American Nuclear Society

Nuclear Criticality Safety Division Newsletter

Summer 2005
http://ncsd.ans.org/

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Maria LeTellier & Chris Haught, Editors

Executive Committee

The current members will serve until the close of the ANS Annual Meeting in June.

2004-5 Officers

Chair
Christa Reed, 434-522-5927
Vice Chair/Chair Elect
Stephen Bowman, 865-574-5263
Treasurer
Kevin D. Kimball, 770-497-8518
Secretary
Lon E. Paulson, 910-675-5460

Other Members

Term ending 2005
James Felty, 301-903-5494
Keyes Niemer, 704-382-9525
Bonnie Rumble, 740-897-4047.
Term ending 2006
Nigel "Jim" Gulliford,
+(44) 925 83 3450 (UK)
Dennis Mennerdahl
Fitz Trumble, 803-502-9615
Term ending 2007
Adolf Garcia, 208-526-4420
Maria LeTellier, 865-531-7425
Randy Shackelford 423-743-2504

2005 Election results

Congratulations to those taking office in June!:

Stephen M. Bowman, Chair
Kevin D. Kimball, Vice Chair
Davis A. Reed, Secretary
David K. Hayes, Treasurer

Others, Term ending 2008
Lawrence J. Berg,
Thomas D. Burns, Jr.,
Charles D. Harmon, II

Message from Chair

Christa Reed, christareed@att.net
2004-2005 Chair

The NCS Division has had a terrific year!

Meetings. NCSD sponsored seven technical sessions, three tutorials, and two standards forums at the Pittsburgh meeting in June and the November meeting in Washington DC. Best paper awards were selected at the June and November meetings.

Bylaws. NCSD has revised its bylaws and rules. Our Executive Committee approved the Bylaws, which have been sent to the national Bylaws and Rules Committee for approval. In addition to needed updates, the revisions provide for a second vice-chair, which will help with both succession planning and turnover. The revised Bylaws will be sent to NCSD members for a vote.

Awards. NCSD awarded a Distinguished Service Award and a Technical Excellence Award at the November meeting. This is the 5th year for giving these awards.

Outreach. ANS Headquarters worked with NCSD and drafted a letter to the Deputy Secretary General of the Chinese Nuclear Society expressing interest in initiating contact with Chinese NCS counterparts. Dr. Qi Ao will present the letter at the 13th International Conference

on Nuclear Engineering (ICONE 13) to be held in China.

Members. NCSD membership has grown significantly in recent years, with 749 members at the end of 2004—**an 80% increase since 1990**!

Whitepapers. NCSD Education Committee has developed four white papers for comment (see article later in this newsletter).

These accomplishments are a result of a tremendous amount of volunteer work by many people. The efforts demonstrate our common commitment to further the exchange of technical information on nuclear criticality safety, with the ultimate goal of promoting the safe handling of fissionable materials outside reactors.

The Division plans to focus on the following initiatives for the future:

Realism. Staying focused on what is really important to criticality safety is a common goal. A session on Realism in NCS is scheduled for the Washington, DC meeting. In addition, Peter Angelo has agreed to head a special NCS committee on realism.

China. As stated above the NCS Division has written a letter to the Chinese Nuclear Society proposing to exchange information with Chinese nuclear criticality safety scientists/engineers about criticality safety practices, critical experiments and operational experiences, including accidents.

Involving all NCS members. An ongoing challenge for the NCS Division and me is to draw upon the enormous reservoir of NCS members who may not be able to attend the national meetings, or NCS professionals who may not even be members. I believe that this will be vital to continued success of the Division. So, as I wrote in the last Newsletter, if you have any ideas, comments, notions, concepts, remarks, questions, or observations, please contact me at (434)522-5927 or email at christareed@att.net.

Upcoming Meetings

Dates and locations of national ANS and NCSD topical meetings are listed below:

June 5-9, 2005, San Diego, CA (*Annual ANS meeting*)

Sept 19-22, 2005, Knoxville, TN (*NCSD Topical Meeting)*

Nov 13-17, 2005, Washington, DC *(Winter ANS Meeting)*

June 4-8, 2006, Reno, NV *(Annual ANS meeting)*

Nov 2006, Albuquerque, NM *(Winter ANS Meeting)*

June 2007, St. Petersburg, Russia *(ICNC international meeting)*

June, 2007, Boston, MA *(Annual ANS meeting)*

2005 NCSD Topical Meeting

R. Trent Primm,
Meeting Technical Program Chair

The NCSD endeavors to sponsor a stand-alone topical meeting once every four years. That makes it a very special event and all members of the criticality safety community should make a concerted effort to participate. This time the topical meeting is being sponsored by the Oak Ridge local section and will be held September 19 – 22 at the Marriott Hotel in Knoxville, TN. Information about the meeting can be found on the web at http://ncsd2005.org/

Fifty papers have been submitted for oral presentation and 35 poster presentations will be made.

Significant dates to remember include:

NCSD 2005 Dates

June 10	Registration open
Jun. 15	Final paper submitted; Abstracts ready for publication
Aug. 28	End of early registration for meeting and hotel
Sept. 19-22	Meeting

The format will include a Monday-morning opening-plenary session with discussions by speakers knowledgeable about TVA Projections for Future Nuclear Power Generation, NASA Nuclear Program Overview,

and International Initiatives Specific to NCS. Topics for the six one-half-day technical sessions (no parallel sessions are planned) include: nuclear criticality safety applications, validation studies and software development, education/ training/qualification, and emerging initiatives.

2005 ANS Winter Meeting

Robert L. Frost,
Robert.Frost@nuclearassociates.com
(423) 610-0249

The **2005 ANS Winter Meeting** will be held November 13th – 17th at the Omni Shoreham Hotel in Washington, D.C. A total of five sessions have been proposed for the meeting. Summaries describing the sessions are shown below. The deadline for summary submission is June 10, and the Call for Papers for the meeting is available on the Internet (http://www.ans.org/meetings/docs/2005/wm2005-cfp.pdf).

Data, Analysis, Operations for Nuclear Criticality Safety

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. **Session Organizer**: Robert Frost, (423)610-0249, robert.frost@nuclearassociates.com.

Nuclear Criticality Safety Standards Forum (Panel)

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

Chemistry in Nuclear Criticality Safety

An understanding of chemistry is often crucial when performing criticality safety analysis of systems involving fissile solutions and/or mixtures. For example, aqueous/organic phase transfer and precipitation of fissile-bearing species can both lead to an increase in fissile concentration. Papers in this session will discuss criticality analyses where an understanding of the relevant chemistry was crucial to establishing the criticality safety basis. This includes operations where consideration of chemistry led to criticality controls that would not otherwise have been needed, or, conversely, situations where proper consideration of system chemistry demonstrated why additional controls were not needed. **Session Organizer:** Robert Frost, (423) 610-0249, Robert.Frost@nuclearassociates.com.

Realism in the Assessment of Nuclear Criticality Safety Hazards

The ANS recently published a position statement on "Realism in the Assessment of Nuclear Technologies." This session will focus on realism, the use of realistic yet adequately conservative models and assumptions, as it applies to nuclear criticality safety. Typically, criticality safety evaluations make conservative assumptions and then add additional safety margin. This may be necessary due to potential common mode failures or lack of total independence of controls, but this can also lead to a loss of focus of what is truly important. This session will discuss examples, the influence of historical events, and direction for the future. **Session Organizer**: Bonnie Rumble, brumble@nisys.com.

Criticality Safety Emergency Planning

The preparation of a criticality emergency plan places significant challenges to the development, implementation, and demonstration of readiness of such a plan. Formulation of a criticality emergency plan demands those involved in its preparation to take account of many disparate factors to ensure overall minimization of risk or harm. In application, these arrangements may often need re-evaluation to take account of process changes. No arrangements can be considered to be robust without regular testing through exercise. Often, the experience and learning points from criticality emergency exercises are key to ensuring comprehensive criticality emergency arrangements. This session will share developments and experience on how these principals are applied in practice. **Session Organizer**: Neil Harris, +44 (0) 19467 79154, neil.harris@bnfl.com.

NCSD Whitepapers to be Posted for Comment

Fitz Trumble,
NCSD Education Committee Chair

By June 1st, the NCSD Education Committee expects to have six draft white papers on the NCSD website for review and comment by the NCSD community. These whitepapers stem from an effort begun in 1999 by the Education Committee (EC) to develop documents which are designed to share good practices, increase communication and stimulate discussion within the NCS Community.

Current EC members include: Fitz Trumble, Lon Paulson, Kevin Reynolds, Harry Felsher. Bonnie Rumble, Doug Bowen, David Erickson, Jim Morman, Les Duncan, Adolf Garcia, Valerie Putman, Chuck Harmon, Jerry Hicks, Bob Wilson, Tom McLaughlin, and Warren Cox .

The posting on the NCSD Website will contain a disclaimer page which will clearly spell out that these white papers are not standards nor are they interpretations of standards and are not meant to be used in that manner.

On the site, you will be presented with links to the various whitepaper drafts. In addition to the whitepapers, the Education Committee has also developed a Whitepaper Approval Guideline, which is available on the web. The purpose of this guideline is to educate the reader on the process that NCSD whitepapers go through to reach approval. Once the whitepapers are posted to the web, a comment solicitation period opens up for 60 days. At the end of that comment period, comment resolution begins and when complete, the whitepapers are finally presented to the NCSD Executive Committee for their vote on approval.

Contact information for the whitepapers is provided along with the disclaimer. A listing of the draft whitepaper titles is provided below.

- *Education Committee Overview*
- *Definition of CSE Specialist*
- *Successful NCS Mentorship Program*
- *Acceptable Evaluation of NCS*
- *CSE Specialist Training and Qualification*
- *Nuclear Criticality Accidents in the Workplace: Fact Sheet* (note this is Rev 1. to an already - approved paper).

Additional whitepaper topics are under development - if you have a relevant topic please contact Fitz.

Obituary: Louis Maubert

Louis Maubert who retired from the Criticality Studies Department at Fontenay-aux-Roses in late 1994, passed away on March 8, 2005.

Without any doubt, Louis Maubert was the most influential criticality-safety specialist in France. Not only was he one of the pioneers of this discipline but more importantly he was the one with the broader view in the field. Author of the French Criticality standard published in 1976, his contribution ranged from the design of fuel cycle facilities in France (most if not all of them), to code and data validation and experimental programs design. Most of the experimental programs performed during the 70s up to late 90s in the experimental laboratory of Valduc were designed by him. He was also active in the OECD criticality safety groups (standard exercises on transport, storage and dissolution, burnup credit group).

He will be missed by his family, his colleagues, students and friends.

Recent Standards Meeting in Oak Ridge

Calvin Hopper and Tom McLaughlin

During April 5 through 7, the International Organization for Standardization (ISO) Technical Committee 85 (TC85 *Nuclear Energy*) Subcommittee 5 (SC5 *Nuclear Fuel Technology*) met at ORNL. Several working groups are included within TC85/SC5 including Working Group 8 (*WG8 Nuclear Criticality Safety*) that is chaired by Calvin Hopper. To take advantage of the ISO meeting assemblage, ANSI/ANS Consensus Committee N16 and ANS Subcommittee 8 held separate meetings April 8 and then had a joint meeting April 9. Highlights of these meetings follow.

There are several ISO standards available or in development under the auspices of WG 8. Available standards include:

ISO 1709, *Nuclear energy - Fissile materials - Principles of criticlity safety in storing, handling and processing* (patterned after ANSI/ANS-8.1)

ISO 7753, *Nuclear energy - Performance and testing requirements for criticality detection and alarm systems* (patterned after ANSI/ANS-8.3)

IEC/ISO 860, *Warning equipment for criticality accidents*

ISO 14943, *Nuclear energy - Nuclear fuel technology - Administrative criteria related to nuclear criticaltiy safety* (patterned after ANSI/ANS-8.19)

The standard under development that has some overlap with ANSI/ANS-8.12, but also some significant philosophical differences is:

ISO CD 14941, *Critical values for homogeneous mixed plutonium-uranium oxide fuels (MOX)*.

Standards considered which are in a committee drafting stage include:

Recommendations for the safety analysis of a postulated criticality accident - an early development; an "umbrella" postulated criticality accident standard that is planned to spawn 3 subsidiary standards (the EP&P standard just mentioned; one on estimating total fission yield; and the third on evaluating radiological impact), and also interface with the existing ISO standard on criticality accident alarms

Criticality evaluation methodology for PWR burn up credit (intended to interface with the technical bases documents from OECD

Nuclear criticality emergency planning and response (likely to parallel ANSI/ANS-8.23), - in development; a burn-up credit standard that will interface with the product of the OECD expert group on burn-up credit - in development; an emergency preparedness and planning standard that is likely to closely resemble ANS-8.23 - in

At the ISO meetings there were IAEA liaisons present, including Mr. Pierre Nocture for WG 8. The IAEA is moving heavily and rapidly into the nuclear "standards" development arena. The word, standards, is put in quotes since these are not consensus standards as per the ISO or ANSI development process, but usually one person from each of several countries trying to represent all safety issues. This has been the case for the two safety related draft IAEA standards that are under development and include criticality safety guidance. This is undesirable and the technical criticality safety guidance therein is of lesser quality than in the ISO and ANSI standards. Anyone more interested about this issue should read the ANS-8 minutes from the 8, 9 April meeting on the ANS-8 website (http://www.wsms.com/) or contact Tom McLaughlin directly.

The ANS-8 meeting discussed organizational issues such as membership (a few good workers are always welcome); proliferation, revision, and consolidation of ANS-8 standards; operating procedures for ANS-8; the NRC document ISG-10 as it touches on ANS-8 issues; liaisons with other standards development bodies, including those within ANS oversight; etc. Consult the minutes for details and to become involved.

More information can be obtained at the following:

International Organization for Standardization (ISO) - http://www.iso.org/iso/en/stdsdevelopment/tc/tclist/TechnicalCommitteeDetailPage.TechnicalCommitteeDetail?COMMID=2486

International Atomic Energy Agency (IAEA) - http://www-ns.iaea.org/standards/documentpages/fuel-cycle-facilities.htm

Organization for Economic and Cooperative Development (OECD) - http://www.nea.fr/html/science/wpncs/index.html

ANSI/ANS Consensus Committee N16 (*Nuclear Criticality Safety* - http://www.ans.org/standards/committees/n16/) and Subcommittee 8 (*Fissionable Material Outside Reactors* - http://www.wxsms.com/ans/)

NCSD Special Awards

Mike Westfall, awards committee

Congratulations to Adolf Garcia and Jim Morman for receiving the following NCSD special recognition awards at the NCSD dinner November, 2004. Nomination information is located on the NCSD website under the awards committee area.

Pictured (left to right): Jim Morman, Mike Westfall, Christa Reed, Adolf Garcia.

American Nuclear Society - Nuclear Criticality Safety Division
Distinguished Service Award
awarded to:

Adolf A. Garcia

Adolf A. Garcia is recognized for distinguished service to the Division in the performance of governance roles, in the development of the Division's technical program, in his chairmanship of ANSI/ANS-8.1, his organization of the DOE NCS Program, and in his continuing effort in working with ANS staff members to facilitate arrangements for Division activities. Adolf shares his Division enthusiasm and commitment with other NCS Professionals, and the result has been noticeably more participation in the Division. He has been an exemplary influence and contributor to the Division, and you can always count on Adolf to add considerable thoughts, insight, and humor to Division business. The NCS Division would not be where it is without the tireless efforts of Adolf.

American Nuclear Society - Nuclear Criticality Safety Division
Technical Excellence Award
awarded to:

James A. Morman

James A. Morman is recognized for technical excellence in the development and management of Nuclear Criticality Safety Engineering Training (NCSET) modules. The twelve NCSET modules provide training information in the areas of neutron physics and kinematics, criticality safety analytical methods and criticality safety operations, evaluations and limits. Jim is also chairing the working group of the proposed standard ANS-8.26 on NCS training. In this role Jim has steadily lead the group to create a successful draft Standard. The success of criticality engineers hinges on proper training, and Jim has positively and graciously used his expertise in the area of training to benefit the NCS community.

Nuclear Criticality Safety Division:
Integrating Criticality Safety into the Resurgence of Nuclear Power

NCSD 2005
September 19-22, 2005
Knoxville, Tennessee

TECHNICAL SESSIONS TOPICS

Applications
- Transportation/packaging
- Commercial power plant
- Burnup credit
- Reprocessing concepts
- Waste management
- Regulations/regulatory guidance
- Accident analysis and alarm systems
- Critical experiments facilities' activities

Validation Studies/ Software Development
- Validation/applicability studies
- Methods development
- Information access

Education/Training/Qualificationtion
- Criticality safety education
- Qualification programs
- University initiatives/courses/distance education
- Student session competition

Emerging initiatives
- High burn-up fuel enrichment/fabrication
- MOX initiatives
- Generation IV Reactor design/fuel fabrication issues
- Storage concepts
- Experiment needs/proposals

ANS Sponsoring Division
Nuclear Criticality Safety Division

ANS Local Section Host
Oak Ridge-Knoxville Section

Plenary Session Topics

TVA Projections for Future Nuclear Power Generation
NASA Nuclear Program Overview
International Initiatives Specific to NCS

DATES:

August 28, 2005
Early registration & Hotel reservation

September 19-22, 2005
Conference

ORGANIZING COMMITTEE

Honorary Chair
Joe Thomas, *ORNL (ret.)*
General Chair
Calvin Hopper, *ORNL*
Assistant General Chair
Sedat Goluoglu, *ORNL*
Technical Program Chair
Trent Primm, *ORNL*
Tech. Prog. Chair Assistants
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DOE Liaison
Jerry McKamy, *US DOE*
NRC Liaison
Melanie A. Galloway, *US NRC*

For more information, please go to our web site at **http://ncsd2005.org** or contact:

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Integrating Criticality Safety into the Resurgence of Nuclear Power