

Joint EFCOG/DOE Chemical Management Workshop

March 8–10, 2005

Perspectives on Chemical Hazard Identification

Topical Themes

- ❖ *Government Perspectives on Chemical Hazard Identification*
- ❖ *Industry Perspectives on Chemical Hazard Identification and Emerging Technologies*
- ❖ *Chemical Hazard Identification: Assessing Facility Risk (Training)*

Sponsored by

EFCOG/DOE Chemical Safety Topical Committee (CSTC)
EFCOG Safety Analysis Working Group
DOE Office of Environment, Safety and Health
DOE Technical Standards Program Office

Workshop Location

DOE Forrestal Auditorium (GE-086)
1000 Independence Ave. SW, Washington, D.C. 20585

And

Audio** and Video-linked to various locations throughout the DOE Complex
Reminder -- Please bring your DOE badge or obtain a visitor's badge upon arrival
[**LISTEN ONLY CALL-IN NUMBER for all three days is: TO BE ANNOUNCED **]

Designated Hotels

The Channel Inn

650 Water St., SW
Washington, D.C. 20024

[Reservations: 1-800-368-5668 or 202-554-2400]

[Room Block under #38427]

Holiday Inn

550 'C' St., SW
Washington, D.C. 20024

[Reservations: 1-800-465-4329 or 202-479-4000]

[Room Block under "DCM"]

REGISTER at our home page at http://www.eh.doe.gov/web/chem_safety/ws2005

Day 1 -- Tuesday, March 8, 2005

OPENING SESSION -- FORRESTAL MAIN AUDITORIUM (GE-086)

Government Perspectives on Chemical Hazard Identification Identification of Chemical Hazards for Security Risk Analysis of Activities (Training)

- 8:30 – 11:30** Registration/Name Tags and Packet Pick-up
- 9:00 – 9:05** Welcome/Opening Comments by EFCOG/DOE-HQ CSTC Co-Chairs
J.C. Laul, Los Alamos National Laboratory/ EFCOG SAWG-CSS Chair/CSTC EFCOG Chair
Bill McArthur, Director, Worker Protection Policy & Programs/EH-52/CSTC DOE Chair
- 9:05 – 9:20** DOE Corporate Welcome - “DOE’s Perspective on the Chemical Management Workshop”
Russell Shearer, DOE Deputy Assistant Secretary for Environment, Safety and Health (EH-1)
- 9:20 – 9:35** EFCOG Corporate Welcome - “Identifying Chemical Hazards at DOE Sites: The EFCOG Perspective”
Thomas Stevens, Senior Vice President, Federal Group and EFCOG Chairman
- 9:35 – 10:05** “Defense Nuclear Facilities Safety Board View on Chemical Hazard Identification at DOE”
John Mansfield, Board Member
- 10:05 -- 10:15** **BREAK**
- 10:15 – 11:25** “Chemical Hazard Identification and the Hanford Tanks”
Joel Eacker, CH2MHill Hanford Group, Inc.
- 11:25 – 12:30** **LUNCH**
- 12:30 – 1:20** *Training:* “Identification of Chemical Hazards for Security Risk Analysis of Activities”
Cal Jaeger, Sandia National Labs
- 1:20 – 1:50** “Recommendations for Addressing Recurring Chemical Incidents at DOE: CSTC Project 2004-B”
James Morgan, WSRC
- 1:50 – 2:35** OSHA’s HAZCOMM Initiatives
Maureen O’Donnell, OSHA
- 2:35 – 2:45** **BREAK**
- 2:45 – 3:30** “Training: Reducing Vulnerability to Chemical Facility Threats by Training Workers: Effective Models from the NIEHS Hazardous Waste Worker Community”
Chip Hughes, NIEHS/NIH/HHS and Bruce Lippy, MDB, Inc
- 3:30 – 4:00** “New Beryllium Work - The LLNL Experience in Expanding the Scope of the Chronic Beryllium Disease Prevention Program”
George Fulton, UC/LLNL
- 4:00 – 4:30** “Beryllium Hazard Identification Challenges at Westinghouse Savannah River Site”
Steve Jahn, WSRC/SRC
- 4:30 – 4:40** Closing Remarks and Highlights of the Day’s Discussions/ Preview of Day 2
Bill McArthur/J.C. Laul

Day 2 -- Wednesday, March 9, 2005

Industry Perspectives on Chemical Hazard Identification and Emerging Technologies

- 8:30 – 10:00** Registration/Name Tags and Packet Pick-up
- 9:00 – 9:45** “Tools Available to Identify Chemical Reactivity and Other Process Safety Hazards”
Scott Berger, CCPS
- 9:45 – 10:30** “How Can Reactive Chemical Incidents Be Prevented?”
Dennis Hendershot, Rohm and Haas Company
- 10:30 – 10:40** **BREAK**
- 10:40 – 11:40** “Lessons from Grangemouth: Hazard Identification in a Chemical Process Setting -- Correlation Among 3 Incidents”
Mike Broadribb, Sr. Technical Advisor, BP Amoco
- 11:40 – 12:15** “Hazard Identification in Undefined Environments”
David Blair, Focus Environmental Management Group
David Quigley, BWXT Y-12
- 12:15 – 1:20** **LUNCH**
- 1:20 – 2:20** “Importance of Chemical Reactivity Identification, Management and Control: U.S. Chemical Safety Board Reports and Experiences”
Carolyn Merritt, Chair and CEO, US CSB
- 2:20 – 3:05** “Reactive Chemicals and Hazard Identification Issues”
Fred Simmons, WSRC
- 3:05 – 3:15** **BREAK**
- 3:15 – 4:00** “Environmental, Health, and Safety Implications of Nanotechnology: The National Nanotechnology Initiative Perspective”
Clayton Teague, National Nanotechnology Coordination Office
- 4:00 – 5:00** Industry Panel Discussion of Hazard Identification Issues
Speakers from Day 2
- 5:00 – 5:05** Closing Remarks and Highlights of the Day’s Discussions/ Preview of Day 3
Ron Eimer/J.C. Laul

Day 3 -- Thursday, March 10, 2005

CSTC 2004 Project Discussions and Path Forward for 2005 and Beyond Reducing Vulnerability to Chemical Facility Threats by Training Workers (Training)

- 9:00 – 9:05** Welcome to Day 3
J.C. Laul/Ron Eimer
- 9:05 – 9:20** CSTC Project 2004-A: “Revisions to the DOE Chemical Management Handbook: Volume 3, Chemical User Safety and Health Requirements”
David Quigley, BWXT, Y-12 [Chair]
- 9:20 – 9:35** CSTC Project 2004-D: “Methods for Addressing the Hazards of Time Sensitive Chemicals”
Helena Whyte, LANL [Chair]
- 9:35 – 9:50** CSTC Project 2004-E: “Chemical Exposures During Closure Activities”
Geoff Gorsuch, Miamisburg Closure Project [Chair]
- 9:50 – 10:20** CSTC Project 2004-C: “Perspectives on Chemical Hazard Characterization Practices”
J.C. Laul, LANL [Chair]
- 10:20 – 10:30** SURVEY RESULTS REPORT
- 10:30 – 10:40** **BREAK**
- 10:40 – 11:20** OPEN FORUM and DISCUSSION:
The Future of the CSTC (E.g., How Can We Revive Interest and Increase Participation? Need for a New Group Title?)
- 11:20 – 12:20** Plenary Session
- Discussion of CSTC Projects for 2005/Balloting and VOTE COUNT
 - Develop list of candidate CSTC projects for 2005 using submitted ballots
 - Discussion of candidate list of 2005 projects
 - Vote count and selection of CSTC projects for 2005 from candidate list
- J.C. Laul/Dan Marsick, Facilitators*
- 12:20 – 1:25** **LUNCH**
- 1:25 – 2:25** Break-out Sessions
- Participants to break-out rooms for 2005 team-building and project discussions:
- Teams develop preliminary project descriptions, strategies, and proposed products
- Break-out Rooms and call-in numbers:**
Main Auditorium [202-287-1341],
GH-019 [202-287-1347], *GH-027* [202-287-1335], *GH-035* [202-287-1352]
- 2:25 – 2:55** Plenary Session
- All CSTC Projects for 2005 -- Team Report-Outs
- Designations of CSTC 2005 Projects, Teams and Team Chairs
 - New Project Preliminary Titles/Goals/Descriptions of Proposed Products
- J.C. Laul/Ron Eimer/Dan Marsick/, Facilitators
CSTC 2005 Project Team Chairs*
- 2:55 – 3:05** **BREAK**
- 3:05 – 3:50** "The Safety Basis Academy - Project Overview and Status"
*Roland Gille, LANL
Michael Kirkpatrick, Edgewater Technical Associates*
- 3:50 – 4:15** Adjournment/Closing Remarks
Ron Eimer/J.C. Laul

ABSTRACTS

Joel Eacker

Chemical Hazard Identification and the Hanford Tanks

The presentation will discuss the Hanford Tank Farm Chemical Vapor issue from genesis in the late 1980's to the present, including the status of efforts underway to resolve the technical and employee concerns. Over 53 million gallons of radioactive waste containing an estimated 1,800 various chemical compounds are present in 177 underground storage tanks at the Hanford Site. This fact combined with worker uncertainty about their potential health effects has led to significant efforts to resolve the issue, including a DOE-OA investigation into these concerns. The presentation will address industrial hygiene program status/improvements, technical basis development, characterization of the tank/emissions/breathing zone, engineering controls being implemented, employee involvement and communication, and OA findings and their resolution.

James Morgan – 2004B

Recommendations for Addressing Recurring Chemical Incidents at DOE

The DOE complex has been averaging one chemical incident a day since the early 1990's. Why? "Failure to identify the chemical hazards." During the 2003 Chemical Safety Topical Committee (CSTC) Chemical Management Workshop, a cross-complex team was formed to examine why the DOE complex is failing to identify chemical hazards. The team's goal was to reanalyze available data then determine the commonality and causes of chemical incidents across the DOE complex and complete a white paper with recommendations to DOE-HQ.

During the 2005 CSTC workshop the final report will be presented. The presentation will include the goals, findings, and recommendations of the team. This presentation will bring to light many factors that contribute to these incidents, as well as recommendations that could be implemented across the complex that could enhance chemical safety.

Maureen O'Donnell/Jacqueline Annis

OSHA's HAZCOMM Initiatives

This presentation will discuss OSHA's progress in addressing the integrity of information on material safety data sheets, especially, as related to enforcement activities.

George Fulton

New Beryllium Work - The LLNL Experience in Expanding the Scope of the Chronic Beryllium Disease Prevention Program (CBDPP)

LLNL is in the process of bringing a new facility on line in the Radioactive and Hazardous Waste Management Division. Due to programmatic needs, and to meet DOE milestones for processing hazardous and potentially mixed waste, changes in the scope of work in the LLNL approved CBDPP had to be made. The CBDPP laid out a process for DOE approval of "new work," in which DOE/LSO committed to an expedited review process. This presentation will review the process.

Steven Jahn

Beryllium Hazard Identification Challenges at Westinghouse Savannah River Site

This presentation will address the speaker's investigation of beryllium exposures in power plant operations and the conclusions drawn from that study with respect to application of 10 CFR 850, the Chronic Beryllium Disease Prevention Program.

DAY 2

Scott Berger

Tools Available to Identify Chemical Reactivity and Other Process Safety Hazards

Over the past several years, the Center for Chemical Process Safety has been working actively on three important process safety focus areas - Chemical Reactivity Hazards, Process Safety Culture (i.e. Process Safety for Corporate Leaders), and Learning from Experiences. This presentation will discuss efforts taken with industry and government to increase awareness of chemical reactivity hazards and methods to prevent them; a new effort to drive culture from lessons gleaned from the Columbia Shuttle Accident Investigation; and, results from two important CCPS initiatives aimed at learning from past accidents.

Dennis Hendershot

How Can Reactive Chemical Incidents Be Prevented?

Several reactive chemistry incident case studies will be described, all of which have general lessons applicable to many chemical processes. In some of these examples, the chemical reaction was intended, but an incident resulted from loss of control of the reaction. In other cases, no chemical reaction was intended in the process, but an incident occurred because of a reaction which was unanticipated. In these incidents, process safety professionals and reactive chemistry experts should have had the knowledge required to anticipate the incident and design systems and procedures to effectively prevent them. Reactivity hazard awareness and recognition is often a major contributor to reactive chemistry incidents, and education of process development and operating personnel on these hazards can reduce their occurrence. Tools, checklists, and resources for recognizing and managing reactive chemical hazards will be reviewed.

Michael Broadribb

Lessons from Grangemouth:

Hazard Identification in a Chemical Process Setting: Correlation Among 3 Incidents

A series of major incidents occurred during a two-week timeframe in May/June 2000 at a petrochemical complex in Grangemouth, Scotland. The Grangemouth facility is one of the largest petrochemical complexes in Europe and is a Major Accident Hazard site as defined under the UK Control of Major Accident Hazard (COMAH) regulations.

This paper will explain how and why the incidents occurred, the general lessons learned, the actions taken to prevent a recurrence, and highlight some wider messages for the industry.

David Blair

Hazard Identification in Undefined Environments

It is not uncommon for unlabeled chemicals to be found. If there is no label, then the potential hazards are not known. Methods for hazard identification of these unknown chemicals will often involve unnecessary risk. This presentation will discuss methodologies, and their associated risks, that can be used to identify the hazards of unlabeled or unknown chemicals.

Carolyn Merritt

Importance of Chemical Reactivity Identification, Management and Control: U. S. Chemical Safety Board Reports and Experiences

In 2002, the Chemical Safety Board completed a two-year study on Reactive Chemistry Industrial Accidents in which 167 incidents were evaluated for cause, severity and prevention. The results of this study show that the frequency and severity of reactive chemistry events can be prevented through the identification of possible combinations of chemicals that can cause toxic releases, runaway reactions, and explosions. This session will review the findings of the related report and recommendations made to better control reactive chemical events. The presentation will also review a series of investigations conducted by the CSB that resulted in toxic releases or explosions that could have been prevented by better identification, control, and management of reactive chemicals. Information on these incidents and the report will be distributed to the attendees for their use in training and understanding how to manage chemicals better.

Frederick Simmons

Reactive Chemicals and Hazard Identification Issues

Reactive chemicals are generally thought of as those chemicals that have known characteristics, such as being a strong oxidizer, and it is thought that these characteristics are generally well understood. However, it has been demonstrated many times, that seemingly benign chemicals will react violently under certain circumstances. We will examine some of the issues and methodologies employed in the identification of reactive chemicals and their associated hazards.

Clayton Teague

Environmental, Health, and Safety Implications of Nanotechnology: The National Nanotechnology Initiative Perspective

The vision of the National Nanotechnology Initiative (NNI) is a future in which the ability to understand and control matter on the nanoscale – nanotechnology - leads to a revolution in technology and industry. Achieving this vision has the potential to produce responsible and sustainable economic benefit, enhance quality of life, and promote national security. A major component of the responsible development of nanotechnology is understanding the environmental, health, and safety implications of the technology and ensuring that appropriate regulatory controls are in place to protect public health and the environment. Following a brief overview of the NNI, this paper will address the efforts by the NNI to support research on the potential health and environmental risks of nanotechnology and to support those agencies responsible for regulating nanotechnology-based products.

DAY 3

David Quigley

CSTC Project 2004-A: "Revisions to the DOE Chemical Management Handbook: Volume 3, Chemical User Safety and Health Requirements"

Helena Whyte

CSTC Project 2004-D: "Methods for Addressing the Hazards of Time Sensitive Chemicals"

"Management of time sensitive chemicals (I): Misconceptions leading to incidents" was peer reviewed and published in the Journal of Chemical Health & Safety September/October 2004. "Management of time sensitive chemicals (II): Their identification, chemistry and management" was peer reviewed and published in the Journal of Chemical Health & Safety November/December 2004. "Management of time sensitive chemicals (III): Stabilization and treatment was written, peer reviewed, and accepted for future publication in the Journal of Chemical Health & Safety. A summary of the first two manuscripts will be presented along with a discussion on the development of manuscript pending publication.

Geoff Gorsuch

CSTC Project 2004-E: "Chemical Exposures During Closure Activities"

The potential for significant chemical exposure is assumed to exist during the performance of D & D activities at DOE facilities. This project compiles some employee sampling data into a series of cases studies of representative D & D activities at DOE sites. The case studies also provide some background information about the facility or operation, as well as a description of the controls implemented to reduce employee exposure.

J.C. Laul

CSTC Project 2004-C: "Perspectives on Chemical Hazard Characterization Practices"

This project focuses on a non-nuclear safety basis (SB) process for chemical facilities and identifies various steps involved in the preparation of a safety document that includes essential features of the five core steps of the ISMS.

The non-nuclear SB process - a) looks at different methodologies including hazard analysis from a chemical industry point of view and DOE-STD-3009 nuclear facility-like

approaches that can be used to implement each step, and b) describes the advantages and disadvantages of various implementing methodologies that are either already in use or could be used by non-nuclear facilities. The approaches presented may be useful in other related areas that require hazard analyses. Results of these findings will be presented at the workshop. Adaptation of any step of the safety document is voluntary.

Bruce Lippy and Chip Hughes

Reducing Vulnerability to Chemical Facility Threats by Training Workers: Effective Models from the NIEHS Hazardous Waste Worker Community

The Worker Education and Training Branch of the National Institute for Environmental Health Sciences, NIEHS, over the last 17 years has trained over a million workers to safely handle hazardous materials and respond to emergencies in workplaces as diverse as hospitals, chemical plants, and nuclear weapons plants. This presentation will include a discussion of the training models developed through NIEHS and will demonstrate how worker training is a potent tool for reducing chemical plant vulnerabilities, and for following Integrated Safety Management principles.

Cal Jaeger

Identification of Chemical Hazards for Security Risk Analysis Activities

Sandia National Laboratories has been working with chemical industry associations, companies and government agencies since January 2001 to develop a security risk analysis/vulnerability assessment (VA) tool for chemical facilities. As a result of these activities a number of security VA approaches, including Sandia's RAM- CFTM approach, were developed. There are typically a large number of potential targets at chemical facilities so it is necessary to include a prioritization process which helps to focus on the most important areas. Recently members of the chemical industry have been supporting the Department of Homeland Security in the development of an approach and database criteria for collecting information on chemical facilities. This presentation will discuss in more detail the approaches used to identify chemical hazards from malevolent attacks at chemical facilities.