Minutes for Wednesdays Phone Call, September 4, 2019; the start time is 9:00 am pacific time, directions below. I would like to remind everyone that this phone call is open to all criticality safety professionals whether they are affiliated with DOE, commercial industry, or international. The goal is to share lessons learned and talk about common interests (although we do need to spend some time on DOE-related activities).


ANS Nuclear Criticality Safety Division is seeking Nominations for Service to Community and Technical Excellence awards.

I want thank Darwin for providing his notes.

Comments by DOE

Update on NCSP business

Below is my understanding of the status of the ANS standards; things are relatively active new. Part of the reason I have added this section to the agenda is remind NCS professionals that a fraction of the standards are in revision at any time. A key element to being in the community is to understand what is in the standards, I think the best way to understand the standards is to get involved in the writing group as either a member, associate member (designed for new professionals), or observer.

- 8.1 Criticality Safety Operations. Recently reaffirmed, PINS approved for revised ANSI-8.1 in August. New Calculations are being prepared for the new version. An ANSI-8.24-compliant validation approach will be developed to define and document the bias and bias uncertainties for each of the SCL to help end users understand the basis behind each limit.
- 8.3 Criticality Accident Alarm System. Reaffirmed 2017. A new version is out for ballot to ANS 8 subcommittee. A formal question has been submitted. The clarification is in development.
- 8.5 Raschig Rings – Reaffirmed 2017, In Maintenance mode Likely to be withdrawn when 8.21 approved
- 8.6 Subcritical Measurement in Situ – Reaffirmed in 2017 in Maintenance. This standard will likely be used for some operations in the LANL Pu facility in the near future to, in part, demonstrating its usefulness to the community.
- 8.7 storage arrays – Revision in Progress.
- 8.10 Operations with shielding and confinement – Will likely submit a reaffirmation followed by a PINS to revise. Started an email and phone call discussions. WG chairs from ANS 8.1 and 8.23 were invited to participate. There was significant discussion on the CSSG comments and how a facility should address evacuations.
- 8.14 Use of soluble absorbers – A clarification has been issued, look for it in nuclear news. Kristin Wessels has volunteered to be working group chairman. Larry Berg has stepped down.
- 8.15 Special Actinides – in maintenance. No revision anticipated anytime soon. Reaffirmation ballot at NCSCC.
- 8.17 LWR Fuel Outside Reactors – Reaffirmation ballot at NCSCC. Volunteers needed to support a new revision. Ellen Saylor is the new WG chair.
- 8.20 Training for Operations Staff – A new version should be submitted to ANS-8 for balloting soon.
- 8.21 neutron absorbers - Sent out for reaffirmation in November – NCSCC comments on new version are being resolved.
- 8.22 Moderator control – reaffirmed 2016 – In maintenance - Pins form being balloted to start the revisions process.
- 8.23 Accident Planning and Response – NCSCC reached consensus with 4 negative votes
- 8.24 Validation – Revised 2017 – in maintenance
- 8.26 criticality engineer training – Reaffirmed 2016 – Met at ANS Meeting, the current plan is to circulate the current version with the writing group for comments.
- 8.27 burnup credit – in maintenance – may need new members for next revision
- 8.28 NDA – A new version has been balloted by ANS 8, several comments were received. Weekly telecons in progress to address ANS-8 comments

Discussion of the EFCOG criticality safety task group annual work plan.

**EFCOG Working Group Planned Activities for FY 2020**
*(October 1, 2019 – September 30, 2020)*

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<th>Activity(s)</th>
<th>Benefit(s)</th>
<th>Deliverable/Key Milestone(s)</th>
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<tr>
<td><strong>3.0 Nuclear &amp; Facility Safety</strong></td>
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<td>Criticality Safety</td>
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**Develop a best practice paper on criticality safety calculations using Monte Carlo codes. This will include guidance on number of neutrons per generation, number of generations to run, and source convergence.**

Provide Monte Carlo methods to enhance the methods currently used at individual sites. Consistently applied methods across the contractor community in the DOE complex. Knowledge Transfer

**Comments during the phone call:** Forrest Brown, LANL, and BJ Marshall, ORNL, have been providing 1 day seminars that need to shared to a wider audience. This seminar

Best Practice Paper - Criticality safety calculational methods using Monte Carlo codes. September 30, 2020
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<tr>
<td>Develop a white paper on fission gram equivalent or plutonium gram equivalent, advantages and disadvantages</td>
<td>Provide gram equivalent methods discuss to ensure proper consideration and use. Consistently applied methods across the contractor community in the DOE complex. Knowledge Transfer Comments during the phone call. Several organizations have identified that they have a version of FGE or PGE and have offered them for the white paper. I expect this white paper will have an extensive review.</td>
<td>White Paper - Fissile gram equivalent or plutonium gram equivalent, advantages and disadvantages. September 30, 2019</td>
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<td>Develop a guide for N&amp;FS on how to effectively share lessons learned across the complex, specifically how similar events could happen at other sites.</td>
<td>Improved sharing of lessons learned to contractors across the DOE complex. Knowledge Transfer Comments during the phone call. This is a white paper version of my presentation at ANS.</td>
<td>Guide – Effective sharing of lessons learned. September 30, 2020</td>
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<td>Develop a best practice paper for correct level of treatment of criticality safety and controls in DSA and TSRs versus implementing as programmatic controls based on NNSA CTA position memo (15Jul19) on Considering D/EBE in CSEs per DOE O 420.1C, Chg. 2, Facility Safety, and EM CTA comment to EFCOG N&amp;FS Chair.</td>
<td>Consistency across DOE complex in how criticality safety requirements are handled in the DSA, and in how the latest DOE guidance on the subject is implemented. Comments during phone call. The paper will draw heavily on DOEMS 3009 and 3007 along with the comments on the CTA position memo. In addition, the site criticality safety will need to provide a maximum source term for a criticality accident.</td>
<td>Best Practice Paper – Treatment of Criticality Safety and Controls in DSAs and TSRs versus Implementing as criticality program controls. September 30, 2020</td>
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**Early Career**

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<td>Comments during the phone call. ANS Nuclear Criticality Safety Division education committee has been developing a Mentor program and is rolling out the mentor match at the November ANS meeting. This might be a good template for the young members activity.</td>
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**New business** - None was brought up. I hope the people who went to France for NCSD will provide a brief overview of the conference.
The following are the 100 word summaries for the criticality safety sessions at this meeting.

**Session Title: “ANS-8 Standards Forum”**  
**Session Type:** Discussion  
**Session Organizer:** Doug Bowen (ORNL)  
**Summary:** Subcommittee ANS-8, Operations with Fissile Material Outside Reactors, meets to discuss various technical and administrative aspects of the approximately 20 national consensus standards under its purview. In addition to status and progress updates by representatives of individual working groups, formal presentations on the technical bases of numerical values such as subcritical limits and experiences with applications of particular standards are solicited. Agenda topics such as new and expanded standards are also encouraged.

**Session Title: “Recent Nuclear Criticality Safety Program Technical Accomplishments”**  
**Session Type:** Contributed Papers  
**Session Organizer:** Lori Scott (SAIC)  
**Summary:** The Nuclear Criticality Safety Program (NCSP) has been doing interesting technical work supporting the DOE criticality safety enterprise, as well as benefiting the nuclear community as a whole. There are few opportunities to learn about these efforts since they cannot all be presented at an ANS meeting. However, an NCSP Technical Seminar was held. The goal of this seminar was to have each NCSP Task Manager present their technical results from FY 2018. Specifically, the presentations provided a summary of: the work that was done; why the work was done; and who benefited from the work or could potentially benefit across the DOE as well as the nuclear complex. This led to an opportunity for the NCSP to showcase outstanding NCSP technical accomplishments and as a result, the best technical results that will have the most benefit to the nuclear community as a whole have been compiled and those presenters will provide these technical results at the 2019 ANS Winter Meeting.

**Session Title: “Impacts to Criticality Safety from Recent Revisions to DOE Standards”**  
**Session Type:** Panel  
**Session Organizer:** Kevin Kimball (CNS retd), John Miller (SNL), Andrew Prichard (PNNL)  
**Summary:** Over the last couple of years, there have been several changes to DOE Orders and Standards that impact Nuclear Criticality Safety (NCS) practices (e.g., 420.1C, 3009, 3007). NCS programs across the complex are starting to implement these changes. This Panel session will have experts from various sites across the complex to discuss the basis and reasoning behind the changes, how these changes were/are being implemented and the lessons learned during implementation. The Panel will also explore any unintended consequences from these changes and if the expected benefits from these changes were realized.

**Session Title: “Implications of NCS Analysis Process Drift”**  
**Session Type:** Panel  
**Session Organizer:** Andrew Prichard (PNNL)  
**Summary:** All new processes with fissionable material are evaluated for criticality safety before operations are started; a common problem is that with time the processes change. This panel session will discuss specific operations, the types of changes that have occurred, and the impact of process drift on the criticality safety. The focus of the panel session identify lessons learned and how they might apply to other organizations.

**Session Title: “Critical and Subcritical Experiments”**  
**Session Type:** Contributed Papers  
**Session Organizer:** Jesson Hutchinson (LANL)  
**Session LEAD sponsor:** NNPD [not submitted by NCSD]  
**Summary:** Critical and subcritical experiments are performed every year to support a variety of national security missions, including nuclear nonproliferation, counter-proliferation, criticality safety research and development, nuclear
emergency response, and a variety of hands-on training. Papers on critical and subcritical experiments (design, measurement, analysis, methods) will showcase current work in this area.

**Session Title: “Introduction to NCSD Mentor Match”**
Session Type: Discussion
Session Organizer: Deb Hill (UK NNL); Hannah Morbach (BWXT); Jennifer Alwin (LANL)
Summary: This session will describe the NCSD Mentor Match program, which leverages a modular framework to connect mentors and mentees based on past experience, desired skillsets, and communication preferences. NCSD Mentor Match allows participants to focus on areas such as calculational methods, conducting walkdowns, writing CSEs, responding to reviewer and/or regulator questions/comments, CAAS analysis, validation, in situ experiments, work/life balance, university teaching, hand calculations, presenting at ANS meetings, critical experiments, solution processing analysis, vault storage analysis, understanding ANS standards...to name a few. The program will also connect participants based on communication preferences and identify expectations for the program.

**Session Title: “Data, Analysis and Operations in Nuclear Criticality Safety”**
Session Type: Contributed Papers
Session Organizer: Theresa Cutler (LANL)
Confirmation Number: Summary: The purpose of this session is to provide a forum for timely presentation of general issues in the area of nuclear criticality safety that are not covered in other special session topics.
*likely 2 sessions based on number of papers submitted
What are you going to present.

The following are the 100 word summaries for the sessions. Now is the time to start writing your papers for the annual meeting.

**Session Title:** “ANS-8 Standards Forum”  
Session Type: Discussion  
Session Organizer: Doug Bowen (ORNL)  
Summary: Subcommittee ANS-8, Operations with Fissile Material Outside Reactors, meets to discuss various technical and administrative aspects of the approximately 20 national consensus standards under its purview. In addition to status and progress updates by representatives of individual working groups, formal presentations on the technical bases of numerical values such as subcritical limits and experiences with applications of particular standards are solicited. Agenda topics such as new and expanded standards are also encouraged.

**Session Title:** “Sharing of Good Industry Practices and/or Lessons Learned in Nuclear Criticality Safety”  
Session Type: Panel  
Session Organizer: Deb Hill (NNL)  
Fundamental to the successful operation of any nuclear site is a first class safety culture which strives to continually improve in response to good industry practices and operating experience feedback. Speakers will provide examples of either specific good practices and/or lessons learned at their site, following which an audience discussion will be initiated on alternative good practices and experiences in these areas.

**Session Title:** “New Developments in Shipping Packages Related to Criticality Safety”  
Session Type: Panel  
Session Organizer: Marvin Barnett (SRS), Doug Bowen (ORNL), Lon Paulson (GEH), Andrew Prichard (PNNL)  
Summary: Over the last decade(s) there have been many new Type A and Type B shipping packages designs and new allowed fissile contents. Both ANSI/ANS Standards and the Code of Federal Regulations require an evaluation of criticality safety for each combination of shipping package configuration and content. The purpose of this session is to provide a discussion of the unique challenges and requirements for criticality safety during both transport and storage of shipping packages.

**Session Title:** “Balancing Competition and National Needs in the Medical Isotopes Market”  
Session Type: Panel  
Session Organizer: Joe Christensen (SHINE), Katherin Goluglu (Isotek)  
Summary: This session addresses the growing field of medical isotope production and the implications for criticality safety. The field involves a number of emerging techniques and technologies which produce criticality safety challenges, INCLUDING handling high-assay low-enriched uranium in known or new chemical compositions. These challenges create opportunities for advancements in criticality safety techniques and demonstrate a continuing need for nuclear data. This panel is designed to highlight challenges, advancements, and current or future needs in the field of criticality safety for medical isotope production facilities.
Session Title: “Review of Recent CSSG Activities”
Session Type: Panel
Session Organizer: David Hayes (LANL)
Summary: The Criticality Safety Support Group (CSSG) was formed in response to Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 97-2, *Continuation of Criticality Safety at Defense Nuclear Facilities in the Department of Energy (DOE) Complex*. The CSSG functions as the technical support group to the DOE Nuclear Criticality Safety Program (NCSP) Manager, providing operational and technical expertise pertinent to the criticality safety needs of DOE missions. This expertise is relevant to integral experiments, nuclear data, analytical methods, training, and organizational structures supporting the development and execution of the NCSP. Additionally, the scope of CSSG activities also includes reviewing:

- Activities or conditions that have the potential for serious degradation of nuclear criticality safety at DOE facilities
- New nuclear facility designs where criticality is a credible hazard
- New or revised DOE orders, standards and guides related to criticality safety
- Contractor nuclear criticality safety programs at DOE facilities in support of DOE line management

While most CSSG Taskings and Responses are openly available, they are not often discussed in an open forum. This session will include an open discussion of recent CSSG activities to help the nuclear criticality safety community better understand the work and current issues around the DOE Complex.

Session Title: “Data, Analysis and Operations in Nuclear Criticality Safety”
Session Type: Contributed Papers
Session Organizer: Theresa Cutler (LANL)
Summary: The purpose of this session is to provide a forum for timely presentation of general issues in the area of nuclear criticality safety that are not covered in other special session topics.
Join by Phone
On-campus PNNL staff dial 5-4555
855-375-2121 or 509-375-4555

Conference ID: 7547027