Are security bars keeping criminals out or locking residents in?
We Deliver the Complete Foam Package.

- R & D Testing
- Distributor Support
- Field Start-Up Assistance
- Drawing and Spec Approvals
- Complete FOAM Hardware Line
- Quotations
- Classroom Training
- Complete FOAM Agent Line
- Dedicated Regional FOAM Managers

Get Your Complete FOAM Information Package - including Brochure, Application/Design CD and High Expansion FOAM Video:
800-346-FOAM or 715-735-7411

Circle 004 Reader Service Card
Now satisfy both with cost-effective, easy-to-install PyroCiC™ 2-hour fire-rated cable. The 2002 NFPA 72 is clear. When emergency notification circuits are used for partial evacuation or relocation of occupants, the wiring must be fire-survivable. Ignore the code, and you could be facing heavy consequences—not just the financial cost of penalties, but the devastating cost of human life.

Fortunately, compliance is easier and less costly than you think. Because new PyroCiC 2-hour fire-rated cable from Pyrotenax was specially designed to meet the survivability and installation requirements of NFPA 70 and NFPA 72.

**Triple barrier. Triple protection.** High-quality PyroCiC features an exclusive triple-barrier design—mica glass tape, silicone rubber insulation and a copper foil shield, all contained in a low-smoke, zero-halogen jacket. When installed in 3/4-inch EMT, it provides the 2-hour protection that shields critical fire alarm circuits from fire.

**Tremendous cost savings.** Forget high-dollar renovations. PyroCiC allows both the initial run and the return loop to be installed in the same shaft. That means the cost of meeting the code—in new installations or retrofits—is a fraction of the cost of construction alternatives.

**Quick, easy installation.** Unlike cables with pressure-extruded jacketing, PyroCiC features a “tubed” jacket for fast, simple removal without damage to the insulation. Just score, break and remove. Color-coded—not merely labeled—wires help speed installation, too.

Don’t wait. Don’t risk the costs of noncompliance. Find out more about PyroCiC cable by calling 1-800-234-6501, e-mailing info@tycothermal.com or visiting www.tycothermal.com. It's a matter of code. It's a matter of conscience. It's a matter of time.
Fire Solutions for Manufacturing

"Finally, a fire alarm network that links to other systems for a total life-safety strategy.

SimplexGrinnell's fire alarm solutions are part of our industry-leading OneStop™ Solutions Integration. OneStop™ is a comprehensive delivery model offering you a total single-source solution across all your integrated security, fire and life safety, building communications and healthcare communications needs. Whether it's new construction, a retrofit application, or the servicing of any of your systems, OneStop™ lets us provide a complete best-in-class solution at lower life-cycle costs. And it's all available from SimplexGrinnell with just one call.

Fire Solutions for Manufacturing

"Buildings, people and processes – we need to protect them all while meeting the strictest OSHA, fire and emergency evacuation standards. So we turned to North America's specialist in life-safety systems integration, SimplexGrinnell. Their fire, security, communications and Internet-based management systems have turned a complex challenge spread over a large area into a seamless life-safety solution. And with their industry-leading Central Station Monitoring Services, we can rest easy, knowing our facilities are being watched 24 hours a day. Best of all, everything's managed under a single contract for complete vendor accountability."

1-800-746-7539
In Canada: 1-800-565-5400
www.simplexgrinnell.com

tyco
Fire & Security

SimplexGrinnell
Protecting People, Property and Peace of Mind®

Circle 024 Reader Service Card
FEATURES

COVER STORY
Insecure: Dangers of Immobile Security Bars 38
While they can lock criminals out, home security bars can just as effectively lock residents in. by John R. Paradise

Sound Asleep 44
Research is needed to determine why children are sleeping through smoke alarms. by Shelly Reese

Gearing Up for New Threats 50
First responders are training to prepare for possible terrorist threats. Is their equipment behind the curve? by Alan S. Brown

On-Duty Deaths: Firefighter Fatalities 2002 56
In 2002, 97 on-duty firefighter deaths occurred in the U.S. This compares to the 440 firefighter fatalities that occurred in 2001. by Rita Fahy and Paul LeBlanc

Safer Assembly 64
In the months since its hearing, the Technical Committee on Assembly Occupancies and NFPA have strive to make places of assembly safer. by John Nicholson

COLUMNs

Meetings 20
by Brian Benstock

Building to Code 22
by Jerry Wooldridge

Heads Up 24
by Russell P. Fleming

Structural Ops 26
by Sanders & Klaene

Just Ask 28
by Amy Spencer & Bonnie Manley

In Compliance 30
by Chip Carson

Inside the Beltway 32
by Stephen Barlas

Buzzwords 34
by Wayne Moore

Ins and Outs 36
by Jenna Padula

Outreach 37
by Meri-K Appy

DEPARTMENTS

First Word 6
by James Shannon

Mail Call 8
by Brian Benstock

In a Flash! 13
by John Nicholson

Firewatch 14
by Kenneth Tremblay

Extra! 18

Section News 68

What's Hot 77

Datebook 79

Classifieds 79

Looking Back 80

Copyright © 2003 NFPA. All rights reserved. PRINTED IN USA. NFPA Journal (ISSN 1054-8793) is a membership magazine published bimonthly, plus a Buyers' Guide annually in February, by NFPA, One Batterymarch Park, Quincy, MA 02269-9101. NFPA annual dues: members, $135 (includes $40.50 subscription to NFPA Journal, organization membership, $50). Periodicals postage rates paid at Boston, MA, and at additional mailing offices. POSTMASTER: Send address changes to NFPA Journal, NFPA, P.O. Box 9101, One Batterymarch Park, Quincy, MA 02269-9101. All issues of NFPA Journal are available in microfilm from University Microfilms, International, 300 North Zeeb Road, Ann Arbor, Michigan 48106.

NOTICE CONCERNING ADVERTISING
NFPA reserves the right to accept or reject any advertisement submitted for publication in NFPA Journal. NFPA does not attempt to investigate or verify claims, including claims of compliance with NFPA codes and standards, made in advertisements appearing in NFPA Journal. The appearance of advertising in NFPA Journal in no way implies endorsement or approval by NFPA of any advertising claims or of the advertiser, its product, or services. NFPA disclaims any liability whatsoever in connection with advertising appearing in NFPA Journal.
ABOUT NFPA
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.

MEMBER BENEFITS
Membership in NFPA gives you access to the most current fire and life safety research, professional contacts and code updates you need in your job. Benefits include:
- Code Newsletter: Enter your preferred email address at www.nfpa.org for access to your online issue of NFPA News for the latest codes and standards activities. Be sure to also register for NFPA Update, a supplementary email newsletter delivered monthly to your desktop.
- Free Section Membership: Get additional benefits targeted to your profession. Joining one of NFPA's 16 specialty sections connects you to other industry experts worldwide. Trade tips and ideas, solve problems and build a network of peers you'll value throughout your career.
- Subscription to NFPA Journal*: NFPA's official members-only bi-monthly magazine helps you stay on top of the latest news and trends in fire and life safety, prevention techniques, post-fire investigations and code developments.
- Advisory Service and Technical Help: Save time searching for answers to your compliance questions with free technical assistance from NFPA fire and life safety staff specialists.
- Directory and Buyers' Guide: Keep these references at hand so you know who to call for answers and referrals. NFPA's Directory lists staff contacts and areas of expertise, as well as guides to technical committees you may wish to serve on. The NFPA Directory's Buyers' Guide helps you locate products, manufacturers, consultants, and trade names quickly.
- Online Privileges at www.nfpa.org: Enjoy members-only access to online features, special reports and code information, which is especially useful if you're preparing reports or presentations. Sign up for special e-mail bulletins on job postings in our Career Center or search for qualified employees for your organization.
- Voting Rights: Have a voice in codes and standards you work with. Vote on proposed changes to codes and standards at the May and November meetings. Voting privileges begin after 180 days of individual membership.
- Member Discounts: Get a 10% discount on all NFPA workshops, services, code books, field guides, continuing education seminars, handbooks, and manuals.

To join NFPA, or to update your membership information, call TOLL FREE 1-800-344-3555, or write NFPA, One Batterymarch Park, Quincy, MA 02169-7471.
A construction site is no place for the weak. Big jobs, tough guys, rough handling are all par for the course. That's why BlazeMaster® fire sprinkler systems are the standard in fire protection.

Nothing is quicker, cleaner, quieter, or easier to install than a BlazeMaster fire sprinkler system.

Check the facts:
- Proven performance with over 15 years of installations (unmatched by anyone in the CPVC industry)
- Factory Mutual* approved
- Meets the requirements of all major model codes
- Exceeds ASTM standards

Listed for more types of applications than any other non-metallic system.

**NEW UL LISTINGS FOR BLAZEMASTER PIPE AND FITTINGS:**
- Use with light hazard, quick response, extended coverage sprinklers in exposed applications with maximum head spacing 20' on pendent and 18' on sidewall
- Return air plenums per NFPA 90A
- Exposed system risers in accordance with NFPA 13D and 13R
- Exposed solid wood joists in NFPA 13D basement installations

A BlazeMaster fire sprinkler system is the best quality CPVC system available on the market. And because installation is so simple, you will find there's substantial cost savings over metal systems.

Talk to the leader in plastic technology about this advanced system. Call today for more information. 888-234-2436

www.blazemaster.com
DURING THE PAST MONTHS, I have testified in both the Senate and the House urging federal support for our nation’s first responders because of the continuing threat to our homeland security. In both the Senate Commerce Committee hearing and the House Science Committee I have been asked different versions of the same question: Isn’t funding our fire service a

local responsibility? Why should the federal government assume the financial burden of paying for what has throughout history always been an obligation of cities and towns?

These are valid questions. But these are not ordinary times. Since September 11, 2001, I have spent a great deal of time with fire service personnel from all over America. Their time, energy, and resources are stretched to the breaking point because of the demands placed on them by the new threats for which they must prepare. In big cities and small towns across America, we expect and the federal government expects our first responders to be prepared to deal with a range of threats that had not been serious concerns just two years ago.

A needs assessment that NFPA conducted for FEMA demonstrates how

severe the problem is for our whole fire service.

- Only 1 in every 10 fire departments has the personnel and equipment required to respond to a building collapse or the release of chemical or biological agents. One in ten.
- Half of our firefighting force lacks the formal training in technical rescue, which involves unique or complex conditions—precisely the situation they would encounter in a terrorist attack.
- As we send our firefighters into a building or any rescue situation, one-third of the protective clothing they are wearing is more than 10 years old.
- At least 65 percent of cities and towns nationwide lack sufficient fire stations to achieve widely recognized response-time guidelines.
- On a typical fire department shift, 45 percent of first responding firefighters lack portable radios. Thirty-six percent lack self-contained breathing apparatus.
- Forty-two percent answer an emergency call without a PASS (Personal Alert Safety System) device. For those of you who don’t know, PASS devices help locate firefighters who are trapped inside buildings. They are crucial should an attack like the one on the Twin Towers occur.

The role of our fire service and other first responders is different today from what it has been at any other point in our history. Never before have enemies from outside threatened America like this. Our fire service is

being asked to respond to a national emergency by our national government. The national government is equipped to assess the threat and coordinate through the Department of Homeland Security preparedness efforts. America’s fire service and community of first responders have answered the call admirably and done their best to protect us all. However, the only way the gaps identified in our needs assessment can be closed is with some federal assistance. That is how this situation is different and why NFPA is doing everything it can to urge the federal government to help our fire service and other first responders to do the job we have asked them to do.

James M. Shannon
President and Chief Executive Officer, NFPA

Threats to our security require support for our first responders
Technology you trust. Experts you can count on.

At EST we know that real value can only be a result of the best equipment coupled with the best trained and most knowledgeable people to install and maintain it. That's why we hand-pick each of our Strategic Partners and continually hold them up to the most exacting standards of excellence found in our industry today. When you deal with an EST Strategic Partner, you're dealing with proven professionals backed by an exclusive support strategy that funnels our combined expertise directly to your installation. It's a strategy that works. It's a partnership we stake our reputation on. Contact EST today to locate the Strategic Partner nearest you.

"In Business for Life"®

For additional information, visit us online at www.est.net/nfpa or call 1-888-EST2Day (1-888-378-2329)
**MAIL CALL**

**A Day Too Late**
The “Over Under” article [on NFPA standards for bridges and tunnels] in the May/June 2003 issue came a day too late for our design team. This article would have saved us some time targeting the issues. Now that the differential equations for fill times have been solved, the heat transfer calculations for heat input have been determined, and life cycle costs with different insulation thickness have been examined, I would now like to add or expand on a few points.

First is fire department coordination. With a Class I system, they will be the ones operating the standpipe. Think of how many times the phrase “with the authority having jurisdiction” appears in NFPA standards. Coordination should include type and class of standpipe system, pressure requirements, number of hose valves at stations, fire department connection locations, testing, and all the other points mentioned in the article.

Take special care when selecting components. For pipe material, steel is more versatile and comes with a wide selection of products for joining and supporting versus cement-lined ductile iron pipe, which is more durable, lasts longer, and provides better flow characteristics. Expansion joints and loops require pipe guides to avoid buckling, and grooved joints may require anchors at changes of direction adjacent to long pipe runs. Pay particular attention to support selection and NFPA requirements. Most catalogued and listed supports are not applicable for custom installations.

Finally, a note should be included for existing structures when considering protection of piping. After all, the standpipe will most likely be installed exposed to the fire zone. Examine all component temperature ratings. In addition, establish what temperature limits you will use for thermal expansion. If the intent is to operate the standpipe during a fire, consider whether the upper temperature limit will be designed to withstand fire temperatures instead of climatic temperatures, or if your standpipe is outdoors, you may then need to consider solar radiation.

**Carlos Alvarez**
MDM Consulting Engineers

**New Sponsor Offers Thanks**
On behalf of Pella Corporation, I want to thank NFPA for the warm welcome received at the World Safety Conference and Exposition®, as a new sponsor of Fire Prevention Week. We were honored to be recognized at the Opening General Session in Dallas May 18, and to have the opportunity to personally meet so many dedicated leaders in the field of fire safety during the conference.

As an industry leader in life improvement, Pella is pleased to partner with NFPA, and the Home Safety Council to help save lives through this essential campaign which stresses the importance of planning and practicing a home fire escape plan. In addition to our sponsorship of Fire Prevention Week, we are launching a year-round home fire safety campaign involving our nearly 7,000 team members who manufacture, and market and service quality windows and doors, to help raise home fire safety awareness and preparedness in their home communities.

We congratulate NFPA on an outstanding World Safety Conference and Exposition, and look forward to a strong partnership, which will help save lives for many years to come.

**Kathy Krafka Harkema**
Corporate Public Relations,
Pella® Windows & Doors
Pella Corporation
Pella, Iowa

**Technical Note**
I enjoy reading your magazine. Just one technical note. I’ve noticed that the word “fumes” is often misapplied to describe any airborne gas that can either ignite or cause illness.

The technical definition of “fumes” is small, solid particles formed by the condensation of the vapors of solid materials. Fumes are generally formed by processes, such as internal combustion engines or welding.

Natural or liquid propane gas are gases and flammable or combustible liquids such as kerosene or heating oils give off vapors when heated to their flash point.

Thanks for letting me explain the difference.

**David R. Burns**
Fire Chief
Minooka, Illinois, Fire District

**Second-Floor Sprinkler in Club Fire**
I was just reading John Nicholson’s article “[Looking Back,” May/June 2003 www.NFPAJournal.org] on the Happy Lands Social Club comparison to the recent tragedy in Rhode Island.

One point was inaccurate. For all the problems associated with the illegal social club, there was in fact a sprinkler system. This is what kept the fire
from spreading to the second floor. I was the officer in charge of the second ladder company at the fire and assigned to search the second floor. The sprinkler head at the top of the stairway landing was operating and contributed to the difficulty in venting the second floor.

Robert McMahon  
Ladder 31 (ret.), FDNY

NFPA RESPONDS:  
Thanks for adding to our information about that tragic fire.

Abandoned Common Sense  
After reading John Paradise’s article “Live Burn” in the May/June ’03 issue, I found it unbelievable how some people abandon all common sense when they put on turnout gear or, even worse, a white helmet. As a survivor of the Parsippany ’92 incident, I speak from experience. One thing that played through my head while lying in St. Barnabas’ burn unit is that once this incident is exposed, it would eliminate the chances of it happening to anyone else. Obviously not the case.

I do see the need for live burn training, but as “boring” as it might be, it has to be done in a controlled structure. The risks are high enough when you’re doing the job. Why risk it all by intentionally building a hazardous condition and sending in your own men—even worse, probies?

I recommend to anyone joining the fire service, listen and learn as much as possible—but NEVER lose your common sense, either on the fireground or the training ground.

Jeff Berry  
Parisippany-Troy Hill, New Jersey, District One, Fire Department

NFPA RESPONDS:  
On June 2, NFPA posted NFPA 1403, Live Fire Evolutions, online as a PDF download, allowing users to review,
Another Hazard

The May/June issue's "Structural Ops" column provides an excellent discussion of the hazards that might be found in a truck terminal. I would like to add another, which, while not very likely, could be devastating if it did occur.

I refer to the shipment of high-energy gamma radiation sources in general cargo. They're packed in containers [with] some degree of fire resistance, predicated on the possibility of a fire in a highway crash. A fire in a terminal could well provide a much more serious exposure, which could partially or completely destroy the lead shielding. An unshielded 1,000-curie Cobalt-60 gamma radiation source will provide 1,600 R/hr (roentgens per hour) at a 3-foot (91.4-centimeter) distance. A fatal exposure would occur in a short time with no warning.

However, this hazard can be avoided. Gamma radiation can't be a hazard without sending out signals of its presence and strength. These signals can be detected by the right "radio," a gamma radiation-measuring device. The potential for a "dirty bomb" attack has caused the dusting off and reactivation of civil defense radiation detectors. Personal radiation measuring devices are being supplied to haz-mat units.

As a former public safety liaison officer with the U.S. Atomic Energy
Commission, I taught the facts about radiation exposure to classes of fire instructors and fire protection engineers across the country. I also provided this tactical suggestion: At any fire in transportation of general cargo where there may be unknown contents, make a gamma radiation survey. If radiation above background is detected, back off to where the level drops to normal and summon expert assistance.

If a heavy lead container is found undamaged, be aware that a low level of radiation is permitted at the surface of the container. This level is predicted on the assumption that transport personnel will be near the container for a short time ....

Francis L. Brannigan
Safety and Fire Protection Engineer

NFPA Clarifies Fire Statistics
In “Behind Closed Doors,” May/June issue, Robert Solomon was quoted as saying that before the Greenwood Health Center fire in Connecticut last February, there hadn't been a multiple-death nursing home fire since a Virginia incident in 1989 that killed 12 people. In fact, Mr. Solomon said that the 1989 fire was the last nursing home fire with a death toll comparable to that of the Connecticut incident.

The last multiple-death nursing home fire (where “multiple death” means three or more fatalities) occurred in 1999.

In addition, Robert Duval’s statement that the preliminary reports indicate that the building met the provisions of the 1997 edition of NFPA 101®, Life Safety Code®, was premature. The investigations by the state of Connecticut and NFPA are still being conducted. It hasn't been determined if the building met or didn't meet NFPA 101.

In the same article, Tom Jaeger was quoted as saying that nursing homes in the United States have averaged 1.0 fire death a year in the last 20 years and 0.3 fire deaths a year in the last 10 years. However, Mr. Jaeger was mis-

Help is Here!

1. FOR FALSE FIRE ALARMS - With devices like our world-famous Stopper® II to help protect manual pull stations.

2. FOR VANDALISM AND ACCIDENTAL DAMAGE - With dozens of Wire Guards and super-tough Polycarbonate Covers.

3. FOR CCTV CAMERA DAMAGE AND TAMPERING - With or without heater, blower and sunshield.

4. FOR PUSH BUTTON PROBLEMS - With our ADA-compliant multi-purpose switches.

Have a problem or don't want to risk one? Call us toll-free or visit our website.

800-888-4STI www.Stopper.com

We protect the things that protect you
Safety Technology International, Inc.
2306 Airport Rd. • Waterford, MI 48327 • Phone: 248-673-9898 • Fax: 248-673-1246

Circle 022 Reader Service Card
PICK UP THE FUTURE OF BACKFLOW TODAY!

Introducing the Most Advanced Design in Backflow Assemblies from Ames, the Company that Invented the "Silver Bullet."

Yes, he is really holding up a 4" double-check assembly unaided! This new, state-of-the-art backflow weighs only 61 pounds including shutoffs. The leading-edge design not only makes the Ames assembly lightweight, it makes it unbeatable. Check out these features:

- Certified lowest pressure loss
- 200% lighter than closest competitor
- Most compact design in the industry
- Entire valve body and closure sleeve manufactured from 300 Series stainless steel
- Approved with gate valves or UL/FM butterfly valves
- Approved in horizontal, vertical, "N" or "Z" pattern installations
- Groove connections for ease of installation and pipe connections
- Patented Link-check assemblies for easy serviceability
- Smallest enclosure
- Made in USA

PICK UP THE INDUSTRY'S BEST BACKFLOW ASSEMBLY TODAY!

DIVISION OF WATTS INDUSTRIES
875 National Drive Suite #107 Sacramento, CA 95834
Phone 916.928.0123 Fax 916.928.9333 www.amesfirewater.com

John R. Hall, Jr.
Assistant Vice-President
NFPA Fire Analysis and Research

Comments? Please send your letter to NFPA Journal, NFPA, One Batterymarch Park, Quincy, MA 02169. You may also fax us at (617) 984-7090 or E-mail us at npajournal@nfpa.org. When sending E-mail, please include your city and state.

In the next issue
* Fire safety and college dorms
* 2002 U.S. Fire Loss Report
* Fire Prevention Week 2003
* Recruiting Fire Protection Engineers
* 2002 U.S. Large Loss Fire Report

quoted and meant to identify these rates as the average death tolls in multiple-death fires for these periods, not in nursing home fires in general. Even so, Mr. Jaeger's calculations missed a 1999 incident that occurred in Pennsylvania and a late death in another incident. Taking these into account, nursing homes averaged 1.3 fire deaths a year from 1983 to 2002 and 0.7 fire deaths a year from 1993 to 2002, both in multiple-death fires only.

Readers may be interested in more details of Mr. Jaeger's cost estimate for sprinklering the remaining unsprinklered nursing homes. The article indicates that 25 percent, or 4,250, of the 17,000 U.S. nursing homes are unsprinklered.

Unsprinklered nursing homes tend to be larger, on average, than sprinklered nursing homes, providing roughly 400 square feet (37 square meters) per resident compared to the 353 square feet (32.7 square meters) per resident in the Greenwood Health Center, and 140 beds per facility compared to an average of 107 beds per facility nationally. Mr. Jaeger's experience with sprinkler retrofits indicates that $4 per square foot (0.09 square meters) is reasonable. Multiplying 4,250 by 400 by 140 by 4 yields an estimate of $952 million, or roughly the $1 billion cited in the article.

12 NFPA JOURNAL JULY/AUGUST 2003 WWW.NFPAJOURNAL.ORG
GAS- AND CHARCOAL-FUELED barbecue grills have become staples of the U.S. lifestyle. According to the Barbecue Industry Association, three out of four households in this country own a barbecue grill. Unfortunately, their misuse can have devastating, sometimes fatal, results.

According to U.S. Home Cooking Fire Patterns and Trends, a report prepared by NFPA's Fire Analysis and Research Division, gas and charcoal grills cause an annual average of 1,500 structure fires and 4,800 outdoor fires in or on residential properties. Although gas-fueled barbecue grills have been involved in four times as many outdoor fires as structure fires in recent years, nearly all deaths and property damage occur in fires that start in, or spread to, the structure. By contrast, the majority of fires involving charcoal-fueled barbecue grills and nearly all associated fire deaths and property damage occur in fires that start in, or spread to, the structure.

Fires involving gas-fueled grills increased two-and-a-half times between 1980 and 1998, primarily because the use of gas-fueled grills increased substantially. In fact, the number of households that own gas grills nearly tripled between 1982 to 1993, up 193 percent from 9.4 million to 27.5 million.*

Fires involving charcoal-fueled grills, on the other hand, declined slightly for outdoor fires and sharply for structure fires from 1980 to 1998. Between 1993 and 1997, charcoal-fueled grills were also responsible for an average of 20 non-fire carbon monoxide poisoning deaths per year, a death toll much higher than the fire death toll for this type of grill.

As with other types of cooking devices, the leading causes of structure fires involving charcoal-fueled grills are unattended cooking and placing combustibles too close to heat. In structure fires, the items first ignited are most commonly the exterior trim and wall coverings, while plants, grass, or brush are the most common items first ignited in outdoor fires.

Interestingly enough, the leading cause of fires involving gas-fueled grills isn't unattended cooking, which was cited as the cause of just 11.7 percent of structure fires and 2.8 percent of outdoor fires involving such grills. Rather, the leading cause of gas-grill fires is part failure, leaks, or breaks, which accounted for 37.1 percent of structure fires and 60.5 percent of outdoor fires. Consistent with these statistics are those for the two leading items first ignited: Fuel and accelerants or some other gas or liquid in or from a pipe or container, which collectively accounted for 40.6 percent of structure fires and 68.4 percent of outdoor fires involving gas grills. Other leading items first ignited include cooking materials and exterior wall coverings.

RESIDENTIAL

Fireworks starts house fire MICHIGAN

A family using legal fireworks on the rear deck of their single-family home to celebrate Independence Day may have inadvertently ignited the deck, sunroom, and rear of their house. However, a number of people in the neighborhood were using illegal fireworks at the same time, so it remains unclear which fireworks actually started the fire.

The two-story, wood-framed house was 35 feet (11 meters) long and 45 feet (14 meters) wide with a wood-truss roof and aluminum and brick siding. There were no fire sprinklers, but smoke alarms had been installed on both floors.

The family used the fireworks between 10 and 11 p.m. Hours later, a resident was awoken by the sound of scratching at the back of the house and went to investigate. When she discovered the fire, she called 911 and roused the other four residents, all of whom escaped.

Firefighters arrived four minutes after the 4:22 a.m. call and found smoke and flames coming from the back of the house and the roof of the attached garage. They stretched a hose line to the second floor, where the smoke, which was light on the first floor, became thicker as fire spread through the attic. When the firefighters opened the ceiling, they encountered heavy fire.

The incident commander evacuated the building when the fire crews failed to extinguish the blaze and used a ladder pipe to knock the fire down. Firefighters then reentered the house and extinguished hot spots.

Investigators believe the fire started when lit fireworks ignited the wooden deck and spread up the decorative wooden lattice into the attic above the sunroom, garage, and family room.

The house, valued at $186,000, had $100,000 in damage, and its contents, valued at $90,000, suffered a $45,000 loss. Radiant heat did $5,000 damage to an adjacent home. There were no injuries.

Candle ignites decorative linen over bed FLORIDA

When a candle ignited bedding in a condominium on the top floor of an 11-story building, the occupants had the presence of mind to close the front door when they left the unit, thus limiting smoke damage to the condominium.

The unsprinklered, 85-unit concrete structure measured 195 feet (59 meters) by 50 feet (15 meters). Standpipe system and portable fire extinguishers were located throughout the building, and there were smoke alarms and manual pull stations in the common areas. Because the fire was confined to the unit of origin, however, smoke didn’t reach the common areas so the internal fire alarm system didn’t sound.

The fire began when a lit candle on a bedside table tipped over and ignited the bed’s decorative linen canopy. The burning linen fell onto the bed, igniting the bedding and the mattress, then spread to other combustibles in the room. The residents tried to extinguish the fire themselves, but the flames spread so quickly they called 911 at 12:44 a.m. and left the unit.

When they encountered arriving firefighters in the lobby, the unit’s residents told the crews where the fire was and what was burning. An engine and rescue company attached hose lines to the standpipe on the fire floor and entered the condo to extinguish the fire, conduct a primary search, and ventilate the unit. Firefighters also evacuated the building’s top four floors.

Although the condo’s occupants closed the unit’s front
Redefining Fire Protection with a *Flexible Network System*

One product series for all your fire detection needs.

**ONYX™ SERIES**

- Enhanced survivability through distributed control
- Faster network communications
- True “Peer-to-Peer” networking
- Small system networkability
- Design flexibility
- Reduced costs

The Onyx Series — everything you would expect from NOTIFIER.

For more information visit www.notifier.com or call 203-484-7161 for a local distributor.

NOTIFIER®
A Honeywell Company
The occupants manufactured an undetected fire burning in concealed areas heavily involved in a building in fire before the fire department arrived. Alerted by a passerby who activated a fire alarm street box at 10:04 p.m., the fire department arrived within four minutes as fire and heavy black smoke was seen coming from attic windows.

The one-and-one-half-story building was constructed of wood framing with an asphalt roof and wooden exterior siding, and measured 90 feet (27 meters) in length and 40 feet (12 meters) in width. The occupants manufactured ornamental pewter objects and had a retail sales area. There were no fire detection systems or fire sprinklers and the building was closed for the night.

Firefighters established a water supply and attempted an interior attack, however the fire had gained so much headway that command ordered the companies into defensive positions and called for two additional alarms. Five fire departments sent apparatus to the scene, as the fire was declared under control at 1:26 a.m.

Investigators determined the point of origin to be near an exterior light fixture on an outside wall near the attic space. The motion-sensor light and associated wiring were removed for further analysis, but are suspected in igniting the fire that spread within the attic space filled with records, boxes, and packing materials. There were no reports of dollar loss, however the building sustained heavy damage. There were no injuries.

**MANUFACTURING**

**Exterior light fixture is suspect in blaze**

**NEW HAMPSHIRE**

An undetected fire burning in concealed areas heavily involved in a building in fire before the fire department arrived. Alerted by a passerby who activated a fire alarm street box at 10:04 p.m., the fire department arrived within four minutes as fire and heavy black smoke was seen coming from attic windows.

The one-and-one-half-story building was constructed of wood framing with an asphalt roof and wooden exterior siding, and measured 90 feet (27 meters) in length and 40 feet (12 meters) in width. The occupants manufactured ornamental pewter objects and had a retail sales area. There were no fire detection systems or fire sprinklers and the building was closed for the night.

Firefighters established a water supply and attempted an interior attack, however the fire had gained so much headway that command ordered the companies into defensive positions and called for two additional alarms. Five fire departments sent apparatus to the scene, as the fire was declared under control at 1:26 a.m.

Investigators determined the point of origin to be near an exterior light fixture on an outside wall near the attic space. The motion-sensor light and associated wiring were removed for further analysis, but are suspected in igniting the fire that spread within the attic space filled with records, boxes, and packing materials. There were no reports of dollar loss, however the building sustained heavy damage. There were no injuries.

**MERCANTILE**

**Quick fire department response stops arson fire**

**MASSACHUSETTS**

The fire department’s rapid response prevented an intentionally set fire from spreading into several businesses that occupied a former shoe factory.

The balloon-framed, L-shaped building was four stories high and constructed of heavy timbers. It had no fire detection systems, although a wet-pipe fire sprinkler system provided full coverage.

A neighbor called 911 at 4:29 a.m. to report a dumpster fire at the building, and arriving firefighters found the dumpster fully involved and flames spreading up the exterior of the building. Using a 1 3/4-inch hose line, one crew started to knock the fire down, while a ladder crew entered the building, encountering moderate smoke on the two lower floors. The crew used a thermal imaging camera and determined that portions of a wall near the floor and around windows were holding heat. They opened these areas up and discovered charring and a smoldering fire.

Investigators determined that someone ignited trash piled against the wall of the building and that the resulting fire quickly spread up the structure’s wooden siding to the dumpster. They also determined that the fire sprinkler system didn’t activate because the fire’s heat didn’t build up in the structure.

Damage to the building, valued at $1.3 million, was estimated at $20,000. Damage to its contents, valued at $5 million, was estimated at $10,000. There were no injuries.

**ASSEMBLY**

**Fire sprinkler douses flames from holiday display**

**PENNSYLVANIA**

Malfunctioning electrical components in the base of an artificial Christmas tree in a country club’s second-floor ballroom ignited the room’s bar, but a fire sprinkler doused the flames and triggered a water flow alarm before the fire spread.

The three-story, wood-framed building, which was 150 feet (46 meters) long and 75 feet (23 meters) wide, was constructed of heavy timber, with concrete and stone walls. A wet-pipe fire sprinkler system had been installed throughout the building, and a central station alarm company monitored the water flow alarm. The building had no smoke alarms or detection equipment.

Firefighters received the water flow alarm around 8:40 p.m., followed by a 911 call. Arriving on scene within eight minutes, firefighters found heavy black smoke throughout the building, from which approximately 25 people had already evacuated. Upon investigation, firefighters discovered that a single fire sprinkler had extinguished the blaze.

Employees of a local store had spent the afternoon setting up a promotional display of holiday decorations, plugged into extension cords. They finished between 4 and 5 p.m. and went home, leaving the room vacant until 8 p.m. when the club manager checked the room. He found that several of the displays had been left on and unplugged the extension cords and power strips in the ballroom. About 20 minutes later, an employee reported smelling
A halogen light at the base powering a traditional string of lights made feeding a conductor that ran a small plastic ballroom bar, one of the tree illuminated the motor used to move a cold disk and a small fan. Investigators believe that a malfunction in the electrical components in the base of the tree started the fire, which consumed parts of the plastic stand and two-thirds of the tree, and damaged part of the carpet before it was extinguished. They found two extension cords plugged into the tree and an outlet under the plastic ballroom bar, one powering a traditional string of lights and feeding a converter that ran a small motor used to move a colored disk and a small fan. A halogen light at the base of the tree illuminated the tree's fiber optic strands.

The building and its contents were valued at $6.4 million. No structural damage was reported, but damage to the contents was estimated at $450,000. There were no injuries.

HEALTH CARE
Fire sprinklers control fire started by cigarette
CONNECTICUT

A cigarette discarded outside the entrance to a limited-care nursing facility ignited wood chips in a garden border. The fire spread to a wooden fence and up the building's siding to the roof, where three fire sprinklers controlled it while occupants were evacuated.

The one-story, wood-framed facility was 247 feet long (75 meters) and 174 feet (53 meters) and built on a concrete slab. Its walls were covered with vinyl siding, and its wood-truss roof was covered with asphalt shingles. A wet-pipe fire sprinkler system provided full coverage, as did a smoke and fire detection system. The 60-bed facility was fully operational at the time of the fire.

A single engine company responded to a report of a brush fire on the property at 3:09 p.m. When they arrived, firefighters saw heavy, brown smoke coming from the roof of the building and immediately requested a full response assignment followed by a second alarm.

The fire melted the vinyl soffit vents and spread into the attic, where three fire sprinklers activated, controlling the blaze until firefighters could open the roof and complete extinguishment.

The building, valued at $3,274,700, suffered damage estimated at $150,000. Its contents, valued at $400,000, suffered $37,000 in damage. There were no injuries.

One dead in board-and-care facility
MISSOURI

A fire that started on the exterior of a three-story, wood-framed board-and-care facility spread to the roof, where it quickly consumed the wooden roof trusses. Fire sprinklers kept the fire from spreading in some locations but couldn't prevent the partial collapse of the roof and ceilings.

The facility's fire sprinkler system was installed in compliance with NFPA 13R, Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height, which doesn't require protection of concealed spaces, such as attics. A fire detection system protected the entire facility. A central station alarm company monitored both systems.

A passerby noticed the fire and called 911 at 11:10 p.m. A battalion chief requested a second alarm on the way to the scene after seeing smoke and fire from several streets away.

Firefighters arrived within four minutes of the call to find flames covering the entire north wall of the structure. As one crew began to attack the fire, others began search and rescue operations and established a water supply. A third and fourth alarm were struck, bringing additional resources to the scene. By this time, however, the fire had fully engulfed the attic, and portions of the ceiling were collapsing. When it became obvious that attack lines on the upper floors weren't making headway, the incident commander pulled crews back to lower floors and ordered the building evacuated. Once the fire began to subside, firefighters reentered the building to conduct a secondary search when a check of the residents showed some were missing. They found three more occupants, whom they sent to the hospital, and discovered the body of an 86-year-old woman in a third-floor bedroom.

The incident commander declared a mass casualty incident to treat and transfer the facility's residents. In addition to the victim, six occupants, ranging in age from 75 to 94, were taken to the hospital suffering from smoke inhalation injuries. Two firefighters, ages 23 and 31, suffered heat-related injuries. Damage to the building was estimated at $3.4 million.
REVENUES IN 2002, the second year of NFPA's traditional three-year business cycle, were $77 million, slightly lower than expected. However, this shortfall was offset by expense savings, resulting in an operating surplus of $2.5 million before investment losses and pension adjustment.

NFPA Treasurer's Report

There was a net reduction of $11.9 million in NFPA's net assets caused by the downturn in the stock market, which reduced the Association's investments, in addition to a pension liability adjustment. Capital expenditures for the year were approximately $3 million. Major expenditures included the cost of a new information and order fulfillment system. There was also the repayment of $1 million of the long-term real estate loan. Accordingly, cash and cash equivalents decreased by approximately $3 million.

An analysis of NFPA's revenue and excerpts from the Association's audited financial statements for the years ending December 31, 2001 and 2002 follow:

The NFPA Treasurer's Report is issued to Association members as required by the Articles of the Association, Section 6.11, Paragraph 2, as adopted through amendment to the Articles in November 2000.

PAUL M. FITZGERALD is NFPA's Treasurer.

### Statements of Financial Position

<table>
<thead>
<tr>
<th></th>
<th>$'000's</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2002</td>
</tr>
<tr>
<td><strong>Assets</strong></td>
<td></td>
</tr>
<tr>
<td>Cash and cash equivalents</td>
<td>9,502</td>
</tr>
<tr>
<td>Inventory, accounts receivable, and other assets</td>
<td>21,687</td>
</tr>
<tr>
<td>Investments</td>
<td>50,327</td>
</tr>
<tr>
<td>Property and equipment</td>
<td>40,055</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>121,571</td>
</tr>
<tr>
<td><strong>Liabilities and net assets</strong></td>
<td></td>
</tr>
<tr>
<td>Accounts payable and other liabilities</td>
<td>16,730</td>
</tr>
<tr>
<td>Deferred revenues</td>
<td>12,168</td>
</tr>
<tr>
<td>Long-term loan</td>
<td>19,219</td>
</tr>
<tr>
<td><strong>Total liabilities</strong></td>
<td>48,117</td>
</tr>
<tr>
<td><strong>Total net assets</strong></td>
<td>73,454</td>
</tr>
<tr>
<td><strong>Total liabilities and net assets</strong></td>
<td>121,571</td>
</tr>
</tbody>
</table>

### Statements of Activities

<table>
<thead>
<tr>
<th></th>
<th>$'000's</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
</tr>
<tr>
<td>Publications</td>
<td>46,007</td>
</tr>
<tr>
<td>Membership</td>
<td>11,290</td>
</tr>
<tr>
<td>Other</td>
<td>19,877</td>
</tr>
<tr>
<td><strong>Total revenue</strong></td>
<td>77,174</td>
</tr>
<tr>
<td><strong>Expenses and investment losses</strong></td>
<td>(89,048)</td>
</tr>
<tr>
<td>Change in net assets</td>
<td>(11,874)</td>
</tr>
<tr>
<td><strong>Net assets as of beginning of year</strong></td>
<td>85,328</td>
</tr>
<tr>
<td><strong>Net assets as of end of year</strong></td>
<td>73,454</td>
</tr>
</tbody>
</table>

### Statements of Cash Flows

<table>
<thead>
<tr>
<th></th>
<th>$'000's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash flows from operating activities</td>
<td>1,329</td>
</tr>
<tr>
<td>Cash flows from investing activities</td>
<td>(3,254)</td>
</tr>
<tr>
<td>Cash flows from financing activities</td>
<td>(1,125)</td>
</tr>
<tr>
<td>Net decrease in cash and cash equivalents</td>
<td>(3,050)</td>
</tr>
<tr>
<td><strong>Cash and cash equivalents as of beginning of year</strong></td>
<td>12,552</td>
</tr>
<tr>
<td><strong>Cash and cash equivalents as of end of year</strong></td>
<td>9,502</td>
</tr>
</tbody>
</table>
NetSOLO® BROADBAND

THE FUTURE OF DISTRIBUTED AUDIO

Developed to meet the widest variety of applications using minimum equipment, NetSOLO® Broadband delivers on a platform of survivability, reliability, intelligibility and flexibility. Imagine full network control and communications, digital messaging, live voice instructions and fire fighter telephone communications implemented throughout a distributed network fire alarm system... on a single pair of wires.

For a free product CD, visit www.firecontrolinstruments.com/netsoload.htm or contact us at (781) 471-3000.

Circle 008 Reader Service Card
MEETINGS

IN RESPONSE TO RECENT domestic and international events, this year’s NFPA Fall Education Conference, to be held November 15 to 19 at the Reno Hilton in Reno, Nevada, will have a special focus on “Homeland Security: Preparedness and Response.”

Topics will include planning for effective response to emergencies and terrorist threats in public and private locations; analysis of emergency management programs incorporating homeland security concerns; and managing a chemical, biological, or nuclear incident affecting the commercial transportation industry. Also on the agenda are reviews of emergency response protocols involving rail transportation systems, including derailments, station emergencies, and acts of terrorism; of “best practices” for responding to security threats with local and regional resources; and of public emergency operations planning using an all-hazards approach, focusing on terrorist threats.

The impact of threats to healthcare providers and their readiness to respond to emergencies will also be discussed, and legal issues in preparing and implementing emergency action plans will be analyzed.

There will also be a variety of education sessions from which to choose, covering such topics as casino fire protection, new tools for public educators, hospital emergency incident command systems, and balancing all-hazards emergency operations planning with terrorism planning.

Before the conference, on Friday, November 14, and Saturday, November 15, several two-day pre-conference seminars will be held. These seminars cover NFPA 5000™, Building Construction and Safety Code™; NFPA 1, Uniform Fire Code™; NFPA 99, Health Care Facilities; and NFPA 921, Fire and Explosion Investigation.

Register for a seminar and save 25 percent on seminar fees. Seminars are priced separately from the main conference, and pre-registration is required.

For those preparing for the Certified Fire Protection Specialist exam, we’re offering a two-day primer, on Friday and Saturday, to increase your chances of success.

As usual, the Fall Education Conference will include a general session and technical committee report session at which the membership will vote on proposed NFPA codes, standards, and recommended practices. Among the documents reporting are NFPA 921, Fire and Explosion Investigation; NFPA 85, Boiler and Combustion Systems Hazards Code; and NFPA 1600, Disaster/Emergency Management and Business Continuity Programs. Also being voted on are NFPA 70E, Electrical Safety Requirements for Employee Workplaces; NFPA 2001, Clean Agent Fire Extinguishing Systems; NFPA 58, Liquefied Petroleum Gas Code; NFPA 59, Utility LP-Gas Plant Code; and NFPA 1670, Operations and Training for Technical Rescue Incidents.

Besides a first-class educational experience, you’ll have a fun, relaxing, carefree, and exciting time in Reno while attending the conference. For details about Reno and why the Reno Hilton is the place to play and the place to stay, visit www.nfpa.org/meetings.

Call (800) 648-5080 or (775) 789-2000 to register at the Reno Hilton. To secure the conference hotel room rate ($102 single/double) when making your reservations, you must use reference code “FIRE’03.” Please be sure to let the reservation agent know if you’re eligible to receive the government rate of $89.

For details on the Fall Education Conference and how to register, visit www.nfpa.org/meetings or call (617) 984-7310. You can bet we’re going to have a great time. See you in Reno!
### The Pelican™ CASH BACK Event:

**$20.00**

Manufacturer Rebate On M9 and M11 Flashlights

Mail in this form along with UPC bar code, store receipt and flashlight serial number

---

**Official Pelican Cash Rebate Offer. Value $20.**

<table>
<thead>
<tr>
<th>Name: First</th>
<th>MI</th>
<th>Last Name</th>
<th>Home Area Code &amp; Phone # (Optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Street Address (including apt. number, if any)</th>
<th>City</th>
<th>State</th>
<th>Zip Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date of Purchase</th>
<th>Date of Birth</th>
<th>Flashlight Serial Number</th>
<th>Email Address (Optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Mail-in Rebate Instructions:**

1. Purchase a Pelican M9 or M11 flashlight between 7/1/03 and 9/30/03 from an authorized Pelican dealer. Legibly complete this form and mail it with the required documentation to the address below to be postmarked by October 31, 2003, and received by November 7, 2003. Incomplete forms or forms without proper documentation and/or forms not received by the deadline will not be honored and will not be returned. Company is not responsible for late, lost, mutilated or misdirected mail. Mail with insufficient postage will be returned. All requests are subject to verification.

2. Send the completed Rebate Form along with a photocopy of the barcode sticker and a photocopy of your original receipt from your Pelican dealer that clearly shows the date of purchase and flashlight serial number.

3. Offer good only in the U.S. to legal U.S. residents, 18 years old or older prior to 7/1/03. Pelican employees, resellers, distributors and their respective agents and their immediate family members are not eligible.

4. Please allow approximately 4-6 weeks from the date you mail your rebate for processing. For questions regarding this offer, please call 800-473-5422 or 310-326-4700.

5. Void where restricted, taxed or prohibited by law. Fraudulent submissions could result in federal prosecution with U.S. Mail Fraud Statute (18 U.S. Code §§ 1241 & 1242).

6. Rebate checks must be cashed within 90 days of date issued.

7. Mail requests via regular U.S. mail to: Pelican Rebate, 23215 Early Ave., Torrance, CA 90505.

Mail the following requirements by October 31, 2003:

- Completed Form
- Photocopy of your original receipt
- Photocopy of your barcode
- Flashlight serial number (on form)

All trademarks and logos displayed herein are registered and unregistered trademarks of Pelican Products, Inc. and others.

©2003 Pelican Products, Inc. All rights reserved. Printed in the USA.
WHILE TRYING TO EXPLAIN why codes are enforced in residential properties, I've heard owners say, "A man’s home is his castle. Why can’t I just build it the way I want it?" Perhaps the best answer lies in statistics.

As with most statistics, fire loss statistics provide us with both good news and bad. First, the good news: The number of fires across the nation continues to drop.

Over the last 20 years, fires have decreased by about 36 percent, and the number of civilian deaths caused by fire has decreased by approximately 53 percent.

The bad news is that our home, the place we spend most of our time, continues to lead the way in the number of civilian deaths.

During 1999, 3,570 civilians died in fires in the United States, and 81 percent of those people died in a home. It comes as no surprise that 71 percent of all structure fires occurred in homes.

NFPA 5000™, Building Construction and Safety Code™, defines a residential occupancy as one that provides sleeping accommodations for purposes other than health care or detention and correction. Thus, residential occupancies include one- and two-family dwellings, lodging or rooming houses, hotels and dormitories, apartment buildings, and residential board-and-care facilities. NFPA 5000 also details the minimum construction requirements for each of these occupancies in Chapters 22 through 26.

In one- and two-family dwellings, the outside or the dwelling has an automatic sprinkler system throughout.

The primary means of escape may be a door, stairway, or ramp that provides an unobstructed path of travel out of the dwelling at or to grade level. The secondary means of escape, which is independent of, and remote from, the primary means of escape, may lead through an adjacent, unlockable space. It may also be a door or window that opens directly to the outside as long as it provides at least 5.7 square feet (0.5 square meters) of clear, openable area. The opening must be at least 20 inches (51 centimeters) wide and 24 inches (61 centimeters) high. However, this provision may only be used when the window is located within 20 feet (6 meters) of grade.

Section 22.2.4 stipulates the minimum widths and heights for doors in residential occupancies. Locking devices on doors within a means of escape cannot impede or prohibit egress, and they must be easily opened without a key.

Stairs that serve as the primary means of escape from dwellings must conform to the same standards as stairs in commercial occupancies. The maximum riser height is 7 inches (18 centimeters), and the minimum tread depth is 11 inches (28 centimeters). Stairs that serve as a secondary means of escape may comply with the fire escape requirements of Table 7.2.8.4.1 of NFPA 101®, Life Safety Code®, which allows risers to be as many as 9 inches (21 centimeters) high and the tread at least 9 inches (21 centimeters) deep.

As for fire protection features, Section 22.3.4.1 of NFPA 5000 requires smoke alarms in all bedrooms, outside each separate bedroom, and on each level of the dwelling, including the basement. Provisions for these alarm systems are found in Section 55.2.

NFPA 5000 doesn’t specifically require automatic sprinkler systems for residential occupancies, but it does allow their use as an alternative to other code requirements as long as they’re installed in accordance with Section 55.3.1.1. This section requires that any automatic sprinkler system installed meet the requirements of NFPA 13, Installation of Sprinkler Systems; NFPA 13R, Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height; or NFPA 13D, Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes.
The world’s only BIG-SCREEN fire detection system now has “Surround Sound.”

Introducing the Siemens FireFinder with VOICE EVACUATION.

Building Evacuation just got better. The Siemens FireFinder System now offers Integrated Digital Emergency Voice Evacuation. The FireFinder XLSV is ideal for highly populated buildings and complexes. It can deliver crystal-clear, multiple and simultaneous messages to various locations, live or prerecorded. The multi-functional, 8-digital-audio-channel XLSV can be used for emergency evacuation and as an everyday building communications system for convenience paging and background music.

Learn more. Call Siemens Building Technologies, Fire Safety Division at 800-222-0108 or visit sbt.siemens.com/fis. Siemens FireFinder with “Surround Sound.” You’ve got to hear it to believe it.
THE FIRE PROTECTION RESEARCH Foundation is currently looking into a new project, tentatively named the Solid Shelf Rack Storage Protection Research Project, to develop possible rack configurations and cost-effective protection arrangements as an alternative to the current criteria in NFPA 13, *Installation of Sprinkler Systems*.

Why now? Because the 2002 edition of NFPA 13 more definitively spells out the protection criteria for racks with solid shelves, thanks to a task group that reviewed all available test data relating to sprinkler performance with solid shelves.

Racks with solid shelving are different from traditional shelf storage, in which the shelves, by definition, are pallet loads as well as those between the bays formed by the rack structure. Flues allow heat from a fire to rise to activate ceiling sprinklers and allow water from the overhead sprinklers to penetrate the rack to stop the spread of a fire. Without open flue spaces, fires have a greater tendency to spread laterally throughout racks, becoming large enough to jump the aisles to adjacent racks.

The task group agreed that solid shelves less than 20 square feet (1.86 square meters) between title spaces are not a concern, since this is basically the size of a standard pallet. Task group members also agreed that racks with solid shelves made of wire mesh, slats, or other materials more than 50 percent open can be considered open racks, provided flue spaces are maintained. This means that racks surfaced with such materials that extend to the limits of the longitudinal and transverse flues can be considered open racks, even if the shelves' surface is bigger than 20 square feet.

The sprinkler protection criteria for rack storage dates back to the 1971 edition of NFPA 231C, *Rack Storage of Materials*, which was merged into NFPA 13 in the 1999 edition. NFPA 231C was based on an extensive series of full-scale fire tests, some of which revealed the poorer performance of ceiling sprinklers in racks using solid shelves, even shelves 27 square feet (2.5 square meters) in area. In those early editions, NFPA 231C always required that "sprinklers be installed both at the ceiling and beneath each shelf in double- or multiple-row racks with solid shelves that obstruct both longitudinal and transverse flue spaces." Another section of the standard traditionally allowed one to eliminate the longitudinal flue for double-row racks without solid shelves up to 25 feet (7.6 meters) high. However, it was never clear what really constituted solid shelves or what was to be done if there were longitudinal flues but no transverse flues.

The new criteria, based on the areas of solid shelves, distinguish between solid shelves 20 to 64 square feet (1.86 to 5.95 square meters) and those larger than 64 square feet. For the larger shelves, the requirement for sprinklers below each shelf has been retained. For the intermediate-sized shelves, sprinklers are required...
New Series LFII Residential Sprinklers

Your Family's Best Line of Defense!

Series LFII Sprinklers are UL Listed for Flat, Sloped & Beamed* ceilings with the lowest pressure ratings in the industry.

All Sprinklers Are Not Created Equal!
LFII Sprinklers are designed for the residential portions of any occupancy per NFPA 13
LFII meets the industry's lowest pressure requirements
LFII is a complete line of residential sprinklers for flat, sloped and beamed* ceilings
LFII is approved for use with TFBP BlazeMaster® CPVC Systems

*Pendent, recessed pendent and flush pendent sprinklers are approved for use with beamed ceilings
SEE TECH DATA SHEETS FOR CRITERIA

Tyco Fire & Building Products
Contact TFBP Distribution 800-558-5236 or
Central Sprinkler Company at 800-523-6512
www.tyco-fire.com

Tyco Fire & Building Products
Fire & Building Products

Circle 027 Reader Service Card
AMONG THE MOST common types of structural fires are those that occur in residential occupancies, which include one- and two-family dwellings, apartment buildings, hotels, motels, dormitories, board and care homes, and lodging and rooming houses. In 2001, 76 percent of all structure fires were residential fires, mostly in one-

and two-family dwellings. If we exclude the events of September 11, 29 percent of firefighter fireground fatalities and 71 percent of civilian fire deaths that occurred in 2001 were in residential occupancies, many again in one- and two-family homes.

Why do so many firefighters die in residential fires in the United States? Although NFPA statistics show that fires in other occupancies, excluding health care and educational properties, are two, three, four, even five times more likely to cause a firefighter fatality, there are far more fires in residential properties than there are in other occupancies.

Also contributing to the firefighter fatality rate may be the fact that firefighters tend to feel less threatened when working in a small one- or two-family house, which can lead to freelancing rather than working in the prescribed teams. Even the incident commander may feel there’s less risk in a small building, where it’s easy to find alternate exits and it takes less time to get out.

Pre-incident plans and fire inspections reduce the risk to occupants and firefighters as well as providing the incident commander with intelligence regarding the building. Few communities have pre-incident plan or regularly inspect one- and two-family dwellings.

Even fewer communities require that such buildings be sprinklered.

Command organization
During size-up at any structural fire, including one at a one- or two-family home, the incident commander must consider the building’s occupancy to determine the risk it poses to firefighters

and occupants. It’s essential that the commander maintain a good command organization, devise a strategic plan based on a risk-versus-benefit analysis, provide a rapid intervention team, establish accountability, and enforce the use of proper protective clothing and equipment, just as he or she would during a fire in any other structure.

In the absence of pre-incident plans, fire officers confronted with a fire in a one- or two-family house must base their size-up on general patterns. However, they must also recognize that there may be unknown hazards since general patterns may not apply in every incident.

For example, the most hazardous time for occupants is when they’re asleep, generally late at night or early in the morning, so most incident commanders assume people are at home during these times. But there are many exceptions. The occupants might work odd hours, or they might be away on vacation. Signs that someone is home, such as lights on or a car in the driveway, may indicate that the building is occupied, but many

extinguish in these buildings.

If the standard pre-connected hose line flows 100 gallons (378 liters) per minute, the only building for which the pre-incident plan needs to include rate-of-flow calculations is one whose rooms have a volume of 20,000 cubic feet (566 cubic meters). We reached this number by dividing the room’s volume by 100 to get 200 gallons (757 liters) per minute. We advocate using volume divided by 100 (V/100) to calculate rate-of-flow in building compartments where the required flow exceeds the rate-of-flow of two standard pre-connected hose lines carried on the apparatus.

No fire should ever be considered routine
When it comes to safety and protection, the experts trust DuPont. So can you.

DuPont pioneers the science behind some of today's most advanced protection systems, from fire-resistant apparel made with DuPont™ Nomex® to protective equipment reinforced with DuPont™ Kevlar®.

Get the best fire suppression for your business, from the experts in safety and protection. Our broad range of DuPont Fire Extinguishants are designed to protect people, high value assets, and the continuity of business.

DuPont Fire Extinguishants has you covered.
FE-227™ FE-25™ FE-36™ FE-13™

DuPont Fire Extinguishants
1-800-473-7790 DuPont.com/fire
WITH THE HELP of more than 6,000 volunteers, NFPA writes more than 300 codes, standards, and recommended practices, and it's a challenge to ensure that all these documents continue to work in concert, complementing and building upon one another's provisions. Recognizing the importance of this coordination process, the NFPA Standards Council in April 2003 instituted a policy (#03-04-19) outlining the steps needed to maintain a fully coordinated set of codes and standards for the built environment.

To help technical committees coordinate their documents, the Standards Council appointed the Staff Scoping Support Team, who developed a set of commonly asked questions and distributed it to all technical committee members and posted it on www.nfpa.org. The following information is extracted from that document.

**NFPA's Document Coordination Project**

In its decision, the Standards Council ruled, in part, that "the special hazards technical committees will have primary responsibility for provisions in the Building Code on subjects in their respective areas." If this is true, how can Section 1.3.2 also be true?

Section 1.3.2 assumes that all NFPA documents already are, or soon will be, coordinated, eventually making Section 1.3.2 a moot point for NFPA.

NFPA 5000, Section 1.3.2, appears to give NFPA 5000 ultimate authority over referenced codes and standards. However, NFPA 5000 also references codes and standards that aren't under NFPA control. Section 1.3.2 is intended to guide authorities having jurisdiction on handling potential conflicts.

Who's ultimately responsible for ensuring that NFPA documents are coordinated?

The success of this effort depends on the cooperation of all NFPA members, volunteers, and staff.

Are all NFPA documents part of this project?

Yes. Certain NFPA codes and standards will be coordinated first because they're either referenced in NFPA 5000 or contain provisions that directly affect topics covered in NFPA 5000.

Although my document isn't currently in cycle, do I still need to do any work in the context of this project?

Yes. NFPA 5000 is in the Annual 2005 revision cycle, with public proposals due October 17, 2003. Even if your document isn't in cycle, you have an opportunity to provide input to the related provisions of NFPA 5000.

Then, as your document comes into cycle, you can pick up the modifications identified during the coordination with NFPA 5000.

How do we coordinate our documents with other NFPA documents?

The process of coordinating all NFPA documents that provide requirements for the built environment will be completed in three basic steps:

- Review and compare the requirements of NFPA and your document;
- Consider changing either your technical committee's scope or your document's scope to take into account any additional topics you may want to cover or delete from the scoping statements; and,
- Develop proposals for NFPA 5000 and your document to ensure coordination.

The remainder of the Commonly Asked Questions provides the tools necessary to accomplish these tasks, including specific guidance on developing the appropriate proposals for both your document and NFPA 5000.

This is your opportunity to participate in the first stages of the ongoing process that will ensure coordination of requirements and recommendations across the entire NFPA code set. Make sure that your committee's expertise is recognized and used in other NFPA codes and standards, particularly NFPA 5000. And remember, other committees may be knocking on your door recommending that you modify your document.

We have amazing resources available. Let's get out there and use them!

AMY SPENCER is a senior chemical engineer and BONNIE MANLEY is a senior structural engineer at NFPA.
Pinnacle™ Smoke Detection for critical process and equipment areas

Intelligent, addressable smoke detector has alarm settings to 0.02% per foot obscuration for ultra-high sensitivity.

Provides earliest possible detection for critical process and equipment areas, such as:
- Telecommunication rooms
- Network server rooms
- Clean rooms
- Semiconductor fabrication facilities
- High value property areas

Circle No. 067 on Reader Service Card

Selectable Output Series™ for your notification needs

Notification devices with the industry's widest range of candela settings - 15, 15/75, 30, 75 and 110 candela.

- All Selectable Output Series operate at dual voltage levels, self-adjusting for either 24 or 12 volts.
- 2-wire and 4-wire models fit standard back boxes with no encroachment.
- Exclusive mounting bracket and QuickClick™ reduces installation times.

Circle No. 070 on Reader Service Card

SpectrAlert® Strobes for your entire building

Full line of 24-volt strobe notification products, offered with 15, 15/75, 30, 75, 115 and 177 candela options.

- Compact, circular shape for low-profile appearance.
- Installs easily and fits standard back boxes even if box is not properly aligned.
- Captured mounting screws for cost effective installation.
- Switch-selectable horn tones.

Circle No. 071 on Reader Service Card

Innovair™ Low-Flow Smoke Detectors for your ducts

Low-flow duct smoke detector with the widest range of airflow speeds – 100 to 4,000 FPM.

- Specifically designed to meet Variable Air Volume systems.
- Eliminates need for in-duct, pendant-type detectors.
- Covers missing signal.
- Watertight and high temperature models available.

Circle No. 068 on Reader Service Card

Acclimate™ Smoke Detectors for your multi-use common areas

A detector with photoelectric and thermal inputs for complete protection.

- Equates multiple sensor inputs into predetermined responses to identify fire scenarios in the quickest manner.
- Self-adjusts to the local environment and sets sensitivity based on recorded data without a service call.
- Minimizes costly transient alarms.

Circle No. 069 on Reader Service Card

For all your building protection needs...

Think System Sensor

For all your building protection needs, System Sensor manufactures the highest quality fire detection and notification products available.

We make it our business to develop advanced ideas that deliver advanced solutions so when you think of building protection, you think System Sensor.

This type of forward thinking led System Sensor to develop the soon-to-be-available Eclipse®, a brand new industry-leading protocol with a complete line of products:

- Photoelectric Smoke Detectors
- Ionization Smoke Detectors
- Heat Detectors
- Photoelectric/Thermal Combination Detectors
- Input/Output Control Modules

Experience - System Sensor is a global manufacturer of fire detection and notification devices. For years, we have designed new products that utilize the most advanced technologies in the most inventive ways, yielding superior building protection products that are more convenient to install and more efficient to operate.

Quality - System Sensor places a high premium on research and development to offer products that provide the earliest detection of fire scenarios, as well as latest-technology audible and visible notification devices. The result is a line of products that is absolutely reliable for real-world applications.

Service - System Sensor is dedicated to meeting your needs. We have application engineers ready to help, a customer support department that is on call to support you, and technical documentation available 24/7 through automated FAX or CD-ROM.

For more information on System Sensor, circle the number on the reader service card for a free E*DOCS® CD-ROM, a comprehensive resource of technical information, or call System Sensor at 800/927-6676.

Circle No. 069 on Reader Service Card

Circle No. 072 on Reader Service Card
ALMOST THREE-FOURTHS of the fire deaths in the United States occur in one- and two-family dwellings. Yet, the building codes and NFPA 101®, *Life Safety Code®*, have very few fire safety requirements for such homes. These codes do require smoke detectors on each level of the home and the newer codes also require smoke detectors in each sleeping room. The newer local fire marshal to come knocking on our door and announcing that he or she is there to inspect for fire hazards. Without enforced fire protection in the home to reduce fire deaths and injuries, the only other option is education.

Who will tell the weekend mechanic that using flammable liquids to clean parts in a garage next to a gas-fired water heater may result in a gas explosion? How will homeowners know that installing burglar bars without interior emergency releases may prevent their families from escaping from their burning houses? Who will tell children not to play with matches or lighters?

How will students living in dorms know that stringing extension cords together so they can move the portable heater to the other side of the room may cause the wire to overheat and start a fire? How will the apartment dweller know that using a charcoal grill on a wooden deck may cause the deck to ignite, or that bringing the charcoal grill inside may result in carbon monoxide poisoning? How will families learn that practicing their home escape plans is the only way to be confident they'll follow it in a real emergency?

The answer to all these questions and the hundreds of others about safe behaviors is education. We can and should support improvements in products, fixtures, and furnishings that will reduce fire losses in the home. And we must advocate for public acceptance of fixed protection so that people are as safe at home as they are in public places. But such advances take time and require that the public understand both the fire problem and the available solutions. The catalyst for change is education, and with our expertise as fire protection professionals and our commitment to fire protection, we can help provide the education that will help facilitate that change.

Until we take education seriously as a basic requirement of any fire protection program, we will continue to have unnecessary fire losses. The only effective way to change people's attitudes and behaviors is through education.

So let's be creative and see what fire safety education programs we can institute where we work and live.

EDITOR'S NOTE: Columnist CHIP CARSON is this year's recipient of NFPA's Standards Medal, the Standards Council's highest honor, awarded to those who have made outstanding contributions to fire safety by serving on the NFPA technical committees that develop codes and standards. Carson received the award at the NFPA World Safety Conference & Exposition™ in May.
LONG BEFORE THE DOORS OPEN,

WE HELP YOU MAKE SURE THE BUILDING HAS
PASSED YOUR MOST IMPORTANT TESTS.

The important work code authorities do today helps safeguard the future. We support your efforts, and at Underwriters Laboratories, we are committed to making your job easier. When you see the UL Mark of Safety, you can feel confident knowing it represents more than a century of experience in testing and certification. This year, the Mark will appear on more than 17 billion products. We will also complete more than a half-million visits to audit compliance and certification requirements. As you go about your inspections, you can look to UL for special on-site evaluation services, an 800 number for questions, access to specialized product directories, and online technical and compliance information. Together, we’re working for a safer world.

www.ul.com

©2002 Underwriters Laboratories Inc.
WILL THE AGING firefighting air fleet be ready this summer?

With wildfire season already upon us in some areas of the United States, the federal agencies responsible for fighting the flames are preparing for what could be a very shaky aerial ride.

Last season’s near-record 73,000 fires made for a very tough year for the U.S. Forest Service and Bureau of Land Management’s (BLM) military-surplus fleet, which includes lead planes, air tankers, and helicopters. Three aircraft—a C-130 aircraft, a PB4Y-2, and an Aerospatiale SA 315B Lama helicopter—crashed, killing six crew members.

As a result, the Forest Service and BLM are sprinting to recertify all 44 of their large air tankers, including the P2s, P3s, and DC 4, 5, and 7s, as well as their remaining C-130s and PB4-Ys. All are 30 to 40 years old and have performed aerial functions they were never intended to perform. Eleven of 19 Beech Baron 58-5 lead planes have already been retired because of safety concerns.

The shaky status of the federal firefighting aerial fleet was underlined in a December 2002 Blue Ribbon Panel report, which the Forest Service and the BLM requested. Written by a panel co-chaired by Jim Hall, former chairman of the National Transportation Safety Board, and Texas State Forester Jim Hull, the report paints a dismal picture of the two agencies’ aerial safety, saying “the federal government is asking employees involved in aerial firefighting to take unnecessary risks.”

The unsettled condition of the aerial firefighting fleet raises two questions, one immediate, the other long-term. Is the fleet ready for the 2003 fire season? And are the agencies—and Congress—turning away from past practices that led to a safety record the report characterized as “unacceptable?”

It appears that neither agency met the requirements of NFPA 295, Wildfire Control, Section B-2.1.6, which warns that “aircraft selection for wildfire suppression and related uses involves certain problems. The performance characteristics must be such that safe and efficient operations can be conducted over typical terrain and at necessary elevations. The aircraft integrity should be such that atmospheric conditions will not present a structural problem.”

On that score, the Blue Ribbon Panel’s report noted that “all aircraft in the current air tanker fleet are being operated outside their original design intent with little or no formal evaluation in the low-level firefighting environment.”

Larry Hamilton, director of fire and aviation in the BLM, doesn’t dispute the report’s conclusion.

“We’ve never had the funding we needed,” he explains. Post-report, the Forest Service and the BLM contracted with Sandia National Laboratory to develop an inspection protocol through which all the creaky air tankers are being run. It’s unknown how many of the 44 will be able to fly in 2003. Those that do take to the skies will fly curtailed missions, Hamilton says, serving as initial attack planes on smaller fires. Their loads will be decreased by about 15 percent to reduce stress on their airframes, and they’ll be fitted with new instrumentation panels so their drops into fire zones won’t be as steep or as fast as they have been. For initial attack, as opposed to prolonged firefighting, the two agencies plan to replace the air tankers that are mothballed with single-engine air tankers, which are essentially glorified crop dusters.

To fight the big fires, the agencies will depend on Hueys and other helicopters, the water capacities of which range from about 300 gallons (1,136 liters) to 1,000 gallons (3,785 liters). This is a steep drop-off from the 2,500-gallon (9,463-liter) capacity of the air tankers, but Hamilton feels that the smaller tankers will do a better job on big fires because “they can lay water down faster, and their water source can be placed much closer.”
For over a century Gamewell has demonstrated an unwavering commitment to excellence, delivering innovative fire and life safety solutions to meet our customers' evolving needs. We recently joined Honeywell International, becoming part of their Fire Solutions Group. Our partnership with this technology and manufacturing leader provides us the global resources to continue to deliver above and beyond our customers' expectations. But while we're now part of Honeywell, our name is still Gamewell, and our commitment remains the same. It's a promise we've delivered on for 150 years, and one our customers can rely on for 150 more.

For more information visit www.gamewell.com or call 203-484-7161.
BUZZ WORDS

FROM 1994 THROUGH 1998, half of all U.S. home fire deaths resulted from fires that occurred between 10 p.m. and 6 a.m. And from 1989 through 1998, fires in which a smoke alarm was present and operated caused only one-fifth of home fire deaths. Together, these statistics reveal that our chances of dying in a fire increase during the time we are most vulnerable and that smoke alarms save lives.

This isn’t new information to those of us in fire protection. However, it may be to the average homeowner. Fortunately, NFPA 72®️️️, National Fire Alarm Code®, provides updated guidance on detection to both code users and occupants of residential occupancies, be they single- or multi-family homes.

Of particular use to alarm installers—whom most homeowners consider to be fire alarm experts—is Chapter 11, “Single- and Multiple-Station Alarms and Household Fire Alarm Systems,” which was rewritten for the 2002 edition to help people better understand when and where smoke alarms should be installed. When an installer calls on a homeowner to discuss a new installation, he or she should carry a copy of Chapter 11 to review with the homeowner.

With Chapter 11 as a resource, installers can explain that the purpose of fire-warning equipment in residential occupancies is to provide the minimum protection required with a reliable means of notifying occupants of a fire and of the need to escape to safety immediately. This is done by installing approved single- and multiple-station smoke alarms outside each sleeping area, in each bedroom, and on each level of the dwelling, including the basement.

Of course, Chapter 11 isn’t limited to one- and two-family dwellings. It also details the location and spacing of smoke alarms in the bedrooms of lodging and rooming houses; in every unit of an apartment building; in the sleeping rooms and living areas of hotels and dormitories; in day-care homes; and in residential board-and-care facilities.

The testing requirements for those occupancies can now be found in Chapter 10, “Inspection, Testing, and Maintenance,” which notes that detectors and single-station smoke alarms in occupancies other than one- and two-family dwellings must be tested in place, just as they are in one- and two-family homes. These tests may be conducted using smoke, a listed aerosol that’s been approved by the alarm manufacturer, or any other manufacturer-approved method that ensures smoke entry into the sensing chamber.

Residential occupancies remain a high priority for life safety, and continued education of the public by everyone in the fire alarm industry, including installers, is as important as “getting the job.”

National Fire Alarm Code®️️️ is updated for residential fire alarm systems

Alarm Systems,” which was rewritten for the 2002 edition to help people better understand when and where smoke alarms should be installed. When an installer calls on a homeowner to discuss a new installation, he or she should carry a copy of Chapter 11 to review with the homeowner.

With Chapter 11 as a resource, installers can explain that the purpose of fire-warning equipment in residential occupancies is to provide the minimum protection required with a reliable means of notifying occupants of a fire and of the need to escape to safety immediately. This is done by installing approved single- and multiple-station smoke alarms outside each sleeping area, in each bedroom, and on each level of the dwelling, including the basement.

Of course, Chapter 11 isn’t limited to one- and two-family dwellings. It also details the location and spacing of smoke alarms in the bedrooms of lodging and rooming houses; in every unit of an apartment building; in the sleeping rooms and living areas of hotels and dormitories; in day-care homes; and in residential board-and-care facilities.

The testing requirements for those occupancies can now be found in Chapter 10, “Inspection, Testing, and Maintenance,” which notes that detectors and single-station smoke alarms in occupancies other than one- and two-family dwellings must be tested in place, just as they are in one- and two-family homes. These tests may be conducted using smoke, a listed aerosol that’s been approved by the alarm manufacturer, or any other manufacturer-approved method that ensures smoke entry into the sensing chamber.

Residential occupancies remain a high priority for life safety, and continued education of the public by everyone in the fire alarm industry, including installers, is as important as “getting the job.”

Illustration: Richard Goldberg
WHEN FIRE STRIKES:

GET OUT!
STAY OUT!

Fire Prevention Week
October 5 - 11, 2003

The Official Sponsor
of FPW Since 1922

Free planning materials are available at
www.firepreventionweek.org. For official
FPW products visit www.nfpacatalog.org
INSANDOUTS

IN AN EFFORT to streamline the volunteer process, NFPA has changed the revision cycle of one of its biggest documents.

NFPA could never do what it does without the hundreds of volunteers worldwide who devote themselves to, among other things, committee work. Being an NFPA committee member involves numerous meetings to process proposals and comments and to draft revised text. Depending on the document, these meetings can involve a significant amount of travel and time away from jobs, so anything that helps lighten the load is always appreciated.

Recently, members of the Technical Correlating Committee for NFPA 5000™, Building Construction and Safety Code™, proposed something that should do just that. They suggested putting NFPA 5000 on the same revision cycle as NFPA 1, Uniform Fire Code™; and NFPA 101®, Life Safety Code®, in a move that would affect hundreds of volunteers, as well as NFPA staff. In January, the Standards Council agreed to the change.

The main reason for the change is that NFPA 5000 and NFPA 101 share many of the same committees. In fact, all the NFPA 101 committees also participate in the NFPA 5000 revision process since both documents follow an occupancy-based format, meaning they’re organized by building use. Considering that there are 15 Life Safety Code committees, this overlap isn’t insignificant.

The logistics
The current editions of NFPA 101 and NFPA 1 were adopted by the NFPA membership at the 2002 Fall Education Conference. Originally, the two documents were scheduled to go before the members again at the 2005 Fall Meeting, but the Council’s decision will move the voting on them forward to the 2005 World Safety Conference and Exposition™ (WSCE) to join NFPA 5000. The 2002 edition of NFPA 5000 was adopted at the 2002 WSCE in Minneapolis.

The schedule for all three documents now looks like this:
• The proposal closing date is October 17, 2003.
• The Report on Proposals (ROP) will mail on July 30, 2004.
• The comment closing date is October 8, 2004.
• The Report on Comments (ROC) will mail on April 1, 2005.

The documents will then be up before the membership for vote at the 2005 WSCE, to be held from May 22 to May 26.

The decision
When a committee wants to change its document’s revision cycle, it must first get the Standards Council’s permission. According to Casey Grant, Standards Council secretary, the Council runs the request by NFPA senior management if the document in question is “one of the big ones [in terms of use and importance].”

The Council looks to NFPA managers to assess the impact such a change would have on staff workloads, NFPA revenue, and attendance at the WSCE or Fall Education conference, which could also have an impact on revenue. In the case at hand, the benefits of changing the revision cycle outweighed any potential negatives, and the Standards Council granted the request.

NFPA has issued a revised meeting schedule for NFPA 5000 and NFPA 101, setting the date of the first set of ROP committee meetings from December 2 to 12 this year. The second wave of ROP meetings will be held from February 2 to 6, 2004. All but one committee will meet in Phoenix, Arizona, both weeks. The rest of the schedule, some of which is still being determined, can be found at www.nfpa.org.
FOR SEVERAL YEARS, I've used this space to celebrate and explore the complex and important work being done at the community level to ensure greater safety for our citizens, want to share some simple home security tips that may not have occurred to you. Surprisingly, some 60 percent of residential burglaries occur during the daytime. Although residential burglaries were down by nearly 4 percent in 2000, the average loss per incident was more than $1,300.

Here are some steps you can easily take to protect your home while you're away:

- Make sure external door and window locks work and replace or install any that are in disrepair or missing. Ideally, doors should have deadbolt locks, and you should put a bar or wooden dowel in the track of glass sliders to supplement the door lock.

- Buy timers so you can set lights to come on in different rooms at different times. Consider installing motion-detection lights in your yard.

- Arrange to have your newspaper delivery suspended and have mail held at the post office or picked up daily by someone you trust.

- Make your home look lived in. Line up relatives or friends to watch your house, feed and care for your pets, and mow your lawn. Ask a trusted neighbor to park one of his or her cars in your driveway while you're away.

- Check outside lighting and replace burned out or dim light bulbs. Re-position automatic security lights so they shine on key areas, such as doorways, driveways, and windows, including those in the backyard.

- Look at your house from outside. What would you do to get in if you were a burglar? Trim overgrown hedges that could provide cover for an intruder. Remove spare keys you may have hidden outside.

- Changing your answering machine greeting to indicate that you are out of town is an open invitation to bur-
DANGERS OF IMMOBLE SECURITY BARS

In cities and towns throughout the United States, crime-weary citizens have bolted immobile security bars over their windows hoping for an extra measure of personal security. However, these bars carry an often-overlooked and quite lethal side effect: While they can effectively lock criminals out, they can just as effectively lock residents in.

IN JANUARY 1993, a 54-year-old grandmother, six of her grandchildren, and her infant great grandchild died in a fire in their two-bedroom Bruce, Mississippi, apartment.

Neighbors were alerted to the fire by the sounds of someone beating on the common wall and yelling for help. Others rushing to help the family reported seeing several of the children wildly reaching through the metal security bars on the windows. Trying to help, neighbors were blocked by the bars.

Efforts to break down the back door finally succeeded, but just as the fire engulfed the apartment, By the time firefighters were able to enter the building flames were coming out of the windows. Next month in Detroit, Michigan, seven more children, ranging in age from 7 months to 9 years, died in a house fire. They were trapped by a barred and padlocked door; barred windows covered with mesh grills; and a window blocked by a wooden door and held in place by a large dresser to keep burglars out. >>

by JOHN R. PARADISE

photograph by JAYNE HINDS BIDAUT
And a strikingly similar tragedy befell two sisters, one of their daughters, a cousin, and five children aged 2 to 10 years. All died in an East Palo Alto, California, blaze in April 1997. Firefighters’ efforts to reach the nine victims were hampered by the bars on their home’s windows.

Metal security bars also delayed firefighters’ attempts to rescue a mother and her 6-year-old daughter, who were trapped in their burning Jackson, Mississippi, home in January 1999. The woman and her daughter died, but two other children managed to escape through a barred bedroom window.

How? According to published reports, the security bars in the bedroom were equipped with an emergency release mechanism that allowed the children to push them open from the inside.

“People are taking steps they think are making them safer in their homes, but what they’re really doing is the exact opposite. They’re putting themselves more at risk,” says Sharon Gamache, executive director of NFPA’s Center for High-Risk Outreach. “What happens if the exit doors are blocked by fire? How are they going to get out if there are bars on the windows? The answer is, they’re not.”

According to NFPA analysis of data from the National Fire Incident Reporting System (NFIRS) and an NFPA survey, an estimated 19 people died per year and another 26 per year have been injured in home fires between 1986 and 1999 when their escape was blocked by what has been termed for reporting purposes “illegal gates and locks.”

Experts attribute many of these deaths to security bars, says Dr. John R. Hall, Jr., assistant vice president of Fire Analysis and Research at NFPA.

The problem is most acute in poorer neighborhoods, Gamache says. “Statistics show that these neighborhoods tend to have both a higher incidence of crime and a higher incidence of fire,” she says. “There are a lot of contributing factors at work here. But if you take the heightened concern about crime in these areas, combine it with an increased chance for fire, and throw in the security bars, you end up with people dying needlessly.”

An earlier study by Alison Miller, a former NFPA analyst, found that these same poorer neighborhoods can have makeshift security arrangements that are just as dangerous as security bars. Windows nailed shut or blocked by heavy furniture may keep criminals out, and do so inexpensively, but they can also trap any occupant cut off from normal exits.

In 1993, the very same year as the tragic fires in Bruce and Detroit, NFPA organized the Home Security and Fire Safety Task Force. Its charge: To address the dangers of security bars head-on by promoting alternatives to immovable window bars, encouraging the efforts of local and state lawmakers to protect residents in their districts from being trapped by such devices, and educating the public about the inherent dangers tied to these products.

James McMullen, a now-retired California state fire marshal who was the founding chairman of the Home Security and Fire Safety Task Force, says the group was assembled soon after fire officials throughout the country began noticing an alarming rise in the number of fire-related deaths in home fires.

“In California, we spotted this increase in the early 1990s. This caught our attention because we had been seeing the numbers dropping steadily for several years. Suddenly, they were going back up,” McMullen says.

At the same time, fire officials in California saw an increase in security bar installations in their communities, he says.

“It didn’t take long to spot the connection,” says McMullen. “Many of the deaths that we were seeing were in homes equipped with these bars. Whole families were dying. We knew that if it was happening in California, it had to be happening in other states.”

Out of this realization, he says, the task force was born.

**Engineering solutions**
The task force has worked to address the security bar problem, Gamache says, by encouraging the use of bars that can be opened from the inside by pulling a simple handle, pushing a button, stepping on a pedal, or kicking a lever.

“These new bars keep criminals out, but with one pull of a lever, they also allow people to use the window as a means of escape in an emergency,” she says.

“We’ve worked closely with Underwriters Laboratories to come up with guidelines for acceptable designs of release mechanisms,” she says. “The most important aspect of their design is that everyone, even children, must be able to operate them easily.”

While Underwriters Laboratories
hasn’t certified a particular design, it has issued a 47-page overview and comparison of the many variations that are now commercially available.

“This bulletin is something cities and towns can use when judging the designs that will be acceptable in their communities,” Gamache says.

**Legislative initiatives**

The task force also encourages and supports local and statewide efforts to regulate the use of security bars.

California, Mississippi, and Texas recently enacted legislation focused specifically on these devices.

“The Mississippi laws were drafted in direct response to the Bruce fire,” Gamache says.

Of the three states, Gamache points to California as the model she hopes other states follow.

“California really tried to get to the heart of the issue,” she says. “They made the most sweeping changes.”

McMullen, who was a fire service member in the California for 30 years, was still the state’s fire marshal when the laws were adopted. He also worked closely with the officials in Texas who were drafting similar laws.

“We tried to do several things with our legislation,” he says of California. “First of all, we wanted to make it illegal to fit every window of a home with bars that didn’t open. With our first bit of legislation, we required at least one window in every sleeping room be equipped with a release mechanism that has been listed or approved by a nationally recognized research lab, like Underwriters Laboratories.”

The state also approved a law giving municipalities authority to enact local ordinances requiring these bars to have a safety lock on the outside that firefighters can use to open them.

“California really tried to get to the heart of the issue,” she says. “They made the most sweeping changes.”

McMullen, who was a fire service member in the California for 30 years, was still the state’s fire marshal when the laws were adopted. He also worked closely with the officials in Texas who were drafting similar laws.

“We tried to do several things with our legislation,” he says of California. “First of all, we wanted to make it illegal to fit every window of a home with bars that didn’t open. With our first bit of legislation, we required at least one window in every sleeping room be equipped with a release mechanism that has been listed or approved by a nationally recognized research lab, like Underwriters Laboratories.”

The state also approved a law giving municipalities authority to enact local ordinances requiring these bars to have a safety lock on the outside that firefighters can use to open them.

“It’s a Knox Box setup,” McMullen says. “Firefighters use a special key to open the bars if they have to get inside. As we’ve seen in some of the past fires, bars not only trap victims inside the houses, they also keep the firefighters out.”

California lawmakers also set a minimum size for windows equipped with these safety locks.

“They have to be big enough for firefighters to get through with full gear,” McMullen says. “What good is it if you can open the bars but you don’t fit inside?”

Finally, the state required that all bar installation kits sold to do-it-yourselfers be clearly labeled to reference the California laws pertaining to these devices.

McMullen says these state laws focus on new construction, as well as existing buildings.

“We wanted to address these problems in all of the buildings, not just the new ones,” he says.

**Education outreach**

In its effort to reach the general public with messages about the risks associated with security bars, the task force and the Center for High-Risk Outreach developed the Safe and Secure program.

This program provides communities with instructions and literature to help officials understand and teach security bar safety along with other basic home fire safety lessons.

“We included the messages about having working smoke detectors and practicing fire drills in the program because they are all important parts of home fire safety,” Gamache says. “Even
Although there were security bars on the doors and windows of this Texas home, they didn't impede the escape of five residents.

if the homeowners don't take all the messages to heart, maybe they'll take one or two. Any little bit helps."

The information, which is meant for distribution through local authorities such as the building, fire, and police departments, can be downloaded directly from the NFPA Web site at www.nfpa.org. Once on the home page, visitors should click first on the blue “Public Education” tab at the top of the screen, then select “Center for High-Risk Outreach” in the blue box at the left of the next screen. From here, visitors can view a brief instructor's guide and the Safe and Secure brochure in both English and Spanish.

"This is all valuable information that communities can put to good use," says Fort Lauderdale, Florida, Fire Marshal Steve Kastner. "Public education is such a key component to saving lives."

Kastner notes that this program was adapted successfully in his city during a crackdown on safety code violations involving security bars.

"Every building code across the country requires two means of egress from bedrooms," he explains. "This minimum requirement is also clearly stated in NFPA 101®, Life Safety Code®. If a bedroom only has one door, one of those means of egress has to be a window. What we were seeing were bars across all of these windows. There was no second egress. It was a clear violation that was putting people in danger."

To begin addressing the problem, officials conducted a drive-by survey of the homes throughout the 35-square-mile (9,065-hectare), 152,000-resident city. Kastner says, "Our inspectors created a list of all the houses with security bars," he says. "From this list, we got a good sense of the scope of the problem." At the same time, officials visited neighborhood groups and civic organizations to explain the dangers associated with the bars. Next, city inspectors went to the homes found to be in violation and gave owners a deadline for complying with the codes. They also provided them with information about what had to be done and, during the same visit, gave them the forms they needed to apply for a grant through the town to help pay for the work.

"We're asking them to replace their old bars with ones that open. Depending on the size of the windows, it could run them about $200 each," Kastner says. "We're talking about mostly low-income neighborhoods. This was a lot to ask. We knew we had to give them some way to pay for the work, as long as they were income-qualified."

The money, part of a state Community Block Grant, wasn't paid directly to the residents.

"We paid a contractor that the city had approved prior to the start of the program," Kastner says. "This way, we were sure the money was being spent correctly and the person doing the work was doing it right."

NFPA's Gamache calls Fort Lauderdale's work, "an outstanding example of public outreach and education."

"In one visit with the homeowner, they explained the problem, told them what they had to do, how to do it, and even gave them a way to pay for it," she says. "This program has everything going for it." What's next for the task force? Asked about the most important aspect of the group's future efforts, Ernest Grant, who serves as the group's current chairman, offers a two-word answer: more publicity.

"A large part of preventing future injuries and deaths is getting the message out," he says. "If lawmakers, firefighters, and the public know about the dangers, then the problem can be addressed properly. The trouble is so many communities have yet to hear the message."

That's where the general media, and publications such as the NFPA Journal®, serve a vital role, Grant says. "Articles like this one get people thinking, get people talking," he says. "Maybe some fire departments were aware of the problem but didn't know where to begin. Now they know our task force exists. They know that we're here, willing to offer technical support and guidance. They also now know that state money can be used to help pay for replacing some of these bars."

Grant, a certified burn nurse and manager of the University of North Carolina Hospitals' burn prevention program, says many of the fire-related injuries his unit handles each week were the result of incidents that could have or should have been prevented.

"I see burn victims who never thought they were at risk for injuries like this," he says. "They never really considered ways to make their homes safer. They never thought about blocked windows or blocked doors. I see firsthand evidence every day of this lack of knowledge that the task force and groups like NFPA are working so hard to overcome."
The importance of life safety has become increasingly evident over recent years. For more than a century, NFPA has developed codes and standards that save lives and protect communities. Our Fall Education Conference, this November in Reno, will help you enhance your career and learn about the latest developments and issues in fire protection and life safety. With a special focus on Emergency Management and Preparedness, you will not want to miss this educational opportunity.

Enhance your career and strengthen your leadership skills, while earning continuing education units (CEUs), with more than 30 hands-on career development seminars.

Enjoy the exciting attractions and beauty of Reno, Nevada.

For more information visit www.nfpa.org/meetings or call +1-617-984-7310!
LAST JANUARY, THE U.S. CONSUMER PRODUCT SAFETY COMMISSION LAUNCHED A TWO-YEAR STUDY TO INVESTIGATE SMOKE-ALARM WAKING EFFECTIVENESS AMONG CHILDREN AND THE ELDERLY, AND THE FIRE PROTECTION RESEARCH FOUNDATION IS SERIOUSLY CONSIDERING CONDUCTING A STUDY OF THE ISSUE OF CHILDREN NOT BEING AWAKENED, ACCORDING TO FOUNDATION

MARCI DOUGLAS STILL CRIES WHEN SHE WATCHES THE VIDEOTAPE.

"I can't help it," she says. "It's so intense to watch. If it had been a real fire..." Her voice trails off. If she thinks about the "if," she'll start to cry again. If it had been a real fire, her son would be dead.

The video to which Douglas refers is a 2001 news feature story depicting sleeping children's responses to smoke alarms that WCCO-TV in Minneapolis produced with the help of the Bloomington, Minnesota, Fire Department. Marci's son Mitchell, then 10 years old, was one of four children WCCO tested to see how they would react to a smoke alarm in the night.

Their responses are frightening. One boy ran through the smoke rather than use a secondary exit. A little girl woke but didn't recognize the sound of the alarm. A third child didn't wake to the alarm and, when prodded by his mother to escape, simply froze.

However, watching Mitchell is what brings tears to his mother's eyes.

"I didn't think much about it before the test," Douglas says. "Mitchell is a smart boy. I thought he'd hop right out of bed. I thought there was a chance he might run right out the bedroom door and into the smoke, but it never occurred to me he wouldn't wake up."

He didn't. Not for almost 15 minutes. >>

by SHELLY REESE  ■ illustration by ROB DUNLAVEY
BECAUSE CHILDREN FIVE AND UNDER AND ADULTS 65 AND OLDER—FOR WHOM SMOKE-ALARM WAKING EFFECTIVENESS MIGHT ALSO BE AN ISSUE—ARE TWICE AS LIKELY AS THE GENERAL POPULATION TO DIE IN A HOME FIRE, THE RESEARCH HAS COMMANDED THE ATTENTION OF EVERYONE INTERESTED IN FIRE SAFETY IN THE HOME.

The first group, composed of pediatric sleep experts, safety engineers, government officials, and manufacturers, was charged with gathering information and proposing future research designed to better understand the physiological and technical aspects of the issue. Such research might help lead to changes in the way smoke alarms operate and how they are installed and used. The second group, composed of UL staff, fire prevention and education specialists, and manufacturers, is developing information to effectively inform the public of smoke alarm and fire safety issues.

Studies launched

Last January, the U.S. Consumer Product Safety Commission launched a two-year study to investigate smoke-alarm waking effectiveness among children and the elderly, and the Fire Protection Research Foundation is seriously considering conducting a study of the issue of children not being awakened, according to Foundation President Rick Mulhaupt. To bring NFPA members up to speed on the issue, NFPA also invited Dr. Dorothy Bruck of Australia, the recognized world leader in research on the topic, to speak at its World Safety Conference and Exposition in Dallas this past May.

In addition, Underwriters Laboratories (UL) made the subject the centerpiece of its March 7, 2003 smoke alarm Standard Technical Panel meeting in Northbrook, Illinois, establishing two working groups to study the topic in detail.

Studies raise concerns

While less emotionally charged than the televised images of children sleeping through alarms, scientific studies published on the topic are perhaps more alarming because they confirm that this problem is neither a fluke nor an artifact of unrealistic test conditions.

Bruck, a psychologist at Victoria University in Australia, was the first to identify the problem. In her 1999 study published in the Fire Safety Journal, Bruck tested 20 children in Australia between the ages of 6 and 17 to determine their response to a 60-decibel alarm sounding at pillow level.

She conducted her test twice and found 17 of the children slept through one or both tests. Two of the three who woke were 16 and 17 years old, among the older children in the sample. Indeed, for the children 15 and under, the reliable waking rate was only 5.6 percent. In contrast, Bruck found all of the parents woke when the alarms sounded.

In subsequent research, Bruck found that raising the sound level at the children’s head made only a limited difference at best. In a presentation to the fourth Asia-Oceania Symposium on Fire Science and Technology in 2000, Bruck and fellow researcher Angela Bliss reported their findings from a study of 28 children between the ages of 6 and 15. In two tests, the children were exposed to an 89-decibel alarm; half slept through one or both tests. Among the 6 to 10-year-olds, that percentage climbed to 71 percent. When children did wake, they were groggy for several minutes, a factor that might well have impaired their ability to make life-saving decisions in a true emergency. Put simply, louder, closer alarms were unlikely to solve the problem.
While adults and some fire protection experts may be surprised by those numbers, kids themselves might not be.

Derrick Ethridge, fire prevention officer for the Loyalist Township Emergency Services in Ontario, Canada, decided to study the issue when children in the schools he visits told him they didn't think they'd hear an alarm if it went off.

“They kept telling me, 'I don’t think I’d hear it,'” he recalls. “I suspected there was a problem just on the basis of what the kids were telling me, and I wanted to find out if that was true.”

With the help of Professor Alistair MacLean of the Queens University Sleep Lab, the Canadian Hearing Society, the Limestone and Algonquin school boards, and the parents of 222 Loyalist Township sixth graders, Ethridge decided to conduct a test. Parents were asked to activate the smoke alarms outside their sleeping children’s bedrooms between 9 and 11 p.m. on two separate nights in April 2002 and time how long it took the children to awaken. Tests were conducted once with the door closed and once with it open. The children knew they’d be tested but didn’t know when.

The team found 31 percent of the children didn’t wake up at all when the smoke alarm was activated, and 53 percent didn’t react within the first minute. Ethridge later conducted random audibility tests in 22 of the homes. Testing once with the bedroom door open and again with it closed, he found sound levels in some cases dipped as low as 64 decibels.

Some parents wrote back, “I took the damn smoke alarm off the ceiling, put it over my kid’s head and he didn’t move.” Or they said the alarm rang until the batteries went dead, and the child never woke up,” he says. “They were definitely concerned.”

As disconcerting as research such as Bruck’s and Ethridge’s may be, it must be considered in light of overwhelming data demonstrating smoke alarms’ proven benefit. Since the early 1970s, when smoke alarms made their way into homes, residential fire deaths have been cut in half. Homes with smoke alarms—whether or not known to be operational—have a death rate 40 to 50 percent lower than the rate for homes without alarms, says Dr. Fahy.

Today, the overwhelming majority of fatalities take place in homes that aren’t equipped with alarms or in homes where the equipment is broken, dismantled, or missing a battery. Half of the people killed in home fires each year die in the 5 percent of homes that don’t have smoke alarms. Of the fatalities that do take place in homes equipped with alarms, half occur in one-third of the cases in which the smoke alarm doesn’t sound.

More research needed

The fact that children are sleeping through alarms must be studied against this backdrop, Fahy says, and the magnitude of the problem can’t be diagnosed without additional research.

“Of all home fire deaths, we’re talking about a subset of the 25 percent that occur in homes with operable alarms,” she says, “and we need to know more about those cases.”

For example, how are people alerted when nighttime fires occur? Are alarms waking parents who then shuffle their children out of the house? If so, are the alarms accomplishing their aim by alerting parents and enabling the family to put its escape plan into action?

While the media focus has been on children sleeping through alarms, what about older residents who are most likely to have hearing loss and are more likely to live alone or with other seniors? Would different types of alarms, such as voice notification or a lower frequency, achieve better results? Would interconnecting alarms as is already required for new construction by NFPA 101®, Life Safety Code®, make a substantial difference?

Without at least some of that information, it’s impossible to draw actionable conclusions from existing studies, demonstrations, and news reports, Fahy says.

John Drengenberg, UL’s manager of Consumer Affairs and moderator for the March panel discussion on the topic, voiced the same sentiment.

“Based on what we heard from pediatric sleep experts and fire prevention officials, there might not be a
single answer to this complicated issue,” he says.

**Practice still the best solution**

While officials study the issue and try to ascertain how best to address it, NFPA President Jim Shannon emphasizes that parents shouldn’t let their concern about the issue distract them from the larger issue of fire safety.

“If parents conclude from the demonstrations that they don’t need some alarm protection, they’ll be dead wrong,” he says. “The fact is, smoke alarms do work. What remains to be seen is if we can make the technology better and use it more effectively.”

Alarm Code is scheduled for publication in 2006. Changes may be forthcoming, if research identifies areas where significant and meaningful improvements could be made.

As Shannon notes, however, the effectiveness of smoke alarms has as much to do with practices in the home as it does with codes and standards.

“As safety groups, including NFPA, explore the issue, there’s still very good reason to remain confident about the role of smoke alarms in home fire safety systems,” he says. “In the near term, the lesson parents should take away from these news broadcasts is that they won’t know how their children will react to the smoke alarm until they’ve tested their response to it. Home fire drills are essential.”

Evidence indicates that familiarization with the sound of the alarm and practicing escape drills holds promise. Bruck cites research indicating that adult subjects who were primed to respond awakened 90 percent of the time. Those who weren’t woke only 25 percent of the time.

Although it wasn’t a research project, families who participated in the WCCO broadcast had a similar experience. After the four children failed the initial test, their parents talked to them about fire safety. They also laid out home escape plans and practiced them. Marci Douglas discussed fire safety with Mitchell, then activated the smoke alarm with a broom handle so her kids would recognize its sound during an emergency.

When WCCO repeated the drill several weeks later, all four children awoke and carried out the drill to the letter.

**Encouraging families to prepare**

Judy Comoletti, assistant vice president of NFPA’s Public Education Division, not only emphasizes the importance of developing and rehearsing home escape plans, but suggests that parents activate their smoke alarms and conduct their drills at night, so they can better gauge the reaction of everyone in the household. Children and the elderly aren’t the only ones at risk of sleeping through an alarm, she notes. Sleep-deprived college students, shift workers, teenagers, the hearing impaired, and anyone taking sedating medication, alcohol or drug-impaired individuals, might conceivably be affected, as well.

“Every family should know who will—and won’t—wake up at the sound of the alarm so they can accommodate any special needs,” she says. If someone is hard to rouse, Comoletti suggests installing additional hard-wired, interconnected alarms in every bedroom. If this doesn’t work, she encourages families to design an escape plan that assigns an adult who awakens easily to rouse the sound sleepers.

“We all think we know our kids so well, and we think we know how they will react to A, B or C” says Douglas. “We think they’re so smart they’ll know just what to do. However, the reality is you don’t know at all until it happens. You have to practice. It’s like helping your kid prepare for a spelling test. You have to drill them.”

Lee Richardson, NFPA staff liaison for NFPA 72®, The National Fire Alarm Code®, advises not to “throw the baby out with the bathwater.”

“People shouldn’t get tunnel vision,” he says. Instead, they need to focus on maintaining and testing their smoke alarms and practicing their home escape plans.

NFPA 72 contains requirements for the type of sound pattern an alarm emits and how loud it needs to be throughout the home and especially in sleeping areas. Although the location of smoke alarms in homes in any U.S. community is determined by local building codes, NFPA 72 includes location requirements typical of those usually found in these codes.

While recent news coverage has raised awareness, NFPA’s technical committees aren’t yet considering changing the codes, Richardson says. The next edition of the National
I LOVE A CHALLENGE

When you're answering an emergency response call, you face enough surprises. You know you don't want your gear to be one of them. You need gear that can stand up to the intense heat and flame of a flash fire or the toxic chemicals and biological threats of a hazmat incident. So you can handle the heat and perform at your best.

DuPont™ NOMEX® helps protect against heat and flame.

DuPont™ KEVLAR® helps protect against cut and abrasion.

DuPont™ TYCHEM® helps protect against chemical and biological hazards.

The best science. The best technology.

DuPont Personal Protection

For more information visit www.personalprotection.dupont.com

© Copyright 2003 E. I. du Pont de Nemours and Company. All rights reserved. The DuPont Oval, DuPont™, The miracles of science™ and NOMEX®, TYPHON®, TYVEK®, KEVLAR® and PROSHIELD® are registered trademarks or trademarks of DuPont or its affiliates. Proper head, hand and respiratory protection also required. Garments shown are part of a total protective system.

Circle 016 Reader Service Card
GEARING UP for new threats

FIRST RESPONDERS ARE TRAINING TO PREPARE FOR POSSIBLE TERRORIST THREATS

FROM HIS SUBURBAN VIRGINIA OFFICE at the Fairfax County Fire and Rescue Department, Deputy Chief Glenn Benarick can’t see the Central Intelligence Agency (CIA) complex on the other side of the county, but he knows it’s there. His department has answered fire and hazardous materials calls at the CIA’s Langley headquarters in the past and recently conducted joint incident management training with the agency to prepare for a possible terrorist attack.

The CIA is just one of several government complexes in Fairfax County outside Washington, D.C. If a major terrorist chemical, biological, radiological, or nuclear (CBRN) attack were to occur in or around the nation’s capital, Fairfax Fire and Rescue would respond to the incident—which puts the department’s 1,400 members on the front lines of the terror-related threats facing first responders in the United States.

Like other large fire departments, Fairfax has rushed to adjust to its changing role. Unlike many departments, however, the county’s haz-mat teams have equipment designed for CBRN use and know how to use it.

“We’ve done what we’ve needed to do as far as training, and we have truckloads of supplies, which isn’t the case everywhere around the country,” Benarick, who also chairs NFPA’s Technical Committee on Fire Service Occupational Safety and Health.

Fairfax’s haz-mat responders will approach a scene encapsulated in garments that form a barrier against industrial or military chemical vapors, and they’ll carry their own air supplies in the form of self-contained breathing apparatus (SCBA) that incorporate personal alert safety system (PASS) alarms.

Even in a department as prepared as Fairfax County’s, though, CBRN protection for first responders is a work in progress. Most planning and products focus on chemical attacks rather than biological or radioactive threats and gaps remain in the availability of needed equipment.

Benarick questions how well his teams’ SCBA units will stand up to chemical warfare agents. The county bought the SCBA two years ago, before the National Institute of Occupational Safety and Health (NIOSH) began certifying SCBAs for CBRN protection. If it wants NIOSH-certified units now, Fairfax County may have to shell out another half million dollars or more, a tough sell in cash-strapped states and municipalities. >

by ALAN S. BROWN
IS THEIR EQUIPMENT BEHIND THE CURVE?
"We weren’t planning to do anything for about six years,” says Benarick. “Some departments keep them for 10 years because they’re so expensive.”

In the meantime, Fairfax is waiting to see if its vendors develop upgrade kits to bring its SCBAs into compliance with NIOSH standards.

Unknown dangers
The SCBA are just part of Benarick’s concerns. The real problem, he says, is that the first responders to any CBRN incident are likely to be engine and ladder companies, and they’ll show up in basic turnout gear.

“If you’re dispatched to a haz-mat event, you typically have some idea of what you’re going into and what chemicals may have been released,” he explains. "With weapons of mass destruction, first responders may not realize what they’re dealing with until they try to mitigate the incident. In some cases, that may be too late for them.”

How the responders are deployed will depend on their level of protection.

Rescue squads and advanced life saving units will bring with them splash-protective suits that comply with the requirements of NFPA 1992, Liquid Splash-Protective Clothing for Hazardous Materials Emergencies. These are called Level B suits when used with SCBA units and Level C suits when used with air-purifying respirators (APRs) or powered air-purifying respirators (PAPRs), after from the edge of the hot zone to field decontamination units. There, ALS technicians in protective clothing will scrub off chemical agents, then move victims to hospitals without contaminating doctors, nurses, and facilities. Beyond the warm zone will be supporting responders wearing NFPA 1992 ensembles with PAPRs.

In the hot zone, the haz-mat team will search for survivors and begin remediation wearing haz-mat suits that meet the requirements of NFPA 1991, Vapor-Protective Ensembles for Hazardous Materials Emergencies, chemical/biological option. NFPA 1991 ensures protection against vapor penetration by chemical agents and toxic industrial chemicals. Fairfax has 66 of these ensembles,

"Physiologically, we could send them back in after a short break, but we’d have to have frequent breaks,” says Louder. This lack of responder productivity, though always a given with haz-mat teams, is troubling. In neighborhood-sized events, those lost work hours could prove vital.

"Longer work periods enable incident commanders to get situations under control faster,” says Bryan Heirston, an Oklahoma City, Oklahoma, Fire Department assistant chief and chair of NFPA’s Technical Committee on Hazardous Materials Protective Clothing and Equipment. “We need better suit designs that increase responder productivity while ensuring the safety and health of the wearer.”
NFPA 1994, *Protective Ensembles for Chemical/Biological Terrorism Incidents*, was supposed to provide requirements for that type of garment. The standard covers all emergency responders with three levels of protection against chemical warfare and toxic industrial materials. A Class 1 vapor-resistant ensemble provides vapor protection and is intended for high vapor concentrations or unknown exposures. Class 2 ensembles provide low-level vapor resistance and liquid splash resistance. And Class 3 ensembles would resist incidental droplets for responders on the periphery of the event.

Work on NFPA 1994 officially began in 1998, and the standard was published in August 2001, a month before 9/11. Yet on equipping the 120 largest cities and training responders to recognize signs of chemical warfare. Since Oklahoma City, NFPA has addressed response capabilities in a broader way.”

NFPA had several models to work with. The requirements in NFPA 1991 and NFPA 1992, written in the late 1980s, were based on those of the EPA’s vapor-tight Level A and liquid-tight Level B suits used in hazardous chemical response and remediation. Unlike the EPA, which merely described the assembly of protective equipment, NFPA set performance requirements.

For anyone who has ever sweated it out in an encapsulated suit, breathable garments sound like a better alternative. However, they have one big flaw, says that the ensemble will prevent penetration of five chemical warfare agents—lewisite, sarin, V-agent, distilled mustard, and cyanogen chloride—as well as selected TICs.

“We originally developed the chem/bio option as a stop-gap measure while writing NFPA 1994, which was designed to deal specifically with the chem/bio threat,” Heirston recounts. “Then we did a risk assessment analysis and realized that a terrorist might target toxic industrial materials, which are widely available. So we decided to keep the NFPA 1991 chem/bio option, which protects against industrial and military threats. That’s become our super suit, our Cadillac.”

Nonetheless, many standards writers are dissatisfied with the results.

![A Cranston, Rhode Island chemical manufacturing plant explosion in February, 2003 brought together Cranston firefighters and Hazardous Materials crew. Firefighters help a Hazardous Materials crew member out of his suit, assist a Hazardous Materials crew member out of a decontamination tent, and wait to assist an employee of the plant after he is decontaminated by a Hazardous Materials crew member (right).](image)

Nearly two years later, only a handful of Class 1 ensembles have been certified. At least one Class 3 ensemble has been approved, and Class 2 ensembles are in the testing process.

Most people trace NFPA 1994 back to March 20, 1995, when the Aum Shinrikyo cult released sarin nerve gas on a Tokyo subway in the first known terrorist attack with a chemical warfare agent. Then came the destruction of the Alfred P. Murrah Federal Building in Oklahoma City.

“Oklahoma City changed people’s perception,” says Stephen N. Foley, NFPA senior fire service specialist. “A lot of folks thought it would never happen to them, that terrorism could only happen in a big city. The initial focus had been

Jeffrey O. Stull, president of International Personal Protection in Austin, Texas.

“While chemical warfare agents are more toxic than any other chemical substances, they are also relatively easy to protect against. They’re all large molecules and can’t permeate a garment easily. But with toxic industrial chemicals (TICs), like ammonia, chlorine, and phosgene, the molecules are small and will go right through,” explains Stull, a member of NFPA’s hazardous materials protective equipment committee.

Therefore, NFPA decided to develop the new CBRN option for its encapsulated NFPA 1991 ensemble, which already protects against industrial hazardous materials. The option ensures

Though designed to protect the wearer against chemical agents terrorists are most likely to use, including dimethyl sulfate, ammonia, chlorine, phosgene, and hydrogen cyanide, they don’t cover all 21 industrial chemicals tested under NFPA 1991. Nor does NFPA 1994 demand the levels of flame and abrasion resistance required by NFPA 1991.

Many of those who originally wrote NFPA 1994 saw it as a way to protect emergency services personnel who are likely to respond to a chemical/biological attack. Those working the hot zone, where the agent and its concentration are unknown, would wear Class 1 ensembles. Those in the hot or warm zone, where gas concentrations are lower and
splashed liquids present a serious threat, would wear Class 2 ensembles. Responders on the perimeter would use a Class 3 ensemble to protect against incidental droplet contact.

“What we ended up with were the same garments we always had,” says Heirston. “They’re encapsulating suits that look like NFPA 1991 and NFPA 1992 ensembles. The manufacturers are cross-certifying existing garments.

“That wasn’t what I envisioned,” he continues. “While I expected Class 1 would have the look and ergonomics of a traditional haz-mat suit, I thought the other levels would reduce heat stress and improve maneuverability.”

Stull also wants to see changes. Haz-mat teams, he notes, are trained to use vapor-protective ensembles effectively.

“A chem/bio event will draw a wider array of first responders to the front line, including fire, law enforcement, EMS, and other personnel,” he says. “With that in mind, my criticism of the industry is that it tests its products against chemical agents and then presumes they can be used by Joe First Responder. That won’t necessarily be true. We need more innovation in how we approach design.”

Not enough products

As of April 1, 2003, only DuPont Personal Protection’s Tychem CPF3 (models 3T463 and 3T464) had been certified as an NFPA 1994 Class 1 ensemble. Several other companies are testing garments, but none have yet received Class 1, 2, or 3 certification.

In fact, says Stull, there is virtually no interest in developing Class 2 ensembles.

“The NFPA 1994 criteria push Class 2 so close to Class 1, manufacturers don’t know where that fits in,” he explains.

The offering is equally slim for the NFPA 1991 chem/bio option. Certified products include DuPont’s Commander, Responder, and Reflector (aluminized overcoat) models and Trellborg Protective Products’ HPS and VPS suits, all with a variety of SCBA pass-through options. In addition, OnGuard Industries has certified its haz-mat boot to the standard.

In May 2002, Interspiro USA received NIOSH certification for three CBRN-approved SCBAs, the Spiromatic 9030, 6630, and 4530, followed by Scott Health & Safety in February 2003. In March, Scott announced it would begin the certification process for CBRN upgrade kits for NFPA-compliant SCBA units. And in May, MSA received NIOSH CBRN certification for its NFPA 1981, 2002 edition-compliant SCBA.

There are several reasons for the chem/bio product drought, starting with the nature of the certification process itself. Chemical warfare agents are highly controlled. Until recently, only the U.S. Army’s SBCCOM laboratory ran live tests, and its charter extended only to military equipment. Since 9/11, other chemical warfare agent testing facilities have opened, and SBCCOM has freed up time and equipment to test responder equipment. Yet delays remain.

Because companies testing products for certification to NFPA standards couldn’t use highly restricted chemical warfare agents, they were flying blind when they submitted products for live testing. Nor could they learn from their mistakes: labs routinely destroyed contaminated garments, so they were unavailable for post-test analysis. Fortunately, NIOSH and SBCCOM revised their procedures in March 2003 to enable companies to test respirator materials, surfaces, and designs before submitting samples.

Still, testing is expensive. Manufacturers estimate it costs $40,000 to $50,000 to test an SCBA unit and significantly more for an APR. Pat Gleason, director of the Safety Equipment Institute, an equipment-testing group, estimates that certifying an NFPA 1994 Class 3 ensemble costs about $90,000 and certifying a Class 1 or 2 ensemble costs $150,000. Rob West, security and emergency services manager for Texas Instruments Inc., estimates that it costs more than $100,000 to certify a NFPA 1991 ensemble with the chem/bio option.

That adds up to big bucks. Fairfax Fire and Rescue’s single-use disposable DuPont TK or Trellborg VPI NFPA 1991 ensembles cost between $1,400 and $1,900 each, and NFPA 1994 Class 1 garments cost about the same. That’s why so few are on the streets, says John M. Eversole, retired chief of Chicago Fire Department Special Operations and a leading authority on haz-mat response.

“This is a suit you put on one time and discard for $1,400,” he says. “How many do you own?”

There are, of course, big differences between NFPA and EPA requirements for haz-mat suits. NFPA standards demand proof of performance, while the EPA requires only that products conform to written specifications.

Stull charges that, without performance standards, inappropriate products can slip through. As an example, he points to haz-mat coveralls with elastified openings around the face and sleeves that are positioned by some distributors for chem/bio use.

“That’s not going to provide any integrity against permeation,” he says. “Therefore, they provide some duct tape or equivalent to secure it. Their cloth zipper provides no barrier protection, so there’s more duct tape. Their seams may or may not be sewn properly. So what good will they do?”

Change

NFPA’s technical committees have been looking for new ways to encourage less expensive, more innovative designs that provide every responder with chemical/biological protection while improving productivity. The goal, say committee members, is to create protection standards that are effective and widely adopted by responders around the country.

With its chemical/biological option, NFPA 1991 appears to be such a standard. It provides the highest possible level of protection against fire and industrial chemicals, and can protect wearers from chemical warfare agents if the chemical/biological option is selected.

The technical committee has also been working for changes to NFPA 1994 that encourage development of a broader range of ensembles. This starts with rethinking how NFPA 1994 classifies threats. Instead of using terms such as hot, warm, and cold zones, for example, a revised standard might focus on spe-
specific exposure threats, says Heirston.

These changes were inspired in part by the anthrax-laden letters distributed in 2001. “It was obvious during the anthrax incidents that we had focused too much on the chemical aspects of terrorism,” says Stull. “If we’d known it was anthrax we were facing, we wouldn’t have worn encapsulated suits. There are better, more comfortable ways to deal with that threat, but our classifications didn’t accommodate them.”

Testing 1, 2, 3
NFPA is also working to revise its test methods to open the door to new designs.

As a user of protective ensembles, Texas Instruments’ West would like to see existing test methods evaluated for their practicality and real-life applicability. “Take abrasion testing, where we rub sandpaper on a seam,” he says. “If it doesn’t pass after 100 times but passes after 92 times, is that an appropriate amount of protection?”

Eversole is concerned that setting standards too high not only adds to cost, making them less available to those who need them, but may make the suits less usable. “When the guys in the suits are doing 40 jobs per month, they’re going to ask why they’re putting on something that adds heat and weight,” he says.

The technical committees may also change the requirements so as to make APRs and PAPRs part of an NFPA-compliant response mix. “In chem/bio, the fire service has been one way about SCBAs: ‘That’s it, no exceptions, we only look at SCBAs,’” says Eversole. “Now we’re in a new world where we’re not looking at a single building but more of a neighborhood situation. We’re looking at respirators again because we need something lighter with more operating time in these situations.”

NIOSH has already published a CBRN standard for APRs and is working on one for PAPRs.

In addition, the technical committees are considering reworking the standards to require that all SCBAs conform to NIOSH’s CBRN standard.

“Most manufacturers tell us that the modifications they have to make to meet CBRN standards are relatively minor,” says Ray Reed, a captain in the Dallas, Texas, Fire Department, and chair of NFPA’s respiratory protection equipment committee. “If it’s not a significant number of modifications and doesn’t affect the comfort of SCBA, we may consider it.”

Future directions
By rethinking threats and altering test methods, standard-makers hope to encourage manufacturers to break out of the encapsulated suit/respirator mold. They might even develop suits firefighters are comfortable wearing.

One possible direction is the introduction of semi-permeable materials, such as those used in sportswear and raincoats that let air out but keep moisture from getting in. They not only keep wearers dry, but they help prevent heat buildup. A suit that lets out air and water vapor while blocking the larger molecules of chemicals used in warfare is already being developed by the U.S. Army’s National Protection Center, says technical program manager Bill Haskell. Haskell admits that toxic industrial chemicals are new to his group, but he says much of the research that’s already been done to protect soldiers from chemical and biological warfare is applicable to responder protection.

“Our ultimate dream is to leverage military technology and incorporate it into the next generation of firefighting structural gear,” says Haskell. “You would have one ensemble that gives you protection against CBRN, extreme weather, and flashover without added weight or heat stress. It would be something responders could wear all the time, instead of carrying separately.”

Haskell, who is field-testing prototypes, says such a responder garment could be on the market in as little as six years.

Broader standards coverage
Some NFPA members hope to broaden the reach of CBRN standards by advocating them for inclusion in the regulations and standards set by the Occupational Safety and Health Administration (OSHA) and other government organizations. This has happened before, when OSHA mandated that all structural firefighting gear meet NFPA 1971, Protective Ensemble for Structural Fire Fighting.

“Before OSHA adopted NFPA 1971, there was a lot of substandard firefighting gear out there,” says Heirston. “Many departments just couldn’t justify the expense of protecting their people with state-of-the-art bunker gear until OSHA required it.”

This time, the push may also come from the federal Interagency Board for Equipment Standardization and Interoperability (IAB). Composed of federal, state, and local organizations, including NFPAs, IAB was formed to ensure that emergency responders have standardized interoperable equipment to cope with weapons of mass destruction.

“Until now, the big dispensers of grant money, like FEMA, the Department of Justice, and the Department of Health and Human Services, haven’t had specific requirements for equipment,” says Stull. “The hope is that they will reference equipment that’s on the list, which will be expanded to include products in the marketplace that meet those requirements.”

Stull and others expect the flood of homeland security dollars to dramatically increase the number of CBRN-compliant products available.

CBRN protection remains very much a work in progress, and requirements are likely to keep changing as responders grapple with both new threats and new ways to meet them.

Until the sarin attack on the Tokyo subway, chemical terrorism didn’t really appear on the first responder’s radar, but response organizations rose to the occasion, adapting haz-mat ensembles for use against chemical weapons. Then they were blindsided by the anthrax scare, which highlighted the need for more effective bioterrorism ensembles. Today, those needs are being addressed, in part through revisions to NFPA 1994. However, work is still needed to prepare for so-called “dusty weapons,” “dirty” bombs, and other potential radiological weapons.
Each year, NFPA collects data on all firefighter fatalities in the U.S. that resulted from injuries or illnesses that occurred while the victims were on-duty. The victims were local career and volunteer firefighters, seasonal and full-time state and federal agency employees with fire suppression responsibilities, prison inmates serving on firefighting crews, military personnel performing assigned fire suppression activities, civilian firefighters working at military installations, and members of industrial fire brigades.

IN 2002, 97 ON-DUTY FIREFIGHTER DEATHS occurred in the U.S. This compares to the 440 firefighter fatalities that occurred in 2001 (340 at the World Trade Center on September 11 and 100 elsewhere in the U.S.). Figure 1 shows firefighter deaths for the years 1977 through 2002, excluding the deaths at the World Trade Center. In 2002, there were 9 multiple-fatality incidents; the most severe of which was a motor vehicle crash that killed 5 firefighters responding to a wildland fire. There were also 5 three-fatality and 3 two-fatality incidents.

**Type of duty**
Figure 2 shows the distribution of the 97 deaths by type of duty. The largest proportion of deaths (47 percent) occurred on the fire ground. Another 19 deaths occurred while responding to or returning from alarms. Although it may surprise some, fire ground deaths accounted for fewer than half of the total on-duty deaths in 8 of the last 10 years (in 2001, aside from the deaths at the World Trade Center). In the past decade, it has been typical for another 1/5 to 1/4 to occur while responding to or returning from alarms, and 2002 was no exception.

Of the 46 fire ground deaths, 14 were due to internal trauma, 13 to heart attacks, 10 to asphyxiation, 5 to crushing injuries, and 2 to burns. One firefighter was shot to death and another suffered an aneurysm.
Ashland firefighters, from right, Dave Rutledge, Bill Davisson, and Randy Jack-enheimier salute May 23, 2003, during the annual Firefighter's Memorial Service at Ashland Cemetery in Ashland, Ohio.
Responding to or returning from alarms accounted for 1/5 of the deaths in 2002. Eight of the 19 deaths were due to heart attacks. Ten were due to collisions or rollovers and a vehicle struck a firefighter while he was responding to the station by bicycle.

Eleven deaths occurred during training activities. Two firefighters suffered fatal heart attacks and 2 suffered strokes. Two died of smoke inhalation at a live fire training exercise and a firefighter died of heat stroke. One drowned during dive training and another was killed when a train struck his tanker while he was returning from a training exercise. Another firefighter was struck and killed by a drunk driver while packing equipment after a roadside training exercise. And a firefighter was killed by fire apparatus that slipped into gear and struck him.

Eleven firefighter deaths occurred during the performance of non-emergency-related on-duty activities. Seven of the 11 firefighters died while engaged in normal administrative or station activities — all as the result of heart attacks. Another firefighter suffered a fatal heart attack while cleaning up after a tornado and another firefighter was killed in the crash of a fire department tanker while returning from routine maintenance.

Another firefighter was killed in a motor vehicle crash while on his way to a meeting and a firefighter died when an errant shell struck him at a Fourth of July fireworks display.

Ten deaths occurred at non-fire emergencies. Five of the 10 firefighters suffered fatal heart attacks at the scenes of medical calls or motor vehicle crashes. Another firefighter suffered an aneurysm at a medical call and vehicles struck 2 while operating at a motor vehicle crash or fire. A firefighter suffered a heart attack while directing traffic at a water main break and a firefighter was asphyxiated while attempting to rescue someone from an underground tank.

**Cause and nature of fatal injury or illness**

Figures 3 and 4 summarize the deaths by cause and nature of fatal injury or illness. The term “cause” refers to the “action, lack of action, or circumstances that resulted directly in the fatal injury.” The term “nature” refers to “the medical process by which death occurred and is often referred to as “cause of death” on death certificates and in autopsy reports.

Stress and overexertion is still the leading cause of fatal injury, as it is almost every year. Of the 40 stress-related deaths in 2002, 37 resulted in heart attacks and 3 resulted in strokes or aneurysms. Heart attack is typically the leading nature of injury and usually accounts for close to half of the total deaths, but in the last 25 years, heart attack deaths have dropped by more than 1/3. Of the 37 heart attack victims in 2002, 7 had a history of heart problems — usually prior heart attacks or bypass surgery — and medical documentation showed that another 6 had severe arteriosclerotic heart disease, 3 were hypertensive and 1 was diabetic. In the past 25 years, medical documentation has been available for 703 of the 1,333 heart attack victims. Of those 703 victims, 48.9 percent had prior heart attacks or bypass surgery and another 30.9 percent had severe arteriosclerotic heart disease. Another 12.7 percent had hypertension or diabetes.

The second leading cause of injury was struck by an object or contact with an object (37 percent). These 36 deaths included 22 killed in motor-vehicle crashes and 7 struck by motor vehicles. Three firefighters were killed when walls collapsed while they were operating outside structure fires. A falling tree struck 1 firefighter and an errant rocket struck another at a public fireworks display. A person jumping from a burning structure killed 1 firefighter and an arsonist shot 1 firefighter to death.

The next leading cause of injury was caught or trapped, resulting in 15 deaths. Eight firefighters were killed inside structural collapses. Four firefighters became lost inside fire-involved structures and ran out of air. Flashover caught 2 firefighters during live fire training and 1 firefighter became trapped underwater and drowned.

Four firefighters were fatally injured when they fell or jumped. One firefighter fell through the floor, and another through the roof, at structure fires. One firefighter fell from a brush firefighting unit and was fatally burned and 1 firefighter jumped from his bulldozer when it began to slide down a hill, but the vehicle ran him over.

In the remaining incidents, fumes overcame and suffocated 1 firefighter while he tried to rescue a man from a molasses tank and 1 firefighter died of heat stroke after exercising.
Ages of firefighters
The firefighters who died in 2002 ranged in age from 14 to 76, with a median age of 42. (The 14-year-old was a junior firefighter attending a station on his bike when a vehicle struck him.) Figures 5 and 6 show the distributions of firefighter deaths and death rates by age.

Heart attacks account for a higher proportion of the deaths among older firefighters, as might be expected. Sixty percent of the firefighters over age 50 who died in 2002 died of heart attacks.

To put the hazards of firefighting in various types of structures into perspective, we examined the number of firefighters killed while responding to fires in 2002. Nine firefighters were killed in 4 crashes while operating at wildland fires. Three of these crashes involved aircraft and 1 involved a fire department vehicle. The remaining 3 crashes involved fire department vehicles during non-emergency activities.

Other findings
Twelve firefighters died in incendiary and suspicious fires - 6 while responding to 2 wildland fires, 3 at structure fires, 2 at wildland fires, and 1 while responding to an incident involved a fire department vehicle.

1998 through 2002 and estimates of the number of firefighters in each age group from the NFPA's 2000 profile of fire departments (mid-year in the range). The lowest death rates are for firefighters in their 30s. The rate for firefighters in their 50s is almost double the average and for firefighters age 60 and over, it is almost 4 times the average. Firefighters over age 50 account for two-fifths of all firefighter deaths over the 5-year period but less than 1/6 of all firefighters.

Fire-ground deaths
Figure 7 shows the distribution of the 46 ground deaths by property use. The largest proportion of deaths occurred in residential structures (46 percent), with 20 in one- and two-family dwellings and 1 in an apartment building. There were 15 ground deaths per 100,000 structure fires by property use using estimates of fire experience from NFPA's fire loss studies from 1997 through 2001 and updated firefighter fatality data for the corresponding years. The results are shown in Figure 8. Although more firefighter deaths occur in residential structures than in any other type of structure, fires in non-residential structures are generally more hazardous to firefighters, on average. There were 8.9 deaths per 100,000 nonresidential structure fires from 1997 through 2001, compared to 4.0 per 100,000 residential structure fires.

Motor vehicle crashes
In 2002, 22 firefighters died in 13 vehicle crashes. Ten of the 22 were responding to incidents when the crashes occurred. In 2002, only 3 victims were driving their personal vehicles when the crashes occurred; all were speeding at the time and 2 weren't wearing seatbelts. The remaining 7 firefighters killed while responding to fires were killed in 3 crashes in fire department vehicles that were on their way to wildland fires - 5 of them in single crash.

STRESS AND OVEREXERTION IS STILL THE LEADING CAUSE OF FATAL INJURY, AS IT IS ALMOST EVERY YEAR.

Nine firefighters were killed in 4 crashes while operating at wildland fires. Three of these crashes involved aircraft and 1 involved a fire department vehicle. The remaining 3 crashes involved fire department vehicles during non-emergency activities.

Of the 16 deaths in road vehicles mentioned above, 8 victims weren't wearing seatbelts (6 were ejected) and 7 were wearing seatbelts (4 were ejected). No information on seatbelt use was available for 1, but he also was ejected in the crash. Excessive speed was cited as a factor in 4 of the 10 crashes, and 1 driver was intoxicated.
to a structure fire. From 1993 through 2002, 92 firefighters (9.4 percent of all on-duty deaths) died in connection with incendiary and suspicious fires. The share of these deaths annually has been dropping fairly steadily since 1985, which is, in part, a reflection of the decline in incendiary and suspicious fires over the same period.

No firefighters died because of false alarms in 2002. In the past 10 years, 25 firefighter deaths have resulted from false calls, whether malicious or alarm malfunctions.

Of the 97 firefighters who died while on duty in 2002, 80 were local, municipal career, and volunteer firefighters; 12 were contractors to federal agencies; 3 were federal land management agency employees; 1 was a state forestry agency employee, and 1 was a member of an industrial fire brigade.

The distribution of deaths of career and volunteer firefighters from local, municipal fire departments is shown in Figure 9. A comparison of the fatality experience of career and volunteer firefighters in 2002 is shown in Table 1.

Conclusions
In 2001, the U.S. fire service experienced its most catastrophic year, in terms of on-duty firefighter fatalities. In 2002, the death toll fell back to the level experienced over the past decade. At 97, the total number of on-duty deaths was slightly below the most recent five-year average of approximately 100 deaths per year.

In 2002, many areas across the U.S. experienced one of the worst wildland fire seasons in recent years, and unfortunately, as a result, it was a particularly bad year for wildland firefighter fatalities. Twenty-two firefighters died while working at or responding to wildland fires or at a controlled burn. Three of the 5 largest loss-of-life incidents involved wildland firefighter fatalities.

There were a few positive findings in 2002. No career firefighters died while responding to or returning from emergencies, and there were fewer than the average number of deaths involving volunteer firefighters responding in personal vehicles. One year doesn’t indicate a trend, but it’s a positive finding that we hope will continue.

But many of the same problems continue to exist, particularly the large number of firefighters who died of heart attacks. Again in 2002, heart attack was the leading cause of on-duty firefighter deaths, and we continue to find that most victims for whom medical documentation was available had pre-existing health problems.

The frequency of these fatalities and other fire ground and training deaths can be reduced by adopting and adhering to a comprehensive safety and health program designed using NFPA 1500, “Fire Department Occupational Safety and Health Program,” and its companion standards, and NFPA 1403, “Live Fire Training Evolutions.” Revised NFPA 1582, “Comprehensive Medical Programs for Fire Departments,” lists the medical conditions that could preclude a candidate from becoming a firefighter, or an individual from serving effectively and safely as a suppression firefighter. Attention to fitness and health throughout every firefighter’s years of service is essential to operating safely. NFPA 1583, “Health-Related Fitness Programs for Fire Fighters,” provides a guideline for departments to follow.

References
1. The NFPA’s files for firefighter on-duty fatal injuries are updated continually for all years.
3. Michael J. Karter, Jr., “U.S. Fire Department Profile Through 2000,” NFPA Fire Analysis and Research Division, Quincy, Massachusetts, December 2001, unpublished. The analysis shown here assumes that the number of firefighters adequately estimates exposure and that the age distribution of career and volunteer firefighters is similar.

Credits
A study made possible by the cooperation and assistance of the United States fire service, the Public Safety Officers’ Benefits Program of the Department of Justice, the United States Fire Administration, the National Institute for Occupational Safety and Health, the Forest Service of the U.S. Department of Agriculture, and the Bureau of Indian Affairs and the Bureau of Land Management of the U.S. Department of the Interior. The authors would also like to thank Stephen N. Foley and Carl E. Peterson of the Public Fire Protection Division for their assistance on the study.
## Comparison of On-Duty Deaths Between Career and Volunteer Firefighters, 2002

### TYPE OF DUTY

<table>
<thead>
<tr>
<th>Type of Duty</th>
<th>Career Firefighters</th>
<th>Volunteer Firefighters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating at fire ground</td>
<td>14 46.7</td>
<td>21 42.0</td>
</tr>
<tr>
<td>Responding to or returning from alarm</td>
<td>0 0.0</td>
<td>14 28.0</td>
</tr>
<tr>
<td>Training</td>
<td>7 23.3</td>
<td>3 6.0</td>
</tr>
<tr>
<td>Operating at non-fire emergencies</td>
<td>2 6.7</td>
<td>8 16.0</td>
</tr>
<tr>
<td>Other on-duty</td>
<td>7 23.3</td>
<td>4 8.0</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>30 100.0</strong></td>
<td><strong>50 100.0</strong></td>
</tr>
</tbody>
</table>

### CAUSE OF FATAL INJURY

<table>
<thead>
<tr>
<th>Cause of Injury</th>
<th>Career Firefighters</th>
<th>Volunteer Firefighters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress</td>
<td>13 43.3</td>
<td>26 52.0</td>
</tr>
<tr>
<td>Struck by or contact with object</td>
<td>6 20.0</td>
<td>14 28.0</td>
</tr>
<tr>
<td>Caught or trapped</td>
<td>8 26.7</td>
<td>7 14.0</td>
</tr>
<tr>
<td>Fell</td>
<td>1 3.3</td>
<td>2 4.0</td>
</tr>
<tr>
<td>Other</td>
<td>2 6.7</td>
<td>1 2.0</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>30 100.0</strong></td>
<td><strong>50 100.0</strong></td>
</tr>
</tbody>
</table>

### NATURE OF FATAL INJURY

<table>
<thead>
<tr>
<th>Nature of Injury</th>
<th>Career Firefighters</th>
<th>Volunteer Firefighters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart attack</td>
<td>12 40.0</td>
<td>25 50.0</td>
</tr>
<tr>
<td>Internal trauma</td>
<td>4 13.3</td>
<td>12 24.0</td>
</tr>
<tr>
<td>Asphyxiation</td>
<td>7 23.3</td>
<td>6 12.0</td>
</tr>
<tr>
<td>Burns</td>
<td>2 6.7</td>
<td>4 8.0</td>
</tr>
<tr>
<td>Drowning</td>
<td>0 0.0</td>
<td>2 4.0</td>
</tr>
<tr>
<td>Crushing</td>
<td>1 3.3</td>
<td>0 0.0</td>
</tr>
<tr>
<td>Gunshot</td>
<td>1 3.3</td>
<td>0 0.0</td>
</tr>
<tr>
<td>Other</td>
<td>3 10.0</td>
<td>1 2.0</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>30 100.0</strong></td>
<td><strong>50 100.0</strong></td>
</tr>
</tbody>
</table>

### RANK

<table>
<thead>
<tr>
<th>Rank</th>
<th>Career Firefighters</th>
<th>Volunteer Firefighters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firefighter</td>
<td>22 73.3</td>
<td>35 70.0</td>
</tr>
<tr>
<td>Company officer</td>
<td>5 16.7</td>
<td>6 12.0</td>
</tr>
<tr>
<td>Chief officer</td>
<td>3 10.0</td>
<td>9 18.0</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>30 100.0</strong></td>
<td><strong>50 100.0</strong></td>
</tr>
</tbody>
</table>

### AGES OF FIREFIGHTERS

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Career Firefighters</th>
<th>Volunteer Firefighters</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 and under</td>
<td>1 3.3</td>
<td>3 6.0</td>
</tr>
<tr>
<td>21 to 25</td>
<td>1 3.3</td>
<td>3 6.0</td>
</tr>
<tr>
<td>26 to 30</td>
<td>3 8.3</td>
<td>9 18.0</td>
</tr>
<tr>
<td>31 to 35</td>
<td>3 4.2</td>
<td>4 8.0</td>
</tr>
<tr>
<td>36 to 40</td>
<td>5 10.0</td>
<td>6 12.0</td>
</tr>
<tr>
<td>41 to 45</td>
<td>6 10.0</td>
<td>5 10.0</td>
</tr>
<tr>
<td>46 to 50</td>
<td>5 10.0</td>
<td>5 10.0</td>
</tr>
<tr>
<td>51 to 55</td>
<td>2 6.7</td>
<td>5 10.0</td>
</tr>
<tr>
<td>56 to 60</td>
<td>2 6.7</td>
<td>3 6.0</td>
</tr>
<tr>
<td>Over 60</td>
<td>2 6.7</td>
<td>7 14.0</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>30 100.0</strong></td>
<td><strong>50 100.0</strong></td>
</tr>
</tbody>
</table>

### AGES OF FIREFIGHTERS - Deaths from heart attacks only

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Career Firefighters</th>
<th>Volunteer Firefighters</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 to 30</td>
<td>2 16.7</td>
<td>2 8.0</td>
</tr>
<tr>
<td>31 to 35</td>
<td>0 0.0</td>
<td>1 4.0</td>
</tr>
<tr>
<td>36 to 40</td>
<td>1 8.3</td>
<td>3 12.0</td>
</tr>
<tr>
<td>41 to 45</td>
<td>2 16.7</td>
<td>3 12.0</td>
</tr>
<tr>
<td>46 to 50</td>
<td>3 25.0</td>
<td>3 12.0</td>
</tr>
<tr>
<td>51 to 55</td>
<td>1 8.3</td>
<td>4 16.0</td>
</tr>
<tr>
<td>56 to 60</td>
<td>2 16.7</td>
<td>3 12.0</td>
</tr>
<tr>
<td>Over 60</td>
<td>1 8.3</td>
<td>6 24.0</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>12 100.0</strong></td>
<td><strong>25 100.0</strong></td>
</tr>
</tbody>
</table>

### FIRE GROUND DEATHS BY FIXED PROPERTY USE

<table>
<thead>
<tr>
<th>Property Use</th>
<th>Career Firefighters</th>
<th>Volunteer Firefighters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwellings and apartments</td>
<td>9 64.3</td>
<td>12 57.1</td>
</tr>
<tr>
<td>Stores</td>
<td>4 28.6</td>
<td>3 14.3</td>
</tr>
<tr>
<td>Vacant</td>
<td>0 0.0</td>
<td>4 19.0</td>
</tr>
<tr>
<td>Public assembly</td>
<td>1 7.1</td>
<td>1 4.8</td>
</tr>
<tr>
<td>Road/highway</td>
<td>0 0.0</td>
<td>1 4.8</td>
</tr>
<tr>
<td>Wildland</td>
<td>0 0.0</td>
<td>1 5.3</td>
</tr>
<tr>
<td>Storage</td>
<td>0 0.0</td>
<td>1 5.3</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>12 100.0</strong></td>
<td><strong>19 100.0</strong></td>
</tr>
</tbody>
</table>

### YEARS OF SERVICE

<table>
<thead>
<tr>
<th>Years of Service</th>
<th>Career Firefighters</th>
<th>Volunteer Firefighters</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 or less</td>
<td>6 20.0</td>
<td>15 30.0</td>
</tr>
<tr>
<td>6 to 10</td>
<td>5 16.7</td>
<td>8 16.0</td>
</tr>
<tr>
<td>11 to 15</td>
<td>6 20.0</td>
<td>4 8.0</td>
</tr>
<tr>
<td>16 to 20</td>
<td>4 13.3</td>
<td>4 8.0</td>
</tr>
<tr>
<td>21 to 25</td>
<td>3 10.0</td>
<td>2 4.0</td>
</tr>
<tr>
<td>26 to 30</td>
<td>3 10.0</td>
<td>4 8.0</td>
</tr>
<tr>
<td>over 30</td>
<td>3 10.0</td>
<td>10 20.0</td>
</tr>
<tr>
<td>Not reported</td>
<td>0 0.0</td>
<td>3 6.0</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>30 100.0</strong></td>
<td><strong>50 100.0</strong></td>
</tr>
</tbody>
</table>

### ATTRIBUTES OF FIRE GROUND DEATHS

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Career Firefighters</th>
<th>Volunteer Firefighters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incendiary and suspicious fires</td>
<td>3 1</td>
<td>1</td>
</tr>
<tr>
<td>Search and rescue operations</td>
<td>3 2</td>
<td>2</td>
</tr>
<tr>
<td><strong>MOTOR VEHICLE CRASHES</strong></td>
<td>1 7</td>
<td></td>
</tr>
<tr>
<td><strong>FALSE ALARMS</strong></td>
<td>0 0</td>
<td>0</td>
</tr>
</tbody>
</table>
FIRE 2002 FIGHTER FATALITIES INCIDENTS

STRUCK BY
On January 10 at 2:26 a.m., a woman called 911 to report a fire in the stairway of her building. The building, a four-story, 50-unit apartment house of ordinary construction with a full basement, wasn't equipped with sprinklers.

On arrival, fire companies observed trapped occupants threatening to jump from the upper stories. A second alarm was immediately sounded. An officer and two firefighters, dressed in full-protective clothing and staffing the first due aerial ladder company on the second alarm, positioned the apparatus at the rear of the building according to standard operating procedures. Two trapped occupants on the top story were observed hanging out the window preparing to jump. Overhead power lines prevented the ladder company from using the aerial ladder and they were unable to raise the 50-foot (15-meter) ground ladder so they grabbed a 35-foot (10-meter) ground ladder and raised it toward the trapped occupants.

As they struggled to place the fully extended ladder, a female occupant jumped and struck the top of the ladder, which was 3 feet (0.9 meters) short of the sill of the fourth story window. She fell and landed at the firefighters' feet. A male occupant jumped immediately after and simultaneously struck a parked van and the firefighter who was bracing the ladder.

The 39-year-old firefighter was knocked to the ground but eventually managed to get to his feet. He continued to rescue additional occupants over the ground ladder and participated in other firefighting activities during the remainder of the fire. At the station after the fire, he complained of severe head, neck and back pain throughout the night but refused treatment until after his work shift when he went to a medical facility near his home where he was treated and released.

Over the next couple of weeks, he continued to have severe headaches. On January 26, he was admitted to the hospital where he lapsed into a coma and died on February 7, never regaining consciousness. The cause of his death was listed as a ruptured aneurysm.

The fire investigation unit determined the fire had been set. A liquid accelerant was poured on the front central stairway from the fourth to the first story landings and ignited. The fire gained entry to the fourth story through an open fire door. Two civilians died as a result of the fire and 10 were injured. Property damage was estimated at $500,000.

FIREWORKS
On July 5 at 11 p.m., 11 members of the fire department were participating in a centennial fireworks show for a nearby town. They were providing a supervised fireworks display, using 3-, 4- and 5-inch (7-, 10-, and 12-centimeter) mortars. Before the display, the fire chief conducted a training session on safety requirements and proper fireworks discharge procedures. The chief assigned the firefighters to their individual duties and the firefighters familiarized themselves with their work areas and proper placement of the shells into the mortars.

The 44-year-old firefighter was loading a 5-inch (12-centimeter) shell when a shell struck him and knocked him to the ground. A witness reported that the firefighter had been down on one knee loading the first of his 2 mortars before the mishap. Firefighters in the area saw him get up and run from the discharge site with sparks streaming down the left side of his body. It appeared he was trying to brush something from his clothing. He ran approximately 20 feet (6 meters) before a shell apparently under his arm exploded knocking him to the ground. A bright blue flash accompanied the explosion.

Firefighters and EMS personnel ran to the injured firefighter and rendered first aid. He was transported to the hospital where he was pronounced dead a short time later. The cause of death was listed as blunt force injuries and thermal burns.

BURNS
On August 1, a call was received at 2 p.m. for a pasture fire. A 48-year-old firefighter responded directly to the fire from his place of business. When he arrived at the scene, he was assigned to ride in the back of a pickup truck and operate a hose fed from a portable water tank. He wasn't wearing any protective clothing.

At some point, the firefighter fell from the back of the truck into the path of the fire, losing his eyeglasses. The driver of the truck was initially unaware that the firefighter had fallen and when he realized that the firefighter was no longer on the truck, he attempted to find him but couldn't, due to the smoke and flames.

Evidence indicates that the firefighter attempted to take refuge at the bottom of a brush covered dry creek bed, 200 feet (61 meters) from where he fell. He then made his way 374 feet (114 meters) along a fence line where firefighters found him. He was removed to a safe location where first aid was administered. He was medivaced to a hospital and then transferred to a burn center.

The firefighter sustained burns to 80 percent of his body surface area and died five days later.

A 71-year-old man was charged with setting the fire that caused the firefighter's death.

DROWNING
June 14 was the last day of a 21-day diving school sponsored by a fire department and held at a privately owned pond. Students at the diving school represented...
FIREFIGHTER FATALITIES: INCIDENTS

AIR TANKER CRASH
At noon on June 15, a wildland fire was discovered that eventually involved 22,750 acres (9,206 hectares) and took more than 10 days to contain.

Two days into the suppression operation, a pilot, co-pilot, and engineer died when their four-engine, air tanker crashed. The plane was a C-130A that was manufactured in 1957 and was used by the military until 1988 when it entered service with the U.S. Forestry Service. The airplane’s records indicated that it had more than 20,000 flight hours.

Witnesses reported that the aircraft was making what appeared to be a normal retardant delivery run. During the delivery, the wings snapped upward and separated from the fuselage near the wing roots. The fuselage and wings crashed into a grassy field. Subsequent fires ignited in the area of the separated wings.

The crew died from traumatic injuries.

STRUCK BY
Eight days after being hired as a “casual-hire employee,” a 51-year-old firefighter died while fighting a forest fire on July 2.

After working on one forest fire for several days, he was reassigned to another fire on July 1. After receiving a briefing on current conditions, he was assigned the job of using a chainsaw to cut down trees that were in danger of falling.

At 1 p.m., crews were ordered to a safety zone due to strong winds. Personnel reported hearing trees falling during the storm. After the winds died down, the crews were briefed on potential safety hazards and the plan of action for the afternoon. The objective was to clear hazardous trees along a trail.

The firefighter was cutting down a tree when two other crew members some distance away saw a treetop in the firefighter’s vicinity begin to move, acquire momentum, and fall. They rushed to his location and found him pinned under the tree. His chainsaw, still running, was found in the back cut of the tree that he had been cutting.

The firefighter died shortly after the tree that hit him was removed. An autopsy was conducted and the cause of death was listed as cranioencephral trauma.

TRAPPED
On May 3 at 9 a.m., firefighters responded to a 2-story commercial building of ordinary construction for a report of smoke showing. On arrival, firefighters in full protective clothing entered the building to conduct a primary search and initiate ventilation operations coordinated with a suppression effort on the first story. They gained entrance to the building through two doors at the front of the building. The door on the right led to the first story and the door on the left to a stairway to the second story. Other companies were assigned to back up the companies that entered the building.

Fire was found on the first story, water was applied and firefighters believed that the fire was knocked down. Ventilation operations revealed, however, that the fire was still burning in the concealed space above the ceiling. An officer who had reached the rear of the building opened an overhead garage door to aid in the ventilation. As he turned around, he observed the fire flare up and travel across the ceiling towards him. He attempted to exit through the garage door but was prevented by a locked security gate across the garage door opening. Conditions quickly deteriorated at that time. He called for help over his department radio and was rescued by companies outside the building.

The incident commander ordered an evacuation of the building for an accountability roll call. During the evacuation, a firefighter on the second story found another firefighter on the floor, unresponsive. He attempted to radio for help but due to the amount of radio traffic was unable to. He tried to drag the firefighter to the stairwell but was unsuccessful. He began to run out of air and left the building. He reported the situation to a battalion chief and a search party was formed.

The search party went to the second story where they found and removed the firefighter. After they exited the building, another accountability roll call was taken and another firefighter was reported missing. A second search party was formed and they reentered the second story. Just as the search party advanced a 1/04-inch hose to the second story, a PASS device was heard sounding in the rear of the building. By this time fire conditions had deteriorated greatly. The second missing firefighter was found and removed through a window to the roof of an adjoining single story building. He was then brought to the lower level in a stokes basket.

The fire progressed to four alarms before it was declared extinguished. Both firefighters were immediately transported to a local hospital where they were pronounced dead. It was determined the firefighter who was removed first was missing for 20 minutes and the second firefighter was missing for 29 minutes.

The cause of death for the two firefighters was listed as smoke inhalation.
In the months since its hearing, the Technical Committee on Assembly Occupancies and NFPA have strived to make places of assembly, such as nightclubs, safer.

by JOHN NICHOLSON

THE EMERGENCY HEARING of the NFPA Technical Committee on Assembly Occupancies and Membrane Structures hadn't begun, but the ballroom at Boston's World Trade Center last March was buzzing with discussion. Gradually, the conversation turned from the February deaths at The Station and the E2 nightclubs, the catalysts for the unprecedented hearing, to the inevitable question: What happens next?

safer assembly
Based on the actions of the technical committee to date, the answer to several of the questions posed at the March hearing is a resounding “Yes.” Possible changes to the 2003 edition of the Life Safety Code are being processed to reflect enhanced safety requirements for assembly occupancies through the TIA process, and the changes will be considered before the regularly scheduled revision cycle.

In the four months since the hearing, the technical committee has completed balloting for its own TIAs and those submitted by others, among them the International Fire Marshals Association (IFMA). The TIAs have been recirculated for further public comment, and the Technical Correlating Committee for Life Safety has reviewed them for conflicts with other provisions of the Life Safety Code via a ballot. The Technical Committee on Assembly Occupancies and Membrane Structures is now ready to review the proposed Life Safety Code amendments at a meeting at NFPA headquarters in Quincy on July 8 and 9. It will then send its final recommendations to the Standards Council, which meets the following week in Portland, Oregon.

The technical committee
The technical committee’s preparation for its meeting in Quincy began almost immediately following the March hearing, when the committee appointed several task groups and began to review each proposed TIA, says Ron Coté, technical committee staff liaison.

According to Coté, it now appears that, based on the technical committee’s TIAs and the balloting, some change to the code is likely. However, the Standards Council will determine the exact timeframe for the change. “The technical committee could recommend that the Standards Council issue something that unifies all the recommendations made through the TIA process,” Coté says.

If the Standards Council opts to issue the TIAs, the amendments would affect the 2003 edition of the Life Safety Code, and it would be up to local jurisdictions to adopt the TIA along with that edition of the code. The TIAs reviewed include:
• Requiring fire sprinklers in all clubs with live entertainment and crowds of more than 300.
• Requiring a minimum of one trained crowd manager for every assembly occupancy.
• Prohibiting “festival seating,” unless an approved life safety evaluation has been performed.
• Requiring sprinklers in clubs where crowds are fewer than 300.

Since the March hearing, IFMA has requested more changes, including mandating sprinklers in every nightclub, regardless of size; requiring club owners to inspect their exits every business day; and mandating better access to fire extinguishers.

A TIA from the technical committee prohibiting “festival seating,” unless an approved life safety evaluation has been performed, was proposed for NFPA 5000. In addition, IFMA proposed a TIA for NFPA 5000 that would better define “Special Assembly Building.”

A TIA was also proposed for NFPA 1126, Use of Pyrotechnics before a Proximate Audience.

Not every TIA submitted will become part of the final committee recommendations. The TIA submittals are well intended, but they sometimes contain flaws that were noted during the balloting process. A TIA that requires a life safety evaluation before allowing festival seating could affect small gatherings, for example. A meeting in a church hall at which children sit on the floor could be seen as an assembly occupancy using festival seating, and a life safety evaluation could technically require the meeting to conform to the code, Coté says.

Furthermore, three-fourths of the technical committee members must agree on a TIA in its letter ballot before the committee can recommend it.

The Standards Council
The regularly scheduled July meeting of the Standards Council, which meets four times a year, will be its second since the March hearing. Like the Technical Committee on Assembly Occupancies, the Standards Council has actively followed code developments since March.

At its April meeting in Washington, D.C., the council appointed additional members to the Technical Committee on Assembly Occupancies to broaden the representation. According to Standards Council Secretary Casey Grant, the new members include representatives of IFMA, the National Fire Sprinkler Association, the American Fire Sprinkler Association, the Michigan Fire Inspectors Association, and the Florida Fire Marshals and Inspectors Association.

In addition, Grant provided the Standards Council with an overview of the March hearing and the progress of the technical committee. “This was a very intense time for all fire professionals and NFPA,” he says.

Standards Council members are monitoring the TIAs produced, including those generated by the technical committee members, Grant says. Grant also noted that it is unusual to receive so

**THESE INCIDENTS WERE UNUSUAL, AND THE RESPONSE THEY ENGENDERED WAS UNUSUAL, TOO.**
many TIAs related to a single event. “We normally review one or two at each of our meetings,” he says. The Standards Council anticipates that the technical committee’s report will be comprehensive, in light of all the work the committee has done. “The Standards Council doesn’t write the codes. That’s the job of the technical committee. In this case, the technical committee is meeting to go over all its materials and will consider all the TIAs, then pull something together for the Standards Council,” Grant says. It’s uncommon for a technical committee to meet to streamline its recommendations in this way before the Standards Council meets, Grant says. Normally, the Standards Council receives the TIAs, then asks the technical committee to study them and report back. However, these incidents were unusual, and the response they engendered was unusual, too.

Full details of the investigation into the causes of the nightclub fire are unavailable because of the confidential nature of the work. However, NFPA is vocal when it comes to espousing its codes and standards. On two occasions, NFPA staff has testified before Rhode Island’s Special Commission to Study All Aspects of Law Concerning Pyrotechnics and Fire Safety, created by the state’s General Assembly in response to the fire. The commission listened to two months of testimony from fire and crowd-control experts, business owners, the public, and several survivors. NFPA Vice-President of Regional Operations Gary Keith gave the panel an overview of what’s been happening since NFPA’s March hearing and advocated that Rhode Island adopt NFPA 1, Uniform Fire Code 

NFPA is uniquely positioned to assist the state, Keith says, because our codes account the fact that many older buildings can’t meet current fire codes and standards for new construction. NFPA 1 UFC is also seen as an important tool for Rhode Island because the 2003 edition of NFPA 1 UFC incorporates provisions from the Western Fire Chiefs’ Uniform Fire Code under the terms of a partnership agreement between NFPA and the Western Fire Chiefs.

NFPA 1 UFC was restructured to be more compatible with the regulatory adoption procedures, including administration and code enforcement, occupancies, processes, equipment, and hazardous materials provisions. Additional extracts and references from NFPA codes and standards essential to the code official were added, bringing the number of referenced NFPA codes and standards to more than 125.

Although there’s an increased interest in NFPA codes and standards on the national level because of the two tragedies, Keith says, it’s too early to tell if the interest will lead to adoptions. He says one thing’s sure, though: There’s a heightened awareness of fire safety nationwide.

“Changes are taking place throughout the country, particularly when it comes to inspections for compliance with existing codes,” Keith says. Elsewhere, the Connecticut House of Representatives passed a bill that would require sprinklers in most buildings in which indoor pyrotechnics are staged, increase the fire marshals’ authority, and raise penalties on lawbreakers.

And in Massachusetts, the state legislature’s public safety committee has recommended more mandatory sprinklers in places of assembly and a ban on most indoor pyrotechnics.

The TIA process that began at the March hearing isn’t the normal code process, Grant says. Normally, code revisions for the current edition of the Life Safety Code and NFPA 5000 would have been considered in January 2004, the start of its regular code revision cycle. However, the public outcry for change that followed the Rhode Island and Chicago nightclub tragedies focused attention on NFPA, and the Association rose to the challenge, first with the March hearing, then by encouraging fire safety professionals’ and the public’s involvement in the TIA process.

**NFPA’s advocacy role**

The two tragedies, the West Warwick fire in particular, saw NFPA take on the familiar roles of information and investigative resources. and standards set minimum safety thresholds for existing occupancies. Rhode Island officials are particularly interested in getting rid of the state’s “grandfathering” process for existing buildings, since this type of exemption shields many older buildings from modern fire regulations, as it did The Station. Adoption of the existing building provisions in Life Safety Code in Rhode Island would help achieve this goal.

A proposed amendment to a bill before the Rhode Island legislature would replace the grandfather clause with the existing building’s provisions of the Life Safety Code, as the state’s Fire Safety Code Board of Appeal & Review has recommended. According to published reports, Rhode Island fire safety officials say NFPA codes and standards would provide a minimum baseline for safety and take into the causes of the nightclub fire are unavailable because of the confidential nature of the work. However, NFPA is vocal when it comes to espousing its codes and standards.

On two occasions, NFPA staff has testified before Rhode Island’s Special Commission to Study All Aspects of Law Concerning Pyrotechnics and Fire Safety, created by the state’s General Assembly in response to the fire. The commission listened to two months of testimony from fire and crowd-control experts, business owners, the public, and several survivors.

NFPA Vice-President of Regional Operations Gary Keith gave the panel an overview of what’s been happening since NFPA’s March hearing and advocated that Rhode Island adopt NFPA 1, Uniform Fire Code, and the Life Safety Code.

NFPA is uniquely positioned to assist the state, Keith says, because our codes

NFPA's advocacy role

The two tragedies, the West Warwick fire in particular, saw NFPA take on the familiar roles of information and investigative resources.
Stay Informed of Critical Issues in Your Industry! In these pages, you'll find news and information affecting your profession and your career.

Architects, Engineers, and Building Officials
WEB SITE: http://www.nfpa.org/aeboweb
CHAIR: John Kampmeyer, Triad Protection Engineering Corp.

HOT ISSUES
Three Fall Education Programs
The AEB0 Board plans to sponsor three programs at NFPA's Fall Education Conference in Reno, Nevada, this November.

NFPA Adoptions: Where are we now and what have we learned?
NFPA staff and building officials will present their experiences. Tentative speakers include building officials from Texas and Arizona; the National Park Service; and California.

Energy Update: NFPA 900
The Building Systems Technical Committee will discuss the status of NFPA 900, Building Energy Code; ASHRAE 90.1; and ASHRAE 90.2.

Overview of IAPMO Codes.
IAPMO staff will discuss how the development of the Uniform Mechanical and Plumbing Codes coordinates with those of NFPA 5000™, Building Construction and Safety Code™; NFPA 1, Uniform Fire Code™; and NFPA 101®, Life Safety Code®.

How to Reach Us: Allan Fraser, Executive Secretary, +1-617-984-7411, afraser@nfpa.org

Aviation
WEB SITE: http://www.nfpa.org/aviation
CHAIR: Dennis Kennedy, P.E., Ansul, Inc.

HOT ISSUES
Support for Revised NFPA 403 in Dallas
NFPA members adopted the revised NFPA 403, ARFF Services at Airports, at the World Safety Conference and Exposition™ (WSCE) in May. The NFPA Standards Council is expected to approve the standard in July, and the document will become effective in August. It will be available in September.

Although the Federal Aviation Administration has yet to adopt NFPA 403 into FAR Part 139 or an Advisory Circular, airports already use it to decide how many vehicles and how much extinguishing agent they need, and to help comply with OSHA criteria for firefighter safety.

WSCE Educational Tracks
Joe Wright and Bernie Valois kicked off the educational presentations with a discussion of large aircraft firefighting and a comparison of ARFF standards. Both drew interesting questions, some from Chief Panayiotis Samaras of the Athens, Greece, International Airport, which allowed attendees to compare their ARFF services to those in Athens.

Later, Captain Tom Phillips recounted his experiences as a pilot for a major carrier and as a firefighter, and Randy Tucker of the RJA Group provided an overview of air traffic control tower fire safety. We also heard from Tom Cortina, who put to bed some misconceptions about foam and the environment.

Special thanks to NFPA Aviation Section Chair Dennis Kennedy of Tyco Suppression Systems for putting the program together.

How to Reach Us: Mark Conroy, Executive Secretary, +1-617-984-7410, mconroy@nfpa.org

Education
WEB SITE: http://www.nfpa.org/edsection
CHAIR: Peg Carson, Carson Associates

HOT ISSUES
Is a Child Safety Program Worth It?
By EDWARD CLARK and SHAWN S. KELLEY
On July 22, 2002, Ann Reed and her 1-year-old daughter Kira were returning home to Arlington County, Virginia, from Washington, D.C. when their 1990 Ford Taurus was broadsided by a vehicle making an illegal left-hand turn. The car was totaled. Thanks to the efforts of Arlington County firefighters, however, Kira survived the crash with nothing more than a few bumps and bruises.

The Arlington County firefighters who saved Kira didn't extricate her from the mangled vehicle, provide emergency medical care, or take her to a hospital. Indeed, the firefighters most responsible for saving her life were nowhere near the scene of the accident. They'd spared Kira by teaching Reed how to install her child safety seat properly.

Having herself survived the accident with only minor injuries, Reed credits the Arlington County Fire Department's (ACFD) child passenger safety program with saving her daughter's life.

"I have no doubt that Kira would have been seriously injured or killed if I hadn't had her car seat checked by the fire department," said Reed.

Reed first turned to ACFD for help when she had a problem installing her daughter's infant seat. On December 9, 2001, when Kira was only 14 days old, Captain Curtis Stilwell helped Reed install it properly at Fire Station No. 7. On June 11, 2002, Reed attended an ACFD child passenger education session, where Captain Robert Pye adjusted Kira's infant seat. The crash took place a few weeks later.

While Kira's story is the first save documented by ACFD's program, others will no doubt emerge as the program moves forward. Since it's difficult to document saves unless a parent returns to tell the fire department about it, ACFD doesn't know how children benefit from the program. Data limitations aside, however, it's apparent that the child passenger safety program has had far-reaching effects. In FY 2002 alone, ACFD personnel inspected approximately 739 child safety seats.

The fire department also offers Child Passenger Safety Certification classes in the belief that a large pool of qualified technicians will make child
passenger safety programs even more effective. Anyone interested in obtaining certification as a child passenger safety technician should contact their local fire department or the American Automobile Association.

Some ask if ACFD's child passenger safety program is worth it. For an answer, try asking one of the thousands of families that have benefited from the program. Better yet, ask Ann and Kira Reed.

Kelley is assistant chief of the Arlington County Fire Department, where Clark is a firefighter/EMT.

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

Electrical
WEB SITE: http://www.nfpa.org/electrical
CHAIR: Richard Loyd, R & N Associates

HOT ISSUES
Chair's Corner
BY RICHARD E. LOYD
The Electrical Section program at the 2003 World Safety Conference and Exposition™ (WSCE) began on Sunday, with presentations on electrical safety and NFPA 70E, Electrical Safety Requirements for Employee Workplaces, and NFPA 70, National Electrical Code® (NEC).

On Monday, the Electrical Section Executive Board met to review section business and begin planning next year's WSCE in Salt Lake City. The 2005 NEC is up for adoption next May, so start making plans to stay through the voting on Thursday.

The section also offered educational programs on Monday, after which section members gathered for a reception sponsored by necdigest.

On Tuesday afternoon and Wednesday morning, the 19 NEC code-making panels reported on the proposals the panels acted on for the 2005 NEC. George Ockuly, first vice-chair of the NFPA Board of Directors; Jack Wells, past chair of the board; Jim Carpenter, executive director of the International Association of Electrical Inspectors and chair of the NEC Technical Correlating Committee; and Jim Pauley, NFPA Standards Council and NEC Technical Correlating Committee member, offered some great information.

Our thanks to Jeff Sargent, section executive secretary, and Paul Dobrowsky, first vice-chair, for coordinating the educational program and the social event. See you in Salt Lake City next May!

2003 Electrical Section Elections
On May 21, the section elected officers and executive and nominating committee members-at-large.

Officers 2003-2004
Chair
Richard E. Loyd, R & N Associates

First Vice-Chair
Paul Dobrowsky, Eastman Kodak Co.

Second Vice-Chair
H. Brooke Stauffer, National Electrical Contractors Association

Third Vice-Chair
James T. Pauley, Schneider, Electric/ Square D. Company

Secretary
Michael I. Callanan, National Joint Apprenticeship & Training Committee

Executive Committee Members-at-Large 2003-2005
Robert Baird, Independent Electrical Contractors

William Hopple, Simplex Grinnell

David Kendall, Carlon Electrical Products/ Lamson & Sessions

Nominating Committee Members-at-Large 2003-2004
James Daly, BICC General, West Nyack, New York

Michael Johnston, International Association of Electrical Inspectors, Richardson, Texas

Immediate Past Chair Art Black is chair of the nominating committee, and George Staniero of AFC Cable Systems is an executive committee member-at-large for a term ending in May 2004.

2005 NEC Comments Due October 31
The next major deadline in the 2005 National Electric Code® (NEC) cycle is the closing of the submission period for public comments on proposal actions. Comments must be at NFPA headquarters by 5 p.m. EST on October 31. Submit comments by mail, fax, or electronically at www.nfpa.org/ Codes/ProposalsAndComments.asp.

Comments introducing material that's new in concept that wasn't available for public review will be reintroduced as proposals for the 2008 NEC. The ROP is available at www. necdigest.org or by calling (617) 984-7249.

A comment submission form for the 2005 ROP is included in the ROP or can be obtained by calling (617) 984-7249. PDF and Word versions are available at www.nfpa.org/PDF/NEC05Comment.

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
CHAIR: Ronald Hopkins, Eastern Kentucky University

HOT ISSUES
Call for Poster Presentation, Forum Abstracts
The section is sponsoring a poster presentation for research projects in post-secondary 2004 education programs, to be held at the World Safety Conference and Exposition™ (WSCE). Posters are welcome from fire science, fire technology, and fire protection engineering.
students in community colleges, technical schools, universities, and graduate schools. They will be displayed in the exhibit hall, and winners will be invited to demonstrate the subject of their posters.

The presentations will illustrate the quality of student research projects, and faculty members are encouraged to integrate this activity into their curricula next year.

Winners will be chosen from several categories. Prizes for the best projects, as evaluated by the Poster Committee, include the latest NFPA Fire Protection Handbook and registration at the WSCE.

Students interested in submitting an abstract should contact Patrick Kennedy, Poster Committee Chair, 7678 Old 301 Boulevard, Sarasota, Florida 34243; (941) 885-8010; fax (941) 351-5849; or pkennedy@kennedy-fire.com. Applications can also be downloaded from http://www.nfpa.org/firescience. Deadline for submission is February 15, 2004.

The section will also sponsor a forum on the state of the art of fire science, fire technology, and fire protection engineering education worldwide at the 2004 WSCE. Ron Hopkins and Robert M. Gagnon, P.E., will moderate.

A primary goal is to understand the way fire protection professionals are trained and how they enter the profession. Topics may include curriculum development, delivery methodology, new programs and courses, books, distance learning, and recruitment.

To register, contact Gagnon at (410) 442-1600 by September 1, 2003. You may also fax him at (410) 489-0140 or e-mail him at robtgagnon@aol.com.

Section-Sponsored Presentations
The section sponsored four presentations at the WSCE in Dallas. Richard Bennett discussed the professional development of fire officers, and Daniel Churchward, Kathryn and Patrick Kennedy, and Ron Hopkins addressed fire investigations. Kathleen Almand, John Frank, Dave Hooton, Ed Kaplan, Dave Lucht, Mark Schofield, and John Watts discussed distance learning, and James Nasby talked about electric fire pump starting.

The section also sponsored a presentation on performance-based fire alarm design by Robert M. Gagnon, P.E., describing Society of Fire Protection Engineers methodology that fire protection engineers apply to fire modeling, performance metrics, and performance thresholds when evaluating detection, notification, control, and supervision functions of fire detection and alarm systems. Other presentations were delivered by Robert T. Foraker, Hopkins, and Patrick Kennedy.

To propose future WSCE presentation topics, contact Frank Florence, executive secretary, at (617) 984-7480 or fflorence@nfpa.org.

Membership Is Up
As of May 2003, the section had 854 members, 61 percent more than in 2002. NFPA members interested in joining can apply at www.nfpa.org/firescience.

Bylaws Change
We've revised the section's bylaws to include student members. We can now consider applications from fire science and fire protection engineering students.

HOW TO REACH US: Frank Florence, Executive Secretary, +1-617-984-7480, fflorence@nfpa.org
Fire Service
WEB SITE: http://www.nfpa.org/fireservice
CHAIR: Terry Allen, Chief, Cambridge, Ontario, Canada

HOT ISSUES
Executive Board Changes
The following are changes to the Fire Service Section Executive Board.

Vice Chair
Kirk H. Owen, Plano, Texas, Fire Department

Secretary
Peter A. McMahon, Town of Grand Island, New York

Directors
Michael A. Wieder, Fire Protection Publications, Oklahoma State University
Thomas J. Cuff, Firemen's Association of the State of New York

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
CHAIR: Richard Strub, Chattanooga, TN

HOT ISSUES
Chair's Corner...
By DICK STRUB
In this issue of NFPA Journal, you'll find several "Section News" articles by members of the section executive board, who will submit material in every other issue of Journal. This is the first example of the board's commitment to increased communication with the NFPA membership.

These articles will be directed primarily at NFPA members affiliated with the American Society for Healthcare Engineering and the American Health Care Association, although we'll address other subjects as appropriate. Alternating issues will feature updates by Mike Daniel, chair of the Codes and Standards Review Committee, and Tom Bulow, vice-chair.

To make this information exchange meaningful, I need your input. You can contact me at 2620 Winter Garden Drive, Chattanooga, Tennessee 37421; (423) 893-0760 or Rstrub4234@AOL.com.

Alcohol-Based Hand Sanitizers
By SUSAN MCLAUGHLIN, SBM CONSULTING
The health-care industry is trying on many fronts to reduce nosocomial, or hospital-acquired, infections, which are said to be responsible for thousands of deaths annually. In October 2002, the Centers for Disease Control and Prevention (CDC) published a revised Guideline for Hand Hygiene in Health Care Settings, supported by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) in January 2003.

Because hand-washing is the most important means of infection control, the CDC's guideline supports the use of alcohol-based hand sanitizers as an effective tool in reducing nosocomial infections. They're quick and easy to use, and are less irritating than soap.

If these sanitizers are to be used effectively, they must be conveniently located. Many have suggested mounting them in corridors outside patient rooms, but this practice has become controversial. The sanitizers are 60 percent alcohol and have a flash point of 75°F (24°C), calling into effect the requirements of NFPA 101®, Life Safety Code®, and NFPA 30, Flammable and Combustible Liquids Code.

According to these codes, projections of no more than 3.5 inches (9 centimeters) are allowed into the corridor of a healthcare occupancy and not about 38 inches (97 centimeters) above the floor. While many dispensers can comply with the projection requirement, they'd be virtually useless within 38 inches of the floor.

Furthermore, flammable liquids and gases cannot be stored or handled anywhere they might compromise egress. JCAHO prohibits installing alcohol-based hand sanitizers in egress corridors or nursing stations open to egress corridors, suggesting instead that they be mounted just inside patient room doors and not immediately above a heat or ignition source, electrical outlet, or light switch. Installation suites is also permitted, but health-care organizations are advised to check with the state fire marshal for guidance on specific locations.

Current corridor installations are permitted on an interim basis only. The American Society for Healthcare Engineering (ASHE) recommends storing up to 10 gallons (38 liters) of sanitizer in a room that's one-hour fire resistance rated and larger amounts in non-flammable cabinets.

While this guidance meets the letter of the code and current accreditation requirements, there are questions as to whether these materials significantly contribute to fire spread. To determine the extent of the materials' contribution to flame spread, ASHE has undertaken a study, the outcome of which will be shared with all interested parties, including JCAHO. Depending on the results, current positions and recommendations may be modified, possibly to the extent of removing existing corridor installations.

Spontaneous Combustion in Nursing Facilities
By THOMAS GARDNER
Spontaneous combustion fires in nursing facility laundries, which typically involve kitchen rags and mop heads, often begin while the rags or mops are cleaned and dried, or shortly afterwards. According to investigators, the washers in which the rags and mop heads are cleaned, which range from commercial units to top loaders, may not do a thorough job.

There are several reasons. The first is inadequate hot water, always a problem in facilities in which the laundry shares the hot water supply with the rest of the facility. Many states require nursing facilities to lower their water temperature to avoid burning patients, but water must be hotter than 165°F (74°C) to break down the fatty acids contaminating grill rags.

A second problem is inadequate chemical action in the wash process, also rooted in patient care. To ensure that sheets and clothing don't irritate patients' skin, the pH of wash chemicals must have a pH of 7. But this isn't high enough to break down grease. And investigators found that facilities with alternative wash formulas specifically for heavily soiled rags or mop heads don't always use them.

Even if nursing facilities were allowed to use higher-alkaline products, certain equipment isn't made for such detergents. And there's the problem of cost. Adding additional product or another cycle to the cleaning process costs money.

While these problems contribute to the spontaneous fires, investigations reveal that the drying process, not the washing
process, is the crucial factor in creating an environment conducive to spontaneous fires. Subjecting rags and mop heads to short, hot drying cycles with no cool-down cycle increases the possibility of fire.

Another factor is high ambient temperatures. Most laundry rooms aren’t air-conditioned, and when temperatures rise above 90°F (32°C), the problem escalates. To prevent spontaneous fires, experts recommend adding an extra break cycle or a presoak program. In the drying process, lower temperatures and longer cycles should be used, and a cool-down cycle added. Facilities should also consider outsourcing the laundry.

A final note: The federal government recently proposed a rule that would require mop heads to be heated to 176°F (80°C) for an hour for infection control. Although this rule is only proposed, we’d like section members to be aware of it.

NFPA 99 Seminar to Be Held in Reno
NFPA will offer a two-day pre-conference seminar on NFPA 99, Health Care Facilities, at the 2003 Fall Education Conference. Instructors Rich Bielen, P.E., executive secretary to the HCS, and David Mohile of Medical Engineering Services, Inc., chair of the Technical Committee on Piping Systems, will review the document. The HCS will also sponsor its popular 4-hour codes and standards review at which the HCS Codes and Standards Review Committee will explain the positions the section proposes to take on documents up for adoption that affect the health-care industry. These codes are NFPA 53, Recommended Practice on Materials, Equipment, and Systems Used in Oxygen-Enriched Atmospheres; NFPA 58, Liquefied Petroleum Gas Code; NFPA 59, Utility LP-Gas Plant Code; NFPA 82, Incinerators and Waste and Linen Handling Systems and Equipment; NFPA 101A, Guide on Alternative Approaches to Life Safety; NFPA 1600, Disaster/Emergency Management and Business Continuity Programs; and NFPA 2001, Clean Agent Fire Extinguishing Systems.

Mohile will also present a 4-hour training session on Chapter 5, “Gas and Vacuum Systems,” of NFPA 99. No one responsible for maintaining medical gas and vacuum systems should miss it.

HOT ISSUES
Chair’s Corner
By MIKE NEWMAN
Another World Safety Conference and Exposition™ (WSCE) has come and gone, and the Industrial Fire Protection Section had a full slate of activities. One highlight was the presentation of the 2002 Fire Prevention Week contest winner, Duke University, ably represented by Thomas Whalen, fire protection specialist with Duke’s Fire Safety Division, and Cackie Joyner and Tara Romano, training coordinators for Duke’s Office of Occupational and Environmental Safety.

I’d also like to recognize Alticor, Inc., Merck & Co., and MeadWestvaco, which received honorable mentions for their fine entries. The quality of entries continues to grow, and so much is being done with such a small investment.

Thanks to the industrial facilities that support these efforts each year. We know

The 3rd International Water Mist Conference will provide the answers.
22 - 24 September, 2003, Madrid, Spain

Please visit www.iwma.net for details

Circle 013 on Reader Service Card

SAFE & ACCURATE TESTING

The HOSE MONSTER

Fire Pump & Roof-top Standpipe Testing

The Hose Monster is the easiest, safest, and most accurate way to test roof-top standpipes and fire pumps without play-pipes. Evaluate water supplies through hydrants. The built-in reversible pitot and exact orifice permit accurate and consistent flow rate measurements. The patented design minimizes property damage and traffic tie-ups by controlling and dramatically reducing the force of flowing water on exit.

1-888-202-9987

Circle 012 on Reader Service Card
how much work you expend on the campaign to make both home and work safe.

Entries for the 2003 contest are due by December 1. The theme for FPW 2003 is "When Fire Strikes—GET OUT, STAY OUT!" For more information, go to the IFPS page on the NFPA Web site.

At the WSCE, we also conducted the annual business meeting and held board elections. This election was unusual in that Incoming Chair Tony Aguilera couldn't move up. His job's changed, so he had to resign his position on the board, making me chair for another year. Our thanks to Tony for his service. We wish you well in your new job.

Elected to the board for one-year terms were Mike Snyder of Dow Corning as vice-chair, Tom Gray of Zurich Insurance as secretary, and Stephen Daily of Anheuser-Busch as past chair. Terry Marski of The Tribune Company, Dave Philip of Nestle Purina, and Diane May of MeadWestvaco were elected directors for three-year terms.

We also chose the 2004 Nominating Committee, three of whom are elected and three of whom are board appointees. The elected members are Stephen Daily, chair; Brian Denk of the Illiana Chapter; and William Cary of the Niagara Frontier Chapter.

We Need Committee Alternates
IFPS is looking for section members to represent the section as alternates on 21 NFPA technical committees. Technical committee alternates may attend committee meetings and have the same rights as the principal member when the member is absent.

To become an alternate committee member, you must be a section member and show knowledge of, and competence in, the committee's work. You must participate actively, responding to correspondence and attending meetings, and keep the section board informed of committee activity and issues. You must also ensure that the industrial community's voice is heard at meetings.

For information, contact Vice-Chair Mike Snyder at mike.snyder@dowcorning.com

Speaker Sessions Hit Mark in Dallas
The IFPS sponsored four educational sessions during the 2003 WSCE. Drew Caldwell, vice-president of Aon Risk Services, discussed "Modeling of Natural Catastrophe and Terrorism Exposures," illustrating how computer models are used to predict building performance in response to catastrophic forces.

Jack Woycheese, senior engineer and director of International Business Development for Hughes Associates, Inc., outlined a fire protection plan for LNG/CNG fueling facilities. He outlined the credible risks as slow or fast leaks and examined the fire protection features required to protect against them. He also addressed the types of installations, associated siting issues, and applicable the codes and standards.

A panel representing an insurer, a broker, and an insured discussed property insurance post-9/11. Panel members George Wilburn of Aon Risk Services, DeWayne Gill of FM Global, and Mike Newman of Johnson & Johnson illustrated the changes in property risk control and insurance marketing strategies resulting from this event and described insurance retention and premiums in the aftermath of the loss.

Stephen Haines, P.E., of Sunoco, Inc., drew a large audience for his program on investigation of flammable gas and liquid fires, which focused on ignition scenarios, the behavior of vapors in open air, and identification of flash fire evidence. The session included testing data and photos.

Those of you unable to make the meeting may get copies of the presen-
tions from the section's staff liaison.

If you have ideas for programs for the 2004 WSCE in Salt Lake City, please submit them at www.nfpa.org. See you in Reno this fall!

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
CHAIR: Ron Farr, Kalamazoo Township Fire Department

HOT ISSUES
IFMA Elects Executive Board
The following board members were elected at the section's business meeting on May 19:

President
John Bender, Maryland State Fire Marshal's Office

First Vice-President
Scott Adams, Park City, Utah

Second Vice-President
Jon Nisja, Minnesota State Fire Marshals Office

Secretary
Jimmy Hill, Los Angeles City, California

Directors (terms expire May 2005)
Don Goff, Hillsborough County, Florida
Bonnie Howe, Goodyear, Arizona

Farr Testifies at Meeting
IFMA President Ronald R. Farr testified at a meeting called by the Technical Committee on Assembly Occupancies and Membrane Structures to address issues related to the Chicago and Rhode Island nightclub incidents. In response to these events, IFMA submitted Tentative Interim Amendments to numerous codes and standards, and two IFMA members were recently appointed to the assembly occupancies technical committee.

Professional Development
The next Principles of Fire Protection Engineering course will be held from September 29 to October 2 in Baltimore.

Maryland. Anyone interested in attending or sponsoring a program may contact Executive Secretary Steven F. Sawyer at (617) 984-7423 or ssawyer@nfpa.org.

Chapters Discuss Research Project
At the annual IFMA Chapter Presidents and Executive Board meeting on May 17, representatives of the 11 chapters began developing the framework of IFMA's Fire Prevention Research Project. IFMA is developing this project to obtain information fire marshals can use to support their staffing and budget requests. For information, visit www.nfpa.org/ifma.

And don't forget...
IFMA turns 100 in 2006. If you have any ideas how to celebrate the occasion, please contact Committee Chair John Robison at firemarshal@insurance.state.al.us.

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

Lodging Industry
WEB SITE: http://www.nfpa.org/lodging
CHAIR: Thomas Daly, Hilton Hotel Corporation

HOT ISSUES
2003-2004 NFPA Lodging Industry Section Executive Committee
Chair
Tom Daly, Hilton Hotel Corporation (term expires May 2004)

Vice-Chair Vacant

Secretary

Immediate Past Chair
April L. Berkol, Starwood Hotels & Resorts Worldwide, Inc.

Directors (terms expire May 2005)
Richard R. Anderson, Merck & Co., Inc.
Byron L. Briese, P.E., Rolf Jensen & Associates, Inc.
Raymond C. Ellis, Jr. C.H.E., C.H.T.P., University of Houston

Terms expire May 2005:
E. Sterling (Tod) Hanger, Jr., The Greenbrier
Jim Ray, Marriott International, Inc.

Executive Secretary (Non-voting)
Gregory E. Harrington, P. E., NFPA

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

Lodging Industry
WEB SITE: http://www.nfpa.org/lodging
CHAIR: Thomas Daly, Hilton Hotel Corporation

HOT ISSUES
2003-2004 NFPA Lodging Industry Section Executive Committee
Chair
Tom Daly, Hilton Hotel Corporation (term expires May 2004)

Vice-Chair Vacant

Secretary

Immediate Past Chair
April L. Berkol, Starwood Hotels & Resorts Worldwide, Inc.

Directors (terms expire May 2005)
Richard R. Anderson, Merck & Co., Inc.
Byron L. Briese, P.E., Rolf Jensen & Associates, Inc.
Raymond C. Ellis, Jr. C.H.E., C.H.T.P., University of Houston

Terms expire May 2005:
E. Sterling (Tod) Hanger, Jr., The Greenbrier
Jim Ray, Marriott International, Inc.

Executive Secretary (Non-voting)
Gregory E. Harrington, P. E., NFPA

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

Research
WEB SITE: http://www.nfpa.org/researchsection
CHAIR: Samuel Dannaway, Dannaway and Assoc.

HOT ISSUES
Research Foundation Holds Symposium
Jack E. Snell, director of the Building and
Fire Research Laboratory of the National Institute of Standards and Technology (NIST), will be the keynote speaker at the eighth annual Fire Risk and Hazard Research Application Symposium, to be held July 9 through 11 at the BWI Airport Marriott in Baltimore, Maryland. The symposium, sponsored by NFPA's Fire Protection Research Foundation, is intended for fire protection engineers, fire prevention officers, code writers, and researchers.


For program information or to register, contact Eric Peterson at epeterson@nfpa.org or (617) 984-7281, or visit www.nfpa.org/foundation.

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
CHAIR: Bill Terry, USDA Forest Service

HOT ISSUES
Section Activities in Dallas
The section addressed several issues in four education sessions at the 2003 World Safety Congress and Exposition™.
Mike Long of the Florida Division of Forestry and Rich Schell of the California Department of Forestry and Fire Protection discussed the impact of the National Fire Plan, addressing its focus on cooperation between stakeholders and communities, its goals of fire prevention and mitigation, and its call for prescribed fire and the use of Firewise techniques.

Jerome Harvey of the Lead, South Dakota, Fire Department reviewed forest fires in the Black Hills from the 1800s through last year's Grizzly Gulch Fire. Lessons from the 1959 Deadwood Fire helped fire crews control the 2002 stand replacement fire, which destroyed more than 27 structures and 10,801 acres (4,371 hectares) of ponderosa pine.

Firewise Community Support Manager Michele Steinberg and Firewise/USA Coordinator Judith Leraas Cook reviewed the federal grant process and requirements for community recognition, and Ken Davis of the Federal Emergency Management Administration and James Thomason of the U.S. Fire Administration discussed how to obtain federal grants for fire suppression and mitigation during a major wildfire.

Look for more information on these presentations at www.nfpa.org/wildland.

HOW TO REACH US: Jim Smalley, Executive Secretary, +1-617-984-7483, jsmalley@nfpa.org

NEW—NEW—NEW—NEW—NEW
• UL Classified and Listed
• "0" Clearance to Combustibles
• 3-Hour Fire Rating
Series 4G™ Grease Duct
Meets the requirements of NFPA 96, for maximum fire protection.

• Safety Engineered
• Evaluated by major code bodies.
• Code compliant in every state.
• Features integral chase system.

For more information and your free Code Compliance Guide, please call 800-835-2830
www.metal-fabinc.com

Circle 015 on Reader Service Card

Circle 018 on Reader Service Card
Why would you want to automate? Consider the following:

- **Simplifies your inspections** - The system schedules, tracks and documents inspections and verifies that each step of the process is complete.
- **Maintains compliance** - The system is configurable to ensure that inspections and maintenance activities are performed as required by OSHA, EPA, NFPA or other regulatory agencies.
- **Eliminates data entry** - Once the information is collected, it is electronically transmitted to the program.
- **Generates easy-to-read standard and user-defined reports** - Ensure that no inspection is missed and verify all inspections.

**Inside the Beltway** from page 32

However, Bill Broadwell, executive director of the Aerial Firefighting Industry Association, notes that the helicopters have range limitations.

Duane Powers, a co-owner of Hawkins & Powers Aviation, Inc., a private contractor, provided 10 of the large air tankers used for aerial firefighting in 2002.

“It’s a mistake to believe that helicopter water drops, or small splashes by single-engine crop dusters, will have the same effect as a full-scale large air tanker drop,” Powers says.

“While the federal agencies have been actively working to justify the currently reduced contracted resources as adequate, responsible wildland fire managers know this is not true, and they fear for results generated by this policy.”

We may soon know who is right.

**Building to Code** from page 22

The issue of residential sprinklers in one- and two-family dwellings sparked one of the more contentious debates during the development of NFPA 5000. One of the arguments against requiring their installation suggests that their impact on overall fire losses would be minimal because most existing U.S. dwellings don’t have automatic suppression systems and won’t get them.

However, I’m not so sure I agree with this reasoning.

I’d suggest that a significant number of fires still occur in newly or recently constructed homes and that the impact on fire losses of automatic suppression systems might be greater than we think.

Between 1994 and 1998, 41 percent of the reported fires in homes occurred in properties protected by working smoke or fire alarms, according to NFPA’s 2001 report, The U.S. Fire Problem Overview Report.

During that same period, home fire deaths dropped by 77 percent.

Maybe the time has come for all our castles to be equipped with an automatic fire suppression system.
VIDEO SURVEILLANCE
Bosch Security Systems raises video surveillance technology to a new level with the introduction of AutoTrack™, the an innovative motion tracking capability built into the AutoDome® cameras. AutoDome with AutoTrack is ideal for a number of uses in warehouses, retail stores, banks, and parking lots. For more information, v. Visit www.boschsecurity.us.
Circle Reader Service Card No. 101

MONITOR
Bosch Security Systems introduces the MON171CL, the new, Philips-branded monitor features of the MON171CL include a picture-in-picture display, an analog VGA input, and two looping composite video inputs.
Circle Reader Service Card No. 102

DETECTOR
The high-performance Bosch VMD01 Video Motion Detector suppresses unwanted alarms and is suitable for a wide variety of uses, such airports and government buildings.
Circle Reader Service Card No. 103
**MONITOR**

Bosch Security Systems' OD850 features motion analyzer signal processing and linear travel distance that measures the distance traveled by a target and eliminates false alarms. Circle Reader Service Card No. 106

---

**FOAM SYSTEM**

Nordic Systems Inc. has released the new Mark V foam system that offers a multitude of functions, remote diagnostic capabilities, dual control and displays, multiple formats. Circle Reader Service Card No. 105

---

**Industrial-Strength Training for the Petrochemical Industry.**

**FSA**

**FIRE SCIENCE ACADEMY**

University of Nevada, Reno

One-million square feet of burnable props
Real fuels • Real-life situations
Call: 800-233-8928 • Web: fireacademy.unr.edu

Circle 030 on Reader Service Card

---

**THINK SPECTRALERT®**

For all your building protection needs, think Selectable Output Series™ notification devices

- Notification devices with the industry's widest range of candela settings - 15, 15/75, 30, 75 and 110 candela
- All Selectable Output Series operate at dual voltage levels, self-adjusting for either 24 or 12 volts
- 2-wire and 4-wire models fit standard back boxes with no encroachment into box
- Exclusive universal mounting bracket and QuickClick™ system reduces installation times
- Attractive design - perfect for any application

Circle the number on the reader service card for a free Spectralert® CD-ROM, a comprehensive resource of technical information, or call 800/927-6676.

Circle 025 on Reader Service Card

---

**NETWORK-BASED DIGITAL CAMERAS**

Bosch Security Systems has extended its Philips-brand NetCam range of network-based digital cameras to include the NetCam2, the NetSVR 1, and NetSVR 6. Adding have been modified with additional feature enhancements and a more user-friendly software interface as well. Circle Reader Service Card No. 104
**CLASSIFIEDS**

**Fire Protection System Specialist**

U.S. Department of State, Office of Overseas Buildings Operations, Operations and Maintenance Office, Fire Protection Division has two (2) openings for a Fire Protection System Specialist at the GS-9/11/12 equivalent position. The primary purpose of these positions is to manage system modifications and repairs and to develop and implement criteria, standards and procedures that ensure the installation quality and performance of the Department installed fire alarms. Worldwide travel required. Additional information available on Monster.com, search under “Fire Protection System Specialist.” Mandatory Requirements: Applicant must be a U.S. citizen. Failure to state this on original application will render you ineligible for consideration. Top Secret security and medical clearances required prior to start. Position is a one-year renewable Personal Services Contract. Please submit an OF-612, SF-171 or detailed resume by COB 7/31/03 via FAX: (703) 875-5771 OBO/RM/HR Announcement #2003-023.

---

**Structural Ops**

Large fires in many apartment buildings, dormitories, and hotels, as well, except in large common areas. However, we don’t advocate using anything smaller than a 1 1/2-inch hose line.

Finally, a strategic plan for one- and two-family dwelling fires should address not only the tactical, life-safety priorities for firefighters and occupants, but also extinguishment and property conservation, in that order. 

---

**ADINDEX**

<table>
<thead>
<tr>
<th>Company Name</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGF Manufacturing</td>
<td><a href="http://www.testanddrain.com">www.testanddrain.com</a></td>
</tr>
<tr>
<td>Altronix (RSC 002)</td>
<td><a href="http://www.altronix.com">www.altronix.com</a></td>
</tr>
<tr>
<td>Ames Corp. (RSC 003)</td>
<td><a href="http://www.amesfirewater.com">www.amesfirewater.com</a></td>
</tr>
<tr>
<td>Ansul (RSC 004)</td>
<td><a href="http://www.ansul.com">www.ansul.com</a></td>
</tr>
<tr>
<td>Blazemaster® Fire Sprinkler Systems (RSC 005)</td>
<td><a href="http://www.blazemaster.com">www.blazemaster.com</a></td>
</tr>
<tr>
<td>DuPont® Fire Extinguishants (RSC 006)</td>
<td><a href="http://www.dupont.com/fire">www.dupont.com/fire</a></td>
</tr>
<tr>
<td>DuPont® Personal Protection (RSC 016)</td>
<td><a href="http://www.personalprotection.dupont.com">www.personalprotection.dupont.com</a></td>
</tr>
<tr>
<td>Edwards Systems Technology (RSC 007)</td>
<td><a href="http://www.est.net">www.est.net</a></td>
</tr>
<tr>
<td>Fire Control Instruments (RSC 008)</td>
<td><a href="http://www.firecontrolinstruments.com">www.firecontrolinstruments.com</a></td>
</tr>
<tr>
<td>Firetrace (RSC 009)</td>
<td><a href="http://www.firetrace.com">www.firetrace.com</a></td>
</tr>
<tr>
<td>Gamewell (RSC 010)</td>
<td><a href="http://www.gamewell.com">www.gamewell.com</a></td>
</tr>
<tr>
<td>Halotron (RSC 011)</td>
<td><a href="http://www.halotron-inc.com">www.halotron-inc.com</a></td>
</tr>
<tr>
<td>Hydro Flow Products (RSC 012)</td>
<td><a href="http://www.hosemonster.com">www.hosemonster.com</a></td>
</tr>
<tr>
<td>International Water Mist Assoc. (RSC 013)</td>
<td><a href="http://www.iwma.net">www.iwma.net</a></td>
</tr>
<tr>
<td>Kidde Fire Systems (RSC 014)</td>
<td><a href="http://www.kiddefiresystems.com">www.kiddefiresystems.com</a></td>
</tr>
<tr>
<td>Knox Co. (RSC 015)</td>
<td><a href="http://www.knoxbox.com">www.knoxbox.com</a></td>
</tr>
<tr>
<td>Matticks (RSC 017)</td>
<td><a href="http://www.matticks.com">www.matticks.com</a></td>
</tr>
<tr>
<td>Metal-Fab Inc. (RSC 018)</td>
<td><a href="http://www.metal-fabinc.com">www.metal-fabinc.com</a></td>
</tr>
<tr>
<td>Notifier (RSC 019)</td>
<td><a href="http://www.notifier.com">www.notifier.com</a></td>
</tr>
<tr>
<td>Pelican Products (RSC 019)</td>
<td><a href="http://www.pelican.com">www.pelican.com</a></td>
</tr>
<tr>
<td>Pyrotenax (RSC 021)</td>
<td><a href="http://www.tycosafety.com">www.tycosafety.com</a></td>
</tr>
<tr>
<td>Safety Technology (RSC 022)</td>
<td><a href="http://www.stopper.com">www.stopper.com</a></td>
</tr>
<tr>
<td>Siemens Fire Safety (RSC 023)</td>
<td><a href="http://www.abt.siemens.com/fisl">www.abt.siemens.com/fisl</a></td>
</tr>
<tr>
<td>Simplex Grinnell (RSC 024)</td>
<td><a href="http://www.simplexgrinnell.com">www.simplexgrinnell.com</a></td>
</tr>
<tr>
<td>System Sensor (RSC 025, 067-072)</td>
<td><a href="http://www.systemsensor.com">www.systemsensor.com</a></td>
</tr>
<tr>
<td>Tiscor (RSC 026)</td>
<td><a href="http://www.tiscor.com">www.tiscor.com</a></td>
</tr>
<tr>
<td>Tyco Fire &amp; Building Products (RSC 027)</td>
<td><a href="http://www.tyco-fire.com">www.tyco-fire.com</a></td>
</tr>
<tr>
<td>Underwriters Laboratories (RSC 028)</td>
<td><a href="http://www.ul.com">www.ul.com</a></td>
</tr>
<tr>
<td>University of Nevada (RSC 030)</td>
<td><a href="http://www.fireacademy.unr.edu">www.fireacademy.unr.edu</a></td>
</tr>
<tr>
<td>Worcester Polytechnic Institute (RSC 029)</td>
<td><a href="http://www.wpi.edu/ADLN/Fire">www.wpi.edu/ADLN/Fire</a></td>
</tr>
</tbody>
</table>

---

**DATEBOOK**

**Fire Risk and Hazard Assessment Research Application Symposium**
July 9-11 • Baltimore, Maryland
Hear 30 cutting edge technical papers on fires’ environmental impacts, fire toxicity, and on new fire test facilities and capabilities.

Jack Snell, director of NIST’s Building & Fire Research Laboratory, is the keynote speaker at this year’s event. For more information, visit www.nfpa.org/foundation.

**Securitex and Fire Malaysia 2003**
July 23-26 • Kuala Lumpur, Malaysia
Numerous topics including Access Control Systems, Building Management Systems, Detection & Alarm Systems and Guard Control & Monitoring will be discussed, among other topics in this year’s seminar held in one of Southeast Asia’s leading security and fire protection markets. For more information, visit www.mes.com.my/elenex2003/securitex.htm.
Cold-Storage and Warehouse Building Fire, Worcester, Massachusetts

For more information, visit www.nfpajournal.org
**AL1042ULADA NAC Power Extenders**

### Features:
- 10 amp max. current rating.
- 24VDC Outputs.
- Eight (8) Class B or Four (4) Class A Notification Appliance Circuits.
- 1 amp Aux. Power Output (w/battery back up).
- 1 amp Aux. Power Output (w/o battery back up).
- Signal Circuit Trouble Memory.
- Built-in 2-wire Horn/Strobe Sync Protocols.
- Input to Output Follower Mode (maintains sync of NACs).
- UL Listed UL864 (Control Units for Fire Protective Signaling Systems) and UL1481 (Power Supplies for Fire Protective Signaling Systems).
- CSFM (California State Fire Marshal) Approved.
- MEA (NYC Department of Buildings) Approved.
- FM (Factory Mutual) Approved.
- Made in the USA with a Lifetime Warranty.

For detailed specifications and CAD drawings of the complete line of Altronix™ NAC Power Extenders/Fire Alarm Power Supplies visit our web site www.altronix.com.

Altronix™ NAC Power Extenders Offer Unlimited Possibilities.

---

ISO 9001:2000 Registered Firm

140 58th Street • Brooklyn, New York 11220
888.258.7669 • 718.567.8181 • fax 718.567.9056
www.altronix.com • info@altronix.com

Circle 002 Reader Service Card
With the incredible new technology of the Kidde ADS System...

you can put the fire protection here...

and the agent storage cylinders way over here.

From the two fire protection leaders - Kidde Fire Systems and Great Lakes Chemical Corp. - comes the Kidde Advanced Delivery System. Thanks to what our engineers call "piston flow" patented technology, the Kidde ADS System gives you a design flexibility not previously found in special hazard fire suppression systems. Now you can provide fast, clean (FM-200), safe fire protection for a high-value asset - a vital data processing center or a museum filled with priceless treasures - without disturbing the aesthetics or the operation of the facility.

Our innovative technology uses nitrogen to "push" the FM-200 agent through a piping network into the protected enclosure. This means the Kidde ADS System can offer longer pipe distances for larger hazards, while still using smaller pipe sizes than regular FM-200 systems. And more economical protection for many of these applications. Not to mention a compact system that blends nicely into its surroundings.

These same characteristics make the Kidde ADS System a virtual "drop in" replacement for existing halon installations. You can use the existing piping and in most cases simply replace nozzles and agent storage cylinders.

So whether you require a fire suppression system with more design flexibility, better performance or lower cost, look no further. The Kidde ADS System. Designed, installed and maintained by a worldwide network of fire protection professionals. Get the specs today... www.kiddefiresystems.com.

Featuring the world's leading clean agent: FM-200®

Call 1-800-872-6527
Kidde Fire Systems
400 Main Street
Ashland, MA 01721
FAX: 508-881-8920