JOURNAL
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MULTIPLE DEATH FIRES 2004

Thirty-two catastrophic fires killed 152 people in the United States last year

2004 U.S. fire loss
Residential fires top the list

Post-impact
The role of fireproofing in the new World Trade Center tower

Pump it up
Proper maintenance and testing will keep your fire pumps in working order

When you go out, blow out
Fire Prevention Week 2005 focuses on candle fire safety

SEPTEMBER/OCTOBER 2005
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nfpa JOURNAL®

COVER STORY

2004 Multiple-Death Fires

Most of the catastrophic fire deaths occurred in residential properties.
By Stephen G. Badger

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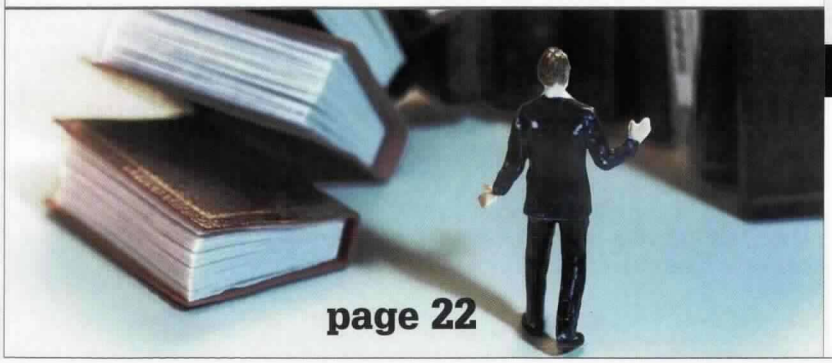

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ABOUT NFPA

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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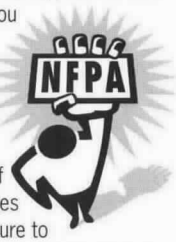

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First Word

by James M. Shannon

Fire-Safe Cigarettes: The Time Has Come

As this publication goes to press, the United States could be on the brink of an advance in fire safety that could save thousands of lives and prevent billions of dollars in property damage over the next several years.

For years, NFPA has worked with the fire service, safety advocates, and political leaders in Washington and across the country to require cigarette manufacturers to make cigarettes that either extinguish themselves or burn at such a low temperature that they will not ignite furniture or mattresses.

I have written about NFPA's campaign for fire-safe cigarettes in this space before. The case for them is compelling: Cigarettes are the number one cause of fatal fires in the United States, taking 700 to 800 lives a year. Annually, property losses from fires caused by cigarettes run into the hundreds of millions of dollars.

Two states, New York and Vermont, have already acted by passing their own laws. New York's went into effect last June, and Vermont's was signed into law in June of this year.

Information on the New York fire experience since the new law took effect is being compiled, but it will take some time before we have a clear picture of how effective the law has been in preventing deaths, injuries, and property loss. However, there is no indication from sales figures that consumers are less likely to purchase fire-safe cigarettes than regular cigarettes. In fact, tax receipts from cigarette sales in New York increased in the year after the law took effect, refuting claims by opponents that this would alter the taste or smoking experience of the cigarette-buying public. New York's experience shows that consumers are ready to accept fire-safe cigarettes, so there is no reasonable business rationale for the cigarette companies' opposition.

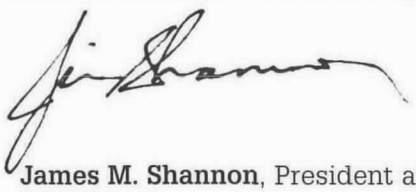
Now California seems ready to follow the lead of New York and Vermont in enacting its own legislation to require that cigarettes be fire-safe if sold in the state. If Governor Schwarzenegger signs the California bill into law, the tobacco companies will be producing fire-safe cigarettes for about 20 percent of the country's population while subjecting the other 80 percent to the unnecessary fire danger posed by traditionally manufactured cigarettes.

Legislative proposals are at various stages in several states, and the national legislation, supported by Representatives Ed Markey (D-MA) and Peter King (R-NY) in the House and Senator Richard Durbin (D-IL) in the Senate, has picked up additional sponsors. The companies that produce cigarettes probably have the political clout to drag out this process for the next few years, but it seems inevitable that, at some time in the near future, the United States will have a national fire-safe cigarette standard, either through national legislation or state-by-state action.

It is time for the tobacco companies themselves to cease their irresponsible opposition to this important safety measure and to announce a date by which they will produce only fire-safe cigarettes.

The attitude toward smoking in the United States has changed tremendously in the last 40 years since the release of the Surgeon General's Report linking smoking and cancer. Public health advocates encourage people as strongly as they can not to smoke, but, for the foreseeable future, a significant proportion of our population will continue to buy and use tobacco. The tobacco companies that make billions of dollars from the sale of cigarettes have it within their power to substantially reduce the fire danger smoking poses. They owe it to all of us to help lead the way to a safer world.

I call on them to take that step for safety. Fire-safe cigarettes are an idea whose time has come. Responsible individuals and corporations, whatever their positions have been in the past, should act now to ensure that this vital safety measure is available to protect everyone in the United States as soon as possible.



James M. Shannon, President and CEO, NFPA

PHOTOGRAPH: JOEL W. BENJAMIN

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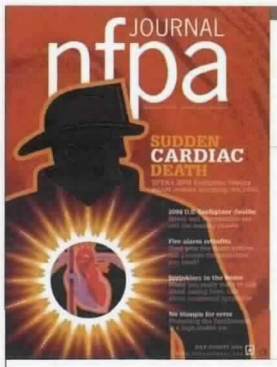

Mail Call

Comments? Please send your information to: ***NFPA Journal,*** 1 Batterymarch Park, Quincy, MA 02269-9101
email: jnicholson@nfpa.org

SMOKING ON OXYGEN

Over the past three years, the Wichita Fire Department has responded to numerous incidents involving burn victims who were on oxygen at the time of the incident. The one common denominator in all incidents was the ever-killing cigarette.

On April 3, 2005 at 0125 hours, 911 received a call from an 80-year-old citizen.

"My house is on fire," she said.

When fire crews arrived on scene the victim was found in the front yard with severe burns over 50 percent of her body. She was able to convey that she just lit a cigarette, and her clothing burst into flames. Fire crews packaged the victim, and EMS transported her to the burn center.

Attack crews, with a 1-inch line, attacked the fire through the front door and were able to quickly extinguish the blaze.

Fire investigators determined that the sofa was the area of fire origin. Next to the sofa was a partially destroyed liquid oxygen system. The oxygen supply hose ran from the tank to the sofa, which was destroyed by the fire. A follow-up interview with the victim confirmed that she had been lying on the sofa and while on oxygen, lit a cigarette....

Unlike three other victims who were smoking while on oxygen, this one did not perish.

Fire departments need to address this problem through public education. This will lead to a safer home for our older citizens.

E.F. BRICKNELL
Fire Marshal
The Wichita Fire Department Fire Prevention Division

NFPA RESPONDS

NFPA's Public Education Division can offer assistance through its *Remembering When: A Fire and Fall Prevention Program for Older Adults*™, developed by NFPA's Center for High-Risk Outreach and the Centers for Disease Control and Prevention to help older adults live at home for as long as possible.

Remembering When is centered around 16 key safety messages–eight fire prevention and eight fall prevention–developed by experts and practitioners from

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national and local safety organizations, as well as through focus group testing in the high-fire-risk states of Alaska, Arkansas, and Mississippi, and in Cleveland and Atlanta. For more information, visit www.nfpa.org.

COMMON SENSE OVERVIEW

Thank you for your excellent article "Welcoming Sprinklers into the Home" in the July/August 2005 issue of *NFPA Journal*. I found it a very positive, logical and common sense overview of the importance of fixed protection in homes.

It could not have come at a better time for Maine–next month, the *Maine Townsman*, the quarterly publication of Maine Municipal Association favored by town and city managers and department heads statewide, will feature an article on the future of volunteer/call firefighters in Maine. Reference to your article could reinforce the importance of detection and automatic suppression in communities' fire protection decisions.

And the September issue of ***Maine Firefighter***, MFT&E's thrice-yearly magazine, will focus on fire prevention. Again, your article is perfect for inclusion.

STEVE WILLIS
Fire Administrator
MFT&E at SMCC
South Portland, Maine

HOLLYWOOD EDUCATION

Thank you for the good news about NFPA code amendments to require sprinklers in all new home construction. Our members sometimes, however, have to work under one or the other model codes, so I hope that all our members will bring pressure to bear on the other code-making bodies.

As happy as the article made me, I was also reminded of the huge damage done to the cause of automatic sprinkler protection by television and Hollywood. Perhaps the various fire-safety organizations could get together and launch a public education program aimed at the studios and entertainment producers.

LARRY J. ROBERTSON
Teaneck, New Jersey

ERRATA

The May/June 2005 issue contained an error in the "What's New for 2005 at the WSCE?" article. Kidde and Fenwal are separate brands offered by Kidde Fenwal. The article incorrectly indentified the ARIES and FENWALNET as inter-related products.

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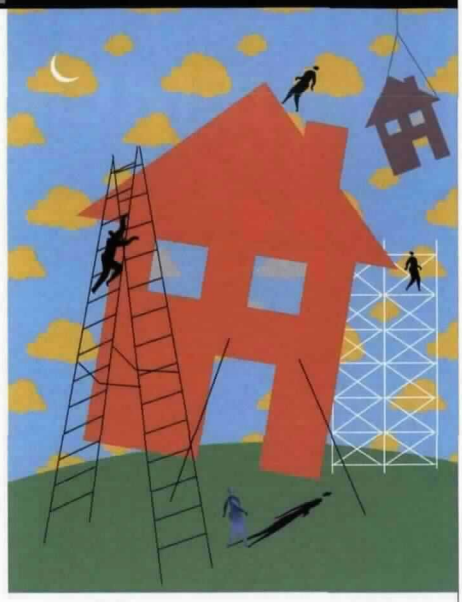
IN A FLASH!

NFPA NEWS
COMPILED BY
JOHN NICHOLSON

CODES AND STANDARDS

NFPA Standards Council issues sprinkler requirements



THE NFPA STANDARDS COUNCIL recently issued two safety codes that will require fire sprinklers in all nursing homes, in new construction of one- and two-family dwellings, and in all new nightclubs and similar facilities, as well as existing nightclubs and similar facilities that can hold over 100 patrons.

The provisions apply to the 2006 editions of NFPA 101®, *Life Safety Code®*, and NFPA 5000®, *Building Construction and Safety Code®*; they went into effect on August 18. The Standards Council action endorsed the report of the applicable NFPA technical committees and the subsequent membership action at the NFPA World Safety Conference and Exposition® last June in Las Vegas.

In a decision dated August 10, 2005, the Standards Council also denied an appeal by the National Association of Home Builders (NAHB) regarding mandatory sprinkler requirements in one- and two-family dwellings for the 2006 edition of NFPA 101, *Life Safety Code*. In writing the decision, Casey Grant, secretary of the NFPA Standards Council stated, "The effect of this action is that NFPA 101 is issued with Comment 101-312 as modified by TC and TCC, resulting in a new requirement that all new one- and two-family dwellings be protected throughout with an approved automatic sprinkler system."

During the hearing on this issue before the NFPA Standards Council, the NAHB did not argue the merits of sprinklers. Instead, it argued against the procedures that the NFPA has used for years.

The general thrust of the NAHB appeal was that any change to an NFPA document in the *Report on Comments* is not subject to public comment and therefore violates the American National Standards Institute (ANSI) requirements for producing ANSI-accredited standards and codes. The Standards Council rejected this argument. For more information, visit www.nfpa.org.

INVESTIGATIONS

NFPA's report of Hartford nursing home fire is now available online

Copies of NFPA's investigation of the 2003 Hartford, Connecticut, nursing home fire are available at www.nfpa.org. The report details the fire, which broke out in the early-morning hours of February 26 in a patient room, resulting in 16 fatalities and dozens of injuries. At the time of the fire, the facility was caring for 148 patients. The three-alarm fire damaged several patients' rooms and a wing of the facility.

Firefighters and the facility staff were faced with a growing fire and heavy volumes of smoke, as well as numerous non-ambulatory patients who were exposed to the smoke and heat.

Investigators determined that the fire began when a patient ignited her bedding with a lighter. She as not charged, as it was determined that she was not competent to stand trial.

NFPA's Fire Investigations Department documents some of the most significant fires and other emergency incidents throughout the world to determine what lessons they can teach us. The information is then made available to the fire safety community to be used in developing future codes and standards. A complete listing of reports can be viewed on the Fire Investigations Web page under "Research and Reports."

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SCHOLARSHIPS

NFPA awards $5,000 for each to promote fire-safety education

ALLAN JOWSEY of the University of Edinburgh, Jessica A. Kratchman of the University of Maryland, and Scott Somers of Arizona State University are this year's winners of NFPA's Fire Safety Education Memorial Fund scholarships.

A committee appointed by the NFPA's Board of Directors selected the recipients based on their academic achievement, leadership qualities, concern for others, commitment to volunteerism, and pursuit of careers in fire safety. Each scholarship is $5,000.

According to an NFPA press release, Jowsey, who is pursuing doctoral studies in fire safety engineering at the University of Edinburgh, is the recipient of the David B. Gratz Scholarship, established for students enrolled in fire science or engineering programs outside the United States or Canada. Jowsey's research has been published in conference proceedings and presented to the fire community across Europe. He refocused his studies from structural engineering to fire safety engineering after witnessing the events of 9/11.

The Gratz Scholarship honors the Maryland fire chief who was instrumental in initiating the fire science program at Montgomery College, where he served as an adjunct professor. Gratz was NFPA's first executive director for international operations, a position that he held for 22 years.

Kratchman, who began part-time graduate studies in the spring and will be a full-time graduate student at the University of Maryland this fall, received the John L. Jablonsky Scholarship, which aids graduate students in fire protection engineering programs in the United States and Canada. Kratchman is currently a fire protection engineer and graduate student intern at the National Institute of Standards and Technology's Building and Fire Research Laboratory in Gaithersburg, Maryland. She is a member of the Society of Women Engineers. Jablonsky, an insurance-company executive, served on the National Commission on Fire Prevention and Control, and held numerous positions with the NFPA, receiving its highest honor, the Paul C. Lamb Award, in 1987.

Somers, a doctoral candidate in public administration at Arizona State University's School of Public Affairs, received the George D. Miller Scholarship. Somers is concentrating his doctoral studies in urban policy and inter-organizational relations to fire-service issues, including homeland security and response to terrorist events. He is a teaching associate in the Fire Programs at ASU East and an author whose articles have been published in *Journal of Emergency Medical Services, Fire Engineering*, and *Emergency Medical Services*.

The Miller Scholarship, established in 2002 in tribute to NFPA's former president and chief executive officer, assists students in fire-service or public administration programs in the United States or Canada.

Contributions to the Fire Safety Educational Memorial Fund also support four additional scholarships for fir service graduate students at Worcester Polytechnic Institute and Quincy College in Massachusetts, the University of Maryland, and Oklahoma State University. The educational institutions choose therecipients of these scholarships.

Applications for these NFPA scholarships and contributions to the fund can be sent to the NFPA Fire Safety Educational Memorial Fund, care of Christine Ellis, at One Batterymarch Park in Quincy, MA 02169-7471.

GRANTS

Reducing fire deaths of the elderly

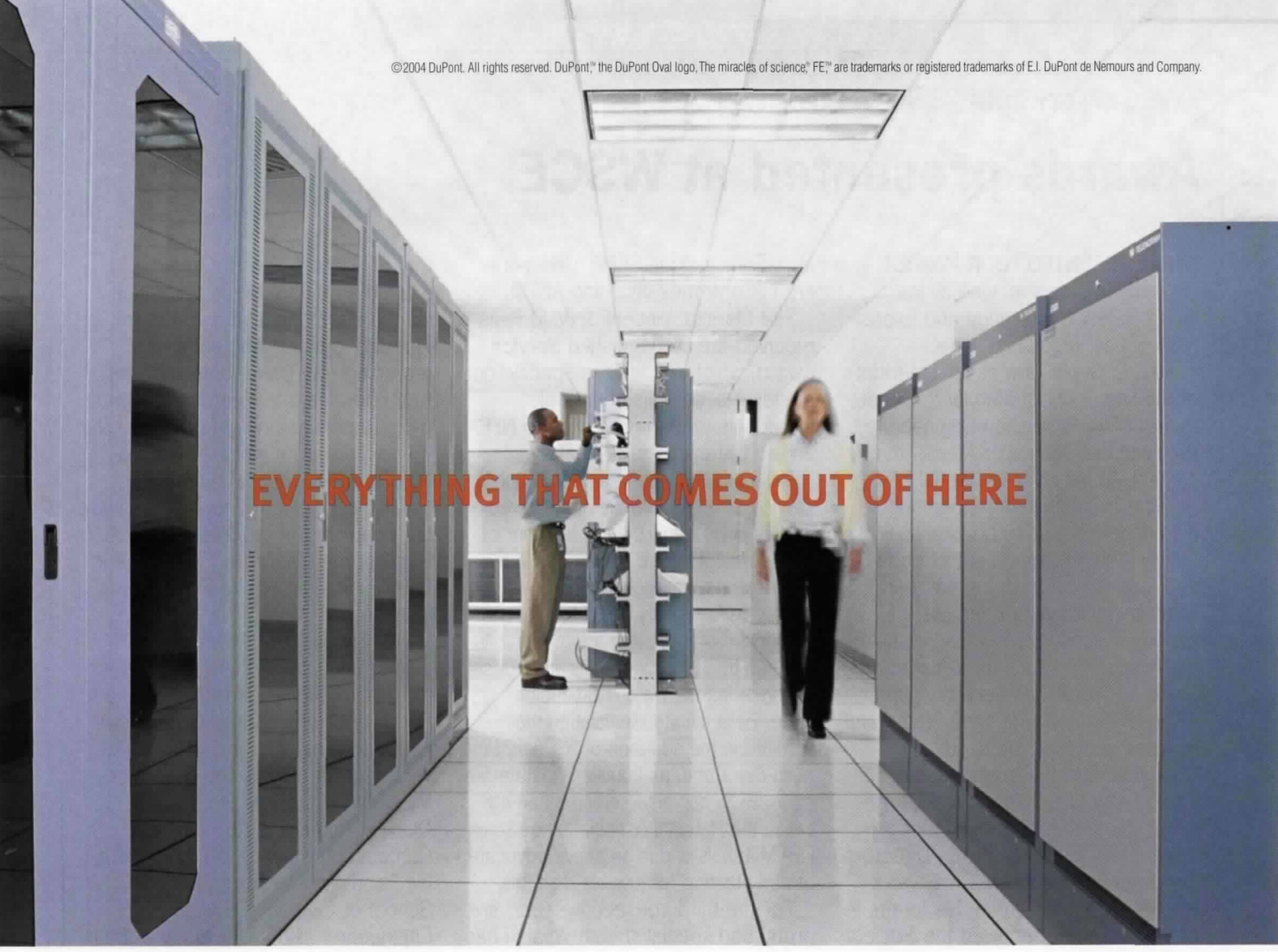
THE FIRE PROTECTION RESEARCH FOUNDATION has received a U.S. Fire Administration grant to carry out a comprehensive study of the audibility and waking effectiveness of smoke alarm signals in the elderly population. The study, which will be carried out in cooperation with Victoria University of Technology in Australia, will explore the influence of signal type and frequency on waking effectiveness and response through sleep studies. A review of emerging technologies will also be carried out. The project is guided by an international advisory panel.

The Fire Protection Research Foundation is an independent nonprofit whose mission is to provide practical, usable data on fire and building safety. The Foundation brings premier fire research resources to experts in code, corporate, and government arenas through objective research documentation on today's crucial fire problems and new solutions.

COMMITTEES

Advisory board formed

NFPA RECENTLY ORGANIZED the Disability Access Review Advisory Committee (DARAC) to advise NFPA's president and Board of Directors how to improve NFPA's codes and standards to help people access the workplace and provide viable emergency egress. For more on the committee, contact Allan Fraser at afraser@nfpa.org.



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WORLD SAFETY CONFERENCE & EXPOSITION

Awards presented at WSCE

NFPA PRESENTED FOUR AWARDS in fire and life safety in June at the World Safety Conference and Exposition® in Las Vegas last June.

John L. Bryan, professor emeritus of the University of Maryland, Department of Fire Protection Engineering, received the Standards Medal, the highest award given by the NFPA Standards Council, in recognition of his outstanding contributions to fire safety in the development of codes and standards. Dr. Bryan has performed in various fire service, academic, and professional consulting occupations for four decades. Since 1966, he has served voluntarily on NFPA technical committees and remains active on the Building Code/Life Safety Code Means of Egress and Life Safety Code Correlating Committees. A long-standing member of NFPA's Board of Directors and Standards Council, Dr. Bryan was elected chair during his tenure in both groups. He received the Society of Fire Protection Engineer's (SFPE) Fire Protection Man of the Year honor in 1977 and NFPA's Paul C. Lamb Award in 1986. Dr. Bryan is a widely published author whose professional affiliations include SFPE, Underwriters Laboratories Inc., and ASTM.

Fire Marshal Vincent J. (V.J.) Bella received the Distinguished Service Award, which recognizes specific outstanding accomplishments of individuals rendering service to NFPA and to the cause of fire safety.

Bella began his long career in public service as a U.S. Marine and entered the fire service in 1947. A member of the Louisiana House of Representatives for 12 years, he sponsored many bills related to fire safety. Bella then served two governors as state fire marshal. In addition to supporting Louisiana's designation as a Risk Watch® Champion state, Bella initiated legislation that resulted in the adoption of NFPA 1, *Uniform Fire Code*, as Louisiana's state fire code. Bella has also served as an officer in the National Association of State Fire Marshals and is an active advocate of early testing for juvenile diabetes.

For the third consecutive year, fire protection specialist Tom Whalen has led his Duke University and Health Systems team to a first-place win in the Industrial Fire Protection Section's Fire Prevention Week Contest. Whalen's group joined forces with the City of Durham, North Carolina, to expand an established residential smoke alarm installation program. Through logistics and volunteer recruiting, the Duke team successfully coordinated volunteer/firefighter pairs to canvass neighborhoods. The winning program included installations and educational outreach.

Tingguang Ma and co-authors were the recipients of the 2005 Harry C. Bigglestone Award for Excellence in Communication of Fire Protection Concepts.

The Bigglestone Award is presented annually to the authors of the most outstanding paper submitted to *Fire Technology* during the previous calendar year. Ma, nowwith the University of Maryland, and co-authors Michael S. Klassen, Stephen M. Olenick, Richard J. Roby, all with Combustion Science & Engineering, Inc., and Jose L. Torero with the School of Civil and Environmental Engineering at the University of Edinburgh, were recognized for their paper, "Burning Rate of Liquid Fuel on Carpet, (Porous Media)," which was published in the July 2004 issue of *Fire Technology*.

CODES AND STANDARDS

All documents now online for review

AS OF JULY 1, 2005, NFPA has made all of its codes and standards available for online review by the public.

Established as a corporate goal by the Board of Directors in 2002, the effort is part of NFPA's commitment to enhancing public safety through the adoption and enforcement of its consensus codes and standards.

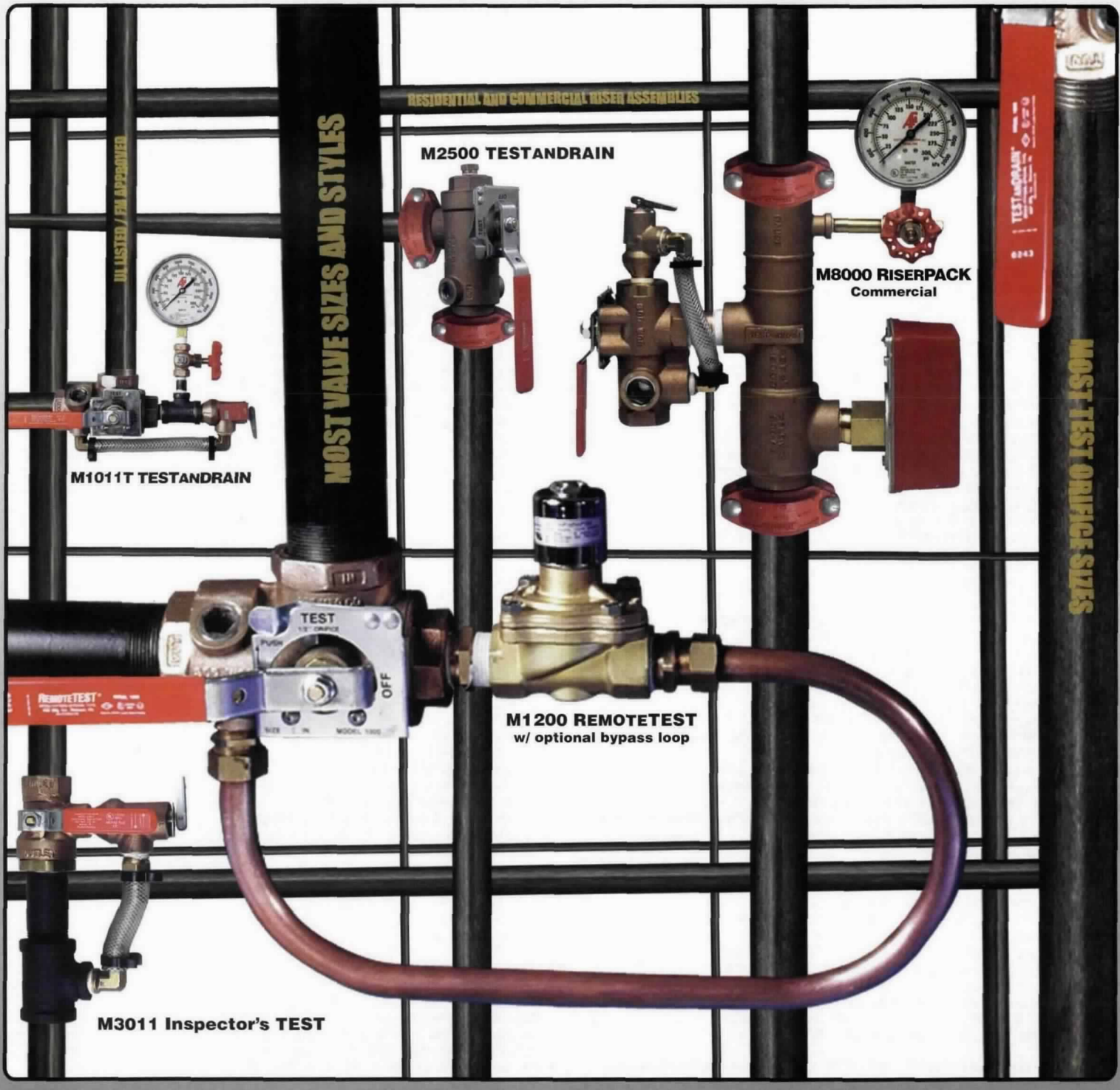
Online review of our documents places important safety information on the desktops of traditional users, as well as others who have an interest.

We're committed to serving the public's interest in technical information, and online access to key codes is a valuable resource.

Since 2002, NFPA had made more than two dozen of our documents available for online review, including NFPA 1, *Uniform Fire Code*; NFPA 54, *National Fuel Gas Code®*; NFPA 58, *Liquefied Petroleum Gas Code*; and NFPA 5000®, *Building Construction and Safety Code®*.

Online users can "flip through the pages" or access specific pages of the documents by using the table of contents as a navigational tool. The documents are designed for online review only; there are no "print," "save" "cut and paste," or "search" options. While viewing these documents, however, visitors may purchase them from our online catalogue.

Users must also consent to a licensing agreement before they are granted access to the online documents.



Certified Fire Protection Specialists

The Certified Fire Protection Specialist (CFPS) Board was formed in 1971 to recognize, through certification, qualified individuals who are dedicated to curtailing both physical and financial loss due to fire. Since 1998, NFPA has administered the CFPS program and examination, which is based on the NFPA *Fire Protection Handbook*.

We are pleased to announce and recognize the following individuals for earning NFPA certifications in the specified fields of practice:

William Allen, Allen & Shariff Corporation, Columbia, MD
Paul Barton, Norris, Inc., Dover, NH
Todd Beattie, Vipond Fire Protection, Toronto, ON
Michael Burns, Leber-Rubes, Inc., Toronto, ON
Thomas Capie, Princeton University, Princeton, NJ
Patrick C. Y. Cheung, Firepoint Technologies, Brampton, ON
Robert Davis, CNA Insurance, Melville, NY
Arnaldo Delgado, CAN Insurance, Parsippany, NJ
Steve Denn, Brampton Fire and Emergency Services, Brampton, ON
Keith Dix, West Metro Fire Department, Lakewood, CO
Aaron Duff, Bristol-Myers Squibb, New Brunswick, NJ
Eddie Ellsberry, Berry College, Mount Berry, GA
Timothy Flanagan, Exelon Energy Delivery, West Conshohocken, PA
Brian Focht, Exelon Energy Delivery, West Conshohocken, PA
Glenn Franzoi, Township of Hamilton Fire Prevention, Mays Landing, NJ
Frank Friend, III, Winslow Township Fire Department, Atco, NJ
Joseph Galaska, Washington Group International, Denver, CO
Dayne Hansrote, MitecNet, Duluth, GA
Zane Henning, Conoco Phillips Alaska, Inc., Anchorage, AK
Gary Honold, City of Missoula Fire Department, Missoula, MT
Wayne Hopkins, DuPont Company, Wilmington, DE
Christopher Hurley, McMaster University, Hamilton, ON
Jeffrey Hutchison, UTD, Inc., Springfield, VA
Frederick Jolicoeur, ADT Security Services, Inc., Plymouth, MI
Jeremy Kube, Liberty Mutual Property, Stratham, NH
Alan Larson, Uponor Wirsbo, Inc. Apple Valley, MN
Timothy Lee, Office of the Ontario Fire Marshal, Midhurst, ON
Timothy Lovly, DPS Juniper, LLC, Bakersfield, CA
George McConaghy, Fire & Emergency Services, NJ
Michael Meyerhoff, Edwards Service, Pennsauken, NJ
Tushar Nandwana, Chubb Group of Insurance Companies, Newport Beach, CA
Carl Osberg, CH2M Hill, Gainesville, FL
Lucas Pfannenstiel, George Butler Associates, Lenexa, KS
Jeffrey Pierce, Lancaster City Bureau of Fire, Lancaster, PA
Alex Possamai, General Sprinklers, Inc. Weston, ON
Ramona Radloff, GE Global Asset Protection Services, Neu-Isenburg, Germany
Chuck Richardson, Conoco Phillips, Sweeny, TX
Philip Rigsby, ISO, Jersey City, NJ
Marc Robbins, I.M.Robbins, P.C., New York, NY
Stephen Roth, University of PA/Public Safety, Philadelphia, PA
Karl Seifert, Hartford Hospital, Hartford, CT
Daniel Starks, Harborview Medical Center, Seattle, WA
Joseph Stough, Tilley Fire Equipment, Doylestown, PA
Ronald Turcotte, AIG/Lexington Insurance Company, Boston, MA
Kenneth Wagoner, Parsley Consulting Engineers, Escondido, CA
Michael Walker, Toronto Fire Services, Thornhill, ON
John Warnet, XL Insurance, New York, NY
Michele Wierzbicki, Unifrax Corporation, Niagara Falls, NY
William Wolfe, City of Phoenix, Phoenix, AZ

Certified Fire Inspector I and II (CFI) and Certified Fire Plan Examiner (CFPE) programs were developed for fire service, commercial and industrial plant, and other facility personnel to verify that facilities have the proper construction and equipment installed, maintained, and operated with related fire codes and standards. These programs offer flexibility by accommodating entry through senior levels of experience. Successful candidates demonstrate theoretical and practical competency in NFPA codes and standards through a professionally developed examination and completion of actual field inspections.

Certified Fire Inspector I
Monty Armstrong, Courtenay Fire Department, Courtenay, BC
Kyle Baker, Michigan Career Tech, Plainwell, MI
James Boritzki, Chelsea Area Fire Authority, Chelsea, MI
Ralph Britton, Battle City Fire Department, Battle Creek, MI
Jerry Chapman, Fort Mill, SC
Donald Collick, Lyon Township, New Hudson, MI
Jason Cross, Tupelo Fire Department, Tupelo, MS
James Dailey, City of Adrian, Adrian, MI
Daniel Farrington, New Castle, DE
Timothy Fuller, Maine State Fire Marshal's Office, Clinton, ME
Brian Garver, Exton, PA
James Graham, Vancouver, WA
Karola Hanks, Bayfield, CO
Trent Hatinger, Dalton Township Fire Department, Muskegon, MI
Mark Heath, City of Pearl Fire Department, Pearl, MS
Donnie Helms, York County Fire Prevention, Rock Hill, SC
Steve Henion, Shelby Township Fire, Shelby Township, MI
Gary Herndon, Fire Department of Three Rivers, Three Rivers, MI
Geneva Heyward, Atlanta Fire Bureau, Atlanta, GA
William Higgs, Sechelt Fire Department, Sechelt, BC
Chuck Hirsch, Sioux City Fire Department, Sioux City, IA
Jim Jeko, Jr., Palmyra Fire Department, Blissfield, MI
Randy Koppa, Courtenay Fire Department, Courtenay, BC
Marc Kuiper, Whistler Fire Department, Pemberton, BC
Jason LeBlanc, University of Texas Health Science, Houston, TX
Timothy Love, Vicksburg Fire Department, Clinton, MS
Alan MacConnachie, Whistler Fire Department, Whistler, BC
Jerry Marshall, Vicksburg Fire Department, Vicksburg, MS
Gregory McClelland, Colwood Volunteer Fire Department, Victoria, BC
Stein McMullen, Starkville Fire Department, Starkville, MS
Andrew McPartland, Aston, PA
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Joel Mitchell, Ostero Co. Detention Center, Alamogorda, NM
Alvin Morris, City of Pearl, Pearl, MS
Michael Navratil, Williams Lake Fire Department, Williams Lake, BC
Michael Norman, Palmyra Fire Department, Adrian, MI
Mark Noval, Delaware Technical Community College, Newark, DE
Curtis Parsons, Raisin Township Dept. of Safety, Tecumseh, MI
Vincent Payne, II, Biloxi Fire Department, Biloxi, MS
Ethan Peterson, Oxford Fire Department, Oxford, MS
Adam Popiel, Thornton, PA
Perry Principi, Horn Lake Fire, Como, MS
Joseph Reading, Hatboro, PA
Lucy Rebuck, Mentone, CA
Leland Reed, Byhalia VFD, Byhalia, MS
Richard Renard, Raisin Township DPS, Tecumseh, MI
Robert Ricks, Jr., Jackson Fire Department, Jackson, MS
John Robinson, Madison Fire Department, Madison, MS
Bruce Rogers, Ocean Springs Fire Department, Ocean Springs, MS
William Romano, Maine State Fire Marshal's Office, Hampden, ME
Isaac Smith, III, Vicksburg Fire Department, Vicksburg, MS
Kaye Squires-Rogers, City of Sumter Fire Department, Sumter, SC
Andrew Stager, City of Wayne, Wayne, MI
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Derek Taylor, Maple Ridge, BC
Rob Thompson, Lansing Township Fire Department, East Lansing, MI
Grant Topham, Peachland Fire & Rescue, Peachland, BC
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Ricky Ward, Raisin Township DPS, Tecumseh, MI
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Jack Coburn, Bozeman, MT
Eugene Fushi, Jackson, MI
Bradley Henson, Olathe Fire Department, Overland Park, KS
Michael Julazadeh, Spartanburg Public Safety, Spartanburg, SC
Mark Klaene, High Rolls Volunteer Fire Department, High Rolls, NM
Laurence Kusler, Las Vegas Fire & Rescue, Las Vegas, NV
Martin Myers, Kalamazoo Public Safety, Kalamazoo, MI
Richard Rozier, Las Vegas Fire & Rescue, Las Vegas, NV

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Kenneth Greever, Goldsborough Realty, Wilmington, DE
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A life safety system should stand ready to evacuate the building, no matter the circumstances. But many factors can hinder a timely evacuation. Occupants may be unfamiliar with the building and its emergency egress routes. Persons with visual impairment may be unable to follow exit markings or signage. And if an area fills with smoke, even unimpaired occupants can become confused and disoriented. Such situations are a formula for tragedy.

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BY KATHLEEN H. ALMAND, P.E., FSFPE

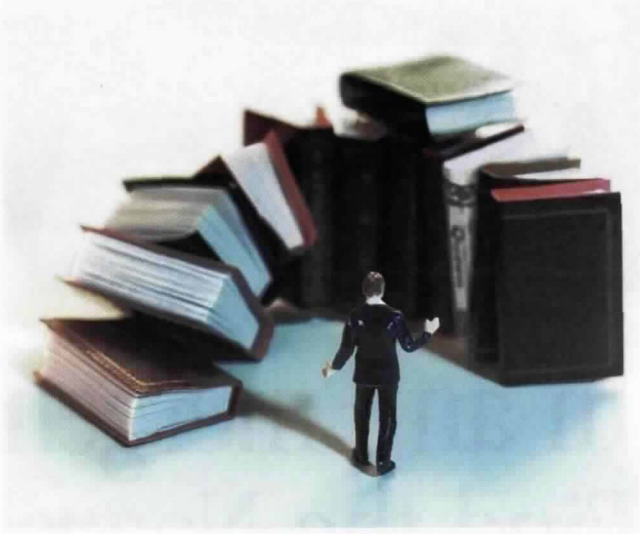
The Fire Protection Research Foundation

SCIENTIFICALLY BASED CONSENSUS codes and standards are at the heart of the NFPA mission. The first NFPA standard on automatic sprinkler protection was based on specific technical information about the installation, operation, and maintenance of these systems. As the range and application of NFPA's standards grew, however, NFPA technical committees turned to other sources of technical information, including fire loss experience and an emerging understanding of fire growth and development. Today, NFPA technical committees routinely develop and modify codes and standards based on their collective knowledge of such information.

In the mid-1970s, NFPA's staff and Board of Directors recognized a growing need to better inform those working on the growing body of NFPA codes and standards and approved the formation of the NFPA Research Foundation, now known as the Fire Protection Research Foundation, in 1982. To ensure that the research the Foundation carried out was independent, it was formed as a separate organization whose mission was "To obtain and communicate objective, usable solutions to problems from fire and other hazards through research."

From its early days, the Foundation has been engaged in major research programs, both domestic and international in scope, designed to provide the type of information that can support the NFPA codes and standards process, as well as NFPA's overall fire safety mission.

The Foundation has three attributes that make it an important contributor to fire-safety research: an independent, credible management structure with a mission rooted in fire safety; a direct line of communication with the research needs of fire-safety practitioners through the NFPA committee process; and a consortium environment where interested stakeholders can combine resources to implement research.



Today's codes and standards environment is evolving, and the research needed to underpin it is changing with it. Among the current issues facing NFPA committees are new technology and new applications, external regulatory restrictions, and performance-based codes.

Today's codes and standards environment is evolving, and the research needed to underpin it is changing with it.

It has always been a challenge for the existing body of codes and standards to appropriately address the introduction of new technology. Prescriptive provisions are naturally written around existing products, and technology developers often don't know where to start trying to gain recognition of their innovations in the codes and standards. The Foundation provides an independent resource for "code roadmapping" new fire technology, as well as an effective means of identifying the performance criteria against which such technology will be evaluated.

As for regulatory restrictions, many developments in fire technology have themselves arisen from an innovative response to environmental or other regulatory restrictions. For example, the Foundation's early work on halons and halon replacements provided a vehicle for the acceptance of new and existing technologies by enabling the development and acceptance of relevant performance information.

Finally, there is the matter of performance-based codes. Most NFPA standards have traditionally had provisions permitting alternative materials and methods, provided justification for equivalency could be provided. The last decade has seen a movement towards the development of performance-based codes and standards, in which the fire-safety objectives of the document can be satisfied using a performance approach. Both of these types of provisions call for the development of technical information to substantiate deviations from prescriptive code requirements. This type of research need dictates a more strategic approach to the development of data, which will inform design decisions over a range of scenarios.

Today, the Research Foundation is responding to these challenges with activities in a number of areas, ranging from fire

>>CONTINUED ON PAGE 104

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Fire Watch

by **Kenneth J. Tremblay**

STORAGE
Fire destroys cold storage, fruit packing buildings

WASHINGTON–A large cold storage warehouse was destroyed when a fire spread through the two middle floors, eventually causing the building to collapse. One exterior wall fell into a nearby fruit packing plant.

The four-story building was constructed of heavy timber with a steel frame and exterior brick walls, and covered approximately 111,550 square feet (10,363 square meters). The building, which also had a basement, had an exterior elevator on one side. The basement and first floor were in use; there was limited activity on the second floor; and the third and fourth floors were unoccupied. The structure had no fire detection or suppression equipment.

As the building was closing for the night, an employee detected the fire and called 911 at 6:04 p.m. Firefighters arriving eight minutes later saw smoke coming from the exterior elevator on the third floor and from the fourth-floor roof overhang. An employee told firefighters that the blaze was on the second floor and that the ammonia refrigeration system had been secured and the power shut off.

The fire department's pre-incident plan called for the application of nearly 6,000 gallons (22,712 liters) of water per minute if the building were 50 percent involved. Knowing that the hydrant system could supply only 1,000 gallons (3,785 liters) per minute, the incident commander ordered additional alarms and resources for a drafting and water-shuttle operation.

Within an hour, the fire had spread to the third floor and vented through the roof in one corner. About 50 minutes later, an exterior wall collapsed onto an attached building in which fruit was packed. At that point, firefighters abandoned their efforts to save the warehouses. Another wall then collapsed onto a hose, shearing it off at the hydrant. Thirteen apparatus and 55 firefighters fought the blaze until 11:30 a.m. the next day, finally using a crane to complete extinguishment.

The buildings, valued at $1.97 million, and their contents, valued at $1.3 million, were a total loss. There were no injuries. The cause is undetermined.

A fire destroyed this four-story cold storage building in Washington. No one was injured.

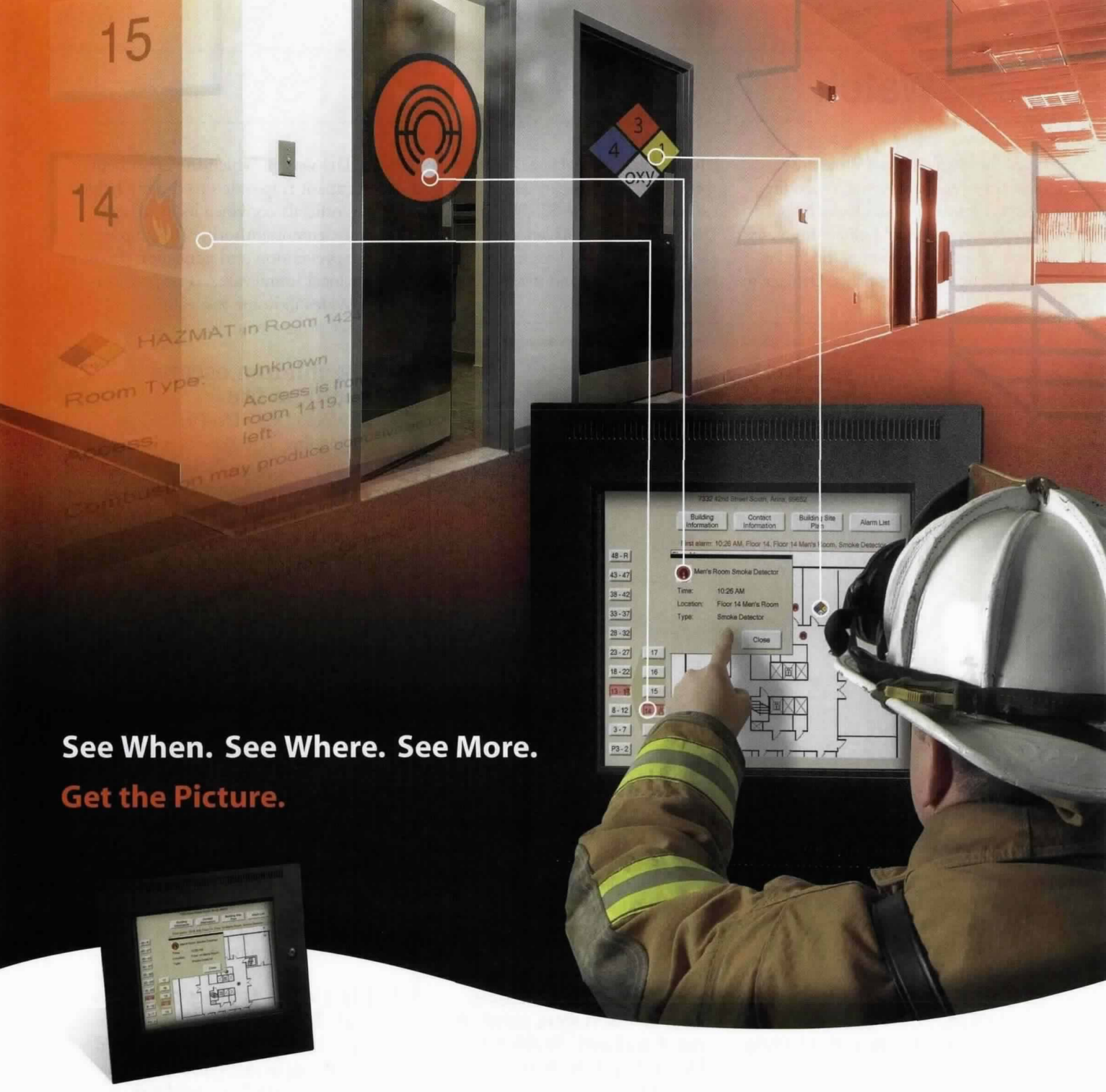
PHOTOGRAPH: AP/WIDE WORLD PHOTOS

RESIDENTIAL
Language barriers delay notification

VERMONT–A member of a newly arrived Sudanese family fell asleep while smoking and ignited a bedroom futon in their three-story apartment building. The fire spread to other combustibles in the bedroom and from there, to the kitchen and living room before firefighters extinguished it.

The wood-frame apartment building, which was 70 feet (21 meters) long and 30 feet (9 meters) wide, had a slate roof and one apartment per floor. Hardwired, interconnected smoke alarms had been installed in the hallways and bedrooms, but the building was unsprinklered.

When a smoke alarm sounded, the man opened all the windows to let out the smoke. Unfamiliar with the 911 emergency telephone number, he did not use it, but fled the building. Neighbors



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heard the alarm and called the fire department at about 8 a.m. When firefighters arrived, the man had left the scene before they could obtain from any details about the location of the fire or the building's other residents. Damage to the building, valued at $175,000, came to $50,000. Damage to its contents, valued at $50,000, came to $25,000. A female resident suffered inhalation and second-degree burns, and three firefighters sustained sprains and strains.

The way in which the apartment occupant responded to the fire helped fire officials convince local refugee resettlement authorities to support a fire prevention and education program for local immigrants. The program provides in-home inspections and other programs in 12 languages.

Six children escape bedroom fire

PENNSYLVANIA–Firefighters responding to a 911 call reporting a fire in a single-family home found that six children had already escaped from the house by the time they arrived.

The three-story house, which had a brick exterior and a flat, built-up roof, had no smoke alarms or sprinklers.

Firefighters responding to the 8:46 a.m. call saw smoke coming from a second-floor window and advanced two hose lines to the upper floors. They also searched for possible victims. Finding no one, they quickly extinguished the blaze, which heavily damaged a bedroom and a bathroom.

Damage to the house, valued at $79,000, was estimated at $15,000, while damage to its contents, valued at $15,000, was estimated at $5,000. The children were taken to a hospital, where they were evaluated for smoke inhalation injuries. The cause of the fire is undetermined.

Man dies trying to extinguish fire

OREGON–A 71-year-old man died after trying to extinguish a small fire, reported by his 71-year-old wife, in the living room of his single-family home. He was able to leave the house, but he collapsed outside from smoke inhalation.

The single-story, wood-frame house, which covered 2,000 square feet (186 square meters), had exterior wood siding and an asphalt-shingle roof. The home had neither fire detection nor suppression equipment.

The couple discovered the fire and called 911 at 5:06 p.m. Before the firefighters arrived eight minutes later,

however, the man tried to put the fire out himself.

Investigators determined that the fire began because the motor bearings of a fan had worn down, causing the fan to freeze and its wiring to overheat, igniting the insulation. The fire then spread to other fan components and to the living room's furnishings.

Damage to the house and its contents, valued at $205,000, was estimated at $600.

Two children die in fire

INDIANA–Two boys, ages 10 and 7, died of smoke inhalation in an early-morning fire in their single-family home, which had no smoke alarms or sprinklers. The two-story, wood frame house was 56 feet (17 meters) long and 26 feet (8 meters) wide.

An occupant dialed 911 at 2:55 a.m. to report that the house was on fire and that people might be trapped inside. Responding firefighters arrived five minutes later to find heavy smoke in the house. They also discovered that some of the residents had been able to escape. Shortly after arrival, the incident commander reported that the structure was fully involved and ordered additional units.

The home, valued at $70,000, sustained losses estimated at $40,000. Its contents, valued at $30,000, sustained losses estimated at $20,000. Investigators discovered the fire's point of origin in a first-floor bedroom, but were unable to determine its cause.

Four die in candle fire

ILLINOIS– A candle left burning on top of a stereo speaker by a sleeping occupant ignited an adjacent couch, starting a fire that killed a couple and their two children.

The two-story, brick apartment building in which the fire occurred had concrete floors and a wooden mansard roof covered in asphalt shingles and slate tile.

Fire detection equipment in the 12-unit structure, which was 150 feet (46 meters) long and 50 feet (15 meters) wide, was limited to single-station, battery-operated smoke alarms. There were no sprinklers.

The 911 call reporting the fire came from a neighbor across the street at 5 a.m. and was followed by many more reports from cell phones. Firefighters arriving within five minutes of the alarm found fire coming from a balcony door.

Using a 2 1/2-inch hose line with a straight stream nozzle, the first-in fire

crew knocked down the heavy fire coming the second-floor unit. Several crews found and removed three victims–a woman, a toddler, and an infant–and took them outside for transport to the hospital. One fire crew completed extinguishment using a 1-3/4-inch line advanced up a ladder. Other firefighters and police officers removed more residents from balconies without incident.

Upon arrival, fire companies were also directed to a fourth victim found outside the building, a 25-year-old man. He lived long enough to tell investigators he was awakened by the sound of a baby crying. Finding the apartment filling with smoke, he picked up the baby but had to set her back down to call 911. The descending smoke layer caused him to abandon the call, and he lost sight of the infant. He left the building alone.

Firefighters later found the infant in the kitchen and the man's 24-year-old partner and 2-year-old son on a bedroom floor. They had all died of smoke inhalation.

The injured man told hospital staff before he died that his family had lit candles in the living room earlier in the evening. Investigators found the remains of several small, tea-type candles near the point of fire origin.

They also found the smoke alarm had no battery.

The value of the building and its contents was not reported, but damage to the building was estimated at $150,000, and damage to the contents was estimated at $2,500.

Alarms fail to work in fatal fire

TEXAS–A couple and their 11-year-old son were killed in an early-morning fire that seriously injured their 10-year-old daughter and heavily damaged their single-family home.

The two-story, wood-frame house, which was 124 feet (38 meters) long and 40 feet (12 meters) wide, had a concrete floor and a composition roof. The unsprinklered structure's hard-wired smoke and heat detectors were later found to be inoperative, and the single-station, battery-operated smoke alarms had no batteries.

Woken by calls for help from her brother, the girl opened her bedroom door and found heavy smoke in the second-floor hallway. She closed the door and went to the bathroom, where she wet a cloth to cover her mouth and nose. Going back into the hallway, she called to her brother,

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telling him to crawl towards her. He told her he couldn't.

As she crawled down the hall toward her parents' bedroom, she came upon her 47-year-old father lying on the hallway floor. He took her to the master bedroom, dangled her by her ankles from a window, and dropped her to the ground. She felt her 45-year-old mother land on top of her and lost consciousness until firefighters found her.

The fire department received the alarm from a neighbor at 3:55 a.m. Responding firefighters arrived within six minutes to find the rear, lower level of the house near the garage involved in fire. As additional companies arrived, they found fire coming from windows on all sides and floors of the building. Within eight minutes of arrival, the incident commander ordered all units from the building and switched to a defensive attack, as fire consumed the interior.

Crews found the girl and her mother, and immediately transferred them to ambulances. After they brought the fire under control, they found the boy on the floor of his bedroom and his father on the floor of the master bathroom. Both had died of smoke inhalation.

The mother died of smoke inhalation and head injuries in the hospital. Her daughter survived but suffered smoke inhalation and traumatic injuries to her legs.

Investigators had difficulty entering the burned home, as second-story floors had partially collapsed. However, they were able to determine that the fire started in voids between the first and second floors above a bathroom ceiling off the large, first-floor foyer.

Apparently, a systemic electrical problem led to overheating or arcing, which ignited structural framing. A housekeeper reported that several electrical fixtures and appliances had to be "jiggled" to get them to work before the fire. The fire spread from the ceiling of the foyer toward the living room and hallway and up the nonenclosed stairwell to the bedrooms. During this time, the girl said she did not hear any smoke alarms operating. The undetected fire continued to spread rapidly when the windows failed, allowing a strong wind to fan the flames.

The home, valued at just over $700,000, and its contents, estimated at $300,000, were almost completely destroyed. Several automobiles parked

What's a child's life worth?

Nicola Garafolo, age 7, died from CO poisoning in her Plymouth, MA. home. Nicola's unborn brother also perished. February 2005

Sheriesa King, 14,and Jan-Na Jones, 15, died from CO poisoning in their Essex,MD home. July 2005

Jeffrey Rodliff died from CO poisoning in an off-campus dorm at the University of Vermont. January 2005

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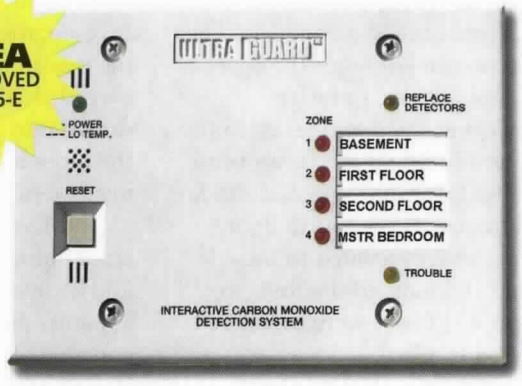

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in a courtyard behind the house also suffered heat damage.

Sprinkler saves occupant of senior housing

NEVADA–An elderly woman suffered first-degree burns and smoke exposure during a fire in the bedroom of her apartment in a 236-unit building for older adults.

However, she escaped additional injury when her attempted escape by wheelchair came to a stop under an operating sprinkler, which controlled the blaze and kept most of the heat and smoke away from her.

Constructed of concrete and concrete-block, the four-story apartment building had complete coverage by smoke detection equipment and a wet-pipe sprinkler system. At the time of the fire, all but one unit was occupied.

The water-flow alarm system alerted the central station alarm company, which notified the fire department at 3:08 a.m. Arriving six minutes after the alarm, firefighters saw smoke and flames coming from the window of an apartment on the fourth floor. The incident commander ordered a second alarm, bringing a total of 20 units and 50 firefighters to the scene.

Reaching the fourth floor, two companies entered the burning apartment, one with a hose attached to a standpipe. They found the woman just inside the door under the spray of the sprinkler.

She was evacuated and taken to the hospital as additional fire crews ventilated the building and knocked the fire down. The rest of the fourth-floor occupants were evacuated to the lobby, and residents of the first, second, and third floors were evacuated or sheltered in place.

Investigators determined that the woman had been smoking in bed and touched her bed linens with her cigarette, starting the fire. As flames spread, she got into her wheelchair, but couldn't make it out of the unit.

The fire department credits the sprinkler with saving her life. The smoke alarm did not activate for undetermined reasons. Fire damage was limited to the woman's apartment, with losses estimated at $15,000.

Three die in unsprinklered fraternity house

MISSISSIPPI–An early-morning fire in a first-floor bedroom of a fraternity house killed three young men and destroyed the building. A passerby reported the fire at 4:30 a.m.

The exterior walls of the three-story, wood-frame structure, which covered 7,600 square feet (706 square meters), were made of wood and brick, and the roof was covered with asphalt shingles. Smoke alarms were present in the unsprinklered structure, but investigators found that they were not working properly.

Investigators could not determine the exact origin of the fire. The building and its contents, each valued at $125,000, were destroyed.

The three victims, a 20-year-old and two 19-year-olds, all died of smoke inhalation.

Natural gas leak ignites, killing two

TEXAS–Two people were killed and two others severely injured when natural gas leaking from a faulty piping system into an apartment ignited. Investigators found that the piping in the two-story apartment building had corroded, allowing natural gas to be drawn into pipe chases from holes in the pipes and, from there, into the living spaces.

The 12-unit building had brick and cinder-block walls, concrete-slab floors, and a concrete-slab roof. There were six units on each floor, and interior concrete-block walls separated them into quadrants, or sections, with two units up and two down.

A single-station smoke alarm in the living room of one apartment operated during the fire, but investigators could find no trace in the debrisof a second smoke alarm that had been installed in the bedroom.

The four occupants of a second-floor apartment were in their living room at 9:20 p.m. when the explosion and fire occurred. Investigators determined that it started in one of the unit's bedrooms and spread from there to the living room and kitchen. The low-order explosion shattered windows throughout the unit and distorted and dislodged the window frames.

Firefighters extinguished the fire as the four victims were treated for burns and smoke inhalation and taken to the hospital, where two of them, a woman and a 4-year-old girl, died of their injuries.

Investigators found a hole nearly 1 foot (30 centimeters) long in an underground pipe near the entrance to the apartment building's utility chase. They also found leaks in fittings near a gas-fired water heater and stoves in two of the units. However, the investigators were not able to determine the exact ignition source.

Neither the value of the building and its contents nor the estimated property damage was reported.

MERCANTILE

Car crashes into gasoline pump, ignites fire

OHIO–At 5:12 p.m., a driver lost control of his car and veered into a fuel pump at a convenience store and gas station. The impact knocked the fuel pump onto a second car and caused a gasoline spill, which ignited.

Store employees who saw the fire immediately activated the fuel cut-off switch and called 911.

The gas station had four fuel pump islands running parallel to the street, each covered by a metal overhan open on the sides and detached from the store. The damaged pump was at the end of the island near the street.

Both of the vehicles involved in the crash caught fire. Fortunately, the driver who caused the accident and the occupants of the other vehicle were able to escape without injury.

Damage was estimated at $50,000.

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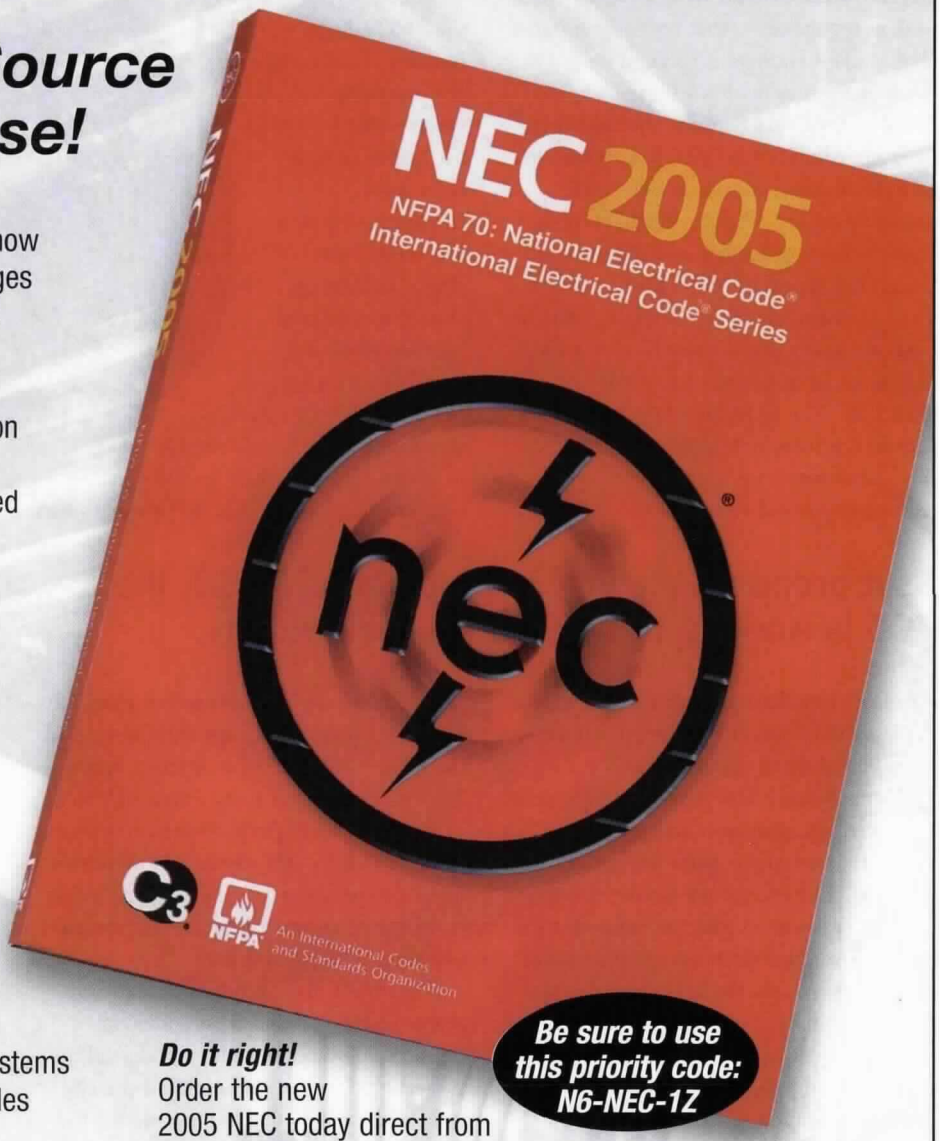

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Protecting Sloped Combustible Attic Spaces

SOMETIMES CODES AND STANDARDS contain requirements that are counter-intuitive, leading many to suspect an error where there is none. Such is the case with the attic protection requirements added to the 2002 edition of NFPA 13, *Installation of Sprinkler Systems*. More accurately, these requirements are officially titled "Sprinklers Under a Roof or Ceiling in Combustible Concealed Spaces of Wood Joist or Wood Truss Construction with Members 3 feet or Less on Center and a Slope Having a Pitch of Four in 12 or Greater (see Figure 8.6.4.1.4)." The inclusion of the figure reference in this intimidating title is worthwhile, since it reinforces the counter-intuitive requirement of Subsection 8.6.4.1.4.3 that sprinklers installed along an eave be located not less than 6 feet (1.8 meters) from the outer line of the concealed space.

Normally, sprinkler spacing requirements are expressed as maximum distances to ensure that adequate water distribution is obtained. The exceptions are the minimum distances associated with avoiding obstructions to sprinkler discharge. In the case of sloped attic spaces, the minimum distance accommodates the obstructions of structural members, since it is difficult for the sprinkler to develop a suitable spray pattern in the limited space at the eaves. Holding the sprinklers back from the eaves also makes it less likely they will be blocked by insulation and improves thermal response. Because heat tends to travel up slopes, a fire originating between two sprinklers along an eave has more potential to grow larger before sprinkler operation. Setting the sprinklers back from the eave makes it more likely that they will respond earlier to such a fire.

The new requirements in the 2002 edition were based on tests conducted at Underwriters Laboratories that looked at the ability of standard spray sprinklers to protect the combination of sloped ceilings and closely spaced combustible structural members. Spacing perpendicular to the slope was found to be important due to obstructions to water spray as well as response. As a result, the new requirements also call for restricted protection areas, 120 feet^2 (11.1 meters^2) per sprinkler instead of the former 130 feet^2 (1.2 meters^2). Sprinklers can be spaced a maximum of 8 feet (2.4 meters) apart perpendicular to the slope (parallel to the eaves) at a minimum allowable pressure of 7 psi (0.5 bar), or up to 10 feet (3 meters) apart at a minimum pressure of 20 psi (1.3 bar).

As it prepares the 2007 edition of NFPA 13, the TCC is working to clarify the requirements.

The NFPA Technical Correlating Committee recognized that these additional restrictions would make it more difficult to protect attic areas economically, especially unheated attics in climates that require the use of dry-pipe sprinkler systems. Slopes greater than 2 in 12 (16.7 percent) and dry-pipe systems each require a 30 percent increase in the assumed sprinkler operating area, and these increases are compounded, resulting in a minimum sprinkler design area of 2,535 feet^2 (235 meters^2). To help mitigate the increased water demand, the committee added an exception to its traditional requirement that dry-pipe systems contain sprinklers with minimum 1/2-inch (K-5.6) orifices. The committee allowed K-4.2 orifices at the 20 psi (1.3 bar) minimum pressure for dry-pipe systems where the piping is corrosion-resistant or has been internally galvanized.

Unfortunately, the final wording of Section 8.6.4.1.4.4 in the 2002 edition allows K-4.2 orifices at the 20 psi (1.3 bar) minimum pressure "for wet-pipe systems and dry-pipe systems where piping is corrosion-resistant or internally galvanized." The wording has erroneously led some to believe that corrosion-resistant piping is required for wet systems used in these applications or that larger-orifice sprinklers cannot be used in this application.

As it prepares the 2007 edition of NFPA 13, the committee is working to clarify the requirements. It has proposed permitting the set-back from the eaves to be 5 feet (1.5 meters) instead of 6 feet (1.8 meters) to allow slightly more flexibility, spaced from the intersection of top and bottom chords, rather than the wall of the building. It has also agreed to add a requirement that the row of sprinklers that have to be within 12 inches (30.5 centimeters) horizontally of the peak of these spaces be arranged with deflectors

>>CONTINUED ON PAGE 104

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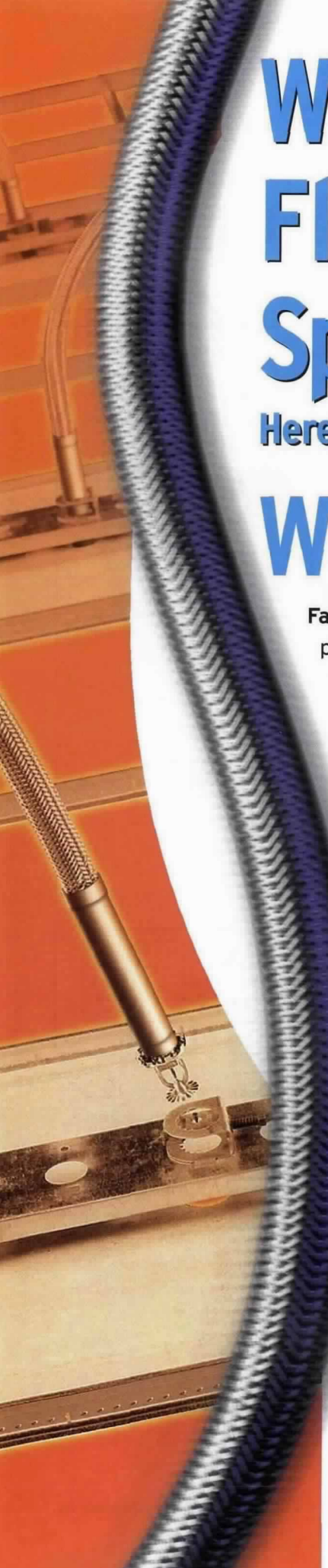

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Applying the Incident Management System

IT IS ESSENTIAL to use the incident management system (IMS) at every emergency to help the incident commander (IC) organize, coordinate, and control all the activities that take place at an incident. A one-alarm incident seldom requires a command staff, section positions, or sectoring, so the IC at a single-unit response will generally perform all command staff and section functions. As incidents expand, however, the organization becomes more complex, requiring more staff and apparatus which increases the need for command staff and section positions.

Since few fire departments respond to enough large-scale incidents to become proficient at organizing complex IMS organizations, training and education are needed to fill the experience gap. We recommend regularly applying the IMS to real or simulated large-scale incidents.

IMS helps you become a better on-scene manager.

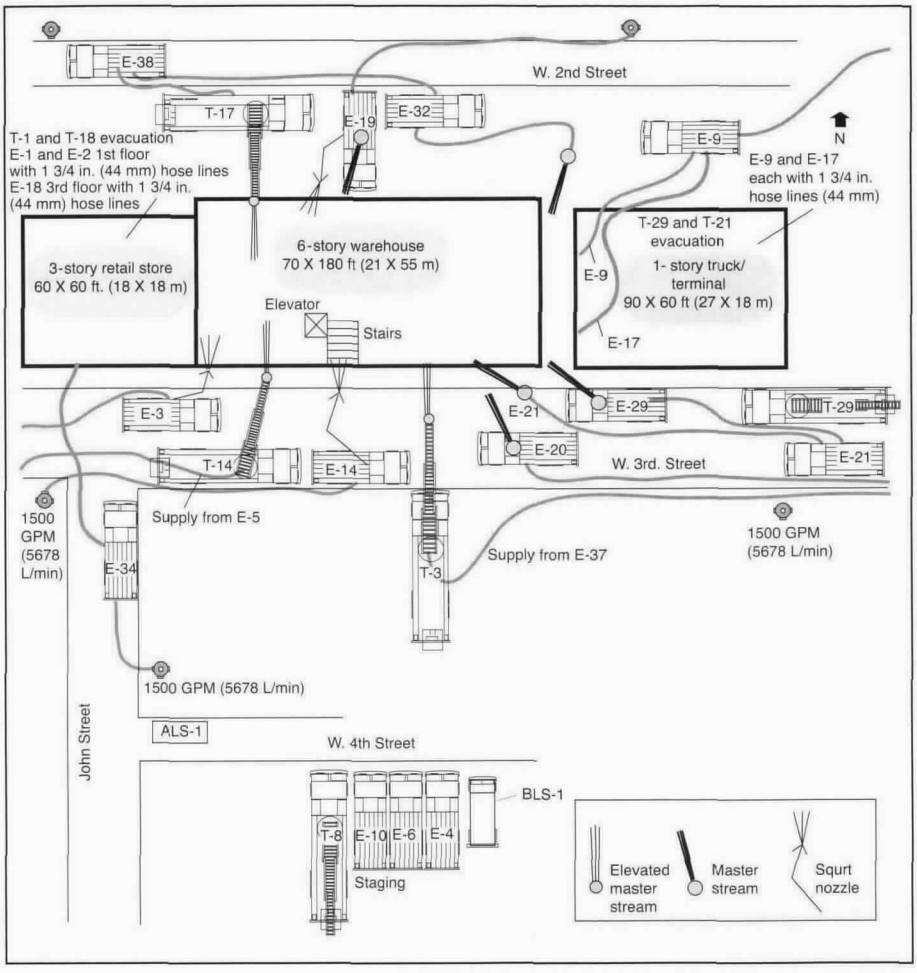
A defensive operation at a fire in a big building or a smaller building with multiple exposures can provide an example of an operation that requires sectoring, command staff, and section positions. For training purposes, we recommend simulating the assignment of several companies on each side of the fire building and providing geographic, tactical-level management units for each side.

Discussion should include which command and sections to staff and why. Every member of the department should be familiar with the IMS terminology and hierarchy, and those who will serve as the IC or in the upper echelon of the IMS organization at larger incidents will need more training in applying the system.

When evaluating your IMS organizational chart, you must answer several critical questions. For instance, does your IMS organization chart show all your companies? Does it use standard IMS terminology? Does the IMS organization follow the standard IMS hierarchy? Are tactical-level management units identified with an intuitive labeling system? Are the areas of responsibility logical?

Are necessary command positions staffed? Safety should be staffed at an incident of this magnitude, and more than one incident safety officer many be needed. Are all necessary sections staffed?

Our book *Structural Fire Fighting* gives examples of activities that can help students practice using the system.



In the figure above, for example, the fire is in the warehouse at the center, and exterior companies are applying water at the front and rear. Additional companies are working inside the two exposure buildings. Obviously, the operation should be sectored using several levels of the IMS.

By working through such scenarios, ICs will be better prepared to manage any incident safely and effectively.

This column is adapted from the book ***Structural Fire Fighting***, available at www.nfpa.org or (800) 344-3555.

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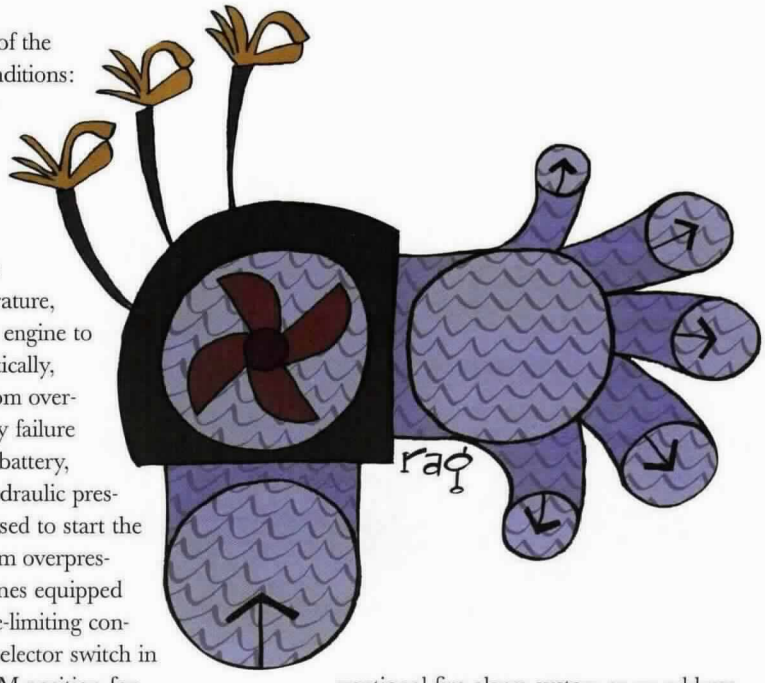
Integrating Fire Alarm Systems and Fire Pumps

IF A FACILITY'S fire pump does not operate, it's a single-point catastrophic failure of the entire fire protection system. For this reason, NFPA 20, *Installation of Stationary Pumps for Fire Protection*, requires building owners to monitor the operational readiness and operation of their fire pumps. One very effective way of doing this is to monitor the building's fire alarm system.

The two specific chapters of NFPA 20 that contain requirements for fire pump monitoring are Chapter 10, "Electric Drive Controllers and Accessories," and Chapter 12, "Engine Drive Controllers," both of which require the fire pump controller itself to monitor certain conditions. They also require that certain signals be transmitted to a remote, constantly attended location if the fire pump itself is not constantly attended. In addition, the chapters require fire pump controller manufacturers to provide contacts in the controller so that a fire alarm system technician can connect supervisory-initiating device circuits for remote monitoring.



Fire pumps can be integrated into a building's fire alarm system to prevent costly failures.

For electric-motor-driven fire pumps, Section 10.4.7 of Chapter 10 requires the remote monitoring, as separate signals, of pump motor running, loss of phase, phase reversals, and connection of the fire pump motor to an alternate power source when so equipped.

For diesel-engine-driven fire pumps, Section 12.4.2 of Chapter 12 requires the remote monitoring, as separate signals, of engine running, controller main switch turned to a position other than automatic, and trouble on the engine or controller. For this last requirement, a single signal will indicate any of the following conditions: critically low oil pressure in the lubrication system, high engine jacket water temperature, failure of the engine to start automatically, shutdown from overspeed, battery failure or a missing battery, low air or hydraulic pressure where used to start the engine, system overpressure for engines equipped with pressure-limiting controls, ECM selector switch in alternate ECM position for engines with ECM controls, fuel injection malfunction for engines with ECM, low fuel level, and loss of output in the battery charger.

NFPA 20 permits the use of a remote annunciator operating at no more than 125 volts to remotely monitor the fire pump operation and operational readiness, but using a fire alarm system to monitor these conditions provides a much more secure method. The fire alarm system will monitor the interconnecting circuits for the integrity of the signaling path and can integrate monitoring the fire pump with monitoring other conditions that may affect overall fire safety.

When developing the fire alarm system for this purpose, the designer may use a conventional fire alarm system or an addressable fire alarm system, which provides a distinct advantage. By putting a signaling line circuit interface or multiplex transponder in the fire pump room or house, all of the above signals, plus the supervisory signals for fire pump control valves, fire pump reservoir or tank level, low city water pressure for a booster fire pump, fire pump room or house low temperature, and reservoir or tank low temperature, can transmit to the fire alarm system control unit over a signaling line circuit.

Using the fire alarm system to monitor a fire pump's operating conditions and reporting those conditions clearly and immediately will help ensure the pump is operational when needed. It will also allow service personnel to respond more quickly to the conditions that can lead to catastrophic failure.

WAYNE D. MOORE, P.E., FSFPE, is chair of the National Fire Alarm Code Technical Correlating Committee.

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'It depends' and 'I don't know'

SEVERAL YEARS AGO, I heard a well-known fire protection expert answer a question with the phrase, "It depends." He went on to explain that the "correct and complete" answer to the question depended on additional information about the circumstances. The expert was Dean Wilson of Industrial Risk Insurers, later with Hughes Associates.

I have used Mr. Wilson's answer on many occasions. In fact, I use that phrase to answer questions quite frequently. I have found that it is the best answer to many fire-protection-related questions, particularly if the question deals with the application of codes and standards. The reason the phrase works so well is that, for most questions, I don't enough information available at that moment to provide a simple, complete, definitive answer.

You don't have to guess the answers to questions about codes and standards when a little research can help you find them.

More information, better answers

Say, for example, that someone asks, "What is the minimum width of a new door in accordance with the *Life Safety Code*®?" The obvious answer would appear to be 32 inches (81 centimeters), in accordance with Section 7.2.2 of the code.

However, there may be other factors that affect the required minimum width. How many people will use that door to evacuate the building? The minimum 32-inch (81-centimeter) door will accommodate 160 people. Thirty-two inches (81 centimeters) divided by 0.2 inches (0.5 centimeters) per person is 160 people.

But what if the door has to accommodate 200 people? Then it would have to be 40 inches (102 centimeters) clear width. Why? Because 200 persons multiplied by 0.2 inches (0.5 centimeters) per person is 40 inches (102 centimters).

What if the question pertained to the door of a patient room in a nursing home? Section 18.2.3.6 of the *Life Safety Code* requires that type of door to be 41.5 inches (105 centimeters) clear width. But what if your questioner is asking about the door to a small room, such as a sink closet, that's no larger than 70 feet^2 (6.5 meters^2)? In that case, the minimum required width would be 24 inches (61 centimeters) wide.

The answer certainly does depend on some additional, detailed information.

By answering with the phrase "it depends," of course, you also gain some time to compose your answer. In other words, it's a way to stall while you decide how to answer the question!

Another expert I always respected (my dad) told me it is perfectly acceptable to say, "I don't know!" The point is that no one is expected to know the answer to every question. It is okay to say, "I don't know, but I will look it up."

Remember, one doesn't have to guess the answers to questions about codes or standards. It may take a few minutes or even a few hours, but you can always find the correct answer through a little research. And if you are not sure of the answer, ask more questions to better define the issue so you can formulate a correct and complete answer. Or simply say, "I don't know," and ask the individual for some time to look it up.

The best answer to a code question may be "It depends" or "I don't know." Those responses are certainly better than giving an incorrect or misleading answer.

CHIP CARSON 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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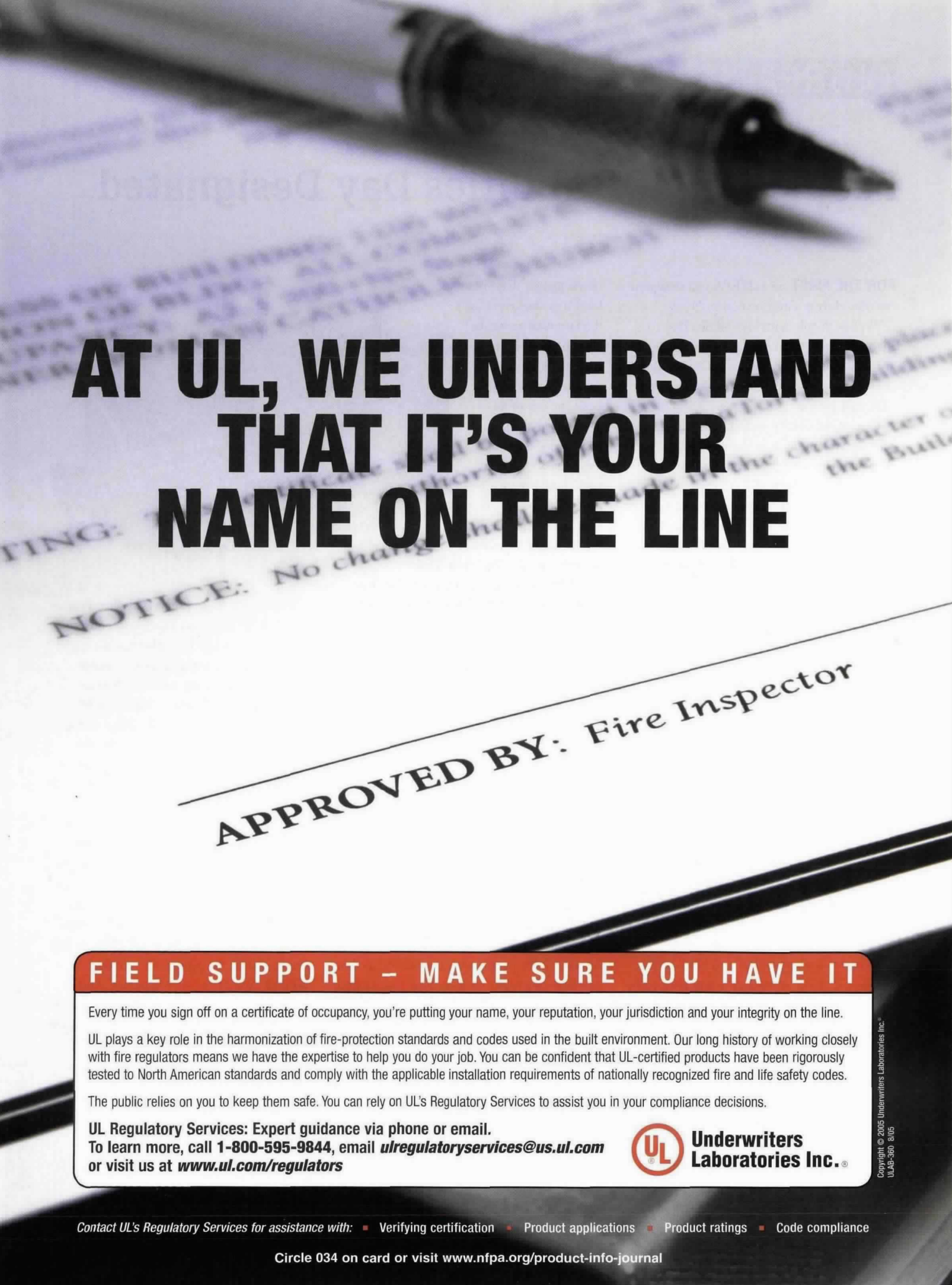

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People with Disabilities Day Designated

FOR THE FIRST time, NFPA will designate one day during Fire Prevention Week (FPW) as People with Disabilities Day to highlight the special fire safety issues people with disabilities face. The emphasis of the day–October 11–will be on planning, detection, and escape.

One of the first opportunities for fire and life safety planning is in the workplace. Although emergency planning should be addressed year round, FPW is a good time to make sure people have their plans together in the workplace, as well as the home. And October is the perfect time for planning for workplace safety, since the U.S. Department of Labor has designated it National Disability Employment Awareness Month. The Office of Disability Employment Policy heads up the planning efforts, producing activities and materials designed to increase awareness of the contributions and skills of workers with disabilities and highlight employment barriers that must still be addressed.

October is the perfect time for planning for workplace safety.

One of those barriers could well be lack of adequate egress from buildings. Over the years, changes have been made to allow more people access to buildings, but provisions for helping them get out of buildings during a fire or other emergency have often been overlooked.

"Emergency responders and employers concerned about workplace safety need to be well aware of different kinds of disabilities and the most efficient and appropriate methods to assist a person with disabilities in an emergency," advises Linda Woodbury, disabilities services coordinator for the City of San Diego and a member of the Center for High-Risk Outreach's Fire Safety for People with Disabilities Task Force.

"A person who is deaf, for example, needs to see the alarm. A person who is blind needs alarms that aren't so loud that they can't hear directions or sense the echo from their surroundings. A wheelchair-user may need the use of an evacuation chair, and so on," says Woodbury. "Evaluation should be made on a situation-by-situation basis, and, ideally, advice should come from people who are disabled themselves."

NFPA's new educational safety handout, ***Workplace Safety for People with Disabilities***, is available in both English and Spanish and can be downloaded free from www.nfpa.org. Also available from NFPA's online catalogue is the Disability Evacuation Training Program VHS/DVD tool kit, designed to help safety directors develop and implement evacuation plans that comply with the Americans with Disabilities Act. Use these resources during FPW as a starting point to including everyone in your fire safety planning activities throughout the year.

Escape planning from the home is also important for people with disabilities, as that is where most fires happen. Fire departments and organizations that conduct smoke alarm installation programs can make these programs more inclusive by installing alarms with special features for people with disabilities. Alarms with 10-year lithium batteries or alarms that can be tested with a remote, for example, work for people who can't stand on a ladder to test an alarm or change a battery. People who can't hear conventional alarms need alarms with strobe lights.

Oklahoma State University Fire Protection Publications and the Massachusetts Office of the State Fire Marshal are implementing comprehensive smoke alarm programs for people who are deaf or hard-of-hearing. Jennifer Mieth, public education manager for the Office of the State Fire Marshal, conducts education sessions on fire safety and smoke alarms for all the people who receive alarms with strobe lights.

"Every smoke alarm project needs to have fire safety education to be effective," says Mieth. "This is even more important for people who are deaf or hard-of-hearing and who are unlikely to pick up this crucial information unless it is specifically directed to them."

You can find information on where to buy smoke alarms for people who are deaf on NFPA's Web site at www.nfpa.org. And to support your home safety planning activities, you can order NFPA's ***Fire Safety for People with Disabilities*** brochure from NFPA's online catalogue. For an audiotape or Braille copies, contact the Center for High-Risk Outreach at (617) 984-7285.

SHARON GAMACHE is executive director of the Center for High-Risk Outreach at NFPA.

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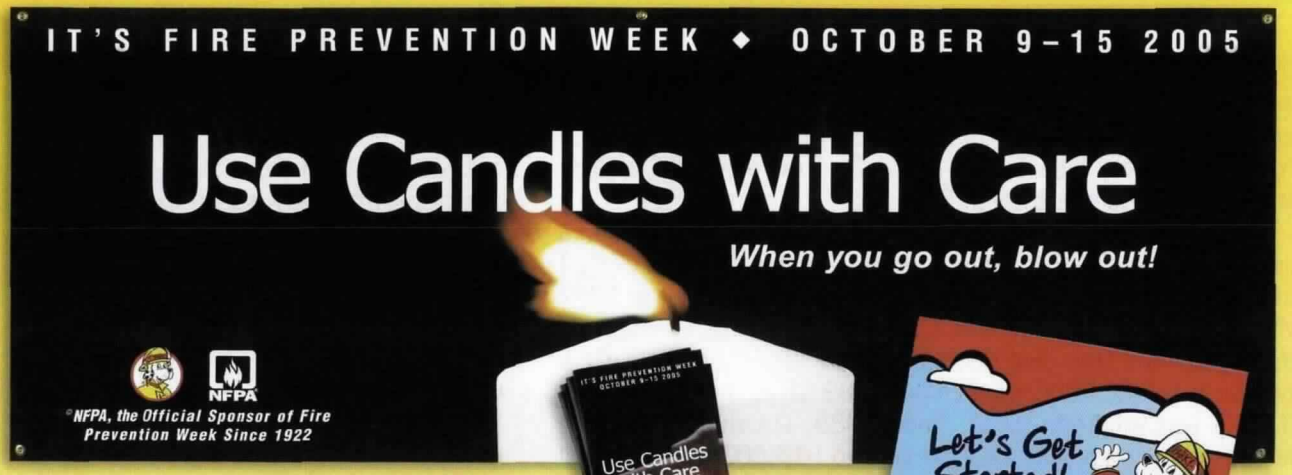

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BY MICHAEL J. KARTER JR.

U.S. Fire Loss for 2004

Residential fires accounted for 78 percent of all structure fires in 2004.

IN 2004, PUBLIC FIRE DEPARTMENTS responded to 1,550,500 fires in the United States, according to estimates based on data NFPA received from fire departments responding to its 2004 National Fire Experience Survey (see Tables 1 and 2). This represents a slight decrease of 2.2 percent from 2003.

There was an estimated 526,000 structure fires in 2004, a slight increase of 1.3 percent from 2003. For the 1977-2004 period, the number of structure fires was 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 in the 517,500 to 526,000 range from 1998 to 2004.

Of the 2004 structure fires, 410,500 were residential fires, accounting for 78 percent of all structure fires, and a slight increase of 2.1 percent from 2003. Of the residential structure fires, 301,500 occurred in one- and two-family dwellings, accounting for 57.3 percent of all structure fires. Another 94,000 occurred in apartments accounting for 17.8 percent of all structure fires.

For nonresidential structure fires, most property types showed little or no change in 2004. The only property types with notable changes were a decrease of 7.1 percent to 13,000 in public assembly properties, a decrease of 7.1 percent to 6,500 in institutional properties, and a 6 percent decrease to 23,500 in store and office properties.

For the 1977-2004 period, the number of outside fires was 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 reached 910,500 in 1993, and stayed near the 1,000,000 level the next three years. In 1997-1998 outside fires were at the 850,000 level, went up 8.7 percent to 931,500 in 1999, before dropping a cumulative 9.9 percent in 2001-2002 to 839,000 by the end of

SUMMARY

- 1,550,500 fires were attended by public fire departments, a slight decrease of 2.2 percent from the year before.
- 526,000 fires occurred in structures, a slight increase of 1.3 percent.
- 410,500 fires or 78 percent of all structure fires occurred in residential properties.
- 297,000 fires occurred in vehicles, a decrease of 4.8 percent from the year before.
- 727,500 fires occurred in outside properties, a decrease of 3.4 percent.
- 3,900 civilian fire deaths occurred in 2004, a very slight decrease of 0.6 percent or virtually no change from a year ago.
- 3,190 civilian fire deaths occurred in the home, a slight increase of 1.4 percent.
- 520 civilians died in highway vehicle fires.
- 80 civilians died in nonresidential structure fires.
- $8,314,000,000 of property damage occurred in structure fires.
- $5,948,000,000 of property loss occurred in residential properties.
- Intentionally set structure fires resulted in $714,000,000 in property loss, an increase of 3.2 percent from last year.
- The full report is available on the Web at www.nfpa.org/Research/.

ILLUSTRATIONS: VEER, CHRIS MCCUSKER

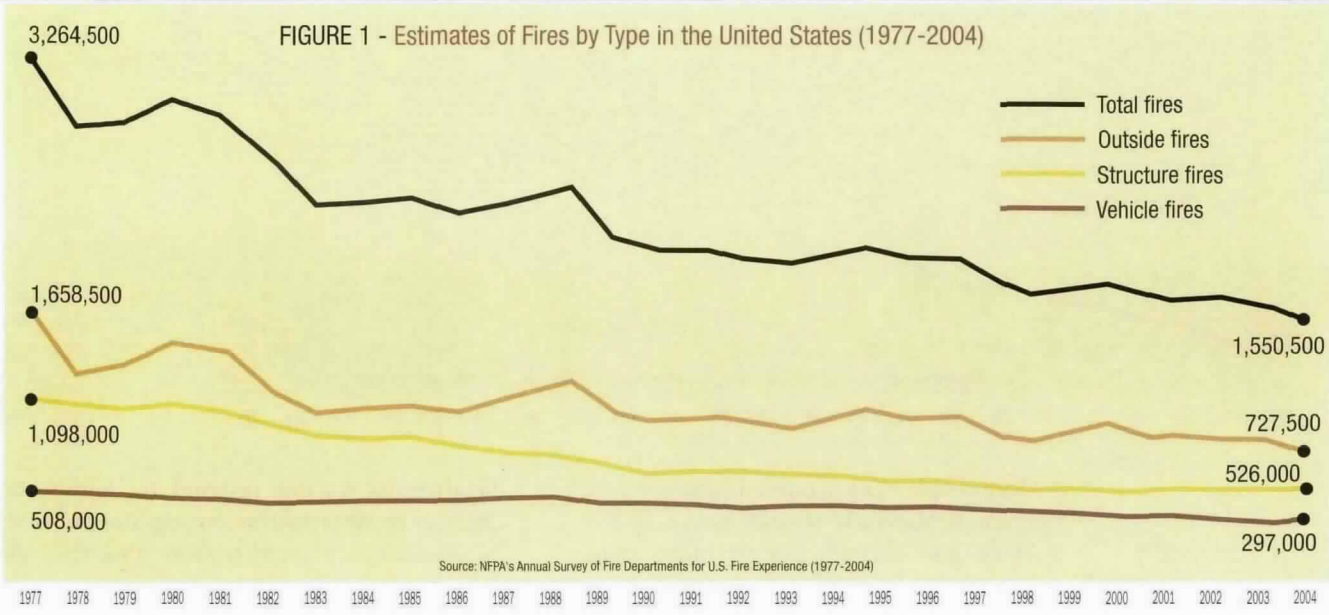


FIGURE 1 - Estimates of Fires by Type in the United States (1977-2004)

2002. In 2003, the number of outside fires decreased a substantial 10.3 percent to 753,000, and decreased another 3.4 percent in 2004 to 727,500. In particular, brush fires decreased 11.1 percent to 320,000 in 2004.

Civilian Deaths

The 1,550,500 fires reported to by fire departments in the U.S. in 2004 resulted in an estimated 3,900 civilian deaths based on data reported to NFPA. This is a very slight decrease of 0.6 percent or virtually no change from a year ago.

An estimated 3,225 died in residential fires in 2004, a slight increase of 1.9 percent. Of these deaths, 510 occurred in apartment fires, a substantial increase of 24.4 percent. Another 2,680 died in one- and two-family dwellings, a slight decrease of 2 percent. Though dwelling death rates changed little in 2004, we remain cautious because death rates can vary considerably from year to year particularly for smaller communities as we have observed in recent years.

In all, fires in the home (one- and two-family dwellings including manufactured homes and apartments) resulted in 3,190 civilian deaths, a slight increase of 1.6 percent from a year ago. Looking at trends in civilian deaths since 1977-78[1], 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 decrease steadily during the 1979-1982 period 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 quite level in the 4,655 to 4,955 area except for 1984 when 4,075 fire deaths occurred. In the past 15 years, home fire deaths moved well below the 1982-1988 plateau and have stayed in the 3,145 to 3,720 area during 1991 to 2004 except for 1996, 1999, and 2002.

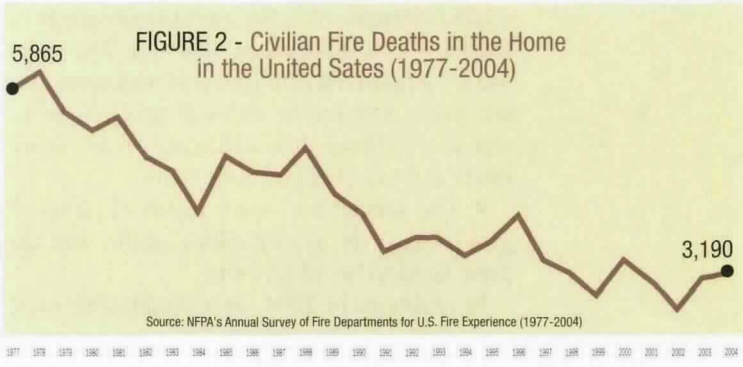
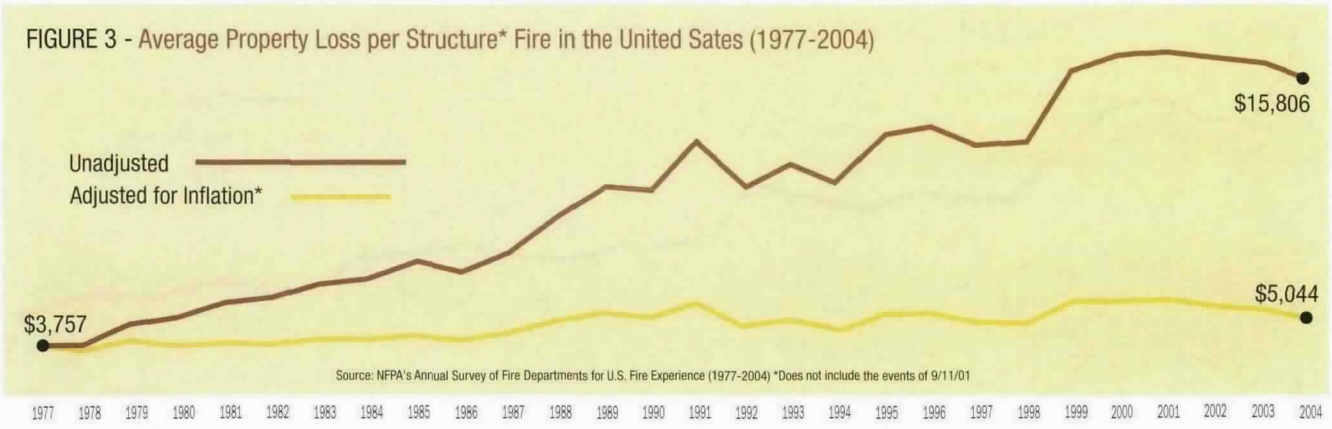


FIGURE 2 - Civilian Fire Deaths in the Home in the United Sates (1977-2004)

With home fire deaths still accounting for 3,190 fire deaths or 82 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:

- More 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.

FIGURE 3 - Average Property Loss per Structure* Fire in the United Sates (1977-2004)



- More people must use and maintain smoke alarms 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 lighters that are more child-resistant are a good example, as is the recent examination of feasibility of less fire-prone 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]

In addition, in 2004, an estimated 80 civilians died in nonresidential structure fires, a highly significant decrease of 63.6 percent. This decrease reflects the 100 fire deaths that occurred in the Station Nightclub fire in Rhode Island, and 31 deaths that occurred in two nursing home fires in Connecticut and Tennessee in 2003.

Of the 3,305 civilians who died in structure fires, 320 or 9.7 percent died in fires that were intentionally set.

In addition, in 2004, 520 civilians died in highway vehicle fires, an increase of 14.3 percent, and the highest figure since 1999. Another 30 civilians died in other vehicle fires.

Civilian Fire Injuries

Results based on data reported to NFPA indicate that in addition to 3,900 civilian fire deaths, there were 17,785 injuries in 2004. This is a slight decrease of 1.4 percent from a year ago.

Estimates of civilian fire injuries are on the low side, because many civilian injuries are not reported to the fire service. For example, many injuries occur at small fires that fire departments do not respond to, and sometimes when departments do respond they may be unaware of injured persons that they did not transport to medical facilities.

NFPA estimates that there were 14,175 civilians injured in residential properties, a slight increase of 0.7 percent. Of these injuries, 10,500 occurred in one- and two-family dwellings, while 3,200 occurred in apartments.

For the 1977-2004 period, the number of civilian injuries has ranged from a high of 31,275 in 1983 to a low of 17,785 in 2004 for an overall decrease of 43 percent. There was no consistent pattern going up or down until 1995, when injuries fell roughly 5,000 in 1994-95 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 21 percent in 2001-2004 to 17,785 by the end of 2004.

Property Loss

NFPA estimates that the 1,550,500 fires responded to by the fire service caused $9,794,000,000 in property damage in 2004. This is a substantial decrease of 20.2 percent from a year ago. (Most of the decrease reflects the Southern California wildfires that occurred in 2003 with an estimated property damage of $2,040,000,000.)

Fires in structures resulted in $8,314,000,000 in property damage, a moderate decrease of 5.3 percent. Average loss per structure fire was $15,806, a decrease of 4.2 percent.

Over the 1977-2004 period, and excluding the events of 9/11/01, the average loss per structure fire ranged from a low of $3,757 to a high of $17,016 in 2001 for an overall increase of 353 percent. When property loss is adjusted for inflation, the increase in the average structure fire loss between 1977 and 2001 is 56 percent.

Of the property loss in 2004, an estimated $5,948,000,000 occurred in residential properties, down a slight 2.1 percent from 2003. An estimated $4,948,000,000 occurred in one- and two-family dwellings, a slight decrease of 2.1 percent. An estimated $885,000,000 also occurred in apartments. Other property damage figures worth noting for 2004 include $358,000,000 in industrial properties, a highly significant decrease of 42.7 percent; $586,000,000 in store and office properties, a significant decrease of 18.7 percent; and $748,000,000 in storage properties, an increase of 10.8 percent; and $25,000,000 in institutional properties, a decrease of 10.7 percent.

Keep 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 analysis of these large loss fires in the November/December issue of *NFPA Journal*® every year.

TABLE 1 - Estimates of 2004 Fires, Civilian Deaths, Civilian Injuries and Property Loss in the United States

Estimate	*Range*[1]	*Percent Change From 2003*
Number of fires		
1,550,500	1,517,500 to 1,583,500	-2.2
Number of civilian deaths		
3,900	3,500 to 4,300	-0.6
Number of civilian injuries		
17,875	16,925 to 18,825	-1.4
Property loss[2]		
$9,794,000,000	$9,504,000,000 to 10,084,000,000	-20.2**[3]

The estimates are based on data reported to the NFPA by fire departments that responded to the 2004 National Fire Experience Survey.
[1] These are 95 percent confidence intervals.
[2] This includes overall direct property loss to contents, structures, vehicles, machinery, vegetation, and anything else involved in a fire. It does not include indirect losses. No adjustment was made for inflation in the year-to-year comparison.
[3] This decrease reflects the Southern California Wildfires (Cedar and Old Wildfires) with an estimated total property loss of $2,040,000,000 that occurred in 2003. Loss by specific property type for this fire was not available.
**Change was statistically significant at the .01 level.

Intentionally Set Fires

Based on data reported by fire departments in the survey, NFPA estimates there were 36,500 intentionally set structure fires in 2004. This is a slight decrease of 2.7 percent from 2003. (Note: The NFPA survey is based on the newly revised 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 320 civilian deaths, an increase of 4.9 percent. These set structure fires also resulted in $714,000,000 in property loss, an increase of 3.2 percent.

In addition, in 2004, there were an estimated 36,000 intentionally set vehicle fires, a significant increase of 18.0 percent from a year ago. These set vehicle fires resulted in $165,000,000, in property loss, a significant increase of 25.0 percent.

Description of NFPA Survey

NFPA annually surveys a sample of fire departments in the U.S. 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 less than 100,000 population, a sample was selected stratified by size of community protected. A total of 2,830 fire departments responded to the 2004 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 (2.1 percent), number of civilian deaths (10 percent), number of civilian injuries (5.3 percent), and property loss (3 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). Also, no adjustments were made 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: Anyone other than a firefighter, and covers public service personnel such as police officers, civil defense staff, non-fire

TABLE 2 - Estimates of 2004 Fires and Property Loss by Property Use

	NUMBER OF FIRES		PROPERTY LOSS[1]	
	Estimate	*Percent Change From 2003*	*Estimate*	*Percent Change from 2003*
Fires in structures	526,000	+1.3	$8,314,000,000	-4.2*
Fires in highway vehicles	266,500	-6.8**	969,000,000	-12.0**
Fires in other vehicles[2]	30,500	+17.3*	335,000,000	+31.4**
Fires outside of structures with value involved but no vehicle (outside storage, crops, timber, etc.)	69,000	+4.6	108,000,000	-33.3**
Fires in brush, grass wildland (excluding crops and timber) with no value or loss involved	320,000	-11.1**	—	—
Fires in rubbish including dumpsters(outside of structures) with no value or loss involved	194,000	+1.8	—	—
All other fires	144,500	+5.9	68,000,000	-4.2
Total	1,550,500	-2.2	$9,794,000,000	-20.2**[3]

The estimates are based on data reported to the NFPA by fire departments that responded to the 2004 National Fire Experience Survey.
[1] This includes overall direct property loss to contents, structure, a vehicle, machinery, vegetation or anything else involved in a fire. It does not include indirect losses, e.g., business interruption or temporary shelter costs. No adjustment was made for inflation in the year-to-year comparison.
[2] This includes trains, boats, ships, aircraft, farm vehicles and construction vehicles.
[3] This decrease reflects the Southern California Wildfires with an estimated loss of $2,040,000,000 that occurred in 2003. Loss by specific property type for the fire was not available.
*Change was statistically significant at the .05 level.
**Change was statistically significant at the .01 level.

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 a person suffers as a direct result of fire and 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, a vehicle, vegetation, or anything else involved in the fire but not indirect losses, such as business interruption or temporary shelter provisions.

TABLE 3 - Estimates of 2004 Structure Fires and Property Loss by Property Use

	STRUCTURE FIRES		PROPERTY LOSS[1]	
	Estimate	*Percent Change from 2003*	*Estimate*	*Percent Change from 2003*
Public assembly	13,000	-7.1	$316,000,000	+4.6
Educational	7,000	0	68,000,000	-1.5
Institutional	6,500	-7.1	25,000,000	-10.7
Residential (total)	410,500	+2.1	5,948,000,000	-2.1
One- and two-family dwellings[2]	301,500	+1.5	4,948,000,000	-2.1
Apartments	94,000	+2.7	885,000,000	-1.3
Other residential[3]	15,000	+11.1*	115,000,000	-8.0
Stores and offices	23,500	-6.0	586,000,000	-18.7**
Industry, utility, defense[4]	12,000	+4.3	423,000,000	-32.3**
Storage in structures	32,000	+1.6	748,000,000	+10.8
Special structures	21,500	0	200,000,000	+8.7
Total	526,000	+1.3	$8,314,000,000	-4.2*[5]

The estimates are based on data reported to the NFPA by fire departments that responded to the 2004 National Fire Experience Survey.
[1] This includes overall direct property loss to contents, structure, a vehicle, machinery, vegetation or anything else involved in a fire. It does not include indirect losses, e.g., business interruption or temporary shelter costs. No adjustment was made for inflation in the year-to-year comparison.
[2] This includes manufactured homes.
[3] Includes hotels and motels, college dormitories, boarding houses, etc.
[4] Incidents handled only by private fire brigades or fixed suppression systems are not included in the figures shown here.
[5] This total figure comparison does not include the Southern California Wildfires that occurred in 2003. Loss by specific property type for this fire was not available.
*Change was statistically significant at the .05 level.
**Change was statistically significant at the .01 level.

TABLE 4 - Estimates of 2004 Civilian Fire Deaths and Injuries by Property Use

	CIVILIAN DEATHS			CIVILIAN INJURIES		
	Estimate	*Percent Change from 2003*	*Percent of all Civilian Deaths*	*Estimate*	*Percent Change from 2003*	*Percent of all Civilian Injuries*
Residential (total)	3,225	+1.9	82.7	14,175	+0.7	79.3
One-and two-family dwellings[1]	2,680	-2.0	68.7	10,500	+5.0	58.7
Apartments	510	+24.4	13.1	3,200	-12.3	17.9
Other Residential[2]	35	+75.0	0.9	475	+11.8	2.7
Non-residential structures[3]	80	-63.6**[4]	2.1	1,350	-11.5	7.5
Highway vehicles	520	+14.3	13.3	1,300	-7.1	7.3
Other vehicles[5]	30	+50.0	0.7	200	0	1.1
All other[6]	45	-30.7	1.2	850	-8.1	4.8
Total	3,900	-0.6		17,785	-1.4	

Estimates are based on data reported to the NFPA by fire departments that responded to the 2004 National Fire Experience Survey. Note that most changes were not statistically significant; considerable year-to-year fluctuation is to be expected for many of these totals because of their small size.
[1] This includes manufactured homes.
[2] Includes hotels and motels, college dormitories, boarding houses, etc.
[3] This includes public assembly, educational, institutional, store and office, industry, utility, storage, and special structure properties.
[4] This decrease reflects 100 fire deaths in the Station Nightclub Fire in Rhode Island, and 31 deaths in two nursing home fires in Connecticut and Tennessee that occurred in 2003.
[5] This includes trains, boats, ships, farm vehicles and construction vehicles.
[6] This includes outside properties with value, as well as brush, rubbish, and other outside locations.

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.

TABLE 5 - Estimate of 2004 Losses in Intentionally* Set Structure Fires

Intentionally Set Structure Fires*	*Estimate*	*Percent Change From 2003*
Number of Structure Fires	36,500	-2.7
Civilian Deaths	320	+4.9
Property Loss[1]	$714,000,000	+3.2

The estimates are based on data reported to the NFPA by fire departments that responded to the 2004 National Fire Experience Survey.
[1] This includes overall direct property loss to contents, structure, a vehicle, machinery, vegetation, or anything else involved in a fire. It does not include indirect losses, e.g., business interruption or temporary shelter costs. No adjustment was made for inflation in the year-to-year comparison.
*The NFPA Survey is based on the newly revised 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.

Full Report on 'U.S. Fire Loss during 2004'

A more detailed and complete report on the overall patterns and trends of 2004 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 scheduled to be available in September on NFPA's Web site, www.nfpa.org, under "One-Stop Data Shop."

Acknowledgments

The NFPA gratefully thanks the many fire departments that responded to the 2004 National Fire Experience Survey for their continuing efforts for providing us in a timely manner the data so necessary to make national projections.

We thank the many members of NFPA staff who worked on this year's survey including Frank Deely, John Baldi, and John Conlon for editing the survey forms and their follow-up calls to fire departments; and Norma Candeloro for handling the processing of survey forms and typing this report.

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.
2. John R. Hall, Jr., Characteristics of Home Fire Victims Including Age and Sex, June 2004, Quincy: NFPA, Fire Analysis and Research Division.
3. Rita F. Fahy and Alison L. Miller, "How Being Poor Affects Fire Risk", *Fire Journal*, Vol. 83, No. 1 (January 1989), p. 28.

BY STEPHEN G. BADGER

U.S. Multiple-Death Fires for 2004

Most of the catastrophic multiple-death fires occur in residential structures.

SUMMARY

- The largest loss-of-life fire in 2004 occurred in a 24-unit apartment building. Ten people died.
- Residential occupancies accounted for 53 percent of the catastrophic multiple-death fires in 2004.
- Five catastrophic nonresidential structure fires killed 19 people in 2004.
- Information on detection equipment was only reported for 10 of the 17 residential fires in 2004. In 6 of the 10 properties, there was no automatic detection system present.
- The full report is available on the Web at www.nfpa.org/Research/.

CATASTROPHIC MULTIPLE-DEATH fires occur all too often, but do they have to?

In 2004, 32 catastrophic multiple-death fires killed 152 people (34 of them children under the age of six) compared to 2003 when 35 fires killed 307 people (including the 100 deaths at the Rhode Island nightclub fire). The 2004 experience was similar to 2002, when 160 people died in 32 catastrophic fires. Catastrophic multiple-death fires are fires that kill five or more people in a residential property or three or more in a nonresidential or nonstructural property.

Imagine reading a news story that says, "A family of five escaped an inferno that broke out in their home at 4 a.m. today." From the reporter's description of the event, we learn that the fire broke out when a candle left unattended on a kitchen table ignited nearby combustibles. A smoke alarm sounded, and the family escaped using various escape routes that they had practiced for years. When firefighters arrived, the family was waiting at a tree in the front yard and told firefighters that all family members were safely out of the house.

Instead, we are more familiar with this tragic tale: Instead of the family getting out, there is death, and we are reading about how a silent or missing smoke alarm results in a deadly fire. It takes just one element to change the whole story.

Most of these large losses—or even the fires themselves—could have been prevented with a simple change in behavior.

The largest loss-of-life fire in 2004 occurred in a 24-unit apartment building, one of several buildings in an apartment complex. The building was three stories high and of protected wood-frame construction. It was not reported if there a smoke detection system was present, but it is known that there was no automatic suppression equipment. While most occupants slept, an incendiary fire was ignited in a stairwell at the north end of the building in the basement. The fire spread up to the third-floor and attic. All 10 victims, two under age six, were located on the third floor. Arriving firefighters faced a large amount of fire and smoke, and dozens of people evacuating, some jumping from upper-story windows.

In the United States, there were an estimated 1,550,500 fires in 2004: 410,500 in residential properties, 115,500 in nonresidential properties, and 1,024,500 in nonstructural properties. They killed 3,900 civilians. Catastrophic, multiple-death fires accounted for 0.002 percent of these fires and 3.9 percent of the deaths.

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 fire 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 United States. We understand that, in many cases, a department cannot release information due to ongoing litigation. And in some cases, depart-

ILLUSTRATION: VEER

ments have been unable to determine the information we request.

Catastrophic residential fires

In 2004, the most catastrophic multiple-death fires occurred in residential structures.

There were 17 residential fires, 13 in single-family dwellings, four of which were manufactured homes; 1 in a 123-unit mote; 1 in the 24-unit apartment building, 1 in a 5-unit apartment building, and 1 in an apartment building with an unreported number of units.

Residential occupancies accounted for 53 percent of the catastrophic multiple-death fires in 2004. There were 96 deaths in these fires, up from 91 deaths in 2003. These deaths represent 63 percent of the total deaths in catastrophic multiple-death fires. Thirty children under the age of six died in these fires, a number comparable to that of 2003.

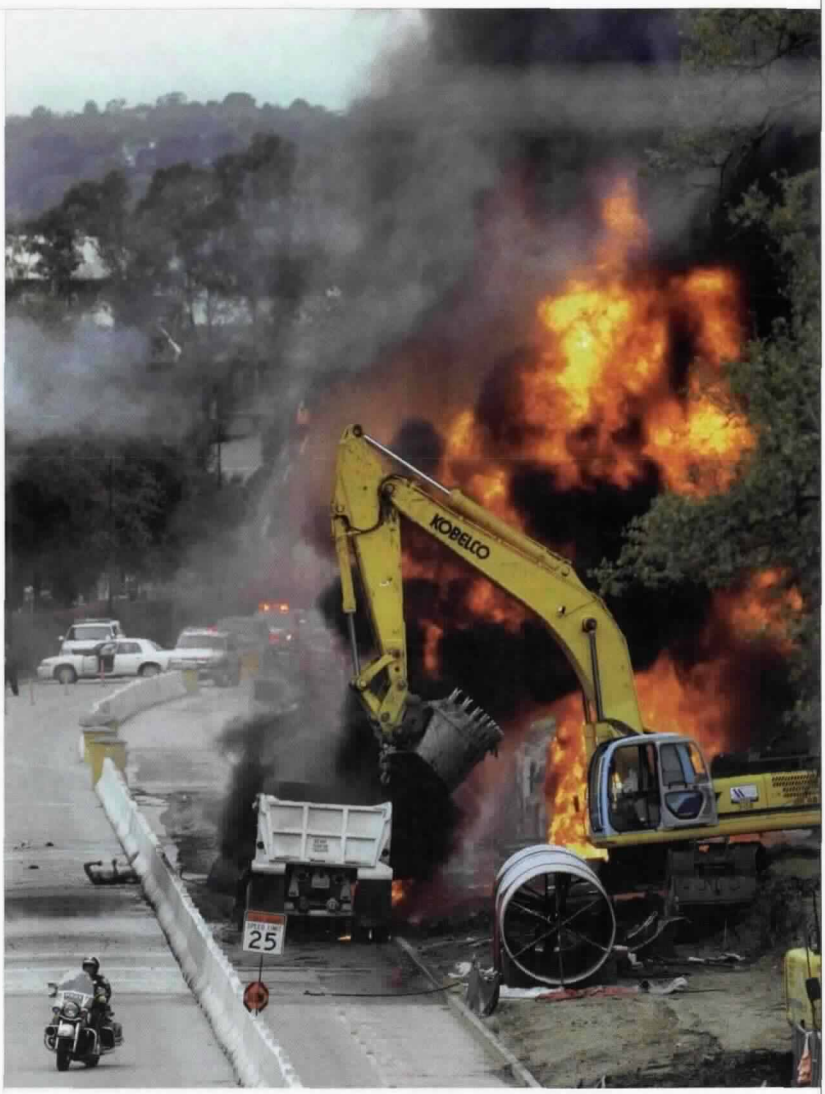
Fourteen of the 17 catastrophic residential fires occurred between 11 p.m. and 7 a.m. (see Table 1).

One fire killed seven unattended children, all under the age of eight, in a five-unit apartment building. The building was two stories high and made of protected wood-frame construction. Smoke alarms were present, but they were not in the area of origin and did not sound. The reason for this was not reported.

The afternoon fire, which originated in a second-story bedroom, involved an open flame and spread to the attic. Upon hearing the children's screams, the mother of six of the children returned from a neighbor's house. She and the neighbors attempted rescues. Arriving firefighters located and removed the victims. Extra firefighters were called to the scene, as most of the first-responding units were involved with life-support measures for the victims.

Four fires killed six people each. The first occurred in a split-level, 123-unit motel that was of fire-resistive construction, with five stories in the front and three stories in the rear. One victim was a child under the age of six. At the time of the fire, the motel was at full operation with 46 registered guests. Some minor remodeling was in progress, and new furnishings were being added. The motel had a complete-coverage combination smoke-and-heat detection system. Local alarms in the guest rooms were not hooked into the system, and there was no automatic suppression equipment. The incendiary fire broke out just inside an exit door in the ground-level foyer at the rear of the building, which was equal to the third level at the front. The fire spread through the foyer and down a corridor.

The building alarms activated and alerted occupants. A guest heard the alarms, saw the fire in the foyer, and unsuccessfully attempted to extinguish the fire. The guest then returned down the corridor beating on doors and screaming fire. When the elevator failed to work, the guest broke a large window at the opposite end of the corridor instead of using the stairs, which caused a 248-foot (75-meter) horizontal chimney effect. The arriving firefighters were faced with a fire spreading through the foyer, people who had jumped, and others who were ready to jump.



Flames and smoke billow from an underground petroleum pipeline that exploded near a high school in California on November 9, 2004.

PHOTOGRAPH: AP/DINO VOURNAS

A firefighter works to extinguish a fire at a retirement home in Tennessee on January 20, 2004. The fire killed three residents and injured at least 12 other people, officials said.

PHOTOGRAPH: AP PHOTO/THE DAILY TIMES, TOM SHERLIN

Firefighters knocked down the fire while the next-arriving company made several rescues over ground ladders from windows. Four victims were found almost at the end of the corridor, near the broken window. Two more victims were found in their rooms. All the victims were on the fire floor.

The second fire, of undetermined cause, occurred in a two-story, single-family home of unprotected wood-frame construction. The house had a smoke alarm, but it had no battery. The early-morning fire started in the first-floor living room, then broke through a large front window and spread to the porch and up to the second story. All six victims were on the second story.

The third fire broke out on the front porch of a one-story, single-family home of unprotected wood-frame construction with a brick veneer. The house had no smoke detection equipment. The fire, of undetermined origin, spread into the home through the front door and traveled to the attic. The six victims were trying to escape through the back door in an attached garage, but the door had security bars with a key lock and they did not make it outside. The family was overcome as it looked for the key. Security bars with no release device on all windows hampered both escape and rescue attempts.

The fourth fire was set in a first-floor hallway of a two-story row house of unprotected ordinary construction. No information on smoke detection equipment or other details were reported.

Eleven fires killed five people each. Eight were in single-family homes, two occurred in two-family homes, and one occurred in an apartment building.

A fire in a one-story, single-family home of unprotected wood-frame construction resulted in the deaths of four children under the age of six. The house had no smoke alarms. A four-year-old woke during the night, turned on a

gas stove, and went back to bed. Food that had been left on the stove ignited, and the fire spread throughout the house. Security bars prevented the victims from escaping.

A fire in a single-family manufactured home ignited when electric heaters overloaded the electrical system. Information on smoke detection equipment was not reported. The home was engulfed by the time the fire department.

In a one-story, single-family home of unprotected ordinary construction, gasoline was ignited in the living room, near the means of egress. The house had no smoke alarms, and security bars on the window impeded escape and hindered firefighters' rescue attempts. One victim was a child under the age of six.

Another fire broke out near an electric panel in the laundry room of a two-story, single-family farmhouse of unprotected wood-frame construction. No smoke alarms were present. Five members of the family were asleep on the second floor and two on the first floor. One person from each level escaped. Most of the windows in the house were open at the time, allowing a strong wind to spread the flame and smoke rapidly.

A fire of unknown origin broke out in the front living room of a one-story duplex of unprotected wood-frame construction. There were no smoke alarms, and the doors and windows all had security bars and gates. The front door gate was locked, forcing firefighters to cut their way in. Also hindering escape and rescue were plywood hurricane shutters.

A fire of undetermined origin broke out in the first-floor lounge of a two-story duplex of unprotected wood-frame construction. Information on smoke detection equipment could not be determined because the house was destroyed. There was a delay in detection of this fire due to the hour and the home's isolated location in a residential cul-de-sac.

A fire of undetermined cause that broke out in the kitchen of a two-story single-family home of unprotected wood-frame construction spread throughout the house. There was a partial coverage of smoke alarms, but they did not operate. One was missing a battery, and one had a dead battery.

Few details were reported for the last four five-fatality fires, which accounted for the deaths of 10 children under age six. Three of them occurred in manufactured homes, and the fourth occurred in an apartment building with an unknown number of units.

Catastrophic nonresidential fires

Five catastrophic nonresidential structure fires killed 19 people in 2004. In comparison, 10 catastrophic nonresidential structure fires, including The Station nightclub fire, killed 163 people in 2003. In 2004, one fire each occurred in a manufacturing plant, an assisted-living facility, a board-and-care facility, an office building, and a natural gas well (see Table 2).

Two fires resulted in five deaths each. The first broke out in a two-story assisted-living facility of protected wood-frame construction. At the time of the fire, there were 16 residents and an unknown number of staff in the facility. A smoke detection system was present, and it operated and alerted occupants. There was no automatic suppression equipment. The fire broke out in a second-story bedroom when a lamp arced and ignited nearby combustibles. Arriving firefighters and police officer rescued several occupants, and the other occupants escaped on their own.

In the second incident, an explosion followed by a fire occurred in a two-story, chemical and plastics manufacturing plant of unprotected, noncombustible construction when an undetermined source ignited a leak in a vinyl chloride system. The plant had no smoke alarms. It did have an automatic wet-pipe sprinkler system, but its coverage and effectiveness is still under investigation.

Three more fires killed three people each. The first occurred at a gas well following an explosion, the cause of which has not yet been undetermined. Arriving firefighters located two of the victims and removed them, but they could not find the third victim. Since the scene was unsafe, the firefighters pulled back, evacuated area residents, and awaited specialty teams. Once the fire was extinguished, the third victim was found.

The second fire broke out in a one- and two-story board-and-care facility of unprotected wood-frame construction. No other information was reported.

The third incident was an explosion in an office building in which four people were present. The building, was one story high and made of unprotected ordinary construction. It had no detection or suppression equipment. Investigators determined that natural gas leaking from a pipe outside the building worked its way into the structure, where it was ignited by an undetermined source. One person was injured in the explosion.

Catastrophic nonstructural fires

There were 10 catastrophic fires outside of structures, 5 in cars or trucks, 3 in aircraft, 1 in a camper trailer, and 1 in an open trench. A medical examiner's or coroner's office verified that the deaths in crashes with ensuing fires were due to fire, not impact. These catastrophic nonstructural fires killed 37 people, including four children under age six. This is fewer than 2003, when nine such fires killed 53 people.

Three nonstructural incidents killed five people each. The first was a single-car car fire, in which three of the victims under age six. No other information was reported.

The second fire occurred when an aircraft crashed in a wooded area past the end of the runway and came to rest in a ravine. An unknown source ignited a large amount of spilled fuel. By the time firefighters arrived, the aircraft was fully engulfed in smoke and flames. The National Transportation Safety Board (NTSB) report has not been released yet.

The third was an explosion followed by a fire. Workers were digging a trench to install new water pipe, when an excavator accidentally hit a gasoline pipeline. Welders working nearby ignited the ensuing high-pressure leak. Most of the five victims died in the trench.

One 2004 fire that killed four people occurred when an airplane practicing touch-and-go landings crashed into a hangar and several vehicles. A fire broke out and destroyed the plane, the vehicles, and the hangar. The NTSB has not yet released its accident report.

Another six fires last year killed three people each. Four occurred in highway vehicles involved in crashes, one involved an aircraft crash, and one was a camper trailer fire.

The first fire resulted when a motor home collided with a semi-tractor trailer. Spilled gasoline ignited, and the fire spread into the motor home, trapping the three occupants.

The second also involved a two-vehicle collision. Gasoline from a ruptured fuel tank ignited, and the fire spread to one of the vehicles. Only one person was rescued from this fire, which firefighters used foam to extinguish.

In the third incident, a train broadsided a tanker truck that had not made it over a highway crossing as the train approached. The truck was carrying approximately 8,000 gallons (30,280 liters) of gasoline, which spilled and was ignited on impact. The driver of the tanker and two train operators were killed.

The fourth incident was a plane crash on a mountainside. As a post-crash fire broke out, two people escaped. They were able to pull one burn victim from the crash, but he died a short time later. The other two victims were trapped in the wreckage and died of burns.

No information was reported for the last two incidents, except that one involved a camper trailer at a camp ground and the other resulted from a two-vehicle collision on a highway.

Role of smoke alarms and sprinklers

Information on detection equipment was only reported for 10 of the 17 residential fires. In 6 of the 10 properties, there was no automatic detection system present. Thirty-one people died in these structures, including two children under the age of six.

Four of the residential structures had smoke alarms. The motel had a complete coverage combination smoke and heat detection system that operated and alerted the guests. One home had a smoke alarm but its battery was missing, and another home had two smoke alarms, one with a dead battery and one missing a battery. The operation of the smoke alarm in the third home couldn't be determined.

In these three home fires, 18 people died, including 5 children under age six. None of the residential occupancies had a sprinkler system.

Information on detection equipment and sprinkler systems was reported in only four of the five nonresidential fires. Three properties had no smoke detection equipment, and one had a system with unreported coverage that operated and alerted the occupants. Another three had no sprinkler equipment, and one had a wet-pipe system, the operation and coverage of which was not reported.

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 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' instructions. NFPA recommends testing residential smoke alarms at least monthly. Batteries should also be replaced according to manufacturer's instructions 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

Firefighters work at the scene of the deadly Twin Spruce boarding home blaze in Pennsylvania on August 14, 2004. Investigators say they believe the fire was accidental and further tests are need to identify the three victims.

PHOTOGRAPH: AP PHOTO/BLOOMSBURG PRESS ENTERPRISE, FRANK WESNOSKI

operating smoke alarm and follow a practiced escape plan that emphasizes two ways out with a designated meeting place.

Exit drills in the home are part of many school curricula. Practicing the plan helps families determine whether children and others waken readily to the sound of a smoke alarm. That information, along with help for family members who require it, can be factored into the plan. Practicing fire prevention principles could have prevented many of the fires.

Security bars

In 2004, security bars on windows and doors hindered or prevented occupants' escape in four residential structure fires, none of which had smoke detection equipment. These fires resulted in 21 deaths, or almost one-fourth of the deaths in residential properties. In at least three buildings, the bars were non-releasing or did not comply with the codes. In one case, there were also plywood hurricane shutters and metal gates on the doors.

Many of the security measures being used to keep criminals out also trap residents in during emergencies, and they worked to keep firefighters from getting in to attempt rescues. NFPA recommends that all security bars be installed with quick-release devices and that family members know where and how to use them.

Acknowledgments

NFPA wishes to thank the U.S. fire service for its contributions, without which this report would not be possible. The author would like to thanks his co-workers for their guidance in the completion of this report.

STEPHEN G. BADGER, fire data assistant in NFPA's Fire Analysis and Research Division, is retired from the Quincy, Massachusetts, Fire Department.

TABLE ONE

OHIO

Month, Time of Alarm, Number of Deaths
September, 2:48 a.m., 10 (two under age six)
Number of Stories, Occupancy, Construction Type
Three-story, 24-unit apartment building of protected wood-frame construction
Smoke Alarm and Other Fire Protection Devices
No information on automatic detection was reported. There was no automatic suppression equipment installed.
Fire Origin and Path
A fire was set in a lower-level stairwell and spread vertically to the third story and attic.
Contributing Factors and Victim Locations
All of the victims were found on the third floor.

OHIO

Month, Time of Alarm, Number of Deaths
October, 2:38 p.m., 7 (four under age six)
Number of Stories, Occupancy Type, Construction Type
Two-story, 5-unit apartment building of protected wood-frame construction
Smoke Alarm and Other Fire Protection Devices
There were smoke alarms in the apartment but not in the room of origin, and none operated. The reason alarms did not operate was not reported.
Fire Origin and Path
An open flame ignited the fire in a second-story bedroom, which then spread to the attic.
Contributing Factors and Victim Locations
The seven victims were all under the age of eight and were unattended. An infant was in one bedroom, the other children were in a second bedroom.

SOUTH CAROLINA

Month, Time of Alarm, Number of Deaths
January, 4:24 a.m., 6 (one under age six)
Number of Stories, Occupancy Type, Construction Type
Split-level, 123-unit motelof fire-resistive construction, with five stories in the front and three stories in the rear
Smoke Alarm and Other Fire Protection Devices
There was a complete-coverage heat and smoke alarm system. Guestrooms had local alarms that were not connected to the system. Alarms activated and alerted the occupants. There was no automatic suppression equipment.
Fire Origin and Path
A fire was set in the foyer of the rear entrance, which was at ground level at the back of the building and on the third level at the front of the building. The fire extended down a corridor, aided by the chimney effect created when a guest broke a window on the opposite end of the corridor.
Contributing Factors and Victim Locations
There were 46 registered guests. Four victims were found in the corridor near the broken window, and two other victims were still in their rooms, all on the fire floor.

NEW YORK

Month, Time of Alarm, Number of Deaths
August, 5 a.m., 6 (one under age six)
Number of Stories, Occupancy Type, Construction Type
Two-story, single-family dwelling of unprotected wood-frame construction
Smoke Alarm and Other Fire Protection Devices
There was a smoke alarm, but the battery had been removed.
Fire Origin and Path
The fire began under a large window in the first-floor living room. The window failed and the fire spread to the front porch and upward. The cause is undetermined.
Contributing Factors and Victim Locations
Smoke and intense heat trapped the six victims on the second floor.

Oklahoma

Month, Time of Alarm, Number of Deaths
September, 9:39 p.m., 6.

Number of Stories, Occupancy Type, Construction Type
One-story, single-family dwelling of unprotected wood-frame construction, with brick veneer
Smoke Alarm and Other Fire Protection Devices
None
Fire Origin and Path
The fire originated on the front porch and spread through the front door and entry way to the attic. The cause is undetermined.
Contributing Factors and Victim Locations
Doors and windows with security bars with no quick-release mechanism hindered escape and firefighter access. The six victims were found in the attached garage where they were looking for the key to a barred back door.

PENNSYLVANIA

Month, Time of Alarm, Number of Deaths
October, 4:57 a.m., 6 (one under age six)
Number of Stories, Occupancy Type, Construction Type
Two-story, single-family row house of unprotected ordinary construction
Smoke Alarm and Other Fire Protection Devices
Not reported
Fire Origin and Path
A fire was set in the first-story hallway. No other details were provided.
Contributing Factors and Victim Locations
None reported

MICHIGAN

Month, Time of Alarm, Number of Deaths
January, 4:29 a.m., 5 (four under age six).
Number of Stories, Occupancy Type, Construction Type
One-story, single-family dwelling of unprotected wood-frame construction
Smoke Alarm and Other Fire Protection Devices
None
Fire Origin and Path
A four-year-old turned on a gas stove and went back to bed. Cooking materials ignited and the fire spread throughout the house.
Contributing Factors and Victim Locations
Due to the early hour, family members were asleep, and the child was unsupervised. Security bars prevented the family's escape. All the victims were found in bedrooms.

INDIANA

Month, Time of Alarm, Number of Deaths
February, 5:46 a.m., 5 (three under age six)
Number of Stories, Occupancy Type, Construction Type
One-story, single-family manufactured home
Smoke Alarm and Other Fire Protection Devices
Not reported
Fire Origin and Path
Electric heaters overloaded the electrical system. The house was fully engulfed when firefighters arrived.
Contributing Factors and Victim Locations
None reported

KENTUCKY

Month, Time of Alarm, Number of Deaths
February, 6:40 a.m., 5 (three under age six)
Number of Stories, Occupancy Type, Construction Type
One-story, single-family manufactured home
Smoke Alarm and Other Fire Protection Devices, Fire Origin and Path, Contributing Factors, and Victim Locations
No information reported

FLORIDA

Month, Time of Alarm, Number of Deaths
February, 12:48 a.m., 5 (one under age six)
Number of Stories, Occupancy Type, Construction Type
One-story, single-family dwelling of unprotected ordinary construction
Smoke Alarm and Other Fire Protection Devices
None
Fire Origin and Path
Gasoline was ignited in the living area near the means of egress.
Contributing Factors and Victim Locations
Non-code-compliant, non-releasing wrought iron security bars hampered firefighters' efforts.

NEW YORK

Month, Time of Alarm, Number of Deaths
April. 5:30 a.m., 5 (one under age six)
Number of Stories, Occupancy Type, Construction Type
Three-stor apartment building of unprotected ordinary construction, unknown number of units
Smoke Alarm and Other Fire Protection Devices
Not reported

Fire Origin and Path, Contributing Factors and Victim Locations
Victims were found in a top-floor apartment.

ALABAMA

Month, Time of Alarm, Number of Deaths
May, 1:10 a.m., 5 (two under age six)
Number of Stories, Occupancy Type, Construction Type
One-story, single-family manufactured home
Smoke Alarm and Other Fire Protection Devices
None
Fire Origin and Path, Contributing Factors and Victim Locations
No information reported

VIRGINIA

Month, Time of Alarm, Number of Deaths
May, 3:54 a.m., 5 (one under age six)
Number of Stories, Occupancy Type, Construction Type
Two-story, single-family dwelling of unprotected wood-frame construction
Smoke Alarm and Other Fire Protection Devices
None
Fire Origin and Path
An unspecified electrical malfunction in the area of the electrical panel resulted in a fire in the first-floor laundry room.
Contributing Factors and Victim Locations
Five people were asleep on the second floor, and two were on the first floor. One from each floor escaped. Most windows were open, allowing a strong wind to spread smoke and flame.

FLORIDA

Month, Time of Alarm, Number of Deaths
September, 1:38 a.m., 5
Number of Stories, Occupancy Type, Construction Type
One-story, two-family dwelling of unprotected wood-frame construction
Smoke Alarm and Other Fire Protection Devices
None
Fire Origin and Path
The fire originated in the front living room. The cause is undetermined.
Contributing Factors and Victim Locations
The doors and windows all had security bars. The front and rear doors had steel gates that firefighters had to cut through to gain entry. Hurricane shutters covered windows. All the victims were found in the bedrooms.

SOUTH CAROLINA

Month, Time of Alarm, Number of Deaths
September, 12:53 p.m., 5 (four under age six)
Number of Stories, Occupancy Type, Construction Type
One-story, single-family manufactured home
Smoke Alarm and Other Fire Protection Devices, Fire Origin and Path, Contributing Factors and Victim Locations
No information reported

MASSACHUSETTS

Month, Time of Alarm, Number of Deaths
October, 1:33 a.m., 5 (two under age six)
Number of Stories, Occupancy Type, Construction Type
Two-story, two-family dwelling of unprotected wood-frame construction
Smoke Alarm and Other Fire Protection Devices
Undetermined due to destruction
Fire Origin and Path
A fire of undetermined cause started in the first-story lounge.
Contributing Factors and Victim Locations
The family was asleep. Given the home's isolated location on a cul de sac, there was no traffic or passersby who might have discovered the fire. Four of the victims were found on the second floor. The location of the fifth victim was not reported.

KANSAS

Month, Time of Alarm, Number of Deaths
October, 5 a.m., 5
Number of Stories, Occupancy Type, Construction Type
Two-story, single-family dwelling of unprotected wood-frame construction

Smoke Alarm and Other Fire Protection Devices
Partial-coverage smoke alarms were present, but they did not operate. One was missing a battery, and the battery in the other was dead.
Fire Origin and Path
The fire, of undetermined cause, began in the first-floor kitchen and spread throughout the structure.
Contributing Factors and Victim Locations
The victims were found in bedrooms on the second floor.

TABLE TWO

TENNESSEE
Month, Time of Alarm, Number of Deaths
January, 9:07 p.m., 5
Occupancy Type and Use, Number of Stories, Construction Type, Operating Status
Two-story assisted-living facility of protected wood-frame construction. There were 16 residents and an unreported number of staff in the facility.
Detection Systems
Operating smoke alarms alerted the occupants, but the type and coverage were not reported.
Suppression Systems
None
Fire Origin and Path
The fire broke out in a second-story bedroom when a lamp arced and ignited nearby combustibles. The fire spread through the room into the attic.
Contributing Factors and Victim Locations
The staff, firefighters, and police officers rescued some of the 11 occupants. Other occupants managed to escape on their own.

ILLINOIS
Month, Time of Alarm, Number of Deaths
April, 10:45 p.m., 5
Occupancy Type and Use, Number of Stories, Construction Type, Operating Status
Two-story chemical and plastics manufacturing plant of unprotected noncombustible construction, full operation
Detection Systems
None
Suppression Systems
An automatic wet-pipe sprinkler system was present. Its coverage was not reported, and the operation of the system is still under investigation.
Fire Origin and Path
An undetermined source ignited a vinyl chloride leak.
Contributing Factors and Victim Locations
Not reported

KENTUCKY
Month, Time of Alarm, Number of Deaths
August, 2:03 p.m., 3
Occupancy Type and Use, Number of Stories, Construction Type, Operating Status
Natural gas well; three workers were onsite to repair a pump
Detection Systems, Suppression Systems
None
Fire Origin and Path
An unknown source ignited gas that had been released from the well.
Contributing Factors and Victim Locations
Two victims were found after firefighters arrived. The third was found after the fire was extinguished.

PENNSYLVANIA
Month, Time of Alarm, Number of Deaths
August, 2:20 a.m., 3
Occupancy Type and Use, Number of Stories, Construction Type, Operating Status
One- and two-story board-and-care facility of unprotected wood-frame construction with 40 patients and an unreported number of staff members.
Detection Systems, Suppression Systems, Fire Origin and Path, Contributing Factors, Victim Location
No information reported

MINNESOTA

Month, Time of Alarm, Number of Deaths
December. 9:47 a.m., 3
Occupancy Type and Use, Number of Stories, Construction Type, Operating Status
One-story, bank office property of unprotected ordinary construction, four people were in the building.
Detection Systems, Suppression Systems
None
Fire Origin and Path
Natural gas from piping underground outside seeped into the building. The explosion resulted when an unknown source ignited the accumulated gas.
Contributing Factors and Victim Locations
The bodies of the three victims were recovered from the wreckage. A fourth person in the building survived.

WASHINGTON

Month, Time of Alarm, Number of Deaths
July, 1 a.m., 5 (three under age six)
Setting
Automobile fire
Climate Conditions, Fire Origin and Path, Factors Hindering Occupant Escape
No information reported

MISSOURI

Month, Time of Alarm, Number of Deaths
August, 9:51 a.m., 5 (One under age six)
Setting
A plane crashed in a wooded area past the end of the runway, landing in a ravine.
Climate Conditions
Not reported
Fire Origin and Path
An unknown source ignited fuel spilled in the crash. The aircraft was engulfed in seconds.
Factors Hindering Occupant Escape
None reported

CALIFORNIA

Month, Time of Alarm, Number of Deaths
November, 1:30 p. m., 5
Setting
Trench for a water supply pipeline installation
Climate Conditions
Not reported
Fire Origin and Path
An excavator digging a trench for new pipe punctured a gasoline pipeline. Sparks from a welder's torch nearby ignited the high-pressure spray, causing an explosion.
Factors Hindering Occupant Escape
The explosion was followed by a fire that engulfed the workers and trapped them in the trench.

PENNSYLVANIA

Month, Time of Alarm, Number of Deaths
July, 4:22 p.m., 4
Setting
Aircraft crash at an airport
Climate Conditions
Overcast
Fire Origin and Path
An aircraft practicing touch-and-go landings crashed into a one-story hangar and several vehicles. Upon impact, the fuel ignited. The NTSB report has not been released yet.
Factors Hindering Occupant Escape
None reported

FLORIDA

Month, Time of Alarm, Number of Deaths
February, 12:58 p.m., 3
Setting
Semi-tractor trailer truck struck a motor home on a highway
Climate Conditions
Not reported
Fire Origin and Path
The collision ignited gasoline from the motor home, and fire spread to its interior.
Factors Hindering Occupant Escape
The three victims were trapped in the motor home.

ILLINOIS

Month, Time of Alarm, Number of Deaths
February, 2:24 a.m., 3
Setting
Two-vehicle collision on a paved roadway
Climate Conditions
Not reported

Fire Origin and Path
Gasoline from a ruptured fuel tank ignited after two passenger cars collided.
Factors Hindering Occupant Escape
None reported

LOUISIANA

Month, Time of Alarm, Number of Deaths
June, 10:05 a.m., 3
Setting
Gasoline tanker truck at grade level at a railroad crossing
Climate Conditions
Not reported
Fire Origin and Path
A tanker truck carrying approximately 8,000 gallons (3,283 liters) of gasoline was struck broadside by a railroad locomotive. Fuel was released and ignited.
Factors Hindering Occupant Escape
None reported. The victims were the truck driver and two operators on the train.

ILLINOIS

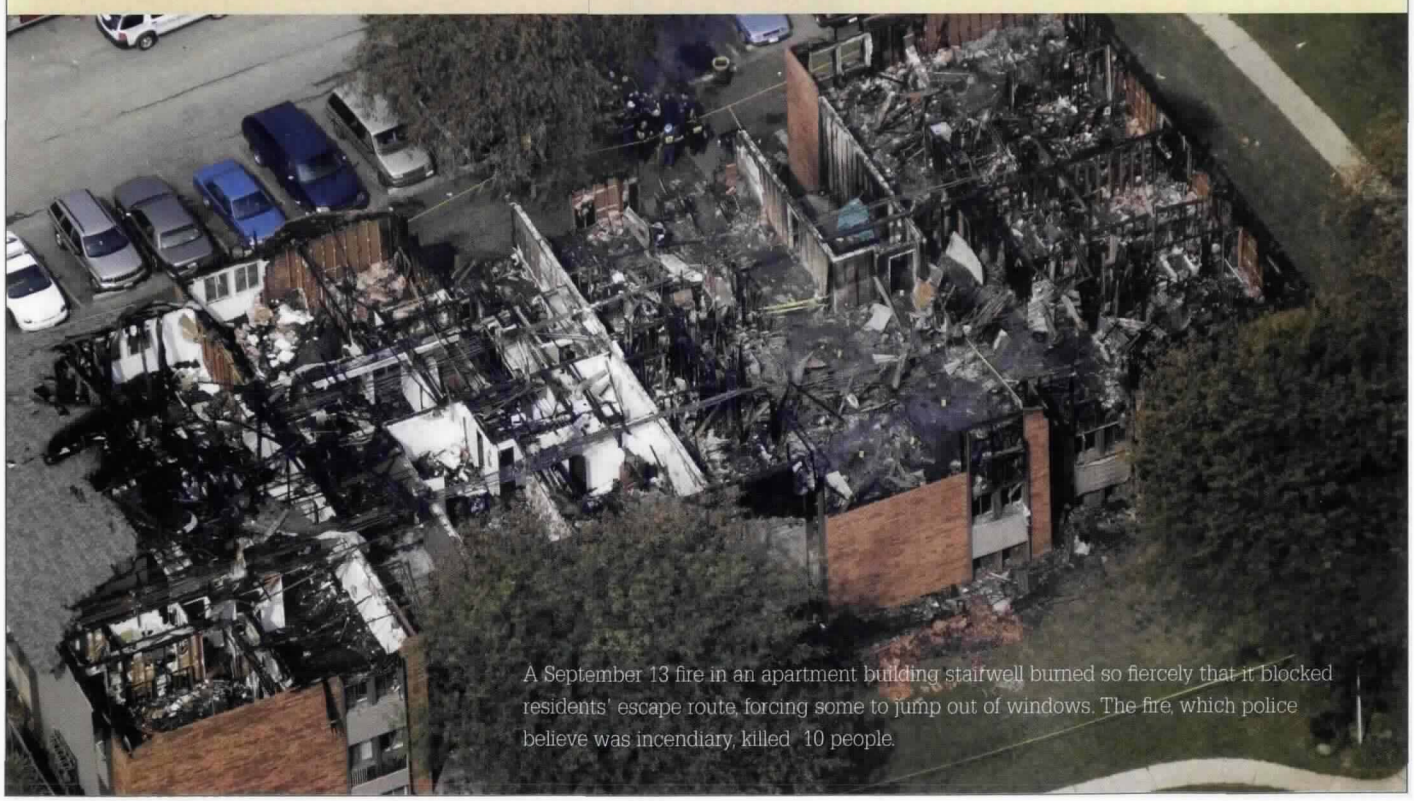
Month, Time of Alarm, Number of Deaths
August, 2 p.m., 3
Setting
Two-car collision on interstate highway
Climate Conditions, Fire Origin and Path, Factors Hindering Occupant Escape
No information reported

MONTANA

Month, Time of Alarm, Number of Deaths
September, 3:30 p.m., 3
Setting, Climate Conditions
An aircraft crash on mountainside; light rain
Fire Origin and Path
An aircraft crashed in mountainous terrain, and a post-crash fire developed.
Factors Hindering Occupant Escape
Two victims trapped in the wreckage died of burns. Two survivors pulled a third person, also burned, from the aircraft, but he died a short time later.

NORTH CAROLINA

Month, Time of Alarm, Number of Deaths
November, 3 a.m., 3
Setting
Camper trailer at a campground
Climate Conditions, Fire Origin and Path, Factors Hindering Occupant Escape
No information reported



A September 13 fire in an apartment building stairwell burned so fiercely that it blocked residents' escape route, forcing some to jump out of windows. The fire, which police believe was incendiary, killed 10 people.

Pump it up

Will your building's fire suppression system work in an emergency? It will with proper maintenance and testing.

By **Stuart M. Lewis**

Across the United States, office towers, single-story nursing homes, schools, industrial plants, and warehouses are protected from fire damage by water-based sprinkler systems and fire pumps that may sit for years before being activated. Should a fire break out, will those systems supply the needed water?

All too often, the answer is no. Fire pump equipment may fail after a fire breaks out or before it is under control. Sometimes, the equipment doesn't even start.

According to Bill Harvey of Harvey & Associates in Fountain Inn, South Carolina, that's what happened at a carpet manufacturing plant in Georgia in 1995. When two improperly maintained diesel-driven fire pumps failed to operate during a fire, the plant was destroyed. No one died in the fire, but property damage reportedly amounted to $200 million.

"The plant failed to provide an adequate maintenance program, and the units failed when needed," says Harvey, who designs, installs, inspects, tests, and repairs fire protection systems. He also serves on the NFPA Technical Committee on Fire Pumps.

Although there are codes and standards regulating the design, installation, performance, testing, and maintenance of fire protection systems, they are not always followed. As a result, says Harvey, "there are fire pump installations where people have a false sense of security, where they think they have water supply when actually they do not due to a non-operating pumping system."

Basics of fire pump installation

Fire pump installation really begins with the early planning stages of a project.

"The fire protection professional should make the hydraulic evaluation of the proposed water supply," Harvey says, "and then take the factors of water flow, duration, and pressure needed in a particular fire protection system to determine whether or not a fire pump is required. Electric fire pumps have been the most common type chosen to either boost the pressure or generate it for a number of years. However, there are other reliable driver choices available to fill the particular needs of a project, such as diesel."

Buildings above a certain height or size will need a fire pump to provide the required water flow and pressure for the sprinkler and standpipe systems. These pumps may either boost the existing water supply or pump water from another source, such as a pond, tank, or well.

The components of a fire pump installation include a power source or fuel storage; a driver, such as an electric motor, a diesel engine, or a steam turbine; a controller for the electric motor or a diesel controller for an engine-driven pump; and other components, such as the fire pump itself, pipes, valves, fittings, a pump house, foundations, and drainage, as well as gauges, alarms, and electrical conductors. The principal requirements for these components are spelled out in NFPA 20, *Installation of Stationary Pumps for Fire Protection.*

According to Jim Nasby, director of engineering for Master Control Systems, Inc. of Lake Bluff, Illinois, all of these components are in a system's "critical starting path."

NFPA 20 considers two sources of electric power reliable when used as a stand-alone, individual power supply: utility company service or an on-site electrical power station that supplies all the facility's normal electrical loads, as defined in Article 695 of NFPA 70, *National Electrical Code*® (NEC). Standby generators and emergency power generators cannot be used as sole sources of power for fire pumps, but they can be used in combination with other sources.

NFPA 20 permits certain combinations of power sources. For example, two or more utility service or on-site power stations may be combined to supply power. So can a standby generator and utility service or on-site power stations, feeders from two or more power sources, one or more feeders in combination with a standby generator, and a diesel engine-driven or steam turbine-driven fire pump.

In each case, the power supply and the conductors from the power source to the fire pump location must be protected from damage by fire or structural failure.

The conductors must also directly connect the power source to a fire pump to ensure that the power supply to the pump will not be disconnected when the plant's power is disconnected. The intent of this wiring is to keep the water flowing to the sprinkler system at all times. Newer fire pump power supplies in the United States use a three-phase, four-wire configuration.

A fire pump controller is a specialized motor controller that starts and monitors a fire pump's electric motor driver. In its role as a guard in the pump room, it receives information from a pressure transducer to start the pump driver, causing the motor contactor to supply power to the electric motor and sending an alarm to an alarm panel or a central monitoring station announcing that the pump motor has started. A controller may or may not contain a transfer switch to move between alternate power sources. If it does, however, NFPA 20 requires that all controller and transfer switches be specifically listed for electric-motor-driven fire pump service.

There are eight different controller starting types. The least expensive is the across-the-line (ATL) or full-voltage controller, which gives the most starting torque, but has the most current draw at startup. It's the most economical type of controller, according to Harvey.

Next is the part winding controller, a reduced starting current type that uses only half the motor's windings at startup. At the end of an acceleration period, which NFPA 20 limits to 10 seconds, a second motor contactor closes and energizes the second set of motor windings, applying full voltage to the motor. This requires a specially wound motor, but it provides approximately 48 percent of starting torque, which is enough to bring the motor to full speed before transitioning to full voltage.

A third type of controller is the primary resistor controller, which inserts a fixed electrical resistance in series with the motor during startup to reduce in-rush current. At the end of the acceleration period, the controller automatically bypasses the resistance, applying full voltage to the motor for normal running. The resistor-type controller is one of the older means of reduced-voltage starting and has been used for some time in fire pump applications. It requires a vented cabinet to help

dissipate the large amount of heat the pump generates from a large bank of line resistors in an adjacent cabinet when starting up.

Another type of controller is the primary reactor controller, not to be confused with the primary resistor controller. Primary reactor controllers use a low-power factor reactor design in which the kilowatts drawn are approximately the same as those drawn by an autotransformer controller, which provides the lowest current of reduced-voltage starting methods. The non-heat producing reactors are installed in an unvented control cabinet.

Wye-delta open transition and wye-delta closed transition controllers change the motor winding configuration to achieve reduced inrush current, starting in the wye mode and running in the delta mode. This provides only 33 percent torque in the starting mode and, according to Nasby, may or may not accelerate a pump with no flow, which is the highest pressure condition. The difference between open and closed transition is that, in open mode, the motor is deenergized for up to 1 second during transition from wye to delta. In closed transition, resistors are inserted in parallel with the wye motor windings, then in series with the windings in delta, so the motor is never deenergized as it switches from wye starting to delta running. These starting methods require a special 6- or 12-lead electric motor.

Solid state soft-start/stop is a newer technology that uses silicon-controlled rectifiers to vary the voltage supplied to the motor during the acceleration period.

Solid-state soft-start/stop is a newer technology that uses silicon-controlled rectifiers to vary the voltage supplied to the motor during the acceleration period. According to Terry Jopko, engineering and marketing manager for Hubbell Industrial Controls of Archdale, North Carolina, "the soft-start controller allows you to ramp up and ramp down [the voltage] when you are increasing the speed of the pump to eliminate water hammer in plumbing. It has become very popular, and we probably sell as many or more at this point than we do the ATL controllers."

The seventh type of controller is the autotransformer controller, which, as its name suggests, uses an autotransformer to provide reduced starting current. When set to the standard 65 percent tap, this method provides 42 percent of starting torque, which is enough to bring the motor to full speed before the transition to full voltage. This starting method provides the lowest current of reduced voltage starting methods.

Finally, the newest and most expensive controllers are variable-speed controllers, which use variable frequency drives to achieve a controlled start of the fire pump motor. Only one variable-speed drive (VSD), from Master Control Systems, is currently listed for fire pump applications. According to Harvey, VSDs "are really the state-of-the-art."

Even more up-to-date, in Jopko's opinion, is a VSD that uses microprocessor logic in place of relay logic, allowing one to program it to keep a history log of operation of the system.

"We can see why the pump started and when and how often it was tested, and if it was stopped manually or automatically," says Jopko.

During initial startup, all controllers must be able to start the pump motor with the emergency handle, typically, across the line. According to Nasby, the ATL or full-voltage starting type is the most common type of controller for electric-motor-driven fire pumps. Also common is a single-source controller with a single source of electricity.

Fire pump controllers may also be described as full service or limited service–that is, limited to a maximum of 30 horsepower. Full service predominates.

Controllers may also be medium- or low-voltage. Medium-voltage controllers are those above 600 volts, usually 2,400 and 4,160 volts, and low-voltage controllers are those between 208 to 600 volts. Low-voltage controllers predominate. Thus, low-voltage, single-source, full-service, ATL fire pump controllers are the most common.

Drivers

According to NFPA 20, all motors for fire pumps must comply with the National Electrical Manufacturers Association's NEMA MG-1 Design B standards, be specifically listed for fire pump service, and be rated for continuous duty. Rated horsepower normally varies from 5 to 500. NEMA Design B motors are usually three-phase, squirrel-cage motors.

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Fire pumps are often driven by diesel engines, which give the pump a completely independent source of power. Chapter 11 of NFPA 20 requires that these engines be listed for fire pump duty, meaning that they are designed and required to operate at their rated speed, typically 1,460 to 3,300 rpm. The engines' speed is regulated by governors controlled by specialized diesel controllers to oversee the engines' starting and operation. As with all pumps, routine exercise and maintenance is critical to their reliable operation.

Although the design objective in most electrical installations is to protect the electrical equipment from failure, this is not the case with fire pump equipment. According to Nasby, "one of the peculiarities of electric fire pump controllers under NFPA 20 is that there shall be no overload elements, as would typically be found in a combination motor starter. Motor protection is provided only by a circuit breaker that cannot trip at any level below 300 percent of the motor full load amps (FLA) and that, at locked rotor condition, which is typically 600 percent of FLA, has to trip within 8 to 20 seconds."

This allows manual intervention should something stop the rotor in the pump from turning, for example.

"The characteristics are such that the controller is not allowed to shut down the pump if it is running, even if the current is up to 299 percent of motor FLA. This means that the controller, motor, wiring, and power supply are all considered sacrificial in following the concept of running the pump to destruction if indeed it is running and supplying water," Nasby says.

Testing and maintenance

Fire protection systems and fire pumps require routine testing because they are not used regu-

THE LATEST DEVICES

OVER THE PAST 25 YEARS, the acceptance of fire pumps as an important component in protecting personnel and buildings has increased significantly.

"Fire pumps have moved from just supplying water to fire systems protecting plants and equipment to a major role in life-safety systems," says Bill Harvey. "Now, pumps are used for residential applications, such as hospitals, motels, nursing homes, schools, and other places of occupancy.

"As the requirement for wider application of fire pumps increased, so did the need for better and more diverse fire pump controllers," he adds.

There are two new, listed methods of providing variable speed and pressure control in a fire pump, according to Jim Nasby. One is called pressure-limiting control, which varies the speed of a pump's engine by adjusting the set point of the governor to keep the pressure within the limits of the set point. This controller is manufactured by Clark Fire Protection Products for its line of listed pressure-limiting driver fire pump diesel engines.

The other method is the electric variable-speed drive (VSD) controller offered by Master Control Systems. Introduced in 2003, it is used to vary the speed of the electric motor drive.

The main reason for using a VSD fire pump, according to Nasby, "is to help solve the problem of controlling fire pump discharge pressure, particularly when there is little or no flow, such as during a weekly test. This is a no-flow test in which the pressure is the highest that it will normally be. These controllers limit the maximum pressure that a fire pump can deliver and eliminate the need for pressure-regulating devices in the pump discharge path." These are still needed when VSD controllers are started across the line.

A pressure transducer monitors system pressure, and the controller varies the motor speed to provide the required system pressure. It also limits the pressure to a predetermined maximum set point. It offers a soft start to the motor and, through appropriate circuitry, a soft stop feature.

The main disadvantage of an electric VSD is its complexity. Because it represents something else in the critical path that might go wrong, a bypass path is provided to switch out the VSD in case of trouble and allow for manual switching. Another disadvantage is the cost, which can range up to twice that of a conventional full-service controller. Special consideration must also be given to pump room temperatures, as the VSD may require air conditioning.

Possible misapplication is also an issue, according to Matthew Roy, marketing manager for the Armstrong Fire Pump Product Group in Toronto, Canada.

"The intent of the application is essentially for cases where there is no other cost-effective or viable alternative," explains Roy. "The major application is for high-challenge buildings where many of the sprinkler heads are rated to a maximum of 175 psi working pressure. Conceivably, it could be used in series high-rise applications to stretch the extent of each zone in the system. Though this is allowed, I don't personally see it as being the intended application. There are others, such as limiting pressures in Class II standpipe systems to 100 psi."

The 2003 edition of NFPA 20, *Installation of Stationary Pumps for Fire Protection*, does not recognize variable speed drives, although the technical committee recognized that they may have to be added to a future edition.

larly and problems might otherwise go unnoticed. An example of such a problem is single phasing, something that has plagued the fire pump industry for years, according to Harvey.

Single phasing occurs when one of the three phases of power supply to the motor is knocked out. It may occur when a lightning strike, a line surge, a transformer malfunction, or something similar damages one of the power supply conductors. The pump may try to start but will only turn slowly until the motor or the controller or both fail. That, says Harvey, can happen very quickly.

"Newer controllers have phase monitors installed that send an alarm when you have a phase failure or a phase reversal," says Harvey. "However, there are thousands of electric-driven controllers in use that do not have a phase monitor or can be damaged in a surge that takes out one of the phases."

NFPA 20 requires that fire pumps be inspected, tested, and maintained in accordance with NFPA 25, *Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, and that fire pump controllers be tested in accordance with the manufacturer's recommended test procedure. NFPA 25 spells out how often tests shall be done, what should be tested, what data should be recorded, and what forms should be used to record the data.

For example, fire pumps must be tested weekly without flowing water. An electric pump must be run at least 10 minutes every week, and a diesel pump at least 30 minutes. Part of the weekly tests must also include checking the power supply for phase reversal and single-phase conditions. In addition, each pump assembly must be tested annually under minimum, rated, and peak flow of water. Adhering to these standards ensures that each piece of equipment is used routinely and that any unusual conditions can be noted and corrected.

Critical to effective testing and maintenance of a fire pump system is people who are familiar with the equipment. NFPA 25 says that the maintenance and testing should be performed by "qualified personnel," although it doesn't clarify what that means.

"It should definitely be by someone who is experienced with the equipment and knows how to take the proper safety precautions," says Nasby. "Depending on the installation and the jurisdiction, there may be lockout/tagout rules required for what has to be done."

Older equipment can present special challenges because test probes have to be used inside the controller cabinet to read currents and voltages.

"You have to put your head and hands in some pretty dangerous places, and it takes trained, safety-conscious people doing it with proper safety equipment," says Harvey.

For newer equipment, the 1999 edition of NFPA 20 requires metering information–volts and amps–to be displayed on the outside of the controller cabinet. This makes it safer to take the required readings because the cabinet door does not have to be opened.

Testing, testing, testing

To what extent are the requirements for periodic tests followed?

"Only to a limited degree," says Nasby. "It's a function of the emphasis that is put on the fire protection system. Typically, if you see a pump room in real clean condition, everything neat and in its place, not used for storage, then odds are the equipment has been tested regularly. When you see a dirty room that looks like it hasn't been used for some time, odds are that it has not."

Harvey agrees.

"Probably many of the installations are not tested weekly," he says. And that's unacceptable.

"To be sure that water will be there when you need it to control a fire," says Harvey, "the planning and engineering stages of a project and the various engineering disciplines must work together to develop a sound fire protection maintenance plan. All the components must work as one unit to protect the facility."

Only when these words are heeded can the security built into our fire protection systems become a reality for hundreds of thousands of buildings across the United States.

For further information

NFPA 20, *Installation of Stationary Pumps for Fire Protection*, 2003.

NFPA 25, *Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2002.

NFPA 70, *National Electrical Code®*, 2002.

UL 1004A, *Fire Pump Motors*, 2003.

UL 218, *Fire Pump Controllers, Diesel- and Electric-Driven*, 2001.

UL 448, *Safety for Pumps for Fire Protection Service*, 2001.

FM 1321/1323, *Controllers for Electric Motor and Diesel Engine Driven Fire Pumps*, 2002.

National Electrical Manufacturers Association (NEMA) MG-1, *Motors*, 2003.

NEMA ICS 14, *Application Guide for Electric Fire Pump Controllers*, 2001.

By **John Nicholson**

When you go out,

Candle safety is the focus of this year's Fire Prevention Week

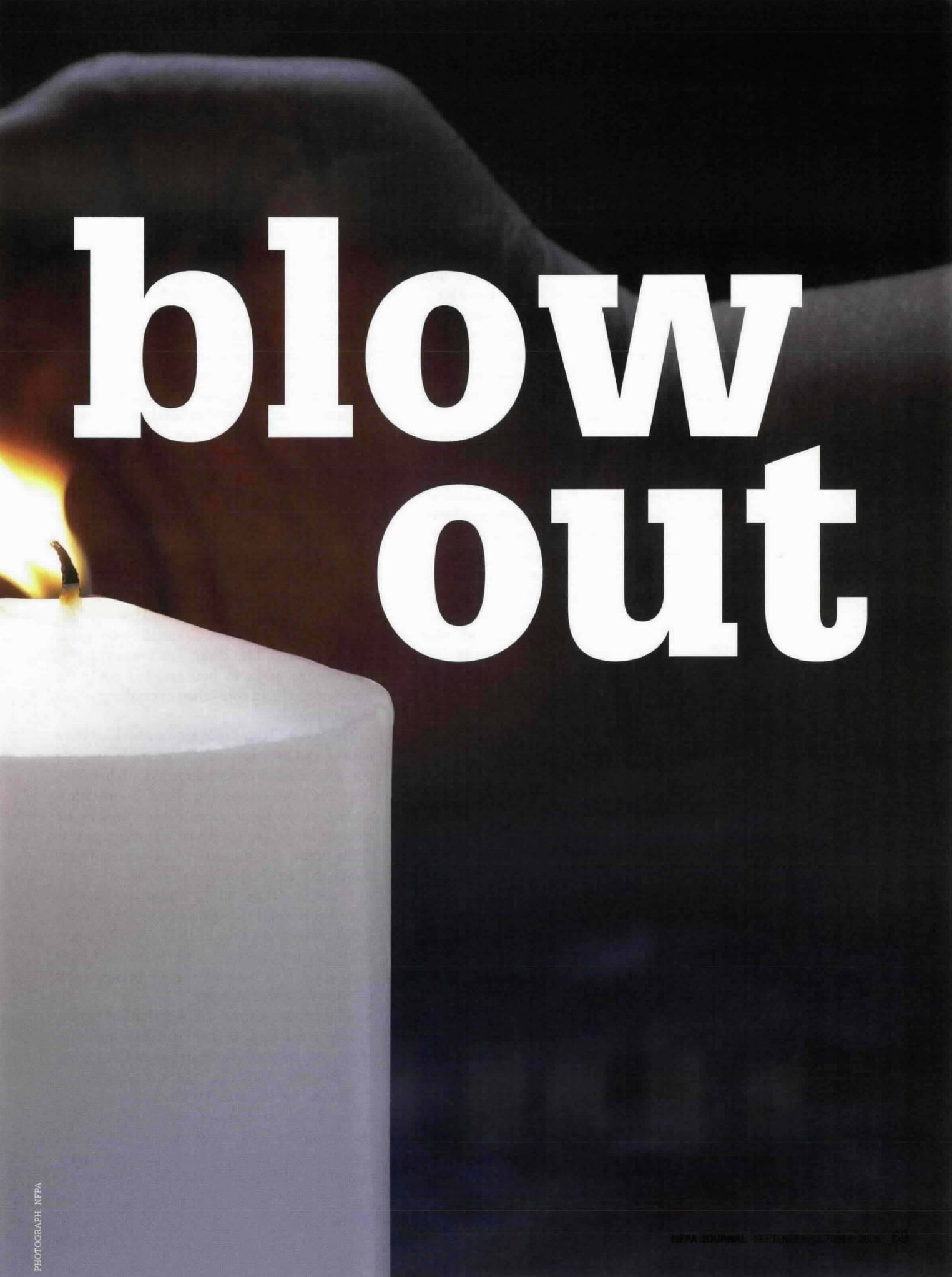
USED SAFELY, CANDLES can fill our homes with fragrance and create a calming and welcoming mood. It's easy to forget that candles are open flames. If safety precautions aren't followed or if a candle flame is exposed to something that can burn, the same inviting candles can start a deadly fire.

That's what happened in a Louisiana family's home in March 2005. Five adults and 10 children under 18 had just moved into a two-story townhouse apartment and were using tea lights for lighting until the utility turned on their electricity. During the night, a candle sitting on a windowsill ignited bedding in a room on the second floor of the house. One man, carrying a young child, escaped through a second floor window. In a desperate attempt to put the fire out, two family members moved the burning mattress down the stairs and put it on a pile of cardboard boxes while they tried to open the front door. Unforunately, they had difficulties with the dead-bolt lock, and the burning mattress ignited the boxes, producing so much fire and smoke that escape through the front door became impossible.

The two who had brought the mattress downstairs escaped through a rear kitchen door and left the door open. One of them then went around the building to the front door and kicked the door in. The front of the structure was engulfed in the ensuing burst of flames.

Eleven of the 15 household members died. It was one of the deadliest fires in Louisiana history.>>

blow out



PHOTOGRAPH: NFPA

Although unusually deadly, this fire was not an isolated incident. The number of candle fires in the United States has tripled since 1990. In 2002, an estimated 18,000 home fires started by candles were reported to fire departments.[1] These 18,000 fires caused 130 civilian deaths, 1,350 civilian injuries, and an estimated property loss of $333 million. The number of home candle fires stabilized from 2001 to 2002. The year 2002 was the first since 1995 that did not result in a new high.

According to National Candle Association (NCA), 7 out of 10 U.S. households use candles, spending an estimated $2 billion a year on retail candle sales. Roughly, 35 percent of the candle business is seasonal, surrounding the Christmas, Hanukkah, and Kwanzaa holidays.

In the United States, more than 350 commercial, religious, and institutional organizations manufacture candles, and a typical manufacturer offers between 1,000 and 2,000 varieties of candles. The three most commonly purchased are, in descending order, tea lights, votive candles, and container candles.[2,3]

The NCA also reports that women use candles more often than men, making 96 percent of all candle purchases, and that candle use is more frequent among younger adults than older adults. Forty-two percent of candle users said they most often burned candles in the living room, 18 percent in the kitchen, and 13 percent in the bedroom.

'Candle with care'

Given the danger and complexity of the problem, fire departments are joining forces with NFPA during Fire Prevention Week (FPW) 2005, held from October 9 to 15, to raise awareness of home candle fires and the steps people can take to avoid them. The campaign is geared toward all segments of the community and has the simple message of "candle with care." This year's theme is "Use Candles with Care–When you go out, blow out!"

"Candles are in use more than ever. Many of us are using candles, and we can all learn the safest way to burn them in a controlled area and not leave them unattended," says Judy Comoletti, assistant vice-president for Public Education at NFPA.

To raise awareness of the hazards associated with using candles for light, NFPA is working with the National Fuel Funds Network, a 250-member group of nonprofit agencies, utilities, and government representatives that provides utility bill assistance raised as charitable donations, according to Amy Lebeau, public education communications manager for NFPA.

Candles can go hand in hand with poverty, when families that can't pay their utility bills turn to candles as a source of light. That's exactly what an immigrant family in northern Kentucky did, says Joe Stambush, chair of the public education committee of the Kentucky Firefighters Association.

"An immigrant family had moved into a manufactured home without heat, power, and plumbing, and was using candles for light," he says. "One night, a child knocked over the candle, which immediately caught the shower curtain on fire. The child, not wanting to get into trouble, went to bed and hid while the flames roared and consumed everything in just a short time."

The result? Four fatalities, one serious burn injury, and horrible memories of a tragedy that should have never happened. To help prevent this from happening again, Stambush is adding information about candle fires to his existing fire safety curricula and warning residents about the dangers of candles through newspaper articles and radio spots.

A special NFPA study found that candles were being used for light in one-third of the fatal home candle fires in 1997 and 1998, generally because power to the home had been shut off due to nonpayment or because of a temporary power outage.

NFPA has been on the forefront of urging people to use candles with care for some time. Marty Ahrens, NFPA's manager of Fire Analysis Services, was the one of the first to document the problem, conducting a statistical analysis after several fire service officials told her about the increasing numbers of candle fires they were seeing in the field. Ahrens is the author of NFPA's ***Home Candle Fires*** statisti-

cal report, which details patterns of home candle fires. Specific information about fire causes and circumstances are based on data compiled from local fire departments' incident reports by the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS). National estimates of the size of specific fire problems are obtained by combining NFIRS data with the summary data collected by NFPA's annual national survey of fire departments' experience.

One of the things noted in Ahrens' report, available at www.nfpa.org, is how important it is to keep candles a safe distance from combustibles. NFPA's statistics show that "heat source too close to combustibles" was a factor contributing to the ignition in half of the home candle fires between 1999 and 2002.

"It is important to think about what could happen if a candle falls, is bumped, or burns all the way down," she says. "What's around it that could catch fire?" Is there anything nearby that could be blown or knocked into the candle?

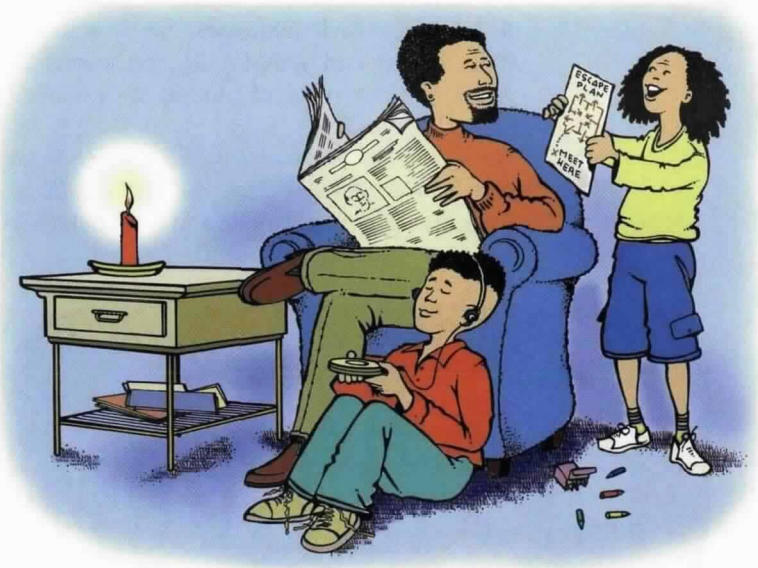
Sleep was identified as a human factor contributing to 12 percent of the home candle fires and 25 percent of the associated civilian deaths in the same period. Forty percent of all home candle fires started in the bedroom.

Fourteen percent of home candle fires in the period between 1999 and 2002 occurred in December, compared to 8 percent the rest of the year. Christmas Day was the peak day for home candle fires, and 10 percent of the home structure fires that occurred on Christmas were started by candles. Eleven percent of home candle fires in December began with decorations, compared to 3 percent the rest of the year. Using lit candles around greenery can be a recipe for disaster.

Care must also be exercised when placing candles in sconces or near walls in general. According to NFPA statistics, interior wall coverings were the item first ignited in only 6 percent of the home candle fires between 1999 and 2002, but this scenario accounted for 17 percent of the associated fire deaths.

As candle sales and candle fires increased during the 1990s, it became clear that standards were needed that candle manufacturers could use to test or label their products. In 1997, ASTM International (formerly the American Society for Testing and Materials) created ASTM Subcommittee F15.45 to address candle safety issues.

Currently, ASTM standards on candles include:



Given the danger and complexity of the problem, fire departments across the country are joining forces with NFPA during Fire Prevention Week (FPW) 2005, held from October 9 to 15, to raise awareness of home candle fires and the steps people can take to avoid them.

• F1972-99, *Standard Guide for Terminology Relating to Candles and Associated Accessory Items*, which establishes standard terms and definitions for common types of candles and associated products.

• F2058-00, *Standard Specification for Cautionary Labeling for Candles Burned in a Home*, which describes labeling requirements, including minimum size, formatting specifications, and the use of the words "Warning: To prevent fire burn candle within sight. Out of the reach of children and pets. Never on anything that can catch fire."

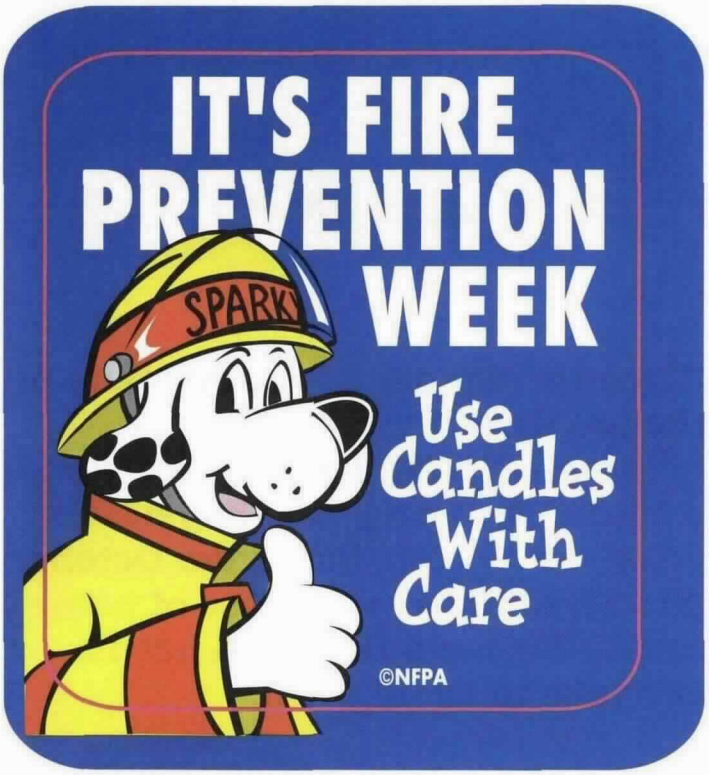
• F2179-02, *Standard Specification for Annealed Soda-Lime Silicate Glass Containers That Are Produced for Use as Candle Containers*, which provides minimum requirements and testing options for containers of this type when they are to be used for candles. Containers should be able to withstand a change in temperature

without cracking or breaking.

• F2417-04, *Standard Specification for Fire Safety for Candles*, which addresses candle stability, flame height, end of useful life, and secondary ignition. Some types of candles are excluded from this standard.

• F2326-04, *Standard Test Method for Collection and Analysis of Visible Emissions from Candles as They Burn* addresses smoke and burn behavior of most types of indoor candles.

These candle standards are all voluntary.



To help prepare for Fire Prevention Week, a number of resources are available. For the fire service, the material available at www.firepreventionweek.org includes statistical information, instructions for implementing a campaign, media materials, and safety tips. For parents, there are safety tips from *Sparky the Fire Dog*®, and for educators, there are lesson plans, safety activities, and success stories.

The future of home candle fires?

In recent years, the Sugar Land, Texas, Fire Department has begun confronting a new candle-related phenomenon: small fires started by candles on religious altars and in prayer rooms. Sugar Land's Asian population accounts for more than 23 percent of the city's roughly 70,000 residents, and many members of this community use candles in shrines and prayer rooms as part of their religious practices.

"It's a growing problem," said Captain Michael S. McLemore of the Sugar Land Fire Department. "The prayer rooms are becoming more and more popular, but when people leave the room or knock over the candle, combustibles catch, and they end up with a fire."

His department is now in the process of surveying the city to determine the scope of the problem. But McLemore and his team have already begun to reach out to Sugar Land's extensive Asian population. How? By visiting religious and cultural centers where people congregate.

"We're giving them tips on how to use candles safely and just how careful you have to be with candles and even with incense," he says.

He's helped in his campaign by information he finds on www.firepreventionweek.org, NFPA's FPW clearinghouse for safety tips and support materials for fire departments, schools, parents, and children that focus on this year's home candle fire theme. Because this is the first year NFPA has chosen candle fires as an FPW focus, many of these safety tips and support materials are new. NFPA has also introduced a series of case studies that highlight the problem of home candle fires in nearly every community across the country.

For the fire service, the material available includes statistical information, instructions for implementing a campaign, media materials, and safety tips. For parents, there are safety tips from *Sparky the Fire Dog*®. And for educators, there are lesson plans, safety activities, and success stories.

NFPA's Public Education Division has also sent out an informational mailing to select NFPA members, which includes a "how to" booklet that takes fire departments through a systematic process of creating the most effective FPW public education campaign.

"The messages are coupled with the traditional theme of creating and practicing home

fire escape routes," says NFPA's Lebeau.

NFPA has also selected October 11 to highlight the fire-safety needs of people with disabilities. On that day, NFPA hopes that you'll reach out to a local organization that works with people with disabilities or highlight some of NFPA's specific fire-safety tips for people with disabilities.

"We all have to be aware of our abilities when it comes to escaping safely from fire," says Sharon Gamache, executive director of NFPA's Center for High Risk Outreach. "Because people with disabilities may require more time or assistance escaping, we need to reflect that in the fire-safety planning we do."

NFPA has taken the lead in public fire-safety outreach by serving as the official sponsor of Fire Prevention Week for the past 83 years. The annual campaign, which is proclaimed by the President of the United States each year, is observed by North American fire departments to mark the anniversary of the Great Chicago Fire of 1871.

Endnotes

1. Ahrens, Marty, ***Home Candle Fires***, NFPA, Quincy, Massachusetts, 2002.
2. NCA Web site.
3. As reported by the Jefferson Parish Arson Investigation Unit, Jefferson, Louisiana.

JOHN NICHOLSON is the managing editor of NFPA Journal. He can be reached at jnicholson@nfpa.org.

PARTICIPATING IN THE FPW CONTEST

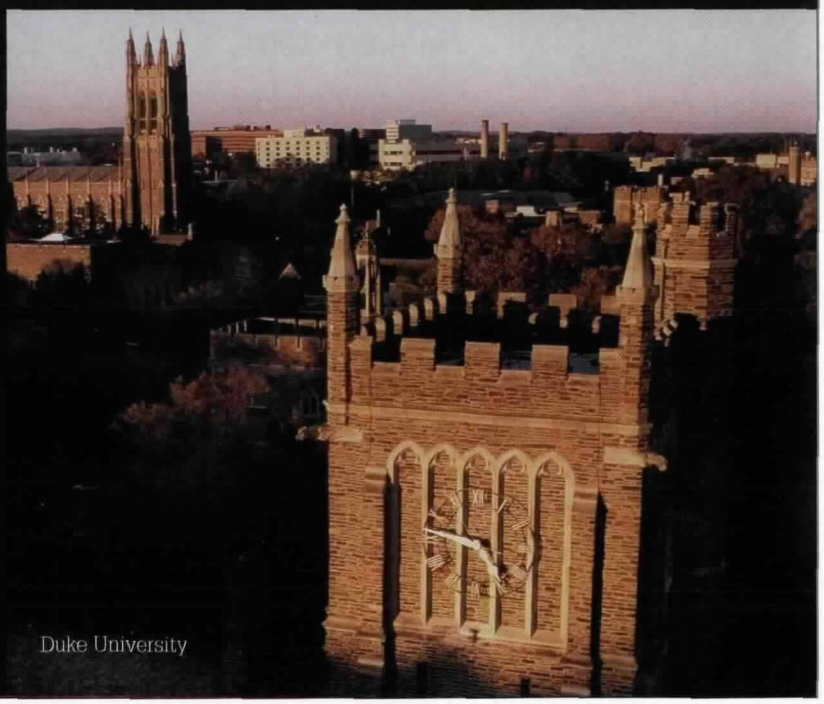
FOR THE THIRD CONSECUTIVE YEAR, fire protection specialist Tom Whalen has led his Duke University and Health Systems team to a first-place win in the annual Industrial Fire Protection Section Fire Prevention Week Contest. This award recognizes businesses that promote fire and related safety messages for employees and their communities in conjunction with local fire departments during Fire Prevention Week of the previous year.

Whalen's group joined forces with the City of Durham, North Carolina, to expand an established residential smoke alarm installation program. Through support of logistics and volunteer recruiting, the Duke team successfully coordinated volunteer/firefighter pairs to canvass neighborhoods. The winning program included installations and educational outreach.

Each year, the Industrial Fire Protection Section sponsors the national competition for FPW programs. For the past three years, Duke University has won that contest. How did they do it?

According to Whalen, planning an FPW program requires creativity and extremely enthusiastic people. It takes many whacky ideas to come up with activities that work for your population and that you can implement with the time, budget, and personnel you have.

Whalen recommends planning early with a small core group, even if the theme has not been announced. They found that putting everything in a binder with pictures and descriptions of the events is the best way to summarize their FPW activities. The theme for FPW 2005—"Use Candles with Care"—supports NFPA's goal of increasing awareness of the risk from careless use of candles. The Industrial Section would like to hear from those in industry who plan to conduct fire safety activities this year in support of Fire Prevention Week, which runs from October 9 to 15. Go to the IFPS Web page and download the entry form and rules for this year's contest or contact Executive Secretary Guy Colonna at (617) 984-7435 or gcolonna@nfpa.org.



Duke University

Safety in numbers

By **Lisa Braxton**

In early 2004, a mother of three living in Cogic Square Apartments, a public housing development in Suffolk, Virginia, left her apartment and put her two daughters, ages 10 and 12, in charge of their 5-year-old brother. The boy went upstairs to his bedroom unsupervised and, using a lighter, set his mattress on fire. Fortunately, a neighbor heard the children yelling for help and called 911. >>

Everyone escaped safely, but the apartment sustained $40,000 in damage. The bedroom in which the fire started was destroyed, possessions were lost, and rooms on the first floor suffered significant fire and smoke damage. The adjacent apartments were also damaged by the smoke.

Suffolk fire and housing officials were frustrated. In an effort to reduce the number of fires in the community, they had formed a partnership two years earlier, offering the Suffolk Fire and Life Safety Education Program to both children and adults living in public housing units. But the volume of fires, started by children playing with matches or lighters and residents leaving cooking food unattended, had continued to grow.

"I would tell them that food continues to cook on the stove whether you stop to answer the phone, go to the door, or pick up the children from school," said Pam King, an investigator and fire and life safety specialist with the Suffolk Department of Fire and Rescue. "We think we can go down the road and pick our children up, but water continues to boil, and pans are melted down to the stove, and a fire starts. It was a problem."

A more active campaign

In the aftermath of the mattress fire, officials decided to become more active with their fire safety campaign.

"Safety is at the top of our list," said Clarissa McAdoo, executive director of the Suffolk Redevelopment and Housing Authority. "We lost no lives in these fires, so we had to do something before something did happen. If we had lost a life, it would have been unbearable. We felt we had an opportunity to avoid this."

In tracking the recent fires, officials noted that none of them involved residents who had taken the initial fire safety classes, which hadn't been required. So the Housing Authority decided to make some changes.

Under Department of Housing and Urban Development guidelines, residents were already required to do eight hours of community service per month. Working closely with the Suffolk Department of Fire and Rescue, Suffolk housing officials decided to amend the housing lease to require current and new residents to complete eight hours of community service by participating in the fire and life safety education program. Four hours would be spent in fire

SMOKE ALARM INSTALLATION PROGRAMS SAVE LIVES

PICAYUNE, MS—Need proof that smoke alarm installation programs save lives? Look no further than this central Mississippi town of 11,000 where in recent months, an installation program has resulted in two saved lives.

In March of this year, the Picayune Fire Department began installing more than a thousand smoke alarms in local homes under an NFPA program that distributes free long-life smoke alarms to key high-risk regions of the United States: Alabama, Mississippi, and the Navaho Nation. According to NFPA's national 2004 report, *U.S. Fire Death Patterns by State*, Mississippi and Alabama had the highest average fire death rates in the period between 1997 and 2001. The ambitious program, which will ultimately distribute 21,000 smoke alarms, is funded in part by NFPA and through the 2003 Assistance to Firefighters Grant Program of the U.S. Fire Administration.

Barry Lee, training officer and chaplain of the Picayune Fire Department, notes that his department made the point of distributing the free smoke alarms to a particular high-risk population: older adults. To contact them, the department sent letters to area churches and the local senior center, asking for names of individuals who might need a smoke alarm. When the department ran out of names, says Lee, on-duty firefighters would stop by older homes in Picayune, many of which are owned by older adults, to install an alarm if one were needed.

"Some of these people think that a smoke alarm isn't necessary because they've lived 50 years without one and have never had a fire," says Lee.

Lee adds that while fire prevention efforts in the schools are successfully educating young people, keeping older adults safe from fire may take a bit of extra effort.

"When we went in to the homes of older people to install the alarms, we found so many people who were in wheelchairs or used walkers, and they had no smoke alarms. It makes you feel good to know that you've done something to help them."

That extra bit of effort has already paid off in Picayune, where the smoke alarm installation program now has two saved lives. In one case, volunteers who'd gone to the home of an older adult to install an alarm helped her get medical treatment after she complained of chest pains. Doctors later concluded that she was having a heart attack. In the second case, an alarm that had been recently installed by the department went off after a space heater shorted out. Everyone in the home escaped safely.

The experience of the Picayune Fire Department has convinced Lee that smoke alarm installation programs are a real lifesaver.

"Use whatever resources you've got and get these smoke alarms and put them up," says Lee. "If you don't save but one person, it's worth every minute it took to put that smoke alarm up."

safety instruction and the other four in conducting a home safety inspection, designing a home fire escape plan with family members, and conducting a fire drill.

Prospective residents had to agree to enroll in the class, or they wouldn't receive a public housing unit. If scheduling was a problem, residents would be allowed to take a makeup class. The Housing Authority also required an annual refresher course.

The Suffolk Department of Fire and Rescue would conduct individual classes for homebound residents. Children would be responsible for completing four hours in the Fire and Life Safety Kids Camp.

"To have it in the lease says that we have something that is enforceable and will stand up in a court of law for someone who challenges us that fire safety isn't important," said McAdoo.

Help from NFPA

Faced with the challenge of expanding a program operating on limited resources, Suffolk fire officials applied for and received the NFPA Rolf H. Jensen Memorial Public Education Award, presented annually to a local fire department to support a community-wide fire and life safety education program or campaign. King spearheaded the effort to secure the $5,000 grant for the Suffolk Department of Fire and Rescue.

"We are grateful for that grant," she said. "It allowed us to have some things we just didn't have in our cabinet."

Those things included a combination TV/VCR, an overhead projector, NFPA fire safety videos and brochures, Sparky® activity books, and copies of NFPA's Home Fire Prevention Checklist.

Rolf H. Jensen, P.E., was a leading authority on fire protection engineering who participated in and supported the NFPA consensus codes and standards process throughout his distinguished career. A former teacher, Mr. Jensen was a staunch proponent of fire and life safety education. On the 25th anniversary of the RJA Group, Inc., (formerly Rolf Jensen and Associates) the founder and chairman of the RJA board was honored by his colleagues with the establishment of an NFPA award in his name.

Under the revamped program, the fire safety component begins at new-resident orientation. Residents are shown a fire safety video and are briefed on the fire and life safety education requirement of the lease. King then tells them about the dangers of children playing with matches and lighters.

"One of the main reasons children play with matches and lighters is curiosity," she says. "We teach children at a very young age not to do drugs or touch chemicals under the kitchen counter. Matches and lighters are tools for adults, not toys for kids, so why shouldn't fire safety be treated the same way?"

Classes rotate each month among the public housing locations. In addition to juvenile fire-setting behaviors, groups gather in the community room to hear from firefighters and fire prevention officials on smoke alarm maintenance and operation; risks associated with smoking; space heaters; extension cords; and cooking safety.

"By the end of the class, residents should be able to list the most important steps they should take to survive a fire in their homes, know how to test a smoke alarm and explain why the device is so critical, understand and demonstrate the proper use of a fire extinguisher, and design a home escape plan and practice it," King said.

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Off to camp

For the children's camp, fire officials use the unintentional injury portion of the NFPA *Risk Watch*® school-based injury-prevention curriculum. The children also watch videos and learn about home fire escape planning and home inspections. To demonstrate fire escape planning, fire officials blindfold some of the children and send them through an obstacle course to simulate maneuvering through their homes in the dark during a fire. Occasionally, a smoke

machine is used to make the demonstration more realistic.

One of the most popular segments of the class is the presentation by Suffolk firefighters, who show the children their safety gear, let them try on their turnout coats, and demonstrate how they dress from the boots up to fight a fire.

The firefighters also don their helmets and SCBA equipment to show the children how they sound when they're speaking through their masks.

"The important message is that they shouldn't be afraid of firefighters, not to hide from them, and that they're there to help," said King.

Just before lunch, the children go outside to see the fire truck. If time permits, a few even get to sit in the cab.

Since the revamped program was inaugurated, Suffolk housing has had only one major fire. A minor fire occurred earlier this year during a domestic dispute involving a visitor to the housing complex. Compare that to 2002, when Suffolk public housing reported six fires during a 45-day period.

"The kids love it. The biggest treat for them is seeing the truck," said King.

Apparently, the children have enjoyed the camp so much, they've told their friends about it. King said 104 children showed up at one kids camp. Fortunately, everyone behaved.

"We're getting kids from outside of the community, which is kind of neat. I'll have kids knock on the door and say, 'I don't live here, but I'd like to come in.' We don't turn them away because a child who comes across the street and isn't in housing and wants to come and do an escape plan is a child who will carry that message back to his family. It's a win-win," King said. "The fire department wants to educate the entire Suffolk community. I think it's good. To me, there's strength in numbers. The more children and adults we can educate, the more proactive we'll be in fire safety."

After the session, the children leave with a home inspection sheet to be completed with their parents.

Residents participate, too

The fire department and the Housing Authority are not the only ones who have become more proactive. The residents have, too. While doing their home inspections, several have come across electrical problems, defective heaters, and other problems, and they've alerted the fire department and the Housing Authority.

Tammey Simpson, who has lived at Hoffler Apartments for the past 12 years, said that she is impressed with the quality of the fire and life safety program and the effect it has had on her own children.

"After the program, my oldest daughter, Natasha, came home and said, 'Mom, do not plug too many cords into an outlet because it can overpower the outlet and cause a fire.' My youngest son, Tony, always says, 'Make sure the oven is off and make sure the stove is off before we leave home,'" she said. "I was amazed by this. Young kids are so distracted. I had no idea they paid that much attention to the fire safety class."

Simpson said that when she took the class in October last year, she volunteered to demonstrate for the firefighter how she would escape through a window if she were trapped in a room during a fire. She and about 25 others also participated in a mock fire drill.

"He (the firefighter) actually sounded off like he was an alarm," she said. "We formed a line

and got out really quickly, and he timed us as to how soon we got out of the building."

Simpson said she was always aware of fire safety, but because of the program, she is much more careful.

"Now that I've taken the class, I'm very cautious," she said. "I make sure everything is off and everything that's hot that they can't reach it, so [the children] won't burn themselves."

Through the efforts of King, Fire Captain A. G. Barrett, Fire Inspector David Grove, other fire department staff, and officials from the Housing Authority, all current residents have attended the fire and life safety program, and the focus is now on new tenants entering the housing system.

Since the revamped program was inaugurated, Suffolk housing has had only one major fire. A minor fire occurred earlier this year during a domestic dispute involving a visitor to the housing complex. Compare that to 2002, when Suffolk public housing reported six fires during a 45-day period.

"We've had no repeat fires from people who had training, so we know the program works," said McAdoo.

Another reason for the program's success, said McAdoo, is the relationship between the two departments and the support of NFPA.

"The fire department was extremely great in stepping up and saying, 'I think we can try to help you educate the residents.' They took it as a personal challenge," she says. "We treasure this partnership with them. And then to get the grant to actually fund the program was phenomenal for us."

King concurs.

"I think the biggest thing is the support between the two agencies, between the fire department and Housing. It's been awesome. Because of the grant, we've been able to get into communities we may not have gotten to at all. It would have been hit or miss," she said.

As word has spread about the success of the program, King has fielded calls from fire officials in Colorado, California, New York, Pennsylvania, Wisconsin, Arizona, and British Columbia who want to learn how to organize a successful fire and life safety education program in their communities.

"They ask me, 'How did you get the Housing Authority to be on board?' I tell them, 'Because they take it seriously.'"

Kings says she's sent other fire departments copies of her curriculum and letters of support.

"Why have them struggle to reinvent the wheel when there's something here that works?" she said.

Although funding for the 2004 Rolf H. Jensen Memorial Public Education Award has concluded, King says that Suffolk Fire Chief Mark Outlaw has agreed to continue funding the program and the Housing Authority has agreed to continue publicizing the sessions, help with record-keeping, and provide refreshments to participants.

"In the end, there is the common goal, and that is to have all of our housing residents living in a safe and hazard-free environment," said King. "I've been here five years, and collectively, this is one of the best cooperative efforts we've had."

LISA BRAXTON is the public education project manager in NFPA's Public Education Division. She can be reached at lbraxton@nfpa.org.

ROLF H. JENSEN MEMORIAL PUBLIC EDUCATION AWARD

This award is presented annually to a local fire department to support a community-wide fire and life safety education program or campaign.

RECIPIENTS TO DATE

1994
Canadian Tire Child Protection Foundation
Fire Prevention Canada

1995
St. Paul Department of Fire and Safety Services
St. Paul Area Chapter, American Red Cross

1996
Oregon Fire Education Association
National Association of Insurance Women, Oregon Chapter

1997
Rochester Fire Department
National Fire Service Support Systems, Inc.
BIC Corporation

1998
Winnipeg Fire Department
Kiwanis Club of Winnipeg

1999
Redlands Fire Department
Loma Linda University Children's Hospital

2001
Glenwood Fire Department
Rhodia Chemical, Chicago Heights Plant

2002
Snohomish County Fire Protection District #8
Sunnyside Preschool

2003
Lacey Fire District Three
Lacey Sunsetters Kiwanis Club

Post Impact

The focus on durability of fire-resistive materials in structures

THE POST-IMPACT COLLAPSE of World Trade Center Buildings One, Two, and Seven following the terrorist attacks of September 11, 2001, prompted several studies to determine the factors that contributed to their collapse and to recommend design and construction improvements that might address such disasters in the future. One conclusion of these analyses was the crucial role fireproofing plays in overall building safety.

Rising 52-stories and encompassing 1.7 million-square feet (158,000-square meters), 7WTC represents a milestone in skyscraper construction. The building features innovation in design, life safety, and technology. The tower is scheduled to be complete in late 2005.

By **Philip A. Zanghi**

Photographs by **Steve Dapkiewicz**

7 World Trade Center as seen from street level.

Constructed of steel and concrete with a glass facade, 7WTC will be taller than its predecessor. Designed by architect David Childs of Skidmore, Owings & Merrill LLP, the building will include enhanced safety features such as fireproofing material twice as durable as currently required, reinforced concrete walls protecting the building's core, and wider stairs for quicker evacuation.

According to the New York City building code, all steel buildings must be fireproofed, so fireproofing was one of the main considerations when it came to building safety requirements for the new 7WTC.

Fireproofing typically refers to the protection of the structural steel and other supporting members in a building.

Structural fireproofing for steel can be anything from concrete encasement, to mineral fiber, intumescent coating or lightweight cementitious materials applied to the steel to prevent overheating and determination of key structural members.

Fireproofing materials as part of an assembly are also tested and rated in accordance with NFPA 251, *Methods of Tests of Fire Endurance of Building Construction and Materials*.

Emphasis on fireproofing

In May 2002, the Federal Emergency Management Agency (FEMA) published the ***World Trade Center Building Performance Study: Data Collection, Preliminary Observations, and Recommendations***, in which fireproofing was cited as one of the critical issues in relation to building performance. According to the report, "Fireproofing needs to adhere under impact and fire conditions that deform steel members, so that the coatings remain on the steel and provide the intended protection." Further, in Appendix A, the report states, "Both the sprayed fiber and, to a lesser extent, cementitious materials, can sometimes fail to adhere to the steel, be mechanically damaged, or otherwise be degraded when exposed to a fire. The current quality control testing of adhesion/cohesion and density, while helpful, does not solve the problem of assuring that the fireproofing will be present at the time of a fire and function throughout the duration of the fire exposure. Other factors that can affect the durability and performance of fireproofing include resistance to abrasion, shock, vibration, and high temperatures."

In addition, the National Institute of Standards and Technology (NIST) conducted a three-year building and fire safety investigation to address these issues and to offer recommendations moving forward. The recommendations, contained in 43 draft reports, were summarized and released in June 2005 for a six-week public comment period. Among the draft recommendations was "Enhanced Fire Resistance of Structures–The procedures and practices used to ensure the fire resistance of structures should be enhanced by improving the technical basis for construction classifications and fire resistance ratings; improving the technical basis for standard fire resistance testing methods; using the 'structural frame'

approach to fire resistance ratings; and developing in-service performance requirements and conformance criteria for spray-applied fire-resistive materials (SFRMs, commonly referred to as 'fireproofing' or 'insulation')."

The recommendations of the draft report will be discussed further when the Technical Conference on the Federal Building and Fire Safety Investigation of the World Trade Center Disaster, is held September 13 to 15 at the National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland.

Some version of the fireproofing recommendations are expected to be part of the final report. In addition, NIST is trying to put together a research group to look into the durability of fireproofing over the next few years. Underwriters' Laboratories, Inc. (UL) is writing a fireproofing durability standard, as well.

The type of fireproofing specified for the 7WTC project is a medium-density, portland cement-based fireproofing product that was chosen for its ease of installation, adhesion properties, and consistency.

Spray-applied fireproofing is only effective when it remains on the steel structure to which it is applied. The mineral fiber fireproofing used in many office buildings has a bond strength of 150 pounds per foot^2 (68 kilograms per 0.3 meters^2).

Fireproofing classifications are measured in terms of density. Technically, density refers to the amount of mass per unit volume. Michael Patti, president of Patti & Sons, Inc., the fireproofing contractor for the project, says "Typical standard density fireproofing products generally have an in place density of 15 pcf (pounds per cubic foot); however, Grace Construction Products' Monokote Z-106/HY fireproofing provides a minimum density of 22 pcf. Higher density material means increased physical performance." See Table 2 for typical applications of higher density product.

Fireproofing classifications and typical use

NFPA 5000® *Building Construction and Safety Code®*, defines "sprayed fire-resistive material" as a cementitious or fiberous material that is spray-applied to structural elements, walls, floors, and roofs to provide fire-resistive protection.

Cementitious fireproofing materials generally contain binders such as portland cement or gypsum as their main ingredient, which, when mixed with water at the job site, forms a slurry that is suitable for pumping and spraying onto steel. The main ingredient of sprayed mineral fiber fireproofing materials typically contains rock wool fiber, which is manufactured by spinning molten pieces of iron slag at high temperatures. These fibers are then mixed with a cement binder to create a mixture that is pumped pneumatically at the job site.

The gypsum-based cementitious, cement-based cementitious, and sprayed fiber materials can be manufactured such that, when applied according to the manufacturer's instructions, they can achieve a targeted dry density measured in pounds per cubic foot. In the fire protection industry, the terms used for varying levels of protection are "standard density," "medium density," and "high density." Performance characteristics that affect durability such as bond strength and compressive, impact penetration, and abrasion resistance increase as dry density increases. See Table 2 for recommended minimum specified performance characteristics.

Across a single project, the fireproofing may experience different types and levels of exposure, such as vibration due to mechanical equipment, high humidity from an unconditioned space, air current in an elevator shaft, and impact in an unconcealed space, just to name a few. Therefore, a combination of different product types are generally used to address the varying conditions present on most projects. Table 2 also lists where standard-, medium-, and high-density products are typically used.

Manufacturers offer guidance to specifiers on where the need for more durable fireproofing would warrant a medium- or high-density product and help them write clear directions in Division 7 of the CSI specifications.

Installation and inspection requirements

The characteristics and performance properties of spray-applied fireproofing have been extensively tested and studied for over 50 years. Relying on correlations developed between in-place properties and fire test performance, building codes mandate special inspection requirements at the time of installation.

Section 40.5, "Quality Assurance for Sprayed Fire-Resistive Materials," in Chapter 40 of NFPA 5000 details surface conditions, ambient temperature during application, thickness, density, and bond strength requirements for sprayed fire-resistive materials. According to Section 40.5, a quality assurance program is the responsibility of the registered design professional.

A construction worker sprays fireproofing inside 7 WTC.

The program, according to Table 40.5.1.2 of NFPA 5000, must include a review of the quality control of the material, a review of the material to determine its conformity to specifications, and verification that the installation is correctly applied and complies with the manufacturer's instructions.

The special inspections are conducted by inspectors from the jurisdiction or by private inspection firms specializing in this service. Documentation and verification of satisfactory results is required for every job. Due to the tight inspection requirements and significant equipment investment, fireproofing is typically applied by trained specialty contractors.

Unfortunately, thorough fireproofing inspection is only required and performed at the time of installation and does not capture the long-term effects on the fireproofing of external factors such as environmental elements and human behavior. While codes such as NFPA 1, *Uniform Fire Code*™, require such materials to be maintained, there are no inspection protocols for these materials.

To ensure that passive fire protection products remain in place for the expected life of the structure, the products and systems must be inspected regularly throughout the life of the building.

Standard for durability tests

In mid-2003, in response to comments in the 2002 FEMA report, UL assembled a group of industry experts, including members of UL's

TABLE 1. RECOMMENDED USE BY FIREPROOFING DENSITY PER ASTM STANDARDS

Performance Characteristic	Standard Density	Medium Density	High Density
Bond Strength (ASTM E 736)	200 psf	2,000 psf	10,000 psf
Compressive Strength (ASTM E761)	1,200 psf	100 psi	550 psi
Air Erosion (ASTM E859)	0.005 g/ft^2	0.000 g/ft^2	0.000 g/ft^2
Impact Penetration (City of San Francisco)	Max. 6 cm^3 abraded	—	—
Abrasion Resistance (City of San Francisco)	Max. 15 cm^3 abraded	—	—

Fire Council and Standards Technical Panel (STP) 263 on Fire Resistance of Building Construction and Assemblies, to develop UL 2431, *Standard for Durability Tests for Fire Resistive Materials Applied to Structural Steel.*

UL was also contracted by NIST to test the steel-joist-supported floor system of the Word Trade Center towers under the fire conditions prescribed in ASTM E119, which included a specific thickness of fireproofing.

The STP is currently working on it's third draft of UL 2431, which will provide a means of measuring the ability of fire-resistive materials to retain their fire-resistive properties after being subjected to various conditioning environments. The fire-resistive performance will be determined by measuring the temperatures of steel tubes protected by the materials.

The conditioning environments include abrasion; aging; a combination of wet, freeze, and dry cycling; humidity; impact; industrial atmosphere; salt spray; ultraviolet light; and vibration. Two fire exposures are defined, a normal-temperature-rise fire and a-rapid-temperature rise fire. The normal-temperatur-rise fire is intended to represent a fully developed interior building fire. The rapid-temperature-rise fire is intended to represent a hydrocarbon pool fire.

"We have a number of working groups that are in the process of completing their assignments, and I expect the STP to meet during the fourth quarter pursuant to completing the draft standard and advancing the document to initial ballot and public review," says Daniel P. Ryan, Standards Technical Panel Chair at UL.

NFPA has assisted with this project. Bob Berhinig, UL's principal engineer for Fire Resistance was invited to make a presentation on the development of UL 2431 at the NFPA World Safety Conference and Exposition® in Salt Lake City in 2004. Feedback from the presentation was incorporated into the UL 2431 development effort, Ryan says.

When the work is completed, architects and specifiers will have a clearer understanding of which products are compliant with the intended application. Until then, manufacturers should provide sufficient evidence that the products they offer will withstand the anticipated need for long-term durability.

PHILIP A. ZANGHI is fire protection product manager for Grace Construction Products. He also chairs the education committee for the International Firestop Council and is treasurer of the National Fireproofing Contractors Association.

TABLE 2. TYPICAL USES

Product Type	Nominal Density	Typical Use
Standard-Density	13-17 pcf	• Interior concealed commercial
Medium-Density	22 pcf	• Interior exposed areas • Parking garages • Mechanical rooms • Elevator shafts • Swimming pool areas
High-Density	40 pcf	• Exterior exposure • Industrial facilities • Manufacturing facilities • Transportation terminals

SECTIONNEWS

Stay informed of critical issues in your industry! In these pages, you'll find news and information affecting your industry and your career.

Architects, Engineers, and Building Officials

WEB SITE: www.nfpa.org/aebo
CHAIR: John Kampmeyer, Triad Protection Engineering Corp.

HOT ISSUES

AEBO Section Has Successful Week at WSCE®

At NFPA's World Safety Conference and Exposition® (WSCE®) in Las Vegas last June, AEBO's education efforts continued to generate great interest. Total attendance at the 14 AEBO-sponsored programs geared towards our membership was 1,158.

"Plan Review Backlog—Frogs in Crisis," presented by Lyndon Loh, Kevin McGee and Warren Whitley of Prince William County, Virginia, had 55 attendees.

"Unique Interiors on the Las Vegas Strip," by Doug Evans of the Clark County Building Department, had 156 attendees.

"Large Nightclub Fires," presented by Jim Arnold, also of the Clark County Building Department, had 183 attendees.

"Math for Code Officials," presented by Mike Ashley, a building official for the City of Rome, Georgia, had 35 attendees.

"Large Building Fires and Subsequent Code Changes," presented by Clark County's Jim Arnold, had 80 attendees.

"Adding Class to Hazardous Materials Classification," presented by NFPA's Guy Colonna, had 61 attendees.

"Who Is My AHJ and Will He Stand Up?" presented by Christopher Beckman, CFPS, of Schiff Kreidler Shell Insurance and Risk Services, had 42 attendees.

"Understanding Building Code Sprinkler Tradeoffs," presented by Robert J. Davidson of Davidson Code Concepts and Sal DiCristina of Rutgers University, had 62 attendees.

"How Fire and Building Officials Work Together to Achieve a Code-Compliant Project," presented by Scott Adams of the Park City, Utah, Fire District; Ed Altizer of the Virginia State Fire Marshal's Office; and Kenneth Crews of the Durham, North Carolina, Fire Department, had 27 attendees.

"Principles of Fire Code Enforcement Administration," presented by NFPA's David Nuss, had 25 attendees.

"Seismic Design of Sprinkler Systems," presented by NFPA's Christian Dubay, P.E., had 150 attendees.

"Building Department Innovation and Regional Consistency," presented by Jim Muir of the Washington County, Oregon, Department of Land Use and Transportation, had 26 attendees.

"Managing Aging Fire and Life Safety Systems," presented by Byron Briese, P.E., of Rolf Jensen and Associates, had 181 attendees.

"Understanding and Testing Smoke Management Systems," presented by John E. Kampmeyer, P.E., of Triad Fire Protection Engineering Corp., had 75 attendees.

Attendance numbers listed are for those who scanned in, stayed for the entire program ,and received education credits. Total numbers were somewhat higher.

News from the AEBO Executive Board

At its June 4 meeting, the Executive Board covered a wide range of issues and made some significant progress on the AEBO strategic plan. The Board talked with George Ockuly, chair of the NFPA Board of Directors, about AEBO's vision for NFPA 5000®, *Building Construction and Safety Code®*, and AEBO's role in outreach programs, including training at local venues.

Dan Whiting, NFPA marketing specialist, informed the Executive Board that several items on the strategic and operational plan have been completed.

The Executive Board also created three sub-committees: Programs, chaired by Sal DiCristina, for annual meetings; Educational Programs, chaired by Dave Collins, for regional presentations; and News and Information, chaired by Mike Ashley, for e-mail blasts, *NFPA Journal* articles, and so on.

The Program Subcommittee will develop 12 to 20 programs each year for the WSCE in conjunction with the executive secretary. The subcommittee will develop areas of interest, both broad and specific; contact potential speakers; and review and rank speakers' proposal abstracts. The executive secretary will process the results through the NFPA Meetings and Professional Development Departments.

The Educational Programs Subcommittee will develop "canned" programs that can be presented by qualified AEBO members or NFPA staff around the country at various trade shows and local venues at the request of AEBO members or related organizations. The programs, which will address subjects that are generic enough to attract all our constituents, will be developed with NFPA Professional Development staff so that attendees can be awarded Continuing Education Units and AIA Learning Units.

The subcommittee will develop areas of interest; determine program length; and develop PowerPoint® presentations. The Executive Secretary will coordinate with the Professional Development staff to publicize the programs and coordinate presentations and presenters.

The News and Information Subcommittee will develop releases to be sent as quarterly e-mail blasts and articles for *NFPA Journal*, and more outlets may be developed over time. The executive secretary and the submittee chair will work with NFPA Periodicals and Marketing staff to process the information. The goal is to have three to five pages of content for each e-mail and one page of content for each issue of *Journal*. Examples include original articles, papers, FAQs, items relating to field experience, educational pieces, and upcoming events. Be creative!

We need volunteers for these three subcommittees, which will conduct their work by e-mail and conference calls. If you are interested, please contact afraser@nfpa.org.

News from the AEBO General Business Meeting

During the AEBO Section business meeting on June 5, the membership elected three directors from a slate of eight nominees. Those elected will serve until the 2008 WSCE.

The new directors are Chris Chwedyck, an architect with The Code Group, Inc., in

In This Issue

Chicago, Illinois; Pete Willse, an engineer with GE Global Asset Protection Services in Hartford, Connecticut; and Sal DiCristina, a building official at Rutgers University in Hightstown, New Jersey.

The Executive Board met immediately afterwards to reorganize and elected John Kampmeyer, P.E. of Triad Fire Protection as chair; Mike Ashley, a building official from Rome, Georgia, as vice-chair; and Chris Chwedyck as clerk.

Questions? Please contact AEBO Executive Secretary Allan B. Fraser at afraser@nfpa.org or (617) 984-7411.

AEBO Section Continues to Grow

AEBO Section membership continues to grow, standing at 4,361 as of June. This is an increase of more than 160 percent from May 1999, when the section had 1,674 members.

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

Aviation

WEB SITE: www.nfpa.org/aviation
CHAIR: Dennis Kennedy, P.E., Tyco Suppression Systems

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

Building Fire Safety Systems

WEB SITE: www.nfpa.org/bfss
CHAIR: Neal Krantz, LCV Technologies, Inc.

SimplexGrinnell Announces New Development Team

On July 29, SimplexGrinnell, a business unit of Tyco Fire & Security, announced the launch of a new sprinkler business development team (SBDT) to improve Simplex Grinnell's operational metrics. The SBDT has 13 members with strong backgrounds in the sprinkler industry.

Heading the SBDT is Daniel Casteel, newly appointed vice-president of sprinkler development. Casteel has almost 20 years experience in the fire industry, most recently as vice-president of fire protection operations at Tyco Fire & Security.

The SBDT will focus on five areas: design capabilities; local office capabili-

ties; fitter and apprentice hiring, retention, and training; the sales force; and streamlining management roles and responsibilities. Within the next month, the SBDT will define specific action items and identify those responsible for achieving them.

HOW TO REACH US: David Hague, Executive Secretary, (617) 984-7452, dhague@nfpa.org

Education

WEB SITE: www.nfpa.org/edsection
CHAIR: Paul Schwartzman

Chair's Corner

Some of us nervously snickered at the "what happens in Vegas, stays in Vegas" slogan as we imagined what might actually happen to some World Safety Conference and Exposition® (WSCE®) attendees last June. And most of us probably pictured the money we'd leave in the slots and at the gaming tables. But the one thing we knew we wouldn't leave in Vegas was the information we acquired and the professional relationships we established or renewed.

Reflecting on this after our time together at the WSCE has helped me revisit how fundamentally important education and the work of the Education Section members really are. The Education Section offered several exceptional presentations, and the potential outcomes of systematically disseminating this knowledge is enormous.

Our initial seminar, "Education 101," focused on the basics of planning, presenting, and evaluating a targeted public education program. It took place the morning after a fire alarm sounded in my hotel, during which I was fascinated at the variety of responses, which ranged from heading to the exit stairways to ignoring the alarm completely. That experience, followed by the seminar, highlighted for me just how essential the fundamentals are and how much we need to continue evaluating our effectiveness in dissmenating them.

Education is a process, and we are all lifelong learners. As educators, we sometimes get discouraged when our efforts are not recognized or the results of our work are not easily measured. However, there is no better alternative. As I contemplate the 2005 WSCE, I realize that, though engineering and legislation are critical, a well-designed and targeted educational campaign is a sure bet.

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

Electrical

WEB SITE: www.nfpa.org/electrical
CHAIR: Paul Dobrowsky, Innovative Technology Services

Tentative Interim Amendment to NEC®

NFPA's Standards Council issued a Tentative Interim Amendment (TIA) to the 2005 edition of NFPA 70, *National Electrical Code®*, on July 29, with an effective date of August 18, 2006. The TIA, which revises Sections 680.26 (C) and 680.26 (C)(1), will become a proposal for the next edition of the *NEC* and be subject to the procedures of the standards-making process at that time.

Sections 680.26 (C) and 680.26 (C)(1) were revised to read:

(C) Equipotential Bonding Grid. The parts specified in 680.26(B) shall be connected to an equipotential bonding grid with a solid copper conductor, insulated, covered, or bare, not smaller than 8 AWG or rigid metal conduit of brass or other identified corrosion-resistant metal conduit. Connection shall be made by exothermic welding or by listed pressure connectors or clamps that are labeled as being suitable for the purpose and are of stainless steel, brass, copper, or copper alloy. The equipotential bonding grid shall conform to the contours of the pool and shall extend within or under paved walking surfaces for 1 m (3 ft) horizontally beyond the inside walls of the pool and shall be permitted to be any of the following:

Exception: The equipotential bonding grid shall not be required to be installed under the bottom of or vertically along the walls of vinyl lined polymer wall, fiberglass composite, or other pools constructed of nonconductive materials. Any metal parts of the pool, including metal structural supports, shall be bonded in accordance with 680.26(B). For the purposes of this section, poured concrete, pneumatically applied (sprayed) concrete, and concrete block, with painted or plastered coatings, shall be considered conductive material.

(1) Structural Reinforcing Steel. The structural reinforcing steel of a concrete pool or deck where the reinforcing rods are bonded together by the usual steel tie wires or the equivalent. Where deck reinforcing steel is not an integral part of the pool, the deck reinforcing steel shall be bonded to other parts of the bonding grid using a minimum 8 AWG solid copper conductor. Connection shall be per 680.26(D).

Proposals on 2008 NEC Due Soon

The first official step in the 2008 *NEC*-development process occurs on November 4, 2005, when the period for submitting proposals closes at 5:00 p.m. EDT.

Numerous task groups have been working on behalf of the *NEC* Technical Correlating Committee on topics ranging from grounding and bonding to homeland security to overall *NEC* usability. The 19 code-making panels that comprise the *National Electrical Code* Committee will meet from January 9 to 21, 2006, at the Crowne Plaza Resort on Hilton Head Island, South Carolina, to act on the proposals developed by the public and the task groups that relate to the *NEC* articles under their jurisdiction. Following the meetings, the *NEC* Technical Correlating Committee will meet from April 24 to 28.

The *Report on Proposals* is scheduled to mail on July 14, 2006.

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

SCHEDULE FOR THE NEC ROP PANEL MEETINGS
January 9-21, 2006, Crowne Plaza Resort, Hilton Head, SC

	S	M	T	W	T	F	S	S	M	T	W	T	F	S
	8TH	9TH	10TH	11TH	12TH	13TH	14TH	15TH	16TH	17TH	18TH	19TH	20TH	21ST
OFFICE		Panel 1							Panel 3					
		Panel 2							Panel 5					
		Panel 8							Panel 13					
		Panel 16							Panel 17					
			Panel 6		Panel 4					Panel 12		Panel 9		
			Panel 10		Panel 7					Panel 14		Panel 19		
			Panel 18		Panel 11					Panel 15				

Fire Science and Technology Educators

WEB SITE: www.nfpa.org/firescience
CHAIR: Patrick Kennedy, John A. Kennedy & Associates

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

Fire Service

WEB SITE: www.nfpa.org/fireservice
CHAIR: Terry Allen, Chief, Cambridge, Ontario, Canada

Code Revision Opens Door for CPVC Sprinkler Piping in Chicago

Chicago's City Council recently approved a revision to the Section 15-16-370 of the *Municipal Code of the City of Chicago* that allows the use of CPVC fire sprinkler systems in new construction. Previously, CPVC pipe was permitted only in retrofits. The country's 50 other largest cities already permit CPVC for both retrofits and new construction.

Previously, Section 15-16-370 allowed only metal piping in sprinkler installations in new construction. The amendment allows CPVC piping systems that meet or exceed the requirements of the 2002 edition of NFPA 13, *Installation of Sprinkler Systems*.

Because CPVC pipe and fittings can be installed in significantly less time than metal piping, their use should result in a savings of both time and money. CPVC fire sprinkler systems also allow contractors flexibility in the field, because modifications can be made at the job site. The pipe is lightweight, making it easier to maneuver on site.

HOW TO REACH US: Gary Tokle, Executive Secretary, (617) 984-7490, gtokle@nfpa.org

Health Care

WEB SITE: www.nfpa.org/healthcare
CHAIR: Susan McLaughlin, SBM Consulting

Chair's Corner

With the 2005 World Safety Conference and Exposition® (WSCE®) behind us, my thoughts go in two directions.

It is probably natural to think first about what we accomplished at the WSCE. Both Richard Nolen and Tom Salamone were reappointed to the Health Care Section Executive Board, and I look forward to working with them over the next two years. Traffic at the section exhibit booth increased as we explained our work on nursing home sprinklers and the placement of alcohol-based hand sanitizers in hospital corridors. And attendance at our codes and standards review session was standing room only. We accomplished a lot.

The WSCE also addressed many codes significant to health care, but for a discussion of them, I defer to Mike Daniels, who explains their ramifications below.

As I look toward the future, I see much yet to be done on the Executive Board and section membership activities.

In late 2005 or early 2006, we plan to conduct a membership survey to determine the extent to which we're meeting your needs. This information will help us grow and serve you better. In addition, the Board and section will explore section membership for those in the assisted-living community.

We have also begun exploring a Health Care Section award for outstanding achievement in health care fire safety or emer-

gency management by an individual or an organization. We are seeking sponsors and developing criteria for application, which we will refine before our next meeting. We hope to present the first award in 2007.

Conversations with the board of the International Fire Marshals Association have resulted in suggestions for a targeted approach in teaching local fire officials about health care occupancies and the defend-in-place concept. We will explore the possibility of making presentations to these groups.

On another note, the Health Care Section is losing a dedicated member with the retirement of Tom Bulow. We want to thank Tom for his many contributions to the section over the years and wish him many happy years of retirement.

Codes and Standards Review Committee News

by MIKE DANIEL, *Committee Chair*

The 2005 WSCE marked the beginning of the new NFPA meeting format and code-development process. Since NFPA has gone to one formal meeting a year rather than two, documents up for adoption will now presented at the WSCE each June. Documents will still be presented in the fall, but only those without potential floor motions will be considered then. Thus, no formal meeting is required. Documents on which no floor motions are made will automatically be adopted as presented in the *Report on Proposals* (ROP) and modified in the *Report on Comments* (ROC). Any documents reporting to the fall cycle on which intents to make a motion are filed will automatically move to the next June meeting for consideration by the NFPA membership.

In support of this new process, intents to make a motion must be filed by a designated date to be considered valid motions. Critical dates in the new process, which will begin with documents reporting to the 2005 fall cycle, can be found at www.nfpa.org. For the fall 2005 cycle, intents to make a motion must be submitted no later than November 10. The fall ROC will available September 16.

That said, let's take a look at activities related to the 2005 WSCE.

I would like to thank those of you who attended the meeting in Las Vegas for your support. It was good to see you. Those unable to attend missed an excellent meeting. The educational sessions were exceptional, providing attendees with up-to-date information on key issues related to health care, including input from authorities having jurisdiction on interpretations. The sessions covered a number of pertinent topics, including changes to the *Life Safety Code®* relevant to health care and how hurricanes affect health care facility operations.

We also held a section town meeting, where we discussed many prominent issues affecting health care, and a Codes and Standards Review Committee meeting, where we discussed in detail proposed changes to the codes and standards related to health care reporting to meetings.

Documents presented for adoption of interest to the health care industry were:

- NFPA 1, *Uniform Fire Code®*
- NFPA 54, *National Fuel Gas Code®*
- NFPA 90A, *Installation of Air-Conditioning and Ventilating Systems*
- NFPA 90B, *Installation of Warm Air Heating and Air-Conditioning Systems*
- NFPA 92A, *Recommended Practice for Smoke-Control Systems*
- NFPA 101, *Life Safety Code®*
- NFPA 220, *Types of Building Construction*
- NFPA 221, *Fire Walls and Fire Barrier Walls*
- NFPA 230, *Fire Protection of Storage*
- NFPA 730, Guide for Premises Security
- NFPA 731, *Installation of Electronic Premises Security Systems*
- NFPA 5000®, *Building Construction and Safety Code®*

NFPA 1, NFPA 54, NFPA 90B, NFPA 92A, NFPA 220, NFPA 221, NFPA 230, and NFPA 731 were adopted as presented in the ROP and as amended in the ROC without further modifications. Although floor motions were made on NFPA 1, NFPA 54, NFPA 221, and NFPA 731, none received the required support of the voting members present at the meeting. NFPA 92A and NFPA 221 are being upgraded from recommended practices to standards. NFPA 92A has been re-titled *Standard for Smoke-Control Systems Utilizing Barriers and Pressure Differences*, and NFPA 221 has been re-titled *Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls.*

Seven motions made on the floor of the Technical Committee Report Session for NFPA 90A all received the required support of the voting membership. Most of them revolved around damper and cabling issues that, for the most part, were favorable to health care facilities. However, the membership also supported a motion to return the entire report to committee. As a result, the previous edition of the document remains the current reference document until the report is again presented for adoption. Given the potential impact of this document's provisions, I encourage you to follow the revision process closely.

More than 20 floor actions were made on NFPA 101 and NFPA 5000. The membership approved 6 on NFPA 101 and 12 on NFPA 5000. However, none of these actions is thought to have a significant impact on health care at present. In fact, the NFPA 101 ROC, as presented for adoption, contains a number of provisions that will provide health care facilities with flexibility in several areas. Among these are provisions for alcohol-based hand-rub solutions, in consonance with the previously approved Tentative Interim Amendments to the 2000 and 2003 editions of NFPA 101; provisions under certain circumstances for horizontal sliding doors for rooms or areas serving fewer than 10 occupants; and the clarification and revision of "suite" provisions. For example, the size of sleeping suites can be increased to 7,500 square feet (697 square meters) if there is direct visual supervision, total smoke detection coverage, and sprinkler protection, and if suite travel distance, intervening rooms, hazardous areas, and other related egress provisions are clarified.

Three motions were initiated for NFPA 730 on the floor, two of which received the required support of the membership. These two issues were actually brought up by a representative of the Health Care Section in response to potential problems noted during the review process. Even though this document is being adopted as a guide only, I encourage you to review it carefully since it has a specific chapter related to health care.

With that, let's turn our attention to the future. The following documents of interest to the health care community will be presented for adoption in the fall of this year:

- NFPA 10, *Portable Fire Extinguishers*
- NFPA 14, *Installation of Standpipe and Hose Systems*
- NFPA 37, *Installation and Use of Stationary Combustion Engines and Gas Turbines*

- NFPA 70B, *Recommended Practice for Electrical Equipment Maintenance*
- NFPA 418, *Heliports*
- NFPA 750, *Water Mist Fire Protection Systems*

If no intents to make a motion are recorded on these documents by 10 November, they will automatically be adopted.

Intents to make a motion for any floor action on a specific ROC up for adoption at the 2006 WSCE in Orlando must be presented by April 7, 2006. The following documents of interest to the health care community will be presented:

- NFPA 13, *Installation of Sprinkler Systems*
- NFPA 13R, *Installation of Sprinkler Systems in Residential Occupancies Up to and Including Four Stories in Height*
- NFPA 20, *Installation of Stationary Pumps for Fire Protection*
- NFPA 72, *National Fire Alarm Code®*
- NFPA 77, *Recommended Practice on Static Electricity*
- NFPA 80, *Fire Doors and Fire Windows*
- NFPA 80A, *Recommended Practice for Protection of Buildings from Exterior Fire Exposures*
- NFPA 101A, *Guide on Alternative Approaches to Life Safety*
- NFPA 101B, *Means of Egress for Buildings and Structures*
- NFPA 105, *Installation of Smoke Door Assemblies*
- NFPA 232, *Protection of Records*
- NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*

We need your support in the review process and at the voting sessions. Remember, the cost of attending a meeting is much lower than the cost of complying with requirements for which there is neither technical nor historical justification. This is especially true now that voting takes place during only one NFPA meeting annually.

I look forward to seeing or hearing from each of you in the future.

Alcohol-Based Hand-Rub Solutions

by DEAN M. MENKEN

During the Town Hall Meeting at the WSCE in Las Vegas last June, there was a lively discussion about alcohol-based hand-rub solutions used to decrease the risk of infection in health care facilities. Many health care facilities have installed hand sanitizers in corridors since NFPA and the Center for Medicare and Medicaid System (CMS) approved of their use, but there has been some confusion about the proper way to do so in order to reduce the risk of fire and to meet the requirement of the *Life Safety Code®*.

Alcohol-based hand-rub dispensers must be protected in accordance with Section 8.7.3 of the *Life Safety Code* unless all of the following conditions are met.

Where dispensers are installed in a corridor, the corridor must be at least 72 inches (183 centimeters) wide. The individual fluid capacity of dispensers in rooms, corridors, and areas open to corridors must be no more than 0.32 gallons (1.2 liters), and the individual fluid capacity of dispensers in suites of rooms must be no more than 0.53 gallons (2 liters).

Dispensers must be spaced at least 48 inches (122 centimeters) horizontally from each other, and they must not be installed over or directly next to an ignition source. Furhtermore, they can be installed directly over a carpet only in sprinklered smoke compartments.

No more than 10 gallons (37.8 liters) of the hand-rub solution can be used outside a storage cabinet in a single smoke compartment, and storage cabinets in a single smoke compartment that contain more than 5 gallons (18.9 liters) must meet the requirements of NFPA 30, *Flammable and Combustible Liquids Code*.

The Health Care Section Executive Board will inform you of any further developments on these technical data and installation requirements.

Dean M. Menken is with Providence Health System.

HOW TO REACH US: Rich Bielen, Executive Secretary, (617) 984-779, rbielen@nfpa.org

Industrial Fire Protection

WEB SITE: www.nfpa.org/industrial
CHAIR: Mike Snyder, Dow Corning Corporation

Chair's Corner

As members of the Industrial Fire Protection Section, we value the design, implementation, use, and maintenance of fire protection systems in our facilities. We also support emergency drills and exercises that test our response readiness in the workplace. As we approach Fire Prevention Week (FPW) 2005, which runs from October 9 to 15, we have another opportunity to advocate for fire safety with our employees and fellow workers, both in the workplace and at home.

NFPA statistics show the significant opportunities we have for improvement in prevention of, and response to, home fires. For example, candles started 18,000 home fires and caused 190 deaths, and the number of fires attributed to candles has continually grown since 1990. Roughly 70 percent of residential fire deaths result from fires in homes with no smoke alarms or no working smoke alarms. Smoke alarms are the great safety success story of the twentieth century, but only when they work properly.

Many of our companies are now starting to focus on developing programs for off-the-job safety, recognizing that good safety attitudes make an important connection between the workplace and home. FPW 2005 provides a ready-made opportunity to provide a home safety program focusing on this year's key message: "Use Candles with Care." If your company wants to enhance its community outreach, why not offer to help your local fire department with its FPW 2005 campaign?

To encourage involvement in FPW, the section sponsors an annual contest for our members. Entries are judged on several key elements, including use of the FPW theme, materials used in the promotion, integration of industry-specific information into the campaign, community involvement, and participation with local fire departments. I again challenge each section member to think about how to take the next step in your organization to share and support the FPW 2005 message.

Neither the message nor the program has to be complicated. The key is to start with a sincere, useful message you can embellish in the future. Ideas for programs and additional information are available at www.nfpa.org/FPW.

We'd love to see a summary of your program in the Industrial Section's FPW 2005 contest and give you and your organization an opportunity to be recognized for your work at the 2006 WSCE in Orlando next June.

The section Web page contains the entry requirements for the FPW contest and the application form. All you need is a section member to sponsor your entry and lots of passion for your company and community as you bring them together to achieve one goal: enhanced fire safety awareness at work and at home.

Remember, our efforts make a difference!

Illiana Chapter Update

The officers of the section's Illiana Chapter for 2005-2006 are:

President: **Todd Schumann**, *GE GAPS (retired)*
3044 W. 100th Street, Evergreen Park, IL 60805
(708) 423-7066; tschum3063@aol.com

Vice President: **Joe Schmitt**, *Alsip Fire Department*
Fire Station #2, 11946 S. Laramie, Alsip, IL 60803
(708) 385-6902, ext 237; afd3074@aol.com

Secretary: **Ted Main**, *HSB Professional Loss Control*
5 South 661, Buttonwood Court, Naperville, IL 60540
(630) 416-3952; theodore_main@hsb.com

Treasurer: **Bob Pikula**, *Reliable Fire Equipment Co.*
12845 S. Cicero Ave, Alsip, IL 60803
(708) 597-5077; rpikula@reliablefire.com

The chapter will hold meetings on September 28 and November 30, 2005 and on January 25, March 19, and May 31, 2006. If you are interested in presenting at a meeting, please contact a chapter officer or the section executive secretary. All section members or prospective members are welcome to attend and, if located in the Illinois-Indiana region, to join the Illiana Chapter.

The section currently has two other active chapters: Niagara Frontier and Tennessee Valley. For more information on the chapters, please see the section Web page.

Safe Tank Alliance Update

On April 7 and 8, 87 safety professionals from industry, OSHA, and allied services sectors attended the first annual Safe Tank Alliance Seminar and Best Practices Sharing Workshop, hosted by NFPA, the American Petroleum Institute (API), OSHA, and Chevron.

The Safe Tank Alliance is a collaborative effort of NFPA, API, and OSHA to get information on safe tank operations into the right hands and make the petroleum industry a safe place to work.

Presentations included updates on API and NFPA standards; an overview of confined space safe practices, ventilation, and fall-protection methods; and an overview of the Alliance and other OSHA compliance-assistance activities. The presentations are posted on http://committees.api.org/ehs/safetank.

As a result of the interest expressed, the Alliance has already begun planning for another seminar next year. If you have any suggestions for topics or presenters, please let us know.

OSHA and API have both submitted proposals for the Industrial Section's sponsored sessions at the 2006 WSCE in Orlando. The Office of Alliance Programs also plans to exhibit at the conference. This will give attendees the opportunity to learn more about OSHA's Alliance program and about the API/NFPA/OSHA Alliance on above-ground petroleum storage tanks.

NFPA, in association with API, will present Safe Tank Entry Workshops in Houston, Texas, and Oakland, California,

this September and October. For information or to register, visit www.nfpa.org.

If you are interested in working with OSHA on their fact sheets for fire protection, confined space safety, or hot work, or in assisting in their other e-tools development, please contact the section executive secretary.

HOW TO REACH US: Guy Colonna, Executive Secretary, (617) 984-7435, gcolonna@nfpa.org

International Fire Marshals Association

WEB SITE: www.nfpa.org/ifma
CHAIR: Fire Marshal Scott Adams, Park City, Utah, Fire District

IFMA Welcomes Chapter 25

IFMA would like to welcome the Ohio Fire Officials Association as IFMA Chapter 25. IFMA now has chapters representing one Canadian province and 32 states.

Professional development

The International Fire Marshals Association Fire Protection Institute "Principles of Fire Protection Engineering" course is being offered from October 18 to 21 in San Diego, California. The "Management Institute for Fire Prevention" is being offered from December 5 to 7, 2005, in Gleneden Beach, Oregon. For information, visit www. ofma.net. Anyone interested in attending or sponsoring a program may contact Section Executive Secretary Steven F. Sawyer at (617) 984-7423 or ssawyer@nfpa.org. Check www.nfpa.org/ifma for complete details.

Web Board

IFMA has a Web board where you can post news or information on educational offerings and employment opportunities. You can also add remarks to each posting. Anyone interested can sign up at www.nfpa.org/ifma.

And don't forget...

IFMA is in the final planning stages for our 100th anniversary celebration at the 2006 NFPA WSCE in Orlando, to be held from June 4 to 9. Hope to see you there.

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

Latin American

WEB SITE: http://www.nfpa.org/latinamerican
CHAIR: José Figueroa, FM Global

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

Lodging Industry

WEB SITE: http://www.nfpa.org/lodging
CHAIR: Richard Anderson, Chimney Hill Farm Inn

Section Wants to Fill Vacancies

The Lodging Industry Section is seeking section members to fill several vacancies on its Executive Committee. The committee meets annually at the WSCE and periodically holds teleconference meetings to discuss fire and other safety issues of interest to the lodging industry. The Executive Committee also plans section-sponsored educational sessions for the WSCE. For more information on serving on the Executive Committee, please contact section Executive Secretary

Gregory Harrington at lodging@nfpa.org.

HOW TO REACH US: Greg Harrington, Executive Secretary, (617) 984-7471, gharrington@nfpa.org

Metropolitan Fire Chiefs

WEB SITE: http://www.nfpa.org/metro
CHAIR: Fire Chief Kelvin Cochran, Shreveport, Louisiana

HOW TO REACH US: Russ Sanders, Executive Secretary, (502) 894-0411, rsanders@nfpa.org

Rail Transportation Systems

WEB SITE: www.nfpa.org/rail
CHAIR: James Gourley, Fire Protection Engineer

Fixed Guideway Transit and Passenger Rail Systems Committee Meets

The Technical Committee on Fixed Guideway Transit and Passenger Rail Systems will meet from September 19 to 21 in Baltimore, Maryland, to work on the *Report on Comments* for NFPA 130, *Fixed Guideway Transit and Passenger Rail Systems*. The *Report on Proposals* is now available.

Section to Sponsor Education Sessions at 2006 WSCE

The Rail Section will sponsor a half-day educational session during the 2006 WSCE in Orlando, Florida, next June. The session will consist of presentations from task group chairs, who worked on changes for the 2006 edition of NFPA 130, *Fixed Guideway Transit and Passenger Rail Systems*. After welcoming comments by Section Chair Jim Gourley, the session will address emergency egress, trainways, emergency ventilation, vehicles, and emergency procedures and communications.

HOW TO REACH US: Jim Lake, Executive Secretary, (617) 984-7470, jlake@nfpa.org

Research

WEB SITE: www.nfpa.org/researchsection
CHAIR: Daniel Madrzykowski, National Institute of Standards and Technology

Election Results

The Research Section has elected Karen Carpenter of the Southwest Research Institute and Commander Joseph Miranda of the Chicago Fire Department to the Executive Committee-at-Large for a term that runs from 2005 to 2007. Elected to the Nominating Committee for a term running from 2005 to 2006 were Michael Fox of Chemical Accident Reconstruction Services and Tom Woodford of Oklahoma State. Continuing their terms are Committee Chair Daniel Madrzykowski, Committee Vice-Chair Stephen Hill, Committee Secretary Rod McPhee, Members-at-Large Anthony LaPalio and Jill Wellens, and Past Chair Samuel Dannaway.

NIST Releases Data-Rich DVDs

The National Institute of Standards and Technology (NIST) has released two DVDs that document its investigations of the Cook County Administration Building fire in Chicago in October 2003 and The Station nightclub fire in Rhode Island in February 2003. Each DVD contains the entire NIST report, including the cone calorimeter data and full-scale fire test data created for each investigation. The DVDs also contain videos of the fire testing and the fire dynamic simulator modeling conducted for each case. The DVDs are available at no cost from madrzy@nist.gov.

HOW TO REACH US: Rita Fahy, Executive Secretary, (617) 984-7469, rfahy@nfpa.org

Wildland Fire Management

WEB SITE: www.nfpa.org/wildland
CHAIR: Bill Terry, USDA Forest Service

Mississippi Holds Firewise Workshops

More Mississippians are building homes next to forest land, and that means wildfires are an increasing danger to people and property. With that in mind, the Mississippi Forestry Commission is hosting 12 Firewise community workshops across the state to make public officials and community leaders aware of the fire danger to homes in their jurisdictions.

Workshop organizers offer tips on landscaping, irrigation, and maintaining a defensible space around homes to reduce the threat.

"With the newly built subdivisions and people building out into the forest, our role

as a forest firefighter now is changing," said urban forester Ed Brown. "Not only do we have to protect the resource, but we [also] have to think about protecting those homes that those wildfires threaten."

National Wildland Fire Management Awards

The Wildland Fire Management Section bestows six awards annually.

The Wildland Fire Public Education Award is presented for outstanding work that increases the quality and effectiveness of information and public education in wildland fire, wildland fire ecology, or related areas; innovation in mechanisms to deliver public forest and wildland fire education programs; or education, citizen participation, and community sustainability in local, state, and federal agencies and organizations.

The Wildland Fire Prevention Award is presented for outstanding work in engineering concepts or standard operating procedures that prevent disastrous losses of resources, wildland/urban interface structures, and lives and for programs that result in incident reduction and community support in preventing unwanted wildland fire.

The Wildland Fire Risk Mitigation Award is presented for outstanding work in establishing local mitigation efforts that have been implemented and have been shown to work. A documented wildland fire need not have tested the mitigation activities, but documentation on how the mitigation and planning effort might affect a future fire is required.

The Wildland Fire Planning Award is presented for outstanding work in developing agency or community fire planning using GIS mapping and information sharing; collaborating with other agencies or organizations; efficiently using planning resources; delivering planning techniques, training, or assistance; creating or improving the quality of community wildfire preparedness plans; or planning to reduce the impact of wildland fires on the environment, communities, and response agencies.

The Wildland Fire Management Award is presented for outstanding improvment of fire management strategies and tactics that have been shown to reduce losses or fire management costs and improve effectiveness. These may include organizational steps that minimize damage from a wildland fire or its aftermath.

The Wildland Firefighter Safety Award is presented for outstanding work in developing or establishing firefighter training, initial response tactics or related programs that effectively reduce firefighters' risk of injury or death and increase the awareness of firefighters' risks, innovative safety policies, or personal protective safety equipment programs. Training programs or policies must be consistent with NWCG or NFPA standards for training, operations, and policies.

These awards may be made annually, depending on activities, the number of nominations, and other circumstances. Nominees need not be NFPA or Wildland Section members, but nominations may only come from an NFPA member. If the NFPA member is not a member of the Wildland Fire Management Section, the nomination form must be endorsed by the appropriate section regional director.

Individuals or groups may be nominated, and the same individual or group may be nominated in multiple categories.

Nominations should be sent to the Wildland Section Executive Board through the section's executive secretary. The nominations and all accompanying documentation will then be forwarded to the Awards Review Committee for consideration. The deadline for all nominations is approximately 90 days before the opening of the WSCE, the specific date of which will be announced in *NFPA Journal* and on the NFPA Web site.

The Wildland Fire Management Section Board will present the awards at the WSCE, at the discretion of the Board. Winners may be given a travel grant to attend the award ceremony. Winners will also present a review of the activities that resulted in their nominations and provide information for an article to be published in *Wildfire News & Notes, NFPA Journal*, or another publication determined by the Executive Board.

Local, state, or federal agency personnel; individuals associated with wildland fire management or public education; or anyone who has for the year before the award shown commitment to public education in forest ecology, wildfire prevention, mitigation, or related fields are eligible for the awards. The programs or activities for which the nominee was responsible must have taken place within two years of the award date.

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

WHAT'S HOT

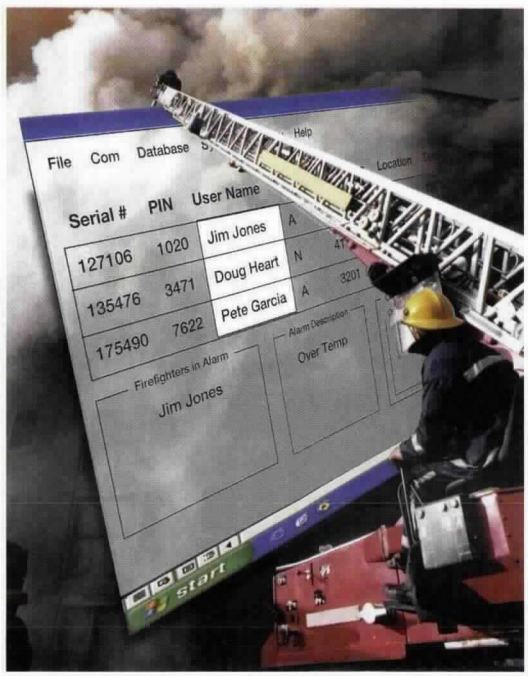
PRODUCT SPOTLIGHT

CLEAN AGENT SUPPRESSION

Fike Corporation's ECARO-25 clean-agent fire suppression system is now available in New York City. The New York City Department of Buildings granted Fike its Material & Equipment Acceptance (MEA) approval on May 26, 2005. Fike will offer the ECARO-25 system through its network of fire suppression distributors in and around New York City. The ECARO-25 system uses a safe, clean, gaseous chemical agent called FE-25 to protect critical assets from fire without the damaging effects of water-based extinguishing systems. Such systems are typically used in computer rooms, telecommunications centers, document storage facilities, and other spaces in which people and critical assets are located. The ECARO-25 system has both Underwriter's Laboratories and Factory Mutual approval. For more information on Fike's ECARO-25 fire suppression system can visit www.fike.com.
Circle Card No. 101

AIR MANAGEMENT SYSTEM

International Safety Instruments (ISI), a leading producer of technologically advanced respiratory protection equipment for firefighters, has introduced ISI TEAMS, a telemetry system that individually and simultaneously monitors vital data of every firefighter at the scene, providing incident commanders with real-time information on PASS status, ambient temperature, cylinder air, and time in fire. ISI TEAMS (Telemetry Electronic Air Management System) is an improvement over traditional PASS telemetry systems that transmit limited information, primarily to alert others to distress situations. The new system integrates with the popular ISI Viking DXL, a technologically advanced SCBA known for its high-performance features and reliability. For more information visit www.intsafety.com. ISI is part of Avon Protection Systems, a division of Avon Rubber plc.
Circle Card No. 102



RESIDENTIAL SPRINKLER

The Viking Corporation introduces their new Microtech™ residential horizontal sidewall sprinkler (VK452). This sprinkler's innovative patent-pending design delivers the fire protection industry's lowest flow rates for various room sizes. This sprinkler is offered in brass, chrome, black, and white standard finishes. For more information on the Microtech residential sidewall sprinkler or any of Viking's full line of quality products, please visit www.vikingcorp.com.
Circle Card No. 103

PRODUCT BROCHURE

A new product brochure and technical data sheet for Pilkington's fire-resistant glasses are now available. The new material includes information on both the Pilkington Pyrostop™ Fire Resistant Glass and Pilkington Pyrodur™ Fire Protection Glass products. Pilkington Pyrostop™ is a fire-rated and impact safety-rated glass for blocking heat and protecting people and valuables from fire. Pilkington Pyrodur™ Fire Protection Glass is based on the same advanced technology as the Pilkington Pyrostop™ and was specifically designed to meet the needs of the 20 minute fire protection market. Its greatest advantage compared to the majority of other glasses in its class is the ability to provide thermal protection. Produced in Germany, Pilkington PyrostopTM and Pilkington Pyrodur™ are warehoused and assembled for the North American market at the Pilkington facility in Toledo, Ohio. The products are available in the U.S. through Technical Glass Products (TGP). You can download a copy of the new brochure and data sheet from our Web site at www.pilkington.com/fire or call us at (419) 478-0165.
Circle Card No. 104

TELEPHONE ZONE CONTROLLER

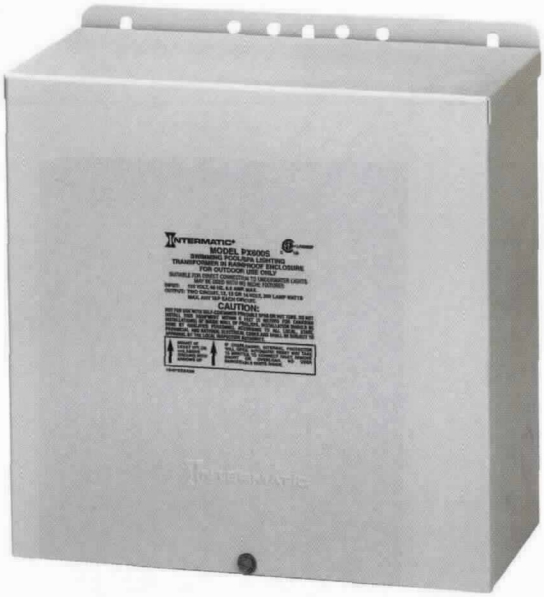
Wheelock, Inc., a leading manufacturer of advanced fire life safety, security and communications products, has expanded the line of enhancements for its SAFEPATH4 Supervised Multi-Function Communications System with the introduction of the SP4-TZC Telephone Zone Controller.The new SP4-TZC allows users to control selectable paging and background music on the SAFEPATH4, which offers these capabilities as well as voice evacuation and general paging in one system. In addition, the Telephone Zone Controller provides the ability to access individual or multiple speaker zones throughout the SP40/2 system via the telephone. It is currently available through Wheelock's certified distributors, which are located nationwide. Headquartered in Long Branch, New Jersey, Wheelock, Inc. is a leader in the Fire Life Safety, Emergency Communications, and Facility Management markets. For more information on all Wheelock products, software, and services please visit www.wheelockinc.com.
Circle Card No. 105

EARLY WARNING SMOKE DETECTION

Vision Systems, a leading supplier of air sampling smoke detection systems, has released the VESDA LaserFOCUS (VLF-500) air sampling smoke detector, designed to protect areas of up to 5,000 square feet. The LaserFOCUS VLF-500 offers the same features that have made the VLF-250 so popular. The smoke level dial display allowing a user to obtain real-time smoke level information from significant distances, industry first Sonic Flow™ advanced air flow monitoring capability, Swift Start™ out-of-the-box installation routines significantly improve onsite installation & commissioning times, a series of pre-engineered pipe network designs which reduce design effort and an Instant Fault Finder™ feature allowing easy user identification of system issues which can then be relayed to a service engineer, ensuring they arrive onsite fully prepared.
Circle Card No. 106

CHEMICAL STORAGE

US Chemical Storage offers versatile hazardous materials buildings provide drum and tote storage solutions. Utilizing the ability to design buildings with compartmentalized usage, these structures allow for safe, custom storage of all hazardous material containers. With the strongest floor in the industry, electrical options, and fire-ratings, US Chemical Storage buildings meet higher standards for compliant hazmat storage. For more information, visit www.uschemicalstorage.com. For free quotes and literature, call (800) 233-1480.
Circle Card No. 107



12-VOLT TRANSFORMER

Intermatic's new Safety Transformers are specially designed to supply 12 volts to pool/spa lights, submersible fixtures and outdoor garden lights. P/N PX600 has a grounded shield between the primary and secondary windings to ensure safe operation, and the built-in circuit protection disconnects power to the transformer in case of overload. P/N PX600S is similar to model number PX600, except the enclosure is made from .06 thick 304 grade stainless steel. The entire enclosure is covered with a specially formulated clear coating to protect the brushed surface finish from fingerprints and contaminants that may build up on its surface. Additional information such as instruction manuals, wiring diagrams, sell sheets and a parts breakdown can be found by visiting the product section of the Intermatic Web site, www.intermatic.com.
Circle Card No. 108

BEAM SMOKE DETECTOR

System Sensor's singled-ended, reflected-type Beam Smoke Detectors feature a 4-wire design. Available with an integral sensitivity test module, these detectors provide coverage in a broad operating temperature range to give early warning in environments where temperatures reach extremes. The detectors have four standard sensitivity selections along with two Acclimate™ settings that automatically adjust sensitivity using advanced software algorithms to select the optimum level for a specific environment. The detectors, available as either conventional or intelligent models, can be equipped with an integral sensitivity test feature that consists of a test filter attached to a servo motor inside the detector optics. For more information, visit www.systemsensor.com.
Circle Card No. 109

FIRE HELMET
From traditional to contemporary, Bullard's new USTM Series traditional fire helmet sports a textured matte finish that gives it the rugged look of leather, while offering the critical protection of modern materials. With an outer shell made from Thermoglas® and an inner shell of urethane foam, USTM offers unmatched durability and superior heat insulation. Standard on all USTM models, the patriotic Stars & Stripes Eagle is the mark of a quality traditional helmet and accommodates every leather front on the market. Bourke eyeshields complete the traditional look. Bullard helmets are engineered to be the most comfortable, boasting innovative features such as a removable brow pad and crown cover. For more information, visit www.bullard.com.
Circle Card No. 110

FIRE DETECTION/RELEASING PANEL
A new fire alarm control panel from Protectowire FireSystems provides a simple multi-purpose unit designed for small detection and releasing applications. The SRP-4x4 Control Panel incorporates many optional features into its single multifunction control board for flexibility in adapting to individual job requirements. The single board design eliminates custom assembly of multiple modules thus ensuring a streamlined system at minimum cost. For more information, visit www.protectowire.com.
Circle Card No. 111

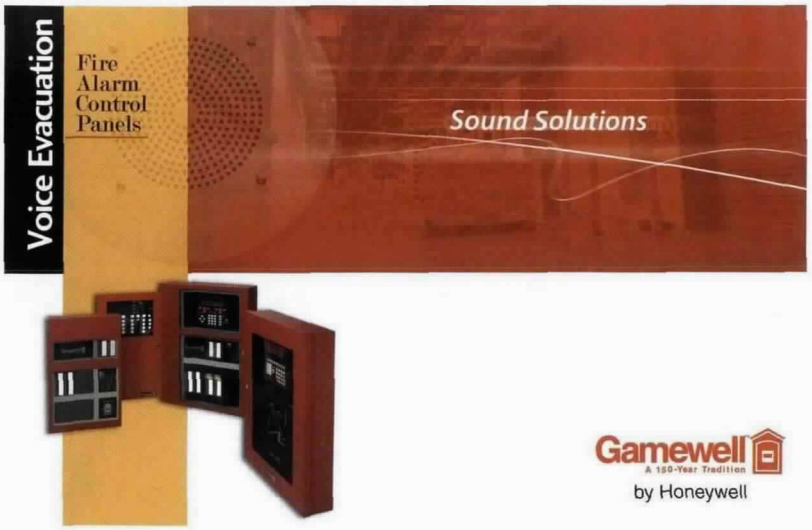
STEEL CUTTING EQUIPMENT
Smith Equipment, a leading manufacturer of premium oxy-fuel cutting equipment, introduces its new 911 Rescue oxy-acetylene fast attack and rapid intervention steel cutting outfit. To meet the critical demands of emergency extrication situations, Smith Equipment developed the 911 Rescue Outfit as an alternative to hydraulic rescue systems, which have limited cutting capacity on thick metals such as "I" beams, pipe and other large construction materials. For more information on Smith's 911 Rescue Oxy-Fuel Cutting Outfit or for more information visit www.smithequipment.com.
Circle Card No. 113

CIRCULAR SAW
Designed for the work you do everyday, the rugged new Hilti WSC 167 Circular Saw has just what you need to get the job done. With a 15-amp motor, durable construction and the ability to cut angles up to 50 degrees, this is one tool you've gotta have. For reliable jobsite performance, the WSC 167 features a 15-amp motor for fast, aggressive cutting. For more information visit www.us.hilti.com.
Circle Card No. 112

EQUIPMENT CONNECTION
Holmatro's newest innovation, Core Technology™, is a revolutionary fluid path and connection technology designed to make hydraulic rescue tool connection, deployment and use faster, easier and safer. This patented technology allows the user to connect and disconnect the tools under flow ("hot-swappable"), saving valuable time. The unique coaxial hose design now places the high pressure line inside the return line, shielding if from physical damage inherent on the rescue scene. Core Technology is the next major step forward in rescue tool design. To learn more, visit www.coretechnology.info.
Circle Card No. 114

PRODUCT MANUAL

Gamewell, a manufacturer of commercial fire alarm control panels and emergency life safety systems, introduces yet another accessory to its Voice Evacuation product line, a new, full-color manual. The new manual, which showcases Gamewell's complete line of state-of-the-art Voice Evacuation products, exemplifies its continual efforts to provide architects and engineers numerous options when specifying for a life safety system. Highlighting new fire panels with integrated solutions and audio expansion alternatives for existing systems, The new manual, titled "Innovations in Sound Solutions," is yet another tool from which specifiers can reference a variety of applications information pertaining to Gamewell Voice Evacuation Systems. To receive one of Gamewell's new manuals, call (203) 484-6202 or e-mail gamewell@honeywell.com.
Circle Card No. 115



RESIDENTIAL PENDENT SPRINKLER

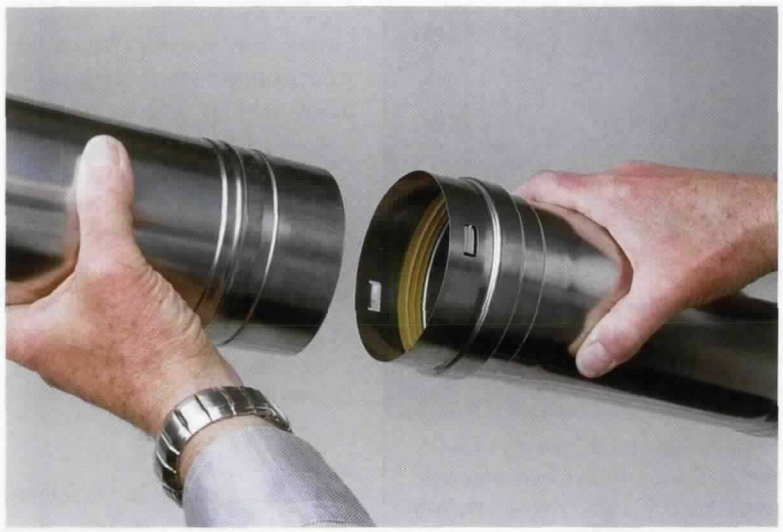
The Viking Corporation, a global leader in fixed fire protection products, further extends their Freedom® line of residential fire sprinklers with the introduction of a new 3.1 (4,5) K factor residential pendent sprinkler (VK435). This cULus listed sprinkler leads the industry in flow characteristics and pressure loss performance in residential applications with smaller room sizes. Viking's Freedom 3.1 K factor sprinkler provides flows as low as 9 GPM (34,1 LPM) at room sizes of 12 x 12 ft. (3,7 x 3,7 m) and 10 GPM (37,9 LPM) in 14 x 14 ft. (4,3 x 4,3 m) rooms. In any smaller room residential application, this sprinkler can enable a less hydraulically demanding, more cost-effective system design. Furthermore, the VK435 sprinkler delivers flows of 20 GPM (75,7 LPM) or less when a two-head design is required. For more information, visit www.vikingcorp.com.
Circle Card No. 116

DESIGN SOFTWARE

Wheelock's NACTool enables users to quickly and easily build NAC circuits using Wheelock's notification appliances. The program precisely calculates the number of appliances per circuit as well as the total length and wire gauge, percentage of voltage drop and speaker wattage. It also provides the capacity to print out material inventories. Another computer-based design tool called the STROBETool facilitates the calculation of "performance based" strobe coverages per NFPA 72®, *National Fire Alarm Code®*, 2002, Chapter 7. Previously, designers had to refer to fixedtables found in the NFPA code to determine these complex calculations. In addition, Wheelock's NACEVAC design tool aids designers and installers by providing a relatively easy method for configuring and calculating SAFEPATH audio, fire and emergency evacuation systems on computers. For more information on all Wheelock products, software and services please visit www.wheelockinc.com.
Circle Card No. 117

VENT PIPE

Metal-Fab, Inc. has introduced a new single wall vent pipe that snaps together in one second, without tools. Available in 3", 4" and 5" diameters, Corr/Guard Single Wall Special Gas Vent is designed for fast one-step connections. Just push together until the snap-lock tabs "click" into locked position, assuring a connection that won't leak condensation water or pressure, and won't sag on horizontal runs. The new vent is UL Listed tested and labeled to UL 1738 for Category II, III and IV appliances. Single wall 3", 4" and 5" diameter ships in 1-2 days. Metal-Fab produces Corr/Guard in single wall and double wall configurations through 24" diameters. For more information, visit www.metal-fabinc.com.
Circle Card No. 118



CLASSIFIEDS

RESEARCH CONTINUED FROM PAGE 22

protection system performance to hazardous materials protection. Currently underway are a signaling and alarm intiative that encompasses four projects ranging from audibility of alarms for the elderly to smoke characterization for detector performance, and a project designed to look at siting requirements for hydrogen storage for stationary fuel cells.

For more information, visit www.nfpa.org/foundation.

KATHLEEN H. ALMAND is the Executive Director of the Research Foundation.

HEADS UP CONTINUED FROM PAGE 34

1 to 12 inches (2.5 to 30.5 centimeters) below the top chord member, not the building peak as currently indicated in the figure. In the view of the committee, these sloped combustible spaces represent a special challenge, but one that has been addressed within the sprinkler rules.

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

MAILCALL CONTINUED FROM PAGE 12

The same article also incorrectly reported that ANSUL would feature a UL-listed Kidde engineered fire suppression system designed for use with the Novec 1230 fire protection fluid.

All three are separate products.

We apologize for any confusion this may have caused.

ADINDEX

BYE, BYE M.I.

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And now Chemetron is proud to announce the introduction of the next generation in Clean Agent fire suppression systems utilizing **3M™ Novec™ 1230 Fire Protection Fluid** - an agent that atomizes readily to provide rapid fire suppression for occupied spaces, while achieving an excellent environmental profile:

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