

FORCON INTERNATIONAL

ANDREW “ANDY” BLUM, P.E., CFEI, CVFI

SUMMARY

Mr. Blum is an established engineer in the field of fire protection engineering. His areas of expertise include, but are not limited to fire/explosion investigations, fire protection systems failure analysis/investigations, fire hazard analysis, life safety/building code surveys, computer fire modeling, small and large-scale fire testing, interpretation and enforcement of fire/building codes, as well as the design, inspection, and analysis of fire protection system installations.

Mr. Blum’s array of specialties includes the application of fire protection engineering principles to origin and cause investigations involving fires, explosions, and other engineering failures. In addition, he has investigated numerous losses related to the failure or inadvertent operation of fire protection systems during or in the absence of a fire. These investigations involved losses in residential homes and commercial kitchens, as well as larger losses in a variety of storage, manufacturing, food processing, power generation, high-rise hotel, apartment, condominium, and commercial facilities.

Mr. Blum has extensive experience utilizing the National Fire Protection Association (NFPA) codes, standards, and recommended practices, as well as the model building and fire codes, Factory Mutual (FM) and Industrial Risk Insurers guidelines and UL standards and listings. He also has experience in performing and supervising small- to large-scale flammability projects for research and development, product testing related to recalls, and litigation support. These tests include firsthand fire testing experience with nationally and internationally accepted standards published by the NFPA, ASTM, ISO, UL, FM and CFR. Mr. Blum has specific expertise in fire-testing lithium ion batteries used in consumer electronics/products, energy storage systems (ESS), electric drive vehicles, and in-storage configurations. In addition, Mr. Blum is a specialized expertise in the evaluating and performing third-party reviews of energy storage systems, combustion systems, and flame-effect installations.

EDUCATION

Master of Science in Fire Protection Engineering - University of Maryland; 2007

Bachelor of Science in Fire Protection Engineering - University of Maryland; 2004

REGISTRATIONS & CERTIFICATIONS

Registered Professional Engineer in the following States:

Alabama
(#37421-E)

Florida
(#77221)

Georgia
(#PE038300)

Maryland
(#37262)

Mississippi
(#27876)

Missouri
(#2018009518)

Tennessee
(#119928)

Certified Fire and Explosion Investigator (CFEI)

Certified Vehicle Fire and Explosion Investigator (CVFI)

PROFESSIONAL ASSOCIATIONS

International Code Council (ICC)

ASTM International (ASTM)

National Fire Protection Association (NFPA)

Society of Fire Protection Engineers (SFPE)

○ Greater Atlanta Chapter

National Association of Fire Investigators (NAFI)

CAREER HISTORY

FORCON International – Fire Protection Engineer

Providing forensic investigation analysis and expert witness services as it relates to his fields of expertise.

Fisher Engineering, Inc. – Senior Fire Protection Engineer

Performs origin and cause investigations involving fires, explosions, and other engineering failures in residential, commercial, and industrial facilities. Conducts failure-analysis investigations of fire protection systems during or in the absence of a fire. Performs design and construction-related services for all types of fire suppression, life safety and fire alarm systems. Performs code analysis, evaluation, and third-party reviews of facilities and fire protection systems.

Exponent, Inc. – Managing Engineer

Performed origin and cause investigations involving fires, explosions, and other engineering failures in residential, commercial, and industrial facilities. Investigations involved losses in residential homes and commercial kitchens, as well as larger losses in a variety of storage, manufacturing, food processing, power generation, high-rise hotel, apartment, condominium, and commercial facilities. Investigated numerous losses related to failure of or inadvertent operation of fire protection systems. Performed third-party reviews of combustion systems and flame effects. Conducted both small- and large-scale fire tests for research and development, product testing related to recalls, and litigation support, including special expertise related to analyzing failures of and fire-testing lithium-ion batteries.

PRESENTATIONS

- **U.S. Department of Energy**
 - “Fire Testing a Lithium-Ion Battery ESS,” Meeting the Challenge: 2017 ESS Safety Forum, February 2017.
- **National Fire Protection Association (NFPA)**
 - “Lithium-Ion Batteries in Energy Storage Systems: Assessing the Hazard,” NFPA Conference and Exposition, June 2016.
 - “Hazard Assessment of Lithium-Ion Battery Energy Storage Systems,” 2016 Fire Protection Research Foundation webinar series, April 2016.
 - “Energy Storage Systems and the Built Environment” workshop hosted by the FDNY, NFPA, and the Fire Protection Research Foundation, November 2015.
- **Society of Fire Protection Engineers (SFPE)**
 - “Lithium-Ion Energy Storage System Fires,” Suppression, Detection and Signaling Research and Applications Conference, March 2016.
 - “Lithium-Ion Batteries: An Overview of Recent Research and Fire Testing,” Chicago Chapter Education Conference, October 2015.
 - “Suppressing Lithium-Ion Electric Drive Vehicle Battery Fires with Water,” Suppression, Detection and Signaling Research and Applications Conference (SupDet), March 2015.
- **Industrial Fabrics Association**
 - “Testing Textiles for Fire Retardancy,” IFA webinar series, February 2016.
- **National Association of Subrogation Professionals**
 - “Investigating Water Losses in Fire Sprinkler Systems,” NASP webinar series, July 2015.
 - “Investigating Water Losses in Fire Sprinkler Systems,” Georgia Chapter meeting, October 2014.
- **Society of Automotive Engineers**
 - “Full-Scale Fire Tests of Electric Drive Vehicle Batteries,” 2015 World Congress, April 2015.
- **International Symposium on Fire Investigation Science and Technology**
 - “Emergency Response to Incidents Involving Electric Vehicle Battery Hazards: Full-Scale Testing Results,” September 2014.
- **American Society of Civil Engineers (ASCE)**
 - “Investigating Inadvertent Automatic Fire Sprinkler System Discharges,” Sixth Forensic Engineering Congress, October 2012.
 - “Analyzing Unsatisfactory Fire Sprinkler Performance,” Sixth Forensic Engineering Congress, October 2012.

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- **International Association of Fire Safety Science (IAFSS)**
 - “Quantifying the Initial Spray from Fire Sprinklers,” Ninth International Symposium Proceedings, September 2008.
- **International Fire Sprinkler Conference and Exhibition**
 - “Unraveling Fire Suppression Sprays,” Seventh International Fire Sprinkler Conference and Exhibition, June 2008.
- **Universita di Modena e Reggio Emilia**
 - “Development of an Atomization Model for Fire Suppression Injectors,” Modena, Italy, December 2006.
- **International Mechanical Engineering Conference and Exposition (ASME)**
 - “Characterizing the Initial Spray from Fire Suppression Devices,” November 2006.

PUBLICATIONS

- Blum AF, Long RT. “*Fire Testing of a Lithium-Ion Battery Energy Storage System.*” Fire Protection Engineering magazine, Society of Fire Protection Engineers, Issue 73, 2017.
- Long RT, Blum AF. *Lithium Ion Batteries Hazard and Use Assessment Phase III: Sprinkler Protection Criteria for Lithium Ion Batteries Stored in Cartons.* Fire Protection Research Foundation report, 2016.
- Blum AF, Long RT. *Hazard Assessment of Lithium Ion Battery Energy Storage Systems.* Fire Protection Research Foundation report, 2016.
- Blum AF, Long, RT. “*Full-Scale Fire Tests of Electric Drive Vehicle Batteries.*” SAE International Journal of Passenger Cars: Mechanical Systems, Society of Automotive Engineers, July 2015.
- Long RT, Blum AF. “*Emergency Response to Incidents Involving Electric Vehicle Battery Hazards: Full-Scale Testing Results,*” proceedings from the International Symposium on Fire Investigation Science and Technology (ISFI), September 2014.
- Long RT, Blum AF. “*Electric Vehicle Battery Hazards: Hands-On Fire Test Data for Emergency Responders.*” Fire Protection Engineering magazine, Society of Fire Protection Engineers, Issue 62, 2014.
- Long RT, Blum AF, Bress TJ, Cotts, BRT. *Best Practices for Emergency Response to Incidents Involving Electric Vehicle Battery Hazards.* Fire Protection Research Foundation report, 2013.
- Blum AF, Long RT, Dillon SE. “*Investigating Inadvertent Automatic Fire Sprinkler System Discharges.*” American Society of Civil Engineers (ASCE), proceedings from the Sixth Forensic Engineering Congress, October 2012.
- Blum AF, Long RT, Wu NP, Dillon SE. “*Analyzing Unsatisfactory Fire Sprinkler Performance.*” American Society of Civil Engineers (ASCE), proceedings from the Sixth Forensic Engineering Congress, October 2012.
- Blum AF, Long RT. “*Investigation of Inadvertent Automatic Fire Sprinkler System Discharges.*” Subrogator Magazine, National Association of Subrogation Professionals, Winter 2011.
- Long RT, Wu NP, Blum AF. “*Lessons Learned from Unsatisfactory Sprinkler Performance.*” Fire Protection Engineering Magazine, Society of Fire Protection Engineers, Issue 48, 2010.
- Ren N, Blum AF, Do C, Marshall AW. “*Atomization and Dispersion Measurements in Fire Sprinkler Sprays.*” Atomization and Sprays Journal, Volume 19, Issue 12, 2009.
- Ren N, Blum AF, Zheng Y, Do C, Marshall AW. “*Quantifying the Initial Spray from Fire Sprinklers.*” International Association of Fire Safety Science (IAFSS), proceedings from the Ninth International Symposium, September 2008.
- Blum AF. *Discharge Characteristics of Canonical Sprinkler Sprays.* Thesis Publication, University of Maryland at College Park, Department of Fire Protection Engineering, May 2007.
- Ren N, Blum AF, Wu D, Marshall AW. “*Characterizing the Initial Spray from Fire Suppression Devices.*” Proceedings of the International Mechanical Engineering Conference and Exposition (IMECE), Chicago, IL, November 2006.

TECHNICAL COMMITTEES & SPECIAL PROJECTS

International Code Council

- Principal Member, International Building Code, Fire Safety Code Development Committee for 2015-2017 Code Development Cycle (2015 to 2017)

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- Principal Member, Fire Performance, Wildland-Urban Interface Code Interpretation Committee (FCIC) (2012 to 2014)

ASTM International

- Committee E05 on Fire Standards (2015 to present)
- Subcommittee Member (2015 to present):
 - E05.15 Furnishings and Contents
 - E05.21 Smoke and Combustion Products
 - E05.22 Surface Burning
 - E05.23 Combustibility
 - E05.33 Fire Safety Engineering

National Fire Protection Association (NFPA)

- Principal Member, Technical Committee on Energy Storage Systems, NFPA 855 Standard for the Installation of Stationary Energy Storage Systems (2016 to present)
- Principal Member, Technical Committee on Single- and Multiple-Station Alarms and Household Fire Alarm Systems, NFPA 72 National Fire Alarm Code (2014 to 2016)
- Principal Member, Technical Correlating Committee on Professional Qualifications (2014 to 2016)
- Principal Member, Building/Life Safety Code Technical Committee on Fundamentals, NFPA 101, Life Safety Code; and NFPA 5000, Building Construction and Safety Code (2010 to 2016)
- Principal Member, Building/Life Safety Code Technical Committee on Board and Care Facilities, NFPA 101, Life Safety Code; and NFPA 5000, Building Construction and Safety Code (2009 to 2016)
- Principal Member, Automatic Sprinkler Research Planning Council (2009 to present)
- Principal Member, Technical Committee on Dry and Wet Chemical Extinguishing Systems, NFPA 17, Standard for Dry Chemical Extinguishing Systems; and NFPA 17A, Standard for Wet Chemical Extinguishing Systems (2008 to 2016)
- Alternate Member, Technical Committee on Single- and Multiple-Station Alarms and Household Fire Alarm Systems, NFPA 72 National Fire Alarm Code (2012 to 2014)
- Alternate Member, Technical Committee on Hot Work Operations, NFPA 51B, Standard for Fire Prevention during Welding, Cutting, and Other Hot Work (2011 to 2016)
- Alternate Member, Technical Committee on Pre-Incident Planning, NFPA 1620, Recommended Practice for Pre-Incident Planning (2011 to 2016)

Technical Reviewer

- Project Panel Member, Sprinkler Protection of Li-ion Battery Based Energy Storage Systems, The Fire Protection Research Foundation (2018 to present).
- Project Panel Member, Obstructions and ESFR Sprinklers, The Fire Protection Research Foundation (2014 to 2016).
- Technical Reviewer, Fire and Materials Journal, 2013.

ACADEMICS

Guest Lecturer, University of Maryland, Department of Fire Protection Engineering, 2011

ACHIEVEMENTS

- Awarded the “2017 Best Project Award” by the NFPA’s Fire Protection Research Foundation for Lithium Ion Batteries Hazard and Use Assessment: Phase 3, a research project that best exemplified the foundation’s fire safety mission. National Fire Protection Association’s Conference and Exposition, June 2014.
- Awarded the “2015 SAE Excellence in Oral Presentation” by SAE International for the presentation Full-Scale Fire Tests of Electric Drive Vehicle Batteries, an award presented to those who gave an outstanding presentation during the SAE 2015 World Congress & Exhibition.
- Awarded the “2014 Best Project Award” by the NFPA’s Fire Protection Research Foundation for Best Practices for Emergency Response to Incidents Involving Electric Vehicles Battery Hazards: A Report on Full-Scale Testing Results, a research project that best exemplified the foundation’s fire safety mission. National Fire Protection Association’s Conference and Exposition, June 2014.

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- Awarded the “2011 Philip Thomas Medal of Excellence” by the International Association of Fire Safety Science (IAFSS) for Quantifying the Initial Spray from Fire Sprinklers, a paper presented at the Ninth International Symposium Proceedings, Karlsruhe, Germany, September 2008.
- Awarded the “Best Fire Research Image” by the International Association of Fire Safety Science (IAFSS) for the best image presented (from the report Quantifying the Initial Spray from Fire Sprinklers) at the Ninth International Symposium Proceedings, Karlsruhe, Germany, September 2008.