

PROCESS SAFETY IN ACTION

2012 ANNUAL REPORT



PUBLIC



EXECUTIVES



OPERATIONS &
MAINTENANCE
MANAGEMENT



TECHNICIANS &
OPERATORS



ENGINEERS



GOVERNMENT
OFFICIALS



STUDENTS

Meeting the Process
Safety Challenge
Together

CONTENTS

You Made an Impact in 2011.....	1
Message from the Executive	2
Challenges and Challenges Met ...	2
Challenge 1 - UNIFIES	3
Challenge 2 – BUILDS	4
Challenge 3 - GUIDES	5
Challenge 4 - TEACHES	7
Challenge 5 - INNOVATES	8
Organizational Structure.....	9
Project Committees.....	11
Staff.....	17
2012 Important Dates.	17

Editor: Lauren Horowitz

Art Directors: Amy Gottlieb, Debbie Slott

Special Thanks: Lamese Bader, Bob Luchino,
Heather Yuengling



THE CCPS STORY

JUST AFTER MIDNIGHT on December 3, 1984, water contamination of a tank of methyl isocyanate in Bhopal, India initiated a series of events that led to a catastrophic toxic release, killing more than 3,000 residents and injuring over 100,000.

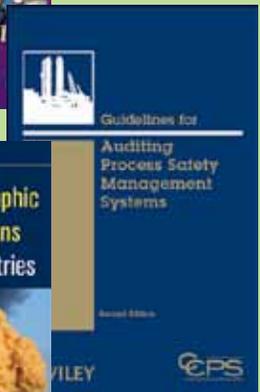
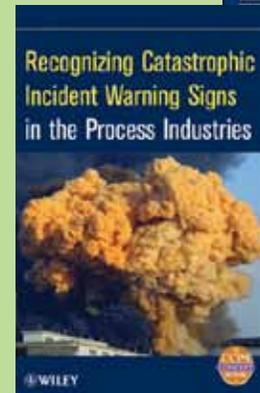
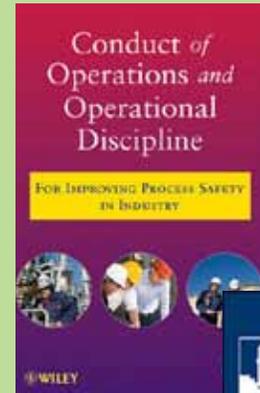
In February of 1985, 17 chemical industry leaders asked the American Institute of Chemical Engineers (AIChE) to lead a collaborative effort to eliminate catastrophic process incidents. On March 23, 1985, AIChE formed the Center for Chemical Process Safety and by the end of 1985 had enlisted 39 charter member companies. CCPS and its member companies quickly published CCPS' first book, Guidelines for Hazard Evaluation Procedures. In a series of subsequent publications, CCPS first codified the critical elements of process safety and provided key tools to manage, implement, and continually improve process safety programs. Focused workshops and annual international conferences provided additional opportunities for integrated learning and formal discussion regarding process safety.

Still following this approach 27 years later, CCPS continues to address the most important process safety needs and encourage an overall culture of process safety. Over 140 corporate members from around the world now participate in CCPS, including most of the world's leading chemical, petroleum, and pharmaceutical companies. CCPS' body of work reflects the great strides made in the area of process safety in the past quarter century.

CCPS continues to expand its catalog of over 100 books and products, build on its legacy of over 30 successful international conferences, and cultivate its Safety and Chemical Engineering Education (SChE) university curriculum program.

You Made an Impact In 2011

- Guidelines for Evaluating Process Plant Buildings for External Fires, Explosions, and Toxic Releases, 2nd Edition
- Recognizing Catastrophic Incident Warning Signs in the Process Industries
- Benchmarking: Process Safety Management Systems, 2nd Round
- Guidelines for Engineering Design for Process Safety, 2nd Edition
- Guidelines for Auditing Process Safety Management Systems
- Guidelines for Conduct of Operations
- Executive Process Safety Seminars



Get Your Company Involved

VOLUNTEER for a CCPS project subcommittee and get the opportunity to share your knowledge and help shape industry best practices

EDUCATE your colleagues by hosting a Process Safety Boot Camp® training

SHARE Share your expertise by submitting an abstract to the Global Congress on Process Safety

MENTOR your new employees by bringing them to the young professional program at GCPS

MODEL your company as a leader in process safety by being a contractor for a CCPS publication

SPREAD Spread the word by forwarding the Beacon to your colleges

CONNECT with your process safety peers through CCPS LinkedIn

JOIN CCPS as a member company and prevent catastrophic process safety incidents



CHALLENGES AND CHALLENGES MET



Scott Berger
Executive Director, CCPS

VISION

In order to protect people, property and the environment, CCPS is committed to bringing the best process safety knowledge and practices to industry, academia, the government and the public around the world through collective wisdom, tools, training and expertise.

MISSION

Eliminate process safety incidents, in all industries, by:

- Promoting process safety as a key societal value and expectation.
- Establishing process safety as the foundation for responsible operations.
- Serving as the premier world-wide resource for process safety and development of the “state-of-the-art” solutions.
- Fostering knowledge, understanding and implementation of process safety by executives, management, technicians, engineers, students, government officials and the public.
- Advancing process safety technology, culture and management practices.

A Message From the Executive Director

AT ITS FOUNDING, and at many occasions throughout its history, CCPS members have asked themselves, “What does excellence in process safety look like?” It should come as no surprise that the answer has changed over the years. In fact, from today’s perspective, the 1985 CCPS vision of “Well-defined hazard evaluation methodology and sound emergency planning” seems relatively primitive. As the vision evolved from “Top management commitment,” to “Sound regulatory policy,” to “Advanced technical analysis,” to “Strong culture” to “Better results with limited resources,” CCPS’ visions of yesterday map out the maturation of process safety to the present day, telling the story of Process Safety in Action.

Today, CCPS looks again to the future, to the “Vision Year,” 2020. Our vision will mature through the coming year, and as it does, CCPS will report it to stakeholders through its website and other forums. Nonetheless, several aspects of this vision can be anticipated with clarity.

First, the flattening of the world makes Unifying the Community of process safety leaders and practitioners more important than ever. As the “Global Community Committed to Process Safety,” CCPS plays a lead role in this effort. CCPS will need to maintain its existing communities like the Technical Steering Committee and Project Subcommittees while building new regional, virtual, and topical communities, forging new partnerships, and providing connections between them.

Implementation will be a critical theme. As CCPS approaches the publication of its 100th book, lack of basic guidance can no longer be given as an excuse for poor performance. As manufacturers and producers focus more on implementation, CCPS will need to ensure that its future guidance come equipped with tools to implement that guidance.

Educating and preparing the next generation will also be important. With the first baby-boomers retiring, a new generation of experts and leaders must step forward, and a new generation of implementers must emerge to take their place. CCPS will need to increase its focus on professional and university education to help make sure the next generations are ready for their important new roles.

On behalf of CCPS, I thank our now more than 140 member companies for rallying together to continually set a new vision and then working tirelessly at innovating the vision. Sometimes when contemplating the future, we can be tempted to think that we can never reach the ideal we strive for. When that happens, just look back at how our vision has been advanced by everything we’ve accomplished. It will be then be clear how much more we can do to prevent accidents.

CHALLENGE:

Promoting process safety as a key mutual societal and industry value and expectation

CHALLENGE MET:

738 Individuals attended and 230 firms and 31 countries were represented at the 2011 7th GCPS

The 8th Global Congress on Process Safety

On April 1-4, 2012 the 8th Global Congress on Process Safety will convene in Houston Texas at the Hilton Americas-Houston and George R. Brown Convention Center, to explore new ways to avoid incidents, manage risk, ensure plant safety and strengthen our process safety management programs.

The “Bring a Young Colleague” program, encouraging attendees to bring a colleague under the age of 35 for half price, continues to be great success.



Cheryl Grounds, VP Process Safety of BP and the 2011 Global Congress Chair commenced the opening session in Chicago, IL.

Process Safety in Latin America

“Being originally from Argentina I understand that there is a limited amount of information available in Spanish and Portuguese,” said Laura Turci, CCPS Project Manager for the 3rd & 4th Latin American Conference on Process Safety (LACPS). “I’m proud that the LACPS is leading the movement to fill this void. The LACPS facilitates discussions and really is strengthening the Latin American process safety community.”



Laura Turci, Project Manager and the Technical Supervisor of the 3rd & 4th LACPS



As the world’s focus turns to Brazil in anticipation of the Soccer World Cup and the upcoming Summer Olympic Games, CCPS will be in Rio de Janeiro, Brazil to host the 4th LACPS on July 3-5, 2012 at the Hotel Sofitel Rio de Janeiro Copacabana, in partnership with the Brazilian Petroleum Institute. Featuring 3 parallel tracks, 2012 LACPS, promises to be the best one yet!

PROJECTS

Process Safety Vision 2020 (Proj. # 244) ETA 2012:

Create a vision for what good process safety management systems will look like in the year 2020. Emphasis will be on excellent execution of management systems. The vision can be published as an evergreen paper on the CCPS website. There will be guidance to help companies understand where they are in relation to the vision, and tools to help them get there.

Business Case for Process Safety and Sustainability (Proj. # 245) ETA 2012:

Update the existing pamphlet on “The Business Case for Process Safety” to incorporate a current perspective of business impacts. In addition, the impact of process safety on sustainability and sustainable growth will be discussed.

Integrating Management Systems and Metrics to Improve Process Safety (Proj. # 247) ETA 2013:

The book will discuss ways to identify and implement synergy opportunities in developing management systems. Key topics will include how to anticipate and alleviate resistance to integration, how to streamline audit functions by reducing or eliminating duplication of audits, and operational reliability and highly reliable organizations.

PROJECTS

Process Safety for Frontline Supervisors (Proj #225) ETA 2012:

Daily “enforcement” at the operator/ technician and supervisor levels is essential to follow through on leadership commitment to process safety and other safety programs. This training program will increase the understanding and buy-in at the front-line supervisory level through better understanding of process safety, its benefits, and the interactions of the various elements.

Conditional Modifiers and Enabling Events (Proj. # 229) ETA 2013

This book will provide information and considerations on developing and using conditional modifiers for Layer of Protection Analysis. It will also provide similar information on applying enabling event values to hazard analyses.

Hazard Identification for Operators and Maintenance: A CCPS Training Module (Proj. # 224) ETA 2012:

Frequently, front line personnel are not made aware of the full extent of process safety hazards present in their work environments. This project will develop web-based training to enhance awareness and identification of process safety hazards by front line personnel.

Share Your Process Safety Moments with Others (Proj. # 219):

Sharing lessons learned is one of the most powerful and effective ways of learning from our past and preventing an undesirable recurrence. To facilitate sharing, CCPS is creating a library of short PowerPoint presentations, video clips, podcasts, etc. that can be used by member companies to impart knowledge on a broad scale. Please share your process safety moments.

CCPS in China

Since 2006, CCPS has partnered with the China University of Petroleum to provide training and other support in China as the CCPS China Section (CCPS-CS). In 2011, CCPS-CS presented its seventh workshop, this time focused on incident investigation. Nearly 150 trainees from Chinese and multinational companies participated. CCPS is grateful to Li Lin and Gu Nai Bing of member company Akzo Nobel for volunteering as translators.



China SAWS Visits The CCPS New York Office

“It provided us with invaluable experience and expertise on chemical process safety management that we can bring in the Chinese chemical industry,” said Liu Qiang,



Deputy Director-General of China SAWS. “We hope to work together with CCPS to develop resources for safe chemical operations in China, and achieve optimal solutions up to par with standards in the developed world.”

CCPS in India

On September 21, 2011, CCPS held its second India regional meeting in Hyderabad, India, thanks to the generous hospitality of member company Dr. Reddy’s Laboratories, Inc. Immediately preceding and following the Regional Meeting, CCPS offered workshops on Risk Based Process Safety and Fire Protection in Mumbai, Hyderabad, and Delhi. Additional onsite training events for senior executives, engineers, and operators occurred throughout the year. The next India Regional Meeting is scheduled for May 2012.



CHALLENGE:

Serving as the premier world-wide resource for process safety and development of the “state-of-the-art” solutions.

CHALLENGE MET:

The Process Safety Beacon is sent to over 22,000 through direct mail in 30 languages. Since the Beacon is freely shared, actual readership likely exceeds one million.

Celebrate The Beacon’s 10Th Anniversary By Forwarding The Beacon

November 2011 marked the 10 year anniversary of the CCPS Process Safety Beacon, a free monthly one page awareness bulletin which shares lessons from process safety incidents. The Beacon is written for front line plant workers – operators, technicians, shift foremen, and maintenance workers, and is also used by engineers, managers and executives . Any organization with a good process safety culture maintains a sense of vulnerability, remembering and respecting the hazards associated with its processes and materials. An important way of doing this is to continually remind personnel of what can happen if process safety management systems fail. Register to receive the Beacon at www.ccpsonline.org.



PROJECTS

Guidelines for Likelihood of Ignition of Released Flammables (Proj. #212) ETA 2012

This book will be the culmination of a research project to collect and evaluate the experiences and methodologies related to the ignition of released flammables. This information will form the foundation for technically estimating the probability that a release of a flammable material will ignite. With this capability, industry can better define risk-based equations and make better technology-based decisions. This may be very useful in the task of siting, as it relates to the protection of people in buildings, as well as for CPQRA and LOPA studies.

Guidelines for Safe Automation, 2nd Edition (Proj. # 241) ETA 2013:

An update to the original 1993 guideline, this edition will cover state-of-the-art design and maintenance of Basic Process Control Systems (BPCS) and their role in overall safe operation. It will also focus on the BPCS/operator interface and will have worked examples of control schemes in combination with SIS. RBPS principles will be integrated, and a control strategy for cyber attack security will also be covered.

Continued on following page.

Hazop Studies E-Learning

This course teaches the anatomy of process safety incidents including process hazard analysis terminology, the basic HAZOP study approach to developing potential incident scenarios, the estimating of scenario risk as a means to determining the adequacy of safeguards, the application of the HAZOP method to procedure-based operations, and the logistical aspects of planning and executing a HAZOP team review.

Continued on following page.

PROJECTS continued

Guidelines for Facility Siting and Layout, 2nd Edition (Proj: # 246) ETA 2013:

This project will revise and update the current CCPS publication, and add new information on occupied portable buildings, facility and plant layout.

Developing, Strengthening and Implementing Process Safety Culture (Proj: # 249) ETA 2013:

Process safety culture is the combination of group values and behaviors that determine the manner in which process safety is managed. It is critical in any process safety management system and business. Without a good culture, even the best management system will only achieve mediocre results or fail outright. This project, which continues CCPS longstanding culture efforts, will develop guidance and tools on establishing, evaluating, and improving process safety culture to help organizations understand, recognize, improve, and sustain a positive process safety culture.



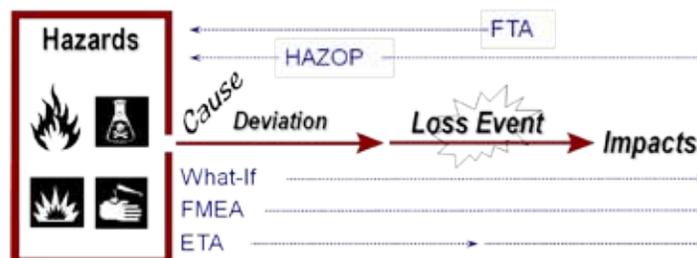
Get Instant Access to CCPS Books Wherever You Are.

Instantly search the entire CCPS library.

The complete collection of CCPS books is available online through partnership with Knovel Corporation. The CCPS-Plus collection, available exclusively for CCPS members contains additional content (see below) and is available at a discounted price. The CCPS collection is also available via Knovel as part of a broader subscription of engineering and science references..

What's On CCPS Plus

- All Current and Archived/Older Editions of CCPS titles on Knovel
- A master index of Checklists from the CCPS library (available only to CCPS members)
- All historical issues of the CCPS Process Safety Beacon
- AIChE/CCPS conference proceedings, 2000 - 2011



CHALLENGE:

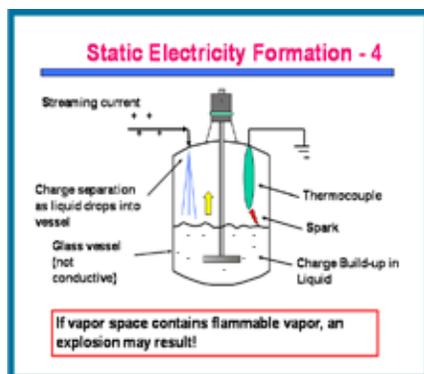
Fostering knowledge understanding implementation of process safety by all.

CHALLENGE MET:

CCPS issued 4500 SChE certificates to students from 211 universities worldwide in 2011.

Safety In Undergraduate Education

For the last 20 years, the Safety and Chemical Engineering Education program (SChE) has been on the forefront supporting process safety as an integral part of chemical engineering curricula in universities. SChE provides more than 50 prepared lectures and 8 self-study modules on a range of process safety topics available worldwide to over 200 universities. Lectures can be integrated into main-stream chemical engineering courses, or used as part of a comprehensive process safety course. Self study modules conclude with an online test. Students passing the test receive a certificate of learning. More than 4,500 students received certificates in 2011.



PROJECTS

Guidelines for Process Safety Knowledge and Expertise (Proj. # 239) ETA 2012

This project will present a framework of process safety knowledge and expertise versus the desired competency level in a “super-matrix” format. The guideline will target multiple audiences, ranging from front-line chemical operators, mechanics and instrument technicians through senior management, including financial and business executives. Gaps between existing and desired training levels can then be identified, and potential remedies suggested. Customization for a specific company will be possible.

Student Handbook for Process Safety (Proj. #242) ETA 2013:

This project will include the development and evaluation of tools for application of process safety principles throughout the standard chemical engineering curriculum in addition to, or as an alternative to, adding a new specific process safety course.



Process Safety Boot Camp® Training

CCPS developed Process Safety Boot Camp to train engineers who need to move beyond an understanding of personnel safety and learn the basics of process safety management. Boot Camp follows the twenty elements of Risk Based Process Safety and aligns with other valuable references. Experienced CCPS staff consultants lead the four-day intensive course. To bring additional relevance to the subject matter, company liaisons reinforce with key messages from management and discuss specific case histories as appropriate. Contact Louisa Nara (LouNa@aiche.org) for more information or to schedule.

Advising Technical Policy Worldwide

CCPS engages broadly in efforts to make policymakers worldwide aware of the best practices in process safety. Highlights of 2011 include:

- Advising the US Department of Homeland Security on lifecycle metrics for inherently safer processes
- Supporting the United Nations Environmental Program (UNEP) APPEL and Responsible Production forums in China and Sri Lanka
- Promotion of the use of Global Process Safety Metrics in Argentina, Brazil, the European Union, India, and Japan

PROJECTS

Guidelines for Implementing Process Safety Management Systems, 2nd Edition (Proj. # 240) ETA 2013:

The second edition is an update to the original process safety management system implementation guideline that recognizes that most companies now have some form of process safety management system, but a number of companies, especially smaller companies, need a roadmap of how to efficiently and effectively upgrade their systems.

Guidelines for Managing Process Safety Impacts of Organizational Change: (Proj. # 227) ETA 2012:

Many companies continue to struggle with effective implementation of Organizational Management of Change (OMOC). This project will culminate in a short book that provides guidance for addressing this issue and will help companies advance their OMOC systems.

CHALLENGE:

Advancing process safety technology, culture, and management practices

CHALLENGE MET:

CCPS completed five new books and a DVD for executives in 2011, and presented new developments on five continents.

CCSP LinkedIn

The CCPS Global LinkedIn group page has become a major hub for the process safety community to connect, share ideas and pose questions in an open, supportive, and non-commercial forum.



Free E-Learning Course: Process Safety for Biofuel Plants.

Process Safety Management in the Biofuel Industry E-Learning Course is an awareness-training course developed by CCPS under a “Susan Harwood Grant” from US OSHA. Its intent is to increase process safety awareness for employees of companies in this rapidly emerging technology sector. The course may be accessed via www.ccpsonline.com and is free under the grant through September 30, 2012.

Technical Steering Committee (TSC)

TSC meetings are a great to network with and learn from your process safety peers as they share their experiences and lessons learned. TSC meetings feature presentation on useful and applicable new developments, process safety technology and management. These meetings are a great way to learn from the experts and bench-



mark with your peers. Make sure someone from your company attends the next meeting.

ORGANIZATIONAL STRUCTURE

CCPS activities are monitored and directed by a Managing Board, an Advisory Board, and a Technical Steering Committee. Additionally, members of the Technical Steering Committee and other member company representatives serve on subcommittees that oversee CCPS projects.

The Managing Board includes members of the Executive Committee and Board of Directors of AIChE, as well as the CCPS Executive Director. It is chaired by the Executive Director of AIChE and oversees CCPS' fiscal and management operations.

The Advisory Board, chaired by the CCPS Executive Director, brings together senior executive representatives of member companies to review CCPS' mission and strategies, support its initiatives, and provide guidance on CCPS projects.

The Technical Steering Committee (TSC) is CCPS' primary operating group. Chaired by the Technical Director, it provides technical direction to CCPS activities and selects its projects. TSC members serve voluntarily on CCPS project subcommittees and provide the technical expertise evident in CCPS publications. All member companies have one voting representative on the Technical Steering Committee.

The Planning Committee is responsible for monitoring process safety needs and trends of industry, and other stakeholders in order to supply the TSC with a portfolio of projects and other activities to consider. The Planning Committee also coordinates with the affiliates of the CCPS Global Community to leverage projects, training, and other efforts.

Managing Board

June Wispelwey..... AIChE Executive Director, Chair
Scott Berger CCPS Executive Director
David Rosenthal..... AIChE President
Phil Westmoreland AIChE President Elect
Maria Burka AIChE Past President
Andre Da Costa..... AIChE Treasurer
Kimberly Ogden AIChE Secretary
Monty Alger AIChE Director
Jack Hipple AIChE Director
Kate Ziemer..... AIChE Director

PROJECTS

Tools for Making Acute Risk Decisions with Chemical Process Safety Applications (Proj. # 248) ETA 2013:

The 2nd Edition will be a general update to include modern decision-making processes based on current practices of member companies and industry leaders. The decision aid concept and the risk analysis section can be built upon and strengthened. New tools, such as LOPA, etc., will be added.

Process Safety Implementation in Capital Projects (Proj. # 250) ETA 2013:

This CCPS concept series book will guide operating companies on how to define the scope and validate performance of Engineering and Contracting (E&C) firms to incorporate adequate process safety considerations into their designs. The scope will address a range of projects from the design of an individual facility component to major capital projects.

ORGANIZATIONAL STRUCTURE

Advisory Board

Scott Berger Executive Director, CCPS, Chair

Per Bagge Angelo Group Vice President, In-service, Integrity/Maintenance, Maersk Oil

Karen Carter Vice President HSE Honeywell Honeywell, Inc.

David Dupre Vice President, Eng. Solutions, Tech Centers, M&E Work Process The Dow Chemical Company

Cheryl Grounds Group Vice President Process Safety, BP

Linda Hicks Vice President Corporate Technology and Manufacturing Vertellus Specialties, Inc.

Craig Huffman Vice President, Engineering Ashland, Inc.

Kou Jianchao Deputy Director, Safety and Environment SINOPEC

Robert Kelley Vice President of Environment, Safety & Communication Formosa Plastics Corporation

Steve Kemp Vice President, Health, Environment and Safety Occidental Chemical Corporation

Danny Kite General Manager, HSE Total

John Licata Head, Health Safety, Environment and Safety Syngenta Crop Protection

Patrick Loughlin Vice President Environment, Health, Safety and Quality Air Products and Chemicals, Inc.

Don Lycette Vice President of EHSS Chevron Phillips Chemical Company

Craig Matthiessen Director, Regulations and Policy Development US EPA/OEM

Anne O'Neal Manager, Health, Environmental and Safety Chevron Energy Technology Company

Ron Rife Process Safety Manager ExxonMobil

Paul Shelton Process Safety Director Monsanto Company

Maureen Song Chai Kee General Manager, Group HSE Strategy Petronas

Karen Tancredi Global Technology Manager—Environmental and Process Safety DuPont Company

Prasad Tipnis Senior Vice President, Chief Centre for HSE Excellence Reliance Industries, Ltd.

Kenichi Uno Managing Executive Office Mitsubishi Chemical Corporation

June Wispelwey Executive Director AIChE

John Wnek Vice President, Environment, Safety and Health Evonik

Linda Zabel Director HSE, 3M Company

Project Planning Committee

Pete Lodal Eastman Chemical Company Chair

Kathy Anderson Vertellus Specialties, Inc.

Scott Berger CCPS

Americo Diniz Carvalho Neto Braskem

Tony Downes Honeywell

Jeff Fox Dow Corning

Eric Freiburger Praxair

Cheryl Grounds BP

Ken Harrington ChevronPhillips Chemical Company

Shakeel Kadri Air Products and Chemicals, Inc.

Neil Maxson Bayer Material Science

Jack McCavit CCPS Emeritus

Louisa Nara CCPS

Cathy Pincus ExxonMobil

John Shah Baker Risk

Kenan Stevick The Dow Chemical Company

Karen Tancredi DuPont Company

Scott Wallace Olin

Process Equipment Reliability Database (PERD)

Gene Meyer The Dow Chemical Company Chair

Dave Belonger CCPS Staff Consultant

Kumar Bhimavarapu FM Global Research

Vincenzo Cane BASF Corporation

Rich Gauvin Zynergy Consulting, LLC

Bill Goble Exida

Randy Keenan Savannah River Nuclear Solutions

Carlton Miller Air Products and Chemicals, Inc.

Luis Eduardo Niño TMC Innovations Inc.

Dean Salvador ChevronPhillips Chemical Company

Steven Shaw DNV

Bob Stack The Dow Chemical Company

Angela Summers SIS-Tech Solutions

Hal Thomas Exida

Stanley Urbanik DuPont Company

Process Safety Incident Database (PSID)

Adrian L. Sepeda CCPS Staff Consultant

Hadley Bedbury Montana Refining Company, Inc.

Laurie Brown Eastman Chemical Company

Curtis Clements DuPont Company

Lisa Faris Bayer Material Science

Shay Geb Teva

Chris Glover Arkema

David Guss Nexen, Inc.

Bruce Hamilton Talisman Energy

Sazali Kassim Petronas

Suresh Kumar Chennai Petroleum Corporation, LTD.

Steve Lyth Spectra Energy

Manny Marta NOVA Chemicals Corp.

Steve Marwitz Formosa Plastics Corporation

Mikelle Moore Buckman North America

Masaki Nakagawa Mitsubishi Chemical Corporation

Albert Ness The Dow Chemical Company

Karen Paulk ConocoPhillips

Jeff Philip Monsanto Company

Rajendra Raghuwanshi Reliance Industries, Ltd.

Bill Ralph BP

Joseph Saverino Air Products and Chemicals, Inc.

Ronald G. Schaffhauser PPG Industries, Inc.

Clark Shepard ExxonMobil

S.L. Sreedhar Santos, Ltd.

Gary Weimer Suncor Energy

Peter Williams Syncrude Canada, Ltd

Raul Wang SINOPEC

David Zhang Husky Energy

PROJECT COMMITTEES

Process Safety Beacon

George King Huntsman Chair

Dennis Hendershot CCPS Staff
Consultant

Don Abrahamson CCPS Emeritus

Mushtaque Ahmed Syncrude
Canada, Ltd.

Kathy Anderson Vertellus
Specialties, Inc.

Larry Duvall Celanese Chemicals

Jeff Fox Dow Corning

Frederic Gil BP

Aaron Gordon Nexen, Inc.

David Guss Nexen, Inc.

John Herber CCPS Emeritus

Daniel Horowitz US Chemical
Safety Board

Mike Korst LyondellBasell

Dave Krabacher BASF

Mike Marshall OSHA

Julio Miranda JPM Process Safety

Louisa Nara CCPS

Antonio Ribeiro Lauzana
Petrobras

Larry LeMesurier Syncrude
Canada, Ltd.

Marc Levin Shell

Bill Marshall Eli Lilly and Company

Jack McCavit CCPS Emeritus

Georges Melhem IoMosaic
Corporation

Masaki Nakagawa Mitsubishi
Chemical Corporation

William Olsen Merck &
Company, Inc.

Roy Sanders PPG (Retired)

Nick Sands DuPont Company

Sara Saxena BP

Adrian L. Sepeda CCPS Emeritus

Jatin Shah BakerRisk

Mike Smith Shell

John Stoney BP

Tony Thompson Retired

Jan Windhorst CCPS Emeritus

Guidelines for Likelihood of Ignition

Bob Stack The Dow Chemical
Company Chair

Adrian L. Sepeda CCPS Staff
Consultant

John Baik BP

Mervyn Carneiro Eli Lilly and
Company

Wayne Chastain Eastman Chemical
Company

Americo Diniz Carvalho Neto
Braskem

Jeff Fox Dow Corning

Randy Hawkins AON Energy Risk
Engineering

David Hermann DuPont Company

Mike Moosemiller BakerRisk

Brad Otis Shell Downstream
Manufacturing

James E. Salter Chevron Energy
Technology Company

Hazard Identification Training for Operators and Maintenance

Murray Callbeck Husky Energy
Chair

Debra McDaniel Koch Nitrogen
Co-Chair

Brian Kelly CCPS Staff
Consultant

Jon Bernardi Lubrizol retired

Chris Buehler Exponent

Mark Futrell Nexen Inc.

Kief Hess Chemtura

Simon Jones Petrotechnics
USA Ltd.

Don Lorenzo ABS Consulting

Steven Lyth Spectra Energy

Karen McGregor BP

Roxy Schneider BP

Luiz Claudio Silva Petrobras

Ken Tague Archer Daniels
Midland

Process Safety for Frontline Supervisors

Jerry Forest Celanese Chemicals Chair

Don Abrahamson CCPS Staff
Consultant

Kathy Anderson Vertellus
Specialties, Inc.

Troy Bennett Arizona Chemical
Company, LLC

Susan Dadd Bayer MaterialScience

Americo Diniz Carvalho Neto
Braskem

Jonas Duarte Chemtura

Frank Gallo Bristol-Myers Squibb
Company

John Herber CCPS Emeritus

Don Hess 3M Company

Dan Housenga Lyondell Basell

Shah Khajeh Najafi Safer Systems

Susan Lee-Martin Arkema

Donald K. Lorenzo ABS Group, Inc.

Bill Marshall Eli Lilly and Company

Mickey Norsworthy Process
Improvement Institute, Inc.

Robert Pappas MeadWestvaco

Adriano Reis Monsanto Company

Sheri Sammons TPC

Francis Schultz SABIC Innovative
Plastics

Brandon Sproles ChevronPhillips
Chemical Company

Kristie Terpening BP

John Traynor Evonik

Guidelines for Managing Process Safety Risks During Organizational Change

John Wincek Croda Chair

Andréia Virginia Pepe Ambrozin
Monsanto Company

Habib Amin Contra Costa County
Health Services

Steve Arendt ABS Group, Inc.

Michael P Broadribb BakerRisk

Joe Chandler Koch Industries, Inc.

Glenn Crowe Potash Corp.

Ken Harrington ChevronPhillips
Chemical Company

Don Lanier Bayer MaterialScience

Jim Miller ConocoPhillips

Keith Pace Praxair

Cathy Pincus ExxonMobil

Dave Thaman PPG Industries, Inc.

Rachel Vincze Suncor Energy

PROJECT COMMITTEES

Conditional Modifier and Enabling Events

Wayne Chastain Eastman Chemical Company Chair

Stanley Urbanik DuPont Company Co-Chair

John Murphy CCPS Staff Consultant

Kathy Anderson Vertellus Specialties, Inc.

Larry Bowler SABIC

William Bridges Process Improvement Institute

Martyn Brown Huntsman Corporation

Mervyn Carneiro Eli Lilly and Company

Andrew Carpenter Exponent, Inc.

Chris Devlin Celanese Chemicals

Thomas Di Leo Albemarle

Jeff Fox Dow Corning

Randy Freeman CCPS Emeritus

Michela Gentile BP

Kieran Glynn BP

Ken Harrington ChevronPhillips Chemical Company

Randy Hawkins AON Energy Risk Engineering

David Kahn AcuTech Consulting Group

Kimberly Mullins Praxair

Robin Pitblado DNV

Jack Reisdorf Fluor Enterprises

Kathy Shell AE Solutions

Byan Saab BP

Bob Stack The Dow Chemical Company

Angela Summers SIS-Tech Solutions

Dave Thompson Koch Industries, Inc.

Nico Versloot TNO

Tim Wagner The Dow Chemical Company

Robert Wasileski NOVA Chemicals Corp.

Guidelines for Process Safety Knowledge and Expertise

Jeff Fox Dow Corning Chair

Dave Belonger CCPS Staff Consultant

Michael P Broadribb BakerRisk

Joe Chandler Flint Hills Resources

S. Ganeshan Toyo Engineering India, Ltd.

Francois Joseph BP

David Lewis Occidental Chemical Corporation

Kay Koslan The Dow Chemical Company

Annette Kyle AON Energy Risk Engineering

Mikelle Moore Buckman North America

Thane Russey Petrotechnics USA Inc.

Sara Saxena BP

Eddy Schedule ABS Group, Inc.

S.L. Sreedhar Santos, Ltd.

William Ward Praxair

Larry Westrum Boulder Scientific Company

Key Performances Indicators for Risk Based Process Safety

Kenan Stevick The Dow Chemical Company Chair

Elroy Christie Honeywell

Jeff Fox Dow Corning

Eric Freiburger Praxair

Andrew Goddard Arkema

Shakeel Kadri Air Products and Chemicals Inc.

Steven Lyth Spectra Energy

Louisa Nara CCPS

Tim Overton BP (retired)

Jeff Philip Monsanto

Phil Rasch BASF Corporation

Marcela Recaman Equion Energia

Daniel Sliva CCPS Staff Consultant

Guidelines for Implementing Process Safety Management Systems 2nd Edition

Bob Stankovich Eli Lilly Chair

Daniel Sliva CCPS Staff Consultant

Abdul Aldeeb Siemens Energy, Inc.

Steve Arendt ABS Group, Inc.

Rajesh Bhatkhande Toyo Engineering India, Ltd.

Jonas Duarte Chemtura

Robert Fischer Total

David Guss Nexen, Inc.

Dennis Hickman Koch Industries, Inc.

Shah Khajeh Najafi Safer Systems

Neil Maxson Bayer MaterialScience

Georges Melhem IoMosaic Corporation

Darrin Miletello LyondellBassell

Cathy Pincus ExxonMobil

Sara Saxena BP

Adrian Sepeda CCPS Emeritus

Guidelines for Safe Automation, 2nd Edition

Wayne Garland Eastman Chemical Company Chair

Daniel Sliva CCPS Staff Consultant

Rehan Baig Bayer

Troy Bennett Arizona Chemical Company, LLC

Michael Boyd Husky Energy

William Bridges Process Improvement Institute

Michael P Broadribb BakerRisk

Russ Davis AON Energy Risk Engineering

Dave Deibert Air Products

Rick Dunn DuPont Company

Kevin He Dow Corning

Kevin Klein Celanese

Vilas Kulkarni Toyo Engineering India, Ltd.

Len Laskowski Emerson Process Analysis

Jack McCavitt CCPS Emeritus

Norm Mcleod Arkema

Russell Ogle Exponent, Inc.

Justin Ogleby Solutia

Ken O'Malley AE Solutions

Eloise Roche Dow

Bob Roubion Shell

Peter Stickles IoMosaic Corporation

Angela Summers SIS-Tech Solutions

Greg Weidner Hunstman

PROJECT COMMITTEES

Student Handbook for Process Safety

Jerry Forest Celanese Chemicals
Chair

Vincent Van Brunt CCPS Staff
Consultant

Don Abrahamson CCPS Emeritus

**Gerson Jose Martins de
Andrade** Petrobras

Iclal Atay New Jersey DEP

Kenny Crighton Nexen, Inc.

Dan Crowl Michigan Technical
University

Cathy Forget Syngenta Crop
Protection

Eric Freiburger Praxair

Vince Harvey BakerRisk

James Klein DuPont Company

Bill Marshall Eli Lilly and
Company

Mikelle Moore Buckman North
America

Jack Philley Baker Petrolite

Chad Schaffer Burns &
McDonnell

Scott Wallace Olin Corporation

Guidelines for Mechanical Integrity, 2nd Edition

Eric Freiburger Praxair Chair

Bob Ormsby CCPS Staff
Consultant

Michael P Broadribb BakerRisk

Russ Davis AON Energy Risk
Engineering

Norm Mcleod Arkema

Georges Melhem IoMosaic
Corporation

Randy Montgomery ABS Group,
Inc.

Alastair Painter DNV

Jeff Philip Monsanto Company

Bhadresh Prajapati ExxonMobil

Bob Ricker BakerRisk

Tom Sandbrook DuPont
Company

John Traynor Evonik

Nico Versloot TNO

Tom Wash, PE 3M Company

Process Safety Vision 2020

Jack McCavit CCPS Emeritus,
Chair

Louisa Nara CCPS Project
Manager

Lansing Bicknell CCPS
Facilitator

Annette Kyle AON Energy Risk
Engineering

Joe Allaben Koch Industries, Inc.

Steve Arendt ABS Group, Inc.

Todd Aukerman LANXESS
Corporation

Michael P Broadribb BakerRisk

Jeff Fox Dow Corning

Walt Frank CCPS Emeritus

Cheryl Grounds BP

Dave Jones Chevron Energy
Technology Company

Pete Lodal Eastman Chemical
Company

Mikelle Moore Buckman North
America

Shannon Ross Covidien

Kenan Stevick The Dow Chemical
Company

Karen Tancredi DuPont Company

Vincent Van Brunt University of
South Carolina

Scott Berger CCPS

CCPS STAFF



Scott Berger, Executive Director, joined CCPS in 2001 after 5 years at Owens Corning, where he held a range of Environment, Health, and Safety (EHS) assignments including Director of EHS Strategic Management. Scott also worked for 18 years at Rohm and Haas Company in R&D, engineering, and EHS. Scott received his BS and MS from the Massachusetts Institute of Technology.



Louisa Nara, Technical Director joined CCPS in 2010 after 15 years at Bayer, most recently as Director of Risk Management, NAFTA. Louisa has over 30 years of domestic and international experience in the chemical, petrochemical, pharmaceutical and food industries. Louisa holds a BS in Chemical Engineering from West Virginia University, a MS in Environmental Engineering from Villanova University and is a Certified Compliance and Ethics Professional (CCEP).



Laura Turci, Project Manager, joined CCPS in 2011. Laura has responsibility for CCPS undergraduate activities (SACHe), global conferences, and regional support for Latin America. Before joining CCPS, Laura specialized in process safety during R&D and scale-up at Sanofi Aventis, L'Oreal, and other pharma companies. Laura is also an Adjunct Professor in Process Safety at NJIT. Laura has a BS and MS in chemical engineering from Universidad Tecnologica Nacional, Argentina.



Pronob Mukherjee, joined CCPS as Asia Pacific Regional Manager in 2009 and manages the CCPS office in Mumbai. Pronob has more than 25 years of experience in process safety. He has worked for both chemical manufacturing companies as well as loss prevention associations in India. Pronob received his BSCHE from National Institute of Technology, Durgapur.



Lamese Bader, Membership Coordinator, joined CCPS in late 2011. Lamese has responsibility for membership development and coordination within CCPS. Before joining CCPS, Lamese worked as the Associate Director of the Arab American Association of New York, and as the Dean of Discipline at A. Fantis Parochial School. Lamese received her BA from Hunter College and a MA in International Affairs from The New School University.

CCPS CHINA SECTION



Prof. Zhao Dongfeng has worked in the China University of Petroleum since 1992. He is now the Director of the CCPS China Section.

2012 Important Dates

EVENT

DATE

Advisory Board Meeting, Philadelphia	March 7
Managing Board Meeting, Houston	March 31
8th Global Congress on Process Safety, Houston	April 1- April 4
Technical Steering Committee Meeting, Houston	April 5
3rd India Regional Meeting	May 15
Technical Steering Committee Web Meeting	June 26 @ 9:30 AM EDT
4th Latin American Conference, Rio de Janeiro, Brazil	July 3 - July 5
China Section Training, Qingdao, China	3rd Quarter, TBD
Technical Steering Committee Web Meeting	September 13 @ 9:30 AM EDT
1st Southeast Asia/Australia Regional Meeting	October 16
Managing Board Meeting, Pittsburgh	October 30
Technical Steering Committee Meeting, Rhode Island	November 13 -14

For more details e-mail ccps@aiiche.org

CCPS STAFF CONSULTANTS



Don Abrahamson has over forty years of experience in operations and engineering roles to draw from: process safety management, operations management, process safety engineering, technical management, quality assurance management, process development and research. He recently retired from Celanese as the Global Process Safety Manager.



David J. Belonger came to CCPS in 1996 as staff consultant for PERD. Dave is a graduate chemical engineer from the University of Wisconsin. He spent most of his career in various assignments with Rohm and Haas Company, including Corporate Safety Director and Plant Manager.



Dennis Hendershot retired in 2005 as Senior Hazard Analysis Fellow at Rohm and Haas Company after 35 years of service. Dennis has dedicated most of his career to process safety and risk management, and is one of the world's foremost champions of inherently safer design. Dennis has a BS in chemical engineering from Lehigh University and an MBA from the University of Pennsylvania.



CCPS wishes to thank **Lauren Horowitz** for two years of outstanding contributions to CCPS. Lauren's non-profit management experience and insight proved invaluable to CCPS as we negotiated a period of high growth and increasing impact. Lauren left behind sound systems to grow on. We wish her well in her future endeavors.



John Herber joined CCPS in 2009 after a 33-year career with 3M Company that included positions in process and project engineering, production operations and corporate safety. John developed programs for improving PSM systems across 3M's operations, including metrics, policy and implementation guidance. John has a BS in Chemical Engineering from Purdue University.



Greg Keeports joined CCPS in early 2008 after retiring from Rohm and Haas Company where he held positions including Global Technical Manager for Agricultural Chemicals and Director of Risk Management Services. He has over 38 years experience in the chemical industry. Greg earned BS and MS degrees in chemical engineering from Penn State and University of Pennsylvania, respectively; he also completed the Wharton Business Management program at Penn.



Brian Kelly joined CCPS in 2005 as a staff consultant after 34 years of service with Imperial Oil and Syncrude Canada Ltd. He held a number of senior positions in engineering, operations, risk management and process safety. Brian received his BASc and MASc degrees in chemical engineering from the University of Ottawa (Canada).



Jack McCavit retired from Celanese Chemical Company after 35 years with experience in operations management and practical application of process safety management systems. Jack served as the BP Baker Panel's technical project manager. He graduated from Texas Tech University with a BS in chemical engineering.



Adrian L. Sepeda joined CCPS in early 2002 as a staff consultant after 33 years of service with Occidental Chemical Corp. During those years, he held positions in a variety of technical and management positions, retiring as the Director of HES Risk Management. Adrian holds a BS in mechanical engineering from Lamar University.



John Murphy retired from the U.S. Chemical Safety and Hazard Investigation Board where he served as lead investigator. John also retired from Dow Chemical Company where he was a leader in process safety. He has a BS in Chemical Engineering from Tufts University and an MBA from Central Michigan University.



Daniel E. Sliva joined CCPS after he retired from GE, where he held a variety of positions over his 30-year career. Dan received his BS and PhD in chemical engineering from Rensselaer Polytechnic Institute and an MS in chemical engineering from the University of Rochester.



Robert W. Ormsby joined CCPS as a staff consultant in 2003 after 27 years of service with Air Products and Chemicals, Inc. Bob served as Global Manager of Process Safety. Bob has a BS in chemical engineering from Penn State University and an MS from Lehigh University.



Néstor Sposito joined CCPS as a staff consultant in 2011 after 32 years of service with Dow Argentina. He has been actively involved in the leadership of NFPA and the United Nations Environmental Program's APPEL Process.



Bob G. Perry retired as Managing Director of AIChE in 1997. Previously, Bob had a 37-year career with Union Carbide, retiring in 1993 as Vice President of Manufacturing and Engineering. Bob is a BS chemical engineering graduate of the University of Texas.



With sadness we bid farewell to Tom Carmody, first CCPS Director. Tom championed the initial idea for CCPS, and later became the first full-time employee of CCPS. Under Tom's leadership from 1986-1993, CCPS became firmly established, and many of Tom's systems and philosophies guide us to this day. A resident of Amelia Island, FL, and Chappaqua, NY, Tom is survived by his wife of 54 years, Jill, his four children, and their families.

2012 WORLDWIDE CCPS MEMBERS

Strengthen Your Corporate Process Safety Culture
Contribute to the Overall Safety of the Industry



3M Company



ABB

Abbott Laboratories

ABS Group, Inc.



AcuTech Consulting Group

AE Solutions



Air Liquide Large Industries US

Air Products and Chemicals, Inc.

AKZO Nobel Chemicals, Inc.



Albemarle

Ambatovy



Amgen

AON Energy Risk Engineering

Archer Daniels Midland



Arizona Chemical Company, LLC

Arkema



Ascend Performance Materials

Ashland



Baker Petrolite

BakerRisk

BASF



BayerCropScience

BayerMaterialScience



Boulder Scientific Company

BP

Braskem



Bristol-Myers Squibb Company

Buckman North America



Burns & McDonnell

Cargill



Celanese Chemicals

CF Industries

Chartis



Chemtrade Logistics Inc.

Chemtura



Chennai Petroleum Corporation, Ltd.

Chevron Energy Technology Company

ChevronPhillips Chemical Company



Chilworth

Cholamadalam MS Risk Services, Inc.



ConocoPhillips

Contra Costa County Health Services

Corden Pharma Colorado Inc.



Covidien

Cray Valley



Croda

CSBP



CYTEC Industries

Diversified CPC

DNV



Dome Oilfield Engineering & Services LLC

Dow Corning



Dr. Reddy's Laboratories, Ltd.

DuPont Company

Eastman Chemical Company

EcoPetrol

Eli Lilly and Company

Emerson Process Management

Enerkem

Equion Energia

Essar Oil Limited

Evonik

Exponent, Inc.

ExxonMobil

Fauske

Fluor Enterprises

FM Global Research

Formosa Plastics Corporation

GE Company

Gulf Petrochemical Industries Corp.

Hess

Honeywell, Inc.

Huntsman Corporation

Husky Energy

Invensys Process Systems

IoMosaic Corporation

KBR Energy and Chemicals

Koch Industries, Inc.

Kraton Polymers

LANXESS Corporation

Larsen and Toubro Limited

Lummus Technology, a CB&I Co.

Lyondell Basell

Maersk Oil

Matrix Laboratories Limited

MeadWestvaco

Merck & Company, Inc.

Mitsubishi Chemical Corporation

Monsanto Company

Montana Refining Company, Inc.

Nagarjuna Fertilizers and Chemicals Ltd.

New Jersey DEP

Nexen, Inc.

NOVA Chemicals Corp.

Occidental Chemical Corporation

Olin Corporation

Orchid Chemicals & Pharmaceuticals Limited

Pan American Energy, LLC

Petrobras

Petrochemical Corporation of Singapore

Petronas

Petrotechnics USA Ltd.

Pidilite Industries Limited

Potash Corp.

PPG Industries, Inc.

Praxair

Primatech Inc.

Process Improvement Institute

Procter and Gamble

REC Silicon

Reliance Industries, Ltd.

Rhodes Technologies

Rhodia, Inc.

Rio Tinto Alcan

SABIC

Safer Systems

Santos, Ltd.

Savannah River Nuclear Solutions

Scientific Protein Laboratories

Shell Downstream Manufacturing

Siemens Energy, Inc.

SINOPEC

SIS-Tech Solutions

Sistemas DACS SA

Solutia, Inc.

Spectra Energy

SRF Limited

Starr Technical Risks Agency, Inc.

Suncor Energy

Sunoco, Inc.

Syncrude Canada, Ltd.

Syngenta Crop Protection

Talisman Energy

Tata Chemicals, Ltd.

The Dow Chemical Company

The Lubrizol Corporation

TNO

Total

Toyo Engineering India, Ltd.

TPC

US EPA/OEM

Vertellus Specialties, Inc.

Virent Energy Systems

Woodside

WorleyParsons



Center for Chemical Process Safety

Center for Chemical Process Safety

Process Safety At A Glance Management System

**A Roadmap to CCPS Management
and Technical Resources**

PROCESS SAFETY AT A GLANCE

Find CCPS resources to meet your needs from the chart on this page.

It always makes sense to start with “Guidelines for Risk Based Process Safety.” When you’re ready to learn more:

Find CCPS Management Resource Tools

Look up CCPS resources based on the 20 CCPS Elements of Risk Based Process Safety categories. Find the applicable elements from the center column, and look left to find more detailed resources.

CCPS Technical Resource Tools

Look up CCPS resources for specific technical topics by searching the right hand column for the topical area, and then search for a title within the area.

Most CCPS Books are Available at www.wiley.com/go/ccps

Deep Search CCPS

by searching on “CCPS” and keywords on Knovel.com. See page 6 for more details.

GUIDELINES (G/L) FOR RISK BASED PROCESS SAFETY

CCPS RESOURCE MANAGEMENT TOOLS

COMMIT TO PROCESS SAFETY

- G/L for Implementing Process Safety Management Systems
- G/L for Process Safety in Outsourced Manufacturing Operations
- Local Emergency Planning Committee Guidebook: Understanding the EPA Risk Management Program Rule
- Practical Compliance with the EPA Risk Management Program
- Process Safety Boot Camp
- Process Safety Culture Toolkit

UNDERSTAND HAZARDS AND RISK

- A Practical Approach to Hazard Identification
- Evaluating Process Safety in the Chemical Industry: A User's Guide to Quantitative Risk Analysis
- G/L for Chemical Process Quantitative Risk Analysis, 2nd Ed.â
- G/L for Chemical Transportation Safety, Security, and Risk Management
- G/L for Developing Quantitative Safety Risk Criteria
- G/L for Hazard Evaluation Procedures, 3rd Ed. Layer of Protection Analysis
- Recognizing Catastrophic Incident Warning Signs in the Process Industries

MANAGE RISK

- Conduct of Operations and Operational Discipline
- G/L for Management of Change for Process Safety
- G/L for Improving Plant Reliability Through Data Collection and Analysis
- G/L for Mechanical Integrity Systems
- G/L for Performing Effective Pre-Startup Safety Reviews
- G/L for Process Safety Documentation
- G/L for Technical Planning for On-Site Emergencies
- Revalidating Process Hazard Analysis
- G/L for Analyzing and Managing the Security Vulnerabilities of Fixed Chemical Sites
- G/L for Postrelease Mitigation Technology in the Chemical Industry
- G/L for Writing Effective Operating and Maintenance Procedures
- Process Equipment Reliability Database

LEARN FROM EXPERIENCE

- CCPS Process Safety Benchmarking Program
- CCPS Process Safety Metrics Online Reporting Application
- G/L for Acquisition Evaluation and Post Merger Integration
- G/L for Auditing Process Safety Management systems, 2nd Ed.
- G/L for Investigating Chemical Process Incidents, 2nd Ed.
- G/L for Process Safety Metrics
- Incidents that Define Process Safety
- Process Safety Incident Database
- Tools for Making Acute Risk Decisions with Chemical Process
- Safety Applications

20 CCPS ELEMENTS OF PROCESS SAFETY

Process Safety Culture

Standards, Codes, Regulations, and Laws

Process Safety Competency

Workforce Involvement

Stakeholder Outreach

Process Knowledge Management

Hazard Identification and Risk Analysis

Operating Procedures

Safe Work Practices

Asset Integrity and Reliability

Contractor Management

Training and Performance Assurance

Management of Change

Operational Readiness

Conduct of Operations

Emergency Management

Incident Investigation

Measurement and Metrics

Auditing

Management Review and Continuous Improvement

CCPS TECHNICAL RESOURCE TOOLS

VENTING AND EMERGENCY RELIEF

- Deflagration and Detonation Flame Arrestors
- Emergency Relief Systems Design Using DIERS Technology
- G/L for Pressure Relief and Effluent Handling Systems
- Safe Design and Operation of Process Vents and Emission Control Systems

CHEMICAL REACTIVITY HAZARDS

- Chemical Reactivity Hazard Training CD-ROM
- Essential Practices for Managing Chemical Reactivity Hazards
- G/L for Process Safety in Batch Reaction Systems
- G/L for Reactivity Evaluation and Application to Process Design
- G/L for Safe Storage and Handling of Reactive Materials
- Reactivity Evaluation Software Tool

SAFE DESIGN

- Continuous Monitoring for Hazardous Material Releases
- G/L for Engineering Design for Process Safety, 2nd ed.
- G/L for Fire Protection in Chemical, Petrochemical, and Hydrocarbon Processing Facilities
- G/L for Safe Warehousing of Chemicals Inherently Safer Design, 2nd Ed.

CONSEQUENCE MODELING

- G/L for Consequence Analysis of Chemical Releases
- G/L for Evaluating Process Plant Buildings for External Explosions and Fires and Toxic Releases, 2nd ed
- G/L for Evaluating the Characteristics of Vapor Cloud Explosion, Pressure Vessel Bursts, BLEVE, and Flash Fire Hazards, 2nd Edition
- Understanding Explosions
- Wind Flow and Vapor Cloud Dispersion at Industrial and Urban Sites

BIOPROCESS SAFETY

- G/L for Process Safety in Bioprocess
- Manufacturing Facilities

DUST EXPLOSION HAZARDS

- G/L for Safe Handling of Powders and Bulk Solids

HUMAN FACTORS

- Human Factors: Methods for Improving Performance in the Process Industries
- G/L for Preventing Human Error in Process Safety

SAFETY INSTRUMENTED SYSTEMS

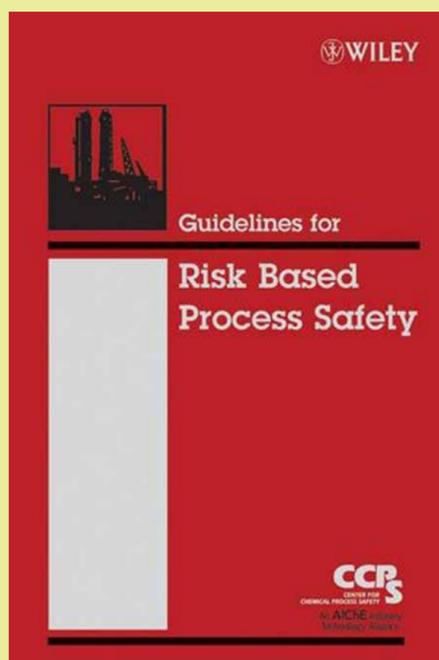
- G/L for Safe and Reliable Instrumented Protective Systems
- G/L for Safe Automation of Chemical Processes

R&D

- Making EHS an Integral Part of Process Design

UPSTREAM

- (Most CCPS titles apply equally to upstream processes. Please see appropriate RBPS element or technical topic)





www.ccpsonline.org

Center for Chemical Process Safety

AIChE

3 Park Ave, New York, NY 10016

www.ccpsonline.org • www.ccps@aiche.org
