

**SAFETY ANALYSIS WORKING GROUP (SAWG)
ANNUAL REPORT TO THE DIRECTORS
(FY 2005)**

Introduction

The purpose of the Energy Facility Contractors Group (EFCOG) Safety Analysis Working Group (SAWG) is to promote excellence in safety analysis applications and programs throughout the Department of Energy (DOE) community. The SAWG provides a forum for accomplishing its purpose through its Steering Committee (SC), Subgroups (SGs), meetings, teleconferences, workshops, and training. The SAWG is actively involved and integrated with facility and DOE customers to accomplish the following:

- Establish initiatives and priorities.
- Facilitate initiatives through subgroups and task teams.
- Investigate safety analysis strategies, leverage experiences, and share lessons learned.
- Maintain safety analysis networking and interfaces using current technology.
- Provide a forum to effectively accomplish activities and conduct business.
- Train safety analysts, engineers, and managers.

The SAWG adheres to the following principles:

- Operate within the framework of the EFCOG charter.
- Ensure that planning and actions promote EFCOG objectives.
- Follow applicable DOE and contractor requirements.

Membership

The membership of the SAWG SC and its three current SGs includes representatives from EFCOG member companies representing most DOE Sites, national laboratories, and contractors that support their work. Currently there are 17 members on the SC, representing contractors at over 13 DOE sites (see attached roster). In addition, effective communication with DOE HQ personnel is facilitated through their active participation on the SC, SGs, workshops and training functions. Relationships have also been developed with EPA and NRC staff and with ANS organizations. During the year, approximately 200 people participated in SAWG activities. Each EFCOG member company is encouraged to provide a representative on the SC. All safety basis professionals are welcome to attend SAWG workshops and training and participate in SG initiatives. Recruiting has been specifically targeted this year to accident analysts and training representatives.

The working group is chaired by David Renfro of ORNL, with Paula Ostby of INL as vice-chair, Dick Englehart of DOE-EH as the DOE Sponsor, and Pamela Horning of

BWXT as the EFCOG Sponsoring Director. Nominations for chair and vice-chair of the SC are accepted from SC members and elections are held annually on a CY basis.

Leadership of SAWG Steering Committee and Subgroups for FY 2005

Steering Committee Chairman	David Renfro, ORNL
Steering Committee Vice Chairman	Paula Ostby, INEEL
DOE Sponsor	Dick Englehart, DOE-EH
Accident Analysis Subgroup Chair (10/04-4/05)	Kevin O’Kula, WSMS
Accident Analysis Subgroup Chair (5/05-9/05)	Louis Restrepo, Omicron
Accident Analysis Subgroup Vice Chair (10/04-4/05)	Louis Restrepo, Omicron
Accident Analysis Subgroup Vice Chair (5/05-9/05)	Mukesh Gupta, WSMS
Chemical Safety Subgroup Chair (10/04-4/05)	J. C. Laul, LANL
Chemical Safety Subgroup Vice Chair (10/04-4/05)	David Pinkston, LLNL
Safety Basis Subgroup Chair (10/04-4/05)	Andrew Vincent, WSRC
Safety Basis Subgroup Chair (5/05-9/05)	Brad Evans, CALIBRE
Safety Basis Subgroup Vice Chair (5/05-9/05)	Rob McKeehan, ORNL
Training Subgroup Chair (10/04-4/05)	John Rice, Epsilon
Training Subgroup Chair (5/05-9/05)	Roland Gille, LANL
Closure Interest Subgroup Co-Chair (10/04-4/05)	Jerry Hansen, WSMS
Closure Interest Subgroup Co-Chair (10/04-4/05)	Jeff Woody, Atlas

Objectives and Achievements

The SAWG conducts business through its SC and SGs. The SC coordinates the SG actions, recommends changes, and establishes priorities. The SC also undertakes short-term activities through informal task teams or as a collective effort. The SAWG SC added several new members during FY 2005.

Steering Committee

- The SAWG participated in the August 2005 ANS International Topical Meeting on *Decommissioning, Decontamination, and Reutilization* as part of the active interface between the SAWG and the ANS. SAWG representatives were members of the technical planning committee and chaired and participated in a decommissioning panel session which included DOE-HQ, DNFSB, and major DOE site contractors.
- One of the most significant SAWG activities each year is hosting the annual Safety Analysis Workshop. The workshop provides training, technical

presentations, and panel discussions as it encourages interaction among the entire DOE community. The workshop is unique in that it is the only national forum of its type, bringing together most of the significant policy makers, line managers, analysts, trainers, reviewers and approvers of DOE safety basis-related activities, applications, and documentation. The 15th Annual Safety Analysis Workshop was held in Santa Fe, NM, April 30 – May 5, 2005 and was sponsored by Los Alamos National Laboratory (LANL). There were over 200 participants from the DOE, contractors, and the DNFSB who attended this workshop. The theme “Opening Doors to Success” continued the long-standing success the workshop has maintained by providing high quality training, outstanding exchange of information, and a venue for DOE and contractors to discuss safety basis compliance issues.

- Sixteen different training courses were provided and over 175 DOE and DOE contractors attended one or more of these courses. The courses consisted of:
 - Airborne Release/Respirable Fraction
 - Radiological Dispersion/Consequence Analysis
 - Chemical Dispersion and Consequence Assessment
 - Criticality
 - Introduction to Plutonium Metallurgy
 - Safety Analysis in Dealing with Energetic Materials
 - Overview of DOE Standard 3009
 - Control Selection Process
 - Technical Safety Requirements
 - USQ Refresher
 - Leak Path Factor,
 - and Fire Source Term Modeling.

Four hands-on computer code courses were also offered and consisted of CFAST, MACCS2, and RSAC-6 for Beginners, and RSAC-6 for Advanced Users. Since there was a high demand for MACCS2, this course was offered twice making a total of 17 training sessions. American Board of Industrial Hygiene (ABIH) awarded Industrial Hygiene (IH) certification maintenance points for each course. These courses were offered to participants at no additional cost.

Former Department of Energy Secretary and current New Mexico Governor Bill Richardson provided the Workshop opening remarks. Dr. Bruce Matthews, DNFSB Member, presented the Workshop keynote address. Dr. Matthews' topic was “Recommendation 2004-1, Oversight of Complex, High-Hazard Nuclear Operations”. Rear Admiral Paul Thomas, Royal Navy (Ret) and current Director of Environment, Health, Safety and Quality at British Nuclear Fuels was the third invited speaker. Rear Admiral Paul Thomas' presentation was “Learning from Disasters.”

- At the request of our DOE sponsor, members of the SC reviewed a report by the Engineering Practices WG entitled *Safety System Design Adequacy* published August 2004 and provided a consolidated set of comments in September 2005.
- A member of the SC was selected to serve on the new DOE Safety Research Review Panel.

Subgroup/Task Group Objectives and Achievements

Accident Analysis Subgroup

Our overall objective is that through consistent implementation of accident analysis, nuclear safety is improved, operational risk is managed, and a better and more consistent understanding of the residual risk of nuclear operations is achieved. These objectives are pursued in a prioritized, cost/effective manner.

- The AA SG supported the resumption of nuclear safety research with submittal of experimentation topics to be supported by DOE over the next several years. Topics including Type B containers, glovebox, spray performance, release fractions, and others were submitted to DOE/EH in mid-2005. From the initial submittal, several topics were selected for further planning and experimental design by a DOE review panel.
- The AA SG played a key role as part of the DOE/EH-31 effort to upgrade the Software Quality Assurance (SQA) programs, processes, and procedures used to maintain, upgrade, and apply safety software for safety basis and design support of DOE facilities. Specifically, the AA SG was part of the Safety Software Guide DOE writing team that assembled the DOE G 414.1-4, *Safety Software Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements, and DOE O 414.1C, Quality Assurance* issued on June 17, 2005. The Guide documents information plus acceptable methods useful for implementing the safety software quality assurance requirements of DOE O 414.1C, *Quality Assurance*.
- Strategic initiatives to improve sharing of lessons learned between the SAWG and its counterpart in the American Nuclear Society (ANS), the Nuclear Installation Safety Division (NISD), continued in FY05. The AA SG proposed and chaired a session on TRU waste drum safety, control, and management during the Washington, D.C. Winter Meeting of ANS, November 13 - 18, 2004. The session included lessons learned and analytical papers from the DNFSB, LLNL, INL, Hanford, and DOE/EM.

Chemical Safety Subgroup

- The Chemical Safety SG issued a report entitled "Proposed Beryllium Metal Bounding Airborne Release Fractions (ARFs/Rates (ARRs) and Respirable Fractions (RFs) for DOE Facility Accident Analysis". Key findings were that ARF/RF values typically based on plutonium and uranium from DOE-HDBK-3010

are not always applicable for beryllium for all accident scenarios. Size fraction plays an important role in evaluating ARF/RF values. These findings suggest closer examination for other elements.

Safety Basis Subgroup

- The SB SG hosted the 2005 Safety Basis Workshop for over 100 attendees from DOE, contractors, and the DNFSB at the DOE Energy Training Center in Albuquerque, NM on January 25-26, 2005. The session topics were Specific Administrative Controls, implementation of revised unreviewed safety question guidance, safety analyst training, integration of nuclear criticality safety into safety basis documentation, software QA, and revisions to DOE-STD-1120.
- The SB SG led the review effort for EFCOG of the revised draft of DOE-STD-3007, *Guidelines for Preparing Criticality Safety Evaluations at Department of Energy Non-Reactor Nuclear Facilities*. Content of this draft Standard required submittal of contractor comments, the disposition of which are planned for the upcoming February 2006 Safety Basis Workshop.
- The SB SG implemented an initiative to document and archive safety basis issues and their disposition, potential lessons learned, and other aspects of how the issue is or was addressed at DOE Sites. The mechanism for this is the EFCOG Discussion Forum, a cost-effective communication tool, where, to date, safety basis issue discussion comprises about 90 percent of the forum participation.

Training Subgroup

- The Training Subgroup focused on safety analyst training needs and a review of existing safety courses presented across the DOE Complex. These courses are being compared to independently developed course design criteria that follow the DOE/NNSA Systematic Approach to Training. The goal was to determine the availability of and quality of safety analyst training courses and courses for technical personnel who aspire to become safety analysts.
- A draft revision of the SAWG Safety Analysis Training Standard was sent to the Training Subgroup and the SAWG Steering Committee for review and will be issued.
- A special afternoon meeting was held at the January 2005 SAWG Safety Basis Workshop in Albuquerque, New Mexico to review and comment on a Safety Analyst Functional Analysis Survey document prepared by the LANL Safety Basis Academy Project. Validation of the Safety Analyst functional areas and competencies was accomplished through two mechanisms: (1) surveys that were distributed to and reviewed by safety basis authorities from across the DOE Complex at the workshop held at the meeting held in January 2005, and (2)

additional surveys were mailed to other DOE complex-wide safety basis authorities not in attendance at the January meeting. The primary objectives of the DOE complex-wide validation process with regard to analyst training surveys were to:

- Characterize Sites/Facilities across the DOE Complex with regard to training needs
- Determine the applicability of functional areas and competencies to DOE sites
- Identify performance issues associated with each functional area
- Determine the adequacy and correctness of each competency statement
- Ensure that all major Safety Analyst competencies were included on the lists
- Identify the need for formal training at the competency level.

The survey results were incorporated into the Safety Analyst Functional Analysis Report published by the Safety Basis Academy project in March 2005.

- An additional session was held at the January 2005 Safety Basis Workshop to describe and discuss recent DOE initiatives in safety analysis training, contractor training needs, and available training. A presentation regarding the methodology and status of the Safety Basis Academy was presented including information on the use of the DOE/NSA Systematic Approach to Training.

Planning for the Year Ahead

Steering Committee

- Westinghouse Savannah River Company will host the 16th Annual Safety Analysis Workshop in Atlanta, GA, from April 30 – May 4, 2006. Training, subgroup meetings, technical paper presentations, panel discussions, and invited speakers will be featured.
- The SC will meet with its DOE sponsor and other key DOE-HQ constituents November 16-17, 2005 to develop short- and long-term strategic initiatives for the SAWG.

Subgroup/Task Group Planning for the Year Ahead

Accident Analysis Subgroup

- Support DOE-EH in the final review and release of the AA Guidebook .
- Issue a paper comparing the use of EPIcode and ALOHA chemical dispersion computer codes.

- Provide user guidance on the use of models and computer codes in support of leak path factor (LPF) analyses, with focus on capabilities, limitations, and lessons learned on the use of the MELCOR computer code to support LPF calculations.
- Coordinate with DOE on Software QA improvements per DNFSB Recommendation 2002-1 and DOE Toolbox codes.
- Continue to recommend and review DOE safety research topics.
- Issue a paper on use of computer codes to support evaluation of control effectiveness.

Safety Basis Subgroup

- Sandia National Laboratories will host the 2006 Safety Basis Workshop at the DOE Energy Training Center in Albuquerque, NM, on February 14-15, 2006. The sessions tentatively planned include:
 - Deactivation and Decommissioning mini-workshop; topics to include change control, hazard analysis techniques, lessons learned, and a case study from Rocky Flats
 - Review and comment on RevCom version of DOE-STD-3007
 - Implementation of DNFSB Recommendation 2004-2, *Active Confinement Systems*.
 - Use and application of Justification for Continued Operation
 - Unreviewed Safety Question process lessons learned
 - Major modification / design process

The subgroup will develop useable products from each of the Safety Basis Workshop sessions.

- The subgroup will sponsor a meeting of USQ subject matter experts on February 13, 2006 (prior to the Safety Basis Workshop) to address DOE HQ concerns about the USQ process, target specific areas to work, and develop one or more initiatives for improvement.
- The subgroup will continue to hold monthly teleconferences to track progress, maintain awareness of DOE initiatives, and identify emerging issues.

Training Subgroup

- Follow DOE employee qualification initiatives for possible contractor flow-down.
- Continue to provide pertinent training information updates to the EFCOG Discussion Forum.

- Provide updated status on the Safety Basis Academy Project.
- Increase communication and participation within the Training Subgroup.
- The Training Subgroup Chair will attend the November meeting with DOE-HQ to discuss EFCOG SAWG priorities for the coming year.
- Finalize and release the SAWG Training Standard.

Lessons Learned

- Review and approval of SG initiatives by the SC before work commences should be required.
- The SAWG and its supporting member companies should consider increasing the priority of safety basis training.
- The SAWG needs to intentionally enlist, train, and mentor younger participants in WG activities.
- Working with technical organizations of similar interest (e.g., ANS, AIChE) can promote cross-fertilization and information sharing that can be cost-beneficial.
- The EFCOG Discussion Forum can be an effective means of identifying issues, capturing comments and lessons learned, and archiving resolution for others to share. There are some topics that are potentially sensitive and should not be discussed in an open forum. The suggestion of a forum registration requirement was provided to the website administrator and implemented; mitigating against malicious use of the forum.

Effectiveness Evaluation

The SAWG continues to be a very effective working group as evidenced by its widespread base of participation and its role in accomplishing improvements in accident analysis, safety basis development and maintenance, training, and policy and guidance development during FY 2005.

Recommendations

The Safety Analysis Working Group should continue along with the Accident Analysis, Safety Basis, and Training Subgroups. The Chemical Safety Subgroup was terminated in May 2005.