



AMY E. GRAY, Ph.D., P.E.
SENIOR MANAGING CONSULTANT
MANAGER OF MIAMI OPERATIONS

aegray@engsys.com

Dr. Gray is a Senior Managing Consultant with Engineering Systems Inc. (ESi), as well as the Manager of Miami operations. She is experienced in mechanical engineering and failure analysis, with specialization in explosions, fires, mechanical systems, and products. Her expertise includes mechanical product failure, gas explosions, dust explosions, tank and boiler ruptures, natural gas pipeline and utility incidents, aviation fire analysis, and chemical processing plant incidents. Dr. Gray has employed blast dynamics, dispersion, and fire dynamics analyses in many of these investigations, as well as performed numerous on-site and laboratory investigations. Additionally, Dr. Gray has expertise in Dust Hazard Analysis (DHA), Process Hazard Analysis (PHA) and Computed Tomography (CT) data analysis.

Prior to joining ESi, she gained experience in the design and implementation of aircraft cooling systems. Her graduate research related to the gas transport and internal-reforming chemistry of alternative fuels within various solid oxide fuel cell anode support materials. She designed, built, and optimized a unique experimental reactor, a protocol utilizing both mass spectrometry (MS) and gas chromatography (GC), and a computational fluid dynamics model including gas-phase and catalytic reactions for the analysis of fuel cell anodes. Dr. Gray also has experience with ceramics processing, material microstructure characterization, and in the dispersion and measurement of aerosols.

Areas of Specialization

Fire and Explosion
Fire Dynamics
Computational Fluid Dynamics
Gas Dispersion Analysis
Explosion Blast Effects
Thermal-Fluid Sciences and Heat Transfer
Chemical and Manufacturing Processes
Industrial and Process Safety
Aviation
Computed Tomography (CT)
Gas Chemical Analysis
Dust and Process Hazard Analysis
Product Liability

Education

Ph.D., Mechanical Engineering, Chemical Engineering Minor, Colorado School of Mines, 2012
M.S., Mechanical Engineering, Colorado School of Mines, 2010
B.S., Mechanical Engineering, Texas A & M University, 2006

Licensed Professional Engineer (P.E.)

State of Arkansas _____ License No. 19420
State of Florida _____ License No. 84063

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State of Louisiana _____ License No. 43069
State of North Carolina _____ License No. 044997
State of South Carolina _____ License No. 34957
State of Texas _____ License No. 118830
NCEES Record _____ ID No. 15-278-12

Other Certifications

Certified Fire and Explosion Investigator (CFEI).....License No. 19458-10979

Professional Affiliations/Honors

American Society of Mechanical Engineers (ASME)
American Institute of Chemical Engineers (AIChE)
International Association of Arson Investigators (IAAA)
National Association of Fire Investigators (NAFI)
National Fire Protection Association (NFPA)
Society of Fire Protection Engineers (SFPE)
Society of Women Engineers (SWE)
Contributing Member, AIChE Division of Safety and Health, 2016 - 2018
Member, Loss Prevention Symposium, American Institute of Chemical Engineers, 2019 - Present

Positions Held

Engineering Systems Inc., Miami, Florida

Senior Managing Consultant, December 2019 - Present
Senior Consultant, April 2019 – Present
Manager of Miami Operations, April 2019 – Present

Engineering Systems Inc., Charlotte, North Carolina

Senior Consultant, 2017 – April 2019
Manager of North Carolina Operations, 2018 – April 2019

Engineering Systems Inc., Dallas, Texas

Senior Consultant, 2017
Senior Staff Consultant, 2015 - 2016
Staff Consultant, 2013 – 2015

L-3 Communications, Greenville, Texas

Mechanical Systems Engineer, 2012 - 2013

Colorado School of Mines, Golden, Colorado

Research Assistant, 2008 - 2012
Teaching Assistant, 2007 - 2008

Sandia National Laboratories, Albuquerque, New Mexico

Student Intern, Summers 2004 – 2005

Continued Education

Process Hazard Analysis (PHA) and Dust Hazard Analysis (DHA) Leader Training
ioMosaic, 2017

US DHS Toxic Inhalation Hazard Chlorine Release Modeling Test (by invitation)
Dugway Proving Grounds, 2015

Advanced Fire, Arson, and Explosion Training Program
National Association of Fire Investigators, 2014

Computer Fire Modeling
National Association of Fire Investigators, 2014

Hazardous Waste Operations and Emergency Response (OSHA HAZWOPER) 40-Hr Certification
Houston Area Safety Council, 2014

Fire Dynamics Simulator
Seneca College School of Fire Protection, 2014

Phast Software Training Course
Det Norske Veritas, 2013

Publications

1. D. Connolley, J. Forest, **A. Gray**. "Hit the Ground Running (Safely): Process Safety for the Early Career Engineer," *13th Global Congress on Process Safety Conference Proceedings*. American Institute of Chemical Engineers. March 2017.
2. M. Hanks, **A. Gray**, R. Pape. "Stratification During Vapor of Gas Freeing of Storage Tanks," *13th Global Congress on Process Safety Conference Proceedings*. American Institute of Chemical Engineers. March 2017.
3. R. Pape, **A. Richards**, M. Hanks. "Apparent Discrepancies in Methods for Predicting the Explosion Energies and Blast Effects of BLEVES," *12th Global Congress on Process Safety Conference Proceedings*. American Institute of Chemical Engineers. April 2016.
4. J. Jordan and **A. Richards**. "The New State of the Art in Evidence Preservation and Interrogation," *For the Defense*. November 2013: 64-68.
5. **A.E. Richards** and N.P. Sullivan. "The interdependence of macro- and microstructure on internal-reforming performance in Ni-YSZ SOFC anode supports," *Fuel Cells: From Fundamentals to System*. 13.4 (2013): 470-475.

6. **A.E. Richards**. "Gas Transport and Internal Chemistry of Solid Oxide Fuel Cell Anode Supports Operating on Alternative Fuels," Ph.D. Dissertation, Colorado School of Mines, May 2012.
7. D.M. Murphy, **A.E. Richards**, A. Colclasure, W. A. Rosensteel, and N.P. Sullivan. "Biogas fuel reforming for solid oxide fuel cells," *Journal of Renewable and Sustainable Energy* 4.2 (2012): 023106.
8. **A.E. Richards**, M.G. McNeeley, R.J. Kee, and N.P. Sullivan. "Gas transport and internal-reforming chemistry in Ni-YSZ and ferritic-steel supports for solid-oxide fuel cells," *Journal of Power Sources*. 196.23 (2011): 10010-10018.
9. **A.E. Richards**. "A Unique Experimental Tool for the Evaluation of Gas Transport and Internal-Reforming Chemistry within Solid Oxide Fuel Cell Anodes," M.S. Thesis, Colorado School of Mines, May 2010.

Presentations

1. **A.E. Gray**, "Explosions and Pressure Vessel Ruptures: An Overview with Claims and Litigation Considerations," presented to various legal and insurance audiences.
2. M.C.K. Sellers, **A.E. Richards**, "The Rainham Chemical Works Explosion: A 100th Anniversary Perspective," Materials Science & Technology 2016, Salt Lake City, Utah, October 2016.
3. M.D. Pratt, **A.E. Richards**, "Applications of New Technologies to Complex Explosion Investigation," *Propane Gas Defense Association Meeting, Invited Speaker*, New Orleans, Louisiana, September, 2016.
4. M.E. Stevenson, **A.E. Richards**, "Emerging Technologies for Handling Complex Evidence," *Trial Attorneys of America Meeting*, Invited Speaker, Chicago, Illinois, June, 2016.
5. **A.E. Richards**, "Technologies in Incident Investigation," *The Chlorine Institute Health, Environment, Safety and Security Seminar*, Invited Speaker, Dallas, Texas, April, 2016.
6. M.B. Craddock, **A.E. Richards**, "New Technologies in Incident Investigation," *Natural Gas Claims & Litigation Association Meeting*, San Antonio, Texas, April, 2015.
7. A.R. Shah, J.G. Jordan, **A.E. Richards**, "Computed Tomography X-Ray Imaging – a Technique for Non-Destructive Examination of Plastic Products," *2015 SPE ANTEC® Conference*, March, 2015.
8. R. Pape, **A.E. Richards**, M. Hanks, "Discrepancies in Methods for Predicting the Explosion Energy of BLEVEs," *AICHE Midwest Regional Conference*, Chicago, IL March, 2015.
9. **A.E. Richards**, J.G. Jordan, "Uses and Capabilities of Computed Tomography in Forensic Engineering and Science," *Materials Science and Technology (MS&T) 2014 Conference*, Pittsburgh, PA October, 2014.
10. **A.E. Richards**, N.P. Sullivan, R.J. Kee, M. McNeeley, and S. Babiniec, "Gas transport and internal reforming chemistry in SOFC anode supports and structures," *219th Meeting of the Electrochemical Society (SOFC XII)*, Montreal, Canada, May 1-6, 2011.

11. S. Babiniec, **A.E. Richards**, N. Faino, and N.P. Sullivan, "Development, fabrication, and testing of perovskite-based anodes for tubular solid oxide fuel cells," *219th Meeting of the Electrochemical Society (SOFC XII)*, Montreal, Canada, May 1-6, 2011.
12. D.M. Murphy, **A.E. Richards**, A. Colclasure, W. Rosensteel, and N.P. Sullivan, "Biogas fuel reforming for solid oxide fuel cells," *219th Meeting of the Electrochemical Society (SOFC XII)*, Montreal, Canada, May 1-6, 2011.
13. **A.E. Richards**, N.P. Sullivan, R.J. Kee, and H. Zhu, "Internal reforming chemistry in novel SOFC anodes and architectures," *European Fuel Cell Forum*, Lucerne, Switzerland, June 28-July 2, 2010.