

Reactive Chemistry Panel Members—Short Biographies

AICHe CCPS Pharma, Food & Fine Chemicals Sub-Committee Workshop

Sept. 7, 2022

Presenters for Virtual Workshop on Effectively Managing Reactive Chemistry Risks—Part 1

Presentation #1: Overview of the Reactive Chemicals Program at Dow

Katie A. Mulligan is a physical chemist with eight years of experience as a member of the Reactive Chemicals Capability at The Dow Chemical Company. She is an expert in Reactive Chemicals hazard recognition, evaluation, and associated utilization of small-scale calorimetric and flammability techniques to assess and quantify reactivity hazards. She works with process owners across the Dow business portfolio to define safe operating limits, determine what process operations are subject to thermal runaway & overpressure, and supports complex root cause investigations.

Katie is passionate about safety at all scales and innovation. She is the project lead a global R&D Dow initiative, R&D PSCE Prevention Project ([R&D P3](#)), to prevent lab-scale safety incidents and has developed and presented externally on novel methods to couple hazard calorimetry to online analytical detection.

She is a member of AICHe and is a regular contributor and volunteer at the annual Global Congress on Process Safety. She was the chair for Process Safety Management Mentoring (PSMM) Symposium at the 2022 Spring AICHE/GCPS meeting. She is a member of the Loss Prevention Symposium committee, the current PSMM committee chair, and a Dow industry representative for the Purdue Process Safety & Assurance Center.

Katie earned her B.S. in Chemistry from Stephen F. Austin State University and her Ph.D. from The University of Texas at Austin.

Presentation #2: Inherently Safer Chemical Reactions

Dennis C. Hendershot is a chemical engineer and AICHe Fellow with 50+ years of experience in process research and development, plant design and startup, and process safety. From 1970 until his retirement in 2005 as a Senior Technical Fellow, he worked at Rohm and Haas Company. He then joined Chilworth Technology Inc. as a Principal Process Safety Specialist (retiring again in 2009), and the Center for Chemical Process Safety (CCPS) of the American Institute of Chemical Engineers as a Staff Consultant. With CCPS, he has worked with the Inherently Safer Design Subcommittee, the Risk Tolerance Criteria Subcommittee, as an instructor for the AICHe Academy, and has been on the Process Safety Beacon Committee since 2005 and served as Beacon editor from 2005-2019. In 2005-2007, he was a member of the BP North American Refineries Independent Safety Panel, chaired by former United States Secretary of State James Baker.

Dennis received his Bachelor of Science degree from Lehigh University, and his Master of Science degree from the University of Pennsylvania.

Donald J. Knoechel, Ph.D.

- B. A. Chemistry – Kalamazoo College 1980
- M.S. & Ph.D. Ch.E. Purdue University 1983, 1986
 - Spectroscopic characterization of heterogeneous catalyst systems
- Worked for Dow Chemical, Midland, MI 1986-1990
 - Installed and ran first Mettler RC1 Reaction Calorimeter in Dow USA
- Joined The Upjohn Company in 1990 at Kalamazoo, MI Site
 - Established and ran Kalamazoo Process Safety Lab at Upjohn/Pharmacia & Upjohn/Pharmacia/Pfizer from 1992 – 2006
 - 2006–2012, Global API Process Technology (GAPT), Multi –metric ton product crystallization and continuous reaction implementation
- 2001–2012, Technical Advisor for the Pfizer Kalamazoo site HAZMAT team and same role for the Kalamazoo County HAZMAT team
- 2012–2021 (Retired), Fauske & Associates as Senior Consulting Engineer, Growth Leader for Reaction Calorimetry Testing and Consulting Services



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Gabe Wood

- B.S.E. in Chemical Engineering from the University of Iowa 2009
- Senior Chemical Engineer at Fauske & Associates 2008 –Present
- Expertise in thermal hazards testing using adiabatic and isothermal calorimetry (VSP2, ARSST, ARC, DSC, C-80, CPA-202)
- Perform relief system design, including reactive systems, using DIERS technology for the chemical process industry
- Provide onsite training for adiabatic and isothermal calorimetry, thermal hazards evaluations, and relief system design



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Other Panel Members:

Bruce D. Bullough, CCPSC, is a chemical engineer with 40+ years of experience across a number of industry sectors including the nuclear fuel cycle, air and water pollution controls, thin film coatings, specialty chemicals, food and beverage, and pharmaceuticals in multiple countries. He was involved in these sectors in developing/designing/scaling up and providing ongoing technical support to numerous chemical processes involving a wide range of reactive chemistries. He has worked as engineer, chemist and manager of labs and pilot plants, designed and installed small-scale batch plants and operations, and spent the bulk of his career supporting new process and product development, all while maintaining a focus on PSM. Bruce is currently Manager, Process Safety, at Pfizer's Kalamazoo, MI, site, supporting new product development and scale-up.

Bruce received a BSChE from the University of Utah; he has been actively involved in AIChE at both the local and national level throughout his career.

Jerry L. Jones, PE is a chemical engineer and AIChE Fellow. He became an AIChE/CCPS staff consultant and instructor in 2012 shortly after his retirement. He has 40+ years of experience across industry sectors including organic and inorganic chemicals, polymers, pharmaceuticals, and electronics industry materials. He has worked in chemical process and bioprocess development and engineering, plant design, process safety functions and supported manufacturing operations in over a dozen countries while an employee of Monsanto, SRI International, Raychem, Optiva, and Genentech/Roche. He has extensive experience with process scaleup into manufacturing and the implementation of enterprise risk management systems. He serves as an instructor for AIChE Academy process safety courses and participated on the CCPS project teams for Process Safety in Bioprocess Manufacturing Facilities and Risk Based Process Safety in Labs and Pilot Plants.

Jerry received BS and ME degrees in chemical engineering from Cornell University and an MS in environmental engineering from Stanford University. He is a licensed professional engineer in Illinois and California and holds a number of safety related certifications.

Waheed Mukaddam is a chemical engineer with over 45 years of experience in the field of chemical process development/design/commercialization, much of it involving First-of-a-Kind chemical synthesis processes at organizations that specialize in commercialization and licensing of proprietary chemical process technologies. His focus has been on reactor design for a wide variety of reactive chemistries in continuous flow and batch processes, numerous processes involving either homogeneous or heterogeneous catalysis.

He has been extensively involved with large-scale continuous flow petrochemical synthesis processes as well as with a range of other reactive chemistries involving oleochemicals and other specialty organic chemicals and inorganic materials such as pyridine and derivatives, and polysilicon, the main component of photovoltaic cells. At Cambridge Chemical Technologies Inc. which he cofounded, he directed project teams that designed and commercialized over 28 world-scale reactors (16 unique), which included numerous fluid bed reactors for polysilicon production.

Waheed received a BS degree in chemistry from the Institute of Science in India and BS and MS degrees in chemical engineering from Cornell University.

Jeffrey Sperry is an organic chemist with 14+ years in pharmaceutical development. He began his career at Wyeth Pharmaceuticals as a process chemist and after Wyeth was acquired by Pfizer, moved to Groton, CT. He spent 7 years doing pharmaceutical development as a process chemist until he took over the Process Safety team in 2015. Jeff and his team were responsible for identifying hazardous chemistry in Pfizer, from Discovery Chemistry all the through the tech transfer for commercial launch.

In 2019, Jeff was offered an opportunity to build a new Process Safety program at Vertex Pharmaceuticals in Boston. Since 2019, he has led the team of process safety experts to analyze and identify high-risk chemistry in the Vertex portfolio. He has also developed a number of workflows to help identify hazardous chemistry early.

Jeff received his B.S. in Chemistry with Honors from Ohio University and his Ph.D. from Dartmouth College. He was also a National Institutes of Health Postdoctoral Fellow at the University of Pennsylvania. Over his academic and industrial career, Jeff has authored 28 publications.

Amy Theis, PE is an experienced process safety engineer with more than 20 years of experience serving the chemical, pharmaceutical and manufacturing industries. She has a strong background in the identification of chemical reaction hazards including facilitating Process Hazard Analysis (PHA) studies. She specializes in calorimetry test design for safe storage, transportation and processing of reactive chemicals including emergency relief system design for reactive chemicals. Her current role as Business Development Director of Energetics and Explosives allows her to ensure that clients obtain appropriate test data to characterize their material hazards. Her education includes a Bachelor's degree in Chemical Engineering as well as being a professional engineer in the state of Illinois. She has served AIChE in multiple roles including Safety & Health Division Chair, SACHE Committee Chair and LPS Committee member.

James E. Torres, CFSE is a chemical engineer with 34+ years of experience and is currently a Sr. Process Safety Advisor for the W.R. Grace Baton Rouge facility. He has extensive experience in process design, research & development, pilot scaleup, and commercial plant startup with halogenated organic components, flame retardants, pharmaceuticals, insecticides, and specialty catalysts. The last 13 years of his career have been in a strict process safety role with a 3-year stint in reactive hazards evaluation and currently managing site PSM/RMP programs, facilitating PHA/LOPA's, performing dynamic consequence modeling, SIS design, implementation, and management. He is a corporate SME for PHA, LOPA, Pressure Relief Design, and Safety Instrumented Systems. He is a Certified Functional Safety Expert and member of the exida Advisory Board. He is also a Senior Member of AIChE and ISA.

James received Bachelor of Science degrees in Chemistry and Chemical Engineering from Louisiana State University.