

Safety & Health News

AIChE

AMERICAN INSTITUTE OF
CHEMICAL ENGINEERS

SAFETY AND HEALTH
DIVISION
www.shdiv.aiche.org



WINTER 2004/2005

SAFETY FORUM

MUTUALITY OF INTERESTS?

The AIChE Safety and Health Division has approximately 1,200 members. It was chartered 25 years ago. The principal function of the Division is technical programming. Members receive *Process Safety Progress*, a technical magazine. The principal work objective of the members involves safety and health. The key science is chemistry.

The Division of Chemical Health and Safety (CHAS) of the American Chemical Society has about 1,500 members. It was initiated almost 25 years ago. The principal Division function is technical programming. Members receive *Chemical Health & Safety*, a bimonthly technical magazine. The principal work objective of the members involves safety and health. The key science is chemistry.

The two Divisions seem to have a lot in common. But is there really a mutuality of interests? That is the issue here. Certainly, the safe handling of chemicals is a common bond. But the CHAS members are largely oriented to laboratory functions, while the AIChE Safety and Health Division members are oriented to plant operations. Bridging this gap to maintain interest by both parties can be tricky.

Why ask the question? At the meeting of the CHAS Executive Committee in August, one of the items discussed was the fact that their Newsletter, *CHASNotes*, has been discontinued. Since the AIChE Safety and Health Division has now discontinued PRINTING of their Newsletter *Safety & Health News*, but continues to issue it in electronic form, it occurred to several in attendance that perhaps a joint electronic Newsletter could be developed. Dennis Hendershot was present, representing the Safety and Health Division. *Safety & Health News* could include information about CHAS activities, and members of both organizations could be notified by e-mail when any new quarterly issue is available on the web site (web sites of both organizations?). Actually, all CHAS members and anybody else who bothers to go to our web site now can read or download the Newsletter since it is freely available. All we would be doing right now is inviting CHAS to provide some content describing their activities. This information will be useful to members of both organizations. The next step could be a joint Newsletter. At this point, it is not possible to determine how many people are members of both Divisions, but it is felt that the number is relatively small.

There is essentially no additional cost here since *Safety & Health News* is no longer printed and mailed. Both Divisions would get broader exposure with a Newsletter seen by members of both organizations. Since the Newsletter is no longer printed, the number of pages is not limited - the limit is really a function of what is considered the maximum number that members would read and download.

This action would very much be in line with the strong sentiment expressed by both the AIChE and ACS Boards of Directors to work more closely together, and to identify opportunities for joint activities. The approach suggested is an effective way to build some bridges between the two organizations with similar interests.

You will note that the planned program for CHAS at the ACS National Meeting in San Diego in March 2005 is included in this issue of *Safety & Health News* as a start.

CHAS is concerned about the health and safety of people who work directly with chemicals, the general public, and the environment as a whole. There is specific interest in technical research about the hazards and management of chemicals as they are used in the laboratory, the general workplace, and the economy as a whole.

Comments of the readers are actively solicited. Please contact me at: aswest@worldnet.att.net.

Pam West

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SAFETY AND HEALTH DIVISION UPDATE

SCOTT OSTROWSKI, CHAIR

The AIChE Safety and Health Division was chartered in 1979, some 25 years ago. One of the stated objectives of the newly formed organization was "to address the problems of safety and health and the protection of property in the manufacture and use of chemicals." We have made significant contributions by supporting the development and refinement of hazard identification procedures, qualitative and quantitative risk analysis techniques, and fundamentally sound risk management systems. Over the past 25 years, tremendous fundamental knowledge and highly effective control strategies have been defined and established for the control of fires and explosions, reduction and mitigation of toxic releases, and identification and control of reactive chemicals and chemical systems, just to name a few advances.

One of the critical challenges faced by the industry is the long-term maintenance of institutional memory, since few, if any, incidents in the petroleum, petrochemical, and chemical process industries have truly unique causes. Incidents, although much less frequent now, are generally occurring from primary causes that have happened in the past. The longer the time period between the incidents (the longer, the better, of course), the higher is the probability that the resulting lesson will have to be relearned. With ever increasing competition for the loss prevention dollar, we professional safety people must become more efficient at identifying, evaluating, and controlling chemical process and related hazards. The members of the Safety and Health Division must continue to emphasize the importance of and drive demand for the application of sound fundamental tools and techniques. In reviewing some of the contributing causes of well documented accidents such as Flixborough 1974 (Management of Change), Bhopal 1984 (Inherent Safety), Longford Australia 1987 (Hazard Identification), Piper Alpha 1988 (Work Permit System), and Phillips Pasadena 1989 (Energy Isolation and Human Factors), it is apparent that in each case there was a weakness in the application of fundamental process safety principles, procedures, and techniques. We must pass on these fundamental process safety lessons to future generations of chemical engineering professionals.

How to we accomplish this objective? We can start by sending not only the established process safety professionals but also the 1-5 year engineers to the GLOBAL CONGRESS ON PROCESS SAFETY to be held in conjunction with the 2005 AIChE Spring Meeting, April 10-14, at the Atlanta Hyatt Regency Hotel. Included in the registration fee for the Spring Meeting are: (1) admission to the 20th Annual CCPS International Conference entitled "Risk Management: The Path Forward," (2) admission to the 7th Biennial Process Plant Safety Symposium (PPSS), and (3) admission to the 39th Annual Loss Prevention Symposium (LPS). The PPSS includes sessions on Human Factors and Ergonomics, Inherently Safer Process Design, Incident Investigations, Improving Safety Culture, and Risk Assessment. The popular LPS has sessions scheduled on Process Hazards in the Pharmaceutical Industry, Fires and Explosions, Inerting of Reactors and Other Process Equipment, Dust Explosions, Chemical Reactivity Hazards, and Case Histories. The latter two symposiums are organized by committees of the Safety and Health Division. This Congress covers a wide range of critical new information and techniques in the process safety field. In addition, there will be several lunches and other opportunities for networking with process safety experts.

It is important to note that the organizers of the 39th Loss Prevention Symposium have agreed to dedicate this symposium to the memory of Ephraim Scheier who passed away on July 25, 2004 (see Obituary in the Fall 2004 *Safety & Health News*). Ephraim was an outstanding engineer, valued friend, and loving father. His contributions to and enthusiasm for the Safety and Health Division will long be remembered.

I encourage each one of you to visit the Division web site at www.shdiv.aiche.org to determine how you can increase your involvement in Division sponsored activities. Working together we can help to optimize the benefits of Division membership. Certainly you can promote membership in the Division with your non-member associates - there is plenty of room for growth and you will be doing them a favor in professional development and career enhancement.

As a final note, this is my last report as Chair of the Safety and Health Division. Walt Silowka of Air Products & Chemicals, Inc., the current First Vice-Chair, will be taking the office of Chair at the start of 2005. I have had substantial help and assistance from the officers, directors, and committee members in the various Division activities, and I thank them for their efforts. I also acknowledge the assistance of Karen Person of the CCPS office, who serves as AIChE liaison to the Division.

Scott Ostrowski

OBITUARIES

William S. Wood, retired chemical safety consultant, died July 24 at the age of 91. Bill was very active in the development of the Loss Prevention Symposiums. He was serving on the Program Area 11a Committee 25 years ago and was heavily involved in the founding of the Safety and Health Division at that time. He was well known and well regarded for his cogent comments regarding paper presentations in the Loss Prevention Symposiums. A graduate of Purdue University, he joined Sun Oil Company in 1937. He was appointed safety engineer in 1952, and retired in 1972. He then established himself as a consultant on chemical and process plant safety issues. During this period, he taught courses in industrial safety at Temple and Hahnemann Universities. He was past chair of the chemical section of the National Safety Council. A Fellow of AIChE, he was also a member of ACS and the American Society of Safety Engineers, serving as a vice-president of that organization.

Warren K. Kingsley, a nationally known innovator, educator, lecturer, and author in chemical safety matters, died on November 24. He was the founding editor of *Chemical Health & Safety*, serving as editor 1994-1995. Prior to initiating that magazine, he was editor of *CHASNotes*, the Newsletter of the ACS Division of Chemical Health and Safety (CHAS), which he transformed into the magazine, at first copublished by ACS and CHAS. After retiring as editor, he continued to write occasional columns for the magazine. He was Chair of CHAS in 1996, and received awards from that Division in 1984 and 1995. He coauthored (with Jay Young and George Wahl) the ACS book *Developing a Chemical Hygiene Plan* in 1990.



CALL-FOR-PAPERS 50TH ANNUAL SAFETY IN AMMONIA PLANTS SYMPOSIUM SEPTEMBER 26-29, 2005 FAIRMOUNT ROYAL YORK TORONTO, ONTARIO, CANADA

The 50th Annual Safety in Ammonia Plants and Related Facilities Symposium organized by Program Area 11c (Ammonia Committee) is scheduled for September 26-29, 2005, in Toronto. This is an international conference. Proposals for papers are solicited. Areas of interest include plants to manufacture ammonia, urea, nitric acid, ammonium nitrate, and methanol. Papers may include, but are not limited to, concrete ideas on how to avoid or manage potential plant incidents, how to solve safety issues, and overviews of procedures and products that can be used to ensure safety measures. Papers may describe incidents, safety developments, safety studies, technological advancements, and maintenance improvements involved in the manufacture of ammonia and related substances. Proposed paper information should include:

- Author(s) name and full contact information including company name, address, telephone, fax, and e-mail;
- Speaker's name and full contact information as above; and
- Title of paper with brief description.

The proposal should be sent by **January 10, 2005**, to Svend Erik Nielsen at: svn@topsoe.dk. ■

ANNUAL STUDENT AWARDS IN SAFETY

The Safety and Health Division National Student Design Competition Awards for Safety, the Ted Ventrone Awards, were presented on November 7, 2004, at the AIChE Annual Meeting in Austin, TX, during the Annual Student Brunch. These awards are given for the best utilization of the principles of inherent safety in the 2004 AIChE Student Design Competition. The winners were: **Scott Roberts** (University of Kansas), **Seth Holderman Sheldon** (University of Kansas), and the team of **David Burke**, **Jamie Triba**, and **Timothy Leong** (Northeastern University).

The Safety and Chemical Engineering Education (SACHE) Program Student Design Competition for Safety in Design Awards were presented at the same time. One individual design award and one team award were given to the two best applications of chemical process safety in the 2004 AIChE Student Design Competition. **Seth Holderman Sheldon** (University of Kansas) was awarded the Walt Howard Individual Award. **David Burke**, **Jamie Triba**, and **Timothy Leong** (Northeastern University) were presented with the Jack Wehman Team Award.

During the ceremonies, 14 Student Chapters were recognized as showing an exceptional level of participation, enthusiasm, program quality, professionalism, and involvement in the university. ■

THE CCPS PAGE CENTER FOR CHEMICAL PROCESS SAFETY

20th ANNIVERSARY OF CCPS

On December 4, 1984, water contamination of a tank of methyl isocyanate in Bhopal, India, initiated a series of events that led to a catastrophic toxic release, killing more than 3,000 residents and injuring perhaps 100,000 people. As a direct result of this event, the Center for Chemical Process Safety (CCPS) was organized on March 25, 1985, with 17 charter sponsor companies. While some thought had been given previously for AIChE to organize a process safety institute of some type, the Bhopal incident triggered the initiation of CCPS.

During the past 20 years, CCPS has worked to eliminate catastrophic process safety incidents by: (1) advancing state-of-the-art process safety technology and management practices; (2) serving as a premier resource for information on process safety; (3) fostering process safety in engineering and science education; and (4) promoting process safety as a key industry value. CCPS invented the 12 elements of process safety to help companies identify the key tenets of a process safety program. Work continues to build on the catalog of over 80 books and products which are related to these key elements. Cultivation of the Safety and Chemical Engineering Education (SACHE) university curriculum program continues to expand.

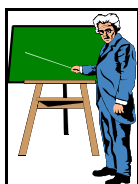
Now twenty years later, CCPS is working on its 180th project and has over 80 participating companies and federal government agencies. On reflection, there are many differences between 1985 and 2005. In the area of hazard recognition, capabilities have been expanded to identify potential causes of accidents, and growing computational and database capabilities enhance abilities and personal knowledge that permit actions to eliminate or mitigate these causes. The consequences of catastrophic incidents can now be estimated and through this knowledge inherently safer processes with reduced potential consequences can be designed and operated. Independent layers of protection are now used so that the failure of one layer does not result in a failure of the entire system. Also, communications and sharing of information about past incidents has grown substantially, helping others to address potential problems before they occur. Causes for lost productivity have been identified which has helped industry to develop, design, and operate reliable production systems not only with a substantial reduction in safety risks but also with more consistent product quality.

The results have been heartening, but also sobering. Since 1985, there has not been a chemically related incident with anywhere near the impact of the Bhopal mishap. Incidents, when they have occurred, have largely been contained to the plant site, and when off-site releases have occurred, emergency procedures and appropriate training have kept off-site consequences at a minimal level. On-site fatalities have dropped by over 60% in this period according to statistics from the Department of Labor.

On the other hand, the U.S. Chemical Safety Board has recently identified close to 200 incidents based on chemical reactivity issues. These have been mostly at smaller manufacturing facilities and in companies whose main business is not chemistry related as such. Nearly all of these could have been prevented if the responsible plant personnel had paid more attention to the chemistry of the processes and had consulted basic process safety references such as CCPS Guidelines and other books.

As CCPS begins its third decade, its mission has been defined. CCPS will work to make impact on companies outside of the central "sphere" of chemical, petroleum, petrochemical, and pharmaceutical industries, while at the same time expanding its program areas to support its key constituents as their businesses evolve. CCPS exists to reduce the likelihood and impact of catastrophic process accidents in these industry sectors. The organization will strive to serve a generation of new engineers and managers who use information differently from their predecessors. Attention will be paid to the needs of small manufacturing companies.

With the recognition of the 20th Anniversary of Bhopal, many companies are recommitting to a process safety emphasis. CCPS has seen an upsurge in industry sponsorship. All feedback and suggestions in identifying companies and contacts that may find value in the many important focus areas and projects of CCPS will be appreciated. For further discussion, please contact Karen Person at **212-591-7319** or **karep@aiche.org**.



20TH ANNUAL CCPS CONFERENCE GLOBAL CONGRESS ON PROCESS SAFETY

The world's most concentrated gathering of process safety professionals will occur in Atlanta on April 10-14, 2005, at the AIChE Spring National Meeting. This is "THE" conference to attend, since the Global Congress will include the 20th Annual CCPS Conference, the 39th Annual Loss Prevention Symposium, and the 7th Biennial Process Plant Safety Symposium. Most sessions will run in parallel, but there will also be some plenary sessions. Networking lunches will be held on three days.

The CCPS Conference will add significant value to the Global Congress. The specific title for the CCPS Conference is "Risk Management: The Path Forward." Changes in the chemical process industries have been dramatic since 1985. During the past two decades, mergers, acquisitions, and globalization have transformed the industry, security has become a watchword, and regulatory oversight has increased substantially. Expectations for safe operations have increased, while resources for process safety work have generally remained static. The conference theme involves looking forward and recognizing that resources, both human and financial, are limited.

Sessions in the 20th Annual CCPS Conference will address the following topics:

- Managing for Better Results with 21st Century Tools and Resources;
- Building Process Safety Culture and Human Factors;
- Risk Analysis: How Risk is Quantified Considering Estimates of Consequences and Frequencies;
- Risk Assessment: The Process by which the Results of Risk Analysis Are Used to Make Decisions;
- Risk Management: The Systematic Application of Management Practices to the Task of Controlling Risk to Protect Employees, the Public, the Environment, and Company Assets;
- Measurement of Process Safety Performance and Public Perception - Are We Better and Can We Prove It. ■

NEW CCPS PROJECTS UNDERWAY

CCPS announced that three new projects are approved and are now just in the early stages of development. Technical subcommittee memberships for each of the projects are available to employees of member companies.

The first is the **Management of Change** project, the object of which is to provide guidance to those having responsibility for developing, implementing, and overseeing MOC systems. The project will document industry "good practices" through CCPS workshops and surveys.

The second new project is **Process Safety Management (PSM)** with the objective of updating previous CCPS books on the subject in order to achieve improved process safety results using fewer resources.

Finally, a CCPS project regarding **Environmental Health and Safety (EHS) Management on Multi-Owner Sites** is in the early stages. The goal is to prepare a Concept Book that will (1) provide due diligence guidance, and (2) lay out the framework for managing EHS on a multi-owner site.

All three projects are accepting committee members. Those interested should contact Karen Person at karep@aiche.org or 215-591-7319. ■

FREE MONTHLY PUBLICATION

The CCPS *Process Safety Beacon* is a free e-mail single-page message directed towards plant personnel. Each month, a topic of interest to process plant operating people is discussed. The readership is greatly expanding since it is now issued in several languages, including English, Spanish, French, German, Portuguese, Chinese, and Hindi. Additional volunteer translators are solicited to continue this significant growth. The *Beacon* depicts incidents, causes, and lessons learned complete with colored photos of appropriate scenes. The September issue covered Tank Farm Fires, the October issue discussed Hidden Hazards, while the November issue reviewed the results of Unapproved Procedure Changes.

As an additional feature, the distribution of the *Beacon* in poster size for display purposes for a fee is now under consideration. This possibility is being explored, thus your feedback is requested.

To receive the *Beacon*, simply register at: www.aiche.org/ccps/safetybeaconfrm.asp. Anyone interested in translating the *Beacon* from English, or in sponsoring an issue, should contact Karen Person at karep@aiche.org or 215-591-7319 for more information. ■

**SAFETY NOTES**

- John Henshaw, Assistant Secretary of Labor and Director of OSHA, visited Beijing, China, in September to discuss occupational safety and health issues at the Second China International Forum on Work Safety.
- The American Chemistry Council (ACC) recently presented its Responsible Care® Sustained Excellence Award and Responsible Care® Leadership Awards to four U.S. chemical facilities, recognizing them for outstanding achievement under the environmental, health, safety, and security performance initiative of the chemical industry. For the third consecutive year, Dow Chemical Company received the Sustained Excellence Award, which honors companies with an excellent safety record, a positive trend in other performance metrics, and timely completion of management system certification and security verifications over a three-year period. Dow was also honored with the Leadership Award in the large company category, while Rohm and Haas was selected in the middle company category, and Milliken Chemical and Wacker Chemical tied for honors in the small company category.
- The Environmental Protection Agency announced the availability of five scientific papers on metals risk assessment. The papers include: (1) Issue Paper on the Environmental Chemistry of Metals; (2) Issue Paper on Metal Exposure Assessment; (3) Issue Paper on the Ecological Effects of Metals; (4) Issue Paper on the Human Health Effects of Metals; and (5) Issue Paper on the Bioavailability and Bioaccumulation of Metals. These papers are available at: <http://cfpub.epa.gov/ncea/raf/recordisplay.cfm?deid=8> (see 69FR, 59226, October 4, 2004).
- In the aftermath of catastrophes, investigations often reveal a series of missed signals and warning signs that, if recognized, could have prevented the incidents. According to a report from the National Academy of Engineering, companies and government agencies need to recognize and act on these signals before the event occurs. Organizations such as hospitals, factories, and power plants need to increase their efforts to collect and use information on accident precursors. While precursor programs are being adopted in aviation, aerospace, chemical, and nuclear industries, such programs are pursued by only a small fraction of the organizations that could benefit from them, and existing initiatives are not always effective. The report is available at: www.national-academies.org (click on "Engineering").
- The rate of workplace fatalities last year remained at the same level as 2002 according to a report from the Bureau of Labor Statistics of the Department of Labor. A total of 5,559 fatal work injuries were recorded during 2003, which is a rate was 4.0 per 100,000. OSHA indicated the report emphasizes that American workers remain safer than they were just a few years ago.
- OSHA announced that it is proposing standards that cover hexavalent chromium in general industry, construction, and shipyards. In addition to lowering the permissible exposure limit, the proposal includes provisions for worker protection such as preferred methods for controlling exposure, respiratory protection, personal protective equipment, and recordkeeping. The proposal appeared in the October 4, 2004, *Federal Register*. Comments are solicited.
- A working group dedicated to promoting safe and healthful workplaces throughout North America met recently in New Orleans, agreeing to an active program of cooperative efforts in 2005. Working groups for the U.S., Mexico, and Canada agreed on numerous projects including the establishment of training workshops for safety and health inspectors, as well as workshops on risk assessment for chemicals in the workplace. Formed in 2002, the working group consists of government experts from the three nations who seek to strengthen cooperation on safety and health issues under the auspices of the North Atlantic Free Trade Agreement.
- A recent study indicates that cleaning products are associated with work-related asthma. Employee training and a review of the adequacy of warning messages on labels are appropriate actions. ■



39TH ANNUAL LOSS PREVENTION SYMPOSIUM APRIL 10-14, 2005 HYATT REGENCY, ATLANTA, GEORGIA

The Global Process Safety Congress includes the 39th Annual Loss Prevention Symposium, organized by the Safety and Health Division Program Area 11a. These popular Loss Prevention Symposiums have been held annually since 1967. The objective of the symposium is to promote safety in the chemical process and allied industries by providing a forum for practitioners from industry, academia, and government to share experiences, technological advances, and new ideas in the loss prevention and process safety fields. Proceedings of the Symposium will be available for attendees at the meeting, and for sale following the meeting. The 39th Annual Symposium will consist of the following six sessions of five or six papers each.

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Walter L. Frank
ABS Consulting

Symposium Vice-Chair
Erdem A. Ural, PhD
Loss Prevention Sciences &
Technologies, Inc.

Session TG001

PROCESS HAZARDS IN THE PHARMACEUTICAL INDUSTRY - Many processes for the manufacture of pharmaceuticals involve hazardous chemicals and hazardous processes. This session presents papers addressing design methods and operating procedures used in pharmaceutical manufacture such as safe handling of hazardous chemicals, safe procedures for various unit operations and unit processes, design of reaction systems, and methods of avoiding runaway reactions.

<u>Chair</u> Stanley S. Grossel Process Safety & Design Inc.	<u>Vice-Chair</u> Larry Floyd Ciba Specialty Chemicals Corp.
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Session TG002

FIRES AND EXPLOSIONS - Fire and explosion hazard identification, analysis, prevention, and mitigation are important issues in loss prevention. This session provides papers that offer new data, methodologies, technologies, and cost effective solutions that address these hazards.

<u>Chair</u> Erdem A. Ural, PhD Loss Prevention Sciences & Technologies, Inc.	<u>Vice-Chair</u> Christopher Hanauska Hughes Associates
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Session TG003

INERTING OF REACTORS AND PROCESS EQUIPMENT - This session addresses the design and installation of inerting systems for equipment and processes containing flammables, combustible dusts, monomers requiring the presence of oxygen to activate an inhibitor, and other applications where an inert atmosphere is needed for process safety.

<u>Chair</u> Raymond A. Freeman, PhD ABS Consulting	<u>Vice-Chair</u> Joseph R. Natale Baker Engg. & Risk Consultants
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Session TG004

DUST EXPLOSIONS - Recent incidents in North Carolina, Indiana, and Kentucky illustrate how catastrophic dust explosions can be. Investigations by the U.S. Chemical Safety Board indicate that many organizations do not adequately understand the hazards of combustible dusts. This session contains papers discussing dust explosion hazards, methods to prevent them or mitigate their effects, and ways of enhancing awareness of dust explosion hazards in all potentially impacted facilities. A recent reference is the CCPS book *Guidelines for Safe Handling of Powders and Bulk Solids* (Publication G-95).

<u>Chair</u> John F. Murphy U.S. Chemical Safety Board	<u>Vice-Chair</u> Dennis C. Hendershot Rohm and Haas Company
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Session TG005

CHEMICAL REACTIVITY HAZARDS - The analysis of chemical reactivity hazards and the prevention and mitigation of uncontrolled chemical reactions are centrally important to the loss prevention community. This session includes new research, tools, and methods that identify, characterize, or offer design and operational guidance related to chemical reactivity hazards. Related issues include controlling intended reactions that yield useful products, runaway reactions, instability, thermal sensitivity, material incompatibility, and uncontrolled reaction consequences.

<u>Chair</u> Robert W. Johnson Unwin Company	<u>Vice-Chair</u> Brian R. Dunbobbin, PhD Air Products & Chemicals, Inc.
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Session TG006

CASE HISTORIES AND LESSONS LEARNED - Reviews of process safety incidents and near misses provide valuable learning opportunities. Papers dealing with incidents, near misses, and the lessons learned are presented. These sessions have been held annually over the years, and have been highly popular and well attended

<u>Chair</u> Henry L. Febo FM Global	<u>Vice-Chair</u> David G. Clark DuPont Company
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The Global Process Safety Congress presents a rare opportunity for process engineers to obtain significant knowledge about the advances in process safety technology as well as to network with international experts in the field at three scheduled lunches and at other events. Be sure to mark your calendars now - **April 10-14, 2005.**

7TH BIENNIAL PROCESS PLANT SAFETY SYMPOSIUM APRIL 10-14, 2005 HYATT REGENCY, ATLANTA, GEORGIA

The Global Process Safety Congress includes the 7th Biennial Process Safety Symposium. The South Texas Section of AIChE and Program Area 11b of the AIChE Safety and Health Division will sponsor the 7th Biennial Process Plant Safety Symposium (PPSS) at the AIChE Spring National Meeting in Atlanta, April 10-14, 2005 in conjunction with the 39th Annual Loss Prevention Symposium and the 20th Annual CCPS Conference. The

objectives of the PPSS include providing new technical information on the identification, prevention, and mitigation of process hazards, the prevention or mitigation of damage to and resultant loss of production facilities, and protection of public health and welfare due to the hazard potential of chemicals and processes. The Symposium Proceedings will be available at the meeting.

The PPSS was originally established and organized locally by the South Texas Section of AIChE but is now organized as Program Area 11b under the Safety and Health Division. The first PPSS was held in the Spring of 1992.

Scheduled sessions follow.

Symposium Chair
Katherine Pearson
Rohm and Haas Company

Symposium Co-Chair
James R. Thompson
INVISTA

Session TH001

HUMAN FACTORS ENGINEERING AND ERGONOMIC ENGINEERING - Human factors and poor ergonomics are often identified as incident root causes. This session includes papers demonstrating the application of human factors or ergonomic engineering methods to minimize operator, maintenance, or management error. Included are innovative solutions to ergonomic problems, the design of man-machine interfaces, and methods to reduce fatigue.

Chair
Don Lorenzo
ABS Consulting

Co-Chair
Lawrence Schulze
University of Houston

Session TH002

INHERENTLY SAFER PROCESS DESIGN AND OPERATIONS This session presents papers demonstrating the use of inherently safer process design methods to reduce the risk of process operations. Included are lower pressure/lower temperature processing, less hazardous chemical use, and equipment made to withstand process extremes.

Chair
Jack Chosnek
KnowledgeOne

Co-Chair
Vic Edwards
Aker Kvaerner

Session TH003

RISK ASSESSMENT - Risk assessment is key to evaluating and improving the safety and business risk of process systems. Papers are included demonstrating the application of both qualitative and quantitative risk assessment techniques such as HAZOP, Layer of Protection Analysis (LOPA), and QRA.

Chair
Phil Myers
Advantage Risk Solutions Inc

Co-Chair
Michael Livingston
WS Atkins

Session TH004

INCIDENT INVESTIGATIONS AND METHODS OF INTERPRETING EVIDENCE - Accurate interpretation of physical evidence is critical to effective accident investigations. This session has papers demonstrating how to protect, preserve, collect, store, interpret, and document physical and electronic information.

Chair
Lisa M. Morrison
PPG Industries Inc.

Co-Chair
Don Connelley
Akzo Nobel Chemicals

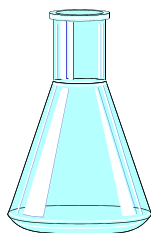
Session TH005

IMPROVING SAFETY CULTURE - Presentations are included demonstrating approaches to reducing incidents through management processes such as operational discipline, behavior sampling, operator training, operating procedures, and interactive task management systems.

Chair
Dr. M. Sam Mannan
Mary Kay O'Connor
Process Safety Center

Co-Chair
Dr. William J. Rogers
Mary Kay O'Connor
Process Safety Center

The Global Process Safety Congress will include a luncheon on each of the three days, a reception on Sunday, Monday, and Tuesday evenings, and a vendor display area. There will be mid-AM and mid-PM coffee breaks each of the three days. The AIChE Spring Meeting registration fee will provide admission to all technical conferences. Lunches and receptions will be ticketed events. A joint LPS/PPSS/CCPS session will kick off the Congress on Monday morning, and a joint session will conclude the Congress on Wednesday afternoon. The Annual Safety and Health Division dinner is scheduled for Monday evening. The Annual Division Executive Committee Meeting will be scheduled during the Congress.



**229th ACS National Meeting
DIVISION OF CHEMICAL HEALTH AND SAFETY (CHAS)
MARCH 13-17, 2005
SAN DIEGO, CA**

Division Programming Chair: Debbie Decker, UC Davis, dmdecker@ucdavis.edu
Sessions Planned:

Chemical Safety Issues for Radiation Work

Organizer: Carol Lentz, Pfizer Global Research, Carol.Lentz@pfizer.com

Chemical handling is frequently part of work which uses ionizing radiation. The radiation may alter the chemistry or cause physical changes which modify the risks. This session addresses the chemical safety issues that occur in conjunction with the radiation safety issues.

Chemical Safety Issues for Work with Biologicals

Organizer: Brenda Wong, UCSD, bwong@ucsd.edu

Chemical handling is frequently part of work with biological samples. The hazards associated with the biological samples are frequently given more attention than for the chemicals that are used in handling the samples. This session addresses the chemical safety issues, including, for example, fire prevention when using an alcohol flame for sterilization.

Nanotechnology: Is Little Stuff Such a Big Deal?

Organizer: Debbie Decker, UC Davis, dmdecker@ucdavis.edu

The emerging field of nanotechnology brings new hazards to the laboratory and production floor. While these hazards are based on the chemistry involved, they need to be understood and controlled. This session will describe the hazards and innovative control methods used.

PDA Use and Trends in Chemical Safety

Organizer: Jim Kapin, Advanced Chemical Safety, jim@chemical-safety.com

PDA's and related small wireless devices are becoming a common tool for collecting, recording, and transmitting data and communications. This session explores new and innovative uses.

Safety Education

Two sessions are planned in this area: (1) "Teaching Safety - Safety Education Expectations in the Real World," and (2) "Addressing the Needs of Industrial Employers - Why Safety is NOT in the Curricula."

Information about the overall meeting in San Diego as well as registration material can be found at the ACS web site: www.chemistry.org, click on "ACS National Meetings." Registrations will be accepted starting in January 2005.

WORKSHOPS SCHEDULED BY CHAS FOR THE SAN DIEGO MEETING

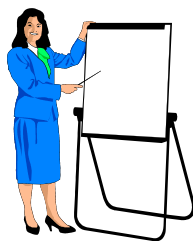
1. The Laboratory Safety Workshop. Friday, March 11, 2005, 8:30 AM - 4:30 PM, Dr. James Kaufman or Dr. Jack Breazeale, \$325 non-members/\$275 CHAS members.

2. Laboratory Waste Management. Friday, March 11, 2005, 8:30 AM - 4:30 PM, Russell Phifer, \$325 non-members/\$275 CHAS members.

3. How to be A More Effective Chemical Hygiene Officer. Saturday, March 12, 2005, 8:30 AM - 4:30 PM, Dr. James Kaufman, Russell Phifer, Dr. George Wahl, Jr., \$325 non-members/\$275 CHAS members.

4. My Fume Hood Sucks - Laboratory Ventilation for the Research Professional. Saturday, March 12, 2005, 8:30 AM - 4:30 PM, Jim Kapin, \$325 non-members/\$275 CHAS members.

For further information about these workshops and for registration information, see the CHAS Division web site: <http://membership.acs.org/c/chas/> or contact Jim Kaufman (CHAS Workshop Chair) at 508-574-6264.



PAPERS PAPERS PAPERS

"Decomposition of Methyl Ethyl Ketone Peroxide and Mixtures of Sulfuric Acid,"

X.Li et al, *J.Loss Prev.Process Ind.* **17**, 23-28 (January 2004).

The fact that an explosion starts at a lower ambient temperature when methyl ethyl ketone peroxide (MEKPO) is not sufficiently neutralized is demonstrated with a highly-sensitive small-scale calorimeter. The data indicate that MEKPO might undergo acid and redox decompositions in addition to thermal decomposition in the accidental scenario. Experimental results of modified closed pressure vessel tests suggest that the decomposition is much more active for MEKPO in the presence of sulfuric acid. Under such conditions, the maximum pressures and maximum rate of pressure rise are significantly higher than those of pure MEKPO.

"Evaluation of Styrene-Acrylonitrile Copolymerization Thermal Stability and Runaway Behavior,"

A.A.Aldeeb, W.J.Rogers, and M.S.Mannan, *J.of Hazardous Materials* **104**, 269-282 (2003).

Evaluation of thermal stability and runaway behavior of any exothermic chemical system is of great importance for the design and operation of chemical process equipment. In this paper, the thermal stability and runaway behavior of styrene-acrylonitrile copolymerization reaction system in bulk is evaluated. Traditional thermal analysis techniques are combined with quantum chemistry methods and computational correlations. Reaction pathways are identified from the theoretical approach and verified by experimental measurements. The results of this analysis are compared to literature data for this system.

"A Cohort-Based Approach for Characterizing Lifetime Inhalation Cancer Risk from Time-Varying Exposure to Air Toxics from Ambient Sources," R.Cook, B.L.Jones, and J.Cleland, *Environmental Progress* **23**, No.2, 120-125 (July 2004).

In this paper, a cohort-based approach that estimates individual lifetime cancer risk based on time-weighted exposure over a lifetime is presented. This approach accounts for changes in exposure level anticipated over time. It also incorporates differences in exposures to children and adults that result from different time-activity patterns, integrating them into a single value for a cohort. The case study includes estimates for the general population and for a highly exposed demographic group such as workers.

"To Vent or Not to Vent," R.Foiles, *Chem.Eng.* **111**, No.11, 58-61 (October 2004).

The most effective explosion protection strategy is one that prevents the blast in the first place. However, given the catastrophic consequences that explosions threaten to process equipment and personnel, responsive measures are vital. This paper discusses common misapplications in explosion venting and describes alternative techniques and strategies. Cases reviewed include handling toxic materials, indoor equipment locations, insufficient available vent areas, and possible obstructed vent areas.

"Implementing Perimeter Air-Monitoring Programs," *Chem.Eng.* **111**, No.11, 42 (October 2004).

Perimeter or fenceline monitoring systems that track ambient air quality and the presence of hazardous materials are widely used in a number of industrial situations. In general, any perimeter air-monitoring system must be designed to protect human health and the environment, enhance worker health and safety, identify the effectiveness of controls used at the site, document ongoing air quality during site activities, provide data needed for risk management and public confidence, and reduce potential owner liabilities.

"An Explosion Accident - Causes and Safety Information Management Lessons to be Learned," T-L Tzou, D.W.Edwards, and P.W.H.Chung, *Loss Prevention Bulletin* **178**, 18-25 (August 2004).

A large chemical reactor ruptured at a chemical plant during a runaway polymerization reaction which involved the production of a water-borne acrylic resin using acrylic monomers and organic peroxide initiators. The plant was destroyed and nearby factories were severely damaged by a series of explosions and fires that resulted. There was one death and over one hundred injuries. The paper presents the initiating and root causes of the incident. In particular, it focuses on those things that were wrong or deficient with respect to managing safety information. ■

PUBLIC MEETING NIGHTMARES

A spill, a fire, a plant expansion, or any other incident that requires discussions with the public can be an ordeal if you are the principal involved in the meeting. Risk communication is the best approach to be effective in high-concern, sensitive, and controversial situations. On a global scale, risk communications have been effective, for example, in motivating people to use seat belts and to quit smoking, but only over a long period of time. Time is not a luxury when faced with a local, immediate situation. Recognize first that there are people involved who are upset and perhaps outraged at the issue. Perceptions are also important - whatever people perceive as "real" is real as far as they are concerned. Trust and credibility must be established with the audience through open and honest dialogue. There are several obstacles here. Inconsistent, overly complex, confusing, and incomplete messages together with a mistrust in the information sources can be an initial problem. Also, news media tend to provide selective reporting.

Over the years, seven "rules" have been established to deal effectively with the public. The origin here is probably the EPA as a response to Superfund-related issues.

1. Accept and involve the public as a legitimate partner. The goal should be an informed public that is involved, interested, reasonable, and collaborative. Demonstrate your respect for the public.

2. Plan carefully and evaluate performance. Begin with clear, explicit objectives, then carefully evaluate your efforts and learn from your mistakes. Understand the quality of the information you have in hand and know the strengths and weaknesses.

3. Listen to your audience. Do not make assumptions about what people know, think, or want done about the risks. Recognize that there may be hidden agendas and symbolic meanings. Recognize the emotions of the people in the audience.

4. Be honest, frank, and open. Trust and credibility are your most important assets. Do not minimize or exaggerate the level of risk. Discuss data uncertainties. Lean toward sharing more, not less, information. Speculate only with extreme caution.

5. Coordinate and collaborate with other credible sources. Few things make risk communication more difficult than conflicts or public disagreements with other credible sources. Try to have communications available with other credible sources.

6. Meet the needs of the media. Be open and accessible to reporters. Recognize deadlines. Provide information tailored to the needs of each type of media.

7. Speak clearly and with compassion. Use simple, non-technical language. Learn how to explain risk data in plain English. Discuss actions that are underway or that can be taken.

This is not an easy task, but there are approaches that can mitigate the problems. ■

LIGHTS! CAMERA! ACTION! ENGINEERS?

Yes, engineers are getting more TV coverage lately, for better or worse. Shows about machines, construction, inventions, and technology are increasing. The Discover Channel offers three shows specifically related to engineering: *Engineering the Impossible*, *Extreme Engineering*, and *Modern Engineering Wonders of the World*. The network has other programming related to construction, mechanics, and technology.

The History Channel offers several programs related to engineering in various ways, for example, *Modern Marvels*, *Tech Effect*, and *Tactical to Practical*.

While most of the programs show engineering in a positive light, the History Channel also has a program on *Engineering Disasters*. It was on one of these programs that the Bhopal incident was described and reviewed on the 20th anniversary of the disaster. Scott Berger, Director of CCPS, was one of the commentators. Other disasters which were featured include the MGM Grand Hotel fire of 1980 and the Soviet R-16 ICBM missile disaster of 1960. This type of programming has a direct bearing on safety issues.

Chemists are portrayed on popular programs such as the *CSI* series, *Medical Investigations*, and other medical shows. But safety issues are largely ignored. Rarely do the participants wear adequate eye protection in the laboratories. On the pistol range, ear and eye protection are usually provided, but not in the laboratory. Proper face masks are frequently not used when laboratory personnel are dealing with bacteria (deadly, of course).

Will the time come when engineers and chemists are portrayed as stars in soap operas? Lawyers, medical doctors, nurses, teachers, and law enforcement personnel certainly dominate the shows now. But perhaps some day there will be a featured engineer. And perhaps this engineer will follow accepted safety practices. When that happens, it will be reported in *Safety & Health News*. ■