Report on
Seventeenth Symposium
on the Occupational Health and Hazards of the Fire Service
John P. Redmond Foundation

After months of planning and preparation by the staff of the IAFF Department of Occupational Health and Safety, The Seventeenth Symposium on the Occupational Health and Hazards of the Fire Service was held October 5-9, 2003 in San Francisco, California. Attendance at the IAFF’s Symposium was more than 1,100 fire fighters, physicians, scientists, lawyers, manufacturers, and government officials gathered in San Francisco last October. The San Francisco Fire Department, IAFF local 798, hosted the event, which is annually co-sponsored by the IAFF’s John P. Redmond Foundation, the IAFF Department of Occupational Health and Safety, and the United States Fire Administration.

Monday, October 6, 2003

General Dennis Reimer and Donald Hewitt gave a keynote presentation on the National Technology Plan for Emergency Response to Catastrophic Terrorism.

Rich Duffy and Pat Morrison discussed the IAFF’s role in addressing fire fighters occupational health, safety and medicine.

The IAFF’s Health, Safety and Medical Response and Activities since the last John P. Redmond Symposium included 9/11/01 – Pentagon, 9/12/01 – New York City, 9-11 Fund, Counseling, Staff Assistance, Memorial Service, PSOB.

9-11 Fund was the largest fund-raising effort in IAFF history grossing $161 million. Funds were provided to 347 families. The first check was provided in 10 days. The total disbursement was $465,000 per family. The IAFF conducted this effort without fanfare, advertising, marketing or any commercial agreements and minimal administrative costs. All monies were raised through public response. IAFF members raised over 65% of the funds.

Both Principal Officers were on the scene for the first week of 9/11 and numerous times since. General President Schaitberger assigned Assistants to the General President Duffy for assistance and expertise and Eric Lamar as liaison for six weeks. A PSOB Coordinator was assigned to work with FDNY staff. Four IAFF administrative staff members continually assisted Locals 94 and 854 seven days a week for over two months. For the past two years, IAFF assisted in retraining and rebuilding FDNY capabilities in Haz-mat response.

GP Schaitberger met with the NY Congressional Delegation on 9/12 in an effort to streamline the benefit application. The result of the meeting was an increase in PSOB
to $250,000. The Senate initiated legislation (named after Fr. Judge) to allow benefits to be paid to insurance beneficiaries (including domestic partners).

Counseling services were established at the Operations Center in Midtown Manhattan by 9-14. The IAFF established a firefighter support structure with FDNY counseling unit. Seventeen IAFF Locals – an average 65 members a day, including peers and clinicians played active roles. Over 4,800 FDNY firefighters were contacted. By November 1st over 70,000 staffing hours of IAFF effort were completed. 475 Firehouses were visited.

The IAFF committed to financially support unit, which included counseling and training for FDNY members, families and retirees. IAFF efforts ensured dignity, respect and help when needed for all FDNY Members.

IAFF in cooperation with Locals 94 & 854 and FDNY agreed to obtain venue, plan march, develop program, and direct logistics. The IAFF initiated efforts with the federal government to prepare for WMD events: Resources, Training, Equipment, Protection, Standards, and CBRN Respirators

Project HEROES was formed to capitalize on the technological advances and emerging technologies. The project will optimize protective equipment for all homeland emergency responses, which could include structural fire fighting, search and rescue, and initial hazardous materials, biological materials and other weapons of mass destruction response.

To date the line of duty deaths tolled at 138 Members for the year. Updates in the processing of LODD include LODD notification and assistance, electronic and web-based, IAFF Medals, direct assistance in Manlius, St. Louis, Osceola County and Memphis.


Dr. M. Sandy Bogucki discussed NFPA 1582, Standard on Comprehensive Occupational Medical Programs for Fire Departments, part of the NFPA 1500 family of documents addressing the health and safety of firefighters. The 2003 edition of NFPA 1582 incorporates many of the initiatives developed in the IAFF-IAFC Labor-Management Fitness and Wellness Program as well as many components of state of the art, industrial occupational medical programs. It requires that fire department physicians understand the physical and physiological demands of firefighting, and calls for medical supervision of fire department fitness programs. Surveillance of fire departments for unusual incidence of injuries or illness, investigation of possible occupational causes, and workplace interventions aimed at reducing morbidity and
mortality of firefighters are now included among the responsibilities of fire department physicians. In keeping with case law and experience with federal regulators, the medical requirements for incumbent firefighters are no longer exactly the same as for candidates, and responsibility for accommodating medical restrictions of firefighters rests with the local jurisdiction. These and other highlights of the latest revision of this important standard were discussed.

Dr. Philip Landrigan discussed his analysis of the chemical contaminants released to the environment by the destruction of the World Trade Center and the complexity of toxins confronting the fire fighters today. Investigations have documented a high prevalence of persistent cough in New York City fire fighters. Questions of great importance that can be resolved only by long term follow-up of exposed populations include: Will pulmonary disease persist in workers exposed to dust, especially in those with very heavy exposures in the first days after September 11 and those with prolonged exposures and will an increased incidence of mesothelioma result from exposures to asbestos?

Dr. Steve Levin discussed the persistent respiratory and mental health symptoms that were common among WTC responders. Challenges in program implementation included: quickly establishing a large program and developing the infrastructure to handle program volume, developing a governance structure responsive to multiple "stakeholders"; establishing fair and uniform criteria for exam eligibility; conducting staged outreach to reach a maximum number of people without overwhelming examination capacity, assuring access to follow up medical and mental health care, the importance of patient satisfaction in ensuring high participation rates, and meeting the needs of a multi-lingual, diverse population.

Dr. David Prezant discussed the importance of wearing SCBA and other appropriate respiratory protection during rescue events. He advocated pre-exposure baseline health assessments so that post exposure change can be identified and treated. He stated the single best thing that fire fighters can do to reduce their cancer risk is not to use tobacco.

Tuesday, October 7, 2003

Dr. Melissa McDiarmid moderated the morning occupational medicine issues.

Gray Cook presented Biomechanics: Functional Movement Screening.

Dr. Robert Cohen presented Cardiopulmonary Exercise Testing in the evaluation of workers exposed to respiratory hazards. He explained how the principles behind testing and how the evaluations are conducted. He discussed how the testing can be used as pre-employment evaluation for workers who will be exposed to respiratory hazards and how it can be used to detect early occupational lung disease. He discussed how the test could help distinguish between cardiac and pulmonary causes of shortness of breath.
He described how it helps in the evaluation of workers who may be disabled from their work due to lung disease.

John Lane presented Sars and the Fire Service – The Toronto Experience.

Dr. John Piacentino presented The ABC’s of Hepatitis. He addressed Hepatitis A and B vaccination strategies for the fire service. In 1997, 180,000 new cases of Hepatitis A were reported, resulting in an average of 27 days lost from work and an estimated cost of $500 million dollars. An estimated 150,000 new cases of Hepatitis B were reported in 2000. Both Hepatitis A and B are preventable.

Tom M. McLellan, PhD presented Approaches for Fire Fighter Rehabilitation. DRDC Toronto received a 2-year grant from WSIB to study the heat stress of wearing firefighting protective clothing and to generate safe work limits for the Toronto Fire Service. One of the main recommendations from the study was that heart rate recovery and subjective feelings of comfort cannot be used as indicators of the heat strain being experience by the fire fighter. Other data obtained in the study showed advantaged of hand and forearm submersion for managing the heat stress of wearing firefighting protective equipment clothing. Recommendations would advocate the use of this cooling strategy during rehabilitation period.

Dr. Stewart presented an overview of the processes involved with the implementation and operation of a public safety occupational health center, with a specific focus on the economic (and non-economic) justifications for such a center. Various models for implementing occupational health centers in municipalities of differing size (and budgets) were presented. Contemporary issues in the management and operation of a public safety occupational health center, including the IAFF Wellness Fitness Initiative, regulatory and legal factors (such as the Americans with Disability Act) ad the effects of 9/11/01 were briefly discussed.

Dr. Diane Elliot and Dr. Kerry Kuehl briefly presented background information and one-year results of the PHLAME (Promoting Healthy Lifestyles: Alternative Models Effects) program. PHLAME was an NIH-funded randomized trial, which involved more than 600 fire fighters from Portland, Oregon and 5 surrounding communities. PHLAME examined three means to achieve healthy lifestyles: testing only, testing plus a team-centered peer-led curriculum and one-on-one counseling. The majority of the presentation provided a framework and practical information relating to costs and benefits for different aspects of a wellness program, including initial assessment, interventions to enhance wellness, immediate pay offs and long-term benefits.

Thomas Carr, Chief of the Division of Fire and Rescue Services in Montgomery County, Maryland discussed the implementation of the Wellness-Fitness Initiative in Montgomery County, Maryland. He focused on program design and the costs associated with implementation and the predicted benefits of the program. In addition to the financial implications, the discussion included organizational and cultural change and impact. Data collection was also be discussed. Montgomery County is in the
process of implementing all components of the initiative in an aggressive manner. Much of the program has been in place for several years.

Dr. Christopher Jankosky moderated the afternoon workshop of new fire service medical standards, taking an in-depth review of the new NFPA 1582 fire service medical standard and how it applies differently for candidates and incumbent emergency responders. The discussion panel included Dr. M. Sandy Bogucki, Dr. David Prezant, and Dr. Franklin Pratt.

Dr. Ellen Kessler moderated an workshop which examined the current issues surrounding bloodborne pathogens and infectious diseases including new and emerging diseases, including smallpox, monkey pox, SARS, anthrax and potential biological weapon agents. New issues surrounding Hepatitis A, B, and C were addressed as well as the latest developments in fire service infectious disease programs. The discussion panel included Dr. Tom Hales, Dr. John Piacentino, and John Niemiec.

Richard Braddee moderated the case studies of recent fire fighter fatalities and the NIOSH investigation program. He presented several case studies from NIOSH fatality investigations including recommendations for the prevention of fire fighter fatalities. The focus of the presentations was on fire fighters who died during the course of training and roof and floor truss system failures. The workshop goals briefly reviewed the purpose of these investigations and reports, and described methods used. Participation included several experienced members of the NIOSH Fire Fighter Fatality Investigation Team. Lessons learned from a comprehensive accident investigation were recognized as tools for enhancing the health and safety of fire fighters. Members of the NIOSH Fire Fighter Fatality and Injury Prevention Project conducted this workshop.

Timothy Merinar presented information from a number of recent NIOSH fire fighter fatality investigations where roof and floor truss system failures have led to fire fighter fatalities. Truss systems are an important structural element in modern lightweight construction as well as heavy timber construction and their use is expected to continue to increase. Truss systems present specific hazards when they are weakened during a fire. The NIOSH Fire Fighter Fatality Investigation and Prevention Program have investigated 15 separate incidents during the 6-year period from 1998 through 2003 involving truss system failures at working fires. These 15 incidents resulted in 25 fatalities and 10 severe injuries. Case histories were presented along with recommendations to educate fire departments and fire fighters on how to safety work around buildings containing truss construction.

Jay Tarley presented information regarding fire fighter fatalities that occurred during live-fire training. Over a 19-year period (between 1983-2002) 10 fire fighters died as a result of injuries received while participating in live-fire training exercises at acquired structures. In the two years from 2000 to 2002, the NIOSH Fire Fighter Fatality Investigation and Prevention Program investigated three separate incidents involving four fire fighters who sustained fatal traumatic injuries during live-fire training. A specific
case and recommendations were discussed as well as an in-depth review of safety concerns associated with live-fire training in acquired structures.

J. Scott Jackson discussed how cardiovascular disease (CVD) is the number one cause of on-duty fire fighter fatalities. Three categories of data are collected when a CVD fatality is investigated: circumstances of the event, EMS and medical response, and individual medical history. Since the program began, NIOSH has conducted over 100 CVD investigations. The talk presented descriptive statistics of these fatalities and discuss potential prevention programs.

Terrence Smith focused on interagency cooperation with line of duty deaths. Typically, the local fire department does an internal investigation on the incident. Indeterminately does the parent agency make the decision to incorporate NIOSH, CAL-OSHA, DISTRICT ATTORNEY, POLICE DEPARTMENT, and FBI during the investigation. Sometimes the local agency has jurisdiction over the investigation and more often than not, independent investigations concur. Brother Smith used a local investigation relating to this issue.

William Ostiguy moderated the coping with stress and trauma workshop.

Ron Tapscott explored the history of behavioral health care in the fire service, particularly focusing on the introduction of critical incident management. Critical incident management's strengths and weaknesses were evaluated. A summation of post 9/11 New York and a rethinking of caring for firefighters by the IAFF EAP Committee provided a springboard to consider other options for behavioral health care services.

Ted Frett reviewed some of the new initiatives the CSU created to exposed Firefighters and EMT's to the value of counseling. Progress to expand the services of peer counselors, firehouse clinicians, and clinicians in the Emergency service culture were detailed. The cooperation of IAFF, NFFF, and FEMA was documented. Additionally programs for children of the perished, retired members, and a design to provide service to a work force of 16,000 people was discussed.

Patricia Fisher introduced a comprehensive research-based approach to the specialized stresses experienced by fire fighters. The Complex Stress Model of Workplace Stress incorporates the two very different sources of stress present in the fire service - systemic workplace stress (job stress, burnout, and sociocultural stress), and traumatic workplace stress (primary traumatic stress, and secondary/vicarious traumatic stress). The mechanisms and effects of systemic and traumatic stress were discussed in terms of the individual and the organization. Effective approaches to the problem are based in the wide body of research defining the many risk and resiliency factors associated with systemic and traumatic stress - this was briefly reviewed. Participants were encouraged to apply the risk/resilience model to their own circumstances, and to then develop appropriate targeted strategies for addressing the problem of workplace stress and trauma in their jurisdictions.
Lori Moore moderated the safe staffing for fire departments workshop. She focused on the staffing resources required to perform on-scene fire suppression and EMS operations. The workshop profiled staffing evaluation and argument development from a number of perspectives. Specifically, participants heard from the IAFF Fire/EMS Operations Department on the methods of fire operation assessment using the NFPA 1710 Standard, the OSHA 2-in-2-out regulation and other industry directives. Participants heard from an independent fire department consultant (Tridata) regarding indicators and performance benchmarks used during the staffing evaluation of a fire department’s operations. Finally, participants heard from an arbitration attorney regarding the poignant arguments to be made before an arbitrator when staffing is on the line. The workshop provided essential information for local leaders to assist them in understanding the relationship between staffing levels and life safety—citizens and firefighters. It is essential to communicate to a community that reduced resources equates to reduced and unsafe service.

Philip Shaenman discussed how consultants approach evaluation of fire departments; benchmarks and standards used; role of the fire department and locals in the studies; data gaps; response time definition; tools used for assessing deployment; misconceptions by various parties; and other factors considered.

Jonathan Moore introduced IAFF membership to the GIS process and the capabilities of the computer software as it pertains to building, enhancing, and protecting fire department staffing. Topics addressed included system design and personnel resource modeling, NFPA 1710 staffing performance objective compliance, and the usefulness of a GIS analysis in educating local policymakers on the many elements of fire department response with a focus on determining adequate staffing levels. Special emphasis was placed on generating a GIS analysis that conveys to local policymakers the issues that are important to the fire department, such as safe staffing and critical response times.

Nancy Lassen focused on IAFF Local 22's epic fight, over the term of several interest arbitrations periods, to eliminate a Philadelphia Fire Department deployment called "task forces," in which a combination engine and ladder company went into service understaffed by one officer.

**Wednesday, October 8, 2003**

Eric Lamar moderated the biological weapons of mass destruction workshop.

Dr. Scott Deitchman discussed how a successful act of biological terrorism, resulting in cases of illness in the community, will confront first responders with challenges to safely transporting potential patients and protecting responders. Dr. Deitchman reviewed prophylaxis, vaccination, and infection control strategies for possible diseases of biological terrorism, and highlight some of the public health response measures being developed by the Centers for Disease Control and Prevention.
Bruce Teele focused on recent changes to NFPA standards on fire and emergency service protective clothing. He discussed the technical committee’s efforts in addressing new technologies.

William E. Haskell overviewed protective clothing technologies currently fielded by the US military and next generation systems being field evaluated using selectively permeable membrane materials.

Les Boord discussed the requirements under federal regulations to provide NIOSH approved respirators appropriate to the expected hazard. He discussed the update of the NIOSH CBRN respirator program.

Jeffrey Stull described the start-up Project HEROES and how it will optimize the fire fighter's protective equipment for all homeland emergency responses, which could include structural fire fighting, search and rescue, and initial hazardous materials, biological materials and other weapons of mass destruction response. The presentation addressed proposed enhancements in the protective ensemble needed to broaden ensemble performance capabilities and provide flexibility for different missions. This included the development of new materials, components, and element designs, which provide more of a "systems" approach for the overall ensemble. The presentation discussed how the IAFF is working with several organizations including universities, government organizations, and innovative manufacturers to provide integrated modern technology for personal protection. The IAFF also has established a relationship with the Natick Soldier Center and its National Protection Center to leverage directly from such military programs as the Object Force Warrior to provide effective technology transfer for the protecting the fire fighter of the future.

Tim Hill moderated the fire service communications workshop. He also discussed Local Union Involvement in the development and use of Public Safety Radio Projects. As the traditional Fire radio systems become older and the spectrum of available frequencies become increasingly crowded, more governmental agencies are being forced to build new 800 MHz. systems. 800 MHz. systems are costly and come in a variety of packages. A system can be simple, trunked, non-trunked, digital, non-digital or a variety of combinations. What is best for us the firefighter? The questions that we must all ask and have answers for are too numerous to list here but may be broken down into logical sections. These include; do I really need a new radio when the one I have seems to work fine? (Evaluation) How will it work and how do I work it? (Training) How will we be assured that we end up with a communications system that works as well or better than the radio that I use today? (Local Union involvement). As local union officers we all feel that our number one responsibility to our members is that everyone gets to go home at the end of each shift. As firefighters we feel the pride of our profession and hope to give our citizens our best effort to save lives and property. One of the most important tools in our toolbox for each of these goals is reliable, effective radio communication. In order to have a reliable system it will most likely be necessary for each local to become involved early on in the process to secure the local unions participation in planning the project. The critical areas covered included appropriate
levels of funding for construction, project staffing, training, acceptance testing and problem solving to name a few. As union Officers and firefighters we all want a system that is safe, reliable and simple to use.

G. Seth Layman discussed suggestions abound for expenditures of $40,000,000, and $100,000,000 for "fixes" to emergency responder's radios to talk anywhere in a jurisdiction. Using ethernet and internet links to provide a firefighter and an EMS responder with the ability to talk between dissimilar radios---when they are at the same fire scene---have been proposed by more than one government agency or equipment manufacturer, or empire builder inside an agency. Magazines intended to address the issue facing their readership, including recognition of operating budgets and staffing, are writing about $150-700,000 vehicles that rival the capabilities of the White House Communications Agency. Meanwhile, WMD grants to most communities generally have not exceeded the mid six figures. After action reports from around the country still list "Radio Communications" issues at the top of the deficiencies list, with particular emphasis on inter-agency radio interoperability. Discussion focused on the operations requirements, technical implementation issues, budget realities, and immediately fieldable solutions that can enhance radio communications for firefighter and other emergency response personnel that firefighters work along side. The material will be grounded in the financial and technical staffing realities of rural, town, city, or military base fire service agencies.

Leif Anderson discussed how firefighter health and safety is more than working out and eating healthy. Firefighter health and safety is also learning, training, and reinforcing basic fireground behaviors, such as fireground communications. However, modern radio systems don't always fulfill our fireground needs. This discussion helped participants understand the basic problem(s) facing the fire service today. The Phoenix Fire Department is currently experiencing a transition to an 800 MHz trunked radio system. If your department has not experienced a radio system change recently, a change is probably on the horizon. This discussion provided a basic understanding of radio systems, the history of Phoenix Fire Department's radio change (issue common to the fire service), how firefighters and IAFF Local 493 have been involved in the change, and it will present 17 specific areas that require firefighter involvement if your department is considering a similar change.

Ray Lehr gave a "lessons learned" briefing on his experiences as Baltimore's project manager for a new consolidated 800MHz communications system. He covered the importance of training, as well as the need to evaluate standard operating procedures after implementing a new system and gaining practical experience. Ray provided his perspective from "both sides" of a communications project, having now worked for Northrop Grumman, a systems integrator on several new communications projects.

Scott Solomon moderated the weapons of mass destruction response workshop. Panel experts included Russell Accardi and Paul Ceresa. The workshop focused on safety and health concerns at a sustained response incident. They discussed the 2001 Florida
Anthrax Incident and provided specific information on how to prepare generally for such an event as well as specific challenges.

Chief Alan Brunacini discussed the incident commander’s role in protecting firefighters. Teaching firefighters emergency survival skills has currently become an important and popular fire service program. Our department members routinely work in tough situations and teaching them how to properly react to save themselves can make the difference between life and death. Very little direction and training has been developed and presented to outline the responsibility for the IC in protecting firefighters. While training firefighters on the task level continues to be critical, it does not describe or prepare the command level of our operations to carry out their safety responsibility to our hazard zone workers. This workshop outlined how the IC plays their part in creating a complete safety program. The participants used actual fireground situations to practice applying the regular command functions to firefighter safety. Students will have the opportunity to actively participate in the workshop discussion and command function exercises. A lack of effective incident command has been a contributory factor in virtually every firefighter death in recent times. We must now train the IC on their strategic level of safety responsibility so they can do their part in protecting firefighters on the task level.

Jill Craig moderated the designing and outfitting exercise facilities for emergency responders workshop. She discussed fitness equipment selection, from budgeting to purchasing. Considerations such as space limitations, traffic patterns, cost, type of exercise equipment, placement and warranties will be addressed. The panel members, each of whom has designed fitness facilities for the fire service, touched on the philosophical basis of their facility designs; i.e., how to best train firefighters for both effective performance and injury prevention. Deborah Castagnola Wheeler participated in this panel.

Ian Crosby discussed the importance and justification of exercise facilities and equipment in the fire service, choosing a facility that best suits your department. This section looked at 3 specific facility options and the pros and cons with each.

Michael Cacciola discussed selecting fitness equipment based on various budgets, obtaining equipment through charitable corporate, community, and private donations, selecting the proper fitness equipment based on floor space and facilities, safety considerations when selecting and designing floor plans, using fitness equipment to develop functional skills training for candidates, recruits, and incumbents.

Rich Duffy opened the afternoon plenary session.

Wayne Haase, PhD, discussed current firefighter operation issues. Firefighting is a dangerous and difficult job performed in a hostile environment. During a fire the atmosphere inside a burning structure can rapidly fill with dense smoke that can reduce visibility to only a few inches and render hand lights useless. Search techniques for locating disabled firefighters and/or civilians have not changed much since Ben Franklin
headed the Philadelphia Fire Brigade. This talk discussed the possible technologies and describes a new system, the Personnel Ultrasonic Locating Safety Equipment, or Pulse, which is capable of significantly reducing search times for locating firefighters and exits by identifying the actual path to the target. The patented Pulse system is able to operate within the hostile environment of a burning structure without being adversely affected by the smoke, heat, or the structure itself. There are a number of reasons why the technology chosen for the Pulse system is ultrasound. First, ultrasound, particularly in the 20 KHz - 100 KHz range, is not significantly affected by the fire environment. Second, the wavelength of ultrasound is sufficiently short to allow the beam pattern of a hand-held device to be quite directional; the wavelength is sufficiently long to prevent Rayleigh scattering. Thus the smoke does not affect the beam. Third, since most surfaces reflect ultrasound, a Beacon can easily be located even if behind obstacles such as a desk or sofa. Because ultrasound reflects off walls, a Beacon can be located even if around the corner of a wall. However, since ultrasound does not penetrate walls, a searcher will not be led down a blind alley. In effect, ultrasound can provide information on the best path to the Beacon; that is, the strongest signal will indicate the shortest distance or path to the Beacon. Because ultrasound is able to pass through small openings, a Beacon can be located behind a closed door, as long as there is a small gap between the door and the floor or wall. Thus ultrasound is ideally suited to the task of finding and rescuing a disabled firefighter. The Pulse System developed by Summit Safety, Inc, consists of two main components, a Beacon and a Tracker. The Beacon, shown in Figure 6-1, is similar to a PASS device and is worn by a firefighter. If the firefighter becomes disabled, the Beacon will go into alarm mode and transmit an omnidirectional ultrasonic homing signal. The Tracker is a hand-held directional receiver, which is carried by the rescuer and detects the Beacon's homing signal. The Tracker indicates the strength of the received signal visually on a bar graph and audibly by a beeper. By scanning an area with the Tracker, much like using a flashlight, and by then moving in the direction of the strongest signal, the rescuer can rapidly find the disabled firefighter. Several technology choices are available for the design of a tracking, safety, and navigation system for firefighters, including optical, radio, and acoustic. Each has its advantages and disadvantages when used in the fire environment. A new system - based on ultrasound - has been shown to complement existing products and promises to significantly reduce the search time required to locate disabled firefighters and exits and thus greatly enhance firefighter safety.

Paul Fedele, PhD discussed risk assessment of using firefighter protective ensemble with SCBA for rescue operations during a terrorist chemical agent incident. Chemical warfare agents are weapons of terror. They are among the many weapons that terrorists might attempt to use and they constitute one of the many possible hazards that first responders might encounter. Rapid response, which is critical in fire rescue and in medical emergencies, can put first responders on-scene, before the presence of chemical warfare agents can necessarily be determined. This can result in exposures of first responders to chemical warfare agents. At the Edgewood Chemical/Biological Center, the Improved Response Program has assessed the hazards presented to firefighter first responders by chemical warfare agent vapors. Vapor hazards presented
to first responders wearing selected firefighter protective ensembles with self-contained breathing apparatus have been assessed. These assessments have been used to develop operational restrictions, which first responders may choose to adopt, if they encounter situations that require rapid victim rescue, in environments not yet known to be free of vapor contamination. A detail of the testing and associated assessment was presented, along with the operational restrictions for such situations. Ideally, protection against all chemical hazards will be incorporated into firefighter protective ensembles, which are available to all firefighter first responders. Until this is achieved, awareness and operational restrictions will remain important factors in continuing emergency response, under a recognized potential for terrorism involving chemical warfare agents.

Thursday, October 9, 2003

James Schwartz presented the Pentagon incident of September 11th. The presentation focused on the complexities of managing a large-scale incident involving numerous local, state and federal agencies. The presentation emphasized those aspects of incident management that support firefighter and emergency responder health and safety.

Peter Hayden Chief Hayden was in his office at 1st Division headquarters in lower Manhattan on the morning of September 11th, 2001. He heard a jetliner flying low over the Manhattan skyline. He ran to the window but saw nothing. Then came the explosion. "There's a plane crash somewhere", Hayden told his aide. Hayden was the 1st Division Commander, an area encompassing all of lower Manhattan. As Hayden prepared to turn out, he heard the radio transmission that a plane had hit the World Trade center. The First Battalion transmitted a third alarm while Hayden raced downtown. In his thirty-two years on the job, he had experienced nothing like the scene he was heading toward. Smoke was pouring from a huge hole in 1 World Trade Center when he arrived. Debris fell from the upper floors and the sidewalk was littered with shards of broken glass. Inside, office workers with critical burns were screaming for help. A body landed on the sidewalk. Then another. Soon dozens were landing on the sidewalks surrounding the building. Hayden took over the command post already set up by Battalion Chief Joseph Pfeifer, the first Chief on the scene. Hayden quickly learned that he could count on very little help from the buildings, including the elevators-they were not working. All the while, dispatchers were transmitting pleas for help called in from civilians trapped throughout the building. Then the second plane hit. Any doubts about what the FDNY was facing that day were erased. This was not an accident. This was war, and the firefighters of New York were on the front lines. Chief Hayden recounted his experience that day, both before and immediately following the collapse. He described FDNY operations as Incident Commander of the World Trade Center Task Force describing the rescue and recovery operations in the ensuing months.

The critical examination of line-of-duty deaths is an important key to preventing firefighters from losing their lives in similar circumstances in the future. The IAFF's Redmond Symposium closed Thursday with an examination of several emergency
operations that killed professional fire fighters, to share the difficult lessons learned from those cases with Redmond delegates.

Speakers described the details of fire operations that killed fire fighters in Manlius, New York; St. Louis, Missouri; Gloucester City, New Jersey; Osceola County, Florida; Coos Bay, Oregon; and Memphis, Tennessee, followed by the recommendations that stemmed from subsequent investigations.

The session also included presentations on fire department operations from September 11, 2001. Arlington County Fire Department Assistant Chief James Schwartz presented “The Response to the Pentagon” and Deputy Assistant Chief Peter Haden of Fire Department, City of New York presented “The Response to the World Trade Center.” Both dedicated their presentations to the memory of the 343 IAFF FDNY members, 1 IAFF New York Fire Partolman member and 3 IAFF retired FDNY members killed on September 11, 2001.

**Manlius, New York**

On March 7, 2002, a 28-year-old male volunteer fire fighter (Victim #1) and a 41-year-old male career fire fighter (Victim #2) died after becoming trapped in the basement. Victim #1 manned the nozzle while Victim #2 provided backup on the handline as they entered the house. After entering the structure, the floor collapsed, trapping both victims in the basement. A career fire fighter captain joining the fire fighters near the time of the collapse was injured trying to rescue one of the fire fighters. Crewmembers responded immediately and attempted to rescue the victims; however, the heat and flames overcame both victims and eliminated any rescue efforts from the garage entrance.

NIOSH investigators concluded that, to minimize the risk of similar occurrences, fire departments should

- ensure that the Incident Commander is clearly identified as the only individual responsible for the overall coordination and direction of all activities at an incident
- ensure that the Incident Commander conveys strategic decisions to all suppression crews on the fireground and continually reevaluates the fire condition ensure that Incident Command conducts an initial size-up of the incident before initiating fire fighting efforts and continually evaluates the risk versus gain during operations mat an incident
- ensure that fire fighters from the ventilation crew and the attack crew coordinate their efforts
- ensure that fire fighters report conditions and hazards encountered to their team leader or Incident Commander
- ensure fire fighters are trained to recognize the danger of operating above a fire
St. Louis, Missouri

On May 3, 2002, a 38-year-old male career fire fighter (Victim #1) died after he became lost and ran out of air while searching for a missing 38-year-old male career fire fighter (Victim #2) at a four-alarm, two-story structure fire. Victim #2 was identified as missing when he failed to respond to a member accountability roll call (MARC). Victim #1 reentered the structure to search for Victim #2 as part of a search-and-rescue team. Shortly thereafter, Victim #1 became lost and radioed Mayday several times. After extensive searches for both victims, they were removed from the structure and provided medical attention on the scene. They were then transported by Emergency Medical Services (EMS) to a local hospital. Victim #1 was pronounced dead on arrival, and Victim #2 was pronounced dead the following day. NIOSH investigators concluded that, to minimize the risk of similar occurrences, fire departments should:

- ensure that team continuity is maintained
- ensure that a rapid intervention team is established and in position immediately upon arrival
- ensure that the incident command system is fully implemented at the fire scene
- ensure that fire fighters, when operating on the floor above the fire, have a charged hoseline
- instruct and train fire fighters on manually activating their PASS device when they become lost, disoriented, or trapped
- ensure that Standard Operating Procedures (SOPs) and equipment are adequate and sufficient to support the volume of radio traffic at multiple-alarm fires
- ensure that self contained breathing apparatus (SCBAs) are properly inspected, used, and maintained to ensure they function properly when needed

St. Louis Battalion Chief Dennis Jenkerson dedicated his presentation to the memory of Captain Robert Morrison and Captain Derek Martin.

Gloucester City, New Jersey

On July 4, 2002, a 30-year-old male volunteer fire chief, a 40-year-old male volunteer deputy fire chief, and a 30-year-old male career fire fighter died when a residential
structure collapsed, trapping them, along with four fire fighters and an officer who survived. At 0136 hours, a combination fire department and a mutual-aid volunteer fire department were dispatched to a structure fire. Local law enforcement radioed Central Dispatch reporting a fully involved structure with three children trapped on the second floor. The first officer on the scene assumed incident command and reported to Central Dispatch that the incident site was a three-story structure with fire showing and that people could be seen at the windows. Note: The female resident (survivor) was the person seen in the window. The three children that were reported as being trapped did not survive and were later found in the debris. Additional units were requested, including a mutual-aid ladder company from a career department. Crews were on the scene searching for occupants and fighting the fire for approximately 27 minutes when the building collapsed. NIOSH investigators concluded that, to minimize the risk of similar incidents, fire departments should

- ensure that the department’s structural fire fighting standard operating guidelines (SOGs) are followed and refresher training is provided
- ensure that the Incident Commander (IC) formulates and establishes a strategic plan for offensive and defensive operations
- ensure that the incident commander (IC) continuously evaluates the risk versus gain during operations at an incident
- ensure that a separate Incident Safety Officer, independent from the Incident Commander, is appointed
- ensure that fire fighters conducting interior operations (e.g., search and rescue, initial attack, etc.) provide progress reports to the IC
- ensure that accountability for all personnel at the fire scene is maintained
- ensure that a Rapid Intervention Team (RIT) is established and in position
- ensure that the officer in charge of an incident recognize factors (e.g., structural defects, large body of fire in an old structure, etc.) when analyzing potential building collapse ensure, when feasible, that fire fighters should respond together, in one emergency vehicle, as a crew

Deputy Commissioner Kevin McCabe dedicated his presentation to the memory of Fire Fighter Thomas G. Stewart, James Sylvester and John West.

Osceola County, Florida
On July 30, 2002, a 32-year-old male career Lieutenant (Victim #1) and a 20-year-old male career fire fighter (Victim #2) died while participating in a live-fire training evolution. A flashover occurred several minutes after the fire had been lit in the acquired vacant structure while both of the victims were performing a simulated search and rescue. The Lieutenant and the fire fighter were both transported by ambulances to a local hospital where they were pronounced dead. NIOSH investigators concluded that, to minimize the risk of similar occurrences, fire departments should:

- ensure that the fuels used in live-fire training have known burning characteristics and the structure is inspected for possible hazards prior to the training
- ensure that ventilation is closely coordinated with interior operations
- ensure that fires are not located in designated exit paths
- ensure that a method of fireground communication is established to enable coordination among the Incident Commander and fire fighters
- ensure that Standard Operating Guidelines (SOGs) specific to live-fire training are developed and followed
- consider using a thermal imaging camera during live-fire training
- developing a permitting procedure for live-fire training to be conducted at acquired structures. States should ensure that all the requirements of NFPA 1403 have been met before issuing the permit

Lieutenant Dan Fleming and Fire Protection Engineer Dan Madrzykowski dedicated their presentation to the memory of Lieutenant John Mickela and Fire Fighter Dallas Begg.

**Coos Bay, Oregon**

On November 25, 2002, at approximately 1320 hours, occupants of an auto parts store returned from lunch to discover a light haze in the air and the smell of something burning. They searched for the source of the haze and burning smell and discovered what appeared to be the source of a fire. At 1351 hours they called 911. Units were immediately dispatched to the auto parts store with reports of smoke in the building. Fire fighters advanced attack lines into the auto parts store and began their interior attack. Crews began opening up the ceiling and wall on the mezzanine where they found fire in the rafters. Three of the eight fire fighters operating on the mezzanine began running low on air. As they were exiting the building, the ventilation crews on the roof began opening the skylights and cutting holes in the roof. The stability of the roof was rapidly deteriorating forcing everyone off the roof. The IC called for an evacuation of the building. Five fire fighters were still operating in the building when the ceiling collapsed. Two fire fighters escaped. Attempts were made to rescue the three fire fighters while
conditions quickly deteriorated. Numerous fire fighters entered the building and removed one of the victims. He was transported to the area hospital and later pronounced dead. Approximately 2 hours later, conditions improved for crews to enter and locate the other two victims on the mezzanine. The Deputy Medical Examiner pronounced the victims dead about an hour later.

NIOSH investigators concluded that, to minimize the risk of similar occurrences, fire departments should

- ensure that fire fighters provide the Incident Commander (IC) with interior size-up reports
- ensure that fire fighters open concealed spaces to determine whether the fire is in these areas
- ensure that pre-emergency planning is completed for mercantile and business occupancies
- ensure that a Rapid Intervention Team (RIT) is established and in position
- consider using a thermal imaging camera as a part of the interior size-up operation to aid in locating fires in concealed areas
- ensure that local citizens are provided with information on fire prevention and the need to report emergency situations as soon as possible to the proper authorities
- ensure that self-contained breathing apparatus (SCBAs) and equipment are properly inspected, used, and maintained to ensure they function properly when needed
- ensure that fire command always maintains close accountability for all personnel operating on the fireground
- Building owners should ensure that building permits are obtained and local building codes are followed when additions or modifications are made

Oregon State Representatives Paul Esselstyn and Rob McGregor dedicated their presentation in memory of Lieutenant Randall E. Carpenter, Firefighters Jeffrey E. Common and R. Chuck Hanners.

Memphis, Tennessee

Two Memphis firefighters lost their lives after they became trapped inside a burning shopping center in the north section of the city. Lt. Trent Kirk and Private Charles Zachary died after being pulled from a burning Family Dollar Store on North Watkins
Street. The fire, dispatched at about 7:45 p.m. Sunday, quickly rose to three alarms and caused the building's roof to collapse while one firefighter was still trapped inside.

The firefighter was missing inside the building for an undetermined amount of time. "[The building] was not heavily involved on arrival but it got that way." Three firefighters entered the strip mall about 10 minutes into the fire attack. Chief Jim Price said there was a report that someone might be inside, and the firefighters went in to search. "Things went bad when they were inside," Price said. "They became disoriented and went down."

Price said two firefighters were rescued but then the fire intensifies and crews had to pull out. At that time the roof collapsed on the area where the third firefighter was located, and fire crews breached a wall to reach him. The rescuers were unable to reach Kirk until it was too late, despite their best efforts.

All three firefighters were transported to the Regional Medical Center at Memphis' Burn Unit, where Zachary was pronounced dead Monday morning.

The third firefighter was treated and released from the hospital Monday.

Federal prosecutors charged Anthony Paul Shaw, manager of the Family Dollar store in Frayser, with starting the Sunday night fire that killed two Memphis firefighters to hide his theft of several thousand dollars from the store safe. Authorities said Shaw, 21, admitted to the crime during a second interview late Monday.

Battalion Chief Henry Posey dedicated his presentation in memory of Lieutenant Trent A Kirk and Fire Fighter Charles A Zachary.

Symposium Adjournment

Participants from IAFF locals across North America attended the 17th Redmond Symposium. Rich Duffy, Assistant to the General President for Health and Safety, closed the symposium by thanking San Francisco Local 798 President John Hanley, the Executive Board, and members of Local 798 for their work toward the event. He also thanked the Redmond Board, San Francisco Fire Chief Mario Trevino and IAFF staff.

The Seventeenth John P. Redmond Symposium was enormously successful and fulfilled our goals of providing an educational event that stressed the importance of health and safety in the fire service.