Radiation Safety Information Computational Center

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Start with good people, lay out the rules, communicate with your employees, motivate them and reward them. If you do all those things effectively, you can't miss.

~ Lee Iacocca

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CHANGES TO THE RSICC CODE AND DATA COLLECTION

There were two updates to the RSICC catalog for those individuals that may be interested.

CCC-832/HGSYSTEMUF6

HGSYSTEMUF6 was contributed by George Mason University, United States; Earthtech, Inc., United States; BlazeTech Corporation, United States; Lockheed Martin Energy Systems, Oak Ridge, TN, United States; Bechtel Jacobs Company, Oak ridge, TN, United States; JBF Associates, United States; LMERC, Oak Ridge, TN, United States through ESTSC, Oak Ridge TN, United States. HGSYSTEMUF6 is a suite of models designed for use in estimating consequences associated with accidental, atmospheric release of Uranium Hexafluoride (UF6) and its reaction products, namely Hydrogen Fluoride (HF), and other non-reactive contaminants which are either negatively, neutrally, or positively buoyant. It is based on HGSYSTEM Version 3.0 of Shell Research LTD (MIS-021/ ESTS0545/01) and contains specific algorithms for the treatment of UF6 chemistry and thermodynamics. HGSYSTEMUF6 contains algorithms for the treatment of dense gases, dry and wet deposition, effects due to the presence of buildings (canyon and wake), plume lift-off, and the effects of complex terrain. The models components of the suite include:

- AEROPLUME/RK, used to model near-field dispersion from pressurized two-phase jet releases of UF6 and its reaction products,

- HEGADAS/UF6 for simulating dense, ground based release of UF6,

- PGPLUME for simulation of passive, neutrally buoyant plumes

- UF6Mixer for modeling warm, potentially reactive, ground-level releases of UF6 from buildings, and

- WAKE, used to model elevated and ground-level releases into building wake cavities of non-reactive plumes that are either neutrally or positively buoyant.

The atmospheric release and transport of UF6 is a complicated process involving the interaction between dispersion, chemical, and thermodynamic processes. This process is characterized by four separate stages (flash, sublimation, chemical reaction entrainment, and passive dispersion) in which one or more of these processes dominate. The various models contained in the suite are applicable to one or more of these stages. For Example, for modeling reactive, multiphase releases of UF6, the AEROPLUME/RK component employs a process-splitting scheme which numerically integrates the differential equations governing dispersion, UF6 chemistry, and thermodynamics. This algorithm is based on the assumption that, for a given time step, the equations governing the processes of dispersion, chemical reaction, and thermodynamics can be solved sequentially and independently. Here, a Runge-Kutta solver is employed to solve the equations governing dispersion, a simple, first-order forward finite difference scheme is used to solve the rate equations for the consumption and production of reactants, while the proprietary nonlinear algebraic equation solver NAESOL, developed by Shell Research LTD. is used to solve equations governing thermodynamic balances of

molar fraction, enthalpy and molar flow rate of HF. Conversely, for simulating downwind dispersion of a passive, ideal gas, the WAKE component employs equations based on advanced empirical formulations of wind tunnel data in conjunction with the standard Gaussian plume model formation.

The package is transmitted on CD and Includes Source Code, Executable Modules, Sample Problem Data, Batch and PIF Files, User Guides; Fortran; Linux, MacOS and Windows. (C823MNYCP00).

MIS-020/MMRW Books

MMRW Books, contributed by M.M.R. Williams, South Croydon Surrey, CR2 0DX, United Kingdom through the OECD Nuclear Energy Agency Data Bank, Issy-les-Moulineaux, France. Prof. M.M..R Williams has now released three of his legacy books for free distribution: "The Slowing Down and Thermalization of Neutrons," "Content, Mathematical Methods in Particle Transport Theory," and "Random Processes in Nuclear Reactors." No Fee.

The package is transmitted on CD. PDF Format. (M020MNYCP00/NEA-1792/01).

MIS-021/HGSYSTEM

HGSYSTEM, contributed by Shell Research Limited, Thornton Research Centre, Chester, United Kingdom through the OECD Nuclear Energy Agency Data Bank, Issy-les-Moulineaux, France. The hazards of hydrogen fluoride (HF) have long been recognized, and operating practices have been aimed at minimizing the possibility of a release and mitigating the effects of a release should it occur. These practices have been continually monitored and improved to maximize safety protection based on the available technical data. HGSYSTEM has been aimed at further improvements based on new technical data.   HGSYSTEM uses the following to calculate HF dispersion: HF thermodynamics, jet plume modeling, gravity spreading, and surface roughness effects.

The package is transmitted on CD and contains source, updated executables, sample inputs and output. FORTRAN; Many computers (M021MNYCP00/ ESTS0545/01).

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" in the subject line by the 20th 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

2015 ANS Winter Meeting and Nuclear Technology Expo

This meeting will be held **November 8-12, 2015**, in Washington, DC at the Marriott Wardman Park. Please visit the ANS website for more information at www.ans.org.

TRAINING COURSES

Radioactive Material Package Shielding Evaluation and Nuclear Criticality Safety Evaluation Training

The U.S. Department of Energy (DOE) Packaging Certification Program (PCP), Office of Packaging and Transportation, is offering Safety Analysis Report for Packaging (SARP) shielding and nuclear criticality safety (NCS) courses for SARP generalists and analysts.

The SARP Generalist Course is designed for project managers, supervisors, NCS/shielding subject matter experts (SME), or SMEs in non-NCS/shielding technical areas (e.g., structural, thermal, package design, etc.) who need to better understand how the NCS/shielding analyses fit in the broader SARP documentation. Specifically, the Generalist Course provides an overview of the regulations and guidelines for the criticality and shielding analysis for a SARP, and the course shows how the NCS/shielding chapters integrate with the other parts of the SARP. Students in the Generalist Course will review an actual SARP document after the course material is presented to emphasize the key elements of the shielding and criticality analyses.

The Analysts Course will provide detailed training on the radioactive material package shielding analyses and NCS evaluation fundamentals needed by analysts/practitioners (i.e., safety analysts and/or technical reviewers) to prepare and/or review technical analyses for the SARP documentation. The Analyst Course also provides an overview of regulations and guidelines in addition to detailed in-class exercises associated with the package shielding and NCS analyses. With regard to the in-class exercises, analysis teams will be faced with "staged" SARP examples in which a number of important decision processes in the generation of a SARP will be demonstrated and discussed.

Both the SARP Generalist and SARP Analyst Courses will be offered in Fiscal Year 2016.

The SARP Generalist Course will be held at Oak Ridge National Laboratory in Oak Ridge, Tennessee. The SARP Generalist Course is tentatively scheduled for the second or third quarter in FY16, and the training dates will be announced once the course logistics are finalized.

The SARP Analyst Course will be scheduled in FY16 after the SARP Generalist Course. The training location and dates for the SARP Analyst Course will be announced once the course logistics are finalized.

Further information will be posted as soon as it is available. Contact Douglas G. Bowen at bowendg@ornl.gov or (865) 576-0315.

LANL MCNP6 Class Schedule

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

Date	Course Name and Description	Cost
Oct 19-23, 2015 Los Alamos, NM	**Introduction to MCNP6** Non-US citizens must register by 2015-08-14 | Mon 10:30 - Fri 12:00	$1800 or $1500*
Oct 26-28, 2015 Los Alamos, NM	**Unstructured Mesh with Attila4MC** Non-US citizens must register by 2015-08-21 | Mon 12:30 - Wed 4:30	$1000 or $800*
Dec 7-11, 2015 Los Alamos, NM	**Introduction to MCNP6** Non-US citizens must register by 2015-10-02 | Mon 10:30 - Fri 12:00	$1800 or $1500*

* Early payment discount: A discount of $300 per student is given when the registration payment is received in full at least 4 weeks before the start of class.

* Classes may be cancelled or postponed if fewer than 8 students register.
* Maximum of 15 students per class.

Introductory classes are for those who have little or no experience with MCNP. This class surveys the features of MCNP so the beginning user will be introduced to the capabilities of the program, and will have hands-on experience at running the code to solve simple problems. Course topics include Basic Geometry, Source Definitions, Output (Tallies), Advanced Geometry (repeated structures specification), Variance Reduction Techniques, Statistical Analysis, Criticality, Plotting of Geometry and Tallies, and Neutron / Photon / Electron Physics.

Intermediate workshops cover the entire spectrum of MCNP/MCNPX but proceed at a much faster pace and are more in-depth than Introductory classes. These workshops are open to new users; the first day of class is a review of basics. However, the intermediate workshops are targeted toward more experienced users and are more problem solving than lecture classes. Intermediate workshops feature flexible course content, skip topics of least interest to the participants, and provide significantly more depth than introductory classes.

Advanced classes - Variance Reduction & Criticality are for people with MCNP experience who want to extend their knowledge and gain depth of understanding. Most areas of MCNP operation will be discussed in detail, with emphasis on Advanced Geometry, Advanced Variance Reduction Techniques, and other advanced features of the program. Time will be available to discuss approaches to specific problems of interest to participants. Classes on specific topics are offered when there is sufficient interest.

NOTE: While MCNP supports a number of platforms, LANL class computers are usually Windows based.

More information about the MCNP courses at LANL is available on their website at https://laws.lanl.gov/vhosts/mcnp.lanl.gov/classes/classinformation.shtml.

MCNP6 and Visual Editor Training

Website: http://www.mcnpvised.com/index.html

MCNP6 Intermediate Workshops 2016		
January 11-15, 2016	MCNP6 Intermediate Workshop	Las Vega, NV

Intermediate Workshops cover the entire spectrum of MCNP6 but proceed at a much faster pace and are more in-depth than Introductory Classes. These workshops are open to new users; the first day is a review of basics. However, the intermediate workshops are targeted toward more experienced users and are more problem solving than lecture classes. Intermediate workshops feature flexible course content, skip topics of least interest to the participants, and provide significantly more depth than introductory classes.

The list of workshops is tentative, as workshops may be added, removed, or modified throughout the year, depending on user interests. Workshops with fewer than 12 registrants on the early registration date are subject to cancellation or rescheduling.

In order to process non-U.S. citizens by the class date, non-U.S. citizens must register at least 6 weeks prior to the start of the training class. All non-U.S. citizens who reside in countries listed in the U.S. Code of Federal Regulations, Title 10, Part 810.8, are required to register at least 8 weeks prior to the start of the training class. These participants must be processed by the DOE and should not make travel arrangements until approval from DOE has been obtained.

Additional information about the courses can be found at the website, http://www.mcnpvised.com/train.html.

To register send an email to Randy Schwarz at randyschwarz@mcnpvised.com, indicating the workshop of interest to you.

Visual Editor Classes 2015 & 2016		
November 2-6, 2015	Advanced Visual MCNP6 with Applications in Mesh Tallies and Variance Reduction.	South Korea
January 25-29, 2016	Advanced Visual MCNP6 with Applications in Mesh Tallies and Variance Reduction.	Richland, WA
February 15-19, 2016	Beginning Visual MCNP6	Paris, France
February 29-March 4, 2016	Advanced Visual MCNP6 with Applications in Mesh Tallies and Variance Reduction.	Barcelona, Spain
March 21-25, 2016	Intermediate Visual MCNP6 for Shielding Calculations	Richland, WA
March 28-April 1, 2016	Intermediate Visual MCNP6 for Criticality Calculations	Richland, WA

April 4-8, 2016	Intermediate Visual MCNP6 for Medical Physics Calculations	Richland, WA
April 11-15, 2016	Beginning Visual MCNP6	Las Vegas, NV
May 16-20, 2015	Advanced Visual MCNP6 with Applications in Mesh Tallies and Variance Reduction.	Las Vegas, NV
May 23-27, 2016	Intermediate Visual MCNP6 for Shielding Calculations	Barcelona, Spain
May 30-June 3, 2016	Intermediate Visual MCNP6 for Criticality Calculations	Barcelona, Spain
June 27-July 1, 2016	Beginning Visual MCNP6	Prague, Czech Republic
July 11-15, 2016	Advanced Visual MCNP6 with Applications in Mesh Tallies and Variance Reduction.	Prague, Czech Republic
October 10-14, 2016	Beginning Visual MCNP6	Paris, France

Classes are taught using the most recent (beta) version of the Visual Editor Code. All class attendees must have a valid MCNP/MCNPX RSICC license. Bring proof of receipt (letter or email) to the class.

The introductory workshops combine teaching on MCNP basics and how to create MCNP input files using the Visual Editor. The intermediate Visual Editor workshops focus on more advanced topics such as tallies and variance reduction using the Visual Editor.

Exercises will focus on creating input files and visualizing output data with the Visual Editor. Attendees are encouraged to bring their own input files for viewing and modifying in the Visual Editor; this is particularly important for the intermediate workshop.

The course description and registration information can be found at
http://www.mcnpvised.com/index.html.

SYMPOSIA

2015 CALENDAR

October

17th International Conference on Emerging Nuclear Energy Systems (ICENES2015), October 4-8, 2015, Istanbul, Turkey. For up-to-date information about this conference, visit their website at http://icenes2015.org/index.php.

International Conference on Clinical PET-CT and Molecular Imaging (IPET2015): PET-CT in the era of multimodality imaging and image-guided therapy, October 5-9, 2015, Vienna, Austria. For up-to-date information about this conference, visit their website.

2015 American Nuclear Society (ANS) Winter Meeting and Nuclear Technology Expo, November 8-12, 2015, Washington D.C. For up-to-date information, visit their website.

International Conference on Research Reactors: Safe Management and Effective Utilization, November 16-20, 2015, Vienna, Austria. For up-to-date information, visit their website.

2016 CALENDAR

January

Institute of Nuclear Materials Management (INMM) 31st Spent Fuel Management Seminar, January 11-13, 2016, Washington, D.C. See website for more information http://www.inmm.org/31st_Spent_Fuel_Seminar.htm.

February

Nuclear and Emerging Technologies for Space (NETS) 2016, February 22-25, 2016, Huntsville, AL. See website for more information http://www.ans.org/meetings/c_3.

May

47th Annual Meeting on Nuclear Technology (AMNT 2016), May 10-12, 2016, Hamburg, Germany. See website for more information http://www.nucleartech-meeting.com/welcome.html.

June

2016 Society of Nuclear Medicine and Molecular Imaging (SNMMI) Annual Meeting, June 11-15, 2016, San Diego, CA. More information to follow.

2016 American Nuclear Society (ANS) Annual Meeting. June 12-16, 2016. New Orleans, LA.

61st Annual Health Physics Society (HPS) Meeting, July 17-21, 2016, Spokane, WA. See website for more information http://hps.org/meetings/meeting39.html.

November

2015 American Nuclear Society (ANS) Winter Meeting and Nuclear Technology Expo. November 6-10, 2016, Las Vegas, NV.

2017 CALENDAR

June

2017 American Nuclear Society (ANS) Annual Meeting. June 11-15, 2017, San Francisco, CA.

July

62nd Annual Health Physics Society (HPS) Meeting. July 9-13, 2017, Spokane, WA.

October

2017 American Nuclear Society (ANS) Winter Meeting and Nuclear Technology Expo. October 29-November 2, 2017, Washington, DC.