Exponent®
Engineering & Scientific Consulting

Nicholas Nava, P.E., CFEI, CVFI

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Professional Profile

Mr. Nava is a licensed fire protection engineer. He applies fire protection engineering and fire science principles to the analysis of active and passive fire protection and life safety systems, consumer product performance, material fire performance, and origin and cause investigation of residential, commercial, and industrial fires and explosions.

Mr. Nava's training and practice experience includes design and testing of automatic sprinkler systems, fire pumps, inert gas and clean agent fire suppression systems, building life safety systems, building smoke management systems, national, state, and local fire and building code compliance, material fire performance, fire testing, fire and explosion origin and cause investigations, occupant egress modeling (Pathfinder), and human burn and thermal injuries caused by fire incidents and thermal events.

Mr. Nava uses his diverse background to investigate failures of wet, dry, pre-action, and deluge automatic sprinkler systems in residential, commercial, storage, manufacturing and industrial occupancies, including root cause failure analysis, water infrastructure and supply analysis, hydrant flow testing, sprinkler system water demand and water delivery analysis through hydraulic calculations, construction and as-built drawing review, inspection, testing, and maintenance requirement analysis, coordination with facility mechanical and HVAC systems, and review of system compliance with applicable codes. This includes failures of automatic sprinkler systems to operate or perform in the event of a fire and inadvertent operation due to rust/oxidation, freezing, excessive heating, and mechanical damage.

In addition, Mr. Nava has investigated fires involving operational failure of commercial kitchen and cooking fire protection equipment (wet chemical systems and dry chemical systems), commercial kitchen and cooking ventilation systems (hood, duct work, fans), vehicle fire suppression systems, low-, medium-, and high-expansion foam systems, fire alarm and detection systems, fire extinguishers, and consumer products including unit and space heaters, LED light bulbs, tubes, fixtures, clothing irons, plastic fuel storage cans, dishwashers, microwaves, and low-pressure boilers.

Mr. Nava has also investigated explosions and fires involving failures of natural gas and liquefied petroleum (LP) regulators, gas piping systems, and cylinders. His experience also includes the evaluation, inspection, and maintenance of buildings, facilities, hazardous materials including flammable and combustible liquids, flammable solids, flammable gases, oxidizers, and products for code compliance in accordance with National Fire Protection Association (NFPA) codes, International Code Council (ICC) codes, and state/local codes.

Mr. Nava has both small- and large-scale fire testing experience with nationally and internationally recognized standards (NFPA, ASTM, and UL). In the Exponent Thermal Characterization Lab, he manages and executes testing, fabricates test equipment and test setups, and is proficient at installing various types of instrumentation to measure temperature, heat flux, pressure, volumetric flow rate, wind speed, and gas concentrations for fire tests.

Previous research in which he participated includes the design of a toxic gas monitor for use by firefighters in an active fire environment, flame spread modeling of fiber reinforced polymer (FRP) building materials, cone calorimeter test sample size validation, and the effects of intumescent paint coatings on interior building finish to achieve compliance during fire testing.

Prior to joining Exponent, Mr. Nava worked as a Fire Protection System Design Engineer at a fire protection sprinkler contractor in the Boston area, where he performed fire protection system designs, hydraulic calculations, system testing, and design coordination with architects and plumbing, HVAC, and electrical trades. Mr. Nava also worked as an engineer at the Naval Air Systems Command in Patuxent, Maryland, where he was responsible for human aviator equipment maintenance, testing, and validation.

Academic Credentials & Professional Honors

M.S., Fire Protection Engineering, Worcester Polytechnic Institute, 2014

B.S., Mechanical Engineering, Worcester Polytechnic Institute, 2013

Principal Member: NFPA Technical Committee on Fire Hose (FHS-AAA), NFPA 1961, NFPA 1962, NFPA 1963, NFPA 1964, NFPA 1965, National Fire Protection Association (2015 to present)

Alternate Member: NFPA Technical Committee on Dry and Wet Chemical Extinguishing Systems (DRY-AAA), NFPA 17, NFPA 17A, National Fire Protection Association (2017 to present)

Licenses and Certifications

Professional Engineer, Maryland, #52645

Professional Engineer, New Jersey, #24GE05718800

40-Hour Hazardous Waste Operation and Emergency Response Certification (HAZWOPER)

Certified Fire and Explosion Investigator (CFEI)

Certified Vehicle Fire Investigator (CVFI)

Fire Investigation Technician (IAAI - FIT) in accordance with the International Association of Arson Investigators

HydraCAD Training

Professional Affiliations

International Association of Arson Investigators—IAAI (member)

National Association of Fire Investigators—NAFI (member)

National Fire Protection Association—NFPA (member)

Society of Fire Protection Engineers—SFPE (affiliate member)

National Fire Sprinkler Association – NFSA (member)

Publications

Nava, N., Swann, J. Impact of Loss of Heat on Fire Sprinkler Systems: How to Reduce the Likelihood of Sprinkler Piping Freeze Failures. NFSA National Fire Sprinkler Magazine, 2021

Nava, N. et al. Computational Fluid Dynamics (CFD) Modeling Use in Fire Investigations and Matterport Camera. Course Material Manuscript, Defense Research Institute (DRI) Fire Science and Litigation Seminar, September 9 – 11, 2021

Nava, N. Converting a Wet System to a Dry System – What to Consider (and not forget). NFSA National Fire Sprinkler Magazine, 2018

Nava, N., Biteau, H. CFD Modeling of Flammable Gas Concentration Levels and Empirical Validation Proceedings, 9th International Symposium of Fire Investigation Science and Technology (ISFI), NAFI, pp. 209-217, 2018

Nava, N., Biteau, H. Transportation of Li-ion batteries: The State of Charge Parameter. Proceedings, 16th International Conference on Automatic Fire Detection (AUBE)/Suppression, Detection and Signaling Research and Applications Conference (SUPDET), Interflam 07, Vol. 1, pp. 427-439, Hyattsville, Maryland, USA, September 12-14, 2017

Invited Presentations

Nava, N. et al. Property Industrial Plant Fire: Did the Fire Protection System Work?. National Association of Subrogation Professionals (NASP) 2021 Annual Conference, November 8–10, 2021.

Nava, N. et al. Property Industrial Plant Fire: No, It Didn't … Now What?. National Association of Subrogation Professionals (NASP) 2021 Annual Conference, November 8–10, 2021.

Nava, N. et al. Live Burn Technology – Fire Scene Investigations - 3 Quick Hits. Defense Research Institute (DRI) DRI Fire Science and Litigation Seminar, September 9 – 11, 2021

Nava, N, Utiskul, Y. Fire Protection Systems for the Fire Investigator – Do You Need an FPE. Oakland County Association of Arson and Fire Investigations, Inc. (OCAAFII): Online Quarterly Training Session with Exponent, March 16, 2021

Biteau, H, Nava N. CFD Modeling of Flammable Gas Concentration Levels and Empirical Validation. Oakland County Association of Arson and Fire Investigations, Inc. (OCAAFII): Online Quarterly Training Session with Exponent, March 16, 2021

Nava, N, Utiskul, Y. Cleaning the System without Modification (Take the Grease, Leave the Rest as You Found it). International Kitchen Exhaust Cleaning Association (IKECA) Virtual Fall Technical Seminar and Expo, October 21-23, 2020

Biteau, H, Nava N. CFD Modeling of Flammable Gas Concentration Levels and Empirical Validation. Proceedings, 9th International Symposium of Fire Investigation Science and Technology (ISFI), NAFI, Itasca, Illinois, USA, September 24-26, 2018

Biteau, H, Nava N. Transportation of Li-ion batteries: The State of Charge Parameter. Proceedings, 16th International Conference on Automatic Fire Detection (AUBE)/Suppression, Detection and Signaling Research and Applications Conference (SUPDET), Hyattsville, Maryland, USA, September 12-14, 2017

Nava N, Mahoney S. Evaluation of fiber reinforced polymer bench scale specimen sizes and prediction of full scale flame spread testing for building applications. American Society of Materials Central Massachusetts Chapter 2013 MQP Competition Meeting, Worcester, MA, 2013

Reports

Nava N, Mahoney S, Acosta C, Wright W. Evaluation of fiber reinforced polymer bench scale specimen sizes and prediction of full-scale flame spread testing for building applications. Major Qualifying Project, Worcester Polytechnic Institute, 2013

Casola R, Downey R, Nava N, Taylor J. Improving Road Safety in the Santa Fe Metropolitan Planning area. Interactive Qualifying Project, Worcester Polytechnic Institute, 2012

Conferences, Seminars, Workshops, and Specialized Training

National Association of Subrogation Professionals (NASP) 2021 Annual Conference, November 8–10, 2021 (speaker)

“Designing Sprinkler Systems for Longevity and Easy Maintenance”, The Society of Fire Protection Engineers (SFPE), 1 PDH, November 5, 2021

DRI Fire Science and Litigation Seminar, September 9 – 11, 2021 (speaker and fire protection demonstration room coach)

“Linear Heat Detection Design and Use in Modern Applications”, The Society of Fire Protection Engineers (SFPE), 1 PDH, July 27, 2021

“Energy Code Impact on Commissioning and Integrated Testing”, The Society of Fire Protection Engineers (SFPE), 1 PDH, June 21, 2021

“Corrosion Prevention & Freeze Protection in Fire Sprinkler Systems”, The Society of Fire Protection Engineers (SFPE), 1 PDH, June 3, 2021

“Understanding and Reducing the Fire Risk of Residential Upholstered Furniture Fires” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, May 24, 2021

“Fire Service Considerations with Lithium-Ion Battery ESS - An Investigation of the Surprise, AZ Incident” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, April 14, 2021

“Design and Inspection Criteria for Freeze Protected Sprinkler Systems” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, April 8, 2021

Oakland County Association of Arson and Fire Investigations, Inc. (OCAAFII): Online Quarterly Training Session with Exponent, March 16, 2021 (speaker)

“The Commercial Club Building - Adapting the Code for Adaptive Reuse” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, March 15, 2021

“BIM-Based Fire - Approval Process” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, February 22, 2021

“The New NIST Fire Calorimetry Database: A Resource for Fire Protection Engineers” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, February 8, 2021

“Sprinkler Hydraulics - The 3rd Edition” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, January 25, 2021

“Florida Building Code 7th Edition: Advanced Course”, American Institute of Architects (AIA), 2 LU/HSW (2 Hours), January 20, 2021

International Kitchen Exhaust Cleaning Association (IKECA) Virtual Fall Technical Seminar and Expo, October 21-23, 2020 (speaker)

“NFPA 770: The New Standard for Hybrid Fire Extinguishing Systems” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, October 20,2020

“Imaging Through Fire Using Narrow Spectrum Illumination” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, October 19,2020

“Freeze Protection and Corrosion Mitigation in Fire Sprinkler System” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, September 30, 2020

“How is COVID-19 Affecting Fire Protection Engineering” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, April 7, 2020

“Probabilistic Fire Risk Analysis in an Automated Intensive Warehouse: A Difference Approach to Fire Safety” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, February 10, 2020

“Oxygen Reduction System for Automated Deep Freeze Warehouse – A Case Study” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, January 13, 2020

“Deluge and Preaction Systems - Introduction, Characteristics and Applications” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, December 4, 2019

“Design and Future Trends of High-Rise Residential Towers – A Comparison Between UK and German Regulations” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, November 25, 2019

International Association of Arson Investigators (IAAI), Complex Fire Investigation for the Insurance Industry, Alcohol Tabaco & Firearms (ATF) National Center for Explosives Training and Research (NCETR), 40 hours tested training, October 28 – November 1, 2019

“Understanding Fiber Optic Linear Heat Detection: Best Design Practices and Application” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, October 23, 2019

“Structural Performance and Particularities of Multi-Story Intermodal Steel Container Structures at Elevated Temperatures” webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, October 21, 2019

"The Fire Protection Engineer's BIM Experience" webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, February 26, 2019

"The Growing Danger of Non-Certified and Counterfeit Sprinklers" webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, January 28, 2019

"SFPE Annual Report" webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, May 31, 2018

"Development of In-Rack Sprinkler Protection Guidance for Mini-Load Automatic Storage and Retrieval Systems" webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, May 3, 2018

"WUI Resiliency: Answering to Climate Change" webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, January 22, 2018

National Association of Fire Investigators (NAFI), International Symposium on Fire Investigation Science and Technology, 2018 (delegate)

DRI, Fire Science and Litigation Burning Down the House, 2018 (controlled burn station coach)

National Association of Fire Investigators (NAFI), Vehicle Fire, Arson & Explosion Investigation Science & Technology Seminar, 2018 (32 hours tested training)

"A Study of Reproducibility of a Full-Scale Multi-Room Compartment Fire Experiment" webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, November 27, 2017

International Association of Arson Investigators (IAAI), NFPA 921 Update 2017 course, November 9, 2017

"Understanding Commissioning and System Acceptance Testing" webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, September 25, 2017

"Simulating Hospital Evacuation" webinar, The Society of Fire Protection Engineers (SFPE), 1 PDH, August 28, 2017

16th International Conference on Automatic Fire Detection (AUBE)/Suppression, Detection and Signaling Research and Applications Conference (SUPDET), 2017 (speaker)

National Fire Sprinkler Association (NFSA), Understanding, Applying and Enforcing NFPA 25, 2017

National Association of Fire Investigators (NAFI), National Fire Investigation Training Program, 2017 (28 hours tested training)

International Association of Arson Investigators (IAAI), Expert Witness Courtroom Testimony Course, 2015 (40 hours tested training)

International Association of Arson Investigators (IAAI), Understanding Fire Through the Candle Experiments, August 20, 2015 (4 hours tested training)

International Association of Arson Investigators (IAAI), Fire Investigator Scene Safety, July 10, 2015 (3 hours tested training)

International Association of Arson Investigators (IAAI), NFPA 1033 and Your Career, June 22, 2015 (2 hours tested training)

International Association of Arson Investigators (IAAI), The Practical Application of the Relationship Between NFPA 1033 and NFPA 921, June 22, 2015 (2 hours tested training)

International Association of Arson Investigators (IAAI), Fundamentals of Fire Investigation Course, March 15, 2015 (40 hours tested training)

International Association of Arson Investigators (IAAI), The Scientific Method for Fire and Explosion Investigation, March 5, 2015 (3 hours tested training)

International Association of Arson Investigators (IAAI), Explosion Dynamics, September 16, 2014 (4 hours tested training)

International Association of Arson Investigators (IAAI), Ethics and the Fire Investigator, July 22, 2014 (3 hours tested training)

International Association of Arson Investigators (IAAI), Fire Protection Systems, July 22, 2014 (3 hours tested training)

International Association of Arson Investigators (IAAI), Documenting the Event, March 6, 2014 (4 hours tested training)

International Association of Arson Investigators (IAAI), Ethics & Social Media, March 6, 2014 (3 hours tested training)

International Association of Arson Investigators (IAAI), Arc Mapping Basics, June 4, 2013 (4 hours tested training)

International Association of Arson Investigators (IAAI), Digital Photography and the Fire Investigator, May 31, 2013 (4 hours tested training)