



**SOCIETY of FIRE PROTECTION ENGINEERS**  
*Southern California Chapter*

[www.sfpeSoCal.org](http://www.sfpeSoCal.org)

## **2016 FIRE PROTECTION ENGINEERING SYMPOSIUM**

**October 5, 2016, 8:00am – 4:00pm**

Old Ranch Country Club  
3901 Lampson Avenue  
Seal Beach, CA 90740

The Southern California Chapter of SFPE is hosting the 2016 Fire Protection Engineering Symposium. Invited speakers will present hot topics in the fire protection industry. Also, the newest fire safety technologies will be exhibited. Proceeds benefit the Chapter Scholarship Fund. Come learn about fire protection engineering and support students.

### **AGENDA**

- 7:00 – 8:00 Registration and Refreshments
- 8:00 – 8:15 Welcome
- 8:15 – 9:00 **Fire Safety of Large Wooden Structures**  
*Dr. Frederick W. Mowrer, Cal Poly SLO*
- 9:00 – 9:45 **Fire Safety Challenges of Tall Wooden Buildings**  
*Amanda Kimball, Fire Protection Research Foundation*
- 9:45 – 10:00 Break and Refreshments
- 10:00 – 10:45 **Fire Alarm Systems and the Internet of Things (IoT)**  
*Dr. Shane Clary, Bay Alarm*
- 10:45 – 11:30 **Healthcare Facilities Construction Update from OSHPD**  
*Gary Dunger, OSHPD*
- 11:30 – 12:00 ~~**The Good, The Bad & The Ugly of the Regulator Relationship**~~  
~~*Chief Tonya L. Hoover, California State Fire Marshal*~~ <<<UNABLE TO PRESENT>>>
- 12:00 – 12:45 Lunch Provided
- 12:45 – 1:30 **Lithium-Ion Battery Flammability Characterization for Storage Protection & Current Research**  
*Amanda Kimball, Fire Protection Research Foundation*
- 1:30 – 2:15 **Preventing Lithium-Ion Battery Thermal Runaway**  
*Nicholas Johnson, 3M*
- 2:15 – 2:30 Break and Refreshments
- 2:30 – 3:15 **Obstructions and Early Suppression Fast Response (ESFR) Sprinklers**  
*Garner Palenske, Jensen Hughes*
- 3:15 – 4:00 **Addressing Corrosion Concerns in Sprinkler Systems**  
*Jake Lehmann, South-Tek*

## Presentation Descriptions

*in order of presentation*

### **Fire Safety of Large Wooden Structures** – *Dr. Frederick W. Mowrer*

Wooden structures are being built larger and taller than ever before. Once completed and occupied, these buildings are typically equipped with automatic sprinkler systems, gypsum-sheathed walls and ceilings, and other features that reduce the fire hazards and risks associated with these large combustible structures. But while they are under construction or demolition, these structures can represent extreme hazards that can threaten surrounding buildings and infrastructure, as evidenced by a number of fires involving such projects while under construction.

### **Fire Safety Challenges of Tall Wood Buildings** – *Amanda Kimball*

Recent architectural trends include the design and construction of increasingly tall buildings with structural components comprised of engineered wood. Previous research has shown that timber elements can contribute to the fuel load in buildings and can increase the initial fire growth rate. There is a need to evaluate the contribution of massive timber elements that would be expected to be found in tall buildings. This presentation will provide a summary and current status of an on-going Research Foundation project to quantify the contribution of timber building elements (e.g. CLT) to a compartment fire.

### **Fire Alarm Systems and the Internet of Things (IoT)** – *Dr. Shane M. Clary*

We are moving away from the traditional hardwire fire alarm system within buildings. While “wireless” systems are now being designed and installed, connection of the system as part of a smart building is also upon us. In the not too distant future, will a smoke detector report to a Fire Alarm Control Unit, or just be part of a Connected or Smart Building? How will the information from the detector and from the system be communicated to building occupants and to emergency responders? This discussion will explore the possible future of fire detection and reporting.

### **Healthcare Facilities Construction Update from OSHPD** – *Gary Dunger*

OSHPD will be discussing the changes to the 2016 California Building Standards Codes requirements pertaining to healthcare facilities. A demonstration of the new Electronic Plan Review process will follow. This presentation should be beneficial for designers, project managers, inspectors and contractors submitting new healthcare construction projects after January 1, 2016.

### ~~**The Good, the Bad, and the Ugly of the Regulator Relationship**~~ – *Chief*

~~*Tonya L. Hoover*~~

~~<<<<UNABLE TO PRESENT>>>>~~

~~Chief Tonya Hoover will discuss the relationships between the designer, contractor and the regulator and how to help keep the project out of the middle. She will also provide an understanding of the role and responsibilities of the regulator.~~

## **Lithium-Ion Battery Flammability Characterization for Storage Protection & Current Research** – *Amanda Kimball*

The Fire Protection Research Foundation has conducted a multi-phase research program sponsored largely by a group of property insurers to develop guidance for the protection of lithium ion batteries in storage. The first two phases of this project, a hazard assessment and a large scale flammability characterization, were completed in 2013. The latter program provided good information on the performance of cartoned small format batteries in storage and indications are that a practical sprinkler protection solution, similar to that used for other common stored commodities will be effective. To confirm this finding, a large scale test was completed this year to ensure that the sprinkler system proposed will be effective in controlling the fire hazard. This presentation will provide the details of this research program as well as highlight any on-going research related to the fire protection of lithium-ion batteries.

## **Preventing Lithium-Ion Battery Thermal Runaway** – *Nicholas Johnson*

Lithium-ion batteries are in widespread use worldwide in a vast array of electronic and electric devices. While generally safe and reliable energy storage devices, lithium-ion batteries are subject to a catastrophic failure mode known as thermal runaway under certain conditions. In an unprotected air atmosphere this high energy event has been found to increase the temperature of adjacent cells creating a cell-to-cell cascading thermal runaway event that is significantly more energetic than the initial event. By having the battery packs immersed in two different dielectric fluids or by application of one of the fluids after the initial thermal event, cell-to-cell cascading thermal runaway can be completely avoided. Different application techniques of the fluid will be discussed as well as the benefits to a number of different applications in which this technology can be applied.

## **Obstructions and ESFR Sprinklers** – *Garner Palenske*

The effect obstructions have on ESFR sprinkler performance is important issue designers encounter every day. The requirements found within the current edition of the NFPA 13, *Standard for the Installation of Sprinkler Systems* are dated and could be overly conservative. This issue was the motivation for the Fire Protection Research Foundation to commission the research project *Obstructions and ESFR Sprinklers*.

This presentation will include an overview of the findings of the third phase of the study, including the review of both full scale fire testing and Actual Delivered Density testing. This testing was completed in June and August of 2016 and has never been publically presented.

## **Addressing Corrosion Concerns in Sprinkler Systems** – *Jake Lehmann*

This presentation will discuss sprinkler pipe corrosion mechanisms in wet, dry and pre-action fire protection systems, including electrochemical, galvanic, and aerobic/anaerobic Microbiologically Influenced Corrosion (MIC). The presentation will address an equation for corrosion in wet, dry and pre-action fire protection systems, ongoing sprinkler pipe corrosion testing, and understanding test results. Solutions for addressing corrosion in dry and pre-action

systems will be explored, including corrosion inhibiting products, such as nitrogen generator, dry pipe inerting, and chemical inhibitors. Solutions for addressing corrosion in wet sprinkler systems will be presented, such as wet air vents, nitrogen inerting, DeOx technology, and chemical inhibitors.

## Invited Speakers

### **Shane M. Clary, Ph.D.**

#### *Bay Alarm*

Dr. Clary is Vice President of Codes and Standards Compliance with Bay Alarm. He holds degrees in Associates in Business, a Masters, and a Ph.D. He has been a part of the alarm industry since 1974. He is a very active member of the National Fire Protection Association and currently serves as a member of over ten NFPA Technical Committees. He is the past Chair of NFPA 72, Technical Committee on Fundamentals, a former Member of the NFPA Standards Council, and a former member of the NFPA Fire Protection Research Foundation Research Advisory Committee. He is past Chairman of the Automatic Fire Alarm Association (AFAA), and past President of the California Automatic Fire Alarm Association (CAFAA). He is also Chairman of the Western Burglar and Fire Alarm Association Unilateral Apprentice Training Committee (WBFAA-UATC).

### **Gary Dunger**

#### *Office of Statewide Health, Planning, and Development*

Gary Dunger is the Chief Fire & Life Safety Officer for the State of California, Office of Statewide Health Planning & Development. He is also the OSHPD Business Process Manager and Program Manager for the Electronic Services Portal – OSHPD’s web-based project tracking system that allows facility owners and licensed professionals to submit project applications online.

### **~~Chief Tonya L. Hoover~~**

**<<<<<Unable to Present>>>>>**

#### *~~Office of the State Fire Marshal~~*

~~Tonya L. Hoover was appointed State Fire Marshal by Governor Edmund G. Brown on November 21, 2011 and was confirmed by the Senate in May 2012 after serving as Acting State Fire Marshal since July 1, 2009. She was appointed and served as the Assistant State Fire Marshal from September 4, 2007. Chief Hoover has been actively involved in Fire Prevention, Public Education and Risk Mitigation for more than 20 years; and served as the Fire Marshal for the Moraga-Orinda Fire District located east of the Oakland/Berkeley hills. Chief Hoover has served as a Deputy Fire Marshal for the University of California at Berkeley and Fire Inspector/Plan Reviewer for two Bay Area fire departments.~~

~~Chief Hoover graduated from Oklahoma State University with an Associate of Science Degree in Fire Protection Engineering Technology and a Bachelor of Science Degree in Technical Education Specializing in Fire Protection Engineering Technology and Safety. She further earned a Master of Business Administration/Human Resources from the University of Phoenix. She holds several State Fire Marshal certifications, is a certified Fire Marshal, and holds a life-time teaching credential.~~

~~She serves as a member of several fire service associations including the: National Fire Protection Association (NFPA) technical committee as a principal member; International Fire Service Training Association (IFSTA); Underwriter's Laboratory Fire Council, the International Code Council, Code and Standards and Residential Code Development Committees; and Vision 20/20. Chief Hoover also serves as a board member of the National Fire Protection Association and the International Fire Service Training Association. She is an active member and past president (Northern Division – NorCal) of the California Fire Chiefs' Fire Prevention Officers Section; and a committee co-chair. Chief Hoover also has sat on the Executive Board for SafeKids California and ICC Fire Code Development Committee.~~

~~She is a recipient of the Northern California Fire Prevention Officers' Charlie Gray Award for Outstanding Service to Northern California Fire Prevention Officers, the recipient of the 2011 Bringing Fire Safety Home Award, American Fire Sprinkler Association 2012 Advocate of the Year, the National Code Services Association's 2012 Robert W. Gains Award, the 2012-13 California Building Officials Association Fire Official of the Year, the National Automatic Fire Alarm Association 2013 Person of the Year, and the 2014 William E. Fox Award Recipient for Outstanding Service and Leadership in the Fire Service, California Fire Chiefs Association Fire Prevention Officers Southern Section.~~

~~Chief Hoover has been a speaker at several professional events that include the Annual Meeting of NFPA, California Fire Chiefs Association, National Firewise Conference, Oklahoma Fire Chiefs Association, and the 43rd Annual International Conference on Campus Safety.~~

## **Nicholas Johnson**

*3M*

Nicholas Johnson is a Research Engineer with 3M Company. Over the past two and a half years he has focused on lithium ion cell-to-cell thermal runaway and solutions to mitigate this hazard. Most recently his work was published in the spring, 2016 issue of SFPE's Fire Protection Engineering Magazine. His work has also been presented at NFPA SUPDET 2016 and SFPE Conference in 2015. Nicholas holds a Bachelor's of Science in Mechanical Engineering from the University of St. Thomas (St. Paul Campus) and plans to start his Masters in Fire Protection Engineering at Cal Poly this January.

## **Amanda Kimball, P.E.**

*Fire Protection Research Foundation*

Amanda Kimball is a senior project manager at the Fire Protection Research Foundation, an affiliate of the National Fire Protection Association, where she is responsible for projects relating

to suppression, fire alarm, and building life safety. She holds a Bachelor's degree in Civil Engineering and a Master's degree in Fire Protection Engineering from Worcester Polytechnic Institute. Mrs. Kimball's professional background includes fire protection engineering consulting with experience in building code life safety analyses, design of fire protection systems, and fire and egress modeling of buildings and subway stations. She is a registered Professional Fire Protection Engineer in the State of Massachusetts.

## **Jake Lehmann**

*South-Tek*

Jake Lehmann is Regional Account Manager for South-Tek Systems. In this position, he covers west of the Mississippi & Canada for South-Tek Systems, the leading manufacturer of nitrogen generators and corrosion inhibiting products for fire protection systems. His expertise stems from years of working closely with fire protection engineers, contractors and metallurgists to better understand the root cause of corrosion in dry, pre-action and wet fire protection systems.

## **Dr. Frederick W. Mowrer, Ph.D., P.E., FSFPE**

*California Polytechnic State University, San Luis Obispo*

Fred Mowrer is the founding Director of Fire Protection Engineering Programs at Cal Poly in San Luis Obispo, California, which is now in its 7th year of operation. Fred taught at the University of Maryland for 21 years before retiring with emeritus status. Fred is a Fellow of the SFPE and served as President of the Society in 2002. He received the John L. Bryan Mentoring Award from the Society in 2015.

## **Garner Palenske, P.E.**

*Jensen Hughes*

Garner A. Palenske, P.E., is a registered fire protection engineer with over 30 years of experience. Mr. Palenske is currently a member of the NFPA 13 Discharge and Correlating Committees. In addition to leadership responsibilities, Garner has published several fire research projects including, Obstructions and ESFR Sprinklers Phases 1 and 2, Fire Safety in Consumer Fireworks, Storage, and Retail Facilities Hazard Assessment; High Velocity Low Speed Fan Research—Phases I and II; and Fire Protection of Compact Mobile Shelving Test Program. Current work includes commodity classification fire testing projects.

Prior to joining Jensen Hughes (a legacy Aon FPE), Mr. Palenske served as the Fire Protection Engineer for the San Diego Fire Department, and worked as an engineer at FM Global. He is a graduate of California State University, Fullerton, where he earned bachelor's degrees in both Structural Engineering and Business Administration. He is presently enrolled in the Cal Poly Fire Protection Engineering Master's Degree Program.

Mr. Palenske is also a frequent author, speaker, and expert witness on fire protection and code compliance issues.