

MEMORANDUM TO: Eric Leeds, Acting Chief  
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Division of Fuel Cycle Safety  
and Safeguards, NMSS

THRU: Charles W. Emeigh, Chief  
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FROM: Harry Felsher  
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SUBJECT: TRIP REPORT: MARCH 27-31, 2000, U.S. DEPARTMENT OF  
ENERGY WORKSHOP & RELATED MEETINGS, ALBUQUERQUE,  
NEW MEXICO

During the last week of March 2000, Harry Felsher of the Licensing and International Safeguards Branch attended the U.S. Department of Energy (DOE) Nuclear Criticality Technology Safety Project (NCTSP) Workshop and related meetings in Albuquerque, NM. The purpose of the trip was to attend (1) the DOE Nuclear Criticality Safety (NCS) Program Review meeting on March 27, 2000, (2) the DOE NCTSP Workshop on March 28 and 29, 2000, and make a DOE NCTSP Workshop presentation, "Regulatory Activity Status of the Rule (10 CFR Part 70) and the U.S. NRC Draft Standard Review Plan (NUREG 1520)," on March 29, 2000, (3) the American National Standards Institute(ANSI)/American Nuclear Society(ANS)-8 Standards Committee meeting on March 30, 2000, and (4) the ANSI/ANS-8.1, ANSI/ANS-8.7, and ANSI/ANS-8.12 Working Group meetings on March 30 and 31, 2000.

The majority of the attendees were members of the NCS community from DOE Headquarters, DOE Field Offices, or contractors/subcontractors at DOE sites. Other attendees were representatives from the Defense Nuclear Facilities Safety Board (DNFSB), NRC, NRC regulated facilities, Japan, Sweden, and contractors/subcontractors at non-DOE sites. About 100 people attended both the DOE NCS Program Review and the NCTSP Workshop, about 50 people attended just the workshop, and about 50 people attended some of the various ANSI/ANS standards meetings. The last session of each day of the NCTSP Workshop (Sessions V and IX) was an open NCS community discussion led by Burton Rothleder (DOE/HQ). A brief summary of the meetings is provided below.

## Summary

### **DOE NCS Program Review meeting on March 27, 2000**

James Felty (SAIC) and Roger Dintamen (DOE/HQ) discussed the elements of the DOE NCS Program developed in response to the DNFSB 97-2 Recommendation (i.e., critical experiments, benchmarking, analytical methods, nuclear data, training & qualification, information preservation & dissemination, and applicable ranges of bounding curves & data). The program has a web site at the following address: <http://ncsc.llnl.gov:8080/>. The site has a user-survey that asks for feedback from the NCS community regarding the importance of the elements of the program. DOE will evaluate the responses and place the results on the web site. After the presentation, an update to the status of each element of the program was discussed:

Steven Clement (LANL/LACEF) discussed the critical experiments being performed at the Los Alamos Critical Experiments Facility (LACEF). One item is that the facility is being used to test for the Japanese Tokimura accident. DOE is considering closing down or moving parts of LACEF because of cost concerns.

Blair Briggs (INEEL/LMIT) discussed the highlights of the updated benchmark notebook that will be distributed by CD in September 2000. It will include the first subcritical benchmark and a mixed-oxide solution with gadolinium critical benchmark. Future work will be to evaluate and compile benchmark data in the areas of critical, criticality alarm/shielding, and subcritical

Michael Westfall (ORNL/LMER) discussed the efforts to continue code maintenance, training, and code package distribution for the analytical methods as well as the efforts to continue linkage between operations and user-identified needed nuclear data.

Thomas McLaughlin (LANL) and James Morman (ANL) discussed the increased need for LACEF training courses based on the new NCS qualification requirements for both contractors and federal employees. In addition, the NCS program web site has NCS training modules in the areas of NCS physics, neutron interactions, fission chain reactions, neutron scattering & moderation, criticality limits, diffusion theory, and Monte Carlo method. Future training modules being developed are criticality accident calculations and hand calculations.

Thomas McLaughlin (LANL) discussed the current information preservation & dissemination efforts. There exists the Criticality Safety Information Resource Center (CSIRC) whose mission is to preserve primary U.S. NCS documentation. The CSIRC website is located at <http://orion.lanl.gov/ncs.index.htm>. The revised LA10860, "Critical Dimensions of Systems Containing U-235, Pu-239, and U-233," will be distributed by CD in April 2000. The revised criticality accident report, which will include the Japanese accident, will be distributed in May 2000 and the references to the report will be on the CSIRC web site in April 2000. The revised LA 12808, "Nuclear Criticality Safety Guide," will be distributed by CD in June 2000.

Calvin Hopper (ORNL/LMER) discussed the highlights of the applicable ranges of bounding curves & data (AROBCAD) program, which will be completed in 2006.

Joseph Roarty (DNFSB) provided the DNFSB perspective on the NCS program and asked the question, "What can be learned from the NRC?"

**Day #1 of the DOE NCTSP Workshop on March 28, 2000**

Burton Rothleder (DOE/HQ) provided the introduction, opening remarks, and view from DOE for the NCTSP Workshop. In the future, the NCTSP will be scheduled for the last week in March each year and will focus on current issues and challenges with discussion sessions

Session I: DNFSB Recommendation 97-2 Response Status (Adolph Garcia, DOE/ID)

James Felty (SAIC) provided an introduction to the DOE NCS Program for those who did not attend the Program Review meeting. The mission of the program is to maintain infrastructure that enables capabilities to support line NCS activities. The challenge is to meet the NCS community needs with limited resources.

The other presentations in this session were not given because they would have been essentially the same as those in the Program Review meeting the previous day. Burton Rothleder (DOE/HQ) handed out copies of the Draft Revision to the NCS DOE Order 420.1, "Facility Safety," reviewed the modifications to Section 4.3 of the Order, and asked for comments from the NCS community.

Session II: Critical Experiment Program at LANL & Sandia (Charlene Cappiello, LANL/LACEF)

Gary Harms (SNL) discussed the Nuclear Energy Research Initiative funded burnup credit program. This is the first year of a three year program to address burnup credit issues, where the critical experiments will be performed in the third year. DOE asked for burnup credit experts to join an ad hoc advisory panel.

Richard Paternoster (LANL/LACEF) discussed upcoming time-dependent benchmark experiments at LACEF that will be used to enhance the understanding of criticality accidents.

Richard Anderson (LANL/LACEF) discussed the future of operations at LACEF and stressed the importance of keeping LACEF open in order to get basic data, perform training, and address unexpected issues, such as the Japanese accident. Future activities at LACEF include criticality accident studies, mixed-oxide calculations, testing of criticality detecting devices, and new power sources for space vehicles.

Other presenters were Rene Sanchez (LANL/LACEF) on "Critical Masses of Uranium Diluted with Matrix Material" and Joetta Goda (LANL/LACEF) on "Equivalent Fundamental Mode Source Method for Validating Spontaneous Fission Rates."

Session III: Tokimura Criticality Accident: U.S. Lessons Learned (Robert Wilson, DOE/RFFO)

Valerie Putman (INEEL/LMIT) discussed the factual overview of the event based on the Japanese report (provisional translation), the International Atomic Energy Agency team visit, and the U.S. team visit.

Thomas McLaughlin (LANL) discussed the U.S. team visit and said that the U.S. team report will be placed on the NCS program web site. The revised criticality accident report, which will include the Japanese accident, will be distributed in May 2000 and the references to the report will be on the CSIRC web site in April 2000.

Ivon Fergus (DOE/HQ) discussed the DOE program to review the DOE self-assessment site response reports to the accident. Summaries of the results of the site response reports were presented by representatives from Hanford, Y-12, INEEL, and RFETS.

Dennis Morey (NRC) discussed the actions taken by NRC, NRC regulated facilities, and the Nuclear Energy Institute in response to the accident. A report will be sent to the Commission in May 2000.

Session IV: Criticality Safety Procedure Violations and Infraction Tracking & Trending  
(Hans Toffer, Hanford/FFS and Thomas Riles, WSMS)

Presentations were made by Ivon Fergus (DOE-HQ), Kevin Carroll (Y-12/LMES), David Dolin (SRS), John Pearson (LLNL), Robert Richard (Hanford/FFS), Stuart Vessard (LANL), and Robert Wilson (DOE/RFFO). Each DOE site had a different infraction tracking and trending program with different categories of and requirements for reporting based on the site's interpretation of what was required by contract, Order, and standards.

**Day #2 of the DOE NCTSP Workshop on March 29, 2000**

Session VI: Code Development, Nuclear Data, & Benchmarking (Michael Westfall, ORNL/LMER)

Timothy Valentine (ORNL/LMER) discussed the need for subcritical measurements, the use of subcritical data, the need to determine whether bias is a function of k-effective, and the need to determine whether applying critical bias to the subcritical model is conservative.

Jim Gulliford (AEA Technology) provided a summary of the current discussion in the United Kingdom concerning the 5% administrative margin of subcriticality for safety including the origin of the 5% value and whether the value is appropriate. He asked for feedback from the NCS community.

Other presenters were Michael Westfall (ORNL/MER) on "Analytical Methods," Luiz Leal (ORNL/LMER) on "Nuclear Data," Calvin Hopper (ORNL/LMER) on "Applicable Ranges of Bounding Curves & Data," and Blair Briggs (INEEL/LMIT) on "Benchmarking and ICSBEP Overview."

Session VII: Criteria for Inclusion or Exclusion of Criticality Alarm Systems (CASs)  
(Valerie Putman, INEEL/LMIT)

Valerie Putman (INEEL/LMIT) discussed the use of the ANSI/ANS-8.3, "Criticality Accident Alarm System" national standard in specifying when and where CASs are needed. Burton Rothleder (DOE/HQ) discussed the modifications to the standard in the DOE NCS Order.

Presentations were made by Debdas Biswas (WSMS/SRS), Howard Gilpin (RFETS), Hans Toffer (Hanford/FFS), Kevin Carroll (Y12/LMES) on experiences with CASs at their sites.

Session VIII: Regulatory Activity Status: The Guide (DOE G 421.1-1) and the Order (DOE O 420.1); the Rule (10 CFR Part 70) and the NRC SRP (Chapter 5 of NUREG 1520) (Burton Rothleder, DOE/HQ)

Burton Rothleder (DOE/HQ) discussed the proposed revisions to the NCS Good Practices Guide and NCS Order and asked for comment from the NCS community.

Harry Felsher (NRC) discussed the draft Part 70 Rule and the NCS chapter of the NRC standard review plan (SRP). The April 2000 public meeting was announced. The draft Rule package including the entire SRP (NUREG-1520) will be sent to the Commission in May 2000.

### **ANSI/ANS-8 Standards Committee meeting on March 30, 2000**

After the welcome, overview, and previous meeting minutes approval led by Thomas McLaughlin (LANL), there was a discussion of the use of ANS standards in other countries and international standards. It was announced that ANSI would stop being the coordinator for international standards work in mid-April 2000, unless more funding sources can be found. At the moment, there is no government funding of international standards. This has been known for some time now and ANS has been working on it.

There were reports from the ANSI/ANS-8 Working Groups. ANSI/ANS-8.9, "Pipe Intersections" has been officially withdrawn/archived. ANS National will maintain it as a reference document. The only other archived standard was ANSI/ANS-8.11.

There will be a poster session on ANSI/ANS standards at the November 2000 Winter Meeting in Washington, D.C. ANSI/ANS-8 Committee always meets during the Winter ANS meeting and there was discussion of whether the other meeting should stay with the NCTSP or change to the June Annual ANS meeting. No decision was made. DOE has decided to move the DOE NCS Program Review meetings to the Annual and Winter ANS meetings starting in Winter 2000.

### **ANSI/ANS-8 Working Groups on March 30, 2000 and March 31, 2000**

Harry Felsher attended the ANSI/ANS-8.7, "Storage of Fissile Materials" working group meeting. He is the NRC representative to the working group. This was the first meeting in the revision process. The next meeting will occur at the June Annual ANS meeting in San Diego, CA. He also attended the ANSI/ANS-8.12, "Mixed Oxides" working group meeting. Based on the work accomplished, the standard is expected to be reaffirmed. In addition, he attended the ANSI/ANS-8.1, "Generic Criticality" working group meeting. The revision process began a year ago and work has started on the calculations.

It was beneficial for NRC to attend these meetings and make a presentation because of the open programmatic and technical NCS discussions at the meetings and the need for NRC to understand the current regulatory environment at DOE considering that NRC might regulate DOE in the future.

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