



Summer 2004  
<http://ncsd.ans.org/>

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# American Nuclear Society

## Nuclear Criticality Safety Division Newsletter

### Message from Outgoing Chair

James Baker, [jbaker@lanl.gov](mailto:jbaker@lanl.gov)  
(505) 665-2814, NCSD Past Chair

I have recently been occupied with “Changing of the Guard” in multiple ways. In February, we bid a happy retirement to Tom McLaughlin who has been our group leader for many years. Tom promises to keep on helping us here at LANL, but may also avail himself of other opportunities. Recently he has been on a working vacation in Australia. I suspect many of us might be envious.

On a sad note, we have said our final farewell to several esteemed colleagues in recent months—Hugh Paxton, Dixon Callahan, Gordon Hansen, Roger Carter, George Goebel, and Dick Handley. I consider myself fortunate to have interacted with some of these pioneers of our business. Though the conversations may have been short, they were often of great value to me. Our group shares some of this legacy in the classes we teach at Los Alamos. I encourage you to interact with some of our pioneers through the Nuclear Criticality: Heritage Video Conference 2000 DVD set produced at Los Alamos. Another similar DVD video collection will be issued by ORNL in the near future. The NCSD Executive Committee recently chartered an ad-hoc group to investigate creating a “Criticality Pioneers” scholarship, with the memorial donations that are being received in honor of these men.

I thank you for the opportunity to serve as the chair of your division. I have recently handed it off to Christa Reed. This fall I succeed Mikey Brady-Raap as chair of the nominating committee. So I will be interested in your suggestions for our future leadership. Please contact me if you would like to nominate someone.

Regards to you all,  
Jim Baker

### Message from Incoming Chair

Christa Reed, [christareed@att.net](mailto:christareed@att.net)  
(434) 522-5927, NCSD Chair

Jim Baker presented the “State of the NCS Division” to the ANS Board of Directors at the ANS Annual meeting in June. Jim’s presentation was excellent and very well received. Jim presented membership trends that show our Division is growing, he talked about our membership’s strong support of the ANS 8 standards, the NCS Division tutorials and education committee white papers, the NCS Division’s best paper and annual awards, and our strong technical program and large attendance at the NCSD sessions. It was clear that the NCS Division’s strength is a direct result of all the hard work of our members. His presentation made me proud to be part of such a growing and active Division.



This upcoming year I plan to focus on several items. These include:

**Membership.** I'd like to provide more opportunities to get involved and more information for members who cannot attend the national meetings. In addition, there is an increase in the membership of the NCSA. However, the age demographics show that the membership in the NCSA does not have significant membership in the younger adult age group. International members will also be an area of focus. The membership committee is made up of Bonnie Rumble, Chair, Sandy Larson, and John Miller. And, the committee is looking for another volunteer!

**Scholarships.** There have been discussions at the last two executive committee meetings about the NCSA endowing a scholarship. Providing student support is one of the very important things a Division can do. Ron Knief with help from Valerie Putman will be working on this issue.

**Realism.** The following is a quote from Nils J. Diaz, Chairman, US Nuclear Regulatory Commission to the Japanese Atomic Industrial Forum Annual Conference, April 21, 2004, Tokyo Japan: *"I am convinced nuclear regulation now needs to be anchored in realistic conservatism...if we are to avoid the twin pitfalls of under-regulation and over-*

*regulation...I use 'conservatism' in the sense of preserving adequate safety margins, and I use 'realistic' in the sense of being anchored in the real world of physics, technology and experience...When engineering margins are applied to input parameters, they can distort our understanding of what is truly important. Safety margins are better discerned when they are applied at the decision-making stage, rather than at the analysis stage."* The ANS has a new ANS Position Statement on Realism (Position Statement # 65 accessible at <http://www.ans.org/pi/ps/>). The NCSA has been asked to help with this new realism initiative and comment on the ANS draft white paper on realism. I believe this effort has many worthwhile possibilities.

Lastly, I would really like to hear from you. If you have any ideas, notions, concepts, questions, comments, observations, or remarks please call me at (434)522-5927 or email at [christareed@att.net](mailto:christareed@att.net).

### 2004 Election Results

The results of the 2004 NCSA election for officers are as follows:

Christa Reed	Chair
Stephen M. Bowman	Vice Chair/ Chair Elect
Kevin D. Kimball	Treasurer
Lon E. Paulson	Secretary
Adolf S. Garcia	Exec. Comm.
Maria S. LeTellier	Exec. Comm.
William R. (Randy) Shackelford	Exec. Comm.

### NCSA Best Paper

Valerie Putman  
Honors and Awards Chair  
Congratulations to Rene Sanchez, David Loaiza, and Robert Kimpland (LANL). Their paper, *Critical Mass Experiment with Uranium Diluted with Concrete and Polyethylene*, was judged the best NCSA paper presented at the November 2003 meeting.

### Mark Your Calendars (NCSA Dinner)

This year's Nuclear Criticality Safety Division Dinner will be held on Tuesday, November 16, 2004 beginning at 6:00pm at Maggiano's in Chevy Chase.

### Upcoming Meetings

Dates and locations of additional national ANS and NCSA topical meetings through 2006 are listed below:

Nov 14-18, 2004, Washington, DC

June 5-9, 2005, San Diego, CA

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

Nov 13-17, 2005, Washington, DC

June 4-8, 2006, Reno, NV

Nov 12-16, 2006, Albuquerque, NM

### Winter 2004 Program

The **2004 ANS Winter Meeting** will be held on November 14-18, 2004 in Washington, DC. To view the preliminary schedule of papers to be presented see:

<http://www.ans.org/meetings/docs/2004/wm2004-prelim.pdf>. There will be a total of seven NCSD sessions at the meeting.

*Data, Analysis, and Operations for Nuclear Criticality Safety*

*Nuclear Criticality Safety Standards Forum*

*Nuclear Criticality Safety for Decontamination and Decommissioning Activities*

*Activities to Meet Regulatory Expectations*

*Non-Destructive Analysis (NDA) Tutorial for Nuclear Criticality Safety – (2 sessions)*

*Non-Destructive Analysis (NDA) Determinations and Relationships to Nuclear Criticality Safety*

*Advances in Depletion Methods Based on Multidimensional Transport*

## Summer 2005 Program

The **2005 ANS Summer Meeting** will be held on June 5-9, 2005 in San Diego, CA. The call for papers, which includes the “100 word” summaries and session organizers, can be viewed at: [http://ncsd.ans.org/site/call\\_papers/shtml](http://ncsd.ans.org/site/call_papers/shtml). There will be a total of six NCSD sessions at the meeting.

*Data, Analysis, and Operations for Nuclear Criticality Safety*

*Nuclear Criticality Safety Standards Forum*

*SCALE State-of-the-art Analysis Tools*

*Identification and Implementation of Nuclear Criticality Safety Controls to Meet Regulatory Requirements*

*Graphical User Interfaces for Nuclear Criticality Safety Analysis*

*History of Nuclear Criticality Safety*

## 2005 NCSD Topical Meeting

The meeting will be held at the Knoxville Marriott Hotel, Knoxville, Tennessee, USA, on September 19-22, 2005. The focus of the meeting will be on integrating criticality safety into the resurgence of nuclear power and will highlight major accomplishments in education, applications, methods development, and new initiatives. For more information see: <http://meetingsandconferences.com/ncsd2005/>.

## EFCOG

Dennis Tollefson,  
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The Energy Facility Contractors Group (EFCOG) is a volunteer organization, directed by senior level executives from DOE contractors, sustained by working level personnel from member contractors, and supported and funded by DOE.

EFCOG was formed in 1991 by a group of DOE contractors who decided to work together to improve the cost effectiveness of DOE operations by promoting,

coordinating, and facilitating the active exchange of successful programs, practices, procedures, lessons learned, and other pertinent information of common interest which have been effectively utilized by M&O contractors, M&I contractors, and laboratories. EFCOG provides for the exchange of information useful to the membership in enhancing excellence in operations. This includes, but is not limited to, lessons learned, best management practices, industry benchmarks/standards, appraisal findings/resolutions, advances in technical and managerial areas, and new ideas/practices.

Of particular interest to the NCSD is the Safety Analysis Working Group (SAWG), as this group includes the people and scope that involves 10CFR830 and the incorporation of NCS information into the Documented Safety Analysis (DSA), which is the Safety Analysis Report (SAR) and the Technical Safety Requirements (TSR). Efforts over the past couple of years between NCSD members (particularly Kevin Carroll, Adolf Garcia, Jim Morman, and others of the CSSG) and regulatory bodies have encompassed several interesting discussions, both at Friday sessions in the DOE Forum at the end of the Annual and Winter ANS meetings and at additional meetings and phone calls involving fewer participants. Over this time, several epiphanies have occurred as participants on all sides of these discussions have reached a better understanding of what the regulations require from the NCS organizations and how the Facilities Safety organizations can better integrate that information into the DSAs. During this same time, there has been an increase in the understanding of NCS by some

on the regulatory side, clear evidence that dialog and engagement can lead to better understanding when dealing with complicated issues.

The annual SAWG meeting for 2004 occurred May 1-6. For information about the content of this meeting, please contact [wong59@LLNL.gov](mailto:wong59@LLNL.gov) or call (925) 423-5722. For more information

about EFCOG, the SAWG, and schedules, please go to <http://www.efcog.org/> or contact me at [borgal3@aol.com](mailto:borgal3@aol.com) (865) 590-1308 and I will help you make the contact you need. Alternatively, contact Kevin Carroll at [carrollkj@y12.doe.gov](mailto:carrollkj@y12.doe.gov) (865) 574-3535 or Chris Robinson at [robinsonrc@y12.doe.gov](mailto:robinsonrc@y12.doe.gov) (865) 574-8509.

**NCSD Special Awards**  
Congratulations to Mark D. DeHart and Jerry N. McKamy for receiving the following NCSD special recognition awards.

*American Nuclear Society  
Nuclear Criticality Safety Division  
Distinguished Service Award  
awarded to:  
Mark D. DeHart*

Mark DeHart is recognized for his distinguished service in providing the Nuclear Criticality Safety Division with the leadership, creativity, and hard work that has maintained the division technical program as one of the most active and prolific within the American Nuclear Society. For the past six years, Mark has served as a dedicated member, Vice-Chair, and Chair of the NCSD Technical Program Committee. Mark has effectively led the Committee and NCSD through the transition from on-site paper reviews to web-based technical reviews. In the recent NCSD Topical Meeting, his ideas and can-do attitude were an indispensable asset in assuring an effective electronic paper review and a smooth operation of the meeting.

Mark DeHart serves as a model soldier of service - willing to serve in the trenches and lead by example.

*American Nuclear Society  
Nuclear Criticality Safety Division  
Technical Excellence Award  
awarded to:  
Jerry N. McKamy*

Jerry Mckamy is recognized for leadership in the development and conduct of the Self-Assessment for Improvement of Nuclear Criticality Safety in Department of Energy's fissionable material operations in 1999 - 2000. This effort involved the organization of a criticality safety workshop, attended by criticality safety specialists and safety managers responsible for nuclear criticality safety at all of the operations throughout the DOE complex. Applying the recommendations and requirements from the professional consensus standards on criticality safety administrative practices, McKamy authored a guide for program self-assessment, which was subsequently carried out at all of the DOE sites.

As a lead criticality safety specialist in DOE headquarters, Jerry McKamy has performed a number of roles in which his knowledge and background in good criticality safety practices has benefited safety in DOE operations. An example is his development of the DOE Guide for the Performance of Criticality Safety Evaluations. These accomplishments have amply met the Division's criterion for Technical excellence in the development of the technical bases for effective and useful NCS guides, standards, and regulations.

## Hugh Paxton 1909-2003



**Hugh Campbell Paxton** died December 25, 2003 in Albuquerque, NM. Hugh was a fellow of both the American Nuclear Society and the American Physical Society who made pioneering contributions to the science of criticality of fissionable materials and the art of criticality safety. Hugh was 94. He is survived by his wife, Jean, a daughter, Susan, a son, Alan, and two grand daughters, Jennifer and Carrie.

Hugh became leader of the criticality group at the Los Alamos Scientific Laboratory in 1948 when the science of criticality was just beginning and the safety of operations with fissionable materials was on an ad hoc basis. Hugh Paxton and Dixon Callihan of the Oak Ridge National Laboratory organized and systematized the existing data in a series of AEC, Los Alamos, and Oak Ridge documents. These data provided a basis for conducting experiments and calculational studies that could fill in the blanks

and provide for additional safety in operations and basic knowledge of fissionable materials. Some especially important experiments were those that established the bare and reflected metallic critical masses highly enriched uranium-235, uranium-233, and plutonium-239. Further experiments with the assembly used to establish the bare critical mass of metallic uranium-235 led to the design of the Godiva reactor, which safely provided large bursts of neutrons within a few microseconds when its reactivity was quickly forced to prompt criticality. Concurrently, the minimum critical masses of enriched uranium moderated with beryllium and with heavy water were found by a series of experiments. In the late 1950s, the program to find how to apply nuclear energy to rockets was begun. The facility provided all of the critical experiments necessary to design the graphite-moderated, hydrogen-cooled propulsion units.

Hugh was a consultant to the government on a number of occasions, providing criticality and safety advice. He was active in the American Nuclear Society and associated organizations. He was a charter member of the American Nuclear Society in 1955 and was honored by becoming a fellow of the Society in 1970. He served on the board of directors from 1966 to 1969. He was a member of the USAEC Reactor Physics Advisory Committee from 1954 to 1959 and was a member of the N6 Steering committee of the American Standards Association in 1957. He was a member of the N6-8 on Standards for Fuel Outside of Reactors beginning in 1957. He joined the American Physical Society in 1937 and was elected to be a fellow of the society in 1959.

Under his leadership the experimental facility designated Technical Area 18 (TA-18) in Pajarito Canyon became world famous and has been THE place to visit by interested scientists from all nations with programs in nuclear energy. A criticality safety course designed and taught in TA-18 has trained over many years 3,000 plus students in the art of criticality safety. These graduates have been invaluable in maintaining the excellent criticality safety record throughout the nuclear industry. In the Pajarito facility itself, no criticality experiment has harmed any person since 1946, a remarkable record considering the number of experimental assemblies that have achieved criticality. The 1945 fatal accident was at the early facility on the OMEGA site.

Born in Los Angeles, California, on April 29, 1909, Hugh graduated from high school at age 16, obtained an AB degree at UCLA in 1930, and was elected to Phi Beta Kappa. During the early 1930s he worked in the Development Division of the Bell Telephone Laboratories when in 1932 he entered the graduate division of the University of California at Berkeley to resume his studies of physics. He received his PhD in Physics under the direction of Prof. E. O. Lawrence in 1937. He married Jean Nellis Thomson on May 28, 1937. During the next year (two years were planned) he worked with Prof. Frederic Joliot at the College of France, the Laboratory of Nuclear Chemistry, in Paris to design and build a cyclotron. He and his wife, Jean, were advised to return to the United States in 1938 because of the perceived threat of war. The next four years were spent as an instructor in physics at Columbia

University with continuing work in nuclear physics. He shifted to wartime activity in gaseous diffusion technology at the SAM Laboratory of Columbia University in New York City and at the Oak Ridge Gaseous Diffusion plant. Peacetime found him engaged in precision casting development at the Sharples Research Laboratories in Philadelphia.

In 1948 he accepted the position of group leader of the critical assembly group at Los Alamos Scientific Laboratory. Hugh retired from Los Alamos National Laboratory in 1976. He and Jean lived in Los Alamos until 2001 when they moved to Albuquerque.

Gary R. Handley



**Gary R. "Dick" Handley**, 62, of Oak Ridge, died February 25, 2004, at his home, after a long battle with cancer. Mr. Handley

began work at the Y-12 National Security Complex in 1965, following a stint in the U.S. Air Force and undergraduate training in nuclear engineering at The University of Tennessee. During his 37 year tenure at Y-12, he rose to senior staff engineer and made many significant contributions. Mr. Handley's technical contributions over the past 30 years have reached beyond the walls of Y-12, greatly impacting the nuclear criticality safety community as a whole. In his early years he was instrumental in the design and development of the current Y-12 Criticality Accident Alarm System (CAAS). Also during his early years, Monte Carlo computational methods were becoming available and he pioneered application of them to nuclear criticality safety analyses, particularly those analyses involving interspersed low density water in storage arrays. He had a long interest in quality assurance of computational methods and many of the practices in place today were the result of his work. He was also instrumental in the design of the concrete tube vaults which was a significant step in establishing Y-12 as a Highly Enriched Uranium (HEU) storage facility within the DOE complex. Both of these contributions were incorporated into the technical basis of respective consensus national standards. The results of some of his work are published in the *Transactions of the American Nuclear Society*.

Additional contributions include authorship of Y/DD-708, *Nuclear*

*Criticality Safety Guidelines for Fire Fighting in the Y-12 Plant* and the authorship of the *Guidance Checklist for the Y-12 TSC Nuclear Criticality Safety Position for Emergency Response Management*. Both documents were firsts throughout the DOE Complex for implementation of NCS guidance in non-process related areas.

Dick Handley will be remembered for many professional accomplishments. However, the one thing which will have continuing impact on Y-12 for many years, is his time spent mentoring new nuclear criticality safety engineers. He had a very strong sense of the right thing to do to satisfy nuclear criticality safety philosophies, policies, and practices and gave of his time, talent, and energy in a very unselfish way for the good of Y-12 and his profession. He will be greatly missed by his many friends and co-workers!

In addition to his wife, Lynn Handley, he is survived by his mother and stepfather, Anna Mae and Les Cornell of Proctorville, Ohio; three daughters, Kathryn Handley of Des Moines, Iowa, Anna Handley, a senior at Oak Ridge High School and Cherry Mitchell of Centerville, Virginia.; and by his stepson, Michael Tipton, who he considered to be his son, and his wife, Donna, and their two children, Hunter and Zachary, all of Taylorsville, Kentucky.