

**American Nuclear Society**  
**Nuclear Criticality Safety Division Newsletter**  
**Summer 2011**



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# Message from the Chair

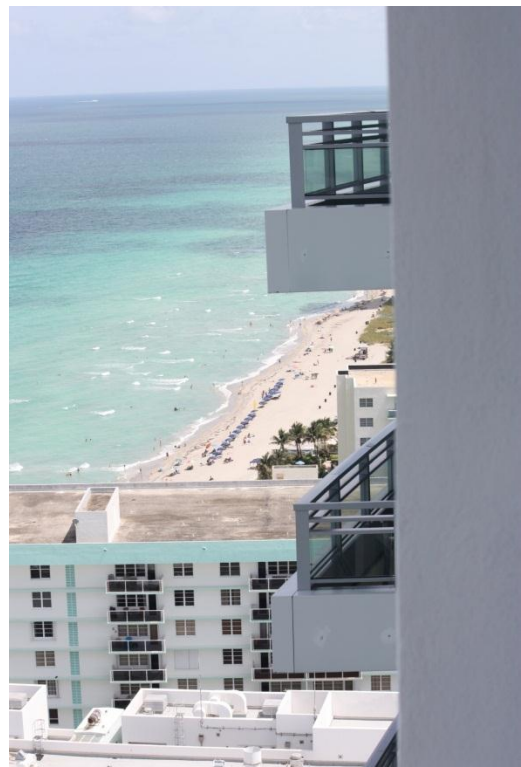
Doug Bowen, [dgbowen@lanl.gov](mailto:dgbowen@lanl.gov), (505) 667-5939, NCSD Chair

It is my pleasure to serve as chair of the Nuclear Criticality Safety Division (NCSD) for 2011-2012. Membership in the division continues to increase and the division is financially sound. The NCSD provided support for the successful 2011 American Nuclear Society (ANS) student conference at Georgia Tech this last April. NCSD support has been requested from the student organizers for the ANS 2012 student conference at the University of Nevada, Las Vegas, "Nuclear Science and Technology: Past, Present and Future" to be held April 12-15, 2012.

It is a very exciting time in the nuclear criticality safety (NCS) field. A new 2-week Nuclear Criticality Safety Course is currently being piloted by personnel at Idaho National Laboratory, Oak Ridge National Laboratory, Sandia National Laboratory (SNL), Lawrence Livermore National Laboratory, and Los Alamos National Laboratory (LANL). The United States Department of Energy Nuclear Criticality Safety Program is developing the course. The first week of the course will provide practical student exercises for criticality safety evaluation development for real fissionable material processes in the LANL plutonium facility. Other topics to be covered during the first week of training will include NCS fundamentals, non-destructive assay data utilization, ANS standards, hazards analysis, human factors and equipment reliability. The second week will involve "hands-on" subcritical and "remote" critical experiments. It has been exciting to see this new training course mature over the last year or so.

At the Hollywood, FL ANS meeting, Rob Frost, Chair of the Special Committee on Fundraising for the Endowed Pioneer Scholarship, presented a "Give Back to the Future" video to the Executive Committee and handed out fliers to support the NCS Pioneers Scholarship Fund. The NCSD established an endowed scholarship to encourage well-qualified students to study criticality safety. We have a goal of raising \$60,000 for the permanent endowment with over \$4,250 donated as of this writing. The gift is tax deductible! To make donations more convenient, the NCSD, in cooperation with ANS National, has made it possible to donate with your credit card via the ANS National webpage. The video presentation and the donation link are available on the NCSD webpage (<http://ncsd.ans.org>), and I encourage everyone to donate so that we can begin awarding endowed scholarships in 2012.

The next NCSD topical meeting is the 2011 International Conference on Nuclear Criticality (ICNC) Safety being held in Edinburgh, Scotland this September. More than 200 technical papers and posters have been submitted for this meeting for eight technical tracks and many NCSD



members are providing assistance and serving as technical track leaders. The next ANS National meeting is the winter meeting being held late October at the Omni Shoreham Hotel in Washington DC. The division currently has 6 sessions scheduled, which is substantial considering the number of papers being presented in Scotland. Moreover, I recently sent out a request for proposals for an NCSD topical to be held in 2013. A special committee will review these proposals and make a recommendation to me prior to the ANS winter meeting. Please look for more information regarding the location of the 2013 NCSD topical in the near future.

I look forward to seeing all of you at the ICNC topical meeting in September and the ANS winter meeting in Washington DC this October.

*Doug Bowen*

Chair, Nuclear Criticality Safety Division

## ***Endowed Scholarship Drive***

**Chair: Rob Frost**

An Endowed scholarship was established last year. For fundraising there is an online credit card donation process available for all divisions. A video was developed and was played at the sessions to really push the effort for fundraising ([watch the video](#)). The goal is \$60,000. As of the publication of the newsletter, \$4250 has been donated. The donor's so far are:

- ✓ ANSI/ANS-8.19 Working Group in memory of Leslie Davenport
- ✓ Ms. Elizabeth Plassmann In honor of Hugh Paxton
- ✓ Dr. Robert Frost In honor of Dr. Hugh Clark
- ✓ Mr. Harry Felsher, general donation
- ✓ Mr. George Bidinger In honor of Clarence L. Schuske
- ✓ Dr. E. Charles Crume, Jr. In honor of Dr. A. Dixon Callihan
- ✓ Mr. Michael J. Vehec, In honor of Mr. Norman Pruvost
- ✓ Mr. David & Mrs. Carol Cise, general donation

With over 800 members in the division, if everyone would donate \$75, the goal would be met. Please consider donating to the scholarship fund. The donations can be made online (<https://secure.ans.org/about/scholarships/>) and are tax deductible.

## ***Executive Committee***

**Chair: Brad Rearden**

The Executive Committee met on Sunday, June 26, 2011. The meeting was chaired by Brad Rearden. There was a good turnout as usual for the meeting. The turnout was such that we initially did not have enough chairs so Fitz Trumble had to sit on the floor, but then we got more chairs.



Sheeri Fey UNLV Student Conference: April 12-15, 2012. Division help can be provided by Technical Session Judge and Workshops. The new officers and committee members were announced. They are: Doug Bowen Chair, Larry Wetzels Vice Chair, Bob Maurer Treasurer, Sandi Larson Secretary, Allison Miller, Chris Haught and Michael Corum to executive committee.

Efforts to develop a fact sheet discussing potential for re-criticality related to the Fukushima Accident have been on-going. Discussion at the meeting lead to a few points: the division should focus on what the message is of the fact sheet. There is a consensus to continue looking at the fact sheet and determine a message. The audience should also be defined, it was mentioned that the audience should be media, or general public.

All metrics that the division focuses on are green. Only concern is the topical meeting (white) because we support the ICNC and have stand-alone meetings every 4 years. We ignore the Class III topical and would rather focus on the topical meetings we do have.

The new Scholarship Chair will be Julie Ezold: Allison Miller is the new Program Committee chair. Membership committee is in need of a replacement. Megan Pritchard is then new Membership Committee Chair.

A change to summary submissions was initiated by NCSD. The will be a page count (minimum of 1 page maximum of 4 pages) rather than a 900 word count. This was approved by the appropriate ANS committees and will become effective for the Summer 2012 meeting.

Education Committee: revising white papers, the Realism white paper was approved and is being sent to the Executive Committee for approval. Other actions from the Education Committee are:

Criticality accidents in workplace still in revision.

Fitz Trumble is taking over the Successful Mentorship white paper.

The committee will move forward with the glossary of terms from the standards.

Membership Committee: Darby Kimball activities have included attending the student conference and handing out flyers. Student and Young Member influx is still increasing but we still need to work on getting new members involved. As of the summer meeting, there were 899 members in the division

Publications Newsletter: There is a link on the website to the scholarship donation site. A formal request was made to allow for archiving of presentations, but we never heard back. They would like us to wait 2 weeks after the meeting to upload the presentations and take them down after 6 months. The division will make the recommendation to the IT group to be able to archive presentations.

Honors and Awards: The Division needs nominations for the fellow awards. There is also a need for nominations for the Service Award.

ICNC 2011: Moving forward. The meeting is being held September 19<sup>th</sup> - 22<sup>nd</sup>, 2011 in Edinburgh.

2013 Topical Meeting: Request for Proposal needs to be sent out as required by ANS. Calendar Placement went to committee for approval. There was concern that the division did not approve the bid from a division. We need to follow the procedures and send out the RFP to all local sections. NCSD Program is the requirements. Rob Frost made the recommendation to form a committee to review the proposals.

Allison Miller, Maria Le'Tellier, Jerry Hicks and Sedat Goluoglu volunteered to be on the 2013 Topical Meeting NCSD committee. RFP will be sent out and local sections will be given 30 days for the review by the subcommittee. Subcommittee will make recommendation to Chair – Doug Bowen.

Doug Bowen presented Brad Rearden with an award for his service with the division as outgoing chair.



## ***Program Committee***

**Chair: Allison Barber**

### **Highlights of the Hollywood Meeting**

There were three technical sessions with a total of 16 papers along with the ANS 8 forum. This was a reasonable number of papers considering ICNC will be held in September. The list of papers and some of the presentation are available on the NCS D website ([http://ncsd.ans.org/site/papers\\_hollywood\\_2011.html](http://ncsd.ans.org/site/papers_hollywood_2011.html))



### **Preliminary Program for the DC Meeting**

The winter meeting in DC has 4 technical sessions plus the ANS 8 Forum.

#### **Data and Analysis in Nuclear Criticality Safety - I,**

A Digital Criticality Safety Document Collection Available Through the U.S. Department of Energy's NCSP Web Site, Brian L. Koponen (LLNL, retired), David P. Heinrichs, Chuck Lee (LLNL)

Study on Particle and Absorber Effects on Multiplication Factors of Debris Beds with MVP, Tsugio Yokoyama (Toshiba Nuclear Engineering Services Corp), Taiki Fujishiro, Hisashi Ninokata (Tokyo Inst Technol)

Supercritical Transient Analysis in Weakly Coupling Systems, Haruka Kikuchi, Toru Obara (Tokyo Inst Technol)

Benchmark Evaluation of GROTESQUE, a Complete Arrangement of HEU Metal Units, Mackenzie L. Gorham (Idaho State Univ)

Acceleration of Monte Carlo Criticality Calculations Using Deterministic-Based Starting Sources, Ahmad M. Ibrahim (Univ of Wisconsin, Madison), Douglas E. Peplow, John C. Wagner, Scott W. Mosher, Thomas M. Evans (ORNL)

First Critical Experiment at Critical Experiment Facility, Rene G. Sanchez, David K. Hayes, Joetta Goda, William L. Myers (LANL)

Validation of BA Rod Worth Evaluation for Criticality Safety Analysis of the RAJ-II BWR Bundle Shipping Package, Tanya Noel Sloma (Westinghouse), Peter J. Vescovi (Transport Logistics International)

CritView: An Electronic Handbook for Criticality Safety, Scott Finrock (Fluor Federal Services), Mark B. Murphy (CH2M HILL Plateau Remediation Company)

The Analysis of the Radial Thermal Expansion of Clear Polyvinyl Chloride and Polyvinylidene Fluoride (KYNAR®) Columns, Katharine Nagley (Central Virginia Governor's School), Larry L. Wetzel (Babcock & Wilcox-NOG)

#### **Data Analysis in Nuclear Criticality Safety - II**

US MOX IROFS Risk Ranking for Enhanced Criticality Safety, Michael J. Shea (Shaw AREVA MOX Services), Leslie E. Duncan (AREVA)

Thermal Total Cross Section Measurement for <sup>63</sup>Cu and <sup>65</sup>Cu at the MIT Reactor, Vladimir Sobes, Ruaridh R. Macdonald (MIT), Luiz Leal (ORNL), Benoit Forget (MIT), Klaus Guber (ORNL), Gordon Kohse (MIT)

MCNP6 Shielding Validation Suite: Past, Present, and Future, Brian C. Kiedrowski, Forrest B. Brown (LANL), Nathan A. Gibson (MIT), Alexander S. Bennett, Matthew A. Gonzales (Univ of New Mexico)

Criticality Safety Engineer Training Fellowship at DOE Idaho, Mackenzie L. Gorham (Idaho State Univ), Adolf S. Garcia (DOE, Idaho Falls), Joseph A. Christensen (DOE), James C. Turnbull (Idaho State Univ)

#### **Recent Advances in Criticality Safety Activities at the Y-12 National Security Complex - I**

Nuclear Criticality Safety Strategic Vision for Y-12 Enriched Uranium Operations, R. Scott Underwood (B&W Y-12)

Improvements to the Interface Between Facility Safety and Criticality Safety at Y-12 NSC, Christophe F. Haught (B&W Y-12)

The Evaluation of Infinite Thickness Reflectors for Neutron Generator Active Interrogation Measurements, Dennis Tollefson (Navarro Research and Engineering, Inc.), Scott L. Creasey (B&W Y-12 Technical Services, L.L.C.), Ralph V. DeMeglio (B&W Y12 Technical Services L.L.C.), John T. Mihalczko (Oak Ridge National Laboratory, UT-Battelle, LLC)

Integration of Criticality Safety into the Uranium Processing Facility Design, Barbara Ina Krogfuss (B&W Y-12)

Design Alternatives for Nuclear Criticality Safety Instrumented Systems, Barbara Ina Krogfuss, Danny Walker, Julia Insalaco (B&W Y12)

Method of Determining Subcritical H/D Ratios for Cylindrical Systems, Richard Taylor, Daniel Francis Hollenbach, Cindy Shields (Y-12)

Transformation of the Y-12 Nuclear Criticality Safety Committee, Douglas Croucher (The Croucher Group, Inc.), John Gertsen (B&W Y-12)

Innovations in CAAS and Emergency Planning/Response at Y-12 NSC, Peter L. Angelo (Y-12 NSC)

## Recent Advances in Criticality Safety Activities at the Y-12 National Security Complex - II

Productivity Techniques and Quality Aspects in the Criticality Safety Evaluation of Y-12 Type-B Fissile Material Packages, John F. Declue (B&W Technical Services)

Small-Angle Compton Scattering to Determine the Attenuation of Gamma Rays from HEU, Rick B. Oberer, Cynthia A. Gunn, Lisa G. Chiang, Michael C. Mattmann (Y-12 NSC)

Improvements in Preventing Uranium Accumulations in Large Volume Machine Coolant Tanks, Bev Lomax, Jerry J. Lichtenwalter (Y-12 NSC)

## Topics for the Chicago Meeting

There are three proposed topic for the Chicago meeting. They are:

### **Session Title: Advancing Criticality Safety Capabilities in a Growing Nuclear World**

**Session Type:** Contributed

**Session Organizer:** Brian C. Kiedrowski, Los Alamos National Laboratory, [bckiedro@lanl.gov](mailto:bckiedro@lanl.gov)

#### **Summary:**

The sharing of knowledge and experience between developers and nuclear criticality practitioners provides benefits to the overall community. Papers within this session are expected to focus on recent, state-of-the-art developments in production-level radiation transport simulation software (e.g., SCALE, MCNP) and nuclear data sets (e.g., ENDF, JENDL) that are relevant to the criticality safety practitioner. Also, papers relating the experience of practitioners on using new capabilities or those focusing on unaddressed current needs are strongly encouraged.

### **Session Title: Benchmarking Experiments for Criticality Safety and Reactor Physics Applications**

**Session Type:** Contributed

**Session Organizer:** John Bess Idaho National Laboratory

#### **Summary:**

The International Criticality Safety Benchmark Evaluation Project (ICSBEP) and the International Reactor Physics Experiment Evaluation Project (IRPhEP) were established to identify and evaluate a comprehensive set of criticality safety and reactor physics related experimental data and preserve the data in a form the will be easily accessible to users. The projects provide a basis for recording, developing, and validating computational and analytical methods. This tutorial will outline and discuss the benchmark process for the ICSBEP and IRPhEP. Topics consist of the importance of quality experimental measurements, benchmark model development, uncertainty quantification, and utilization of these benchmarks in real-world applications.



**Session Title: Data Analysis in Nuclear Criticality Safety**

**Session Type:** Contributed

**Session Organizer:** Allison Miller Sandia National Laboratories 505-845-3684

**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.

Take all look at the topic and consider submitting a summary. As professionals, the exchange of information is essential to maintain a fresh prospective on work and help assure the safety of the workers and public.

**Upcoming Meetings (at a glance)**

Dates and locations of upcoming meetings are listed below:

<b>Dates</b>	<b>Location</b>
Sept. 19 -22, 2011	<a href="#">Edinburgh, Scotland (ICNC 2011)</a>
Oct 30-Nov 3, 2011	<a href="#">Washington, DC (ANS Winter Meeting)</a>
June 24-28, 2012	Chicago, IL (ANS Annual Meeting)
Nov. 11-15, 2012	San Diego, CA (ANS Winter Meeting)
June 16-20, 2013	Atlanta, GA (ANS Annual Meeting) NCSD Topical (TBD)
Nov. 10-14, 2013	Washington, DC (ANS Winter Meeting)
June 15-19, 2014	Atlanta, GA (ANS Annual Meeting)
November 9-13, 2014	Anaheim, CA (ANS Winter Meeting)
June 7-11, 2015	San Antonio, TX (ANS Annual Meeting) ICNC (TBD)
November 8-12, 2015	Washington, DC (ANS Winter Meeting)

## Division Officers and Executive Committee Members

Division Officers	
<ul style="list-style-type: none"> <li>• <b>Chair:</b> <a href="#">Doug Bowen</a> Phone: 505-667-5939 Los Alamos National Lab</li> <li>• <b>Vice Chair:</b> Larry Wetzel Phone: 434-522-6580 Babcock &amp; Wilcox - NOG</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Treasurer/Finance:</b> <a href="#">Sedat Goluoglu</a> Phone: 865-574-5255, Oak Ridge National Lab</li> <li>• <b>Secretary:</b> <a href="#">Sandi Larson</a> Phone: 865-483-8247 Nuclear Safety Associates</li> </ul>

Executive Committee		
<p><b>Through June 2012:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Jerry Hicks</a> Phone: 505-845-6287 DOE, Albuquerque</li> <li>• <a href="#">Deborah A. Hill,</a> Phone: (+44) 1772 764359 National Nuclear Laboratory</li> <li>• <a href="#">Ronald E. Pevey</a> Phone: 865-974-7573 University of Tennessee</li> </ul>	<p><b>Through June 2013:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Chris Robinson</a> Phone: 865-574-8509 BWXT Y-12, LLC</li> <li>• <a href="#">Adolf Garcia</a> Phone: 208-526 4420 DOE, Idaho</li> <li>• <a href="#">Nick Brown</a> Phone: 423-753-0209 Nuclear Fuel Services</li> </ul>	<p><b>Through June 2014:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Allison Barber</a> Phone: 505-301-7426 Sandia National Lab, Inc</li> <li>• <a href="#">Michael Corrum</a> Phone: Nuclear Safety Associates</li> <li>• <a href="#">Chris Haught</a> Phone: 865-576-5522 BWXT Y-12, LLC</li> </ul>

Photographs by Larry Wetzel.