



American Nuclear Society

Nuclear Criticality Safety Division Newsletter

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Message from the Chair

Robert Wilson, NCSD Chair

The many thousands of lives lost this month due to terrorist acts stuns us whose professional purpose is based on the value of human life. Our response must be to work yet more diligently to affirm our commitment to life.

Nuclear Criticality Safety.

Those of us who practice nuclear criticality safety came to the field from many educational backgrounds. We have degrees in nuclear physics, mathematics, nuclear engineering, chemical engineers and others. As we have no natural academic home to acquire our skills, we seem to realize more than most the value of learning from others with our job description and support professional meetings with unusual enthusiasm. The richness of our diversity has contributed to the vigor of our discussions about approaches to criticality safety. From the beginning, we have understood that the limits and controls we establish to support nuclear operations have their basis in nuclear data and experiments. Our craft is dependent on accelerators and critical mass laboratories and will continue to be if we are to improve. As we wish to improve because we are professionals, we are deeply concerned about the vulnerability of facilities that measure things. Many in our field no longer work for an owner or operator of nuclear facilities, but are contract employees without traditional human resources protections for reporting unwelcome news. We

need to increasingly provide community support as individuals make difficult decisions. The need for a clear vision of professional ethics remains a part of our careers.

Nuclear Criticality Safety Division

Although the larger society has struggled with maintaining membership, our Division's participation has progressed upward for decades and has currently stabilized at somewhat over 600. Our strength is based on a three decade history of solid leadership, a membership and tradition which values professional development, and our inherent understanding that the difficult decisions our jobs demand require discussion and reflection in community. We would be stronger still if the other colleagues who practice our craft would join us. Please continue to encourage membership in our Society and Division. Participation in the relevant technical society is a reasonable expectation of a conscientious professional.

At the June meeting, the Division's Executive Committee approved two initiatives for the Division. The first was a proposal to sponsor local meetings of the Division. The Division's strength is within its active membership. We have over 600 members and about 10% are able to attend a national meeting. We wish to provide additional services for the 90% who do not benefit from the technical sessions we sponsor. Local meetings would be especially valuable in geographic

areas with criticality specialists in multiple organizations. It was agreed that each officer and executive committee member would assume responsibility for an inaugural meeting in their geographic area and report back at the Reno meeting on the lessons learned. If the results are positive then we will propose that a "local committee" coordinator to become an appointed Division position. Promotion of local meetings would then become a Division objective.

The second initiative was a mechanism to address perplexing professional issues. Our technical program sessions deal with significant issues in nuclear criticality safety. Often, a white paper on the issue could be developed from the presentations and expertise of the session chair and authors. The collected wisdom of the Division would

then be documented on various issues. Mikey Brady-Raap was tasked with developing this activity and a committee was appointed.

I would be most interested in your thoughts on the initiatives, and hopefully on ways to make them succeed.

NCS D Topical Meeting

Steve Bowman, General Chair
Fitz Trumble, Technical Program Chair
<http://ncsd.ans.org/topical>

Sixty-five papers were accepted for the Nuclear Criticality Safety Division 2001 6th Topical Meeting. The Meeting is to be held November 11-15, 2001 in Reno, Nevada, and will be an embedded topical held along with the ANS Winter Meeting. The preliminary program is available

on the Topical Web Site at <http://ncsd.ans.org/topical>.

Authors should remember to submit a hard copy of their full papers as well as the ANS copyright and ANS cover page directly to ANS as soon as possible. An NCS D dinner will be held Tuesday, November 13 in conjunction with the Topical Meeting. See below for details on the dinner.

Program Committee

Mark D. DeHart

The ANS Annual Meeting is scheduled for June 9-13, 2002, in Hollywood, Florida. The NCS D sessions are below and paper submittals are due at ANS Headquarters by January 3, 2002. See www.ans.org for a copy of the Call for Papers.

Data and Analysis for Nuclear Criticality Safety. This session is the general session for NCS D papers, which do not fit any other session topic. For more information contact Mark DeHart, (865-576-3468, dehartmd@ornl.gov).

Nuclear Criticality Safety Standards Forum – Panel

Session Organizer: Tom McLaughlin (505-667-7628, tpm@lanl.gov)

Technical Bases for ANS-8 Standards

Session Organizers: Adolf Garcia, (208-526-4420, GarciaAS@id.doe.gov) and Mike Westfall, (865-574-5267, WestfallRM@ornl.gov)

Nuclear Needs for New Initiatives

Session Organizers: Hans Toffer, (509-376-5230, HToffer@aol.com) and Bob Schaffer

Nuclear Criticality Safety Division (2001-2002)

Officers

Chair: Robert Wilson, <robert.wilson@rf.doe.gov>
 Vice Chair: Michael Brady-Rapp, <michael.bradyraap@pnl.gov>
 Secretary: Christa Reed, <christareed@att.net>
 Treasurer: Tom Doering, <tdoering@epri.com>

Executive Committee and Committee Chairs

2002 Kathleen Bhanot, International Relations, <keb3@bnfl.co.uk>
 2004 Mark DeHart, Program Committee, <dehartmd@ornl.gov>
 2004 Paul Felsler, Publications, <paul.felsler@rfets.gov>
 2002 Kevin Kimball, <kkimball@nisyscorp.com>
 2003 Jerry McKamy, Membership, <jerry.mckamy@eh.doe.gov>
 2003 Lon Paulson, Education <lon.paulson@gnf.com>
 2003 Valerie Putman, Honors and Awards, <vputman@inel.gov>
 2004 Chris Robinson, <y12.doe.gov>
 2002 Richard Taylor, <rgt@ispchannel.com>
 Mark DeHart, Program Committee Chair, <dehartmd@ornl.gov>
 Thomas McLaughlin, ANS-8 Chair, <tpm@lanl.gov>
 Jack Bullington, Nominating Committee Chair, <jack.bullington@srs.gov>
 John Schlessler, ANS-8 Liaison, <john.schlessler@srs.gov>
 R. Michael Westfall, Fellow Award-Coordinator, <we@ornl.gov>

Overview of Burnup Credit Issues and Approaches – A Tutorial. Session Organizer: Mikey Brady Raap, (509-375-3781, Michaele.BradyRaap@pnl.gov), and Cecil Parks, (865-574-5280 parkscv@ornl.gov)

News & Announcements

- The 8.26 Working Group will meet during the upcoming Topical meeting at 0700 on Tuesday, November 13 in the Roby 1 room.
- "NuclearSafety Associates will sponsor a hospitality suite during the Reno conference on Wednesday, November 14, from 4:00 - 7:00pm. Check the conference bulletin board for the location."

NCS Division Dinner

In association with the "Practical Implementation of Nuclear Criticality Safety" Embedded Topical, the Nuclear Criticality Safety Division (NCS) will have a social gathering Tuesday night, November 13, at one of Reno's best restaurants, Cafe Soleil, located above Reno in the Sierra Foothills at McCarran & Caughlin Pkwy. The Restaurant has a wonderful view of the city, casual atmosphere and unique dishes.

The cost of the dinner is \$22 per person. You may purchase tickets in advance when you register for the topical meeting. Thanks to the sponsors, the price includes dinner, gratuity, taxes, and shuttle bus transportation between the hotel and restaurant. Contact Maria LeTellier at

mslcse@gateway.net for more information. The NCS thanks NISYS Corporation, Westinghouse Safety Management Solutions, Navarro Research, C. S. Engineering, PAI Corporation, and iNM Nuclear Safety Services for sponsoring the dinner.

A Standard for Training and Qualification of Criticality Safety Engineers, ANSI/ANS-8.26

James Morman

Development of a standard for the training and qualification of nuclear criticality safety engineers has long been a topic of discussion within the criticality safety community. The training working group of the Nuclear Criticality Technology Safety Project often debated the usefulness of establishing a unified standard for the qualification and certification of criticality safety professionals. Two standards within the ANSI/ANS-8 series treat criticality safety training, ANSI/ANS-8.20, *Nuclear Criticality Safety Training*, and ANSI/ANS-8.19, *Administrative Practices for Nuclear Criticality Safety*, but neither contains sufficient detail for establishing criticality safety engineer training programs.

The Department of Energy (DOE) has issued DOE-STD-1135-99, *Guidance for Nuclear Criticality Safety Engineer Training and Qualification* and the Nuclear Regulatory Commission (NRC) adopts the ANSI/ANS-8 Standards in Regulatory Guide 3.71 (1998).

At this point in time, however, there is no high-level guidance that can be uniformly adopted by DOE, NRC and contractor sites as defining the standard for training and qualification of criticality safety engineers. With the goal of creating such a standard, it was moved at the March 2000 meeting of ANS-8 that a new working group be formed to develop an ANSI/ANS Standard for the training and qualification of criticality safety professionals. In July 2000, the formal request was submitted to initiate the project and approval was voted by ANS-8 at the end of August to pursue development of ANSI/ANS-8.26, *Criticality Safety Engineer Training and Qualification Program*. The goal of the ANS-8.26 working group is to develop a Standard that captures all of the required competencies for criticality safety engineers without being overly prescriptive in how those competencies are to be achieved. The Standard will attempt to identify training requirements that balance the need for appropriate academic background with the need for actual operating-floor experience. Although still in the early stages of development, several important principles have been identified as being essential to this Standard. The qualification program should be transferable between sites. That is, once the basic training requirements have been achieved, there should be no need to repeat them at another site that applies the same Standard. Only site-specific training would have to be completed. Training by experience must be taken into account. Many experts in the field of criticality safety have gained their expertise through years of hands-on experience, not by

earning advanced degrees. Interactions with operating personnel and facility management must be stressed. The role of the criticality safety engineer is to assist operating personnel to minimize the risk of a criticality accident by establishing appropriate controls and limits. To effectively do this, criticality safety staff must spend adequate

time in the operating facilities working with their staff.

There is considerable overlap in the memberships of the NCSD Education Committee and the ANSI/ANS-8.26 working group. With this broad representation of criticality safety specialists, who interact with an even broader base of criticality safety engineers, the

ANS-8.26 working group expects that this Standard will develop into one that defines a qualified criticality safety engineer without imposing undue constraints on management or the criticality safety staff, and will minimize the necessity for repeated training as people move ahead in their careers.

NCS Courses

University of Tennessee, Knoxville – CERTIFICATE IN NUCLEAR CRITICALITY SAFETY

The Department of Nuclear Engineering at the University of Tennessee offers a graduate certificate program in nuclear criticality safety. The program is designed primarily for part-time students in that the courses are available in the evening through distance education via synchronous, interactive delivery on the web. The program is intended to provide a good foundation for further additional training such as on-the-job and site-specific training that is required by most nuclear organizations.

The 12-credit hour certificate (i.e., four 3-hour graduate courses) is earned by completing NE 421 (Introduction to Nuclear Criticality Safety), 543 (Selected topics in Nuclear Criticality Safety), and 582 (Monte Carlo) plus one of the following three courses: 470 (Reactor Theory I), 571 (Advanced Reactor Physics), or 581 (Deterministic Radiation Transport). The selection of one of the latter three courses is determined through an advising conference with each individual student, and is based on the student's academic background and work experience. Criteria for acceptance into the program are the same as for acceptance into the M.S. program in nuclear engineering. Students without a nuclear engineering background must take NE 301 (Fundamentals of Nuclear and Radiological Engineering) prior to beginning the graduate coursework described above. All of the above graduate courses may also be applied toward satisfying the requirements for the MS degree in nuclear engineering, which is available entirely online.

Contact UT Nuclear Engineering Department utne@tennessee.edu or (865) 974-2525 or visit <http://www.anywhere.tennessee.edu/ne/default.htm> for more information.

SCALE Training – Contact Kay Lichtenwalter at x4s@ornl.gov or (865) 574-9213 or visit <http://www.cped.ornl.gov/scale> for more information on the following courses:

October 15-19, 2001

SCALE Shielding Source Terms

In-depth introduction to SCALE shielding and depletion/decay sequences (including ORIGEN-ARP)

October 22-26, 2001

SCALE KENO-V.a Criticality Course

In-depth introduction to CSAS/KENO V.a