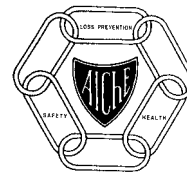


Safety & Health News

AICHE

AMERICAN INSTITUTE OF
CHEMICAL ENGINEERS

SAFETY AND HEALTH
DIVISION
www.shdiv.aiche.org



SPRING 2006

SAFETY FORUM

WHAT NEEDS TO BE DONE?

Declining membership in the Safety and Health Division is a continuing problem in recent years. This is also an issue with the ACS Division of Chemical Health and Safety. The question then arises as to what can be done at the Safety and Health Division level, not only to improve membership numbers but also to increase the value of membership. These are obviously related factors, but sometimes are treated in a separate manner. How can programming be improved? What are the cutting edge technologies in chemical plant and process safety? What can be done to make membership in the Division more attractive? In fact, what can be done to make membership in the Division an essential element for lifetime career development of process engineers?

The Division has a fine magazine in *Process Safety Progress*, and that is certainly a good place to start. But the overall objective of the Division can be summarized as putting on the Annual Loss Prevention Symposium, and to some extent, what is now the Annual Process Plant Safety Symposium, almost to the exclusion of all other activities. The Annual Ammonia and Related Facilities Symposium, while considered a Division activity, has a life of its own, and there seems to be little if any interaction between this valuable activity and the Division Executive Committee.

About six years ago, the Chemical Engineering Technology Operating Council, which is charged among other things to help Divisions succeed in their membership, programming, and publishing endeavors, outlined guidelines for a successful Division as follows:

- Division has a clear vision and a mission that are well-aligned with the AIChE vision and mission,
- Division has a strategic plan that is well aligned with the AIChE strategic plan,
- Current and planned future leadership of the Division is expected to be effective,
- There are reliable and available volunteer resources within the Division to fulfill the mission,
- Division is relevant and adds value to current and potential AIChE members,
- Division addresses current AIChE issues of globalization, industrial participation, societal impact, career and education needs, emerging technologies, sustainable development, and Institute revenue growth,
- Technologies addressed by the Division are current or leading edge,
- Interactions/collaborations with other AIChE entities and with organizations outside AIChE are useful and productive, and
- Division is a visible demonstration of the AIChE leadership of the profession.

That's quite a laundry list. Now it is your turn as Division members to stand up and be heard. Give us your opinion on how the Division is doing and what needs to be done. Contact either Bob Benedetti (Chair) at bbenedetti@nfpa.org or me at aswest@worldnet.att.net.

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

Undoubtedly you have noticed that there has not been a report from the Division Chair since the Summer 2005 issue of this Newsletter. In its place in the Fall issue was an obituary for Walt Silowka, the 2005 Chair. It is ironic that Walt had stated that the 2005 Loss Prevention Symposium was dedicated to Ephraim Scheier, recently deceased at the time, who had been a very active member of the Division, devoting a lot of time and effort to Division activities, particularly to the Loss Prevention Symposiums. And then Walt himself died shortly thereafter.

Anyone who read Walt's formal obituary that appeared in the Allentown, PA, newspaper has to be amazed at the range of this man's interests. I'll skip his many technical affiliations and achievements since these are known to Division members. Walt was a devoted family man who enjoyed being involved in his children's extracurricular activities - he coached their soccer and T-ball teams. He was active in the New Jersey Civil Air Patrol, and was involved with amateur rocketry, amateur astronomy, the U.S. Coast Guard Auxiliary, the Salvation Army, numerous local charitable and arts related organizations, the Smithsonian National Museum of the American Indian, and the list goes on and on. Truly, his death represents a loss to our loss prevention community, and much more so to his family and home community. The Safety and Health Division has made a donation to the scholarship fund of the Chemical Engineering Department at the University of Delaware in memory of Walt.

The Division ballot for election of new officers and directors for 2006 is late in being organized, but should be available shortly. The election will be for Second Vice-Chair and for Secretary/Treasurer, each for one year terms. Two Directors to serve for the years 2006-2008 will also be elected. Write-in nominees, of course, will be allowed.

The 2nd Annual Global Congress on Process Safety will be held April 24 through 26, 2006, at Disney's Dolphin Hotel in Orlando, FL, as part of the AIChE Spring National Meeting. The Safety and Health Division has organized the 40th Loss Prevention Symposium and the 8th Process Plant Safety Symposium, while CCPS has organized its 21st Annual International Conference, all making up the Global Congress. The programs can be found on pages 10-12 of this Newsletter. You're sure to find numerous sessions of direct and particular interest to help you in your technical and professional development.

The Annual Safety and Health Division dinner will be held on Monday evening, April 24, at Disney's Attic Restaurant, on the Boardwalk near the Dolphin Hotel. Dinner space is limited, so be sure to preregister for this important and entertaining event.

The Annual Meeting of the Division Executive Committee is scheduled for Tuesday evening, April 25, from 5:30 PM to 7:00 PM. The exact location will be posted. All members of the Division are invited to attend; this is an open meeting so your participation and comments are sincerely welcome. Some of the items to be discussed are:

- a review of the financial position of the Division
- the membership of the Division and how we might attract new members
- the AIChE campaign for Web Excellence (and how we might use the new AIChE web page)
- planning for the 2007 Loss Prevention Symposium
- will there be a 3rd Global Congress on Process Safety in 2007.

One topic of discussion at the Annual Division Meeting will be the Eighth World Congress of Chemical Engineering scheduled for August 23-27, 2009, in Montreal, Quebec. The Congress is being hosted by the Canadian Society of Chemical Engineers. AIChE will be a participant and has been asked particularly to be involved in the area of loss prevention and safety programming. While this promises to be an exciting opportunity to join with colleagues from around the world, and a terrific learning experience for those who rarely leave our shores, it might well have an impact on the usual programming activities of the Division. So, if you have an opinion or two about how we might collaborate with our friends across the Northern border in developing the program, please join the Executive Committee Meeting on Tuesday evening, April 25.

One final reminder: if you have an interest in participating more actively in the Division, or if you have some ideas or thoughts regarding programming or other activities, please call me or send an e-mail. I can be reached at **617-984-7433** or **bbenedetti@nfpa.org**.

Look forward to seeing you in Orlando!

Bob Benedetti

SECOND GLOBAL CONGRESS ON PROCESS SAFETY

The success of the First Global Congress on Process Safety in Atlanta in 2005, with positive feedback received from those in attendance, prompted the development of the 2nd Global Congress scheduled during the AIChE Spring National Meeting in Orlando, FL, April 23-27, 2006, at Disney's Dolphin Hotel. Three major symposiums on process safety are scheduled. The 40th Annual Loss Prevention Symposium, organized by Program Area 11a, the 8th Process Plant Safety Symposium, organized by Program Area 11b, and the 21st Annual CCPS International Conference make up this Second Global Congress.

Papers focusing on the global demand for information on process safety procedures, tools, research efforts, and practical experiences are included. The three symposiums will combine for keynote presentations by **Gary R. Veurink**, Vice President of Manufacturing and Engineering, the Dow Chemical Company, and **John Mogford**, Group Vice President of Renewables and Alternatives, Manufacturing and Health and Safety, British Petroleum. There will be three common luncheon presentations and a common closing session on "Case Histories and Lessons Learned." The 21st CCPS International Conference will include several outstanding speakers from countries outside of the USA. The programs for the three symposiums are found on pages 10 through 12 of this Newsletter.

This year, the Ethylene Producers Conference and the Fifth World Congress on Particle Technology, both part of the AIChE Spring National Meeting, will also have sessions on safety issues.

The AIChE 2006 Spring National Meeting is the most comprehensive conference designed exclusively for chemical engineers who want to grow professionally and advance in their careers. For further information, including registration information, see www.aiche.org/Spring. Members who register by March 19, 2006, save \$200 over non-member rates. ■

ANNUAL SAFETY AND HEALTH DIVISION DINNER

The Annual Safety and Health Division Dinner is scheduled to be held at the Attic on Disney's Boardwalk, a short walk from the Dolphin Hotel, on Monday, April 24, 2006, from 6:00 PM to 9:30 PM. The speaker is Ronald Finger, who works in the citrus industry in the areas of process safety. The dinner cost is \$60. There is limited seating at this location, so early registration is advised.

Speaker - Ronald Finger, PE, MSEM; Safety Manager, United States Sugar Company, Clewiston, FL.

Topic title - "Creating Safety Culture Change Through Implication of Process Safety Management Principles"

The winner of the Norton H. Walton/Russell L. Miller Award will be announced and the presentation will be made. This award of the Safety and Health Division is in recognition of outstanding chemical engineering contributions and achievements in the areas of loss prevention, safety, and health. ■

51ST ANNUAL SAFETY IN AMMONIA PLANTS SYMPOSIUM

The 51st Annual Safety in Ammonia Plants and Related Facilities Symposium, organized by 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. The Call-for-Papers closes on May 1, 2006. Information can be found at: www.aiche.org.

DIVISION MEMBERSHIP

There is a continuing decline in AIChE membership and in the number of AIChE members who join Divisions. The Safety and Health Division has encountered this membership reduction, although not quite as drastic as some other Divisions. At a meeting of the Council of Division/Forum Officers held in Cincinnati in October during the 2005 AIChE Annual Meeting, this issue was discussed at length. The future health of the Institute and of the Divisions necessitates a variety of efforts to change the trend. Best practices of several Divisions were noted, including collaboration with Local Sections to put on technical events. The help of each Institute and Division member is needed to turn this around. Your ideas are indeed solicited (see page 1). ■

THE CCPS PAGE CENTER FOR CHEMICAL PROCESS SAFETY

NEW PROJECTS STARTING IN 2006

Five new projects have been initiated or are planned to start in 2006 as CCPS begins its third decade of building a global community committed to process safety.

1. *Inherently Safer Processes, 2nd Edition* - CCPS published the first book on inherent safety in 1996. This publication took a conceptual and retrospective approach since the number of examples of inherently safer design at the time was limited. Now, with ten years of experience, CCPS is updating this book, including detailed design guidance and practical examples such as retrofitting inherently safer concepts into operating plants.

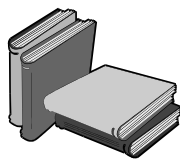
2. *Guidelines for Chemical Transportation Risk and Security Analysis, 2nd Edition* - The first edition covering chemical transportation risk, published in 1995, is being updated to make it more user-friendly for transportation professionals and to include content regarding the currently critically important transportation security issues.

3. *Guidelines for Pre-Start-Up Safety Review* - Start-up remains one of the highest risk phases of plant operation. A well executed pre-start-up safety review is critical to maintaining safety during this period. This new publication will guide start-up engineers and operation leaders through the pre-start-up review process providing customizable checklists to facilitate the work.

4. *Incidents that Define Process Safety* - CCPS believes it is critical that the engineers of the next generation understand both the "how" and the "why" of process safety. This publication will use historical accounts to illustrate critically important aspects of process safety.

5. *Guidelines for Hazard Evaluation Procedures, 3rd Edition* - This update of the CCPS classic, *Guidelines for Hazard Evaluation Procedures*, will showcase lessons learned since the 2nd Edition was published in 1992, including new hazard evaluation procedures and a refinement of the detailed PHA checklists included in the first two editions. ■

TWO NEW CCPS BOOKS PUBLISHED



Guidelines for Mechanical Integrity, Publication No. G-96, ISBN 0-816-90952-0, 320 pp, AIChE/CCPS New York (2006), \$119.00.

Process Safety provides many benefits, not the least of which is avoiding accidents. A strong maintenance and mechanical integrity program is how process safety drives benefits to the top line - sales. By stopping equipment failures as a cause of accidents, plants can also increase their on-stream efficiency, enabling increased production. This book, in the well regarded CCPS Guidelines Series, helps companies develop comprehensive mechanical integrity programs not only to meet OSHA Process Safety Management regulations but also to realize the business benefit of process safety.

Safe Design and Operation of Process Vents and Emission Control Systems, ISBN 0-471-79296-9, 336 pp, AIChE/CCPS New York (2006), \$94.95.

This book describes design strategies to address flammability, explosive, and toxic hazards specific to process vent headers used for normal, emergency, and combined service. A thorough treatment of the hazardous phenomena, such as flammability limit variation, deflagration, pressure piling, and detonation is presented. Regulatory issues are discussed and design sequence, design strategies, and inherently safer approaches are described in detail.

These books are available through the AIChE web site: www.aiche.org or from www.wiley.com. ■

The new CCPS web site went online late in 2005. The site can be accessed through the AIChE web site or directly at: www.ccpsonline.org. This site includes two new free publications: "Corporate Crisis Management" and "Building Process Safety Culture." Readers are particularly encouraged to use the book on safety culture broadly within their organizations to help maintain the focus on process safety. The site provides links to substantial online process safety resources.



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

Papers are solicited for presentation at the DCHAS sessions scheduled for the 232nd National ACS Meeting in San Francisco, September 10-14, 2006. The Online Abstract Submittal System (OASYS) of ACS should be used. This can be accessed at: oasys.acs.org. The deadline is **April 21, 2006**. The following 7 sessions are planned.

Program Chair: Stefan Wawzyniecki, Jr.
University of Connecticut
stefan.w@uconn.edu

1. **Advances in Skin and Eye Decontamination** - 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 & Safety** - Chairs: Russell Phifer, WC Environmental, rphifer@glasmesh.com and Frankie Wood-Black, Frankie.K.Wood-Black@connocophillips.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. ■

DCHAS CREATES SPEAKERS BUREAU

The Division of Chemical Health and Safety (DCHAS) of ACS has created a Speakers Bureau. The objective is to enhance public awareness of chemical health and safety issues by providing professional, qualified speakers for presentations on appropriate topics of interest to the scientific community. The Speakers Bureau Committee invites DCHAS members interested in participating as speakers to contact the Committee Chair for application materials and additional information. The Committee also invites organizations interested in having presentations by DCHAS speakers to request information from the Committee Chair. A summary of potential topics and speakers is available.

The Committee Chair is Jim Kaufman, jimkaufman@labsafety.org. The other two members of the Committee are Robert Hill and Russ Phifer.

This Speakers Bureau is made possible in part by an Innovative Project Fund Grant for Divisional Enhancement. The grant is offered by the ACS Council Committee on Divisional Activities. Funds from the grant will be used to help support speaker travel expenses and other operating expenses. ■

WORKSHOPS AT 231ST ACS NATIONAL MEETING

There are four workshops offered by the Division of Chemical Health and Safety in conjunction with the 231st ACS National Meeting in Atlanta, March 26-30, 2005. Contact Russ Phifer: rphifer@glasmesh.com for info.

1. **The Laboratory Safety Workshop**, Friday, March 24, Dr. James Kaufman or Dr. Jack Breazeale

This classic presentation on laboratory safety has been attended by thousands of safety professionals. With experience in both industrial and academic laboratories, Jim and Jack give a "real world" approach to safety issues in the laboratory. \$325 non-members/\$275 CHAS members.

2. **Laboratory Waste Management**, Friday, March 24, Russell Phifer

This comprehensive one-day course will identify the various regulatory requirements that apply to laboratories. Insights are provided for both on-site and off-site disposal methods. \$375 non-members/\$325 CHAS members.

3. **How to Be a More Effective Chemical Hygiene Officer**, Saturday, March 25, Dr. James Kaufman, Russell Phifer, and Dr. George Wahl, Jr.

Focus is on safety issues in the laboratory and on what a CHO does and how it can be done better. \$375 non-members/\$325 CHAS members.

4. **Laboratory Ventilation for the Research Professional**, Saturday, March 25, Jim Kapin

Effective laboratory ventilation is crucial for the control of inhalation exposures to hazardous chemicals in a research setting. \$375 non-members/\$325 CHAS members. ■

OCCUPATIONAL EXPOSURE LEVELS: KEEPING CURRENT

JIM KAPIN, CHAIR, CHEMICAL HEALTH AND SAFETY DIVISION, ACS

More than a decade coming, OSHA finally established a new, lower Permissible Exposure Limit (PEL) for hexavalent chromium on February 27, 2006. The new PEL of 5 mg/m³ represents a significant reduction from the former PEL of 52 mg/m³, but it is significantly higher than the 1 mg/m³ PEL proposed by OSHA as recently as two years ago. This for a material that was identified by NIOSH as a human carcinogen in 1976. Litigation is the primary reason this new PEL was established. Legal action brought by outside parties led OSHA to reduce this PEL, continuing the trend set for ethylene oxide, cadmium, and formaldehyde rulemaking.

The majority of OSHA PELs remain unchanged since adoption in 1970, based on the Threshold Limit Values (TLVs) established by the American Conference of Government Industrial Hygienists (ACGIH). A massive effort to revise PELs in the late 1980s was thrown out when the 11th Circuit Court vacated the 428 PELs adopted in January 1989 based on the determination that OSHA did not follow fully the Administrative Procedures Act to ensure adequate review and comment.

OSHA has consistently failed to meet even the lowest expectations by its rulemaking agenda in recent years and, given experience with the hexavalent chromium standard, it would seem this situation is unlikely to change in the near future. On top of this, OSHA reform measures are working their way through legislative channels. Late in 2005, Senator Mike Enzi introduced three bills that would make a number of changes in the OSHA Act of 1970, including expanding the review commission, modifying MSDS requirements, and even fining workers who do not wear supplied PPE. Reaction has generally broken down along labor/management lines, and the future of the bills is uncertain.

So what is a safety professional to do?

Exposure limits such as the OSHA PELs are a primary tool in disease prevention and are an essential part of a comprehensive occupational health and safety program. However, the process for establishing or updating PEL values is clearly broken. Other guidelines are available, including the TLVs, but they have faced legal challenges of their own. In any event, no other occupational exposure limits are legally binding.

I do not have an answer to my question, but I would like to offer my services as Chair of the ACS Division of Chemical Health and Safety (CHAS) to start a conversation on these issues within CHAS as well as with the AIChE Safety and Health Division. The problem is not going to go away, but if our two groups, working together, were able to make even a small contribution towards a fair and flexible process to establish and review PELs on an ongoing basis, that would be quite an accomplishment. I would indeed like to hear from you. I can be reached at jim@chemical-safety.com or at 619-990-5955. ■

SPRING 2006 CHAS REPORT

JIM KAPIN, CHAIR, CHEMICAL HEALTH AND SAFETY DIVISION, ACS

As Chair of the ACS Division of Chemical Health and Safety, I am looking forward to a busy year. It seems that CHAS activities increase in quality and quantity every year, and I anticipate that 2006 will be no exception.

Technical programming at National Meetings is in excellent hands. Debbie Decker and Stefan Wawzyniecki attended the "new and improved" Program Planning and Coordinating Conference (P2C2), and are increasing the long standing focus on long term planning, on coordinating programming among the ACS technical divisions, and on multi-discipline topics. They are planning meetings at least one year out, allowing the development of quality programming. We will also increase CHAS participation in Regional Meetings. I participated in the January Western Regional Meeting in January, and with Russ Phifer's long time commitment to Regional meetings, we anticipate CHAS participation in at least two other such meetings this year.

The *Journal of Chemical Health & Safety* continues to provide the quality and quantity of relevant chemical safety information that makes it a leader in its field. The range of topics addressed grows each year, and the field of contributors gets wider.

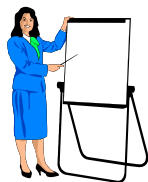
There are, however, some areas that I hope to improve. I would like to increase CHAS membership overall, as well as increase participation in our technical programs and on our Executive Committee. Division finances are stable again after a few rough years. Better budgeting has helped.

In conclusion, we have set some quite high goals for ourselves, and we have several exciting ideas and even a small amount of money to spend. I invite everyone to come to our Executive Committee Meetings which are held on the Sunday morning of each ACS National Meeting.

Jim Kapin

**SAFETY NOTES**

- OSHA and the Society of the Plastics Industry renewed its alliance to continue furthering workplace safety and health in the plastics industry. Key to the agreement is providing employers and workers with information, guidance, and access to training resources to promote equipment safety and to help identify and eliminate machinery hazards that can result in injuries, burns, and lacerations. The renewal will also focus on raising awareness of hazard communication issues in the workplace.
- Approximately 4.3 million injuries and illnesses were reported in private industry workplaces during 2004, according to a report by the Bureau of Labor Statistics of the Department of Labor. This number translates to a rate of 4.8 cases per 100 full-time workers, somewhat less than the 5.0 rate reported for 2003. Secretary of Labor Elaine L. Chao said that the "improved health and safety data once again demonstrate the effectiveness of the department's three-pronged approach to protecting workers." That approach includes strong, fair, and effective enforcement; outreach, education, and compliance assistance; and cooperative and voluntary programs.
- The American Chemical Society has signed on with industrial organizations and government agencies as part of the Chemical Reactivity Hazards Management Alliance. The Center for Chemical Process Safety of the AIChE is already one of the participating organizations. Members of this group provide OSHA with expertise on chemical reactivity hazards, disseminate information on chemical hazards through conferences and reports, and develop electronic assistance tools to help prevent accidents. Formed in March 2004, the alliance strives to protect the health and safety of employees and communities through improved communication and better identification and management of risks caused by highly reactive chemicals.
- The North American Occupational Safety and Health (NAOSH) Week is scheduled for **April 30 - May 6, 2006**. Events during this week are geared to increasing the public awareness of the importance of workplace safety and health. Participating organizations include OSHA, the American Society of Safety Engineers, the Canadian Society of Safety Engineering, the Board of Certified Safety Professionals, the National Safety Council, the American Industrial Hygiene Association, and the American Heart Association. These organizations will be involved in a variety of activities during the annual NAOSH Week including holding events and distributing key information to their members and in their communities worldwide.
- A recent study at the University of Oklahoma Health Sciences Center indicates that arsenic in drinking water can both stimulate the growth of cancerous tumors and cause them to spread faster. While researchers do not yet know if arsenic in drinking water increases the overall incidences of tumors, the study shows that arsenic levels as low as 4 ppb can stimulate blood vessel growth, and levels as low as 10 ppb cause tumors to expand. Previous studies have linked arsenic ingestion and cancer, especially skin and bladder cancers. This report comes at a time when some public water systems in the USA, particularly in western states, are struggling to meet the new federal arsenic standard of 10 ppb. The previous standard was 50 ppb. For further information, see www.wqa.org.
- Workers of today are safer on the job than they are at home or in their communities. According to the National Safety Council, gains in lowering workplace death rates have been undone by the rate of fatalities occurring off the job. The business costs of off-the-job accidents are highly significant including lost wages and productivity, medical and disability payments, and training of new employees. Businesses are recognizing the value of keeping their employees safe at all times both on and off the job. An Off-the-Job Safety Symposium was held in mid-February, 2006, in Orlando, FL, where corporate safety and health experts presented off-the-job case studies.
- In cooperation with the National Library of Medicine, the National Toxicology Program of NIEHS has incorporated links to chemical-related information contained in the data bases in ChemIDPlus. See "Testing Status of Agents" at <http://ntp.niehs.nih.gov/>. ■



PAPERS PAPERS PAPERS

"Safe Chemical Reaction Scale Up," D.C.Hendershot and A.Sarafinas, *Chem. Health & Safety* **12**, No.6, 29-35 (November/December 2005).

The fundamental issue of scale up is at it is not possible to keep everything constant when scaling up a chemical reaction process. As the equipment becomes larger, different process parameters will change in different ways, impacting the chemical reaction differently. The changes which occur in scale up will change the conditions under which the chemical reaction occurs, for example, the temperature, the mass transfer across phase boundaries, and the relative concentrations of reactants, products, and by-products. In this paper, several specific scale up issues, such as heat transfer, vapor disengagement area, and mixing characteristics, are discussed. Then follows a review of 17 safe reaction scale up considerations. No scale up of a chemical reaction process can be considered successful without proper utilization of the principles of the safety aspects.

"Results of a Round-Robin with di-tertiary Butyl Peroxide in Various Adiabatic Equipment for Assessment of Runaway Reaction Hazards," R.J.A.Kersten et al, *J.Loss Prev.Process Ind.* **18**, No.3, 145-151 (May 2005).

The results of a round-robin test of the decomposition reaction of 15% di-t-butyl peroxide in toluene are described in this paper. The aim of the testing was to compare the results in different adiabatic and pseudo-adiabatic reaction calorimeters in terms of accuracy and reliability for practical applications. The experiments were performed in the Accelerating Rate Calorimeter (ARC), the Phi-Tec Calorimeter, Pressure Dewar Calorimeter, temperature-controlled reactor (CRVM), and the Automatic Pressure Track Accelerating Calorimeter (APTAC). Although the various types of equipment showed differences in accuracy and reproducibility, in general, no specific type of equipment out-performed the others in this study.

"Handling Chemicals in Small Containers," A.Ness and R.Gibson, *Process Safety Progress* **24**, No.4, 299-302 (December 2005).

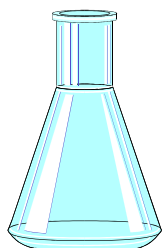
This paper describes three incidents involving buckets or other small, open containers. In one, a reaction between sodium and water propelled a bucket with considerable force, resulting in an injury. In another, a fire occurred when the lid of a plastic bucket containing a liquid peroxide became contaminated during filling and was blown off. In the third incident, a solid peroxide and several different initiators and catalysts were staged on a pallet for use in batch reactors. A fire was caused by the mixing of small spills from the containers, which caused severe damage. In all cases, a good Environmental, Health, and Safety Review would have identified the problems, and methods to prevent the incidents would have been defined.

"Understanding Vinyl Acetate Polymerization Incidents," J.-L. Gustin, *Chem. Health & Safety* **12**, No.6, 36-46 (November/December 2005).

Vinyl acetate is used to manufacture polymers and copolymers for use in water-based paints, adhesives, paper coatings, non-woven binders, and other applications. Solution, suspension, and emulsion processes are used. Incidents involving the runaway polymerization of vinyl acetate monomer are known. For example, in a process where the polymerization initiator was dissolved in the monomer, the initiator premix polymerized violently in the premix vessel. In polymerization processes where unreacted vinyl acetate monomer was recycled, violent bulk polymerizations have taken place probably because the recycled material contained traces of polymerization initiator. This paper reviews various incidents involving vinyl acetate. Experimental results on bulk polymerization of vinyl acetate are presented.

"The Acid-Catalyzed Phenol-Formaldehyde Reaction Critical Runaway Conditions and Stability Criteria," K.-T.Lu et al, *Trans.IChemE*, **82**, No.1, Part B (Process Safety and Environmental Protection), 37-47 (January 2004).

The reaction mechanisms of phenol-formaldehyde polymerization are complicated in both acid- and base-catalyzed systems. Furthermore, there is a considerable release of heat during polymerization. Numerous runaway situations have occurred in industrial processes. This paper describes experiments using either oxalic acid or hydrochloric acid as the catalyst. Reaction kinetic parameters were estimated to evaluate the thermal hazard conditions. ■

**231ST AMERICAN CHEMICAL SOCIETY NATIONAL MEETING
GEORGIA WORLD CONGRESS CENTER****ATLANTA, GA****MARCH 26-30, 2006****DIVISION OF CHEMICAL HEALTH AND SAFETY**

Organizer: Debbie M. Decker
University of California, Davis
dmdecker@ucdavis.edu

SESSION SUMMARIES

Sunday afternoon, March 26: "Do You Know What You Are Breathing? Exposure Assessment Strategies in Research Laboratories" Chair: Thomas Murdock Co-Chair: James M. Kapin

Medtronic World Headquarters

Advanced Chemical Safety

"Exposure Assessment in the Research Laboratory: The AIHA Model"; "Applying a Control-Focused Risk Management Toolkit for Chemical Exposures"; "Control Banding and Control Technologies for Research Labs"; "Environmental Health and Safety Levels for Chemicals in the Workplace."

Sunday afternoon, March 26: General Papers

Chair: Kathryn G. Benedict
Pfizer Michigan

Co-Chair: Debbie M. Decker
University of California, Davis

"Toxic Emissions from Wildfires"; "Undertaking Federal and Other Organization Chemical Emergency Lists: A Chemical Class Approach"; "FileMaker Pro: The Perfect (?) Program for Managing Your Chemical Inventories and Wastes"; "Getting the Most from Your Occupational Medicine Provider"; "Estimation and Impact Factors Analysis of Motor Vehicle Toxic Emissions in the Urban of China Cities."

Monday morning, March 27: "Teaching Safety - Industry Focus"

Chair: George H. Wahl
North Carolina State University

"Explosives? What's the Big Deal, and Other Chemical Safety Hazards in Research Labs"; "Thirty Years of Academic Lab Safety: A Teacher's Perspective"; "Safety Comprehension Made Easy: The MSDS Hyperglossary"; "Completing the Safety Circle: Accident Prevention, Response, and Investigation"; "Teaching Safety to Adults: It's Not Kids Stuff"; "CCOHS Experience in Delivering Classroom and e-Learning Training in Health and Safety Management"; "Training: Self Study, Classroom, or On-line?."

Monday afternoon, March 27: "Ask Dr. Safety"

Chair: James M. Kapin
Advanced Chemical Safety

Co-Chair: Neal Langerman
Advanced Chemical Safety

Roundtable discussion with experts available to answer your safety questions. Bring your safety issues, safety questions, gripes, concerns, and ask Dr. Safety for help!

Monday evening, March 27: "Safety Humor"

Chair: Russell Phifer
WC Environmental

Poster session at the SCI-MIX. This series of posters will show the lighter side of chemical safety from cartoons.

Monday evening, March 27: "Spot the Hazard"

Chair: Frankie Wood-Black
ConocoPhillips

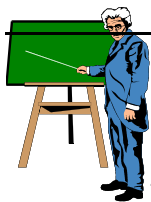
Poster session at the SCI-MIX. "Spot the Hazard in the Laboratory"; "Spot the Hazard on Television."

Tuesday morning, March 28 "How Did That Happen? Learning from Our Mistakes"

Chair: Robert H. Hill
Atlanta Analytical Services

"What Protective Gloves Don't Protect: Consequences of Poor Safety Practices and How We Can Prevent Them"; "Isocyanates: Be Careful What You Touch"; "Development of New Chemical Hazard Management Systems"; "Lessons for Chemists from Biological Incidents"; "Carbon Monoxide Poisoning After the Use of Explosives"; "What if? Thinking About What is Possible"; "A 'Hot Pot' Distillation Apparatus Gone Wrong"; "Incidents and Accidents: Are Your Prepared?"; "Explosion and Fire in the UCR Organic Chemistry Stockroom."

For further information, see <http://chemistry.org/techprogramatl>. ■



Second Global Congress on Process Safety
SPECIAL 40TH ANNUAL LOSS PREVENTION SYMPOSIUM
APRIL 23-26, 2006, ORLANDO, FL

The Loss Prevention Symposium, organized by the AIChE Safety and Health Division Area 11a, has been held annually since 1967. The objective of the symposium is to promote safety in the 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. This special 40th Annual Symposium will consist of the following six sessions:

Symposium Chair
 Erdem A. Ural, PhD
 Loss Prevention Science & Technologies, Inc.

Symposium Vice-Chair
 Christopher Hanauska
 Hughes Associates, Inc.

Monday morning, April 24: 7:45 AM: OPENING SESSION

Joint with 8th Process Plant Safety Symposium and 21st CCPS International Conference (see pages 11 and 12).

Remarks by the three symposium chairs: Erdem Ural, Jim Thompson, and Tim Overton. Keynote addresses: Gary R. Veurink, Executive Vice President, Dow Chemical, and John Mogford, Group Vice President, British Petroleum.

1. LOSS PREVENTION: PAST, PRESENT, AND FUTURE.

An invited paper will introduce this session by highlighting the 40-year history of the Loss Prevention Symposia and by addressing how this forum has remained in the forefront.

Chair
 David G. Clark
 DuPont Company

Vice-Chair
 Walter L. Frank
 ABS Consulting

"Expanding Role of the Loss Prevention Professional, Past, Present, and Future"; "The History of the Loss Prevention Symposia"; "Looking from the Past to the Future - Is Loss Prevention Affected by Globalization?"; "Evolving a Corporate KPC HSE Management System"; "Ten Years of Progress or Slipping into Complacency."

2. FIRE, EXPLOSION, AND REACTIVE HAZARDS. The analysis, prevention, and mitigation of fire, explosion, and reactivity hazards continue to be important tissues.

Chair
 Peter N. Lodal
 Eastman Chemical Company

Vice-Chair
 Jean Paul LaCourse
 Universite de Sherbrooke

"The Dow Chemical Company's Expert System for Fire and Reactivity MSDS Text"; "Explosion Consequences of Low Velocity Releases of Dense Flammable Vapor Inside a Chemical Manufacturing Facility with a Complex Ventilation System"; "Stability of Concentrated Initiator Solutions"; "Prediction of DDT of Hydrogen Explosions"; "A Flame Speed Correlation for Unconfined Gaseous Explosions"; "Elevated Internal Pressures in Vented Deflagration Tests."

3. HAZARD ASPECTS OF COMBUSTION EQUIPMENT.

This session focuses on hazard aspects of various types of combustion equipment such as fired heaters, flares, thermal oxidizers, steam boilers, and waste heat boilers.

Chair
 Stanley S. Grossel
 Process Safety & Design Inc.

Vice-Chair
 Daniel A. Crowl
 Michigan Technological University

"A Proposed Comprehensive Model for Elevated Flare Flames and Plumes"; "Flare Safety and Reliability Enhanced with New Flare Pilot Systems"; "Proper Flare Safety"; "The Role of Basic Design Data in Preventing Explosions with Fired Equipment: A

Case Study"; "In-Line Flame Arrester Application Limits and Matrix Complex for Process Safety from Flash Back of Thermal Combustion Units"; "Using LOPA to Verify the Design of a Burner Management System."

4. HAZARDS & RISKS ASSOCIATED WITH ALTERNATE ENERGY SYSTEMS.

The commercialization of alternative energy systems is becoming increasingly important to the Loss Prevention community.

Chair
 Brian R. Dunbobbin
 Air Products & Chemicals Inc.

Vice-Chair
 Cheryl A. Grounds
 Baker Engineering & Risk Cons.

"The Hazards and Risks of Hydrogen"; "Safety Considerations for Interfacing Hydrogen with the Public for Vehicles"; "Hazards and Hazard Mitigation Techniques for Natural Gas and Hydrogen Refueling Operations"; "LPG and Safety Concerns"; "Risk Analysis of Hydrogen Gas Transmission Using Natural Gas Infrastructure"; "Experimental Study of Accidental Industrial LPG Releases."

5. MECHANICAL INTEGRITY. Mechanical integrity is a key requirement for harnessing the tremendous hazard potential created by industrial operations dealing with toxic materials or large quantities of chemical, thermal, mechanical, and electrical energy.

Chair
 Christopher Hanauska
 Hughes Associates, Inc.

Vice-Chair
 Henry L. Febo
 FM Global

"Risk-Based Integrity Modeling of Process Equipment"; "Flexible Storage Phosphor Plate Versus Film-Based Technology for Erosion/Corrosion Profiling"; "Managing on Stream Leak Repairs"; "Beyond Compliance - Taking Your Mechanical Integrity Program to the Next Level"; "Mechanical Integrity Best Practices for Sulphuric Acid Plants"; "An Analysis of the Gas Pipeline Explosion at Ghislenghien, Belgium."

6. CASE HISTORIES AND LESSONS LEARNED. Reviews of process safety incidents and near misses provide valuable learning opportunities.

Chair
 John F. Murphy
 retired - US Safety Board

Vice-Chair
 Robert P. Benedetti
 NFPA International

"A Case Study of a TFE Explosion in a PTFE Manufacturing Facility"; "Flammable Liquid Process Tank Fire"; "Fired Heater Damage Following Outage due to Management of Change Problems"; "BP Texas City: March 23, 2005"; "BP Amoco Texas City Incident"; "The Accident in Bhopal: Observations 20 Years Later."

Wednesday afternoon, April 26, 3:30 PM: CLOSING SESSION.

Joint with the 8th Annual Process Plant Safety Symposium and the 21st Annual CCPS International Conference. ■

Second Global Congress on Process Safety
8TH PROCESS PLANT SAFETY SYMPOSIUM
APRIL 23-26, 2006, ORLANDO, FL



The Process Plant Safety Symposium (PPSS), originally organized as a stand-alone conference by the AIChE South Texas Local Section, is now part of the AIChE Safety and Health Division programming effort. The Program Area 11b Committee is responsible for the program development. Through 2005, the PPSS was held on a biennial basis which made it part of the First Global Congress on Process Safety. The very positive response of the attendees at this Global Congress to the idea of having a choice of three simultaneous process safety related sessions led to the decision to move the PPSS to an annual basis, and thus to the development of this Second Global Congress on Process Safety.

The Global Congress on Process Safety presents a rare opportunity for process engineers to obtain significant knowledge about the advances in process safety technology.

The scheduled sessions in the 8th PPSS are as follows:

Symposium Chair

Jim Thompson
INVISTA

Symposium Co-Chair

Phil Meyers
Advantage Risk Solutions Inc

Monday morning, April 24: 7:45 AM: OPENING SESSION

Joint with the 40th Annual Loss Prevention Symposium and the 21st Annual CCPS International Conference (see pages 10 and 12).

Monday afternoon, April 24: IMPROVING SAFETY CULTURE.

A strong safety culture is of critical importance to the development and maintenance of a superlative safety program. Papers are scheduled for this session that demonstrate approaches to reducing incidents through management processes such as operator training, effective operating procedures, interactive management systems, and similar procedures.

Chair

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

Co-Chair

Dr. Stephanie C. Payne
Texas A&M University

"Safety Culture in the CCPS Risk-Based Process Safety Model"; "Safety Climate and Decision Making"; "Maintaining a Healthy Safety Culture"; "Impact of Engineering Ethics on Safety Culture" (an interactive session).

Tuesday morning, April 25: RISK ASSESSMENT

Risk assessment is key to evaluating and improving the safety and business risk of process systems. This session includes papers demonstrating the application of both qualitative and quantitative risk assessment techniques (such as HAZOP, Layer of Protection Analysis, Fault Tree, and Quantitative Risk Assessment) as well as Risk Screening Techniques. Practical applications are discussed.

Chair

Albert I. Ness
Rohm and Haas Co.

Co-Chair

Chris Richardson
WS Atkins

"Do You Know Your Engineered Systems?"; "Dust Explosion Consequence Categories for Semi-Quantitative Risk Assessment"; "Utility Failures - Are You Prepared?"; "Frequency and Consequence Modeling of Rare Events using Accident Databases"; "What Risk Should the Public Accept from LNG Facilities?"; "A Three Level Approach for the Assessment of Domino Effect."

Tuesday afternoon, April 25: FACILITY SITING ISSUES

Facility siting remains important to Process Safety, and has

many aspects. Papers in this session include novel approaches and applications to facility siting, and on important ancillary issues such as controlling the location of temporary buildings/trailers, and controlling access of non-essential personnel to process areas during startup/shutdown/emergency operations.

Chair

Jack Chosnek
KnowledgeOne

Co-Chair

Michael Livingston
WS Atkins

"Facility Siting and the BP Texas City Incident: What it Means for Our Industry"; "Lessons Learned through OSHA's Enforcement of the Facility Siting Provisions in the PSM Standard"; "Facility Siting Following Merger of Two Large Oil Companies"; "Techniques for Siting New Buildings in Petrochemical Facilities"; "Facility Siting Database and Analysis"; "Infrastructure Impacts During Hurricanes Katrina and Rita."

Wednesday morning, April 26: SAFETY INSTRUMENTED SYSTEMS AND SAFETY CRITICAL DEVICES

The proper application of Safety Instrumented Systems (SIS) is obviously important in process plants. However, non-SIS Safety Critical Systems (e.g., Safety Critical Devices) also play an important role. This session includes papers in the areas of (1) Safety Instrumented Systems such as SIS design, application of LOPA to SIS, and probability calculations, and (2) Safety Critical Devices (SCD) such as opportunities to apply SCD instead of SIS, management of SCD, and application of LOPA to SCD.

Chair

Harry West
Mary Kay O'Connor
Process Safety Center

Co-Chair

Angela Summers
SIS-Tech Systems

"Risk Abatement Provided by Safety Instrumented Systems May Cause Remote Hazards with Higher Risks"; "Failure Conundrum"; "Using Layer of Protection Analysis to Define Safety Integrity Requirements"; "Use of Layer Protection Analysis to Determine Protective System Requirements"; "Asset Protection - Applying Safety Life Cycle Methods"; "Equipment Safety Manuals - A User's Expectations."

Wednesday afternoon, April 26: CASE HISTORIES AND LESSONS LEARNED

Joint Session with the 40th Annual Loss Prevention Symposium and the 21st Annual CCPS International Conference. ■

Second Global Congress on Process Safety
21ST ANNUAL CCPS INTERNATIONAL CONFERENCE
APRIL 23-26, 2006, ORLANDO, FL
"PROCESS SAFETY CHALLENGES IN A GLOBAL ECONOMY"



Conference Chair: Tim Overton

Monday morning, April 24, 7:45 AM:
OPENING SESSION

Joint with the 40th Annual Loss Prevention Symposium and the 8th Process Plant Safety Symposium (see pages 10 and 11).

Monday morning, April 24, 10:15 AM: PROCESS SAFETY REQUIREMENTS AND CONDUCTING BUSINESS IN FOREIGN COUNTRIES

Session Chair: Shakeel Kadri, Air Products and Chemicals Co.
 Mu Shanjin, Representative from SINOPEC
 Americo Neto, Representative from Braskem
 John Mogford, BP, Senior Vice President, Safety and Operations
 Kevin Allars, UK Health and Safety Executive
 B. Karthikeyan, Director, Prism Consultants, India
 Rafael Batres, Toyohashi University of Technology, Japan

Monday afternoon, April 24, 1:45 PM: CULTIVATING A GLOBAL PROCESS SAFETY CULTURE

Session Chair: Bob Conger, Celanese
 Raul Mora, "Considerations in Creating a Total Safety Culture in a Latin American Country"
 Howard Railton, "How to Make Problem Customers an Asset - Process Safety Challenges when Working with Diverse Customers"
 Greg Schultz, "The Next Generation of Chemical Process Safety - A Comparison with the Nuclear Industry"

Monday afternoon, April 24, 4:00 PM: SYNERGIES BETWEEN PROCESS SAFETY AND SECURITY

Session Chair: Monica Stiglich
 Don Abramson, "Expanding Known Process Safety and Risk Analysis Concepts to Manage Security Concerns"
 David Kaelin, "Explosible Dusts: US Codes and Standards of Safe Management Practices"
 Susan Smith, "The Problem of Likelihood: Keeping Uncertainty from Undermining Security Decisions"

Tuesday morning, April 25, 8:00 AM: BUILDING ON LESSONS LEARNED

Session Chair: Don Connolley, AKZO Nobel
 Raymond Bennett, "The Inclusion of Construction Trailers and Modular Buildings in Siting Studies"
 Monica Stiglich, "Six Sigma Fire and Explosion Reduction Project"
 John Woodward, "Tracing Source of Ethylene Oxide Gas House Explosion Using Damage Indicators and Thermal Modeling"

Tuesday morning, April 25, 10:15 AM: ASSESSMENT OF RISK I

Session Chair: Greg Keepports, Rohm and Haas
 Nic Cavanagh, "Process Business Risk - A Methodology for Assessing and Mitigating the Financial Impact of Process Plant Accidents"
 Jatin Shah, "Simplify EHS Decision Making Risk-based

SUMMARY OF CONFERENCE SESSIONS

Decision Support Tools

Frank Van het Veld, "Risk Curves - A Comprehensive Program Package for Performing a Quantitative Risk Assessment"

Colin Howar, "Application, Organization, and Outcomes in the Food Processing Industry"

Tuesday afternoon, April 25, 1:45 PM: PROCESS SAFETY OF LNG PRODUCTION, TRANSPORTATION, AND DISTRIBUTION

Session Chair: Dave Jones, Chevron Texaco

Doug Hobbs, "The Effects of Uncertainty on Quantified Risk Assessment for LNG Facilities"

B.R. Poblete, "Lessons Learned from the Application of Risk Management in the Shipment of LNG"

Dave Moore, "LNG Security Vulnerability Assessment"

Tuesday afternoon, April 25, 4:00 PM: INTERNATIONAL TRENDS IN PROCESS SAFETY

Session Chair: Craig Matthiessen, US EPA

Richard Gowland, "Differences in European States' Application of the Seveso 2 Directive in Major Accident Hazards"

N. Dechy, "International Trends in Process Safety Regulations, Enforcement, Cultural Differences, and Process Safety Practices"

Wednesday morning, April 26, 8:00 AM: GLOBAL APPROACHES TO INHERENTLY SAFER TECHNOLOGY AND HUMAN FACTORS

Session Chair: Karen Person, CCPS

Paul Amyotte, "Incorporation of Inherent Safety Principles in Process Safety Management"

Doug Skoyles, "Human Factor Considerations for Process Safety in a Global Economy"

Jaffee Suardin, "The Integration of Dow's Fire and Explosion Index into Process Design and Optimization to Achieve Inherently Safer Design"

Wednesday morning, April 26, 10:15 AM: ASSESSMENT OF RISK II

Session Chair: Pete Lodal, Eastman Chemical

Marco Boers, "Layer of Protection Analysis: Selecting Cost Effective Safety Measures"

Valerio Cozzani, "Assessing the Inherent Safety of Substances: Precursors of Hazardous Products in the Loss of Control of Chemical Systems"

Bob Stankovich, "Development of Hazardous Material Compatibility Storage Guideline and Tool"

Antonio Ribeiro, "Impact of Failure Data Especialization in Quantitative Risk Assessment of Process Plants"

Wednesday afternoon, April 26, 1:45 PM: LESSONS LEARNED FROM NATURAL DISASTERS

Session Chair: Karen Tancredi

Panel discussion

Wednesday afternoon, April 26, 3:30 PM: CASE HISTORIES AND LESSONS LEARNED

Joint Session with LPS and PPSS. ■