



# FireTox

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## **JAMIE MCALLISTER, Ph.D., P.E., C.F.I., C.S.P.**

### **EDUCATION:**

Ph.D., Toxicology, University of Maryland, School of Medicine, Baltimore, MD, 2010.  
M.S., Fire Protection Engineering, University of Maryland, School of Engineering, College Park, MD, 2002.  
B.S., Fire Protection Engineering, University of Maryland, School of Engineering, College Park, MD, 2000.

### **DOCTORAL THESIS:**

Ferrino-McAllister, J. "Fire Victim Blood Cyanide Stability and the Development of a Cyanide Uptake Model",  
University of Maryland, Baltimore, May 2010.

### **MASTER THESIS:**

Ferrino, J. "An Investigation of Fire Phenomena in Residential Electrical Wiring and Connections", University of  
Maryland, College Park, December 2002.

### **PROFESSIONAL EXPERIENCE:**

**FireTox, LLC, New Market, MD, 2017 to present.**

***Technical Director, Principal Engineer and Toxicologist***

Responsible for managing daily business operations including litigation and fire protection engineering services, as well as research and training initiatives. Serve as lead forensic investigator and expert witness for fire, combustion, and toxicological incidents. Serve as the principal investigator on fire science and toxicological research projects including those associated with occupational safety and health, combustion toxicity, forensic toxicology, fire investigation, fire protection systems, and fire service training. Serve as principal fire protection engineer on design and construction projects involving complex structures and systems, performance-based approaches, fire modeling, and tenability analyses. Serve as the lead instructor for fire death/injury and fire investigation training courses.

**Combustion Science & Engineering, Inc., Columbia, MD, 2000 to 2020.**

***Consulting Engineer/Toxicologist (8/2013 to 2/2020)***

Responsible for the evaluation of issues related to fire, combustion, and toxicological incidents. Conduct fire hazard analysis, forensic failure investigations, post-fire reconstruction analyses, victim toxicological analyses, computational fluid dynamics fire modeling, fire dynamics analyses, case-related large and small-scale experimentation, fire alarm and suppression system failure analyses including re-design, and building and fire code compliance reviews. Serve as an expert witness on fire litigation cases with experience spans a broad range of both criminal and civil cases.

***Principal Engineer/Toxicologist (5/2010 to 7/2013)***

Responsible for managing the fire investigations unit and acting as a lead scene investigator and expert witness. Directed, managed, and conducted fire, combustion, and toxicological incident investigations. Directed, managed, and conducted engineering fire hazard analyses and forensic failure investigations to prevent and/or explain fires, explosions, and toxicological incidents. Directed, managed, and conducted post-fire reconstruction analyses, victim toxicological analyses, computational fluid dynamics fire

modeling, fire dynamics analyses, case-related large and small-scale experimentation, fire alarm and suppression system failure analyses including re-design, and building and fire code compliance reviews. Directed, managed, and conducted investigations of carbon monoxide poisoning incidents from combustion devices. Additional areas of focus included fire department operations as it related to fire spread, damage, and pattern development, and drug and alcohol effects as it related to victim impairment. Served as an expert witness on fire litigation cases with experience spans a broad range of both criminal and civil cases.

***Senior Engineer (1/2007 to 4/2010)***

Performed the duties previously described under “*Project Engineer*” as well as directed and managed other Project Engineers in the performance of the same duties. Served as an expert witness in fire litigation cases.

***Project Engineer (12/2002 to 12/2006)***

Performed origin and cause investigations; Conducted engineering fire hazard analyses and forensic failure investigations to prevent and/or explain fires and explosions; Oversaw post-fire reconstruction and laboratory testing; Performed code review, fire modeling (CFAST and FDS), fire dynamics analyses, carbon monoxide poisoning analyses, and fire victim toxicological analyses.

***Staff Engineer (12/2000 to 11/2002)***

Performed origin and cause investigations and the duties previously described under “*Engineering Technician*” in a full-time capacity; Designed (in addition to conducting) laboratory tests for litigation support and research and development; Performed code reviews, fire modeling (CFAST and FDS), and fire dynamics analyses for litigation support.

***Engineering Technician (5/2000 to 11/2000)***

Assisted lead origin and cause investigators in the investigation of residential, commercial, industrial, and vehicular fires; Conducted laboratory experiments for the purposes of post-fire reconstruction analyses and product failure analyses in conjunction with fire litigation; Conducted laboratory experiments for the purposes of fire modeling validation; Conducted laboratory experiments for government-funded and corporate-funded research and development; Responsible for designing data acquisition programs, constructing small and large-scale test compartments, and instrumenting compartments with thermocouples, heat flux gauges, and gas probes.

**National Institute of Standards and Technology, Gaithersburg, MD, 2013 to 2020.**

***Supervisory Fire Protection Engineer and NIST Authority Having Jurisdiction (8/2015 to 1/2020)***

Performed the duties previously described under “*Fire Protection Engineer*.” Performed the duties of the NIST Authority Having Jurisdiction for all NIST-owned and operated campuses including those located in Gaithersburg, MD, Boulder, CO, Fort Collins, CO, Charleston, SC, and Kauai, HI. Supervised and lead the Office of Safety, Health, and Environment, Fire & Facilities Safety Group composed of fire protection engineers, an electrical safety engineer, and a fire alarm system administrator. Developed the NIST Fire and Life Safety Program and implemented code adoptions, policies, and programs related to fire, life, and electrical safety applicable to all NIST campuses. Ensured campuses were complying with the requirements set forth in the International codes, NFPA codes, best practices adopted by NIST, and relevant OSHA regulations. Assisted the NIST workplace inspection team in identifying and remediating fire and life safety hazards in offices, laboratories, residential facilities, assembly spaces, healthcare clinic, and various other occupancy types. Managed contracts for fire alarm programming and fire alarm and suppression system inspection, testing, and maintenance on the NIST Gaithersburg and Boulder campuses. Graduated from the NIST New Leader Program and obtained certifications as a Certified Safety Professional and Level 2 Contracting Officer’s Representative.

***Fire Protection Engineer (8/2013 to 7/2015)***

Conducted laboratory hazard assessments to identify safety concerns related to usage of hazardous chemicals such as flammable, combustible, toxic, pyrophoric, explosive, and reactive gas, liquids, and solids. Provided requirements to eliminate or protect against hazards associated with laboratory research including implementation of monitoring devices, fire suppression and detection systems, and personal

protective equipment. Reviewed design and construction submittals for renovations and small- and large-scale construction projects on NIST campuses to ensure compliance with regulatory codes. Occupancy types included Assembly, Business, Factory, High-Hazard, Residential, Storage, Utility, and Miscellaneous Groups. Provided fire and life safety system design services to NIST. Acted as the lead investigator of fire and electrical incidents occurring on NIST campuses.

**University of Maryland, College Park, MD, 2014 to present.**

***Assistant Research Scientist (9/2021 to present)***

Serve as principal investigator on federally funded grant program investigating approaches to fire contaminant exposure control in the fire service and health and safety officer continuing education. Response for management of research program, collaborating with other research entities, and ensuring project deliverables are produced on time and within budget. Responsible for management of students assigned to perform research tasks.

***Lecturer (1/2014 to present)***

Instructor for the School of Engineering, Fire Protection Engineering Online Graduate Program. Responsibilities include educating graduate students on topics related to human behavior, people movement, life safety, heat and toxic species production, and tenability in fires.

***Fire Laboratory Technician (9/1999 to 5/2000)***

Used the cone calorimeter, performed flammability characteristics calculations. Conducted research project in conjunction with the National Institute of Standards and Technology studying burning characteristics of gypsum wallboard with varying layers of paint (over 150 tests). Research was published in "Flammability of Oil-Based Painted Gypsum Wallboard Subjected to Fire Heat Fluxes" by Dr. Mowrer and presented at the 2001 NFPA World Fire Safety Congress and Exposition.

**Eastern Kentucky University, Richmond, KY, 2010 to 2018.**

***Instructor/Facilitator (8/2010 to 5/2018)***

Online instructor and facilitator for Fire Protection Administration and Fire Protection and Safety Engineering Technology Programs. Responsibilities included educating undergraduate students on topics related to fire behavior, combustion sciences, and the use of statistics in fire safety analyses.

**University of Maryland, University College, Adelphi, MD, 2008 to 2017.**

***Associate Professor (8/2014 to 12/2017)***

Instructor for the Mathematics Departments. Responsibilities included educating undergraduate students on topics related to collegiate mathematics. Promotion to Associate Professor is based on years of service, as well as, relevant and effective service and support of institutional academic rigor.

***Assistant Professor (4/2008 to 7/2014)***

Instructor for the Fire Science and Mathematics Departments. Responsibilities included educating undergraduate students on topics related to fire origin and cause investigation, fire behavior, fire ignition, fire growth and spread, and legal considerations in fire investigation, as well as, mathematics.

**Stanton Engineering, Laurel, MD, 1999 to 2000.**

***Engineering Technician, (11/1999 to 5/2000)***

Used National Fire Codes, specifically NFPA 13, 72, and 101. Performed life safety analyses, fire alarm and sprinkler system design, fire modeling, and fire risk assessment. Notable projects: The Pentagon, United States Naval Academy, The Smithsonian Institute. Used *Microstation*

**Tilley Fire Equipment Company, Doylestown, PA, 1999.**

***Sprinkler System Designer/Engineering Technician (5/1999 to 8/1999, Summer Internship)***

Used National Fire Codes, specifically NFPA 13, 13D, and 13R. Designed retrofit, tenant finish, and new sprinkler systems. Performed field checks, surveyed installation and fabrication. Assessed blueprints, cut sheets, fabrication reports, and hydraulic calculations. Used *Autocad 14 w/ SprinkCad*.

**ABB Power Products, Montgomeryville, PA, 1997-1998.**

***Technician (1997 to 1998)***

Responsible for inventory and assembly of electrical power generation, transmission, and distribution equipment including circuit breakers, transformers, switchgear, controls, and relays.

**RELATED EXPERIENCE:**

*Contract Instructor:* National Fire Academy, Emmitsburg, MD

*Reviewer:* Fire Technology, Fire Safety Journal, International Association of Fire Safety Science, and Brady Publishing

*Subject Matter Expert:* Department of Defense- Toxic (Fire) Gas Inhalation Injury (BIPTAP), Society of Fire Protection Engineering- Guide on Human Behavior in Fire, DHS/FEMA/USFA Practical Applications of Fire Dynamics and Modeling

*Colmar Vol. Fire Company (July '95- December '00)*

Position(s) Held: Firefighter

*Beltsville Vol. Fire Department (Station 41)/Prince George's County Fire Department (Oct '98-Jan '03)*

Position(s) Held: Firefighter/EMT

*West Lanham Vol. Fire Department (Station 48)/Prince George's County Fire Department (Jan '03-June '03)*

Position(s) Held: Firefighter/EMT

*Morningside Vol. Fire Department (Station 27)/Prince George's County Fire Department (June '03-Present)*

Position(s) Held: Firefighter/EMT, Apparatus Driver/Operator, Lieutenant, Vice President, Life Member, Recruitment/Retention Team Member, New Apparatus Design/Procurement Committee Member, Grant Committee Chairperson, By-Law Committee Chairperson, and Board of Directors Member.

Fire Department Certifications: Firefighter Level I & II, Emergency Medical Technician, Hazardous Materials Technician, Rescue Technician (Vehicle, Trench, Structural Collapse), Emergency Vehicle Operator, Pump Operator, Fire Service Instructor I & II, NFA Fire/Arson Origin and Cause Investigation.

Other Certifications: OSHA 30-Hour Construction Industry Outreach

**PRESENTATIONS/LECTURERS/APPEARANCES:**

“Electrical Fire Research” presented at NFPA 921 Committee Meeting, Tucson, AZ, February 2002.

“Arson Investigation” segment, Fox 5 News, WTTG-DC, May 2005.

“Comparison of Gasoline Weathering on Carpet Samples Exposed to Various Thermal Environments”, presented at International Symposium on Fire Investigation Science and Technology, Cincinnati, OH, June 2006.

“The Extent of Evaporation of Ignitable Liquids Under Exposure to Compartment Fires, Non-Fire Thermal and Non-Thermal Environments” presented at Fire and Materials, San Francisco, CA, January 2007.

“Smoke Detection Systems, Fire Modeling, and Fire Toxicology: Useful Tools in Fire Investigation and Reconstruction,” presented at Cozen O’Connor Continuing Legal Education seminar, Philadelphia, PA, April 2007.

“Application of Fundamental Principles”, presented at International Association of Arson Investigators Conference, Denver, CO, April 2008.

“Applications of Forensic Toxicology in Fire Origin and Cause Determination”, presented at the Society of Fire Protection Engineers Professional Development Conference, Charlotte, NC, October 2008.

“The Use of Forensic Toxicology in Fire Origin and Cause Determination”, presented to the Advanced Fire Investigation Class, Montgomery College, Rockville, MD, February 2009.

“Forensics: You Decide- Up in Flames”, Season 1, Episode 3, Investigation Discovery, Discovery Channel, August 2009.

NFPA 921: Guide to Fire and Explosion Investigation; Session 1: Electricity and Fire, Session 2: Fire and Explosion Deaths and Injuries, presented to the Office of the Maryland State Fire Marshal, February 17, 2010 and March 3, 2010.

“Burned: Arson Investigation Evidence Changes with Science”, 20/20, ABC News, May 7, 2010.

“Forensic Toxicology in Fire Investigation: The Kristine Bunch Case Study”, presented to the Society of Fire Protection Engineers, Beltsville, MD February 8, 2011.

“The Scientific Method and a Case of Arson-for-Hire”, presented at the Circumstantial Arson Case: Investigative Techniques and Strategies Seminar, King of Prussia, PA, February 9, 2011.

“Fire Related Deaths and Injuries: The Use of Toxicological Data in Fire Origin and Cause Determination”, presented at the National Fire Academy, Emmitsburg, MD, March 19, 2011, April 19, 2011, June 28, 2011.

“Fire Related Deaths and Injuries: The Use of Toxicological Data in Fire Origin and Cause Determination”, presented at the International Association of Arson Investigators, NC/SC Chapter Training Conference, Myrtle Beach, SC, October 20, 2011.

“Toxicology in Fire Investigation”, presented at the International Association of Arson Investigators, Annual Training Conference, Dover, DE, April 25, 2012.

“Practical Applications of Fire Dynamics and Modeling”, presented at the National Fire Academy, Emmitsburg, MD, August 21<sup>st</sup>-23<sup>rd</sup>, 2012 and December 2<sup>nd</sup>- 7<sup>th</sup>, 2012.

“Fire Death Investigations”, presented at the Collin County Fire & Arson Investigation Association- 3<sup>rd</sup> Annual Forensic Fire Death Investigations Course, Huntsville, TX, September 21, 2015.

“Fire Dynamics for Beginners”, presented as a Webinar for the National Association of Subrogation Professionals, February 16, 2018.

“Forensic Toxicology: Furthering Fire Causation Analysis with Medical Evidence”, presented at the Maine Event, Portland, ME, July 26, 2018.

“The Scientific Method in Fire Death Investigation” and “The Impact of Drugs and Alcohol in Fire-Related Death” presented at the International Association of Arson Investigators, Oregon Chapter 31, Advanced Arson Seminar, Newport, OR, September 19, 2018.

“Fire and Emergency Service Personnel Knowledge, Skills, and Maintaining Proficiency”, presented at the National Fire Protection Association, Fire Protection Research Foundation Workshop, Quincy, MA, October 1<sup>st</sup> and 2<sup>nd</sup>.

“The Kristine Bunch Case- The Relevance of Forensic Toxicology in Fire Investigation”, presented at the Indiana Public Defender Council (IPDC) Seminar, December 4, 2020.

## **PROFESSIONAL CERTIFICATIONS:**

Associate Safety Professional, Board of Certified Safety Professionals, Certification # ASP-25757, (2016-2017)  
Certified Fire and Explosion Investigator, National Association of Fire Investigators, Registration # 10121-4644 (2004-2012)  
Certified Fire Investigator, International Association of Arson Investigators, Certification #53-120705 (2009-present)  
Certified Safety Professional, Board of Certified Safety Professionals, Certification # CSP-33215, (2017-present)  
Contracting Officer's Representative- Level I, Federal Acquisition Institute (2016-2018)  
Contracting Officer's Representative- Level II, Federal Acquisition Institute (2018-2020)  
International Firestop Council- Firestop Inspector Certification (2020-present)  
Registered Professional Engineer, State of Delaware, License #13162 (2004-present)  
Registered Professional Engineer, State of Florida, License #91014 (2021-present)  
Registered Professional Engineer, State of Maryland, License #39570 (2010-present)  
Registered Professional Engineer, State of New Jersey, License #24GE05643300 (2021-present)  
Registered Professional Engineer, State of Pennsylvania, License #PE092170 (2021-present)

## **PROFESSIONAL AFFILIATIONS:**

### Current

Member, Board of Certified Safety Professionals (BCSP)  
Member, International Association of Arson Investigators (IAAI)  
Member, International Code Council (ICC)  
Member, National Fire Protection Association (NFPA)  
Member, Society of Forensic Toxicology (SOFT)  
Member, Society of Fire Protection Engineers (SFPE)

### Past

Friend, NFPA 921, Guide for Fire and Explosion Investigations  
Committee, NFPA 720, Standard for the Installation of Carbon Monoxide Detection and Warning Equipment  
Committee, ISO/TC 92/SC3, Fire threat to people and the environment  
Member, International Association for Fire Safety Science (IAFSS)  
Member, Society of Toxicology (SOT)  
Member, Technical Working Group for Fire and Explosives (TWGFEX)

## **PUBLICATIONS:**

Ferrino-McAllister, J., Roby, R.J., Milke, J., "Heating of Electrical Contacts: Characterizing the Effects of Torque, Contact Area, and Movement on the Temperature of Residential Receptacles", Fire Technology, Volume 42, No.1, January 2006, pp. 49-74.

Ferrino-McAllister, J.L., Roby, R.J., Klassen, M.S., Milke, J., "Heating of Electrical Conductors: Characterizing the Deformation of Cable Exposed to External Radiant Heating and Internal Overload", Fire and Arson Investigator, Volume 56, Number 2, October 2005.

Ferrino-McAllister, J.L., Carpenter, D., Roby, Richard, "Comparison of Gasoline Weathering on Carpet Samples Exposed to Various Thermal Environments", Proceedings from the 2<sup>nd</sup> International Symposium on Fire Investigation Science and Technology, Cincinnati, OH, 2006.

Ferrino-McAllister, J.L., Carpenter, D., Roby, R., Torero, J., "The Extent of Evaporation of Ignitable Liquids Under Exposure to Compartment Fires, Non-Fire Thermal and Non-Thermal Environments", Proceedings from the 10<sup>th</sup> International Conference, Fire and Materials, San Francisco, CA, 2007.

McAllister, J.L., Roby, R., Levine, B., Purser, D., "Stability of Cyanide in Cadavers and in Postmortem Stored Tissue Specimens, a Review", Journal of Analytical Toxicology, Volume 32, Number 8, pp. 612-620,

October 2008.

Goodman, A., Schooler, C., McAllister, J.L., “Physical Characteristics of Non-Energized and Energized Cables in Scaled Compartment Fires” Proceedings from the International Symposium on Fire Investigation Science and Technology, College Park, MD, 2010.

McAllister, J.L., Roby, R., Levine, B., Purser, D., “The Effect of Sodium Fluoride on the Stability of Cyanide in Postmortem Blood Samples from Fire Victims”, *Forensic Science International*, Volume 209, pp. 29-33, May 2011.

Roby, R., McAllister, J.L., “Forensic Investigation Techniques for Inspecting Electrical Conductors Involved in Fire”, United States Department of Justice, Document No. 239052, July 2012.

Hussain, N., McAllister, J.L., Roby, R., “Analysis of Beads Formed on Energized and Non-Energized Electrical Copper Conductors Exposed to Various Thermal Insults”, Proceedings from the International Symposium on Fire Investigation Science and Technology, College Park, MD, 2012.

McAllister, J.L., Carpenter, D.J., Roby, R.J., Purser, D. “The Importance of Autopsy and Injury Data in the Investigation of Fires”, *Fire Technology*, November 2014, Volume 50, Issue 6, pp. 1357-1377.

McAllister, J. (2014). Health Effects in Groups Exposed to Wildland and Urban Fires. *In Health Effects from Combustion Products*. Abingdon, Oxfordshire: Royal Society of Chemistry.

McAllister, J., & Purser, D. (2016). Assessment of Hazards to Occupants from Smoke, Toxic Gases, and Heat. In *SFPE Handbook of Fire Protection Engineering* (5th ed.). Quincy, Massachusetts: National Fire Protection Association.

McAllister, J., et al. (2016). Fire Investigation: Fire Dynamics and Modeling, Student Manual, 2<sup>nd</sup> Edition, FEMA/USFA/NFA

McAllister, J. et al. (2019). *Guide to Human Behavior in Fire*. (2nd ed.). Society of Fire Protection Engineering, Gaithersburg, Maryland.

Ko, Y., McAllister, J., Gwynne, S., Kruszelnicki, M. (2019). A Study of the Effect of Smoke Toxicity from an Inmate Cell Fire, Proceedings from the Third International Fire Safety Symposium.

McAllister, J. & McAllister, B. (2019). Fire and Emergency Service Personnel Knowledge and Skills Proficiency, Final Report, Fire Protection Research Foundation, Quincy, MA.

McAllister J., Kunsman G.W., Levine B.S. (2020) Carbon Monoxide/Cyanide. In: Levine B., KERRIGAN S. (eds) Principles of Forensic Toxicology. Springer, Cham. [https://doi.org/10.1007/978-3-030-42917-1\\_30](https://doi.org/10.1007/978-3-030-42917-1_30)

McAllister, J. & McAllister, B. (2020). Leadership: Fire and Emergency Service Personnel Knowledge and Skills Proficiency, *Fire Engineering*, October 22, 2020.