



Curriculum Vitae

Lee K. McCarthy, P.E., IAAI-CFI, CFEI, CVFI
Fire Protection Engineer

Professional Practice

Lee McCarthy is a licensed professional engineer with more than 10 years of experience in the areas of fire and explosion investigation, fire protection engineering, and fire science. Lee provides clients with expert consultation regarding origin and cause determination, fire protection and alarm systems, life safety, fire dynamics, fire testing, fire and risk assessment, as well as compliance with codes and standards. He has a comprehensive understanding of origin and cause investigations of fire and explosions. Lee's experience includes numerous fire and explosion investigations involving residences, vehicles, as well as commercial and industrial facilities. He has expertise applying scientific tools, such as computer models, mathematical models, reduced-scale experiments, and full-scale experiments, to answer complex problems in the areas of heat transfer, ignition, flame spread, fire growth, and fire dynamics. Lee has experience evaluating, designing, testing, and commissioning fire and life safety systems, including sprinkler systems, fire alarm, and smoke control systems. With over 15 years of experience as a volunteer firefighter and line officer, Lee also has practical knowledge and understanding of emergency fire and rescue operations.

Employment History

Fire Protection Engineer – Crane Engineering

Plymouth, MN • 2014 - Present

Specializes in fire protection engineering, fire science, and fire and explosion investigations. Applies his knowledge of fire dynamics and fire protection principles to the analysis and investigation of building fire and life safety systems, the causation of fires and explosions, the evaluation of product and liability issues, and the prevention of accidents, with particular emphasis on fires and explosions. Routinely performs analyses of fire protection and alarm systems to determine mechanisms of failure and compliance with codes, regulations, and industry best practices. Performs site safety assessments, hazard and risk evaluations and code conformance audits of facilities to determine the cause of accidents as well as to assist facilities in the prevention of accidents.

Fire Research Engineer – Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF), Fire Research Laboratory (FRL)

Ammendale, MD • 2010-2014

Provided engineering analyses, technical assistance, and fire scene support to ATF Special Agents/Certified Fire Investigators (CFI) in determining the origin and cause of fires and explosions. Performed numerous small and large-scale experiments evaluating ignition, fire growth, and fire dynamics related to fire investigations. Conducted engineering analysis of building fire protection systems. Utilized computer fire models and hand calculation methods in the analysis of fire dynamics and progression. Responded to numerous investigations of large fires as a member of ATF's prestigious National Response Team (NRT). Developed and instructed course segments for ATF CFI Candidates, CFIs, and fire investigators across the country.

Fire Protection Engineer – U.S. Department of Commerce, National Institute of Standards and Technology (NIST)

Gaithersburg, MD • 2008 - 2010

Involved in various projects aimed to advance fire fighter safety, fire ground operations, and effectiveness of the fire service, as a member of the Building and Fire Research Laboratory's (BFRL) Fire Fighting Technology Research Group (FFTG). Primarily responsible for researching reactive cooling systems for use in firefighter protective clothing.

Graduate Teaching Assistant – University of Maryland, Department of Fire Protection Engineering

College Park, MD • 2008 - 2009

Courses: Water Based Fire Protection and Design, Advanced Fire Dynamics, Advanced Fire Suppression, Smoke Detection and Management, and Performance Based Design.

Fire Protection Engineer – Hughes Associates, Inc.

Baltimore, MD • 2007

Designed and evaluated smoke management systems utilizing CONTAM building airflow model. Assisted the Office of the Pentagon Fire Marshal in evaluating fire protection and life safety issues and investigating incidents. Reviewed fire protection and life safety drawings, conducted fire and life safety inspections, and was responsible for testing and commissioning fire protection systems within the Pentagon in Arlington, VA.



Professional Licenses

Licensed Professional Engineer

Maryland, Minnesota, Pennsylvania

IAAI Certified Fire Investigator (IAAI-CFI)

IAAI Certified Instructor (IAAI-CI)

NAFI Certified Fire and Explosion Investigator (CFEI)

NAFI Certified Vehicle Fire Investigator (CVFI)

HAZWOPER – Hazardous Waste Operations and Emergency Response training in accordance with 29 CFR 1910.120

Professional Affiliations

Society of Fire Protection Engineers (SFPE) – Professional Member

Society of Fire Protection Engineers, Pittsburgh Chapter – Member

International Association of Arson Investigators (IAAI) – Member

International Association of Arson Investigators (IAAI), Training & Education Committee – Member

Pennsylvania Association of Arson Investigators (PAAI) – Member

National Association of Fire Investigators (NAFI) – Member

National Fire Protection Association (NFPA) – Member

The International Association for Fire Safety Science (IAFSS) – Member

Oklahoma State University (OSU), School of Forensic Sciences – Adjunct Instructor

National Fire Academy (NFA) – Instructor

Community College of Allegheny County – Instructor

Education

M.S., Fire Protection Engineering, University of Maryland, College Park, MD, 2010

B.S. Civil Engineering, Carnegie Mellon University, Pittsburgh, PA, 2006



Publications

McCarthy L.K., Geiman, J.A., *Assessment of Damage by Fire Investigators*, Proceedings of the Fire and Materials 2015 Conference, Interscience Communications Limited, San Francisco, CA, pp. 987-1001, 2015.

McCarthy L.K., Quintiere J.G., Reeves L.S., Wolfe A.J., *Application of Scale Fire Modeling*, Fire Protection Engineering Emerging Trends, Issues 75, Society of Fire Protection Engineers (SFPE), 2013.

Prince George's County Fire/EMS Department (PGFD) Safety Investigation Team Report: 6404 57th Avenue, Riverdale Heights, MD, Subject Matter Expert and Contributing Author, 2013.

McCarthy L.K., di Marzo M., *The Application of Phase Change Material in Fire Fighter Protective Clothing*, Fire Technology, Volume 48, Issue 4, pp 841-865, 2012.

McCarthy L.K., *Evaluation of the thermal performance of fire fighter protective clothing with the addition of phase change material*, MS Thesis, University of Maryland, College Park, 2010.

Presentations

Fire Behavior & Live Fire Flow Path Demonstration, Entry Level Fire Training, Structural Burn Sessions, Allegheny County Fire Academy, multiple occasions: 2016-present.

Virginia State Police Fire Investigation In-Service: Fire dynamics, Impact of Ventilation, Live fire and practical exercises, Blackstone, VA, April 18-22, 2016.

"Fire Dynamics for the Fire Investigator", New Jersey Chapter of the International Association of Arson Investigators (IAAI) 2016 Annual Training Conference, Atlantic City, NJ, March 9, 2016.

R0204 Practical Applications of Fire Dynamics and Modeling, National Fire Academy, Emmitsburg, MD, January 17-22, 2016.

"The Role of the Power Company in Fire Investigations," 17th Annual Electric Power Conference and Exhibition, Chicago, IL, April 22, 2015.

"Impact of Vertical Ventilation on Post-Flashover Fires," The International Association of Arson Investigators, Inc. (IAAI) 2014 International Training Conference, Las Vegas, NV, April 17, 2014.

"Post Fire Investigation -Smoke Detector Analysis", Northern Virginia Joint Committee on Fire and Arson Investigation (NVJCFA) Fall School, Manassas, VA, November 19, 2013.

"Case Study: Easley, SC Fatal Residential Fire," New Jersey Chapter of the International Association of Arson Investigators (IAAI) 2013 Annual Training Conference, Atlantic City, NJ.

"Radiant Heat Exposures Utilizing an Intermediate-Scale Calorimeter," ATF Certified Fire Investigator (CFI) Annual Training, Beltsville, MD, April & May 2012.

"Scale Model Testing of Fire Growth in a Furnished Room," The International Association of Arson



Investigators, Inc. (IAAI) 2012-Annual Training Conference, Dover, DE, April 23, 2012.

“Fire Dynamics and Practical Application for Fire Investigators”, Virginia Chapter of the International Association of Arson Investigators Conference, Waynesboro, VA, March 19, 2012.

An Overview of the ATF Fire Research Laboratory & Case studies, Guest lecturer at University of Maryland, College Park, MD, April 2011; November 2011.

R206 Fire/Arson Origin and Cause Investigations -Fire Dynamics block, National Fire Academy, Emmitsburg, MD, August 2010; August 2011; September 2011; January 2012; August 2012, February 2013, December 2013, January 2014.

Special Agent Basic Training (SABT) -Arson block, Federal Law Enforcement Training Center (FLETC), Glynco, GA, May 2010; May 2014.

Fire Fighting Experience

Ingomar Volunteer Fire Company – *Volunteer Firefighter*, Wexford, PA., 2002-2007; 2015-present.

Hyattsville Volunteer Fire Department, Inc. – *Volunteer Fire/EMS Firefighter, Sergeant, Lieutenant, Captain, Training Officer, and Safety Officer*, Hyattsville, MD, 2008-2014.

Certifications: Fire Officer I & II, Fire Service Instructor I, Fire Fighter I & II, Vehicle and Machinery Technical Rescuer I & II, Hazardous Materials Incidents – Awareness & Operations, Maryland Emergency Medical Technician – Basic.

