

2009 SAWG Meeting Notes

Albuquerque, NM
October 19-22nd 2009

I. Sandia Welcome – Kim Davis, DOE Sandia Assistant Site Manager

- Provided overview of Sandia as \$2.4 billion annual budget operation with 10,000 employees
- Sandia working with a “governance” mandate which will shift applicable requirements for the site. Nuclear facilities seen as staying under DOE orders in a “nuclear island.”

II. DNFSB 2009-1 Quantitative Risk Analysis Update - Jeff Shackelford (DNFSB) and Jim O’Brien (DOE HS-21)

The DNFSB recommendation 2009-1, *Risk Assessment Methodologies at Defense Nuclear Facilities*, was formally issued on July 30, 2009 with a requested response deadline on Sept 26, 2009.

The Board recommends that DOE:

- Establish a policy on the use of quantitative risk assessment for nuclear safety applications.
- Consistent with this policy, establish requirements and guidance in a DOE directive or directives that prescribe controls over the quality, use, implementation, and applicability of quantitative risk assessment in the design and operation of defense nuclear facilities.
- Evaluate current ongoing uses of quantitative risk assessment methodologies at defense nuclear facilities to determine if interim guidance or special oversight is warranted pending the development of formal policy and guidance.
- Establish a requirement to identify deficiencies and gaps in ongoing applications of quantitative risk assessment along with the additional research necessary to fill those gaps in support of the development and implementation of the final policy and guidance.

DOE – HQ has indicated acceptance of recommendation 2009-1 but is still developing scope of policy.

Concerns:

- DOE historically used deterministic approach
- Increased use of quantitative risk assessment since early 1990s
- Policy/Guidance development has stalled
- Ad hoc applications contrary to the standards-based approach

DOE Path Forward:

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- Plan on accepting recommendation but some further considerations for broader view in progress
- Implementation Plan to be issued with letter accepting recommendation
- Board has been briefed on proposed response and implementation plan

Actions Underway

- Information Notice Development
- Training
- Risk Assessment Expert Group
- Nuclear Safety Policy Update (SEN 35-91)
- Risk Study - To look at the use by DOE and other industries

III. SAC Update – Mark Blackburn (HS-21)

- Site verification ongoing
- Expect to get back to DNFSB in early 2010

IV. ISA 84.01 Guide - DOE Standard for the Design of Safety Instrumented Systems at DOE Nuclear Facilities – Pranab Guha (HS-21)

- **Safety Instrumented System (SIS):** Used to implement one or more safety functions. A SIS is composed of any combination of sensors, logic solvers, and final control elements.
- DOE uses safety instrumented systems to prevent or mitigate the effects of potential accidents.
- SISs are used in nuclear facilities in both Safety Class and Safety Significant applications.
- DOE Order 420.1B, *Facility Safety*, provides requirements and DOE Guide 420.1-1 provides implementing guidance that points to application of industry standards.
- **Safety Class SIS:** Nuclear Power Industry Standards referenced and applied in practice.
- **Safety Significant SIS:** Several Industry Standards referenced in Guide 420.1-1, but their application is not well defined. (ISA 84.01 Guide applies to SS SIS only)

Purpose of the Guide

- DOE will benefit from more specific guidance for SISs used in safety significant applications which also address digital instrumentation and controls.
- Use of ISA 84 will provide appropriate design, safety, and operation criteria to ensure reliable design of safety significant SISs.
- DOE Standard is under development that provides an approach for use of ISA 84 within DOE's Safety Analysis and Facility Design requirements and practices.
- Standard will use Safety Integrity Level (SIL) matrix approach (i.e., a qualitative approach). Requires application of commercial grade dedication.
- Standard applies only to new projects and major modifications. Doesn't make sense to apply to piecemeal upgrades.

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- DOE Standard will be going into RevCom by the end of the year.

V. Ad Hoc Discussion of Draft Revision of STD-1066

- Stems from DNFSB Recommendation 2008-1
- Only applies to safety fire protection in new nuclear projects
- Currently only for wet-pipe sprinkler systems and water supplies
- Conservative design margins and, for safety-significant supplies, a reliability analysis required

VI. Chemical Safety Course Overview – Ron Selvage (LANL)

- The DOE Safety Basis Academy, Chemical Facility Safety Basis course provides working knowledge and skills needed to understand the safety basis programs and facility safety requirements associated with a DOE hazardous chemical facility. The purpose is to address chemical hazards of greater than 10,000 lbs. It does not include explosives.
- This course also covers the general process used to conduct characterization and analysis. The course presents chemical industry analysis approaches.

VII. Chief of Nuclear Safety (CNS) Report – Chip Lagdon

- The DOE nuclear complex is changing and downsizing. This needs to be factored into the final approach on addressing DNFSB 2009-1.
- A CNS Technical Paper has been recently released to address the challenge to the deposition velocity used in MACCS2. Another paper is in preparation to address non-destructive examination as used at Savannah River site.

VIII. Revised USQ Guide (DOE Guide 424.1-1) Update- Mark Blackburn (HS-21) and Mark Mitchell (LLNL)

The new revision is through Revcom and the final version target date for release is late CY 09/early CY10

- Revision addressed concerns/confusion with application of Justifications for Continued Operation (JCO)
- Clarified guidance on use of Evaluation of Safety of the Situation (ESS)
- Consolidated JCO and ESS guidance into a single appendix that addresses the 10 CFR 830 Potential Inadequate Safety Analysis (PISA) process
- Added flow chart for the PISA process

Group Discussion after presentation:

The EFCOG group still has concerns with the wording on determination of operability.

DOE (Jim O'Brien) has committed that DOE review that section again before finalization.

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IX. USQ Efficiencies – Mark Mitchell (LLNL) and Phil Montgomery (B&W Y-12)

In response to the mandate to save money and perform better from the DOE Secretary:

Improve internal consistency of DOE USQ Guide

- DOE can greatly benefit from a more efficient USQ process
- DOE USQ process consumes limited DOE resources
 - Concern that this is not a wise stewardship of taxpayer dollars
 - Large costs to implement, direct and indirect
 - Manpower diverted from higher priority/value added topics
 - Focus diverted from key issues
 - Schedule delays
- Discussion focused on improving efficiency by:
 - Improving the DOE USQ Guide aka create DOE G 424.1-1C
 - Changing 10 CFR 830

Opportunities for Improvement

- Improving internal consistency of DOE USQ Guide
 - DOE G 424.1-1B consolidates PISA text in one location and improves consistency
 - Proposal: Build upon this improvement, consolidating and improving consistency for the rest of the DOE USQ Guide
 - DOE USQ Guide, since it was drafted, has been subjected to many small changes, additions, clarifications, etc. that have had the effect of rendering it difficult to use and inconsistent
 - 'Clean sheet' rewrite to integrate the content, resolve the vagaries and inconsistencies, and format it into a guide rather than a collection of comment resolutions
 - Inconsistent Terminology:
 - 'USQD' and 'screening' are inconsistently used throughout the Guide
 - Confusion of "USQ process" and "a change requiring a USQD"
 - These are two different concepts, however, the wording is used inconsistently
 - 'USQD' is generally understood to mean application of the seven questions
 - However, in multiple locations, 'USQD process' refers to the implementation of the DOE-approved USQ procedure (i.e., 'USQ process') that may/may not require USQD
 - Recommend adoption of consistent terminology with a thorough scrub
 - List of terms for which a definition section would be beneficial

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- Applicability Assessment/Entry Condition
 - USQ Process
 - USQ Documents
 - Categorical Exclusion
 - Screening
 - USQ Determination (aka USQ Evaluation)
- Confusion of Applicability Assessment and Screening
- Applicability Assessment: whether change is inside or outside of USQ process
 - Example proposals:
 - Applicability Assessment/Entry Condition: Changes that are excluded from USQ review based on the DOE-approved USQ procedure (e.g., 401k procedures, changes in cafeterias outside nuclear facilities that cannot effect nuclear facilities, changes that require DOE approval such as TIMs and TSRs).
 - This includes changes which are exempted by identification and exclusion in other programs (e.g., routine maintenance) or procedures.
 - Such exceptions are described in the DOE-approved USQ procedure, but implementation occurs in other programs and procedures.
 - USQ Documents: USQ documents include Categorical Exclusions, USQ screenings, and USQDs (does not include Applicability Assessments).
 - Must be prepared by USQ qualified personnel.
 - Subject to 10 CFR 830.203 documentation requirements.
 - Screening: review inside USQ process which indicates if a USQD is required
 - Focus on Regulatory Basis, e.g.,
- What enters the USQ process and what does not
- Categorical Exclusions
 - Screening
 - USQD
 - Expeditious USQD (Expert USQD)
 - USQD level-of-detail (Who is the intended reviewer?)
 - Disconnect between DOE-STD-3009 and DOE USQ Guide

Y-12 has developed a pilot program that introduces an Expert USQD to reduce the number of Standard USQDs required.

- Expert USQD criterion checklist developed with input/comments from:
- Y-12 Engineering & Operations
 - Y-12 Site Office
 - CDNS Staff
 - Y-12 DNFSB Staff

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- Expert USQD determines:
 - Not a USQ, or
 - Requires Standard USQD
- Pilot procedure specifies performing the expert process in parallel with existing DOE approved USQ Process
- Approved by Y-12 mgt. for 6 month pilot use in a designated facility (12/08 – 5/09)
- Pilot Expert USQD Results

Expert USQD Result	Procedures Reviewed	Physical Changes	All Changes
Total	32	27	59
Std USQD Required	14	17	31
Not a USQ	18	10	28
Std USQDs Eliminated	56%	37%	47%

- Significant potential savings
 - 6 months of piloted expert reviews represent
 - ~ 12% of changes normally requiring USQDs @ Y-12 for a this period
 - 47% of Std. USQDs potentially eliminated
 - Majority of procedure revision USQDs eliminated
- No wrong expert USQD outcomes
 - Results compared against the Std. USQD for the change
 - Some minor compliance/quality issues identified
 - Correctable during feedback and improvement
- Expert USQDs are rule compliant (10 CFR 830.203)

EFCOG group suggestions for improving efficiencies in the USQ process

- Add explicit definition section to the Guide
- Change 10-CFR-830 – DOE HQ says the time is right politically
- Revise the USQ guide with topics identified by the USQ sub-group
- Refocus any changes to the rule or the guide on the real purpose of the USQ process – Determining the approval authority (limit scope creep)

Change the Rule or Change the Guide or both?

- The process can be improved
- The Sub-group has identified specific areas of improvement
- Targeted EFCOG suggestions for guide revision by Christmas

Path Forward

- USQ Subgroup will do the Guide suggested revision by Christmas
- Steering Committee will look at changing the “Rule”

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X. EFCOG Safety Analysis Workshop - 2010 – Rob McKeehan (ORNL)

Theme “Streamlining for Safety and Risk Performance”

April 24-29, 2010 in Knoxville, Tennessee

The workshop features:

- Training on Saturday through Monday
- Technical Subgroup meetings
- Technical Tour at the Oak Ridge National Laboratory, including the billion dollar Spallation Neutron Source and several of the world’s fastest computers
- Reception on Monday evening in the Knoxville World's Fair Sunsphere Tower (266 feet tall)
- Invited Speakers at the opening plenary session and on the Tuesday luncheon
- Fun-filled Social Event Tuesday evening
- Cutting-edge Technical Presentations
- Panel Discussions of today’s issues

Encourage young professionals from your site to attend

XI. Hydrogen Safety Initiative – Mukesh Gupta (WSMS)

- Most DOE/NNSA sites and laboratories have waste hydrogen issues
 - TRU waste drum, waste tank, and vitrification facilities
 - Share issues with chemical processing and commercial nuclear
- Numerous (& inconsistent) approaches taken throughout the Complex
 - Deflagration/detonation, time to reach LFL, analytical methods control set identification, others
 - Hydrogen hazards can be poorly characterized or not recognized
 - Resulting controls may not be adequately defined
- Benefits of creating an interest group with hydrogen safety focus
 - A true “savings through sharing” concept to improve consistency among our facilities
 - Provides focal point for collecting and disseminating information, data, and lessons learned
 - Encourages exchange with similar “agenda” technical and contractor groups in the U.S. and internationally
 - National Fire Protection Association
 - DOE Hydrogen Program/Safety Panel
 - Center for Chemical Process Safety (CCPS/AIChE)
 - United Kingdom’s Hydrogen Working Party (HWP)

H2 Safety Interest Group Objectives (H2SIG)

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- Identify cross-cutting hydrogen safety operations and management issues and opportunities for data and information exchange
- Promote, coordinate, and facilitate the active exchange of successful hydrogen safety analysis and management programs, practices, procedures, lessons learned, and other pertinent information
- Share lessons learned on operational events
- Develop standards and guidance on safety policy, principles and methodology
- Provide a technical forum to examine issues, obtain consensus, and encourage a proactive hydrogen hazards management approach.
- Provide a focal point to discuss common issues with similar-agenda technical bodies in the U.S. and with international colleagues.
- Share lessons learned, present technical papers, and provide training opportunities
- Coordinate hydrogen safety training during workshops, subgroup meetings, and seminars
- Provide a means to communicate on related combustible gas issues
- Review U.S. Nuclear Regulatory Commission risk-informed regulations for insights
- Develop topical reports, white papers and other work products to disseminate information to the DOE/NNSA Complex in a timely manner to address existing and emerging issues

EFCOG Suggestions to the H2SIG:

- Develop deflagration vs detonation guidelines
- Find out what the UK focus is and what data they can provide
- Look into the work done at Sandia on hydrogen in the 1980's and 1990's

XII. Training - Safety Basis Academy Project – Julie Johnston (LANL)

- During 2007 through 2009, LANL implemented a Safety Basis Academy (SBA)
- SBA facilitates uniformity in technical qualifications of safety basis professionals
- Required development, delivery, and finalizing a set of 23 courses
- Courses developed support qualification efforts for both federal and contractor personnel throughout the DOE/NNSA Complex
- From 2007 through 2009, 23 courses were developed, piloted, and vetted by NNSA, SBA staff, and course participants.
- Each course contained the following components:
 - Study Guide for student use
 - Student activities and structured discussions, when applicable
 - Lesson Plan containing instructor guidance
 - Set of slides for classroom presentation
 - Course exam
 - LANL course cover page authorizing public release as unclassified content
- Each course pilot had participation with diverse representation from the DOE/NNSA Complex

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- Course developers-instructors ensured formal-documented resolution of NNSA, SBA staff, and student comments
- Each course was finalized, then submitted by LANL to the DOE National Training Center
- All courses were deemed acceptable to the DOE NTC, meeting their specifications and compliant per Systematic Approach to Training

Summary:

- The SBA has developed courses that are available for your site by contacting LANL or NTC
- The LANL SBA project of course development is complete
- The National Training Center has funding to provide 7 courses in FY10
- Provides consistent training cross the complex for DOE and the contractor
- Reach out to students to provide recruitment opportunities
- Julie Johnston is the current point of contact at LANL

EFCOG Suggestions:

- ANS National Student Conference is the 1st week of April in Michigan
- Seek out University support
- Make contact with UT during spring SAWG session including universities within driving distance

XIII. Site Reports

Site reports were provided for:

- o PNNL – Brad Evans
- o INL – Rod Peatross
- o WIPP – James McCormick
- o LANL – Ron Selvage
- o SRNS – Grant Ryan

XIV. Criticality Update – Kevin Carroll (LLNL) and Kevin Kimball (Isotek)

1027 Break Out Session

Group discussed criticality inputs to the final facility hazard Categorization. If criticality is only driver, then maybe the hazard categorization should be less than Category 2.

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Path Forward:

Recommendation paper for the steering committee review and possible submittal to DOE

EFCOG Suggestions:

If criticality is the only thing driving a Haz Cat 2 classification it might be possible to use the graded approach for the DSA similar to a Category 3, and it could result in a revision to 3009

NCS 3007/3009 Break Out

Discussion and EFCOG Group identified issues:

- Inappropriate DSA requirements in NCSE Standard
 - Recommend moving to the 420.X docs
- Inconsistent Requirement 3007 vs ANS 8-1
 - Define DOE criteria
- Insufficient guidance - 3007
 - Rewrite guidance in appropriate DSA, TSR or USQ documents
- Insufficient guidance – DCP deviations
 - Establish criteria for NCS controls based on real risk. Elevate to DOE approved DSA/TSR document

Path Forward:

Establish writing group – Draft initial revision to guidance

XV. IVR Update – Jim O’Brien (HS-21)

- “Best Practices” guide issued for 6 month trial period (ended in Sept 19)
- Next steps:
 - Incorporate feedback from the field
 - Include IVR guidance to the TSR Implementation Guide, DOE G 423.1-1, as an Appendix
 - Enter guide into RevCom

Discussion and Suggestions from the EFCOG group after presentation:

- Add definitions of verification vs validation
- Verification – documentation review
- Validation – Performance based review
- “I” – Independent vs Implementation – minor changes may not need to be independent

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- IVR if done first is a good precursor to the ORR. Difficulties can arise from doing them concurrently.