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NOVEMBER/DECEMBER 2002

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Fire-Safe Cigarettes

It's time for Congress to do the right thing
By U.S. Rep. Edward Markey



9/11 After-Action Report

How well did the Arlington County Fire Department respond to the disaster at the Pentagon?

Alternative Fuel Stations

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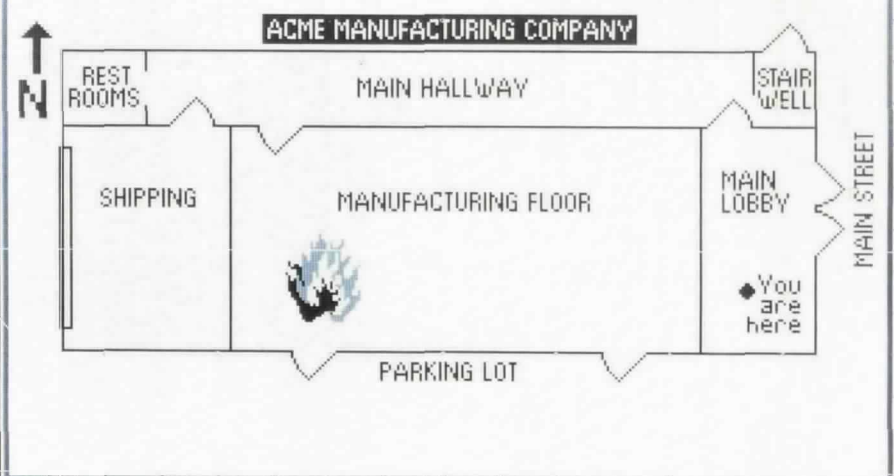
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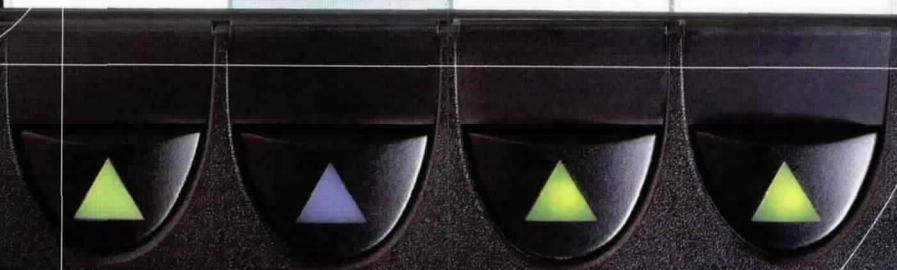


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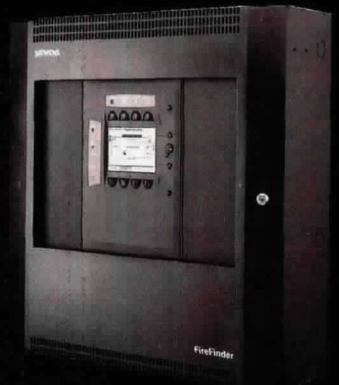
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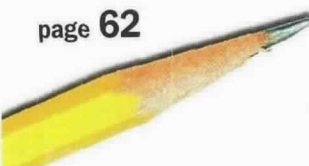
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FEATURES

36 Pentagon After-Action Report

PAM WEIGER
Arlington County, Virginia, starts implementing changes urged in 9/11 report

46 "Regular or Alternative?"

JOHN NICHOLSON AND THOMAS DOLAN
Alternative fuels are becoming more common at filling stations

52 Schooled in Fire

ED COMEAU
A new program helps drive campus fire-safety at our nation's colleges and universities

56 A Win-Win Partnership

ALISA WOLF
Taking a long-term relationship to the next level, NFPA and IAPMO cooperate on a single set of ANSI-accredited consensus codes for the built environment

62 Test Pattern

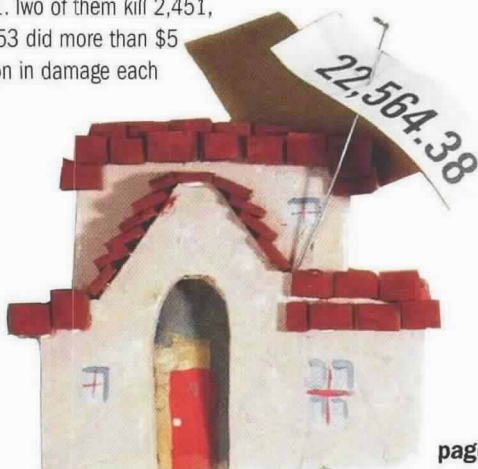
BILL FLYNN
NFPA develops a testing system to gauge proficiency in using NFPA 5000

66 Formula for Success

KEVIN BAUM
The Austin, Texas, Fire Department finds a way to measure the effectiveness of fire and life-safety inspections

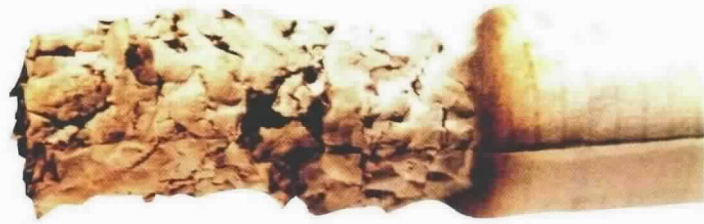
70 2001 Fire Loss and Large Loss

MICHAEL KARTER AND STEPHEN BADGER
Fire departments responded to more than one million fires in 2001. Two of them kill 2,451, and 53 did more than \$5 million in damage each



page 66

COVER STORY



Slow Burn: Fire-Safe Cigarettes

The ongoing struggle to reduce fires ignited by cigarettes was one congressman's legacy, **page 42**

Cover image by ©GUP STUDIO INC./GRAPHISTOCK

COLUMNS

23 Up to Code

WALTER STERLING

24 Heads Up

RUSSELL P. FLEMING, P.E.

26 Structural Firefighting

RUSSELL SANDERS & BEN KLAENE

27 Just Ask

MARK SCHOFIELD

28 In Compliance

CHIP CARSON, P.E.

30 Inside the Beltway

STEPHEN BARLAS

32 Buzzwords

WAYNE MOORE, P.E., FSFPE

34 Leadership

ROBIN F. PAULSGROVE

35 Outreach

MERIK APPY



page 30

DEPARTMENTS

6 First Word

9 Mail Call

14 NFPA Meetings

17 In a Flash

18 Fire Watch

76 Section News

88 Company Connections

93 Date Book

94 Classifieds

96 Looking Back

From the Editor

In this issue, we examine the ongoing fight to create fire-safe cigarettes. Massachusetts Democrat Rep. Edward Markey wrote a detailed report on the legislation that would force a change in the way cigarettes are made and the setbacks this effort has endured. We also look at the work being done by the Arlington County Fire Department following the release of an informative report on their response to the attack on the Pentagon. As always, we're interested in hearing from you, so E-mail us at NFPAJournal@NFPA.org.

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NFPA has been a worldwide leader in providing fire, electrical, building, and life safety to the public since 1896. The mission of the international nonprofit organization is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating scientifically-based consensus codes and standards, research, training and education.

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Volume 96/Number 6

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NFPA web site:

www.nfpajournal.org

E-Mail: NFPA.Journal@NFPA.org

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Fire-Safe Cigarettes: The Long Battle



When I was a freshman congressman, my colleague from Massachusetts, Rep. Joe Moakley, asked me whether I would co-sponsor a bill he was about to introduce to promote the use of fire-safe cigarettes. When left burning unattended, they'd extinguish themselves or burn at temperatures too low to ignite furniture or mattresses, thereby lessening the chance of fire.

After I learned how many fires smoking caused and saw the statistics on injuries and deaths that could be prevented by imposing fire-safety standards on cigarette manufacturers, I didn't find the decision difficult. I signed on, assuming that the logic of the arguments in favor of the legislation would soon overcome the tobacco companies' opposition. I


was wrong. Almost a quarter of a century later, we've seen little progress toward making the fire-safe cigarette mandatory in the United States, even though the arguments in favor of fire-safe cigarettes are stronger than ever. Smoking materials are the leading cause of fatal fires in this country. Recent NFPA statistics show: In one year, smoking materials led to 900 fire deaths, 2,500 injuries, and \$410 million in property. Not only do we experience a devastating loss of civilian lives, but the lives of firefighters are needlessly put at risk, as well.

There's been some action at the state level, including enactment of a bill in New York and the formation of a strong coalition supporting a tough pending bill in Massachusetts. However, we'll only begin to make a dent in these awful statistics when we have a tough national law that requires all manufacturers of smoking materials to comply.

There's hope that real progress can be made. After Moakley died last year, his cause was taken up by Massachusetts Rep. Ed Markey, who assembled a bipartisan coalition in Washington, D.C., and is pushing hard for the adoption of *The Joseph Moakley Memorial Fire Safe Cigarette Act of 2002* (see related story on page 42). So far, NFPA, the fire service, medical groups, health organizations, and advocates for burn victims, among others, have shown tremendous support, but it's going to take more to move this bill forward.

At NFPA, we've always supported changes that protect public safety, and we can be proud of our success record. The adoption of fire codes, requirements for sprinklers and smoke detectors, and standards for child-proof lighters came only after long battles, but we never gave up the fight. Now, it's time to concentrate on fire-safe cigarettes.

I'll do everything I can as president of NFPA to let our national leaders know that fire-safe cigarettes will save lives. I hope you'll join me and tell your representatives in Congress how important it is that they get behind this bill now. ♣



James M. Shannon, President
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Elevators in an emergency

In reading the article, "Evacuation Access," (July/August *NFPA Journal*[®]) it's apparent that some quotes are from individuals who are unfamiliar with the current code requirements for elevator operation during a fire need clarifying.

Elevators aren't necessarily removed from automatic operation when a fire occurs. The Safety Code for Elevators and Escalators, ASME A17.1-2000, Section 2.27.3.2.1, requires automatic recall of elevators by fire alarm initiating devices in compliance with NFPA 72[®], *National Fire Alarm Code*[®]. NFPA 72-1999, Section 3-9.3.1, states, "unless otherwise required by the authority having jurisdictions, only the elevator lobby, elevator hoistway and machine room smoke detectors or other automatic fire detection as permitted by 3.9.35 shall be used to recall elevators for fire fighters' service."

The only other method permitted by ASME A17.1 to recall the elevator is by placing the Phase I key switch (Section 2.27.3.1) in the "on" position. ASME A17.1, Section 2.27.8, classifies the Phase I key as Group 3 Security. It further requires that keys classified as Group 3 Security only be available to firefighters and emergency personnel.

In reference to the issue of water, power to the elevator isn't "cut automatically and immediately if water is sensed nearby." Power to the elevator is removed only to the "affected elevator upon or prior to the application of water from sprinklers located in the machine room or in the hoistway more than 600 millimeters (24 inches) above the pit floor."

The ASME A17.1 code further states "the activation of sprinklers outside the hoistway or machine room shall not disconnect the main line power supply" to an elevator. (Section 2.8.2.3.2).

A number of years ago, the ASME A17 Emergency Operations Committee worked with the New York City Fire Department to study reported failures of elevators during fire-fighting operations. It was found that the majority of failures were due to the accumulation of water in the pit. Once the water was

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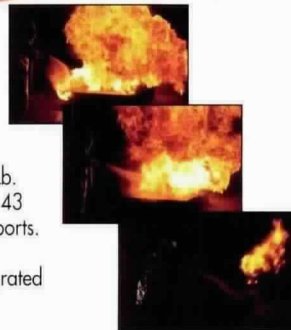


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removed and the electrical equipment dried, elevator operation returned to normal.

As a result, ASME A17.1, Section 2.2.2.5, requires that a drain or sump pump be provided in the elevator pit when firefighters' emergency operations are provided.

Additionally, the study concluded that elevator equipment located on the landing side of the hoistway enclosure and its associated wiring may be susceptible to accidental grounding or short-circuiting from sprinkler water. As a result, ASME A17.1, Section 2.27.3.3.6, requires that these circuits be protected such that an accidental ground or short circuit shall not disable Phase II once it has been activated.

The ASME A17 Emergency Operation Committee works closely with the firefighting and fire protection community, including NFPA, which has had a representative on the committee for many years. I have been an active member of that committee for more than 25 years. During my tenure on the committee, a proposal has never been submitted for elevators to be automatically programmed for use by building occupants to exit a building during a fire. However, the committee does recognize that when an elevator is operated on Phase II by firefighters, it may be used to safely transport building occupants during a fire. Currently, this is the safest operation that can be provided, given current building designs and the potential hazardous conditions that elevator passengers could be exposed to during a fire.

It's not the elevator that's the problem during a fire; it's the environment it's expected to operate in. Control the environment (smoke, flame, water, reliable power, etc.) and the elevator can continue to operate. The elevator industry is, and has always been, willing to discuss these concerns with code-writing organizations and if elevators are ever made available for self-egress during a fire, many changes would be required in the building codes, such as controlling the environment elevators would be exposed to in a fire. In addition, the ASME A17.1 code would need to develop a standardized operating protocol.

Edward A. Donoghue, CPCA
Code and Safety Consultant
National Elevator Industry, Inc.
Teaneck, New Jersey

■ 'Fueling a Change' questions

I had been fire protection engineer at United Airlines during the construction of the new Denver International Airport. There were several items which I had tried to have changed. I have wondered if the lack of fire alarm pull stations (FAPS) along the ramp side of terminal buildings might ever result in any delay of response of Aircraft Rescue and Firefighting to the scene of a fire.

Your article ("Fueling a Change," September/October *NFPA Journal*) didn't mention a delay. You indicate that the aircraft arrived at Gate 37 shortly after 5 p.m. and that the ARFF equipment was dispatched at 5:14 p.m. The lack of FAPS might have contributed to some delay in response.

There are no FAPS along the ramp areas outside of the terminal buildings. There are emergency fuel shut off stations (EFSOS) provided along the ramp areas outside of the buildings. There are an adequate number of FAPS inside the terminal buildings, but none where the highest hazard exists. At most airports, there are both FAPS and EFSOS stations located at ramp near each gate. It's normal that the FAPS has a red light adjacent to the station, or directly above it, and each EFSOS will have a blue light adjacent to or above the switch.

I had asked for the installation of FAPS, each to be located near, or next to, each EFSOS for those terminal buildings to be occupied by United Airlines. Denver declined the request. I next asked for the installation of signs, which would indicate the location of the nearest FAPS. Again, Denver declined. Their reasoning, as explained to me, was that adding either of these items would "clutter" the ramp area of their new airport. Fire Safety was not an adequate reason to provide the FAPS.

For your information, United Airlines (Fire Safety Regulation 5-25) requires two 350-pound (158 kilogram) Purple K wheeled fire extinguishers at wide body gates, somewhat greater than required by NFPA standards.

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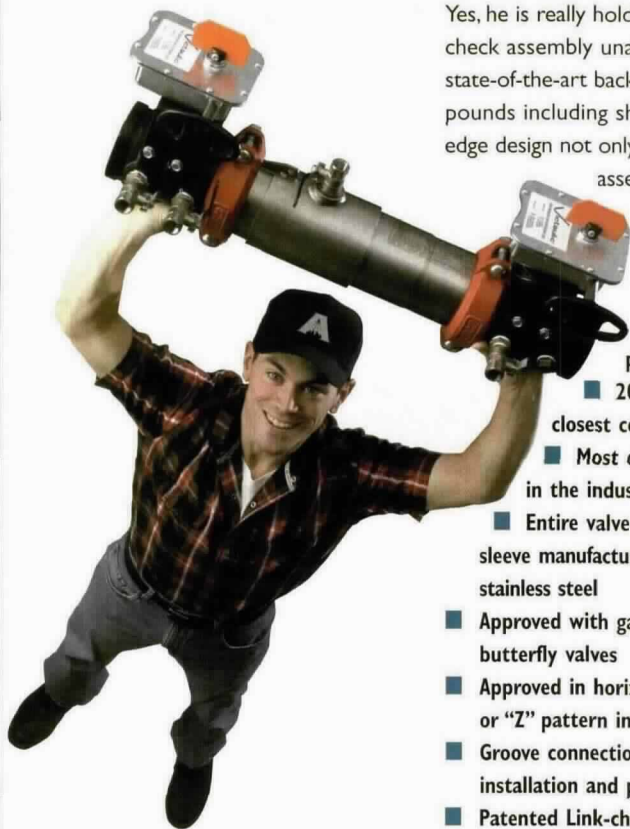


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The author responds:

Workers near the aircraft were the first to respond to the fire and had it nearly under control by the time the ARFF team responded. The placement of fire extinguishers as required by NFPA standards and United Airlines made this quick response possible. There was no delay reported in the ARFF response.

John Nicholson
Managing Editor
NFPA Journal

What were the conditions?

I'd like very much to learn what conditions and configurations existed which contributed to a cigarette lighting asphalt shingles ("Fire Watch," September/October). I'm not second guessing nor do I pass judgment without knowing all the facts, but am just curious. I'm constantly attempting to hone my skills as a fire investigator, so I would appreciate hearing from anyone who could enlighten me on this incident.

Captain John Young
Deputy Fire Marshal
Snake River Fire Rescue
Keystone, Colorado

NFPA responds:

The summary from the fire department states, "A cigarette discarded by a construction worker apparently ignited asphalt treated materials on the roof..." The report lists the material first ignited as "exterior roof finish."

The narrative in the report contains the following: "The exemplar building had bits of wood debris which would contribute to the ignition and spread of a fire. ...believe this condition was most likely present on the roof of the fire building, as it was under construction."

The use of the phrase "would contribute" rather than "did contribute" moves this from the realm of a conclusion to the realm of speculation. Our policy is to exclude speculation from the "Fire Watch" narratives.

Marty Ahrens
Fire Analysis Specialist

Clarification

In the September/October issue, the story "2001 Catastrophic Fires" states 2,791 civil-



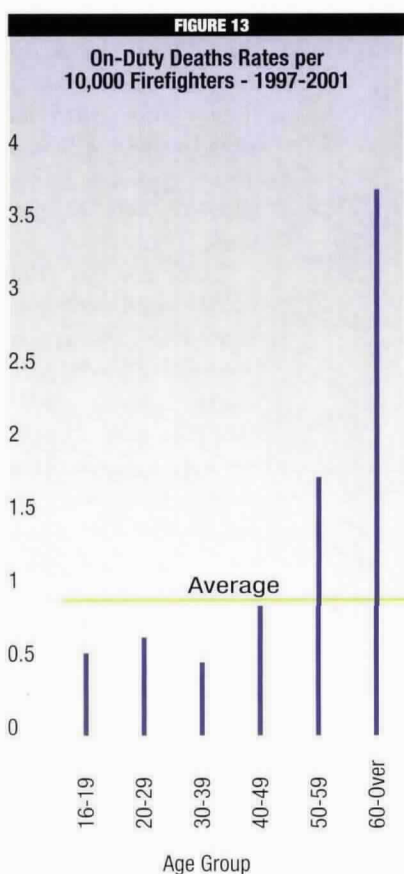
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ians, police and emergency personnel died on September 11, 2001. In "2001 Fire Loss/Large Loss" on page 70, the figure for civilian-only losses at the Pentagon and World Trade Center is 2,451. It doesn't include emergency personnel.

Errata

A chart in the July/August "2001 Firefighter Fatalities" article was incorrectly duplicated. The correct Figure 13 is shown.



In the next issue:

- * Protecting historic structures
- * How might pending litigation affect the future of codes and standards?
- * High-rise buildings today

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TO REGISTER, OR FOR INFORMATION ON NFPA'S AMERICAS' FIRE EXPO, VISIT WWW.NFPAAMERICAS-FIRE.COM



Believe it or not, it's time to start planning for the 2003 NFPA World Safety Conference and Exposition™ (WSCE). This time, NFPA is holding the largest event of its kind in North America in a state where everything is big ... Texas! Prepare to enjoy a great meeting in the Lone Star State from May 18 to 22 at the Dallas Convention Center.

Next year, NFPA will add a ninth track to our lineup. The new telecommunications and data network protection track will bring together many well-known fire protection experts in the telecommunications and information technology industries to discuss important factors in protecting critical business equipment and networks, now and in the future.

NFPA members will also have the opportunity to vote on the codes and standards that affect public safety throughout the world. NFPA 1, *Uniform Fire Code*™; NFPA 101®, *Life Safety Code*®; and NFPA 720, *Household Carbon Monoxide (CO) Warning Equipment*, are just a few of the important documents up for adoption during the technical committee report session next year.

So mark your calendar now for the 2003 NFPA World Safety Conference and Exposition. For more information, visit www.nfpa.org/meetings and check back often for updates.

Another success

It's also time to plan to attend NFPA's third annual Americas' Fire Expo (AFE), which will be held in Miami Beach, Florida, from July 22 to 24. Proposals for the conference educational sessions are now

being accepted.

AFE provides NFPA's Latin American constituents with a three-day forum in which to share the latest information on fire and security in Spanish, Portuguese, and English. Among the highlights of this year's conference were sessions presented by the International Association of Hispanic Fire Fighters, featuring representatives of the Miami/Dade Fire Urban Search and Rescue Task Force, which trains and supports the fire service throughout Latin America. The exhibit floor also provided attendees with a look at new products and allowed them to network.

"Our goal is that you'll build on your know-how, share your perspective with colleagues from other countries, and learn of the latest equipment and services for building fire and security systems, as well as firefighting apparatus and techniques," says Nick Candee, assistant vice president and executive director of NFPA's International Operations.

You can download an application for AFE from www.nfpa.org/ProfessionalDev/EventsCalendar/AmericasFireExpo.

International Conference on Tall Buildings

NFPA is co-sponsoring the International Conference on Tall Buildings: Strategies for Performance in the Aftermath of the World Trade Center in Kuala Lumpur, Malaysia. The conference is scheduled for May 8-10, 2003, and is being presented by the International Council for Research and Innovation in Building Construction and the Council on Tall Buildings and Urban Habitat. For more information, visit www.cibklutn.com.



BRIAN BENSTOCK is NFPA's exposition marketing manager.
OLGA CALEDONIA is NFPA's global projects manager.

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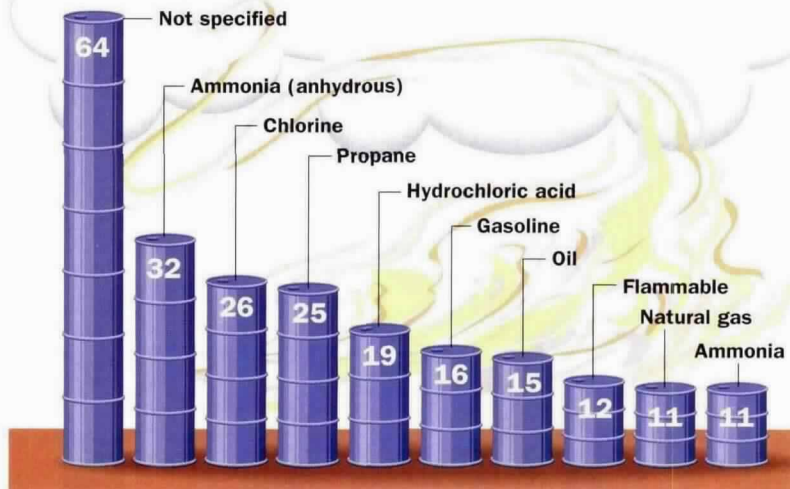
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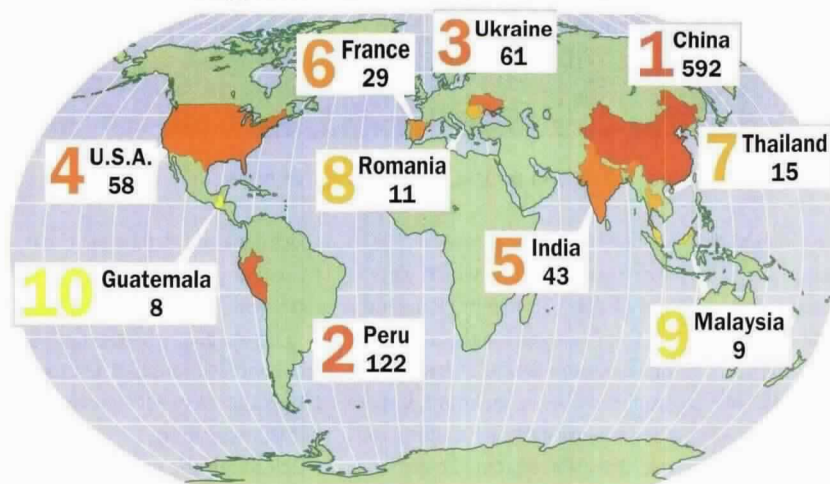


Top Ten Chemicals

Top ten chemicals involved in reported chemical incidents in U.S. and Canada in the CIRC database over the last 365 days



Highest Number of Fatalities



Ten countries with highest number of reported fatalities (may be an estimated amount) in the CIRC database over the last 365 days

Disclaimer: The Chemical Incident Reports Center (CIRC) is an information service provided by the U.S. Chemical Safety and Hazard Investigation Board (CSB). Users of this service should note that the contents of the CIRC aren't intended to be a comprehensive listing of all incidents that have occurred; many incidents go unreported or aren't entered into the database. Therefore, it isn't appropriate to use the CIRC database to perform statistical analysis that extends conclusions beyond the content of the CIRC. Although the CSB never knowingly posts inaccurate information, the CSB is unable to independently verify all information that it receives from its various sources, much of which is based on initial reports. CIRC users should also note that the CSB receives more comprehensive reports about incidents that occur in the United States. Comparisons made between U.S. incidents and those in other nations should take this into consideration. Source: www.chemsafety.gov/circ.

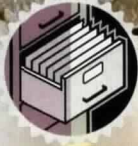
Reporting Chemical Incidents Around the World

Every day, the U.S. Chemical Safety and Hazard Investigation Board (CSB) receives reports about chemical incidents around the world from official government sources, the news media, eyewitnesses, and others.

The CSB incorporates this information into databases it shares with other government agencies and chemical-safety stakeholders, and uses it to decide whether to deploy investigation teams based on supplementary information developed after the report is received.

In July 2001, for example, CSB dispatched six investigators to the site of the catastrophic failure of a storage tank containing spent sulfuric acid at Motiva Enterprise's Delaware refinery. The incident occurred during maintenance operations near the tank, which released spent acid and flammable material that ignited, injuring eight people and killing one. For more information on the Motiva accident, see "Inside the Beltway" on page 30.

The CSB has committed resources to create and maintain the Chemical Incident Reports Center, a searchable online database of chemical incidents that researchers, government agencies, and others may use to improve chemical safety. ♣



FROM OUR FILES

firewatch

KENNETH J. TREMBLAY

Natural gas leaking under the floor of this single-story house exploded, killing two people and injuring five others.

RESIDENTIAL

■ Gas explosion kills two TEXAS

Two people died and five others were injured when a single-family house collapsed after natural gas leaking from a supply pipe under the floor exploded and set it ablaze.

The single-story, wood-frame structure, which was built on piers, had a brick veneer exterior and an asphalt shingle roof. There were no smoke alarms or sprinklers in the house, which

was 60 feet (18 meters) long and 25 feet (8 meters) wide.

Upon arrival, fire crews discovered that two sides of the building were in flames, the exterior walls had collapsed, and the roof had fallen in. A 75-year-old man and a 72-year-old woman were fatally injured.

Investigators determined that a cross-threaded elbow in the natural-gas pipeline leaked and the gas collected in the sub-floor space and attic until the gas-fired water heater ignited it.

The house and its contents, valued at \$275,000, were nearly a total loss.

■ Carelessly discarded cigarette leads to fatal fire NEBRASKA

A cigarette carelessly discarded in an overstuffed chair started a fire that killed a 46-year-old woman in her apartment.

The two-story, four-unit apartment building, which was 60 feet (18 meters) long and 30 feet (9 meters) wide, had brick exterior walls. There were smoke alarms in each unit, but they weren't part of a monitored fire-detection system. There were no sprinklers.

At 10:12 p.m., firefighters received a call from a neighbor who thought she heard a smoke detector sounding. Fire crews arrived minutes later and were directed to a smoke-filled, second-floor unit, where they found the unconscious woman. Paramedics transported her to the local hospital.

The fire was mostly confined to the living room chair, although smoke damaged other parts of the apartment. Investigators found cigarette butts, empty cigarette packages, and burn marks throughout the

apartment and determined that the victim had dropped a cigarette, which ignited the chair.

The woman, who died of smoke inhalation, had a chronic illness that may have prevented her from escaping.

Although the unit of origin suffered heavy smoke damage, the rest of the building had only moderate smoke and heat damage. Losses to the building, valued at \$160,000, were estimated at \$5,000. Its contents, valued at \$10,000, sustained a \$5,000 loss.

■ Vacant building target of juvenile arson MASSACHUSETTS

Juveniles using an aerosol paint can and matches or a lighter ignited combustibles on the second floor of a vacant seven-story apartment building. Firefighters prepared for an interior attack,

KENNETH J. TREMBLAY

is a technical project assistant with Firewise Communities and a career lieutenant with the Lexington, Massachusetts, Fire Department.

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but flames spread quickly to the upper floors, so the incident commander shifted to a defensive attack, then sounded additional alarms.

The 46-unit, wood-frame, brick-veneered building was 77 feet (23 meters) long and 50 feet (15 meters) wide with 3,850 square feet (358 square meters) of space per floor. It was unsprinklered and had no fire- or smoke-detection systems. The police indicated that vagrants using the building tended to use the rear door, which was secure when firefighters arrived.

The fire department was called to the blaze at 10:26 p.m., and fire crews saw heavy smoke coming from the building as they left the station. The incident commander ordered a second alarm and additional resources when he saw flames on the second floor in the middle of the building spreading to the upper floors.

As first-alarm engine companies established a water supply, ladder companies forced their way into the building with attack lines. A third alarm was sounded when the incident commander decided to switch to a defensive attack using exterior master streams as flames vented through the roof. All companies were ordered to defensive positions outside a collapse zone to protect exposures as two additional alarms were ordered.

It took 60 firefighters from 5 communities with 12 engines and 4 ladder trucks to bring the fire under control.

Two firefighters suffered minor injuries. The value of the building's contents wasn't reported, but the structural damage was estimated at \$75,000.



Heat and flames escaping from a flue or firebox ignited concealed structural framing of this bed and breakfast.

■ Fire destroys bed and breakfast

PENNSYLVANIA

A fire spread undetected for hours in concealed spaces in a large, four-story bed-and-breakfast inn, eventually destroying it. It wasn't until flames broke through an interior wall, allowing smoke to enter the building and activate the smoke detectors, that the occupants became aware of the blaze. Everyone escaped safely, although property damage is estimated at \$1.4 million.

The bed and breakfast was originally a barn with heavy wooden timbers and wood balloon-frame construction. Two exterior walls were stone. When it was converted into an inn, the renovations were also wood-framed. The roof deck was tin, covered with asphalt shingles. There were single-station smoke alarms in guest rooms and common areas. There were no sprinklers.

When the smoke alarm operated, the occupants checked for

fire and called the fire department at 4:49 p.m. Fire crews arrived five minutes later to find flames coming from around the central chimney and roof gables.

Although told that no one was in the building, firefighters conducted a primary search of the lower three floors. Fire conditions on the fourth floor

prevented entry. When fire was discovered in the walls at every level, the incident commander ordered the crews from the building and began a defensive attack. Shortly afterward, the roof collapsed, allowing the fire to consume the entire building. With a drought limiting the water supply, fire crews had to use water provided by a tanker and pumped from a creek. It took seven hours to extinguish the blaze.

Investigators determined that heat and flames escaping from a second-floor flue or firebox ignited concealed structural framing, which burned undetected until the fire spread to the attic and broke out into the fourth-floor living areas. The building's balloon-frame construction allowed the fire to spread rapidly to other areas of the structure.

The building, valued at \$400,000, contained nearly \$1 million worth of antiques, which were completely destroyed. There were no injuries.



This unsprinklered bed and breakfast was destroyed in a \$1.4 million fire that spread undetected in concealed spaces for hours.

■ Heat detectors delay response to dorm fire

ILLINOIS

The discovery of a fire intentionally set in an unsprinklered, ninth-floor lounge in a high-rise university dormitory was delayed by the room's configuration and a lack of smoke detectors in the building's common areas.

Although automatic heat detectors in the lounge alerted occupants, open doors and voids around vertical piping allowed flames and smoke to spread to the upper floors.

The 20-story, steel-frame building had poured concrete floors, concrete block walls, and a flat, built-up roof, covering 9,505 square feet (883 square meters) of floor space. The fire-detection system, which was monitored, consisted of rate-of-rise heat detectors in the hallways and lounges, and smoke detectors in the students' rooms. Although there were no sprinklers, the stairwells contained a standpipe system supported by the fire department using an exterior connection.

The dorm's central station alarm company reported a fire alarm in the building at 4:15 a.m., and fire crews arrived shortly afterward to find fire on the ninth floor. The arriving units were split into three operational sectors. A fire-suppression sector was assigned to the fire floor to extinguish the blaze with 1³/₄-inch hose lines from the standpipe. A second sector was assigned to perform search-and-rescue operations above the fire floor. The third sector, working with the university's public-safety officers, was responsible for evacuation.

Investigators believe the fire started when the foam rubber

cushions of the lounge's sofa were intentionally ignited with an unknown source. Flames and smoke spread from the burning couch to the upper floors through a pipe chase and throughout the floor of origin through an open door. Although fire damage was primarily confined to the ninth floor, some smoke and fire damaged the upper floors.

Two 19-year-old men suffered smoke-inhalation injuries. Property loss is estimated at more than \$1 million.

■ Cigarette ignites apartment fire

MINNESOTA

A 51-year-old woman died in her apartment after her cigarette ignited a sofa, and the fire spread throughout the unit. The blaze vented outside, spreading to upper floors before firefighters could control it. The victim, who died of burns, was terminally ill and slept on the sofa.

The three-story, wood-frame apartment building, which was 281 feet (85 meters) long and 62 feet (19 meters) wide, had a built-up roof. Interconnected smoke detectors in entranceways and hallways provided a local alarm in the building, as did the single-station smoke alarms in the apartments. However, it's unknown whether the alarm in the unit of origin operated. The building was unsprinklered.

Shortly before 2 a.m., the victim's husband awoke to find the living room of their ground-floor unit enveloped in fire. When he left the apartment, he pulled the fire alarm in the hallway, alerting occupants and a neighbor across the street, who called 911.

Firefighters arrived minutes later to find all three floors

ablaze on one side of the building. Open stairwells allowed the fire to spread throughout the building, and flames from the first-floor unit's patio door ignited the structure's combustible exterior. Faced with high heat and heavy smoke, the firefighters rescued a number of victims from the building of origin and a connected building.

Investigators determined that the point of fire origin was the end of the victim's outstretched arm.

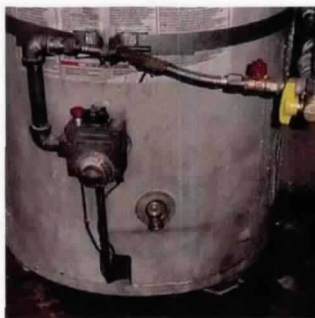
Five people, including two firefighters, were injured. The value of the building and its contents wasn't reported, but the combined property losses are estimated at \$3 million.

■ Sprinkler extinguishes flash fire

CALIFORNIA

A 2-year-old child was injured when he placed an open gasoline container next to an operating natural-gas water heater. The heater's pilot light ignited the gasoline fumes in a flash fire that severely burned the child and activated a sprinkler in the garage.

The one-story, single-family, wood-frame house, which was 40 feet (12 meters) long and 75 feet (23 meters) wide, was built



This water heater's pilot light ignited gasoline fumes, burning a child.



A toddler placed this open gasoline container by a water heater.

on a concrete slab and had an asphalt shingle roof. A wet-pipe sprinkler system had been installed, but the system wasn't monitored. There was no report of smoke alarms.

An occupant called 911, and the father rescued the burned boy from the garage as a single sprinkler extinguished the fire. The toddler, who suffered burns to 80 percent of his body, and his father, who had burns on both arms, were taken to the hospital.

Property loss was estimated at \$100.

■ Man dies from hotel room fire

NEW JERSEY

A 34-year-old man died when his bedding ignited while he was smoking illegal drugs in his hotel room. Sprinklers controlled the fire, but not before it had spread to the headboard and the mattress.

The five-story hotel, which was 65 feet (20 meters) long and 45 feet (14 meters) wide, was built of brick and wood with heavy-timber floor framing and a flat, tar-covered roof. A fire-detection system was installed in the common areas and the guest rooms, and a central station alarm company monitored the wet-pipe sprinkler system.

The detection and suppression

systems activated at 6:14 a.m., alerting guests and the fire department. Six sprinklers activated and extinguished the fire, which caused \$500 in damage.

The man, who was burned, died when he fell from his second-floor window, landed on an awning, and tumbled to the ground.

MANUFACTURING

■ Heater ignites dust

MISSOURI

A food-additives manufacturer suffered significant losses when dust from powdered tryptophan created by a malfunctioning auger ignited. The building's sprinkler system failed to operate, exacerbating the problem.

The four-story, steel-frame building had metal walls, and a rubber membrane covered the roof. There was no fire-detection system, but a wet-pipe sprinkler system provided some coverage in the area of origin. Unfortunately, the sprinkler piping had separated, rendering the system useless.

At the time of the incident, workers were using an auger to transfer large amounts of powdered tryptophan into a hopper during a bagging operation. When the auger malfunctioned, it blew the additive into the air in a combustible concentration, and a portable propane heater ignited it. The workers tried to control the fire with extinguishers, but this only displaced more additive and intensified the blaze.

A passerby called the fire department. When firefighters arrived, they discovered that the fire had spread and the roof beams were begin-

ning to collapse. Fire crews supported the sprinkler system using the fire department connection, but the system wasn't effective.

The building, valued at almost \$5 million, sustained structural damage estimated at \$1 million to \$2 million. Its contents, valued at almost \$2 million, sustained losses of \$1 million. There were no injuries.

EDUCATIONAL

■ Stage lights ignite backdrop in auditorium

CONNECTICUT

A student tripped over ropes holding up a stage backdrop in a school auditorium, knocking the combustible backdrop against the stage lights, which eventually ignited it, triggering the building's fire-detection system.

The single-story, steel-frame high school had masonry walls and a metal roof covered with built-up materials. Its fire-detection system consisted of hallway smoke detectors, heat detectors in hazardous storage areas, and manual pull stations. The entire system was connected to a municipal fire alarm system. The school, which was unsprinklered, wasn't in session because it was a weekend, but several people were on hand to attend special events.

Heat from the fire tripped the auditorium's detectors, alerting the custodian and the fire department at 12:46 p.m. Several people also called 911 to report the fire. When fire crews arrived six minutes later, they discovered heavy smoke and struck a second alarm. Firefighters brought

the blaze under control five hours later, limiting fire damage to the auditorium and smoke damage to the hallways and areas near the auditorium.

Investigators believe that when the student tripped, the backdrop fell against the stage lights, which later were turned on for about an hour, then turned off. By that time, however, they'd created enough heat to ignite the backdrop.

No dollar loss was reported, and there were no injuries.

ASSEMBLY

■ Overloaded extension cord starts fire

LOUISIANA

A light-duty extension cord being used to power a two-burner stove and two slow-cookers overheated and ignited combustibles in a convention center. Investigators found that the extension cord was plugged into a heavy-gauge extension cord that had a four-socket outlet box.

The irregularly shaped building, which was closed for the evening, contained an open display area 160 feet (49 meters) long and 80 feet (24 meters) wide. Wings off two sides housed support and service areas.

The unsprinklered, wood-frame structure had masonry walls and a wooden roof with a built-up covering. At the time of the fire, the building, which had no smoke detectors, housed an arts and crafts exhibition.

A passerby saw smoke coming from the structure and reported it to the police, who notified the fire department at

5:10 a.m. Firefighters arrived four minutes later to find heavy smoke coming from the center of the building.

Investigators found that slack from the light-duty extension cord had been loosely coiled and placed on the floor against an exterior wall in the assembly area. When the cord became overloaded, it produced enough heat to ignite nearby combustibles.

The building, valued at \$3.8 million, sustained an estimated \$1.2 million in damage. Its contents, valued at \$400,000, sustained \$300,000 in damage. There were no injuries.

■ Sprinkler system controls kitchen fire

NEW JERSEY

An improperly installed commercial kitchen hood system allowed heat from a cooking grill to pyrolyze a restaurant's wooden wall studs until they ignited. The restaurant was open at the time, and an occupant called 911.

The single-story, wood-frame restaurant was 100 feet (30 meters) long and 50 feet (15 meters) wide, with a flat, built-up roof. A central station alarm company monitored smoke detectors and a sprinkler system.

Upon arrival, fire crews supported the sprinkler system, which confined the fire to the kitchen and extinguished the blaze.

Investigators determined that the fire began behind a kitchen ventilation-exhaust hood when holes in it exposed studs to the heat. Loss estimates weren't reported. 🔥

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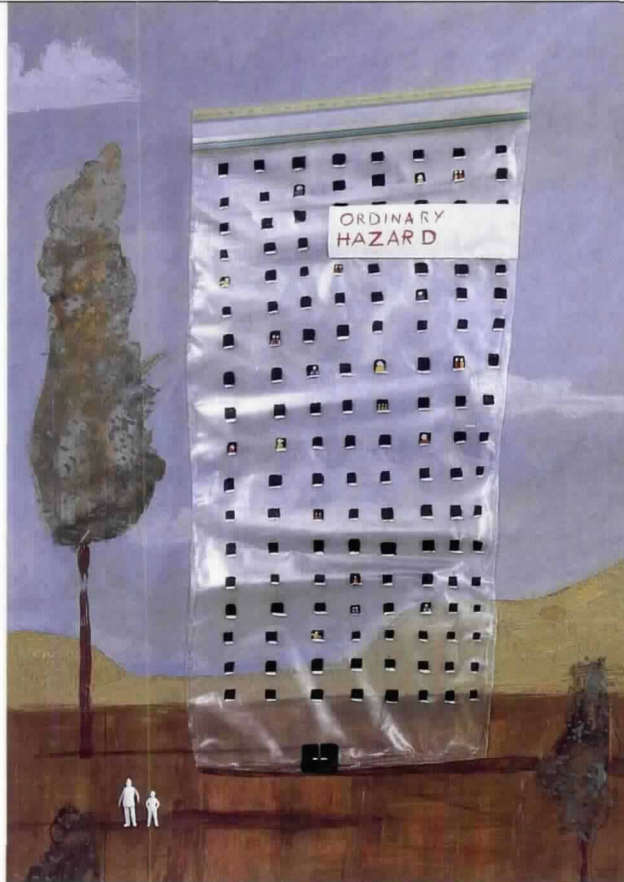
NFPA 5000™, *Building Construction and Safety Code*,™ and NFPA 1, *Uniform Fire Code*™, offer a well-defined process to address hazardous materials provisions in buildings and other structures. This process doesn't have to be confusing or complicated. Instead of identifying a facility containing hazardous materials as a separate occupancy classification, which has been the general practice in other documents, NFPA 5000 and NFPA 1 simply require that additional conditions related to the specific hazard level be satisfied. The type of occupancy is identified and the presence of contents that would make classifying the occupancy or facility as containing hazardous materials is determined.

This approach is similar to the approach taken with other specific occupancy conditions found in NFPA 5000 and NFPA 101®, *Life Safety Code*®. For example, a facility with an occupied floor more than 75 feet (23 meters) above the lowest level of fire department vehicle access is considered a high-rise. This doesn't change the type of occupancy, but it requires that the building comply with the provisions peculiar to a high-rise. The same can be said of occupancies in structures considered to be underground, to have limited-access, or to be in a flood-hazard plan. It's also the concept used for occupancies containing hazardous materials, in which additional provisions must be satisfied if certain thresholds are reached.

Ordinary hazard

Section 6.3 of NFPA 5000 establishes a hazard classification list based on building contents. These classifications include low-, ordinary-, and high-hazard, which has five levels. Because a majority of occupancies' contents are classified as ordinary hazard, the requirements found in building, life safety, and fire codes are developed for that particular classification. When an occupancy contains contents that aren't classified as ordinary, it's appropriate to modify to the base level of occupant and property safety using a simple, step-by-step process.

The first step is to determine whether any high-hazard material is being used, handled, or stored in the facility and which of the five high-hazard levels they represent. If high-hazard materials are present, the facility must satisfy the requirements pertaining to them in Chapter 33 of



NFPA 5000, "High Hazard Contents," or Chapter 67 of the proposed NFPA 1, "Hazardous Materials."

The classifications of high-hazard content in both chapters correspond to each other, establishing three categories or conditions that relate to the materials and the type of occupancy. The first condition is one of applicability and quantity limits, based on occupancy type. Even if a facility contains or uses high-hazard materials, it isn't classified as containing high-hazard materials if the materials are used or stored in accordance with certain referenced standards and certain quantities.

The second condition establishes maximum allowable quantities (MAQ) of hazardous materials per control area. This permits a facility to use certain amounts of materials without additional requirements for, among other things, control areas and separation construction.

The third condition applies to those facilities in which the quantity of high-hazard materials exceeds the MAQ. Once a facility exceeds those thresholds, additional

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CONTINUED ON PAGE 92

WALTER STERLING
is an NFPA senior fire
protection specialist.

What Drives the Cost of Residential Sprinklers?

Code requirements don't result in high installation costs. Community requirements do.

TO ORDER COPIES OF NFPA 13D OR THE NFPA POCKET GUIDE TO SPRINKLER SYSTEM INSTALLATION, GO TO WWW.NFPA.ORG.

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RUSSELL P. FLEMING CAN BE REACHED AT FLEMING@NFSA.ORG.



During the development of the 2002 edition of NFPA 13D, *Sprinkler Systems for One- and Two-Family Dwellings and Manufactured Homes*, there was a great deal of debate as to whether certain changes in the standard would increase system costs.

Several proposals that participants thought might add cost didn't make it through the process, but two did. One calls for a minimum average floor density for residential sprinklers of 0.05 gallons/minute/square ft (2 mm/min), and the other eliminates Chapter 5, "Limited-Area Dwelling Sprinklers."

Although some residential-sprinkler supporters worried that these two changes compromised the original goals of low-cost sprinkler protection, they actually typify the progress made in the last two decades toward, not away from, lower residential-sprinkler protection costs.

A closer look

Let's look at these two changes, starting with the new minimum average floor density. This density is consistent



with a change in the listing organizations' product approval standards, which took effect July 12 as the result of a major review of the fire test used to evaluate residential sprinklers. Though it retained the original,

reasonable worst-case combustible corner fire scenario, the new test was refined using tools, such as the large-scale calorimeter, that weren't available when the residential sprinkler was developed in the late 1970s.

The research that led to residential sprinklers called for a maximum protection area per sprinkler of 12 by 12 feet (3.7 by 3.7 meters) and a first-sprinkler flow of 18 gallons (69 liters) per minute. It also called for a two-sprinkler flow of 13 gallons (49 liters) per minute each, resulting in a minimum, multiple-sprinkler, average floor density of 0.09 gallons/minute/square ft (4 mm/min).

Using the special listing option in NFPA 13D, sprinkler manufacturers expanded the protection areas per sprinkler, which is the single biggest factor in reducing the cost of residential sprinklers. At the same time, the average floor densities steadily dropped, until the new minimums are barely half those required in 1980.

The other change was the elimination of Chapter 5, first introduced to create a special residential sprinkler for single-story, manufactured homes of less than 2,000 square feet (186 square meters) with stored water supplies of no more than 100 gallons (378 liters). To limit the water supply in this manner, the protection area was reduced to 8 by 8 feet (2.4 by 2.4 meters), except where a single sprinkler could protect a room no bigger than 10 by 10 feet (3 by 3 meters).

Today, Chapter 5 is no longer needed. Even with the minimum density of 0.05 gallons/minute/square ft, (2 mm/min) the standard contains an option for residential sprinklers listed to protect areas measuring 10 by 10 feet with a water supply of only 70 gallons (265 liters) or 12 by 12 feet with a water supply of 101 gallons (382 liters).

The real culprits in the story of unnecessary system costs aren't these code requirements, but community requirements such as excessive meter charges, tap-in fees, water standby charges, and others that exceed the minimum standards. Recent reports from progressive communities such as Scottsdale, Arizona, indicate that residential sprinklers can be installed economically and that they perform exceptionally well in the field. Communities that want to emulate Scottsdale's success should focus on eliminating their excessive installation requirements, all of which create obstacles to low-cost residential-sprinkler protection. ❖

RUSSELL P. FLEMING, P.E., is executive vice-president of the National Fire Sprinkler Association and a member of the NFPA Technical Correlating Committee on Automatic Sprinklers.

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THIS COLUMN IS ADAPTED FROM THE BOOK *STRUCTURAL FIRE FIGHTING*, AVAILABLE THROUGH NFPA AT WWW.NFPA.ORG OR (800) 344-3555.



RUSS SANDERS

served with the Louisville, Kentucky, Fire Department for 29 years, the last 9 as department chief. He's now NFPA's Central Regional Manager. After 30 years with the Cincinnati Fire Department, BEN KLAENE retired as the Training/Safety Chief to teach at the University of Cincinnati Open Learning Fire Science Program.

In general, industrial facilities have a good fire prevention and fire protection record, but a fire at an industrial property increases firefighters' risk of death and injury. NFPA statistics indicate that between 1996 to 2000, six firefighters died per 100,000 structure fires in manufacturing properties, as opposed to 3.7 firefighter deaths per 100,000 residential fires.

Pre-incident planning is critical to establishing special tactics for large manufacturing, processing, and storage facilities in any jurisdiction. However, pre-incident planning alone isn't enough. Cooperation between plant personnel and firefighters is essential. Firefighters are the fire suppression and rescue experts, but on-site employees are facility experts who know where the control valves are, how to get around the plant, how to shut down processes, and how to operate machinery. If the plant experts don't help the fire protection experts, everyone is subject to unnecessary risks.

Part of pre-incident planning should include a discussion of the plant employees' role, especially the role of employees assigned to the plant fire brigade or fire department, which can seldom bring to an incident scene the resources available to public fire departments. Establishing who's in charge and who's responsible for reporting incidents to the public fire department is important, especially since delayed alarms are a common problem in large-loss industrial fires.

The need to cooperate doesn't necessarily mean that a large industrial fire should involve a unified command. In most cases, the public fire department incident commander (IC) serves as the sole IC, with plant personnel serving as expert advisors. The key-



Pre-incident planning and cooperation between firefighters and plant personnel are essential at large, complex sites.

word here is "advisor." Although information from facility experts is often crucial in developing safe, effective strategic plans, the IC has the final say on tactics since he or she is responsible for the safety of the entire community. If runoff from master streams threatens the community's water supply, for example, the IC could be forced to let the plant burn.

In addition to working directly with the IC as part of his or her planning team, industrial plant experts can be assigned to help division, group, and sector leaders. When organizing a plant fire brigade or department teams, it's best to let plant personnel supervise their own teams and report directly to a division, group, or sector leader, or to the operations chief.

The fire service and industry can reduce the risk to firefighters through cooperation. Fire departments should learn as much as possible about the industrial properties in their jurisdictions before a fire occurs, and they must realize that those working at a facility can often provide valuable information that will help the IC develop a strategic plan that lowers the risk to firefighters, plant personnel, and the larger community. ❖

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NFPA continues to show our commitment to online learning by introducing two new online certificate programs.

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tion. Participants in our synchronous, web-based program can take advantage of polling tools or a chat room, and those who prefer the self-paced program can get immediate feedback on opportunities to apply their learning throughout the course. The format may be different, but the result is the same.

Tell me more about the new certificate programs.

The programs, "Fire and Life Safety in Health-Care Occupancies" and "Electrical Installations in Hazardous Locations," each consist of eight self-paced courses that give you essential information and enable you to receive continuing education units (CEUs) for an investment of \$35 per course or \$196 for the entire program. If students need a refresher or want to take the complete course again, they can. Each registrant has unlimited access to the course for 90 days.

What's covered in the "Electrical Installations in Hazardous Locations" program and who should attend?

This program teaches you to recognize areas that are likely to be classified because of their potential for combustible gases or dusts and how to select and apply wiring methods and electrical equipment in those areas. It's ideal for electrical engineers or fire-safety professionals who don't work regularly with electrical equipment in hazardous areas but need an introduction to the requirements.

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This program is designed for health-care managers, safety professionals, and facilities staff who need an overview of the fire- and life-safety issues unique to a health-care facility. It explains NFPA 101®, *Life Safety Code*®, and associated criteria for health-care occupancies, and teaches you how to apply them.

Are more courses on the way?

Yes, more courses are planned. Future topics will include many of the "in-demand" professional development training programs, including NFPA 70, *National Electrical Code*®; NFPA 72®, *National Fire Alarm Code*®; the sprinkler codes; facility fire-safety workshops; and more.

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MARK SCHOFIELD
 is NFPA's assistant
 vice-president of Training
 and Development.

CONTINUED ON PAGE 92

If Anything Can Go Wrong...

Planning for an emergency at a petrochemical plant is the supreme test.

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The basic process of planning for an emergency in a petrochemical facility is the same as it is in a smaller, less complex facility. The risks and hazards must be evaluated, a means for reducing them formulated, and appropriate protection systems for occupants and the facility installed.

In this process, risk is generally defined as the potential for something to happen, while hazard is defined as the potential for harm. Thus, hazard is how bad the outcome will be if a risk actually materializes into an event. Risk relates to probability, and hazard relates to severity.

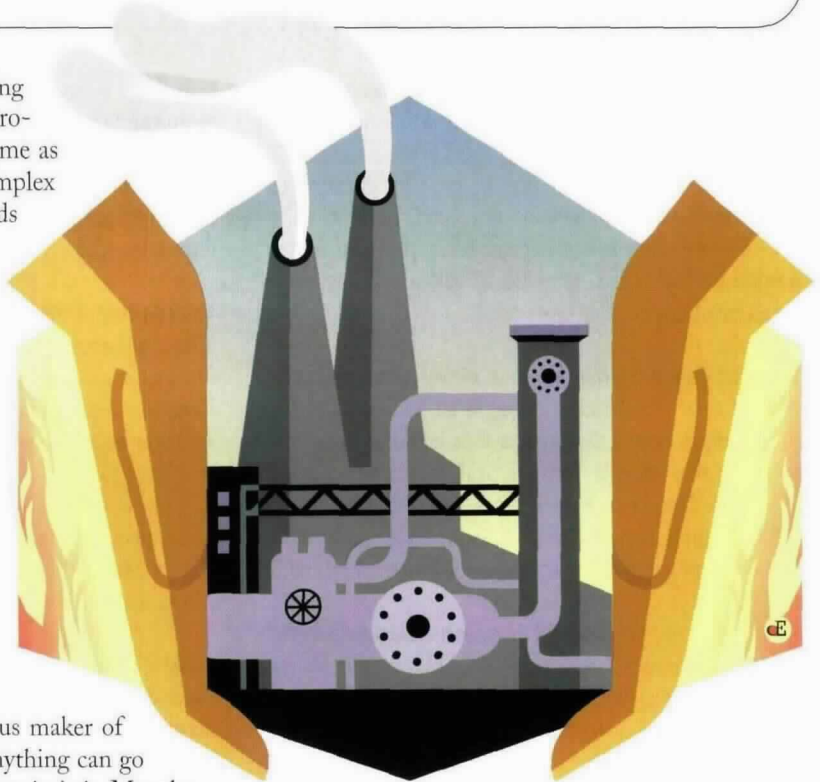
Mr. Murphy, the world-famous maker of laws, defines risk this way: "If anything can go wrong, it will go wrong." The pessimistic Murphy was pegging the universal risk of disaster for any undertaking at 100 percent.

If one never takes a risk, however, the probability of an adverse outcome is nil. Unless a plane falls on him from the sky, there's no chance that pro football announcer John Madden will die in a plane crash, because those who never fly have zero risk of death in an airline accident.

As for hazards, Murphy says: "When things just can't get any worse, they will." Handling flammable liquids may be risky at any time, but doing it while smoking is extremely hazardous.

The variety of processes that take place at petrochemical plants and the quantity of materials involved put the practice of risk management in such facilities to the supreme test.

To help make the risk-management process, which covers both probability and severity, somewhat easier, NFPA developed NFPA 550, *Fire Safety Concepts Tree*. The tree, an outgrowth of the fault-tree analysis concepts developed in the space program, is a systems approach to fire safety that provides a methodology for addressing the interrelation of fire-safety features' effect on achieving fire-safety goals, rather than con-



sidering each feature independently. The tree also provides a means of analyzing the potential impact of codes and standards on a project.


The human element

Of course, the most important element of any safety program is the people involved in the design, construction, acceptance testing, operation, maintenance, and repair of a facility. They're the element most likely to fail in any system.

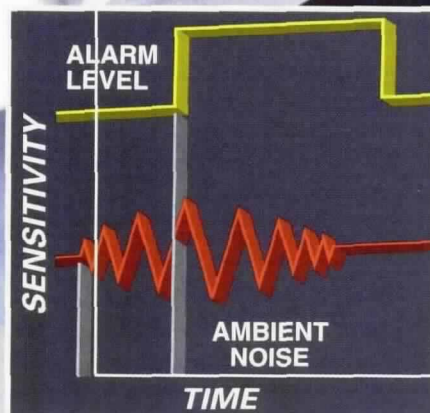
The best way to improve the effectiveness and reliability of the human element is to engender an attitude of safety throughout the organization, starting at the top. If every level of management demonstrates the importance of safety and requires that safety be part of facility operations, that attitude will filter down through the entire organization. Without this attitude, safety becomes the responsibility of "someone else."

Mr. Murphy also had a law that neatly sums up why management needs to be involved in developing a fire-safety plan: "Left to themselves, things tend to go from bad to worse." ❗

WAYNE "CHIP" CARSON, P.E., is president of Carson Associates Inc., a fire protection engineering and code consulting firm in Warrenton, Virginia.



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Trying to Prevent Catastrophic Fireballs

Senate committee moves to protect chemical facilities to keep them safe from terrorists.

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MORE DETAIL ON THE EPA'S RMP CAN BE FOUND AT WWW.EPA.GOV/SWERCPEP/BI-RIMA.HTM.

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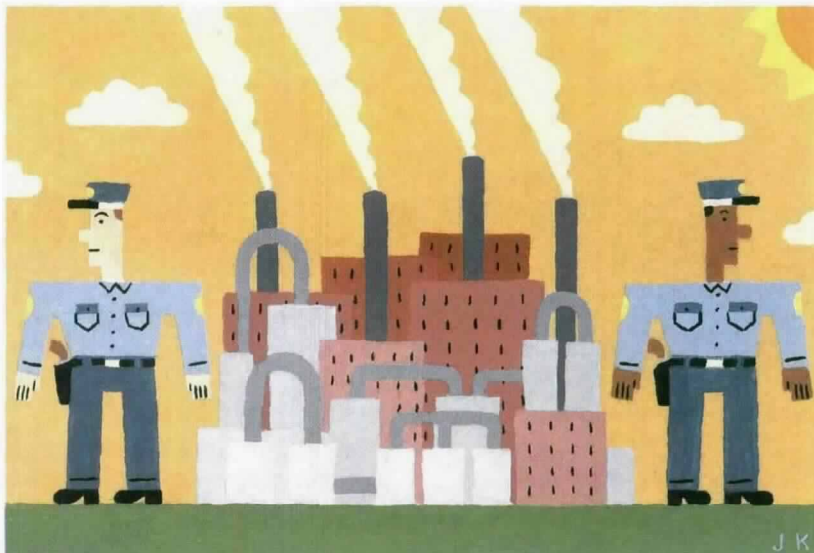
A terrorist version of deadly fires such as the accidental one at Motiva Enterprise's refinery in Delaware City, Delaware, is what a Senate committee and the Bush administration want to prevent by forcing petrochemical companies to undertake new hazard assessments designed to thwart attacks.

The accident at Motiva occurred on July 17, 2001, when vapors from a spent sulfuric acid tank were ignited by welders operating on an overhead catwalk. The explosion and fire killed one person, injured eight, and resulted in the release of 1.1 million gallons (4,163,878 liters) of acid.

The U.S. Chemical Safety and Hazard Investigation Board (CSB) reviewed the accident investigation on August 28, just weeks before a homeland security bill (S. 2452) came to the floor of the Senate. Among the issues the Senate considered was whether to attach the bill to the *Chemical Security Act* (S. 1602) approved by the Senate Environment and Public Works Committee by a vote of 19 to 0 on July 25. The act, sponsored by Sen. Jon Corzine, D-N.J., would require the Department of Homeland Security, which Congress seems ready to create, to designate a broad category of high-priority chemical and petrochemical "substances of concern," stored at facilities that could be targets for terrorists. Plants that stock those combinations would have to assess their security operations and draft plans to respond to any vulnerabilities.

The House homeland security bill (H.R. 5005), passed on July 26, didn't include the *Chemical Security Act*, whose House sponsor is Rep. Frank Pallone, D-N.J. If the Senate includes it, a House-Senate conference committee would have to decide whether to keep the Corzine/Pallone amendment in the final bill.

For a while late this summer, it appeared the Bush administration might make the Corzine/Pallone bill moot. The Environmental Protection Agency (EPA) and the Office of Homeland Security were already considering a plan requiring 30 high-priority chemical plants to survey their security arrangements and make improvements



where necessary. That would be a milder approach than the Corzine bill, which would require designating substances of concern and forcing all companies with those substances on hand to take action, a move that could affect hundreds of chemical and petrochemical plants. But EPA Administrator Christine Todd Whitman said on October 3 that the agency decided it lacked the legal authority to establish a new chemical plant-security program.

The American Petroleum Institute (API) opposes the Corzine bill. API feels new federal security requirements would duplicate existing federal programs, such as the EPA's Risk Management Program (RMP) rule, the Occupational Safety & Health Administration's Process Safety Management rule, and the U.S. Department of Transportation's Hazardous Material Regulations. Moreover, according to industry sources, petrochemical plants already adhere to the U.S. Department of Energy's voluntary guidelines on terrorism prevention.

The API also thinks some of the Corzine bill's provisions are naive. For example, it dictates that chemical companies find less flammable components.

"Petroleum products are capable of heating our homes and powering our vehicles because of their flammable and combustible properties," the API said in testimony submitted to the Senate Environmental and Public Works Committee. "At this time, there are no substitutes that do not have similar chemical properties."

NFPA and the fire service have not taken a position on the Corzine bill.

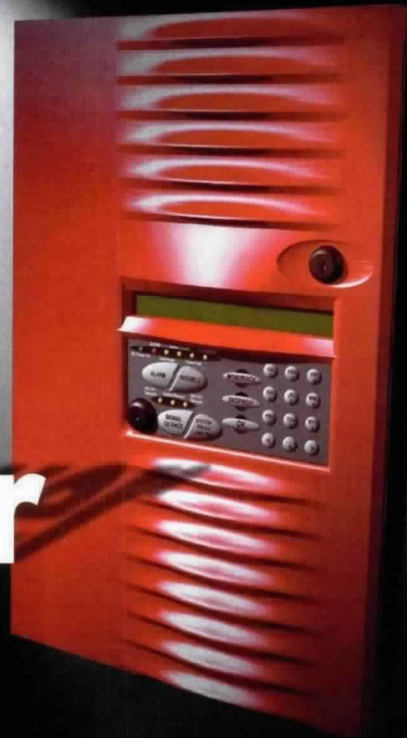
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STEPHEN BARLAS is a freelance writer based in Washington, D.C. He's covered political issues for more than 20 years.

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Who Controls System Reliability?

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How reliable is the fire alarm system you've designed, installed, maintained, or approved? How do you define reliability? Do code-compliant fire alarm systems perform reliably by definition?

Actual practice defines a reliable fire alarm system as one that will operate when called upon. Practitioners commonly call this the "mission effectiveness" of a system. Four factors affect mission effectiveness: design, equipment, installation, and maintenance.

Owners take the first step in making sure a system is reliable by determining their fire protection goals and objectives, and expressing them to the system designer. Owners shouldn't be afraid to involve fire officials in the process, too. In fact, owners should require that the designer and installer coordinate their designs and installations with the authority having jurisdiction (AHJ).

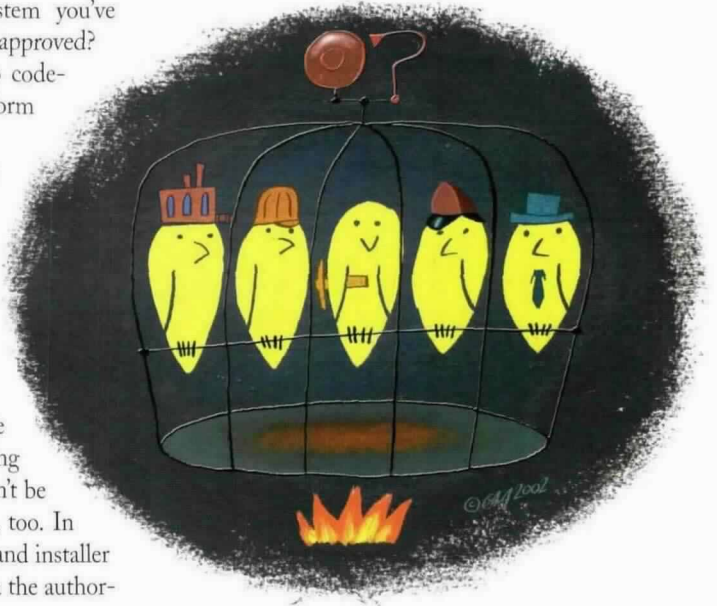
However, an owner shouldn't expect the AHJ to provide construction oversight. Such a task isn't their responsibility. Rather, an owner should require the designer to oversee construction to ensure that the installation meets the owner's fire protection goals.

The designer's responsibilities

Once the system's owner has made his or her goals clear, it's the designer's turn. Section 1-5.1.3 of the 1999 edition of NFPA 72®, *National Fire Alarm Code*®, says that someone experienced in the proper design, application, installation, and testing of fire alarm systems must develop the plans and specifications. The designer must be identified on the system design documents and provide the AHJ with his or her qualifications if asked.

Designers must know how to apply the relevant codes and standards with an understanding of their intent and performance requirements, and they must understand how the equipment they intend to specify will operate, given the environmental conditions. This means that the designer must know the environment of the installation site, as well as the demands of both the owner and AHJ for a fire alarm system installation that's credible, or free of false alarms, and reliable.

What role do equipment manufacturers play in the reliability equation? Obviously, they must design and manufacture reliable equipment, but their obligation does-



n't end there. Manufacturers must develop specification/data sheets that provide information designers and installers need to apply the equipment properly. They must also teach their sales people and distributors the application, installation, and maintenance requirements for their products.

Section 1-5.1.4 of NFPA 72 requires that someone qualified and experienced in installing, inspecting, and testing fire alarm systems supervise the installer. The section gives examples of appropriate qualifications.

In my opinion, installers should be familiar with all the codes and standards that apply to system installations, including NFPA 72 and NFPA 70, *National Electrical Code*®, as well as local building and fire codes. Furthermore, they should be taught the proper techniques for system installation. This may take the form of on-the-job training supervised by experienced journeyman technicians. How these qualifications are measured may include licensing and certification.

Installations need to be programmed. If the installing contractor can't do it, the manufacturer's representative or a factory-trained technician must. Contractors who modify system programming and maintain fire alarm systems must also be factory trained.

The AHJ has more influence in ensuring the other players perform as expected than anyone else involved in

CONTINUED ON PAGE 92

WAYNE D. MOORE, P. E.,
FSFPE, is chair of the
National Fire Alarm Code
Technical Correlating
Committee, a member of
NFPA 909, Protection of
Cultural Resources, Com-
mittee, and director of
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The Changing Role of the 'Life Saver'

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When our economy was much more robust, an Arlington, Texas, city councilor said property tax rates shouldn't be increased in an "up" economy because high property values and higher sales taxes should provide the new revenue to meet service demands. An increase in the property tax rate could have a negative impact on economic growth, he said.

Today, the same councilor said never raise taxes in a "down" economy. He cited unemployment, the compounding effect of increasing taxes from other entities, the necessity of maintaining our tax rate as a competitive advantage, and the impact such an increase could have on our economic recovery.

This councilor is expressing his personal views, advocating for his constituents, and protecting the interests of the entire community. However, this is a good example of the reasonable arguments that stand in the way of increasing revenues in any economic climate. Ironically, this comes at a time when an increased emphasis on the fire service's role in homeland security has led many to anticipate an increase in funding.

We must resist becoming mired in the competition that surrounds the distribution of scarce resources. Even within a single fire service agency, evaluating discrete programs for reduction opportunities and separating "core" service missions from "supporting" missions throw fuel on the simmering resentments between field staff and the dreaded administrative staff, between operations and prevention personnel, and between uniformed, sworn personnel and those labeled "civilians"—usually accompanied by a sneer.

Most fire service agencies accept and respect the critical importance of prevention programs, public education, and community service. Most can quote the mantra that investing in prevention represents a better value than investing in fire suppression. Since our efforts to prevent emergencies still don't permit us to accurately predict fires, however, we've had limited opportunity to reduce our financial commitment to suppression efforts.

And as we broaden our mission to include rescue and emergency medical services, the city manager's challenge increases. Everything's important. But everything can't be equally important. Setting priorities among missions and programs is often difficult, and, during these times, emergency prevention and public-education program-

ming suffers. It's in these struggles that relationships, trust, and credibility are damaged.

We're challenged by an industry that, for organizational convenience and personal preference, seeks to isolate missions by division. Emergency prevention can never be effective if limited staffing restricts the fire prevention division. That truth is driven home as we're forced to make difficult reduction decisions.

Every fire department employee must identify with the mission of his or her organization. We can't support a culture where nonfirefighters are treated as though they're less valuable than firefighters because they don't fight fires. Our acceptance of diversity must extend well beyond gender and cultural background to include those assigned to all divisions.

Emergency prevention through education, engineering, and enforcement is fundamental to the direction of the Arlington Fire Department. Again, Emergency Prevention can't be effective if the mission is restricted. To foster a them-vs.-us attitude toward a fire prevention division hinders our mission.

Acknowledging that we're all "life savers" doesn't diminish our respect for firefighters. ♣

ROBIN F. PAULSGROVE is the chief of the Arlington, Texas, Fire Department, past chair of the IAFC/NFPA Metro Chiefs Section, and a member of NFPA's Board of Directors.



Don't Let a Candle Fire Ruin Your Holiday

Candle fires rise to a 19-year high after a decade-long decline.

Candle fires in one- and two-family dwellings, manufactured housing, and apartments have been on an uphill track recently, reaching a 19-year high in 1998, the last year for which NFPA has statistics. That year, 12,540 fires resulted in 157 deaths, 1,106 civilian injuries, and \$176.1 million in property damage. This increase comes after a decline from 8,240 candle fires reported in 1980, the first year of available data, through 1990, when they hit a low of 5,460.

And if the past is any indicator, we're likely to see twice as many home candle fires this December as we do in an average month. The winter holiday season is the peak time for candle sales, which have increased dramatically during the past decade, according to the National Candle Association.

You don't have to go far to hear a frightening candle story. Marty Ahrens, NFPA fire analysis specialist and author of the annual *Candle Fires in U.S. Homes, and Other Occupancies*, recently experienced a close call.

"A friend had invited a small group to her home and created a cozy atmosphere by placing several candles of assorted sizes on a large, low coffee table," Marty says. "As my friend's sweet, old long-hair cat passed by the table, the tip of his tail brushed the candle and burst into flames."

A guest extinguished the fire before the cat even noticed it. If the cat been alone in the room, the story might have had a tragic ending, with the poor cat attempting to flee or hide, possibly igniting furnishings as he went.

No doubt, NFPA members already follow safe candle-burning procedures, but I fear many folks you know don't. So pass along this information at your next holiday party. It could be the best gift you've ever given.

Safety tips

- Extinguish all candles when leaving the room or going to sleep.
- Keep candles away from items that can catch fire, such as clothing, books, paper, curtains, Christmas trees, and flammable decorations.
- Use sturdy candleholders that won't tip over easily, are made of a material that can't burn, and are large enough to collect dripping wax.
 - Don't place lit candles in windows, where blinds and curtains can close over them.
 - Place candleholders on a sturdy, uncluttered surface and don't use candles in places where children or pets can knock them over.
- Keep candles and all open flames away from flammable liquids.
- Trim candle wicks to one-quarter inch (6.4 millimeters) and extinguish taper and pillar candles when they get to within 2 inches (5.1 centimeters) of the holder. Votives should be extinguished before the last half-inch (1.3 centimeters) of wax starts to melt.
- Avoid candles with combustible items embedded in them.

Candles and children

- Keep candles up high, out of reach of children.
- Never leave a child unattended in a room with a candle.
- A child shouldn't sleep in a room with a lit candle.
 - Don't allow children or teens to have candles in their bedrooms.
 - Store candles, matches, and lighters up high, out of children's sight and reach, preferably in a locked cabinet.

During power outages

- Use flashlights whenever possible. Try to avoid carrying a lit candle. Don't use a lit candle when searching for items in a confined space.
- Never use a candle for light when checking pilot lights or fueling equipment, such as kerosene heaters or lanterns. The flame may ignite the fumes. ⚠



YOU CAN ALSO READ "OUTREACH" ONLINE AT
WWW.NFPAJOURNAL.ORG.

FOR MORE HOLIDAY AND CANDLE SAFETY TIPS, VISIT
WWW.NFPA.ORG.



MERI-K APPY
is NFPA's vice president of
Public Education.

Pentagon Report

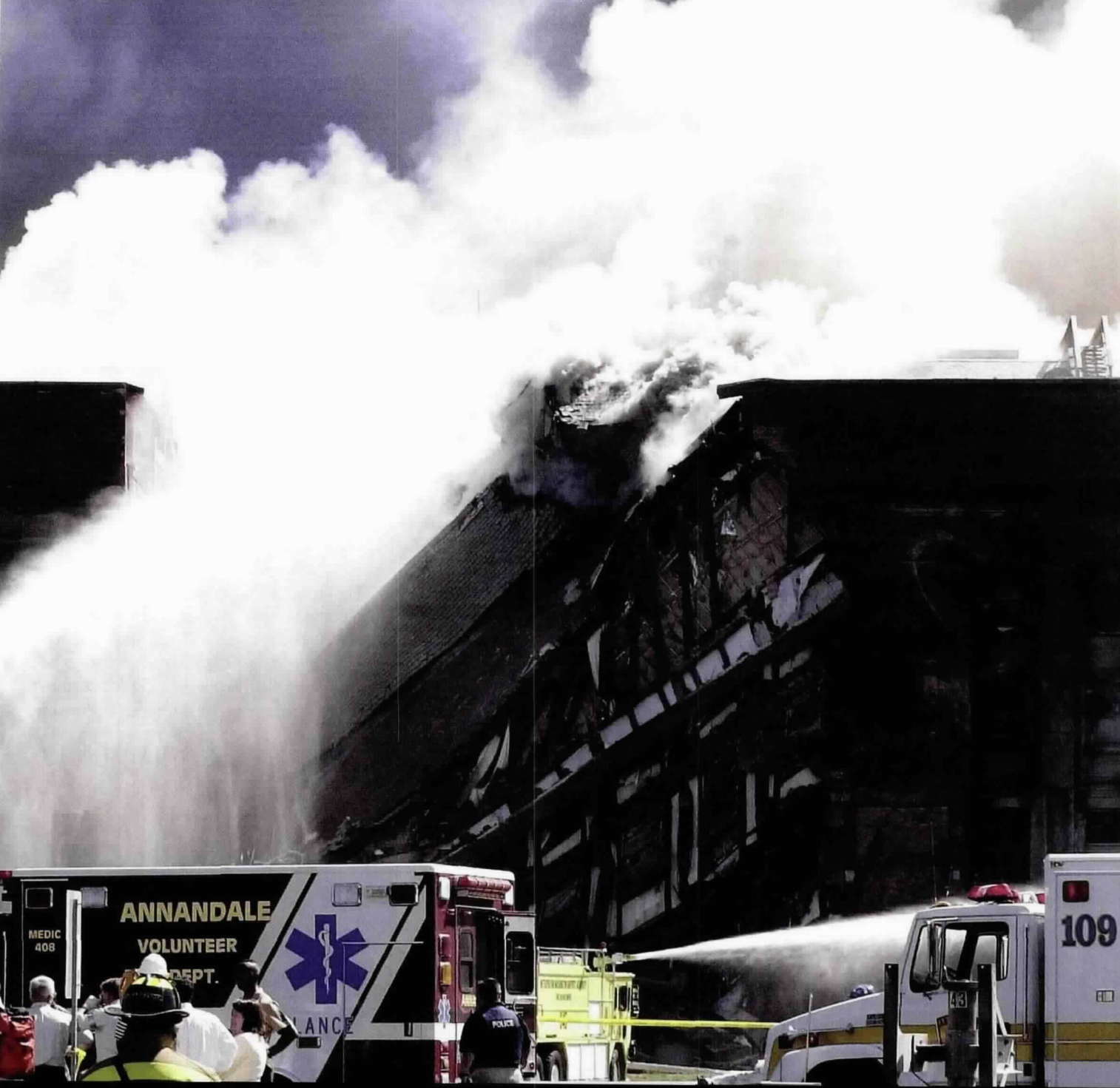
ARLINGTON COUNTY
STARTS IMPLEMENTING
CHANGES URGED
IN 9/11 REPORT

■ PAM WEIGER

The mutual-aid response to the Pentagon in Arlington, Virginia, on September 11, 2001, was automatic. Among the regional fire departments first on the scene was the Metropolitan Washington Airports Authority, whose two foam units from nearby Reagan National Airport are fighting the impact-zone fire behind the Annandale, Virginia, ambulance.



AFTER-



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HE TERRORIST ATTACKS OF SEPTEMBER 11, 2001, forced fire departments across the United States to rethink the way they operate. Many implemented changes based on media reports or word-of-mouth information from other public safety officials.

Now, a report on the Pentagon response provides concrete recommendations and guidance for dealing with mass destruction.

From the moment American Airlines Flight 77 crashed into the Pentagon in Arlington County, Virginia, the county fire and rescue department was responsible for a major mass-casualty incident that lasted 10 days and strained the department's resources to their limits. Ten months later, the federally funded *Arlington County After-Action Report on the September 11 Terrorist Attack on the Pentagon* concluded that the strategic vision, tactical leadership, flexibility and breadth of capabilities, and technical competence of the department and its leadership led to a successful response to the attack.

Arlington County used a \$400,000 grant from the U.S. Department of Justice to contract with Titan Systems Corporation of San Diego, California, to develop the report, incorporating information from all the agencies that participated in the response. The county and neighboring jurisdictions began incorporating the report's recommendations into their standard operating procedures (SOPs) immediately after, sometimes even before, the report was released in July.

Nearly 200 pages long, the report makes 235 recommendations and observations in four sections devoted to fire department operations, the response of hospitals and clinics, the law enforcement response, and the actions of the emergency management/emergency operations center. One hundred eleven of these recommendations and observations pertain to fire departments. Some are models other jurisdictions can emulate, while others describe challenges encountered during the

response that must be addressed if they're to be avoided in the future.

Among the areas in which the report recommends improvement are self-dispatching and staff recall; personnel accountability on the scene; reporting to the incident-command staging officer; fixed and mobile command and control facilities; radio compatibility; communications; logistics; staffing levels; and coordination with hospitals.

Automatic mutual aid

Although the report pointed out problems with self-dispatching and units operating outside the command structure, it also cited the

THE ARLINGTON COUNTY REPORT NOTES THAT UNITS FAILING TO REPORT TO THE INCIDENT COMMAND POST BEFORE JOINING THE FIREFIGHT AT THE PENTAGON CAUSED A MAJOR PROBLEM.

county's mutual-aid system and outside support as something other jurisdictions should emulate. Most fire chiefs in the Washington, D.C., metropolitan region applaud the strong mutual-aid system in northern Virginia, which includes SOPs that are consistent across jurisdictional lines.

"We were working on that more than a year ago," says Fire Chief Ed Stinnette of the Fairfax County, Virginia, Fire and Rescue Department. "We're almost to the point of sharing battalion chiefs across the lines on first-alarm assignments."

"The rest of the nation talks about mutual aid. We have automatic aid," says Fire Chief Tom Hawkins of Alexandria, Virginia. "We have the same command boards, the same systems."

Chief Hawkins believes that the mutual-aid problems cited in the report resulted simply because units weren't called in on September 11 using the normal sequential order.



This member of the Montgomery County, Maryland, Fire & Rescue was one of the many outside responders to the Pentagon.

Hawkins, whose department produced a "fairly exhaustive" internal report on September 11 late last year, said that, while the first several hours of an incident are bound to be chaotic, it falls upon the fire chief and the firefighters' own sense of discipline to prevent

them from responding to a scene before they're called to do so.

To that end, Hawkins and Alexandria's city manager have met with all fire department employees in small groups to explain the importance of not self-dispatching.

"I'd been criticized for not allowing everyone to go to the Pentagon," Hawkins says. "I was there when the Air Florida flight crashed into the 14th Street Bridge and the Potomac River in 1982, and I know that if people just rush in, that's when you lose people."

In March 2002, the Washington Metropolitan Council of Governments strengthened the regional mutual-aid agreement, which encompasses fire departments in Virginia, Maryland, and the District of Columbia. This year, a three-day training session has been planned for all the jurisdictions, covering incident command, high-rise firefighting, and mass-casualty incidents.

THE ARLINGTON COUNTY PENTAGON AFTER-ACTION REPORT CAN BE DOWNLOADED AT WWW.CO.ARLINGTON.VA.US/FIRE/EDU/ABOUT/PDF/AFTER_REPORT.PDF.

PAM WEIGER is a freelance writer based in Orlando, Florida.

Outside a unified structure

The Arlington County report also notes that units that failed to report to the incident command post before joining the firefight caused a major problem and recommends replacing "units that choose to operate outside a unified structure." The report notes that the failure of units, including those that self-dispatched, to report to the incident-command staging officer "reduces management control, increases risk, and severely hinders accountability."

The report singles out the Washington, D.C., Fire Department, in particular, for not following instructions on sending units to assist. Although chief officers in the District wouldn't comment on the report, fire department spokesman Alan Etter says the department has modified its command system based on extensive revisions in the region's emergency action plan.

"We're aware of the criticism that we maintained our own command structure while under the command of Arlington County," says Etter. "That was done to maintain a cohesive radio network, because our radios were the only ones that were working. We've made some revisions in our operations since September 11, but nothing based on information in the Arlington report."

Accountability of personnel

Tangential to the issue of self-dispatching were problems with staff recall. Arlington County has already implemented a new staff-recall SOP and is currently developing Internet-based group-mail systems and a telestaff recall system. The county is also trying to upgrade its equipment, including pagers, which the report recommends issuing to all firefighters and emergency medical technicians.

The report also questions the passport accountability system currently used by fire departments nationwide, advising departments to consider developing a completely new badging and accountability system.

"Our current system, with Velcro and tags, is very labor-intensive for a mass-casualty situation," says Fairfax County Chief Stinnette. "I'm sure if you don't capture everyone's tags early, it's possible to have a unit or two out of place."

Fairfax County is looking at bar codes, smart cards, and other new technologies that

may eliminate some of the accountability problems encountered at the Pentagon.

Command facilities and communications

Another criticism was the Arlington County Fire Department's lack of fixed and mobile command and control facilities. In fact, the report calls almost every aspect of communications problematic, from the initial dispatch to operational instructions.

To remedy the problem, the department is using \$600,000 of a \$16 million federal grant to buy a mobile command unit, which it expects to place in service in about six months. Arlington County also received a grant from the National Institute of Justice to install on-board computers in all fire, EMS, and police units. And the department has filled all its vacant dispatch positions to maintain a minimum staffing level of seven police/fire/EMS dispatchers. Because the report said a minimum staffing level of seven dispatchers proved insufficient, the department is also reviewing the minimum staffing requirements for its dispatch center.

The radio incompatibility that plagued responders at both the Pentagon and the World Trade Center remains a great concern. In September 2001, Arlington County had a never-before-used communications computer hub that theoretically allows radios and cell phones on different frequencies to link to each other. However, it wasn't used during the Pentagon response because the mechanics of getting it to the scene and programming it for all the agencies that responded were overwhelming, according to Assistant Chief James Schwartz, who commanded the incident.

Arlington County is now reviewing a proposal for a new First Responder™ communication and command system packaged by Raytheon Corporation that promises to link all public-safety and military radios and cell phones arriving at a command post. The proposed system includes radio-interoperability software; programmable radios; wireless LAN and video links; equipment compatible with Verizon, Cingular, and AT&T cell-phone networks; satellite and Global Star uplinks and telephone capabilities; and power and com-

FBI-Fire Service Liaison Pays Off

Arlington County's training, exercises, and shared experiences earned the Pentagon after-action report's praise under the category of capabilities others should emulate. Particularly noted was the well-established relationship between the fire department and the Federal Bureau of Investigation (FBI), which began in 1998 when the FBI Washington field office established a fire liaison position to work specifically with local fire departments.

Special Agent Christopher Combs volunteered for the job. With eight years of experience as a volunteer firefighter in Freeport, New York, and New Berlin, Wisconsin, he was a natural choice.

"Everyone in my family is in the fire service," Combs says. "Even the guy who married my sister."

Combs, who was on the scene at the Pentagon within six minutes of the September 11 attack, says the message from the FBI top brass to all its field offices is to get better connected with the fire service, particularly the local haz-mat teams.

"I went to many presentations after Oklahoma City, and what I learned was liaison is everything," he says. "Having an established relationship with the fire department is the key to the whole thing. If we don't understand the fire department mission, then we can't operate."

Combs says the Bureau is now working to get firefighters, particularly bomb technicians, haz-mat specialists, and those involved in weapons of mass destruction incidents, through the FBI training course.

Meanwhile, Combs has been ordered to give presentations at major fire department conferences, and the FBI has invited an Arlington County assistant chief to make presentations at FBI terrorism conferences.

puter equipment. Also included are wireless laptop computers, video-conferencing capabilities, and a wireless remote-video camera that can send pictures back to the command vehicle or any remote location via satellite. System components, which cost \$171,000 before installation, are modularized and can be made to fit the department's specifications.

"There are aspects of this system that we're interested in exploring, but this package may not be the end-all for communications issues," says Schwartz. "Some of these capabilities may be available elsewhere."

Staffing changes

The report recommends that the Arlington County Fire Department review its fire apparatus-staffing levels to ensure the speed of early search-and-rescue operations and provide for the safety of the crew. Arlington Assistant Chief Schwartz says that the county has approved funding to staff all 10 fire department engines with four firefighters, following the requirements of NFPA 1710, *Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, which requires a minimum crew of four firefighters for engines and ladder trucks. Previously, only seven engines had four-firefighter crews. The department is looking at staffing its heavy rescue vehicles with four firefighters in 2004 and the ladder trucks after that.

The department's haz-mat team is increasing from 33 members to 45, and the technical rescue team is growing from 30 to 42. The department is using NFPA 471, *Responding to Hazardous Materials Incidents*; NFPA 472, *Professional Competence of Responders to Hazardous Materials Incidents*; and NFPA 1006, *Rescue Technician Professional Qualifications*, as the training and certification standards for the new team members.

Full-time logistics captain

From a logistics perspective, Arlington County, like most jurisdictions, wasn't prepared for the magnitude and duration of the Pentagon operation.

"We were no different from most fire departments," Arlington County Fire Chief Ed Plaughter says. "Where do you get thousands of pairs of gloves?"

Today, the fire department has a full-time logistics captain and is storing equipment in an old library as it makes plans to build its own warehouse. The region's departments are currently formalizing a regional logistics team to accumulate the vast array of supplies Plaughter believes will equip the region for major incidents.

Finally, the after-action report notes deficiencies in hospital coordination that weren't simply equipment failures, but represent "flaws in the system." Because regional hospital disaster plans no longer required a clearinghouse hospital, emergency rooms in the area first learned of the Pentagon victims from EMS units bringing the victims in. The report recommends integrating all medical treatment facilities into a single EMS structure.

Arlington County and surrounding jurisdictions are following the report's recommendation to identify unique and critical facilities in their locales and to update emergency response plans for them. The report notes that, although the outside façades of government buildings typically remain unchanged, their interiors are modified frequently, necessitating an ongoing review of their emergency plans. In addition to the myriad government and military offices scattered throughout the region, Alexandria is the site of the federal courthouse where suspected terrorists are tried, and Fairfax County is home to CIA headquarters, as well as several water treatment plants.

Blueprint for fire departments nationwide

To produce the report, Titan Systems conducted 92 debriefing sessions, interviewed approximately 475 people, and extensively reviewed planning documents, mutual-aid agreements, journals, and logbooks during a six-month period. The resulting document summarizes the incident concisely, provides guidance on homeland defence, and focuses on building relationships and developing trust before an incident occurs. According to Chief Plaughter, it's a nonpolitical, independent, third-party review that's virtually unprecedented. (A month later, in August, New York City released a report by the consulting firm McKinsey & Company on the city's police and fire department responses to the World Trade Center attacks.)

"One critical element was having the com-

pany conduct up-front interviews in classic fire department critique format, without chief officers present," says Plaughter, who'd hoped from the outset that the report could serve as a blueprint for fire departments nationwide in responding to large-scale terrorist incidents. "I think the report gives you a context to judge your own situation, which is different for different communities. It says, 'Have you thought about these areas?'"

Arlington is breaking down each of the report's fire department recommendations into a statement, analyzing the statement to see how it relates to other recommendations, grouping like statements together, and deciding what to do with each group. Sometimes, action on a recommendation has already been taken. For example, the report recommends more reserve apparatus and equipment. Arlington's secured the additional apparatus and is now focusing on the equipment.

The Arlington County Fire Department has also placed each recommendation into a stand-alone work program that goes into an overall work plan to be reviewed quarterly by the county manager. While not all recommendations will be implemented, Plaughter says money isn't being used as a disqualifier. The department is using grant money and going through its standard budgeting process

Others Should Emulate:

- ICS and Unified Command
- Mutual Aid and Outside Support
- Arlington County Emergency Management Plan
- Employee Assistance Program
- Training, Exercises, and Shared Experiences

Challenges That Must Be Met:

- Self-Dispatching
- Fixed and Mobile Command and Control Facilities
- Communications
- Logistics
- Hospital Coordination



Clockwise, from top left: the mutual-aid response to the Pentagon 10 minutes after the plane crashed; the initial Arlington County command post; Metropolitan Washington Airports Authority (MWAA) Foam Unit 331 at the impact zone; MWAA fire officers and firefighters conferring after evacuating to Washington Boulevard; and MWAA and Arlington County firefighters after the impact-zone collapse.

to obtain necessary funds.

While sifting through all 111 recommendations can be daunting for any fire department, Plaughter says a good place to start is with the 10 important summary items near the beginning of the document. Under the heading “Capabilities Others Should Emulate,” the report describes five areas that worked very well and contributed significantly to the successful outcome of the incident (see previous page). A second category of five items, titled “Challenges That Must Be Met,” represents difficulties encountered during the course of the incident. These areas need to be corrected now or avoided in the future.

The Arlington fire chief admits that some parts of the report disappointed him.

“I’d envisioned more of a reliance upon the sequence of events to clearly portray the chronology of the incident,” Plaughter says. “Incidents of this magnitude . . . all have in common the timeline thread.”

For example, Plaughter says he’d like to have seen a schematic showing when specific elements should occur—three hours into the incident, scene security and credentialing should be in place, and so on—to illustrate what responders did fast enough and what took too long.

High marks

Overall, Arlington County garnered high marks for its incident command system (ICS) and unified command. The report praises Plaughter for his decision not to take command of the incident, something he says is common practice in the Washington metropolitan region.

“You really need to let the people who do it all the time—the assistant chiefs and battalion chiefs—do it, with your full faith and trust that they can command the incident,” Plaughter says. “I knew the talents of the individual in command.”

Instead of serving as the incident commander, Plaughter took on a coordinating role as planning chief, encompassing planning, safety, communications, logistics, and media issues. Because that concept worked so well at the Pentagon, Arlington is now designing a completely new regional ICS module for major incidents that incorporates both an incident commander and a planning chief who would work together. The concept is spreading to other arenas, too. George Washington University Hospital in Washington, D.C., is conducting a study to determine whether the concept can be used in the hospital setting during mass-casualty incidents.

“We didn’t know we were creating a new system at the time, but maybe we were,” Plaughter says.

The report also praises Arlington’s strong county emergency management plan for being well-thought-out, maintained, practiced, and implemented by government leaders and the county’s aggressive, well-established employee assistance program (EAP). EAP staff was at the Pentagon within three hours of the attack, proving “invaluable to first responders, their families, and the entire county support network.”

While the after-action report may not be headed for the best-seller list, the initial 500 print copies and CDs have been spoken for, and Arlington County is arranging to print an additional 1,000 copies to meet the demands of organizations hoping to benefit from the lessons learned at the Pentagon. The report can also be downloaded from the Arlington County Fire and Rescue Department website at www.co.arlington.va.us/fire/edu/about/pdf/after_report.pdf.

“I think this report will have more value when the next incident occurs and people look to this document and ask what’s been done,” Plaughter says. “We’re still too close to the incident to fully appreciate the value of this report right now.” ♦

SLO

BURN

FIRE-SAFE CIGARETTES

THE ONGOING STRUGGLE TO REDUCE FIRES IGNITED BY CIGARETTES IS ONE CONGRESSMAN'S LEGACY ■ **U.S. REPRESENTATIVE EDWARD MARKEY**

CONGRESS HAD A GOLDEN OPPORTUNITY THIS year to reduce the number of fires started by cigarettes, but it appears to have slipped away, adding one more disappointment to the long struggle to reduce the risks of cigarette-ignited fires to life, property, and firefighters.

In 1979, a residential fire started by a neglected cigarette killed five children and their parents. It was only one of the thousands of fires caused that year by cigarettes, but it occurred in Westwood, Massachusetts, in the congressional district of my friend, Represen-

tative Joseph Moakley. The tragedy motivated Joe's 20-year quest to bring so-called fire-safe cigarettes to consumers and thus decrease the number of fires started by unattended cigarettes. His goal wasn't fully realized before his death in May 2001, but it lives on in *The*

Joseph Moakley Memorial Fire Safe Cigarette Act of 2002 (H.R. 4607), which I introduced in the House of Representatives with Representative James Hansen, R-Utah. Senator Richard Durbin, D-Ill., and Senator Sam Brownback, R-Kan., introduced a companion bill in the Senate. This crucial fire-safety legislation is the culmination of Joe's determination to elevate cigarette-ignited fires from local tragedy to national concern and prod the tobacco industry into producing a cigarette with a lower propensity to start fires.¹

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Cigarettes are the single largest cause of fire deaths in the United States, igniting approximately 30 percent of fatal fires.² According to the most recent NFPA report, they result in about 1,000 deaths and 2,500 to 3,000 injuries each year and cause more than \$6 billion in property damage.³ But smokers aren't the only victims. More than 100 children and non-smokers die annually from fires that could be prevented, and our fire service professionals must deal with more than 150,000 tobacco-related fires a year, most of which are started by cigarettes.⁴

How can we justify putting a single fire-fighter at risk putting out a fire that could've been prevented at the cost of pennies simply by changing the construction of a cigarette? Fire-safe cigarettes have a significantly lower tendency to ignite upholstered furniture and mattresses because of small design changes, including a smaller diameter, a filter tip, less porous paper, citrate-free paper, and less densely packed tobacco.

The legislative history

Congressional interest in cigarette fire safety dates back to 1929 when the National Bureau of Standards, now the National Institute of Standards and Technology (NIST), conducted research on the issue on the behalf of Congress.⁵ More recently, work began in 1979 with Joe Moakley's introduction of legislation that would've required the U.S. Consumer Product Safety Commission (CPSC) to regulate cigarettes as a fire hazard. However, Moakley was unable to overcome the tobacco industry's objections to fire-safe cigarette standards until the passage of the *Cigarette Safety Act of 1984*, which established a technical study group to determine whether it was technically and economically feasible to make a fire-safe cigarette. Three years later, the technical study group reported to Congress that the production of more fire-safe cigarettes was indeed technically and economically feasible

and within the capabilities of the tobacco industry at that time, a point the industry denied.⁶

Three years after the report was published, Moakley shepherded the *Fire Safe Cigarette Act of 1990* into public law. The legislation mandated the development of a test method for cigarette fire safety within three years. NIST developed two tests, and nine laboratories, including four of them from the tobacco industry, demonstrated that both tests produced reliable results.⁷

With the testing methods in place, Moakley introduced the *Fire Safe Cigarette Act of 1999*, 20 years after the tragic fire that killed seven of his constituents. As in his initial 1979 legislation, this bill required the CPSC to establish and implement a fire-safety standard for cigarettes sold or manufactured in the United States.

Building on this momentum, I, as a Massachusetts congressman, introduced *The Joseph Moakley Memorial Fire Safe Cigarette Act* with the support of NFPA, the International Association of Fire Fighters, the National Association of State Fire Marshals, American Cancer Society, American Heart Association, American Lung Association, and the Congressional Fire Services Institute. Nevertheless, hearings on the bill have yet to be held, and Durbin's bill, which enjoys equal support, was blocked by an anonymous "hold" in the Senate, preventing its passage.

In the absence of a federal standard, Massachusetts, Minnesota, Oregon, and Vermont have introduced their own legislation to regulate the fire safety of cigarettes. However, only New York has passed a law requiring a fire-safety standard for cigarettes. Signed on August 16, 2000, the law requires the cigarette fire-safety standard be established by January 1, 2003, and it will come into effect the following July 1. At this time, it's unknown what standard New York will adopt, but the testing strategy will be based upon the methods developed at NIST in the early 1990s. Although the European Union, Canada, and New Zealand have expressed interest in developing fire-safety standards for cigarettes, the New York law is the only one of its kind to date.

The tobacco industry hasn't generally supported legislation mandating fire-safe cigarettes. They've argued that fire-safe ciga-

rettes aren't technically feasible and that any cigarette that would meet a fire-safety standard wouldn't satisfy their consumers. They also believe that a fire-safe cigarette would give smokers a false sense of security, leading to an increase in negligence because smokers would assume they couldn't start a fire.⁸

According to a statement from R.J. Reynolds Tobacco Company, extensive "testing with commercial upholstered fabrics demonstrates that the laboratory tests for fire-safe cigarettes have little, if any, relationship to how cigarette-related fires occur. Cigarettes that pass a laboratory test, and thus could be labeled 'fire-safe,' do not necessarily reduce the likelihood of ignition when dropped on the wide variety of upholstered furniture fabrics as they are used in homes in real-life situations, or when dropped on anything else outside the lab."

Instead of developing fire-safe cigarettes, the industry has shifted the fire-resistance burden to mattress, furniture, and pajama manufacturers. Their answer to cigarette fire safety is, in the words of Joe Moakley, "to fire-proof the world against our torches."

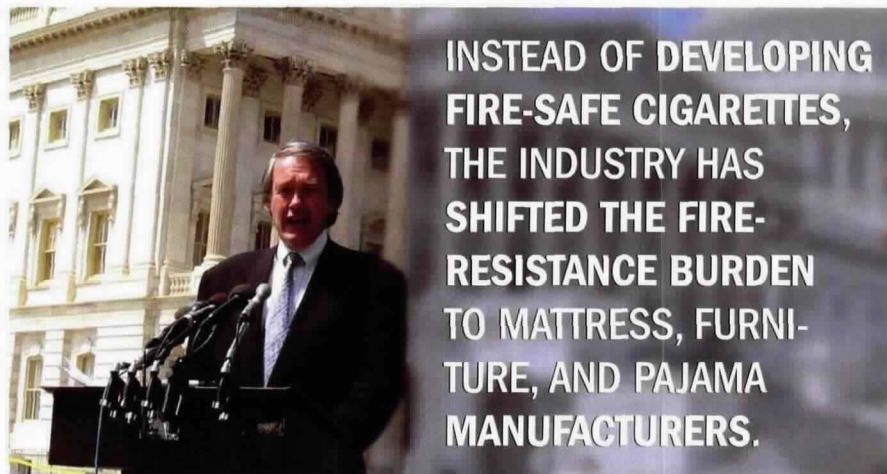
Now that state legislatures are seeking to establish various fire-safe cigarette standards, however, the tobacco industry has expressed some interest in a single national standard. Philip Morris has split from its industry brethren and endorsed moving forward with a Senate bill, although they insist on a different bill in the House.⁹ In fact, the industry has refused to endorse the House bill and instead chosen to support provisions that would preempt the states' rights to establish stronger standards, prolong implementation of the standard, and allow the economic hardship on the industry, rather than public safety, to sway future reconsideration of the standard.¹⁰

Standards and current technology

The two test methods NIST developed under the mandate of the *Fire Safe Cigarette Act of 1990* to establish fire-safety standards for cigarettes are still in use.¹¹ The first involves laying a lit cigarette on a piece of fabric, which simulates a piece of furniture, to directly test whether the cigarette will ignite a bed or chair. In the second test, designed to determine whether a cigarette can ignite furniture, a lit cigarette is placed on several layers of

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CONGRESSMAN EDWARD MARKEY, D-MA,
first elected to Congress in 1976, is a champion of
consumer rights and health reform.



Congressman Edward Markey

extremely pure and strictly standardized filter paper used in the chemical industry to ensure repeatable test results. A strong igniter, as are most of today's cigarettes, burns its full length while a weak cigarette loses energy to the paper and goes out. Cigarettes perform comparably in both test methods.

A test similar to the second test will be used as the basis of the New York standard. The voluntary standards organization, the American Society for Testing and Materials (ASTM) International, also used the second test to develop ASTM E 2187 with the participation of most of the major tobacco companies.

After developing these testing methods, NIST researchers also tested commercially available cigarettes' propensity to cause fires for their 1993 report to Congress. They found that the 14 bestsellers, all of which had similar tobacco-packing density, paper permeability, and circumference, ignited the fabrics in the tests, but six other brands with different characteristics showed lower ignition propensities, an encouraging sign that fire-safe cigarettes could be developed.¹²

In July 2000, Philip Morris announced it had, in fact, developed a cigarette paper that would make a cigarette less likely to start a fire. After extensive consumer testing, its PaperSelect™ paper is now used on its Merit brand cigarettes nationwide. According to Philip Morris, PaperSelect cigarettes have "speed bumps" that slow down the rate at which the cigarette burns. Rings of ultra-thin paper are applied on top of traditional cigarette paper during the papermaking process to

make a cigarette that's more likely to extinguish on its own when left unattended, a concept tested and shown effective under the *Cigarette Safety Act of 1984*.¹³

In May 2000, the Federal Trade Commission asked NIST to test the PaperSelect cigarettes in order to verify Philip Morris' claim that the cigarette reduced the risk of ignition if dropped or discarded. Using the testing methods it developed under the *Fire Safe Cigarette Act of 1990*, NIST tested modified cigarettes from a test-marketing city and unmodified cigarettes from the Washington, D.C. area, which wasn't a test market. NIST determined that the modified cigarette did have a lower relative ignition propensity than the traditional cigarette.¹⁴ The use of PaperSelect paper in cigarettes nationwide could reduce the number of cigarette-induced fires.

Philip Morris has also tested the toxicological properties of cigarettes made with the new paper and found there was no major difference in the overall smoke chemistry or biological activity of the PaperSelect cigarettes as compared to those made with the usual cigarette paper.¹⁵

Smokes without fires?

Some 23 years after the 1979 tragedy that started the late Joe Moakley's quest for fire-safe cigarettes and thousands of deaths later, we still don't have a national fire-safety cigarette standard. With NIST's robust testing methods in place, the time is right to develop a national fire-safety standard for cigarettes. We know it's feasible to make a less fire-prone cigarette because Philip Morris already has one on the market. Twenty years of public

awareness campaigns and attempts to fire-proof furniture haven't stopped the fatalities caused by cigarette-ignited fires. Delaying these standards again just puts lives at risk.

Although the opportunity was lost this year, there's a strong commitment in Congress to complete Moakley's work and extinguish the "torches." With the continued help of fire-safety professionals across the nation, we will establish a national fire-safety cigarette standard. ♣

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“regular or alternative?”

ALTERNATIVE FUELS ARE BECOMING MORE COMMON AT FILLING STATIONS ■ JOHN NICHOLSON AND THOMAS DOLAN

CAN YOU ENVISION DRIVING YOUR CAR into a full-service filling station to be topped off with your choice of not only regular gasoline and diesel fuel, but compressed natural gas (CNG), liquefied natural gas (LNG), propane, electricity, or the ultimate in non-polluting fuels, hydrogen? Many can, and with good reason: all of these fuels, not just gasoline and diesel fuel, currently exist in some combination.

The most fully developed alternative fuels on the market today are propane, CNG, and LNG, which are addressed in NFPA 52, *Compressed Natural Gas (CNG) Vehicular Fuel Systems*, and NFPA 57, *Liquefied Natural Gas (LNG) Vehicular Fuel Systems*.

“Natural gas is the best alternate fuel, envi-

ronmentally speaking, since it’s made of 90 percent methane, and it’s cheaper than propane,” says Carl Rivkin, senior chemical engineer for NFPA.

Both CNG and LNG are natural gas, though in different states, and it’s the state that determines its use. LNG is much denser

than CNG and produces a higher energy appropriate for running buses and trucks. However, it must be stored under high pressure, thus requiring the use of heavy-duty equipment. CNG, on the other hand, requires less special handling and is easier to use at the pump.

The problem with both CNG and LNG, Rivkin says, is that “there isn’t much of an infrastructure in place to support their use, especially outside of cities. The stations that provide it are, for the most part, run by truck or bus fleets or public transportation.”

“There are currently a number of gas stations throughout the country where you have the

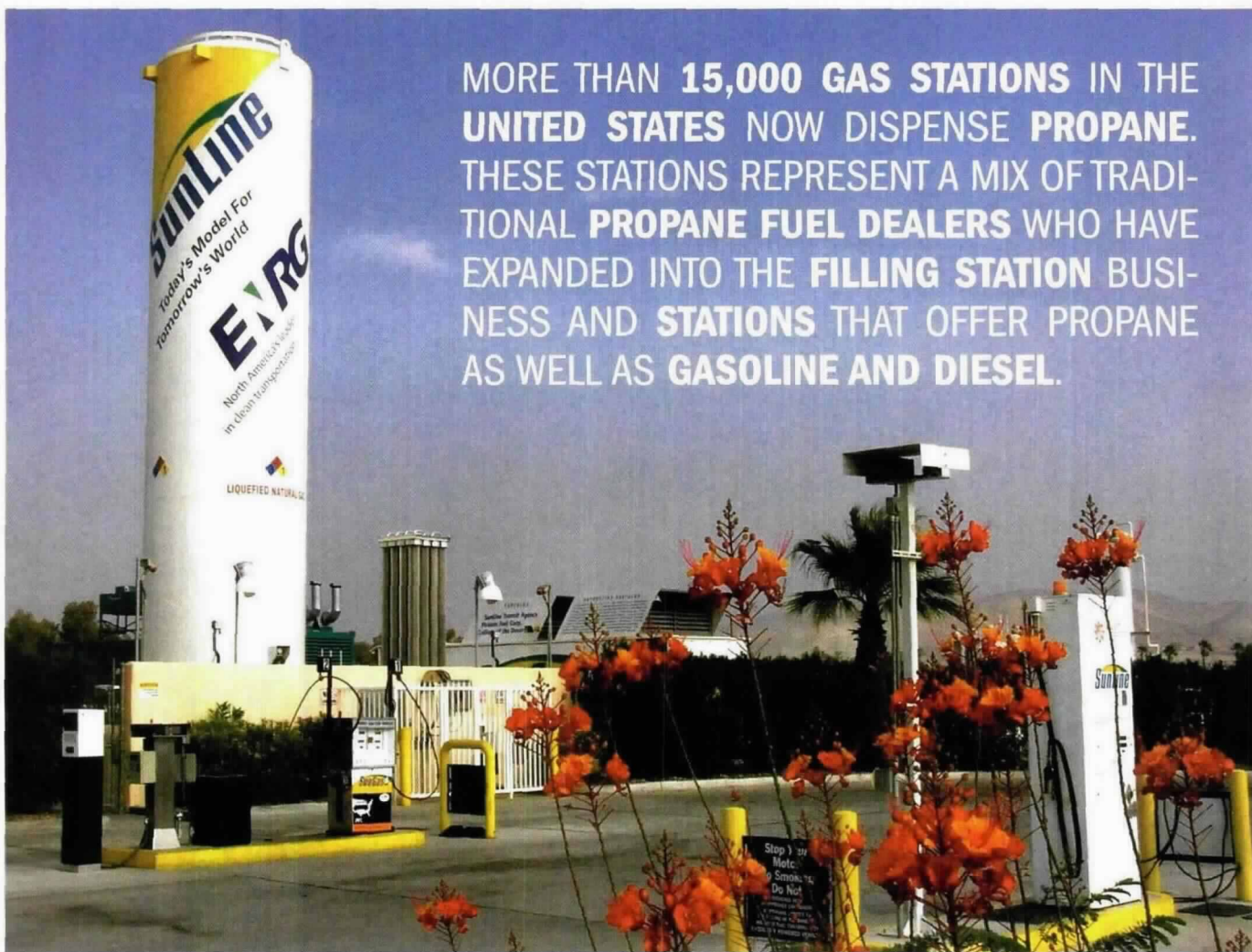


ALTERNATIVE
BOB'S
FUELS

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Bob

BOB'S



MORE THAN 15,000 GAS STATIONS IN THE UNITED STATES NOW DISPENSE PROPANE. THESE STATIONS REPRESENT A MIX OF TRADITIONAL PROPANE FUEL DEALERS WHO HAVE EXPANDED INTO THE FILLING STATION BUSINESS AND STATIONS THAT OFFER PROPANE AS WELL AS GASOLINE AND DIESEL.

An alternative fuels station in Thousand Oaks, California.

option of buying natural gas along with gasoline or diesel," says Hank Seiff, director of Technology for the Natural Gas Vehicle Coalition in Washington, D.C., "but not nearly enough. Natural gas is a niche market now and is doing best in public transit, airport shuttles, garbage trucks, and other public vehicles."

Nevertheless, says Rivkin, "this may be changing because of pressure from the U.S. Environmental Protection Agency (EPA), which is a major driving force in using these

fuels. I think you're going to see their use increase. I don't know how quickly it will happen, but where you have extreme pollution, such as Los Angeles, there will be more regulation than in, say, northern Michigan, which doesn't have air quality issues."

Another obstacle to the widespread use of natural gas is its cost. Although natural gas is often less expensive than diesel or gasoline, Seiff says, it currently costs about 25 cents a gallon (3.8 liters) more than gasoline in the United States, making it less attractive to U.S. drivers than it might be to drivers in other countries. In fact, natural gas is making great headway in countries such as Bolivia, which is currently the best market in the world for natural gas as it has no petroleum but plenty of natural gas. The same is true in Bangladesh. India and Pakistan are also making a major

effort to switch to natural gas, as is China, which is trying to improve its air quality in time for the 2008 Summer Olympic games.

Not only is natural gas more expensive in the United States than gasoline or diesel fuel, but a passenger car powered by natural gas costs about \$3,000 more to make than a gasoline-powered car. And heavy-duty trucks and buses cost \$30,000 to \$50,000 more. Once engineers optimize the design, the cost will drop, but time and use won't bring down the price of compressed or liquefied natural gas cylinders, which cost more and take up more room than conventional fuel tanks.

When might natural gas become a mainstream product?

"My crystal ball doesn't say, but a combination of circumstances might move it along, such as the *Clean Air Act* passing in Congress

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JOHN NICHOLSON is the managing editor of *NFPA Journal*. THOMAS DOLAN is a Washington-based freelance writer.

and OPEC screwing down the taps again," says Seiff. "Tax incentives for fuels, vehicles, and stations would go a long way to make it all more cost-beneficial."

How safe are CNG and LNG when used or stored at a facility? In case of a leak, CNG rises, creating a potential explosion risk in enclosed areas. And since it must be stored under pressure in heavy tanks, there is a possibility of an over-pressure rupture. LNG, on the other hand, is cooled cryogenically for storage to -260°F (-162°C). At this temperature, contact with the fuel can cause frostbite. Because LNG is odorless and odorants can't be added to it, facilities in which it's used must install methane-gas detectors to detect leaks. CNG is also odorless, but odorants can be added to it to make people aware of a leak.

According to Pacific LNG Systems, Inc., the LNG industry has an almost accident-free record for the last 30 years. Since 1970, there have been only 16 LNG-related accidents worldwide; since 1980, there have been two

LNG-related fatalities worldwide. All prior accident causes have been incorporated into existing regulatory standards.

Of the 20 LNG-vehicle accidents since 1971, only 6 resulted in an LNG release, and only 3 resulted in LNG-related fires. LNG's flammability limits, ignition temperatures, vapor densities, and explosive potential are less all hazardous than that of propane and gasoline.

Propane

Nonetheless, the leading alternative vehicle fuel both worldwide and in the United States, according to Brian Feehan, executive director of the Propane Vehicle Council in Washington, D.C., is propane or liquid petroleum gas (LPG).

"In Paris," he notes, "the case has been made and accepted for public fleets over the past four years, and there are numerous regions in France where it's common to pull up to a station and fill up with propane. In Holland, about 50 percent of the market is saturated, and 40 percent of the stations all

over Australia offer propane."

In the United States, Feehan reports, an estimated 281,000 vehicles currently run on propane alone.

Compared to other alternate fuels, propane most resembles gasoline in terms of range. Fifteen gallons (56 liters) of gasoline will take you about 400 miles (643 kilometers), while 15 gallons of propane will take you about 320 miles (515 kilometers).

"With propane, you lose no horsepower or torque capacity in that driving range," says Feehan.

Propane's major advantage is that, unlike LNG and CNG, it doesn't require a separate infrastructure. This makes it especially suitable for use in rural or other areas where there are no natural gas pipelines. Because propane is transported by truck from a primary dispensary, it can go anywhere. And propane tanks can be installed economically either above or below ground.

More than 15,000 gas stations in the

Waiting for everyone to catch up

While the rest of the country is moving incrementally toward low-emission alternative fuels, the SunLine Transit Agency, based in Thousand Palms, California, decided to use them exclusively and let the rest of the world catch up.

SunLine provides the bus transit for nine cities in Riverside County, about 120 miles (193 kilometers) east of Los Angeles.

"About 10 years ago, we made the decision to convert our entire fleet to alternative fuel," says Richard Cromwell, CEO and general manager. "We've always wanted hydrogen-run fuel cells, but the technology wasn't ready, so eight years ago we changed our whole fleet to run on natural gas."

SunLine collaborated with Southern California Gas to put in the first natural-gas station and with the College of the Desert, a local community college, for a natural-gas station and vehicle-maintenance program. At the time, there was no similar program in the United States.

After two years, the California Public Utility Commission determined that the company could no longer own a public filling station with a third party, so the Picken Fuel Corporation stepped in. Today, SunLine now has seven CNG stations, including its acclaimed clean-fuels mall, a fuel-service area that also offers LNG and Hythane®, a blend of 20 percent hydrogen and 80 percent CNG.

Since opening its revolutionary hydrogen-generation, -storage, and -dispensing facility in 2000, SunLine has attracted a steady stream of international scientists, researchers, policymakers, automakers, and other intrigued visitors, all of whom want to see a working model of sus-

tainable energy and clean transportation. SunLine is happy to oblige.

The company currently uses electrolyzers to generate hydrogen from renewable solar power and a reformer to generate it from natural gas. To store hydrogen, SunLine uses a high-volume system from FIBA Technologies composed of a 16-tube Department of Transportation (DOT) storage trailer and two high-pressure ASME tube tanks. These tanks are attached to a cascade control panel used to fill hydrogen buses and pick-up trucks at the public fueling island across from SunLine's on-site CNG gas station.

Because the project generates more hydrogen than can be stored, SunLine stands ready to market the gas to area customers using the DOT-approved trailer as a convenient distribution system. SunLine is also planning to expand its clean-fuels mall, by adding more storage capacity, increasing dispensing pressure to accommodate the automotive industry, and developing a wind-to-hydrogen demonstration project, and adding stationary fuel cells.

"We've had seven fantastic years on CNG, but our ultimate goal has always been a zero-emission fleet powered by hydrogen fuel cells," says Cromwell. "Since they're not yet commercially available, we're viewing Hythane as an interim step."

By adding just a small amount of hydrogen to CNG at the pump, CNG's already-low emissions are reduced. Still, says Cromwell, hydrogen is the only permanent solution.

"In fact, we plan to have at least three fuel cell-powered buses on the road in 2003," he says.

All SunLine stations are open to the public.

United States now dispense propane. These stations represent a mix of traditional propane fuel dealers who have expanded into the filling-station business and stations that offer propane as well as gasoline and diesel.

"Some systems are complete fuel-management systems," Feehan says, "which track the fuel use, the driver, dates, and other data needed to generate meaningful reports."

Feehan thinks stations offering the full range of conventional and alternative fuels are a long way off, but feels "we have to change the public's perception today on how to fuel cars to get to the challenge of the future, for the fuels of the future will face the same dilemmas we face today, of infrastructure and product availability."

"We see propane as bridging the gap to the use of fuel cells down the road," he says. "By all of the stakeholders working together today, we can develop the infrastructure to support the fuels of tomorrow."

NFPA 58, *Liquefied Petroleum Gas Code*, guides the design, construction, installation, and operation of fixed and portable LPG systems in bulk plants and commercial, industrial (with specified exceptions), institutional, and similar properties; truck transportation of LPG; engine fuel systems on motor vehicles and other mobile equipment that use LPG; storage of LPG containers awaiting use or resale; installation on commercial vehicles; and LPG service stations.

According to the Department of Energy, strong construction for LPG tanks is required, but the pressure hazard associated with propane is less than with CNG. LPG should be odorized and detectors are recommended to help detect leaks or spills. LPG is extremely volatile, and LPG fires burn twice as hot as gasoline fires.

Electricity

At a more experimental stage as a vehicle fuel is electricity, produced either by a battery or a fuel cell. One great advantage to electric "fuel" is the lack of emissions it produces when a car is stopped at a light, simply because the motor isn't running. However, batteries must be replaced or recharged. Fuel cells, which produce almost no emissions beyond water, convert hydrogen to electric energy and theoretically last longer than batteries.

The fuel cell is a passive device that physically resembles a battery into which hydrogen is fed to mix with oxygen. The resulting friction between protons and electrons creates electricity, which can power an engine. Since no hydrocarbons are burned, no emissions are vented into the atmosphere and the only residue is a slight trail of water.

However, many organizations are concerned with hydrogen safety and much effort has gone into the preparation and publication of guidelines and requirements for hydrogen systems and equipment. NFPA publishes guidelines for hydrogen storage systems. The Department of Transportation regulates the distribution of hydrogen over the nation's roads. Associations such as the American National Standards Institute and the American Society of Mechanical Engineers publish standards for components used in hydrogen equipment, while the Compressed Gas Association sets standards for many gases including hydrogen production, handling, and use.

Today, some hybrid vehicles, such as Toyota's Prius use gasoline to drive distances and a battery for trips around the city. Another type uses electricity and CNG or LNG instead of gasoline, making it even more environmentally friendly, says Rivkin.

Currently, electric vehicles use either lead acid and nickel metal hydride (NiMH) batteries. Lead acid batteries, the most common and least expensive type of battery, generally give vehicles a range of less than 100 miles (161 kilometers) per charge and last about three years. Chrysler, Ford, General Motors, and Toyota vehicles use this type of battery.

NiMH batteries also offer a range of about 100 miles (161 kilometers) per charge, but are more expensive. The life expectancy of the battery is about 100,000 miles (161,000 kilometers). Chrysler, General Motors, Honda, and Toyota offer vehicles with NiMH technology.

Electric-vehicle battery packs store enough energy to produce a dangerous, even lethal shock, so their electrical circuits are self-contained and grounded to limit the risk of shock from the vehicle frame. In addition, electrolytes in the battery may cause chemical burns, so anyone working on them must wear protective gear. However, the fire risk associated with electric vehicles and electric-vehicle

recharging stations is minimal, compared to those associated with LPG, LNG, and CNG.

Toyota develops a guide for responders

To educate and assist emergency responders in the safe handling of its Prius gasoline-electric hybrid vehicle following an accident, Toyota developed a special guide explaining the electrical system, which powers its electric motor, generator, and inverter. All other conventional automotive electrical devices such as the headlights, radio, and gauges are powered from a separate 12-volt battery.

Numerous safeguards have been designed into the Prius to ensure that the 274-volt, NiMH, hybrid vehicle (HV) battery pack is kept safe and secure in an accident. The Prius pack contains sealed batteries similar to rechargeable batteries used in laptop computers, cell phones, and other consumer products. Because the electrolyte is absorbed into the battery cell plates, it won't normally leak out even if the battery is cracked. In the unlikely event the electrolyte does leak, it can be easily neutralized with a dilute boric acid solution or vinegar.

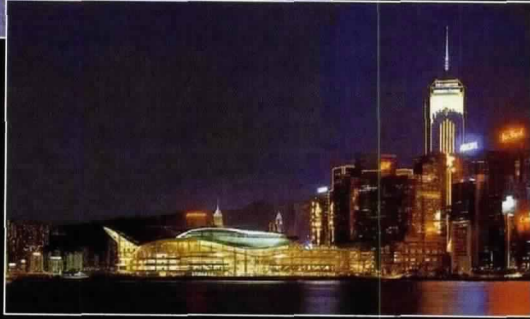
High-voltage cables, identifiable by their orange insulation and connectors, are isolated from the metal chassis of the vehicle and routed underneath and in the floor-pan reinforcement. Emergency responders don't normally access these areas at the scene of an accident.

What's the average price at the pump?

Like gasoline and diesel, the price of alternative fuels fluctuates according to international economic changes and supply and demand. Since the accessibility of alternative fuels is regional, geographic location can also affect the price at the pump. For example, propane is generally less expensive in southern states that have easy access to the Dixie pipeline, while natural gas is more economical in urban areas and ethanol producers tend to sell their fuel in the Midwest to cut down on fuel-transportation costs. Since LPG and CNG are also used outside the transportation sector, it's difficult to isolate the price charged for vehicle refueling. For more detailed information on the price of alternative fuels visit the Energy Information Administration at www.eia.doe.gov. 🔥



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A NEW PROGRAM HELPS DRIVE CAMPUS
FIRE-SAFETY GROWTH AT OUR NATION'S
COLLEGES AND UNIVERSITIES ■ ED COMEAU

Chapel Hill, North Carolina, firefighters work Sunday afternoon May 12, 1996, at the Phi Gamma Delta fraternity house on the University of North Carolina-Chapel Hill campus. A fire discovered just after 6 a.m. claimed the lives of five people and left three injured.

school in fire

IN JANUARY 2000, A FIRE BROKE out in a residence hall at Seton Hall University in South Orange, New Jersey, trapping students in their rooms. Three freshmen died. The following March, a fraternity house fire at Bloomsburg University in Bloomsburg, Pennsylvania, killed another three students.

Both fires focused attention once again on the fire dangers students at colleges and universities all over the United States face.

Contributing to the 1,500 fires that occur each year in college residences is the lack of fire-safety information aimed specifically at college students, which forces many college fire-safety professionals to use inappropriate videos and literature or develop their own materials. Recently, organizers of the Campus Fire Safety Forums, held annually since 1999 at the NFPA Fall Education Conference, decided to do something about the problem by funding the development of material that could be distributed to institutions across the United States. Because one of the goals of this innovative program, which they called "Living

with Fire," was to eliminate cost as a barrier to using the material, Campus Fire Safety Forum organizers approached several organizations and companies for help. It didn't take long to sign them up.

What's on the web site?

With the funders on board, organizers began developing their fire-safety material, using discussions and focus groups with educators and students to guide the content.

Several focus groups were held with students, and campus fire safety educators were interviewed to determine what is needed—what would appeal to the students of today.

To enable campus fire-safety educators to assemble their own programs or update exist-

ing programs, the development group put the material together like a toolbox—only these tools include information bulletins covering such topics as fire safety and alcohol, candles, and smoking; automatic sprinkler and alarm systems; building fire-safety features; and fire extinguishers. Bulletins detailing past dormitory and fraternity-house fires are written in Microsoft Word™ and can be easily photocopied. Adding a logo and contact information can also customize the bulletin.

Because some schools don't have the time to develop lesson plans for delivering much-needed fire-safety messages, "Living with Fire" comes with its own lesson plans that address evacuation, fire behavior, fire extinguishers, off-campus fraternity housing, on-campus residential housing, and on-campus dormitories. Along with these lesson plans come practical activities for interactive learning.

One of the most comprehensive parts of the



toolbox is a library of photographs of fires in student occupancies across the country. These photographs of candle fires, fraternity fires, fire-safety obstructions, off-campus housing fires, successful sprinkler activations, and a demonstration burn in a mock-up of a student's room, can be used to develop customized presentations.

To catch students' attention, the program developers had to come up with creative ideas that would cut through the advertising and media messages that bombard students. One idea, concocted by Campus Firewatch, was to advertise "Living with Fire" on buses. Another was to use stickers on pizza boxes. Every college town has pizza shops for students, and the program developers saw the stickers as an excellent medium for reaching its target audience.

Artwork that local educators can use to print their own stickers is available on the U.S. Fire Administration's web site www.usfa-fema.gov. The Fire Administration agreed to post the material on its high-traffic site to make it accessible and to take care of any copyright issues that might have arisen if it weren't in the public domain.

THE HIGH POINT OF THE WEEK WAS A LIVE BURN IN THE MIDDLE OF THE UNIVERSITY OF MASSACHUSETTS CAMPUS.

Testing the program

To determine whether these concepts worked, the developers decided to test them last spring in Massachusetts. With its five colleges, Amherst provided an excellent laboratory.

In the days leading up to "Living with Fire" week, stickers were distributed to all area pizza shops and promotional ads asking "Are You Ready?—Graduate Alive" were placed on buses that served the colleges. The advertisements' cryptic message created a buzz among students.

Stickers were also put onto Frisbees®, which were handed out to students, in one case by their professor. The idea was success-

ful, with students swapping Frisbees of different colors and messages.

The high point of the week was a live burn in the middle of the University of Massachusetts campus. A mock-up of a student room was built and furnished, then set ablaze, making an indelible impression on the students and providing a great media opportunity.

At Smith College, another mock-up was equipped with an automatic sprinkler system to demonstrate how effectively sprinklers control fires. Thirty seconds after the fire was set, a sprinkler activated and extinguished it. To reinforce just how important sprinklers are, the system was shut off and the contents of the mock-up were reignited. Within five minutes, fire destroyed the room.

In September, a fire-safety booth was erected on the concourse in the center of campus at the University of Massachusetts. Prizes such as a kayak, mountain bike, and discount airline tickets were raffled off. To enter the raffle, students had to complete a fire-safety crossword puzzle, go through fire-extinguisher training, and participate in other safety-related activities. Burned items from past dormitory fires, such as radios, comput-

ers, and lamps, were displayed at an information booth, and videos of the mock-up burns were run continuously.

Also shown was a video called "Graduation: Fatally Denied," which takes the viewer through an evening with a fictional college student named Amelia. We follow her into her room, where we look at the covered smoke detector, the lit candles, the overloaded electrical outlets, her halogen lamp, and a number of other fire dangers. As we watch, Amelia lights a cigarette, sits down to study, and falls asleep.

Suddenly, the sound of the smoke detector wakes her. She tries to escape but is overcome by the smoke and collapses, unconscious. We watch as firefighters pull her burned body out of the building and put her into the ambulance that takes her to the hospital, where she dies. At the end of the video, a fire chief standing in the burned-out shell of Amelia's



Campus fire-safety educators can get a copy of "Graduation: Fatally Denied" for \$17.95, the cost of duplication, shipping, and handling. It's distributed by Emergency Film Group, (www.efilmgroup.com).

room delivers a strong fire-safety message.

This video, taped from the student's perspective, and shot at Amherst Fire Department, the University of Massachusetts, and Cooley Dickinson Hospital in nearby Northampton, vividly shows just how frightening a fire can be and what happens when someone is rescued. Its development was underwritten by contributions from the American Cancer Society, Gage-Babcock and Associates, the National Fire Sprinkler Association, Royal & SunAlliance, Simplex-Grinnell, the University Risk Management and Insurance Association, the University of Texas system, Hobbs Group/Kirklin & Co, LLC, and MJ Insurance Sorority Division, all of which are dedicated to reducing the number of fires at colleges and universities across the country.

Through efforts such as this, the developers of "Living with Fire" hope to reduce the number of fires that occur on and off campus each year at our nation's colleges and universities. They also hope that "Living with Fire" will serve as a focal point for new ideas on effectively reaching students with fire-safety information. Given student turnover each year, it's critical to keep such programs fresh with new learning experiences. 🔥

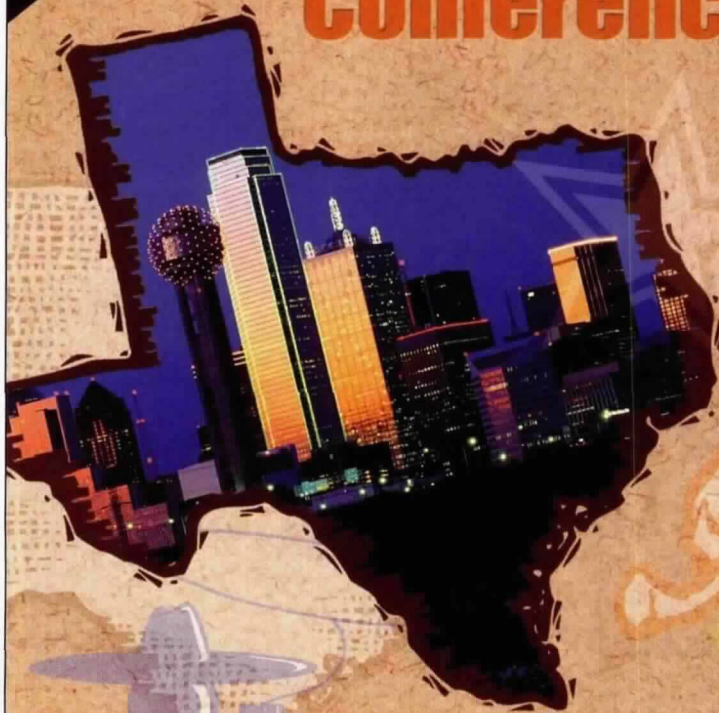
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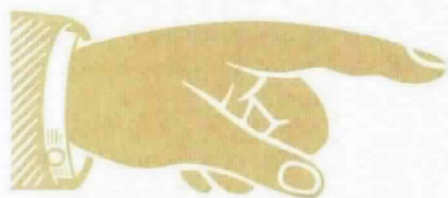
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TAKING A LONG-TERM RELATIONSHIP TO THE NEXT LEVEL, NFPA AND IAPMO COOPERATE ON A SINGLE SET OF ANSI-ACCREDITED CONSENSUS CODES FOR THE BUILT ENVIRONMENT ■ ALISA WOLF



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partnership



WHEN TWO INTERNATIONALLY RECOGNIZED code-making organizations form a partnership, what changes can their members, their customers, and their respective staffs expect? Partners have equal status and independence, so each organization will continue to do what it does best. But

they also have obligations to each other, which mean changes in the ways both organizations work.

Change is good news, especially for code adopters and users, if the partners are NFPA and the International Association of Plumbing and Mechanical Officials (IAPMO). True to the definition of a partnership, the NFPA/IAPMO relationship gives each organization, as well as NFPA's other partners, the autonomy to develop its own codes in its areas of expertise. It also provides for mutual support, most notably through both organizations' involvement in NFPA's C3 (*Comprehensive Consensus Codes*TM) code set, a complete set of codes for the built environment accredited by the American National Standards Institute (ANSI). The set includes NFPA's major codes, including NFPA 1, *Uniform Fire Code*TM, being developed in partnership with the Western Fire Chiefs Association, and the two energy standards developed by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers that are intended to become codes, as well as IAPMO's *Uniform Plumbing Code*TM (UPC) and *Uniform Mechanical Code*TM (UMC).

Partnering on the C3 code set has created new opportunities for IAPMO and NFPA to support each other in several areas, including implementing the ANSI-accredited code-making process, sharing technical information and expertise, promoting adoption of each other's codes, and promoting each other's advisory and educational services.

"Much of what we do enhances each others' existing products and services," says Russ Chaney, IAPMO's executive director. He

sums up the partnership as one based on mutual respect.

"We keep our autonomy by understanding and respecting that the membership of each organization has expertise that the other organization doesn't have," he says. "We enhance and supplement each other's ability to offer products and services in a better way."

A relationship in progress

The cooperative relationship between NFPA and IAPMO has a long history.

"It's important to understand that ours aren't competing documents," Chaney says. "Throughout the years, IAPMO has developed codes and standards for the plumbing and mechanical features [of a structure], and NFPA has for fire, electrical, and building features."

In fact, the recent partnership between IAPMO and NFPA occurred as a natural result of long-term cooperation in making codes and standards for the built environment.

The built environment itself brings the two code-makers close. In any building, says Guy Colonna, assistant vice president of Engineering for NFPA, plumbing and mechanical elements run near, if not through, the fire-protection features.

"Besides electrical systems, HVAC and plumbing are the two building features most likely to penetrate fire-rated construction," Colonna notes. "It's important that we have access and collaboration on these important building features to bring all those systems together to make sure that they're constructed and installed in harmony."

The need for harmony in codes for the built environment remains the same today, as it was 100 years ago. In the mid- to late 1990s, however, changes in the code-making environment brought NFPA and IAPMO closer. These changes formed the basis for the current partnership, which began in 1996.

"IAPMO was involved in promoting its codes, standards, and services outside the United States, and we started showing up at meetings where NFPA staff was showing up," Chaney says. "We saw the opportunity to support each other in promoting codes and services outside the United States. In the first memorandum of understanding between the two organizations, in 1997, NFPA and IAPMO agreed to support adoption of each other's codes outside the United States."

The second memorandum of understanding, signed in August 1999, resulted from both organizations' need to offer a compatible set of ANSI-accredited consensus codes in the United States.

"The most recent agreement said a number of things," says Chaney. "One, that IAPMO and NFPA would structure our code development process from that point forward in such a way that we would use the same procedures, to a large extent, to develop our codes."

For IAPMO, this meant a change in its code-making process to meet ANSI requirements.

Creating an ANSI-accredited process

Until recently, IAPMO's code-making procedures limited voting on the final content of a code to plumbing and mechanical inspectors. To switch to the ANSI consensus process, IAPMO took an interim step, opening voting rights up to certain other sectors of the industry. Then IAPMO revamped its process again, using NFPA's consensus process as a model.

"What we were striving for, besides the importance of IAPMO documents in the C3 code set," says Colonna, "was to help IAPMO move closer to an ANSI-recognized process. What we've done is facilitate IAPMO's move in that direction by giving them use of our model procedures."

IAPMO put these procedures into place and developed the 2003 editions of the UPC and the UMC as ANSI-accredited consensus codes. This represents a win for NFPA, too.

"It gives us the key requirements for mechanical systems through HVAC, exhaust systems, and plumbing in the C3 code set," Colonna says.

IAPMO's consensus process is now similar to NFPA's. The two IAPMO technical committees, the Plumbing Technical Committee

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ALISA WOLF is a frequent contributor to <i>NFPA Journal</i> .

and the Mechanical Technical Committee consist of a chair, a secretary appointed by the chair, and members from nine interest categories: manufacturers, users, installers/maintainers, labor, researchers, enforcers, insurers, consumers, and special experts. IAPMO's technical committees also review proposed amendments to the codes and comments on proposals. If two-thirds of the technical committee members agree on all issues, they recommend a final draft of each code to the IAPMO Standards Council. All IAPMO members are eligible to debate and vote on code adoption at the IAPMO's annual convention, after which, the IAPMO Standards Council hears any appeals and issues the code.

The only difference between NFPA's and IAPMO's processes is that NFPA's Standards Council fills the role in IAPMO's code-making process that NFPA's Board of Directors does in NFPA's. This affects two areas, says

or IAPMO's. There's compatibility, a high degree of transparency, and the opportunity to make a case and get a fair hearing. It's what cemented this relationship."

At IAPMO, the change to an ANSI-accredited, consensus code-making process has been met favorably.

"Overall, it's been a learning experience for everyone," says Gaby Davis, recording secretary, IAPMO's Standards Council. "We've gotten very positive feedback."

One of the benefits has been increased opportunity for member participation.

"I think the membership is pleased overall," says Neil Bogatz, IAPMO's general counsel. "They recognize that it's somewhat new, to give everyone the ability to express a point of view. In the end, the code results from consensus, and most members feel that this is the right way to go with the code. The technical meetings we had were very well received."

tion is twofold. The first is users need and want a coordinated set of codes. The second reason has to do with ANSI's requirements.

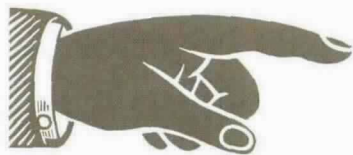
"In order for a document to meet ANSI's requirements, it can't conflict with any existing American National Standard, so we have to make certain that, to the extent that the IAPMO codes touch on NFPA's, there are no conflicts," Chaney says.

This, Grant adds, isn't easy.

"Addressing overlaps in scope is the prime charter of the NFPA Standards Council, which serves as traffic cop between various NFPA committees," Grant explains. "If one committee's scope overlaps another's, the Standards Council sorts it out. This is tough enough when you're dealing with NFPA documents alone. It gets more complicated with other organizations'."

Complications arise because IAPMO has its own Standards Council and its own polic-

IT WILL TAKE TIME TO FINE-TUNE THE PARTNERSHIP,
BUT IAPMO AND NFPA BOTH HAVE MORE TO GAIN BY
MAKING IT WORK.



Casey Grant, secretary to NFPA's Standards Council. One is the way petitions from constituents who still object to code revisions after the IAPMO Standards Council approves the final draft are handled. In NFPA's process, the NFPA Board of Directors adjudicates the petition. In IAPMO's process, the NFPA Standards Council fills this role.

Grant stresses that issues rarely go as far as the petition stage.

"A petition provides the ultimate relief valve for issues that are truly extraordinary," says Grant.

The other key role the NFPA Standards Council serves for IAPMO is appointing IAPMO Standards Council members and approving all code-making procedures.

These minor differences in the two organizations' code structures are technical and have no impact on the consensus process.

"IAPMO has the same commitment to consensus we have," says Jim Shannon, NFPA president. "It's one of the great things for people who are looking to work within our system

They were also well attended.

"As a result of making the transition to an ANSI consensus process," says Chaney, "we had people attending meetings that they typically had not attended in the past. They could express their views, either by being appointed to one of the technical committees or submitting proposals and comments on proposals. The National Association of Home Builders and the American Gas Association were both members of our technical committees. Both were very active in trying to shape final content of the 2003 UPC and the UMC."

Twofold need for harmonization

Once IAPMO got its consensus process in place and appointed its technical committees for the 2003 editions of the UPC and the UMC, the work to coordinate NFPA and IAPMO code requirements began.

"It was critically important to our ultimate goal to ensure that there be no conflicts among our documents," Chaney says.

He explains that the need for harmoniza-

ing process for code overlaps.

To work out the differences between the two organizations' documents, the NFPA and IAPMO Standards Councils appointed a Joint Scoping Advisory Task Group to address specific technical issues in the UPC and UMC that conflict with NFPA requirements.

"At a January 2002 meeting, the task group identified the conflicts," says IAPMO's Davis.

The group then guided the NFPA and IAPMO technical committees in working out the conflicts in their own processes.

"When the Joint Scoping Advisory Task Group met for the first time," says IAPMO's Bogatz, "to the extent possible, it let each organization attempt to solve conflicts in its own processes by appointing task groups to recommend ways to fix conflicts through the consensus process."

If NFPA documents accept a product that IAPMO's codes don't, for example, the conflict can be hashed out and settled by IAPMO's technical committees, which reported their progress to IAPMO's Stan-

dards Council in September 2002.

"Next, the technical committees told the NFPA and IAPMO Standards Councils in October which conflicts still existed," Davis says.

"For any lingering issues," adds Grant, "the Joint Scoping Advisory Task Group comes up with recommendations for both standards councils. The two councils have the ultimate say for their organizations."

Grant considers the Joint Scoping Advisory Task Group a success.

"In January, they generated some direction for the various committees to follow," he says. "The technical committees have come up with

committees also revised UPC sections on medical gases so that they're consistent with NFPA 99, *Health Care Facilities*, and that the IAPMO codes reference several other NFPA documents, such as NFPA 58, *Liquefied Petroleum Gas Code*; NFPA 96, *Ventilation Control and Fire Protection of Commercial Cooking Operations*, and NFPA 211, *Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances*.

Lemoff believes both organizations benefit from information-sharing and discussion. For example, a meeting between IAPMO's UMC and NFPA 96 Technical Committees achieved, he says, "a positive exchange of tech-

groups couldn't separately," says NFPA's Shannon. "IAPMO's constituencies are different enough from ours that, when you put the two together, it makes a stronger constituency."

Jurisdictions will also be interested in the money-saving opportunities resulting from the two organizations' use of each other's materials. Savings extend to other types of user support, as well, such as advisory services and training. In fact, IAPMO has announced that it will provide free training and associated code books, either the UPC or the UMC, for code officials who attend their code-adoption seminars.

IAPMO'S CONSENSUS PROCESS IS NOW SIMILAR TO NFPA'S. THE TWO IAPMO TECHNICAL COMMITTEES, THE PLUMBING TECHNICAL COMMITTEE AND THE MECHANICAL TECHNICAL COMMITTEE CONSIST OF A CHAIR, A SECRETARY APPOINTED BY THE CHAIR, AND MEMBERS FROM NINE INTEREST CATEGORIES: MANUFACTURERS, USERS, INSTALLERS/MAINTAINERS, LABOR, RESEARCHERS, ENFORCERS, INSURERS, CONSUMERS, AND SPECIAL EXPERTS. IAPMO'S TECHNICAL COMMITTEES ALSO REVIEW PROPOSED AMENDMENTS TO THE CODES AND COMMENTS ON PROPOSALS.

middle ground on some key issues. Right now, we're heading in a good direction."

Working out the kinks

In fact, many code conflicts were successfully settled without much fuss, says Ted Lemoff, NFPA's principal gases engineer who's also a member of the IAPMO technical committees for the 2003 editions of the UPC and the UMC. One way the committees handled conflicts was to use the section of the partnership agreement that allows each organization to extract copyrighted material from the other's documents, thus streamlining the coordination process.

"IAPMO has always extracted material from NFPA 54, *National Fuel Gas Code*," says Lemoff. "And the extent of the extracts broadened in this cycle. For example, a section of piping coverage in the UPC was replaced with an extract from NFPA 54. Conversely, proposals for changes to NFPA 54 resulted from IAPMO's technical committee meetings."

Lemoff adds that IAPMO's technical

information that resulted in improvements to both documents. We made them aware of new research, and they made certain recommendations based on installation practices. The exchange went both ways."

User benefits

Ultimately, it's the code-user who benefits most from the partnership, first by having a coordinated set of ANSI-accredited codes for the built environment, and second by having a broader base of expertise upon which to call.

"NFPA codes tend to look at issues more from the design side than the installation side, and IAPMO's tend to look at them more from the perspective of installation and inspection," Lemoff says. "Both organizations can benefit by broadening their outlooks."

This will translate into stronger codes and more support for each organization from the other.

"We can do a lot together that the two

"NFPA came out with the program first," says Chaney, referring to NFPA's established practice of providing state officials in adopting jurisdictions with training on all of its major codes. "We decided to offer a very similar program. There are a number of benefits in helping states reduce the budgetary impact of code adoption."

Additional areas in which the two organizations may cooperate include educational programs administered either jointly or individually and supplemental documents that are as coordinated as the codes themselves.

It will take time to fine-tune the partnership, but IAPMO and NFPA both have a lot more to gain by making it work.

"The momentum is clearly there," says Grant. "Clearly, there's a spirit of cooperation on our overall objective of having a full set of ANSI-accredited consensus codes for the built environment. We're joined at the hip, and we want to make it work." ❖

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NFPA DEVELOPS A TESTING SYSTEM TO GAUGE
BUILDING CODE PROFICIENCY ■ BILL FLYNN

TE

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IF A BUILDING INSPECTOR OR PLANS examiner needs up to four hours to take a test that certifies his or her proficiency in applying NFPA 5000™, *Building Construction and Safety Code*™, how long should it take the testers to develop the exam? “More than a year” is the correct answer.

NFPA developed the 100-question test, which will be widely available in January 2003, as the final step in our new certification program, the rigorous development process of which relied strongly on the NFPA’s consensus-based code-making process.

The test was approved last August by the NFPA 5000 Certification Program Job Task Analysis (JTA) Advisory Committee, a group representing every aspect of building construction and safety, which deliberated for more than a year before giving the test its imprimatur.

“This was a group of outstanding professionals from all parts of the country who gave their time unselfishly to achieve the final product,” says Paul J. Carrafa, committee chair and president of P.J. Carrafa Inspections and Property Maintenance Inspections, Inc. in Willingboro, New Jersey. He’s also the former

president of Building Inspection Underwriters, Inc.

The committee initially developed much of the test during several two-day, Internet-linked conferences, but committee members ultimately met in person three times to complete the test. To validate the questions, committee members took the test themselves, says Rex Evans, a committee member and architect/partner at JMA Architecture Studios in Las Vegas, Nevada, where he’s director of operations.

Evans says most test questions were clear, however some misinterpreted the code, and others missed the mark, forcing the committee to rewrite or delete them.

Robert Ruscitto, NFPA’s director of Certification, says it’s important to demonstrate to building officials that the test was meticulously developed, and is a fair, rational

assessment of professional competence.

“This was a rigorous process that distilled material that truly reflects a body of knowledge and skill needed by building professionals to properly apply NFPA 5000,” Ruscitto says. “We hired one of the best-respected test-development companies to make sure proper procedures were followed and to make sure we produced a fair and defensible test.”

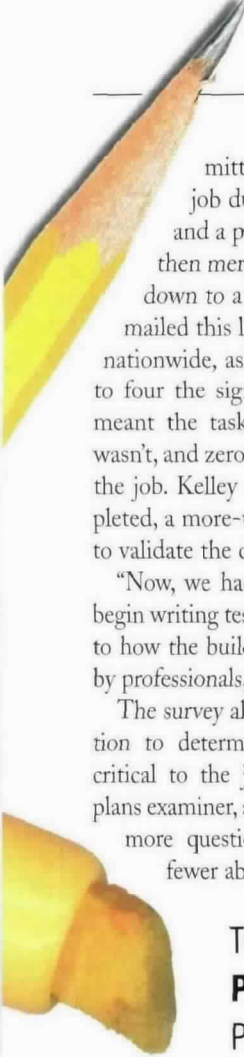
That company was Applied Measurement Professionals (AMP) of Lenexa, Kansas, which assigned Research Associate Jeff Kelley to give the advisory committee the framework and guidance needed to complete the project. He also supplied the committee with subject matter experts.

“When you develop a test to measure the competence of professionals, the only group that can do that are other professionals in the industry, but these subject matter experts need to be trained to do this properly,” Ruscitto says. “Jeff Kelley did a wonderful job facilitating discussions that focused on ways of testing the knowledge needed for competence.”

To do this, Kelley first asked each com-

ST





mittee member to list all possible job duties for a building inspector and a plans examiner. The lists were then merged into a master list and cut down to a manageable number. NFPA mailed this list to 2,000 building officials nationwide, asking them to rate from zero to four the significance of each task. Four meant the task was critical, one meant it wasn't, and zero meant it had no relevance to the job. Kelley says 363 surveys were completed, a more-than-adequate response level to validate the data.

"Now, we had the material we needed to begin writing test questions that were relevant to how the building code is used in the field by professionals," Kelley says.

The survey also provided enough information to determine which tasks were most critical to the job of building inspector or plans examiner, allowing the committee to ask more questions about those topics and fewer about less-critical tasks.

TO PREPARE FOR THE TESTS, BUILDING INSPECTORS AND PLANS EXAMINERS CAN ATTEND ON-DEMAND TRAINING PROGRAMS BEGINNING EARLY IN JANUARY.

"You want to make sure you ask more questions about the aspects of a job that are the most important," Kelley says.

To this point in the test-development process, the committee's work was conducted by telephone or during Internet conferences. However, Kelley decided to assemble the committee members and several NFPA staffers for a two-day, test-writing seminar in Orlando, Florida.

"It's my job to teach people how to write a professionally done test, but it's the job of the professionals in the field to determine what subjects need to be covered," Kelley says. He taught the committee the pitfalls of writing test questions.

"We also worked on the art of taking the questions and assembling a good examina-

tion, one that covers all the necessary material, but remains fair," he says.

"But the job analysis and the nationwide survey make it difficult to argue successfully that our test is unfair," Ruscitto says.

Committee members produced nearly 500 potential test questions, which Kelley brought back to Kansas and entered in AMP's test-development software. He and several colleagues then eliminated redundant questions and did some fine-tuning for the committee's next meeting.

At that meeting, the members took the test and quickly recognized poorly worded questions and those that focused on issues pertinent to only one region of the country. Those questions were thrown out, and the test was further refined over the next eight weeks.

The committee met again in August to make its final decisions about the test and to set the grade an applicant would have to achieve to complete the test successfully.

"Committee members rated the difficulty

of each question on a scale, and we were able to get an average to determine the minimum score needed to pass the test," Kelley says.

How to apply it

To prepare for the tests, building inspectors and plans examiners will be able to attend on-demand training programs that NFPA plans to offer at various locations around the United States beginning early in January 2003.

"Right now, we plan to offer two-day seminars that will include an overview of the code and examples of how to apply it," says Steve Younis, the senior NFPA fire safety engineer developing the program. How often and where the training program will be offered hasn't yet been decided, says Younis.

Anyone interested in taking the test must apply to NFPA. Once NFPA approves the applicants, they'll be given a list of test sites. They can then schedule an appointment on any weekday at the location of their choice. For details, applicants can go to the NFPA web site at www.nfpalearn.org.

JTA committee member Larry Litchfield,

regional manager for the Phoenix, Arizona, office of Schirmer Engineering, says NFPA's commitment to consensus makes the certification test valid.

"The NFPA certification program asks questions about the duties plans reviewers and inspectors perform daily," he says. "Since the questions are based on job duties from the national survey, the methodology of developing the questions follows the consensus process by gathering input from as many people as possible.

"Obviously, only a few people could actually develop the questions, but they're based on the result of the national job survey. This form of consensus-based test development makes the NFPA certification program unique."

"This program will allow people who use the code daily to show that they've established a certain level of competence in its use," adds Litchfield.

Younis says that the committee hasn't yet determined the method of recognizing experienced inspectors and examiners, but it's likely that veteran professionals in both job categories will have little difficulty being certified for NFPA 5000.

"The basic requirement would be that an inspector or plans examiner already be certified by a related, nationally recognized certification program," Younis says, "If you've been certified by a Building Officials and Code Administrators or International Code Council program, we'll recognize that."

Sal DiCristina, a JTA committee member who was a New Jersey building code enforcement official for 25 years, emphasizes that, without the proper training and enforcement, the codes can't be effective.

"The entire built environment is a fabric woven according to requirements designed to protect human life and property," says DiCristina, now a code enforcement officer at Rutgers University in New Jersey. "From obvious features such as exit signs or handrails to not-so-obvious features like a tamper switch on the sprinkler valve or the flame-spread rating of paneling in an office, there are thousands of safety features that didn't get there by accident."

Those who enforce the rules mandating such protection features need good training to ensure that the "fabric" is woven properly. ♣

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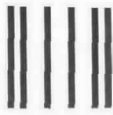
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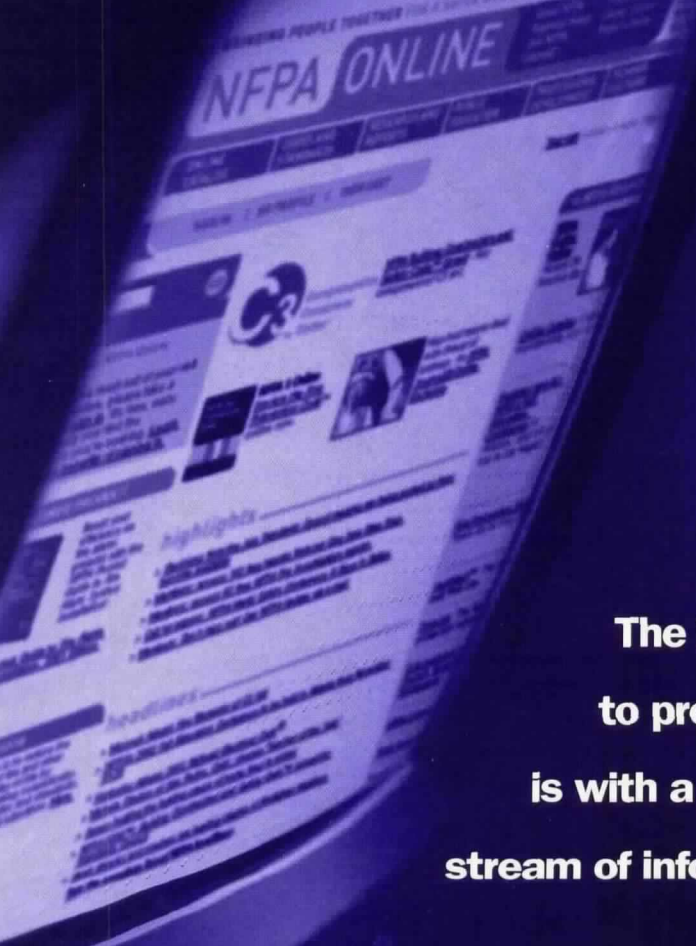
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time and resources to a function that we “think” makes a difference.

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729.91

344.54





inspector notes during a maintenance inspection that a building's sprinklers have been painted over and that the sprinklers are subsequently repaired. A fire may still occur in the building, but it will be much smaller than it would have been had the inspector not noticed the damaged sprinklers.

property type and, we hoped, a clear picture of Austin's fire problem.

Fundamental to any concept of risk are the frequency with which events occur and their consequences. After a fair amount of debate, we decided that a building's fire risk could be represented by the number of fires it suffered over time,

Austin fire experience is consistent with national trends. Unfortunately, the AFD doesn't have the authority to inspect one- and two-family homes. However, we do have the authority to inspect multifamily dwellings, which the model codes view as commercial enterprises, and multifamily dwellings are the number-two high-risk

OUR POST-INCIDENT INSPECTION PROGRAM, COUPLED WITH THE STATISTICAL MODEL OF RISK, ENABLES US TO SHOW CONVINCINGLY THAT OUR INSPECTION EFFORTS HAVE SIGNIFICANTLY REDUCED THE MAGNITUDE AND EXTENT OF HOSTILE FIRES IN AUSTIN.

Understanding risk

As we dug into the problem, we noted that our approach to choosing the structures for which we'd conduct in-service inspections was inconsistent, emphasizing quantity rather than quality. This led us to reevaluate our occupancy types, focusing on them in a logical fashion so we could coherently justify our choices and measure our results statistically.

To evaluate occupancy types, we first had to define their risk levels. To do this, we had to develop a consistent model of risk we could apply to historical incident data and sort using NFIRS coding. This would provide a relative-risk indicator by

multiplied by the number of casualties these fires caused, plus the amount of dollar loss they generated. As a mathematical formula, this concept of relative risk looks like this:

$$R=F*C$$

Where "R" is the risk of fire; "F" is the frequency, or number, of fires; times "C," the consequence of the fires, or the number of casualties plus the dollar loss.

Each time we ran the model, we calculated the consequences by property use. For example, the total number of fires in one- and two-family residences for the reporting period—usually a year—was multiplied by the number of fatalities in that property type as a percent of overall fire fatalities in all property types, plus the total dollar loss in that property type as a percent of total fire-related dollar loss in all properties.

This model produced some interesting results. We've known for years, based on national studies, that more people die in fires in their one- and two-family homes than in any other type of occupancy. The

occupancy in Austin. Here was a clear a road map for our inspection efforts.

Based on these data, we redirected the entire focus of the in-service inspection program to multifamily occupancies. Today, the AFD inspects more than 10,000 apartment buildings each year, and we inspect every such occupancy within the city limits over the course of two years.

Measuring inspection effectiveness

Since fire and life-safety inspections are designed to manage a hostile fire once it ignites, not prevent ignition, anyone attempting to measure the effectiveness of an inspection, empirically or otherwise, must first recognize that a hostile fire in an inspected property isn't just acceptable, it's expected, even inescapable. The trick is to develop a model that determines whether inspection efforts affect the magnitude, not occurrence, of these events over time.

In 2000, we realized that, if our relative-risk formula provided a risk value for each property type, we could follow that value

FOR MORE INFORMATION, KEVIN.BAUM@CI.AUSTIN.TX.US.

KEVIN BAUM is the assistant fire chief and fire marshal of the Austin, Texas, Fire Department. Chief Baum regularly speaks on the department's efforts in performance-based management and managing for results.



over time for our target occupancies and see whether it dropped, thus suggesting a positive influence. After careful consideration, we developed the following formula:

$$R=F(C)+F(D)/P$$

Where "R" is risk, "F(C)" is frequency of fires times the number of casualties, "F(D)" is the frequency of fires times dollar loss in millions divided by "P," is population in thousands.

Frequency in this model is the number of fires in a specific property class for a specific period. Consequence is the same as it is in the relative-risk formula, but we don't calculate percentage of consequence as a value of the overall fire experience in the city. We simply calculate the specific number of casualties and the specific amount of dollar loss, adjusted for inflation, in the population of occupancies in that category.

We further enhanced our previous model by normalizing the data with a population divisor. Austin has experienced incredible economic growth in the last 10 years, and the population has increased in lockstep with the booming economy. By normalizing the data with a population divisor, we effectively account for increases or decreases in at-risk occupancies and occupants.

There are three ways to infer inspection success from these data. Does the risk value decrease over time while the number of fires remains constant or increases? Does the risk value remain constant while the number of fires increases? Or do the risk value and the fire frequency decrease, while the population increases?

As you can see, these data don't penalize based on fire ignitions. Rather, the data propose to measure the magnitude, in terms of casualties and dollar loss, of hos-

tile fires over time in at-risk occupancies, based on our assumption that hostile fires will occur and that effective inspection efforts will produce a decrease in the magnitude of damage they cause over time, as represented by the risk value.

Our information suggests a clear downward trend in the mean risk value for at-risk occupancies in Austin, although the frequency of fire has remained relatively constant and the population has literally exploded. While there are other variables at work here, we can claim that these data provide evidence that the AFD's focus on at-risk occupancies is having a mitigating effect on the magnitude, extent, and scale of hostile fires.

After the fire

To supplement our statistical model, the AFD introduced a post-incident inspection program in the late 1990s. Today, all fires in at-risk occupancies are inspected literally before the fire is out. A Prevention Division inspector is dispatched to each multifamily residential fire to determine what inspection efforts took place before the event, determine whether identified hazards were corrected, and see if the previous inspection efforts had a measurable impact on the size and spread of the fire.

These findings are immediately communicated to those conducting the inspections, and First-On-Scene Awards are given to the crew and officer of the unit that conducted the successful inspection. Such immediate feedback motivates the troops for future inspections and reinforces the value of the prevention mission in the department and community.

This post-incident inspection program, coupled with the statistical model of risk, enables us to show convincingly that the

AFD's inspection efforts have significantly reduced the magnitude and extent of hostile fires in Austin. This is indeed good news.

Lessons learned

It bears repeating that you can't measure the effectiveness of fire and life-safety inspections unless you have something to measure them with. To achieve this, you must first develop a coherent and logical methodology with which to choose the occupancies to be inspected, then foster the skills and expertise necessary to conduct a comprehensive and meaningful inspection. You also need adequate data collection and analysis skills, tools, and processes, as well as systematic statistical and anecdotal measurement formulas and tools. Finally, you need to give inspectors quick feedback on the results of their efforts.

Developing meaningful performance measures for the Austin Fire Department's inspection services has taken quite a while, and we're by no means finished. But it's brought us to a new level of sophistication in performance reporting and program management, which are vital to AFD managers in their ongoing effort to secure funding for important programs. If we can't empirically and convincingly demonstrate that we know what we're doing, why we're doing it, and what the results are, we'll certainly lose the fight for the few public dollars that remain for fire department programs that aren't being directed into post-9-11 initiatives. If other important programs are to survive, we need to be able to demonstrate compelling evidence that they exist for a reason. Sound performance measures will give us that proof. ♣

2001 FIRE LOSS LARGE LOSS

IN 2001, A FIRE DEPARTMENT SOMEWHERE in the United States responded to a fire every 18 seconds. Every 60 seconds, a structure ignited. Every 80 seconds, a home went up in flames. Every 90 seconds, a vehicle burned. And every 37 seconds, there was a fire in an outside property. Nationwide, a civilian died in a fire in the home every 170 minutes, and a civilian was injured every 34 minutes.

As alarming as these statistics may seem, they actually represent a number of encouraging trends. For example, the number of fires to which U.S. fire departments responded last year was only 1.6

percent higher than the number to which they responded in 2000. Home-fire deaths were the second lowest we've recorded, and the number of civilians injured in residential fires continued to

drop. Without the events of September 11, there would have been very little change in civilian fire deaths and property damage overall between 2000 and 2001.

But the World Trade Center and the Pentagon *were* attacked, and the number of civilians killed rose significantly, as did the amount of property damage. Of the 6,196 civilians who died in fires in 2001, 2,451 died in the World Trade Center and the Pentagon on September 11. Eight hundred of the 21,100 people injured last



An explosion and fire at AeroTech Inc., in Las Vegas, Monday night, Oct. 15, 2001, is seen from the roof of a nearby building. The explosion at the hobby-rocket company injured three employees, one critically, and forced the evacuation of residents within a 1-mile (1.6-kilometer) radius because of hazardous chemicals.

FIRE DEPARTMENTS RESPONDED TO MORE THAN ONE MILLION FIRES IN 2001. TWO OF THEM KILLED 2,451 CIVILIANS, AND 53 DID MORE THAN \$5 MILLION IN DAMAGE EACH ■ **MICHAEL KARTER AND STEPHEN BADGER**

year were hurt on September 11, and \$33.44 billion of the \$44 billion in estimated property damage occurred in those two incidents.

As we've noted in past articles, the unique nature of these two fires makes it difficult to include them in any discussion of trends or patterns in the 2001 fire experience. This doesn't mean we omitted them from our statistics, but it does mean we've exempted them from any discussion of fire-experience patterns over the past year. To do otherwise would give us a distorted view of those patterns over the long-term.

The numbers

According to estimates based on data NFPA received from the fire service, public fire departments in this country responded to 1,734,500 fires in 2001. An estimated 521,500 of these fires occurred in structures, 3.2 percent more than the year before when 505,500 structures burned. More than three-quarters, or 396,500, of these fires occurred in residential properties, leaving 3,140 civilians dead and 15,575 injured. Residential properties include one- and two-family dwellings and apartments, which are known for the purposes of our study as homes, as well as hotels, motels, and other buildings, such as dormitories.

As large as these figures seem, the number of residential fire deaths was actually 8.9 percent lower than the year before, and the number of injuries

ESTIMATES OF 2001 FIRES, CIVILIAN DEATHS, CIVILIAN INJURIES, AND PROPERTY LOSS IN THE UNITED STATES

	Estimate	Range ¹	Estimate Without Events of 9/11/01
Number of Fires.....	1,734,500.....	1,700,500 to 1,768,500	1,734,500
Number of Civilian Deaths	6,196 ²	5,836 to 6,556	3,745
Number of Civilian Injuries.....	21,100 ³	20,100 to 22,100	20,300
Property Loss ⁴ ..	\$44,023,000,000 ⁵	\$43,773,000,000 to 44,273,000,000	\$10,583,000,000

The estimates are based on data reported to the NFPA by fire departments that responded to the 2001 National Fire Experience Survey.

¹ These are 95 percent confidence intervals.

² This includes 2,451 civilian deaths that occurred from the events of 9/11/01.

³ This includes 800 civilian injuries that occurred from the events of 9/11/01.

⁴ This includes overall direct property loss to contents, structures, vehicles, machinery, vegetation, and anything else involved in a fire. It does not include indirect losses. No adjustment was made for inflation in the year-to-year comparison.

⁵ This includes \$33.44 billion in property loss that occurred from the events of 9/11/01.

dropped by 10.5 percent. Of the 3,140 people who died in residential fires in 2001, 2,650 died in one- and two-family dwellings, 270 less than the year before, and 460 died in apartment fires, or 40 less than the year before. Together, fires in one- and two-family dwellings and apartments resulted in 3,110 civilian deaths, a decrease of 9.1 percent between 2000 and 2001 and the second-lowest number we've recorded since 1977, when we changed our survey methodology. Only in 1999, when 2,895 people died in their homes, were there fewer such fatalities.

Although the change in survey methodology makes meaningful comparisons with fire statistics before 1977

impossible, we can track patterns in fires, deaths, and injuries since then. The trend toward fewer home-fire deaths began in 1979, the year before home-fire fatalities peaked at 6,015. Between 1979 and 1982, the number dropped by 20 percent to 4,820. From 1982 to 1988, home-fire deaths remained in the range of 4,655 to 4,955, although the number dipped to 4,075 in 1984. From 1991 to 2001, home-fire deaths fell well below the plateau of the previous few years to between 3,110 and 3,720 fatalities. The two exceptions were 1996, when 4,035 people died, and 1999.

In addition to those killed in residential fires, we estimate that 15,575 civilians

THIS STORY COMBINED DETAILS OF THE 2001 FIRE LOSS AND THE 2001 LARGE-LOSS FIRE REPORTS.

FULL COPIES OF THE REPORTS ARE AVAILABLE AT WWW.NFPA.ORG/RESEARCH.ASP

MICHAEL KARTER is a senior statistician with NFPA's Fire Analysis and Research Division.

STEPHEN BADGER is a member of NFPA's Fire Analysis and Research Division and a full-time fire-fighter with the Quincy, Massachusetts, Fire Department.

were injured last year, 11,400 in one- and two-family dwellings and 3,800 in apartments. Estimates of civilian fire injuries are generally on the low side because many injuries, such as those that occur at small fires to which fire departments don't respond, aren't reported to the fire service.

Between 1977 and 2001, the number of civilian injuries in all residential fires ranged from a high of 31,275 in 1983 to a low of 21,100 last year, for an overall decrease of 33 percent. There was no consistent pattern until 1995, when injuries fell by roughly 5,000 to 25,775. The number remained consistent in 1996 then dropped another 8 percent in 1997. It plateaued again in 1998, then dropped 5 percent in 1999. After a slight increase in 2000, the number of civilian fire injuries fell another 6 percent last year, to 15,575.

The 295,500 fires in one- and two-family dwellings accounted for 56.7 percent of all structure fires, while the 88,000 apartment fires accounted for 16.9 percent.

The number of structure fires in general peaked in 1977 at 1,098,000. By 2001, that figure had dropped to 521,500. Between 2000 and 2001 alone, the number of fires in industrial properties declined 10 percent to 13,500, while those in stores and offices dropped 8.5 percent to 25,500.

The number of fires that occurred outside structures also peaked in 1977 at 1,658,500. Over the next six years, the number dropped 39 percent to 1,011,000, then remained steady until 1988, when it jumped to 1,214,000. By 1993, the num-



A blaze burns at a California refinery on April 23, 2001. The fire shot huge balls of fire dozens of feet into the air and sent plumes of black smoke billowing over the area, but no one was injured and no evacuations were ordered.

ber of outside fires had dropped again, to 910,500, and it stayed near the 1,000,000 level over the next three years. Further decreases in 1997 and 1998 brought the number to 850,000 before it rose 8.7 percent to 931,500 in 1999, then dropped again to 861,500 last year. Brush and grass fires, in particular, decreased in 2001 by 9 percent to 414,000.

Property loss

We estimate that the fires to which the fire service responded in 2001 did \$44 billion in property damage to structures and non-structures alike. Of this, \$33.44 billion occurred on September 11. If we exclude that amount, fires in structures accounted for \$10.6 billion in property damage, for an average loss per structure fire of \$17,016, up 1.2 percent from the year before.

If we again exclude the events of September 11, the average loss per structure

fire between 1977 and 2001 ranged from a low of \$3,757 in 1977 to a high of \$17,016 in 2001, for an overall increase of 353 percent. When this number is adjusted for inflation, however, the increase drops to 56 percent.

An estimated \$5.6 billion of the 2001 property losses occurred in residential properties, down 0.5 percent from the year before. Of that, \$4.7 billion is estimated to have occurred in one- and two-family dwellings, up just 0.3 percent from 2000, and \$864 million is estimated to have occurred in apartments. Fires in educational properties did \$170 million worth of property damage, an increase of 57.4 percent, while those in storage properties did \$930 million, an increase of 34 percent.

NFPA estimates that 45,500 of the structure fires that occurred in the United States last year were intentionally set. Although the number of incendiary fires



An office building in Pennsylvania burns on May 7, 2001. The electrical fire broke out in a void space above the ceiling area of the second floor. A full collapse of the roof occurred within minutes of the firefighters arrival. One firefighter was injured. Loss to the structure was \$4,000,000.

remained consistent with the year before, the number of civilians they killed rose to from 375 to 2,781, of whom 2,451 died on September 11. Intentionally set fires also resulted in \$34.45 billion in property loss, of which \$33.44 billion was due to the September 11 terrorist attacks. Excluding the events of September 11, an estimated 330 died and \$1 billion in property damage occurred in intentionally set structure fires last year.

An estimated 39,500 incendiary fires were set in vehicles, down 15.1 percent from the year before. However, the amount of property damage they did rose 17.7 percent to approximately \$219 million. Highway vehicle fires resulted in an estimated 470 civilian deaths last year, while 15 died in fires in other types of vehicles.

2001 LARGE-LOSS FIRE REPORT

When discussing annual property loss totals, we must remember that they can change dramatically from year to year as a result of the occasional large-loss fire or explosion, which we define as one in which the property loss is \$5 million or more. In 2001, 53 large-loss fires in the United States resulted in \$44 billion in direct property loss.

Of course, the largest large-loss fire of 2001 was the World Trade Center fire, which caused direct property losses of \$33.4 billion. It was by far the costliest and deadliest fire in U.S. history and quite probably the costliest peacetime fires in world history. It was also the largest of 20 fires that caused an estimated \$10 million or more each in property loss.

Although large-loss fires accounted for only 0.003 percent of all the fires estimated to have occurred in the United States last year, they accounted for 9.2 percent of the estimated dollar loss. As large as the direct property-loss figure for 2001 seems, however, total property loss for large-loss fires was actually \$1 billion, or 51.8 percent, lower than it was in 2000 if we exclude the World Trade Center and Pentagon incidents.

Before adjustment for inflation, in fact, the number of large-loss fires in 2001 was the third lowest since 1992, and the total loss from these fires was the second lowest since 1992, or 32.6 percent below the 10-year average adjusted loss total. Year-to-year figures are volatile, however, and most measures show no consistent trend up or down over the past 10 years.

For the third straight year, there were large-loss fires in every property category

except health-care, correctional, and public-assembly occupancies. Fifteen large-loss fires in manufacturing properties resulted in \$393 million in property damage, while 11 fires in stores and offices, excluding the World Trade Center and the Pentagon, resulted in \$106.6 million in damage. Six of the 11 fires, which did \$38.6 million in damage, occurred in stores, and five occurred in offices, resulting in \$68 million in damage.

In storage properties, another 10 large-loss fires resulted in \$322.5 million in damage. One of these fires, which occurred in February in an Iowa warehouse used to store machinery, was the sec-

ond-largest large-loss fire of the year, doing \$250 million in damage and injuring five firefighters.

Six large-loss fires in educational and special properties resulted in \$57 million and \$56.5 million in damage, respectively, while one fire in an industrial property and another in a home resulted in \$8 million and \$5.1 million in property damage, respectively.

Only three large-loss fires occurred outside structures. Two were wildland fires, which together did \$13.6 million in damage, and the third was a single-vehicle fire, which did \$16 million.

The smaller of the two wildland fires was intentionally set in vegetation in an urban-wildland interface area in California. It injured three firefighters and destroyed at least four condominium units and 2.5 acres (1 square hectare) of land, for a total property loss of \$5 million. There were also 13 incendiary structure fires, which did \$129.6 million in property damage.

Detection, suppression systems

Only 26 properties that experienced large-loss fires last year had some form of automatic detection equipment, although only 12 systems are reported to have

operated. Eighteen properties had no detection system, and no one could determine whether the other six did or not. This means that 59 percent of the properties for which the presence of detection equipment was known had some type of system.

Only 16 structures involved in large-loss fires in 2001 are known to have been equipped with automatic suppression equipment. Twelve had wet-pipe systems, one had a dry-pipe system, and three had systems of an unknown type. Twenty-six other properties had no coverage.

In nine of the 16 properties protected, the suppression system operated. However, only five controlled or extinguished the fire. Four of the systems were ineffective, one due to a lack of maintenance, one to water supply problems, one because it didn't cover the area of fire origin, and one because the fire spread to an unsprinkled area. In two other properties, the suppression system failed to operate, one because it was damaged by an explosion and one because it had been shut down before the fire.

What we can do

Over the years, we've seen overall fire-related losses in the United States reach the \$10-billion level and kill thousands of people. But most of us never dreamed that we'd see—literally—a fire or explosion that did tens of billions of dollars in property damage and killed thousands of people by itself. The enormity of the World Trade Center and the Pentagon disaster is so overwhelming that we can't include it in any statistical analysis of loss patterns in a way that would result in a coherent picture of the more common realities of fire in the United States today.

If we thus exclude the fires at the World Trade Center and Pentagon from our figures, we find that home-fire deaths accounted for the largest share of civilian fire deaths in 2001, as they have since we began keeping records. This being so, fire-safety initiatives targeted at the home remain the key to reducing the overall fire-death toll in the United States.

As NFPA members, we must continue to hammer home the common causes of

LARGE-LOSS FIRES OF \$10 MILLION OR MORE IN 2001		
Incident and Location		Loss in Millions
World Trade Center, New York.....		\$33,400.0
Equipment storage warehouse, Iowa		250.0
Refinery, Illinois		125.0
Refinery, California		72.0
Steel manufacturing plant, Ohio		60.0
Pentagon, Virginia		40.0
Wood products manufacturing, Minnesota.....		40.0
Collage administration, Virginia		20.0
Refinery, Virginia		18.0
Ship fire, Washington.....		16.0
School under renovation, Washington.....		15.0
Office building, Kentucky.....		15.0
Building under construction, California		15.0
Vehicle storage, Maine		12.5
Chemical manufacturing, Nevada		12.0
Steel manufacturing plant, Ohio		11.0
Clothing warehouse, Texas		10.0
Boatyard, Maine		10.0
Department store, New York.....		10.0
Wood products manufacturing, Minnesota.....		10.0
Total	20 Fires	\$34,161.5

fatal residential fires, particularly in our fire-safety education messages, and push for more widespread public fire-safety education programs. We must also keep working toward universal smoke-detector coverage—with working smoke detectors—and the development of escape plans for every household.

On the product side, we must aggressively pursue the wider use of residential sprinklers in any way we can, including legislation, and encourage manufacturers to make products used in the home safer from fire. With a concerted effort, fire-safety advocates made regulations requiring child-resistant lighters a reality. Now it's time to do the same with fire-safe cigarettes and children's sleepwear.

Finally, we must address the special fire-safety needs of high-risk groups, such as the young, the elderly, and the poor. People in these groups often don't or can't take advantage of the type of edu-

cational programs in which many of us engage, so it requires a special effort to seek them out and make sure they know their fire-safety basics.

As for large-loss fires, the major factors contributing to them are almost always human error and negligence. Insisting on proper construction, storage methods, and maintenance, as well as adherence to the fire-protection principles reflected in NFPA's codes and standards, will reduce the likelihood of such fires and limit fire spread if they do occur. Educational efforts are also appropriate remedies, as are the installation of properly designed, maintained, and operating fire-protection systems. Automatic detection and suppression systems may not stop deadly mistakes, but they can keep such fires from becoming large-loss fires.

Over the years, we've been increasingly successful in reducing the toll of fire worldwide, but we still have a lot left to do. ♣



sectionnews

In This Issue

Helping You Stay Informed of Critical Issues in Your Industry

In the next several pages, you'll find the latest news and information affecting your industry. Expanded versions of these articles can be found on the section web sites, where you'll also discover how joining a section can enhance your career. If you're not yet enrolled, please download an application form from www.nfpa.org/membersections. Section membership is free to all NFPA members who qualify. If you're interested in contributing to "Section News," contact the Executive Secretary of the section for which you'd like to write.

Architects, Engineers, and Building Officials

WEB SITE: <http://www.nfpa.org/aebo>

SECTION CHAIR: John Kampmeyer, Triad Protection Engineering Corp., Springfield, Pennsylvania

WHAT WE DO: Enhance expertise in fire and life safety design practices.

WHO WE ARE: Architects, engineers, building officials, code administrators, and others interested in building design, construction, and code enforcement.

HOT ISSUES

Call for Presentations

AEBO is accepting proposals for presentations at the World Organization of Building Officials' (WOBO) 2003 World Congress to be held in Dallas, Texas, from May 18 to 21. To share your experience and expertise, please complete the form on <http://www.nfpa.org/aebo> and return it to NFPA by December 20.

Presentations should be non-commercial, and specific brand names should not be mentioned. The Sessions Committee will make selections based on quality, relevance, focus, practical application, timeliness, and the presenter's experience and credentials. ♦

HOW TO REACH US: Allan Fraser, Executive Secretary, +1-617-984-7411, afraser@nfpa.org

Aviation

WEB SITE: <http://www.nfpa.org/aviation>

SECTION CHAIR: Dennis Kennedy, P.E., Ansul, Inc., Marinette, Wisconsin

WHAT WE DO: Provide a forum in which to discuss fire and life safety concepts pertaining to the aircraft industry and airports.

WHO WE ARE: Aircraft and airport designers, pilots, air traffic controllers, airport security personnel, and others interested in aviation fire and life safety.

HOT ISSUES

Options for Hangar Protection

by Mark Conroy

The new edition of NFPA 409, *Aircraft Hangars*, has been on the street for almost a year, and word is getting out that there are new options for Group I hangars, the largest category. Where the last edition allowed only foam-water deluge protection, it now allows overhead sprinklers with either high- or low-expansion foam. These two new options are more economical and will replace the conventional foam-water deluge system for new construction.

The 2001 edition of NFPA 409 also addresses fire protection for membrane-covered hangars. Because these structures will vent immediately, the document only requires that a foam system cover the potential spill fire area, which is the entire floor area. And because the fabric cover will burn away almost immediately, these locations

may become the best-protected parking places for aircraft on the ramp.

I'm sure carriers will look at the business-interruption issue before committing to this cost-effective alternative. It may take longer to replace a cover and other fire-damaged components of lightweight, rigid-steel structures than it would to clean up the area and repair the damage to a conventional hangar with appropriate fire protection. ♦

ARFF Vehicles

The new edition of NFPA 414, *ARFF Vehicles*, is not only the norm for U.S. civilian and military airports, it's also the basis for purchasing specifications worldwide. The new three-category system of sizing vehicles matches Federal Aviation Administration criteria and military needs for new vehicles. The ARFF Technical Committee did an exceptional job developing the new tables, as no inconsistencies have been noted since publication. ♦

Committee Activities

The NFPA ARFF Technical Committee will meet in San Antonio, Texas, from October 28 to 30 to finalize the revision of NFPA 403, *ARFF Services at Airports*. The main issue will be airport fire department staffing levels, the committee's deliberations on which the FAA Working Group on FAR Part 139 ARFF, meeting at the airport later in the week, is interested.

The NFPA Aircraft Maintenance Operations Technical Committee will meet from December 2 to 4 in Fort Lauderdale, Florida, to continue revising NFPA 410, *Aircraft Maintenance*. The committee is looking for new members. If you know anyone experienced in maintenance performed in hangars, please have them contact me at mconroy@nfpa.org or 617-984-7950.

The NFPA 407 Task Group on Routine Hose Pressure Testing held a teleconference on August 26 and will continue to meet by phone. The committee's next meeting hasn't been scheduled. ♦

HOW TO REACH US: Mark Conroy, Executive Secretary, +1-617-984-7410, mconroy@nfpa.org

76 ARCHITECTS, ENGINEERS, AND BUILDING OFFICIALS
76 AVIATION
77 BUILDING FIRE SAFETY SYSTEMS
77 EDUCATION
78 ELECTRICAL

78 FIRE SCIENCE AND TECHNOLOGY EDUCATORS
79 FIRE SERVICE
80 HEALTH CARE
80 INDUSTRIAL FIRE PROTECTION
81 INTERNATIONAL FIRE MARSHALS ASSOCIATION

81 LATIN AMERICAN
82 LODGING INDUSTRY
84 METROPOLITAN FIRE CHIEFS
85 RAIL TRANSPORTATION SYSTEMS
85 RESEARCH
85 WILDLAND FIRE MANAGEMENT

Building Fire Safety Systems

WEB SITE: <http://www.nfpa.org/bfss>

SECTION CHAIR: Neal Krantz, Siemens Fire Safety, Livonia, Michigan

WHAT WE DO: Promote the use of fire safety systems and equipment in buildings and provide a forum for education and training.

WHO WE ARE: Fire safety system designers, distributors, manufacturers, installers, inspectors, and maintenance personnel.

HOT ISSUES

Meeting Minutes Online

With the unanimous approval of its Board of Directors, the American Fire Sprinkler Association (AFSA) chose Jim Ford, assistant chief/fire marshal of the Scottsdale, Arizona, Rural/Metro Fire Department, as 2002 Fire Sprinkler Advocate of the Year. AFSA presented Ford with the award on September 8 during AFSA's 21st Annual Convention in San Diego, California.

"Sometimes the benefits of sprinklers are hard to quantify, but Jim Ford has produced an extremely effective and detailed analysis of the effect of residential sprinklers in Scottsdale, Arizona," AFSA President Steve Muncy says. "Jim is dedicated to sprinklers because he knows they work—and he can prove it!"

Ford has been with the Rural/Metro Fire Department for 27 years, serving in every operational and supervisory capacity. He became involved with residential sprinkler systems in 1982 when residential sprinkler tests were performed to determine their feasibility. The tests were successful, but it took more than three years to develop and refine the zero-square-foot concept of built-in fire protection and to win local political approval.

When the ordinance was approved in 1986, Scottsdale had a population of 100,000. Today, 220,000 residents call Scottsdale home, and more than 50 percent of single-family homes and 75 percent of commercial property are have sprinklers.

Ford developed a 10-year study of the ordinance in 1996. Since then, he's made pre-

sentations about Scottsdale's experience in Europe, Canada, Singapore, and throughout the United States.

AFSA's Fire Sprinkler Advocate of the Year Award honors individuals not directly involved in the sprinkler industry whose efforts have advanced the fire protection industry and automatic sprinklers. The award, previously known as the Fire Service Person of the Year Award, was renamed in 2001 to reflect the diversity of backgrounds of those who have an impact on the industry. ♦

HOW TO REACH US: Richard Bielen, Executive Secretary, +1-617-984-7279, rbielen@nfpa.org

Education

WEB SITE: <http://www.nfpa.org/education>

SECTION CHAIR: Peg Carson, Carson Associates, Inc., Warrenton, Virginia

WHAT WE DO: Foster resources needed to develop and conduct effective fire and life safety programs for children and adults.

WHO WE ARE: Individuals responsible for, or interested in, fire and life safety education.

HOT ISSUES

Reality and Risk, Prime-Time

by Peg Carson, Chair

I must first admit that I fall into the category of extreme safety nerd. It's a condition I've had since birth, intensified by my older brother's condition, risk-taking. I remember visits each summer to the emergency room where he received stitches, casts, and crutches. All these episodes brought attention from friends and opportunities for retelling the story of the act that caused the injury. For me, the attention wasn't worth the pain, even though I got to read comic books and eat popsicles with him. I realized that my role in the relationship was to point out the potential danger in all situations.

This need persists, and there's one potential danger I want to point out to you: Television has an unfair advantage in developing attitudes toward risk-taking, particularly as "extreme" and "challenging" reality programs claim more and more air time. While

educators work to instill in children safe attitudes that require assessing potential risks and making wise choices, television glorifies a very different attitude.

I can't begin to understand why someone should be asked to jump from one speeding boat to another or eat bugs or surround himself with rodents. Presumably, it's entertaining. Or perhaps we're being asked to believe that those who make it (without serious injury) are better, stronger, more fearless?

As someone committed to instilling a responsible attitude toward safety in children, I find such programming completely irresponsible. Young children may not have speeding boats at their command, but going beyond reasonable limits can be played out in other ways. Why not just point your wagons down the hill, then jump from one to the other? If extreme challenges "shouldn't be tried at home," then where? It's cool to try the stunts seen on television.

I don't advocate refraining from sports or riding roller coasters, but I do advocate doing those things safely. When my children were young, there were plenty of characters and acts on television and in movies that I didn't admire. I didn't want my children to emulate them, but neither did I want them out of the mainstream, unable to relate to other kids, nerdy. At our house, we limited viewing but seldom outlawed shows. Instead, my husband and I watched with them, offering our opinions and asking theirs during the show. Some shows were no longer fun to watch with Mom and Dad.

I wouldn't know where to begin if I had young children today. I do know that the current television programming communicates the idea that winners are extreme risk-takers who'll go beyond what's physically reasonable to achieve a goal. I also know that unintentional injuries are the major health threat to children under 19. Those injuries aren't accidental; they result from not appreciating and avoiding hazards.

It seems to me that the new television season has just made our jobs more challenging. ♦

HOW TO REACH US: Judy Comoletti, Executive Secretary, +1-617-984-7287, jcomoletti@nfpa.org

Electrical

WEB SITE: <http://www.nfpa.org/electrical>

SECTION CHAIR: Richard Loyd, R&N Associates, Perryville, Arkansas

WHAT WE DO: Discuss the impact of changing technology and codes on the electrical industry.

WHO WE ARE: Those who make, test, sell, regulate, certify, and service electrical or fire alarm products and services; design, construct, install, test, inspect, maintain, and approve electrical or fire alarm installation; and perform and teach electrical or fire alarm services.

HOT ISSUES

In Memoriam: Anthony Montuori

It's our sad duty to report the untimely passing of Anthony (Tony) Montuori, president and 39-year member of the International Association of Electrical Inspectors (IAEI). Montuori's distinguished career in the electrical industry spanned six decades, during which he rose to the position of chief electrical inspector with the New York Board of Fire Underwriters (NYBFU). He also served on several city licensing, advisory, and code-revision boards.

Montuori participated in NFPA technical committees since 1991, including Code-Making Panel 9 of the *National Electrical Code*® Committee and the NFPA 73, *Electrical Inspection Code for Existing Dwellings*, Committee. He was a principal member of CMP-9, representing the IAEI for the past three cycles of the *NEC*. ♦

Three Documents Revised

In July, the NFPA Standards Council issued the 2002 editions of NFPA 70B, *Recommended Practice for Electrical Equipment Maintenance*; NFPA 72™, *National Fire Alarm Code*™ and NFPA 79, *Electrical Standard for Industrial Machinery*. All three documents, now available from the NFPA Customer Service Department at (800) 344-3555, have been significantly revised. Visit www.nfpa.org/electrical or www.necdigest.org and click on menu button "electrical section membership" for a description of the revisions. ♦

HOW TO REACH US: Jeff Sargent, Executive Secretary, +1-617-984-7442, jsargent@nfpa.org

Fire Science and Technology Educators

WEB SITE: <http://www.nfpa.org/firescience>

SECTION CHAIR: Ronald Hopkins, Eastern Kentucky University, Richmond, Kentucky

WHAT WE DO: Enable faculty, instructors, and administrators of fire science, technology, and education programs in institutions of higher learning to exchange ideas.

WHO WE ARE: Faculty, instructors, and administrators of fire science, technology, and education programs.

HOT ISSUES

New Board Members

The Fire Science and Technology Educators Section has announced the members of its Executive Board:

Ronald L. Hopkins, Chair, 2004

Eastern Kentucky University
250 Stratton Building
Richmond, Kentucky 40475
(859) 622-1053
(859) 622-1530
hopkins@acs.eku.edu

Robert Gagnon, Vice-Chair, 2004

Gagnon Engineering
10110 Labelle Court
Ellicott City, Maryland 21042
(410) 461-6949
(410) 750-8514
robtgagnon@aol.com

Clinton H. Smoke, Jr., Secretary, 2004

Technical Community College
8 Hickory Creek Court
Asheville, North Carolina 28704
(828) 254-1921 ext. 844
(828) 281-9852
CSmoke@asheville.cc.nc.us

Patrick Kennedy, Director, 2003

John A. Kennedy & Associates
7678 Old 301 Boulevard
Sarasota, Florida 34243
(941) 885-8010
(941) 351-5849

Thomas J. Woodford, Director, 2003

303 Campus Fire Station
Stillwater, Oklahoma 74048-0306
(405) 744-5721
(405) 744-6758
woodfor@okstate.edu

Robert T. Foraker, Director, 2004

Delaware Technical and
Community College
10 Saybrook Way
New Castle, Delaware 19720
(302) 454-3933
(302) 421-6487
foraker@college.dtcc.edu

Jeffery Hartle, Director, 2003

Central Missouri State University
323A Humphreys
Warrensburg, MO 64093
(660) 543-4411
(660) 543-8142
firesafety@hotmail.com

Anthony Van Odyk, Director, 2004

Seneca College of Applied Arts
and Technology
1750 Finch Avenue, East
Willowdale, Ontario M2J 2X5
(416) 491-5050 ext. 6148
(416) 491-0629
Anthony.VanOdyk@senecac.on.ca

Richard Custer, Past Chair

Arup Fire
160 East Main Street, Suite A
PO Box 1432
Westborough, MA 01581-6432
(508) 616-9990
(508) 616-9991
richard.custer@arup.com

Frank E. Florence, Executive Secretary

NFPA
1 Batterymarch Park
Quincy, MA 02269
(617) 984-7480
(617) 984-7056

HOW TO REACH US: Frank Florence, Executive Secretary, +1-617-984-7480, fflorence@nfpa.org

Fire Service

WEB SITE: <http://www.nfpa.org/fireservice>

SECTION CHAIR: Terry Allen, Chief, Cambridge, Ontario, Canada

WHAT WE DO: Conduct seminars on current issues and produce investigative reports and codes and standards updates.

WHO WE ARE: Fire service members, those involved in training and equipment manufacturing and sales, and representatives of educational institutions.

HOT ISSUES

National Type I Incident Management Team

by Division Chief Gary L. Neilson,
Reno Fire Department

On the afternoon of July 30, 2002, with central Oregon ablaze, I was assigned to serve as safety officer on the command staff of Paul Hefner's Great Basin National Type I Incident Management Team. This type of incident management team usually handles com-

plex fires, floods, earthquakes, and other natural disasters.

Generally, a Type I team consists of 35 members. The command staff includes the incident commander, deputy incident commander, information officers, and safety officers, and the general staff consists of operations, plans, logistics, and finance personnel. Unit leaders operate under them in the incident command system.

There are 17 Type I teams in the United States, all on a national and a local rotation schedule. Each team is designated for all risks, and each has a 14-day period during which it can be assigned to an incident, not including travel days. This year, Type I teams have been assigned to 72 incidents throughout the country.

When I arrived in Lakeview, Oregon, the area command team briefed the command and general staffs at the Interagency Headquarters of the Bureau of Land Management and the U.S. Forest Service. The rest of the team had already been dispatched to

the command post in Silver Lake, Oregon.

Our team was ordered to take over the Winter fire from an Oregon Department of Forestry team and the Tool Box complex, which consisted of the Tool Box, Silver, and Lava fires, from another Type I team that had already spent two weeks managing them. Together, these four fires, ravaged more than 120,000 acres (48,563 hectares) of wildland.

The number of personnel assigned to the Tool Box complex alone necessitated the use of a Type I team. When we arrived, about 1,700 personnel were fighting the Tool Box fires, and approximately 1,300 staff had been assigned to the Winter fire.

One of the first logistical issues we faced was the existence of two fire camps more than 50 miles (80.5 kilometers) apart. We realized we had to coordinate the two camps quickly to allow us to oversee thousands of personnel in an area with limited services. This was particularly challenging since our team was taking over the management of fires previously co-ordinated by two groups.

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The two camps housed more than 60 hand crews and various overhead teams, as well as those needed to operate the 178 engines, 25 bulldozers, and 12 helicopters being used. Two shifts worked 12 hours each, although the night shift was eventually discontinued to concentrate efforts during daylight hours.

Each shift began with a briefing addressing the weather forecast, fire behavior, safety, assignments, communications, logistics, and financial issues. The incident commander concluded the meeting with a summary, then each division broke out with its assigned personnel to make plans for the day.

The fires covered such a vast area that we needed repeater sites to maintain radio communication. More than 10 tactical channels were assigned, along with air-to-ground and command frequencies. A cell site was also set up at the command post, and more than 40 cell phones were available for use.

In addition to overseeing the firefighting operations, the management team supported what was basically a small city, providing catering, laundry service, and showers.

All 3,000 crew members had to be fed three times a day. To keep food frozen in temperatures over 90°F (32°C), the caterers maintained five 40-foot (12-meter) refrigerated trailers from which they provided two hot meals and a sack lunch every day. As for laundry, firefighters could drop off their dirty clothes in the morning and pick them up 12 hours later. And because everyone lived in tents, three self-contained showers were hired, a welcome sight when the crews came off the line after a 12-hour shift.

A commissary was also provided so firefighters could buy boots, shirts, toiletries, and other sundries, and a medical unit staffed with paramedics and emergency medical technicians stood by.

Our team was released on August 7, and the fire was turned over to a Type III team. Before we left, we demobilized all engines, hand crews, and related logistical support, coordinating travel arrangements and reassignment logistics.

As a Type I team member, I gained valuable insight into the organization of a wildland firefighting operation. We in the fire service

can be proud we're associated with such incident management teams. For more information on them and related assignments, go to the National Interagency Fire Center's web site at www.nifc.gov. ♦

HOW TO REACH US: Stephen N. Foley, Executive Secretary, +1-617-984-7468, sfoley@nfpa.org

Health Care

WEB SITE: <http://www.nfpa.org/healthcare>

SECTION CHAIR: Thomas Haynes, Woodpecker Hill Nursing Home, Greene, Rhode Island

WHAT WE DO: Exchange information on fire and life safety at health-care facilities.

WHO WE ARE: Staff of health-care facilities and organizations, and individuals who engineer, manufacture, test, sell, regulate, or service medical products or services and those who design, construct, test, inspect, maintain, regulate, license, and certify health-care facilities.

HOT ISSUES

News from the Codes and Standards Review Committee

by Tom Bulow, Codes and Standards Review Committee Chair

Many of the changes made during NFPA's code revision cycle affect the Association's 63 health-care codes, so the Health Care Section monitors the cycle closely. Although professional demands may make it difficult to attend meetings, there are ways you can get involved in the codes and standards review process.

One is to correspond with section leaders or visit NFPA's web site to learn what codes are up for review. This will allow you to direct your concerns to the section leadership in a timely manner. Another source of information is the section members serving on technical committees. They're responsible for keeping section members informed of issues related to code development, and their reports are due at least 30 days before the fall and spring meetings, so pertinent details can be incorporated into the meeting minutes. The section's executive secretary transmits these reports to the section's executive board and committee.

With the Fall Education Conference just around the corner, we still have a lot to consider for the meeting. Among the codes we'll discuss at the Section's Code and Standards Review Forum in Atlanta are NFPA 1, *Fire Prevention Code*; NFPA 14, *Installation of Standpipe, Hydrant, and Hose Systems*; NFPA 55, *Compressed and Liquid Gas in Portable Cylinders*; and NFPA 70E, *Electrical Safety in the Workplace*. Also up for discussion are NFPA 80, *Fire Doors and Fire Windows*; NFPA 101®, *Life Safety Code*®; and NFPA 105, *Smoke-Control Door Assembly*.

Those in the health-care section have a grass-roots view of the industry's needs, so your input is always welcome. Each of you has a say in the meetings, and the section's executive secretary will forward any correspondence to committee members for consideration.

To get to Committees Soliciting Proposals, visit www.nfpa.org and follow the instructions. Look for codes and standards that affect you and follow the Technical Committee Reports. Stay well-informed! ♦

HOW TO REACH US: Richard Bielen, Executive Secretary, +1-617-984-7279, rbielen@nfpa.org

Industrial Fire Protection

WEB SITE: <http://www.nfpa.org/industrial>

SECTION CHAIR: Mike Newman, Johnson and Johnson Company, New Brunswick, New Jersey

WHAT WE DO: Provide information to improve industrial fire and life safety programs.

WHO WE ARE: Professionals concerned with fire protection, prevention, and suppression in industrial settings.

HOT ISSUES

IFPS Board Meets at NFPA

The Industrial Fire Protection Section held its fall meeting at NFPA headquarters, giving board members an opportunity to meet NFPA staff and learn first-hand about key Association initiatives. Board members met NFPA's new president, Jim Shannon, who discussed

NFPA's strategic goals and how sections can contribute.

Board members also met with Bob Ruscitto, director of NFPA's Certification Programs, and discussed possible industrial sector links to the programs currently available. The most applicable is the Certified Fire Protection Specialist program that originated with the Ben Franklin Chapter of the Industrial Section during the 1970s.

In addition, the board finalized the educational program for NFPA's 2003 World Safety Conference and Exposition™ to be held in Dallas next May. Once the NFPA program committee has reviewed and approved the topics, we'll list the information on the section's web site.

The board meets next in the first quarter of 2003 to judge the FPW contest entrants and finalize the nominating committee report for the 2003 elections. If you have any items you'd like the board to consider, please forward it to Executive Secretary Guy Colonna at nfpa.org.

HOW TO REACH US: Guy Colonna, Executive Secretary, NFPA, +1-617-984-7435, gcolonna@nfpa.org

International Fire Marshals Association

WEB SITE: <http://www.nfpa.org/ifma>

SECTION CHAIR: Ron Farr, Kalamazoo Township Fire Department, Kalamazoo Township, Michigan

WHAT WE DO: Advocate, promote, and provide leadership in preventing and mitigating fires, explosions, and related hazards.

WHO WE ARE: Fire officials who enforce fire laws and regulations.

HOT ISSUES

International Fire Marshals Association Conference

The Fourth Annual Fire Marshals Conference will be held in conjunction with NFPA's Fall Educational Meeting this November in Atlanta, Georgia. Check the program when you register for final day and times.

Sunday, November 17

8:00 a.m. to 12:00 p.m.,

IFMA Executive Board Meeting

8:00 a.m. to 12:00 p.m., *Legal Aspects of Fire Investigation*

8:00 a.m. to 12:00 p.m., *NFPA's Performance-Based Codes*

1:00 to 5:00 p.m., *Retail Sales of Consumer Fireworks—NFPA 1124*

Monday, November 18

8:00 to 11:00 a.m., *Opening General Session*

1:00 to 2:30 p.m., *An Update on NFPA 1, Uniform Fire Code™*

1:00 to 5:00 p.m., *Legal Aspects of Fire Prevention*

1:00 to 5:00 p.m., *Lessons Learned from the 2002 Winter Olympics*

Tuesday, November 19

8:00 a.m. to 12:00 p.m., *Poverty and Fires*

2:00 p.m. to 3:30 p.m., *UL Certifications and the Fire Code*

2:00 p.m. to 4:00 p.m., *Fire Inspector's Role at Fire Pump Acceptance Testing*

4:00 p.m. to 4:30 p.m., *IFMA Business Meeting*

4:30 p.m. to 5:30 p.m., *IFMA Codes and Standards Forum*

Wednesday, November 20

Technical Committee Sessions

Training programs

The International Fire Marshals Association currently offers three training programs.

The tentative 2003 schedule is:

March 24–27, 2003, *Management Institute for Fire Marshals, Chelan, Washington*

March 24–27, 2003, *Principles of Fire Protection Engineering, Las Vegas, Nevada*

April 29–30, 2003, *Management Institute for Fire Marshals, Auburn Hills, Michigan*

Anyone interested in attending or sponsoring a program should contact Executive Secretary Steven F. Sawyer at (617) 984-7423 or ssawyer@nfpa.org. Please check the IFMA web site for complete details.

HOW TO REACH US: Steven Sawyer, Executive Secretary, +1-617-984-7423, ssawyer@nfpa.org

Latin American

WEB SITE: <http://www.nfpa.org/latinamerican>

SECTION CHAIR: Eduardo Abé, Tecin Rosenbauer S. A., Buenos Aires, Argentina

WHAT WE DO: Provide a bilingual forum in which to discuss fire protection in Latin America.

WHO WE ARE: NFPA members interested in promoting fire and life safety in Latin America.

HOT ISSUES

NFPA 101 Seminar

To fulfill the needs of those in the Spanish-speaking world who are interested in fire and life safety, NFPA and the International Fire Safety Training Association (IFSTA) have begun offering NFPA seminars in Spanish in Latin America and Spain.

One of the first took place in Santo Domingo, Dominican Republic, from May 27 to 29, 2002. Teaching the seminar, which focused on NFPA 101®, *Life Safety Code*®, were Eduardo Álvarez of Argentina and Federico Cvetresnik of Uruguay. Lucille Hollemont of Dominican Watchman opened the program with a few remarks, and Juan Carlos Guilbe, vice president of Fire Technologies, introduced NFPA. Fire Technologies and Dominican Watchman sponsored the seminar, which was attended by 58 people.

For more information on participating, log on to www.capacitacionnfpa.com.

In Puerto Rico and Colombia

On September 5, NFPA held its first technical breakfast, organized by Latin American Section board member Reynaldo Cartagena, in San Juan, Puerto Rico. Antonio Macias, NFPA regional director for Mexico, Central America, and the Caribbean, discussed with the 55 attendees the organization of a Puerto Rico chapter, adoption of NFPA codes and standards into law in Puerto Rico, and NFPA membership.

Last June, John Caloggero, NFPA's electrical specialist, participated in the second Aterramiento de Sistemas Eléctricos (Grounding of Electrical Systems) conference, sponsored by the Colombian Association of Engineers in Bogotá. Approximately 65 people participated in the four sessions, which focused on grounded systems, the reasons for grounding, the compo-

nents of grounded systems, and systems that require grounding. The seminar was based on the 1999 edition of the *NEC*, which Colombia has adopted as a recommended practice. ♣

First International Industrial Emergency Response Congress

The nonprofit Venezuelan civil association ASOHAZMAT conducted the first international conference on response to, and control of, industrial emergencies at the Maracaibo Convention Center in Maracaibo, Venezuela, on May 17 and 18. Among the topics addressed were technology, fires, the environment, haz-mats, and rescue. The speakers, from various countries in Latin America, included Eduardo E. Abé, section president. As part of the congress, companies showcased their products for the 250 attendees.

The organizers plan to hold a second congress next year. ♣

HOW TO REACH US: Olga Caledonia, Executive Secretary, +1-617-984-7231, ocaledonia@nfpa.org

Lodging Industry

WEB SITE: <http://www.nfpa.org/lodging>

SECTION CHAIR: Thomas Daly, Hilton Hotel Corporation, Beverly Hills, California

WHAT WE DO: Exchange information on fire and life safety in lodging facilities.

WHO WE ARE: NFPA members employed by lodging facilities or management companies who are involved in life or fire safety-related activities.

HOT ISSUES

New York City to Revise Building Code, Affecting High-Rise Hotels

The Building Department of the City of New York has announced plans to propose revisions to the city's building code by year-end. The revisions would primarily affect high-rise buildings, including existing high-rise hotels. A task force, led by the building department and including representatives of the real estate community, architectural and engineering firms, and the fire department, will make recommendations

to the mayor and city council by January 1, 2003. The council must take legislative action to amend the code or adopt a new code.

New York is one of a handful of cities in the United States that writes its own building code, codified in Title 27 of the city's *Administrative Code*. Additional requirements found in the *Regulations of the City of New York* (RCNY) can be revised by administrative rulemaking. Although New York State recently adopted the 2000 edition of the *International Building Code* (IBC), cities with populations greater than 500,000 can write their own codes or adopt other model codes.

The changes were spurred by recommendations in the Federal Emergency Management Agency and American Society of Civil Engineers' report, *World Trade Center Building Performance Study: Data Collection, Preliminary Observations, and Recommendations*. They'll be influenced by the report the National Institute of Standards and Technology is developing on the disaster.

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The last significant fire and life safety amendments to the city's building code affecting hotels were made in 1984. That ordinance, Local Law 16, provided a short compliance time for hotels, even though some of the retrofit provisions were extensive. Local Law 5, a similar fire safety ordinance primarily affecting office buildings, was mired in court challenges for more than a decade after it was adopted in 1973.

The Lodging Industry Section will report on further developments in future editions of *NFPA Journal*. ♦

From the Chair—Welcome Back?

by Thomas G. Daly, Chair

When I volunteered to fill an unexpected vacancy as your vice-chair last year, it was with the expectation that our chair, Bob Elliott, would serve the customary two two-year terms. We'd seek a candidate for vice-chair in Bob's second term, and that candidate would assume the chair when Bob's term was up.

Never assume! Bob's left our industry, and I've stepped in as chair. I want to take this opportunity to thank Bob for his hard work as chair and for his time as a member of our executive committee.

So now what? Well, I had to dust off a copy of our constitution and bylaws, available at <http://www.nfpa.org/lodging>, and read up. Lots to do.

We have a good program scheduled for the Fall Education Conference in Atlanta on November 16 through 20. On Tuesday, November 19, Carl Baldasarra, president of Schirmer Engineering Corporation, and I will present a paper from 2 to 4 p.m. at the Hyatt Regency Atlanta on the impact of NFPA 5000™, *Building Construction and Safety Code*™, on new hotel construction. We'll also discuss some potentially controversial ideas about what may be coming in future codes in the wake of the World Trade Center tragedy.

Our executive committee meeting will follow at 5 p.m. to discuss pending issues,

including the NFPA premises security project, major code changes pending in New York City, and carbon monoxide detection. You don't have to be an executive committee member to attend. The meeting room location will be published in the conference program.

The NFPA Board of Directors approved amendments to the section constitution and bylaws in June, and a membership subcommittee was formed to review new member applications and requests from non-voting associate members to become voting members.

Volunteers to fill the vacant vice-chair position should contact April Berkol, chair of our nominating committee, at Starwood Hotels and Resorts.

Our section's web site is getting more robust as Executive Secretary Gregory Harrington and other NFPA staff add information. Thanks to Greg and the staff for keeping the site interesting. ♦

HOW TO REACH US: Greg Harrington, Executive Secretary, +1-617-984-7471, gharrington@nfpa.org



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Metropolitan Fire Chiefs

WEB SITE: <http://www.nfpa.org/metro>

SECTION CHAIR: Mario Trevino, Chief, San Francisco, California

WHAT WE DO: Bring together fire chiefs from large metropolitan fire departments to share information on issues to effect policy changes.

WHO WE ARE: Active and retired fire chiefs who are of NFPA and International Association of Fire Chiefs members and who supervise jurisdictions with minimum staffs of 400 fully paid career firefighters.

Metro Chiefs Meet in Kansas City by Russ Sanders, Executive Secretary

The Metro Chiefs Section held its business meeting in Kansas City, Missouri, on August 25 in conjunction with the International Association

of Fire Chiefs Fire Rescue International Conference. After business was completed, section members reported on plans to participate in the memorial services honoring those lost on September 11 and throughout the year; on enhanced 9-11 reports (see article on the Metro web page); and on international recruitment. Also addressed were the NFPA 1710 implementation plan and the findings of the Candidate Physical Ability Test (CPAT) survey. In addition, members reported on the update of the new Metro policy manual, reviewed homeland security activities, and discussed IAFC and NFPA board and staff activities. Incoming IAFC President Randy Bruegman offered his greetings, and USFA Administrator Dave Paulison reported on United States Fire Administration priorities. The section is working closely with Paulison, a senior Metro member, to achieve common goals.

The next Metro Section business meeting will be November 17 in Atlanta, Georgia, in conjunction with NFPA's Fall Education Conference. The next section annual conference will be held from June 29 to July 3, 2003, in Calgary, Alberta, Canada.

Membership in the Metro Chiefs Section, a joint section of the IAFC and NFPA, is limited to IAFC and NFPA members who are fire chiefs of jurisdictions with minimum staffing of 400 fully paid, career firefighters. If you meet these criteria, please contact Russ Sanders, Executive Secretary, at (502) 894-0411 or rsanders@nfpa.org.

HOW TO REACH US: Russ Sanders, Executive Secretary, +1-502-894-0411, rsanders@nfap.org

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Rail Transportation Systems

WEB SITE: <http://www.nfpa.org/rail>

SECTION CHAIR: James Gourley, Fire Protection Engineer, Glenside, Pennsylvania

WHAT WE DO: Promote fire protection and prevention on rail properties and pursue methods of safely transporting passengers, freight, and hazardous materials.

WHO WE ARE: Officers or full-time employees of a rail transportation company and organizations the industry supports.

HOT ISSUES

Rail Symposium Takes Shape

The following presenters are scheduled for the NFPA Rail Transportation Systems Section's First Annual Rail Fire Safety and Security Symposium:

Art Candenquist, Amtrak, "Passenger Train Emergency Response Training"

Chief William Goodwin, Baltimore Fire Department, "Surviving a Train Crash—Fire Department Response to a Train Incident"

Harold Levitt, PANYNJ, "Reconstructing Rail Service Under the World Trade Center"

Joe Zearfoss, AON Risk Insurers, "Positive Train Control"

Rick Ellis, CSX International, "Personal Preparedness: The Often-Forgotten Element in Planning for Natural Disasters"

Phil Tapper, Schirmer Engineering, "Analyzing Fire Behavior in Trainsets Using FDS2"

Jim Lake, NFPA, "Update on Proposed Changes to NFPA 130, *Standard for Fixed Guideway Transit and Passenger Rail Systems*"

Leroy Coffman, Tempest Technologies, "Portable Tunnel Ventilation Equipment"

Paul Calderwood, Deputy Chief, City of Everett, Mass., Fire Department, "Fire Department Response to Train Incidents"

Dirk Sprakel, Fogtec International, "European Development of Fire Protection Systems in Rail Systems"

Stephanie Markos, U.S. Department of Transportation, Volpe National Transportation Systems Center, "Revised FRA Passenger Train Fire Safety Requirements"

The symposium will be held on Sunday, November 17, as part of the NFPA Fall Educational Conference in Atlanta. For more information, call Executive Secretary James Lake at (617) 984-7401, fax him at (617) 984-7110, or E-mail jlake@nfpa.org.

HOW TO REACH US: *Jim Lake, Executive Secretary, +1-617-984-7470, jlake@nfpa.org*

Research

WEB SITE: <http://www.nfpa.org/research>

SECTION CHAIR: Samuel Dannaway, Dannaway and Associates, Pearl Harbor, Hawaii

WHAT WE DO: Enable communication between researchers and research users, and offer opportunities for widespread use of fire research in managing fire hazards and risks.

WHO WE ARE: NFPA members interested in research related to fire safety, fire science, fire codes and standards, and fire protection.

HOT ISSUES

What's New in Fire Technology

The third-quarter issue of *Fire Technology*, an international quarterly journal devoted to fire science research, features the following papers:

- "Positive-Pressure Ventilation in Single Medium-Sized Premises" by Haukar Ingason and Ronny Fallbery;
- "How Design Fires Can Be Used in Fire Hazard Analysis" by David T. Yung and Nouredine Benichou;
- "A Parametric Study on the Time-to-Failure of Wood-Framed Walls in Fire" by P. Clancy; and
- "An Investigation on the Building Officials' Perception and Use of Performance-Based Fire Engineering Approach to Building Design" by S. M. Lo, et al.

HOW TO REACH US: *John Hall, Executive Secretary, +1-617-984-7460, jhall@nfpa.org*

Wildland Fire Management

WEB SITE: <http://www.nfpa.org/wildland>

SECTION CHAIR: Bill Terry, USDA Forest Service, Washington, D.C.

WHAT WE DO: Enable wildland fire management professionals to share methods, experiences, ideas, and technology.

WHO WE ARE: NFPA members interested in wildfire prevention, education, investigation, and management.

HOT ISSUES

Santa Barbara County Reduces Wildfire Potential

by James Langhorne, Fire Marshal Montecito Fire Department

The Montecito Fire Protection District in Santa Barbara County, California, is pleased to report the final adoption by its governing board of directors of comprehensive environmental documentation for its proposal to reduce fuel loads in high-hazard areas. The adoption is the culmination of years of effort by the fire district to exercise a sustainable wildland fire mitigation plan.

The documentation took the form of a program environmental impact report developed by Science Applications International Corporation (SAIC), which reviewed in detail mitigation proposals for the Montecito Community Fire Protection Plan. The plan, developed by Firewise 2000, outlined several projects that would be beneficial to wildfire management. Unfortunately, nearly half the work was to occur in designated environmentally sensitive habitats (ESHs) in which no work could be done under the county's current comprehensive plan.

For several years, the fire district's maintained a vegetation management program directed by Curtis Vincent, who conceived of and supervised efforts to remove dead vegetation threatening area homes. Outside the ESH areas, this work proceeded under Negative Declarations, by which the fire district certified that an emergency existed

and that the abatement work would have a minimally adverse impact on the environment. The problem with this approach is that, once the emergency is over, the district must maintain the area to avoid another emergency later.

Several treatments evolved, supported by biologists, who consider traditional abatement methods destructive. One was the use of a shredder that reduces chipped brush to litter mulch and conveys it to the areas from which it was removed. The litter is vital to sustaining these critical habitats because aerial ladder fuels decompose into ground litter. While the fuel load hasn't been removed, it's been reconfigured into a less volatile hazard, and the habitat has been preserved because its critical litter layer has been maintained.

The environmental review resulted in another change to the way the fire district exercised its fire plan. For several years, the district applied fire retardants to roadside grasses in interface areas. The review revealed that, in addition to presenting a fire hazard, these grasses were largely invasive species that posed a significant environmental hazard. As a form of fertilizer, the retardants actually caused the grasses to regenerate. The environmental review suggested that mowing the grasses before they developed seeds would allow the district to reintroduce a more beneficial, less hazardous species. This approach is less costly and requires less effort than applying fire retardant.

Ultimately, the fire district received significant support for its efforts. In fact, the Los Padres National Forest, which abuts the district, was instrumental in helping the district

get grant funding for both the shredder and the mowing project. The district bought the shredder with a Community Fire Assistance Grant administered by the United States Forest Service, and the roadside vegetation modification was done this year with the help of a Western Wildfire Urban Interface Grant from the California Department of Forestry and Fire Protection.

By adopting its Community Fire Plan and documenting its environmental impact, the Montecito Fire Protection District is well on the way to reducing its exposure to wildfire.

For more information, visit montecitofire.com or contact Curtis Vincent at (805) 969-7762. ♦

HOW TO REACH US: Jim Smalley, Executive Secretary, +1-617-984-7483, jsmalley@nfpa.org

NFPA Section Application

Please fill out this application and fax it to 1-800-593-6372 (+1-508-895-8301 outside the U.S.), or mail it to NFPA Fulfillment Division, 11 Tracy Drive, Avon, MA 02322-1145.

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Note: NFPA bylaws state that section members must be members of NFPA.

I have reviewed the NFPA section membership qualifications for the _____ Section, and I believe I meet the requirements.

Note: Section qualifications are included in the member section descriptions on the NFPA web site, www.nfpa.org/membersections.

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Note: Affiliates can participate in section activities, but they may not hold office or vote in the affairs of the section.

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Note: Section membership is contingent upon approval of your qualifications by the section membership committee.

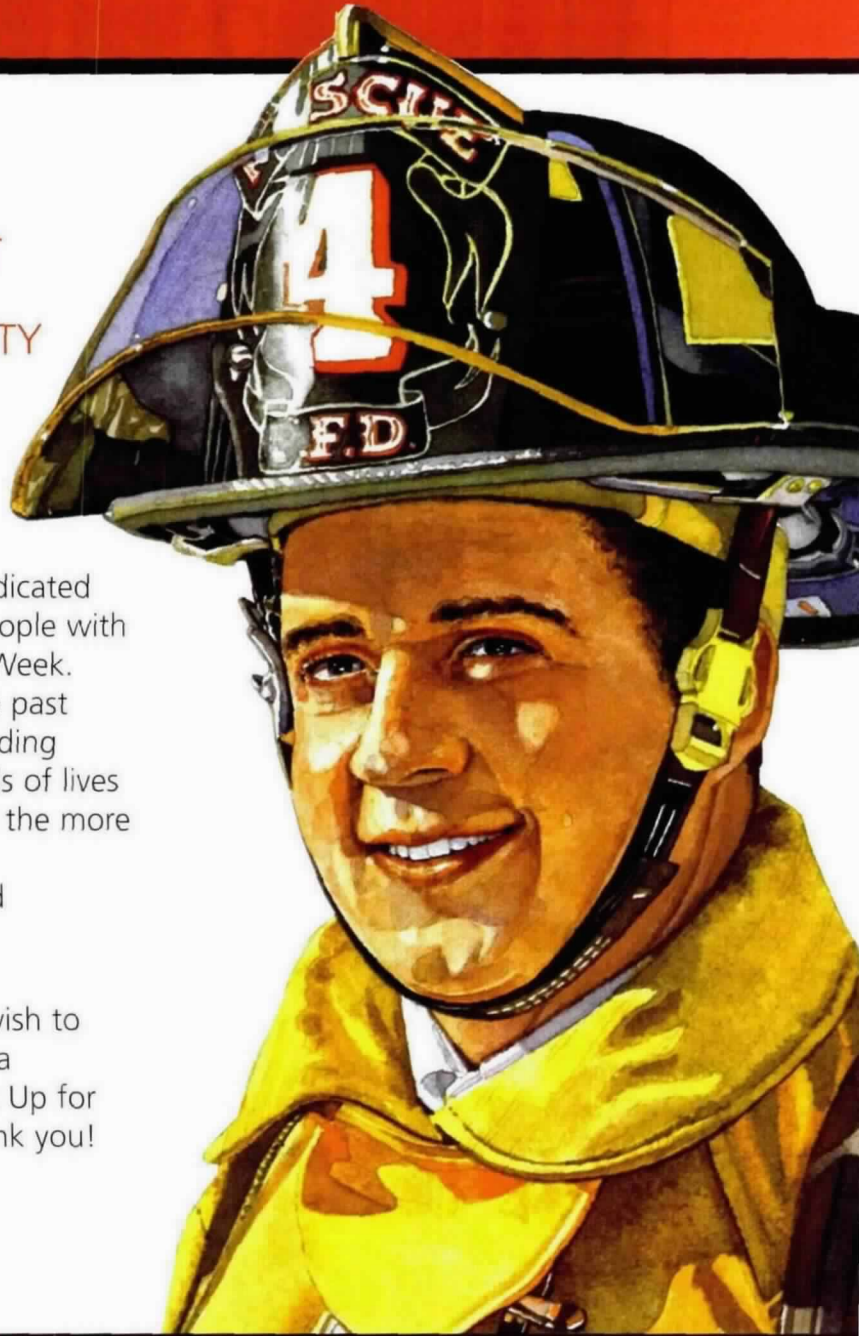
A HEARTFELT THANK YOU

NFPA TIPS ITS HAT TO THE FIREFIGHTERS AND OTHER FIRST RESPONDERS WHOSE COMMITMENT TO PUBLIC SAFETY EDUCATION HELPED LEAD THE U.S. TO A 9% DROP IN HOME FIRE DEATHS IN 2001.

Each year for the past 80 years, NFPA has been proud to support North America's dedicated firefighters in their local efforts to reach people with the lifesaving messages of Fire Prevention Week. We know these messages work, and in the past year, the fire service's commitment to providing public safety education paid off in hundreds of lives saved. NFPA's annual fire loss report credits the more than 9% decline in home fire deaths to a combination of public safety education and advances in fire technology.

NFPA and its FPW 2002 funding partners wish to thank all those first responders who make a difference in our lives. Every day we "Team Up for Fire Safety" in support of your efforts. Thank you!

www.firepreventionweek.org



Official Sponsor Since 1922



Major funding for FPW 2002 provided by FEMA's United States Fire Administration, Lowe's Home Safety Council, and Underwriters Laboratories Inc., with generous support from First Alert.

Evacuation Chairs

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Circle Reader Service Card No. 99



Purging and Pressurizing Systems

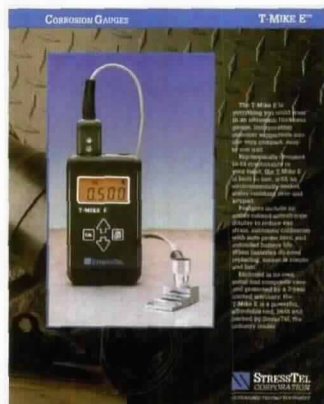
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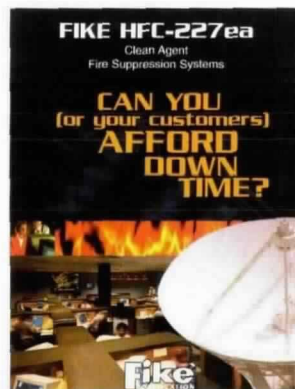
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Clean Agent Suppression Systems

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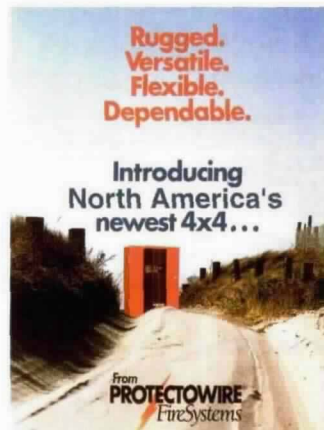
Tyco Fire and Building Services
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Control Panel

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Protectowire Company
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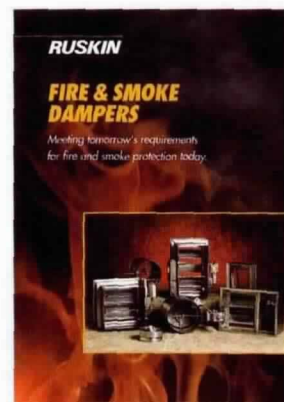
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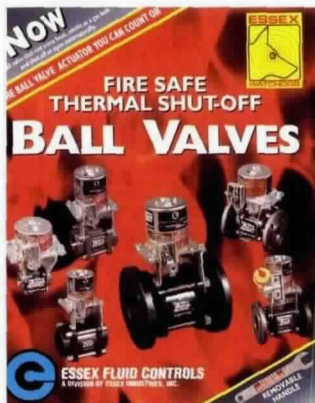
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Essex Fluid Controls
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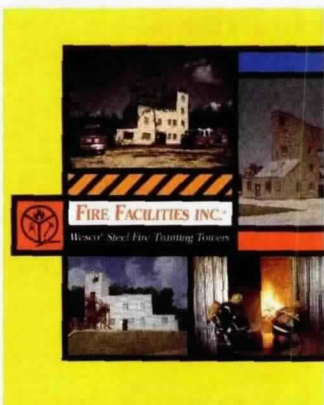
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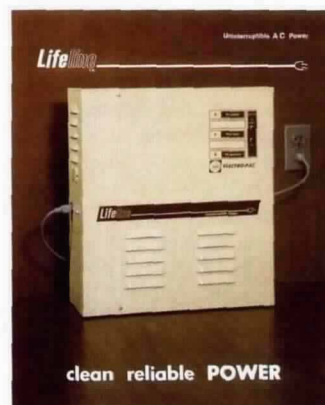
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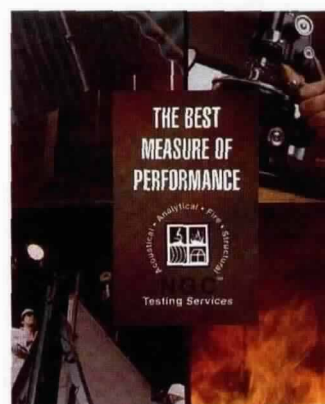
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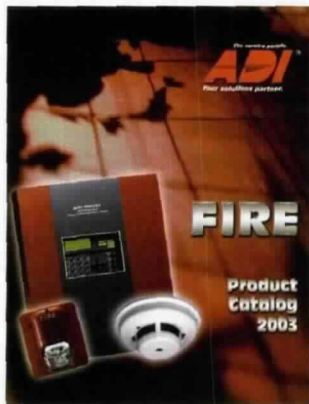


Product Catalog

The 2003 ADI Fire Catalog features conventional, addressable, and voice evacuation control panels, ADA compliant notification appliances and explosion-proof signals; smoke, beam, gas and carbon monoxide detectors; sprinkler monitoring and water flow detection devices; emergency lighting products and fire alarm cable. Call (800) 233-6261 for your free copy.

ADI

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Home Safeguard Industries

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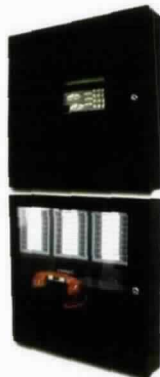


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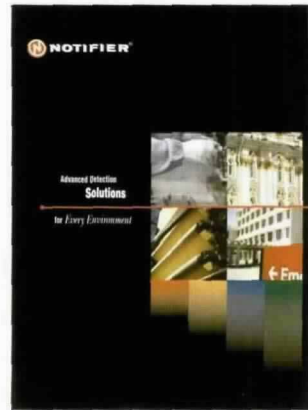


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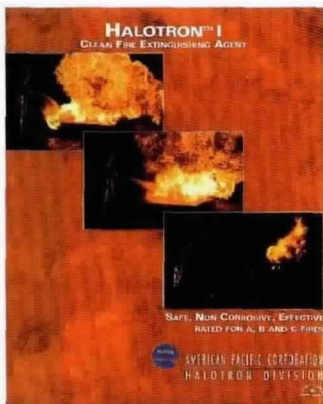
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NFPA

NFPA has been a worldwide leader in providing fire, electrical, building, and life safety to the public since 1896. NFPA is also a partner in the development of the *Comprehensive Consensus Codes* (C3) set for the built environment. NFPA also produces educational curricula, including the Risk Watch® community-based injury prevention curriculum. Visit us at www.nfpa.org.

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Will participants get study guides?

Course materials, quizzes, and specific code references for the training materials are part of the online course. We're not sending any printed materials; you can even print a certificate of completion for the CEUs earned.

What's the benefit of the online seminar?

Attendees find the live format beneficial because they can communicate with the instructor and other seminar attendees by e-mail and phone.

Why isn't the "NEC Changes" seminar still available?

The seminar, which ran from October 2001 to May 2002, updated attendees on the 2001 code changes. When demand decreased as the newness of the NEC wore off, we retired the seminar. However, we'll use a similar structure for future programs. ❖

requirements must be satisfied, based on the hazard level the materials present. These may include minimum property-line distances, or exits to an attached building, and exterior walls.

These chapters establish minimum requirements for buildings containing hazardous materials. Other standards address the handling, storage, and use of such materials and they should be applied or enforced when they're adopted for use. Since this is the first edition of NFPA 5000, there may be conflicts between it and these other documents, but these differences will be identified during upcoming revision cycles and the appropriate actions taken to establish a level of consistency among all the affected codes and standards. If your facility contains hazardous materials, you needn't be overly concerned. This isn't your average haz-mat classification approach, but a simple process establishing minimum requirements for a new building from a building code perspective and for existing facilities from a fire code perspective. ❖

players perform as expected than anyone else involved in the process. To determine whether the designer and installer have done their jobs, AHJs must have a minimum set of qualifications, which may include knowing how to read floor plans and evaluate alarm system layouts. AHJs should also know what constitutes good workmanship.

Because the typical AHJ is a fire inspector who doesn't have experience with electrical systems, comprehensive training is imperative *before* he or she can responsibly sign off on a system installation. AHJs must understand what they need to review in an alarm system design or installation, then be able to apply that knowledge consistently and professionally. If training isn't available, the AHJ should contract with a fire protection engineer to review the system plans and inspect the installation.

Remember, the goal is to keep the system's mission-effectiveness rating high. Just because a fire alarm system is code-compliant doesn't mean it's inherently reliable. System reliability also depends on the quality, training, and experience of everyone involved in the installation process. ❖

Don't take a back seat when it comes to vandalism, false fire alarms and theft.



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Circle 015 on Reader Service Card

Many of the petrochemical facilities that would ostensibly be covered by the Corzine bill are already covered by the EPA's RMP, which went into effect in 1999. About 15,000 facilities are registered nationwide. Company-submitted RMPs contain a wide range of information about each plant, including what would happen in incidents involving chemicals that could pose a serious risk to life and health if released into the atmosphere.

The RMPs fall short in terms of the more limited goal of preventing accidental releases. NFPA Senior Chemical Engineer Amy Spencer agrees the RMP regulations don't prescribe specific safety features. But if the company's experts determine through the RMP-required hazard analysis that these measures are necessary (such as employing guards or installing special piping), they are documented in the RMP and are implemented, she says.

There's little doubt that terrorists could turn petrochemical facilities such as Motiva's refinery into catastrophic fireballs. That's why Congress is trying to light a fire under the industry on the issue of plant security before someone malevolent strikes a destructive match. ❖

To include your event in "Date Book," please submit full details four months before the event to NFPA Journal, One Batterymarch Park, Quincy, MA 02169-7471, fax the information to (617) 984-7090, or E-mail it to jnicholson@nfpa.org.



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December 2-6 •

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St. Louis, Missouri

December 9-13 •

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McLean, Virginia

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NFPA's Facility Fire Safety Seminar

December 2-6 •

Denver, Colorado

This seminar gives you the practical knowledge you need to make informed safety decisions to protect your property and employees.

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December 2-6 •

Denver, Colorado

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May 8-10, 2003 •

Kuala Lumpur, Malaysia

The conference is presented by the International Council for Research and Innovation in Building Construction and the Council on Tall Buildings and Urban Habitat. For more information, visit www.cibklutm.com.

For registration, further information, or a complete list of NFPA's continuing education seminars and workshops, contact NFPA, Continuing Education Department, P.O. Box 9101, Quincy, MA 02269-9101; www.nfpa.org; or (800) 344-3555.

Wildfire 2002: Surviving the Interface Danger Zone

December 4-6 •

Kansas City, Missouri

Designed to cover timely questions regarding wildland-urban interface fire prevention, mitigation and management. Sponsored by the International Association of Wildland Fire and the International Association of Fire Chiefs, in conjunction with the U.S. Department of Agriculture Forest Service-Rocky Mountain Research Station.

7th Fire Suppression and Detection Research Application Symposium

January 22-24 •

Orlando, Florida

Hear cutting edge technical papers on current suppression and detection research, development and case studies. Contact Eric Peterson, (617) 984-7281.

Issues in Fire Risk Assessment and Management: Addressing the Spectrum from Expected to Extreme Events

December 5-6 •

New Orleans, Louisiana

For more information, visit Society of Fire Protection Engineer's web site, www.sfpe.org, or call (301) 718-2910.

Making the Connection: Infection Control and Occupational Health

December 12-13 •

Baltimore, Maryland

This training course for safety professionals in infection control and occupational health is at Johns Hopkins University. Topics include biological and environmental pathogens, outbreak management and protocol development. For registration information, send E-mail to mdoyle@jhsph.edu or call (410) 955-0423.

Fire and Materials 2003

January 27-28 •

San Francisco, California

This forum on fire performance of materials is sponsored by Interscience Communications focuses on manufacturers, designers, and regulators. For information, visit www.intercomm.dial.pipex.com. 🔥

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Ames Corp. (RSC 002) www.amesfirewater.com	12	SimplexGrinnell (RSC 017)	
Aurora Pump (RSC 003) www.aurorapump.com	10	www.simplexgrinnell.com/safe	2
Bilco Co. (RSC 004) www.bilco.com	11	System Sensor (RSC 018) www.systemsensor.com	29
DuPont Nomex (RSC 005) www.dupont.com/nomex	15	3M - Novec (RSC 019) www.3m.com	16
Edwards Systems Technology (RSC 006) www.est.net	7	Telular Corp. (RSC 020) www.Telguard.com	13
Faraday LLC (RSC 007) www.faradayllc.com	33	Tiscor (RSC 021) www.tiscor.com	94
Fire Control Instruments (RSC 027)		Twenty-First Century Fire Equipment (RSC 026)	
www.firecontrolinstruments.com	31	www.21centuryfire.com	79
Firetrol, Inc. (RSC 008) www.firetrol.com	82	Tyco Fire & Building Products (RSC 022)	
Halotron (RSC 009) www.halotron-inc.com	9	www.Tyco-Fire.com	25
Kidde Fire Systems (RSC 010)		University of Nevada (RSC 023)	
www.kiddefiresystems.com	BC	www.fireacademy.unr.edu	91
Knox Co. (RSC 011) www.knoxbox.com	84	Victaulic Company of America (RSC 024)	
Macurco (RSC 012) www.detectgas.com	84	www.victaulic.com	8
NFPA www.nfpa.org	51, 55, 65, 82, 87	Wheelock Inc. (RSC 028) www.wheelockinc.com	61
Notifier (RSC 013) www.notifier.com	19	Worcester Polytechnic Institute (RSC 025)	
Pyrotenax (RSC 014) www.pyrotenax.com	IBC	www.wpi.edu/+ADLN/Fire	83
Safety Technology (RSC 015) www.sti-usa.com	92		

United States Postal Service

Statement of Ownership, Management, and Circulation

1. Publication Title NFPA JOURNAL	2. Publication Number 1054-8793	3. Filing Date 01/02
4. Issue Frequency BIMONTHLY	5. Number of Issues Published Annually 6	6. Annual Subscription Price \$84.50
7. Complete Mailing Address of Known Office of Publication (Not printer) (Street, city, county, state, and ZIP+4) 1 BATTERY MARCH PARK QUINCY, MA 02269-9101		8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not printer) SAME AS ABOVE
9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do not leave blank)		
Publisher (Name and complete mailing address) KATHLEEN H. ROBINSON, NFPA 1 BATTERY MARCH PARK, QUINCY, MA 02269-9101		
Editor (Name and complete mailing address) STEPHEN MURPHY, NFPA 1 BATTERY MARCH PARK, QUINCY, MA 02269-9101		
Managing Editor (Name and complete mailing address) JOHN NICHOLSON, NFPA 1 BATTERY MARCH PARK, QUINCY, MA 02269-9101		
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Full Name NATIONAL FIRE PROTECTION ASSN.		Complete Mailing Address 1 BATTERY MARCH PARK, QUINCY, MA 02269-9101
11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities. If none, check box <input checked="" type="checkbox"/> None		
Full Name NONE		Complete Mailing Address
12. Tax Status (For completion by nonprofit organizations authorized to mail at nonprofit rates) (Check one) <input type="checkbox"/> The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes. <input type="checkbox"/> Has Not Changed During Preceding 12 Months <input type="checkbox"/> Has Changed During Preceding 12 Months (Publisher must submit explanation of change with this statement)		

13. Publication Title NFPA JOURNAL	14. Issue Date for Circulation Data Below SEPTEMBER/OCTOBER 2002	
15. Extent and Nature of Circulation	Average No. Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
a. Total Number of Copies (Net press run)	93,590	97,654
(1) Paid/Requested Outside-County Mail Subscriptions (Sales or Form 3541) (Include advertiser's proof and exchange copies)	75,457	79,801
(2) Paid In-County Subscriptions (Sales or Form 3541) (Include advertiser's proof and exchange copies)	0	0
(3) Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Non-USPS Paid Distribution	N/A	N/A
(4) Other Classes Mailed Through the USPS	0	0
c. Total Paid and/or Requested Circulation (Sum of 15b(1), (2), (3), and (4))	75,457	79,801
d. Free Distribution by Mail (Samples, complimentary, and other free)		
(1) Outside-County as Stated on Form 3541	7,800	7,723
(2) In-County as Stated on Form 3541	0	0
(3) Other Classes Mailed Through the USPS	0	0
e. Free Distribution Outside the Mail (Carriers or other means)	9,513	9,245
f. Total Free Distribution (Sum of 15d and 15e)	17,313	16,968
g. Total Distribution (Sum of 15c and 15f)	92,770	96,769
h. Copies not Distributed	720	825
i. Total (Sum of 15g and h)	93,030	90,257
j. Percent Paid and/or Requested Circulation (15c divided by 15g times 100)	81.33%	82.56%
16. Publication of Statement of Ownership <input checked="" type="checkbox"/> Publication required. Will be printed in the Nov/Dec 2002 issue of this publication. <input type="checkbox"/> Publication not required.		
17. Signature and Title of Editor, Publisher, Business Manager, or Owner Kathleen H. Robinson		Date 10/1/02
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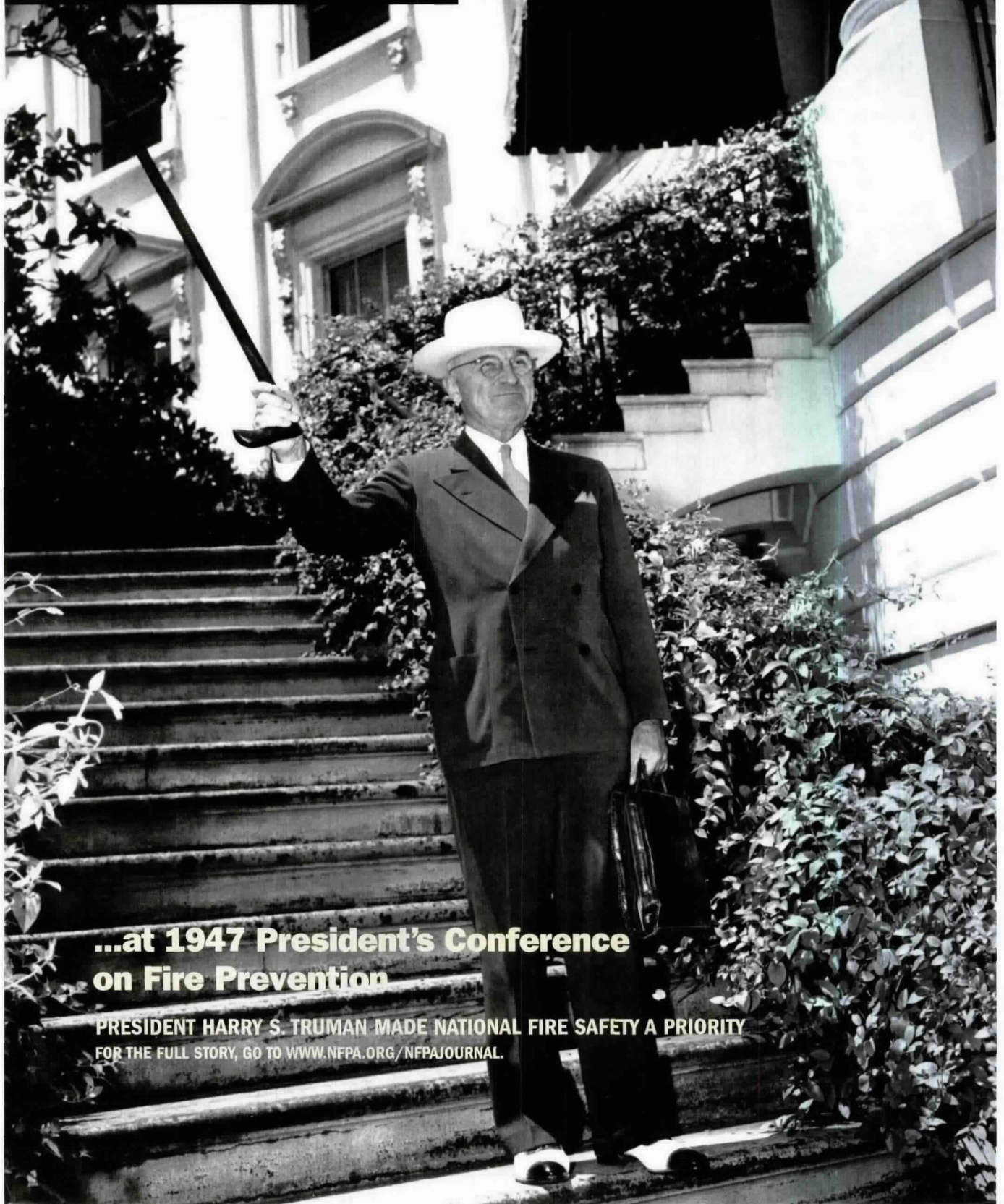
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JOHN NICHOLSON



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