

**Timothy J. Myers, Ph.D., P.E., CFEl, CFI**  
**Principal Engineer****Professional Profile**

Dr. Timothy Myers is a Principal Engineer in Exponent's Thermal Sciences practice. He applies chemical engineering principles to analyze industrial processes and to investigate and prevent incidents involving chemical releases, fires, and explosions. His investigations have included incidents involving chemical and industrial facilities, the warehousing and transport of hazardous chemicals, commercial and residential structures, and consumer products. Dr. Myers has investigated incidents involving combustion equipment ranging from hand held torches fueled by propane, to residential heating systems fueled by natural gas or oil, to industrial boilers fueled by coal. He has conducted engineering analysis and experimental testing involving chemical reactions, heat and mass transfer, fluid mechanics, thermodynamics, fires, and dust and gas explosions. Dr. Myers is a member of the ASTM committee responsible for the development of standards to determine the thermal stability of liquid and solids and the ignition and flammability properties of gases, vapors, and dusts clouds.

Dr. Myers has investigated several catastrophic dust explosions that have occurred throughout North America. His work in these investigations has included determining the origin and cause of the explosions, experimentally measuring the dust explosion properties of materials, modeling explosion dynamics, and determining compliance of the facility with current and historical regulations, codes, and guidelines for the prevention of dust explosions. Dr. Myers audits new and existing facilities for dust explosion hazards, and assists clients in developing approaches to mitigate dust explosion hazards, including assistance with OSHA's Combustible Dust National Emphasis Program (NEP). He is a principal member of six NFPA technical committees responsible for standards related to the prevention and mitigation of dust fires and explosions. Dr. Myers oversees testing in Exponent's Combustible Dust Testing Laboratory.

Dr. Myers has a particular interest in the stability of chemicals and chemical mixtures and their reactivity hazards. He has investigated incidents involving self-heating or thermal runaway of chemicals, the unintentional reactions of incompatible chemicals, and analyzed the effects of specific chemicals on the integrity of materials including plastics, composites, and metals.

Prior to joining Exponent, Dr. Myers was a Graduate Student Researcher at the University of California, Berkeley and Lawrence Berkeley National Laboratory. He has also worked in process engineering and process control in the pulp and paper industry.

**Academic Credentials and Professional Honors**

Ph.D., Chemical Engineering, University of California, Berkeley, 1999  
B.S., Forest Resources—Pulp and Paper Science, University of Washington (*magna cum laude*),  
1993

Golden Key National Honor Society; University of Washington Kyosti V. Sarkanen Scholarship, 1992; Technical Association of the Pulp and Paper Industry (TAPPI) Engineering Division Scholarship, 1992; TAPPI Paper and Board Manufacture Division Scholarship, 1992

### **Licenses and Certifications**

Registered Professional Chemical Engineer, California, #CH6329; Registered Professional Chemical Engineer, Maine, #12065; Registered Professional Engineer, Colorado, #PE-43576; Registered Professional Engineer, Ohio, 74253; Registered Professional Engineer, Georgia, PE036505

Blasting Certificate of Competency, Massachusetts, BL 7189; Certified Fire and Explosion Investigator (CFEI) in accordance with the National Association of Fire Investigators; Certified Fire Investigator (CFI) in accordance with the International Association of Arson Investigators; Fire Origin and Cause Investigation Training, California State Fire Marshal; Confined Space Entry Certification, 29 CFR 1910.146; Hazardous Waste Operation and Emergency Response Certification, 29 CFR 1910.120

### **Publications and Conference Proceedings**

Ashcraft RW, Ibarreta A, Myers, TJ. Leaking gas from a snow-covered pipe: Empirical evidence and modeling of preferential flow paths. *Journal of Fire Protection Engineering* 2011; 21:57–79.

Ashcraft RW, Ibarreta AF, Myers, TJ. Preferential gas flow around a snow-covered pipe: Empirical evidence and modeling. *Proceedings, International Symposium on Fire Investigation Science and Technology*, Hyattsville, MD, 2010.

Kytömaa HK, Myers TJ, Ibarreta AF, Ponchaut N. Using real time process models to detect loss of containment and mitigate hazards. *Proceedings, 12<sup>th</sup> Process Plant Safety Symposium*, American Institute of Chemical Engineers Spring National Meeting, San Antonio, TX, 2010.

Myers TJ, Kytömaa HK, Ibarreta AF, Ponchaut N. Analyzing historic process data to identify near misses and warning signs: Examples from the Buncefield incident. *Proceedings, 6<sup>th</sup> Global Congress on Process Safety*, American Institute of Chemical Engineers Spring National Meeting, San Antonio, TX, 2010.

Myers TJ, Ibarreta AF. Investigation of the Jahn Foundry and CTA Acoustics dust explosions: Similarities and differences. *Journal of Loss Prevention in the Process Industries* 2009; 22:740–745.

Myers TJ. Dust explosions. *Georgia Defense Lawyer* 2009; VI(II):12, 27, 28.

Myers TJ, Ibarreta AF. Case study of a hydrogen explosion in an electrical panel. *Fire Safety Magazine* 2009 Spring; 12–19.

Myers TJ, Ibarreta AF, Ashcraft RW. Dust explosion prevention: regulations, standards, and mitigation techniques. Proceedings, 43<sup>rd</sup> Annual Loss Prevention Symposium, American Institute of Chemical Engineers Spring National Meeting, Tampa, FL, 2009.

Myers TJ. Reducing aluminum dust explosion hazards: Case study of dust inerting in an aluminum buffing operation. *Journal of Hazard Materials* 2008; 159(1):72–80.

Myers TJ, Long RT, Gavelli F, Kytömaa HK. The use of smoke detector sequence of activation in determining the area of origin of a fire: investigation of the FedEx DC-10 fire. Proceedings, International Symposium on Fire Investigation Science and Technology, Cincinnati, OH, 2008.

Myers TJ, White KC, Xu T. Did a dust explosion occur? Microscopic and thermogravimetric techniques to determine if dust participated in an explosion event. Proceedings, International Symposium on Fire Investigation Science and Technology, Cincinnati, OH, 2008 and Proceedings, Mary Kay O'Connor Process Safety Center Symposium, College Station, TX, 2008.

Myers TJ, Hinze PC, Kytömaa HK. Fire and explosion in an explosives conditioning bunker. Proceedings, 42<sup>nd</sup> Annual Loss Prevention Symposium, American Institute of Chemical Engineers Spring National Meeting, New Orleans, LA, 2008.

Myers TJ, Ibarreta AF. Case study of a hydrogen explosion in an electrical panel. Proceedings, 42<sup>nd</sup> Annual Loss Prevention Symposium, American Institute of Chemical Engineers Spring National Meeting, New Orleans, LA, 2008.

Myers TJ, Ibarreta AF. Investigation of the Jahn Foundry and CTA acoustics dust explosions: Similarities and differences. Proceedings, Mary Kay O'Connor Process Safety Center Symposium, College Station, TX, 2007.

Rangwala AS, Myers TJ, Ibarreta AF. Measurements of the non-dimensional Frank-Kamenetskii number using a standard dust layer ignition testing apparatus. Proceedings, 5<sup>th</sup> International Seminar on Fire and Explosion Hazards, Edinburgh, UK, 2007.

Myers TJ, Kytömaa HK, Smith TR. Environmental stress-corrosion cracking of fiberglass: Lessons learned from failures in the chemical industry. *Journal of Hazardous Materials* 2007; 142(3):695–704.

Myers TJ. Reducing aluminum dust explosion hazards: Case study of dust inerting in an aluminum buffing operation. Proceedings, Mary Kay O'Connor Process Safety Center Symposium, College Station, TX, 2006.

Myers TJ. Concurrent investigations with the CSB—The perspective of a private party investigator. Proceedings, International Symposium on Fire Investigation Science and Technology, Cincinnati, OH, 2006.

Myers TJ, McWhorter T. Making a reactive chemical system inherently safer at a small company: Case study of the CDG Gas:Solid™ chlorine dioxide generator. Proceedings, Mary Kay O'Connor Process Safety Center Symposium, College Station, TX, 2005.

Myers TJ, Kytömaa HK, Smith TR. Environmental stress-corrosion cracking of fiberglass: Lessons learned from failures at small chemical facilities. Proceedings, Mary Kay O'Connor Process Safety Center Symposium, College Station, TX, 2005.

Myers TJ. Dust explosions in the pulp and paper industry. Proceedings, Technical Association of the Pulp and Paper Industry Engineering, Pulping, and Environmental Conference, Philadelphia, PA, 2005.

Myers TJ, Kytömaa HK, Martin RJ. Fires and explosions in vapor control systems: A lessons learned anthology. Process Safety Progress 2003; 22(4):195–199.

Martin RJ, Myers TJ, Hinze PC, Kytömaa HK. Test your incinerator knowledge. Chemical Engineering Progress 2003; 99(2):36–39.

Martin RJ, Hinze PC, Myers TJ, Kytömaa HK. Thermal oxidizing systems. Hydrocarbon Processing 2002; 81(11):79–80.

Myers TJ, Kytömaa HK, Martin RJ. Fires and explosions in vapor control systems: A lessons learned anthology. Proceedings, 36<sup>th</sup> Annual Loss Prevention Symposium, American Institute of Chemical Engineers Spring National Meeting, New Orleans, LA, 2002.

Myers TJ, Radke CJ. Transient foam displacement in the presence of residual oil: Experiment and simulation using a population-balance model. Industrial & Engineering Chemistry Research 2000; 39:2725–2741.

Myers TJ. The role of residual oil in the mechanistic simulation of foam flow in porous media: Experiment and simulation with the population-balance method. Ph.D. Dissertation, University of California, Berkeley, 1999.

## **Presentations**

Bucher, JM, Ibarreta, AF, Myers, TJ. Combustible dusts: hazard recognition and abatement. Greater Boston Chapter American Society of Safety Engineers (ASSE), Hopkinton, MA, 2011.

Myers TJ. How a small company responded to incidents and made a reactive chemical system inherently safer. AIChE Northeast Regional Conference, New York, NY, 2011.

Ibarreta AF, Myers TJ. Fires and explosions involving fuel gas systems. First Party Claims Conference (FPCC), Providence-Warwick, RI, 2010.

Ibarreta AF, Ashcraft RW, Myers, TJ. Preferential gas flow around a snow-covered pipe: Empirical evidence and modeling. International Symposium on Fire Investigation Science and Technology, Hyattsville, MD, 2010.

Myers TJ. OSHA regulation updates on powder coating safety—Explosion prevention and fire suppression systems. National Association of Pipe Coating Applicators Summer Workshop, Houston, TX, 2010.

Myers TJ, Ibarreta AF. Investigation of explosions using engineering analysis. Worcester Polytechnic Institute (WPI), Department of Fire Protection Engineering, Worcester, MA, 2010.

Kytömaa HK, Myers TJ, Ibarreta AF, Ponchaut NF. Using real time process models to detect loss of containment and mitigate hazards. 12<sup>th</sup> Process Plant Safety Symposium, American Institute of Chemical Engineers Spring National Meeting, San Antonio, TX, 2010.

Myers TJ, Kytömaa HK, Ibarreta AF, Ponchaut NF. Analyzing historic process data to identify near misses and warning signs: Examples from the Buncefield incident. 6<sup>th</sup> Global Congress on Process Safety, American Institute of Chemical Engineers Spring National Meeting, San Antonio, TX, 2010.

Myers TJ, Ibarreta AF. Water leaks, oil spills and gas explosions – When good pipes go bad. Cozen O’Connor, Philadelphia, PA, 2010.

Kytömaa HK, Myers TJ, Ibarreta AF, Ponchaut NF. Anatomy of the failures that led to the Buncefield explosion and fire. Mary Kay O’Connor Process Safety Center Symposium, College Station, TX, 2009.

Myers TJ. Dust explosions. Webinar, American Institute of Chemical Engineers, 2009.

Myers TJ, Ibarreta AF, Ashcraft RW. Dust explosion prevention: regulations, standards, and mitigation techniques. 43<sup>rd</sup> Annual Loss Prevention Symposium, American Institute of Chemical Engineers Spring National Meeting, Tampa, FL, 2009.

Myers TJ, Ibarreta AF. Using fire protection engineering to investigate explosions. Worcester Polytechnic Institute (WPI), Department of Fire Protection Engineering, Worcester, MA, 2009.

Myers TJ. Dust explosion mitigation: OSHA regulations and relevant standards. National Association of Pipe Coating Applicators Summer Workshop, Houston, TX, 2008.

Myers TJ, Long RT, Gavelli F, Kytömaa HK. The use of smoke detector sequence of activation in determining the area of origin of a fire: investigation of the FedEx DC-10 fire. International Symposium on Fire Investigation Science and Technology, Cincinnati, OH, 2008.

Myers TJ, White KC, Xu T. Did a dust explosion occur? Microscopic and thermogravimetric techniques to determine if dust participated in an explosion event. International Symposium on Fire Investigation Science and Technology, Cincinnati, OH, 2008 and Mary Kay O’Connor Process Safety Center Symposium, College Station, TX, 2008.

Myers TJ, Hinze, PC, Kytömaa, HK. Fire and explosion in an explosives conditioning bunker. 42<sup>nd</sup> Annual Loss Prevention Symposium, American Institute of Chemical Engineers Spring National Meeting, New Orleans, LA, 2008.

Myers TJ, Ibarreta AF. Case study of a hydrogen explosion in an electrical panel. 42<sup>nd</sup> Annual Loss Prevention Symposium, American Institute of Chemical Engineers Spring National Meeting, New Orleans, LA, 2008.

Myers TJ, Ibarreta AF. Explosion investigation: Reverse-engineering a blast scene. Worcester Polytechnic Institute (WPI), Department of Fire Protection Engineering, Worcester, MA, 2007.

Myers TJ. Dust explosions—Identifying and mitigating the hazard using consensus standards. American Society of Safety Engineers (ASSE) Professional Development Conference, New England Area, Worcester, MA, 2007.

Ramirez J, Myers TJ, Long RT. Identificación de los Peligros de Explosiones de Polvo Usando las Normas de la NFPA. XXII Exposición, SegurShow 07, Caracas, Venezuela, 2007.

Myers TJ, Ibarreta AF. Investigation of the Jahn Foundry and CTA acoustics dust explosions: Similarities and differences. Mary Kay O'Connor Process Safety Center Symposium, College Station, TX, 2007.

Myers TJ, Long RT. Identification of dust explosion hazards and mitigation using NFPA Standards. National Fire Protection Association World Safety Congress and Exposition, Boston, MA, 2007.

Myers TJ, Wu N. Material flammability and its contribution to fire growth. The Hartford Financial Services Group, Hartford, CT, 2007.

Rangwala AS, Myers TJ, Ibarreta AF. Measurements of the non-dimensional Frank-Kamenetskii number using a standard dust layer ignition testing apparatus. 5<sup>th</sup> International Seminar on Fire and Explosion Hazards, Edinburgh, UK, 2007.

Myers TJ. Reducing aluminum dust explosion hazards: Case study of dust inerting in an aluminum buffing operation. Mary Kay O'Connor Process Safety Center Symposium, College Station, TX, 2006.

Myers TJ. Concurrent investigations with the CSB—The perspective of a private party investigator. International Symposium on Fire Investigation Science and Technology, Cincinnati, OH, 2006.

Myers TJ, McWhorter T. Making a reactive chemical system inherently safer at a small company: Case study of the CDG Gas:Solid™ chlorine dioxide generator. Mary Kay O'Connor Process Safety Center Symposium, College Station, TX, 2005.

Myers TJ, Kytömaa HK, Smith TR. Environmental stress-corrosion cracking of fiberglass: Lessons learned from failures at small chemical facilities. Mary Kay O'Connor Process Safety Center Symposium, College Station, TX, 2005.

Myers TJ. Dust explosions in the pulp and paper industry. Technical Association of the Pulp and Paper Industry Engineering, Pulping, and Environmental Conference, Philadelphia, PA, 2005.

Myers TJ. Scientific investigation of fires and explosions. Pennsylvania Defense Institute Annual Meeting, Gettysburg, PA, 2004.

Myers TJ, Kytömaa HK, Martin RJ. Fires and explosions in vapor control systems: A lessons learned anthology. 36<sup>th</sup> Annual Loss Prevention Symposium, American Institute of Chemical Engineers Spring National Meeting, New Orleans, LA, 2002.

Myers TJ, Radke CJ. The bridging coefficient as an antifoaming criterion: Thermodynamic basis and film-rupture mechanisms. American Institute of Chemical Engineers Annual Meeting, Dallas, TX, 1999.

Myers TJ, Radke CJ. Transient foam displacement in the presence of residual oil: Experiment and simulation using a population-balance model. Society of Petroleum Engineers Annual Technical Conference and Exhibition, Houston, TX, 1999.

Myers TJ, Radke CJ. The role of residual oil in the mechanistic simulation of foam flow in porous media: Theory and experiment. 68<sup>th</sup> Annual Western Regional Meeting of the Society of Petroleum Engineers, Bakersfield, CA, 1998.

Myers TJ, Radke CJ. Mechanism of rupture of foam lamellae moving across a wetting discontinuity. American Institute of Chemical Engineers Annual Meeting, Los Angeles, CA, 1997.

### **Peer Reviewer**

- *Journal of Composite Materials*
- *Journal of Hazardous Materials*

### **Professional Affiliations**

- American Institute of Chemical Engineers—AIChE (Senior Member, Member of Safety & Health Division)
- AIChE Boston Section – Ichthyologists (Member, Chem E Car Safety Inspector)
- American Society for Testing and Materials—ASTM (Member Committee E27 on Hazard Potential of Chemicals)
- International Association of Arson Investigators—IAAI (Member, CFI)
- IAAI, Massachusetts Chapter—MAIAAI (Member)
- National Association of Fire Investigators—NAFI (Member, CFEI)

- National Fire Protection Association—NFPA
  - Principal Member: Committee on Fundamentals of Combustible Dusts
  - Principal Member: Technical Correlating Committee on Combustible Dusts
  - Principal Member: Committee on Agricultural Dusts responsible for NFPA 61 *Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities*
  - Alternate member: Committee on Explosion Protection Systems responsible for NFPA 68 *Standard on Explosion Protection by Deflagration Venting* and NFPA 69 *Standard on Explosion Prevention Systems*
  - Principal Member: Committee on Combustible Metals and Metal Dusts responsible for NFPA 484 *Standard for Combustible Metals*
  - Principal Member Committee on Electrical Equipment in Chemical Atmospheres responsible for NFPA 496 *Standard for Purged and Pressurized Enclosures for Electrical Equipment*, NFPA 497 *Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*, and NFPA 499 *Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*
  - Principal Member Committee on Wood and Cellulosic Materials Processing responsible for NFPA 664 *Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities*
- Technical Association of the Pulp and Paper Industry—TAPPI (Member)