports a wide range of reactor physics analysis capabilities. SCALE reactor physics calculations couple neutron transport calculations with ORIGEN to simulate the time-dependent transmutation of various materials of interest. TRITON is SCALE's modular reactor physics sequence for a wide variety of system types. Attendees of this course will learn how to use TRITON for depletion analysis. The TRITON training material is centered around using the NEWT 2-D transport module for 2-D depletion analysis and briefly touches on 3-D depletion analysis. The course will instruct users on the use of KENO in place of NEWT for 3-D Monte Carlo-based depletion; however, KENO is not covered in depth within this course. Additional applications of TRITON are incorporated into the training, including the creation of ORIGEN libraries for rapid spent fuel characterization calculations, defining appropriate unit cell calculations of various reactor types for cross section processing, performing restart calculations, and performing uncertainty analysis of reactor physics calculations using Sampler.	ORNL Oak Ridge, TN USA	$2000*
October 9-13, 2017	**SCALE/ORIGEN Standalone Fuel Depletion, Activation, and Source Term Analysis Course** This is a hands-on class that covers the use of ORIGEN for isotopic depletion, decay, decay heat, and radiation source-terms calculations. The course features the use of the Fulcrum consolidated SCALE graphical interface and Fulcrum plotting capabilities for displaying nuclear data and results. The class includes solving activation, spent fuel, and nuclear safeguards and security analyses. This class	ORNL Oak Ridge, TN USA	$2000*

	provides an introduction to the ORIGAMI tool for convenient characterization of spent nuclear fuel with radially and axially varying burnup. Advanced applications including simulation of chemical processing, continuous feed and removal are also covered.		
October 16-20, 2017	**SCALE Criticality Safety and Radiation Shielding Course** This course provides instruction on the use of the KENO-VI Monte Carlo code for criticality safety calculations and the MAVRIC (Monaco with Automated Variance Reduction using Importance Calculations) shielding sequence with 3-D automated variance reduction for deep-penetration problems. KENO-VI is a 3D eigenvalue Monte Carlo code for criticality safety and Monaco is a 3D fixed-source Monte Carlo code for shielding analysis. Both codes use the SCALE Standard Composition Library and the SCALE Generalized Geometry Package (SGGP), which allows for versatile modeling of complex geometries and provides convenient, efficient methods for modeling repeated and nested geometry configurations such as lattices. The MAVRIC sequence is based on the CADIS (Consistent Adjoint Driven Importance Sampling) methodology. For a given tally in a Monte Carlo calculation that the users wants to optimize, the CADIS method uses the result of an adjoint calculation from the Denovo 3D deterministic code to create both an importance map for weight windows and a biased source distribution. MAVRIC is completely automated in that from a single user input, it creates the cross sections (forward and adjoint), computes the adjoint fluxes, creates the importance map and biased source, and then executes Monaco. An extension to the CADIS method using both forward and adjoint discrete ordinates calculations (FW-CADIS) is included in MAVRIC so that multiple point tallies or mesh tallies over large areas can be optimized (calculated with roughly the same relative uncertainty). Both KENO and Monaco use ENDF/B-VII.0 or ENDF/B-VII.1 cross-section data distributed with SCALE to perform continuous energy (CE) or multigroup (MG) calculations. Both codes can also be used with the Fulcrum consolidated SCALE user interface and KENO3D for interactive model setup, computation, output review, and 3-D visualization. Instruction is also provided on the SCALE material input and resonance self-shielding capabilities and the data visualization capabilities within Fulcrum for visualizing fluxes, reaction rates, and cross-section data as well as mesh tallies. KENO-VI and MAVRIC can be applied together to perform an integrated criticality accident alarm system (CAAS) analysis.	ORNL Oak Ridge, TN USA	$2000*
October 23-27, 2017	**SCALE Sensitivity and Uncertainty Analysis for Criticality Safety Assessment and Validation** Sensitivity and uncertainty analysis methods provide advanced techniques for criticality safety validation including the	ORNL Oak Ridge, TN USA	$2000*

	identification of appropriate experiments, detailed quantification of bias and bias uncertainty, identification of gaps in available experiments, and the design of new experiments. The Sampler sequence within SCALE provides a flexible tool for quantifying uncertainties due to manufacturing tolerances as well as composition and dimensional uncertainties in criticality safety assessments. This 5-day training class provides a foundation on sensitivity and uncertainty analysis and applies these methods to criticality safety validation applications, as well as instruction on the use of Sampler for uncertainty quantification. Topics covered include: • The TSUNAMI sensitivity and uncertainty analysis techniques for determining the sensitivity of the k-eff eigenvalue to cross section uncertainties using both multigroup and continuous-energy physics. • SCALE's comprehensive cross section covariance data library, which is applied to these sensitivity coefficients to estimate the data-induced uncertainty in k-eff. • The TSUNAMI-IP code, which determines the correlation between benchmark and application systems in terms of their shared sources of data-induced uncertainty. • The USLSTATS trending analysis tool, which uses similarity coefficients from TSUNAMI-IP (among other parameters) to estimate the computational bias and bias uncertainty for design and licensing applications. • The TSURFER data adjustment tool, which uses generalized linear least squares to adjust nuclear data parameters to minimize discrepancies between computed predictions and the results of integral experiments; these adjustments can then be used to estimate bias and bias uncertainty in design and licensing applications. • The SAMPLER code for uncertainty assessment, which randomly samples nuclear data and/or system compositions and dimensions to quantify the uncertainty in system k-eff. This course will cover the theoretical basis for these analysis techniques and will also conduct exercises for attendees to familiarize themselves with these tools. It is recommended that attendees are familiar with the KENO Monte Carlo code or are experienced SCALE users, although these are not necessary prerequisites.		

***Full-time university students can register at a reduced rate. Both professional and student registration fees are discounted $200 for each course over one.*

FOREIGN NATIONAL VISITORS TO ORNL - *Payment MUST be received at least one week prior to attending the training course. All foreign national visitors must register 40 days before the start date of the training course they plan to attend.*

For more information regarding these courses, visit the website at http://scale.ornl.gov/.

SYMPOSIA

2017 CALENDAR

September

2017 Nuclear Criticality Safety Division Topical, September 10-15, 2017, Carlsbad, New Mexico. Website: http://carlsbadans.com/index.php/carlsbad-conference

Nuclear Power for the People, September 11-14, 2017, Varna, Bulgaria. Website: http://www.bgns.bg/

October

Fourth International Conference on Nuclear Power Plant Life Management, October 23-27, 2017, Lyon, France. Website: http://www-pub.iaea.org/iaeameetings/50811/Fourth-International-Conference-on-Nuclear-Power-Plant-Life-Management

2017 American Nuclear Society (ANS) Winter Meeting and Nuclear Technology Expo, October 29-November 2, 2017, Washington, DC. Website: http://www.ans.org/meetings/c_1

November

International Conference on Physical Protection of Nuclear Material and Nuclear Facilities, November 13-17, 2017, Vienna, Austria. Website: http://www-pub.iaea.org/iaeameetings/50819/International-Conference-on-Physical-Protection-of-Nuclear-Material-and-Nuclear-Facilities

2018 CALENDAR

June

2018 American Nuclear Society (ANS) Annual Meeting, June 17-21, 2018, Philadelphia, Pennsylvania. Website: http://www.ans.org/meetings/c_1

July

HPS 63rd Annual Meeting, July 15-19, 2018, Cleveland. Ohio. Website: http://hps.org/meetings/meeting46.html

August

20th Topical Meeting of the Radiation Protection & Shielding Division of ANS (RPSD-2018), August 26-31, 2018, Santa Fe, New Mexico. Website: http://rpsd2018.ans.org.

November

2018 American Nuclear Society (ANS) Winter Meeting, November 11-15, 2018, Orlando, Florida. Website: http://www.ans.org/meetings/c_1

2019 CALENDAR

June

2019 American Nuclear Society (ANS) Annual Meeting, June 9-13, 2019, Minneapolis, Minnesota.
Website: http://www.ans.org/meetings/c_1