



2021 FIRE PROTECTION ENGINEERING SYMPOSIUM

A TWO HALF-DAY LIVE VIRTUAL EVENT

Presentations to be delivered live via Zoom

The Southern California Chapter of SFPE is hosting the 6th Annual Fire Protection Engineering Symposium. Proceeds benefit the Chapter Scholarship Fund for Cal Poly San Luis Obispo fire protection engineering students.

AGENDA

Session I: Monday, December 6, 2021, from 8:30am – 12:00pm PST

- 8:30 Welcome Remarks
- 8:35 2019 Code Changes, What's Coming in the 2021-22 Codes, and Current Hot Topics
Greg Andersen, California Office of the State Fire Marshal
- 9:20 Dust Hazard Analysis
Fatima Ibrahim, Jensen Hughes
- 10:05 Break (10-minutes)
- 10:15 Two Way Communications Systems – The Coming Evolution
Joseph Cervantes, CAFAA
- 11:00 Development of Fire Protection Engineering Practitioner Tools
Leslie Marshall, Ph.D., SFPE Foundation
Greg Baker, Ph.D., Fire Research Group Ltd.
- 11:50 Closing Thoughts

Session II: Tuesday, December 7, 2021, from 8:30am – 12:00pm PST

- 8:30 Welcome Remarks
- 8:35 WUI Fire Institute – Current Research
Dr. Richard Emberley, Cal Poly SLO
- 9:20 PFAS and Hangar Foam Systems
Doug Fisher, Fisher Engineering
- 10:20 Break (10-minutes)
- 10:30 Codes and Firefighting Operations
Timothy Kerbrat, OCFA
- 11:00 NFPA 13 Update and Hot Topics
Bob Caputo, AFSA
- 11:50 Closing Thoughts

PRESENTATION DESCRIPTIONS AND PRESENTERS' BIOGRAPHIES

2019 Code Changes, What's Coming in the 2021-22 Codes, and Current Hot Topics

– *Greg Anderson*

The codes are constantly evolving, and the State Fire Marshal's Office has statutory authority for fire and panic safety which spans all uses and codes. This state agency has the most code amendments over the most codes - Building, Residential, Electrical, Plumbing, Mechanical, and more (of course, Fire, too!). This presentation covers an overview of the 2019 intervening code cycle changes to the California Building Standards Code. Greg will share significant changes coming in the new triennial IBC as well as state amendments thereof, as well as several "hot topics" such as A2L, mass timber, and others.

Gregory Andersen

The Office of the State Fire Marshal

Gregory Andersen has been the Division Chief of Code Development & Analysis for CAL FIRE/Office of the State Fire Marshal since September 2015 and has been with the State for over 26 years. During Greg's career he has promoted through the ranks from field deputy, plan reviewer, and Supervising Deputy Fire Marshal responsible for the Fire & Life Safety Division in the Central Valley.



Greg started his education path with a major in physics but instead decided a different path. He holds two Associate of Science degrees, one in Business Administration and one in Fire Technology, a Bachelor of Science in Organizational Management, and a Master of Arts in Leadership Studies; he is also a certified Fire Marshal by the State Board of Fire Service. Greg was recognized by CALBO (California Building Officials) as the 2020 Fire Official of the Year.

PRESENTATION DESCRIPTIONS AND PRESENTERS' BIOGRAPHIES

Dust Hazard Analysis

– *Fatima Ibrahim*

Combustible dust standards are going through major changes that will soon be adopted in the International Fire and Building codes. There are several standards that have been adopted by the building and fire codes pertinent to different industries and facilities, including NFPA 61, NFPA 499, NFPA 652, NFPA 654. Sometimes it's not immediately clear which standard(s) are applicable and why. This presentation will cover the basics of combustible dust standards and two significant upcoming changes to the standards: the major overhaul to the standards and the process behind it, and a significant Tentative Interim Amendment (TIA) that everyone using the standards should be aware of.

Fatima Ibrahim

Jensen Hughes

Fatima is a senior fire protection and hazardous materials consultant with Jensen Hughes working with high-risk facilities to assess the extent of fire, reactivity, and health hazards of chemicals in diverse settings through the lens of building and fire codes and OSHA regulations. She has a background in chemical hazard analysis, special hazards protection, combustible dust, and the occupational safety of industrial processes. Previously, she conducted research in the fields of toxicology, medical physics, and biophysics. Fatima has a BS in physics and chemistry from the University of California, Irvine, an MS in physics from California State University, Long Beach, and an MS in global medicine from the University of Southern California.

PRESENTATION DESCRIPTIONS AND PRESENTERS' BIOGRAPHIES

Two-Way Communications Systems – The Coming Evolution

– *Joseph Cervantes*

Whether its buildings, subways, tunnels or office towers, continuity of critical life safety systems wiring and components is paramount. With the upcoming anticipated adoption of NFPA 72—2022 and publication of the UL 2525 Two-Way Emergency Communications Systems for Rescue Assistance standard on June 12, 2020, the time of evolution is upon the industry, with NFPA 72 making direct reference to this new standard. As more buildings are subject to two-way communications, an understanding of these systems is important. This discussion will focus on minimum standards for two-way communication system design, installation, and inspection/testing, and the coming evolution of codes and standards with emphasis on California.

Joseph Cervantes

CAFAA

Joseph Cervantes has been working in the fire protection and life safety field since 1996, beginning his career as a system Installer and progressing through the field ranks to become a Project Manager, and Operations Manager for two very large organizations in Southern California. His experience includes project management in all vertical markets from K-12, higher education, government, commercial, residential, high rise, and clean room application.

Joseph serves as the Treasurer for SFPE in San Diego, Secretary of the Board for the California Automatic Fire Alarm Association (CAFAA), member of the Southern California Fire Prevention Officers Fire Equipment and Devices Committee, educational chair for the American Society of Safety Professionals, and fire protection advisor to the American Wood Council.

Currently Joseph is the Western Region Business Development Manager for Space Age Electronics where his goal is to change the level of integration opportunities available to the life safety industry.



PRESENTATION DESCRIPTIONS AND PRESENTERS' BIOGRAPHIES

Development of Fire Protection Engineering Practitioner Tools

– Leslie Marshall, Ph.D. & Greg Baker, Ph.D.

Dr. Marshall will provide an overview of the Foundation and current opportunities for engagement, followed by Dr. Greg Baker, one of the Foundation's recent research grant recipients whose team led the "Development of Fire Engineering Practitioner Tools Project" to develop a comprehensive set of tools that can be used by engineers in alignment with the best practices of the 5th edition of the SFPE Handbook of Fire Protection Engineering. Dr. Baker's presentation will cover project highlights including the international survey of current practices, an assessment of available tools, a gaps analysis, and a summary of the findings and priorities for industry tool development.

Leslie Marshall, Ph.D.

SFPE Foundation

Dr. Leslie Marshall serves as the Director of SFPE Foundation, a global non-profit organization that supports research and education to improve the scientific understanding of fire and its interaction with the natural and build environment. Affiliated with the Society of Fire Protection Engineers, Inc., SFPE Foundation leverages support from external grants and individual, corporate, and SFPE chapter donations to fund professional awards, student scholarships, and research grants; lead cross-sectoral research collaborations; conduct research workshops and meetings; develop new initiatives to support the next generation of fire protection engineers; and disseminate knowledge to advance the field of fire engineering and fire safety science globally. Previously, Dr. Marshall served as founding Associate Director of the Center for Sustainable Business at the University of Pittsburgh, where she was also Lead Author for the Marshall Plan for Middle America (MP4MA) Roadmap, an award-winning, non-partisan, multi-sectoral research effort to envision a more equitable and sustainable regional economic future for the Ohio River Valley and Upper Appalachia. Her academic work has been published in top academic journals, including the Journal of Experimental Political Science, The Journal of Politics, and the Quarterly Journal of Political Science. She holds a Ph.D. and an M.A. in Political Science from the University of Pittsburgh and a B.A. in Philosophy, Politics, and Economics from Denison University.



Greg Baker, Ph.D.

Fire Research Group Ltd.

Greg Baker is a Director of Fire Research Group Ltd., a specialist applied fire research consultancy based in Wellington, New Zealand. Greg has worked in the building and construction sector for approximately 35 years. Originally starting his working life as a consulting structural engineer, then building product manufacturing, contracting, product R&D, and scientific research for the last 25 years. Greg's primary area of professional activity is performance-based fire safety engineering. Greg is the Chair of the SFPE's Standing Committee for Research Tools and Methods (RTM) and within that committee also chairs a committee which is developing a new SFPE PBD Standard. Greg has an undergraduate degree in civil engineering and two post-graduate degrees in fire engineering. He is a Chartered Professional Engineer in Australia, a Fellow of the Institution of Engineers Australia, and a Professional Member of SFPE.



PRESENTATION DESCRIPTIONS AND PRESENTERS' BIOGRAPHIES

WUI Fire Institute – Current Research

– Richard Emberley, Ph.D.

California and wildfires have always seemed to “go together”. California has experienced several of the most destructive wildfires in history with many notable ones occurring since 2017, motivating significant interest has in the wildland-urban interface (WUI) to better understand the problem and recommend solutions. California Polytechnic State University - San Luis Obispo (Cal Poly) created the WUI FIRE Institute to aid in the synthesis of WUI related information and research currently generated around the world. The WUI FIRE Institute’s aim is to be the leading source on WUI fire science, engineering, information, intelligence, research, and education, and to promote holistic solutions. The presentation will discuss the current state of the WUI FIRE Institute and research being conducted by the faculty and associated partnerships and collaborations.

Richard Emberley, Ph.D.

California Polytechnic State University - San Luis Obispo

Richard Emberley is an assistant professor in the Mechanical Engineering Department and Fire Protection Engineering Program at California Polytechnic State University (Cal Poly). Richard completed his PhD under the supervision of Professor Jose L. Torero at the University of Queensland in Brisbane, Australia in early 2017. Richard holds two MS degrees in Civil and Fire Protection Engineering from Worcester Polytechnic Institute as well as a BS in Civil Engineering with a focus on Structural Engineering. His research focuses in the areas of fire safety engineering, structural mechanics, combustion, and heat transfer among other areas. His PhD research focused on structural debonding of cross-laminated timber under fire conditions as well as self-extinction of timber and the fundamentals for designing tall timber buildings for fire exposure. Richard has extensively published and presented academic papers in *Engineering Structures*, *Fire Safety Journal*, *Tunneling and Underground Space Technology*, *Proceedings of the Combustion Institute*, and at the International Association for Fire Safety Science (IAFSS) Symposiums among other conferences.



PRESENTATION DESCRIPTIONS AND PRESENTERS' BIOGRAPHIES

PFAS and Hangar Foam Systems

– Doug Fisher

Is PFAS the next asbestos? PFAS has become a popular four letter word in the news over the past few years. While PFAS is in popular products like water repellent coatings, stain-resistant carpets and non-stick cookware, its also an ingredient in firefighting foam. In the rush to address the environmental and health issues associated with PFAS, there is significant confusion related to “foam” and PFAS. States are enacting legislation banning the use of “firefighting foam” as well as filing civil litigation against manufacturers who have used PFAS in their products. Congress, through the National Defense Authorization Act of 2020, required the Department of Defense to phase out all PFAS containing foam by October 1, 2020 (with exceptions).

With the environmental concerns related to PFAS, the aircraft hangar industry started to take a stronger look at foam fire suppression systems due to concern over inadvertent discharges. Since 2018, there have been three studies (two published as of the date of this presentation) that have analyzed fuel spill fires in aircraft hangars as well as the financial impact of inadvertent foam discharges. These studies have led to proposed revisions to the 2022 edition of NFPA 409, particularly related to fire protection systems in Group II hangars.

This presentation will review the environmental concerns of foam due to PFAS, examine recent research on hangar fuel spill fires and the inadvertent foam system discharge dilemma, and discuss current aircraft hangar fire protection schemes including changes to NFPA 409 and DoD criteria.

Douglas W. Fisher, PE, FSFPE, LEED® AP BD+C

Fisher Engineering

Mr. Fisher is a licensed fire protection engineer, a Fellow in the Society of Fire Protection Engineers and LEED® Accredited Professional in Building Design and Construction with over 26 years of experience in the field. He is a professional fire protection engineer, by exam, and currently licensed in 26 states. Doug is a principal member of the NFPA Technical Committees on Space Ports, Commissioning and Integrated Testing, and Flammable and Combustible Liquids (Correlating Committee and Operations) as well as the Chair of the NFPA Technical Committee on Water Tanks. He is an active member of the Society of Fire Protection Engineers (SFPE) and the Chair of the SFPE Committee on Professional Qualifications. He is also a Past President of the SFPE Greater Atlanta Chapter and Governor of the SFPE Greater Atlanta Chapter Foundation.



He is currently a Principal Fire Protection Engineer in the Georgia office of Fisher Engineering, Inc. His experience includes design, review, commissioning and retro-commissioning of active and passive fire protection systems, fire protection system failure analysis, life safety/building code review and analysis, fire hazard analysis and fire modeling. He holds a Bachelor of Science degree in Fire Protection Engineering from the University of Maryland and Master of Business Administration degree from Emory University.

Doug has extensive experience with the design, review, commissioning and retro-commissioning aircraft hangar foam fire suppression for private industry as well as the federal government. Doug also provides forensic engineering services for a variety of clients after foam system discharges to determine the cause as well as recommendations to prevent future inadvertent activation.

PRESENTATION DESCRIPTIONS AND PRESENTERS' BIOGRAPHIES

Codes and Firefighting Operations

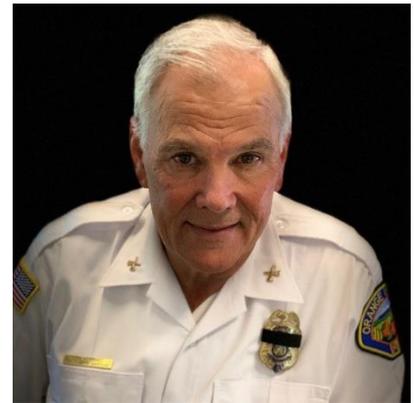
– *Timothy Kerbrat*

Codes should be supportive of firefighting operations. The general public and even many users of the building and fire codes are unaware of firefighting operations, giving the impression that many code requirements appear overly restrictive or unnecessary. This presentation is intended to give a brief introduction to firefighting operations involving access, ventilation, and standpipes, then demonstrate how codes support these operations. How fire prevention bureaus are working with current challenges such as the “Tesla Roof” will be discussed.

Timothy Kerbrat

Deputy Fire Marshal, Orange County Fire Authority

Tim Kerbrat is Deputy Fire Marshal of Orange County Fire Authority's (OCFA) Planning and Development Section. In this capacity, he oversees all the fire plan reviews, new construction inspections, and the fire code amendment process for 24 partner cities and the unincorporated Orange County areas.



Prior to joining the OCFA, Tim served 37 years with Los Angeles City Fire Department (LAFD) and retired as a Battalion Chief responsible for the Los Angeles Harbor Area. Tim's fire operations experience included roles as a firefighter, apparatus operator, fire inspector, captain and chief officer where he participated in major historical emergency incidents including the Dorothy Mae Apartment Fire, First Interstate Fire, Los Angeles 1992 Civil Unrest, and Northridge Earthquake. During his final years with the LAFD he served as a member on Type I CALFIRE Incident Management Teams and Type III LAFD Incident Management Teams.

Tim also has an extensive fire prevention background and was instrumental in the LAFD Code transition to the California Code of Regulations, the implementation of the LAFD Chief Regulation 4 Program, the development of the LAFD High Rise Unit and a charter member of the NFPA 1730 Standard Committee. Tim has numerous State Fire Marshal Certifications and a Bachelor's degree in Business Administration from Mount Saint Mary's University.

PRESENTATION DESCRIPTIONS AND PRESENTERS' BIOGRAPHIES

NFPA 13 Update and Hop Topics

– *Bob Caputo*

This program will provide an overview of the new layout of NFPA 13, introduced with the 2019 edition, along with a discussion of the significant technical changes in both the 2019 edition and soon to be released 2022 edition of the Fire Sprinkler Installation Standard.

Bob Caputo, CFPS

AFSA

Bob Caputo is the President of the American Fire Sprinkler Association, a non-profit international association representing merit shop fire sprinkler contractors dedicated to training and education and promoting the benefits of fire sprinklers. With over 40 years of experience in the fire protection contracting and consulting field, Bob is active in code development and outreach. He is a member of multiple NFPA technical committees including NFPA 13 and NFPA 25, chairs the NFPA 16, 24 and 291 Committees, and is a member of the Advisory Board at Oklahoma State University School of Fire Protection & Safety Engineering. A passionate proponent of fire sprinklers and fire protection, Bob has presented seminars in most US States and 14 countries, is a regular speaker at the annual NFPA and AFSA conventions, and is a contributor to the NFPA 13 and NFPA 25 Handbooks as well as the NFPA Fire & Life Safety Inspection Manual.



Bob is a US Navy veteran and former volunteer firefighter. Bob has been recognized for his accomplishments and passion with awards including Fire Prevention Officer of the Year in 1994 by the San Diego County Fire Chief's Association, Fire Protection Contractor Magazine's "Man of the Year" in 1997, and in 2017 he received the highest AFSA honor, the "Henry S. Parmelee" award.