

Safety & Health News

AIChE

AMERICAN INSTITUTE OF
CHEMICAL ENGINEERS

SAFETY AND HEALTH
DIVISION
www.shdiv.aiche.org

SPRING 2007

SAFETY FORUM HOW ARE WE DOING?

A review of the program for the forthcoming Third Global Congress on Process Safety strongly suggests that the AIChE Safety and Health Division is meeting its objective of providing for and collaborating in programs on safety and health topics of current interest. But overall, is the Division meeting its myriad of objectives beyond the programming effort? Perhaps a review of the stated objectives is in order to answer this question. The objectives of the Division are ambitious, as defined in the Bylaws and as described below.

The objectives of the Division shall be:

- To further the application of chemical engineering to the broad field of safety and health, and to further the application of the field of safety and health to chemical engineering;
- To recommend to the AIChE Board of Directors positions or policies relating to safety and health;
- To provide and to collaborate in suitable programs on safety and health topics of current interest, in cooperation with the National Program Committee;
- To provide a communication medium for chemical engineers and other individuals to exchange non-confidential information concerning all facets of safety and health;
- To promote the publication of papers in the field that are of interest to chemical engineers;
- To coordinate the Institute's activities with other societies active in the broad field of the safety and health of persons and the protection of property;
- To act as a source of information for chemical engineers who are not actively engaged in the safety and health field and to alert them to the importance of a concern for safety and health, including protection of property, to the need for a consideration of safety and health in the design and operation of process plants, and to the opportunities in research and in the design of equipment and processes to solve safety and health problems;
- To address the problems of safety and health and of the protection of property in the manufacture, processing, distribution, and use of chemicals; and
- To encourage chemical engineering educators to place suitable emphasis on the field of safety and health of persons and the protection of property.

This is indeed an impressive list of objectives. Certainly, the Division has been active and successful in those areas involving appropriate technical programming, getting technical papers published, and providing a communication medium for exchange of non-confidential information. Efforts along these lines must be continued and, in fact, enhanced as appropriate to maintain an interested and informed membership.

(continued on page 6 - see OBJECTIVES)

Safety & Health News, an e-Newsletter, 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, this Newsletter is also available on the CHAS web site: <http://membership.acs.org/c/chas/>.

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THIRD GLOBAL CONGRESS ON PROCESS SAFETY

The Third Global Congress on Process Safety is part of the AIChE 2007 Spring National Meeting scheduled for April 22-26 in Houston. There are three primary symposiums associated with this Global Congress - the 41st Annual Loss Prevention Symposium, organized by Program Area 11a; the 9th Process Plant Safety Symposium, organized by Program Area 11b; and the 22nd Annual CCPS International Conference. Details of the programs appear on pages 9, 10, and 11 of this Newsletter. While there is some overlap in topic areas, the Loss Prevention Symposium has traditionally focused on technology issues, the Process Plant Safety Symposium has focused on plant issues, while the CCPS Conferences have largely focused on risk management, particularly from an international perspective.

Overall, the AIChE 2007 Spring National Meeting is a highly comprehensive conference designed for chemical engineers and chemical scientists who want to grow professionally and advance in their careers. For further information, including registration, visit www.aiche.org.

The Safety and Health Division Annual Dinner is scheduled for Monday, April 23 (see below). The Annual Meeting of the Safety and Health Division Executive Committee will be held late Tuesday afternoon, April 24. All Division members are welcome to attend this meeting and to partake in the discussions. Check the Announcement Board at the AIChE meeting for time and location.

All Global Congress attendees are invited to attend a **CCPS Project Brainstorming Reception** which will be held on Wednesday, April 25, from 5:00 PM to 6:30 PM. Please attend and let the CCPS managers and staff consultants know what challenges you face in your work that would benefit from CCPS project work. The Announcement Board at the AIChE meeting will indicate the location. ■

ANNUAL SAFETY AND HEALTH DIVISION DINNER

The Annual AIChE Safety and Health Division Dinner is scheduled to be held at Chesterfield's Restaurant, a short walk from the Houston Hilton, on Monday, April 23, 2007, starting at 6:30 PM. The dinner cost is \$55. There will be a choice of three entrees, and a glass of house wine will be included.

The speaker is Bryan Haywood, founder and president of SAFTENG.net safety engineers' website and consultancy. His presentation is entitled "Moving PSM Forward Using Leading Indicators." Bryan has worked in the chemical process industry and the emergency response field since 1988. He obtained a BS in Occupational Safety and Health from Murray State University followed by an MS in Safety Engineering. His experience includes developing and implementing six-sigma safety processes, behavior-based safety observation processes, safety and health training, and compliance auditing. He is an internationally known speaker particularly on managing safety and achieving sustainable long-range results. He has over 5,800 hours of training in firefighting, HAZMAT, technical rescue, and security from recognized training organizations.

The winner of the 2007 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. ■

52ND ANNUAL SAFETY IN AMMONIA PLANTS AND RELATED FACILITIES SYMPOSIUM

The 52nd Annual Safety in Ammonia Plants and Related Facilities Symposium, organized by the Safety and Health Division Area 11c (Ammonia Safety Committee), is scheduled to be held at the Loew's Lake Las Vegas in Henderson, NV, on September 16-20, 2007. This symposium attracts experts of safety interest in plants that manufacture ammonia, urea, nitric acid, ammonium nitrate, and methanol. The symposiums are dedicated to making these plants as safe as possible. Attendees will hear more than 25 high quality papers from noted practitioners. Subjects include examples and ideas on how to avoid or manage potential plant accidents, natural disaster or incident disaster response, plant incidents and lessons learned, and an overview of products available to ensure safety measures. The Program Chair is Harrie Duisters, Ammonia Technology Manager, DSM Agro, The Netherlands.

Note to foreign attendees - recent changes in USA visa policy and procedures have increased the amount of time it can take to obtain a visa. An early application is encouraged.

For further information about the symposium, visit www.aiche.org.

A COMMITMENT TO SAFETY EXCELLENCE**BARBARA L. FOSTER, CHAIR****ACS DIVISION OF CHEMICAL HEALTH AND SAFETY**

It is with great pleasure that I assume my responsibilities as 2007 Chair of the American Chemical Society Division of Chemical Health and Safety (CHAS). By way of an introduction, I currently serve as the Safety Director of the C. Eugene Bennett Department of Chemistry at West Virginia University. Additionally, I serve as the Safety Coordinator for the Forensic Program and the Departments of Biology, Chemistry, Geology and Geography, and Physics within the Eberly College of Arts and Sciences at West Virginia University.

I am often asked, "How can we avoid incidents and accidents in the laboratory?" You can reduce the number and severity of accidents by building a solid safety program that includes enforcement of the Chemical Hygiene Plan policies and the Safety Rules in the laboratories, thorough laboratory inspections, and annual chemical inventory updates. One of the latest projects at my work is to promote safe chemical management within our research laboratories. To this end, I am participating in individual meetings with the research-active faculty in their offices. I posted a presentation on my safety web page to allow our busy faculty members to review it before our meetings. So far, the meetings have been very well received, and the faculty have responded with thoughtful questions and comments. These meetings seem to open the door for me to work with the faculty members to ensure laboratory safety and safe work practices. Perhaps this type of project might be useful to you in your efforts to promote safety in the workplace.

I encourage you and your colleagues to make a commitment to safety excellence and to strengthen your laboratory safety program by joining the ACS Division of Chemical Health and Safety. The Division includes 1500 members with various scientific, industrial, and academic backgrounds. Member benefits include six issues per year of the *Journal of Chemical Health & Safety*, interactions with experts in the field, and lively discussions with safety colleagues on the ListServe DCHAS-L. These benefits will keep you up-to-date and knowledgeable about safety and compliance issues. You can join our organization by logging on to http://membership.acs.org/c/chas/chas_membership_app.pdf and then completing and submitting the Division membership application form.

Division members will participate in a Strategic Planning session during the ACS 233rd National Meeting and Exposition in Chicago, March 25-29, 2007. The two-day event is designed to assist the Executive Committee members as they work to bridge the gap from the present to the future. As the Executive Committee members assess the strengths and challenges of the Division, they will be better able to create goals and initiatives that will serve to strengthen our Division and to move it forward. Member participation and comments are indeed welcome at this session.

CHAS has created a Speakers Bureau. The goal is to enhance public awareness of chemical health and safety issues by providing professional, qualified speakers for presentations on various topics of interest. This Speakers Bureau is made possible in part by an Innovative Project fund Grant for Divisional Enhancement, provided by the ACS Committee on Divisional Activities. Funds from the grant support the travel expenses of speakers as well as the Speakers Bureau operating expenses. Members of the CHAS Speakers Bureau Committee include Robert Hill, Russ Phifer, and Jim Kaufman as Chair. To learn more about this activity, please visit http://membership.acs.org/c/chas/speakers/chas_speakers.doc.

The Division offers workshops for laboratory workers and managers covering regulatory and safety aspects of working in laboratories. These workshops are offered at National ACS Meetings and at many of the ACS Regional Meetings. Three such workshops are planned for the Middle Atlantic Regional Meeting at Ursinus College near Philadelphia on May 16-19, 2007. You may contact Russ Phifer at rphifer@glasmesh.com for the latest information on the workshop schedule. Abstracts of the workshops can be viewed at <http://membership.acs.org/c/chas/workshops.htm>.

Debbie Decker, CHAS Program Chair for Spring Meetings has organized an interesting program for the ACS 233rd Annual Meeting in Chicago, March 25-29, as described elsewhere in this Newsletter (page 4).

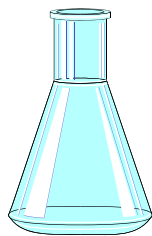
Stefan Wawzyniecki, CHAS Program Chair for Fall Meetings, has issued a Call-for-Papers for the 234th ACS Meeting and Exposition scheduled for August 19-23, 2007, in Boston, which also appears elsewhere in this Newsletter (page 4).

Please contact me with any suggestions or comments you have about CHAS activities, current or future. I can be reached at bfoster@wvu.edu or 304-293-2729. I hope to see you in Chicago at the CHAS sessions.

Barbara L. Foster

CHAS SESSIONS

233RD ACS NATIONAL MEETING, CHICAGO, MARCH 25-29, 2007



The following CHAS sessions are scheduled for the 233rd ACS National Meeting in Chicago, March 25-29, 2007. Debbie Decker of the University of California - Davis is the CHAS Spring Meeting Program Chair.

Monday afternoon, March 26: "**Teaching Safety: Learning by Accident**," organized by George Wahl (North Carolina State University) and Tom Murdock (Medtronic);

Monday evening, March 26: "**Chemical Health and Safety**," at the Sci-Mix event, organized by Russ Phifer (WC Environmental) and Frankie K. Wood-Black (ConocoPhillips);

Tuesday morning, March 27: "**Developing a Teaching Plan for Teaching Chemistry in the Home School Situation**," joint program with the Division of Chemical Education;

Tuesday morning, March 27: "**Safety and Health Issues at Small Chemical Businesses**," joint program with the Division of Small Chemical Businesses. This session presents a unique opportunity for CHAS members, who by definition are experts in the safety and health field, to interact with ACS members who are involved in small businesses and could indeed benefit from CHAS experts.

These CHAS sessions are part of the wide range of programming scheduled, including more than 850 scientific sessions, invited symposiums, poster sessions, special lectures and events, award presentations, and workshops. An Exposition is also scheduled.

Registration may be made on-line at <http://chemistry.org/meetings/national/registration.html> or on-site. For further information about the meeting, see <http://chemistry.org/meetings>. ■

CALL-FOR-PAPERS CHAS SESSIONS

234TH ACS NATIONAL MEETING, BOSTON, AUGUST 19-23, 2007



Stefan Wawzyniecki of the University of Connecticut, the CHAS Fall Meeting Chair, has issued a Call-for-Papers for the CHAS sessions scheduled for the 234th ACS National Meeting in Boston, August 19-23, 2007. The following four sessions are planned.

"**CHAS Awards Symposium**," organizer Douglas Walters (KCP, Inc., Raleigh, NC). CHAS Award winners are honored and present invited talks. In addition to acknowledging the recipients of the awards, this is a great opportunity for presenting papers in traditional areas of chemical health and safety such as laboratory ventilation and working safely with chemicals.

"**Safety in NanoTechnology Research**," organizers David Bunzow (North Dakota State University, Fargo, ND) and Kim Jeskie (Oak Ridge National Laboratory, Oak Ridge, TN). Although nanotechnology research has become an established area, safety and health issues are not keeping up and must be recognized and addressed.

"**Teaching Safety: Learning by Accident**," organizers George Wahl (North Carolina State University) and Tom Murdock (Medtronic, Minneapolis, MN). Many times, the most effective training occurs when there has been an unexpected outcome. Did you have an incident that precipitated change in your organization? Is there an occurrence that you use in your training that is illustrative of a "what not to do"? Have you had an incident you would like to share with a wider health and safety community so that others can learn?

"**RCRA 2007 and Other Compliance Issues**," organizers Russ Phifer (WC Environmental, West Chester, PA) and Erik Talley (Weill Medical College of Cornell University, New York, NY). This symposium will provide updates and insights on environmental, health, and safety regulations. Papers are solicited by speakers from academia, government, industry, and consulting firms to provide a range of expertise on the subject.

The ACS Online Abstract Submittal System (OASYS) should be used. To submit proposed abstracts, access <http://oasys.acs.org/acs/234nm/oasys.htm> and click on CHAS in the pick list. Abstracts are due by **April 2, 2007**.

The Preliminary Program will be published in the June 25 issue of *Chemical & Engineering News* and the technical program will be in the July 30 issue.

Submission of a paper for presentation at an ACS meeting does not constitute submission for publication in an ACS or ACS Division journal. Regulations for the acceptance of papers to be presented as part of Division programming vary for each Division.

If further information is needed, contact the CHAS Division Fall Meeting Chair Stefan Wawzyniecki (University of Connecticut) at stefan.w@uconn.edu. ■

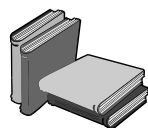
THE CCPS PAGE

CENTER FOR CHEMICAL PROCESS SAFETY

The Center for Chemical Process Safety (CCPS) is a not-for-profit corporate membership organization within AIChE that identifies and addresses process safety needs within the chemical, pharmaceutical, and petroleum industries. CCPS brings together manufacturers, government agencies, consultants, academia, and insurers to lead the way in improving industrial process safety. CCPS continues to achieve its mission by:

ADVANCING state-of-the-art process safety technology and management practices; **SERVING** as a premier resource for information on process safety; **FOSTERING** process safety in engineering and science education; and **PROMOTING** process safety as a key industry value. For information about corporate or organizational membership, contact Karen Person at karep@aiiche.org or 212-591-7319.

THREE NEW BOOKS



CCPS is expected to release three new books at the Third Global Congress on Process Safety scheduled for April 22-26, 2007, in Houston. A special event is planned to herald the availability of these new and important publications.

- **Guidelines for Risk-Based Process Safety.** This book will establish a paradigm shift for industries that manufacture, consume, or handle chemicals with a focus on new ways to design, correct, and improve process safety management practices. This book was developed under Project #179.
- **Guidelines for Pre-Startup Safety Review.** Guidance to those having responsibility for scheduling and executing a pre-startup review is outlined in this book. A protocol and a tool for use by project and turn-around teams are provided. This book was developed under Project #184.
- **Guidelines for Safe and Reliable Instrumented Protective Systems.** This guidelines book will help engineers design instrumented protective systems. It was developed as Project #159. ■

THREE MORE NEW BOOKS

There are three additional books expected to be released during the summer.

Guidelines for Management of Change for Process Safety will bring an up-to-date guide that describes the best current thinking about management of change (MOC) from the process safety perspective. This will be the result of work under Project #180.

Inherently Safer Processes, 2nd Edition is an update of the 1995 "Gold Book" to address experience gained in the last ten years in the consideration of inherently safer processes, including expanded practical guidance and useful tools. The 1st Edition was a best seller. This book is being developed under Project #183.

Incidents that Define Process Safety is a new lessons-learned book using actual incidents to describe how the various components of process safety came into being, and to underscore why they are important considerations. This book originated under Project #186. ■

CCPS MISCELLANY

NEW STAFF MEMBERS. CCPS announced that there are now two new staff consultants. **Jack McCavit** retired from a career at Celanese and has been actively involved with CCPS for years. **John Murphy** retired from the U.S. Chemical Safety Board and also has a long history with CCPS. Both Jack and John are also emeritus members of CCPS. They are now actively engaged in new CCPS projects.

RISK MANAGEMENT OF CHEMICAL PARKS. A 22-page report entitled "Process Safety and Risk Management of Chemical Parks" was prepared by the European Process Safety Center in conjunction with CCPS in 2006. A number of issues beyond process safety and risk management are discussed, such as other health and safety problems and environmental concerns. Several key points are identified such as the need to minimize land use, the need to protect the environment, and to conserve resources by networking the use of energy and materials. This report can be downloaded from the CCPS web site www.aiiche.org/ccps.

NEW CCPS MEMBERS. CCPS welcomes four new corporate members. Suncor, AIG Global Marine and Energy, Petronas, and Hikal Limited have joined the CCPS organization for 2007.

LESSONS LEARNED FROM NATURAL DISASTERS. CCPS, through a generous grant from the United Engineering Foundation, has prepared an informative document on "Lessons Learned from Natural Disasters." This is based on procedures and best practices within the chemical industry in preparing and dealing with hurricanes. The document should be available this summer on the CCPS web site. ■

OBJECTIVES (continued from page 1)

However, there are some objectives that are not really acted upon during the course of a typical year and that should be strongly considered for action to improve the benefits of membership, to encourage new members, to meet professional obligations, and to strengthen the Division. For example, there does not appear to be a great deal of effort directed towards coordinating activities with other societies in the broad field of safety and health. This Newsletter might be considered one small step in that direction since it now contains news items of interest to members of the ACS Division of Health and Safety (CHAS). The Newsletter does fall short of being a true joint publication, however. Some joint programming is now being considered for the 2008 Spring National Meeting since both AIChE and ACS will be meeting in New Orleans during the same time period in April. But joint efforts with other societies seems to be quite limited.

Regarding another objective, recommendations to the AIChE Board of Directors on positions relating to safety and health have not really been made in any recent period.

Without reviewing any of the other objectives, it does seem that the Division works very hard as necessary to put together the technical programming for the Spring National Meetings, but that efforts in other directions to meet objectives are quite limited. Perhaps some thought and discussions are needed here, particularly to encourage new members and to enhance the benefits of membership.

The objectives of the ACS Division of Health and Safety (CHAS), as stated in the Division Administrative Manual, are:

- to focus information on the properties of chemicals that affect humans directly or through the environment;
- to monitor the technical aspects of the above;
- to develop symposia and general sessions on topics related to above at national, regional, divisional, and other meetings of the Society (ACS);
- to foster publications and other modes of dissemination of information pertaining to the above; and
- to provide expertise in chemical health and safety to the Society and, in the public interest, to others as specified in the Charter of the Society.

Emphasis here is on providing key technical sessions and appropriate publications, including the *Journal of Chemical Health & Safety*. Technical sessions are planned for each of the two National ACS Meetings each year, and more effort is now being placed in bringing health and safety sessions to the regional ACS meetings.

Perhaps there is a real benefit in presenting the objectives of the two Divisions here at the start of the year as new officers and directors become heavily involved in respective Division affairs. With the two Division Executive Committees meeting soon (CHAS in March in Chicago; AIChE Safety and Health in April in Houston), new ideas, thoughts, and directions should be on the table for discussions. Strong consideration should be given to enhanced member benefits for professional and technical development, and to increasing the membership of the Divisions.

Your ideas and comments, as members, are sincerely solicited. Refer to page 12 for e-mail addresses of the appropriate Chairs.

Sam West

PRODUCT SAFETY IN THE AUTO INDUSTRY

Readers of this Newsletter are largely chemical-based professionals concerned with product and process safety among other safety issues. It might be interesting, then, to have a look at new thoughts and approaches in a different industry regarding specific product safety.

Research on auto accident statistics has shown that the driver is the single most important factor as the root cause of accidents, and is the most unpredictable - no surprise here. Focus of research, then, is on helping good drivers get better. The current high structural crash stability of modern cars suggests that safety research should be focused on accident avoidance.

Near-term research is centered on technology that enables vehicles to "see" and react to potential dangers by either warning or assisting the driver, or by taking control of the car. For example, rapid advances in sensing technology permits delivery of appropriate data regarding an imminent impact.

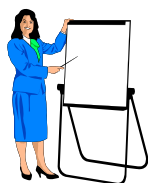
The worldwide technical success of electronic stability control (ESC), despite the proven benefits, has not been widely accepted by customers, probably because there is a lack of public awareness of this feature.

Another goal is to use technology to reduce traffic congestion and accidents. There is a major project sponsored by Nissan regarding this issue in Yokohama, where there are about 63,000 accidents each year. Various drivers have been selected to participate in this project as part of their normal driving routines. The project will certainly provide these drivers with an increased appreciation of the technology involved. ■



SAFETY NOTES

- You can surf around safety information in many different languages at the European Union Occupational Safety and Health Administration web site: <http://europe.osha.eu.int>.
- OSHA has developed a new safety and health topics information page aimed at demonstrating that investment in workplace safety and health makes good business sense. "Making the Case for Safety and Health" is a product of several alliances with OSHA including, among others, the American Industrial Hygiene Association, American Society of Safety Engineers, and the National Federation of Independent Businesses. The page highlights information on how a comprehensive safety and health program can help employers save money while protecting their employees.
- The Board of Certified Safety Professionals (BCSP) directors have elected officers for 2007. **Jeffrey L. Robinson, CSP, P.E.**, is President and **Paul S. Adams, PhD, CSP, P.E., CPE**, is Vice President. Jeff Robinson is currently with the Harrington Group in Duluth, GA. He holds a B.S. in Fire Protection Engineering from the University of Maryland, and a B.S. in Mechanical Engineering from Geneva College. Paul Adams is employed with Applied Safety & Ergonomics in Ann Arbor, MI. He holds a PhD and an M.S.E. in Industrial and Operations Engineering from the University of Michigan, an M.S. in Industrial Safety from Central Missouri State University, and a B.S. in Industrial Engineering from Iowa State University. **Glenn D. Daviet** is continuing as Secretary-Treasurer. BCSP establishes standards for and verifies minimum competency in professional safety practice.
- The Center for the Evaluation of Risks to Human Reproduction (CERHR) in conjunction with the National Toxicology Program (NTP) prepared a Monograph on the reproductive and developmental effects of **di-(2-ethylhexyl) phthalate**. It is available at <http://cerhr.niehs.nih.gov/go/reports>.
- Congress has requested of NIEHS that the NTP Interagency Center for the Evaluation of Alternative Toxicology Methods in partnership with the relevant federal agencies develop a 5-year plan that addresses: (1) research, development, translation, and validation of new and revised non-animal and other alternative assays for integration into federal agency testing programs, and (2) identification of areas of high priority for new and revised non-animal and alternative assays for the replacement, reduction, and refinement (less pain and distress) of animal tests. Public comments have been received.
- An OSHA Compliance Officer, while driving in Illinois, observed a construction employee in an unprotected 6½ foot trench. He stopped and immediately asked that the employee be removed from the trench due to the imminent danger of the unstable walls. The soil was Type C and was freely seeping water. Minutes later, the trench caved in at the point where the employee was working. The construction company had a trench box on site, but was not using it. Failure to use safety equipment - sound familiar?
- Slips, trips, and falls result in a large number of general industry accidents. Prevention methods are obvious, but are frequently overlooked or ignored. Walkways and stairs should be clear of scrap and debris. Extension cords, electric lines, and hoses should be coiled when not in use. Spills should be wiped up immediately. Appropriate non-slip, waterproof footwear should be worn. Wet surfaces should be covered with non-skid materials. Use salt or sand in icy conditions as necessary. "Walking/Working Surfaces" is a Safety and Health topic on the OSHA web site.
- Recent National Toxicology Program Reports include "Toxicology and Carcinogenesis Studies of Divinylbenzene (TR 534)" and "Toxicology and Carcinogenesis Studies of Methyl Isobutyl Ketone (TR 538)." These are available at <http://ntp.niehs.nih.gov/go/reports>.
- What familiar English word is invariably pronounced wrong by every scientist at the Institute for Advanced Learning in Princeton? (Answer: "wrong"). ■

**PAPERS PAPERS PAPERS**

"Calorimetric Study of the Inhibition of Runaway Reactions During Methacrylate Polymerization Processes," C.Ampelli et al, *J.Loss Prev. Process Ind.* **19**, 419-424 (September 2006).

Reaction inhibition was adopted as a method to halt runaway phenomena during polymerization experiments. Use of reaction calorimetry coupled with a particular system for early detection of the onset of runaway has allowed investigation of the behavior of two substances, hydroquinone and 1,4-benzoquinone, that can influence the reaction rate. Free-radical polymerizations of methyl methacrylate carried out under batch conditions in bulk and in emulsion were studied. The two substances tested behave differently. Hydroquinone is an inhibitor because it completely stopped the process., while 1,4-benzoquinone is a retarder that can be used industrially to control the process and keep the reactor temperature within safe limits.

"Adiabatic-Temperature Rise: An Awkward Calculation Made Simple," S.Hada and B.K.Harrison, *Chem.Eng.* **114**, No.1, 45-48 (January 2007).

Predicting the adiabatic-temperature rise is useful for a number of situations. For example, it can be calculated for any reaction of interest and thus is often used in the analysis and design of reactors. It can also be used to evaluate reaction hazards as part of a safety assessment. With combustion reactions it is useful to determine the adiabatic-flame temperature. Calculating the adiabatic-temperature rise, however, can require a tedious iterative solution frequently accomplished with relatively expensive computer flowsheet-simulation programs. This paper describes a technique utilizing considerably less expensive software.

"Designing for a Safe Process," P.Leckner, *Chem.Eng.* **113**, No.13, 30-33 (December 2006).

Addressing safety concerns throughout the design of a process can help to prevent accidents from occurring and can also help to minimize potentially serious consequences that would result if an accident did occur. A methodology is presented in this paper to promote a safe process design at the basic process engineering level, at the detailed process engineering level, and in implementing a management of change procedure.

"Troubleshooting Field Failures of Rupture Disks," A.T.Wilson, *Chem.Eng.* **113**, No.13, 34-36 (December 2006).

Rupture disks are often installed as the last line of defense against over-pressurization of equipment used for the manufacture, transport, and storage of a wide variety of chemical substances. They can provide safety against catastrophic equipment failures and personal injuries from unexpected results such as runaway reactions. However, the causes of rupture disk failures are many beyond bursting at the expected pressure. This paper discusses the causes for rupture disk failures and suggests methods for analyzing the reasons.

"Calorimetric Behaviors of Hydrazine by DSC and SuperCRC," M.Kowhakul et al, *J.Loss Prev. Process Ind.* **19**, 452-458 (September 2006).

This study obtained information about the decomposition of hydrazine (N_2H_4) caused by metals using Differential Scanning Calorimetry (DSC) and SuperCRC. The DSC measurements revealed that the exothermic reactions of hydrazine were caused by the reaction conditions including the types of cells. Heat flow profiles were observed with SuperCRC during the mixing of hydrazine and metal ion solutions. The maximum heat flow was related to the metal ion oxidative characteristics. The higher oxidative characters provided a faster acceleration for the exothermic behavior than the lower oxidative ions. Based on this study, Mn (VII) and Cr (VI) were considered to exhibit strongly oxidative characteristics during mixing with hydrazine.

"Design Safer Solids Processing Plants," S.Dhodapkar, K.Manjunath, and P.Jain, *Chem.Eng.* **114**, No.1, 34-39 (January 2007).

Processing and manufacturing of chemicals, plastics, pharmaceuticals, food products, agricultural chemicals, coal, and biochemicals present a wide array of processes where the raw materials, intermediates, and products are in particulate form. A proposed logical approach towards designing safer solids processing plants is presented in this paper. Particulate solids behave differently from liquids and gases, and it is essential to appreciate these differences. ■

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

at the Houston Hilton adjacent to the George R. Brown Convention Center



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.

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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 included: gas explosions, venting, suppression, or isolation protection, model development, model validation, and successful model application.

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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 covers papers on new research, tools, and methods that identify, characterize, and offer design and operational guidance on fire, explosion, and reactivity hazards.

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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 included.

Chair

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 BP Exploration & Production

Vice-Chair

Jean Paul LaCoursiere
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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 include the following topics: (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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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 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 also covered.

Chair

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6. CASE HISTORIES AND LESSONS LEARNED.

This popular session topic includes papers dealing with incidents, near misses, and the lessons learned to provide valuable learning experiences.

Chair

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Third Global Congress on Process Safety
9TH PROCESS PLANT SAFETY SYMPOSIUM

APRIL 22-26, 2007, HOUSTON, TX

at the Houston Hilton adjacent to the George R. Brown Convention Center



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. This symposium continues to focus on process safety and risk issues and solutions for immediate application in process plants and throughout industry.

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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 scheduled. Also, success stories in influencing plant management, business leaders, executives, and the public, and in creatively eliminating or minimizing risks will be included.

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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) are ongoing challenges in the process industries. This session includes papers in the areas of Independent Protection Layer (IPL) identification, Safety Instrumented Function (SIF), Safety Integrity Level (SIL) assignment, and SIS management systems. This session is co-sponsored by CCPS.

Chair

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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 included 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.

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 are presented that illustrate successful application of best practices.

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5. SECURITY, VULNERABILITY ASSESSMENTS, AND MITIGATION.

This session contains 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. Included are new techniques and methods, advances in application of existing approaches, and use of innovative new technologies.

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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. Papers here demonstrate proactive approaches to assess, build, maintain, and nurture a strong safety culture to achieve process safety excellence.

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

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

at the Houston Hilton adjacent to the George R. Brown Convention Center



The 2007 Annual CCPS Conference is again running as part of the Global Congress on Process Safety. The theme is "Advancing Process Safety Through Design and Operations." 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. The conference will include the following topical areas:

- **Risk-Based Process Safety and Risk Tolerance Criteria.** Session Chair: Lisa Morrison, PPG Industries, lmorrison@ppg.com
 "Improve the Risk Ranking Process by Categorizing and Detailing Consequence and Probability Categories"; "Implementing a Risk-Based Process Safety Management System because it Makes Dollars and Sense"; "How to Incorporate the Health, Safety, and Environmental Management System in Quantitative Risk Assessments."
- **Process Safety Management Systems.** Session Chair: Steve Meszaros, Wyeth Pharmaceutical, MESZARS@wyeth.com
 "Safety Culture: 'Black Art' or 'Paradigm Shift?'; "Finding Potential Failures Deliberately"; "Six Sigma Analysis Applied to Process Safety Systems"; "Labor Accidents and the Relation with Human Factors"; "Evaluating and Improving Operational Discipline"; "Management Review - Be Sure Your Process Safety Systems are Working"; "OECD Guidance on Safety Performance Indicators."
- **Inherent Safety.** Session Chair: Dan Wiff, Nova Chemical, wiffd@novachem.com
 "Reactivity Hazards in Storage: A Simplified Approach"; "How to Stimulate Examples of Successful Inherent Safer Solutions in Other Companies"; "Regulating Inherent Safety."
- **Standards, Codes, and Regulations, and Criteria for Retroactive Implementation.** Session Chair: Shakeel Kadri, Air Products, kadrish@apci.com
 "Legal Considerations for Complying with Changing Regulations or Consensus Standards"; "The AMEX Directives - Explosion Safety and Regulation: The European Approach"; "Retrofitting New Standards into Existing Facilities is Not as Easy as it Seems."
- **Reliability and Process Safety including Mechanical Integrity, Risk-Based Process Safety, and Turnaround Considerations.** Session Chair: John Herber, 3M, jwherber@mmm.com
 "Passive Device Technology: The Trend Away from Reliance upon Venting Systems to Address Transfer Line Failure"; "From PSM to Operational Excellence: Safety Critical Variables and Equipment"; "Field-based Evaluation of PFD Valves to Safety-related Loop Typical."
- **Safety Instrumented Systems.** Joint with PPSS - see page 10.

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. ■

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