Safety & Health News

AIChE
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS

SAFETY AND HEALTH DIVISION
www.shdiv.aiche.org

SUMMER 2009

WILL WE EVER LEARN?

Dennis C. Hendershot

I recall, many years ago, reading a paper by Trevor Kletz in which he "predicted" a number of incidents which would occur in the upcoming year. Of course, Trevor did not claim to be a clairvoyant, to have psychic powers, or to have access to some kind of oracle. All he did was describe, in general terms, a number of accidents which had occurred in the past, and predict that they would happen again. I don't recall Trevor's specific examples, but it is easy to come up with a list:

- A fire will occur when a tank of flammable material is overfilled and the resulting spill ignites
- Somebody will be injured because a pressure relief valve does not discharge to a safe place
- There will be a dust explosion caused by dispersion of dust lying about in a plant due to poor housekeeping, with an ignition source present
- An unexpected runaway reaction will occur when water leaks into a reactor or other vessel containing a water reactive material
- Somebody will be injured or killed by entering a process vessel which contains an inert atmosphere, and perhaps a would-be rescuer will also be injured or killed when trying to save the victim

All of you could easily "predict" these, and also create a much longer list. Trevor's point was that we rarely have "new" accidents. We just keep having the same old ones over and over again. We know what the immediate technical causes of these accidents are, and we know how to prevent them. We do not need to invent new technology in order to stop these accidents, we don't have to learn anything about the technical causes (the social and cultural causes are another matter, the point of this commentary). All we have to do is actually do what we already know how to do, and do it everywhere, all of the time. Of course, that is easier said than done.

I was reminded of Trevor's article when I read the United States Chemical Safety and Hazard Investigation Board (CSB) report on the November 2008 fertilizer tank collapse at Allied Terminals in Chesapeake, VA[*]. Quoting from the CSB press release announcing the report:

> "CSB investigators found that the tank involved in the accident – referred to as Tank 201 – had undergone welding work. Contractors removed the vertical riveted seams and replaced them with welded plates with the intent of strengthening the joints. Similar work was done to three other tanks at the facility. The CSB's investigation found that the welding performed on the tanks did not conform with recommended industry practices. Additionally the company did not ensure that post-welding inspections were conducted prior to refilling the tank to its maximum capacity."

[*] http://www.csb.gov/newsroom/detail.aspx?nid=242

So, why did this remind me of Trevor's article? One of the things that I have been doing in my retirement years is to serve as the CCPS Staff Consultant for the CCPS Process Safety Beacon Committee. As soon as I read the CSB report, I immediately remembered the May 2007 Beacon, describing the "Great Boston Molasses Flood of 1919" which killed 21 people, injured over 150, and caused over 100 million US dollars in property damage in 2007 dollars[†]. Some of the causes of the 1919 disaster sound familiar: the tank was not properly inspected during construction, and the tank was not tested after construction and before filling it with molasses. The May, 2007 Beacon also referenced two other tank failure incidents, in January 1988 in Floreffe, Pennsylvania, and in January 2000 in Cincinnati, Ohio. (What is it about January – the Boston molasses tank failure occurred on January 19?) Also, since the May 2007 Beacon was published, a colleague has told me about two other major spills of molasses – one in 1999 in Delft, Netherlands, and another in Maui, Hawaii in 2003. So, will we ever learn?

We all need to do a better job of learning from past experience. In order to do that, you have to know what has happened in the past. Studying case histories and lessons from incidents are one of the best ways to make sure that we don't repeat the same accidents. And, they are better learning tools. You could give a long and dry seminar about tank construction, inspection, and startup techniques, and half the audience would fall asleep half way through (the other half was probably asleep from the start!). Nobody will remember any of it. But, if you talk about an incident, even a very old one, say from 1919, people will remember it, and are more likely to remember some of its lessons. Case histories have been a prominent feature of AIChE Safety and Health Division and CCPS technical programming from the beginning, and the Case Histories session is always one of the most important sessions at the Global Congress on Process Safety. The archive of these papers provides a wealth of material on what can, and has, gone wrong in the process industries. We must use it to understand what has happened and how to prevent similar incidents in the future. Also note that the CCPS Process Safety Beacon usually describes process industry incidents, and is distributed free of charge each month. The intended audience for the Beacon is plant operators and maintenance personnel, but it certainly provides useful information for technical and management personnel as well. You can register to receive the Beacon at:

http://www.aiche.org/CCPS/Publications/Beacon/index.aspx

Dennis C. Hendershot
Co-Editor, *Safety and Health News*

AIChE SAFETY & HEALTH DIVISION UPDATE

By John Murphy, 2009 Global Congress on Process Safety Chair

The 5th Annual Global Congress on Process Safety was held at the Tampa Convention Center in Tampa FL as a part of the 2009 AIChE Spring Meeting. The Congress was very successful, with the introduction of webcasting to provide access to those who could not attend in person[‡]. The Congress had three tracks, the 43rd Loss Prevention Symposium featuring technical topics, the 11th Process Plant Safety Symposium featuring plant applications, and the 24th Center for Chemical Process Safety Conference featuring management systems and emerging issues. Ninety-four

[†] Past issues of the CCPS Process Safety Beacon can viewed (read only) at www.sache.org. You must be a member of SACHE to get access to the printable Beacon archive.

[‡] You can still purchase a subscription to view the Global Congress webcasts from: http://www.aiche.org/Conferences/SpringMeeting/Webcast/Global_Congress_on_Process_Safety.aspx

papers were presented over four days at the Congress, in addition to approximately twenty papers that were presented at the Tuesday evening poster sessions. Topics included the traditional subjects such as fire, explosions, and reactive chemicals and case histories, as well as current issues such as risk criteria, and managing organizational change.

Jean-Paul Lacoursiere was the chair of the Loss Prevention Symposium, John Champion was the chair of the Process Plant Safety Symposium, and Eric Freiburger was the Chair of the Center for Chemical Process Safety Conference. Roxy Schneider was the AIChE staff coordinator assigned to the Global Congress under the leadership of Scott Berger, Director, Technical Alliances and International Programs for AIChE. The theme of the Congress was Process Safety: the Next Generation. John Murphy, Chair of the Global Congress presented a short paper on this theme, and John Bresland, Chair of the United States Chemicals Safety and Hazard Investigation Board (CSB) gave the key note address entitled “Process Safety in Turbulent Times”.

A number of awards were presented at the Congress. The William H. Doyle Award for the best paper given at the 2008 Loss Prevention Symposium was presented to W.P. Schmidt, Air Products and Chemicals for his paper "Hydrocarbon Haze and ASU Safety". The Award for the Best Paper from the 2008 Process Plant Safety Symposium was presented to Julia Bukowski, Associate Professor at Villanova University for her paper entitled “Statistical Analysis of Pressure Relief Valve Proof Test Data: Findings and Implications". The 2008 Norton H. Walton/Russell L. Miller Award in Safety/Loss Prevention recognizes an individual's outstanding chemical engineering contributions and achievements in the loss prevention, safety and health fields, and was presented to M. Sam Mannan of Texas A&M University.

The 6th Annual Global Congress for Process Safety, part of the 2010 AIChE Spring National Meeting, will be held at the San Antonio Grand Hyatt, San Antonio TX. Presentation proposals are welcomed for all sessions. The Call for Papers for the 6th Global Congress can be found in this newsletter. We hope to see you there.

John Murphy

PERSONAL PROTECTIVE EQUIPMENT

Russell Phifer, 2009 Chair, ACS Division of Chemical Health & Safety

The safety field has been filled with news lately of the death of a UCLA research assistant earlier this year. As many of you are probably aware, this fatality was due to burns from exposure to a pyrophoric material which occurred when the researcher failed to wear appropriate personal protective equipment. This researcher, who was also working alone, was wearing only a highly flammable synthetic sweater instead of a lab coat or flammable resistant clothing. She also failed to use a safety shower approximately six feet away, which might have saved her life. UCLA was cited for failure to properly train this employee and to document such training.

Walking through a printing plant this morning where I have safety and health responsibilities, I observed a worker dipping paper towels into a pitcher of a toluene- ethyl acetate solvent blend with his bare hands, another example of failure to use PPE. When I asked the worker where his gloves were, he pointed a few feet away to where they sat on a work bench. In this same plant, supervisors routinely fail to wear appropriate eye protection although it is required of all employees.

Why is it so difficult to get workers to wear PPE? Usually it's due to inconvenience, improper fit, or perceived discomfort on the part of the employee. In my experience, appropriate PPE is pretty much always available, offered, and required, yet most of us have probably observed employees without proper protection at one time or another. Rarely does the failure to use PPE result in death or serious injury; yet when it does, the need for its proper use hits home. The death at UCLA resulted in relatively modest fines (about $32,000) from Cal-OSHA, but the likelihood of impending criminal and additional civil action in this case should hit home with employers, managers, and employees alike. No one likes to wield the hammer of enforcement, especially on co-workers, and knowing that 99 times out of 100 the failure to wear appropriate PPE will have no repercussions makes us even less likely to raise a stink. But… that one hundredth time should be enough warning that the unthinkable can and eventually will catch up to us. Everyone should recognize we are all responsible for safety, of ourselves and each other.

Russ Phifer

Editors Note: The following information is from Neal Langerman, Treasurer of the ACS Division of Chemical Health and Safety and is related to Russ Phifer's comments above.

The Division of Chemical Health and Safety of the ACS has posted two reports prepared by the California Department of Public Health. One is a factual report based on the Department's investigation of the UCLA fatality. The second is a fact sheet on handling pyrophoric liquids. The documents are at www.dchas.org. These documents have been subjected to stringent review, equivalent to the peer-review process and should be considered authoritative. If you have technical questions that are more appropriately handled directly, please feel free to email me at neal@chemical-safety.com. Thank you for your continuing dedication to chemical safety.

AIChE Safety and Health Division Awards

Norton H. Walton/ Russell L. Miller Award

The award recognizes an individual's outstanding chemical engineering contributions and achievements in the fields of loss prevention, safety and health. The award was presented to Dr. M. Sam Mannan, professor of Chemical Engineering at Texas A&M University. Dr. Mannan serves as director of the Mary Kay O'Connor Process Safety Center, and is an internationally recognized expert on process safety and risk assessment. A professional engineer and certified safety professional, he is a member of AIChE, the American Society of Safety Engineers, the International Institute of Ammonia Refrigeration and the National Fire Protection Association. In addition to his many professional honors and achievements, Mannan has served as a consultant to numerous entities in both the academic and private sectors and has testified before the U.S. Congress on multiple occasions, lending his expertise on matters of national security as it relates to chemical safety and infrastructure. At right, Dr. Mannan receives the award from Safety and Health Division Chair Kathy Pearson at the annual Safety and Health Division Dinner.

Bill Doyle Award

The Safety & Health Division and the Area 11a (Loss Prevention) Programming Committee presents this award in memory of Bill Doyle. He was a founder of the AIChE Loss Prevention Symposium series and contributed greatly to the knowledge and understanding of loss prevention in the chemical industry for over 50 years. Selection criteria include: 1) the paper is clearly written and well presented. 2) The paper has a wide applicability to chemical industry loss prevention efforts. 3) The paper adds substantial knowledge to the field of loss prevention. 4) The paper engages the intellect of the audience. The William H. Doyle Award for the best paper given at the 2008 Loss Prevention Symposium was presented to W.P. Schmidt, Air Products and Chemicals for his paper "Hydrocarbon Haze and ASU Safety".

Process Plant Safety Symposium Award

The Safety & Health Division and the Area 11c (PPSS) Programming Committee presents this award for the best paper given at the annual Process Plant Safety Symposium. The PPSS Award for the best paper presented at the 2008 PPSS was presented to Dr. Julia Bukowski, Associate Professor at Villanova University, for her paper entitled “Statistical Analysis of Pressure Relief Valve Proof Test Data: Findings and Implications". At right, Dr. Bukowski receives the award from 2008 PPSS Chair Jack Chosnek.

ACS Division of Chemical Health and Safety Awards

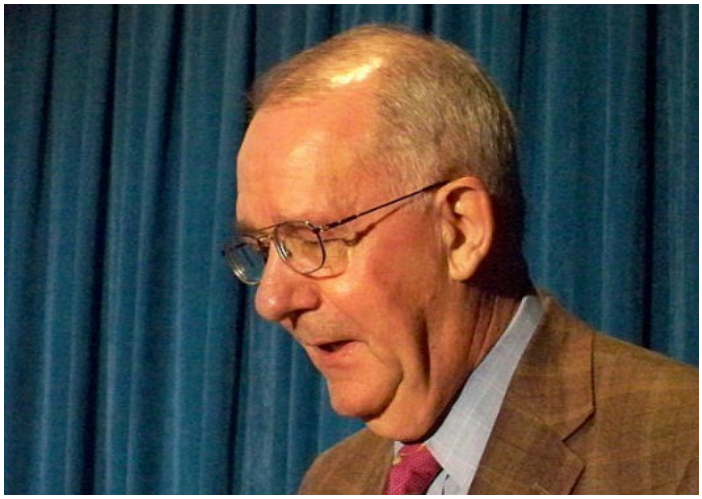
Howard Fawcett Chemical Health and Safety Award

Established in 1983, the Howard Fawcett Chemical Health and Safety Award recognizes outstanding individual contributions to the field of Chemical Health and Safety. The 2008 award was presented to the United States Chemical Safety and Hazard Investigation Board. At right, Mr. John Bresland (left), Chair of the CSB, accepts the award on behalf of the Board from CHAS Awards Chair, Doug Walters.

PICTURES FROM THE GLOBAL CONGRESS ON PROCESS SAFETY TAMPA, FLORIDA, APRIL 26-30, 2009

(Photos courtesy of Ron Willey)

John Murphy, Chair of the 5th Global Congress on Process Safety, addresses the opening session of the Congress



John Bresland, Chair of the United States Chemical Safety and Hazard Investigation Board, presents the keynote address at the 5th Global Congress on Process Safety

2008 Loss Prevention Symposium Chair Jean Paul Lacoursiere

Area 11a (Loss Prevention) Programming Committee Member Lisa Long

PICTURES FROM THE GLOBAL CONGRESS ON PROCESS SAFETY TAMPA, FLORIDA, APRIL 26-30, 2009

(Photos courtesy of Ron Willey)

Walton-Miller Award recipient Sam Mannan (left) and US Chemical Safety and Hazard Investigation Board Chairman John Bresland

CCPS Director Scott Berger, with Maria Molnarne from Bundesanstalt für Materialforschung und–prüfung (Federal Institute for Materials Research and Testing) in Berlin

Safety and Health Division First Vice Chair Pete Lodal at the Safety and Health Division Dinner

Attendees at the Safety and Health Division Dinner in Tampa

April 29, 2009

Occasion: The 43rd Annual Loss Prevention Symposium

Subject: William Bradford

Resolution

Whereas William Bradford …

- For Olin, headed corporate fire protection efforts as well as provided safety guidance on individual unit operations (for example, on calcium hypochlorite packaging) … thereby minimizing capital loses and injuries from fires and minimizing material handling hazards
- And was, while at Exxon, a key figure in highlighting to the chemical and petrochemical industries necessary design features and facility-siting criteria for control rooms … thereby protecting operators and allowing for orderly shutdowns in emergencies
- And was a founding-father of the AIChE Safety and Health Division, serving as its first secretary-treasurer for many years and earning in those years a reputation for being a skin-flint … thereby, in a cost-efficient manner, helping to nurture-to-maturity safety management concepts in the chemical processing industry
- And contributed to the development of National Fire Protection Association standards by providing necessary yet practical advice for inclusion in the codes and was a presenter of the AIChE "Fundamentals of Loss Prevention in the Chemical Process Industries" continuing education course … thereby accepting a leadership role in the education of others
- And shared, enthusiastically and selflessly, words of wisdom via published papers, conferences, and presentations, via casual discussions during coffee breaks and dinners, and via participation in, and taking leadership roles in, the 11A Committee … thereby making all who listened that much richer in process safety
- And is, to all on the 11A Committee, in the truest sense, a friend …

These things being so, the AIChE Health and Safety Division 11A Committee collectively, and members of this committee individually, express a hearty 'Hey, Bill!' to Mr. Bradford and make it known that his efforts in saving both lives and reducing injuries in chemical manufacturing facilities are both recognized and appreciated.

Sincerely,

David G. Clark
Chairman, 11A Committee
On behalf of the 11A Committee

Biographies of Major Contributors to Process Safety and Awardees of the AIChE Safety and Health Division

(J. Louvar, J. Davenport, Stan Grossel, J. Murphy, and E. Ural)

Bill Doyle

William H. (Bill) Doyle graduated from Worcester Polytechnic Institute in 1931 with a BS degree in Chemistry. He was immediately employed by the Factory Insurance Association (FIA) and located in the Syracuse Office. In 1940 he was transferred to the Eastern Regional Office (ERO) in Hartford as a supervisor. In 1945 he established the ERO Chemical Department. He retired from FIA in 1973. He was a charter member of Society of Fire Protection Engineers (SFPE) in 1950. He served on the Board of Directors of SFPE from 1971 to 1977. He was elected to SFPE Life Member in 1973 and elected to Fellow in 1978. He was a member of the New England Chapter and was President from 1967 to 1969.

For the American Institute of Chemical Engineers (AlChE) he founded the Loss Prevention Programming Committee (11A) which held its first annual Loss Prevention Symposium in 1967. These symposia are continuing today. He taught the AlChE Chemical Plant Loss Prevention Management continuing education course for many years. He was elected to Fellow of AlChE.
He was chairman of the National Fire Protection Association (NFPA) Hazardous Chemical Committee and was a member of the NFPA Chemicals and Explosives Correlating Committee, Flammable and Combustible Liquids Committee, Liquefied Natural Gas Committee, and Liquefied Petroleum Gas Committee.

In 1984 the Loss Prevention Programming Committee (11A) established the William H. Doyle Award. This annual award is presented to the person presenting the most outstanding paper at the previous year's Loss Prevention Symposium. The first recipient of the award was Dr. James McQuaid of the United Kingdom's Health and Safety Executive. Annual awards are still presented at each Loss Prevention Symposium.

Norton Walton

Norton Walton graduated from University of Pennsylvania and spent his first 7 years as an operator at the Atlantic Refining plant where he gained grass-roots respect for safety. Because of major industrial accidents with low temperature air separation plants in the early 1950s, a group of people met at the AIChE meeting in Boston in December 1956. Based on the interest shown, an Ammonia Programming Committee was formed and the annual Ammonia Symposia titled Safety in Air and Ammonia Plants were started. Mr. Norton Walton, General Foreman at the Atlantic Refining Company, was an organizer of the first symposium held at the Baltimore National Meeting in September 1957. Norton Walton was the founder of the Ammonia Safety Programming Committee. He was also the chair of the second symposium held at the National Meeting in Salt Lake City in September 1958.

The problems with air separation plants were largely solved in a number of years and the symposia titles were changed to Safety in Ammonia and Related Facilities. These symposia are still held, continue to attract substantial attendance and are held at venues separate from the AIChE national meetings. One of the early activities of the Safety and Health Division, other than programming, was

the establishment of the Walton-Miller Award. This award was originated to reward those people who have made an outstanding contribution to safety in the chemical industry.

Russell Miller

In about 1965, a number of sizable explosions and fires occurred in the oil and petrochemical industries. A light hydrocarbons plant and a refinery, both in Louisiana, suffered vapor cloud explosions. This phenomenon, while it had occurred before, was largely unrecognized in industry. At about the same time, the process industries were moving toward the "jumbo" plants. As a response to these trends, Mr. Russell Miller, Director of Safety and Loss Prevention at Monsanto Chemical Company contacted Mr. William Doyle, Chief Chemical Engineer at Factory Insurance Association to put together a symposium on Loss Prevention in the Chemical Industry. Together they put together six sessions of papers and the first symposium was held at the AIChE National meeting in Houston in 1967. Again, attendance was excellent and a committee was formed to prepare annual symposia on safety. Russell Miller was the founder of the Loss Prevention Programming Committee (11A). These symposia are still held at AIChE National Spring meetings.

One of the early activities of the Safety and Health Division, other than programming, was the establishment of the Walton-Miller Award. This award was originated to reward those people who have made an outstanding contribution to safety in the chemical industry. As previously stated, Norton Walton was a founder of the Ammonia Safety Programming Committee and Russ Miller was a founder of the Loss Prevention Programming Committee. The first recipient of this award in 1987 was Dr. Walter B. Howard of Monsanto. Walt Howard assisted Russ Miller in forming the Loss Prevention Programming Committee. The second award was to Gene DeHaven, founder of the Division.

Ted Ventrone

Ted received a bachelor's degree from Rhode Island State College in Chemical Engineering in 1937. Ted immediately went to work for Factory Insurance Association (FIA) as a field engineer. He was drafted in the Army in World War II as a private. He progressed through the ranks and after attending Officer Candidate School became an officer, serving in Europe. He was discharged as a major. He rejoined FIA after the war, and In November 1953 Ted left FIA and joined American Cyanamid as loss prevention manager in Bound Brook, NJ. Ted's career with Cyanamid lasted for 26 years when he retired in 1980.

Early in his career, Ted worked with a group of engineers that were concerned with loss prevention for the chemical industry that was going through a period of expansion and growth. Ted was a member of the organizing committee for the first Loss Prevention Symposium (LPS) in Houston in 1967. He was also a cochairman of the 7th Loss Prevention Symposium in 1972. He continued to serve as an emeritus member of the 11A Committee (responsible for organizing the LPS) for many years. From the founding of LPS in 1967 until the early 1980s the papers presented at the Loss Prevention Symposia and the Ammonia Safety Symposia were published as proceedings by the AIChE. It was recognized that many valuable papers were being lost for the future. In 1982 a decision was made to develop a new AIChE journal; i.e. Plant/Operations Progress (POP) that is now called Process Safety Progress (PSP). Because of Ted's extensive background and interest in chemical process safety he was chosen to be the first editor of this new Journal and served for 22 years. During that time 88 issues of POP and PSP were produced, containing more than 950 papers by more than 1200 authors and coauthors.

Ted received the 1992 Walton-Miller Award from the Health and Safety Division. At the 2003 AIChE spring meeting, the Safety and Health Division established the Ted Ventrone Safety and Health Division Design Award. This award is given to the student whose design best incorporates inherent safety into the solution of AIChE's Annual Student Design Competition. In 2002 the S&H Div. created the Ted Ventrone Award for the Application of Inherent Safety.

Walt Silowka

Walt received his BS degree from the University of Delaware and his MS degree from Lehigh University, both in chemical engineering. In 1997 he received the University of Delaware Engineering Alumni Association's Outstanding Alumnus Award. For several years, he was consultant/lecturer for the chemical engineering senior design course at Lehigh. In addition to being a member of AIChE, he was a voting board member of the Compressed Gas Association and a member of the Society of Plastics Engineers. Walt was 2005 Chair of the AIChE Safety and Health Division and was a Director of the Division from 2001 to 2003. He was also involved in the Center for Chemical Process Safety and its Risk Assessment Subcommittee.

Walt retired in June 2005 after a 31-year career with Air Products and Chemicals, Inc. His most recent assignment with Air Products was a Director of Process Safety and Reliability in the Corporate Engineering Department. In this capacity, he managed a group of process safety specialists who developed and implemented the policies, tools, and work practices that the company followed worldwide in the areas of process safety. This work included hazard identification, consequence and fault tree analysis, and employee and public risk assessment. Previous assignments included work as a process design engineer, section manager, senior process engineer, and director of process technology and corporate engineering. Before his Air Products years, he worked for NL Industries and for DuPont. In 2006 the S&H Div. created a student AICHE design problem award in his honor – for the best use of inherent safety in their designs.

Ephraim Scheier

Ephraim earned a BS degree at Rutgers University and an MS degree at Worcester Polytechnic Institute, both in chemical engineering. He was most recently the HSSE Manager for BP America in Houston, TX. Active in the Safety and Health Division affairs, he was particularly valuable in the programming efforts. He was a Division Program Coordinator, 2002-2003, and served as the Vice-Chair of the 6th Biennial Process Plant Safety Symposium held in New Orleans in April 2003. He was an especially bright, energetic, outgoing individual who made significant contributions to the Safety and Health Division, especially the work of the Program Area 11a Committee. In 2006 the S&H Div. created a student AICHE design problem award in his honor – for the best use of inherent safety in their designs.

Walter Howard

Walt was born on January 22, 1916 in Corpus Christie, TX. Walt received a PhD in chemical engineering from the University of Texas, Austin, after which he spent a short time there as a professor. In 1955 he began a career with Monsanto, starting at Texas City and moving to St. Louis in 1965. He retired in 1981 but continued to be a major international presence in process safety.
In 1965 the Executive Board of the AIChE National Program Committee asked Dr. Walter Howard of Monsanto to be Chairman of the Technical Program Committee (TPC) for the spring 1965 National

Meeting of AIChE at Houston. As a leader of this meeting Dr. Howard then presented to the Executive Board the idea for a process safety or loss prevention symposium. He asked his boss at Monsanto at the time, Russ Miller, to be an organizer and suggested that Bill Doyle of the Factory Insurance Association be a co-organizer. Walt facilitated this first session on process safety. These three pioneers in loss prevention laid the foundation for the 40 years of successful symposia.

At the April 1976 AIChE meeting in Kansas City, Dr. Alan Duxbury of ICI presented a paper outlining the weaknesses in our knowledge of chemical reactor venting design. Dr. Walter B. Howard of Monsanto arranged for a special meeting that was held after the regular Loss Prevention Symposium in the basement of the meeting hotel. About 50 interested people attended the meeting and the first seeds of the Design Institute for Emergency Relief Systems (DIERS) were planted. Mr. Harold Fisher of Union Carbide later designated the chair of DIERS to develop methods for the design of emergency relief systems to handle run-away reactions. Of particular interest were the prediction of when two-phase flow venting would occur and the applicability of various sizing methods for two-phase vapor-liquid flashing flow. DIERS spent approximately $1.6 million to investigate two-phase vapor-liquid onset / disengagement dynamics and the hydrodynamics of emergency relief systems. The primary contractor on the original DIERS work was Dr. Hans Fauske. Walter Howard was essentially a founder of the Loss Prevention Symposium and DIERS.

Walt received many awards. In 1987 he received the first AIChE Safety and Health Division Norton H. Walton / Russell L. Miller award for significant contributions in loss prevention and safety. He was named a Fellow of AICHE in the early 1990s. In 1999 he received the Merit Award from the Mary K. O'Connor Process Safety Center. In 2003 an award was designated in his honor by SACHE for the AIChE senior student design problem solution that exhibited the best application of the principles of chemical process safety.

54th Annual Safety in Ammonia Plants and Related Facilities Symposium

September 13th-17th, 2009, Hyatt Regency, Calgary, AB, Canada

Join the experts who manufacture ammonia and related chemicals when they gather in Calgary, Canada, September 13th-17th, at the Hyatt Regency. Whether your area of interest is ammonia, urea, nitric acid, ammonium nitrate, or methanol, this conference will provide you with the information you need to make your plant as safe as possible. Plant and safety engineers and managers who attend will hear:

- Concrete examples and ideas of how to avoid or manage a potential plant accident
- Examples, through presentation papers, on how others are solving these problems
- An overview of what products are available to ensure safety measures
- More than 25 high-quality papers from noted practitioners
- Papers will be printed in the Symposium Proceedings
- Papers will be also available on CD
- Roundtable Workshop – bring your questions to the experts
- Exciting Guest Program to explore the city and vicinity of Calgary

6th Global Congress on Process Safety
March 22-25, 2010
Grand Hyatt, San Antonio, Texas
Call for Papers

In 2010, the 6th Global Congress on Process Safety will again feature the coordinated conferences of the Loss Prevention Symposium (LPS), and the Process Plant Safety Symposium (PPSS), and the Center for Chemical Process Safety (CCPS). This annual event is the primary forum for practitioners to share practical and technological advances in all aspects of process safety. The largest gathering of process safety professionals in the world, the Global Congress is presented by CCPS and the AIChE Safety & Health Division. This year, we will focus on Process Safety – Learning from the Past to Improve the Future. Drawing on the learning and experience from the past to improving the future by reducing incidents, better focusing risk reduction, and learning from plant level experiences. The Program includes the following tracks and sessions:

Global Conference Joint Session

Case Histories and Lessons Learned

Chair and contact: Steve Meszaros, meszars@wyeth.com

44th Annual Loss Prevention Symposium (LPS)

- Fires, Explosions and Reactive Chemicals
- Combustible Dust Hazards
- QRA and Risk Criteria
- Human Factors

LPS Chair and contact: Ron Willey, LPSchair@aiche.org

Note: The Spring 2009 issue of *Safety and Health News* contains a more complete description of LPS sessions and specific session contact information.

12th Process Plant Safety Symposium (PPSS)

- Risk Assessment – Expanding Horizons for the PSM Environment
- Layer of Protection Analyses (LOPA) – Case Studies & Experiences
- Management of Change - The Most Difficult PSM Challenge
- Preventing Loss of Containment Incidents - Beyond Mechanical Integrity
- National Emphasis Programs - Preparation, Reviews, Outcomes & Challenges
- The "Soft Side" of Process Safety – Culture, Competency, Improvement
- Mechanical Integrity

PPSS Chair and contact: Chip Howat, PPSSchair@aiche.org

25th annual Center for Chemical Process Safety (CCPS) International conference

- LOPA Bloopers & Outtakes
- Consequence Modeling
- Case Histories of Risk Assessment & Problem Solving
- Rewrite of the OSHA & RMP Regulation
- Inherently Safer Design/ Inherently Safer Technologies
- Learning from the Past
- Process Safety into the Future

CCPS Chair and contact: Don Connolley, CCPSchair@aiche.org

ABSTRACTS DEADLINE: OCTOBER 5, 2009

Full details on each session are provided at www.aiche.org/gcps.

For questions on the GCPS please contact:

Kathy Pearson
2010 Global Congress Chair
Tel: 281-228-8236
GCPSchair@aiche.org

Additional contact for abstracts and information:

Roxy Schneider
AIChE Global Congress Oversight
Tel: 212-591-7319
roxys@aiche.org

ARTICLES AND PAPERS OF INTEREST

Thanks to Stan Grossel for providing the following list of papers potentially of interest to Division members.

1. "Visualization of Emergency Viscous Two-Phase Venting Behaviors" by Duh, Y-S et al, *J. Loss Prev. Proc. Ind.*, Vol. 22, No. 2, pp. 145-152 (March 2009).

Safety design of emergency relief systems must consider adequate vent sizing whether the flow is a single phase or two-phase vapor-liquid flow, and two-phase flow generally requires a larger relief area. It is an even more complex situation due to the effect of friction loss in a relief line with high viscous fluids. Generally, viscous fluids are polymer solutions or melts. The purpose of the present work is to study the effect of the viscosity of the liquid on the venting behavior and ascertain how well the SAFIRE program can model the emergency venting of a non-reacting fluid. The fluids used in this study were water solutions made by adding a neutral polymer of PVP (polyvinyl pyrrolidone) to water with l0 weight percent of the concentrations of the additive in the water. The viscosity was adjusted by selecting the different molecular weight with 40,000 g/mol and 3,600,000 g/mol of PVP to simulate the conversion condition of polymerization. At ambient temperature, the viscosity was estimated to be 0.007 and 0.113 Ns/m^2., respectively. The blowdown was performed by a bench-scale reactor with a volume of 1600 cc and a 0.1 m^3 pilot reactor at 150°C where the relief pressure was about 5 bar. Venting experiments in the pilot reactor are important in simulating a large vessel in industry and avoiding the small pipe effect in the bench scale reactor. Simulation of the characteristics of two-phase flow was conducted by the SAFIRE program. Experimental data of pressure and mass flow were compared with the results of simulation by using bubbly, churn-turbulent, and homogeneous flow models. The microscopic dynamic behaviors were studied by the fast photography technique in a 1600 cc reactor with two windows to allow the flow visualization. Experimental data of superficial vapor velocity and bubble rise velocity were directly measured by fast photography in the blowdown. It is expected that the present study may contribute to a better understanding of the dynamic behavior and the mechanism of flashing flow.

2. "Thermal Characteristics of Hydroxypropyl Methyl Cellulose" by Lim, W-S et al, *J. Loss Prev. Proc. Ind.*, Vol. 22, No, 2, pp. 182-186 (March 2009).

This study was designed to investigate the thermal characteristics of hydroxypropyl methyl celluloses (HPMC), Because HPMC is used in various industries extensively, it is very important to clarify the thermal characteristics in terms of its potential hazards and spontaneous ignition. In this study, thermal analysis was performed with the TG-DTA and spontaneous ignition tester (SIT). Based on the data of the SIT, it was determined that the critical spontaneous ignition temperature and the apparent activation energy of HPMC were about 185°C and 104.54 kJ/mol respectively. However, when the amount of the sample is larger to a certain degree, ignition can occur below this temperature. At a flat sample thickness of 1 m, it was calculated to have a critical temperature value of approximately 180°C by the Frank-Kamenetskii method. Upon analyzing thermal behavior using the TG-DTA, it was found that the pyrolysis occurred at 200°C, below the rate of temperature of 1 °K/min, which is slightly lower than that of common cellulose. Gas analysis indicated that carbon monoxide was emitted at the start of the reaction.

3. "Computational Fluid Dynamics Analysis on the Critical Behavior of Reactive Chemicals" by Liu, L. et al, *J. Loss Prev. Proc. Ind*., Vol. 22, No. 2, pp. 187-196 (March 2009).

Thermal explosion may occur in the storage process of reactive chemicals with exothermic decomposition reactions when heat removal is not sufficient. The inflection point on temperature versus concentration or time curve has been widely used to study the critical behavior for this type of system. Previous work of critical behavior analysis normally assumed uniform temperature distribution or only pure heat conduction. Hence, the results obtained were only applicable to the small-scale or solid systems. The self-heating effect of the decomposition reaction and reactant consumption often induce temperature and concentration gradients, respectively, which consequently induce natural convection. Therefore, a study of the influence of natural convection on the critical behavior for a large-scale system is necessary. In this work, the critical behavior of hydroxylamine nitrate (HAN) in a cylindrical tank stored in air is studied with the commercial CFD package, Fluent 6.3, by considering the air-film thermal resistance. It was found that the feasible storage region of a large-scale system is smaller than that of the small-scale system because the increase of heat generation with quantity increase overwhelms the heat transfer enhancement due to natural convection.

4. "Hazard Evaluation of Runaway Reaction of Hydrogen Peroxide – Influence of Contamination of Various Ions" by Eto, I. et al, *J. Loss Prev. Proc. Ind*., Vol. 22, No. 1, pp. 15-20 (January 2009).

This study evaluates the influence of the contamination of various metal compounds on a runaway reaction hazard of aqueous hydrogen peroxide. The test apparatus was assembled on an experimental basis. Especially, to avoid any catalytic effects, a glass vessel was used. Within the experiments conducted, iron, copper, chlorine ions accelerated the runaway reaction. However, nickel, potassium, sulfate, and nitrate ions showed no effect. In the case of iron and copper, there is a linear correlation between the reciprocal of an additive's concentration and the logarithm of times to maximum temperature like the Arrhenius equation, although the reason cannot be explained at the present. The important factors which affected the runaway reaction should be multi-valency. The reactivity difference in several metal compounds is well explained by this factor.

5. "Impact of Emergency Shutdown Devices on Relief System Sizing and Design" by Goyal, R. K. and Al-Ansari, E. G., *J. Loss Prev. Proc. Ind.,* Vol. 22, No. 1, pp. 35-44 (January 2009).

In the sizing of individual relief valves protecting equipment, or process, or system, it is a common practice no to take cognizance of any immediate operator action of the action of any mitigating devices. However, an increasing number of consultants and practitioners are recommending not to apply the same philosophy when it comes to designing an overall refinery flare system to cope with common mode failures (e.g., loss of power, cooling water supply failure, etc.). They propose taking credit for the action of devices such as unit emergency shutdown (ESD) systems, trips (for example, fired heater fuel supply cutoffs), or autostarts of pumps whose actions reduce the potential load on the overall refinery flare system. Savings can thus be realized in the sizing of flare headers and other ancillary equipment. While there is no objection, in principle, to taking credit for ESDs in the design of relief systems, its application in practice deserves careful scrutiny. There are still many related issues that have not been adequately addressed by the proponents of the credit-taking approach. This paper highlights these concerns and offers practical advice to those facing relief system design decisions.

6. "Pressure-Relief System Design" by Mukherjee, S., *Chemical Engineering*, pp. 40-45 (November 2008).

Pressure relief systems are vital in the chemical process industries for handling a wide variety of situations. They are used to prevent pressurization above a system's design pressure; for

venting during an unusual or emergency situation; and for normal depressurization during a shutdown, as examples. In some cases, such as when non-combustible gases including steam, air, and nitrogen are used, venting into the atmosphere may be an option. In other cases, such as those typically encountered in the hydrocarbon sector, elaborate systems for the disposal of vented gases may be required. This article describes some of the causes of overpressurization, the types of valves and rupture disks that are available, and some of the components needed for a pressure relief system. Example calculations are given, as well as a list of installation considerations. (see January 2008 issue of Chemical Engineering for a letter from Dilip Das discussing some points in the article, and response from the author).

7. "Shortstopping and Jet Mixers in Preventing Runaway Reactions" by Dakshinamoorthy, D. and Louver, J. F., *Chem. Eng. Sci*., Vol. 63, Issue 8, pp. 2283-2293 (April 2008).

Runaway reactions are continuing to be a major problem in the chemical industry (26% of major accidents). One of the main reasons for runaways is power failure. Runaway reactions could be inhibited in two ways: by the addition of cold diluents and by the addition of an inhibitor (chemical reaction stopper). This technology is called shortstopping. After a power failure, the process of adding an inhibiting Agent and mixing it with the reactor contents becomes a major problem in the shortstopping process. Jets or impellers, driven by a small generator, however, can be used for mixing the inhibitor with the reactor contents. Dakshinamoorthy et al [J. Loss Prev. Proc. Ind., Vol. 19, pp. 570-581 (2006)] compared the efficiency of using jet mixers versus impeller-stirred vessels in shortstopping runaway reactions. On the basis of equal power consumption, the comparative study showed that jet mixers are ineffective when used for shortstopping. One needs to identify additional factors, to effectively shortstop when using jet mixers. Due to the hazardous nature of runaway reactions, these factors cannot be determined with lab scale or pilot plant scale experiments. Recent developments with CFD make it possible to carry out virtual experiments. The computational model is solved using FLUENT. Shortstopping studies via the addition of a reaction inhibitor and cold diluent are discussed in detail. The results reported in this study identify the major and minor factors, which contribute to effective shortstopping: I.e., power requirements, locations for adding the inhibitor, the quantity of inhibitor added, rate of the inhibition, the use of cold diluent, and the use of multiple nozzles. These results especially demonstrate the value of using CFD simulations in situations that are experimentally prohibitive.

8. Some additional references of interest, supplied by the authors:

    1. D. Moncalvo and L.Friedel, Single and two-phase flows of shear-thinning media in safety valves, *J. Hazardous Materials*, 2009, 168 (2), 1521-1526.
    2. D.Moncalvo, L. Friedel, B. Jörgensen, Sizing of safety valves for very viscous shear-thinning liquids, *Proceedings of the 7th World Conference on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics*, 2009, Krakow, Poland
    3. D. Moncalvo and L.Friedel, Influence of the liquid phase physical properties on the void fraction at the inlet of a full-lift safety valve, *Chem. Eng. Technol.* 2009, 32 (2), 273-282
    4. D.Moncalvo, L. Friedel, B. Jörgensen, T.Höhne: Sizing of safety valves using ANSYS CFX-Flo, *Chem. Eng. Technol.* 2009, 32 (2), 247-251

ACS DIVISION OF CHEMICAL HEALTH AND SAFETY OFFICERS AND COMMITTEE CHAIRS

Visit the DCHAS web site at http://membership.acs.org/C/chas/default.htm.

Chair (2009)
Russell W. Phifer
WC Environmental, LLC
PO Box 1718
West Chester, PA 19380
(W) 610-696-9220
(H) 610-869-0119
(F) 610-344-7519
rphifer@wcenvironmental.com

Chair-Elect; Audit Committee Chair; (2010 Chair)
Stefan Wawzyniecki
Dept EH&S Unit 4097
University of Connecticut
3102 Horsebarn Hill Road
Storrs, CT 06269-4097
(860)486-1110
stefan.w@uconn.edu

Immediate Past Chair; Nominating Committee (2008 Chair)
Erik Talley
450 East 63rd Street, 8F
New York, NY 10021
(H) 212-207-3833
(W) 212-746-6201
(F) 212-746-8288
ert2002@ med.cornell.edu

Treasurer (2009)
Neal Langerman
Advanced Chemical Safety
7563 Convoy Court
San Diego, CA 92111
(W) 858-874-5577
(F) 858-874-8239
neal@chemical-safety.com

Secretary (2009); Web site and E-mail Administrator
Ralph Stuart
University of Vermont
667 Spear St.
Burlington, VT 05405
rstuart@uvm.edu

JCHAS Editor
Harry J. Elston
Editor, Chemical Health and Safety
Midwest Chemical Safety
9380 Wandering Trails Lane
Dawson, IL 62520
(W) 217 971-6047
(F) 217 364 9626
helston@bigfoot.com

Councilor (2010)
George H. Wahl, Jr.
Box 8204, Department of Chemistry
North Carolina State University
Raleigh, NC 27695-8204
(W) 919-515-2941
(F) 919-515-2545
george_wahl@ncsu.edu

Alternate Councilor (2010) and Long Range Planning
Laurence Doemeny
4922 Armin Way
San Diego, CA
92115-1002
(H) 619-265-8154
ldoemeny@cox.net

Member-at-Large (2010)
Ken Fivizzani
Nalco Company
1601 West Diehl Road
Naperville, IL 60563
Phone: 630-305-2032
Fax: 630-305-2982

Training and Workshops Coordinator
Russell W. Phifer
WC Environmental, LLC
PO Box 1718
West Chester, PA 19380
(W) 610-696-9220
(H) 610-869-0119
(F) 610-344-7519
rphifer@glasmesh.com

Awards
Douglas Walters
Environmental and Chemical Safety Educational Institute
6807 Breezewood Rd.
Raleigh, NC 27607
919-851-1465
waltersdb@earthlink.net

Social Chair
Pat Schumann
Safety Specialist (contract)
Sanofi-Aventis
520-403-8228(cell)
Patricia-EXT.Schumann@sanofi-aventis.com

Program Co-Chair
Linda Stroud
Science & Safety Consulting Services
2808 Rue Sans Famille
Raleigh, NC 27607
lmstroud@sciencesafetyconsulting.com

Program Co-Chair
Debbie M. Decker
Environmental Health and Safety
University of California, Davis
1 Shields Ave.
Davis, CA 95616
530-754-7964 (office)
530-752-1493 (EH&S main office)
530-752-4527 (FAX)
dmdecker@ucdavis.edu

Regional Meeting Coordinator
Vicki A. Stanavitch
Instructor of Biology and Chemistry, Laboratory Supervisor
Keystone College
One College Green
La Plume, PA 18440
vicki.stanavitch@keystone.edu

Archives; Speaker's Bureau
James Kaufman, Chair
The Laboratory Safety Institute
192 Worcester Road
Natick, MA 01760-2252
(W) 508-647-1900
(F) 508-647-0062
labsafe@aol.com

Membership
Kim Jeskie
Oak Ridge National Laboratory
PO Box 2008, MS 6230
Oak Ridge, TN 37831-6230
(865)574-4945
jeskiekb@ornl.gov

AICHE SAFETY AND HEALTH DIVISION OFFICERS

Chair
Katherine Pearson
Rohm & Haas Company
6519 State Highway 225
Deer Park, TX 77536
281-228-8236
281-228-8675
katherinepearson@rohmhaas.com

First Vice-Chair
Peter N. Lodal
Eastman Chemical Company
Tennessee Division – Bldg 18
P. O. Box 511
Kingsport, TN 37662
423-229-2675
423-229-3949 (FAX)
pnlodal@eastman.com

Second Vice-Chair
Cheryl A. Grounds
BP Exploration & Production, Inc.
501 Westlake Park Boulevard
Houston, TX 77079-2696
281-366-4740
281-366-7969 (FAX)
cheryl.grounds@bp.com

Past Chair
Robert W. Johnson
Unwin Company
1920 Northwest Boulevard, Suite 201
Columbus, OH 43212-1197
614-486-2245
614-486-2141 (FAX)
rjohnson@unwin-co.com

Secretary-Treasurer
Albert Ness
Rohm & Haas Company
Engineering Division
3100 State Road
Croydon, PA 19021
215-785-7567
215-785-7077 (FAX)
aness@rohmhaas.com

Director (2007 – 2009)
David D. Herrmann
DuPont Company
1007 Market Street (B7246)
Wilmington, DE 19898
302-774-1766
302-773-6508
david.d.herrmann@usa.dupont.com

Director (2007 – 2009)
Philip M. Myers
Advantage Risk Solutions
P O Box 510
Sunbury OH 43074
740-965-6304
740-965-9159 (FAX)
pmyers@arisksolution.com

Director (2008 – 2010)
Dr. Brian R. Dunbobbin
Air Products & Chemicals, Inc.
7201 Hamilton Boulevard
Allentown, PA 18195-1501
610-481-6736
610-481-7157 (FAX)
dunbobbr@apci.com

Director (2008 – 2010)
Brian D. Kelly
Bririsk Consulting Ltd.
121 Royal Bay NW
Calgary AB T3G 5J6
403-375-0709
403-375-0710 (FAX)
kellybd@telus.net

Director (2009 – 2011)
Dr. Daniel A. Crowl
Michigan Technological University
203 Chem Sci & Eng. Bld
1400 Townsend Drive
Houghton MI 49931-1295
906-482-7144
906-487-3213 (FAX)
crowl@mtu.edu

Director (2009 – 2011)
Henry Febo
FM Global
P.O. Box 9102
1151 Boston-Providence Tpke
Norwood, MA 02062
781-255-4771
henry.febo@fmglobal.com

AIChE Liaison to Division
Felicia Guglielmo
American Institute of Chemical Engineers
Three Park Avenue
New York, NY 10016-5991
646-495-7329
646-495-8882
felig@aiche.org

Center for Chemical Process Safety Liaison to Division
Roxy Schneider
Center for Chemical Process Safety
American Institute of Chemical Engineers
Three Park Avenue
New York, NY 10016-5991
646-495-1372
roxys@aiche.org

Chemical Technology Operating Council Liaison to Division
Stephen Smith
American Institute of Chemical Engineers
Three Park Avenue
New York, NY 10016-5991
646-495-7335
646-495-8883 (FAX)
steps@aiche.org

Webmaster
Emil H. Groth
Michigan Technological University
Minerals & Materials Building, Room 727
Houghton, MI 49931
906-487-2079
906-487-2782 (FAX)
ehgroth@mtu.edu

Process Safety Progress Editor
Ronald J. Willey
Northeastern University
Dept. of Chemical Engineering, 342 SN
360 Huntington Ave
Boston, MA 02026
617-373-3962
617-373-2205 (FAX)
r.willey@neu.edu

Process Safety Progress Editor
Joseph F. Louvar
Wayne State University
Department of Chemical Engineering
5050 Anthony Wayne Road
Detroit, Michigan 48202-9988
313-577-9358
313-577-3810 (FAX)
jlouvar@ameritech.net

Newsletter Editors
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hamjfm@embarqmail.com

Dennis C. Hendershot
d.c.hendershot@att.net