

**PPE And The Law** *by Jim Juneau: Juneau, Boll, Stacy & Ucherek, PLLC, Dallas, TX*

Attorney Jim Juneau is a well-known fire-service products liability attorney and Texas board certified trial lawyer who will “lay it on the line,” speaking from his experience about both the risk of injury and the risk of legal liability associated with failure to provide, use and maintain firefighter PPE as required by national standards.

**A Common Sense Approach to Battle Firefighter Cancer and PPE Issues** *by Keith Tyson, Firefighter/Paramedic, Miami-Dade Fire Rescue Department (ret.) and Vice-President of Education and Research, Firefighter Cancer Support Network*

This is an interactive presentation discussing many of the issues and problems in the fire service dealing with firefighter cancer to include some quick national firefighter cancer stats as well as discussions on PPE usage, preliminary exposure reduction methods while on scene, as well as transportation, cleaning, storage and potential station issues.

**From Risk Assessment to Distribution, Protective Clothing Evaluations** *by Captain Patrick Woods, Fire Department of New York and Lieutenant/Quartermaster Jim Reidy, San Antonio Fire Department*

A discussion based on practical experience of the process used in evaluating different types of Firefighting PPE elements. The discussion will begin with formulative stages of the process; what type of risk assessment can be used and how to involve personnel to facilitate buy in. The process for material selection and advertisement of the evaluation will be presented, along with examples of invitations for industry to participate in the field trial process. Different evaluation lengths will be discussed and successful! short, medium, and long field trials/evaluations will be presented. An end-user-based selection process will be discussed with advantages presented.

**PPE Research Update** *by Casey Grant, Executive Director, Fire Protection Research Foundation*

There is a LOT going on with research in the world of emergency services PPE. This presentation will be an overview and update of multiple PPE research activities. As the research affiliate of NFPA, the Fire Protection Research Foundation is an independent nonprofit whose mission is to plan, manage and communicate research in support of the association. The Research Foundation was established in 1982 in response to a growing need for research that better informed NFPA’s expanding body of codes and standards. To ensure the research remained independent, the Foundation was formed as a separate 501(c) (3) organization.

**Broadening Cleaning Practices Beyond Turnout Clothing** *by Jeff Stull, President, International Personnel Protection, Inc.*

While cleaning is being more routinely applied to turnout clothing, several elements of the ensemble are not being adequately addressed. This presentation will describe research and recommend best practices for the advanced cleaning and sanitization of gloves, footwear, helmets, and hoods based on evolving work from a new Fire Protection Research Foundation project. The presentation will provide specific information on the types and levels of contamination found in these items and the effectiveness of different cleaning practices.

**Station Wear Selection, Use, and Design in the U.S. Fire Service** *by Dr. Meredith McQuerry, Assistant Professor, Florida State University, and Division Chief Jeremy Metz, West Metro Fire Department*

Station wear, or clothing worn underneath a NFPA 1971 structural firefighter turnout suit, contributes to the overall thermal protection, comfort, and mobility of the PPE ensemble. The station wear's fiber content and material fabrication (i.e. synthetics) may also contribute to potential burn injury. The purpose of this study, sponsored by the NFPA Fire Protection Research Foundation, was to evaluate the impact of NFPA 1975 certified versus non-certified station wear garments on firefighter burn and thermal injuries. A comprehensive literature review was conducted to identify gaps in the current body of knowledge and to determine the contributing factors that lead to burn injury including: material type (fiber content), garment certification, base layer burn protection, and thermal stability. A nationwide information gathering questionnaire was designed and distributed with over 1,800 active-duty United States firefighting personnel responding to questions regarding the selection, use, and design specifications of their station wear. Results indicate 80% of participants were aware of the overall risk of wearing non-certified station wear garments (i.e. synthetics that will melt or drip). However, even though a high percentage of awareness was reported, 45% of career firefighters responded that they were not required to wear certified or flame resistant station wear per NFPA 1975. The findings of this study should be disseminated to the fire service to enhance education and awareness of station wear PPE requirements and selection. Results will also inform the NFPA 1975 and NFPA 1971 technical standards committees and assist in the design of future station wear.

**Concord Decontamination Model and Carcinogen Reduction Methods** *by Battalion Chief Josh Simpson, Concord Fire Department and Board Member, Education and Outreach, North Carolina Cancer Alliance*

We will discuss and present the Concord Decon Bucket and the Concord Decontamination Model developed in 2015 to aid in reduction of carcinogens on contaminated Structural Firefighting Protective Ensemble. This method was modeled after other methods and is presented across the state along with the NC Firefighter Cancer Alliance Cancer 2.0 education program. We will also discuss the recent studies out of the Illinois Fire Service Institute on chemical exposures and the effectiveness of on scene decontamination procedures and how they reinforce these methods.

**Effects of Temperature and Specialized Cleaning Procedures on the Removal of Chemical Contaminants from Fire Fighter Turn Out Gear** *by Jay Tarley, Physical Scientist, NIOSH NPPTL, and Lee A. Greenawald, Physical Scientist, NIOSH NPPTL, and Crystal D. Forester, Research Chemist, NIOSH NPPTL*

This presentation will provide an overview of recent work conducted in the National Institute for Occupational Safety and Health, National Personal Protective Technology Laboratory (NIOSH/NPPTL) located in Morgantown, WV. It is known from previous studies that certain chemical contaminants that may cause adverse health remain on turnout gear through the laundering procedure. The National Fire Protection Association (NFPA) 1851: Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting currently recommends a wash temperature no greater than 105°F. This work involved laundering firefighting gear at 3 temperatures, 105°F, 125°F and 140°F to assess temperature effects on cleaning efficiency. Also, pre-soaking swatches of outer shell fabric in various commercially available solutions was studied to evaluate their ability to enhance cleaning efficiencies of these persistent chemicals.

**Tactical Thermal PPE Management** *by Chief Joe Starnes, Chief, Sandy Ridge Volunteer Fire Department (ret.), Manager, AT&T (ret.) and Chief of Project "Kill the Flashover"*

PPE Thermal Limits are designed to protect the firefighter to a tested specified limit, yet our tactics do not consider these limits when placing the firefighter into these IDLH environments. We need to transform our processes to provide these tactical approaches. We have the tools, yet we refuse to modify these SOPs. If we know better and do not, we are negligent! Learn about the changes needed.

**Effects of High Temperature Exposure on the Performance of Fire Fighter Equipment** *by Fire Protection Engineer, Michelle Donnelly, National Institute of Standards and Technology-Fire Research Division*

This presentation will focus on research by the National Institute of Standards and Technology (NIST) investigating the performance of fire fighter equipment during high temperature exposures, and how this research is used to support NFPA standards development. NIST has studied equipment operations and limitations for fire fighter gear including hand-held radios, thermal imaging cameras, and personal alert safety systems (PASS). NIST testing facilities and apparatus will be discussed. The presentation will also provide updates of current NIST investigations regarding the effects of thermal exposure on self-contained breathing apparatus (SCBA), and the integration of new technologies in the age of “smart fire fighting.”

**Fire Fighting Operational Thermal Environment** *by Dr. Daniel Madrzykowski Madrzykowski, P.E., Research Engineer, UL Firefighter Safety Research Institute*

This presentation will help you understand the negative effects of elevated temperatures exposure on the performance of fire fighter gear and learn how NFPA standards are being developed and modified to address these issues. Participants will also gain knowledge of the testing methods and apparatus used by NIST researchers for fire equipment investigations in support of these standards.

**PPE, Cancer and Other Related Issues in the Fire Service** *by Keith Tyson, Firefighter/Paramedic, Miami-Dade Fire Rescue Department (ret.) and Vice-President of Education and Research, Firefighter Cancer Support Network*

Cancer has become a major epidemic in the fire service and this presentation will discuss the connections to PPE, on-scene gross decontamination of PPE and the future changes to NFPA 1851. Discussions will also include defining what is the CLEAN CAB concept in apparatus design, and the future of PPE storage and change out on scene via new procedures! In addition to a discussion on present SOPs, there will be information shared on what future ones will look like also!

**Fire Department Based Inspections and Repairs: Is it possible?** *by Captain Ritch Moore, Cary Fire Department*

Can fire departments fiscally benefit from performing their own 1851 advanced inspections and basic repairs in house rather than relying on ISP? Does this program reduce the amount of out of service time to the department and end user? Does the continued use of this type of program show reduced repairs due to firefighters being able to more quickly receive their PPE back from service than when an ISP is used? This class will investigate all of those questions

based on real world policies and procedures from a fire department that has implemented this system and benefited greatly. Included in the class is the pro's and con's of starting the project and fiscal projections of start-up costs versus long term benefits.

**Joint Response Teams - Joining up the Risks and Protections** *by Assistant Chief Chris Case, Chatham-Kent Fire and Emergency Services*

Following the experiences of creating a number of high performing, multi-agency specialist teams, the presentation will examine some case histories as to controlling liability and safety concerns. When diverse agencies come together to deal with a common threat, the divergence of roles and disciplines can create a mismatch of personal protective equipment, clothing and procedures. The presentation will examine some of the challenges and some of the workable solutions that facilitate innovation.”

**SCBA Facepieces: Mechanical and Thermal Performance** *by Richard Kesler, Research Scientist, Illinois Fire Service Institute*

The SCBA facepiece is one of the most critical components of the firefighters PPE. In this updated presentation we will discuss several studies conducted by IFSI Research examining the effects of repeat radiant exposures on the properties of the SCBA facepiece. SCBA facepiece lenses from two editions of the NFPA 1981 standard were exposed to repeated thermal loads similar to those that could be encountered on a fireground. We examined the effect on mechanical properties (tensile strength and response to impact), subjected the samples to the NFPA 1981 Lens Radiant Heat Test, and tested lenses for potential off-gassing that was proposed to be the result of polycarbonate decomposition from typical fireground thermal loads.

**NFPA 1500 Update: PPE and Cancer Prevention** *by Battalion Chief Dave Bernzweig, Columbus Fire Department and Director of Health & Safety, Ohio Association of Professional Firefighters*

This session details the changes to the 2018 edition of NFPA 1500 (Fire Department Occupational Safety, Health, and Wellness) that impact protective clothing and equipment, as well as new requirements intended to address controlling exposures to fireground toxic contaminants such as carcinogens, toxic chemicals, and other harmful products of combustion. The issue of contamination control continues to be a major focus of the technical committee as work on the 2020 edition of the standard moves forward. The presentation will also review work that the committee is doing to address contamination control in other NFPA Standards covered by this committee.

**Traditional Knit Hoods versus Particulate Blocking Hoods: Pros, Cons, and Trade-Offs** by *Dr. R. Bryan Ormond, Assistant Professor, North Carolina State University, Textile Protection and Comfort Center, Textile Engineering, Chemistry, and Science Department*

This presentation will focus on providing firefighters with a general overview of the trade-offs associated with traditional knit protective hoods and particulate blocking hoods, those recently introduced to address exposures to carcinogens on the fireground. Main topics in the discussion will be the effect of particulate blocking layers on thermal protection, thermal comfort, air permeability, and situational awareness. Performance measurements of hoods will be shown from both NFPA 1971 material-level tests as well as headform level evaluations on PyroHead, a sweating head, and a particulate headform. The presentation will also discuss the NFPA 1851 topics relating to cleaning, care, and inspection of both types of hoods, and data will be presented addressing the durability of hood materials when subjected to on-the-job exposures such as UV light, radiant heat, smoke, and laundering.

**Fireground PPE Exposures and How to Mitigate Them** by *Gavin Horn, Director of Research, Illinois Fire Service Institute (IFSI)*

Live-fire exposures have potential to increase firefighters' risk for cardiovascular events and cancer. The US fire service has become acutely aware of the limitations of some components of their PPE and the need to clean PPE after fires. However, there exist no guidance on how often PPE should be laundered vs deconned and how effective PPE cleaning remains after multiple washes. Furthermore, the hood has been identified as a vulnerable location where contaminants may penetrate PPE. This presentation will discuss protection provided by PPE, the impacts of cleaning measures and the importance of considering donning and doffing processes.

**How Clean is Clean: Understanding Cleaning Effectiveness** by *Jeff Stull, President, International Personnel Protection, Inc.*

Findings from the Fire Protection Research Foundation Study for "How Clean is Clean" will be presented along with their impact on fire service care of turnout garments. Information will be provided to distinguish the effectiveness of different practices for advanced cleaning and sanitization of outer shell fabrics and the respective impacts of selected process variables, such as temperature. The implementation of cleaning verification procedures within NFPA 1851 will be discussed and supplemented with an overview of how to judge the results for cleaning efficiency.

**“The Right Gear for the Job: Balancing Protection vs Physiologic Strain** *by Fire Chief Craig A. Haigh, Hanover Park Fire Department & University of Illinois Fire Service Institute, Dr. Denise Smith, Director, First Responder Health & Safety Laboratory, Skidmore College, and Andrea Wilkinson, Project Manager, First Responder Health and Safety Laboratory, Skidmore College*

Everyone wears PPE, but how much do we know and understand about the physiologic consequences of PPE? PPE is designed and worn for firefighter protection, but how does the gear that you’re wearing affect your ability to work safely and effectively? Traditionally, firefighters are wearing bunker gear to calls that don’t necessitate the thermal barrier in order to provide defense from abrasion and blood borne pathogens, and to ensure they are protected against unanticipated fire exposures. This presentation will address the trade-offs of protection and physiologic strain, (question of what gear is most appropriate for the job at hand) and will address research on the rescue gear configurations and thermal strain during work. Information will be presented to help participants consider the physiologic burden of PPE and explore potential new gear options. Additional information will be presented on the historical changes in PPE as well as implementation strategies for new gear policies and procedures.”

**Developing a Turnout Specification that Works for Your Department** *by Captain Chad Christensen and Captain Derrick Chapman, Los Angeles County Fire Department*

This class will go over how to evaluate materials to assist you in developing the best turnout spec for your department. We will also look at how to run a wear trail and evaluate gear that will be best suited for your agency. We will discuss what did and didn’t work for LACOFD in our compressive materials test and wear trials over the last few years.

**Tradition, Leadership and Contamination Control** *by Rick Swan, Director, International Association of Fire Fighters and Deputy Chief CAL FIRE (ret.)*

The fire service is steeped in tradition and adverse to change, but the issue of Cancer and Contamination Control will require leadership from all avenues of the fire service. We will take a short look back in time and guide the participants through many of the important issues facing the fire service. The presentation will provide examples of how to turn this Titanic and will speak to the leadership that fire fighters will be looking for to address this epidemic.