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MICHAEL L. HANKS, Ph.D., P.E.
SENIOR CONSULTANT

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Dr. Michael L. Hanks has a Ph.D. in chemical engineering and is a Senior Consultant for Engineering Systems Inc. (ESi). Dr. Hanks investigates industrial and residential fires and explosions, chemical process incidents, manufacturing process incidents, and hazardous materials release and exposure incidents. He is a NAFI certified fire and explosion investigator. He investigates failures caused by unexpected or uncontrolled chemical reactions and issues due to incompatible materials, analyzes chemicals to identify unknown materials or contaminants, and evaluates compliance with OSHA regulations for chemical hazard communication and general industry safety practices. Dr. Hanks managed a corporate laboratory that performed chemical analysis and product-performance testing, and led the materials development function that was responsible for developing and evaluating coatings and adhesives, thermoplastic compounds, and thermoplastic elastomers. He has failure analysis experience with polyurethanes, polyolefins, PVC, EDPM rubber compounds, and other polymers.

Areas of Specialization

Fire and Explosion Investigations
Chemical Reactions
Hazardous Materials
OSHA General Industry Safety Regulations
Intellectual Property
Composites
Project Management
Chemical and Manufacturing Processes
Testing and Chemical Analysis
Dust Explosions
Hydraulic Hose Failures
Polymers and Polymer Processing
Product and Process Development
Paints, Coatings, and Adhesives

Education

Ph.D., Chemical Engineering, Carnegie Mellon University, 1991
M.S., Chemical Engineering, Brigham Young University, 1988
B.S., Chemical Engineering, Brigham Young University, 1986

March 2019

Licensed Professional Engineer (P.E.)

State of Alabama ..... License No. 31781
State of Florida …….. License No. 63487
State of Georgia …… License No. PE033903
State of Illinois ……... License No. 062-057676
State of Indiana …….. License No. PE10505013
State of Iowa ……..... License No. 17674
State of Kentucky ……... License No. 24708
State of Michigan …….. License No. 6201040973
State of Mississippi ……... License No. 20092
State of North Carolina ……..License No. 038133
State of Ohio ……..…. License No. PE68996
State of Pennsylvania ……...License No. PE071173
State of South Carolina ……. License No. 28746
State of Texas ……... License No. 112566
State of Wisconsin …… License No. 37176-6

Continued Education

Process Safety Management for Bioethanol Plants
September 28, 2017
PHAST Training
May 16 – 18, 2016
Pressure Relief Basics
September 14, 2015
Dust Explosion Prevention
September 4, 2015
Pneumatic Conveying of Bulk Solids
June 26, 2015
Dust Explosion Control
September 4, 2015
Layer of Protection Analysis (LOPA)
May 8, 2014
OSHA GHS & Hazard Communication Course
November 21, 2013
International Symposium on Fire Investigation Science and Technology
2012, 2014, 2016
Chemical Reactivity Hazards
March 15, 2013
SynerGee Gas and Unsteady Module Training
January 16 – 20, 2012

HazOp – Process Hazard Analysis
November 14 – 16, 2011
HAZWOPER Refresher
August 9, 2018 most recent
NAFI CFEI
2014
NCSF/TWGFEX Fire Dynamics
September 15, 2009
Advanced Fire, Arson, & Explosion Investigation Training Program
August 3 – 5, 2009
OSHA 503 Update for General Industry Outreach Trainers
October 31 – November 2, 2007
U.S. Industrial and Consumer Labeling
September 27, 2007
PSM: Design and Evaluation of Process Safety Management Systems
March 19 – 21, 2007
Dust Explosions: Fundamentals and Modern Developments
April 23, 2006
Fire Science & Fire Investigation
April 3 – 7, 2006
Electricity and Fire
September 15 – 16, 2005
Basic Fire Investigation
September 12 – 14, 2005
Permit Required Confined Space Entry
December 8 – 10, 2004
Hazardous Materials Incident Response Operations (HAZWOPER) EPA 165.5
February 9 – 13, 2004, February 5-21, 2010 (online course)
OSHA 501 Trainer Course in Occupational Safety & Health Standards for General Industry
November 10 – 13, 2003
Investigation of Gas and Electric Appliance Fires
November 7 – 8, 2002

Professional Affiliations

American Institute of Chemical Engineers
American Chemical Society
Society of Plastics Engineers
National Fire Protection Association
National Association of Fire Investigators
Product Development and Management Association
Sigma Xi

Positions Held

Engineering Systems Inc., Atlanta, Georgia
Senior Consultant, 2008 – Present

ITC Expert Services, Saint Petersburg, Florida
Vice President Chemical Technology, 2007 – 2008

Packer Engineering, Ann Arbor, Michigan
Senior Director, 2002 – 2007

Cooper-Standard Automotive, Dearborn, Michigan
Director of Materials Development, 1996 – 2002

Aeroquip Corporation, Ann Arbor, Michigan
Associate Engineer, 1994 – 1996

DuPont, Brevard, North Carolina
Technical Services Engineer, 1991 – 1993

Teaching

General Chemistry, Washtenaw Community College
Part-Time Instructor, 1994 – 1996

Publications/Presentations

Presentation “Fire Chemistry and Thermodynamics; Hazardous Materials (Topics for NFPA 1033)” presented to the Liberty Mutual Fire Investigation Unit, May 24, 2017.

“Stratification During Vapor or Gas Freeing of Storage Tanks,” M. L. Hanks, A. E. Gray, R. Pape, 13th Global Conference on Process Safety, San Antonio, TX, 2017

“Estimating Fuel Gas Concentration in an Enclosed Room,” M. L. Hanks, A. E. Richards, R. Pape, International Symposium on Fire Investigation, Scottsdale, AZ, ISFI 2016

“Avoiding Accidents and OSHA Citations by Knowing Your Combustible Dust Hazards,” M. L. Hanks, R. Kenney, Powder and Bulk Engineering, Vol. 26, No.12, December, 2012

“Challenges in Investigating Chlorinated Polyvinyl Chloride Pipe Failures,” M. D. Hayes, M. L. Hanks, F. E. Hagan, D. Edwards, D. Duvall, Journal of ASTM International, Vol. 8, No. 1, Paper ID JAI102854, January 2011

Presentation “Product Development and Products Liability” presented at The Hartford Southeast Commercial Claim Center, August 24, 2010

“Failures Due to Product Changes: The Importance of Performance Testing when Making Product Modifications,” M. L. Hanks, Journal of Failure Analysis and Prevention, Vol. 9 No. 6, pp 499-503, 2009

Presentation “Failure Investigation of a Modified Product: The Importance of Performance Testing When Making Small Changes to Existing Products” presented at The Society of Plastics Engineers Annual Technical Conference 2009.

Presentation “Chemical Hazards Before, During, and After a Fire” presented at the Georgia Fire Investigator’s Association Spring Meeting, March 26, 2009

Presentation “Investigating Explosions” presented at The Hartford Southeast Claim Center, March 12, 2009

Presentation “Introduction to Process Safety Management” presented to the University of Michigan Chemical Engineering Department graduate and undergraduate students, March 22, 2007

Invited guest lecturer (CIV ENG 395-0 Engineering Forensics) at Northwestern University, Robert R. McCormick School of Engineering and Applied Science, 2006

Presentation “Why OSHA: An Introduction to OSHA General Industry Safety Regulations” presented to the University of Michigan Chemical Engineering Department graduate and undergraduate students, December 1, 2005

Presentation “A Primer on the Investigation of Fires and Explosions” presented to the Illinois Strike Force on Fire and Arson, October 15, 2003 and to the Ohio Association of Civil Trial Attorneys, June 18, 2004

Chair of the 2002 Automotive Elastomers Conference, Dearborn, MI

Presentation: M. L. Hanks and W. Noble, “Optimizing Simulated Molding Conditions Using Designed-Experiment Methods,” C-Mold Users Group, 1995

“Relative Importance of Macro- and Micro-Mixing in Turbulent, Reacting Jets,” M. L. Hanks and H. L. Toor, I&EC Research, Vol. 34, pp 3252-3256, 1995