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ONLINE EXCLUSIVES
- NEW NFPA PODCAST
- Protecting Hazardous Liquids
- Testing Behind NFPA 2001

Cover Illustration: Charles Beyl. Sparky the Firedog is a registered trademark of NFPA.
In the 2007 edition of the NFPA 72®, National Fire Alarm Code®, two specific issues were addressed and changes to installation requirements were made based on fire research and modeling.

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by Honeywell
Astounding progress

IT WAS JUST a little more than a year and a half ago that NFPA formed the Coalition for Fire-Safe Cigarettes with the goal of having only cigarettes manufactured to a “fire-safe” standard sold in the United States. Our strategy was to get enough states to pass laws mandating fire-safe cigarettes that the cigarette manufacturers would decide to make only those products that complied with those laws.

When we began, we knew that we had taken on a tough task. Before the Coalition was conceived of, only New York and Vermont had adopted legislation. We anticipated that getting all of the other legislatures to act would be a long, drawn-out process, but committed ourselves along with all of the organizations, which joined the Coalition to a long-term strategy to get there.

After all, this issue had languished in Congress for about 25 years with no significant prospects of progress on the horizon. The tobacco lobby knew what levers to pull to keep it bottled up.

We recognized that individual state action might take many years, but if we were willing to stick with the fight, a state-by-state strategy offered a better chance for long-term success. And even if it were to take a long time, the safety benefits would be more than worth the effort.

Less than two years later, all of us are astounded by the progress that we have made. As I write this, 22 states have passed fire-safe cigarette legislation. In 2007 alone, 16 governors from all across the country signed legislation into law. Even states in the heart of tobacco country, such as Kentucky and North Carolina, have passed “fire-safe” cigarette laws. (See map on page 18.)

We are very close to the day when we will have established a fire-safe cigarette standard for the whole United States.

Why did this issue take off all of a sudden? There are a number of explanations. The Coalition became the vehicle for coordinating information and strategy. We provided a model bill and easy-to-use materials to help legislators and supporters prepare legislation and muster the best arguments for the change.

The power of the idea of fire safe cigarettes captured the imagination of the fire service, the public health community and consumer activists all across the country. The prospect of putting such a large dent in the fire problem—700 to 900 lives are lost every year in the United States because of fires caused by smoking—energized an entire community that cares about fire safety and that energy caused miracles to take place. States where there was no chance of progress were all of a sudden scheduling bill-signing ceremonies. It happened because people in each of those states cared enough and saw the opportunity to act.

We formed a true coalition. All of the groups involved had different strengths. By establishing a strategy in each of our targeted states that took into account which of our Coalition partners was best positioned to influence the outcome, we were able to maximize our influence. We had a different strategy for each state to arrive at the same place, but each of the 22 states that have acted so far has enacted laws with exactly the same technical requirements.

It might surprise some to learn that throughout this whole campaign we have maintained communication with the major cigarette companies. I wrote to them at the beginning to tell them what we intended to do and urge them not to wait for the law to change but to take the initiative to change all of their manufacturing to the New York standard. They were unwilling to do that then but one company.

Continued on page 110

FROM NFPA PRESIDENT JAMES M. SHANNON

first word

IT WAS JUST a little more than a year and a half ago that NFPA formed the Coalition for Fire-Safe Cigarettes with the goal of having only cigarettes manufactured to a "fire-safe" standard sold in the United States. Our strategy was to get enough states to pass laws mandating fire-safe cigarettes that the cigarette manufacturers would decide to make only those products that complied with those laws.

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Continued on page 110
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Thank you for Harvard

I would like to extend a “thank you” to the National Fire Protection Association (NFPA), United States Fire Administration (USFA), International Fire Service Training Association (IFSTA), and the International Association of Fire Chiefs (IAFC).

I recently returned from Harvard University’s program for Senior Executives in State and Local Government and would like to personally thank each of those four organizations for helping make this dream a reality! Each organization sponsors two fellowships for chief fire officers to attend this outstanding program, held in both June and July each year.

Without their financial assistance and the support of my supervisor, Chief Scott Anderson of the Maple Grove Fire Department, the opportunity to attend a program like this would never have been possible.

The three weeks were jam-packed with thought-provoking discussions, an array of innovative ideas, and a renewed appreciation for public service. The program also provided a forum where I was able to develop new friendships and expand my professional network across the globe with the other class members who attended. This program is not just for fire personnel. In our July session out of the 80 who attended, only six were chief fire officers.

The rest included many elected or appointed officials and public servants from all over the United States, as well as the world – including three from Ireland and one each from New Zealand, Mexico, and Taiwan.

The experience was amazing and one that will stay with me throughout my fire service career. I am honored to have met such wonderful mix of people and grateful to have had the opportunity to work with 5 other outstanding chief fire officers.

To the NFPA, USFA, IFSTA, and IAFC - your encouragement through this Fellowship program will no doubt have a positive influence on the
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Judy A. Smith Thill
Deputy Chief
Maple Grove Fire Department

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JUDY A. SMITH THILL
Deputy Chief
Maple Grove Fire Department

NFPA Responds
NFPA partners each year with the U.S. Department of Homeland Security’s U.S. Fire Administration, the International Association of Fire Chiefs and the International Fire Service Training Association to offer fellowships for the Harvard program. The John F. Kennedy School of Government’s admission committee and a nominating panel selected the candidates awarded fellowships.

In addition to Deputy Chief Thill, the 2007 awardees were:
- Robert Creecy, Chief, Richmond Department of Fire & Emergency Services, Virginia;
- Clare Frank, Chief, City of Milpitas Fire Department, California;
- William Goodwin, Chief, City of Baltimore Fire Department, Maryland;
- Bruce Martin, Chief, City of Fremont Fire Department, California;
- Patricia McAllister, Deputy Chief, Broward Sheriff’s Office, Department of Fire Rescue & Emergency Services, Fort Lauderdale, Florida;
- Ned Pettus, Chief, City of Columbus Department of Public Safety, Columbus Division of Fire, Ohio, and
- Kevin Simmons, Deputy Chief, Howard County Department of Fire & Rescue Services, Columbia, Maryland.

The candidates awarded fellowships were selected by the John F. Kennedy School of Government’s admission committee and a nominating panel made up of representatives from NFPA, IAFC, IFSTA, DHS/USFA, and former program participants.

Best Information
I learned of your Web site through the Ohio Rehabilitation Service Commission’s newsletter, NewsNet. This is by far the best information I have ever come upon. I am the Director of Disability Support Services on my campus and we are upgrading our emergency preparedness plans.

The information from your Web site will be most helpful. I especially found the Personal Emergency Evacuation Planning Checklist helpful as we have many students with disabilities living away from home for the first time and they have never thought about how they will handle this aspect.
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of their life. I will be better able to guide them as they make a plan for their personal safety on the campus.

KAREN A. SARACUSA
Director of Disability Support Services, Mount Union College
Alliance, Ohio
Linn County, Cedar Rapids, Iowa

NFPA RESPONDS

The document is a valuable resource for people with disabilities as well as employers, building owners and managers, and others involved in developing emergency evacuation plans. Critical information on the operational, planning, and response elements necessary to develop a well-thought-out plan for evacuating a building or taking other appropriate action in the event of an emergency are covered.

Five general categories of disabilities covered in the guide include mobility impairments, visual impairments, hearing impairments, speech impairments, and cognitive impairments. Four elements of evacuation information needed by occupants are: notification, way finding, use of way, and assistance. Basically, in the event of an emergency, a person would need to be notified of the emergency; identify a way out; assess if they can get out on their own, with the help of a device, or with assistance; and identify and express if assistance is needed and what that would involve.

Materials include a personal emergency evacuation planning checklist that building services managers and people with disabilities can use to design a personalized evacuation plan.

The Emergency Evacuation Planning Guide for People with Disabilities was developed and issued in March 2007.

The document provides general information to assist in identifying the needs of people with disabilities related to emergency evacuation planning.

Encouraging information
I read with interest the article “NFPA 96: Cutting Edge” by committee Chairman Leicht. I also sat in on his presentation at the WSC&E in Boston that he delivered to a “standing room only” audience. It is not surprising with the number of fires in restaurants that the topic of proper fire protection is getting wide spread attention. I consider the information presented in the article and the presentation to be very valuable to the NFPA membership.

During the conference, I made a successful motion on the floor of the
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technical session, which has an impact on the information presented by Chairman Leicht. The effect of the motion will return NFPA 96 to previous edition text on the issue of certification. This will allow the committee time to review the work of the NFPA 17/17A committee on this matter. I believe the 17/17A committee is on the right track with proposed clear concise requirements for the qualification of service technician (see F07 ROC). It is extremely important that the NFPA documents are uniform with criteria for persons performing maintenance on restaurant extinguishing systems.

On the topic of certification, it is encouraging that people are starting to take a more active role when it comes to technician certification. A meeting was held on June 5 in Boston on the topic of fire extinguisher service technician qualifications based on the new requirement in NFPA 10. It was attended by 14 people including representatives of manufacturers, fire equipment distributors, academia, a trade association, the NFPA certification department, SFPE, and the Fire Protection Research Foundation.

At the meeting, I suggested that the industry develop an examination question test bank that could be used for the purpose of supporting certification programs. Although several groups are currently heading off in different directions with certification programs, my hope is that we can all work together to standardize the practice. I am going to continue to push for a reasonable industry certification program that AHI's can count on.

Any individual that is competent and qualified should be acknowledged using one set of questions that will reasonably challenge his or her knowledge of the subject matter.

MARK CONROY
Senior Engineer
Brooks Equipment Company

Comments?
We welcome your letters, comments, and story suggestions. Please send your information to:
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To learn more about our regulatory support services, call 1-800-595-9844, e-mail ulregulatoryservices@us.ul.com or visit www.ul.com/regulators.
Evacuation planning guide is now available

THE PERSONAL SCHOOL EMERGENCY Evacuation Planning Checklist is the newest addition to NFPA's Emergency Evacuation Planning Guide for People with Disabilities project. This new guideline is geared toward teachers, school administrators, special education staff, parents and students to help them create an appropriate and effective plan so student with disabilities will be safely evacuated from school buildings in the event of an emergency. It can also be used as a tool for facilitating the movement of students with disabilities around the school building during non-emergency or routine conditions. The guide can be downloaded at www.nfpa.org.

The checklist includes questions that need to be studied, discussed, and answered about the effectiveness of building and operational components of an evacuation, including appropriate emergency notification devices for the student, exit signs in accessible formats, service animal requirements, emergency contact information and whether alternative approaches need to be implemented.

The checklist is designed for incorporation into a student's Individual Educational Plan. The educational plan evaluates the student's specific needs to ensure that an equal education is provided to every student.

In addition, a puzzle/sequence card activity for early elementary school children to learn about fire escape planning and practice at school is available. A detailed lesson plan guides teachers in a discussion of why some people need help getting out in an emergency. Escape scenarios including various disabilities provide an opportunity for the students to discuss how to assist others escaping. The scenarios are pictorial and can be used in a variety of classroom activities that include role-playing, sequencing, and story starters. This is also available at www.nfpa.org.

Fire Prevention Week is a great opportunity to use NFPA's newest materials to reinforce fire escape planning for people with disabilities.

WSC&E® presentation deadline approaching

NFPA IS ACCEPTING proposals for educational presentations at our 2008 World Safety Conference & Exposition® (WSC&E®). We invite you to share your knowledge with your peers in the field of fire and life safety as a presenter in Las Vegas, Nevada, June 2-6, 2008. Please complete an application in full and submit by Friday, September 14, 2007 at 5 p.m. EDT.

Submissions emphasizing a specific product, process, or manufacturer will not be considered.

The Conference Planning Committee and the Content Advisory Council will review all presentation proposals. Selections will be made based on quality, relevance, focus, practical application, timeliness, and on the presenter's experience and credentials.

If your proposal is accepted, you will be required to submit a handout by Friday, April 18, 2008. Continuing education credits (CEUs) will be awarded for all education sessions and a handout is an important requirement of an education session. For more information, visit www.nfpa.org.
Sweep of fire-safe cigarette laws reaches Alaska

ALASKA GOVERNOR Sarah Palin has extended the nationwide reach of fire-safe cigarettes by becoming the 15th governor this year—the 21st overall—to sign legislation mandating fire-safe cigarettes. The new law will help prevent fire deaths, injuries, and property destruction.

Alaska has the sixth highest smoking rate in the country, so efforts to protect smokers and non-smokers in that state from devastating fire are critically important.

"Cigarette-ignited fires are the leading cause of residential fire death," said James M. Shannon, president of NFPA, coordinator of the nationwide Coalition for Fire-Safe Cigarettes. "With Governor Palin's signature, we are one important step closer to requiring the tobacco companies to sell fire-safe cigarettes nationwide."

So-called "fire-safe" cigarettes are designed to self-extinguish if dropped or left unattended, making them less likely to ignite clothing, bedding, or other material.

"I am proud to sign this bill into law requiring the use of fire-safe cigarettes in Alaska. Not only does this directly benefit Alaska, it will benefit the nation as a whole," said Governor Palin.

"By requiring tobacco companies to sell only fire-safe cigarettes in Alaska, the legislature and Governor Palin will help to save lives statewide," said Shannon. "We continue to ask tobacco companies to do the right thing and switch to fire-safe cigarettes without waiting for states to legislate such a simple, life-saving requirement. The tipping point is near."

"Congratulations to Senator Donnie Olson for championing this effort," said Shannon. "Representative Reggie Joule and Representative Carl Gatto deserve recognition for their roles in this effort as well."

"This bill could not have succeeded, however, without the strong and active support of the State Fire Marshal's Office, the Alaska Fire Chiefs Association and the Alaska State Firefighters Association," Shannon added. "These men and women know firsthand the destruction and human cost that cigarette fires wreak."

Shannon particularly acknowledged the efforts of Rusty Belanger, Assistant State Fire Marshal, Warren Cummings, president of the Alaska Fire Chiefs Association and Jason Elson, chairman of the Legislative Committee for the Alaska Fire Chiefs Association.

Nearly half of U.S. residents live in states where fire-safe cigarette laws have passed or are in effect.


States with laws on the books that have not yet taken effect: Alaska, Connecticut, Delaware, Illinois, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Montana, New Hampshire, New Jersey, Rhode Island, Texas, and Utah.

www.firesafecigarettes.org

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Legislation for fire-safe cigarettes around the U.S.

- States in which legislation has become effective
- States that have passed legislation
- States that have filed legislation
- States that have not yet filed legislation

Nearly half of the U.S. population is now or soon will be better protected from cigarette fires thanks to state passage of fire-safe cigarette legislation.

In Canada, fire-safe cigarettes are required nationwide using the New York standard.
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North Charleston Fire Department granted 2007 Jensen Award for its smoke alarm program

NORTH CHARLESTON FIRE Department of South Carolina has been selected as the winner of the 2007 Rolf H. Jensen Memorial Public Education Award. The $5,000 will support an ongoing smoke alarm installation and inspection project.

NFPA gives the award annually to support a community-wide fire and life safety education program or campaign.

North Charleston Fire Department will use the award to support its ongoing Smoke Alarm Assistance Program. The program aims to reduce the home fire death and injury rate in the community by identifying areas at the highest risk for residential fires and providing smoke alarm inspection and installation in these areas. Database information and mapping technology are used for a targeted and systematic approach to identify neighborhoods at highest risk where approximately 180 suppression personnel assess needs and provide alarms by conducting door-to-door visits.

The Jensen Award was named for the founder of one of the largest fire protection-consulting firms in the world. Recipients are chosen based on these criteria: demonstration of a plan to implement a community-wide fire and life safety program/campaign aimed at the general public or a targeted group, clearly stated goals and objectives, staff assigned to implement the program/campaign, and a final report, including an overview of the project, number of people reached, media coverage, life saves, etc. For more information on the Rolf Jensen Award program, visit the public education pages at www.nfpa.org.

Metro Chiefs elect new officers at their annual conference

THE METROPOLITAN “METRO” Fire Chiefs Association, a section of the International Association of Fire Chiefs (IAFC) and NFPA recently held its 2007 annual conference in Los Angeles.

Approximately 150 Metro chiefs from Canada, China, France, Switzerland, the United Kingdom, and the United States attended the conference and elected the Section’s 2007-2008 officers and board members.

The new officers are: Chief Keith Richter of the Contra Costa County, California Fire Department, chair; Chief William Stewart of the Toronto, Ontario Fire Services, vice chair; Chief William “Shorty” Bryson of the Miami, Florida Fire Rescue, secretary; and Chief Bob Hendricks of the Lexington, Kentucky Division of Fire & Emergency Services, treasurer. The new board members are: Chief Sherman George of the St. Louis, Missouri Fire Department, board member; Chief (retired) Doug Ratto of the Stockton, California Fire Department, senior board member; Chief Greg Fredrick of the Louisville, Kentucky Fire & Rescue, alternate board member; and Chief (retired) William McCammon of the Alameda County, California Fire Department, immediate past chair.

The Metro Chiefs bestowed the following 2007 Metro Awards: Sir Ken Knight, Commissioner of the London, England Fire Brigade was named Fire Chief of the Year; Chief (retired) Dennis Compton of the Mesa, Arizona Fire Department received the Lifetime Achievement Award; and Ron Siarnicki, Executive Director of the National Fallen Fire Fighters Foundation received the President’s Award of Distinction.

The Metro Chiefs also passed resolutions expressing unanimous support for the immediate confirmation of Virginia Beach, Virginia Chief Greg Cade for the position of Administrator of the United States Fire Administration, as well as for numerous other initiatives, such as the Coalition for Fire-safe Cigarette, residential sprinklers, firefighter safety and diversity in hiring programs and more.
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NFPA sprinkler report provides updated data

ACCORDING TO THE latest information from NFPA, automatic sprinklers are highly effective and reliable elements of total system designs for fire protection in buildings. Based on fires from 2002 to 2004 that were reported to U.S. fire departments, excluding cases of failure or ineffectiveness because of a lack of sprinklers in the fire area and after some recoding between failure and ineffectiveness based on reasons given, sprinklers operate in 93 percent of all reported structure fires large enough to activate sprinklers.

When they operate, they are effective 97 percent of the time, resulting in a combined performance reliability of 90 percent. When sprinklers fail to operate, the reason most often (66 percent of failures) given is shutoff of the system before fire began, as may occur in the course of routine inspection maintenance. Other leading reasons are manual intervention that defeated the system (16 percent), lack of maintenance (10 percent), and inappropriate system for the type of fire (6 percent). Only 2 percent of sprinkler failures are attributed to component damage.

When sprinklers operate but are ineffective, the reason usually has to do with an insufficiency of water applied to the fire, either because water did not reach the fire (41 percent of cases of ineffective performance) or because not enough water was released (29 percent).

NFPA members can download free PDF copies of selected One-Stop Data Shop reports. For more information on the sprinkler report, visit www.nfpa.org.

Innovative fire protection engineer remembered

LONGTIME NFPA MEMBER
Robert Brady Williamson, a pioneer in fire safety engineering science education and a professor emeritus at the University of California, Berkeley, died August 1. He was 73.

"Brady was a major figure in the field of fire protection engineering for something on the order of half a century. Based primarily at the University of California at Berkeley, he is especially well known for contributions in the area of fire resistance, but I knew him also as a great champion and mentor of young professionals (especially but not only his students) and a role model for a certain kind of engineer/researcher that has always been rare but has become more so," says John R. Hall, Jr., Ph.D., Assistant Vice President, Fire Analysis & Research, NFPA.

Professor Williamson was a faculty member in the Department of Civil and Environmental Engineering at the University of California, Berkeley, from 1968–2001. He was educated at Harvard University, receiving his Ph.D. in 1965. Professor Williamson was a worldwide leader in the field of fire-safety engineering.

He specialized in full-scale experimental fire research, assessment methods for fire safety, modeling of fires, and the translation of fire research into practice. Williamson’s developments addressed gaps in building codes in the 1970s. It was Williamson’s corner test that revealed the high flammability of cellular foam plastics, commonly used as building insulation.

Williamson was born on November 19, 1933, in New York State, living in various locations around the country before settling down in Kansas City, Missouri, where he attended middle school and high school.


Williamson is survived by his wife, Nancy Brown-Williamson of Berkeley; their son, John Bradford Williamson of San Francisco; his children from a previous marriage, son, Robert Lowell Williamson of Incline Village, Nevada; and daughters, Katherine T. Bettencourt of Clio, Michigan, Anne L. Curtis of Belmont, Massachusetts, and Sarah T. St. John of San Jose, California; a brother, Otis Turner Williamson of Kilmarnock, Virginia; and five grandchildren.

A memorial service has been scheduled for October 7, at the UC Berkeley Faculty Club.
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One person dies in camper fire
NORTH CAROLINA—An explosion and fire destroyed a camper and killed a 42-year-old man. The man had borrowed cigarettes from a friend and returned to the camper before the fire. A neighbor called 911 to report an explosion and fire at 1:54 a.m., but nothing could have been done to save him.

The trailer-type camper was 8 feet (2.4 meters) wide and 18 feet (5.4 meters) long with a wooden porch on one side. The trailer had a single room with a bed, kitchen, dining area, and a small bathroom in the rear. Two cylinders of liquefied propane (LP) gas were at the front of the camper. No smoke alarms were found during the investigation, and there were no sprinklers.

Investigators found the victim's body near the dining area where he apparently fell asleep before the fire or died after the fire started. The fire smoldered for some time and eventually reached free burning stage. The victim never woke up or tried to escape. The fire report does not provide any information about why an explosion occurred, but the LP gas cylinders were hooked up and operating.

The camper constructed of a steel frame with wood frame construction and covered by sheet metal was completely destroyed. Value of the camper and contents was estimated at $5,500.

RESIDENTIAL
Wind factor in fast-spreading fire
OHIO—Wind helped spread a fire...
that surrounded and engulfed a single-family home. A 35-year-old woman died in the fire.

The two-story, wood-frame dwelling had a shingled, wood-joist roof. There were no smoke detectors or sprinklers installed in the home.

Investigators determined the fire started in a storage area for scrap tires, automotive batteries, and scrap metal. They believe battery acid leaked onto the scrap material and created a heat-producing chemical reaction.

Aided by the wind, fire spread from the tires, plastic, and available structural wood framing of the porch to the home.

The victim was aware of the fire and had called a local emergency phone number to report it at 4 p.m. At some point, she became trapped in the structure and was overcome by smoke. Damage to the home, valued at $40,000 with contents of $10,000, was a total loss.

Fireworks inside a residence ignite deadly fire
MISSOURI—A 6-year-old boy and a 40-year-old male died when fireworks ignited the interior of their home. Investigators believe hot embers from fireworks ignited an upholstered sofa and quickly spread, trapping the occupants. Firefighters fought through the fire and heavy smoke coming from the front door and quickly found one victim and later a second, but both had succumbed to smoke inhalation and burn injuries.

The single-family home was constructed of wood framing with a wooden roof and asphalt shingles. The 1,200-square-foot (111-square-meter) home lacked smoke alarms and sprinklers.

The fire department received a call from a passerby at 11:50 p.m. and arrived five minutes later to find police on scene reporting a person possibly trapped. As flames came out the front door and window, firefighters advanced a hose line into the front door knocking down the heavy fire as they went.

Within 10 feet (3 meters) of the door, the first victim was found and removed to the front lawn. Firefighters suppressed the fire and continued the primary search. A second victim was found in the kitchen and removed. The fire was contained to the first floor and the dwelling ventilated as the investigation began. Damages to the home were not reported.

Baby succumbs to heat and smoke exposure
VIRGINIA—Despite attempts by a police officer, two civilians, and an off-duty firefighter, a 19-month-old baby sleeping in a crib died of exposure to heat and smoke. A juvenile playing with a lighter ignited a twin bed in the baby’s room, left, and closed the door after the fire was.
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Ignited. The fire consumed bedding and a foam mattress, producing heat and smoke, but extinguished itself by the time firefighters arrived.

The apartment was within a building having eight units with construction details not reported. The fire was started on the second floor where a smoke alarm was outside the bedrooms and bathroom. Another alarm was in the living room and kitchen but their operation was not reported.

The juvenile who started the fire called 911 at 10:20 a.m. to report the fire. Firefighters quickly responded and arrived within four minutes.

Before firefighters arrived, an off-duty firefighter went to the second floor but was turned back from the burning room. After taking off his shirt and wetting it, he reentered the room and vented the window. He was unable to find the baby, and he exited the home.

When firefighters arrived, they found black smoke coming from the bedroom window and a ladder placed against the home. Firefighters entered the dwelling wearing full-protective gear, rescued the baby, and extinguished a few hot spots still burning within the room.

Investigators found that after the bedding was ignited, it spread to a foam mattress. The fire spread vertically and horizontally as smoke filled the room. The closed bedroom door delayed detection and limited heat and smoke damage to the remainder of the floor. One firefighter suffered burns. The baby died of thermal burns and smoke inhalation. Losses were estimated at $1,300.

**Four dead in home lacking operating smoke alarms**

Ohio—Two smoke alarms, one located on the second floor and another in a third-floor attic space, were found without batteries upon investigation of a house fire that killed four people. The fire was started unintentionally when food left on an operating gas-fired stove ignited and spread to cabinets and other combustibles. Two victims were located on the first floor, and two others, a two-year-old boy and his mother, were found in the second-floor hallway.

The fire occurred in one of two units of a duplex, two and one-half stories in height and measuring 36 feet (11 meters) by 28 feet (8.5 meters). Constructed of wood framing with an asphalt shingle roof, the exterior siding was vinyl. The battery-operated smoke alarms were found in the attic and another in debris of the second floor hallway. Neither smoke alarm had batteries within the unit. There were no sprinklers.

Reported to the fire department at 11:21 p.m., firefighters responded within five minutes of the 911 call.
made by neighbors. On arrival, fire could be seen coming from a failed kitchen window at the rear of the building and all doors to the home were secured. Forcing open the front door, firefighters advanced a hose line from the unburned area toward the kitchen located in the rear. Two victims were found in the living room, a 68-year-old male and a 57-year-old female, located near the stairs to the upper floor. During the search of the home, two more victims were located on the second floor including a 26-year-old female. She was located in the hallway between two bedrooms and was found kneeling over her 2-year-old son.

Investigators determined an aluminum pan had been placed on the rear burner of the gas-fired stove and left unattended. The burning food and melted aluminum pan appeared to ignite wooden cabinets overhead and spread from the kitchen to the dining room and living room, traveling vertically up the stairs to the second floor. The home, valued at $75,000, with contents of $30,000, was a total loss. All the victims died of smoke inhalation and the adult male victim may have been impaired by alcohol at the time of the incident.

**Electrical cord arcs and ignites combustible**

TEXAS—Firefighters discovered a victim during extinguishment at a single-family home fire. Once the victim was removed, firefighters extinguished the fire, ventilated the home, and investigated how the fire started.

The single-story home was constructed of wood framing and covered an area of about 1,200 square feet (111 square meters). A battery-operated smoke alarm was found but its operation during the fire was not determined. There were no sprinklers.

An electrical cord lying against the baseboard of a bedroom doorway where the victim was found led to a window-mounted air conditioning unit. The cord showed signs of arcing and may have ignited nearby combustibles. The fire spread from the bedroom to the hallway, living room, and vented out windows to enter the eaves and attic space. The victim’s age was not reported, and the home, valued at $50,000 had losses of $10,000 with contents of $15,000, suffered $5,000 in loss.

**Disabled woman dies from fire injuries**

MISSISSIPPI—A fire that was extinguished with less than 500 gallons (1,892 liters) of water created enough smoke and heat to kill a disabled woman.

The single-story home was con-
fire watch

The home was constructed of wood framing with an asphalt roof and a brick exterior wall. The home was 35 feet (10 meters) long and 40 feet (12 meters) wide and lacked smoke alarms and sprinklers. A portable, window-style air conditioning unit operating in a dining room arced from the electrical plug, which ignited the wooden baseboard. Flames spread to a nearby table, newspapers, and other combustibles within the room.

While transferring from the bed to the wheelchair, the victim landed on the floor. She called 911 to report the fire and to tell them she was trapped. Firefighters responded with four engine companies at 8:39 p.m. and found heavy smoke coming from the house. Fire was visible in the front windows. Using a 1-3/4-inch hose line, a hose team advanced into the home and moved to the right after entering toward the dining room. Another crew entered and turned left toward the bedroom areas in search of the occupant.

The fire department was knowledgeable of the home, as they had assisted the woman in the past. Firefighters found the victim's bedroom and tried to open the door but found it blocked. Using a second door, firefighters found the victim on the floor. The fire was quickly extinguished with significant heat damage throughout the dwelling.

The victim was treated on scene and transported to the hospital for stabilization and eventually taken to a trauma hospital, but her injuries were so severe she died about a week later. Investigators determined that the fire started when an aftermarket electrical plug was attached to the end of the cord powering the air conditioner. This connection arced and started the fire. Heat from the fire melted plastic ceiling tiles in the victim's bedroom as they dripped to the floor.

The home, valued at $50,000 with contents of $10,000, suffered building losses of $20,000 and contents losses of $7,000. There were no firefighter injuries.

STORAGE

Fire destroys logging yard

UTAH—A fire believed to have been ignited by the burning of a slash pile days earlier spread to stacks of logs and equipment. The fire spread quickly over a large log storage area. Firefighters fought the fire defensively and cut a 100-foot (30-meter) firebreak between the log pile and a nearby trailer park as a precaution and to prevent further involvement.

The privately owned logging operation contained trees that had been felled, limbed, and prepared for placement on trucks for shipment.

In fact, a semi-trailer unit had been loaded, was parked near the pile, and later became involved in fire. At the time of the incident, the property was unoccupied and the fire was reported by a passerby at 4:59 p.m.

Two days before the fire the owner...
of the property had burned a pile of slash, creating flame heights from 15 feet (4 meters) to 30 feet (9 meters) tall. Fire and heat from the pile caused a concern for neighbors, and the owner was told to extinguish the pile by sheriffs.

The stored log pile was 125 feet (38 meters) from the slash pile, but within minutes of the alarm, the fire quickly grew from a few logs to hundreds of logs. Flames spread and consumed the semi-truck adjacent to the pile and sparks and brands ignited spot fires nearby.

The fire department set up a perimeter to control the spread of fire and monitored the blaze until it burned out. Investigators suspect that smoldering brands from the slash pile fire ignited the logs that smoldered for two days before igniting under increasing wind conditions.

Loss of the material and logging equipment is estimated between $1 million and $2 million.

**MERCANTILE**

**Fire damages convenience store, gas station**

**PENNSYLVANIA**—After smelling something burning at a 24-hour convenience store/gas station, occupants discovered a fire near a walk-in cooler. Employees evacuated the store and shut off electrical power to the cooler and the fuel pumps before leaving. A passerby saw the fire and called 911 at 6:37 p.m.

The wooden-frame, single-story building measured 120 feet (36 meters) by 30 feet (9 meters). Interior walls were wood framing over a concrete slab with wooden roof trusses creating a flat roof covered by a rubberized surface. The building did not have a fire detection system or sprinklers.

The fire burned 20 to 30 minutes before detection. It started in a wall where a 200-amp electrical service entered the building. An undetermined malfunction occurred within the electrical wiring and ignited structural wood-frame members behind the walk-in cooler. Flames spread vertically into the attic/roof void and externally through a large hole burned through the outside walls.

From 15 blocks away, heavy smoke could be seen coming from the store. Firefighters arrived within three minutes of the 911 call and observed fire coming from the left rear corner of the building. Smoke was pushing out of the façade, but no other fire was visible. Two crews advancing hose lines into the building found little smoke or heat and quickly made it to the back of the store. Using a thermal imaging camera, crews observed extreme fire involvement of the void space and pulled ceilings and applied water into the space. It had no effect, and they retreated. Command ordered everyone from the building as roof crews reported the roof sagging. All crews were accounted for before commencing a defensive attack. Large master streams were...
HEALTH CARE
Sprinkler controls dryer fire in nursing home
ILLINOIS—A fully operational nursing home was evacuated as smoke from burning bedding within a gas-fired clothes dryer filled the building with smoke. Open access panels leading to an elevator shaft provided an avenue for smoke to travel to upper floors. A single sprinkler fused and extinguished the fire, but five occupants suffered smoke inhalation during the incident.

The two-story building was 150 feet (45 meters) long and 75 feet (22 meters) wide and constructed of concrete block walls covered by brick. The wooden roof had asphalt shingles. The facility had 68 patient rooms and was protected by a smoke detection system with pull stations. A wet-pipe sprinkler system provided full coverage and a central station alarm company monitored the system. The occupancy was operating 24 hours a day.

The dryer was overloaded with bed linens. The drum was unable to turn due to the weight and volume. Once the dryer was started, warm air filled the bin. The dryer overheated and ignited some of the linen. Heat and smoke coming from the dryer spread from the laundry room to the first floor and upper floor via the elevator shaft. Activation of the sprinkler system and by an employee provided the alarm at 12:53 p.m.

Firewalls and doors prevented spread of some the smoke and most of the occupants were protected in place. However, some residents were evacuated as fire crews tried to ventilate the building. Five occupants suffered some smoke inhalation, but none were seriously injured. The building, valued at $1 million with contents of $350,000, suffered only $6,000 in structural loss and $500 of contents loss.

MANUFACTURING
Foam padding manufacturer suffers loss during production
NEW JERSEY—A wet-pipe sprinkler system controlled a fire within an industrial oven. Padding being fed into the oven became jammed when rollers failed.

The single-story manufacturing plant had a sprinkler system provided full coverage and a central station alarm company monitored the system. There were no smoke alarms and the building was operating.

The fire was quickly extinguished, and the building, valued at $6 million with contents of $1 million, had a combined loss of $150,000.
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Emergency evacuation
Changing occupant attitudes and notification system effectiveness

A MAJOR FOCUS OF MANY NFPA codes and standards is safe occupant egress from buildings. With heightened security concerns in the building community, emergency evacuation systems and procedures are under review. The Foundation has recently completed two projects in this area designed to support the needs of NFPA committees addressing these issues. The full reports from both projects can be found on the Foundation’s Web site at www.nfpa.org/Foundation.

Public perceptions
A concern in the fire safety community in light of the events of September 11, 2001 is that the public’s attitudes toward emergency notification and evacuation procedures may have changed and that current assumptions about occupant behavior in this regard may no longer be valid.

In response to a recommendation by the NFPA High-Rise Building Safety Advisory Committee, NFPA commissioned the Foundation to carry out a survey of high-rise building occupants to explore their general knowledge of high-rise building safety and emergency evacuation procedures and their attitudes and perceptions about high-rise safety and emergency evacuation procedures. Some 244 residential building occupants in Chicago, New York City, and San Francisco, and 228 commercial building occupants in Boston, Chicago, Detroit, Houston, Los Angeles, Miami, and Philadelphia were surveyed.

The study, carried out for the Foundation by NuStats, Inc., revealed both expected and unexpected attitudes among building occupants. Among the findings:

The events of September 11, 2001 have heightened occupants’ concerns about safety in high-rise buildings.

Eight in ten commercial building respondents (80 percent) reported they participated in a fire drill within the last year, compared to 18 percent of residential building respondents. The most frequent top-of-mind suggestion to building management to improve safety was “more fire drills”.

Almost all occupants know where the fire exits are.

In keeping with conventional wisdom, most occupants believe using elevators is unsafe during a fire. However, 28 percent also believe that going to the roof is a possible alternative to using the stairs.

Notification effectiveness
Another recently completed Foundation project, supported by a grant from the Department of Homeland Security, explored the effectiveness of emergency notification systems on occupant evacuation from public spaces through a series of evacuation studies in which tonal and voice alarms were provided to trained and untrained occupants, with and without trained staff assistance. Hughes Associates carried out the study for the Foundation, with the cooperation of the General Services Administration and the University of Greenwich. Among the findings:

Informed occupants evacuate more effectively.

The effectiveness of notification systems that only alert the population to an incident (e.g., a tonal signal) is dependent on the level of training of the occupants or the reliable presence of trained staff.

This type of staffing effort should be supported by other means of informing occupants of the incident (such as a voice notification system), in order to provide redundancy in the system.

It is critical that a voice notification system provide information in an authoritative and consistent manner; and clear regulatory guidance should be developed in this area.

Consideration should be given to alternate means of notification, such as visual or tactile systems.

Understanding the perceptions and behavior of building occupants is essential to improving the effectiveness of notification systems and their reference in NFPA 72.

KATHLEEN H. ALMAND, P.E., FSFPE, is the executive director of the Fire Protection Research Foundation.
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Hose connections to sprinkler systems

Annex material in the new edition provides guidance.

A CHANGE TO THE ANNEX of the 2007 edition of NFPA 13, Installation of Sprinkler Systems, may give the impression that 2-1/2-inch (65-millimeter) hose connections may be made to sprinkler piping, but such connections are only permitted as part of a fire department standpipe system, and NFPA 14, Installation of Standpipe Systems, has jurisdiction over pressure and flow requirements.

The 2-1/2-inch hose connections are treated differently than 1-1/2-inch (40-millimeter) hose connections within NFPA 13. The smaller hose connections, addressed in Section 8.17.5 of the 2007 edition, have traditionally been connected to sprinkler systems to facilitate mop-up operations and were typically required in storage occupancies. Although the hose connections are the same size as the 1-1/2-inch Class II standpipe hose connections, they have never been considered as standpipe connections, and have therefore not been required to meet the minimum flow and pressure requirements of NFPA 14. NFPA 14 currently requires 100 gpm (379 lpm) at minimum 65 psi (4.5 bar) for Class II standpipe service, which is also provided as part of Class III service. By contrast, NFPA 13 specifies a minimum of 50 gpm (189 lpm) at the available pressure of the sprinkler systems for its 1-1/2-inch hose connections.

Codes such as the NFPA 101®, Life Safety Code®, recognize this difference, and for applications such as stages in new assembly occupancies allow the provision of either Class II or III standpipe service or 1-1/2-inch hose connections from the sprinkler system. The fact that there are two different types of 1-1/2-inch hose connections is also supported by product listing requirements. A review of Underwriters Laboratories requirements shows that the 1-1/2-inch hose outlets for Class II standpipe systems have 1-1/2-inch inlets, whereas the 1-1/2-inch hose outlets for sprinkler systems have 1-inch (25-millimeter) inlets. This demonstrates a concern that water not be discharged from a sprinkler system hose connection in such quantities that it could compromise the effectiveness of the sprinklers.

This same concern is the reason 2-1/2-inch outlets should not be connected to a sprinkler system unless as part of a combined riser serving both standpipe hose outlets and the sprinkler system. In most cases, the water demand and pressure for the standpipe system will substantially exceed that of the sprinkler system. Both NFPA 13 and 14 recognize that in the case of a building fully sprinklered in accordance with NFPA 13 there is no need to add any additional water for the sprinklers.

The allowance for 2-1/2-inch hose connections to the common riser serving both sprinklers and standpipes is found in Section 8.17.5.2 of the 2007 edition of the sprinkler standard. The title, "Hose Connections for Fire Department Use" clarifies the intent, since it is consistent with the definition of Class I standpipe service. When the combined riser first became popular in the late 1970's, it was agreed the NFPA 14 Committee would have authority over the minimum flow and pressure requirements.

When developing the 2007 edition of NFPA 13, the sprinkler committee wanted to specifically address the question of whether inside hose allowance was to be added for a combined riser and proposed the following wording: "A.11.2.3.1.8(8) If hose valves or stations are provided on a combination sprinkler riser and standpipe for fire department use in accordance with NFPA 14 there is no need to add any additional water for the sprinklers."

Continued on page 110

RUSS FLEMING, P.E., is the executive vice-president of the National Fire Sprinkler Association and a member of the NFPA Technical Correlating Committee on Automatic Sprinklers.
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THE FIREGROUND IS becoming more hazardous. Lightweight construction combined with heavy fuel loads (including large quantities of synthetic materials) in very large buildings significantly increase the hazard to fire fighters. Modern personal protective equipment provides a higher level of protection, thus permitting fire fighters to make a closer approach to the fire. Advancing further inside the building and closer to the fire places fire fighters at greater risk. Therefore, it is imperative that fire fighters understand the limitations of their personal protective equipment.

Fire administrators must be committed to fire fighter safety and must ensure that the necessary procedures, training, and equipment are provided. The incident commander (IC) is ultimately responsibility for incident-scene safety, which weighs heavily on the crucial offensive/defensive attack decision. Once a decision is made, the IC must then monitor, organize, coordinate, and provide safety measures as described in Chapter 8 of NFPA 1500, Fire Department Occupational Safety and Health Program. Company officers have a responsibility to properly supervise members of their companies. Fire fighters must take personal responsibility for their safety and the safety of members working with them by following procedures, maintaining firefighting skills, and properly using the equipment provided.

Understanding the dynamics associated with structural collapse is critically important to the fire fighter. The IC must pay close attention to signs of impending structural failure. Oftentimes the decision to conduct an attack in the defensive rather than the offensive mode is based on the building's structural integrity. When a safety officer is on scene, he or she must pay close attention to signs of collapse.

A variety of construction materials and methods have been employed in buildings over the years. These range from heavy timber construction to lightweight wood trusses. Because of the different materials used, the behavior of buildings under fire attack will vary significantly.

No building is completely immune to structural failure, but some buildings will withstand a very large and intense fire without a catastrophic (total) collapse. Other structures are known to experience early collapse under intense fire conditions. A key consideration when developing the incident action plan—especially when deciding on an offensive/defensive strategy and assigning fire fighters and apparatus
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Access-controlled egress doors and locks

‘Permission’ is needed from a specific occupancy chapter in NFPA 101.

NFPA 101®, LIFE SAFETY CODE®, Section 7.2.1.6.2 permits a method of securing (locking) doors to rooms or areas where security is a concern. This type of locking is called “access-controlled egress doors.” Section 7.2.1.6.2 of NFPA 101 is not a blanket permission to use this type of locking. Instead, it states that “where permitted,” this type of locking can be installed.

The phrase “where permitted” means that permission is needed from the specific occupancy chapter in NFPA 101. Since locks are installed on doors, and doors are considered an egress component by the Code, one would look in the 2.2 Section of the specific occupancy chapter applicable to the area where the lock will be installed. For example, we will look at a secure office area in a “Business Occupancy.” Chapter 38, New Business Occupancies, Section 38.2.2.2.5 of NFPA 101 states that “Access-controlled egress locks complying with 7.2.1.6.2 shall be permitted.” Therefore, such a locking arrangement is permitted in business occupancies.

This type of lock is usually a magnetic lock installed on the door to prevent entry. The magnetic lock secures the door locked, and entry is typically made into the room by means of a cipher keypad or a card reader. Of course, the Code is not really concerned with entry into the room but with egress from the room. The Code requires that a motion sensor be placed on the egress side to detect a person approaching the door and cause the release of power to the locking mechanism allowing the door to be opened for egress. However, the Code has concerns about the reliability of that motion sensor and includes two important redundant features: unlocking when the power goes out and a manual release device.

Loss of power will cause the door to be unlocked. With a magnetic lock this is not an issue, as loss of power to the electro-magnet will cause loss of the magnetic property and the door becomes unlocked. The second redundancy is that a manual release device such as a button be located within 5 feet (1.5 meters) of the door and installed 40 inches (101 centimeters) to 48 inches (120 centimeters) above the floor. This button must be clearly accessible and identified by a sign reading: “PUSH TO EXIT.” Activation of this manual release device must directly interrupt power to the locking mechanism, usually the magnetic lock.

This section also requires that activation of the building sprinkler system (if any) and activation of the fire detection system (if any) shall automatically unlock the door in the direction of egress. Activation of the manual fire alarm boxes does not have to unlock the egress door.

An Annex note clarifies that it is not the intent that this section be applied to all doors that restrict access into a building or space. The Life Safety Code is not concerned with entry into a building but only with egress for those occupants who are inside the building.

It is also important to note that this provision is not a blanket permission to use magnetic locks in a building to restrict egress. I have often heard people say that they have installed magnetic locks on egress doors that automatically unlock upon activation of the building fire alarm system and that this arrangement complies with the Life Safety Code. That is not the case. Magnetic locks are not specifically addressed in the Code. If such a locking arrangement is used, other than as provided for in Section 7.2.1.6.2, then an equivalency is needed in accordance with Section 1.4 of NFPA 101.

CHIP CARSON, P.E., is owner and president of Carson Associates, Inc., in Warrenton, Virginia. He is also a member of the NFPA Board of Directors.
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Why does the *Fire Alarm Code* change?

Research has a significant influence on changes to NFPA 72.

IN THE 2007 edition of the NFPA 72®, *National Fire Alarm Code*, two specific issues were addressed and changes to installation requirements were made based on fire research and modeling.


The research proved the efficacy of duct smoke detectors to perform properly in their application to prevent the re-circulation of smoke by the HVAC system. In addition, the University of Maryland and the National Research Council of Canada provided insight that changed the guidance contained in the Code for duct smoke detector installation.

Annex material to Section 5.16.5.2 of NFPA 72-2007 provides in part that the "Sampling tubes should be oriented to overcome thermal stratification due to buoyancy of the smoke in the upper half of the duct. This condition occurs where duct velocities are low, buoyancy exceeds flow inertia, or the detector is installed close to the fire compartment. A vertical orientation of sampling tubes overcomes the effects of differential buoyancy.

"Where a detector is installed on a duct serving a single fire compartment, where the buoyancy exceeds the flow inertia of the air in the duct and the sampling tube cannot be oriented vertically, then the effects of thermal stratification can be minimized by locating the detector sampling tube in the upper half of the duct."

"The thermal stratification is not a concern where the detector is installed far from the fire compartment or where the smoke is at or close to the average temperature in the duct."

This represents a radical change in sampling tube installation.

Another significant change in detector installation resulted from the Fire Protection Research Foundation-sponsored program for smoke detector applications and spacing with level beamed and waffle ceilings.

The research resulted in major changes to Section 5.7.3.2.4.2 that states: "for level ceilings the following shall apply:

"(1) For ceilings with beam depths of less than 10 percent of the ceiling height (0.1 H), smooth ceiling spacing shall be permitted.

"(2) For ceilings with beam depths equal to or greater than 10 percent of the ceiling height (0.1 H) and beam spacing equal to or greater than 40 percent of the ceiling height (0.4 H), spot-type detectors shall be located on the ceiling in each beam pocket.

"(3) * For waffle or pan-type ceilings with beams or solid joists no greater than 600 mm (24 in.) deep and no greater than 3.66 m (12 ft) center-to-center spacing, the following shall be permitted:

"(a) Smooth ceiling spacing including those provisions permitted for irregular areas in 5.6.5.1.2, substituting 'selected spacing' for 'listed spacing';

"(b) Location of spot-type smoke detectors on ceilings or on the bottom of beams.

"(4) * For corridors 4.5 m (15 ft) in width or less having ceiling beams or solid joists perpendicular to the

Continued on page 110

WAYNE D. MOORE, P.E., FSFPE is a principal with Hughes Associates and immediate past chair of the NFPA 72 Technical Correlating Committee.
Why use FlexHead flexible fire sprinkler connections?

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Fill in the blank. The Great American _________.

I KNOW SOME OF your answers: The Great American Smokeout (sponsored by the American Cancer Society); The Great American Chocolate Bar (Hershey’s, the well-known chocolate bar), and The Great American Ball Park (home of the Cincinnati Reds).

I bet no one thought of The Great American Fire Drill. I am not surprised because this is the first year that NFPA is promoting the biggest fire drill ever. The Great American Fire Drill supports the 2007 Fire Prevention Week theme: "It's Fire Prevention Week, Practice Your Escape Plan!"

According to a poll conducted for NFPA, while the majority of Americans have an escape plan in case of a fire, most haven’t practiced it. And three-quarters of Americans believe they have 10 minutes or less until a fire turns deadly.

The Great American Fire Drill was developed by NFPA to get people—young and old—excited about practicing a home escape plan. During the month of October, we are asking kids and families all across North America to practice their home fire escape plans. Once they practice their plans, they can visit sparky.org and make their drill count by filling in some quick information about their drill. Did the drill take place at home, at work, or at school? How many people participated in the drill? Where do they live? Once a visitor presses the "enter" key, there is no turning back. The animated Web page is designed to provide information and enforce the message of practicing your escape route.

The page features a counter that will show them how many people have come before them and practiced their home escape plan. There is also an interactive certificate that allows visitors to type in their name and then print out the certificate that congratulates them on completing the task.

Fire departments can take the lead in promoting this event by downloading a flyer and escape grid from firepreventionweek.org. Make copies of the grid and distribute them throughout your community during the last week in September. Some other ideas to tie your Fire Prevention Week campaign into the Drill:

Provide copies of the flyer and grid to local libraries, grocery stores, schools, town hall, fire station, dry cleaners, and other places in your community.

Have volunteers call residents and encourage them to be counted in the drill.

Use your local cable station to demonstrate how to plan and practice an escape plan and promote participation in The Great American Fire Drill. NFPA has also developed a call to action for kids, which is based on the drill. The challenge is simple and comes directly from Sparky®, the Fire Dog.

Sparky says "Find five people (could be grandparents, friends, neighbors, or family) and spread the word about home escape planning. Take this checklist and make sure the five people who you pick will be ready in case there is a fire. After they have done their home fire drill, have them go to sparky.org and make their drill count with The Great American Fire Drill."

Visit firepreventionweek.org to download the checklist or to find more ideas on incorporating the drill in your community Fire Prevention Week plans.

When it comes to smoke detectors, ionization smoke detection is generally more responsive to flaming fires and photoelectric smoke detection is generally more responsive to smoldering fires. Both technologies have improved home fire safety. NFPA has convened a task group to consider a range of issues including false alarms and the speed of detector response for both types of alarms. In the interim, it is recommended that both types of detection be installed in homes.

Join The Great American Fire Drill this year. Just how big will the drill be? It's up to you. Fill in the blank.

JUDY COMOLETTI is the Assistant Vice President for Public Education at NFPA.
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On average, every three and a half hours someone in the U.S. dies in a home fire. According to a 2004 poll conducted for NFPA, 66 percent of Americans have an escape plan in case of a fire but only 35 percent of those with a plan have practiced it. In addition, one-third of American households who made an estimate thought they would have 10 minutes or less before a fire in their home would become life threatening. The time available may be less. By John Nicholson
IN 2006, U.S. FIRE DEPARTMENTS responded to 396,000 fires in residential properties and those fires caused 2,580 civilian deaths. Approximately 12,500 civilian injuries occurred in home fires and those fires caused $6.8 billion in property damage. Given the statistics, it is clear that having an escape plan is not enough. To escape safely from a home fire you've got to make sure that everyone in the home has practiced the plan as well.

The theme for Fire Prevention Week 2007 is “Practice Your Escape Plan!” From October 7 to October 13, fire safety advocates across the country will be spreading the word that when it comes to escape plans, practice is key. Include everyone in your home and make a home escape plan making provisions for anyone who has a specific need. Eighteen to 24-year-olds are the least likely to have even developed an escape plan. Practice your plan at least twice a year. Your ability to get out depends on advance warning from smoke alarms and advance planning.

According to Judy Comoletti, Assistant Vice President of Public Education at NFPA, you should plan regular fire drills to ensure that everyone knows exactly what to do when the smoke alarm sounds. Hold a drill at night to make sure that sleeping family members awaken at the sound of the alarm. More than half of all home fire deaths result from incidents reported between 11 p.m. and 7 a.m. But only 20 percent of home fires occur between those hours.
Practice, practice, practice
Pull together everyone in your household and make a plan. Walk through your home and inspect all possible exits and escape routes. Households with children should consider drawing a floor plan of your home, marking two ways out of each room, including windows and doors. Also, mark the location of each smoke alarm. Allow children to master fire escape planning and practice before holding a fire drill at night when they are sleeping. The objective is to practice, not to frighten, so telling children there will be a drill before they go to bed can be as effective as a surprise drill.

Although children five and under make up about 7 percent of the country’s population, they accounted for 12 percent of the home fire deaths, assigning them a risk almost twice that of an average person. It’s important to determine during the drill whether children and others can readily waken to the sound of the smoke alarm. If they fail to awaken, make sure that someone is assigned to wake them up as part of the drill and in a real emergency situation.

Research studies have shown that some children may not awaken to the sound of the smoke alarm. Dr. Dorothy Bruck, a psychologist at Victoria University in Australia, was the first to identify the problem. In her 1999 study published in Fire Safety Journal, Dr. 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, Dr. Bruck found all of the parents woke when the alarms sounded.

In subsequent research, Dr. 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, Dr. 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.

When planning, always choose the escape route that is safest—the one with the least amount of smoke and heat—but be prepared to escape under toxic smoke if necessary. When you do your fire drill, everyone in the family should practice getting low and going under the smoke to your exit. Closing doors on your way out slows the spread of fire, giving you more time to safely escape.

Everyone in the household must understand the escape plan. When you walk through your plan, check to make sure the escape routes are clear and doors and windows can be opened easily. If windows or doors in your home have security bars, make sure that the bars have emergency release devices inside so that they can be opened immediately in an emergency. Emergency release devices won’t compromise your security - but they will increase your chances of safely escaping a home fire.

The metal bars that some people put on their windows and doors for security can trap them inside during a fire. Make sure the metal bars have a quick release mechanism for escape.

In Oklahoma City, six people, including three teenagers and an 11-year-old child, were killed September 26, 2004, when fire swept through their home. It was reported that burglar bars on the windows trapped the victims. And in Homestead, Florida, four children and their stepfather were killed on September 23, 2004, by a fast-spreading house fire. The windows of their home were still boarded up after recent hurricane warnings. Plywood had been wedged between all the windows and the home’s burglar bars.

If there are infants, older adults, or family members with mobility limitations, make sure that someone is assigned to assist them in the fire drill and in the event of an emergency. Assign a backup person too, in case the designee is not home during the emergency.

Be fully prepared for a real fire: when a smoke alarm sounds, get out immediately. If your home has two floors, every family member (including children) must be able to escape from the second floor rooms. Escape ladders can be placed in or near windows to provide an additional escape route. Review the manufacturer’s instructions carefully so you’ll be able to use a safety ladder in an emergency. Practice setting up the ladder from a first floor window to make sure you can do it correctly and quickly. Children should only practice with a grown-up, and only from a first-story window. Store the ladder near the window, in an easily accessible location. You don’t want to have to search for it during a fire.

Residents of high-rise and apartment buildings may be safer using a staged evacuation or relocation strategy. Staged evacuation is...
commonly in the plan for high-rise buildings. An advantage of staged evacuation is that only those occupants in immediate danger - normally defined as those on the fire floor as well as those on the floors immediately above and below the fire floor are directed to use the exit stairs. The fewer people in the stairs, the more quickly occupants can exit or relocate to other floors, yielding shorter queues at the stair entrances. Staged evacuation requires continuous monitoring of the incident to determine if the evacuation of additional occupants will be necessary. The fire department or designated fire safety officer should always be involved in staging operations.

Where staged evacuation is used, the location of the fire or other incident in the building is identified, and only those occupants who might be immediately threatened are notified to leave the building. The remaining occupants are typically notified that an emergency has been reported in the building and they are to await further instructions.

Once you're out, stay out. Under no circumstances should you ever go back into a burning building. If someone is missing, inform the fire department dispatcher when you call. Firefighters have the skills and equipment to perform rescues.

It is important to choose an outside meeting place (i.e. neighbor's house, a light post, mailbox, or stop sign) a safe distance in front of your home where everyone can meet after they've escaped. Make sure to mark the location of the meeting place on your escape plan.

Prepare for the fire department and have everyone memorize the emergency phone number of the fire department. That way any member of the household can call from a neighbor's home or a cellular phone once safely outside. Also make sure your home is visible. Go outside to see if your street number is clearly evident from the road. If not, paint it on the curb or install house numbers to ensure that responding emergency personnel can find your home.

In some cases, smoke or fire may prevent you from exiting your home or apartment building. To prepare for an emergency like this, practice "sealing yourself in for safety" as part of your home fire escape plan.

Close all doors between you and the fire. Use duct tape or towels to seal the door cracks and cover air vents to keep smoke from coming in. If possible, open your windows at the top and bottom so fresh air can get in.

Call the fire department to report your exact location. Wave a flashlight or light-colored cloth at the window to let the fire department know where you are located.

Practice your home fire escape plan twice a year, making the drill as realistic as possible.

**Sounding the alarm**

Based on a telephone survey done in 2004, 96 percent of all homes have at least one smoke alarm. According to the survey, only 8 percent of people said their first thought on hearing a smoke alarm would be to get out. Because fire can grow and spread so quickly, having working smoke alarms in your home can mean the difference between life and death.

For the 2007 edition of NFPA 72®, *National Fire Alarm Code*, the Technical Committee for Chapter 11, Single- and Multiple-Station Alarms and Household Fire Alarm Systems, made a number of changes to promote the use of additional interconnected smoke alarms throughout

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**IFPS chooses FPW Contest winner**

MICHELIN NORTH AMERICA was the recipient of the Industrial Fire Protection Section (IFPS) Fire Prevention Week Contest and was recognized at the 2007 World Safety Conference and Exposition® (WSC&E®) in Boston. The award recognizes businesses that promote fire and related safety messages for employees and their communities in conjunction with local fire departments during Fire Prevention Week from the previous year.

Michelin North America's winning Fire Prevention Week program promoted the importance of safe cooking to coincide with the 2006 Fire Prevention Week theme, *Prevent Cooking Fires: Watch What You Heat!* Employees received materials on safe cooking throughout the week and the company partnered with local fire departments to educate children on good fire prevention and safety practices. They also provided hands-on training to over 1,500 employees on the proper operation of fire extinguishers.

The Industrial Fire Protection Section sponsors the annual contest and the section's board of directors chooses the winner.

IFPS is a subgroup of the NFPA membership that comes together as professionals representing such occupancies as factories, refineries, mills, mines, utilities, warehouses, and distribution centers to exchange information and promote awareness for the need to improve industrial fire protection programs. This section seeks to advance the development of improved fire protection equipment, devices, and methodologies by soliciting expertise and experience from our members, by noting common themes, and by communicating relevant issues to the full NFPA membership and the greater fire-safety community.
In past editions, requirements for the installation of smoke alarms in bedrooms and for the interconnection of smoke alarms (that is, when one sounds, they all sound) were restricted to new construction.

The Technical Committee changed the Code to require a uniform set of installation requirements regardless of occupancy age. It has always been the recommendation for all construction that smoke alarms be located in bedrooms as well as outside of each separate sleeping area and on each level of a dwelling unit. The interconnection of all alarms in the dwelling also assures that an alarm signal meeting the Code will be provided in the bedrooms regardless of the location of the first sounding smoke alarm, which may be two floors away from the sleeping area. These changes are partly enabled by new wireless technologies that permit battery-operated smoke alarms to be interconnected.

Mount smoke alarms high on walls or ceilings (remember, smoke rises). Ceiling mounted alarms should be installed at least four inches away from the nearest wall; wall-mounted alarms should be installed four to 12 inches away from the ceiling. If you have ceilings that are pitched, install the alarm near the ceiling’s highest point. Don’t install smoke alarms near windows, doors, or ducts where drafts might interfere with their operation and never paint smoke alarms. Paint, stickers, or other decorations could keep the alarms from working.

Check your smoke alarms regularly
But these life-saving devices are only effective when they’re working properly. Follow manufacturers’ instructions, generally smoke alarms with batteries that are dead, disconnected, or missing can’t alert you to the dangers of smoke and fire. Test your smoke alarms at least once a month, following the manufacturer’s instructions and replace the batteries in your smoke alarm once a year, or when the alarm “chirps” warning that the battery is low.

Some alarms are equipped with large, easy to push test buttons. Alarms that can be tested by using a flashlight or television remote are particularly helpful for people with mobility disabilities, people who are blind or have low vision, or for older adults.

Alarms with a 10-year lithium battery eliminate the problem of having to change batteries. The battery is supposed to last the life of an alarm, which is 10 years. Ten-year battery alarms still need to be tested in accordance with manufacturers’ instructions at least once a month.

Regularly vacuum or dust your smoke alarms, following the manufacturer’s instructions. This can keep them working properly.

Never “borrow” a battery from a smoke alarm. Smoke alarms can’t warn you of fire if their batteries are missing or if they have been disconnected. Don’t disable smoke alarms—even temporarily.

Sadly, incidents of fire and fire fatalities due to missing batteries are numerous. In March, 2007 New York City Firefighters battled a three-alarm fire in the Highbridge section of the Bronx. The fire claimed the lives of nine children and one adult. Eight additional civilians were injured in the blaze. Fire marshals determined the fire started on the first floor and was caused by an overheated space heater appliance cord. Two smoke alarms were found in the building, but they did not contain batteries.

If your smoke alarm is sounding “nuisance alarms,” try relocating it farther from kitchens or bathrooms, where cooking fumes and steam can cause the alarm to sound. Nuisance alarms can discourage people from using smoke alarms.

Reasons for smoke alarm failure
Overall, three-quarters of all U.S. homes have at least one working smoke alarm. The 2000-2004 statistics derived from the Version 5.0 of the U.S. Fire Administration’s National Fire Incident Reporting System (NFIRS) and NFPA’s annual fire department experience survey show that smoke alarms sounded in roughly half of the home fires reported to U.S. departments.

65 percent of reported home fire deaths in 2000-2004 resulted from fires in homes with no smoke alarms or no working smoke alarms.

No smoke alarms were present in 43 percent of the home fire deaths.

In 22 percent of the home fire deaths, smoke alarms were present but did not sound.

In more than half of the reported fires in which the smoke alarms did not operate, batteries were missing or disconnected. Nuisance alarms were the leading reason for disconnecting smoke alarms. Roughly one of every five smoke alarm failures was due to dead batteries. Only 7 percent of the failures were due to hard-wired power source problems. Hard-wired smoke alarms operate on your household electrical current. Alarms that are hard-wired should have battery backup in case of a power outage, and should be installed by a qualified electrician.

Ionization smoke detection is generally more responsive to flaming fires and photoelectric smoke detection is generally more responsive to smoldering fires. Both technologies have improved
home fire safety. NFPA has convened a task group to consider a range of issues including false alarms and the speed of detector response for both types of alarms. In the interim, it is recommended that both types of detection be installed in homes.

Residential sprinklers
Sprinklers and smoke alarms together cut your risk of dying in a home fire 82 percent relative to having neither—a savings of thousands of lives a year.

According to the June 2007 U.S. Experience with Sprinklers and Other Automatic Fire Extinguishing Equipment, automatic extinguishing systems are reported in only 1 percent of fires in one- or two-family dwellings and only 8 percent of fires in apartments. Clearly, there is great potential for expanded use. The National Residential Fire Sprinkler Initiative of the U.S. Fire Administration reported in 2003 that no more than 2 percent of all new residences were then being protected with residential sprinkler systems. This very low proportion of sprinkler-protected new residences suggests that sprinklers continue to have only a token presence in dwellings. The initiative hopes to increase interest in residential sprinkler systems among builders, developers, community officials, and especially homeowners.

The Home Fire Sprinkler Coalition, formed in 1996, has developed a variety of educational materials about the benefits of home fire sprinklers. These materials address common questions and misconceptions. They may be accessed through their Web site http://www.homefiresprinkler.org.

Older adults and people with disabilities
Older adults are also at greater risk of dying in a home fire than the population at large. Adults 65 and older face a risk twice that of the average person, while people 85 and older have a risk that is over four times that of the average person.

To increase fire safety for older adults, NFPA offers the following guidelines:

- If you don't live in an apartment building, consider sleeping in a room on the ground floor in order to make emergency escape easier. Make sure that smoke alarms are installed in every sleeping room and outside sleeping areas. Have a telephone installed where you sleep in case of emergency. When looking for an apartment or high-rise home, look for one with an automatic sprinkler system. Sprinklers can extinguish a home fire in less time that it takes for the fire department to arrive.

- Conduct your own, or participate in, regular fire drills to make sure you know what to do in the event of a home fire. If you or someone you live with cannot escape alone, designate a member of the household to assist, and decide on backups in case the designee isn't home. Fire drills are also a good opportunity to make sure that everyone is able to hear and respond to smoke alarms.

  Make sure that you are able to open all doors and windows in your home. Locks and pins should open easily from inside. (Some apartment and high-rise buildings have windows designed not to open.) If you have security bars on doors or windows, they should have emergency release devices inside so that they can be opened easily. These devices won't compromise your safety, but they will enable you to open the window from inside in the event of a fire. Check to be sure that windows haven't been sealed shut with paint or nailed shut; if they have, arrange for someone to break the seals all around your home or remove the nails.

  Keep a telephone nearby, along with emergency phone numbers so that you can communicate with emergency personnel if you're trapped in your room by fire or smoke.

'Great American Fire Drill'
During Fire Prevention Week 2007, NFPA is asking kids and families all across North America to practice their home fire escape plans. Just how big will the Great American Fire Drill be? With your help, we're hoping to have the world's biggest fire drill. Pick a date in October, make your plan, practice your escape drill and then go to sparky.org to make your drill count.

Fire departments are being asked to throw a Great American Fire Drill Party. To make this activity work, you will need to have lots of teachers on board as well as the participation of members of your fire department. It will take some planning, but it can be great. The objective is to get local families to practice their escape plan and be recognized for doing so. If families make a plan and never practice, they aren't really safe; this activity can help. For more information, visit firepreventionweek.org.

Endnotes
1. Fire Prevention Week Survey conducted for the Public Education Division of NFPA by HarrisInteractive Market Research, Fall 2004.
2. Fire Loss in the United States During 2006, Michael J. Karter, Jr., Fire Analysis and Research Division, NFPA

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For the second year in a row, the largest loss of life in a multiple-death fire occurred in a vehicle fire. In 2006, 24 aircraft passengers died of burns or smoke inhalation following an aircraft crash in Kentucky. In 2005, 23 people lost their lives when a bus carrying hurricane evacuees from a nursing home caught fire on a Texas interstate highway. In August 2006, an early morning flight from Lexington, Kentucky, to Atlanta, Georgia, was preparing for takeoff. The aircraft, a 54-seat, two-engine turbo jet with 3 crew members and 47 passengers on board was cleared to take off on one runway, but mistakenly taxied onto another runway, which was approximately 3,500 feet (1,067 meters) shorter. The aircraft attempted to take off, but was still on the ground when it reached the end of the runway, and crashed into a fence and trees. The shattered aircraft came to rest in a field about 1,800 feet (549 meters) from the end of the runway and caught fire. The first-arriving emergency responders were able to assist the co-pilot from a window and to safety. He was in critical condition, but has survived. The other 2 crew members and all the passengers perished. Twenty-four of the deaths were fire-related. Ten died of thermal injuries, and 14 died of smoke and products of combustion inhalation. The remaining 25 died of multiple blunt force trauma. After the aircraft was cleared for takeoff, the air traffic controller, who was working alone, turned around to perform other duties. He heard a noise, saw a fire, and notified the fire department of the emergency within seconds on the tower crash phone. A complete report of this incident is available from the National Transportation Safety Board. This incident was just 1 of 36 catastrophic multiple-death fires in 2006 that killed 223 people, 6 of whom were firefighters and 28 children under the age of 6. This is in contrast to 2005, when there were 20 such fires that killed 134 people, 23 of whom were children under age 6. A "catastrophic multiple-death fire" is one that kills 5 or more people in residential properties or kills 3 or more people in nonresidential and nonstructural properties.

In the last 10 years (1997-2006), 1 fire has been the deadliest fire of the year in 8 years, and in the other 2 years, 2 fires have had equal death tolls greater than those in any other fire. Vehicles accounted for the deadliest fire of the year in 3 years (2 aircraft and a bus) and one of the deadliest fires (a multi-vehicle highway crash fire) in one of the 2 years with a tie. Homes accounted for the deadliest fire of the year in 2 years (a dwelling and an apartment building) and one of the deadliest fires (a duplex and a manufactured home) in both of the years with a tie. All other properties accounted for the deadliest fires in only 3 years (the World Trade Center attack, the Station Night Club fire, and a board and care home) and one of the deadliest fires (a jail) in one of the 2 years were the same.

Homes and vehicles consistently account for most of the fire deaths in the U.S. It is worth remembering that they also often account for the deadliest fires as well.

The 36 catastrophic multiple-death fires in 2006, accounting for 223 deaths, were both slightly above the recent 10-year average of 35 fires and 206 deaths.

In the U.S. in 2006, there were an estimated 1,642,500 fires (412,500 in residential properties, 111,500 in nonresidential, and 1,118,500 in nonstructural properties). There were an estimated 3,245 civilian deaths (2,620 in residential properties, 85 in non-residential, and 540 in nonstructural properties). The catastrophic multiple-death fires accounted for .002 percent of these fires and 6.9 percent of the deaths.

Catastrophic residential fires
The largest number of catastrophic multiple-death fires (18) occurred in residential structures. Of these 18 residential fires, 15 involved single-family dwellings (5 of which were manufactured homes),
2 involved apartment buildings (one a 4-unit and one a 12-unit building), and one involved a 104-unit residential hotel. These 18 fires accounted for half the catastrophic multiple-death fires in 2006, 5 fires more than in 2005. In these residential structure fires, there were 106 deaths—almost half the deaths in catastrophic multiple-death fires 2006, and 26 more than in 2005. The deaths of 25 children under age 6, up 2 from 2005, accounted for almost one-quarter of the residential catastrophic multiple-fire deaths in 2006.

Seventeen of the 18 fires occurred between the hours of 11 p.m. and 7 a.m. Ninety-four of the deaths occurred during this time period. All the children under age 6 died during this time period. See Table 1 for details on these fires.

The largest loss-of-life residential fire killed 12 people. The fire occurred in a 4-story, 104-room residential hotel that had complete coverage smoke alarms, smoke detection, and manual pull stations. In the second story hallway, numerous box springs and mattresses were stored as they were removed and replaced in the rooms. During the evening, an argument ensued between two second-story occupants. Shortly after that, one of the participants in the argument took a mattress and placed it in front of the door of the other person. She set the mattress on fire and returned to her room. Fire and heat spread rapidly until the hallway flashed over. Smoke and fire spread rapidly throughout most of the building. The smoke alarm in the area of ignition activated and notified a central station alarm company, which in turn notified the fire department. The 12 victims were located in various areas of the U-shaped structure—6 on the second story, 4 on the third story, and 2 on the fourth story. Two people involved in the argument survived. The woman who set the fire was arrested and convicted.²

The second largest fire killed 9 people, 4 of them under 6. The fire occurred in a two-story, single-family dwelling of unprotected wood-frame construction that had no smoke alarms. Arcing electrical equipment ignited combustibles in the ceiling/attic area above a second-story bedroom. Something woke a resident asleep on the first story. He heard screams from the second story, and he made several unsuccessful rescue attempts before he escaped unharmed.

The third fire killed seven people, one of them a child under age 6. The building was a one-story, single-family dwelling of unprotected wood-frame construction with no smoke alarms. Very little information was reported other than that the fire occurred when an overheated refrigerator motor ignited nearby combustibles.

Three fires killed six people each. The first fire was in a one-story, single-family dwelling of unprotected wood-frame construction with no smoke alarms. One victim was under the age of 6. Due to the destruction, the cause and origin could not be determined. Indications are that four victims, two adults and two children, were attempting to escape and were located near the back door. The location of the other two victims was unclear.

The second fire occurred in a two-section manufactured home of unprotected wood-frame construction with no smoke alarms. The family arrived home from a trip to find the power had been shut off the day before. They lit a propane lantern and placed it in a kitchen nook/dining area. The family went to bed and left the lantern unattended. Nearby combustibles ignited, and the fire burned into the bathroom and up above the ceiling throughout the home. There were three 20-pound (9.1 kilogram) propane cylinders and four oxygen bottles inside the home, which contributed to fire spread. The victims were located in various bedrooms.

The third fire broke out in a 12-unit, three-story apartment building of unprotected ordinary construction. There were two victims under age 6. There were no smoke alarms in the apartment where the victims were located, and it was not reported if there were any in the rest of the building. An open flame in contact with clothing in a third-story apartment hallway caused the fire. It was not reported why the open flame was in use. The fire extended throughout the third-story apartment only.

There were 12 fires that killed five people each. The 12 fires consisted of five dwelling fires (three two-story dwellings, a one-and-a-half-story dwelling, and a one-story dwelling), four manufactured homes, and three apartment buildings (a four-story building, a three-story row house, and a two-story row house). In several of the buildings with more than one story, fire trapped some victims on upper floors after beginning on the ground floor.

Six of the twelve fires began in a living room, family room, den, or front room. Three fires began in an unreported area, and the other three began in a computer room, a crawl space, and a porch.

Two of the fires cited unusual complicating factors that point to important safety lessons:
• Trying to fight fire using water from a sink;
• Only one egress door available; and
• Candles used for lighting because power had been shut off before fire.
Catastrophic nonresidential fires

There were seven nonresidential catastrophic multiple-death fires in 2006, which resulted in 42 deaths, compared to two in 2005, which resulted in 18 deaths. Two of the seven fires occurred in coal mines and one each in a 19-bedroom residential care facility, a religious social hall, a dwelling under construction, a warehouse, and an oil storage tank facility. See Table 2 for details on these fires.

The largest loss-of-life incident in this category was an explosion that killed 12 coal miners. Lightning struck a cable a distance from the coal mine, followed it in, and caused a methane explosion. There was no detection or suppression equipment in place in the mine. One miner was killed in the explosion. Twelve others survived the explosion and sought refuge behind a barricade curtain they built to keep out the deadly fumes. Approximately 41 hours after the explosion, rescuers located one survivor and the bodies of the other 11 miners two miles (3.2 kilometers) into the mine. A report on the incident is available on the Mine Safety and Health Administration (MSHA) Web site (www.msha.gov).

The second fire was in a one-story, 19-bedroom residential care facility of unprotected ordinary construction. Eleven people died in this fire, including 10 residents and one caregiver. There were smoke alarms in the common areas, and three manual pull stations but only a single horn/strobe in the building. There were no reports of any alarms operating. There was no automatic suppression equipment present.

An electrical malfunction in a common area near the north wall of the structure ignited combustibles. The fire spread to the attic and raced to the south end of the structure. A neighbor reported the fire after seeing flames coming from the roof. Arriving firefighters found heavy fire from the roof and numerous casualties. At first, firefighters were able to enter the building, but they were forced out by smoke and fire conditions. At least 24 other residents were injured, many of them removed before the fire department arrived. Since this incident, the state has required sprinklers in group homes and nursing homes.

The third incident was another methane explosion in a coal mine. This explosion killed five miners—two as a result of the blast and three due to inhalation of smoke and soot. There was no detection or suppression equipment in use. A portable methane detector was present but was not in use. Miners were cutting a metal roof strap with an acetylene torch. The torch ignited methane that leaked around a seal leading to an unused section of the mine. A report on the incident is available on the MSHA Web site.

Two fires killed four people each. The first occurred at a single-family house under construction. Due to pending legal actions, the fire department could not release any details on the incident.

The other occurred in a three-story building of unprotected wood-frame construction with a social hall on the ground floor. There were four apartments on the second and third stories, three of which were occupied. There were smoke alarms in the apartments, but none on the ground floor. There was no suppression equipment in the building. At the time of the fire, there were 24 to 30 occupants in the hall and kitchen area on the ground floor, preparing for a religious festival.

There was a 350-square-foot (32.5-square-meter) religious shrine constructed of wood and paper in a large open meeting room on the ground floor. Candles floated in pans of water on the shrine. When someone attempted to light a candle, the head of the match broke and landed in paper decorations. The shrine soon became involved and the fire spread rapidly.

The fire was between the exits and the kitchen area where the victims were working, trapping them. Investigators found several code violations, but they did not directly cause the deaths. Ten other people were injured.

Two fires killed three persons each. The first occurred in a crude-oil storage tank. There was no detection or suppression equipment. Welders were working on top of one tank in a series of crude oil tanks connected by a pipeline. The tank being welded had been purged, but the others had not. The connecting pipe had been disconnected near the tank and left open ended and not capped. A torch ignited vapors escaping the uncapped pipe. The fire flashed into the tank being worked on and the tank next to it. The workers were thrown off the roof by the resulting explosion.

The second incident was an explosion in a 60,000-square-foot (5574-square-meter) one-story warehouse of protected non-combustible construction. There was no automatic detection equipment. No information on suppression equipment was reported. The explosion and fire resulted in complete devastation over the 10-acre (4.4-hectare) site. The cause of this massive explosion and ensuing fire is still under investigation. Along with the 3 fatalities, at least 40 other workers were injured.

Catastrophic nonstructural fires

There were 11 nonstructural catastrophic multiple-death fires in 2006, killing 75 people,
or a third of the deaths in catastrophic multiple-death incidents. The fires occurred in nine vehicle incidents—five involving highway vehicles, three involving aircraft, and one involving a tugboat, barges, and a pipeline—as well as two wildland fires. See Table 3 for details on these fires.

A medical examiner or coroner verified that the deaths in the vehicle crashes and fires were due to inhalation of products of combustion or thermal injuries, not impact.

The largest loss-of-life in an incident in this category was 24 in the aircraft crash and fire discussed earlier. One wildland incident killed 12 people. This was a wildland complex that encompassed two large fires and six smaller ones. This incident occurred during drought condition where the area had no rainfall for 11 months. Downed power lines caused the fires, which burned 907,245 acres (367,149 hectares) and destroyed 89 structures, including 9 homes, five vehicles, 1,040 electric poles, 2,000 miles (3,219 kilometers) of fence, and 4,296 head of cattle.

The deaths occurred in various locations. A firefighter was killed when his fire apparatus overturned while he was responding to one of the fires in the complex. Four people died in a nine-vehicle collision on a smoke-shrouded highway. Visibility was down to zero when one vehicle stopped and caused the chain reaction crash. Four more died when their car ran off the road and fire overran them when they were fleeing. Three people died in their homes as they were preparing to evacuate.

One fire killed six people. This incident occurred as a tugboat pushed two barges about 1½ to two miles (2.4 to 3.2 kilometers) off shore. The aft spud, a five-ton (4,535.9-kilogram) steel shaft used as a mooring device on one of the barges, released from a fully upright position on the barge, fell into the shallow water, and struck a submerged natural gas pipeline. The release of gas ignited in a fireball that engulfed the vessels. Two people survived the fire. The United States Coast Guard and NTSB are investigating.

Four fires killed five people each. This first fire occurred on an interstate as a two-vehicle crash and fire. One child under age 6 died in this fire. A pickup truck was rear ended by an 18-wheel semi-truck trailer and both vehicles ended up off the side of the highway. Sparks ignited spilled fuel. The seven occupants in the pickup died: three due to burns, two due to smoke inhalation, and two due to blunt force trauma.

The second fire had no information reported other than it was a two-vehicle crash and fire; with one victim under age 6.

The third fire occurred when a small single-engine aircraft struck a manufactured home, then crashed and burned in a cornfield. One child under age 6 was among the victims. The plane was performing a touch-and-go-around when its engine stalled. The plane struck the home, then crashed in a field, killing all five on board the aircraft. No one on the ground or in the home was killed.

The fourth one was a wildland fire that killed five firefighters. This incendiary fire was set on a day that had Santa Ana wind conditions with gusts of up to 50 mph (80.5 kph) and relative humidity of between 5 and 10 percent. The blaze burned over 40,000 acres (16,187.4 hectares) and destroyed 34 homes and 20 outbuildings. The firefighters died as they were protecting a home in the path of the fire. The fire overran and trapped them.¹

There was one crash and fire that killed four people. This occurred when a small aircraft crashed on a mountain at the 2,070-foot (631-meter) elevation mark. The cause of the crash has not been determined yet. The NTSB is investigating.

There were three vehicle crashes and fires that killed three people each. Two were single-vehicle crashes. One ran off the road and into a tree and one hit a barrier and overturned. The third was a multi-vehicle crash and fire on an interstate highway. In all cases, victims were trapped in the wreckage and engulfed by the fire.

Role of smoke alarms and sprinklers

Information on detection equipment was reported for 14 of the 18 residential fires. Six properties had detection equipment present—one had complete coverage, two had partial coverage, and the coverage of three was unknown. Two systems operated properly, yet there were 17 deaths in these fires. Of these two fires flashed over in a hallway and rapidly filled the building with fire and thick smoke. No reason for detector ineffectiveness was reported in the second fire. In one of the remaining four properties, there were two detectors found—one operated, and the other was missing a battery. Two properties had equipment that didn't operate because both were missing their batteries. The operation of the equipment in the sixth property was unknown or not reported.

Eight properties had no detection equipment. They accounted for 49 deaths (11 children under age 6).

Information on detection equipment was reported for 6 of the non-residential properties. Two properties had detection equipment. Both had only partial coverage, and the operation of both was unknown. In one case they were known not to have had coverage in the area of the fire and the
deaths. Four non-residential properties had no detection equipment, and these fires accounted for 23 deaths. Detector presence in one non-residential property was not reported or unknown.

None of the 18 residential and none of the 5 of 7 non-residential properties that reported information had sprinklers.

Smoke alarms have been proven effective in reducing the risk of death in home fires. The most effective arrangement is to use interconnected multiple-station smoke alarms that are supplied by hard-wired AC power, with a battery backup. These should be located outside each sleeping area, on each level, and in each bedroom. Homeowners should routinely test smoke alarms according to manufacturers' recommendations. NFPA recommends testing residential smoke alarms at least monthly. Batteries should also be replaced according to manufacturer's recommendations but at least yearly.

Smoke alarms are only effective if occupants exit the building when they sound.

Children should be familiar with the sound of a properly operating smoke alarm. They should follow a practiced escape plan that emphasizes two exits with a designated meeting place.

Exit drills in the home are part of many school curricula. Practicing the plan helps families determine if children and others readily waken to the sound of a smoke alarm, and that, along with assistance for family members who require it, can be factored into the plan.

Practicing fire prevention principles could have prevented many of the fires.

**Where we get our data**

NFPA obtains its data by reviewing national and local news media, including fire service publications. A news clipping service reads all daily U.S. newspapers and notifies the NFPA Fire Analysis and Research Division of catastrophic fires. Once an incident has been identified, we request information from the local fire department or the agency having jurisdiction. NFPA's annual survey of U.S. fire experience and mailings to state fire marshals are additional data sources, although not principal ones. We also contact federal agencies that have participated in the investigation of such fires. The diversity and redundancy of these sources enable us to collect the most complete data available on catastrophic fires in the U.S. We understand that in many cases, due to ongoing litigation, a department cannot release information. Also, in some cases departments have been unable to determine the information we request.

**Acknowledgments**

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**Endnotes**

TABLE 1 - RESIDENTIAL

NEVADA
Date, Time of Alarm, Number of Deaths
October, 10:02 p.m., 12
Number of Stories, Occupancy Type, Construction Type
This three- and four-story, 104-room residential hotel was of unprotected, ordinary construction. There were 83 occupants at the time of the fire.
Smoke Alarm and Other Protection Devices
Complete coverage of smoke alarms and manual pull stations. The smoke alarm system activated in the area of ignition and alerted a central station which in turn notified the fire department. There was no automatic suppression equipment present.
Fire Origin and Path
After an argument in a second-story hallway, a resident placed a mattress in front of a door to another room and ignited it. The fire spread rapidly down the corridor and ignited numerous other mattresses and box springs that were stored temporarily in the corridor. The corridor flashed over and fire spread to the third story and smoke spread throughout the building.
Contributing Factors and Victim Locations
Arriving firefighters found heavy fire conditions, fought the fire, and made searches and many rescues. Victims were located throughout the building, with a total of six on the second story, four on the third story, and the last two on the fourth story. There were 30 civilian injuries. An arrest and conviction has been made in the case.

TENNESSEE
Date, Time of Alarm, Number of Deaths
March, 6:15 a.m., 9 (4 under age 6)
Number of Stories, Occupancy Type, Construction Type
This two-story, single-family home was of unprotected wood-frame construction.
Smoke Alarm and Other Protection Devices
None
Fire Origin and Path
The area of origin appears to be the ceiling/attic area above a second-story bedroom where arcing in the electrical system ignited unknown items. The fire spread throughout the attic, down to the second story and then to the first story.
Contributing Factors and Victim Locations
Arriving firefighters found heavy fire conditions, fought the fire, and made searches and many rescues. Victims were located throughout the building, with a total of six on the second story, four on the third story, and the last two on the fourth story. There were 30 civilian injuries. An arrest and conviction has been made in the case.

OKLAHOMA
Date, Time of Alarm, Number of Deaths
July, 5 a.m., 7 (1 under age 6)
Number of Stories, Occupancy Type, Construction Type
This one-story, single-family home was of unprotected wood-frame construction.
Smoke Alarm and Other Protection Devices
None
Fire Origin and Path
Due to the destruction, the cause and origin of this fire has remained undetermined.
Contributing Factors and Victim Locations
Two adults and two children were found near the back door. The exact locations of the other two victims were not reported.

FLORIDA
Date, Time of Alarm, Number of Deaths
April, 3 a.m., 6
Number of Stories, Occupancy Type, Construction Type
This single-family, double-wide manufactured home was of unprotected wood-frame construction.
Smoke Alarm and Other Protection Devices
None
Fire Origin and Path
This fire broke out in a kitchen nook/dining area when a propane lantern ignited unknown combustibles. The fire burned into the bathroom, then above the ceiling throughout the structure. The power to the home had been shut off the day before, so the family lit the lantern when they arrived home late from a trip out of state.
Contributing Factors and Victim Locations
The lantern was left unattended when the family went to bed. Three 20-pound (9.1 kilogram) propane tanks and four oxygen cylinders were found throughout the home and contributed to the fire spread. The victims were located in the bedrooms.
ILLINOIS
Date, Time of Alarm, Number of Deaths
September, 12:18 a.m., 6 (2 under age 6)
Number of Stories, Occupancy Type, Construction Type
This three-story, 12-unit apartment building was of unprotected ordinary construction.
Smoke Alarm and Other Protection Devices
No smoke alarms in the apartment of origin. It was not reported if the rest of the building had any.
Fire Origin and Path
A fire began in a third-story hallway when an open flame contacted class A combustibles and clothing. The smoke and fire were contained to one apartment.
Contributing Factors and Victim Locations
None reported.

TEXAS
Date, Time of Alarm, Number of Deaths
January, 11:30 p.m., 5 (2 under age 6)
Number of Stories, Occupancy Type, Construction Type
This single-family manufactured home was of unprotected wood-frame construction.
Smoke Alarm and Other Protection Devices
There was one smoke alarm in the living room that operated and alerted occupants.
Fire Origin and Path
Fire originated in the living room. Due to ongoing civil suits, information on the origin and path of the fire was not available.
Contributing Factors and Victim Locations
Two other occupants were injured.

PENNSYLVANIA
Date, Time of Alarm, Number of Deaths
February, 1:30 a.m., 5
Number of Stories, Occupancy Type, Construction Type
This four-story, four-unit apartment building was of unprotected wood-frame construction.
Smoke Alarm and Other Protection Devices
Not reported.
Fire Origin and Path
Fire of undetermined cause began in a front room of the first-story apartment.
Contributing Factors and Victim Locations
None reported.

NORTH CAROLINA
Date, Time of Alarm, Number of Deaths
March, 4 a.m., 5 (1 under age 6)
Number of Stories, Occupancy Type, Construction Type
This 1-1/2-story, single-family home was of unprotected ordinary construction.
Smoke Alarm and Other Protection Devices
The remains of a smoke alarm was found, with battery installed, but it is undetermined if it activated.
Fire Origin and Path
The fire originated in the living room. A couch was positioned against an extension cord plug. Pressure from the arm support flattened the plug causing a short circuit in the wiring. The short circuit ignited the couch. Fire burned into the fabric and foam cushion, producing heavy black smoke. Four of the victims were located in a first-story bedroom with doors closed. The fifth victim was found near the doorway. He had attempted to extinguish the fire with water from a sink.
Contributing Factors and Victim Locations
There was a delay in reporting the fire, and one occupant attempted to extinguish the fire rather than evacuate.

PENNSYLVANIA
Date, Time of Alarm, Number of Deaths
March, 2:30 a.m., 5 (2 under age 6)
Number of Stories, Occupancy Type, Construction Type
This two-story, single-family row house was of unprotected ordinary construction.
Smoke Alarm and Other Protection Devices
None
Fire Origin and Path
An extension cord to a space heater was under a chair and was damaged by the weight of the chair. The damaged overloaded cord ignited the chair. The fire spread to a nearby sofa then vented out the first-story front room. The fire also extended up an open stairway to the second-story hallway.
Contributing Factors and Victim Locations
A heavy security screen and a security storm door hindered escape of the victims and delayed the firefighters in their fire attack and rescue. The only exit was a front door. One victim had jumped and was found outside, while another was located on the first story, and the other three were in a second-story bedroom.

KENTUCKY
Date, Time of Alarm, Number of Deaths
March, 1:55 a.m., 5
Number of Stories, Occupancy Type, Construction Type
This single-family, double-wide manufactured home was of unprotected wood-frame construction.
Smoke Alarm and Other Protection Devices
None
Fire Origin and Path
This fire broke out when a cigarette was discarded in
trash in a computer room. Firefighters arrived to find the home well-involved in fire.

**Contributing Factors and Victim Locations**
A woman was found in a bedroom with three children. An adult male was found in the hallway outside the bedrooms. One firefighter was injured.

**PENNSYLVANIA**

**Date, Time of Alarm, Number of Deaths**
April, 6:06 a.m., 5 (3 under age 6)

**Number of Stories, Occupancy Type, Construction Type**
This two-story single-family home was of unprotected wood-frame construction.

**Smoke Alarm and Other Protection Devices**
There were smoke alarms on the second story but none in the area of ignition. The smoke alarms upstairs did not operate because they had no batteries.

**Fire Origin and Path**
A fire of unknown cause began in the area of a couch in a first-story living room. The fire was contained to the living room.

**Contributing Factors and Victim Locations**
None reported.

**NEBRASKA**

**Date, Time of Alarm, Number of Deaths**
July, 1:50 a.m., 5 (1 under age 6)

**Number of Stories, Occupancy Type, Construction Type**
This single-family manufactured home was of unprotected wood-frame construction.

**Smoke Alarm and Other Protection Devices**
None

**Fire Origin and Path**
This fire began in a crawl space under the manufactured home when a motor on an air conditioner blower overheated and ignited combustibles. The fire spread throughout the underside before burning through the flooring into the living area.

**Contributing Factors and Victim Locations**
None reported.

**MISSOURI**

**Date, Time of Alarm, Number of Deaths**
August, 4:15 a.m., 5 (4 under age 6)

**Number of Stories, Occupancy Type, Construction Type**
This one-story, single-family home was of unprotected wood-frame construction.

**Smoke Alarm and Other Protection Devices**
No information reported.

**Fire Origin and Path**
No information reported.

**KANSAS**

**Date, Time of Alarm, Number of Deaths**
September, 12:42 a.m., 5 (2 under age 6)

**Number of Stories, Occupancy Type, Construction Type**
This two-story, single-family home was of unprotected wood-frame construction.

**Smoke Alarm and Other Protection Devices**
Two smoke alarms were present, but their location was not reported. One activated, and one was missing its battery.

**Fire Origin and Path**
The fire started on the front porch. The cause is unknown. The fire entered the house through the front door and spread into the living room and dining room on the first story, then up an open stairway.

**Contributing Factors and Victim Locations**
The victims, including a sixth person who suffered non-fatal injuries, were located on the second story. One firefighter was injured.

**WEST VIRGINIA**

**Date, Time of Alarm, Number of Deaths**
December, 1:30 a.m., 5 (2 under age 6)

**Number of Stories, Occupancy Type, Construction Type**
This single-family manufactured home was of unprotected wood-frame construction.

**Smoke Alarm and Other Protection Devices**
No information reported.

**Fire Origin and Path**
No information reported.

**OHIO**

**Date, Time of Alarm, Number of Deaths**
December, 6:12 a.m., 5

**Number of Stories, Occupancy Type, Construction Type**
This two-story, single-family home was of unprotected wood-frame construction.

**Smoke Alarm and Other Protection Devices**
Unknown. The fire department had found smoke alarms in the home on a previous inspection, but firefighters found no evidence of any at the time of the fire.

**Fire Origin and Path**
This fire broke out in the first-story living room. Power to the house had been shut off prior to the fire, and the occupants were using candles throughout the house for light. A candle on a coffee table burned down to...
the table and ignited it. The smoke and fire spread, blocking egress from the stairs.

**Contributing Factors and Victim Locations**
A guest fell asleep in the living room, and the candle burned unattended. The guest and four occupants upstairs were killed.

**PENNSYLVANIA**

**Date, Time of Alarm, Number of Deaths**
December, 6:30 a.m., 5

**Number of Stories, Occupancy Type, Construction Type**
This three-story, single-family row house was of unprotected ordinary construction.

**Smoke Alarm and Other Protection Devices**
There were smoke alarms present, but their location was not reported. None had batteries.

**Fire Origin and Path**
The fire was caused by a short circuit in a set of light-duty Christmas lights in a first-story living room. The fire burned nearby combustibles as well as wood paneling, then broke out a front window and spread along connected porches. There was heavy smoke and heat but little fire damage on the upper stories.

**Contributing Factors and Victim Locations**
There were 13 residents in the house. Two victims were located in a second-story bedroom, and three victims were located in third-story bedrooms. The other eight residents were all injured by smoke inhalation.

**TABLE 2 - NONRESIDENTIAL**

**WEST VIRGINIA**

**Date, Time of Alarm, Number of Deaths**
January, 6:26 a.m., 12

**Number of Stories, Occupancy Type, Construction Type, Operating Status**
Underground coal mine. Approximately two miles (3.2 kilometers) in from mine entrance.

**Detection Systems and Suppression Systems**
None. (One portable methane detector was present but it was not used.)

**Fire Origin and Path**
Methane gas was ignited by a lightning strike that occurred a distance from the mine and followed a cable into the mine.

**Contributing Factors and Victim Locations**
The explosion killed one miner and a collapse forced the other 12 miners to retreat and await rescue behind a barricade curtain they built. Rescuers located one survivor and the bodies of the other 11 miners approximately 41 hours after the explosion.

**MISSOURI**

**Date, Time of Alarm, Number of Deaths**
November, 1 a.m., 11

**Number of Stories, Occupancy Type, Construction Type, Operating Status**
This one-story, 19-bedroom board and care facility was of unprotected ordinary construction. There were 33 occupants and two caregivers in the structure when the fire broke out.

**Detection Systems and Suppression Systems**
There were smoke alarms in the common areas and three manual pull stations. There was a single horn/strobe in the building. There were no reports of any alarms sounding. No suppression equipment was present.

**Fire Origin and Path**
An electrical malfunction in a common room area near the north wall has been determined as the most probable cause. The fire spread into the attic and spread to the south end of the building. A neighbor reported the fire after seeing flames coming from the roof. First-arriving firefighters reported fire from the roof and were faced with a multiple-casualty incident.

**Contributing Factors and Victim Locations**
Firefighters had insufficient resources to conduct simultaneous firefighting and rescue operations. Twenty-four occupants were injured. Locations of the victims were not known as several had been removed from the building before the fire department arrived. One of the caregivers died in the fire; the other victims were residents of the facility.

**KENTUCKY**

**Date, Time of Alarm, Number of Deaths**
May, 1 a.m., 5

**Number of Stories, Occupancy Type, Construction Type, Operating Status**
Underground coal mine. Approximately 3,200 feet (975 meters) underground.

**Detection Systems and Suppression Systems**
None. (One portable methane detector was present but it was not used.)

**Fire Origin and Path**
Methane gas that was leaking from a sealed-off area of the mine was ignited by an acetylene torch two miners were using to cut and remove a metal roof strap, approximately 54 inches long by 5 inches wide (136.2 centimeters by 12.7 centimeters).

**Contributing Factors and Victim Locations**
Two miners died of multiple blunt force trauma in the explosion, and three died of carbon monoxide poisoning with smoke and soot inhalation. One miner was rescued and treated for smoke and soot inhalation.

**WEST VIRGINIA**

**Date, Time of Alarm, Number of Deaths**
April, 10:30 a.m., 4

**Number of Stories, Occupancy Type, Construction Type, Operating Status**
Underground coal mine. Approximately 3,200 feet (975 meters) underground.
Type, Operating Status
This was a single-family house under construction. No other details could be reported due to litigation.

Detection Systems and Suppression Systems
No information reported.

Fire Origin and Path
No information reported.

Contributing Factors and Victim Locations
None reported.

MASSACHUSETTS

Date, Time of Alarm, Number of Deaths
June, 7:22 p.m., 4

Number of Stories, Occupancy Type, Construction Type, Operating Status
This three-story social club was of unprotected wood-frame construction. There were 24 to 30 occupants in the hall. There were two apartments each on the second and third stories. Three of the apartments were occupied.

Detection Systems and Suppression Systems
There were heat and smoke alarms in stairwells and in the apartments and heat detectors in the basement. They were not a factor due to location of the fire. No suppression equipment was present.

Fire Origin and Path
There was a 350-square-foot (32.5-square-meter) religious shrine constructed of wood and paper in a large open meeting room on the ground floor. Candles floated in pans of water in front of the shrine. When someone attempted to light the candles with a match, the head of the match broke off and landed in paper decorations. The decorations on the shrine soon became involved and fire spread rapidly.

Contributing Factors and Victim Locations
The fire broke out between the kitchen where the victims were working and the exit, preventing their escape. The victims were all found in the kitchen. Several code violations were found, but they did not directly cause the deaths. Ten other civilians and two firefighters were injured.

MISSISSIPPI

Date, Time of Alarm, Number of Deaths
June, 8:30 a.m., 3

Number of Stories, Occupancy Type, Construction Type, Operating Status
One-story warehouse of protected noncombustible construction. Operating.

Detection Systems and Suppression Systems
No detection system was present, and no information on suppression equipment was reported.

Fire Origin and Path
The cause of the explosion and ensuing fire is still under investigation.

Contributing Factors and Victim Locations
Along with the three fatalities, there were at least 40 others injured in the blast. A 60,000-square-foot (5,574-square-meter) building was demolished and another 12 buildings and 100 vehicles in the surrounding area were damaged. The 10-acre (4.04-hectare) site was completely devastated. Firefighters were faced with fire impinging on propane and oxygen tanks.

TABLE 3 - NONSTRUCTURAL

KENTUCKY

Date, Time of Alarm, Number of Deaths
August, 6:07 a.m., 24

Setting
Aircraft crash and fire in a farm area past the end of a runway.

Climate
Visibility was 8 miles (12.9 kilometers). No precipitation during takeoff.

Fire Origin and Path
An airplane was cleared for one runway but instead taxied to and attempted takeoff on another runway that was 3,503 feet (1,067 meters) shorter. The aircraft was still on the ground when it reached the end of the runway. Past the end of the runway, the aircraft crashed through a fence, struck trees, and stopped in a field where it caught fire.

Factors Hindering Occupant escape
The impact and post-crash fire destroyed the aircraft. There were 47 passengers and three crew members on board. Fourteen people died of smoke inhalation, 10 died by thermal injuries, and the other 25 died of blunt force trauma injuries. The co-pilot survived.
TEXAS

**Date, Time of Alarm, Number of Deaths**
March, 11:07 a.m., 12 (including one firefighter)

**Setting**
Wildfire. Grass and brush

**Climate**
Hot and dry. Drought conditions (11 months without rain), and windy.

**Fire Origin and Path**
This complex consisted of two larger fires and six smaller fires. The larger fire was started when a power line fell igniting dry grass. Destroyed were 89 structures including 9 houses, 5 vehicles, 1,040 electrical poles, and 2,000 miles (3,219 kilometers) of fence, and 907,245 acres (367,149 hectares) were burned. It was estimated that 4,296 head of livestock perished. Eight towns were evacuated and a 90-mile (144.8-kilometer) stretch of the interstate was closed for nine hours due to the blinding smoke condition.

**Factors Hindering Occupant escape**
A firefighter was killed when the fire apparatus he was riding overturned. Four people died in a nine-vehicle crash on the smoke-covered interstate. Four died when their vehicle ran off the road and the fire overran the occupants attempting to escape the fire. Three died in their homes while preparing to evacuate.

LOUISIANA

**Date, Time of Alarm, Number of Deaths**
October, 12:00 a.m., 6

**Setting**
Tugboat pushing two barges about 1½ to 2 miles (2.4 to 3.2 kilometers) off shore.

**Climate**
Not reported.

**Fire Origin and Path**
The aft spud, a five-ton (4535.9-kilogram) steel shaft used as a mooring device on one of the barges, released from a fully upright position, fell into the water, and struck a submerged natural gas pipeline. The released gas ignited in a fireball, engulfing the vessels.

**Factors Hindering Occupant escape**
The victims had no time to escape the fireball. Two people, one on the tugboat and one on one of the barges, survived the fire.

ARIZONA

**Date, Time of Alarm, Number of Deaths**
May, 6 p.m., 5 (1 under age 6)

**Setting**
Two-vehicle crash and fire on interstate highway.

**Climate**
Not reported.

**Fire Origin and Path**
A pickup truck was rear-ended by an 18-wheel semi-tractor trailer. Both vehicles ended up off the side of the highway and exploded in fire as the gasoline and diesel fuel were ignited by sparks.

**Factors Hindering Occupant escape**
The victims were trapped in the wreckage of the pickup truck. Three died of burns, two by smoke inhalation, and the other two by multiple blunt force trauma.

CALIFORNIA

**Date, Time of Alarm, Number of Deaths**
July, Time not reported, 5 (1 under age 6)

**Setting**
Two-vehicle crash/fire

**Climate**
No information reported.

**Fire Origin and Path**
No information reported.

**Factors Hindering Occupant escape**
None reported.

GEORGIA

**Date, Time of Alarm, Number of Deaths**
July, 12:50 p.m., 5 (1 under age 6)

**Setting**
Aircraft crash and fire. Plane struck a single-family manufactured home, then crashed and burned in a cornfield.

**Climate**
Not reported.

**Fire Origin and Path**
An airplane with five persons on board made a touch down on the runway, then gave power and took off again for a go-around. The aircraft banked, stalled, and collided with a single-family home and caught on fire when it crashed in a cornfield.

**Factors Hindering Occupant escape**
All five passengers in the aircraft died of thermal injuries or soot inhalation. No one was injured or killed on the ground or in the home.

CALIFORNIA

**Date, Time of Alarm, Number of Deaths**
October, 1:12 a.m., 5 Firefighters

**Setting**
Wildland fire.

**Climate**
Santa Ana wind conditions with gusts up to 50 miles per hour (80.5 kilometers per hour). Relative humidity was between 5 percent and 10 percent.

**Fire Origin and Path**
Incendiary fire. The five firefighters were attempting to protect a home in the Esperanza wildfire. A rapid spread of the fire trapped the firefighters, who had no time to retreat to the fire engine or use their portable...
fire shelters. Three of the firefighters died at the scene, one died en route to the hospital, and the fifth died five days later.

**Factors Hindering Occupant escape**

Weather and seasonally dry vegetation with extreme wind conditions produced extreme fire behavior conditions and a rapid rate of spread. A rapid spread of the fire trapped the firefighters. The fire burned over 40,200 acres (16,268.4 hectares) and destroyed 34 homes and 20 outbuildings. Twelve firefighters were also injured.

**MAINE**

**Date, Time of Alarm, Number of Deaths**

June, 2:10 p.m., 4

**Setting**

Aircraft crash and fire on mountain side at the 2,070-foot (631-meter) elevation point.

**Climate**

Warm, clear with a few clouds.

**Fire Origin and Path**

This aircraft with four persons on board crashed and burned in a heavily wooded area of the mountain side. The cause of the crash has not been determined yet. National Transportation Safety Board is investigating.

**Factors Hindering Occupant escape**

None reported.

**MISSOURI**

**Date, Time of Alarm, Number of Deaths**

October, 11:12 p.m., 3

**Setting**

Motor vehicle crash and fire on Interstate highway.

**Climate**

Not reported

**Fire Origin and Path**

Multi-vehicle collision involving at least three semi tractor-trailers and five cars. It was not reported how the fire originated, but it did involve spilled diesel fuel.

**Factors Hindering Occupant escape**

The victims were trapped in their vehicles as the fire quickly engulfed them.

**VIRGINIA**

**Date, Time of Alarm, Number of Deaths**

November, 12:05 p.m., 3

**Setting**

Single-vehicle crash and fire, car hit a tree.

**Climate**

Not reported.

**Fire Origin and Path**

A car reportedly ran off the road on a curve, struck a tree, and caught on fire.

**Factors Hindering Occupant escape**

Another person also died of blunt force trauma.

**NEW YORK**

**Date, Time of Alarm, Number of Deaths**

November, 4:45 a.m., 3

**Setting**

Single-car crash/fire. Off ramp from expressway.

**Climate**

No information reported.

**Fire Origin and Path**

The car reportedly struck a barrier and overturned and caught fire.

**Factors Hindering Occupant escape**

Another person died of blunt force trauma.
In 2006, public fire departments responded to 1,642,500 fires in the United States, according to estimates based on data NFPA received from fire departments responding to its 2006 National Fire Experience Survey (see Tables 1 and 2). This represents an increase of 2.5 percent from 2005 and is the highest total since 2002, when fire departments responded to 1,687,500 fires.

There were an estimated 524,000 structure fires reported to fire departments in 2006, an increase of 2.5 percent. From 1977 to 2006, the numbers of structure fires were at their peak in 1977, when 1,098,000 structure fires occurred (see Figure 1). The number of structure fires then decreased quite steadily, particularly in the 1980s, to 688,000 by the end of 1989, for an overall decrease of 37.3 percent from 1977. Since 1989, structure fires again decreased quite steadily, 24.7 percent to 517,500 by the end of 1998, and have stayed between 505,000 and 526,000 from 1999 to 2006.

Of the structure fires, 412,500 were residential fires, accounting for 78.7 percent of all structure fires, and an increase of 4.2 percent from a year ago (see Table 3). Of the residential structure fires, 304,500 occurred in one- and two-family dwellings, accounting for 58.1 percent of all structure fires. Another 91,500 occurred in apartments, accounting for 17.5 percent of all structure fires.

For nonresidential structure fires, most property types changed little in 2006, though changes occurred in a few property types: a decrease of 13.0 percent in store and office properties to 20,000, a 10.0 percent increase in other residential properties to 16,500, and an increase of 8.3 percent in educational properties to 6,500.

From 1977 to 2006, the numbers of outside fires were at their high in 1977, when 1,658,500 outside fires occurred. The number of outside fires decreased steadily the next six years to 1,011,000 in 1983, for a considerable decrease of 39.0 percent from 1977. Outside fires changed little for the rest of the 1980s, except for 1988 when 1,214,000 occurred. Outside fires dropped to 910,500 in 1993, and stayed near the 1,000,000 level the next three years. Since 1997, the number of outside fires stayed between 839,000 and 861,500, except for 1999 when they jumped to 931,500 and during the 2003-2005 period, when they were between 727,500 and 801,000.

In 2006, there were 840,500 outside fires, an increase of 4.9 percent from a year ago. In particular, brush fires increased 9.5 percent to 415,500.

**Civilian deaths**

The 1,642,500 fires reported by fire departments in the U.S. in 2006 resulted in an estimated 3,245 civilian deaths based on data reported to NFPA (see Table 4). This is a decrease of 11.7 percent from 2005, and the lowest total since NFPA began using its current survey methodology in 1977-1978. The nature of this decrease is better understood when results are examined by property type.

An estimated 2,620 civilians died in residential fires in 2006, a decrease of 14.2 percent. Of these deaths, 425 occurred in apartment fires, and 2,155 in one- and two-family dwelling fires, a decrease of 16.1 percent. Most of the decrease is due to a 49 percent drop in the death rate for departments that protect communities of 5,000 to 9,999, and a 30 percent drop in the death rate for departments that protect communities of 2,500 to 4,999 people. Though encouraged by this drop in 2006, we must remain cautious because death rates can vary considerably from year to year, particularly for smaller communities.

In all, fires in the home (one- and two-family dwellings including manufactured homes and apartments) resulted in 2,580 civilian deaths, a decrease of 14.9 percent from a year ago. Looking at trends in civilian deaths since 1977-1978, several observations are worth noting (see Figure 2). Home fire deaths were at their peak in 1978, when 6,015 fire deaths occurred. Home fire deaths then decreased steadily from 1979 to 1982 except for 1981, and decreased a substantial 20 percent...
during the period to 4,820 by the end of 1982. From 1982 to 1988, the number of home fire deaths stayed between 4,655 and 4,955, except for 1984 when 4,075 fire deaths occurred. In the past 17 years, home fire deaths moved well below the 1982 to 1988 plateau and have stayed between 3,140 and 3,720 during 1991 to 2006 except for 1996, 1999, 2001 to 2002, and 2005 to 2006.

With home fire deaths still accounting for 2,580 fire deaths or 80 percent of all civilian deaths, fire safety initiatives targeted at the home remain the key to any reductions in the overall fire death toll. Five major strategies are:

- Widespread public fire safety education is needed on how to prevent fires and how to avoid serious injury or death if fire occurs. Information on the common causes of fatal home fires should continue to be used in the design of fire safety education messages.
- More people must use and maintain smoke detectors and develop and practice escape plans.
- Wider use of residential sprinklers must be aggressively pursued.
- Additional ways must be sought to make home products more fire safe. The regulations requiring more child-resistant lighters are a good example, as are requirements for cigarettes with reduced ignition strength (generally called fire-safe cigarettes). The wider use of upholstered furniture and mattresses that are more resistant to cigarette ignitions is an example of change that has already accomplished much and will continue to do more.
- The special fire safety needs of high-risk groups, e.g., the young, older adults, and the poor, need to be addressed.2, 3

Also in 2006, 85 civilians died in nonresidential structure fires, an increase of 70.0 percent, and similar to the 2004 level.

Of the 2,705 civilians who died in structure fires, 305 or 11.2 percent died in fires that were intentionally set.

Also in 2006, 445 civilians died in highway vehicle fires, a decrease of 11.7 percent, the lowest it's been since 2002. Another 45 civilians died in other vehicle fires, and this includes 24 civilians who died as a result of fire and smoke in an airplane crash incident.

### Civilian fire injuries

Results based on data reported to NFPA indicate that in addition to 3,245 civilian fire deaths, there were 16,400 civilian injuries in 2006 (see Table 4). This represents a decrease of 8.5 percent from 2005 and is the lowest it's been since 1977 to 1978 when NFPA started using its current survey methodology.

Estimates of civilian fire injuries are on the low side, because many civilian injuries are not...
Number of fires
• 1,642,500 fires were attended by public fire departments, an increase of 2.5 percent from 2005.
• 524,000 fires occurred in structures, an increase of 2.5 percent.
• 412,500 fires or 79 percent of all structure fires occurred in residential properties.
• 278,000 fires occurred in vehicles, a decrease of 4.1 percent from the year before.
• 840,500 fires occurred in outside properties, an increase of 4.9 percent.
• What do these fire frequencies above mean? Every 19 seconds, a fire department responds to a fire somewhere in the nation. A fire occurs in a structure at the rate of one every 60 seconds, and in particular a residential fire occurs every 76 seconds. Fires occur in vehicles at the rate of 1 every 113 seconds, and there’s a fire in an outside property every 38 seconds.

Civilian fire deaths
• 3,245 civilian fire deaths occurred in 2006, a decrease of 11.7 percent.
• About 80 percent of all fire deaths occurred in the home.
• 2,580 civilian fire deaths occurred in the home, a decrease of 14.9 percent.
• 445 civilians died in highway vehicle fires.
• 85 civilians died in nonresidential structure fires.
• Nationwide, there was a civilian fire death every 162 minutes.

Civilian fire injuries
• 16,400 civilian fire injuries occurred in 2006, a decrease of 8.5 percent. This estimate for civilian injuries is on the low side, due to underreporting of civilian injuries to the fire service.
• 12,925 of all civilian injuries occurred in residential properties, while 1,425 occurred in nonresidential structure fires.
• Nationwide, there was a civilian fire injury every 32 minutes.

Property damage
• An estimated $11,307,000,000 in property damage occurred as a result of fire in 2006, an increase of 6.0 percent from last year.
• $9,636,000,000 of property damage occurred in structure fires.
• $6,990,000,000 of property loss occurred in residential properties.

Intentionally set fires
• An estimated 31,000 intentionally set structure fires occurred in 2006, a slight decrease of 1.6 percent.
• Intentionally set fires in structures resulted in 305 civilian deaths, a decrease of 3.2 percent.
• Intentionally set structure fires also resulted in $755,000,000 in property loss, a significant increase of 13.7 percent.
• 20,500 intentionally set vehicle fires occurred, a decrease of 2.4 percent from a year ago, and caused $134,000,000 in property damage, an increase of 18.6 percent from a year ago.
reported to the fire service. For example, many injuries occur at small fires that fire departments do not respond to, and sometime when departments do respond they may be unaware of injured persons that they did not transport to medical facilities.

NFPA estimates that there were 12,925 civilians injured in residential properties, a decrease of 6.5 percent. Of these injuries, 8,800 occurred in one- and two-family dwellings, while 3,700 occurred in apartments.

From 1977 to 2006, the number of civilian injuries has ranged from a high of 31,275 in 1983 to a low of 16,400 in 2006 for an overall decrease of 48 percent. There was no consistent pattern going up or down until 1995, when injuries fell roughly 5,000 in 1994 to 1995 to 25,775, changed little in 1996, dropped 8 percent to 23,750 in 1997, changed little in 1998, dropped 5 percent in 1999, and then increased slightly in 2000, and then dropped 26 percent in 2001 to 2006 to 16,400 by the end of 2006.

**Property loss**

NFPA estimates that the 1,642,500 fires responded to by the fire service caused $11,307,000,000 in property damage in 2006. This is an increase of 6.0 percent from 2005.

Fires in structures resulted in $9,636,000,000, an increase of 4.8 percent. Average loss per structure fire was $18,389, an increase of 2.2 percent.

From 1977 to 2006, and excluding terrorist attacks of September 2001, the average loss per structure fire ranged from a low of $3,757 to a high of $18,389 in 2006 for an overall increase of 389 percent. When property loss is adjusted for inflation, the increase in the average structure fire loss between 1977 and 2006 is 47 percent.

Of the property loss in structure fires, $6,990,000,000 occurred in residential properties, a slight increase of 1.7 percent. An estimated $5,936,000,000 occurred in one- and two-family dwellings, an increase of 2.7 percent. An estimated $896,000,000 also occurred in apartments.

Other property damage figures worth noting for 2006 include: $573,000,000 in industrial properties, an increase of 52.4 percent; $105,000,000 in educational properties, an increase of 56.7 percent; $444,000,000 in public assembly properties, an increase of 38.8 percent; and $262,000,000 in fires outside structure with value involved, an increase of 181.7 percent, and which includes a wildfire incident that resulted in $95,000,000 in property damage.

It should be kept in mind that property loss totals could change dramatically from year to year because of the impact of occasional large loss fires. NFPA provides an annual analysis of these large loss fires in the November/December issue of NFPA Journal.

**Intentionally set fires**

Based on data reported by fire departments in...
the survey, the NFPA estimates there were 31,000 intentionally set structure fires in 2006, a slight decrease of 1.6 percent from a year ago (see Table 5). (Note that the NFPA survey is based on the NFIRS 5.0 system. This new system has an “intentionally set” category, which is equivalent to the old “incendiary” category. There is no new equivalent to the old “suspicious” category, which has been eliminated.) These intentionally set structure fires resulted in an estimated 305 civilian deaths, a decrease of 3.2 percent. These set structure fires also resulted in $755,000,000 in property loss, a significant increase of 13.7 percent.

Also in 2006, there were an estimated 20,500 intentionally set vehicle fires, a decrease of 2.4 percent from a year ago. These set vehicle fires resulted in $134,000,000 in property loss, an increase of 18.6 percent.

**Description of NFPA survey**

NFPA annually surveys a sample of fire departments in the United States to make national projections of the fire problem. The sample is stratified by the size of the community protected by the fire department. All U.S. fire departments that protect communities of 100,000 or more are included in the sample, because they constitute a small number of departments with a large share of the total population protected. For departments that protect a population less than 100,000, a sample was selected stratified by size of community protected. A total of 2,560 fire departments responded to the 2006 fire experience survey. The national projections are made by weighting sample results according to the proportion of total U.S. population accounted for by communities of each size.

For each estimate, a sampling or standard error was also calculated. The sampling error is a measure of the error caused by the fact that the estimates are based on a sampling of fire losses rather than a complete census of the fire problem. Due to the fact that the survey is based on a random sample, we can be very confident that the actual value falls within the percentage noted in parentheses for each overall fire loss estimate: number of fires (1.8 percent), number of civilian deaths (10.5 percent), number of civilian injuries (4.9 percent), and property loss (2.6 percent).

The results presented in this report are based on fire incidents attended by public fire departments. No adjustments were made for unreported fires and losses (e.g., fires extinguished by the occupant), for fires attended solely by private fire brigades (e.g., industry and military installations) or for fires extinguished by fixed suppression systems with no fire department response.

**Definition of terms**

**Civilian:** The term “civilian” includes anyone other than a fire fighter, and covers public service personnel such as police officers, civil defense staff, non-fire service medical personnel, and utility company employees.

**Death:** An injury that occurred as a direct result of a fire that is fatal or becomes fatal within one year.

**Fire:** Any instance of uncontrolled burning. Includes combustion explosions and fires out on arrival. Excludes controlled burning (whether authorized or not), over-pressure rupture without combustion, mutual aid responses, smoke scares, and hazardous responses (e.g., oil spill without fire).

**Injury:** Physical damage that is suffered by a person as a direct result of fire and that requires (or should require) treatment by a practitioner.
of medicine (physician, nurse, paramedic, EMT) within one year of the incident (regardless of whether treatment was actually received), or results in at least one day of restricted activity immediately following the incident. Examples of injuries resulting from fire are smoke inhalation, burns, wounds and punctures, fractures, heart attacks (resulting from stress under fire condition), strains, and sprains.

**Property Damage:** Includes all forms of direct loss to contents, structure, machinery, vehicles, vegetation, or anything else involved in the fire but not indirect losses, such as business interruption or temporary shelter provisions.

**Structure:** An assembly of materials forming a construction for occupancy or use in such a manner as to serve a specific purpose. A building is a form of structure. Open platforms, bridges, roof assemblies over open storage or process areas, tents, air-supported, and grandstands are other forms of structures.

**Vehicles, Highway and Other:** Fires in these instances may have been associated with an accident; however, reported casualties and property loss should be the direct result of the fire only. Highway vehicles include any vehicle designed to operate normally on highways, e.g., automobiles, motorcycles, buses, trucks, trailers (not mobile homes on foundations), etc. Other vehicles include trains, boats and ships, aircraft, and farm and construction vehicles.

**Full Report on 'U.S. Fire Loss during 2006'**

The data and information included in this report are only part of the fire loss picture. A more detailed and complete report on the overall patterns and trends of 2006 will be available from the Fire Analysis and Research Division. The complete report includes patterns by size of community; patterns by region and size of community; and a more complete description of survey methodology. The full report is available on NFPA’s Web site, www.nfpa.org, under One-Stop Data Shop. Hard copies can be ordered through Nancy Schwartz at 617-984-7450 or osds@nfpa.org.

**MICHAEL J. KARTER, JR.** is a senior statistician with NFPA’s Fire Analysis and Research Division.

**Endnotes**

1. Note that the NFPA changed its survey methodology in 1977-78, and meaningful comparisons cannot be made with fire statistics estimated before 1977.
Like a patient after a transplant or after receiving a vital transfusion, NFPA 99, Health Care Facilities, is on the road to improvement thanks to a Technical Correlating Committee (TCC) interested in making the proper diagnosis and a forward-thinking Standards Council. By John Nicholson

"INCONSISTENT," "DIFFICULT TO NAVIGATE," AND "OUTDATED" were terms used by users to previously describe NFPA 99. Hearing those words too often took a toll on the Technical Correlating Committee on Health Care Facilities, so they requested and received approval from the Standards Council for a comprehensive restructuring of the standard and the scopes and memberships of the Technical Committees (TCs) involved in NFPA's Health Care Project.

"The radical changes were necessary as NFPA 99 is a 25-year-old document that was a compilation of even older standards," says Technical Correlating Committee chair Douglas S. Erickson. "In reviewing the document there were chapters and annexes that had not been referenced for over a decade. With the dramatic changes in health care technology, electronic medical records, natural disasters, and a sicker patient population, NFPA 99 needs to be reinvented to fit this modern-day delivery system."
Erickson is also the director of research and development for the American Society for Healthcare Engineering and its representative to the Health Care Project. The society is part of the American Hospital Association.

The document is now in the Annual 2009 revision cycle and will result in a 2010 edition. In January 2007 the Standards Council gave its approval to the rosters of the project’s Technical Committees. Those committees began meeting in February 2007 to begin writing the draft document, and the proposal closing is scheduled for this November. The TCs will have approximately 10 months to complete their work on the draft documents, which is very ambitious given the new subject areas as well as the need for reformatting the entire document.

“We are just starting to get proposals for the 2010 edition. This is going to be a very interesting ROP period as proposals will come in all shapes and sizes; some will want to only modify language in the 2005 edition; others will want to eliminate chapters or annexes; and I know of some which will be a complete rewrite of chapters/sections. It will be a real juggling act to follow NFPA procedures. The proposal closing date is November 29, 2007, and then all the fun will begin as the Technical Committees start to meet,” says Erickson.

**Road to recovery**

The restructuring of the document, which is widely used throughout the United States, began in July 2006, when the Technical Correlating Committee on Health Care Facilities sought approval from the Standards Council. In its request, the TCC stated that the current standard is “difficult to navigate, is inconsistent in the chapter format, and needs to be updated to reflect current medical practices and procedures.”

“We had three strategic planning meetings of the TCC and invited the chairs of the TCs to attend and participate in the planning process,” says Erickson. “We also met frequently with NFPA’s Codes and Standards Administration staff to make sure they were aware of the direction we were headed and could offer advice and counsel if there appeared to be potential conflicts with other standards. Our staff liaison also played a critical role in making sure we were not violating any organizational rules or protocols.”

In making its request, the TCC did not propose any change to their TCC scope but provided the Council with proposed revised scopes for all but one of the TCs within the project. The proposed plan presented to the Standards Council in July 2006 had eight TCs re-aligned into seven TCs with all responsible for portions of NFPA 99.

According to the initial presentation to the Standards Council, some of the existing TCs were to be merged with others, some were to be eliminated, and new TCs were proposed. The following are the proposed details the TCC first presented to the Standards Council in July 2006:

**TC on Fundamentals:** This committee is being renamed “Fundamentals” from “Administration.” In addition to its existing responsibilities, this committee will also be responsible for determining the relative risk level of various medical procedures in order to specify the level of service. This would pertain to gas and vacuum systems, electrical systems, fire protection, and special hazards. For example, they will determine the relative fire risk in an operating room or MRI and specify a particular fire extinguisher or suppression/detection system to protect the hazard. It is not anticipated that this committee will develop any fire protection or egress requirements that are already covered in other standards or codes, such as NFPA 101®, Life Safety Code®, NFPA 13, Installation of Sprinkler Systems, or NFPA 72®, National Fire Alarm Code®. It may extract or reference these requirements into NFPA 99 where appropriate.

**TC on Medical Equipment:** This new committee would be a merger of the existing TC on Electrical Equipment and the TC on Gas Delivery Equipment. There is no proposed change from the existing scope or intent of the two existing committees.

**TC on Electrical Systems:** This is an existing committee, but its scope will be expanded to go beyond just electrical power systems. In addition to electrical power systems, the committee will also address low voltage systems such as nurse call systems, telemedicine, wireless technology used in patient care, and informatics (electronic information data bases). This committee may extract or reference the requirements from NFPA 70, National Electrical Code®, into NFPA 99 where appropriate.

**TC on Mechanical Systems:** This is a new committee that would address the existing performance operations, testing, and maintenance requirements for failure management criteria for air quality, and also address new subjects such as temperature, humidity control, critical space pressure relationships for infection control water and wastewater, and air quality issues. This committee may extract or reference the requirements from NFPA 90A, Installation of Air-Conditioning and Ventilating Systems into NFPA 99 where appropriate.
TC on Emergency Management and Security Committee: This is an existing committee with an expanded scope to include security issues in health care facilities. This committee will continue to address the requirements pertaining to emergency management as currently addressed in NFPA 99. They will also co-ordinate with NFPA 1600, Disaster/Emergency Management and Business Continuity Programs where applicable. This committee will address a new subject of health care security. Currently the TC on Premises Security addresses security in health care facilities in NFPA 730, Guide for Premises Security. The TC on Emergency Management and Security is requesting they have the primary responsibility for security in health care facilities. This material may be extracted or referenced by NFPA 730. The TC on Emergency Management and Security would address issues such as infant abduction and drug diversion.

TC on Piped Gas Installation: This is an existing committee with a name change. This committee will address installation, performance, maintenance, and testing requirements for piped medical and dental gas and vacuum systems.

No changes were proposed for the TC on Health Care Facilities and the TC on Hyperbaric and Hypobaric Facilities.

Criticality of timing
According to the TCC leadership, time was vital for the project's success, and it pushed for a timely transition. NFPA 99 is currently in the Annual 2009 cycle with the proposal closing date for this cycle in November 2007. There are several major milestones that must be completed in short order that include disbanding the existing committees, forming new committees, and drafting the restructured document NFPA 99. Therefore, the proposed timeline for the project is as follows:

July 2006, Standards Council reviews a proposed restructuring.

With the dramatic changes in health care technology, electronic medical records, natural disasters, and a sicker patient population, NFPA 99, Health Care Facilities, needs to be reinvented to fit this modern-day delivery system.
November 2006, Council approves the restructuring. Disbands all existing TCs and places a call for committee members for all TCs.

January 2007, the Standards Council appoints the chairs and start up roster.

January 11, 2007, TCC meets with all TC chairs to review the scope of the project and to make assignments to develop the new documents.

February 2007, TCs start to meet and develop new draft documents.

November 2007, TCs complete the draft documents.

January 2008, ROP meetings.

September 2008, ROC meetings.

June 2009, Association meeting.

July 2009, Standards Council issues documents.

The TCs will have approximately 10 months to complete their work on the draft documents, which is very ambitious given the new subject areas as well as the need for reformatting the entire document.

“In teaching the principal elements of the standard for over 20 years, it was becoming evident to the users of the document that it needed to be modernized. The membership of the American Society for Healthcare Engineering and the TCC all agreed that a ‘band-aid’ approach was no longer sufficient to get the standard ready for 2010,” Erickson says.

Standards Council response

At its July 2006 meeting, the Standards Council considered the request from the Technical Correlating Committee on Health Care Facilities for the proposed restructuring of the Health Care Facilities Project.

After a review of the proposed new structure, the Council requested that the TCC further clarify where in the proposed new structure the project was intending to assume primary jurisdiction for subject matter that was currently within the jurisdiction of another project.

Specifically, the Council requested that the TCC identify where, through the proposed new structure, the Health Care Facilities Project was requesting primary jurisdiction over any subject matter that it would currently have been required to address by reference to or extract from other documents in accordance with extract policy.

The Council was concerned that the Health Care Facilities Project might, through the proposed new scopes and structure, be proposing to take primary responsibility for establishing requirements on certain subjects that were currently the responsibility of other Projects. If this was the case, the affected projects were informed and had an opportunity to provide input to the Council before the Council took further action on the proposed new structure.

Once that additional information was provided, the Council directed that the proposed restructuring be circulated through the normal channels for public review, with specific notice directed toward other related and affected Projects in the NFPA codes and standards process. In addition to soliciting comments from the existing TC in the Health Care Project, the Council directed that comments be solicited from the committees responsible for the following NFPA documents: NFPA 1, 13, 14, 45, 52, 90A, 70E, 72, 101, 110, 318, 730, 1600, and 5000.

Homeland security

One aspect of the proposed restructuring relates to the on-going attempts to address homeland security-related concerns within the NFPA codes and standards process. In this case, the Health Care Project TCC proposed expanding the name and scope of the TC on “Health Care Emergency Management” to the TC on “Emergency Management and Security” to include security issues in health care facilities.

In accordance with the Council’s policy on homeland security issues, the Council solicited specific comment on the proposed expansion of the Health Care project to address security issues in health care facilities.

As requested, the TCC solicited additional information, and in November 2006, the Standards Council voted to approve the restructuring, with modification, the approved TCs and respective TC scopes as previously discussed.

All existing members of the Health Care Facilities Project Technical Committees reapplied, and a notice was published calling for new members and specifically soliciting additional expertise as necessitated by this restructuring.

Change of scope, change of name

The Standards Council revised the scope of the Technical Committee on Electrical Systems (HEA-ELS). It shall have primary responsibility for documents or portions of documents covering the minimum requirements for performance, testing, maintenance, operations, and failure management of electrical systems, low voltage systems, wireless technologies, informatics, and telemedicine to safeguard patients, staff, and visitors within health care facilities.

The Technical Committee on Fundamentals (HEA-FUN) underwent a TC name change from
Administration to Fundamentals and its scope was revised. This Committee shall have primary responsibility for documents or portions of documents on the scope, application, and intended use of documents under the Health Care Facilities Project, including reference standards, performance, the protection of special hazards, criteria for levels of health care services based on risk, as well as definitions not assigned to other committees in the Health Care Facilities Project.

The Technical Committee on Health Care Emergency Management and Security (HEA-HES) is a renamed committee as well and its scope was revised. Its name was changed from Health Care Emergency Management to Health Care Emergency Management and Security. This Committee shall have primary responsibility for documents or portions of documents covering the framework for emergency management and security of health care facilities proportionate to the risk of the patient and health care staff. This Committee shall have primary responsibility for the elements of planning over a continuum from minor incidences to catastrophic events, including: management controls, mitigation practices, incident response, continuity of services, recovery, stored capacity, staff training, and program evaluation.

The Standards Council also formed a new Technical Committee on Mechanical Systems (HEA-MEC) that shall have primary responsibility for documents or portions of documents covering the performance, operations, testing, maintenance, and failure management criteria for air quality, temperature, humidity, critical space pressure relationships, water and wastewater, and their associated systems.

The TCs on Electrical Equipment and Gas Delivery Equipment merged to become the Technical Committee on Medical Equipment (HEA-MED), which shall have primary responsibility for documents or portions of documents covering the performance, operations, testing, maintenance, and testing of electrical medical equipment and portable patient-related gas equipment for the purpose of safeguarding patients and health care personnel within patient care areas of health care facilities from the hazards of fire, explosion, electricity, nonionizing radiation, heat, and electrical interference.

**Unchanged TCs**

The Technical Committee on Hyperbaric and Hypobaric Facilities (HEA-HYP) retains primary responsibility for documents or portions of documents covering the construction, installation, testing, performance, and maintenance of hyperbaric and hypobaric facilities for safeguarding staff and occupants of chambers. The Technical Committee on Piping Systems (HEA-PIP) maintains primary responsibility for documents or portions of documents covering the performance, maintenance, installation, and testing of medical and dental related gas piping systems and medical and dental related vacuum piping systems.

In addition, the Health Care Facilities Technical Correlating Committee (HEA-AAC) remains responsible for documents that contain criteria for safeguarding patients and health care personnel in the delivery of health care services within health care facilities: a) from fire, explosion, electrical, and related hazards resulting either from the use of anesthetic agents, medical gas equipment, electrical apparatus, and high frequency electricity, or from internal or external incidents that disrupt normal patient care; b) from fire and explosion hazards associated with laboratory practices; c) in connection with the use of hyperbaric and hypobaric facilities for medical purposes; d) through performance, maintenance, and testing criteria for electrical systems, both normal and essential; and e) through performance, maintenance, testing, and installation criteria: (1) for vacuum systems for medical or surgical purposes, and (2) for medical gas systems.

At its meeting in January 2007, the Standards Council approved the rosters for the Technical Committees for electrical systems, fundamentals, health care emergency management and security, hyperbaric and hypobaric systems, mechanical systems, medical equipment, and piping systems.

Has the restructuring met with the TC's expectations? According to Erickson, yes and no. “For the most part the TCC members are satisfied with the restructuring and the new Technical Committee structure. There are some, however, who don't believe we are going far enough with revising the 2010 version,” says Erickson. “In the initial meeting the TCC had discussed looking at defining various levels of health care and writing standards to fit the levels. For example, a limited critical care unit in a rural hospital has different minimal needs than a critical care unit in a major urban tertiary medical center. What we all need to remember is this is a work in progress and if it all doesn't get done for the 2010 edition it can still happen for 2013.”

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CASE STUDY

Building Design and Patient Safety

New York City hospital conducts a self-examination of fire walls and fire barriers that leads to improved safety.

By Kenneth R. Chin

CURRENT PRACTICE AT HEALTH CARE FACILITIES and conventional wisdom rely heavily on fire walls and smoke barrier walls to protect patients and staff from fire. However, actual experience with fires in health care facilities has shown this doesn't always work. Good building design must be accompanied by an effective fire and smoke barrier management system to assure safety.

If a fire breaks out in one area of one floor, patients are to be quickly moved horizontally to another area on the same floor past a smoke barrier wall. Smoke barrier walls are designed and constructed to confine smoke to the compartment of origin. The presence of a fire wall or fire barrier wall works to minimize fire spread for a predetermined length of time to allow for further evacuation or relocation of patients if necessary and to prevent the spread of fire so that the fire fighters can do their job more successfully. This strategy varies in actual configuration throughout any health care facility, but the theme is the same. Once a fire occurs, contain the fire and smoke through building design and construction.

There are two principal reasons why this cannot always be relied upon to work in every case. First, the doors that perforate the wall where there
are corridors may be chocked open during a fire emergency. Second, the wall itself may have openings allowing heat and smoke to pass through. Medical gas piping, electrical and communications wiring, and HVAC ducts are among the systems that can penetrate fire walls and smoke barrier walls.

As this case study of New York-Presbyterian Hospital's inspection program reveals, the presence of fire walls with open penetrations may have more to do with an ineffective fire barrier management system.

New York-Presbyterian Hospital—based in New York City—is the nation's largest not-for-profit, non-sectarian hospital, with 2,335 beds. It provides state-of-the-art inpatient, ambulatory, and preventive care in all areas of medicine

As this case study of New York-Presbyterian Hospital's inspection program reveals, the presence of fire walls with open penetrations may have more to do with an ineffective fire barrier management system.

New York-Presbyterian Hospital—based in New York City—is the nation's largest not-for-profit, non-sectarian hospital, with 2,335 beds. It provides state-of-the-art inpatient, ambulatory, and preventive care in all areas of medicine for cables, cable trays, conduits, pipes, tubes, combustion vents and exhaust vents, wires, and similar items to accommodate electrical, mechanical, plumbing, and communications systems that pass through a wall, floor, or floor/ceiling assembly constructed as a fire barrier shall be protected by a fire stop system or device.

A fire stop system is an approved method utilizing a combination of materials and/or devices, which could include the penetrating items, required to form a complete fire stop.

The following factors must be considered at New York-Presbyterian Hospital:

- Most penetrations occur above the ceiling, where they are not easily identified.
- Penetrations can be horizontal through walls or vertical through floor structures.

at five major centers: New York-Presbyterian Hospital/Weill Cornell Medical Center, New York-Presbyterian Hospital/Columbia University Medical Center, Morgan Stanley Children’s Hospital of New York-Presbyterian, New York-Presbyterian Hospital/Allen Pavilion, and New York-Presbyterian Hospital/Westchester Division.

Costly issue
According to NFPA statistics from the March 2006 report Selections from U.S. Fires in Selected Occupancies/Health Care Facilities, Excluding Nursing Homes, of the 3,150 fires in health care facilities excluding nursing homes between 1999 and 2002, five percent of those fires extended beyond the room of origin. That five percent caused $13.1 million in direct property damage, or 62 percent of the total $21.3 million in direct property damage in health care facilities. Three-fourths of the 3,150 fires were specifically in a hospital or hospice.

Managing the integrity of fire barriers and smoke barriers is a formidable challenge. NFPA 101®, Life Safety Code®, states that penetrations

- Numerous contractors or hospital departments may be involved independently in separate work projects requiring penetrations. Hospital-wide oversight and coordination are required to monitor the potential for barrier penetration.
- Commercial contractors generally do not expect to be concerned about barrier penetrations unless they have previously worked in a hospital or other health care setting.
- Fire stopping techniques used to render penetrations capable of maintaining the integrity of the fire barrier are complex and numerous depending on the product, the barrier design requirements, and the type and configuration of the penetration itself.

Fire stopping a penetration can be labor intensive and time consuming, therefore having a significant cost impact. Contractors unaccustomed to fire stopping requirements must allow for additional labor time and material. In New York City, additional costs can vary considerably from
contractor to contractor. A conservative average range would be $40 to $120 per linear foot of hole (regardless of area size or depth).

The responsibility for fire stopping "old penetrations" and/or upgrading under-rated walls must be determined and provided for as they are identified. In New York City, estimates could range from $256 to $780 per linear foot.

Resources to inspect barriers for penetrations are frequently limited or may involve costly contracted services.

In addition, NFPA 101 requires that the fire stop system or device shall be tested in accordance with ASTM E 814, *Standard Test Method for Fire Tests of Through Penetration Fire Stops*, or UL 1479, *Fire Tests of Through-Penetration Firestops*, at a minimum positive pressure differential of 0.01 in. water column (2.5 N/m²) between the exposed and the unexposed surface of the test assembly.

**Inspection program**

New York-Presbyterian Hospital first began internally organized inspections to maintain the integrity of its fire barriers in 2000. The initial focus of the inspection program was on projects requiring the deployment of communication lines, e.g., "data cable pulls" for nurse call systems. Environmental Health and Safety (EH&S) staff organized project teams throughout New York-Presbyterian Hospital to identify the total number of locations where penetrations would be expected to occur. Safety staff then inspected sites to determine the percentage of penetrations inappropriately fire stopped. During the first year of implementation, the program was able to inspect 60 percent of the penetrations made during "cable pulls."

The results were startling and revealed an unexpected vulnerability: 14.5 percent of the penetrations were not properly fire stopped. As the new inspection program continued, the numbers significantly improved.

The importance of a more effective safety management system became apparent over time. The program originally focused on communication cabling, but EH&S realized that large numbers of penetrations were made by other projects as well. With the immense number of potential projects involved, it became necessary to develop a formal policy and procedure to encompass all work done across the hospital's five campuses involving some 69 miles (111 kilometers) of fire and smoke barriers. The concept of a "central authority" evolved as a means of enhancing program consistency and effectiveness.

By July 2003 cooperation between the Office of Facilities Operations and the EH&S Department yielded a new system of permits, inspections, and accountability embracing all work conducted within New York-Presbyterian Hospital.

This system formed the basis of the operating features of the program in use today whose essential elements include:

- Definitions clearly identify the extent of coverage.
- Pre- and post-installation procedures are specific and instructional.
- The "central authority" is clearly identified.

A permit system requires all penetrations to be sealed with proper fire stopping and places responsibility squarely on the shoulders of the contractor or other project manager making the penetration. Contractors apply and receive permits from EH&S clearly identifying where they will be making penetrations.

Contractor compliance with Hospital policy is tied directly to project close-out documentation and ultimate payment to the contractor. On completion, the contractor must email digital photographs of the fire stopped penetration(s) to EH&S to prove compliance. If contractors cannot prove that they have properly sealed any penetrations they have made, the project is not considered completed and payment is withheld accordingly. This represents the real teeth of the program.

This new approach has made it easier for contractors and other affected personnel to know exactly what is expected of them and how to comply with New York-Presbyterian Hospital policy. In setting up the management system, EH&S took...
these accomplishments and suggests the following as possibly important contributing factors:

- Contractor familiarity and cooperation with the process has increased over time.
- EH&S increased department staffing by 40 percent in part for this purpose, thus enabling a more productive focus.
- Procedure planning and coverage has been effective.
- Field procedures have been routinized and continuously improved, as with digital photography.

Hospitals are often locked in a cycle of expending large amounts of resources to survey and plug barrier penetrations that have accumulated since the last inspection. Without an aggressive program to manage penetrations as they occur, the hospital is resigned to this wasteful repetition. A successful program of barrier management appears to be a synergistic relationship between contractors and the hospital managers. Designing a practical approach for the hands-on personnel while making clear the accountability structure are both key factors to this end.

The effectiveness of this systematic approach to managing smoke barrier and fire wall integrity is clearly demonstrated in the oversight results. Since June 2004 inspections have verified that all inspected penetrations have been properly fire stopped. Assurance of compliance has steadily improved with the percentage of penetration inspections completed—100 percent from May 2006 onward; and the random verifications conducted by EH&S further enhance confidence.

Ultimately, the critical result is to assure fire wall integrity and maintain the level of protection for patients and staff designed into building construction. Minimization of any loss, human or financial, is fundamental to good business management. Although no one would want to see a real-life test of the effectiveness of this program, management can be confident that the building design probability of success will be at the highest possible level. Furthermore, a well-documented program will increase regulators’ confidence in hospital management practices.

KENNETH CHIN is an NFPA member and the Corporate Director of Environmental Health and Safety for New York-Presbyterian Hospital. He can be reached at kec9038@nyp.org.
8.3.5 Penetrations. The provisions of 8.3.5 shall govern the materials and methods of construction used to protect through-penetration and membrane penetrations in fire walls, fire barrier walls, and fire resistance-rated horizontal assemblies. The provisions of 8.3.5 shall not apply to approved existing materials and methods of construction used to protect existing through-penetration and existing membrane penetrations in fire walls, fire barrier walls, or fire resistance-rated horizontal assemblies, unless otherwise required by Chapter 12 through Chapter 42.

8.3.5.1 Firestop Systems and Devices Required. Penetrations for cables, cable trays, conduits, pipes, tubes, combustion vents and exhaust vents, wires, and similar items to accommodate electrical, mechanical, plumbing, and communications systems that pass through a wall, floor, or floor/ceiling assembly constructed as a fire barrier shall be protected by a firestop system or device. The firestop system or device shall be tested in accordance with ASTM E 814, Standard Test Method for Fire Tests of Through Penetration Fire Stops, or UL 1479, Standard for Fire Tests of Through-Penetration Firestops, at a minimum positive pressure differential of 0.01 in. water column (2.5 N/m²) between the exposed and the unexposed surface of the test assembly.

8.3.5.1.1 The requirements of 8.3.5.1 shall not apply where otherwise permitted by any one of the following:


(2) Where penetrations through floors are enclosed in a shaft enclosure designed as a fire barrier.

(3) Where concrete, grout, or mortar has been used to fill the annular spaces around cast-iron, copper, or steel piping that penetrates one or more concrete or masonry fire resistance-rated assemblies and both of the following criteria are also met:

(a) The nominal diameter of each penetrating item shall not exceed 6 in. (150 mm), and the opening size shall not exceed 1 ft² (0.09 m²).

(b) The thickness of the concrete, grout, or mortar shall be the full thickness of the assembly.

(4) Where firestopping materials are used with the penetrating items in 8.3.5.1.1(1) through 8.3.5.1.1(3) and both of the following criteria are also met:

(a) The penetration shall be limited to only one floor.

(b) The firestopping material shall be capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste when subjected to the time-temperature fire conditions of NFPA 251, ASTM E 119, or UL 263 under a minimum positive pressure differential of 0.01 in. water column (2.5 N/m²) at the location of the penetration for the time period equivalent to the required fire resistance rating of the assembly penetrated.

8.3.5.1.2 The maximum nominal diameter of the following penetrating items shall be not greater than 4 in. (100 mm), and the aggregate area of all penetrating items shall not exceed 0.7 ft² (0.06 m²) in any 100 ft² (9.3 m²) of floor or wall area:

(1) Steel, ferrous, or copper cables
(2) Cable or wire with steel jackets
(3) Cast-iron, steel, or copper pipes
(4) Steel conduit or tubing

8.3.5.1.3 Firestop systems and devices shall have an F rating of at least 1 hour, but not less than the required fire-resistive rating of the fire barrier penetrated.

8.3.5.1.4 Penetrations in fire-rated horizontal assemblies shall be required to have a T rating of at least 1 hour, but not less than the rating of the horizontal assembly, and shall not be required for the following:

(1) Floor penetrations contained within the cavity of a wall assembly
(2) Penetrations through floors or floor assemblies where the penetration is not in direct contact with combustible material

8.3.5.2 Penetrations.

8.5.6 Penetrations.

8.5.6.1 The provisions of 8.5.6 shall govern the materials and methods of construction used to protect through-penetrations and membrane penetrations of smoke barriers.

8.5.6.2 Penetrations for cables, cable trays, conduits, pipes, tubes, vents, wires, and similar items to accommodate electrical, mechanical, plumbing, and communications systems that pass through a wall, floor, or floor/ceiling assembly constructed as a smoke barrier, or through the ceiling membrane of the roof/ceiling of a smoke
8.5.6.3 Where a smoke barrier is also constructed as a fire barrier, the penetrations shall be protected in accordance with the requirements of 8.3.5 to limit the spread of fire for a time period equal to the fire resistance rating of the assembly and 8.5.6 to restrict the transfer of smoke, unless the requirements of 8.5.6.4 are met.

8.5.6.4 Where sprinklers penetrate a single membrane of a fire resistance-rated assembly in buildings equipped throughout with an approved automatic fire sprinkler system, noncombustible escutcheon plates shall be permitted, provided that the space around each sprinkler penetration does not exceed 1/2 in. (13 mm), measured between the edge of the membrane and the sprinkler.

8.5.6.5 Where the penetrating item uses a sleeve to penetrate the smoke barrier, the sleeve shall be securely set in the smoke barrier, and the space between the item and the sleeve shall be filled with a material capable of restricting the transfer of smoke.

8.5.6.6 Where designs take transmission of vibrations into consideration, any vibration isolation shall meet one of the following conditions:

(1) It shall be provided on either side of the fire barrier.

(2) It shall be designed for the specific purpose.

8.5.7 Joints.

8.5.7.1 The provisions of 8.5.7 shall govern the materials and methods of construction used to protect joints in between and at the perimeter of smoke barriers or, where smoke barriers meet other smoke barriers, the floor or roof deck above, or the outside walls. The provisions of 8.5.7 shall not apply to approved existing materials and methods of construction used to protect existing joints in smoke barriers, unless otherwise required by Chapter 12 through Chapter 42.

8.5.7.2 Joints made within or at the perimeter of smoke barriers shall be protected with a joint system that is capable of limiting the transfer of smoke.

8.5.7.3 Joints made within or between smoke barriers shall be protected with a smoke-tight joint system that is capable of limiting the transfer of smoke.

8.5.7.4 Smoke barriers that are also constructed as fire barriers shall be protected with a joint system that is designed and tested to resist the spread of fire for a time period equal to the required fire resistance rating of the assembly and restrict the transfer of smoke.

8.5.7.5 Testing of the joint system in a smoke barrier that also serves as fire barrier shall be representative of the actual installation suitable for the required engineering demand without compromising the fire resistance rating of the assembly or the structural integrity of the assembly.

8.6 Vertical Openings.

8.6.1 Floor Smoke Barriers. Every floor that separates stories in a building shall meet the following criteria:

(1) It shall be constructed as a smoke barrier in accordance with Section 8.5.

(2) It shall be permitted to have openings as described by 8.6.6, 8.6.7, 8.6.8, or Chapter 11 through Chapter 42.

8.6.2* Continuity. Openings through floors shall be enclosed with fire barrier walls, shall be continuous from floor to floor, or floor to roof, and shall be protected as appropriate for the fire resistance rating of the barrier.

8.6.3 Continuity Exemptions. The requirements of 8.6.2 shall not apply where otherwise permitted by the following:

(1) Where pneumatic tube conveyors are protected in accordance with 8.3.5.1;

(2) Where specified by 8.6.6, 8.6.7, 8.6.8.1, 8.6.8.2, or Chapter 11 through Chapter 42;

(3) Where escalators and moving walks are protected in accordance with 8.6.8.5 or 8.6.8.6;

(4) Where expansion or seismic joints are designed to prevent the penetration of fire and are shown to have a fire resistance rating of not less than that required for the floor when tested in accordance with UL 2079, Standard for Tests of Fire Resistance of Building Joint Systems;

(5) Where existing mail chutes meet one of the following criteria:

(a) The cross-sectional area does not exceed 0.1 ft² (0.01 m²).

(b) The building is protected throughout by an approved automatic sprinkler system in accordance with Section 9.7.

8.6.4 Shafts. Shafts that do not extend to the bottom or the top of the building or structure shall comply with either 8.6.4.1, 8.6.4.2, or 8.6.4.3.

8.6.4.1 Shafts shall be enclosed at the lowest or highest level of the shaft, respectively, with construction in accordance with 8.6.5.

8.6.4.2 Shafts shall be permitted to terminate in a room or space having a use related to the purpose of the shaft, provided that the room or space is separated from the remainder of the building by construction having a fire resistance rating and opening protective in accordance with 8.6.5 and 8.3.4.

8.6.4.3 Shafts that do not extend to the bottom or top of the building or structure shall be protected by approved fire dampers installed in accordance with their listing at the lowest or highest floor level, as applicable, within the shaft enclosure.
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The Internet has changed the way we read newspapers, rent movies, and buy books. It may now revolutionize the way we access and use electrical information, including electrical codes and standards. By Alisa Wolf

NFPA, THE CREATORS OF NFPA 70, National Electrical Code® (NEC®) knew they were at the forefront of a burgeoning electrical industry. What they couldn’t have foreseen was that, 110 years after the first edition of the NEC was published in 1897, another technology would revolutionize our lives: E-commerce—the practice of doing business on the Internet—has already changed the way we read newspapers, rent movies, and buy books. It may now revolutionize how we access and use electrical information in the NEC: NFPA 70E®, Electrical Safety in the Workplace®; the UL White Book; and other industry resources.

Fundamentally, online publication doesn’t change NFPA’s electrical codes and standards—not their content, not the full consensus process by which they are created, and not the original code-makers’ mission of developing model national codes and standards that serve all interests in the industry. What the launch of necplus™ does have is the potential to influence how easy it is to access and understand electrical information.
How it works

Chances are that most users of electrical codes and standards already subscribe to an online subscription service that works much like necplus.org. Typically, services such as The Wall Street Journal Online or Netflix® charge a monthly subscription fee. No letters, advertising flyers, brochures, or other mail is produced or distributed. Users sign up and pay via a secure Web site, and all communication about billing and site updates is done by e-mail.

Web-based subscription services augment the original product with features that can’t be reproduced at a local newsstand or video store. For example, movie trailers, tailored recommendations, and user reviews are available on Netflix. And in addition to the full text of the newspaper, the Wall Street Journal Online offers market and investing tips, as well as links to related information. Similarly, necplus.org subscribers can access a comprehensive source of current electrical information designed to enhance the electrical professional’s ability to find requirements in the NEC and NFPA 70E, as well as many other resources, including industry-related articles.

necplus.org subscribers can access the full text of the 2008 edition of the NEC, the draft of the 2008 Report on Proposals (ROP), the 2008 Report on Comments (ROC), and the 2004 edition of NFPA 70E. The site also houses an archive that includes an enhanced version of the 2005 edition of the NEC. In the future, even earlier editions of the NEC are scheduled for online archiving. This deep archive makes it easy for users to research the origin of a Code requirement, quickly compare a requirement in the new edition with that of a previous edition, and trace a requirement’s progress through the consensus process, from ROP to ROC to the final text.

In addition, subscribers can click on an icon in the 2005 edition of the NEC for immediate access to information relevant to that section, such as the ROP and ROC, an illustration, an example, or a staff note that will help the user understand the intent of that requirement and how to follow it. These enhancements will be added to the 2008 edition of the NEC every month and to NFPA 70E. A special bonus for subscribers to necplus.org is early access to the new edition of the 2008 edition of the Code, which is scheduled for online publication before the hard copy is available for distribution.

Links to industry-related articles with news, opinion, and discussion are also available on the site and will be continuously updated. Subscribers will be able to link seamlessly to other sources, including an electronic version of UL’s White Book to access UL Guide information for product categories and product certification information. UL has partnered with NFPA to provide this link, in the hopes that it will help electrical professionals find vital information quickly and conveniently.

“necplus.org is the first complete compliance tool that provides the Code requirement, the background for the requirement, and what type of listed product can be used to become Code-compliant. This will go a long way to increasing safe Code-compliant designs and installations,” says Al Ramirez, UL’s manager of Regulatory Services.

Code users who prefer to flip through pages or who need the hard copy of the Code in the field needn’t worry that they’ll have to give up their printed copies of the NEC. After all, newspapers and video stores are still around, despite the availability of online subscription services, and necplus.org won’t elbow out the book or CD-ROM versions of the Code.

“We’re looking at necplus as a unique product,” says Kim Fontes, director of Product Development at NFPA.

Find what you need—fast

One way in which necplus may be most useful to users is through the robust search engine the Internet makes possible.

Consider the extra search power that Wall Street Journal Online subscribers have. They can search for headlines in today’s paper, archived editions, and other sources on the Web. And Netflix subscribers can use any number of key words and links to find new releases and classic films on DVD. Now imagine that kind of search power applied to the NEC, NFPA 70E, and related electrical documents.

necplus.org offers accessibility to a vast database of information, available to subscribers any time of day or night. Subscribers can locate the exact Code requirement they need in seconds. With the click of a mouse, they can go back and forth among all the references on the site, without paging through a book, consulting an index, or visiting a library.

“Since it’s Web-based, it’s dynamic, and we have the ability to change content on the fly,” says Fontes. Combined with other benefits—the convenience of the Internet, the powerful search engine, and the ability to drill down through several sources for background information—the subscription service is a tool for users who consult the Code frequently, even daily.

“It’s for those who need the Code at their
fingertips," says Fontes, "for information for reports or for projects."

As publishing goes, so goes the NEC
During the past 110 years, the NEC has led the way for change in code and standards delivery, responding to trends in the publishing and to users' needs. In 1923, for example, the NEC was rearranged and rewritten for easier use. The first Spanish-language edition of the NEC came out in 1927. And in 1959, NFPA introduced a new numbering system that is still in use in today. Now, NFPA is reaching out to users who are doing more and more of their business online.

“NFPA is changing its practices as the world changes,” says Sylvia Dovner, the director of Editorial and Production Services at NFPA. “People want information more quickly, and they want it accessible, whether they’re traveling, in the field, or at home.”

More and more electrical users are also daily Internet users. For these professionals, the online subscription service represents the next logical step in fulfilling the mission of electrical safety through the NEC and NFPA 70E. One such user is Mark Earley, NFPA’s chief electrical engineer, who calls necplus.org a “total growth approach to the NEC.”

“It’s going to go beyond anything provided before,” says Earley.

Though at first he may have been reluctant to embrace the new wave of interactive media, Earley has come around. The turning point came when he signed up for an online management course recently and, to his surprise, discovered an impressive world of electronic teaching tools. Expecting whiz-bang add-ons, he found instead high-quality content that helped him delve more deeply into his subject. Any reservations he might have had about “virtual” learning were soon replaced with enthusiasm.

“It’s where books are going,” Earley says. “They’re fully featured. We want to be right up in front [of the trend in online publishing].”

Carol Ann Faber, director of Membership and Continuity Products for NFPA, characterizes the subscription service as “the place on the Web for all things electrical, in terms of the Code.”

“We’ve put everything in one place—what the Code committee is thinking, how a requirement came into being—it’s all right there,” says Faber. “necplus.org is an integrated, one-stop shop for electrical Code content.”


ALISA WOLF is a freelance writer based in Massachusetts.
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BUILDING FIRE SAFETY SYSTEMS

Member Spotlight

Thinking of Installing a 'Non-Required Fire Alarm System'?

By Traci L. Velez

Many of the fire alarm systems installed today are considered non-required, volunteer, or non-jurisdictional installations. Many owners feel that, by choosing to install a fire alarm or emergency voice communications system when the local building or fire codes do not require them, they need not follow any specific requirements for the system's installation, maintenance, and operational capabilities. As a result, such systems are often installed using substandard methods, are inadequately tested and maintained, and are in varying states of disrepair. Fire detection devices and notification appliances are often installed improperly, as well, and may not operate. And when repairs or renovations are performed, these devices are often relocated or simply removed, resulting in inadequate spacing or coverage.

Those installing non-required fire alarm systems often overlook the fact that many local building and fire codes mandate installing and maintaining non-required fire alarm systems according to the same criteria or standards that required fire alarm systems must follow. When owners elect to install non-required fire alarm systems, those systems become, in essence, required systems and must be maintained as such. Some building and fire codes also require that anything that appears to be a fire alarm system be treated as a required fire alarm system. In other words, if it looks like a smoke detector, it had better detect smoke and alert someone to a potential fire.

Not only may the failure to maintain the fire alarm system violate the local building codes, but the system's owner could subject himself to legal issues if an emergency occurs. For example, devices such as smoke detectors or strobes installed in a room could lead an occupant to assume some level of protection in a fire. Should the occupant die or be injured because the fire alarm system failed to operate in the expected manner, the owner could find himself defending a lawsuit.

Owners may also find themselves negotiating with their insurance carriers for claims reimbursement if they have informed their carriers that they have fire alarm systems when, in fact, the systems are not functioning as required. Insurance companies investigate fires, and one item they look at is whether the property had a fire alarm system and whether the system was working properly. If it was not, the insurer could even deny coverage at the conclusion of the policy period.

The bottom line is that there is no such thing as a non-required or voluntary fire alarm system. Once an alarm system has been installed, it is subject to the same requirements and public expectations as a code-mandated system. If you elect to install a non-required fire alarm system, make sure you install it and maintain it in accordance with local building codes. Where such requirements do not exist, you should follow nationally recognized codes and standards.

Traci L. Velez is a senior consultant with Schirmer Engineering Corporation.
From the Members

AVIATION

Section Activities at WSC&E

By Mark Conroy

What a surprise for NFPA members arriving at Logan International Airport for the NFPA World Safety Conference & Exposition (WSC&E) to see welcome banners displayed at every baggage claim area. This was just one of the many thoughtful ideas of Chief Bob Donahue of the Massachusetts Port Authority (Massport) Fire Department.

On Monday, he sent the fireboat over to pick up Aviation Section members for a tour of Boston harbor, then dropped us off to visit Massport’s state-of-the-art fire station and tour the airport facilities. One of the highlights of the tour was a demonstration of the water deluge system that protect the windows facing the ramp on the new Terminal A. The tour concluded with a social hour hosted by Massport at Jasper White’s Summer Shack in Terminal A.

The 25 section members who attended the event were impressed by how well Boston Logan Fire Rescue provides a safe environment for the traveling public and supports the airport’s business continuity. To show the section’s appreciation for all he did for NFPA, Aviation Section Chairman Nat Addleman presented Chief Donahue with a plaque.

Mark Conroy is a senior engineer with Brooks Equipment Company of Charlotte, North Carolina.

EDUCATION

Community Fire Prevention Week Activities

By Dayna Hilton

Looking for a new way to kick off your Fire Prevention Week activities, bring your community together, and keep those in your community safe? There are many activities you can implement to do just that.

Each year, fire departments, community groups, and emergency service organizations in Johnson County, Arkansas, come together to host a variety of events to kick off the National Fire Protection Association’s Fire Prevention Week. Why? Because Arkansas has one of the highest numbers of fire-related deaths in the United States, and most of the victims are young children and the elderly, according to the United States Fire Administration.

In October 2003, we decided to change that unfortunate situation by coming together to start a small event that would highlight the problem and its possible solutions. That small event has since grown into a significant annual community event that features banners hung across Main Street and a Sparky flag flying on the town of Clarksville’s Sesquicentennial flagpole. The county’s fire chiefs, judge, and Fire Prevention Week coordinator also participate in a Proclamation Ceremony to kick off Fire Prevention Week.

The highlights of the event are the Annual Fire Safety Awareness Parade that showcases area fire trucks and emergency vehicles and the Kidsfest Safety Fair, now in its fifth year. The fair focuses primarily on teaching children ages 10 and under, who are most at risk, the basics of fire- and life-safety education.

The Fire Prevention Week coordinator works closely with Johnson County fire chiefs, local firefighters, and the Johnson County RFD #1 Fire Corps, who together donate hundreds of hours of time planning these events.

The project

The day-long fire safety awareness parade, a collaborative effort by the Johnson County Fire Chiefs’ Association and numerous other organizations and agencies, is open to all fire departments, law enforcement agencies, and emergency service organizations in and outside the county. Other area organizations are also invited to participate as long as their entry involves a fire-safety-related message.

In 2006, the event involved 11 fire departments and 17 other agencies, including the Johnson County Sheriff’s Office, Project Kid Print, Johnson County EMS, the Johnson County Health Unit, Clarksville Light and Water, the U.S. Forest Service, the Arkansas Forestry Commission, the Arkansas Game and Fish Commission, Inferno Martial Arts, the National Weather Service, the Arkansas State Police, Clarksville Medical Group, Girl Scout Peachtree Service Unit, Lamar Girl Scouts, the Johnson County RFD #1 Fire Corps, and the Clarksville High School Internet Safety Team.

The Johnson County Fire Chief’s Association chooses a marshal to lead the parade. Past marshals have included various local and state leaders instrumental in assisting county fire departments.

The day-long safety fair, held the day before Fire Prevention Week starts, provides fun interactive activities, including the Fire Safety House, where children and their families learn how to practice an escape plan and how to get low and go under smoke. After the children participate in the Fire Safety House, the fire department gives them age-appropriate literature, which is available to all those in attendance as well. Also on hand to help reinforce fire safety messages are Sparky the Fire Dog, who arrives by helicopter; Sparkles and Spanner, RFD #1’s Dalmatian mascots; Firefly the Fire Safety Clown; Freddie Fire Truck; and Pluggie the Fire Hydrant.

Another feature of the fair is a Junior Firefighter Challenge in which children practice various fire safety methods. Approximately 200 children participate in this event annually. There is also a Fire Prevention Week Fire Safety Poster Board.
Involve citizen advocates such as Fire Corps members. Fire Corps members are excellent citizen advocates who assist fire departments and EMS organizations in non-operational roles. The Fire Corps can help with promotion and marketing, serve on committees, help organizations with booths, and assist with other tasks as needed.

Planning your event is a year-long endeavor. Organize committee heads for the various Fire Prevention Week activities and meet frequently with them to follow-up on tasks. Also consider planning your parade route to drive traffic and people to your safety fair.

Advertise your event. Many newspapers are willing to publish articles about your event. Your local newspaper might even donate space for an ad, or a local business might be willing to help financially in return for being mentioned as a sponsor.

The night before the event is the ideal time to set up your safety fair to reduce stress and fatigue. It also helps the core group bond and get to know each other better.

Once the parade begins, ask Fire Corps members or volunteers from other organizations to keep a watchful eye on the displays. Asking someone to watch the parking areas planned for apparatus is extremely important. If someone does not watch these areas, people may park their cars where the fire truck should be.

Pictures are important. Ask plenty of people to take pictures to document the event. This will help later with publicity, funding, and participants.

Ensure that all participants staff their booths, emergency equipment, or apparatus to ensure attendees' safety. And ask participants to stay until the end of the fair. If some pull out too early, your event will look sparse to those just arriving.

At the end of the day, survey the organizations involved. Ask for suggestions for improvement and put valid ideas into play the following year. Meet with your committee heads shortly after the event while it is fresh in their minds. Make a list of "lessons learned" and use that as a guide as you plan your event for the following year.

Dayna Hilton is with the Clarksville, Arkansas, Fire Department. Copyright 2007, Dayna Hilton.

FIRE SERVICE

In the Wake of the South Carolina Fire

BY JOSEPH J. COFFEY

As the nation reflects on the deaths of the nine firefighters who perished in the recent South Carolina furniture warehouse fire, there will be many questions, and many reports will be written about what caused their deaths and whether they could have been prevented. Unfortunately, none of that information will bring the firefighters back to their crews and families. My condolences to the fallen firefighters' families and crews.

A week before the South Carolina fire, I was visiting Boston, walking down the tree-lined mall on Commonwealth Avenue with my family, when I came across a memorial marking the death of nine Boston firefighters in a fire at the Vendome Hotel in 1972. It made me realize that we need to look on these tragic events, both past and present, as lessons that can help prevent more firefighter deaths in the future.

If other professions in the United States suffered as many deaths a year as the fire service, those professions would be forced to change the way they operate. We need start looking at what we can do differently and change now. NFPA and other agencies have a lot of data we must use to create an environment that will prevent further firefighters death. The sacrifice of our brothers and sisters must not be in vain.

We must remember our dead, but now it is time to prevent future deaths. Let's not have to build any more firefighter memorials.

RAIL TRANSPORTATION SYSTEMS

European, African Train Incidents

According to the Associate Press, a small fire in a Paris Metro car on July 29 sent 15 people to the hospital for smoke inhalation after black smoke filled a subway tunnel. The car was stopped between two stations when the fire broke out in its suspension mechanism. Some 120 firefighters were called to the scene to extinguish the fire and help evacuate passengers.


The Associated Press also reported that about 100 people died on August 1 when an overnight train derailed in central Congo after its brakes failed. The train's locomotive stopped responding to controls as it traveled between the city of Ilebo and the provincial capital of Kananga, leaving the conductor with no way to brake.

Seven cars overturned in the accident, which occurred just before midnight.

Roads and rail lines in Congo are notoriously dilapidated. Most of its railroads were built more than 100 years ago, when the country was a Belgian colony.

Technical Committee Meeting

The NFPA 130, Fixed Guideway Transit and Passenger Rail Systems, Technical Committee will meet in Los Angeles, California, from September 24 to 26 for task group work. The committee is accepting public proposals for the 2010 edition of NFPA 130 until November 26, 2007.
Contest displaying the works of kindergarten and first-grade students from the Clarksville Primary School. Each year, the winning class is treated to a pizza party with Sparkles following the event.

New activities are added annually. In 2006, for example, RFD #1's Fire Corps members, composed of University of the Ozarks Phi Beta Lambda students, created "Sparkles' Spot," an activity that includes face painting and "Pin the Tail on Sparkles." While the children are in line, Fire Corps members share various fire-safety messages with them.

Local fire departments also participate by staging suppression demonstrations, sharing information about firefighting equipment, and offering safety messages throughout the day.

The anticipated outcome of the Kidsfest Fire Safety Fair is a reduction in fire-related deaths and injuries among small children in Johnson County. A community risk profile is conducted regularly, data are collected continually, and activities are updated and revised so that we can better reach the target populations.

One evaluation method is the treasure hunt, in which children and their families go to each booth to learn safety information. Once they complete a treasure hunt form, the children's names are entered into a drawing, which allows the event coordinator to track the number of kids visiting each booth. Later, the RFD #1's Fire Corps enters the data and analyses them.

The NFPA Web site, www.firepreventionweek.org, is full of great ideas for Fire Prevention Week. Among the resources available are sample proclamations and sample editorials and press releases you can use to write your own submissions to the local media. "Fire Prevention Week in a Box," which includes a banner, brochures, stickers, magnets, and "Fire Fact" newsletters, is also available to kick off your event. Everything you need to get started is in this tool kit.

With the support of your community and materials from NFPA, you can keep your community fire-safe!

Tips on Implementing FPW Activities in Your Community

Collaborate with other organizations in your area that have similar goals. Many groups may want to help provide educational programs and activities. Start advertising early in the year by asking organizations to participate in your safety fair or parade. Keep track of these participants and ask them what they need. For example, do they require tables or electricity?
This past July, the Latin American Section was once again a proud sponsor of NFPA’s Americas’ Fire & Security Expo (AFSE), which brought together professionals from the United States, Mexico, Central America, South America, the Caribbean, and Spain. Miami, the gateway to Latin America and the Caribbean, provided the ideal location, and the AFSE provided a stimulating and unique laboratory for learning new concepts in fire and security. The event also provided the consummate networking opportunity, allowing fire products distributors from Chile and other countries to network with engineers and construction managers from Mexico and other Latin America nations.

The AFSE exhibit featured modern fire, security, and life-safety products, systems, and services, while diverse educational sessions presented information on key political and economic indicators for Latin America. Sessions also touched on the outlook for business globalization, highlighting political, social, economic, and technological characteristics of the region as they apply to the challenges of fire protection and the application of NFPA codes and standards.

Other sessions described the fundamental role of engineering in fire prevention in commercial, industrial, and institutional organizations. One session reviewed vitally important design features and explained the interaction between the fire protection engineer and the project architect, a subject that is particularly pertinent today, as a construction boom in some Latin American cities is bringing high-rise buildings 80 stories and higher to the region for the first time.

NFPA’s Latin American Professional Development Programs, administered by IFST, conducted pre-conference seminars taught by technical experts and internationally recognized consultants. These sessions are key in building up technical capabilities in the region.

As the newly elected Latin American Section chair, and with the support of the rest of the section team, I am committed to making the AFSE an even bigger success in the future. We will work very closely with event organizers to help achieve this goal. If you are as excited as I am about helping in this effort, do not hesitate to contact me with your input and ideas. See you in Miami Beach in July 2008!

Annual Elections
At the section’s annual member meeting, the membership approved all nominations. Elected positions include:
Chair: Maria Figueroa Rodriguez,

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Clarke couplings now UL-listed.

As an industry leader in fire protection, Clarke accepted the task of engineering and UL testing to make listed couplings a reality. The result? This year Clarke proudly introduces UL listed flexible couplings for electric motors. These products will be certified for fire pump service and will begin shipping in October 2007.

Clarke now offers certified flexible couplings for electric motor fire pump drives. Whether you’re retrofitting an existing fire protection system or specifying equipment for a new build, insist on certified couplings from Clarke. To place an order for your installation, give us a call at 800-513-9591.

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Yosti Méndez and Ramón Domínguez Betancourt of Mexico City, Mexico, and Caonabo Javier Peguero of Santo Domingo, Dominican Republic, were elected to two-year terms as Board members. No applications were received for the user category. The position remains unfilled and will be considered by the Executive Board under Section 5.6 of the Bylaws.

From the Board

ARCHITECTS, ENGINEERS AND BUILDING OFFICIALS

New Seminar in Chicago

You are cordially invited to attend NFPA’s first Emergency Evacuation Planning Guide for People with Disabilities seminar, sponsored by the Chicago Fire Department and the Illinois State Fire Marshal’s Office. The seminar will be held on October 9, 2007 from 9:00 am to 2:00 pm at the Hilton Garden Inn Chicago Downtown Magnificent Mile at 10 East Grand Avenue.

The $25 registration fee includes a copy of the guide, presentation handouts, a certificate of attendance, Continental breakfast, and a Chicago-style deli buffet lunch.

NFPA published the Emergency Evacuation Planning Guide for People with Disabilities on March 2, 2007, and it had been downloaded from our Web site, http://www.nfpa.org/assets/files/PDF/Forms/EvacuationGuide.pdf, more than 18,000 times as of July 30. We’ve also received many calls, letters, and emails from people all over the world who want more information, ask questions, and make suggestions.

Space is limited so you need to register ASAP. Call (800) 344-3555 and press 1 for a customer sales representative or download the registration form at www.nfpa.org and fax it to NFPA at (800) 593-6372 or (508) 895-8301. You may also mail your completed form to NFPA at 11 Tracy Dr, Avon, MA 02322; refer to Seminar EEP12007021L01.

For more information, contact Senior Building Code Specialist Allan B. Fraser at afraser@nfpa.org.

Call for Presentations 2008 World Safety Conference & Exposition

Do you have a story about code enforcement, a case study, or a great practical method you use that relates to code administration or working with codes? A better way of doing something, a new tool, or maybe something to watch out for? Tell us. The Architects, Engineers and Building Officials Section is looking for people who can share their experience with their peers at the 2008 World Safety Conference & Exposition (WSC&E’), to be held at the Mandalay Bay Resort and Casino in Las Vegas, Nevada, from June 2 to 6.

Shrinking budgets; escalating demands from contractors, owners, and public officials; code changes; and innovative technologies are affecting our industry and challenging us to create solutions that are better, faster, and safer. Help pave the way for others and get the latest information and best practices related to codes and standards.

At the 2007 WSC&E in Boston, AEB0 sponsored 6 of the more-than 140 excellent education programs, and we’re hoping to do even more in 2008. Come join the fun helping to improve our industry!

Here are just some of the programs that we’ve sponsored since 2005:

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EDUCATION

Illustrating What We Do

By Peg Carson

We hope that all of you who attended the 2007 NFPA World Safety Conference & Exposition (WSC&E) in Boston stopped by the Education Section booth and were impressed by our continuous slide show. Our thanks to those who submitted the photos that helped tell the story of fire- and life-safety education in action.

But wait...we are not finished with the up-date. We still need your help to add to the story of fire- and life-safety education in pictures. The section board will continue collecting photos of educators in action to add to the booth display and possibly for other marketing use, with your permission.

Although fire- and life-safety education (FLSE) involves much more that making presentations to young children and showing them a fire truck, such "snapshots" may be the only thing many people, including other fire prevention professionals, think public educators do. This is an opportunity to tell the rest of the story.

Today's fire and life safety educators perform a great variety of functions that require diverse skills, and you can help us tell the whole story by sending photos that depict activities educators perform every day in communities large and small across the United States.

Ideally, we'd like to illustrate the role of today's educator in administration, planning, and development; education and implementation; and evaluation, the areas of responsibility described in NFPA 1035, Professional Qualifications for Fire and Life Safety Educators. It is undoubtedly easier to identify compelling photos in the area of education and implementation, but it would also be beneficial to illustrate the other important things we do.

Please be creative in finding ways to illustrate all the duties you perform. To help you, I've drawn up a list of duties identified from certification for fire- and life-safety educators, public information officers, and juvenile firesetter intervention specialists:

- Administration
  - Schedule activities
  - Maintain records
  - Prepare and maintain budgets
  - Advocate public policy
  - Manage personnel
  - Develop department policies for FLSE
- Planning and Development
  - Partner with community groups, agencies, and organizations
  - Review programs and materials for delivering FLSE
  - Develop FLSE strategies for targeted audiences and risks

Speakers will receive complimentary registration to the 2008 WSC&E, a value of more than $700.

Submit your presentation proposal on line at www.nfpe.org by September 14, 2007, to be a part of this important event.

For questions or information, please see the section Web site at www.nfpa.org or contact the Executive Secretary Allan Fraser at (617) 984-7411 or afraser@nfpa.org.

• NFPA's New Emergency Evacuation Planning Guide for People with Disabilities
• Where Does He Get All Those Wonderful Toys? Inexpensive Tools for Building Officials
• Interior Finishes, Facades, Decorative Features, and More: A Fire Protection Focus
• Commissioning of Fire Protection Systems
• Unique Interiors on the Las Vegas Strip
• Building Department Innovation and Regional Consistency
• Math for Code Officials
• Large Building Fires and Subsequent Code Changes
• How Fire and Building Officials Work Together to Achieve a Code-Compliant Project
• Understanding Building Code Sprinkler Trade-offs

System 3505 - the world's leading universal head end, identifies alarm sources, issues alerts, suggests best responses, annunciates, prints and displays addressable information. Allows mixing and matching of alarm input devices and transmission media.

MuxPad II - a supervised UL interface to a variety of FACP's. Transmits precise addressable information and/or EOL Points over most transmission media to System 3505.

Remote Annunciator - a remote operator interface linked to one or more System 3505s by Ethernet. Displays alarm/trouble information at additional locations, includes user-defined programmable functions for alarm/trouble events.

Digitize systems - UL-listed and FM-approved - protect more than 5,000 facilities worldwide.
Organize and participate in coalitions

- Education and Implementation
  - Present lessons about a variety of targeted hazards/risks to diverse audiences in diverse settings using a variety of methods
  - Distribute public information through print and mass media
  - Develop lesson plans
  - Design FLSE programs
  - Train department personnel

- Evaluation
  - Measure outcomes and effectiveness of FLSE programs

- Public Information Officer
  - Conduct media interviews
  - Establish a media area at emergency incidents
  - Coordinate dissemination of information
  - Write news releases and media advisories
  - Coordinate press conferences

- Juvenile Firesetter Intervention Specialist I & II
  - Conduct interviews with juveniles and their families
  - Implement educational, mental health, and legal interventions as appropriate
  - Establish and work within interagency network for referrals
  - Measure changes and document program results
  - Develop training for program personnel
  - Develop community awareness programs about juvenile firesetting

Please send high-resolution digital photos or large (5- by 7-inch or 8- by 10-inch) prints from a film camera. For digital photos, use the "very fine" setting or the highest pixel resolution available. And remember, proper release forms are essential from everyone in the photo and from the photographer.

Please send your photos, along with the completed release forms, which you can download from www.nfpa.org; the names of everyone in the photo; and a description of the activity being depicted to Peg Carson at 35 Horner Street, Suite 120, Warrenton, Virginia 20186 no later than October 1, 2007. You may also phone me at (540) 347-7488 or email me at peg@carson-associates.com.

Peg Carson is past chair of the NFPA Education Section.

Section Delivers Impressive Program Lineup at WSC&E

BY JANET KNOWLES

We hope you enjoyed the very impressive line-up of seminars the Education Section sponsored this year.

On Sunday, June 3, Angela Mickalide of the Home Safety Council (HSC) and Andrea Gielen of the Johns Hopkins University Bloomberg School of Public Health presented findings from the national survey, Fire and Life Safety Education in U.S. Fire Departments, conducted in 2006. Responses collected from 1,523 fire departments offer an understanding of the current levels of fire- and life-safety educa-
tion (FLSE) activity, barriers to increased commitment, and types of resources and assistance that would be most beneficial to those who deliver FLSE programs at the local level.

Most helpful in increasing department FLSE activity would be free safety products to distribute, free community education materials, and information about funding FLSE activities. The full report is available at www.homesafetycouncil.org.

Also on Sunday, Mike Halligan from the University of Utah, who is also president and CEO of the Board of Directors for the Center for Campus Fire Safety, and Michael Swain from the University of Massachusetts delivered a program packed with information on fire safety for jurisdictions with college or university housing.

Primary factors in fatal campus housing fires were lack of automatic fire sprinklers, missing or disabled smoke alarms, careless disposal of smoking materials, and alcohol consumption. Perhaps the biggest challenge is arson because students look at their activities as simple pranks.

Halligan and Swain discussed legislative initiatives and described resources from the Center for Campus Fire Safety for use in student training programs. They closed the session with examples of, and suggestions for, campus fire-safety programs.

On Monday, June 4, Cindy Giedraitis of the College Station, Texas, Fire Department and Bill Timmons of the Ridge Road Fire District in Rochester, New York, spoke about successful interaction between fire inspectors and fire educators. They discussed why fire codes are important for the educator and the inspector, and explained why both need to understand the codes. Examples demonstrated how properly constructed buildings benefit the public and how fire-safety messages interact with the fire codes. They also shared successful community programs that involve the educator and the inspector. Attendees were encouraged to get to know their counterparts in prevention and interact to make the community safer together.

Burn nurse educators Pat Mieszala of Burn Concerns and Amy Acton of the Phoenix Society for Burn Survivors discussed whether to use the reality of burn injuries in fire and burn prevention presentations. Their presentations highlighted various techniques and campaigns using fear appeals. They reviewed current research in public health, identifying when and why using these realities can be effective in changing safety attitudes and behaviors.

As a burn survivor, Amy emphasized the importance in education programs of being sensitive to the needs of burn survivors and their families. Survivors willing to participate in such programs need tools from fire department and burn prevention educators to use in presenting effective prevention messages, as well as recognition for their courage in breaking the stereotypes of those with disfigurements.

Dr. John Hall and Sharon Gamache, both of NFPA, presented results from an NFPA research project funded by the U.S. Fire Administration that covered three of the most important topics in fire safety: smoking, the leading cause of fatal home fires in the United States; cooking, the leading cause of fires and fire injuries; and rural areas, the leading high-risk area for fire deaths.

Panel discussion
The section also sponsored a panel discussion on the cooking fire problem, a topic on which there is substantial disagreement in the fire protection community. Moderated by NFPA's John Hall, the discussion featured presentations by NFPA's Marty Ahrens and Gary Keith, Kerry Bell of Underwriters Laboratories (UL), Daniel Madrzyskowski of the National Institute of Standards and Technology (NIST), and Wayne Senter of South Kitsap Fire & Rescue.

Marty opened with NFPA's research on the cooking fire problem. Over the past 20 years, kitchen fires have declined very slightly compared to home fires in
general. Ahrens said it can be tempting to think that all kitchen fires are caused by cooking, but a significant percentage are caused by cooking equipment and smoking materials.

Wayne Senter discussed education, enforcement, and engineering as they relate to residential kitchen fires. He suggested inexpensive technology to ease acceptance of retrofit applications, including a range-top firestop product that costs about $100, a slightly more expensive automatic hood system, and one or two sprinklers above the stove top.

Dan Madrzykowski opened his presentation with the results of tests NIST conducted on suppression of residential cooking fires. The study looked at self-contained, hood-mounted, wet-chemical systems (and some dry chemical systems); a high-pressure water mist system mounted in the ceiling; a single low-flow residential sprinkler; a water mist system mounted in the hood; and hand-held extinguishers. He noted the pros and cons of each type of system, including cost and ease of retrofit, area of protection, re-ignition, and the water pressure available for a single sprinkler.

Kerry Bell noted that UL has been listing small self-contained units specifically for range-top suppression for more than 20 years but said that the majority have been installed in military facilities. Currently, five companies have listed products, which can be found in UL's online certification directory. Bell noted that these products have not been tested and may not work in some kitchen layouts in new construction.

Gary Keith noted that the Home Fire Sprinkler Coalition (HFSC) bases its protection recommendations on systems installed in accordance with NFPA 13D. Sprinkler Installations in One and Two-Family Dwellings and Manufactured Homes, and that HFSC sees a big difference between store-top and full-home fire protection.

A residential system complying with NFPA 13D is a partial system. From HFSC's viewpoint, a kitchen-only system must be endorsed by the NFPA standards process, and it should be used primarily for retrofit applications.

Dr. Hall closed the two-hour program by summarizing what had been discussed and discussing how to evaluate the options, explaining that, for each option we consider, we ought to ask the same questions and interpret the answers using the same criteria. He also noted that the purpose of the program was not to pick the best solution but to have a smarter discussion and end up making better decisions for fire safety.

"On that score, I think we've done very well indeed," he said.

Fire safety and a night out
On Tuesday, June 5, the Education Section schedule began with a program that focused on how to be fire-safe when going out with family and friends. Presenters were Dr. Jeff Thomas of Arizona State University and Lynn Schofield of Provo, Utah, Fire and Rescue, who discussed the technologies available to keep us safe, such as sprinklers, smoke alarms, exit plans, and exits, and the resolve needed to respond to fire alarms, even when no one else does.

Another Tuesday program featured Paul Schwartzman of Fairport Counseling Services and Pat Mieszala of Burn Concerns, who emphasized that juvenile fire-setting is not just a fire service concern. Juveniles who misuse fire are motivated to engage in this behavior for many different reasons and often require the support of many community professionals in varying disciplines. A community coalition helps to maintain an effective intervention program and facilitates access to these services.

Developing a coalition takes persistence. Getting individuals and agencies to work together requires understanding, common goals, clear communication, and flexibility. The seminar sparked a lively discussion in which participants shared their frustrations and successes in addressing these issues in their own communities.

Another lively seminar on Tuesday gave attendees an opportunity to learn about the official Fire Prevention Week (FPW) theme, Practice Your Escape Plan. FPW is celebrated throughout the month of October with a special emphasis on the week of October 7 through 13. Judy Comoletti, NFPA's assistant vice-president of Public Education, provided an overview of Fire Prevention Week in a Box, which includes the FPW poster, banner, brochure, a kid's brochure, and Facts About Fire.

Amy LeBeau, NFPA's public education communications manager, introduced attendees to the Fire Prevention Week Web site with a guided tour of www.firepreventionweek.org. Attendees were also introduced to NFPA's newest family members, the Uh Ohs. These whimsical figures teach children about safety and have their own Web site at www.theuhohs.org.

Business meeting and dinner
The annual business meeting closed the Education Section's programming. Chairman Paul Schwartzman introduced officers and other members of the section Executive Board and encouraged all section members to get involved with section committees and activities.

Peg Paul, representing the HFSC, closed the session by describing the educational components available in the coalition's new public educator kit. She gave a kit to educators in the meeting and encouraged visits to the coalition Web site, www.homefiresprinkler.org.

Public educators from across the country ended their Boston experience with the Education Section dinner at Durbin-Park Restaurant in Boston's famous Faneuil Hall Market. Watch for details on next year's program in Las Vegas!

Janet Knowles is with the American Fire Sprinkler Association.
FIRE SERVICE

Section Executive Secretary Retires

Section Chair Kirk Owen presented NFPA Assistant Vice-President of Public Fire Protection and Executive Secretary of the Fire Service Section Gary Tokle with a gift in appreciation for his support of the section and the fire service at the 2007 World Safety Conference & Exposition on June 4.

Gary retired on August 1 after 21 years with NFPA. Many other organizations and individuals also recognized Gary for his support of both fire prevention and the fire service.

Steven Sawyer has been named the section's new executive secretary. Steven has worked at NFPA for 14 years, mostly in the Public Fire Protection Division. He is also executive secretary of the International Fire Marshals Association. Steven has more than 30 years' of fire service experience, serving as a deputy chief and deputy fire marshal. He is still an active firefighter.

Accident and Near-Miss Reporting: A Tool to Drive Down Firefighter Deaths?

BY DAVID KENNEDY

Having just returned from San Diego for the NFPA Fire Service Section Board meeting, I was amazed at the apparent complacency that still exists amongst firefighters regarding accident and near-miss reporting.

The National Firefighter Near-Miss Reporting System (NFMRS) promoted by John B. Tippett, which includes exceptionally high-calibre promotional and teaching material, should be sufficient to grab our attention. It would seem that it is not. Well, at least not according to the banter and chat I heard amongst some young and not-so-young operational personnel at leisure.

There I was, enjoying a well-earned beer following the 7,000-mile trip from Scotland to San Diego, when I heard someone say, "Only the cautious report accidents." The statement was accurate enough, but the delivery of the words was scathing in tone.

I am not going into the number of firefighter fatalities reported in the United States or the causes of these sad occurrences. NFPA's Rita Fahy does a much better job at that than I ever could. But I will say that the comment alerted me to the fact that we all have a long way to go. The near-miss reporting system is a first-class process, but it is only the midpoint of the journey to eradicate fatalities and serious injuries.

In 1987, I was promoted to Strathclyde Fire and Rescue Service health and...


**About NFPA**

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

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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 e-mail 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 e-mail 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.

- **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.

- **Free Directory and Buyers’ Guide:** Keep these references at hand so you know who to call for what. NFPA Directory lists staff contacts and areas of expertise as well as directories to technical committees you may wish to serve on. The NFPA Journal Buyer’s Guide helps you locate products, manufacturers, consultants, and trade names quickly.

- **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.

- **Executive (HSE), which is our equivalent in the U.K. to up their game or expect serious injuries from our control room, whether as a result of incidents in the U.K. have a voice in codes and standards, research, training, and education.

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- **To join NFPA or to update your membership information, call 1-617-770-3000 or 1-800-344-3555; write to NFPA, One Battery March Park, Quincy, MA 02169-7471; fax 1-617-770-0700; or visit www.nfpa.org.**

safety officer. Strathclyde has some 2,300 career, 650 part-time, and 250 volunteer firefighters, and 113 fire houses. A further 500 support staff serve a population of 2.5 million citizens.

At that time, I was the fire department’s only safety officer, and I can assure you it was not a job senior colleagues relished. In 1987, senior management had not got a grip on the strategic or dynamic aspects of firefighter health and safety, and the firefighter unions were scathing of their “it’s a dangerous job that will sometimes get you injured or, God forbid, killed” approach. And rightly so. Reporting near misses was way off the chief’s radar screen, and receiving accident reports was a real achievement since asking crews or officers to complete the paperwork was a great chore.

Around this time, the Health and Safety Executive (HSE), which is our equivalent of OSHA, was pushing all industries in the U.K. to up their game or expect trouble with a capital T. Some chief fire service officers were more aware of the lack of serious effort put into driving down the causes of accidents, and many of those in positions similar to mine began a network of safety officers.

The HSE, which had great expertise in accident investigation and training investigators, were happy to assist and fund the new network. Slowly—and I mean slowly—we began to raise the issue of accident reporting and proper investigation to the top of the fire service agenda.

In Strathclyde, we set about building a team of officers throughout the brigade who had an interest in establishing a system of alerting us not only to the number of accidents on the fire ground, but also to those that occurred en route to a fire and in the fire station. To make sure the unions took us seriously, I took all serious injuries from our control room, whether I was on or off duty, and informed the local union rep, whatever the time of day or night, that I was about to begin an investigation immediately, inviting him to join me at the location.

I am not certain that their wives or partners were pleased to be awakened in the early hours of a winter morning by such a call, but we achieved the goal of alerting everyone that we were serious about raising awareness. We realized some success when the union reps eventually began asking for an initial investigation report the next day.

My senior colleagues soon received similar calls regarding injuries to their division or battalion personnel at the time of occurrence. For the first time, we were all more informed of the actual seriousness of what was happening out on the ground, instead of just accepting that it was an unavoidable part of the job. And after about five years, we began to notice a dramatic decline in accidents in all categories.

How did we do it? We insisted that every accident that occurred on duty be reported on a form submitted by the officer in charge of the station and that groups of officers scrutinize and collate them, providing feedback when appropriate. We coordinated common occurrences and informed all sections of the department about them, making sure that accident reporting had a high profile from the top of the organization.

We gave the chief officer or deputy total responsibility for chairing the annual safety committee meeting, in which union and station personnel were asked to become involved and to attend. We also published regular safety notices about the most common or dangerous occurrences and produced a short but punchy annual report. In addition, colleagues made regular visits to frontline fire stations to push the importance of saving firefighters the pain of injury.

Over the past 10 years, firefighter deaths as a result of incidents in the U.K. have declined. Some years, none have been recorded. Serious injuries have followed a similar pattern.
The unions, personnel, and officers have played an important part in that success. It is amazing the number of people who will volunteer to scrutinize reports and collate common trends if they can see it makes a difference and is supported by senior management. Scrutiny of accidents and reports picks up instances of faulty equipment, flawed operational procedures, or careless acts by individuals. Without this process, departments miss the opportunity to reduce accidents, injuries, and deaths.

Near-miss programs are excellent, and the standard of the material being circulated by the National Fire Fighter Campaign is exceptional. However, a good accident reporting process can provide early warnings that can help prevent near misses.

I am unaware how sharp OSHA’s teeth are. In the U.K., however, the HSE have sharp teeth when required. Should a fire department fail, in their judgement, to protect its personnel or the public, the HSE can issue prohibition or improvement notices. Failure to comply can lead to prosecution of senior officers or the implanting of a mentor to help implement improvements. No chief officer wishes to suffer that indignity.

There are obviously many other aspects to raising awareness amongst those of us serving in dangerous occupations, and I have only touched on some in support of the near-miss campaign. Any avenue that leads us through our careers safely and helps us keep our skills available to protect the public is imperative.

David Kennedy, QFSM, is deputy fire chief (retired) of Strathclyde Fire and Rescue in Strathclyde, Scotland.

Suggestions Welcome
If you have any suggestions for the Fire Service Section, please contact any board member or the Executive Secretary Steven Sawyer at (617) 984-7423 or at ssawyer@nfpa.org. Remember, this is your section.
to flaming required glowing combustion to be present. Ignition times generally increased as the surface temperature decreased until a temperature was reached at which ignition was no longer seen.

Ignition times for given applied wind and surface temperatures and transition to flaming behavior depended on the fuel. An applied wind generally reduced the time required for ignition, with the reduction being greater as the velocity increased.

A commercially available cone calorimeter operated in the non-piloted ignition mode was used to impose known radiative heat fluxes on the fuel surface, and ignition times were measured as a function of applied heat flux. Shredded newsprint, heat fluxes on the fuel surface, and ignition times identify risks and address ways they can modify homes and landscapes to better resist wildfires. The course is based on decades of research into how homes ignite during wildfires.

According to wildland/urban interface (WUI) specialist Brian Ballou, the course "reveals the truths about how fires in WUI areas really work," and helps participants understand "that it's possible to make homes in the interface very resistant to damage or destruction from wildfire."

The two-day course presents the myths and facts of fire in the WUI, the history and context of wildfires, the science of wildfire behavior, and risk factors in the home ignition zone. It also discusses how to conduct home inspections and hazard assessments. Attendees will receive a student workbook and notebook that includes the instructor's slide presentations, as well as the opportunity to practice home assessments in the classroom.

Course locations include Austin, Texas; Denver, Colorado; and Tampa, Florida.

For more information about the course and to make a hotel reservation, please visit www.firewise.org/hizworkshop. To register and take advantage of your 15 percent member discount, print the registration form and mail the completed form, along with a check for $170 made out to NFPA, to Linda Coyle, NFPA, 1 Batterymarch Park, Quincy, MA 02169. Include your NFPA member number on the check.
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Circle Card No. 045

Remote System Management
GE Security's EST brand FireWorks command interface goes global with remote connectivity via LAN, WAN, or Web connection. Now FireWorks workstations can remotely monitor events and generate facility-wide reports from any number of locations across town or around the world. Its unique filtering feature allows personnel in different locations to see only the information relevant to their sphere of activity: service personnel get details on maintenance events, while elsewhere, security personnel keep tabs on access control happenings. For more information, contact gesecurity.com/est
Circle Card No. 046

Alarm System Monitoring
Fire and security alarms can be relayed with pinpoint accuracy using the new Text-2-Cell Alarm Monitoring and Dispatching System from Digitize. Employed in conjunction with the Digitize Remote Annunciator, Text-2-Cell instantly transmits alarm and response information from the Remote Annunciator to those people with a need to know, regardless of their locations. Compatible with all cell phone networks, Text-2-Cell supplies detailed information, as it appears on the System 3505 and Remote Annunciator. For additional information visit digitize-inc.com.
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Here's the perfect way to jump start your campaign and build excitement around the 2007 FPW theme—"It's Fire Prevention Week. Practice Your Escape Plan." Order this selection of official FPW products today so you'll be ready to spread the message of the importance of escape planning across your community. Just choose the size that's right for you!

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When you have questions about today's fire alarm system requirements, the 2007 National Fire Alarm Code Handbook has the answers. Significant new and revised provisions concerning such important topics as Mass Notification Systems, smoke detection in joist and beam ceiling applications, video image smoke and flame detection, multi-sensor and multi-criteria detectors, exit marking audible notification appliances, synchronization of visible notification appliances and smoke alarms with voice offer enormous potential for improving fire protection and life safety. The National Fire Alarm Code Handbook is your key to doing jobs right the first time. For more information, visit www.nfpa.org/catalog.
Circle Card No. 048

Linear Heat Detector

The Protectowire Company, Inc. introduces a new linear heat detector, Model PHSC-135-XLT that provides increased flexibility for the system designer. PHSC-135-XLT is the first digital type linear heat detector with an industry standard 135°F (57°C) alarm temperature, and has the ability to withstand ambient temperatures to -60°F (-51°C). For more information, visit www.protectowire.com.
Circle Card No. 049

Access Control

STI announces the Exit Stopper is now available with dual access control. This version continues to help solve the problems of unauthorized exits and entries of fire doors with the added feature of operating the Stopper from both sides of the exit/entry door without using alarm delays. STI Exit Stopper with Dual Access Control contains an Exit Stopper housing with a DPDT (double pole double throw) key switch to be mounted on one side of a door or wall; and a similar looking housing, also with DPDT key switch (without an alarm), for the opposite side of the door. For more information visit www.sti-usa.com.
Circle Card No. 050
Seismic Detectors
Bosch Security Systems, Inc. has launched two new safe and vault seismic detectors - the Bosch ISN-SM-50 and ISN-SM-80. With their patented SENSTEC® sensor and micro-controller-based signal processing system, the detectors are ideal for complete 24-hour monitoring of safes, ATMs, night deposits, and strong room walls and doors. The detectors' construction makes them easy to install. Application-specific predefined settings allow installers to quickly set the detectors for most environments. For further information, please visit the Bosch Security Systems Web site at www.boschsecurity.us.

Circle Card No. 054

Alarm Control Systems
NOTIFIER announces that its ONYX® Series of intelligent fire alarm control systems is UL 864 Ninth Edition listed. The ONYX Series is comprised of the NFS-320 for small applications such as restaurants, strip malls, and standalone retail facilities, the NFS2-640 for mid-size applications like office buildings, assisted living facilities, and school buildings, and the NFS2-3030 for larger installations such as high-rise buildings, hospitals, shopping malls, and airports. All ONYX Series panels features NOTIFIER's patented FlashScan® intelligent device polling protocol, which exceeds worldwide code requirements for response time. For more information, visit www.notifier.com.

Circle Card No. 053

Mass Notification System
The United States Department of Homeland Security (DHS) recently issued MadahCom, Inc., a division of Cooper Industries, a certification for its WAVES Mass Notification System (MNS) as an "approved product for homeland security" under the Support Anti-terrorism by Fostering Effective Technologies Act of 2002 (SAFETY Act). This Act provides legal liability protection for MadahCom and its customers of WAVES, a "qualified anti-terrorism" technology. Under the SAFETY Act, MadahCom's WAVES is the only certified and approved product for mass notification. The technology provides mass notification to alert, warn and inform people of actions to take in the event of a terrorist attack. For more information, visit www.madah.com.

Circle Card No. 052

Flame Detection
MICROPACK's new generation flame detector provides all the benefits of "True Flame" visual flame detection technology, with superior quality color video. New levels of sensitivity are achieved without affecting the detector's superior false-alarm immunity and its ability to detect fires in the presence of sunlight, rain, fog, and hot-objects. For more information about MICROPACK Detection (Americas) Inc., visit www.micropackamericas.com.

Circle Card No. 051
Fire and Gas Detection
Detector Electronics Corporation (Det-Tronics) released a fire and gas detection system certified for applications to Safety Integrity Level 2 (SIL-2) by the globally-recognized certification agencies exida and TuV Nord. Det-Tronics SIL-2 certified X3301 multi-spectrum infrared flame detector and PIRECL Eclipse infrared combustible gas detector, together with the Eagle Quantum Premier (EQP) controller and Enhanced Discrete Input/Output (EDIO) module, are the components that form the SIL 2 capable system. The SIL-2 EQP system provides industrial customers a single solution that fulfills both the needs of a Safety Instrumented System and an approved fire and gas detection system (FM approved to NFPA 72). Requiring the most reliable fire and gas detectors and systems available, companies are moving toward implementation of safety systems in accordance with the international safety standard IEC 61508, which is a risk-based approach for determining the safety integrity level of safety instrumented functions. Learn more at www.det-tronics.com.

CO Gas Detection
SimplexGrinnell has added important new technology to its portfolio of industry-leading life-safety solutions - a CO gas detection kit that enables Simplex fire alarm systems to detect excessive levels of poisonous carbon monoxide and warn building occupants of the condition. The company’s introduction of the CO gas detection solution comes amid growing legislative efforts to help protect against carbon monoxide poisoning. The basic CO solution from SimplexGrinnell includes a UL-listed carbon monoxide detector and a UL-listed Simplex supervised Individual Addressable Module (IAM) that can be connected to a Simplex fire alarm panel. This combination of technologies enables a Simplex panel to monitor a CO detector for supervisory service alarm and trouble conditions. If a potentially harmful level of carbon monoxide is detected, an audible alarm is sounded and the detector’s specific location is communicated to the fire panel to help facilitate a fast response. CO alarm conditions can also be reported to a central station monitoring center or via the Internet to offsite management personnel.

Portable Detector
Early Warning Fire Detection systems, or simply a “burning or electrical odor” can alert you of an impending fire threat long before a fire occurs, but they cannot tell you where the fire threat is located. The ProLocator is the first handheld portable detector that can guide you to the source of the fire alarm. Using CCD technology, the ProLocator is immune to dust, dirt, and other factors that could deter it from leading you in the right direction. The ProLocator is the perfect addition to any fire detection system. For more information, visit our Web site, www.safebydetection.com/PL

Detection Systems
Vision Fire & Security is pleased to announce the company has changed its name to Xtralis. Xtralis’ product range encompasses air-sampling smoke detection systems (VESDA), sophisticated video-based security solutions (ADPRO), voice alarm systems (MILLBANK), fire control & management solutions (PROACTIV) and a latest acquisition of ASIM, a manufacturer of security detectors, traffic detection & traffic data acquisition systems. For more information, visit www.xtralis.com.
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FIRST WORD from page 6

Altria, which owns Philip Morris, has supported the legislation.
This campaign has also inspired other countries to look at the issue. There is action in the European Union to pass a regulation that will mirror what we have done by next year.
This battle is not over yet. As of right now, we still have 28 states and the District of Columbia to go until we have a true national standard. We are not ready to take a victory lap quite yet, but we are closer to our goal than anyone thought we could be by now.
We hope that this campaign and the lessons we learn from its success will be a starting point for other projects NFPA will lead to save lives and protect property from fire.

BUZZWORDS from page 42

Corridor length, the following shall be permitted:
(a) Smooth ceiling spacing including those provisions permitted for irregular areas in 5.6.5.1.2, substituting ‘selected spacing’ for ‘listed spacing’;
(b) Location of spot-type smoke detectors on ceilings, sidewalls, or the bottom of beams or solid joists.
(5) For rooms of 84 m² (900 ft²) area or less, only one smoke detector shall be required.

The asterisks shown next to the numbers indicate explanatory material in Annex A of the Code.
There are additional changes to the Code based on other research, but the above examples show how the process works.

STRUCTURALOPS from page 38

for rescue and/or fire attack—is structural stability.
Modern construction methods conserve materials by using lightweight structural members providing the same load-bearing capabilities as earlier construction methods using massive structural members. The primary way this is accomplished is through truss construction. Lightweight trusses take the place of large wood beams or steel I-beams. Truss construction methods are structurally sound under most conditions. However, these lightweight structural members are adversely affected by a fire much sooner than heavier building materials. Compounding the problem is the fact that once the truss loses its triangular configuration, it loses load-bearing capacity. A well-involved fire in a truss space may not be detected until it breaks out of containment. Several fire reports mention that fire fighters working on the interior reported that there was little indication of a serious fire prior to collapse.
A truss roof failure over a compartmented area may be partially suspended by walls separating the rooms below. Truss roofs above large open areas are particularly dangerous. Truss roof collapse over an open area generally results in a large area of damage and poses a serious threat to fire fighters working on the roof or inside the building. Many older buildings are modernized by suspending ceilings or by adding walls or paneling and installing a facade. Retrofit of air-conditioning units or other HVAC equipment to the roof may impose additional loads to the structure that were previously not contemplated. These renovations provide additional concealed spaces for the fire and present additional dangers to fire fighters. Fire entering a concealed truss area causes failure in a relatively short time, as has happened in several fires that have killed fire fighters. Heavy timber or fire-resistive structures, subjected to the same volume of fire, would be expected to withstand fire attack longer than a frame structure.
A building’s performance under fire conditions can be unpredictable and exterior appearances may not indicate interior conditions. Structural failure can occur at any time. Always consider structural stability when sizing up a fire. The risk to fire fighters tends to increase and the possibility of saving lives and property diminishes as the fire continues to burn. When attacking a well-involved fire in the offensive mode, the IC should start the clock.
When an “all clear” is established, or if after a given period of time the fire is still not under control, the incident action plan should be reviewed and a change to a defensive attack considered.

HEADS UP from page 36

sprinklered buildings, if hose valves or stations are provided on a combination sprinkler riser and standpipe for fire department use in accordance with NFPA 14, the hydraulic calculation for the sprinkler system is not required to include the standpipe allowance and should be limited to 50 gpm at each hose valve to a maximum of 100 gpm.

Consistent with the history of this entire issue, this new wording should simply be interpreted to address the possible presence of small hose connections on the downstream sprinkler systems, and should not be considered a waiver of the water demand for the 2-1/2-inch hose valves on the combined riser, over which NFPA 14 continues to have jurisdiction.
AD INDEX

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A NUMBER OF nursing home fires occurred in the early 1950s. Following World War II, hundreds of older hotels, homes, hospitals, and other buildings were converted to nursing homes; and by 1954, there were 270,000 people living in 9,000 nursing homes across the country. Lack of standards and the age of many converted buildings made nursing homes especially vulnerable to fire.

NFPA listed 28 fatal nursing home fires in the April 1953 issue of Fire News. The deadliest of these included a 1951 convalescent home fire in Hoquiam, Washington, that killed 21 of 29 patients, and nursing home fires in Hillsboro, Missouri, in 1952 that killed 20 and in Largo, Florida, that killed 33 in 1953.

The NFPA Safety to Life Committee developed standards for nursing homes, and NFPA's Technical Secretary, Robert Moulton, prepared and sent to all NFPA members a set of fire safety recommendations for nursing homes. Then the October 1954 issue of the Quarterly included "Let's Prevent Nursing Home Fire Casualties" by Chester Babcock of the NFPA staff. But the deadly nursing home fires continued to occur.

Both Babcock and Moulton served in an editorial capacity for the Quarterly and Fire Journal.

Unsprinklered nursing homes
On February 17, 1957, fire broke out at the unsprinklered Katie Jane Nursing Home in Warrenton, Missouri. This fire killed 72 of the 149 patients. The Golden Age Nursing Home fire in Fitchville, Ohio, killed 63 of the 84 patients on November 23, 1963, but it was overshadowed in the national media by the assassination of President John F. Kennedy, which had occurred a day earlier. There were no sprinklers or fire alarm systems, and the facility was miles from the nearest volunteer fire department.

In 1967, amendments to the Social Security Act added language that nursing homes meet the requirements of Life Safety Code as a condition of Medicare and Medicaid reimbursement, thereby establishing NFPA 101 as the Federal fire safety standard for health care facilities. Unfortunately, enforcement of these regulations was inconsistent, and in 1970 the nursing home fire problems resurfaced when a convalescent home fire in Marietta, Ohio, killed 31 of the 46 patients.

From 1970 to 1973, there were 8 care-of-aged facility fires, each killing at least 10 people and collectively killing 112. The number of multiple-death fires in nursing homes was between 15 and 18 annually. A pattern of insufficient fire protection, no sprinklers, and undivided construction due to adding extensions to aging dwellings was revealed. Codes, including the Life Safety Code, were strengthened, but multiple fatality fires continued.

In 1976, fires in the Wincrest and Cermak House nursing homes killed 23 and 8, respectively. Both of these fires were detailed in Fire Journal. Neither facility had automatic sprinklers.

Fires on the decline
Fatal fires in facilities that care for the aged began to decline, dropping 27 percent from 1980 to 1999 despite a 1989 fire in a retirement home in Roanoke, Virginia, that killed 12. In 1991, the Life Safety Code mandated sprinklers for all newly constructed nursing homes regardless of height or construction, but did not extend this requirement to all existing nursing homes because of retrofit costs and the exceptional fire record during this period.

From 1994 through 1999 the average number of fire related nursing home deaths nationwide dropped to five.

**Life Safety Code requirement**

But in 2003, fires in unsprinklered nursing homes in Connecticut and Tennessee killed 16 and 15 people, respectively, and restarted the debate on whether those at high risk were safe. The Life Safety Code Committee again reviewed the evidence and in the 2006 edition of NFPA 101 added requirements for the sprinklering of all nursing homes including all existing nursing homes. These requirements were endorsed and supported by the American Health Care Association. It is estimated, however, that 20 to 30 percent of the 16,300 nursing homes nationwide lack automatic sprinkler protection. Until the Life Safety Code sprinkler requirements are fully implemented, choosing a fully sprinklered nursing home for your loved ones is the safest option.

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