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DATES TO REMEMBER

Hands-On Training & Education Course Dates:
Two-week Practitioner Course Dates:
Jan 25-Feb 5, 2021 Aug 9-20, 2021

One-week Manager's Course Dates:
Apr 5-9, 2021 Jun 7-11, 2021

Course Registration:
https://ncsp.llnl.gov/tmg_apply.php

LINKS TO REMEMBER

- [NCSP Website](#)
- [NCSP Program Management](#)
- [NCSP Mission and Vision](#)
- [NCSP Five-Year Execution Plan](#)
- [NCSP Planning Calendar](#)
- [Previous NCSP Newsletters](#)
- [CSSG Taskings](#)
- [Nondestructive Assay Program](#)



Happy New Year, FY2021!

- **FY2021 – FY2025 Five Year Plan**
The Five Year Execution Plan for the Mission and Vision of the United States Department of Energy (DOE) Nuclear Criticality Safety Program (NCSP) – FY 2021 through FY 2025 has now been posted on the website, https://ncsp.llnl.gov/docs/FY21-25_NCSP_Five-Year_Execution_Plan.pdf
- **FY2021 NCSP Planning Calendar**
The FY21 NCSP Planning Calendar has been posted on the website, https://ncsp.llnl.gov/docs/NCSP_Planning_Calendar.pdf

Please note: The NCSP Technical Program Review will be held February 23 and 24 with other group-specific meetings held on February 22. The TPR will be held virtually this year. Planning efforts begin in November. More information will be coming as we draw closer to February.

Call for Proposals

The Call for Proposals for the NCSP tasks for Fiscal Years 2022 – 2026 has been issued. Proposals are due by November 13, 2020.

Because of anticipated funding limitations for FY22 and beyond, there are some preferred proposal topics.

- Integral Experiments: Safety basis support for fissile solution and powder experiments at NCERC
- Information Preservation and Dissemination: Development of a Nuclear Criticality Safety reference database beyond what is available in the NCSP website for archiving
- Nuclear Data: Nuclear data tasks focused on current, emerging, issues, e.g., pit production, thermal neutron scattering, etc.

If you would like to receive the flyer and application form, please contact Doug Bowen (bowendg@ornl.gov) or Marsha Henley (henleym@ornl.gov).

A Message from the CSSG

With what is happening in the US, and around the world, these are interesting times, but the CSSG has been proceeding safely. Since the last status, one Tasking has been completed, one is in progress, and one is being drafted. Each of these will be discussed below.

Tasking 2020-03, the review of DOE Order 420.1C, III.3.f, has been completed and issued. The Tasking response can be found on the CSSG pages of the NCSP website. In summary the Tasking provides some suggested changes for DOE O 420.1C and DOE-STD-3007. These changes should allow alignment with other DOE standards regarding NCS analysis of NPH events.

Tasking 2020-04, a CSSG review of the CD-1 submittal related to the SRPPF, for the NNSA, is in progress. As documents are being made available, they are being provided to the review team. Barring unforeseen circumstances, this effort should be completed by Thanksgiving.

Draft Tasking 2020-05, CSSG review of CSCT Draft Revision of DOE-STD-1134-99. Due to requests from within DOE, the CSCT has developed a revision to STD-1134, and has requested that the CSSG review the draft and provide feedback, prior to the revision entering the RevCom process. This effort may be in progress by the time you read this.

The CSSG is always looking for opportunities to support the NCSP and the DOE Criticality Safety Community at large. Just let the NCSP Manager, or any CSSG member, know if you see something/somewhere where you think we can assist.

David Erickson, CSSG Chair

The NCSP Criticality Safety Support Group (CSSG) will hold a Panel Session, Review of Recent CSSG Activities, during the 2020 ANS Virtual Winter Meeting (<https://www.ans.org/meetings/wm2020/session/view-213/>). Register and login to the session to hear how the CSSG is impacting criticality safety throughout the DOE complex

2020 ANS Virtual Winter Meeting

The 2020 American Nuclear Society (ANS) Winter Meeting will be held November 16 – 19, 2020. It will be a virtual meeting. Please be sure to visit, <https://www.ans.org/meetings/wm2020/> to register and update your calendar with meetings you would like to attend. The theme of this year's meeting is "Nuclear: Good for You" with the aim to highlight the myriad of ways nuclear science and technology contribute to improving our environment, health care and overall human flourishing.

The Nuclear Criticality Safety Division (NCSD) will sponsor the technical session, "Recent Nuclear Criticality Safety Program Technical Accomplishments" on Monday, November 16 from 1 – 3:10 PM EST. Presented papers include:

- "Data Testing of Polyethylene Thermal Scattering Law with New Thermal Epithermal eXperiments (TEX) Plutonium Baseline Benchmark, PU-MET-MIXED-002," Catherine Percher (LLNL), Jesse Norris (LLNL), Soon Kim (LLNL) and David Heinrichs (LLNL)

- “Bayesian Monte Carlo Evaluation Framework for Cross Sections Nuclear Data and Integral Benchmark Experiments,” Goran Arbanas (ORNL), Jesse Brown (ORNL), Andrew Holcomb (ORNL) and Dorothea Wiarda (ORNL)
- “S/U Comparison Study with a Focus on USLs,” Jennifer Alwin (LANL), Forrest Brown (LANL), Justin Clarity (ORNL), Isabelle Duhamel (IRSN), Frederic Fernex (IRSN), Luiz Leal (IRSN), Robert Little (LANL), William J. Marshall (ORNL), Michael Rising (LANL), Ellen Saylor (ORNL), and Kristina Spencer (LANL)
- “Experiments at Sandia to Measure the Effect of Temperature on Critical Systems,” Gary Harms (Sandia), David Ames (Sandia)

Integral Experiments – IER 297 Experiments at NCERC

In June, the Department of Energy’s Nuclear Criticality Safety Program (NCSP) successfully completed a series of high-priority integral experiments designed by Lawrence Livermore National Laboratory (LLNL). The experiments were constructed on the Comet Vertical Lift Machine in the Nuclear Criticality Experiments Research Center (NCERC) of the Nevada National Security Site. This series is part of the Thermal/Epithermal eXperiments (TEX) Program led by LLNL to design and execute integral experiments that span a wide range of fission energy spectra using existing NCSP fissile material assets. The experiment series was interrupted in March due to COVID-19. However, the Los Alamos National Laboratory (LANL) led team at NCERC was able to bring the facility back up and running successfully during the crisis to complete the series.

The focus of these experiments was highly enriched uranium and polyethylene, both in the form of cylindrical plates. These plates were assembled in separate top and bottom halves on Comet. The machine then brought the two halves together remotely to measure the nuclear fission taking place in the system. Preliminary analysis shows the thermal and fast configurations are in good agreement with calculation results, but the mixed and intermediate configurations are consistently underpredicted.

The goal of these experiments is to provide experimental data to validate the neutron transport codes that are used to model nuclear systems and the neutron interaction data they rely on. These experiments will also provide nuclear criticality safety practitioners with a benchmark to ensure the continued safety of nuclear material operations throughout the Department of Energy Complex. This series of experiments will be submitted as a benchmark to the International Criticality Safety Benchmark Evaluation Project for September 2021. Another series of experiments based on this design is planned for FY2021, which will include hafnium plates as a diluent material.



LANL operators setting up and aligning the bottom half of the experiment on the Comet vertical lift machine.

Critical experiment during operation (1/4" configuration) showing the diaphragm being lifted as the two halves of the experiment come into contact.



LANL operator measuring the height of the experiment prior to operation.

NCSP Management and Coordinator Role Changes

NCSP Management Team - Lori Scott

At the end of September, Lori Scott left the NCSP Management Team to focus on other work, such as the International Criticality Safety Benchmark Evaluation Project (ICSBEP) and to support other NNSA sites. Lori supported many aspects of the NCSP over her many years of support to support the Technical Support, Information Preservation and Dissemination and Training and Education NCSP Technical Program Elements, such as the NCSP website, generation of the 5-year plans, and the NCSP Mission and Vision document. We thank Lori for her hard work and dedication over the years.



LANL Task Manager – Joetta Goda



In September, we had a change in the Los Alamos National Laboratory (LANL) task manager. We say goodbye and many thanks for your hard work to Brian Bluhm who has a new position for NA-22 in Washington, D.C. We say hello and welcome to Joetta Goda.

Joetta Goda first came to LANL as a summer student in 1996. She returned in 1997 and became a critical assembly crew member and later a crew chief. Joetta received a BS in Nuclear Engineering from the University of Illinois at Urbana-Champaign and an MS in Nuclear Engineering from the University of New Mexico. She has worked primarily in the area of nuclear criticality experiments both at the Los Alamos Critical Assembly Facility (LACEF) at TA-18 and now at the National Criticality Experiments Research Center (NCERC). She is the current Principal Investigator for the Godiva IV critical assembly.

In addition to supporting the Nuclear Criticality Safety Program, Joetta has worked on the HEU Transparency Project which monitored the down-blending of HEU from Russia into feedstock for US nuclear power plant fuel and conducted research in the area of transmission measurements for determining uranium enrichment in UF₆ gas. Before becoming an NCSP Task Manager, Joetta served as the LANL Program Manager for Material Management and Minimization (NA-23) for several years.

IRSN Task Manager – Sophie Pignet

As we say goodbye to Isabelle Duhamel who is taking a new position with the “Institut de Radioprotection et de Sûreté Nucléaire” (IRSN) Severe Accident department, we welcome Sophie Pignet as the new NCSP task manager for IRSN. Sophie Pignet works at IRSN as the Head of the neutronics and criticality safety department. IRSN is the French public expert on nuclear and radiological risks, providing expertise and research projects to French public authorities and the public at large.



She has over 25 years of experience working on activities in connection to nuclear safety in France. At IRSN, she has had various responsibilities in research project ranging from severe accident, thermal hydraulics and reactor physics. She was responsible for the assessment of french PWR 4th 10-year periodic safety review related to severe accident.

She is a graduate from ISAE-SUPAERO, top French aerospace engineering school.

Donnette Lewis Retirement from LANL

At the end of September, Donnette Lewis retired from LANL to take a new job in the federal system. This will allow Donnette to spend more time with her husband, Jeff, who recently retired from MSTs. We thank Donnette for her support to the NCSP over the years and wish her the best in her new position.



Non-NCSP IERs Point-of-Contact – Lauren Spirodek (LANL)

At the end of September, Donnette Lewis announced her retirement from LANL and new work in a federal capacity. Lauren Spirodek is assuming Donnette's responsibilities to track and report progress on non-NCSP IERs. Lauren works for Los Alamos National Laboratory as a Quality Assurance Analyst for the National Criticality Experiments Research Center (NCERC) located at the Device Facility Assembly at the Nevada National Security Site (NNSS). Lauren has a BS in Business Administration and has worked with Nuclear Management since 2016. She joined the NCERC team in 2018 and supports Non-NCSP funded projects at the NNSS. She believes the most rewarding part of her job is conducting work that directly impacts the DOE mission and receiving recognition for it.



2020 SCALE Users' Group Workshop

Oak Ridge National Laboratory (ORNL) recently held their 4th annual SCALE Users' Group Workshop, July 27 – 29, 2020 using a virtual platform. The workshop provided a highly interactive forum for a fruitful exchange between SCALE users and developers and included a mix of short presentations, open discussions and tutorial sessions. End users were invited to participate in the meeting and contribute with presentations on impactful and innovative applications of SCALE.

Topical areas discussed included criticality safety, reactor physics, depletion and source terms, radiation shielding, nuclear data, and sensitivity and uncertainty analysis. A morning plenary session was held day one of the meeting. For the afternoon of day one and day two, there were two concurrent tracks. The two concurrent tracks were: (1) technical presentations and (2) hands-on tutorials. On day three, tutorials were held in the morning and a closing session in the afternoon.

Eight tutorials, two hours each, were presented. The instructors and participants interacted individually through breakout rooms of the platform used for the virtual meeting. To be able to participate in the tutorials, registrants were required to have an individual user license for SCALE 6.2.

In addition, a Best SCALE Model Contest was held. Javier Alonso Sanz with INGENICID, Spain was the winner of the best of non-ORNL models while Mike Smith was the winner of the best of ORNL models.

Please visit the 2020 SCALE Users' Group Workshop website, <https://www.ornl.gov/content/2020-scale-users-group-workshop>, to access presentations, models and tutorials.

Training and Education

NCSP Hands-on Training and Education Courses

*** At this time the training will be in person and not virtual. Planning efforts have begun on a virtual lecture portion (1st week) of the course.*

A special Y-12 is being held (lecture week in September and hands-on week in November) to train about a dozen Y-12 staff scheduled to be trained early in the year. ORNL and SNL instructors conducted this course over a 2-day period with the NCSP Manager's approval.

Two-week Practitioner Course Dates:

Jan 25-Feb 5, 2021 Aug 9-20, 2021

The NCS Practitioners Courses will be held at the National Atomic Testing Museum (NATM), the National Criticality Experiments Research Center (NCERC) and Sandia National Laboratories in Las Vegas, Nevada. The courses are designed to meet the ANSI/ANS-8.26, "Criticality Safety Engineer Training and Qualification Program," requirement for hands-on experimental training. The NATM portion of the course involves classroom lectures and workshops for NCS Evaluation development and the NCERC and SNL portions of the course involve experiments with the critical assemblies. MSTS, LANL, ORNL, LLNL, SNL, Y12 and NFO staff participate in the course execution.

One-week Manager's Course Dates:

Apr 5-9, 2021 Jun 7-11, 2021

The Managers courses will be held at both NCERC and SNL. THE courses are designed for fissile material handlers, process supervisors, line managers and regulators with criticality safety responsibilities. MSTS, LANL, ORNL, LLNL, SNL, Y12 and NFO staff participate in the course execution.



Class Information: <https://mcnp.lanl.gov/classes/classinformation.shtml>

Fees and Registration Information:
<https://laws.lanl.gov/vhosts/mcnp.lanl.gov/classes/CostsRegistrationInfo.shtml>

Oct 19 - 21, 2020	Criticality Calculations with MCNP6 (online)
Nov 30 – Dec 4, 2020	Introduction to MCNP6 (online)
Dec 14 – 16, 2020	Variance Reduction with MCNP6 (online)



Course Information: <https://www.ornl.gov/scale/training>

Current plans are to have courses February 22 – March 19, 2021.

Planned courses include:

- SCALE Criticality Safety and Radiation Shielding Course
- SCALE/ORIGEN Standalone Fuel Depletion, Activation, and Source Term Analysis Course
- SCALE/Polaris Lattice Physics, Depletion, and Uncertainty Analysis
- SCALE Computational Methods for Burnup Credit