



Fall 1998

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Christa Boman, Editor  
Cecil Parks, Associate Editor

# American Nuclear Society Nuclear Criticality Safety Division Newsletter

## Message from the Chair

*Cecil Parks*

Nuclear criticality safety remains a vibrant and challenging area in which to work. The increased accountability that NCS professionals must often demonstrate both in the preparation and review of safety evaluations can provide significant challenges even for the most experienced in the field. And despite the end of the Cold War and the lack of growth in the nuclear power industry, there seems to be an increasing diversity of situations and problems that relate to criticality safety. However, there are continuing concerns that there is a shortage of information, knowledge, and experience pertinent to many of these diverse situations. Thus, it is more important than ever that NCSD strive to facilitate communication to assure a continued exchange of technical, regulatory, and policy information that aids professional development and awareness. I am hopeful that each of you will seek to present pertinent technical information within the framework of ANS-sponsored meetings and journals. Steve Bowman is initiating planning activities for our next NCSD Topical in 2001 and the NCSD Program Chair, Ron Marble, continues to plan national meeting sessions sponsored by NCSD. Please contact either of these individuals or me to contribute ideas for future technical sessions at national or topical meetings. Similarly, I'm sure Jerry McKamy, the new Chair of our Education Committee, would appreciate your input on how to provide opportunities for professional growth of our membership. And of course your ideas on how to facilitate professional discussions on regulatory and policy issues are always welcome.

It is the activity and communication of the membership and the efforts of all

those who have gone before me that have made NCSD such a dynamic professional division. The need for the professional growth and information exchange within our Division is greater than ever. I would welcome your feedback on ways the Division can help prepare you to meet the challenges you face.

## Electronic Paper Review

*Mark DeHart, Ron Marble*

The NCSD program committee is investigating the possibility of a transition to an electronic paper review format via the World Wide Web. This technology will reduce the number of people required to attend a paper review, and hopefully will increase the participation of potential reviewers who do not have funding support for travel to paper reviews. Although some reviewers will still be required at the paper review meeting to take care of other administrative issues, it is expected that only a few will need to attend.

A proposal for a web site for facilitating electronic review, together with the mechanisms for electronic paper submission, will be presented to the Division Executive meeting in Washington. If approved, the web site will be set up and put in place for a trial review for the Boston paper review (early 1999).



## Education Committee

*Jerry McKamy*

The Education Committee members are: Adolf Garcia, Jim Morman, Lee Dodds, Bob Busch, Lon Paulson, Jim Mincey, Dennis Damon, Jack Davis, Mikey Brady, Donna D'Aquila, George Bidinger, Wayne Andrews, and Ron Knief. The Committee will work on training and qualification of criticality safety engineers, developing workshops and short courses to fill in gaps in existing curricula, and promoting consistency across regulatory and organizational boundaries. At the November meeting a mission/vision statement for the committee will be approved and planning will begin for the committee's activities. The Committee will meet at 9:30 AM on Monday, in the Park Tower, Rm. 8126.

## Program Committee

*Ron Marble*

**The ANS Winter Meeting** is scheduled for November 15-19, 1998, and will be held in Washington, DC. The sessions being sponsored by NCSA are: 1) Data and Analysis for Nuclear Criticality Safety; 2) Criticality Evaluations of Potentially Deteriorated Fissile Material Systems; 3) Criticality Safety Analysis of Interaction Between Fissile Units and 4) Burnup Credit.

**The ANS Annual Meeting** is scheduled for June 6-10, 1999, in Boston, MA. The sessions being sponsored by the NCSA are described below and paper submittals are due at ANS Headquarters by January 8, 1999. Please contact the session organizer, or Ron Marble, if the paper submittal will be delayed beyond

that point.

**1. Data and Analysis for Nuclear Criticality Safety.** This session is the general session for NCSA papers, which do not fit any other session topic. For more information, **contact Ron Marble (423-574-6059).**

**2. The Place of Deterministic Codes in a Monte Carlo World.** The session will address new and evolving applications in complex problem domains for which Monte Carlo transport simulations are less than adequate, and in which deterministic methods are being applied. Monte Carlo methods have become the established norm in many criticality safety applications due to the power of Monte Carlo to accurately simulate radiation transport in large and complex geometrical configurations. Papers are sought which discuss new and innovative application of deterministic methods in problems that are generally considered to reside in the Monte Carlo world. **For additional information, contact Robert Singleterry (757-864-1437) or Mark DeHart (423-576-3468).**

**3. Use of Risk-Informed Methodology in Nuclear Criticality Safety.** NRC proposed changes to regulations include the establishment of a risk-informed regulatory framework. Performance objectives (consequence and likelihood criteria) will be established and performance of an Integrated Safety Analysis (ISA) will be required. This session seeks papers from both the regulatory agency and current or future NRC licensees or certificate holders in the area of guidance or examples of application of risk-informed regulation in the area of nuclear criticality safety. Examples of nuclear criticality safety assessments (practice or actual) are desired. For additional information, **contact Donna D'Aquila (740-897-4076) or John Massari (702-295-4438).**

**4. Nuclear Criticality Safety in the Mixed Oxide (MOX) Cycle.** The United States is moving toward a Mixed Oxide (MOX) Cycle as a means of

## *Nuclear Criticality Safety Division (1998-1999)*

### Officers

Chair: Cecil Parks (ORNL, 423-574-5280, [cvp@ornl.gov](mailto:cvp@ornl.gov))  
Vice Chair: Doug Croucher (RFET, 303-966-2175, [douglas.croucher@rfets.gov](mailto:douglas.croucher@rfets.gov))  
Secretary: Trent Primm (ORNL, 423-574-0566, [rtp@ornl.gov](mailto:rtp@ornl.gov))  
Treasurer: Jack Bullington (WSMS, 502-744-9767, [jack.bullington@wsms.com](mailto:jack.bullington@wsms.com))

### Executive Committee and Committee Chairs

1999 Francis M. Alcorn, (BWXT, 804-522-5157, [fmalcorn@aol.com](mailto:fmalcorn@aol.com))  
2001 Christa Boman, Publications/Newsletter, (BWXT, 925-422-2272, [boman1@llnl.gov](mailto:boman1@llnl.gov))  
2000 Steve Bowman, Liaison to 2001 Topical, (ORNL, 423-574-5263, [st5@ornl.gov](mailto:st5@ornl.gov))  
2001 Tom Doering, Membership, (702-295-4382, [Thomas\\_Doering@notes.ymp.gov](mailto:Thomas_Doering@notes.ymp.gov))  
2000 Song Huang, Awards, (LLNL, 925-422-6516, [huang3@llnl.gov](mailto:huang3@llnl.gov))  
2001 Kevin Kimball, (NISYS, [kimballkd@lmus.com](mailto:kimballkd@lmus.com))  
2000 Richard Paternoster, Honors/Awards, (LANL, 505-667-4728, [rpateroster@lanl.gov](mailto:rpateroster@lanl.gov))  
1999 Richard Taylor, Liaison to Public Information Committee (ORNL, 423-574-3529, [rqt@ornl.gov](mailto:rqt@ornl.gov))  
1999 Peter Thorne, International Relations, (BNFL, 011-44-1925-833004, [prt@amqmps.com](mailto:prt@amqmps.com))  
Ron Marble, Program Committee Chair, (ORNL, 423-574-6059, [marblerc@ornl.gov](mailto:marblerc@ornl.gov))  
Jerry McKamy, Education, (301-903-8031, [jerry.mckamy@eh.doe.gov](mailto:jerry.mckamy@eh.doe.gov))  
Thomas McLaughlin, ANS-8 Chair, (LANL, 505-667-4789, [tpm@lanl.gov](mailto:tpm@lanl.gov))  
Dennis Tollefson, Bylaws, Division Representative, Nominating Committee Chair  
John Schlessler, ANS-8 Secretary, (LANL, 505-665-2815, [johna@lanl.gov](mailto:johna@lanl.gov))  
R. Michael Westfall, Fellow Award-Coordinator, (ORNL, 423-574-3530, [rwe@ornl.gov](mailto:rwe@ornl.gov))

disposing of plutonium from weapons. Other countries are moving forward with plutonium recycle to enhance the economics of nuclear power. This session will encourage both US and foreign papers in the area of MOX as related to nuclear criticality safety. Papers dealing with either operating or proposed facilities will be encouraged as well as supporting activities at National Labs which will impact long-term disposal of MOX. For additional information, **contact Francis Alcorn (804-522-5157) or Thomas Doering (702-295-4382).**

## Nominating Committee

*Dennis Tollefson*

Dennis Tollefson, the past-Chair of NCS, is the Chair of our Nominating Committee responsible for preparing a slate of nominees for the officers and executive committee of NCS. The current plan is to run both the Secretary and Treasurer position with two nominees. There will be three new members of the Executive Committee and it would be desirable to have six to eight nominees for the membership to vote on. The slate of nominees must go to ANS at the upcoming ANS Winter Meeting, so your suggestions for the nominees (that can include yourself) should be sent to Cecil Parks, the current NCS Chair, who will forward the information to Dennis. Cecil Parks can be reached at 423-574-5280 or [cvp@ornl.gov](mailto:cvp@ornl.gov). The ANS election will be next spring and the new slate of officers and committee members will begin their term after the 1999 ANS summer meeting.

## NCS Topical Meeting

*Steve Bowman*

The next NCS topical meeting will be an embedded topical meeting at the ANS June 2001 Meeting in Reno, Nevada. Executive Committee member Steve Bowman is coordinating the

organization of NCS 2001 Embedded Topical Meeting. If you would like to help in the preparations for this meeting, contact Steve at [bowmansm@ornl.gov](mailto:bowmansm@ornl.gov) or 423-574-5263.

## ICNC'99

*Cecil Parks*

The 6<sup>th</sup> International Conference on Nuclear Criticality Safety will be held in Versailles France on September 20-24, 1999. The conference provides an international technical forum for Nuclear Criticality Safety Issues. The plenary session will be conducted in French and in English. The other sessions will be in English only. Oral and Poster papers will be in English. Authors are invited to propose papers for inclusion in ICNC'99 focusing on a broad range of technical topics as well as on criticality safety analysis, administrative practices, criticality calculation codes, critical experimental data and criticality accidents. Selection for inclusion in the ICNC'99 conference will be made based on the merits of the paper as judged through review of the extended abstract by the International Technical Program Committee. An extended abstract (approximately 600 words) should be submitted by December 1st, 1998, and full Papers submitted by May 15, 1999. More information is available on the ICNC'99 web site at: <http://www.ipsn.fr/icnc99/> or by contacting Cecil Parks at [cvp@ornl.gov](mailto:cvp@ornl.gov) or (423) 574-5280.

## News & Announcements

- Several nuclear engineering students won **Outstanding Student Paper Awards** at the national ANS meeting held in Nashville, TN in June 1998. The winners of the Student Paper Awards are as follows: Katherine Goluoglu from the University of Tennessee won first place; Daniel Romero from the University of New Mexico won second place; Deborah Bentzinger from the

# Training Courses

**October 27-30, 1998**  
**Oak Ridge, Tennessee**  
**SCALE/KENO**

Oak Ridge National Laboratory (ORNL) is hosting a SCALE/KENO V.a course. There are still spaces available. Contact Steve Bowman immediately at (423) 574-5263.

**November 19, 1998**  
**Washington, DC**  
**ANS Professional Development Workshop II Criticality Alarm Systems**

This one day workshop provides Criticality Alarm Systems (CASs) technical and regulatory overviews. Topics range from determining if a CAS is needed to determining if a CAS meets current standards to learning lessons from others experiences. U.S. requirements, methodologies and experiences are the primary focus but international issues and information are included. The workshop notebook parallels presentations and includes much supplemental information with copies of U.S. requirement and guidance documents. For information, or questions, contact Valerie Putnam at [vlp@barbie.inel.gov](mailto:vlp@barbie.inel.gov) or (208) 526-9529.

**July 19-23, 1999**  
**University of New Mexico**  
**20<sup>th</sup> Annual NCS Short Course**

The purpose of the short course is to provide an overview of the theory and practice of nuclear criticality safety. The course content is directed toward the individual with less than two years experience of the field. However, one who is experience in a particular aspect of the field may find the overview to be of value. The basic fee for the Nuclear Criticality Safety Short Course is \$1,300.00. This fee covers tuition, Knief's textbook, all other course materials, and lunch each day. Enrollment for the short course is limited to 60 attendees (20 minimum). For information or questions, contact Bob Busch at [busch@unm.edu](mailto:busch@unm.edu) or (505) 277-8027.

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University of Tennessee won third place; Hiep Hoang from Purdue University won fourth place; and Ralph Demeglio from the University of Tennessee and Derek Brice from Oregon State University received honorable mention.

• Billy Lee has volunteered his time to maintain our **NCS D Web site** at <http://www.vic.com/~ncsd>. The site will only be as good as the information provided to it by the membership. If you have information that you think would benefit the NCS D community, please contact Billy ([leebl@ornl.gov](mailto:leebl@ornl.gov)) or one of the NCS D officers or committee members.

• The draft **proposed Part 70 and Standard Review Plan** is currently at the NRC Commission level, and is simultaneously available to the public. The NRC is encouraging industry participation. Licensees and certificate holders organized under NEI, and the NRC staff are working together to resolve issues of disagreement. These issues include: risk based assessment vs. consequence based; inclusion of ISA results in licenses; chemical consequence limits; requirements for performance of preliminary ISA's; implementation of prescriptive design criteria; and, timeliness of a backfit rule.

• Standards subcommittee ANS-8 is considering a recommendation to withdraw the American National Standard **ANSI/ANS-8.9-1987** (R1995), *Nuclear Criticality Safety Criteria for Steel-Pipe Intersections Containing Aqueous Solutions of Fissile Material*. Contact Francis Alcorn at (804) 522-5157 for more information.

• A request for clarification of **ANSI/ANS-8.2-1986**, *Criticality Accident Alarm System*, has been completed. See the September 1998 issue of Nuclear News for information on both 8.2 and 8.9.

• The **ANS 8.17 working group** will meet from 5-7 PM on Tuesday, Nov 17 in the Idaho Room. Contact Brian Kidd at (804) 522-6311. Refer to the final program for other working group meetings and the ANS-8 subcommittee meeting.

• The **NCS D Program Committee and NCS D Executive Committee** will meet Sunday afternoon, November 15 beginning at 1:00 PM Delaware B of the Marriott Wardman Park Hotel. Everyone is invited.

**July 13-15, 1999**

**University of New Mexico**

**Criticality Safety Assessments Workshop**

A three day workshop designed for criticality safety personnel with some experience doing assessments (evaluations) and some computer code experience (KENO, MCNP, MONK, DANTSYS). The participants will be divided into groups of three to four. Each group will be given an operation/process which is to be evaluated and for which limits and controls are to be determined. Each group will have a faculty observer/facilitator who will act as the "operations" representative. The group will be responsible for interviewing operations, identifying normal and off-normal conditions, parameters to be controlled, how the parameters will be controlled, limits, estimates of the k-effectives of different configurations, a summary of the assessment, and example postings and procedures. Each group will present their assessment to the faculty who will provide a critique of the results. The participants will have a chance to use handbooks, reports, manuals, and computer codes to evaluate the neutronics of the process and determine the sensitivity of k-effective to various parameters such as mass, concentration, reflection, etc. Enrollment for the workshop is limited to 16 attendees. The basic fee for the Assessments Workshop is \$1,000.00 which covers tuition, access to the computer codes, all other course materials and lunch each day. For information, or questions, contact Bob Busch at [busch@unm.edu](mailto:busch@unm.edu) or (505) 277-8027.

**July 27-29, 1999**

**University of New Mexico**

**14<sup>th</sup> Workshop for Managers in Nuclear Criticality Safety**

The information presented at this workshop is designed for those people with oversight responsibility for criticality safety but not direct supervision of the criticality safety process. These may be managers who are in charge of all safety (fire, OSHA, crit, etc.) for a plant, or the plant manager. Anyone who needs to know what is involved in criticality safety and how it will affect their responsibilities should take this course. It is expected that they will leave the course with a better understanding of the criticality engineer's perspective of k-effective, validation, uncertainty, double contingency, rules, standards, and regulations. They will also understand the risks and the probability of a criticality accident; what is contained in a process analysis, and what is expected of management and supervisors in formulating and implementing a criticality safety program. The basic fee for the Managers Workshop is \$800.00. This fee covers tuition, Knief's textbook, all other course materials, lunch Tuesday and Wednesday. Enrollment for the workshop is limited to 20 attendees (10 minimum). For information, or questions, contact Bob Busch at [busch@unm.edu](mailto:busch@unm.edu) or (505) 277-8027.

**August 16-20, 1999**

**University of Tennessee, Knoxville**

**Nuclear Criticality Safety Short Course**

Our next NCS short course is scheduled for August 16-20, 1999 on the UT-Knoxville campus. The cost is \$1195 per person which includes a complete set of bound notes used in the course. Additional information including registration information is posted on the Web site at [www.engr.utk.edu/nuclear](http://www.engr.utk.edu/nuclear) or contact Lee Dodds at [hld@utk.edu](mailto:hld@utk.edu) or (423) 974-2525.

**1999**

**SCALE Training**

ORNL is considering a SCALE/KENO-VI course in Boulder, CO, in January or February 1999. There will be a KENO V.a or KENO-VI course at ORNL in late April 1999 and in late October 1999. Check the SCALE Web site at [http://www.cad.ornl.gov/cad\\_nea/text/scale-home.html](http://www.cad.ornl.gov/cad_nea/text/scale-home.html) later this fall for more precise information.