

SAFETY ANALYSIS WORKING GROUP (SAWG) ANNUAL REPORT TO THE DIRECTORS (FY 2008)

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 27 members on the SC, representing contractors at over 15 DOE sites (see attached roster). In addition, effective communication with DOE Headquarters (HQ) personnel is facilitated through their active participation on the SC, SGs, workshops and training functions.

Relationships have also been developed with Environmental Protection Agency (EPA) and Nuclear Regulatory Commission (NRC) staff and with American Nuclear Society (ANS) organizations. During the year, over 250 people participated in SAWG activities. Each EFCOG member company is encouraged to provide a representative to the SC. All safety basis professionals are welcome to attend SAWG workshops and training and participate in SG initiatives.

The working group was chaired through FY 2008 by Andrew Vincent of Savannah River Nuclear Solutions (SRNS), with Brad Evans of Pacific Northwest National Laboratory (PNNL) as vice-chair, Richard Englehart of DOE-Health, Safety and Security (HSS) as the DOE Sponsor, and Robin Madison of Los Alamos National Laboratory (LANL) 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 2008

Steering Committee Chairman	Andrew Vincent, SRNS
Steering Committee Vice Chairman	Brad Evans, PNNL
DOE Sponsor	Dick Englehart, DOE-HSS
Accident Analysis Subgroup Chair	Mukesh Gupta, WSMS
Safety Basis Subgroup Chair	Rob McKeehan, ORNL
USQ Subgroup Chair	Mark Mitchell, LLNL
Training Liaison	Julie Johnston, LANL

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 2008.

Steering Committee

With elections completed in October, 2008, Brad Evans was elected as Chairman and Rob McKeehan elected as the Vice Chairman, both effective immediately.

Annual Workshop

- 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 many significant policy makers, line managers, analysts, trainers, reviewers and approvers of DOE safety basis-related activities, applications, and documentation. The 18th Annual Safety Analysis Workshop was held in Richland, WA, May 2 - 8, 2008, sponsored by Fluor Hanford and the Pacific Northwest National Laboratory (PNNL). There were approximately 250 participants from the DOE, contractors, and the Defense Nuclear Facilities Safety Board (DNFSB) who attended this workshop. This year's theme "The Nuclear Renaissance," focusing on the resurgent nuclear industry, 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.

- Eleven different training courses were provided and over 150 DOE and DOE contractors attended one or more of these courses. The courses consisted of:
 - Areal Locations of Hazardous Atmospheres (ALOHA)
 - Safety Basis Document Preparation- Advanced (3009)
 - Lab Specific Lessons Learned
 - Introduction to Plutonium Metallurgy
 - Human Performance Improvement
 - Risk Analysis Fundamentals
 - GENII
 - 1189 Safety Design Integration
 - Control Selection and Development of Technical Safety Requirements
 - Unreviewed Safety Questions (USQ) Refresher
 - Water Hammer in Industrial Piping Systems

Two hands-on computer code courses were also offered in ALOHA and GENII. . These courses were offered to participants at no additional cost.

David Mathews, Director of the Division of New Reactor Licensing, Nuclear Regulatory Commission gave the keynote address and provided the attendees with a view of how the Nuclear Regulatory Commission is dealing with the re-emerging nuclear power industry.

The hosted luncheon speaker was William Elkins, Project Director for the Waste Treatment Plant Project at Hanford. Mr. Elkins had slides and video of the largest DOE project currently under construction in the country.

SAWG Priorities Discussion Session, September 2008, Washington, DC

The SAWG Steering Committee met with nuclear safety leadership within DOE in Washington DC to discuss topics of current interest. The purpose was to help guide the SAWG in its focused efforts in support of DOE, and in support of the contractor community in accomplishing the objectives of the Department. The resultant topics in order of the final priorities are listed below. The steering committee and the SAWG subgroups will develop and / or continue implementation of actions to address the topics in the coming year.

- Implementation of 1189
- Criticality Analysis and Control Selection
- Revision of STD-3024
- Safety Digital I&C
- Addressing Chemical Hazards in DSA
- TSR (SAC) Threshold
- USQ Guide Revision & ESS

- DNFSB Rec. 2008-1
- Regulatory Stability
- Unmitigated Scenarios Guidance
- LL from System Engineering Program – EPWOG
- Independent Validation Review
- Safety Basis Supplement
- Safety Analyst Training

With the rise of criticality safety as a topic of interest, a decision was made to stand up a criticality safety & integration sub-group. The Criticality Safety Subgroup will work closely with the criticality safety community as a whole, and specifically concentrate on communications and integration with the ANS (American Nuclear Society) NCSD (Nuclear Criticality Safety Division) as well as the DOE NCS CSSG (Criticality Safety Support Group). Membership in the subgroup will be both safety basis and criticality safety practitioners. The subgroup will also ensure close ties and communication with the DOE NCSP (Nuclear Criticality Safety Program) Manager NA-171 in addition to the HSS sponsors for Nuclear Safety.

DOE-STD-1189-2008, *Integration of Safety into the Design Process*

Beginning in 2006, the SAWG working with the EPWOG led the effort with DOE to plan, develop, review, approve, and implement the new DOE Technical Standard DOE-STD-1189-2008, *Integration of Safety into the Design Process*.

The Standard was approved and issued in March of 2008, and the implementation phase has followed with the identification of other related DOE documents requiring revision, and to address a Defense Nuclear Facility Safety Board concern with the way chemical hazards are analyzed.

Training on DOE-STD-1189 was developed, presented at recent Safety Analysis Workshops and posted to the EFCOG website. The SAWG is continuing work with DOE to support revision of the additional DOE documents, to establish a “Frequently Asked Questions” site, and to support specific training activities.

Safety Basis Supplement Paper

The SAWG published a paper on Safety Basis Supplements as potential input to DOE directives. The purpose of the paper is to define an acceptable means of preparing safety documentation for relatively short term planned activities that satisfies 10CFR830 safe harbors, but that minimizes impact to the full DSA and TSR's.

Fire Analysis Paper

A paper on fire analysis development for FHA and DSA's was drafted, as a joint effort of the SAWG, the Engineering Practices Working Group, and DOE. The genesis of the paper was concerns over potential issues in the integration of FHA's and DSA's, and also with base fire analysis assumptions leading to DSA decisions. The paper is undergoing a final revision, and the SAWG will work with DOE toward integration of the paper into the directive system.

Subgroup/Task Group Objectives and Achievements

Accident Analysis Subgroup

The overall objective of the Accident Analysis (AA) subgroup is to improve nuclear safety, manage operational risk, and achieve a better and more consistent understanding of the residual risk of nuclear operations through consistent implementation of accident analysis. These objectives are pursued in a prioritized, cost/effective manner.

- Members of the AA SG provided support in completing the HOTSPOT Gap Analysis and Code Guidance Report.
- AA SG members are coordinating with DOE-HQ on updating and adding new codes to the DOE Toolbox Codes.
- AA SG members supported the development of guidance on Integration of FHA and DSA.
- AA SG members provided technical topics for the DOE-HQ meeting that prioritized topics to be considered by SAWG in coming years

Safety Basis Subgroup

- The Safety Basis (SB) SG held a meeting on May 7, 2008 at Richland in conjunction with the SAWG Safety Analysis Workshop. At the SG meeting, there was discussion on identifying the highest priority issues for discussion with DOE in the planned Washington meeting, providing examples of site controls for validation of safety basis implementation, the need for DOE to clarify its position on application of the STD-1027 Guidance document; the need for a better understanding of assumptions for an unmitigated accident scenario analysis; status of response to DNFSB Recommendation 2008-1; completion actions for the Safety Basis Supplement whitepaper, and potential need to revise STD-3009 in consideration of STD-3007.
- The SB SG hosted the 2008 Safety Basis Workshop at the Kirkland Air Force Base in Albuquerque, NM on October 23 and 24, 2008. Over 100 participants

from DOE and contracting organizations were in attendance. The session topics were: (1) summary of issues from the September SAWG Steering Committee meeting with DOE in Washington; (2) STD- 1189 implementation experiences; (3) chemical screening and modeling under STD-1189; (4) Independent Validation Review process examples and practices; (5) System Design Description (SDD) integration with the application of STD-1189 and need for updating the SDD standard; (6) status of Implementation Plan actions in response to DNFSB Recommendation 2008-1 for fire protection design requirements; (7) feedback to the pending revision of the Unreviewed Safety Question Guide to clarify response actions to potential inadequacies in the safety analysis; (8) development of a new standard for safety digital instrumentation based on application of standard ISA-84; (9) potential use of Appendix B of STD-1189 for incorporation into STD-3009 to address chemical hazards; (10) criticality and safety integration issues under Standards 3007 and 3009; (11) practices and weaknesses in application of Specific Administrative Controls; and (12) safety basis training status and plans. The Workshop served to further the attendees' knowledge on these topics and to stimulate further progress in several of these areas.

- The SB SG members participated in regular monthly telephone conferences to discuss new and pending developments of significance to the SB process and to offer lessons learned. Our DOE sponsor was a regular participant and was helpful in offering insights for application to SB issues. The telephone conferences were also used to follow-up on issues and actions identified at the SAWG and SB Workshops.

USQ Subgroup

- The USQ Working Subgroup is a working committee whose intent is to facilitate the objectives of the EFCOG as related to the particular area of the USQ process, including PISA, JCOs, Evaluation of the Safety of the Situation (ESS), and safety basis amendments. The purpose of the USQ Working Subgroup is for members to promote excellence in Department of Energy (DOE) USQ programs by sharing information and lessons learned, and by facilitating the application of information and techniques to the degree appropriate for their contract/facility.
- The USQ Subgroup conducted monthly teleconferences as well as a working session at the Safety Analysis Workshop and panel discussions at the Safety Analysis Workshop and the Safety Basis Workshop. The USQ Subgroup also worked with the Safety Basis Subgroup on the VSS panel discussion.
- The USQ Subgroup promoted, coordinated, and facilitated the active exchange of successful USQ best practices, procedures, lessons learned, and other pertinent information of common interest through the monthly USQ teleconferences, which included:
 - Applicability of the USQ Process
 - USQ Process Entry Conditions,

- Categorical Exclusions,
 - USQ Screens,
 - USQ Determinations (USQDs),
 - USQ Review/Assessment processes utilized by DOE contractors,
 - Interface between the USQ process and institutional procedures,
 - Interface between the USQ process and site-wide DSAs (aka Generic DSAs),
 - Interface between the USQ process and DOE contract transition (aka blue sheeting)
 - Interface between the USQ process and Occurrence Reporting,
 - PISA, Evaluation of the Safety of the Situation (ESS), and Justification for Continued Operation,
 - Initiation of Safety Basis Amendments,
 - Training
 - USQ reviews for quality assurance,
 - Lessons learned from site-specific USQ procedure development and implementation, and
 - Other USQ related lessons learned.
- A paper was drafted on the “Evaluation of the Safety of the Situation”, or ESS. While that draft was prepared, much discussion evolved in the specific expectations of 10CFR830 and the USQ implementation guide on the subject. It became evident that some detailed work was necessary in better defining the expectations and terms, and thus a flowchart effort was commenced. A revision to the paper is in progress at this writing, and it is expected that the results will be used in an ongoing revision to the implementation guide.

Training

The SAWG is maintaining a liaison relationship to the Safety Basis Academy (SBA), due to its direct relevance to the interests and purposes of the SAWG. The SBA consists of 8 basic-level courses and 15 specialty-level courses. Nineteen of these were piloted during 2007-2008 with 4 courses to be piloted during 2009. The SBA is a collaborative effort with NNSA Chief of Defense Nuclear Safety – Authorization Basis Senior Advisor. LANL supports this work as the technical lead for the Safety Basis Academy. Logistics, roles, and responsibilities need to be established for the DOE National Training Center as the distribution point-of-contact for the SBA courses for both federal and contractor sites. EFCOG SAWG representatives are involved in technical review of applicable courses when these are presented through the DOE National Training Center. Several of the courses are being considered for offering at the May 2009 SAWG annual meeting in Las Vegas.

Planning for the Year Ahead

Steering Committee

- NTS will host the 2009 Annual Safety Analysis Workshop in Las Vegas, Nevada, May, 2009. Training, subgroup meetings, technical paper presentations, panel discussions, and invited speakers will be featured.

Subgroup/Task Group Planning for the Year Ahead

Accident Analysis Subgroup

- The SG will continue to coordinate with DOE-HQ on updating and adding the new codes to the DOE Toolbox Codes.
- The SG will work with SCAPA in developing Chemical Consequence Methodology.
- The SG will work on a paper to address derivation of Unmitigated accident analysis Scenarios.

Safety Basis Subgroup

- The SG will conduct the 2009 Safety Basis Workshop in Albuquerque, hosted by Sandia National Laboratory, on Oct. 20 and 21.
- The SG will address actions in its scope by providing deliverables and assistance to improve safety basis practices. This potentially includes guidance on chemical hazards evaluation, Specific Administrative Controls, and Independent Validation Review.
- The SG will continue to hold monthly teleconferences to track progress, maintain awareness of DOE initiatives, and identify emerging issues.

USQ Subgroup

- The USQ Subgroup will complete the development of a USQ functional process map, and incorporate that into the white paper on Evaluation of the Safety of the Situation (ESS).
- The USQ Subgroup will continue to conduct monthly USQ teleconferences on the aforementioned areas of interest to the DOE complex.
- The USQ Subgroup will continue to work closely with other EFCOG organizations, such as the Safety Basis Subgroup.
- The USQ Subgroup will hold appropriate discussion sessions at the 2009 Safety Analysis Workshop and Safety Basis Subgroup meeting.

Training Liaison

The SAWG will continue the liaison relationship with the SBA, including representation on the steering committee, and possible incorporation of selected course in the May 2009 annual workshop in Las Vegas.

Lessons Learned

- The SAWG and its supporting member companies should continue to consider increasing the priority of safety basis training.
- The SAWG needs to intentionally enlist, train, and mentor younger participants in WG activities.
- SAWG has benefited by working with other EFCOG working groups on several efforts this year. The integration of input from several technical disciplines from the various working groups has improved the quality and usefulness of the final products. In addition, the sharing of information among the working groups has promoted a better understanding for all members of the magnitude of issues confronting DOE contractors and has established new working relationships among EFCOG members.

Effectiveness Evaluation

The SAWG continues to be a very effective working group as evidenced by its widespread base of participation and its direct contributions in support of new DOE standards and guides on integration of safety into the design process and the unreviewed safety questions process, during FY 2008.

Recommendations

The Safety Analysis Working Group should continue, including the Accident Analysis, Safety Basis, and the USQ Subgroups. Additionally, a Criticality Safety & Integration Subgroup will be established.

