Radiation Safety Information Computational Center

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No. 623 April 2017

"We cannot live only for ourselves. A thousand fibers connect us with our fellow men." Herman Melville

TABLE of CONTENTS

CHANGES TO THE RSICC CODE AND DATA COLLECTION

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

DLC-275/PWR-MSLB-REV.4

PWR-MSLB-REV.4 was contributed by the Pennsylvania State University, University Park, PA 16802, USA via the OECD NEA Data Bank, Boulogne-Billancourt, France. PWR-MSLB is a Main Steam-Line Break (MSLB) benchmark problem derived from the reactor geometry and operational data of the Three Mile Island Unit 1 (TMI-I) nuclear power plant. The objective of the benchmark is to verify the capability of coupled neutronics - thermal-hydraulics code systems to analyse complex transients with coupled core-plant interaction, and to fully test the thermal-hydraulic coupling. A three dimensional neutronics core model has been defined. The benchmark consists of three exercises:

1. Point kinetics plant simulation
2. Coupled neutronics/core thermal-hydraulics evaluation of core response from a multi-dimensional (3-D) perspective
3. Best-estimate coupled core - plant transient modeling

This package contains the text of the four reports produced, the first one of which contains the specification, tables, pictures and numerical data files required for the modeling of the MSLB event.

PWR-MSLB-REV.4 is distributed on one CD containing documentation, reference material, and data. (D00275MNYCP00 NEADB ID: NEA-1554).

PSR-158/SAMMY-8.1.0

Oak Ridge National Laboratory, Oak Ridge, Tennessee, has contributed a newly frozen version of SAMMY8.1.0, a multilevel multichannel R-matrix code system. SAMMY can be used to analyze time-of-flight cross section data in the resolved and unresolved resonance regions, where the incident particle is either a neutron or a charged particle (p, α, d, etc.). Energy-differential cross sections and angular-distribution data are treated, as are certain forms of energy-integrated data. Bayes' Theorem (generalized least squares) is used to find the "best fit" values of parameters and the associated parameter covariance matrix. In the resolved resonance region (RRR), different data sets, or different

energy ranges of the same data set, may be analyzed either simultaneously (though the implementation is cumbersome) or sequentially with results effectively equivalent to those which would be obtained via a simultaneous analysis, provided the output parameter values and covariance matrix from the first analysis are used as input to the second analysis. Also included are expeditious methods (the "propagated uncertainty parameter" and "implicit data covariance" procedures) of including the correct data covariance matrix within the fitting procedure. In the RRR, sequential analysis is the default mode though analyses can also be performed simultaneously. In the URR, the default mode is simultaneous analysis, though capability for sequential analyses is also available.

The new features added to SAMMY 8.1.0 include:

1. The auxiliary code SAMINT is now distributed with SAMMY. SAMINT can be used to include the information in integral benchmark experiments in the analysis of the RRR along with differential experimental data.
2. New detector resolution functions based on MCNP simulations for liquid scintillator detector EJ-301, and for lithium glass detector NE-110.
3. Updated physical constants in SAMMY to make results identical to SAMRML's.
4. Improved SQA by modernized build, test, version control, and bug tracking processes.

The package is distributed on CD which contains the referenced document in PDF format and a compressed tar file with the source code, executables for Linux, MacOS and Windows systems and tutorials, scripts, and test cases. Reference: ORNL/TM-9179/R8 ENDF-364/R2 (October 2008). Fortran 77, CMAKE 2.8.12; PC Linux, MacOS and Windows (P00158/MNYCP13).

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" 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

MCNP/MCNPX-PoliMi Workshop

MCNP/MCNPX-PoliMi Workshop
May 23rd – 25th, 2017

This three-day workshop will instruct users in the MCNP and MCNPX-PoliMi codes will be held **May 23-25, 2017**. Day 1 will focus on the basics of MCNP simulations; days 2 and 3 will focus on application of MCNPX-PoliMi. Full Workshop registration fees are $400 for regular attendees or $150 for student attendees; reduced rates are available for single- or two-day registrants. Seating is limited; registrations will be accepted on first-come-first-serve basis. Registration closes on May 1, 2017. Register online: https://www.regonline.com/mcnpxpolimiworkshop2017. Please email clardesd@umich.edu if you have any questions.

Workshop on Multi-Physics Model Validation

The Nuclear Energy Knowledge and Validation Center (NEKVaC), INL-DOE in cooperation with the OECD/NEA Expert Group of Multi-Physics Experiments, Benchmarks, and Validation (EGMPEBV), and with the support of Nuclear University Consortium (NUC), INL is conducting a Workshop on Multi-Physics Model Validation. It will be held **June 27-29, 2017** in Raleigh, NC. The workshop is hosted by the Nuclear Engineering Department (NED) at North Carolina State University (NCSU), and is supported by corresponding focus areas in the DOE Consortium for Advanced LWR Simulation (CASL), the DOE Nuclear Energy Advanced Modeling and Simulation (NEAMS), and similar international activities. The NCSU faculty, which have been involved in national and international multi-physics code validation projects, are organizing and conducting the workshop with the support of lecturers from academia, national labs, industry and research organizations in USA and abroad. The targeted audience are professionals from industry, regulation, national laboratories and government agencies as well as graduate students, post-doctoral scholars and faculty from universities. This workshop will provide participants with understanding and knowledge of state-of-the-art concepts, principles, procedures, and challenges for validation of traditional and novel multi-physics modeling and simulation tools. There will be no registration fee, coffee break refreshments and lunches will be provided as well as one dinner/social reception. The link for registration as well as more information about for workshop organization can be found at:
https://www.ne.ncsu.edu/outreach-engagement/workshops/multi-physics-model-validation-workshop/

IEEE Computing Conference

The Computing Conference (formerly called Science and Information (SAI) Conference) is a research conference that will be **July 18-20, 2017**, London, U.K. The goal of the conference is to be a premier venue for researchers and industry practitioners to share new ideas, research results and development experiences in the areas of Computer Science, Electronics and Communication. Accepted papers will be published in IEEE Xplore and indexed in various databases. Please see their website for more information at http://www.saiconference.com/Computing2017.

TRAINING COURSES

Safety Analysis Report for Packaging (SARP)
Developed and Conducted by Oak Ridge National Laboratory

SARP Shielding/Criticality Safety Generalist and Analyst Courses

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 SARP Generalist Course will be held at Oak Ridge National Laboratory in Oak Ridge, TN, at the National Transportation Research Center, **June 5-9, 2017**.

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. Regarding the in-class exercises, analysis teams will be faced with "staged" SARP examples in which several important decision processes in the generation of a SARP will be demonstrated and discussed. The SARP Analyst Course will be held at Oak Ridge National Laboratory in Oak Ridge, TN, at the National Transportation Research Center, **September 18-22, 2017**.

Course registration information is available at the following website link:
https://public.ornl.gov/conferences/sarp/index.shtml .

Contact Douglas G. Bowen by email (bowendg@ornl.gov) or phone (865) 576-0315.

Practical MCNP® for the Health Physicist, Rad Engineer, and Medical Physicist

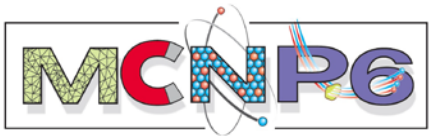
DATES: **June 26-30, 2017**
FEE: $1,800 per person
PLACE: Los Alamos National Lab, TA00-0767-149, Los Alamos, NM, 87545

Monte Carlo type calculations are ideally suited to solving a variety of problems in radiation protection and dosimetry. The Los Alamos MCNP® code is a general and powerful Monte Carlo transport code for photons, neutrons, electrons and many other particles, and can be safely described as the "industry standard." This course is aimed at the HP, medical physicist, and rad engineer with no prior experience with Monte Carlo techniques. The focus is almost entirely on the application of MCNP® to solve a

variety of practical problems in radiation shielding and dosimetry. The intent is to "jump start" the student toward using MCNP® productively. With a little practice and study of the examples, many will find they are able to solve problems that have, in the past, been out of reach.

Course content: Extensive interactive practice sessions are conducted on desktop computers. Topics will include an overview of the MCNP® code and the Monte Carlo method, input file preparation, geometry, source definition, standard MCNP® tallies, interpretation of the output file, exposure and dose rate calculations, radiation shielding, photon skyshine, detector simulation and dosimetry. Students will be provided with a comprehensive class manual and a CD containing all of the practice problems. This course has been granted 32 Continuing Education Credits by the AAHP. The course is offered by the RP2 Radiation Services Group at Los Alamos National Laboratory and is co-sponsored by RSICC. Participants must be vetted by LANL's Export Control Office (a two-sided form will be sent upon registration to complete and submit to the EC Office) before allowed to attend. Possessing a recent copy of the MCNP® code will expedite this process. Contact RSICC directly (https://rsicc.ornl.gov/) if a copy of the code (and license) is desired. Note that class computers will be provided.

Registration is available online at http://www.lanl.gov/orgs/rp/mcnp.shtml. Non-US citizens need to register 60 days in advance to allow for necessary visitor approvals. Inquiries regarding registration, class space availability and payment options should be made to David Seagraves, 505-667-4959, e-mail: dseagraves@lanl.gov. Technical questions may also be directed to Tom McLean, 505-665-9944, email: tmclean@lanl.gov.



LANL MCNP6 Class Schedule

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

May 16-19, 2017 Los Alamos, NM	Unstructured Mesh with Attila4MC Non-US citizens must register by 2017-02-20 | Tues 12:30 - Fri 4:30	$1500 or $1200*
June 5-9, 2017 Los Alamos, NM	Introduction to MCNP6 Non-US citizens must register by 2017-03-13 | Mon 10:30 - Fri 12:00	$1800 or $1500*
July 31 - Aug 4, 2017 Los Alamos, NM	Introduction to MCNP6 Non-US citizens must register by 2017-05-08 | Mon 10:30 - Fri 12:00	$1800 or $1500*
Aug 7-11, 2017 Los Alamos, NM	Variance Reduction with MCNP6 Non-US citizens must register by 2017-05-15 | Mon 10:30 - Fri 12:00	$1800 or $1500*
Aug 14-18, 2017 Los Alamos, NM	Criticality Calculations with MCNP6 Non-US citizens must register by 2017-05-22 | Mon 10:30 - Fri 12:00	$1800 or $1500*
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	$1200 or $900*
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*

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**
June 26-30, 2017	**MCNP6 Intermediate Workshop**	**To see an outline for the course, Click Here.**	**Prague, Czech Republic**
August 21-25, 2017	**MCNP6 Intermediate Workshop**	**To see an outline for the course, Click Here.**	**Anaheim, CA**
October 9-13, 2017	**MCNP6 Intermediate Workshop**	**To see an outline for the course, Click Here.**	**Paris, France**

MCNP6 Visual Editor Training

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

May 1-5, 2017	Using Nucwiz for Rapid Geometry Development and Advanced Analysis. **New Class**			Richland, WA
May 15-19, 2017	Beginning Visual MCNP6		Detailed Description	Las Vegas, NV
May 22-26, 2017	Advanced Visual MCNP6 with Applications in Mesh Tallies and Variance Reduction.		Detailed Description	Las Vegas, NV
June 19-23, 2017	Beginning Visual Editor		Detailed Description	Prague, Czech Republic
July 10-14, 2017	Advanced Visual Editor with Applications in Mesh Tallies and Variance Reduction.		Detailed Description	Barcelona, Spain
September 11-15, 2017	Beginning Visual MCNP6		Detailed Description	Las Vegas, NV
September 18-22, 2017	Advanced Visual MCNP6 with Applications in Mesh Tallies and Variance Reduction.		Detailed Description	Las Vegas, NV
October 2-6, 2017	Beginning Visual MCNP6. The NEA handles registration for this course.		Detailed Description	Paris, France

NEA Nuclear Energy Agency

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

Date	Course	Location	Information
June 13-15, 2017	**FISPACT-II**, Inventory Simulation Platform for Nuclear Observables and Materials Science	NEA headquarters, Paris, France	http://www.oecd-nea.org/dbprog/courses/fispact-c2-summary.pdf
July 3-7, 2017	Electron-Photon Transport Modelling with **PENELOPE-2014** Physics, Code Structure and Operation	University of Barcelona, Barcelona, Spain	http://www.oecd-nea.org/dbprog/courses/nsc-doc2015-3.pdf

These workshops combine teaching by the authors on program physics, along with instructions on how to use the software. The courses include a large number of practical exercises.

A course may be cancelled if a minimum enrolment is not reached one month prior to the start of the course.

Course fees are refundable up to one month before the start of the course.

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 User's Group Workshop

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

May

2017 International Symposium on Reactor Dosimetry, ISRD-16**.** May 7-12, 2017, Santa Fe, NM.

June

Annual Meeting of the Society of Nuclear Medicine and Molecular Imaging. June 10-13, 2017, Denver, CO.

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, Raleigh, NC.

U.S. Women in Nuclear Conference. July 23-26, 2017, San Francisco, CA. Website not yet available.

13th International Topical Meeting on Nuclear Applications of Accelerators (AccApp '17). July 31-August 4, 2017. Quebec City, Quebec, Canada.

September

2017 Nuclear Criticality Safety Division Topical September 10-15, 2017. Carlsbad, NM.

Nuclear Power for the People**.** September 11-14, 2017. Varna, Bulgaria.

October

Fourth International Conference on Nuclear Power Plant Life Management**.** October 23-27, 2017, Lyon, France.

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

November

International Conference on Physical Protection of Nuclear Material and Nuclear Facilities. November 13-17, 2017, Vienna, Austria.

2018 CALENDAR

June

2018 American Nuclear Society (ANS) Annual Meeting. June 17-21, 2018, Philadelphia PA.

July

HPS 63rd Annual Meeting. July 15-19, 2018, Cleveland. OH.

November

2018 American Nuclear Society (ANS) Winter Meeting. November 11-15, 2018, Orlando, FL.

2019 CALENDAR

June

2018 American Nuclear Society (ANS) Annual Meeting. June 9-13, 2019, Minneapolis, MN.

July

64th Annual Meeting. July 7-11, 2019, Orlando FL.