

R. Thomas Long, Jr., P.E., CFEI
Principal Engineer and Office Director

Professional Profile

Mr. Long is a Principal Engineer and the Director of Exponent's Maryland office. He applies fire protection engineering principles including: material fire performance; ignition of liquid, gaseous, and solid fuels; flamespread; and fire modeling to the origin and cause investigation, engineering analysis, and prevention of fires, explosions, and other thermal events.

Mr. Long has investigated numerous losses ranging from small residential fires to large explosions and fires involving commercial, residential, manufacturing, storage, power generation, petroleum, and chemical facilities. He has also investigated losses involving welding and hot work operations, mechanical and HVAC equipment, manufacturing processes, firefighter PPE, textiles and garments, consumer products, appliances, utilities, candles, residential and commercial cooking equipment, mattresses, upholstered furniture, automotive, rail, and marine vehicles, as well as propane and natural gas appliances and systems (both portable and fixed), including CSST. Mr. Long has testified as an expert witness in various occasions.

Mr. Long provides fire protection code consultation and interpretation on fire detection and suppression system operation, design, installation, evaluation, inadvertent operation, and failure analysis, in residential, commercial, storage, manufacturing, processing, and other industrial applications. He has experience in the evaluation of facilities and systems for compliance with nationally and internationally accepted building and fire safety codes, standards, guidelines, and regulations, including those published by the National Fire Protection Association (NFPA), the Building Officials and Code Administrators, International (BOCAi), and the International Code Council (ICC). Mr. Long has acted as representative and liaison between clients and Authorities Having Jurisdiction (AHJs). Mr. Long also has special expertise in the design review, installation, operation, evaluation, and third-party review of combustion systems.

Mr. Long has extensive experience with the numerous small, intermediate, and large-scale fire and flammability testing protocols and methods, including those published by the ASTM, NFPA, CBHFTI, FM, UFAC, and UL. Prior to joining Exponent, Mr. Long conducted fire and flammability research at the University of Maryland at College Park, Department of Fire Protection Engineering.

Academic Credentials and Professional Honors

M.S., Fire Protection Engineering, University of Maryland, 1998
B.S., Fire Protection Engineering, University of Maryland, 1996
B.S., Physical Science, Salisbury State University, 1997

Principal Member: Technical Committee on Fundamentals of Combustion System Hazards (BCS-FUN), NFPA 85: *Boiler Combustion System Hazards Code*, National Fire Protection Association, 2003–present

Principal Member: (PIP-AAA) NFPA 1620: *Recommended Practice for Pre-Incident Planning*, National Fire Protection Association, 2008–present

Principal Member: Technical Committee on Hot Work Operations (HWO-AAA), NFPA 51B: *Standard for Fire Prevention during Welding, Cutting, and Other Hot Work*, National Fire Protection Association, 2008–present; Member of the Smoldering Task Group.

Principal Member: Technical Committee on Fire Tests (FIZ-AAA), National Fire Protection Association (Representing the Upholstered Furniture Action Council), 2011–present

Principal Member: Building/Life Safety Code Technical Committee on Residential Occupancies (SAF-RES, BLD-RES), NFPA 101, *Life Safety Code*; and NFPA 5000, *Building Construction and Safety Code*, National Fire Protection Association (Representing the Upholstered Furniture Action Council), 2011–present

Principal Member: Building/Life Safety Code Technical Committee on Furnishings and Contents (SAF-FUR, BLD-FUR), NFPA 101, *Life Safety Code*; and NFPA 5000, *Building Construction and Safety Code*, National Fire Protection Association (Representing the Upholstered Furniture Action Council), 2011–present

Principal Member: NFPA Technical Committee on Hazard and Risk of Contents and Furnishings (HAR-AAA): NFPA 555 *Guide on Methods for Evaluating Potential for Room Flashover*, NFPA 556 *Guide on Methods for Evaluating Fire Hazard to Occupants of Passenger Road Vehicles*, NFPA 557 *Standard Fire Loads for Engineering Design of Structural Fire Resistance in Buildings*. (Representing the Upholstered Furniture Action Council), 2009–present

Alternate Member: Technical Committee on Single- and Multiple-Station Alarms and Household Fire Alarm Systems (SIG-HOU): NFPA 72 *National Fire Alarm Code*, National Fire Protection Association, 2010–present

Alternate Member: Technical Committee on Dry and Wet Chemical Extinguishing Systems (DRY-AAA), NFPA 17: *Standard for Dry Chemical Extinguishing Systems* and NFPA 17A: *Standard for Wet Chemical Extinguishing Systems*, National Fire Protection Association, 2009–present

Alternate Member: Building/Life Safety Code Technical Committee on Fundamentals, NFPA 101, *Life Safety Code*; and NFPA 5000, *Building Construction and Safety Code*, National Fire Protection Association, 2010–present

Member: International Standards Council (ISC), International Code Council (ICC), 2009–2010

Hartford Steam Boiler Professional Loss Control Fellowship 1997–1998; NASA Graduate Research Assistant UMD, 1997–1998

Licenses and Certifications

Registered Professional Engineer: California, #FP1707; Colorado, #PE-42866; Delaware, #16006; Illinois #062.061500; Maryland, #31236; New Hampshire #12760; New York, #086751; Pennsylvania, #076022; Virginia, #045406; Washington D.C., #904965; Wisconsin, #39698; New Jersey, #24GE04845800; Tennessee, #00113898; South Carolina, #28379; Indiana, #11100127; Rhode Island, #9587.

NCEES Council Record file No. 36240

Passed the Professional Engineer Principles and Practice Examination in Fire Protection Engineering

Certified Fire and Explosion Investigator (CFEI) in accordance with the National Association of Fire Investigators (NAFI) National Certification Board per NFPA 921 (2004); Recertified, 2008 NAFI *Advanced Fire, Arson, and Explosion Investigation Training Program* (21 hours tested)

Hazardous Waste Operations and Emergency Response Training, in accordance with OSHA 29 CFR 1910.120, 1926.65

Confined Space Entry Training, in accordance with OSHA 29 CFR 1910.146

Asbestos Awareness Training, in accordance with OSHA 29 CFR 1926.1101

Occupational Health and Safety Fire Extinguisher Training, in accordance with OSHA regulation #1910-157

CFITrainer.net:

- “Documenting the Event” (4 hour tested)
- “Investigating Motor Vehicle Fires” (4 hour tested)
- “The Fire Investigator & the 2011 NFPA 921 Changes” (4 hour tested)

Publications

Long RT, Wu NP. Professional practice. Fire Protection Engineering, 3rd Quarter 2011.

Long RT, Blum AF. Investigation of inadvertent automatic fire sprinkler system discharges. Subrogator Magazine, National Association of Subrogation Professionals, Winter, 2011.

Long RT, Wu NP, Blum AF. Unsatisfactory sprinkler performance: An update on trends and a root cause discussion from the investigating engineer’s perspective. Fire Protection Engineering, 4th Quarter 2010.

Myers T, 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, May 2008.

Garrett JL, Smith SJ, Long RT. Blast indicators and damage assessment associated with a boiler explosion. Mechanics and Materials Conference, 2001.

Long RT, Quintiere JG, Torero JL, Fernandez-Pello AC. Scale and transport considerations on piloted ignition of PMMA. 6th International Symposium on Fire Safety Science, 1999.

Cordova JL, Zhou Y, Pfaff CC, Long RT, Fernandez-Pello AC, Torero JL. Effects of oxidizer flow characteristics on the flammability diagrams of solid combustible materials. 5th ASME/JSME Thermal Engineering Joint Conference, AJTE99-6244, 1999.

Steinhaus T, Olenick SM, Long RT, Sifuentes A, Torero JL. A method for assessing material flammability for micro-gravity environments. Joint Meeting of the United States Sections, The Combustion Institute, Washington, D.C., 1999.

Dillon SE, Wu NP, Long RT, Heater D. Material fire properties. FAA Fire Conference, Atlantic City, NJ, November 1998.

Long RT. An evaluation of the lateral ignition and flame spread test for material flammability assessment for micro-gravity environments. Thesis Publication 1998, University of Maryland at College Park, Department of Fire Protection Engineering.

Cordova JL, Ceamonos J, Long RT, Fernandez-Pello AC, Quintiere JG, Torero JL. Flow effects on the flammability diagrams of solid fuels. 4th International Micro Gravity Combustion Symposium Workshop, Cleveland, OH, May 1997.

Book Chapters

Long RT, Colwell J, Grossman H, Ray R, Thomas B, Strassburger R. Passenger vehicle fires. Chapter 1, Section 21. In: Fire Protection Handbook, 20th Edition. National Fire Protection Association (NFPA), pp. 21-3–21-14 Quincy, MA, 2008.

Reports

Long RT, Mikolajczak C, White K, Kahn M. Lithium-ion batteries hazard and use assessment. Fire Protection Research Foundation Report, July 2011.

<http://www.nfpa.org/assets/files//PDF/Research/RFLithiumIonBatteriesHazard.pdf>

Anderson L, Mikolajczak C, Long RT, Paustenbach D. A review of CBHF proposed Technical Bulletin 603. Exponent Report, April 2003.

Long RT, Reza A, Mongia R. Damage to the WTC Complex due to the collapse of a single tower, mechanical subsystems, fire, smoke and dust contamination. Chapter 2: World Trade

R. Thomas Long, Jr., P.E., CFEI

Page 4

11/11

Center Fire Protection System Performance and Expected Actions of the Fire Department City of New York if Only One Plane Strike had Occurred on September 11, 2001, 2002.

Smith T, Reza A, Long RT. Investigation of the October 13, 1998 explosion at Condea Vista Chemicals, Baltimore, Maryland. Exponent FaAA Report, March 1999.

Torero JL, Quintiere JG, Long RT. Scaling effects on the lateral ignition and flame spread test apparatus. NASA – LeRC – Report, 1997.

Ghandi S, Quintiere JG, Long RT. Fire tests of passenger rail car materials. NTSB 12-96-SP-034, November 1996.

Selected Invited Presentations

Long RT, Mikolajczak C. Lithium ion battery hazard. NFPA Conference & Expo, Las Vegas, NV June 11–14, 2012, accepted.

Long RT, Mikolajczak C, Kahn M. Lithium ion fire protection considerations. The 29th International Battery Seminar & Exhibit: Primary & Secondary Batteries – Other Technologies; Broward County Convention Center Ft. Lauderdale, FL, March 12–15, 2012, accepted.

Long RT, Mikolajczak C, Kahn M. Lithium-ion failure rates and fire protection considerations. Battery Safety 2011 - Advancements in System Design, Integration & Testing for Safety & Reliability, Las Vegas, NV, November 9, 2011.

Long RT, Ogle R, Morrison D, Dillon S, Blum A. Performing a high-rise life safety analysis: Lessons learned from the Cook County administration building fire. 2009 NFPA America's Fire and Security Exposition, Miami Beach, FL, July 30, 2009.

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

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

Myers T, Long RT. Identification of dust explosion hazards and mitigation using NFPA Standards. 2007 NFPA World Safety Conference & Exposition, Boston, MA, June 5, 2007.

Long RT. Ford Rouge explosion and fire, February 1, 1999. 5th International Seminar on Fire and Explosion Hazards, Plenary Lecture, Edinburgh, Scotland, UK, April 27, 2007.

Clarke C, Long RT, Tsuji J, Gavelli F. Fire and toxicity aspects of polyurethane foams. Proceedings, 2005 Polyurethane Foam Association Spring Meeting and Technical Program, Washington, DC, May 2005.

Conferences, Seminars, and Workshops Attended

“Lithium Ion Battery Storage Protection Strategies,” Fire Protection Research Foundation Research Planning Workshop, Baltimore, Maryland, August 30, 2011.

“Inspection, Testing, and Maintenance of Fire Alarms,” National Fire Protection Association Seminar on NFPA 72-2007, 0.7 CEU’s (7 hours), October 2008.

“Advanced Fire, Arson, & Explosion Investigation Training Program,” National Association of Fire Investigators, Sarasota, Florida, August 4-6, 2008. 21 tested hours.

Fire Protection Research Foundation (FPRF) Upholstered Furniture Fire Performance Research Planning Workshop, Southpoint, Durham, NC, January 30–31, 2008.

American Home Furnishings Alliance (AHFA) Upholstered Furniture Flammability Stakeholder Meeting, Arlington, VA, July 25, 2007.

“Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems,” National Fire Protection Association Seminar on NFPA 25-2002, 0.7 CEU’s (7 hours), May 2007.

“Understanding 16 CFR Part 1633: Standard for the Flammability (Open-Flame) of Mattress Sets,” U.S. Consumer Product Safety Commission (CPSC) Staff Mattress Seminar, Bethesda, MD, March 28, 2007.

“Suppression Systems Seminar,” The Viking Corporation, Hastings, MI, March 12–13, 2007. (Hands-on system training and presentations, wet, dry, deluge, foam, pre-action, and sprinklers).

“Symposia: Partners for Protection: Fire Protection Engineer and the Fire Service,” Sponsored by the Society of Fire Protection Engineers, October 2006.

“How to Study for the FPE/P.E. Exam,” Sponsored by the Society of Fire Protection Engineers (SFPE), 1.6 CEU’s (16 hours), September 2004.

“Workshop to Identify Research Needs to Foster Improved Fire Safety in the United States,” sponsored by the Board on Infrastructure and the Constructed Environment (BICE) of the National Research Council at the request of the National Science Foundation (NSF), April 15–16, 2002.

Technical Reviewer

Member, Society of Fire Protection Engineers (SFPE) Editorial Advisory Board for *Fire Protection Engineering* magazine (2008–present)

Technical Reviewer, Compartment Fires Track, 8th, 9th Annual International Fire Safety Science Symposium (IAFSS), 2005, 2008.

Technical Reviewer, Burning Finished Products and Measurement Methods Track, 9th Annual International Fire Safety Science Symposium (IAFSS), 2008.

Technical Reviewer, Fire Safety Technical Session, SAE International World Congress, 2007, 2008.

Technical Reviewer, *Fire Technology*, 2008, 2009, 2011 (SI: Fire Investigations).

Technical Reviewer, *Fire Safety Journal*, 2009.

Academic Experience

Guest Lecturer, University of Maryland, Department of Fire Protection Engineering, 2006, 2008, 2009, 2010, 2011.

Instructor (with F. Mowrer): SFPE Professional Development Conference and Exposition: The Annual Meeting, “Beyond Cause and Origin: Engineering Analysis of Building Fires,” 2009, 2010.

Special Experience

Participated as the project manager for the review, testing, evaluation, and implementation of the Fire Department City of New York (FDNY) Personal Safety System (PSS), a compact, lightweight escape system intended for use by firefighters for quick escape from burning buildings. This device was named one of the best safety inventions of 2006 by TIME Magazine.

Professional Affiliations

- National Fire Protection Association—NFPA (member)
- Society of Fire Protection Engineers—SFPE (professional member grade)
- International Association of Arson Investigators—IAAI (member)
- International Code Council®—ICC (previously BOCAi) (professional member)
- National Association of Fire Investigators—NAFI (member)
- Order of the Engineer (member)
- National Society of Professional Engineers—NSPE (member)
- Maryland Society of Professional Engineers—MDSPE (member)
- Maryland Fire and Explosive Investigator’s Association -MFEIA-IAAI (member)
- Sigma Alpha Epsilon (member)