

Safety & Health News

AIChE

AMERICAN INSTITUTE OF
CHEMICAL ENGINEERS

SAFETY AND HEALTH
DIVISION
www.shdiv.aiche.org



SUMMER 2006

SAFETY FORUM WHAT IS LESS TOXIC?

When process safety issues are discussed, the use of "less toxic" substances is frequently recommended, particularly in reference to inherently safer processes. Rarely, though, is it possible to define what is meant by "less toxic." Process safety engineers are well versed in the physical and chemical principles as well as the management techniques used in the approach to an inherently safer process. Flammability and explosibility characteristics of the substances involved in the process are indeed considered as important factors in design and operation. However, sometimes little attention is placed on the toxicity characteristics of the chemicals involved, particularly in reference to solvents, catalysts, additives, and other substances not specifically required as desired reactants.

A fundamental principle of toxicology is that **there are no harmless substances, only harmless ways of using substances**. The writings of the 16th Century Swiss physician Paracelsus made it clear that "all things are poison and nothing is without poison - the dose makes the difference." He distinguished between acute and chronic toxic effects, and was one of the first practitioners to use chemical medications rather than popular magic potions. This is an extremely important principle, although not clearly understood by the public. A small amount of a toxic substance may well not have an adverse effect, but a larger amount could overwhelm the body processes. Heavy metals represent examples here. The nutritionally essential metals for humans include cobalt, chromium III, copper, iron, molybdenum, selenium, and zinc, but in small quantities only.

A second fundamental principle of toxicity states that chemical structure and biology determine the specific response observed. This principle relates to the specificity of toxic materials in target organisms, in short, what chemical X does to target organ Y.

As a third principle, it is stated that humans are animals, so the study of toxicity in animals is of value in understanding the effects in humans. This principle indicates that understanding the action of a chemical in test species is relevant to understanding the effects in humans.

Following these last two principles, in the absence of evidence to the contrary, effects observed in animal tests under properly controlled conditions have a reasonable likelihood of occurring in exposed humans by the same mechanisms observed in animals.

Chemical engineers will generally interact with industrial hygienists rather than directly with toxicologists. Some understanding of toxicological principles is thus of value in design and operation of inherently safer processes.

Sam West

Safety & Health News is issued quarterly by the Safety and Health Division of the American Institute of Chemical Engineers (AIChE). It is available on the Division web site: www.shdiv.aiche.org. Since news items of interest to members of the Division of Chemical Health and Safety (CHAS) of the American Chemical Society (ACS) are included, the Newsletter is also available on the CHAS web site: <http://membership.acs.org/c/chas/>.

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AICHE SAFETY AND HEALTH DIVISION UPDATE

BOB BENEDETTI, CHAIR

The 2006 Annual Meeting of the Safety and Health Division Executive Committee was held at the Walt Disney Dolphin Hotel during the AIChE Spring National Meeting. Two new members of the Executive Committee - Cheryl Grounds and Lisa Long - were welcomed as recently elected Directors for 2006-2008. Bob Johnson was recognized as the new 2nd Vice Chair, although not a new member of the Executive Committee since he served as Director 2003-2005. More than 20 members of the Division, including the Executive Committee, attended. Scott Berger and Karen Person represented CCPS, and two representatives from the Canadian Society of Chemical Engineers were in attendance.

Nominating Committee. Randy Freeman and Dennis Hendershot agreed to co-chair the Nominating Committee to prepare a slate of nominees for the 2007 election of Division Officers and Directors.

Finances. Secretary/Treasurer Al Ness provided a report on the financial status of the Division. The 2005 year-end balance was \$32,880. Income flows from dues, the annual Division dinner, and interest totaled about \$8,141. Expenses totaled \$6,423. Net income from sales of the Loss Prevention Symposium CD-ROM was \$2,100 which partially replenishes the funds advanced to prepare the CD. The Division membership now stands at just under 1,000, a slight increase over the year 2004.

ACS Liaison. Dennis Hendershot, liaison to the American Chemical Society Division of Chemical Health and Safety (CHAS), reported that CHAS is interested in presenting a joint program at the 2008 Loss Prevention Symposium in New Orleans since the ACS Annual Spring Meeting will be held there at the same time. A session relating to safety issues in process development was suggested.

Institute Affairs. Scott Berger, Director of CCPS, provided an update about AIChE. The Institute completed its second year in a row with positive financial results. However, membership is still a concern since overall it has been on the decline over the past few years. AIChE has set an ambitious goal of increasing membership from 37,000 to 43,000 over the next two years. One way, and perhaps the only way, that this objective can be reached is for all of us to speak to colleagues who aren't members now and encourage them to join. AIChE isn't unique in this respect. I am a member of the Society of Fire Protection Engineers, and SFPE has the same concerns.

The Executive Committee discussed a request from the AIChE Publications Committee for ideas for new products or projects. It was noted that the Safety and Health Division is already committed to the development of new book projects and new products through CCPS. Further, the Division is the major supporter of *Process Safety Progress* and issues quarterly the electronic newsletter *Safety & Health News*.

Loss Prevention Symposium. Erdem Ural, 2006 Loss Prevention Symposium Chair, reported that attendance has been good and the papers presented have been of high quality in the four sessions completed at the time of the Executive Committee Meeting. Chris Hanauska, 2007 Loss Prevention Symposium Chair, reported that the Call-for-Papers would be available shortly following the meeting (see page 9 of this Newsletter). In a related matter, representatives of the Canadian Society of Chemical Engineers and the Chemical Institute of Canada were on hand to invite our participation at the 8th World Congress of Chemical Engineering to be held August 23-27, 2009, in Montreal. This was discussed in detail by the Executive Committee, which decided to collaborate with CSChE, perhaps by holding the 2009 Annual Loss Prevention Symposium there.

Awards. Dennis Hendershot was the recipient of the 2006 Norton H. Walton/Russell L. Miller Award as announced the previous evening at the annual Division dinner. This is the major award of the Safety and Health Division. It was agreed that the Division should build a "bank" of potential recipients for this award. The Division members can be instrumental in developing this bank. Names of potential nominees are solicited.

At the suggestion of Joe Louvar, who manages the Student Design Awards regarding process safety, the Executive Committee voted to increase the monetary stipend to \$600.00.

Other Matters. The Executive Committee voted to retire the Continuing Education Committee since all of the continuing education courses are now handled jointly through ASME and AIChE.

Jean Paul LaCoursiere reported that the Organization for Economic Cooperation and Development (OECD) has released several publications related to chemical accidents. Of particular interest is the publication "Guiding Principles for Chemical Accident Prevention, Preparedness, and Response" available for download at: www2.oecd.org/guidingprinciples/index.asp.

If you have an interest in participating more actively in the Division or if you have some ideas or thoughts related to programming and other activities, please contact me at 617-984-7433 or bbenedetti@nfpa.org.

Bob Benedetti



HENDERSHOT WINS WALTON-MILLER AWARD

The AIChE Safety and Health Division presented the prestigious Norton H. Walton/Russell L. Miller Award in recognition of outstanding chemical engineering contributions and achievements in the areas of loss prevention, safety, and health to **Dennis C. Hendershot** at the 2006 Spring National Meeting in Orlando. Dennis has served in many capacities for the Safety and Health Division, and was a Director of AIChE in 2001-2003.

He received a BSChE degree from the Lehigh University and an MS degree in chemical engineering from the University of Pennsylvania. He spent his major working career with Rohm and Haas Company where he advanced from a process research engineer through several successively more critical positions to that of Senior Technical Fellow in the Process Hazard Assessment/Environmental Engineering Department. During most of his career, he was responsible for providing process safety support to new and existing facilities, including developing process safety standards and conducting security vulnerability assessments. He has retired from Rohm and Haas Company and is now Senior Process Safety Specialist for Chilworth Technology and is a staff consultant to the Center for Chemical Process Safety.

Mr. Hendershot has served AIChE on a number of CCPS subcommittees and on their Managing Board. He has been a Session Chair, Symposium Chair, and Committee Chair for the AIChE Area 11a Loss Prevention Symposium Committee. He served as Chair of the Safety and Health Division in 1998. He was a member of the AIChE National Program Committee 2000-2003, was on the AIChE Board of Directors 2001-2003, and was an AIChE Foundation Trustee 2002-2004.

Dennis currently serves as liaison between the AIChE Safety and Health Division and the ACS Division of Chemical Health and Safety. He served on the American Chemistry Council (ACC) Distribution Risk Management Task Group and on the ACC Committee on Assessing Vulnerabilities related to the National Chemical Infrastructure. He currently is on the editorial boards of *Process Safety Progress*, *Chemical Engineering Progress*, and the *Journal of Loss Prevention in the Process Industries*.

He has been the author or coauthor of more than 50 papers and publications on process safety and loss prevention. His interests extend to the history of technology, the philosophy of engineering design, and the creative aspects of engineering.

The Safety and Health Division recognizes and appreciates the contributions of Mr. Hendershot to chemical process safety. He joins a list of distinguished Walton-Miller Award recipients:

1987	Walter B. Howard	1994	Gui LeGendre	2002	Daniel A. Crowl
1988	Eugene S. DeHaven	1998	Robert W. Ormsby	2003	Lawrence G. Britton
1990	Stanley S. Grossel	1999	Richard F. Schwab	2004	Henry L. Febo, Jr.
1991	William J. Bradford	2000	John A. Davenport	2005	Gary J. Powers
1993	Ted A. Ventrone	2001	Joseph F. Louvar	2006	Dennis C. Hendershot ■

WILLIAM DOYLE PAPER AWARD TO ERDEM URAL

The William H. Doyle Award is presented by the Loss Prevention Committee (Program Area 11a) to the author of the best paper, considering both technical content and presentation. At the 2006 Spring National Meeting in Orlando, the award for the best paper at the 2005 Symposium was announced.

Erdem A. Ural of Loss Prevention Science and Technologies, Inc., Stoughton, MA, was selected as the award recipient for the presentation entitled "Dust Explosion Venting through Ducts." The paper reviewed available test data and contemporary understanding of the phenomena involved in deflagration venting through ducts, which is often the lowest cost solution to explosion venting. An improved calculation method was proposed. This new method eliminates the problems identified with the published methods. It can also handle real life vent duct installations which may have obstructions such as bends, elbows, bird screens and, rain covers.

Vent duct effects are accounted for using simple algebraic correlations. Improved correction factors for vent cover deployment pressure and enclosure aspect ratio are also developed and presented in the paper. These new correlations are also applicable to simple vents without ducts.

Erdem has been active in the affairs of the Safety and Health Division. He served as a Director 2003-2005, was Vice-Chair of the 2005 Loss Prevention Symposium and was Chair of the 40th Annual Loss Prevention Symposium held in Orlando in 2006. He was instrumental in developing the contest to design a Loss Prevention Symposium logo which was unveiled at the 40th Annual Symposium. ■

SAFETY AND HEALTH DIVISION ELECTION

In the recently completed Safety and Health Division election for Officers and Directors, **Robert W. Johnson** was elected 2nd Vice-Chair, starting the progression to Chair. **Cheryl A. Grounds** and **Lisa A. Long** were elected Directors for the 2006-2008 term. Most of the member votes were via electronic ballots, although there were still some conventional ballots used.

Bob Benedetti, National Fire Protection Association, moved to Chair following service in the 1st Vice-Chair post, and **Ronald Willey** of Northeastern University advanced to 1st Vice-Chair from 2nd Vice Chair. **Al Ness**, Rohm and Haas Company, continues as Secretary-Treasurer.

Bob Johnson has considerable experience on the Executive Committee having served as a Director 2003-2005. He has been heavily involved with the work of the Area 11a Program Committee in developing the Annual Loss Prevention Symposiums (LPS), and was the winner of the LPS Logo Contest (see news item below). Bob holds BS and MS degrees in Chemical Engineering from Purdue University. He has been a process safety consultant for 28 years. Currently, he is President of Unwin Company, a process risk management consultancy. Previously, he held positions with Hercules, Dow, and Battelle. Author of two CCPS books and a SACHE module on managing chemical reactivity hazards, Bob lectures on process safety topics for SACHE. He continues his activities in CCPS and the Safety and Health Division.

Cheryl Grounds is a Principal Engineer in process safety at Baker Engineering and Risk Consultants. She has over 23 years experience in oil and chemical industry work, providing technical support in the areas of process safety management, hazard and risk analysis, and fire protection engineering. Previously, she held positions with Exxon and ExxonMobil. As Loss Prevention Engineering Group Leader at Mobil Research and Engineering, she was responsible for providing safety and risk consulting services to existing facilities and major capital projects worldwide. She has been active in the work of the Safety and Health Division, and is currently a Session Chair for the 41st Loss Prevention Symposium scheduled for 2007. Cheryl holds a BS degree in Fire Protection Engineering from the University of Maryland. She is a Certified Safety Professional and a licensed Professional Engineer.

Lisa Long is an investigator with the U.S. Safety and Hazard Investigation Board in Washington, DC. Since joining CSB in 2000, she has been involved in many investigations, including serving as the Lead Investigator on the Georgia Pacific, Catalysts Systems, Honeywell, and Formosa Plastics investigations. Prior to joining CSB, she held positions in the chemical industry working for FMC, Albright and Wilson, and Rhodia. She has experience in plant operations, management, safety, and process engineering. She has been involved with activities of the Safety and Health Division and is currently a Session Chair for the 41st Loss Prevention Symposium scheduled for 2007. Lisa holds a BS degree in Chemical Engineering from Virginia Tech. ■

JOHNSON WINS LPS LOGO CONTEST

As announced at the AIChE 2006 Spring National Meeting, **Robert W. Johnson** was selected as the winner of an international competition for the creation of a new logo for the Loss Prevention Symposium in time for the 40th Annual LPS. The Area 11a Program Committee of the Safety and Health Division sponsored the competition and selected the winning submittal. The committee thanks all the persons submitting logo contest entries for their time and effort on behalf of the LPS.

The new logo is expected to enjoy wide exposure through selected LPS committee communication channels including announcements of symposiums, proceedings of symposiums, compact disks, web sites, and archival publications.

Bob Johnson is no stranger to the LPS. His first published paper, "Ignition of Flammable Vapors by Human Electrostatic Discharge," was presented at the 14th Symposium in 1981. He was the Symposium Chair in 2004

and has served as Chair of the Area 11a Program Committee.

Bob has used his graphic design abilities to improve aspects of the Symposiums, including the coordinating presentations used by the LPS Session Chairs. However, he considers other members of his family to be far more artistic, including a sister who has won awards for her photography, his father who enjoys oil painting, a daughter who is double-majoring in Multimedia Technology and Theater Production, and another daughter in a Cosmetology program. Bob also has three sons with diverse college studies of computer engineering, plant biology/microbiology, and neuroscience. He enjoys being a "gentlemen farmer" on his six-acre property outside Plain City, OH.

Bob was just elected as 2nd Vice-Chair of the Safety and Health Division following a three-year term as a Director (see news item above). ■

THE CCPS PAGE CENTER FOR CHEMICAL PROCESS SAFETY

NEW CCPS PROJECTS FOR 2006

CCPS is pleased to announce the commencement of the following five 2006 CCPS projects recently voted on and approved by both the Technical Steering and the Advisory Committees:

- Guidelines for Measuring Process Safety Progress
- Guidelines for Development of Risk Tolerance Criteria
- Guidelines for Vapor Cloud Explosions, Flash Fires, and BLEVEs, 2nd Edition
- Guidelines for Effluent Handling
- CCPS web community/discussion forum

For more information on the projects and on how to become involved, contact Karen Person at **212-591-7319** or by e-mail at **karep@aiiche.org**. ■

INVITATION TO CCPS MEMBERSHIP

If your company or organization has ever considered becoming a member of CCPS, now is a great time to explore the many benefits of membership. You are invited to call to discuss ways that CCPS can help your company. If you mention learning about this invitation from reading about it in *Safety & Health News*, the AIChE Safety and Health Division newsletter, a **20% discount** on the first year's dues will be applied.

Join the 85+ companies and organizations from the chemical, pharmaceutical, and petroleum industries as they promote and enhance process safety and security. Some of the advantages to being a CCPS member include:

- Your employees receive the sponsor registration rate to the CCPS Annual International Conference. Upon registration, your employees may also attend sessions at the AIChE Spring Meeting, which include the Loss Prevention Symposium and the Plant Process Safety Symposium held in the same hotel during the same dates.
- Your employees receive the CCPS sponsor book discount of 20%, plus additional discounts on bulk purchases.
- Your company can receive a discount on subscriptions to CCPS books-on-line at www.knovel.com.
- You will have free access to the CCPS sponsors-only "SafetyNet" containing meeting minutes and project documents.
- You will be able to participate directly in CCPS project developments.
- By participating in CCPS projects, your employers can learn from colleagues in other companies and organizations in the same and other industries that can be considered as free training.

For further information and to receive answers to any questions about CCPS membership, please contact Karen Person at **215-591-7319** or by e-mail at **karep@aiiche.org**. ■

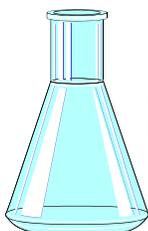
STATUS OF SOME MAJOR PROJECTS

1. Human Factors (Project #172). The objective is to develop an easy to understand concept book that helps engineers design processes that enable plant employees to operate in a safe manner. The concept book is currently being edited for peer review.

2. Management of Change (Project #180). The objective is to create an up-to-date guide that describes the best current thinking about Management of Change. The work to complete this book has been moving along well keeping to the original scheduled completion date. Coordination and integration with the Risk-Based Process Safety Project has been ongoing. The book draft is now undergoing peer review.

3. Risk-Based Process Safety Management (Project #179). The scope is to update previous CCPS Process Safety Management books with the goal of achieving better process safety results with fewer resources. The resulting book is about 50% complete. Most companies have process safety systems in place, but are challenged to make the systems more efficient. The organization of the new process safety management elements places 20 elements in four categories: (1) commit to process safety; (2) understand hazards and risks; (3) manage residual risk; (4) learn from experience.

REPORT OF THE AMERICAN CHEMICAL SOCIETY DIVISION OF CHEMICAL HEALTH AND SAFETY (CHAS)



The CHAS Executive Committee Meeting was held on March 26, 2006, during the 231st ACS National Meeting in Atlanta. Chair Jim Kapin led a discussion of the priorities and successes of the Division. In general, the mission is to provide technical expertise on chemical health and safety issues in a variety of forms, including programming at National and Regional meetings, the bimonthly *Journal of Chemical Health & Safety*, the CHAS web site and e-mail list, and review of *Chemical & Engineering News* safety material.

The current financial situation of the Division continues to be strong. The Division faces specific challenges, however, such as:

- Membership issues
- Attendance at technical programming is often relatively weak
- Workshop attendance and diversity has leveled
- Divisional leadership is active, but limited to a group of familiar faces with a need for new people to be added to the group
- Several committees lack chairs or chairs take responsibility for more than one committee
- Division activists are busy people with other responsibilities so that the Division needs to develop strategic plans to maintain priorities.

Four major action items were then proposed to deal with the challenges: (1) arrange a monthly conference call of the Executive Committee to follow up on plans made during the national meetings; (2) develop written Executive Committee member job descriptions collected in a fleshed out version of the Administrative Manual with connections to key indicators; (3) develop a collection of Strategic Division Metrics with indicators in potential areas of programming trends, financial trends, regional meeting activities, workshops, the *Journal*, unfilled positions, membership, and communications; and (4) challenge each Executive Committee member to find one new way to contribute to Division activities and, preferable, recruit someone to do it.

Financial Matters. The 2006 Division Budget predicts a \$5000 operating loss, but based on history, this is unlikely to occur because expenses are generally overestimated in the budgeting process. The Division has about \$93,000 in long term assets. Better options for investment of these funds, particularly through ACS avenues, are being investigated. It was agreed that the Division dues for 2007 should remain the same, that is, basically \$9 for a full member and \$27 for the *Journal of Chemical Health & Safety* with an opt out provision.

Treasurer Neal Langerman has been contacting people who resign from the Division to determine the reasons for discontinuing membership. The primary reason cited was a job reassignment that took people out of the specific chemical safety responsibilities.

Journal of Chemical Health & Safety. The pipeline for *JCHAS* is full until December 2006. The number of foreign contributors is steadily increasing, but language issues create quality problems in this group (15 of 15 foreign contributions this year have been rejected primarily due to language challenges). This phenomenon is increasing the burden on the editorial review process throughout ACS publications, and defending against the "rush to publish" will be an ongoing issue.

Long Range Planning. Many people on the Long Range Planning Committee feel that one-year chair terms are too short for effective planning and implementation of strategic activities for the Division. Lengthening the term of Chair to two years and adjusting the terms of the Chair-Elect and Past-Chair, and providing more explicit duties would address this challenge. A formal change to the Division by-laws will be brought forward at the next meeting of the Executive Committee in San Francisco.

Speakers Bureau. The developing speakers bureau now has three speakers on the current roster: Barbara Foster, Russ Phifer, and Jim Kaufmann. More speakers are needed. A grant of \$6000 is available to fund travel expenses through this program. It is the intention for the speakers to address public groups and Local Sections about chemical safety issues.

Workshops. Based on recent experience at Regional Meetings, it was suggested that the Division workshops be moved from weekends to mid-week time slots at National Meetings. In particular, the 2005 SE/SW Joint Regional Meeting had excellent workshop response, which was scheduled during the meeting. The Division participated in two Regional meetings in 2005 and plans to participate in three such Meetings during 2006.

CHAS Executive Committee Shirts. Past-Chair Russ Phifer suggested that a CHAS Executive Committee shirt would be a good form of recognition and publicity for the work of the Committee. He volunteered to look into design and supply issues, and will report at the next meeting. ■

**232ND ACS NATIONAL MEETING
SAN FRANCISCO, CA, SEPTEMBER 10-14, 2006
DIVISION OF CHEMICAL HEALTH AND SAFETY**



The following seven sessions are planned by the ACS Division of Chemical Health and Safety for the 232nd ACS National Meeting in San Francisco on September 10-14, 2006. For information, see the Meetings Section at <http://chemistry.org>.

Program Chair: Stefan Wawzyniecki, Jr.
University of Connecticut
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- 1. Advances in Skin and Eye Contamination** - Chair: Neal Langerman, Advanced Chemical Safety, neal@chemical-safety.com.
- 2. Awards Symposium** - Chair: D. B. Walters, KCP, Inc., waltersdb@earthlink.net.
- 3. Chemical Health and Safety** - Chairs: Russell Phifer, WC Environmental, rphifer@glasmesh.com, and Frankie Wood-Black, Frankie.K.Wood-Black@conocophillips.com.
- 4. General Papers** - Chair: R. N. Vernon, U. of California Riverside, russell.vernon@ucr.edu.
- 5. Lab Ventilation** - Chair: J. M. Kapin, Advanced Chemical Safety, jim@chemical-safety.com.
- 6. Safety in Biology Labs** - J. G. Palmer, U. of California San Diego, jpalmer@ucsd.edu.
- 7. Teaching Safety** - G. H. Wahl, North Carolina State University, george_wahl@ncsu.edu. ■

HAZARD COMMUNICATION IN THE 21ST CENTURY

Ralph Stuart of the University of Vermont and the current CHAS Secretary wrote an article for the *Vermont Environmental Monitor* discussing hazard communication and industrial hygiene in the 21st Century. Reflecting on the papers presented at the CHAS Sessions as part of the 231st ACS National Meeting in Atlanta, he reviewed the globally harmonized system (GHS) for the classification and labeling of chemicals. A summary of his article appears here. More information can be found at www.enviro-source.com.

Industrial hygiene has evolved since the OSHA Hazard Communication Standard was issued twenty years ago. Material Safety Data Sheets (MSDS) were originally established as an OSHA requirement for the shipbuilding industry in the early 1970s. They were designed to be useful for the materials that create health and environmental problems around shipyards, such as paints, oils, and asbestos. The format specified by OSHA was useful only in that setting.

In 1983, OSHA promulgated the Hazard Communication Standard requiring access to MSDSs for all hazardous chemicals used in workplaces in the United States. Employers retained the responsibility for assuring that the information on the MSDSs was adequate to support chemical safety training in the workplace. Note, however, that those benefitting from information on the MSDSs were not the same people who were writing them. For this reason, MSDSs were carefully worded to prevent potential liability to the chemical manufacturers and suppliers.

In 1994, the American National Standards Institute established a standard format for MSDSs which included 16 sections. While this made MSDSs longer, they were not necessarily more understandable to the average worker.

Since 1992, a variety of countries, including the USA, China, Canada, and most of the European countries, have been developing the "Globalized System for Classification and Labeling of Chemicals." This system is to be a framework that national regulators can use to develop a system of appropriately harmonized classification and communication requirements for chemical hazards that will be internationally recognized. There are two primary elements: (1) standard criteria for classifying chemical substances and mixtures according to their health, environmental, and physical hazards, and (2) and harmonized hazard communication elements, including requirements for labeling and MSDSs. A document that compares GHS elements with the current OSHA requirements is available at: www.osha.gov/dsg/hazcom/GHSOSHAComparison.html.

One of the issues is the use of "control banding" which is a system for selecting worker protection strategies based on grouping chemicals into "bands" or classes of chemicals of similar toxicity, and selecting controls based on which band a particular chemical fits into. For highly toxic materials, this may not be an acceptable approach to control of hazards. ■

SAFETY NOTES

- OSHA announced a new advanced search engine on its web site: www.osha.gov. This permits users to conduct efficient topical or keyword searches in various sections of the web site, such as standards, compliance directives, interpretations, small business issues, training, and many other areas. Searches can be limited to one area or expanded to many different areas of the site.
- New officers and directors have been elected by the Board of Certified Safety professionals for 2006. **Larry Jones**, Manager, Speciality Engineering with Dynetics, Inc., was elected President. **Jeffrey Robinson, P.E.**, with Westinghouse Savannah River Company, is the new Vice-President. Serving his first year as Secretary-Treasurer is **Glenn Daviet**, Vice-President of Sedgwick Claims Management Services, Inc. **Emory Knowles III** was elected as a new Director. He is Manager of Industrial Hygiene and Safety for Northrup Grumman Corporation.
- The Chemical Safety & Hazard Investigation Board (CSB) has asked the National Institute for Occupational Health & Safety (NIOSH) to address chemical process safety and release prevention in its agenda. CSB proposed research into several broad areas, including the effectiveness of chemical emergency preparedness programs and the safety implications of having a large contractor workforce in the chemical industry. The CSB also wants NIOSH to examine methods to evaluate the safety culture of companies, ways to reach small and medium businesses with preventive lessons, and how to improve the data available to describe and measure chemical releases.
- A large explosion in late March at a chemistry school in eastern France resulted in the death of one person and serious injury to another, as well as structural damage. Fire officials indicated that the blast which then ignited a fire occurred in the city of Mulhouse near the border with Germany on the ground floor of the Superior National School of Chemistry. About 8,000 students are enrolled there. Rescue officials said one woman, a professor, was pulled from the building and later died. A second person was in serious condition. The cause of the explosion is not yet known. Ethylene was indicated as the major chemical component involved.
- *Preventing the Uncontrolled Release of Anhydrous Ammonia at Loading Stations* is the focus of a new OSHA Safety and Health Information Bulletin available on the OSHA web site. The document outlines the potential for an uncontrolled anhydrous ammonia release during transfer operations at loading stations and at other anhydrous ammonia systems/processes without certain safety mechanisms. The bulletin shows examples of devices, work practices, and training that employers and workers can use to eliminate or reduce the likelihood of incidents.
- Donald Jones, Dow Chemical Safety Manager, during a presentation at a recent American Society of Safety Engineers (ASSE) Safety Symposium, discussed how leadership strategies within safety and health management systems was vital to preventing accidents and injuries. The first thing a company that is serious about safety needs to have is management commitment. Equal protection to all employees regardless of their positions, a disciplinary system, and an annual evaluation are all required in effective safety management systems.
- Dr. Christopher Portier has assumed a new leadership role as Associate Director for Risk Assessment at the National Institute of Environmental Health Sciences (NIEHS), one of the National Institutes of Health. He will oversee and coordinate risk assessment activities within NIEHS, and will apply the results of toxicological studies to national and international efforts dedicated to assessing the human health risks of chemicals, drugs, and physical agents. The new position is in line with the renewed interest at NIEHS in using environmental health sciences to understand human disease and to improve human health.
- OSHA announced that the Agency cited 85,307 total violations of standards and regulations during FY 2005, an overall increase of 9.5% over the past five years. Of particular note was the increase in willful violations issued during the year (62% over FY 2004). ■

**Third Global Congress on Process Safety
CALL-FOR-PAPERS
41ST ANNUAL LOSS PREVENTION SYMPOSIUM
APRIL 22-26, 2007, HOUSTON, TX**



The Loss Prevention Symposium, organized by the AIChE Safety and Health Division Area 11a, has been held annually since 1967. To present a paper, please contact the appropriate Chair and submit a short abstract of 200-300 words by **October 2, 2006**. Include the names, addresses, and affiliations of the authors with the abstract. Session chairs will select the papers to be presented and will notify the authors later in the fall.

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1. MODELING IN FIRE AND EXPLOSION PROTECTION.

CFD and similar modeling techniques have been used for characterizing fires and explosions and are being used more frequently for predicting the performance of protection systems. The newest models are able to address more complex geometrics and have diverse uses such as optimizing testing projects, post-explosion forensic analysis, process design, and protection design. Modeling papers on the following topics are invited: gas explosions, venting, suppression, or isolation protection, model development, model validation, and successful model application.

Chair

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Vice-Chair

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2. FIRE, EXPLOSION, AND REACTIVE HAZARDS.

The analysis, prevention, and mitigation of fire, explosion, and reactive hazards continue to be extremely important to the Loss Prevention community. This session invites papers on new research, tools, and methods that identify, characterize, or offer design and operational guidance on fire, explosion, and reactivity hazards.

Chair

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Vice-Chair

Robert P. Benedetti
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3. FACILITY SITING AND BUILDING DESIGN FOR EXPLOSION PROTECTION.

The siting and design of buildings continue to be critical aspects in providing a safe workplace. A decade ago, the focus was on explosion risks to central control buildings. Incidents in the last few years both in the process industries and on the security front have highlighted the importance of applying these concepts to all occupied structures. New design tools provide greater analysis options and allow for more cost-effective blast resistant designs. Papers addressing the relevant and effective solutions to the problems are invited.

Chair

Cheryl A. Grounds
Baker Engineering Consultants
Universite de Sherbrooke

Vice-Chair

Jean Paul LaCoursiere

4. COMMUNICATING EXPERT KNOWLEDGE TO TECHNICAL COMMUNITIES.

This session is primarily intended to help engineers effectively communicate important safety technology within and between companies (hazard communication, product labeling, product stewardship, etc.), but also to improve communications from the technical community to non-technical executives. Papers with the following topics are invited: (a) sources of technical information for plant safety; (b) highlights of recent technology that need better dissemination; (c) highlights of older technology that are neglected; and (d) tools and methods for improving communications in the safety arena.

Chair

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Vice-Chair

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5. PREPARING FOR NATURAL DISASTERS AND LESSONS LEARNED.

Process facilities face many and varied natural threats that can impose forces and consequences far greater than the design limits of equipment and controls. Papers are invited that address many of the issues related to natural disasters, including plant siting, design basis selection, rare natural event likelihood and consequence assessments, supply and product chain management, and lessons learned from the 2005 hurricanes and other natural disasters. Natural disaster emergency preparation, response, and recovery are other potential subjects.

Chair

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Vice-Chair

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6. CASE HISTORIES AND LESSONS LEARNED. Papers dealing with incidents, near misses, and the lessons learned are solicited to provide valuable learning experiences.

Chair

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Vice-Chair

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**Third Global Congress on Process Safety
CALL-FOR-PAPERS
9TH PROCESS PLANT SAFETY SYMPOSIUM
APRIL 22-26, 2007, HOUSTON, TX**



The 9th Process Plant Safety Symposium (PPSS), organized by the AIChE Safety and Health Division Area 11b, is scheduled to be held as part of the Third Global Congress on Process Safety during the 2007 AIChE Spring Meeting in Houston, TX. The PPSS was originally organized by the South Texas Section of AIChE as a stand-alone meeting on a biennial basis, but it was incorporated into the Safety and Health Division programming efforts as part of the First Global Congress on Process Safety, and has been held annually since. To present a paper, please contact the Symposium Chair Phil Myers or the appropriate Session Chair, and submit a 150-300 word abstract by **October 2, 2006**. Include the names, addresses, and affiliations of the authors with the abstract.

Symposium Chair

Philip M. Myers
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1. RISK ASSESSMENT AND RISK MANAGEMENT - NEW DIRECTIONS. Innovation continues in the assessment of plant and corporate risks in business terms. Papers highlighting the assessment and risk management of process safety related business risks and successful integration of risk decision making into main stream business processes are desired. Also of interest are success stories in influencing plant management, business leaders, executives, and the public, and in creatively eliminating or minimizing risks.

Chair

Jack Chosnek
KnowledgeOne, Houston, TX
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2. SAFETY INSTRUMENTED SYSTEMS - IDENTIFICATION, DESIGN, AND APPLICATION. The identification of Safety Instrumented Functions (SIFs) and the design and proper application of Safety Instrumented Systems (SIS) is an ongoing challenge in the process industries. This session invites papers in the areas of Independent Protection Layer (IPL) identification, Safety Instrumented Function (SIF), Safety Integrity Level (SIL) assignment, and SIS management systems.

Chair

Angela Summers
SIS-Tech Solutions, Houston, TX
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3. PSM AND RISK TRAINING IN THE 21ST CENTURY - METHODS, TOOLS, AND INNOVATIONS. Formal structured methods of training material development are an important aid in setting specific objectives and creating materials that achieve them uniformly in delivery. Advances in technology provide many new avenues for development and implementation of training programs in risk, process safety, and security. Papers are requested that highlight formal methods of training material development and utilization of current technology and media (e.g., CD, internet, intranet, web casting, pod casting) to enhance delivery of training programs through traditional and innovative approaches.

Chair

James Thompson
INVISTA S.à.r.l., Victoria, TX
361-572-2032
james.r.thompson@invista.com

4. ASSURING SAFETY IN DESIGN AND CONSTRUCTION OF PROCESS SYSTEMS. Engineering design and projection execution methods are important components in the development and construction of safer process plants. Case histories that illustrate successful application of best practices here are solicited.

Chair

Vic Edwards
Aker Kvaerner, Houston, TX
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vic.edwards@akerkvaerner.com

5. SECURITY, VULNERABILITY ASSESSMENTS, AND MITIGATION. This session solicits papers regarding security, vulnerability assessments, and innovative and cost-effective mitigation solutions for plant sites, in transportation and distribution operations, and throughout the value chain. New techniques and methods, advances in application of existing approaches, and use of innovative new technologies are of interest.

Chair

John Champion
Rohm and Haas Company, Deer Park, TX
281-228-8265
jchampion@rohmmaas.com

6. SAFETY CULTURE - KEY TO PROCESS SAFETY PERFORMANCE. Building, maintaining, and nurturing a strong safety culture is critical to long-term process safety performance. There are many challenges to ensuring a positive safety culture in business operations at all locations, with additional challenges posed by acquisitions, mergers, and divestitures. This session invites papers demonstrating proactive approaches to assess, build, maintain, and nurture a strong safety culture to achieve process safety excellence.

Chair

Dr. M. Sam Mannan
Mary Kay O'Connor Process Safety Center, College Station, TX
979-862-3985
mannan@tamu.edu

7. CASE HISTORIES AND LESSONS LEARNED. Joint with the Loss Prevention Symposium - see page 9. ■

Third Global Congress on Process Safety
CALL-FOR-PAPERS
22ND ANNUAL CCPS INTERNATIONAL CONFERENCE
CASE HISTORIES - ADVANCING PROCESS SAFETY
THROUGH DESIGN AND OPERATIONS
APRIL 22-26, 2007, HOUSTON, TX



The 2006 CCPS Conference successfully wrapped up in April, and plans are now underway for 2007. This 2007 Conference is again running as part of the Global Congress on Process Safety. The theme is "Advancing Process Safety Through Design and Operations." Abstracts for proposed papers are now being accepted. Early submittals are encouraged. Contact Karen Person at **212-591-7319** or **karep@aiiche.org** for further information.. Abstracts must be received by **October 2, 2006**. Please e-mail to **ccpsicw@aiiche.org**.

There are many factors that can affect achieving process safety excellence. Some of these include sound process design adhering to current engineering standards, codes, and practices; employing inherent safety approaches for new designs; ensuring ongoing mechanical integrity with effective preventive maintenance, inspections, and turnaround programs; identifying hazards and managing their risk using passive, active, and administrative safeguards; and implementing management systems to drive operations, stability, and health, safety, and environmental performance.

At the CCPS 2007 Annual Conference, papers will discuss and explore the most current thinking and approaches as demonstrated through case histories and lessons learned. Please add your voice to this discussion by submitting an abstract of a proposed presentation.

The Conference will include the following topical areas:

- Risk Based Process Safety
- Risk Tolerance Criteria
- Process Safety Management Systems
- Inherent Safety
- Standards, Codes, and Regulations
- New Standards - Criteria for Retroactive Implementation
- Reliability and Process Safety
- Mechanical Integrity, Risk Based Inspection, and Turnaround Considerations
- Relief and Header Designs
- Safety Instrumented Systems

The Center for Chemical Process Safety was formally chartered by AIChE on March 25, 1985, following a preliminary discussion with 17 senior executives from 13 major chemical and petroleum companies. While the immediate driving force was the Bhopal incident of December 1984, CCPS in concert with industry envisioned a broad and far reaching mission to advance the state-of-the-art process safety technology and management practices. Annual international conferences represent one of the many programs established by CCPS to accomplish the continuing mission. ■

51ST ANNUAL SAFETY IN AMMONIA PLANTS SYMPOSIUM

The 51st Annual Safety in Ammonia Plants and Related Facilities Symposium, organized by the Safety and Health Division Program Area 11c (Ammonia Committee), is scheduled for **September 10-14, 2006**, at the Hyatt Regency in Vancouver, British Columbia, Canada. Presentations will cover issues of safety interest in plants to manufacture ammonia, urea, nitric acid, ammonium nitrate, and methanol. Papers will include 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. International speakers are included in this popular symposium. For more information, see **www.aiiche.org/conferences**.



PAPERS PAPERS PAPERS

"Mixing Hazard Evaluation of Organic Peroxides with Other Chemicals," A.Miyake, N.Yamada, and T.Ogawa, *J.Loss Prev. Process Ind.* **18**, 4-6, 380-383 (July-November 2005).

Organic peroxides are known for their self-reactivity and also as a hazard when mixing with other chemicals such as acids and alkalis. This paper proposes a simple but useful evaluation of mixing hazards using conventional experimental techniques such as a glass test tube, Dewar vessel, and DSC. Tests were run mixing seven different organic peroxides with various concentrations of sulfuric acid, sodium hydroxide, α -iron (III) oxide, and acrylonitrile. Based on the proposed evaluation, testing results were classified into four ranks based on hazard criteria.

"Study on the Early Stage of Runaway Reactions using Dewar Vessels," X-R Li and H.Koseki, *J.Loss Prev. Process Ind.* **18**, 4-6, 455-459 (July-November 2005).

In this study, the early stages of runaway reactions of several liquid and solid samples, including three organic peroxides and a reactive material, were studied in Dewar vessels. To characterize the ability of the adiabatic nature of a storage vessel, it was shown that a spherical Dewar vessel could simulate a plant process having a critical storage size of a reactive material. It is recommended that such a technique be used to investigate the SADT of an unstable material in large scale packaging situations.

"Safe Handling of Chlorine," A.K.Saroha, *J.Chem.Health & Safety* **13**, 4, 5-11 (March/April 2006).

Chlorine is a toxic gas that can be lethal in relatively low doses. The TLV is 0.5 ppm. Chlorine is extremely hazardous via inhalation, dermal absorption, ingestion, and eye contact. The initial symptom of exposure to chlorine is irritation to the mucous membranes of the upper respiratory tract and of the eyes. This irritation increases to an intense burning sensation. The toxic effects of chlorine are discussed in this paper. Fire and explosion hazards are reviewed. The two hazards during chlorination reactions can be gas phase explosion, and runaway reaction and thermal explosion in the condensed phase. Dry chlorine gas is generally non-corrosive but it is highly corrosive in the presence of moisture. Safety precautions for handling and storing chlorine are presented.

"How to Handle Hydrogen in Process Plants," R.C.Hachoose, *Chem.Eng.* **113**, 4, 54-59 (April 2006).

Process unit layout, piping, instrumentation/control, and materials of construction are but a few of the technical issues requiring special attention during the design or retrofitting of process plants that use hydrogen. Hydrogen is widely used for hydrogenation and other reactions. It also holds promise as a fuel. However, the gas is highly explosive, prone to leakage and permeation, and difficult to detect. Safe design practices are described.

"Know Your Hydrogen Supply Options," A.Stubinitzky and C.J.J.Reijerkerk, *Chem.Eng.* **113**, 4, 60-63 (April 2006).

This paper discusses the best delivery method for process units depending upon plant location, and on the amount and purity of hydrogen needed. This paper is useful in conjunction with the paper described immediately above.

"Incident Investigation of Mono-Nitro Toluene Still Explosion," A.Sachdev and J.Todd, *J.Loss Prev. Process Ind.* **18**, 4-6, 531-536 (July-November 2005).

At a nitrotoluene facility, an o-nitrotoluene still was in standby mode. During this standby mode, feed to the still had been stopped, the column was not drained, steam flow to the reboiler was not shut off, and the condenser provided total reflux. After 22 days of standby, steam was shut off for five days for annual plant maintenance. Eight days after the re-start of steam, the still exploded, hurling debris as far as one mile. The internal packing was expelled from the column and landed on the ground burning. As part of the investigation of this incident, Accelerating Rate Calorimetry was used extensively to determine the onset temperature for exothermic activity in the presence and absence of a number of materials to establish the underlying cause of the explosion. ■