JIM SHANNON, incoming president, sees NFPA at a crossroads as an information provider.

SHANNON'S PLAN

ALSO
GLOBAL DESIGN HARMONY
THE NEW NFPA 72
TOKYO FIRE SERVICE
PYROTECHNIC DISPLAYS
For nearly a decade, Anslul's "Foam Systems Design and Applications Guide" has been required reading for fire protection professionals... containing everything from general application concepts to specific design criteria. Now, we've placed this valuable information on Compact Disk in an easy-to-use interactive format. We've even added three foam movies and a full color brochure.

If it's your job to design, specify, or purchase fire protection products, we want to make your job easier. Ask for your FREE Foam CD.

ANSUL ADVANTAGES
- In-house foam experts provide design assistance and quotations.
- Field representatives in your area dedicated to foam products.
- Full line of foam concentrates including ANSULITE® 3x3… The Multifunction Class-B Foam.
- Complete line of foam proportioning equipment, bladder tanks and discharge devices.
- Special line of JET-X® high-expansion foam agents and generators.
- Manufactured by ANSUL in the U.S.A.

Call: 800-346-FOAM or 715-735-7411

www.ansul.com

ISO 9001 Registered
When you specify cable for emergency systems, there's no room for error. You need the product you can trust unconditionally — Pyrotenax Mineral Insulated cable.

**A real survivor.**
Pyrotenax MI cable is extremely tough and durable. The very name means "fire resistant." In fact, it's the only wiring system with a long history of "fire survival" — essential to efficient fire fighting operations and safe egress from buildings.

**Zero smoke. Zero fire.**
MI cable is constructed of solid copper rods in a seamless copper tube with a compacted mineral insulation. It has no organic compounds, therefore nothing that burns. So it produces zero smoke and zero flame spread — unlike recently introduced ceramifiable cable.

**Legendary-tough.**
The mechanical integrity of MI cable is legend. When reduced to half its diameter by a series of crushing blows administered during independent testing, it was still able to carry its full rated load.

**Installation-ready.**
MI cable arrives at the job site fire-rated, eliminating the need for fire proofing in the field. Excellent field support and service ensure fast, easy, and cost-effective installation. Pyrotenax System 1850 cables are UL classified two-hour fire resistive, and meet the requirements of NEC® Articles 695 and 700.

**Don't compromise.**
Choose the system that's earned the trust of design and installation professionals. In addition to proven reliability, you'll be getting something equally important — peace of mind.

For more information on Pyrotenax products, service, and technical support, visit us at www.pyrotenax.com. Or call 1-800-234-6501.

National Electrical Code® is a registered trademark of the National Fire Protection Association, Quincy MA 02269.
If you could safeguard your entire facility with just one phone call, you'd be smiling too.

Welcome to OneStop™ Solutions Integration from SimplexGrinnell.

Our OneStop delivery model offers a complete single-source solution from the world's largest systems integrator of fire, security, communications and healthcare systems.

As a Tyco company, SimplexGrinnell protects your people, property and assets with the best brands and the best technology the industry has to offer. Here's just a sampling of the products we have available. Simplex® and Autocall® fire detection and alarm systems. Grinnell® fire suppression systems. iSecure™ Pro and other advanced integrated access control systems. Executone® and Zettler® healthcare communications systems. And integrated ProLogic® controllers for criminal justice facilities.

Better yet, you get world-class integration and support services from a North American network of NICET-certified field specialists who'll stop at nothing to ensure your success.

There simply isn't a better way to leverage today's leading-edge technology and achieve the unsurpassed facilities management, asset protection, and cost containment you're looking for.

Now that's something to smile about.

How can OneStop™ help you?

Find out by calling 1-800-746-7539 (in Canada: 1-800-565-5400) or visiting www.simplexgrinnellonestop.com
FEATURES

66 Global Design Harmony
MARTIN REISS, RE. AND JAMES ANTELL, AIA, RE.
The Kingdom Centre in Riyadh, Saudi Arabia, and the Jin Mao Tower in Shanghai, China, are two examples of international buildings using NFPA codes and standards.

72 Tokyo Fire Service
DENISE LAITINEN
In Tokyo, the low fire rate is testament to a well-trained department and its citizens.

76 Update: E-Committee
CATHY BROWN
It's easy to participate in the technical committees now working online.

78 Pyrotechnics
JOHN NICHOLSON
All major amusement parks and family resorts in the United States rely on NFPA standards for pyrotechnics.

82 Life (Saving) Lessons
JOHN R. PARADISE
Testing children's knowledge of safety behaviors, communities are encouraged by Risk Watch® results.

86 Computerized Design Challenges
SIMON FO0, G. A'DOUST, AND KEN RICHARDSON
Complying with the codes in a performance-based environment requires a review of methodologies used.

92 The Latest Changes to NFPA 72
MERTON BUNKER, RE.
Sweeping technical changes are proposed for one of NFPA's most frequently used documents.

96 World Safety Conference and Exposition
JOHN NICHOLSON
Additional TCR sessions are added in anticipation of a protracted debate on the proposed Building Code®.

100 Learning from 9-11
PAMELA R. WEIGER AND JOHN NICHOLSON
Research organizations and other agencies eye wide-ranging safety improvements.

COLUMNS

38 Up to Code
NFPA STAFF

40 Heads Up
RUSSELL FLEMING, RE.

42 Structural Firefighting
RUSSELL SANDERS & BEN KLEENE

45 Just Ask
LEE RICHARDSON

46 In Compliance
CHIP CARSON, RE.

48 Inside the Beltway
ANTHONY R. O'NEILL

50 Buzzwords
WAYNE MOORE, RE., FSFPE

52 Leadership
ROBIN F. PAULSGROVE

54 Outreach
MERI-K APPY

DEPARTMENTS

6 First Response

9 Mail Call

26 NFPA Meetings

28 In a Flash

30 Fire Watch

106 Section News

118 Exhibitor's Showcase

154 Date Book

158 Classifieds

160 Looking Back
From the Editor
In this issue, we focus on multi-use structures, which are quickly becoming the most common type of building constructed around the world. Learn how NFPA codes were used in two global projects, one in China, the other in Saudi Arabia, on page 66. Also find out how Tokyo deals with multi-use buildings, on page 72.
This month we say goodbye to George Miller, and welcome Jim Shannon as the new president of NFPA. To learn more about Mr. Shannon, check out page 36.
As always, we're interested in hearing from you, so E-mail us at NFPAJournal@NFPA.org.

ABOUT NFPA
NFPA, a nonprofit voluntary membership organization founded in 1896, is a clearinghouse for information on fire prevention, firefighting procedures, and methods of fire protection and life safety. Membership is open to all those interested in promoting the science of fire protection and prevention, and life safety.

MEMBER BENEFITS
Here's how NFPA gives you an inside track with relevant updates delivered right to you...
Code newsletter—Your NFPA News keeps you up to speed on code and standards.
NFPA Journal®—This is the exclusive, full-color magazine everyone wants, but only members get. The official magazine of NFPA, the award-winning NFPA Journal® gives you a 360-degree perspective on fire prevention and safety practices.
NFPA Update On-line—Your NFPA membership is packed with privileges, and NFPA Update On-line ensures you know what they are and how to use them.
NFPA Online—Your NFPA membership entitles you to exclusive privileges at NFPA's web site, www.nfpa.org, including access to online features from NFPA Journal® and special reports from our One-Stop Data Shop. In addition, our new online registration process allows us to present personalized information based on your areas of interest.
Handy Buyers' Guide—Save time shopping around. The NFPA Journal® Buyers' Guide is a comprehensive listing of products and services right at your fingertips. If it's in the Buyers' Guide, you can depend on it.
And remember, as an NFPA member, you NEVER pay full price on code books, field guides, continuing education, handbooks, or manuals.

Your NFPA membership card also connects you with other "best in the business" colleagues through your section membership. Your section is a council of peers that focuses on issues in your industry. And it costs you nothing extra to join—it's a privilege of your regular NFPA membership. You can trade tips, share stories, solve problems, and build a referral network you'll value for a lifetime. Working over seas? You can find a colleague who's been there. Doing a renovation in a data center? Talk to someone who's done one. Full details on membership are available from the NFPA, P.O. Box 9101, One Batterymarch Park, Quincy, MA 02269-9101. Or call (800) 344-3555 or fax (617) 770-0700.

NOTICE CONCERNING CONTENT
The content of articles contained in NFPA Journal® solely reflects the personal opinions of the authors or contributors and does not necessarily represent the official position of NFPA, which, as to the meaning and intent of NFPA codes and standards, can only be obtained through NFPA's published procedures for requesting formal interpretations. Content must not be reprinted without the written permission of NFPA. NFPA Journal® is a registered trademark of NFPA.

Volume 96/Number 3
Publisher
Kathleen M. Robinson
Executive Editor
Stephen D. Murphy
Managing Editor
Denise M. Laitinen
Associate Editor
John Nicholson
Art Director
David Yount
Production Manager
Adrienne M. Albrecht
Editorial Secretary
Liz MacDonald
Ad Services Director
Melissa Feehan
Advertising Systems Manager
Susan Richard
Advertising Traffic Manager
Donna Ferguson
E-Commerce/Projects
Julie Laatsch
Advertising Sales Assistant
Maureen Keane, (617) 984-7520
Advertising Coordinator
Lynne Grant

NFPA web site:
www.nfpa.org
E-Mail: NFPA Journal@NFPA.org

Copyright © 2002 NFPA. All rights reserved. PRINTED IN USA. NFPA Journal (ISSN 1054-8789) is a membership magazine published bimonthly, plus a Buyers' Guide annually in February, by NFPA, One Batterymarch Park, Quincy, MA 02269-9101. NFPA annual dues: members, $115 (includes $34.50 subscription to NFPA Journal®), organization membership, $500. Periodicals postage paid at Boston, MA, and at additional mailing offices. POSTMASTER: Send address changes to NFPA Journal, NFPA, P.O. Box 9101, One Batterymarch Park, Quincy, MA 02269-9101. All issues of NFPA Journal® are available in microfilm from University Microfilms, International, 300 North Zeeb Road, Ann Arbor, Michigan 48106.

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

Protect business-critical assets with a clean agent, special hazard fire protection system from Fike.

- HFC-227ea Systems for areas that may be occupied or where sensitive electrical or high-value equipment are to be protected.
- CO₂ Systems for local and total-flood applications where sensitive electrical or high-value equipment or processes are to be protected.
- Water Mist Systems for the protection of diesel and gas turbine generators, or other machinery spaces.

No one can afford unexpected down time due to fire.
Protect business-critical assets with a system from Fike Corporation, before the unexpected happens!

Fike Corporation
(816) 229-3405 • fpssales@fike.com • www.fike.com
See us at the NFPA Show, Booth 1615

Circle box on Reader Service Card
A Fond Farewell

This column marks my 60th and final bimonthly message to you, the members of NFPA. At the conclusion of my 10 years at the Association, I find myself looking back at the past decade, asking myself how NFPA has changed. I see several significant developments.

One is the expansion of our mission. Since our inception, NFPA's work has been built on the conviction that we can help save lives and property by presenting the right information in the right way to the right people. We rely on this conviction in developing and disseminating codes and standards, conducting research, producing educational programs, offering training and certification. However, we no longer focus solely on fire safety. We include life safety, as well.

To that end, we've developed NFPA's first building code, an alternative to the existing model building codes that we hope the building community will find more acceptable because it has been developed through our open consensus process.

The focus of our public education strategy now includes life safety beyond fire safety. We're committed to providing schools with a comprehensive safety curriculum, teachers with appropriate training, and communities with "Champions" to teach children life-saving messages. And our new Risk Watch® curriculum teaches behaviors related to fire as well as other common hazards.

We're also reaching more people in more parts of the world with our regional offices in Canada, Mexico, Brazil, Hong Kong, and Europe. We've concluded major agreements resulting in the translation of our codes and standards into Spanish, Chinese, Korean, French, and other languages. And we send staff around the world to participate in conferences, deliver papers, and represent NFPA.

None of this could have happened without a dramatic change in our finances. When I arrived in 1992, NFPA was in dire financial straits. Within the next few years, however, we paid off the mortgage on our headquarters and built a modern customer service facility. As an investment, we also built an office building on our property, and we instituted sensible budgeting procedures to ensure that we spend our money wisely. Because we established reserves in the event of business interruption and economic downturns, NFPA can now weather the economic storms that have shaken other non-profits.

These changes, unthinkable 10 years ago, were possible because of you, our members, and our outstanding staff, which has the expertise required to carry out its technical duties and the education and experience needed to manage the organization. Our field representatives worldwide have been chosen for their commitment to NFPA and their ability to promote our codes and standards and our public safety programs.

Finally, but surely most importantly, I've been able to rely on you, our members. NFPA had burned many of its bridges by the time I arrived, and it was my job to rebuild them and restore NFPA's credibility. Fortunately, I discovered early on that you're solidly committed to NFPA's mission and goals.

Above all, I'm grateful to have led an association composed of such dedicated and talented individuals; to have watched our influence expand worldwide; to have worked with so many outstanding people and associations; to have helped provide for NFPA's future. For 10 years of success—our success—and for your unswerving support, I thank you all. The groundwork has been laid for a dynamic, successful future for NFPA to operate in the true mode of a public service organization. We can all be proud of the life and property saving role we play.

George Miller, President
NFPA

When your building is in a crisis situation, you're battling more than the problem that set off the alarm. You're fighting human nature. In most cases, you're up against the powerful urge to flee danger at all costs—even if it means getting trampled or crushed in the process. On the other hand, where occupants can't see or sense the danger, they may not react to the alarm at all, putting their lives in peril.

Fortunately, the company founded by fire bell inventor Robert Edwards once again has the answer: EST Emergency Evacuation Systems. Designed with modern complex architecture in mind, EST's latest breakthrough integrates eight multiplexed channels of digital audio into the entire life safety package, enabling you to manage evacuations as never before possible.

Seven channels of messages plus live paging can be broadcast simultaneously—continuously rolling through as many different languages as necessary. Specific messages can play to evacuation and alert zones, while firefighters talk over handsets and response personnel broadcast instructions to people in stairwells or elevators. Panic is quelled. Apathy is erased. Timely, relevant, distortion-free messages direct occupants to safety in a swift, orderly fashion. No other system can do all that.

To find out more, call 1-800-EST-2DAY or visit our website.

Circle 020 on Reader Service Card
You might call it Victaulic® FireLock™ DNA.

It's the quality and reliability built into every Victaulic FireLock product. Not just our famous grooved system, but also our full line of sprinkler heads, valves, fittings, devices, even CPVC products.

In fact, our family of fire protection products is growing so fast, your system can now be 100% end-to-end Victaulic FireLock.

For more information, call us at 1-800-PICK-VIC. Or visit our website at www.victaulic.com
Leadership

I just wanted to comment on Chief Paulsgrove's column in the March/April 2002 issue of NFPA Journal. I really enjoyed your story. It's refreshing to take a moment once in a while to reflect on the true meaning of life, versus the egotistical moments many of us always want to share or tell about.

Thanks for sharing your enjoyment of life experience.

Dave Traiforos
Fire Department Chief
Franklin Park, Illinois

Firefighter fatalities

Regarding “Firefighter Fatalities in 2000” in the July/August 2001 issue, the authors state, “from 1991 through 2000...56 [firefighters died] as a result of structural collapses.”

I find it amazing that NFPA 1021, Fire Officer Professional Qualifications, doesn’t contain a single citation requiring that a “competent” fire officer obtain and maintain strategic knowledge of building construction principles, methods, and techniques.

Mark Emery
Fire Command, Inc.
Woodinville, Washington

NFPA responds: As the staff liaison to NFPA 1021, Fire Officer Professional Qualifications, I would agree that the loss of 56 firefighters from 1991 to 2000 as a result of structural collapse is shocking. The goal of the fire service is to eliminate the loss of life both to the public and the fire service.

To answer your question about the knowledge of building principles, methods, and techniques, you may wish to refer to the following citations from the 1997 edition of NFPA 1001, Fire Fighter Professional Qualifications: Chapter 3 Fire Fighter I 3.3.3 (a) and (b), 3.3.4 (a) and (b), 3.3.5 (a) and (b), 3.3.9 (a) and (b) and 3.3.10 (a) and (b) 3.3.11 (a) and (b), 3-3.12 (a) and (b).

In the 1997 edition of NFPA 1021, please refer to Chapter 2, Fire Officer I, 2-1.1 General Prerequisite Knowledge, as well as 2-6.1 (a) and (b) from NFPA 1001 and NFPA 1021. This basic requirement is found in Fire Fighter I and continues in Fire Fighter II and Fire Officer I, certification documents that list the minimum qualifications for these positions. They aren’t designed to be training documents, but rather to measure the observable results of training.

If you feel that additional requirements should be added, you can submit a proposal by going to www.nfpa.org, clicking on “Codes and Standards,” and following the instructions.

Frank Florence
NFPA Senior Fire Service Specialist

What would have made a difference?

Robert McCarthy’s report on “Catastrophic Fires of 2000” in the September/October 2001 issue identifies smoke detectors as “the first line of defense” in connecting with home fire safety. Children, he writes, need to know what a “properly operating” smoke detector sounds like so they can quickly exit the home. Surely, nobody can take exception to these and other remarks he makes. But Mr. McCarthy could have gone beyond this and explained that smoke detectors need to be tested routinely, so that they can be relied upon to operate properly.

His reference to children suggests to me that NFPA should do much more to urge parents to teach children the value of proactive home fire safety, including the benefits of routine testing of smoke alarms. In 1995, the U.S. Consumer Product Safety Commission found that there were 16 million smoke detectors in the nation’s homes that didn’t work; more than one of every four homes were at risk at that time. The obvious explanation: no one in these homes was doing proper routine testing.

How should it be done? Not with the test button alone. It’s clear that the button can’t check for smoke entry. Rather, the testing should include an approved smoke substitute, such as an aerosol spray that allows for a true functional test in addition to checking the detector’s electronics and power supply.

NFPA 72®, National Fire Alarm Code®,
100% Reliable

That's because Glo Brite® Exit Signs use no electricity and have no internal lights to burn out.

Glo Brite® Exit Signs are non-toxic and non-radioactive. Using the latest photoluminescent technology, these signs glow in total darkness after exposure to ambient fluorescent light. Available in Red, Green or Black, Glo Brite® Exit Signs are easy to install and virtually maintenance-free. These durable signs offer superior visibility under blackout or smoky conditions.

With U.S. companies spending billions of dollars per year to operate exit signs, it makes sense to save on energy dollars by choosing non-electric Glo Brite® Exit Signs.

We can help you to ensure that your exit signs are 100% reliable and save you money. Call Today!

Scott A. Pyle
President, CEO
Home Safeguard Industries, LLC
Rolling Meadows, Illinois

mailcall

allows this means of functional testing of all smoke detectors. Yet, it appears that enforcement of this standard has been lacking in the residential sector. NFPA should do more to educate consumers that the only safe, sure, and effective way to check a smoke alarm is to put it through a complete and proper test. This includes using the detector's test button and performing a functional check for smoke entry. This will make all the difference!

Scott A. Pyle
President, CEO
Home Safeguard Industries, LLC
Rolling Meadows, Illinois

'Buzzwords' comment

I read with some consternation Wayne Moore's column "Buzzwords" in the March/April 2002 issue. Mr. Moore contends that documentation required by NFPA 72® for the fire alarm system life cycle (concept to decommissioning) is sufficient for establishing code compliance and maintaining system reliability. For system design documentation, I respectfully disagree.

Unlike the majority of NFPA suppression system design and installation standards, which stipulate in excruciating detail minimum requirements for design/shop drawings and supporting calculations, Section 1-6 of the 1999 edition of NFPA 72 only allows an authority having jurisdiction (AHJ) to request "...complete documentation..." for approval. NFPA 72 doesn't specify minimum requirements for initial design/shop drawing preparation nor resulting as-builts. Recent technical committee actions on proposals to Section 1-6 do little to improve matters related to design documentation.

The technical committee's actions to place some requirements for design/shop drawings in the annex of next revision of the standard is incomplete and inconsistent with other NFPA standards. Without clear, minimum expectations of design drawings and supporting calculations for submittal to the AHJ, this entity or even the third-party reviewing/approving organization pointed to in other sections of the standard have a hampered ability to review, approve, and verify
Ozone depletion is a matter that concerns everyone. Which is another good reason to use DuPont FE-36™ in your portable extinguishers. Unlike some extinguishants, it won’t affect the ozone. And because FE-36™ eliminates fire without leaving a trace, it won’t affect your uptime the same way messier extinguishants can. Plus it’s globally available and universally effective, on every kind of fire, helping you relax, no matter what. For more information, call 1-800-473-7790.
The majority of NFPA design/installation standards for fire protection systems invoke minimum design and calculation expectations in the body of the standard. NFPA 72 should be no different, considering a fire alarm system's role in supporting occupant life safety. Placing some requirements in the annex...puts the AHJ or third-party entity in an unenviable role of requesting design firms multiple times for more information for review/approval purposes. The lack of consistency and quality of fire alarm system design drawings and supporting calculations creates problems with system installations, acceptance testing, routine testing and maintenance, and maintaining future configuration management.

Why should AHJs and building owners have to "...make sure that record drawings don't simply reproduce the designer's original device layout"? Shouldn't this instead be the responsibility of the installation firm to provide under NFPA 72?

The opinions expressed in this letter are my own, and shall not be construed as the opinions of my employer or the U.S. Department of Energy.

Jim Streit
Los Alamos National Laboratory
Los Alamos, New Mexico

The author responds: Mr. Streit is correct that NFPA 72 isn't as detailed in its requirements for documentation as other NFPA documents. However, the documentation described in the article represent minimum code requirements. Apparently, in the eyes of the Technical Committee on Fundamentals of Fire Alarm Systems, the stated requirements for documentation represent the minimum requirements for a consensus document. I'm certain the Technical Committee on Fundamentals would welcome additional proposals that improve and expand on the existing requirements.

In my opinion, the AHJ also has some responsibility to assure that installed systems have appropriate documentation. Requesting drawings and verifying their correctness shouldn't create an undue burden on any AHJ. A knowledgeable AHJ should know what documentation a contractor should provide for review. In teaching seminars on NFPA 72, we encourage AHJs to develop a detailed list of the documentation they wish to review to help ensure that they receive uniform submittals from the contractors.

Mr. Streit is correct in saying that the code doesn't specifically require some of the details...
The Most Powerful NAC Power Extenders in the World!

**AL1002UL-ADA**
NAC Power Extender
- 24VDC/10 amp outputs.
- Four (4) class B or two (2) class A supervised NAC outputs.
- Built-in 2-wire horn/strobe sync modes provide Gentex®, System Sensor®, Faraday and Amseco protocols.
- Signal circuit trouble memory is now included in all models.
  This allows for fast and accurate identification of system trouble.

**AL802UL-ADA**
NAC Power Extender
- 24VDC or 12VDC/8 amp outputs.
- Four (4) class B or two (2) class A supervised NAC outputs.
- Built-in 2-wire horn/strobe sync modes provide Gentex®, System Sensor®, Faraday and Amseco protocols.
- Signal circuit trouble memory is now included in all models.
  This allows for fast and accurate identification of system trouble.

**AL602UL-ADA**
NAC Power Extender
- 24VDC or 12VDC/6.5 amp outputs.
- Four (4) class B or two (2) class A supervised NAC outputs.
- Built-in 2-wire horn/strobe sync modes provide Gentex®, System Sensor®, Faraday and Amseco protocols.
- Signal circuit trouble memory is now included in all models.
  This allows for fast and accurate identification of system trouble.

**AL1024ULXR**
UL Listed Fire/Access Control Power Supply/Charger
- 8 amps continuous supply current w/10 amp supply current during alarm.
- 10 amps continuous current for Access Control applications.
- 24VDC output.
- AC fail, battery fail and battery presence monitoring.

Visit the Altronix web site www.altronix.com for detailed specifications.
Order your FREE Product CD today!

Visit us at Booth #407 at the NFPA Exposition

Made in U.S.A.
Lifetime Warranty

Altronix® Making It Work.™

140 58th Street, Brooklyn, NY 11220 • Tel.: 718.567.8181 • Toll-free: 888.258.7669 • Fax: 718.567.9056
Web site: www.altronix.com • Email: info@altronix.com

Gentex® is a registered trademark of Gentex Corporation. System Sensor® is a registered trademark of Honeywell®.
outlined in the article. Nevertheless, NFPA 72-1999 defines "Record Drawings" as "Drawings (as-built) that document the location of all devices, appliances, wiring sequences, wiring methods, and connections of the components of the fire alarm system as installed." I hope that Mr. Streit would agree that a "qualified" contractor should understand what information he or she should include in the as-built drawings. These items normally include the items I stated in my article, even the ones that the code doesn't specifically require.

I hoped this article would create an opportunity to open a dialogue regarding this issue, and for that reason, I particularly appreciate Mr. Streit's comments. I also urge him to submit his comments to the Technical Committee on Fundamentals in the form of a proposal.

Wayne Moore, P.E., FSFPE

'Trial by Fire' article

The article, "Trial by Fire: Protecting Federal Records," [in the March/April 2002 issue] was well-written and provided interesting information involving the history and background of protecting valuable records.

One point that caught my eye was the reference to a fire test listed on page 52 citing, "The under-catwalk sprinkler system consisted of quick response sprinklers with 1/2-inch orifices rated at 155°F. They could deliver a 25-gpm flow and had 4.5-inch heat collectors/forklift guards."

The term "heat collector" shouldn't be used, as this implies there's a dramatic difference between the response time of heads with "heat collectors" versus those without. In fact, if I'm not mistaken, FM conducted testing comparing the differences of response times of identical sprinklers of those with and without heat collectors, and found the time to operation between the two was negligible, if measurable at all. I believe what Mr. Hannestad is describing is, in fact, a water shield, which is used to prevent water from overhead sprinklers from cooling sprinklers such as those under catwalks and at the lower levels, thus delaying their time to actuation. In addition, they're used in conjunction with in-rack sprinklers for the same purpose.

Heat collectors are an urban legend that sound good in theory, but have yet to show any distinct difference in time to actuation.

Michael E. Petrie, SFPE

HES Professional-Marathon Ashland Petroleum, LLC
DEMANDING INSTALLATIONS ARE NOTHING NEW.
DEMAND THE BEST-BLAZEMASTER® FIRE SPRINKLER SYSTEMS.

BLAZEMASTER® CPVC FIRE SPRINKLER SYSTEMS

A construction site is no place for the weak. Big jobs, tough guys, rough handling are all par for the course. That's why BlazeMaster® fire sprinkler systems are the standard in fire protection.

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

Check the facts:
- Proven performance with over 15 years of installations (unmatched by anyone in the CPVC industry)
- Factory Mutual* approved
- Meets the requirements of all major model codes
- Exceeds ASTM standards
- Permitted for use in air plenums
- Meets light hazard NFPA sprinkler requirements
- Listed by UL, UL of Canada, and Loss Prevention Council Board
- Backed by a dedicated field organization

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

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

NEW UL LISTINGS FOR BLAZEMASTER PIPE AND FITTINGS:
- Exposed solid wood joists in NFPA 13D basement installations
- Exposed system risers in accordance with 13D and 13R
- No set-back at ceiling openings

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

www.blazemaster.com

BlazeMaster® is a registered trademark of Noveon, Inc.
Circle 009 on Reader Service Card
© Noveon, Inc. 2002
Response to letter to editor
In responding to Dennis Kirson’s letter to the editor on “WTC evacuation” in the March/April 2002 issue, my view on total evacuation is that the current means of exit stairs in high-rise buildings would take many hours to empty all building occupants in extreme emergencies. The “defend-in-place” concept enables those people who either have difficulty or find it downright impossible to use stairs to take temporary refuge while waiting for outside help to get them down to the ground. However, the inability of providing means for this group of people to get out of the building in the event of a major evacuation continues to be a basic ethical problem.

Considering all people are given the right to access to buildings, should such a right also extend to an equal right of emergency egress in future tall building designs? Many improvements can be made to current egress requirements.

Given that normal elevators are unsafe to use in emergency and that stair travel is taxing and potentially dangerous for the disabled, NFPA 101®, Life Safety Code®, could address the issues of evacuation of buildings for all people. To try to get out of a building menaced by smoke or by structural impairments is the only acceptable way to guarantee the most efficient life safety protection.

I believe it’s possible to make further improvements on the staircase enclosure to provide an additional means of allowing the disabled to reach to the ground quicker and safer than current means. Emergency egress design that can be used by all people and is economically feasible incorporates a multiple escape chute system inside the enhanced staircase enclosure. When an emergency occurs, the disabled and the mobility-impaired will have to make their way, assisted or unassisted, and take temporary refuge inside this stair enclosure while awaiting rescue. They can either choose to use the chute inside the stair enclosure that would get them to the ground floor quickly and safely or to be assisted down the stairs.

Since 1982, escape chute evacuation has been an alternative means to supplement stairs evacuation in multi-story buildings. Although current fire regulations don’t require buildings to provide such facilities for escape or rescue purposes, building owners in many countries have incorporated such emergency egress design to meet their evacuation requirement. It’s
INTRODUCING THE LOW-COST, EASY-TO-INSTALL ALTERNATIVE TO MINERAL INSULATED CABLE

LIFELINE™ RHH is the new, user-friendly alternative to Mineral Insulated cable and other labor-intensive barrier systems. Now you can protect critical fire pump and emergency circuits from attack by fire per NEC® Articles 695 and 700 with a simple-to-install single conductor conduit cable. Say goodbye to MI, say hello to LIFELINE™ RHH.

Call your LIFELINE™ friend at: 800-333-4248 x2600 or visit www.drakausa.com/lifeline
estimated that over a million people have tested the escape chute evacuation.

The use of escape chute and exit stairs together to accommodate mass building evacuation would take much less time to empty the total building population.

John Ng
Singapore
mobilux@singnet.com.sg

Finding a halon alternative
I want to comment on the article appearing in the March/April 2002 issue, “Finding a Halon Alternative,” by Ann Freestone. We manufacture Halotron I, which is a clean agent replacement for Halon 1211. Halotron I is sold through approximately 80 percent of the U.S. market channels, including four of the five fire extinguisher manufacturers...

The title of the [article] refers only to “halon,” yet the body of the piece is almost exclusively concerned with Halon 1301, a gaseous flooding agent, not Halon 1211, a liquid-based streaming agent used in portable extinguishers. Halon 1301 and 1211 are two markedly different agents and have been used historically in very different applications. Therefore, I believe that the title was misleading to the reader....

Ms. Freestone...states, “Since 1994, one halocarbon—FM 200—and one inert gas—Inergen—have emerged as leading halon replacements in the United States...” These two agents are strictly Halon 1301 replacements, not universal halon replacements, since they don’t replace Halon 1211 in a significant manner. The only mention of a streaming agent is when Ms. Freestone quotes a Dupont representative explaining that “FE-36 is a streaming agent for portables or local applications.” There was no mention of Halotron I, yet it was the first halocarbon-based Halon 1211 replacement commercialized in a full line of UL-listed extinguishers in early 1996.

On page 72, Mr. Rivers of 3M is quoted regarding his 3M study, in which he reveals “the top two things we consistently heard no matter who we talked to—end-users, manufacturers, OEMs, or distributors—were that it had to be non-ozone-depleting and it had to be a non-global warmer.” Then he adds, “...On a list of 10, fire performance was down at 4 or 5.” This...conclusion...is different than what we found in our market studies in dealing with manufacturers, OEMs, and end-users. [In them,] firefighting performance...is...assigned critical and important priority....
Do you need System Integration & Flexibility in your Applications?

Integlex

fire alarm system

The Integlex system is a flexible analog addressable fire alarm system. With its versatility, the system can be used in a variety of applications. In addition to typical point type detectors, a dedicated type of VESDA-VESDA LaserCOMPACT LP has been fully integrated into the system.

Specific Features

- 255 or 510 addresses per FACP
- Max. 64 nodes per network system
- Grouping FACPs on network (max. 64 groups per network system)
- Master and local groups on network
- VESDA LaserCOMPACT LP* directly on SLC
- Fiber optic system for network system
- Inter-panel zones (i.e., circuit-interlocking between FACPs)
- Ample LCD and sufficient information on FACP
- 1000 event log per FACP
- Suppression zone (using Cross zone, Counting zone, Delay time, Soak time, Abort, Second shot, etc.)
- Alarm simulation
- Low temperature functionality
- Multiple thresholds in every analog detector
- Day/Night/Holiday monitoring level change-over per analog detector
- Sensor monitoring
- Auto program
- Silent input

VESDA LaserCOMPACT LP

Point Type Detector

Fire Alarm Control Panel

VESDA LaserCOMPACT LP

Point Type Detector

Fire Alarm Control Panel

System Monitoring Program

NOHMI

NOHMI BOSAI LTD.

Head Office: 4-7-3 Kudan-miri, Chiyoda-ku, Tokyo 102-8277, Japan
International Division: Shinjuku Park Tower 10th floor, P.O. Box 8155, 3-7-1 Nishi-shinjuku, Shinjuku-ku, Tokyo 163-1010, Japan
Phone: (81) 3-8325-0803
FAX: (81) 3-5325-0802
URL: http://www.nohmi.co.jp/e/ego2/

Circle 048 on Reader Service Card
I would hope that perhaps...your publication, in a future issue, could address the story of significant progress that has been made in moving away from the severely ozone-depleting Halon 1211. Halotron I has played a significant role in that story....

Jeff Gibson
American Pacific Corp.
Las Vegas, Nevada

NFPA responds: We're sorry Mr. Gibson found the title of the article misleading. Perhaps a future issue will address the complete range of Halon 1211 replacements more fully.

'Up to Code' question
The diagram [in the "Up to Code" column] in the January/February 2002 issue is wrong in a remarkable number of ways.

What catches the eye first is the incorrect spelling of "equilateral." That's the wrong word anyway. An "equilateral" triangle is defined as one having three sides all the same length, obviously not true of any of the triangles in the diagram.

These triangles are similar, meaning that they're of identical shapes but differing size. The diagram identifies a variable "Z" as "Y - 2/4," without ever defining "Y".

The diagram is sprinkled with red lines of different lengths, yet all labeled with either "2/4" or "4/4." No indication is given of what any of those lines are intended to measure.

Also, the text offers no clue as to what the diagram is meant to show.

R. L. Nall, RE.
Hales Corners, Wisconsin

The author responds: As I understand it, the term "equilateral" as used here means that the two triangles are of different size, but have the same angles. The diagram was inserted for technical accuracy, but simply to show the public some of the mathematical/anthropologic complexity in looking at the issues.

The equation to determine the height of the wheelchair platform is based on determining the height of "B," adding it to the eye height of the standing spectator, and the "C" value, typically 2. After "B" is known, subtract the height of the eye of the spectator in a wheelchair from the total height. Therefore, the bottom edge of the "B" is 18.25 inches (46 centimeters) above the tread of the wheelchair platform when using the anthropometrics of the Ellerbe settlement. The height of "B" depends upon the length of "A" and the dimensions of "X" and "Z." By requiring the front of the wheelchair space to be 12 inches (30 centimeters) or less from the...
World-Class Quality Assurance

Patterson Pump Company has Six Sigma and ISO 9001 certification, which attest to the world-class quality and dependability of our pumps. You are assured of an optimized level of performance. Our pump designing know-how, efficient production capability and careful attention to testing details ensure that each Patterson fire pump will perform its intended function efficiently, economically, reliably and durably.

Comprehensive Line of Available Fire Pumps

Patterson continues to be the industry leader in prompt delivery of all standard model fire pumps worldwide. Four types are offered, for anything from small commercial establishments, to mid-range fire service, to large installations with existing wet pits. Choose from horizontal split case, vertical turbine, vertical-in-line or end suction models, or choose our highly efficient Pre-Pac® prepackaged fire system.

World-Class Training

Patterson reliability is enhanced by coordinated training in proper operation and maintenance of fire pumps at our state-of-the-art training facility in Toccoa. This is an essential part of providing full service to contractor, industrial, commercial and governmental customers.

Personalized Service

Whether a complete rebuild, a single O.E.M. part requirement, or simply a question, Patterson stands ready to give personal field and factory service, as required, to maintain our reputation for providing the best service in the industry.

Call, fax or write us today. Or, reach us on the Internet.
(20 centimeters), therefore $X$ plus 34 inches (86 centimeters). "Y" is the seating riser height. When using the anthropometrics of the Ellerbe settlement, the equation for the height of the wheelchair platform is

$$\frac{(X+34)}{(Y-2.25)/X}+18.25.$$
FI R E P R E T I O N DON'T HAVE TO BE BIG TO BE EFFECTIVE

Firetrace flexible detection tubing is the “heart” of our system.

Firetrace is the perfect solution to your in-cabinet fire protection needs. Now, protecting critical equipment such as computers, CNC machines, electrical control cabinets and fume hoods is not only practical but cost-effective.

Both detection and suppression come together in the fully automatic Firetrace system. With our flexible, proprietary tubing routed throughout your enclosure, fire detection is fast, accurate and occurs where the most heat is detected. Then, complete fire suppression is instantly delivered from a variety of fire-suppressing agents such as FM-200®, dry chemical powders, CO₂, water and foam. What's more, the Firetrace system is FM-Approved*, requires no electricity and can be configured to cut off power or fuel supplies to equipment.

Losses from fire affect many areas. The repair and/or replacement of vital equipment can take months and result in tremendous downtime. Plus, insurance coverage can never replace lost data. That's why Firetrace is the ideal supplemental protection for your critical equipment.

Call us today, toll-free, at (866) 607-1218 and see how you can get EFFECTIVE fire protection for your small enclosures.

* Approval is valid on Indirect Low Pressure (ILP) Systems using FM-200®

Visit us at the NFPA World Fire Safety Congress and Exposition, booth #433
Firetrace International: 7898 E. Acoma Drive, Suite 106 • Scottsdale, AZ 85260 USA
Tel: (480) 607-1218 • Fax: (480) 315-1316 • E-mail: firetrace@firetrace.com • www.firetrace.com/info.html
Circle 024 on Reader Service Card
Introducing the world’s first big-screen fire detection system.

FireFinder, the fastest intelligent fire detection system with the biggest, easiest display screen.

It makes all the difference in an emergency. The big 6" display on the FireFinder panel is the easiest for firefighters to understand when trying to locate a fire. Because it has an unrivaled capacity for hundreds of easy-to-read, large-font text characters, Hazmat icons, NFPA fire safety symbols and graphic maps. All of these features work to help fire personnel identify fire location, hazards and occupants faster than ever. Unlike small screens with room only for vague, abbreviated messages which can delay and confuse fire personnel.

The FireFinder system also responds with unrivaled speed, detecting fire and notifying occupants in under 3 seconds. And it’s the simplest intelligent system to install and maintain. The display lets operators view the entire system and locate specific alarms with a simple “user prompting” sequence of lighted buttons. Field programmable from a touch screen, it makes system control and changes simple for all users. For installers, revolutionary wiring technology can reduce wiring errors and cut installation time by up to 25%.

What’s more, the FireFinder offers a very-low life-cycle cost. Learn how this big screen system can bring you big savings and big peace-of-mind. Call Siemens Building Technologies, Fire Safety Division at 973-593-2600 or visit cerbpyro.com

See us at the NFPA Show, Booth 1301

* Depending on type and size of facility
After an extremely successful 2001 debut, NFPA's Americas' Fire Expo (AFE) returns to the Miami Beach Convention Center from July 9 to 11. The three-day fire prevention and security event brings together professionals, buyers, and decision makers from Latin America, the Caribbean Basin, and the southeastern United States.

In 2001, AFE attracted more than 7,000 participants from 45 states and more than 70 countries, making AFE the largest event of its kind in North America. This year, AFE will be even bigger and better, with more attendees and a larger exhibition of products and services, including building materials, detection and suppression systems, and fire and rescue equipment.

"The summoning power of this event is impressive," says Milton Ortega, sales manager for Latin America of Bullard. "In addition to seeing many known faces, I had the opportunity to exchange ideas with new professionals in the industry, expanding my network of contacts in Latin America."

World-class conference
The AFE Conference boasts internationally recognized speakers and more than 27 educational sessions that address a variety of issues of particular interest in Latin America, including life safety and fire protection, aircraft rescue and firefighting, and security. All sessions will be simultaneously translated into Spanish, Portuguese, and English and will be structured to allow you to personalize your education, with three session tracks and three session lengths from which to choose.

To help attendees learn from the terrorist attacks in New York City and Washington, D.C., NFPA has teamed up with the International Association of Hispanic Firefighters (IAHFF), which will offer sessions, presented by trainers from the Miami/Dade Fire Rescue Urban Search and Rescue Task Force, focusing on haz-mat competencies and response, weapons of mass destruction, and technical rescue operations and training. There will also be a technical rescue competition.

"We participated in the 2001 NFPA's Americas' Fire Expo," says IAHF President Ron Morales. "We were planning our own training conference and convention for 2002. The IAHF Conference draws a large number of participants from Latin America, so it was only natural that we co-locate with AFE. This IAHF/NFPA partnership allows us to offer the premier environment for fire service professionals here and in the Latino community."

This year, NFPA will also offer pre- and post-expo technical seminars covering NFPA 72®, National Fire Alarm Code®, and NFPA 13, Installation of Sprinkler Systems, as well as the Certified Fire Protection Specialist examination in Spanish. For more information on the seminars, visit www.capacitacionnfpa.com.

The AFE opening general session on Tuesday, July 9, will begin with a ceremony commemorating those who lost their lives in the September attack on the World Trade Center and a summary report of the impact the terrorist attacks will have on safety and security in the United States.

Added bonus
Once again, NFPA will share the exhibit floor with two concurrent events, the 8th Annual Americas' Security Expo and the 2nd Annual Americas' Building and Home Automation Expo, bringing together thousands of professionals from allied industries. Among the three shows, more than 300 exhibitors are expected to showcase their products and services.

Networking opportunities abound at AFE. It's a great opportunity to meet and talk with manufacturers, distributors, and consultants, and to attend programs devoted to advances in security and fire safety presented by international experts with vast experience in Latin America.

Mark your calendar now for the 2nd Annual Americas' Fire Expo. We'll see you in Miami!
The Viking Dorm Sprinkler

Notice how its concealed design preserves the room's subtle elegance.

You'll find last month's term paper in this room before you find Viking's new Quick Response Concealed Horizontal Sidewall Sprinkler. With an extremely low profile and small 2 3/4" diameter cover plate that's available in any color, it provides protection that's guaranteed to go unnoticed.

And while it's hard to see, the new sprinkler is easy to install — especially in retrofit applications, where ceiling spaces can be hard to access. The cover plate allows up to 1/2" (12.7 mm) horizontal adjustment.

Backed by UL and c-UL listings, the quick response sprinkler is perfect for protecting dormitories, hotels, hospitals, and office buildings — providing safety while minimizing the potential for aesthetic intrusion or sprinkler head damage.

The Quick Response Concealed Horizontal Sidewall Sprinkler from Viking. It may be the most important thing a college student never learns about.
The high cost of fire in the United States

When discussing the total cost of fire, fire service expenses have risen more than building construction costs for fire protection, fire insurance costs, and economic losses from $5.7 billion in 1980 to $20.3 billion in 1998. Figure 1 provides an overview of the core total cost of fire and its principal components from 1980 to 1998, while Figure 2 shows how each changed between 1980 and 1998, as a share of the total.

But not all can be explained by increases in the number of career firefighters. According to NFPA's Fire Analysis and Research Division report "The Total Cost of Fire in the United States" by John R. Hall, Jr., other possible explanations include faster-than-inflation increases in the costs of health and retirement benefits; expanded responsibilities, such as emergency medical service, that increase fire department's needs for resources; and increases in staff or overtime costs to cover for reductions in the work week.

The fastest-rising component of the total cost since the slowdown in the rapid rise in career fire department expenditures in the early part of the 1990s was construction due to fire protection. It has risen from $10.6 billion to $34.3 billion. Economic losses also rose, from $7.9 billion to $10.4 billion, as did net fire insurance, from $4.1 billion to $7.8 billion. But both those components' percentage shares of the total cost declined.

For more information on the total cost of fire in the United States, go to www.nfpa.org/Research/index.asp.

Components of Estimated Core Total Cost of Fire in the U.S.A.
1980-1998, in billions of dollars

Note: Figures aren't adjusted for inflation; they're the figures reported in those years. Some figures for earlier years have been changed from earlier total cost reports to reflect revisions shown in published sources.

Sources: NFPA survey; Statistical Abstract of the United States, The I.I.I. Insurance Fact Book, and telephone conversations with their data sources; formulas from special studies.

Changes in Components of Estimated Core Total Cost of Fire
1980-1998

FIGURE 1

FIGURE 2
Innovative Fire System Solutions from Silent Knight

IntelliKnight Addressable Fire Panels
The IntelliKnight 5820XL has been expanded to 508 addressable points, giving you unprecedented levels of power and control. Or try the NEW IntelliKnight 5808. With 127 addressable points, it's a cost-effective alternative to conventional FACP.

30-zone Conventional Fire Panel
The SK-5208 is an easy-to-install conventional FACP that monitors up to 30 zones. This all-in-one control panel comes equipped with a built-in digital communicator and LCD display. Silent Knight also offers its SK family of 2-, 4- and 6-zone panels.

50-watt Voice Evacuation System
Silent Knight’s SKE-450 Voice Evacuation system helps you meet compliance in areas of assembly where voice evac is required. With its best-in-class 50-watt amplifier, the SKE-450 is the edge you need to be even more competitive in your bids.

FirePower NAC Expanders
Silent Knight’s FirePower 5499 NAC expander offers 9 amps of distributed power. The FirePower 5495 is also available with 6 amps of power. Both NAC expanders feature built-in sync for appliances from System Sensor, Gentex, and Faraday.

Reliable fire protection — knight after knight.
Silent Knight’s full line of fire systems and accessories is the most innovative and reliable in the entire industry. When you need a job done right — Bring on the Knight!

For a FREE product guide, call 1-800-446-6444 or visit www.silentknight.com. Please visit us at the NFPA Expo at Booth #701.
RESIDENTIAL

Heat from gas grill causes $4.5 million fire

PENNSYLVANIA

A single-family house was heavily damaged when heat from a propane gas-fired grill ignited the wood siding. The fire spread through a roof overhang into the attic and caused $4.5 million in damage before firefighters could control it.

The two-story, wood-frame house, which was 50 feet (15 meters) long and 30 feet (9 meters) wide, had wood sidewalls and a wood-shake roof. There were no sprinklers, but there were smoke alarms, which operated during the fire.

The barbeque grill was left close to an exterior wall. To cook off the grease and food remaining on the grill, the residents left the propane gas burners on. Heat from the grill ignited the wood siding, and the fire spread to the second floor and attic.

The house, valued at $4 million, sustained $2 million in damage. Its contents, valued at $6 million, sustained $2.5 million in damage. One firefighter was injured.

Burglar bars on windows in fatal fire

TEXAS

A lack of smoke alarms and burglar bars on windows contributed to the deaths of three people in a house fire.

The one-story, single-family house was 35 feet (11 meters) long and 30 feet (9 meters) high. The exterior walls of the wood-frame structure were aluminum sided, and it had an asphalt roof. There were no smoke alarms or sprinklers.

Four adults were in the house, including a 76-year-old man who was debilitated by a stroke.

The elderly man, a 41-year-old man, and two women, ages 66 and 43, were asleep when the fire broke out on the living room couch.

The fire was detected by a neighbor who saw the flames and called 911 at about 3:00 a.m. The residents' escape attempts were hampered by the fire and smoke blocking the exit and by the burglar bars blocking the windows. The burglar bars didn't have a quick-release mechanism.

The 43-year-old woman survived with burn and smoke inhalation injuries. The bodies of the three others were found on their beds.

A final cause determination had not been made at the time of the report.

The house, valued at $30,000, and its contents, valued at $5,000, were a total loss. There were no firefighter injuries.

Smoking, disabled smoke alarm contribute to deaths

MINNESOTA

A mother and daughter died, but three others were able to use secondary exits to escape the heat and smoke of a fire.
The Flexible Onyx™ 640 Panel

Need flexibility in a fire detection panel? NOTIFIER introduces the Onyx 640 — the first panel in the new Onyx series of fire detection products.

The new Onyx 640 panel is:
- Expandable — one loop to two, 318 points per loop
- Scalable — can put multiple two-loop units into a single enclosure
- Networkable — stands alone or can be linked to other panels
- Backward compatible — works with existing NOTIFIER devices
- Voice ready — using the new Onyx XPIQ transponder

Plug into the Onyx 640 panel — first in the new Onyx series of products from NOTIFIER.

Call (203) 484-7161 or visit www.notifier.com

BACnet™ Compatible Gateway via Ethernet

BACnet is a trademark of ASHRAE
that began in the first-floor living room. Two of the residents climbed through a first-floor window, while another jumped from a second-floor window.

The multi-story, wood-frame, single-family house had an asphalt-shingled roof. Smoke alarms had been installed, but, based on the survivors’ statements, all three had been disabled. There were no sprinklers.

Investigators believe the fire began when discarded smoking materials ignited the living room couch. Flames spread to the kitchen and up the stairwell, trapping three occupants. Although the man jumped from the second-story window, the mother and daughter were reluctant to follow.

A neighbor called 911 to report the fire at 1:33 a.m., and firefighters arrived within four minutes. Despite aggressive rescue efforts by fire crews, the girl, aged 12, and her mother, aged 40, succumbed to heat and smoke inhalation.

The house, valued at $88,000, and its contents, valued at $60,000, were a total loss.

**Child playing with lighter ignites fire, killing self and mother**

**ALABAMA**

A 25-year-old woman and her 3-year-old son died in a fire the boy started as he played with a lighter while his mother slept. The boy hid after starting the fire without waking her up.

The single-story, wood-frame, single-family house, which was 50 feet (15 meters) long and 30 feet (3 meters) wide, had a brick veneer in front and an asphalt-shingled roof.

The little boy apparently ignited his mattress and bed linens with the lighter, then became scared by what he’d done and ran to the living room, where he covered himself with a blanket. His mother was asleep in a rear bedroom.

A neighbor called 911 at 8:00 p.m. when they saw smoke coming from the house. Police officers and firefighters, who arrived within two minutes of the call, controlled the fire within five minutes and shortly thereafter found the mother and child. They were taken to the hospital, where they were pronounced dead.

The boy’s father said he had recently reprimanded the child for playing with a lighter and that he stored the lighters in a kitchen drawer.

The house, valued at $60,000, sustained $10,000 in damages. Contents, valued at $25,000, sustained losses of $10,000.

**Student dies when he sets apartment on fire**

**TEXAS**

An 18-year-old college student intentionally ignited a fire in his dorm room, killing himself and severely injuring his roommate. The student had a history of fire play.

The nine-story apartment building, which served as student housing, was constructed of steel and concrete. The one-bedroom unit accommodated two students and included a living room, kitchen, and bathroom.

The structure was protected by a supervised internal fire detection system with hardwired smoke detectors in all the hallways and common areas. Battery-operated smoke alarms that provided localized protection were installed in the units. There were no sprinklers, but the building did have a standpipe system. A security guard was on duty when the fire broke out.

The student returned to the apartment shortly after 6:00 a.m. and asked the security guard to let him into his second-floor apartment because he’d been locked out. The guard said nothing seemed out of the ordinary in the apartment when he let the student in and continued his rounds. Ten minutes later, however, the second-floor fire alarm activated.

When the guard went to investigate, he discovered that the same door to the apartment he’d let the student into was hot and that smoke was coming from the unit. The guard and another man grabbed a fire extinguisher, and tried to open the door, but were only able to open it about a foot when they encountered intense heat and smoke. They then began evacuating the building.

The fire department responded at 6:24 a.m., four minutes after receiving notification from the security guard. Entering the apartment, fire crews found one victim in the doorway to the bedroom and began CPR. He was transported to the hospital and pronounced dead on arrival. The roommate, who had already been assisted to a safe location, was taken to the hospital.

For nearly 45 minutes restaurant employees tried to find and extinguish a fire that burned in a concealed wall space before they called 911. The delay in notification allowed the fire to spread into ceiling and roof voids, destroying the restaurant.

The single-story, wood-frame
Cutting-edge technology that not only pre-lubricates Gruvlok® Gaskets, but continues to provide a secure seal after installation is complete.

• **FASTER**
  - No field lubrication required means faster assembly.

• **CLEANER**
  - No lubricant, no messy gloves, no slippery tools and no residue to clean up.

• **BETTER**
  - The DRI-SEAL™ gasket is a cutting edge elastomer process that not only provides a pre-lubricant installation, but supports gasket sealability after the joint assembly.

**FIRE-RITE™**
- CAD designed shorter than standard dimensions and increased internal diameters.
- 300 PSI rating in conjunction with Gruvlok® Rigidlite® 7400A couplings - Key for fire protection systems using secondary pressure pumps.
- Made in the USA
- ISO 9002 Certified Manufacturing
- UL/FM/ULC Approved
- Fire-Rite™ - Light Weight - Heavy Value!

**SOCK-IT®**
- GRUVLOK® SOCK-IT® Piping Method provides a quick, secure and reliable method of joining plain-end steel pipe.
- Now includes 2 1/2" x 2 1/2" x 3/4" and 1" NPT threaded outlets.
- Fittings designed for minimum pressure drop and uniform strength.
- UL, ULC & FM approved solutions for both wet and dry fire protection systems with 175 psi working pressure.

ANVIL INTERNATIONAL, INC. Tel: 603-422-8000 Fax: 603-422-8033 www.anvilintl.com

Visit Anvil at Booth #301
building, which was 100 feet (30 meters) long and 70 feet (21 meters) wide, had a stucco exterior and a flat, built-up tile roof. It had a fire detection system and a carbon dioxide suppression system, a dry chemical hood system, and fire extinguishers. There were no sprinklers. The restaurant was closed for the night but staff were still present. Employees called 911 at 12:14 a.m. to report the fire. By the time firefighters arrived four minutes later, smoke and flames were coming through the roof.

The first-in engine company advanced a ½-inch hose line into the structure, where they found interior conditions deteriorating rapidly. Cracking and popping in the ceiling space forced the interior and roof crews to evacuate, while additional companies secured power to the building and removed several cylinders containing oxygen and acetylene. Firefighters then began a defensive attack as the roof collapsed.

The blaze began when radiant heat from gas-fired cooking grills ignited the restaurant’s wooden structural members. Once ignited, flames traveled through concealed spaces into the ceiling, out of reach of the built-in suppression systems.

Losses to the structure and its contents were estimated at $1 million dollars each. There were no injuries.

Lightning strikes start church fire

FLORIDA

A church sustained $1.3 million in structural damage after lightning struck the building in two places, igniting it and causing a power surge through the electrical wiring. These events led to numerous points of ignition in the attic and a second ignition at a corner of the second-floor day school area.

The 51-year-old, two-story church had concrete-and-block walls, wood roof trusses, and a slate roof. It was 122 feet (37 meters) long and 80 feet (24 meters) wide, and contained a workshop and a day care center. Only the day care center had a fire detection system, which operated after firefighters began suppression activities. There were no sprinklers.

Nearby lightning strikes caused a massive power surge in the building’s electrical system and first-floor main power room, causing all the wiring and fuses in one of three main circuit breaker boxes to melt. The surge continued through the building’s internal wiring and arced at several points in the electrical distribution system. A second, more direct, lightning bolt struck a second-floor corner of the building, causing the roof overhang to smolder. The current also spread through and out of the conduit, igniting several areas of wood truss in the attic.

A passerby called 911 at 1:12 a.m. The building, valued at $3 million, sustained an estimated $1.3 million in damage. Contents, valued at $500,000, sustained an estimated $250,000 in losses.

A National Weather Service Doppler radar map showed 500 lightning strikes within one-half mile (0.8 kilometers) of the church during the storm.

Mercantile

Sprinklers extinguish arson fire

WASHINGTON

When three dumpsters within 100 yards (91 meters) of each other at the rear of a strip mall were set ablaze just after midnight, two sprinklers protecting one of the mall’s combustible canopies activated, preventing the fire from spreading into the building.

The single-story, multi-occupancy strip mall was 680 feet (207 meters) long and 119 feet (36 meters) wide. It had concrete block walls and a wood roof deck covered with asphalt shingles.

A wet-pipe sprinkler system provided full coverage and a dry-pipe system had been installed in some areas. Both wet- and dry-pipe systems were monitored by a central station alarm company.

An arsonist ignited trash and debris in the three dumpsters and the fire spread from one dumpster to a combustible canopy protecting a loading dock. Sprinklers extinguished the canopy fire and protected the loading dock from the burning dumpster.

The building, valued at $10 million, and its contents, valued at $23 million, sustained only $5,000 in damages.

Storage

Incendiary fire destroys aircraft hangar

CALIFORNIA

A fire intentionally set using aviation fuel heavily damaged an airplane repair and storage facility. Flames quickly consumed the building, and firefighters had to forgo an offensive attack due to the size of the fire.

The steel-frame, single-story building had metal siding and a metal roof. It measured 100 feet by 100 feet (30 meters by 30 meters) and contained a 15-by-15-foot (4.5-by-4.5-meter) wooden office. It had no fire detection or sprinkler system.

The building was closed for the night when the fire broke out.

A passerby called 911 at 4:54 a.m. and firefighters arrived within five minutes to set up a defensive attack in an effort to protect exposures.

Investigators believe an arsonist broke into the building and poured 15 gallons (57 liters) of aviation fuel inside the office. The arsonist then ignited the fuel with some sort of open-flame device, and the resulting fire quickly engulfed the building.

The hangar, valued at $300,000, was a total loss. Damage to the $1.8 million contents, which included nine aircraft, was estimated at $1.7 million. There were no injuries.

Boat fire spreads to other boats in marina

WASHINGTON

A fire that started by a portable electric heater on a boat docked in a covered marina spread to several other boats, fanned by high winds that impeded fire ground operations.

The boats were moored at a wooden dock that had a wood frame and a metal roof overhang. The boat on which the fire started was at the end of a dock, several slips of which were occupied by other boats. The marina had no detection or sprinkler system and was closed for the night when the fire broke out.

Although a portable heater
FORMULA FOR COMPLETE!
FIRE/LIFE SAFETY

BECAUSE LIVES, PROPERTY AND BUSINESSES AREN'T FIREPROOF

COST-EFFECTIVE, QUALITY PRODUCTS DELIVERED ON TIME

* CONTROL PANELS
* DETECTION / INITIATION DEVICES
* SIGNALING / NOTIFICATION APPLIANCES
* ACCESSORY DEVICES

SUPPORT

WORLD-CLASS, PROMPT AND CORRECT

* SERVICES FOR BOTH OUR CUSTOMERS AND THEIRS
* SUPPORT BEFORE, DURING AND AFTER THE SALE
* FROM CODE TO COMPLETION AND BEYOND

SERVICE

NATIONWIDE NETWORK OF SERVICE-ORIENTED DEALERS

* FACTORY-TRAINED & CERTIFIED
* DESIGN, INSTALLATION, TEST, MAINTENANCE & WARRANTY

Harrington Signal, Inc.
P.O. Box 590
Moline, IL 61266-0590
Phone: (800) 577-5758
Fax: (309) 762-8215
Web: www.harringtonfire.com

HARRINGTON SIGNAL INC.
FIRE ALARM

GET THE SIGNAL
Circle 029 on Reader Service Card

ISO 9001 Certified Management System
UL Listed
CSFM Listed
FM Approved
MEA Listed
was identified as the heat source for the unintentional fire, the exact cause and the ignition sequence was unknown. The flames spread to the boat's interior and from there to the roof overhang and several other boats before firefighters arrived.

Using several hose lines, firefighters were able to protect a nearby garage and restaurant, despite winds of 20 to 30 miles (32 to 48 kilometers).

Damage to the building and its contents are estimated at $915,000.

MANUFACTURING

Sprinklers keep fire from spreading

NORTH CAROLINA

A fire in the unprotected warehouse of a clothing manufacturer caused significant damage, even though the sprinkler system prevented it from spreading to the manufacturing section. A total of 120 sprinklers activated as the blaze spread into the manufacturing section through an open roll-up door that separated the two sections.

The single-story, steel-frame building had masonry block and metal-covered walls, and a metal-covered roof. It measured 113 feet (34 meters) long by 160 feet (49 meters) wide and was divided into a manufacturing, office area and two warehouse areas.

The building's sprinkler system, which had a supervised water-flow alarm, protected the manufacturing and office area. A dry system protected the second warehouse area, but no sprinklers were present in the warehouse area where the fire occurred. The unprotected warehouse contained an office below the mezzanine, which was also unsprinklered. The company, which printed color designs on fabric used for clothing, was closed for the night when the fire broke out in one warehouse, which contained 10,000 cardboard tubes. Each tube was 8 feet (2 meters) long and 1 foot (0.3 meter) in diameter and held a screen used to make designs. Feeding off the combustible stock, flames spread through the warehouse and heat and smoke filled the manufacturing side.

Firefighters were called to the scene when the sprinklers tripped the water-flow alarm at 4:33 a.m. Upon arrival, they found flames and heavy smoke coming from the warehouse. As they began laying a 5-inch water supply line, additional companies arrived and advanced two 1 1/2-inch hose lines into the building, where they encountered heavy fire on the ground floor and mezzanine. Sprinklers operating in areas not yet affected by the flames held the fire back, but smoke filled the area.

Engine crews tried to advance into the warehouse without success. Crews on the roof opened the building's skylights to aid in ventilation.

Using large-diameter hoses and deck guns, fire crews contained the blaze and supported the sprinkler system with an additional water supply and pressure. The warehouse and its contents were so heavily damaged that an excavator had to be brought in so the firefighters could open an exterior wall to complete extinguishment.

The extensive fire damage and the removal of most of the contents made it impossible for investigators to determine the cause of the fire. They believe it began in the warehouse office under the mezzanine.

The building, valued at $3 million, sustained an estimated $1 million in damage. Its contents, valued at $12 million, sustained $1.5 million in damage. There were no injuries.

Future animal shelter damaged by arson fire

CALIFORNIA

An incendiary fire set at a nearly completed animal shelter heavily damaged the building and caused the roof to collapse. The structure's complete-cover-age fire detection and suppression systems hadn't been completed, so they weren't a factor.

The single-story, wood-frame building sat on a concrete slab and had a plywood roof topped by rolled roofing material. The exterior of the 39,000-square-foot (3,623-square-meter) building had been completed, and the interior was nearly done. The sprinkler system hadn't been completed and wasn't yet operational. The smoke detection system hadn't been installed, either, and no one but the security guard was on site.

The fire department received numerous 911 calls reporting the fire from passersby and a follow-up call from the security guard at 1:44 a.m. The security guard smelled smoke 15 minutes before the fire, but a problem with his cell phone delayed his call.

Flames vented through the roof near an office and spread to the lobby.

Investigators determined the fire began in an office space used by construction workers to store paint, epoxy, and electrical fixtures.

Investigators determined that someone used an open-flame device to ignite the combustibles in the room and that the fire spread undetected to other parts of the building.

Valued at $9 million, the shelter sustained an estimated $3 million in damage.
What good is your emergency exit if you can’t find it?

Shedding new light on safety.

Have you done everything you can to ensure the safety of your building occupants and visitors? What about in a blackout? Sometimes just meeting code isn’t enough. In an emergency situation, Safe-T-First™ picks up where some emergency systems leave off. The Safe-T-First System creates low-location, bright, luminous pathways on floors, along the wall base and in stairwells, leading the way to safety. Because the system works down low, it is less likely to be obscured by smoke in an emergency. And since Safe-T-First requires neither electrical nor battery power, it can act as a nearly fail-safe system without requiring backup generators or constant maintenance.

The system’s photoluminescence is the result of patented PermaLight™ technology that incorporates bright, long-lasting pigments into Johnsonite’s colorful floor and wall products. After absorbing light, the system can provide up to 10 hours of light. Not designed to replace backup lighting systems, Safe-T-First will instead act as a supplement to your building’s safety systems, giving you peace of mind that you’ve done everything you can.

For the safest possible environment, get Safe-T-First.
Keeping Mixed-Use Occupancies Safe

NFPA 101® and the proposed NFPA 5000™ respond to trends in building design and multiple-use.

NFPA 101®, Life Safety Code®, and the draft of NFPA 5000, Building Code™, define a mixed-use occupancy as one "in which two or more classes of occupancy exist in the same building or structure and where such classes are intermingled, so that separate safeguards are impracticable." An example of a mixed-occupancy office building is one containing a conference room that can accommodate 70 if the conference and office areas share some interior space.

When a building’s design features can be arranged so that separate safeguards are practicable, the building isn’t considered a mixed-use occupancy, but a multiple occupancy. This type of occupancy is defined by the proposed NFPA 5000 as “a building or structure in which two or more classes of occupancy exist.” The definitions of both types of structures appear to be similar, but that of mixed occupancy is actually derived from that of multiple occupancy. A third derivative of this approach is that of separated-use occupancies.

A concept newly introduced in NFPA 5000 is that of separated-use occupancies, which involve co-location of different uses or occupancies in the building, but only when an hourly separation is provided between the uses. This approach permits the space to be optimized, remain safe for occupants, and lets the designer apply all of the relevant criteria for each specific occupancy category.

Allowing for multiple occupancies in a building isn’t a new concept, nor is it an inherently dangerous one. It simply permits a building to have a variety of uses. However, identifying and defining a multiple-occupancy building's main occupancy classification is crucial, since it gives the code official, the engineer, and the architect an overall impression of the building’s ultimate use, thus allowing them to determine which protection requirements apply, where they apply, and when they apply.

Determining criteria

Determining a building's occupancy classification based on such items as fuel load and occupant capabilities will result in a relative ranking of the building's inherent hazards that can be used to determine its structural design criteria. Mixed-occupancy rules require you to determine the more conservative set of circumstances and apply the most rigid or conservative design approaches to the building or that portion of the building where the overlapping occupancies occur. A wide range of occupancies can then be safely housed in a single structure. The occupants are protected, the building is protected, and the building developer has provided a structure that appeals to potential tenants.

Almost all buildings have one or more uses, so scalability of multiple occupancies or mixed-occupancy uses is of paramount importance in our more public structures. Take the airport hotel, for example. While the concept isn’t new, the design of such hotels has steadily crept to new levels. A case in point: the Hyatt Hotel at the Orlando, Florida, International Airport, which is located squarely in the main terminal building. Design considerations would have included the movement of hotel guests and employees into and through the terminal building, thus providing "competition" for egress capacity, as well as an evaluation of the hotel occupancy and the airport assembly occupancy. Mixed-use occupancy criteria would then dictate that the most restrictive criteria be applied at points where common areas were so "intermingled that separate safeguards" couldn’t be provided.

Depending on the relative hazards of two or more occupancies, NFPA's proposed Building Code allows such
The specifier's guide to quality time and life safety systems.

Vol.1: Life Safety Systems

900 Series Fire Alarm
- Color graphics command center
- Field programmable
- Modem and printer interfaces
- Non-volatile history/configuration memory
- Password protected
- Display and/or point annunciation
- Multi-channel audio
- One/two way firefighters communication
- Programmable switches and status LEDs
- Fiber optic communications

902 Series Fire Alarm
- 252 DigiComm™ addressable points
- 5 amps of notification appliance power
- Network capability
- Synchronized horn/strobe operation on single pair of wires
- Silence horns/strobe operation on single pair of wires
- 24 VDC auxiliary power output
- 80 character back-lit display
- Expandable design

902 Series Fire Alarm Annunciator
- 80 character back-lit display
- Full system control
- User friendly
- Password protected
- Expandable design
- Auto programming

Since 1930, National Time & Signal Corporation has been designing, manufacturing and distributing quality clock and life safety systems.
National Time & Signal Corporation. New world solutions and time-honored values.
Find out more, call 1-800-326-8456 or visit our website at www.natsco.net
New Rules and Regulations for Sprinklers

The 2002 edition of NFPA 25, Inspection Testing and Maintenance of Water-Based Fire Protection Systems, contains many new rules and recommendations for automatic sprinkler systems. Although the new document contains other items of interest, such as a rewrite of water tank inspection requirements and new criteria for testing standpipe system hose valves, most of the changes revolve around sprinklers.

Sprinkler sample testing

Among these changes are several dealing with the sample testing of sprinklers. The basic requirement that sprinklers must be replaced after 50 years of service unless sample testing shows their use can be continued, hasn't changed. However, the new edition requires dry-type sprinklers to be replaced or sample-tested after 10 years of service. And any type of sprinkler exposed to a harsh environment, such as a corrosive water supply or atmosphere, must be sample-tested after five years of service.

Fast-response sprinklers, including residential quick-response and early suppression sprinklers, must still be sample-tested after 20 years of service, but the rule has taken on greater significance since the first fast-response sprinklers have begun coming due. The first residential sprinkler was listed for service in 1981, and the first quick-response sprinkler was listed for service in 1983.

Alarm and flow test frequency

Efforts to align the alarm test frequencies required by NFPA 25 and NFPA 72®, National Fire Alarm Code®, have been marginally successful. Valve supervisory equipment and paddle-type, water-flow switches must be tested every six months, according to both documents. However, NFPA 25 still requires quarterly testing of water-motor gongs and pressure-type alarm switches because these devices clog.

A philosophical difference between the committees writing these two codes may prevent full agreement. In NFPA 25, alarm equipment is used to ensure that the equipment is working properly, as well as to ensure the availability of an automatic water supply.

Another test used to ensure the availability of water is the system main drain test, in which a drain is opened to allow substantial flow from the water supply, making closed or partially closed valves obvious. These tests are conducted annually following any work on the system. An important change in the 2002 edition of NFPA 25 requires that a main drain test be done quarterly for at least one system downstream of any backflow or pressure-reducing device on a sole-source water supply. Field experience indicates that these valves have to be used more than once a year to operate properly.

Random internal inspection

Another significant change calls for a random internal inspection of the sprinkler system piping every five years. This involves removing a flushing connection cap from the end of one main and a sprinkler near the end of one branch line, and looking inside. Indications of obstructions warrant a more complete investigation. If necessary, the system might have to be flushed.

The purpose of the random inspection is to look for any obstructions, including stones or welding coupons, that could block the sprinklers. If slime or tubercles are discovered, NFPA 25 requires that the system be tested for microbiologically influenced corrosion.

Before this edition of NFPA 25 was published, there was no specific requirement to look inside the piping,
Central Sprinkler has another FIRST. Take a look at this innovative solution to eliminate in-rack sprinklers and dry systems for freezer applications.

Do you know what’s available from Central Sprinkler TODAY?

- Freezer Applications with Temperatures Between +10°F to -20°F
- Industry’s First FM Approved ESFR Anti-Freeze Fluid
- Tyco Fire Products ESFR-25 Sprinklers
- Tyco Fire Products Alarm Valve with Special Trim
- Proprietary Maintenance Panel and Controls
- WilFlow® Anti-Freeze Solution – Available Through Central Sprinkler

Central Sprinkler Company • 800-523-6512 • Fax 215-362-5385
www.centralsprinkler.com

Circle 067 on Reader Service Card
Alarm Systems and False Alarms

Habitual nuisance and false alarms can cause complacency.

The large number of nuisance and false alarms generated by fire suppression and detection systems can lead to a dangerous tendency to treat all alarms as false alarms. When fire officers assume an alarm is false, they tend to focus on resetting the system and returning to the station, rather than conducting a proper size-up.

When responding to properties with a history of nuisance or false alarms, the incident commander (IC) must be alert to signs of complacency, such as failure to don the proper personal protective equipment and spending excessive time in the alarm room. This complacency can have deadly consequences if it delays the implementation of an emergency action plan, when the alarm turns out to be a real emergency.

In a fire department’s quest to address nuisance alarms, the IC might levy fines against property owners who have excessive false alarms. However, such policies often prove counterproductive and shouldn’t be implemented without careful study. In their zeal to avoid fines, some owners might resort to drastic measures, such as disabling the alarm system or directing employees to investigate alarms before notifying the fire department. Fires in the First Interstate Bank Building in Los Angeles, California, and One Meridian Plaza in Philadelphia, Pennsylvania, (see “Looking Back” on page 176) are just two examples in which delayed alarms contributed to a loss of life and property. Since delayed alarms are frequently contributing factors to fires involving major loss of life and property, the IC should be careful to avoid any action that might tempt property owners to delay calling the fire department.

It’s important that we learn from history and take measures necessary to prevent delayed alarms. Many jurisdictions require that alarm systems automatically transmit a signal to the fire department, thus avoiding potentially deadly delayed alarms. While it’s essential to have measures to prevent delayed alarms, it’s also important that the local fire department and the building’s occupants take appropriate action when an alarm activates.

There have been many fires where occupants failed to properly respond to an alarm system. We’ve experienced incidents in high-rise hotels where guests failed to act when the alarm sounded. In one incident, a firefighter conference was being held in the hotel when an alarm sounded in the middle of the night. Only a few people responded and went to the lobby to await instructions. While the guests waited, firefighters arrived and tried several times to reset the alarm system. No attempt by department personnel was made to find the source of the alarm. The inaction by the guests, many of them firefighters, and the delayed action while the fire department tried to reset the alarm had the potential for a large loss of life. Fortunately, the alarm was accidental.

Nuisance alarms are a serious problem, and correcting them should be an IC’s top priority. The fire department and property owner should work together to eliminate nuisance and false alarms by ensuring that all detection and suppression systems are properly installed and maintained.

In the interim, the IC must be vigilant because every alarm must be treated as an emergency until a thorough investigation proves otherwise.
Two wires and a hundred stories.

Fire Control Instruments Introduces the Future of Networked Voice Evacuation Systems.

2002 NFPA EXPOSITION • BOOTH 901

www.firecontrolinstruments.com

Circle 023 on Reader Service Card
Challenged with engineering a performance-based fire and/or gas system?

Regardless of what you’re protecting...

an aircraft hangar...

a gas plant...

or a convention center,

Det-Tronics flame and gas detection products provide greater design flexibility, better safety and lower cost of coverage.

Detector Electronics Corporation
T: 800.765.3473 or 952.941.5665
W: www.detronics.com

X3301 Protect•ir

PointWatch Eclipse

A Kidde Company

Circle 015 on Reader Service Card
Using NFPA 72® Correctly

NFPA staff answer some of the most frequently asked questions about this widely used code.

NFPA 72®, National Fire Alarm Code®, is one of NFPA's most frequently used documents, and here are some of the most frequently asked questions about it.

Where does it specify that a fire alarm system is required and that automatic fire detection, occupant notification, and off-premises notification are required?

Although the requirements of NFPA 72 apply to the performance, installation, and maintenance of all fire alarm systems, the code doesn't specify when a fire alarm system is required. NFPA 101®, Life Safety Code®, and other codes enforced by the authority having jurisdiction determine whether a fire alarm system is required for an occupancy. These occupancy-based codes also specify the basic attributes of the fire alarm system. Such attributes typically include the type of signal initiation required, whether manual, automatic, or as a result of extinguishing system operation; requirements for occupant notification, both audible and visible; and requirements for off-premises emergency forces notification.

However, NFPA 72 amplifies on occupant notification in Section 3-8.4.1. This section requires that fire alarm systems used for evacuating or relocating occupants have notification appliances installed on each floor to meet the conditions specified in Chapter 4.

NFPA 72 also includes an automatic fire detection requirement in Section 1-5.6, which specifies that a smoke detector must be installed at the site of the fire alarm control unit if the unit is installed in an area that isn't continuously occupied. This requirement applies even if no other automatic detection devices are required.

What qualifications must designers, installers, and service personnel have?

Section 1-5.1.3 of NFPA 72 requires that those who develop fire alarm system plans and specifications be experienced in the proper design, application, installation, and testing of fire alarm systems, and Section 1-5.1.4 requires that installation personnel be supervised by someone qualified and experienced in the installation, inspection, and testing of fire alarm systems.

Service personnel must also be qualified and experienced in the inspection, testing, and maintenance of fire alarm systems according to Section 7-1.2.2.

Examples of qualified personnel are included in the referenced code sections or in the related appendix sections.

What coverage is required for automatic fire detection?

The type of coverage required for automatic fire detection is mandated by occupancy-based codes or local statutes. Section 2-1.4.2 of NFPA 72 addresses three types of required coverage: complete coverage, partial coverage, and selective coverage. Total coverage requires detection in virtually all accessible locations, although exceptions apply. Partial coverage includes common areas and workspaces, such as corridors, lobbies, storage rooms, equipment rooms, and other tenantless spaces. And selective coverage involves only spaces specifically required by occupancy-based codes, statutes, or the authority having jurisdiction.

What do “public mode” and “private mode” mean?

The terms “public mode” and “private mode” refer to the way notification signals are used, not to whether the building is a public or private building. These terms are specifically defined in Section 1-4 under “operating mode.”

Public mode operation can be viewed as the default mode for occupant notification. Audible and visible signals are directed to the occupants of the protected area, alerting them to take action to evacuate or relocate themselves as required. Private mode operation involves audible or visible signals only to persons directly concerned with
Figuring Safety in Mixed-Use Structures

NFPA 101® includes provisions to determine if an occupancy is mixed-use or incidental.

Most larger buildings have mixed-use occupancies. Hotels, for example, contain residential, offices, assembly, and storage areas, even parking garages. Office buildings have meeting rooms, cafeterias, and storage areas. And factories have cafeterias, offices, and storerooms.

The question facing designers and authorities having jurisdiction is whether such multiple uses represent mixed-use occupancies or incidental occupancies. The answer to this question will determine how the codes are applied.

NFPA 101®, Life Safety Code®, defines mixed-use buildings as those with two or more occupancy classifications so intermingled that separate safeguards can't be provided. Incidental occupancies, on the other hand, are areas that are either considered incidental to the building's primary occupancy classification or areas that have a nonresidential use that allows for an occupant load under the occupancy threshold established in Chapter 6 of the Life Safety Code. For example, a meeting room that holds no more than 50 people isn't an assembly occupancy and so can be considered incidental to the building's primary use.

Where incidental occupancies occur, the building must comply with the requirements that apply to its primary occupancy. Residential uses can't be considered incidental. Any space containing sleeping accommodations must be classified as a residential occupancy.

Other than sleeping accommodations, the Life Safety Code doesn't establish any qualifications for determining when an occupancy is incidental, since one can always play "games" with such things as size limits, staying just one square foot under the limit or breaking the space up into several smaller spaces.

However, the code considers a building to contain mixed occupancies if those occupancies share portions of the required means of egress.

Separate safeguard
When a building is considered mixed-use, the most stringent requirements of the occupancies involved apply to those particular areas. For example, office areas must comply with business occupancy requirements. However, requirements that affect the entire building, such as sprinklers or fire alarm systems, must apply to the entire building.

Portions of the means of egress shared by the various uses must also meet the most stringent requirements of the occupancies involved. Separate safeguards for egress have generally been interpreted to mean that people in the different occupancies have their own separate means of escape from the occupancy.

Although the Life Safety Code doesn't require that occupancies have a specific fire-rated separation between them to be considered separate occupancies, the building codes used in a particular jurisdiction may.

Determining the question of mixed or incidental occupancies can present designers and authorities having jurisdiction with quite a challenge, but an egress analysis can help. 
LONG BEFORE THE DOORS OPEN,

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

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

www.ul.com

©2002 Underwriters Laboratories Inc.®

Circle 071 on Reader Service Card
Fire Grant Program Here to Stay

Grant money available to fire departments in 2002 is nearly four times that of last year.

Following last year's successful $92 million funding of local fire departments under the Assistance to Local Firefighters Grant Program, Congress has appropriated $360 million for fiscal year 2002. Not long ago, many wondered whether there was actually a need for any federal assistance to local fire departments. After all, fire protection was a local matter—or it was until 19,000 fire departments large and small, career and volunteer, across the United States bombarded Washington, D.C., with an overwhelming number of grant applications. And that was before September 11.

$3 billion in requests/$92 million available

By this time last year, the United States Fire Administration (USFA) had received more than 31,000 grant applications from 19,000 fire departments around the United States. Two out of every three fire departments in the United States applied for assistance, with requests totalling $2.99 billion, or more than 30 times the $92 million available. Of the 31,000 applications, only 7,500 or 39 percent, met the established criteria and were deemed competitive. These applications were then reviewed further for need and cost-effectiveness. Finally, legislative requirements, such as geographic distribution and the type of fire department were considered. Of the 7,500 applications that were deemed competitive, only 1,855 grants totaling $92 million were awarded. That means fewer than 1 in 10 fire departments that applied received a grant.

Where the money went

In addition to the direct fire department grants, $4.6 million went to national, state, and local fire and burn prevention programs. NFPA’s Public Education department received a $500,000 grant to conduct the Risk Watch® Champion Mentorship Program, which will pair a Risk Watch Champion with a fire department to expand Risk Watch training this fall. An additional little more than $3 million went toward USFA administrative costs.

Personal protective equipment led the request list, with $14.6 million going to career fire departments and $19.6 million going to volunteer departments. Another $6.5 million went to career departments and $13.9 million to volunteer fire departments for fire apparatus, followed by $14.9 million for firefighting equipment for both types of departments, $9.1 million for fire prevention, $8.2 million for wellness and fitness programs, and $5.2 million for training.

Fire department requests for federal assistance far exceeded government officials’ expectations. Then came the horrible events that cemented public opinion as to the importance of our nation’s first responders.

$360 million now available

As we go to press, USFA is deciding which fire departments will receive a piece of this year’s federal pie and for which categories. In addition to the six fire grant categories listed last year, fire-based Emergency Medical Service has been added. Fire departments can also apply for a “programmatic” category, comprising a combination of activities in the categories of fire operations/firefighter safety programs, fire prevention programs, emergency medical services, or firefighting vehicles. An example of a “programmatic” combo could be the creation of a rapid-intervention team involving both equipment and training. Only one grant application per fire department will be considered this year.

Congress has reauthorized the program through fiscal year 2004 and has increased the authorized funding level amount to $900 million. Congress will decide the exact funding level through the appropriations process each year.

For up-to-date information, visit USFA’s web site and sign up for periodic updates at www.usfa.fema.gov.
The System Sensor microprocessor-based Laser Technology Smoke Detector, PINNACLE™, uses a focused beam of laser light to identify fast flaming or low smoldering fires at the earliest stages of combustion.

What Smoke Detector Would You Use For Highly Sensitive Applications?

PINNACLE™ Laser Technology Smoke Detector from System Sensor® is especially useful for applications such as clean rooms, telecommunication centers, computer rooms, museums, historic buildings or anywhere rapid fire/smoke identification is required and damage to irreplaceable items or buildings could occur. A laser diode and precision optics make PINNACLE™ super-sensitive to smoke.

Time By determining smoke at extremely low levels, PINNACLE saves you precious time in critical areas where any damage to equipment or a process is too much. PINNACLE is up to 160 times more sensitive than standard spot-type sensors, with minimal potential for false alarms. PINNACLE also saves time during system installation by seamlessly integrating with other standard spot-type detectors. No special equipment is needed for installation.

Experience System Sensor understands the importance of early detection in highly sensitive applications. In many applications, if smoke is present for even seconds, catastrophic damage will occur to microelectronic devices. System Sensor has years of experience testing smoke detectors in fire scenarios of all types and sizes.

PINNACLE features an advanced microprocessor running a suite of sophisticated on-board signal processing algorithms that produce unprecedented stability at ultra-high sensitivities over its entire temperature range. PINNACLE’s sensitivity also can be finely tuned across a broad range—from .02 to 2.0% obscuration per foot.

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

Find out why PINNACLE makes sense for your application. Call for a free E-DOCS™ CD-ROM, a comprehensive resource of technical information, or call 800/927-6676.

Visit us at NFPA Conference May 19-23 Booth #1025

www.pinnacledetector.com

SYSTEM SENSOR
It Makes Sense
800/927-6676

Circle 062 on Reader Service Card
Staying Qualified as an Alarm Professional

What defines a qualified fire alarm system designer or technician?

Becoming qualified to do the job is paramount in the business of fire alarm system design and installation. Section 1-5.1.3 of the 1999 edition of NFPA 72®, National Fire Alarm Code®, states "the system designer shall be identified on the system design documents. Evidence of qualifications shall be provided when requested by the authority having jurisdiction." And Section 1-5.1.4 requires that "installation personnel shall be supervised by persons who are qualified and experienced in the installation, inspection, and testing of fire alarm systems."

The 2002 edition of NFPA 70, National Electric Code®, defines a qualified person as "one who has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training on the hazards involved." OSHA regulations, found in 29 CFR 1910, also define a qualified person, saying that he or she is "one familiar with the construction and operation of the equipment and the hazards involved."

Becoming a qualified fire alarm technician or designer is only one part of the equation. The other is staying qualified by taking continuing education courses. The field keeps changing, and the smart designer or technician changes with it.

Yet many people resist professional training programs. I recently received a letter asking why so few individuals "sign up to attend a seminar that will surely give a boost to the knowledge they use every day in their job and add to their qualifications?"

Good question. Based on the numerous daily queries NFPA receives about code and installation issues, it's apparent that lots of folks who use NFPA 72 don't really understand it—that they don't know what they don't know. They need to attend a fire alarm code seminar or some other seminars before they can discover what they don't know.

My letter writer discusses this issue. "Unfortunately," he says, "some people think they know all they need to know, which makes it more difficult to convince them that they may be wrong or somewhat ignorant on the subject. This seems particularly prevalent among engineers and similar practitioners who have no particular training in fire protection, but are assigned to take care of fire protection on a specific project."

"I am a professional engineer, I know all about this fire protection stuff. I don't need any specific training or background. Or so they must think."

The letter writer went on to ask, "Why is it that an electrical or other non-civil engineer who would never dare try to design a structure feels perfectly capable of designing fire protection strategies and systems without any particular training or experience?"

This may seem a harsh criticism of some engineers. But the letter writer explains that he's dealt with such individuals.

How does one ensure a better understanding of fire alarm systems and the codes and standards that apply to them? Well, in addition to owning a copy of NFPA 72, attending seminars that explain the code's intent and application will most certainly help.

I'm amazed that so many unqualified individuals seem so sure they hold a correct opinion on a specific code requirement when most of them don't even own a copy of the code. Most of these individuals have never made any attempt to discover if they really understand the requirement. I've encountered many seminar attendees who found out that they'd assumed they understood some information correctly, but truly had not.
Your Right Choice Today For Fire Alarm Systems.

At Gamewell, as an independent manufacturer we know that you have choices in the selection of advanced Fire Alarm Systems. Let us simplify the process with our:

- Dependable, full-featured family of fire alarm systems
- Dedicated system engineering sales support team
- Network of independent Engineered Systems Distributors.

To select the right Gamewell system for your application or explore the possibility of joining our Distributor Network, please contact us today.

COMMITTED TO EXCELLENCE

Gamewell Worldwide
60 Pleasant Street, Ashland, MA 01721
Tel (888) FIREBOX • (508) 231-1400 Fax (508) 231-0900
www.gamewell.com

Circle 025 on Reader Service Card
I’ve written this column for more than five years now, and my credibility as a columnist may depend on your belief that I have insights to share, even if our experiences have been quite different. I’ve been in the fire service for 26 years. I’ve worked in dispatch, in prevention as an inspector, and as a public education officer. I’ve worked as the department’s public information officer and been assigned to a hazardous materials unit, an aircraft fire rescue unit, engines, and truck companies. I’ve been honored to serve as chief of two major Texas cities. I’ve commanded major incidents, and I’ve made right decisions and wrong decisions.

On a good day, I believe I have insights to share with other leaders like you. And that’s probably within the healthy bounds of self-respect, as long as I never forget how much I must learn from others like you. As leaders, we must be both teacher and student. And we learn best not by talking, but by listening.

When we listen with open minds and open hearts, we hear not only words, but the unspoken messages. Often, we hear frustrations that we’re powerless to fix, but sometimes we help just by providing a chance to be heard.

As leaders, we sometimes tell, and we frequently sell. But it’s through our active listening that we establish the real foundation for communication. By listening, we communicate a powerful message: respect. In my “real” world, the attention and interest my organization has in what I say is proportional to the interest I’ve shown in them. As Chief Fire Officer Alan Speed of the Greater Toronto, Canada, Fire Service often says, “People won’t care how much you know until they know how much you care.”

Two valuable tools to establish a foundation for communication are humility and humor.

Why humility? Because, although “command presence” is a part of the confidence that leaders project, we’re rarely in the role of the omniscient incident commander. Usually, we’re preparing for change in a dynamic, unpredictable world. We’re human, and we make mistakes. When we guard against arrogance, we’re more approachable. When we acknowledge our limitations, we allow others to be human, too.

There’s a difficult, but critical, balance to achieve here. We need the self-confidence to lead through difficult circumstances and inspire an organization unsettled by change. But we’re often strongest when we communicate our courage by showing the strength to admit to personal limitations. Humility isn’t an admission of weakness. It suggests a respect for others and acknowledges that we can’t achieve success by ourselves.

And humor? Abraham Lincoln called laughter “the joyful, beautiful, universal evergreen of life.” Ever the pragmatic politician, he also said that humor “was the shortest common denominator to reach the hearts and minds of our countrymen.”

As leaders, we have enormous influence. We set the tone. As leaders, we’ve had occasion to make sure that the seriousness of our message was absolutely understood, but we can also reduce tension by finding something funny in difficult situations. We can be the first to smile. We can make it okay to find humor in a day. And we can use humor to break down communication barriers and reinforce our leadership role as students, continuing to learn from members of the organization.
Meet THERMO-MAN®, a state-of-the-art life-sized thermal burn injury evaluation system and one of the reasons why more firefighters trust DuPont™ NOMEX® to get them home safe to their families. THERMO-MAN® literally gives NOMEX® a trial by fire, with 122 heat sensors to test protective apparel under a wide variety of conditions. Another reason to trust NOMEX®? The NOMEX® Brand Preferred Program, a certification program that strives to provide the highest possible protection for firefighters. Our partners are those elite manufacturers who truly understand and meet rigorous industry FR standards. So look for protective apparel of NOMEX® brand fiber from Preferred Partner manufacturers. If NOMEX® helps THERMO-MAN® survive thousands of fires, it can help you survive just one. www.dupont.com/nomex

NOMEX

PERFORM WHEN THE HEAT'S ON

Circle 019 on Reader Service Card
Panic Is a Misunderstood Concept

Public safety education has made the difference in emergency behavior.

Panic. Webster's Dictionary defines it as "a sudden overpowering fright; esp: a sudden unreasoning terror often accompanied by mass flight." The word conjures up images of mass hysteria, uncontrolled fear, and "survival of the fittest" behavior. Whenever I'm interviewed by reporters or even asked by acquaintances about my job at NFPA, inevitably the questioner will use the word "panic" to describe how they believe people react when confronted by fire. But do they?

Not according to Guylène Proulx of the National Research Council of Canada, an active NFPA member and a leading researcher in the area of fire and human behavior. Despite what we read or see, says Dr. Proulx, "panic, which supposes irrational behavior for a situation, is rarely observed in fires. Most people appear to apply rational decision-making in relation to their understanding of the situation at the time of the fire. Contrary to common belief, it appears that it's the lack of panic that characterizes most fires."

Dr. Proulx's colleague Rita F. Fahy, NFPA Fire Databases and Systems manager and another internationally respected scientist in this field, agrees with this assessment.

"It's important not to confuse 'anxiety' with 'panic,'" Dr. Fahy says. "The people evacuating the World Trade Center attack in September almost certainly experienced great distress and concern in that situation. Yet we have many reports of altruistic behavior—people helping one another despite potential risk to themselves, evacuating in an orderly fashion, weighing different options...actions that are inconsistent with the idea of uncontrolled, self-centered, or hysterical behavior."

Patricia Brennan at the Centre for Environmental Safety and Risk Engineering at Victoria University in Melbourne, Australia, has been researching the relationship between people and fire for use in models for performance-based codes.

"Panic is often offered as an explanation for observed behavior, especially when the outcome of the behavior is negative," says Ms. Brennan. In other words, one may mistakenly assume panic on the part of someone who's taken an action that later proves to have been ineffective in responding to a fire, when, in fact, the action was quite rational given the circumstances.

Dr. Proulx puts it this way: "Being fearful or tense doesn't prevent a person from thinking and making decisions."

She cites three reasons decision-making during a fire is different from everyday decision-making. More is at stake; information on which to base a decision is limited at the time; and time to make a decision is limited.

"If a person already has a plan of action, well thought through and discussed and practiced with family members, decisions will be much easier to make," says Dr. Proulx. "Education and training are the keys."

NFPA agrees. It's for this reason that all our public education programs emphasize the skills needed to assess the risk of fire accurately and take effective action to prevent and survive it.

NFPA provides many opportunities for people to learn critical fire safety skills.

The more we can help people grasp basic concepts and practice well-conceived plans in advance, the better their chances of making life-saving choices in a fire. Implementing proven educational programs to help people at home or at work is an essential fire survival tool.
Introducing 3M™ Novec™ 1230 Fire Protection Fluid—the new standard for halon replacement. Protect what matters most with Novec 1230 fluid. It's the long-term, sustainable clean agent that has the greatest margin of safety of halon replacements. Ideal for use in occupied spaces, it protects high-value assets, has zero ozone depletion potential, a global warming potential of one and a five-day atmospheric lifetime. Novec 1230 fluid not only meets today's regulations but those of the foreseeable future. It is easy to handle and store, and is available for use in streaming and flooding applications. To view or download product information, visit our Web site at www.3m.com/novec1230fluid. Or call 800-632-2304 in the U.S. or 323 250 7874 in Europe.

See us at the NFPA World Safety Conference & Exposition™ Booth #1001.
Outgoing NFPA President GEORGE D. MILLER (left) leaves behind an impressive legacy as the incoming president, JIM SHANNON, leads the organization into the future.
THE

BOSS
The man who turned NFPA around

The past decade has been an impressive one for NFPA, thanks to George D. Miller.

A DECADE AGO, NFPA selected George D. Miller as its new president, the first outsider in its 95-year history to fill the post. Though he had little background in fire protection, Miller had what NFPA needed: integrity and a track record for turning around financially troubled organizations.

As he steps down, Miller leaves behind an impressive legacy of financial stability, international expansion, and a broadened agenda.

The year 1992 was a time of crisis for NFPA. The former president had resigned amid charges of fiscal mismanagement, and the board of directors had been running the organization for eight difficult months. Vergeing on bankruptcy aside from the land they were sitting on, NFPA had $800,000 in assets and $23 million in debt. The bank would no longer handle the Association's finances. On top of that, the organization was in a troubling revenue cycle—every third year, NFPA ran a deficit as the major codes and standards entered the last year of their revision cycle.

Miller began by addressing staff morale.

"I had to show the staff that we were setting a new course, and they were going to be part of it," says Miller. "I said, 'It's imperative that you understand that a few words mean a lot to me, and we will live by them: honor, integrity, and accountability.'"

Olin Greene, currently NFPA southern regional manager, was the U.S. Fire Administrator at the time and recalls that difficult transition.

"NFPA had lost the respect of many in the field," he says. "It was a bold move by the board of directors to go outside the Association and seek a leader. It turned out to be the greatest thing that ever happened to NFPA.

"George's vision of what NFPA should be doing and how to get there was as great as his leadership," adds Greene. "He gave everybody a job to do and then stepped out of their way."

Early on, Miller jumped in and got to know the members.

"Overall, he's done a fantastic job by working with all of the different committees and all of the different organizations that support NFPA," says James Stalcup, an electrical industry expert. "He came to section meetings and actually stayed a while."

Fire consultant and longtime NFPA member Art Black agrees.

"He takes the time to know people, to stop and talk to members," says Black. "He's good at what he was brought on to do—but being who he is, he's good at it personally, as well."

What a difference a decade makes

Ten years later, NFPA is financially strong and has run a surplus every year since Miller took over. Membership has increased from 59,000 to 73,530, with a dramatic increase in the number of international members. And the Association's agenda has broadened to encompass the built environment.

NFPA Central Regional Manager Russ Sanders sums up Miller's legacy.

"He turned things around financially and saved the organization from going under," he says. "He brought back credibility, not only in the United States and Canada, but gave us a strong presence throughout the world. Then he broadened our scope in the building code arena and in international markets."

Miller stabilized NFPA finances by finding alternate revenue sources, and real estate was one of the keys.

In 1992, NFPA's bank held a $16 million mortgage on the NFPA headquarters building, the value of which had declined from $16 million to $12 million, and a final balloon payment was soon due. Miller saw financial disaster looming.

"If we'd rolled the loan over, we'd have had to come up with $4 million from somewhere. So I convinced the board that we needed to put away $2 million a year just to roll over the note on our building," says Miller.

With reserves being set aside, Miller convinced the note holder to accept an offer of $12 million for it, $4 million less than the note it held. Miller quickly put together a business plan that convinced a new banker to provide a line of credit.

NFPA paid off its Quincy, Massachusetts, headquarters building in 1993. Miller smiles, remembering the financial coup.

"That made the difference," he says. When Miller eliminated the debt on the Quincy headquarters building, NFPA's financial situation immediately turned around.

With Miller at the helm, NFPA also purchased a warehouse in Avon, Massachusetts, and NFPA's warehouse and fulfillment personnel moved out of expensive leased space into the new facility. The Cus-
I had to show the staff that we were setting a new course, and they were going to be part of it. I said, 'It's imperative that you understand that a few words mean a lot to me, and we will live by them: honor, integrity, and accountability.'

— GEORGE D. MILLER
tomer Service Department moved to the warehouse as well, freeing additional office space in the headquarters building that NFPA could lease.

Miller wasn't finished.

"I looked out the window and thought, 'Boy, we sure do have a lot of property here. What if we build another building?'"

The new office building was completed in 1999. It includes an extra parking lot, which is leased to other tenants in the complex.

"It was built as an investment," says Miller, "and was 100 percent leased when it opened.

"It was like digging in the backyard and finding gold," says Miller. "Codes were still our principal cash source. But by getting sources of revenue other than codes, we could introduce some stability into our revenues."

International focus
Miller’s presidency has also focused on expanding NFPA’s role internationally. Under his leadership, an International Division was established, and NFPA opened offices in Europe, Asia, Canada, Mexico, and South America, placing special emphasis on the Americas.

Miller remembers sharing his vision with the board.

"We were a worldwide organization but didn’t have the resources to focus everywhere,” he said. "The world was dividing itself into regional trading blocks, and the European Union was going to be very powerful. I could envision other trading blocks, the most powerful being the Americas. Instead of a shotgun approach, I said, ‘Let’s focus our attention on bringing the Americas together, using the same codes and standards.’"

His efforts have yielded impressive results.

"Recently, the Mexican government agreed to use our National Electric Code®," he said. “Venezuela, Colombia, Panama all use it. And I’ve signed an agreement with the umbrella Latin American standards organization COPANT to use NFPA standards when there are no comparable international standards.”

Sanders also represents NFPA in Europe.

“I’ve had a chance to see first-hand how NFPA’s scope and credibility have broadened internationally,” he says. “And it’s due to George’s leadership.”

Beyond fire protection
Since its inception more than 100 years ago, NFPA has prided itself on developing consensus-based standards. Traditionally focused on fire protection

GEORGE D. MILLER’S TENURE: NFPA HIGHLIGHTS

**1993**
George D. Miller makes $1 million commitment to public education.

**1994**
NFPA membership: 63,000

**1995**
NFPA launches Learn Not to Burn® Champion Award Program.

**1996**
NFPA signs COPANT (Pan American Standards Commission) agreement. Translation accords signed with Colombia and Argentina.

**1997**
NFPA establishes web presence.

**1998**
NFPA establishes International/Global Operations department.

**1999**
All NFPA codes published in Korean.

**2000**
NFPA establishes office in Thailand for Asia-Pacific region.

**2001**
NFPA celebrates its centennial.

**2002**
NFPA engages coalition of six Canadian entities for French translation program.

**2003**
Home Fire Sprinkler Coalition co-founded by NFPA, the American Fire Sprinkler Association, and the National Fire Sprinkler Association.

**2004**
Learn Not to Burn® Foundation incorporated into NFPA Public Education Division as the NFPA Center for High-Risk Outreach.

**2005**
NFPA membership: 68,000.

**2006**
NFPA establishes Latin American Section.
and electricity, NFPA codes and standards have long been referenced by model building codes.

Under Miller's leadership, however, NFPA has expanded beyond fire protection.

"We've developed a building code, providing safety throughout the built environment," says Miller.

"It was our intention to make sure that our codes stayed compatible. We began to hear from local officials that they wanted a full set of codes. If NFPA couldn't bring them a full set, then they'd have to use fire codes developed by building officials."

Miller is very clear on the added value of NFPA's proposed Building Code®.

"One thing that sets us apart from model building code organizations is that we use a broad consensus process," he says. "We allow individuals around the world to participate. It's what makes NFPA a truly international, consensus-based organization."

**Challenges for the new president**

As Miller passes a financially healthy, international organization to his successor, Jim Shannon, he sees the need to continue expanding internationally and to communicate the advantages of NFPA's Building Code to the world. Though codes and standards continue to be NFPA's primary revenue source, Miller feels it's now time to prepare for an uncertain future. The Internet makes it easier to communicate codes and standards worldwide, but it also makes it easier to copy them.

"We have to protect that source of revenue, while we protect other sources," he said. NFPA needs to increase its reserves to the point where it can carry out its public-service mission without revenue from codes and standards if necessary."

**What's next?**

Miller's 10-year tenure as NFPA president is only one chapter in an impressive career that began in 1953 in the U.S. Air Force where he developed a distinguished record as a fighter pilot. Rising to the rank of three-star general, he was also vice-commander of the Strategic Air Command. Miller then spent several years as executive director of the U.S. Olympic Committee. Before taking the reins as NFPA president, he was president of the Morris Animal Foundation.

What's next? "I'm completely open. Probably consulting and board work," he says.

"I'm of the opinion when one door closes, another opens."
I think you have to communicate clearly, and then have confidence in the people you work with, in their judgement, and not second-guess them.

"There's a lot of talent here, a lot of good ideas, and people who have a deep commitment to the organization. I want members and staff to have an opportunity to express themselves about the organization before we make any changes." — JIM SHANNON
Capable hands
Jim Shannon's vision: NFPA as an information organization.

INSIDER SAVVY WITH OUTSIDER experience. A politician's leadership with an administrator's knack for making bureaucracy work. A lawyer's powers of persuasion with a manager's fiscal prudence. These are some of the qualities Jim Shannon, NFPA general counsel and vice president since 1991, brings to his new role as NFPA president.

The right choice
When the NFPA Board of Directors went looking for a leader whose background, personal qualities, and skills would best suit NFPA, they found what they were looking for right at home in Shannon.

"Jim is an outstanding model of leadership and equal to the demands necessary to achieve NFPA's important mission," says NFPA Board Chair Martin (Mickey) Reiss.

Outgoing NFPA President George D. Miller agrees.

"I have every confidence in Jim's ability to further NFPA's important work and to carry NFPA forward in its notable and most worthy mission," he says.

Law and politics
Just as some kids grow up wanting to be firefighters, Shannon grew up wanting to be a leader. At 26, he became the youngest member of the 96th Congress, representing Massachusetts, and went on to serve three terms. After that, he became senior partner at Hale and Dorr, one of Boston's premier law firms and served as Attorney General of the Commonwealth of Massachusetts from 1987 to 1991.

Shannon says politics and the law prepared him well for joining NFPA.

"All those lessons about dealing with people with different interests and points of view are applicable in an organization like ours," he says. "Coming to NFPA forced me to apply those lessons in a completely different context."

At NFPA, Shannon found he had to prove himself anew.

"I don't have any technical training, and I was dealing with a lot of highly skilled technical people to whom my previous experience didn't mean a thing," he says. "I had to show that I could be effective in their world."

Shannon might have thought he was leaving behind the turmoil of politics when came to NFPA, but in 1991, NFPA was anything but calm. Months after he joined the Association, the president resigned, and the organization began to flounder as staff morale suffered. It would be months before a new president came onboard.

"There were times during that period that I didn't think this would be a long-term relationship," Shannon says candidly. "But that changed once George Miller came in. Immediately, things turned around, and everyone was pulling to get the ship righted. George did a brilliant job laying a foundation for what we're doing now."

Bringing his legal expertise to NFPA
"My principal job as general counsel was giving legal advice and direction to the Association," says Shannon about his role during the past decade. "We have a lot of serious legal issues because of the nature of our work. My role on the administrative side has grown. Managing projects like the real estate development of the office building next to NFPA's headquarters has taken a lot of attention."

"I've also been involved in policy making and negotiations with other organizations, including past discussions with the International Code Council."

Shannon's also been actively involved in NFPA globalization efforts, particularly in Latin America.

If there's one thing Shannon hopes he's learned from working alongside Miller, it's not to micro-manage.

"George has been great to work with because he operates on the theory that, once there's agreement on what you're supposed to do, he assumes it's happening unless you tell him otherwise," he says. "I think you have to communicate clearly, and then have confidence in the people you work with, in their judgement, and not second-guess them."

Up to now, Shannon has been a behind-the-scenes guy at NFPA, and the presidency is a public role. With his extensive background in politics though, it's a role he's well-prepared to tackle.

"I feel very lucky because I've had not just the public experience, but lengthy experience inside NFPA before assuming this role."

Current initiatives, new challenges
Among Shannon's priorities are continuing current initiatives.
"The Building Code is a whole new endeavor and a real challenge for us," he says. "We'll be providing a service we've never provided before and doing so in collaboration with other organizations. Going out and telling people what this is and how it works, and encouraging them to use it will occupy a lot of my time. We'll also be doing a lot more internationally than we have before. I think the focus still has to be on the Americas, because we have a lot more to do there."

Shannon has an overarching vision of NFPA.

"You can look at NFPA as a fire organization—we're the major one in the world. We're also one of the major standards-developing organizations in the world," he says. "But if you take a step back, what we really are is an information organization. We fulfill our mission, we save lives by providing information—codes and standards, training, and support materials, such as handbooks."

As an information provider, Shannon sees NFPA at a crossroads.

"Traditionally, we've communicated and made our revenues by printing books and selling them. That's changing, and the Internet is a big piece of this."

HOW THE PRESIDENT WAS SELECTED

The NFPA Board of Directors appointed a Search Committee to handle the process of identifying three to four people who could lead the Association.

Search Committee members included George Ockuly, Chair, Corinne Broderick, Robin Paulsgrove, Jan Gratton, and George Miller. Mickey Reiss was an ex-officio member.

Last summer, the Committee hired a nationally known executive search firm, Korn/Ferry to identify qualified candidates for the committee to consider.

Through the end of 2001 and the beginning of 2002 the search firm and the committee interviewed numerous candidates with final candidates interviewed by the full Board in March 2002.

At that meeting there was a unanimous vote to appoint Jim Shannon our next President.

The duties of the President are outlined in the Association's bylaws.

According to NFPA's Bylaws, the President shall be the Chief Executive Officer of the Association. The President shall report to the Association at the Annual Meeting of Members with respect to the affairs of the Association. The President may sign, with the Secretary or any other proper Officer of the Association, any deeds, mortgages, bonds, contracts, or other instruments which the Board of Directors has authorized to be executed, except in cases where the signing and execution thereof shall be expressly delegated by the Board of Directors, these Bylaws, or by statute to some other Officer of the Association. The President shall serve as an ex-officio member, without vote, on all committees to which not specifically named. The President shall not be a member of the Audit or Nominating Committees.

The President shall perform such additional duties that may be assigned from time to time by the Board of Directors or the requirements of Massachusetts law, and shall exercise such other powers to the extent authorized by law.
If It Doesn’t Say FM-200®

This room protected by an

FM-200®
Clean Agent Fire Suppression System

It’s Not.

You may have heard about other clean agents “just like FM-200®.” But no other clean agent is backed by a decade’s worth of performance and safety experience. No other clean agent can boast more than 100,000 space-efficient installations in more than 70 nations around the world. And no other brand has been here since the beginning, providing the fastest fire suppression possible to protect people, the environment, and your high-value assets.

So when you need a fire suppression solution that has stood the test of time, look for the FM-200 logo. It’s your proof that you’ve made the best choice.

www.FM-200.com
FM-200 is a registered trademark.
FM-200 use is covered by U.S. patent 5,124,053.
©2002 Great Lakes Chemical Corporation

Circle 027 on Reader Service Card

The World’s Most Trusted Choice In Clean Agent Fire Suppression.
The Kingdom Centre in Riyadh, Saudi Arabia, and the Jin Mao Tower in Shanghai, China, are two examples of international buildings using NFPA codes and standards.

MARTIN H. REISS, P.E. AND JAMES H. ANTELL, AIA, P.E.
Whether it involves advances or innovations in life safety system technology or design techniques, the world often looks to North American organizations for solutions to the fire protection challenges of high-rise buildings. The American design and building community, including codes and standards organizations, continues to raise the bar of fire safety, expanding an impressive bank of knowledge on how best to protect multi-story, multi-use structures.

With so many high-rise buildings already dotting the country, the United States may not see an increase in new high-rise construction any time soon. In other parts of the world, however, particularly Asia, leading cities and ambitious developers are intent on making bold statements through monumental building projects. The desire to test the limits will continue to intensify in the coming years, as several proposed projects, such as the Lotte Building in Pusan, South Korea, and the Mori building in Shanghai, China, get underway.

Two of the world's most prestigious existing multi-story, multi-use complexes are the Kingdom Centre in Riyadh, Saudi Arabia, and the Jin Mao Tower in Shanghai, China, both built during the past decade by architects, engineers, and contractors with a single, unwavering design objective in mind: to create monumental symbols of their clients' sophistication, culture, and focus on the future. Integral to that objective was the highest degree of life safety.

Achieving a comprehensive safety system involved two major challenges for the fire engineering consultants from Rolf Jensen and Associates who designed the building's fire protection systems: selecting the codes and standards to follow in the design and installation of both passive and active fire protection systems, and determining the blend of global design practices necessary to raise the life safety bar.

Selecting the codes and standards to follow is not necessarily an easy task. Although today's global economy is exerting tremendous pressure on public bodies to standardize regulations and technical standards, fire safety codes, fire protection system design standards, and product testing standards still vary widely from country to country. Fortunately, NFPA's National Fire Codes, which cover building materials, as well as fire protection systems and fire protection design features, are accepted on many projects in Latin America, Asia, and the Middle East. And as more international projects involve design teams with a variety of backgrounds—an architect from Chicago working with an engineer in London and a construction manager from Riyadh—designers are beginning to harmonize their design practices in much the same way codes and standards-making bodies are harmonizing their documents. Both trends were evident in the Kingdom Centre and the Jin Mao Tower projects.

The Kingdom Centre
Arguably the most significant construction project in Saudi Arabia in the past two decades, the recently completed Kingdom Centre integrates many uses, including extensive retail space, a Four Seasons Hotel, a wedding and conference facility unparalleled in the Middle East, and the corporate offices of the Kingdom Holding Company. Designed by Ellerbe Becket, of Minneapolis, Minnesota, the project occupies 1,033,365 square feet (96,000 square meters) in the heart of the Riyadh's retail district.

The Kingdom Centre has three components: the tower, the podium, and below-grade parking and service facilities. The 984-foot (300-meter) tower, containing offices, a five-star hotel, and 44 luxury apartments, is a dramatic icon visible from the corporate and a construction manager from Riyadh—designers are beginning to harmonize their design practices in much the same way codes and standards-making bodies are harmonizing their documents. Both trends were evident in the Kingdom Centre and the Jin Mao Tower projects.

The Kingdom Centre
Arguably the most significant construction project in Saudi Arabia in the past two decades, the recently completed Kingdom Centre integrates many uses, including extensive retail space, a Four Seasons Hotel, a wedding and conference facility unparalleled in the Middle East, and the corporate offices of the Kingdom Holding Company. Designed by Ellerbe Becket, of Minneapolis, Minnesota, the project occupies 1,033,365 square feet (96,000 square meters) in the heart of the Riyadh's retail district.

The Kingdom Centre has three components: the tower, the podium, and below-grade parking and service facilities. The 984-foot (300-meter) tower, containing offices, a five-star hotel, and 44 luxury apartments, is a dramatic icon visible from the heart of the Riyadh's retail district.

In addition to banking, business, and physiotherapy centers, the three-level podium houses a covered mall that contains the finest retail center in the Middle East, featuring a "women only" district for shopping and dining in adherence to Muslim practices. The podium's 129,171-square-foot (12,000-square-meter) wedding and conference hall can be divided into six smaller halls. Completing the podium are a deluxe sports club covering 22,389 square feet (2,080 square meters) and behind-the-scenes areas serving the hotel and banquet facilities.

Parking is available in three below-grade levels that also house service areas for storage, deliveries, and administration.

Saudi Arabia isn't new to NFPA codes and standards, which have been used in military and industrial construction in the country. Using NFPA 101®, Life Safety Code®, among other codes and standards, the Kingdom Centre fire protection system consultants designed a master fire protection plan to detect a fire; alert building occupants and staff, and the fire department; suppress or control a fire before firefighters arrive; and facilitate evacuation and fire service response.

The Kingdom Centre is protected by automatic sprinkler systems, which were designed, calculated, and installed in accordance with NFPA 13, Installation of Sprinkler Systems. Wet-pipe systems predominate, supplemented by pre-action systems in areas where water damage is a
concern. Quick-response and residential sprinklers were installed in each hotel guest room and residential living area.

The fire protection water supply consists of dedicated fire pumps for high- and low-pressure zones, taking suction from water storage tanks supplied by the municipal water supply. The pumps comply with NFPA 20, Installation of Stationary Pumps.

For effective firefighting, a fire department standpipe system, designed in accordance with NFPA 14, Installation of Stand Pipe Private Hydrants and Hose Systems, was installed throughout the facility. In addition, portable fire extinguishers are positioned around the complex, as required by NFPA 10, Portable Fire Extinguishers.

Automatic smoke detectors, hard-wired into the building's electrical power system with battery backup, were installed in guest rooms and residences. Detectors were also installed in corridors, mechanical/electrical rooms, and HVAC plenum/duct inlets in accordance with NFPA 72®, National Fire Alarm Code®.

A microprocessor-based, multiplex fire alarm system was connected to a central station monitoring service. The supervised, addressable system, which includes voice and visual alarms, was designed as a stand-alone system, but it interfaces with the building automation and security systems, using special fire suppression system control panels, to control smoke and release locked doors. A central command center in a 1-hour fire-rated room in the podium enables building safety and fire department personnel to monitor and control all emergency functions.

Automatic sprinklers, which limit the amount of smoke produced, are the complex's primary means of smoke control. In the high-rise tower, the building's HVAC system is designed to exhaust the fire floor, using the pressurization method described in NFPA 92B, Smoke Management Systems in Malls, Atria, and Large Areas. This creates a negative pressure, while adjacent floors are pressurized with outside air, creating a pressure sandwich that limits smoke movement from one floor to another. In addition, each atrium and the covered shopping mall is equipped with mechanical smoke control systems.

NFPA's NATIONAL FIRE CODES, WHICH COVER BUILDING MATERIALS, AS WELL AS FIRE PROTECTION SYSTEMS AND FIRE PROTECTION DESIGN FEATURES, ARE ACCEPTED ON MANY PROJECTS IN LATIN AMERICA, ASIA, AND THE MIDDLE EAST.

The emergency exiting system consists of enclosed exit stairs and doors leading outside, and the exit paths from the tower, mall, and wedding and conference areas are independent of one another. The entire complex is designed for selective evacuation. In the tower, the fire floor, the floor above, and the floor below will be evacuated. The mall and the wedding and conference areas will be completely evacu-
The exterior step-back pattern of the Jin Mao Tower reflects the pagoda style of ancient China, while the interior's sleek look reflects modern architectural theory. Designers used Chinese and North American codes, including NFPA 13 and NFPA 70, for optimum safety.

Emergency lighting and illuminated exit signs are provided throughout the Kingdom Centre. Both systems are on the emergency electrical circuits and connected to a standby emergency power system designed in accordance with NFPA 70, National Electric Code®, and NFPA 110, Emergency and Standby Power Systems.

The Jin Mao Tower
Towering 1,381 feet (421 meters) high, the Jin Mao Tower is one of the tallest structures in the world and represents a triumph of modern engineering and architectural theory. Designed by Skidmore, Owings and Merrill for the China Shanghai Foreign Trade Center, Jin Mao recalls the ancient pagodas of China, gently stepping back to create a rhythmic pattern as it rises 88 stories. In the evening, the tower is illuminated to create a beacon on the Shanghai skyline.

Completed in 1998 and located in Pudong, the city's financial and trade district, Jin Mao is a 3,001,065-square-foot (278,800-square-meter), multi-use complex consisting of the 88-story tower and a 6-story podium building. The tower houses the Grand Hyatt Shanghai Hotel and office space, while the podium consists of hotel function areas, a conference and exhibition center, an auditorium, and a retail galleria. Both structures are designed to withstand earthquakes and typhoons, which can create winds up to 125 miles per hour (201 kilometers per hour).

Jin Mao project designers had to establish a level of fire safety consistent not only with the codes of the People's Republic of China, but also with the intent of North American codes and standards. Among the documents they used were several developed by NFPA, the American National Standards Institute (ANSI), the American Society of Heating, Refrigeration and Air-Conditioning Engineers, and Underwriters Laboratories. These included NFPA 13, Installation of Sprinkler Systems; NFPA 70, National Electric Code®, ANSI 117.1, governing handicapped accessibility; and the Uniform Plumbing Code.

Because the building's height and size make it difficult to fight an uncontrolled fire manually and evacuating the entire building would take quite a bit of time, the life safety and fire protection systems specified for the Jin Mao Tower focus on early detection and suppression, coupled with selective evacuation of the building. As in the Kingdom Centre, a defend-in-place strategy was adopted to confine fire growth to one floor or fire compartment, manage the spread of smoke beyond the floor of fire origin, and facilitate evacuation. Areas of refuge were established in the tower, compartmentalized with fire walls and floors and independently ventilated.

Low-pressure carbon dioxide systems were provided for all high-voltage substations, switchgear, and engine generator rooms. In addition, the building's boiler room and fuel oil transfer pump room were equipped with dedicated overhead sprinkler systems using water and aqueous film-forming foam in a balanced proportioning system.

Despite the pressures of the global economy, no single set of building standards is universally accepted throughout the world. However, NFPA's consensus-based code set, including NFPA 5000, Building Code™, if adopted, should provide the world with a comprehensive set of building construction and fire safety regulations.
People count on you for protection.

Tyco Fire & Security has over 60 leading brands including:

- ADT
  Electronic security solutions and services
- Ansul
  Special hazard fire protection solutions
- Niedner
  Municipal, forestry and industrial hoses
- Sensormatic
  Video surveillance and anti-theft technologies
- Scott
  Firefighter, law enforcement and personal protective equipment
- SimplexGrinnell
  Fire, life safety and communications systems and services
- Software House
  Access control and building management solutions

You can count on us.

We're Tyco Fire & Security. As a $10 billion division of Tyco International, our resources and commitment to research and development allow us to bring you the products and services needed to safeguard firefighters, prevent fires and protect people and property.

With more than 100,000 professionals in over 100 countries, operating under more than 60 leading brands, Tyco Fire & Security provides a full scope of integrated solutions for your protection needs.

Whether it's an advancement in life-saving fire systems, a breakthrough in early warning detection or a new concept in personal protective equipment, Tyco companies are there. In an unsure world, one thing is for sure, our commitment to the protection solutions that will help make the world safer.

Now, and in the future, you can count on us.

For more information go to www.tycofireandsecurity.com

Circle 070 on Reader Service Card
In Tokyo, the low fire rate is a testament to a well-trained fire department and its citizens. — DENISE LAITINEN

The Tokyo Fire Department (TFD) has come a long way from the Edo period (1603 to 1867), when fires were put out by demolishing the burning building. Back then, the samurai acted as firefighters, and their wives wore red coats to stand out in the crowd and help evacuate people. Today, the fire department is the largest in the world, with 17,993 employees and a budget of US$2 billion (244 billion yen for fiscal year 2001). Some 1,839 pieces of apparatus, including 20 firefighting motorcycles, are housed in 80 fire stations throughout Tokyo, which is composed of 23 wards, called “ku,” 24 surrounding cities, 3 towns, and a village.

For a city of 12 million residents, or 10 percent of the entire Japanese population, Tokyo has a remarkably low fire rate. There are roughly 19 fires of various types and origin every day, or approximately 6,933 a year. In 2001, 4,044 of these were structure fires.

Although buildings in Tokyo are typically five to seven stories high, there is tremendous interest in building Tokyo up instead of out. As a result, the city has become a hodgepodge of soaring skyscrapers, high-rises, and one- and two-story dwellings. And with land at a premium, it’s increasingly common for high-rises to be multi-use buildings.

In the Shinjuku section of Tokyo, for instance, the lower floors of a 45-story high-rise contain restaurants, while several upper floors contain offices. On the 19th floor is a hotel lobby.

Among the companies investing millions in new multi-use buildings is Misawa Homes, which is spending $1.5 billion to develop twin 60-story towers containing offices and condominiums. Minori Mori, the biggest landlord in Tokyo with 88 buildings, plans to complete 17 new office buildings in central Tokyo in the next three years. The largest of the Mori Building Company projects is Roppongi Hills, a $2.1 billion office, cultural, and residential complex. Mori and other developers are betting that childless couples, the largest growing segment of Japan’s population, will prefer to live in multi-use high-rises close to work and attractions than in the suburbs.

Keeping buildings safe

One of the major codes that govern buildings in Tokyo is the Building Safety Law, managed by the Land, Infrastructure and Transport Ministry and enforced in Tokyo by the Tokyo Metropolitan Government. The other is the Fire Service Law, which has applied nationwide since 1948.

According to the Fire Service Law, a high-rise is a building 101 feet (31 meters) high—the length to which a typical fire department ladder extends—or higher. A building 101 feet (31 meters) tall is about 11 stories, and the Fire Service Law stipulates that buildings 11 stories or higher must be sprinklered. Office buildings, factories, apartment houses, schools, and warehouses 11 stories or less need not be sprinklered. However, fire prevention ordinances in Tokyo require sprinklers in buildings not governed by the Fire Service Law, including those with

Tokyo is a hodgepodge of skyscrapers, high-rises, and one- and two-story dwellings.
brigade, the size of which is determined by the square meters. Buildings 11 stories or higher must have emergency power outlets for firefighter operations. Automatic detection systems are required for small buildings.

Multi-use buildings in Tokyo use three types of automatic detection systems: heat detectors, smoke detectors, and flame detectors, which sound alarms to alert occupants and send a signal to a safety center control room in the building.

Workplace managers are required to form private fire brigades depending on the square footage and occupancy capacity. Movie theaters, for example, those in high-rise shopping centers, must have fire brigades if they’re 107,642 square feet (10,000 square meters) or larger, or if they can hold more than 2,000 or more people. Multi-use buildings that cover 1,858 square feet (20,000 square meters) or more must also have a private fire brigade, the size of which is determined by the building’s size. Japanese building codes are strict when it comes to protecting multi-use structures from fire, since they house different types of occupancies and a large number of unspecified people.

According to the Building Standard Law, the authority to approve or disapprove construction in Tokyo lies with the city building supervisor or designated inspection specialist who must get consent from the Tokyo Fire Chief or one of the local station chiefs before he or she gives the owner(s) permission to build. Houses, built in unzoned areas, such as the suburbs, are exempt from this rule.

Even flame-retardant products inside multi-use buildings are regulated. According to Fire Service Law Article 8-3, high-rises, including the offices and residential units within them, and buildings used by a large number of unspecified people are required to have flame retardant items, such as curtains and carpets above the level set by the Cabinet Order. Officially approved “flame retardant materials” are marked by a white label with red “flame retardant” letters.

On the other hand, upholstered furniture, bedding, and so forth isn’t regulated by law, but is given approval by the Japan Fire Retardant Association, a private body. Items approved by the Japan Fire Retardant Association are designated as “flame retardant products.” For example, officials encourage the use of such designated products for car covers, because arsonists often set fire to car covers in Japan.

Safety-conscious citizens
The Tokyo Metropolitan Government requires every workplace to have a disaster preparedness plan that includes safety drills, and building fire protection managers, who are often the building’s owner, are trained in fire safety and disaster preparedness. Of the 780,000 workplaces in Tokyo, 330,000 must submit preparedness plans to the authorities. Though the owners needn’t submit their plans, they must be prepared, as fire department personnel visit workplaces regularly to make sure plans are in place and are being practiced.

Safety drills are held every year, although the frequency differs according to the type of occupancy.

Public education and these repeated safety drills are key elements in maintaining Japan’s low fire rate. The TFD relies heavily on educating its residents in fire safety and on changing behavioral patterns. This pertains not only to fire safety, but to disaster preparedness, as well. In fact, says Tokyo Fire Chief Tetsuya Sugimura, the department’s “first priority is on earthquake preparedness, residential fire safety, and emergency medical services.”

Fifty-two fire stations in the city have a seismic meter, and every year on September 1, Japanese fire, police, civil defense departments, municipal governments, and residents participate in a national, large-scale safety drill focusing on earthquake preparedness, as well as weapons of mass destruction. This is hardly surprising when you consider that Japan experiences a large-scale earthquake about once a decade and has withstood seven quakes that measured more than 7.0 on the Richter scale since 1945. One of these was the Great Hanshin Awaji earthquake of 1995, which killed 6,000 residents of Kobe. A similar-sized earthquake is feared to strike Tokyo in the future.

After the Great Hanshin Awaji earthquake, TFD officials reviewed and strengthened all its disaster measures. Their goal is to prepare the city for disasters by encouraging officials to redevelop urban areas, particularly those in which wooden houses proliferate; secure open spaces; widen roads; and support the construction of fire-resistant buildings. Large water cisterns have also been strategically placed in important areas, such as refuge areas, to aid fire crews.

Preventing the fires that often erupt after an earthquake is one of TFD’s most important disaster preparedness policies. Fire
Tokyo fire officials also train about two million people a year at three Life Safety Centers around the city run by the Tokyo Fire Department. The Honjo Life Safety Center, one of the three centers, cost 2.8 billion yen to build and is a virtual wonderland of hands-on fire and life safety training, open to the public free of charge.

Visitors to the Life Safety Centers get experience putting out a kitchen fire in the firefighting training section, finding an exit while crawling through a smoke-filled hallway in the smoke maze section, taking appropriate action during an earthquake in the earthquake simulation section, and performing CPR in the first-aid training section. Daily training is provided to anyone interested, including schoolchildren.

All this is part of the TFD's seven-pronged Earthquake Countermeasure Promotion Plan, which also stresses the management of information to save lives and the deployment of specially skilled rescue crews. Technological innovations, such as pop-out electric outlets, have also been introduced to help reduce the threat of electrical fires after earthquakes, and a long-distance water supply system has been implemented to help control fire spread.

**The future**

As the global source of cutting-edge electronic equipment, it may seem surprising that the Japanese rely more on people than technology when it comes to fire safety, but training remains key to the Tokyo Fire Department.

"We continue to enhance volunteer fire corps capabilities, improve our citizens' ability to respond to disasters, and promote fire prevention," says Chief Sugimura.

Every year, the Tokyo Fire Department receives a million emergency calls, and fire service personnel perform about 570,000 ambulance runs, 60 percent of which are minor injuries. And department officials expect this number to climb dramatically in the next 5 to 10 years. The better prepared people are to prevent fires and to respond effectively to disasters on their own, officials feel, the more effective fire crews will be when deployed to an incident.

**FIREFIGHTING ROBOTS**

While search and rescue robotics are new technology in the United States, they've been used in Japan since 1971, when the Tokyo Fire Department first developed a remote-control monitor nozzle vehicle. The department has been using robotics in search and rescue operations, haz-mat responses, and incidents of weapons of mass destruction for more than a decade.

Six types of robots are used in fires and disasters, depending on the circumstances. The unmanned monitor nozzle vehicle, which looks like a mini-tank with a long metal arm attached to the front, was created in response to the Katsushima warehouse fire in 1964. Designed to respond to disasters, the robot is equipped with an obstacle remover than can move haz-mat drums, fallen debris, and other heavy objects. It also has four cameras and two nozzles that can discharge 1,320 gallons (5,000 liters) of water per minute and 792 gallons (3,000 liters) of foam per minute.

At the other end of the robotic spectrum is the remote-control firefighting vehicle, or Jet Fighter (pictured). Only inches tall, the Jet Fighter is used at tunnel and underground shopping mall fires. Propelled by high-pressure water discharge and a motor, it can enter small spaces firefighters can't reach and douse them with water.

A reconnaissance robot, called Fire Search, is an initial deployment device used to survey a fire or disaster scene and measure gas density. Able to ascend stairs, it has an eye-level camera to relay images in heavy smoke conditions and movable arms that can open doors and valves.

The submersible robot Water Search, which was used in underwater rescue operations during an earthquake off Okushiri Island, looks like the motorized scooters used by scuba divers. Equipped with a television camera, it can dive to a depth of 361 feet (110 meters) and has extendable arms that can pick up a person or an object.
NFPA's technical committees have a new home on the Internet. Committee members are logging onto their individual committee pages to find information about upcoming meetings—everything from hotel and airline information, to agendas and minutes from past meetings, even complete ballot packages. Current committee lists are also available, complete with phone and E-mail addresses for all committee members. Committee members can also access the NFPA documents for which their committee is responsible.

The intent of the E-Committee pages is to assist technical committees in their work, not to replace meetings. When changes occur in meeting materials, there's no need to wait for delivery of updated information. Files posted online are immediately accessible in PDF format, viewable using the free Adobe Acrobat download. Access to all other materials relevant to technical committees, such as regulations and procedures, forms and applications, are only a mouse click away.

Response to this new benefit has been good, as committee members and staff learn new ways to disseminate committee information. The majority of technical committees currently have an E-Committee page on www.nfpa.org, and those that don't will have one by May.

Accessing E-Committee info online
For NFPA technical committee members, accessing an E-Committee page is easy. Once you've completed the initial log-in process, which is based on either your NFPA identification number, minus the leading zeros, or a unique committee member number, your log-in identification is your E-mail address, along with a password you set up during the initial log-in. All the committees on which you serve are listed under the technical committee heading in the navigation

FOR MORE INFORMATION ON NFPA'S E-COMMITTEES, GO TO WWW.NFPA.ORG.

CATHY BROWN
is NFPA's manager of Codes and Standards Development. She's overseeing the E-Committee project, along with other web-related activities.
bar down the left side of the screen. This section also contains your member information, along with any subscriptions you may have, including free access to your committee's codes and standards. You can access the same information by clicking on the "My Profile" button next to the "Sign In" button. If you forget your password, there's a handy "Forgot Password" button, on the sign-in page that will E-mail you a reminder.

After each Standards Council meeting, new committee members will automatically receive their log-in information. If you've already logged in, either as a current committee member or an NFPA member, you don't need to go through the set-up log-in again. Your new committee will automatically be added to your list of technical committees.

All committee members were either mailed or E-mailed their log-in information last October. Those of you who may have inadvertently discarded your notification can send an E-mail to stds_admin@nfpa.org, and we'll forward you the information.

What's next for E-Committee? Look for online balloting, which will allow you to review all necessary data and submit your ballot from the secure site of your E-Committee page.
All major amusement parks and family resorts in the United States rely on NFPA standards for pyrotechnic safety. — JOHN NICHOLSON

Many of the largest theme parks and resorts in the United States boast daily pyrotechnics and fireworks displays, which are as much a draw at most large amusement venues as high-speed roller coasters or film-inspired thrill rides. In Orlando, Florida, for example, Universal Studios offers a variety of daily shows using special pyrotechnic effects, while neighboring SeaWorld Adventure Park has a single show nightly. And what would Pleasure Island at Walt Disney World be without the fireworks that cap off the nightly “New Year’s Eve” celebration 365 days a year?

Despite the differences in their pyrotechnic shows, the large resorts and amusement parks in the United States rely on NFPA standards to keep their displays safe. For top pyrotechnics professionals, NFPA codes and standards are the definitive source of information and the basis of their own standard operating procedures.

“NFPA’s standards are the preferred choice because they consider all types of venues and they have exhaustive technical support,” says Jon Fuller of Universal Studios Florida.

The NFPA standards most commonly used by the pyrotechnic community, according to Guy Colonna, NFPA assistant vice president of Hazardous Chemicals/Materials, are NFPA 160, Flame Effects Before an Audience; NFPA 1123, Fireworks Displays; NFPA 1124, Manufacture, Transportation, and Storage of Fireworks and Pyrotechnic Articles; and NFPA 1126, Use of Pyrotechnics Before a Proximate Audience.

Although NFPA’s standards dealing with fireworks and pyrotechnics apply to a very small portion of the U.S. standards-using community, that portion is extremely important to, and active in, the standards-making process, Colonna says.

“Without the operational view, the standards wouldn’t reflect the concerns of those who use pyrotechnics on a daily basis,” says Colonna. “The users bring an exceptional value to the process because of the impact the standards have on them and their operations. They bring their concerns to the table. Without their input, the process would be missing a valuable component.”

How the standards are used

With more than 1,000 fireworks shows a year, many to musical accompaniment, Walt Disney World Resort provides truly impressive pyrotechnics displays. During the Fantasy in the Sky display at the Magic Kingdom, visitors watch as Tinker Bell flies from the top of Cinderella’s Castle to ignite the fireworks in a burst 700 feet (213 meters) in diameter. At Epcot, 12 barges in
the World Showcase Lagoon launch fireworks nightly during IllumiNations. And at Sorcery in the Sky at Disney-MGM Studios, a 55-foot-tall (17-meter-tall) inflatable Sorcerer Mickey rises above the Chinese Theater, shooting fireworks from his fingertip.

According to T.J. Scammon, director of entertainment and global resources for Disney, there are numerous shows at Disney resorts throughout the country and internationally.

"On a minimum, there are four outdoor shows a night and numerous pyrotechnic special effects going on inside the various attractions," he says.

"NFPA standards are the baseline documents for us at Disney. We take the basic information the standards apply, and we have created our own procedures for indoor and outdoor displays," says NFPA member Tony Zmorenski, senior safety technician manager at Disney.

Disney also has its own code-compliance committee to ensure that all special effects are done in accordance with Disney's procedures.

"We create an event for our visitors that is safe and enjoyable. We work very closely with all the performers, and each display, if performers are involved, is carefully choreographed," Zmorenski says.

Disney takes its safety procedures very seriously and is proud of the fact that many of the country's top pyrotechnic specialists got their start at Disney.

"We were here long before the others arrived. Most of the people working at the other resorts trained and worked at Disney. We also continue to share our information with others in the industry, making it safe for everyone," says Scammon.

Disney is considered an innovator in the field of pyrotechnics. Among other things, it has developed its own air launch system for fireworks using compressed air for the final discharge of airborne pyrotechnic materials.

At Universal Orlando Resort, a working film and television studio, there are two theme parks, Islands of Adventure and Universal Studios® Movie Theme Park. Integral to the excitement at Islands of Adventure are the special effects involving pyrotechnics at the Eighth Voyage of Sinbad show. Fireworks are also part of the special effects at the Monsters Revue and the Wild, Wild, Wild West Stunt Show at Universal Studios. Depending on attendance, there are also special events involving evening fireworks displays.

According to Fuller, compliance executive for Technical Services at Universal Studios, the pyrotechnic displays are carefully
planned in accordance with NFPA 1126, and every performer must be at a certain spot, or "mark," for the effect to work. If the performers aren't in position, the effect doesn't take place, or "fire." This fail-safe system is designed to protect those on stage and in the audience, says Fuller.

"All our daily shows are in a roofed building," he says. "They are also being performed during the day, so there's a very low display. We're using the pyrotechnics as special effects for our shows."

Guiding Fuller and his staff at Universal are several NFPA standards. The show's technical director follows NFPA 1123 and the precautions it outlines for the safe discharge of the effect.

"In all instances, we meet or exceed NFPA (requirements)," Fuller says. "Using NFPA standards eliminates any guest (protection) issues."

At SeaWorld Orlando, a 200-acre marine adventure park owned by Anheuser-Busch Companies, more than 80 million visitors have explored the mysteries of the sea with up-close encounters with killer whales, dolphins, sea lions, stingrays, and more. The park also has shows and state-of-the-art rides.

Martin Steinke manages theatrical services at the resort, including the pyrotechnics, the storage and transportation of fireworks, and training. Because SeaWorld is part of Busch Entertainment, Steinke also helps train personnel and plan pyrotechnic displays at other Anheuser-Busch venues.

At the heart of SeaWorld's guidelines are NFPA standards. Steinke regularly consults NFPA 1123, 1124, 1126, and 160.

"Then we have our own guidelines that go a step further," he says. "NFPA 1124 is important to us because we have our own fireworks storage area."

Because SeaWorld's main entertainment thrust is marine life, fireworks displays and pyrotechnics aren't extensive, but that doesn't lessen the need for safe practices.

"We have a fireworks display called Red, Bright, and Blue that was offered on a seasonal basis. About five years ago, it became very popular, so it's offered every night," says Steinke.

In addition to its own shows, SeaWorld works with people outside the resort who want to use the park for their own events, which often include fireworks. These shows are either done by SeaWorld's trained pyrotechnic staff or by a licensed contractor.

"If the performance isn't done by the standards, it will not be performed during the day, so there's a very low display. We are using the pyrotechnics as special effects for our shows."

According to Steinke, "NFPA is a huge help to us when it comes to collaborating with local fire marshals who may not be knowledgeable about all the facets of fireworks displays. But NFPA's standards provide a "common tool for communication," Steinke says. In the state of Florida, the state fire marshals' office actually requires the use of NFPA standards and codes.

"NFPA 160 represents a footprint that can be used throughout the industry," notes Fuller, a member of the Technical Committee on Special Effects, which has oversight of NFPA 160. "It's a true guideline and without it, everyone (licensed in pyrotechnics) would have their own interpretation of what should be done and how a display should be set up. In the industry, NFPA 160 is followed and known as a definitive standard."

"The true intent of the standard is to provide the licensed professional the information needed for safe special effects," Colonna says. "It's intentionally straightforward and isn't difficult for trained people to follow."

However, giving NFPA 160 to an authority having jurisdiction also gives him or her a firm guide to planning a fireworks display.

"NFPA provides good, strong language," says Fuller.

In addition to the specific fireworks standards, Universal, SeaWorld, and Disney all follow NFPA 1, Fire Prevention Code, and NFPA 101®, Life Safety Code®.

"NFPA 101 is the bible," Fuller says. "Its contents are extremely convincing because all the recommendations make sense, and it's enforceable."
History of the standards
The Technical Committee on Special Effects originally developed NFPA 160 in 1994 to help public safety officials, design- ers, and operators of flame effects protect both audiences and performers. For the 2001 edition, the committee revised NFPA 160 to amend standardized definitions and to harmonize with the pyrotechnic special effects document. In addition, editorial changes were made to bring the standard into compliance with the NFPA Manual of Style.

NFPA 1123 was developed in 1975 when the Technical Committee on Pyrotechnics received a proposed standard from the American Pyrotechnics Association. The proposed standard was redrafted and officially adopted by NFPA at its 1978 Fall Meeting. The 1978 edition was amended in 1980, and the amended version was adopted at the 1981 Fall Meeting.

In the 1990 edition of NFPA 1123, the committee completely revised the document to incorporate details pertaining to the operation of outdoor fireworks displays, including an increase in audience separation distances. The committee also addressed the electrical firing of outdoor fireworks displays, a new technology at the time. Generally, the committee provided performance requirements, rather than specific prescriptions for meeting those requirements.

In 1995, NFPA 1123 was revised editorially in accordance with the Manual of Style to make it more user-friendly. The committee also updated the definitions of fireworks to make them consistent with the terminology used in the U.S. Department of Transportation regulations incorporating the United Nations’ shipping designations for fireworks. In addition, the committee incorporated a new chapter containing requirements for electrically firing fireworks displays and refined the provisions for manual firing of large-diameter aerial shells.

The latest edition of NFPA 1123 is the 2000 edition, which contains three significant changes. The first is a new chapter on display fireworks from floating vessels and platforms, which provides guidance on construction, sizing, operation, and egress requirements. The second is the addition of requirements for mortar installation and placement. And the third is a revision and expansion of the tables in Appendix A that provide guidance on mortar wall thickness for steel, paper, high-density polyethylene, and fiberglass mortars.

NFPA 1124, originally designated NFPA 44A, was developed by the Technical Committee on Explosives of the NFPA Committee on Chemicals and Explosives, and adopted as a Tentative Code at the 1972 NFPA Annual Meeting. It was further revised and officially adopted at the 1973 Annual Meeting. A revised edition was adopted in 1974.

In 1980, the Technical Committee on Explosives and the Committee on Pyrotechnics voted to transfer responsibility for NFPA 44A to the Committee on Pyrotechnics. The Correlating Committee on Chemicals and Explosives agreed, and the Standards Council approved the change in June 1981.

Over the next few years, the Committee on Pyrotechnics reviewed the 1974 edition of NFPA 44A and renumbered the document NFPA 1124 so that it was consistent with the other documents relating to pyrotechnics. The revised NFPA 1124 was issued in 1984.

The 1988 edition of the standard updated the references and incorporated the latest separation distances as approved by the Institute of Makers of Explosives in May 1983. It also included new provisions for salutes manufacturing and for storing salute powder.

The 1995 edition included editorial revisions that improved its usability and brought it in line with the Manual of Style. The committee also incorporated the latest separation distances, as approved by the Institute of Makers of Explosives in June 1991, and updated the definitions of fireworks to make them consistent with the new terminology used in Department of Transportation regulations.

A definition and clarification of the storage requirements and separation distances were also added, and the requirements for fireworks laboratories were clarified. In addition, the committee incorporated an appendix that extracts language from the American Pyrotechnics Association Standard 87-1, providing document users with the definitions used in the federal regulations for fireworks, novelties, and theatrical pyrotechnics.

The latest edition of NFPA 1124 is the 1998 edition, which amends the separation distances for fireworks manufacturing plants based upon gross weight, clarifies the storage requirements for manufacturing facilities, and provides requirements for fireworks storage at non-manufacturing facilities such as warehouses and distribution facilities.

NFPA 1126, which covers the use of pyrotechnics in theatrical, musical, or similar productions before a proximate audience, performers, or support personnel, was first published in 1992. It was developed by the Pyrotechnics Committee to provide public safety officials with guidance on the safe use of pyrotechnic special effects indoors and out.

For the 1996 edition, several new definitions were added, including “producer” and “venue manager.” In addition, the requirements for labeling pyrotechnic pre-loads were clarified, and the standard was revised editorially to conform with the Manual of Style. Revisions made regarding the use of pyrotechnics incorporated a tentative interim amendment addressing measures of safeguarding performers.

The 1996 edition of NFPA 1126 was the first completed by the Committee on Special Effects, which is now responsible for flame and pyrotechnic special effects before a proximate audience. The previous editions were the responsibility of the Committee on Pyrotechnics, but NFPA 1126 was reassigned when activity began on NFPA 160 so that the requirements of both proximate audience documents would be consistent.

“With the continued input from organizations like Disney, SeaWorld, and Universal, NFPA standards will continue to reflect the needs and recommendations of those in pyrotechnics,” says Colonna.
ON A RAINY DAY in early September 1999, nine-year-old Daniel Kelly of Brockville, Ontario, Canada, saved his mother’s life. The pair was preparing to set off on bicycles to pick up Daniel’s two sisters at school when the boy handed his mom her bicycle helmet. Although Heidi Kelly always made sure her three children wore their helmets when riding their bikes, she rarely wore one herself. But that afternoon, Daniel insisted.

“I told my mom, ‘You better wear a helmet in case you have an accident,’ “ he told the local newspaper.

Kelly checked over her shoulder to make sure Daniel was still following. As she turned the corner toward the school, she slammed headlong into a bus. Daniel’s story is just one of the many “saves” linked to Risk Watch®, the school-based injury prevention program NFPA developed to teach children, from preschool through grade 8, to recognize and avoid risks. Risk Watch, available for purchase directly from NFPA since 1998, grew out of the Association’s Learn Not to Burn® curriculum, another education series developed in 1979 that focuses on fire safety. “Learn Not to Burn was incredibly successful across the country,” says Judy Comolitti, director of Public Education at NFPA. “But we saw the need for a program that went beyond fire and burn prevention only.”

Teachers and local safety officials, representing fire departments, law enforcement, and health agencies, work together on Risk Watch lessons. The sequential program, which allows teachers to build upon previous lessons, focuses on eight major areas that kill or injure the most children each year: motor vehicle safety; fires and burn prevention; choking, suf-
location and strangulation prevention; poison prevention; fall prevention; firearms injury prevention; water safety; and bicycle and pedestrian safety.

Daniel was introduced to Risk Watch at his school, Commonwealth Public School, which was participating in a three-year independent evaluation of the new program.

Six communities participate
Interwest Applied Research, a research and evaluation firm based in Portland, Oregon, designed and oversaw the evaluation process, which ran from the 1998-99 school year through 2001. Daniel's town was one of six communities that participated in the evaluation, which was intended to determine the impact Risk Watch had on children's knowledge of important safety behaviors. It also sought to reveal the impact these lessons had on the children's lives. Schools selected for the pilot program varied in socioeconomic status and ranged from inner city to suburban schools.

The other communities involved in the evaluation were all in the United States and were Philadelphia, Pennsylvania; Champaign, Illinois; Plano, Texas; Portland, Oregon; and Palm Beach County, Florida. Each community followed the NFPA Champion model, which includes a multi-agency coalition that oversees the program and supports the participants with training, technical support, and classroom visits.

The results were encouraging. Interwest determined that Risk Watch markedly increased students' safety-related knowledge and found evidence that children were putting their safety knowledge to practical use.

"The evaluation showed us all that kids can learn this material and that they can learn to be safer," says Dorothy Stewart, a retired teacher for the Upper Canada School District, who helped coordinate the evaluation in Brockville schools.

"Not only that, but we found out that these kids were teaching other people in their lives to be safer. Daniel Kelly is a perfect example of that," she says.

Comoletti says NFPA opted for an independent evaluation to avoid any appearance of bias. "We had faith in the program, but we wanted to really put it to the test. That's why we chose to hire a consultant for the study," she says. "Good or bad, we wanted to know how effective this curriculum is. We didn't want anyone to have any questions about the validity of these results. We were putting ourselves on the line."

The evaluation process
The communities agreed to provide three classrooms for each Risk Watch teacher module—pre-K, kindergarten, grades 1 and 2, grades 3 and 4, grades 5 and 6 and grades 7 and 8—and a like number of control classrooms in similar schools in their districts that would be observed but wouldn't receive Risk Watch lessons.

"We wanted a control group to compare the progress, if any, of the Risk Watch students," says Evelyn Brzezinski of Interwest. "We wanted to know if, at the end of a session, the program students had a greater knowledge of good safety habits after participating in Risk Watch than the students in the comparison classrooms."

According to Brzezinski, the demographic similarity between the program classrooms and the comparison classrooms was vital, since she wanted no one questioning whether the socioeconomic or cultural variances between the two groups affected the evaluation results.

Central to the evaluation process were multiple-choice tests. The first test was given to students before the first Risk Watch lesson to establish a baseline of safety-related knowledge. The second was administered after the last program lesson to determine how much they had learned. Both the program students and the comparison students took part in the testing. Tests were geared to specific age groups, and the complexity of the questions increased as the grade level increased.

Test results
At the end of the first round, Interwest found that program and comparison students performed similarly, as expected. In the second round of tests, however, Interwest found that the Risk Watch students dramatically outperformed the comparison group. Although the test results for both groups had improved since the first round of testing, scores improved by an average of 9.6 percent in the program group, while the average comparison students' scores rose just 3.9 percent.

Interwest took the test score evaluation process beyond statistics and measured the educational significance of the results. In other words, they tried to determine whether the difference between the first and second test scores was large enough to merit attention from educators.

This process is complex, and there's little consensus in the field about the way educational significance should be determined, but Interwest used the common method of looking across many studies of educational interventions to see how big a difference they make to a student's overall knowledge. Based on this model, Interwest found that the changes in the Risk Watch students' test scores were "very significant." The change in the control group's scores were "moderately significant."

The Risk Watch students demonstrated such a dramatic improvement in safety knowledge in the first two years of the evaluation that several coordinators asked Interwest to end the control portion of the study and allow the students in the control group to participate in the program.

"They basically said that they didn't want the comparison students to miss out on the Risk Watch lessons," says Brzezinski.

Interwest agreed and ended the compari-
son portion of the evaluation at the end of the second year.

**Measuring behavior**
Besides changes in knowledge, Interwest hoped to measure changes in student behavior as a result of Risk Watch participation. For instance, first and second grade students involved in the program were taught to take five giant steps away from a school bus after it drops them off at school. Were they really doing it? Interwest wanted to know whether the Risk Watch lessons were, in fact, causing children to adopt safer behaviors.

The firm planned to look for changes in the way students got on and off school buses, the way they played on the playground, and the way they behaved in the cafeteria. Unfortunately, it became clear early on that evaluators couldn’t follow the students rigorously enough to provide reliable results about behavioral change. “It was just too difficult to accumulate any dependable data,” says Brzezinski.

Interwest also surveyed teachers to learn if the Risk Watch materials were effective and easy to use in the classroom. They received high marks all around. Asked to rate various aspects of the program on a scale of 1 to 5, 5 being excellent, the teachers gave the materials an average score ranging from 4.1 to 4.6. The highest-rated aspects of the program were its effectiveness in teaching students to make good safety choices and the program’s thoroughness. Teachers also provided excellent suggestions for improvement.

Some felt the four-hour training recommended by NFPA was too long. While all agreed there should be some training, they believed instructions on how to teach the content was unnecessary.

A few teachers thought the in-service training that the Risk Watch Champion teams provided was lengthy and that some material was too simplistic for older students. However, most praised the program’s comprehensiveness and its ability to unite schools, fire and police departments, and medical community for life-saving lessons.

“We couldn’t have been happier with the results of the evaluation,” says Comoletti. “The outcome reinforced our belief that Risk Watch is an effective and easy program for teachers to use. Also, the results are going to provide towns with the proof they need to get the program going in their schools.”

In Palm Beach County, the number of schools participating in the program has increased considerably since the evaluation. “We had 12 schools in the pilot. Now we have 20, and it keeps growing,” says Gerri Penney, community education coordinator for the Palm Beach County Fire Rescue and evaluation coordinator for the three-year study.

“It’s won a lot of support here, including support of the Child Fatality Review Team,” she says. “They look into all deaths of children from birth to 18 to see if the deaths were preventable. One of their biggest recommendations now is to get Risk Watch into all the classrooms.”

In Portland, the number of Risk Watch schools has also grown dramatically.

“The current number stands at 65 schools, both elementary and middle,” says Portland Fire and Rescue public education officer Dan Redding, who helped coordinate the Risk Watch evaluation in his area.

“We’ve also reached five schools in the Parkrose district, 10 in David Douglas and we’ve just been approved in 13 schools in the Reynolds district.”

Additionally, Redding has made regular appearances on the Spanish-language educational cable program “Hola Hola” to deliver Risk Watch safety messages. The program is part of the area’s school curriculum for teaching Spanish.

“With this program alone, we’re reaching 25,000 students,” he says. “In four or five years, we’d love to have our own cable show dedicated exclusively to Risk Watch.”

Philadelphia has also witnessed a significant growth in the number of schools involved in the program.

“Our current goal is to get every school involved in the program,” says Philadelphia Fire Department Lieutenant Joe Flores, who coordinated the Risk Watch evaluation in Philadelphia. “We’re a little more than halfway there.

“An independent study like this is really something you can hang your hat on when you’re asking your city or town for funding or asking your schools to make Risk Watch part of their lesson plan,” says Flores.”What most people care about are the objective facts that only a study like this can uncover. We were happy to be a part of it.”

**Risk Watch® WEB SITE**
More detailed information about Risk Watch® is available on the Web at www.riskwatch.org.

The site provides visitors with a glimpse into the curriculum itself and a state-by-state list of Risk Watch resources, as well as special sections for parents and teachers outlining the importance of teaching children about personal safety. There’s also information about establishing Risk Watch programs, including a guide to funding.

In addition, the site has an area for children featuring interactive games and puzzles, each with its own safety-related message. For instance, a game called “Home Hazard Hunt” allows children to search out dangers in the rooms of an animated house. Another poses risk-avoidance riddles. With each correct answer, the player receives one more clue toward identifying the “Risk Riddler.”

Visitors to the Risk Watch web site can also download reports about the three-year independent evaluation of the program, read accounts of how children have put Risk Watch lessons to use to save lives and property, and link to other safety-related web sites such as those of NFPA, Lowe’s Home Safety Council, the National SAFE KIDS Campaign, and the American Academy of Pediatrics.
Complying with the codes in a performance-based environment requires a review of methodologies used to produce the designs.

SIMON FOO, G. A’DOUST, AND KEN RICHARDSON
The success of performance-based design hinges on effectively using relatively new calculation methods, many of which are packaged as computer models," says Milosh Puchovsky of the consulting engineer firm of Arup.1 Because computer models are the tools fire safety designers and regulators will use to evaluate whether a design meets the goals of a performance-based code, their credibility becomes a significant issue.

Structural and mechanical engineers have used computer models for some time and evaluate them as a matter of course. In the fire safety arena, however, these tools are still considered relatively new. Some models, such as those predicting temperatures from a radiant heat source, can easily be verified by experiment, but others, such as risk assessment models that allow one to quantify risk to building occupants, can't. Since risk assessment models are key to providing a sound technical basis for a performance-based code, however, evaluating them is imperative.2

The value of risk assessment models

In their paper “Fire Risk Analysis: General Conceptual Frameworks for Describing Models,” which appeared in Fire Technology in 1991, Drs. John Hall and Ai Sekizawa described fire risk assessment as the most comprehensive analytical approach to developing the information needed to make decisions about “buildings, products, processes, systems and the like.”3 While not specifically acknowledged, fire risk assessment has implicitly been an integral part of our codes- and standards-making system for years.4 Committees evaluating code changes use some form of risk assessment to find the most effective ways to establish code requirements, and regulators and designers creating and reviewing designs for code compliance undertake a risk assessment when specific compliance with the code is unattainable. Formalizing this accepted practice in a computer model, then, will affect the way many NFPA members currently operate.

At the Second Conference on Fire Safety Design in the 21st Century, held at Worcester Polytechnic Institute in Worcester, Massachusetts, in 1999, presenters pointed to the lack of validated engineering tools available to evaluate such models and asked how authorities having jurisdiction were to determine whether the information they produce is valid.5 Recognizing this need, the NFPA Standards Council established a new project in 1999 devoted to fire risk assessment methods and appointed a committee to develop documents “to describe the properties of risk assessment methods for use in regulations.”

The committee has begun its task, but it will be a few years before a document emerges. In the interim, potential users of computer-based fire risk assessment models are themselves trying to find ways to evaluate them for use in design and regulations.

The computer model

One risk assessment model for which an evaluation process has been established is FiRECAM®-Office, developed for office buildings by the National Research Council of Canada (NRC) and Public Works and Government Services Canada (PWGSC). FiRECAM-Office is a “computer program that can be used to assess the level of fire safety that is provided to the occupants in an...office building by a particular fire safety design.”6 On a prototypical basis, NRC has used the model, which also figures the costs of fire safety and fire losses associated with the fire safety design, to assess government office buildings.7

To help prepare for Canada's upcoming transition to objective-based codes, FiRECAM-Office developers considered it necessary for potential users to review the model to ensure that it was appropriate for use in life safety and in regulation. Allowing people to use the model would give them experience in applying it and helped “establish a comfort level in the degree to which the model results correlate with the regulators' own expectations...”8 While the review focused on FiRECAM-Office, the process could have been used to evaluate any risk assessment model.

The evaluation process

Evaluating a computer-based fire safety tool for general use can be somewhat complicated, depending on the complexity of the tool itself, its intended use, and the potential impact of decisions made using it. This was the major issue facing the developers as they embarked on the model's “roll out” for use by the fire protection community.

PWGSC felt that, if a tool such as FiRECAM were to be of value to its staff and to members of other government agencies, consultants, and regulatory officials in cost-effectively renovating office buildings, it was necessary to ensure that the model provided reasonable results, was as free from criticism as could normally be expected, and could easily be used effectively and efficiently by fire safety professionals.

The evaluation typically consists of a series of reviews, sometimes including a scientific
review, as is customary in the peer-review process. Since NRC had already published a number of peer-reviewed papers on FiRECAM and its constituent submodels, the scientific review had already been completed.

A second type of review is the technical user review, in which users assess the model to determine whether it can be used easily, whether it takes into account the relevant design parameters, whether its assumptions represent common practice, whether the probabilities used represent current statistics, and whether its predictions are realistic and reasonable. This is usually done in a controlled manner, and comments from the users become the basis of necessary changes.

During this review, users normally want to see case studies comparing model predictions to data or, in the case of risk assessment models, to best engineering judgements. They may also wish to see the model reviewed by a third-party assessment agency, especially if it’s to be used in a regulatory environment.

Finally, there's the general use review. After a program is released, users may report problems or inconsistencies to the program’s developer or distributor, and changes may be made as a result.

The review process

To review FiRECAM, a multi-disciplinary Technical User Review Committee (TURC) was appointed, and its members were taught to use the model. The size of the TURC was intentionally limited to allow the work to proceed efficiently and to increase the chances that the group would learn to use the model. Of the 11 members, one was a municipal building official, two were fire prevention officers, two were fire safety engineering consultants, two were researchers, three were building owners, and one was a government representative. They were all from the same area and knew each other professionally. They were also, to varying degrees, familiar with FiRECAM and its use.

Once the TURC was in place, case study buildings were chosen for evaluation, and the life safety of one building was subjectively assessed to serve as a basis for comparison.

Parametric analyses were then performed on a number of fire safety options for the case study building using the model, and the computer-generated results were compared to the subjective judgement assessments. Once the weaknesses of the computer-generated results and any difficulties using the program were identified, improvements were recommended. Finally, another parametric analysis was performed using the model on other case study buildings.

Case study

Two office buildings were chosen as prototypes for case study. They weren’t real buildings, but they were representative of a number of PWGSC buildings across Canada.

Building A was a 15-story, center-core building of approximately 11,194 square feet (1,040 square meters) per story with open plan offices on all floors. Building B was an 8-story building with an area of 16,146 square feet (1,500 square meters) per floor laid out either on an open plan or with individual offices, or with a mix of the two. Both buildings’ construction was non-combustible, as described in the National Building Code of Canada.

Sixty-three options or combinations of options were assessed for Building A, but only 19 will be reported here. For the purposes of this analysis, the TURC assessed a “base building” design and compared all other options to that design.

One might conclude that setting full-scale fires in occupied buildings and documenting the occupants’ and building’s responses would be the only way to evaluate a fire risk assessment model's results. Because burning down an occupied building isn't feasible, however, another method of providing a basis of comparison for model results is used: determining individual or collective subjective evaluations.

Such collective, subjective evaluations were used to develop the Fire Safety Evaluation Systems in NFPA 101A, Alternative Approaches to Life Safety, which are updated using a consensus process composed of balanced committees. Most TURC members had already conducted individual subjective evaluations as part of their normal duties as regulatory officials, building owners, or consultants, so they were familiar with this approach.

The TURC members were asked to judge the life safety of Building A by comparing the safety in each of the options to the base building. This subjective process, based on expert judgement, is often used in making fire safety decisions when detailed statistical data aren’t available. The TURC’s results served as the basis of comparison with the model calculations undertaken later.

For the subjective judgements, the base building design was assigned a value of 1 and the code-complying option a value of 10. TURC members assigned scores for the other options based on these two reference points. The standard deviation in the range of assigned scores was ±1 to 2 relative to the mean score. The results show the arithmetic averages of the assigned scores, which were converted to an expected risk to life (ERL) and normalized to the base building design risk. The lower the ERL, the less risk a particular design posed to building occupants.

TURC members used the model to evaluate the same fire safety options for Building A as those they’d judged subjectively. The TURC evaluated the case study options at each meeting to ensure that every member had used the model correctly, and each option was modeled a number of times to make sure the results could be reproduced.

As each option was assessed, TURC members discussed whether the model’s results were reasonable, when compared to the scores...
assigned using subjective judgement. In most cases, the TURC was satisfied that they were and that the ERL numbers generally increased or decreased as expected.

In cases that appeared unreasonable, the TURC recommended that the developers re-examine the model to determine whether there were "bugs" in it or whether the manner in which the phenomena were modeled should be changed. When the calculated results were significantly different from the subjective judgements or didn't seem realistic, further analysis was undertaken to determine the factors that might have led to those differences. However, consistent results from repeated runs on a specific option led TURC members to conclude that the model was providing repeatable solutions.

As part of their work, TURC members also assessed the ease of using the model. They noted that the initial data input for the base building, which took two to three hours, was relatively easy and straightforward and that building conditions for the various options could be changed quickly.

A comparison of the subjective judgements and the model results revealed reasonable agreement between the judgements and calculated results, allowing the TURC to conclude that, with the exception of obvious problem options that required further work, the model provided reasonable and realistic estimates of risk to life for Building A occupants.

The TURC then conducted a second case study to determine the model's ability to address a somewhat different set of building parameters. As with Building A, Building B was a prototype created for the occasion.

Building B was assigned an ERL of 1, and all other options were compared to it. Thus, designs that posed less risk to occupants had an ERL less than 1—in other words, higher safety—and those that posed a greater risk had an ERL of more than 1—in other words, less safety.

During this second series of tests, TURC members decided they didn't have to perform a formal subjective evaluation on the specific options in Building B. As they assessed each option, they decided whether the model-generated result was reasonable and realistic from their individual and collective perspectives.

During the second set of tests, an increase in the number of disabled occupants caused the option building's ERL to become higher than that of the base building. The model's developers addressed this inconsistency, and subsequent versions of the model provided reasonable results.

**Results of the process**

During and after the TURC review, the members' recommended fixing bugs in the system, adding features, and improving the method of modeling certain features. The TURC also recommended that FiRECAM be evaluated further by others knowledgeable and experienced in fire protection.

PWGSC and NRC established task groups to perform similar reviews in three other Canadian cities using both real buildings and prototypes. Following this extensive review, the users concluded that the model's predictions were generally reasonable, although the results differed from the users' expectations in a few situations.

With the completion of the evaluation, plans were made to release the model for general use.

The evaluation of this fire risk assessment model, undertaken by PWGSC, was well-received by the fire protection professionals involved. This process can serve as a template for other agencies that want to evaluate fire risk assessment models for use in a regulatory environment. It will also serve as input to the NFPA Committee on Risk Assessment Methods as it develops a guide to use when evaluating risk assessment methods.

Even with the code-complying solution, there still exists a risk to life to building occupants. However, this process shows one means by which both designers and regulators can ensure that appropriate tools are used to demonstrate compliance in a performance-based code environment.

**Footnotes**

Today, more than ever, people need to be safe and aware 24/7. At Faraday, we engineer and supply products to help keep them that way. You may know us as an industry leader in audible and visual signals, alarm systems and components for fire safety. We also make signaling equipment for transportation, defense and industry applications. In addition, our specialized timekeeping products offer precise monitoring and recording — products that began with the founding of our company more than 125 years ago.

When our name is spoken, a time-proven reputation for dependable performance and quality underscores it. And because of that, wherever people are concerned with safety, signaling or timekeeping, Faraday has a value-added solution.
Sweeping technical changes are proposed for one of NFPA's most frequently used documents. MERTON BUNKER, P.E.
URING THE LAST 18 months, the technical committees responsible for NFPA 72®, National Fire Alarm Code®, have been developing changes for the 2002 edition, which is up for adoption by NFPA members at the World Safety Conference and Exposition™ in Minneapolis in May. With the membership vote to adopt the new edition of the code, it will be published in September.

This new edition represents countless hours of work by committee volunteers, NFPA staff, and users of the code. At the Report on Proposals meetings, held in San Antonio, Texas, in January 2001, committee members processed 587 proposals, a large number of which were submitted by those who use the code. And at the Report on Comments meetings also held in San Antonio during December 2001, committee members processed 422 comments on the proposals.

Among the most visible changes is another restructuring of chapters to conform to the 2000 edition of the Manual of Style for NFPA Technical Committee Documents, the use of which was mandated by the NFPA Standards Council. Because the style manual requires a separate chapter for administrative rules, referenced publications, and definitions, the current chapter on fundamentals was broken up to provide material for the new administrative chapters.

Overall, the code has been reorganized as follows: Chapter 1, Administration; Chapter 2, Referenced Publications; Chapter 3, Definitions; Chapter 4, Fundamentals of Fire Alarm Systems; Chapter 5, Initiating Devices; Chapter 6, Protected Premises Fire Alarm Systems; Chapter 7, Notification Appliances for Fire Alarm Systems; Chapter 8, Supervising Station Fire Alarm Systems; Chapter 9, Public Fire Alarm Reporting Systems; Chapter 10, Inspection, Testing, and Maintenance; and Chapter 11, Single- and Multiple-Station Alarms and Household Fire Alarm Systems.

In addition, the code’s appendices were renamed “Annexes.” Annex A will include explanatory material. Other annexes will include an Engineering Guide for Automatic Fire Detector Spacing; a sample ordinance; extracted sources; and nonmandatory referenced publications. All measurements will now appear in metric units, followed by the English units in parentheses.

For ease of reference, the section and chapter numbers that follow are those used in the 1999 edition of NFPA 72.

Existing Chapter 1

In the definitions section of the existing Chapter 1, Proposal 72-46a and Comment 72-30 changed the term “non-required system” to “non-required (voluntary) system” to indicate that non-required systems are voluntarily installed and aren’t required by building or fire codes. Section 3-2.4, which makes it clear that even voluntarily installed systems must meet the requirements of NFPA 72, was also revised to reflect this change in terminology.

Section 1-6.1.1 was revised to add shop drawings to the list of documents that must be submitted upon request to the authority having jurisdiction (AHJ), and new annex material was added to explain what shop drawings are and what they should contain. This change should result in better documentation and quality control before installation.

Also intended to result in better quality control was a change to the requirements of Section 1-6.2.3, which in the 1999 edition contains specific requirements for certifying and placarding central station fire alarm systems. The revision extends these requirements, in a more general way, to all fire alarm systems, including protected premises (local) systems and supervising station systems. This revision provides a framework for implementing third-party verification when required. Specific requirements for certifying and placarding central station systems can still be found in the chapter on supervising station fire alarm systems.

Yet another change in documentation requirements will require that the installer provide the owner with a record copy of the site-specific software for the system. This change, made by Proposal 72-140, was intended to provide a means of quickly returning the system to normal following a catastrophic equipment failure, such as that caused by a lightning strike.

Proposal 72-69 completely re-organizes the power supply requirements of Section 1-5.2 and provides performance characteristics more consistently. Exception Number 2 and Exception Number 3 to Section 1-5.2.3, which allowed installers to eliminate the secondary power supply where primary power was supplied by a dedicated branch circuit of an NFPA 70, National Electrical Code® (NEC®) Article 700, 701 or 702 system, have been eliminated. NEC Articles 700, 701 and 702 define the requirements for emergency, legally required standby and optional standby power systems, respectively. A primary and secondary power source will now always be required.

Other major changes to power supply requirements include a revision of the secondary power supply capacity requirements of Section 1-5.2.6. Emergency voice/alarm communications systems will require 24 hours at quiescent load and, at the end of that period, 15 minutes of all call. All other systems will require 24 hours at quiescent load and 5 minutes of alarm. The requirements for 60 hours of secondary power for auxiliary and remote station systems will no longer apply.

The rules formerly in Section 1-5.4.3.2.2 will now provide indication and response requirements specific to both latching and non-latching supervisory circuits. In addition, rules formerly in Section 3-8.3.3.1.3 will permit the use of supervisory signals that latch in the off-normal state, where approved by the AHJ. These changes clearly allow supervisory signals to be latched where it’s appropriate for someone to respond, such as for the situation of an unauthorized valve closure.

Existing Chapter 2

Section 2-3.6.1.1 requires a reduction in the spacing of smoke detectors in areas of high-air-movement, based on the number of air changes. However, spacing needn’t be reduced in heating, ventilating, and air conditioning mechanical rooms used as plenums for return air, according to a proposed new rule. This is based on the rationale that reduced spacing under these conditions doesn’t improve response time.

Proposal 72-185 added a requirement for
signage on the manual fire alarm boxes of protected premises (local) fire alarm systems. These signs, intended to let occupants know that the system doesn't summon firefighters, must instruct occupants to leave the building and call the fire department. They must also provide the emergency telephone number.

A new section was added near the beginning of the initiating devices chapter to establish requirements for documenting and approving performance-based designs for detection systems. Companion changes made by Comments 72-144 and 72-147 to the general requirements for heat and smoke detectors address performance-based design.

Existing Chapter 3

Proposals 72-261 and 72-262 moved the requirements for both presignal features and positive alarm sequences from the chapter on fire alarm system fundamentals to the chapter on protected premises systems. Also moved from the fundamentals chapter to the protected premises chapter were the existing requirements for fire safety function and alarm signal actuation times, which were also consolidated. Both changes were made because the requirements apply only to protected premises systems, not all fire alarm systems.

Comment 72-192 removed existing Section 3-8.3.1.2, which requires a manual fire alarm box on any system that uses automatic fire detection or water-flow devices. The section was cut because the requirement is also found in occupancy level codes and needn't be repeated in NFPA 72.

Existing Chapter 4

One of the most interesting of the proposed changes relates to voice intelligibility. Proposals 72-318 and 72-319 revised former Section 4-3.1.5 to require that messages produced by emergency voice/alarm communications systems have an intelligibility score of 0.70 on the Common Intelligibility Scale. This proposal was modified by Comment 72-270, which added the words “where required” to the beginning of the paragraph.

Annex material was added to explain that there may be spaces in some applications that don’t require intelligible voice signaling. Requirements for measuring voice intelligibility testing weren’t added to the testing and maintenance chapter, but Proposal 72-443 added annex material identifying methods of verifying intelligibility.

New sections were added allowing the reduction or elimination of audible fire alarm signals where public mode visible signaling is provided in accordance with the code, as long as the AHJ approves the move or it’s allowed by other governing codes or standards.

Another change affecting the requirements of Section 4-3.4, raises the criteria for minimum sound pressure levels in sleeping rooms from 70 dBA to 75 dBA. Not only does this correlate with international codes, but industry data suggest that an audible signal of 75 dBA is needed to awaken the average sleeper.

Requirements for visible signaling have also changed. Section 4-4.4.1.1(3), which permitted non-synchronized strobes if they were at least 55 feet (16.8 meters) apart in a room that measured at least 80 feet (24 meters) by 80 feet (24 meters), was deleted, and a new requirement synchronizing visible signals in corridors was added.

Both changes are intended to make synchronization requirements for visible notification appliances uniform and prevent seizures in persons with photosensitive epilepsy.

Existing Chapter 5

One of the biggest changes proposed for the chapter on supervising station fire alarm systems will require third-party verification for remote supervising stations. The proposed change calls for either certification or placarding, similar to the requirement for central stations, or compliance with state or local government programs that act as a means of third-party verification. Some local jurisdictions have programs already in place to serve as a surrogate to certification and placarding.

The same proposal also requires remote supervising stations to transmit supervisory signals, as well as alarm signals, because many remote stations supervise sprinkler systems. Transmitting an indication of off-normal conditions allows corrective action to be taken.

Existing Chapters 7 and 8

Proposal 72-431 revised the requirements of Section 7-1.6.2.1 to reduce the scope of re-acceptance testing following system modification. The revised requirements now specify that tests focus directly on affected components, rather than examining much of the system for small changes.

The technical correlating committee directed that all testing and maintenance requirements be consolidated in a single chapter, moving the testing and maintenance requirements related to single- and multiple-station alarms and household fire alarm systems to the chapter on inspection, testing, and maintenance.

In addition, the functional testing frequency for single- and multiple-station smoke alarms was extended to once annually. However, NFPA 72 also requires smoke alarms to be functionally tested in accordance with the manufacturer's instructions, and these instructions often specify monthly, sometimes even weekly, tests.

Technical committee members, NFPA staff, and interested parties have invested a great deal of time and effort in improving NFPA 72, one of NFPA's most frequently used documents. While it may take some time to get used to the organizational changes, they'll make the code easier to use in the long run and more compatible with other NFPA documents.

Many of the technical changes will also make the code requirements easier to understand and enforce. The changes are subject to change since NFPA and the Standards Council haven't approved them yet.
Additional Technical Committee Reports sessions have been added in anticipation of a protracted debate on the proposed Building Code. □ JOHN NICHOLSON

WHEN NFPA MEMBERS GATHER in May at the Minneapolis Convention Center in Minneapolis, Minnesota, for the 2002 World Safety Conference and Exposition™, they'll act on Technical Committee Reports (TCR) recommending revisions to 56 codes and standards including NFPA 5000, Building Code™, NFPA 72®, National Fire Alarm Code®, and NFPA 13, Installation of Sprinkler Systems.

Because so many documents are up for adoption this year, TCR sessions have been scheduled for Sunday, as well as Wednesday and Thursday. If the agenda can't be completed Thursday, there will be a Friday session to handle the Building Code.

Voting at NFPA membership meetings is restricted to members who have registered for the meeting and who have been members of record for 180 days before the opening of the first general session of the meeting. There's only one exception: individuals who join NFPA at a May or November meeting are entitled to vote at the next November or May meeting.

NFPA codes and standards are reviewed every three to five years to keep current with new fire protection technologies,
and many are amended to include lessons learned from significant fires. Revisions follow the same consensus-based process used to create a document.

Anyone may attend the meeting and present views on the Report on Proposals (ROP) and Report on Comments (ROC) for all the code revisions being made. However, the only amendments that may be proposed are those that have been previously published as proposals in the ROP or as comments in the ROC. But anyone may propose that an entire report be returned to the technical committee for further study. Anyone may propose that a portion of an ROP or ROC return to the wording in the previous edition of the document if there’s a change between the release of the ROP and the ROC. After the debate, NFPA membership votes to approve, amend, return a portion of the report to the technical committee, or return the entire report to the committee. The technical committee then votes on any amendments made at the meeting.

NFPA 5000
For years, NFPA explored developing, in cooperation with interested partners, a full set of consensus-based codes and standards for the built environment, and discussions with code adoption officials confirmed that they wanted the option of adopting such a set of codes and standards. So in November 1999, the NFPA Board of Directors charged NFPA staff with developing a plan for integrating NFPA’s codes and standards into such a set.

If approved by the Standards Council, NFPA 5000 will be the first building code in the United States developed through a consensus process accredited by the American National Standards Institute, which administers and coordinates the voluntary standardization system.

Developed in partnership with the Western Fire Chiefs Association and the International Association of Plumbing and Mechanical Officials, the Building Code rounds out NFPA’s Consensus Codes.

NFPA 13, 24
From the new to the established, NFPA members will also vote on revisions to NFPA 13, the first standard published by the newly founded NFPA in 1896 under the auspices of the NFPA Committee on Automatic Sprinklers. Originally titled Rules and Regulations of the National Board of Fire Underwriters for Sprinkler Equipments, Automatic and Open Systems, NFPA 13 has been continuously updated ever since.

The proposed style and format changes for the 2002 edition include restructuring the document to comply with NFPA’s Manual of Style, consolidating underground piping requirements, and expanding requirements to address irregular ceiling configurations.

NFPA 13 provides the minimum requirements for the design and installation of automatic fire sprinkler systems and exposure protection sprinkler systems, including the character and adequacy of water supplies and the selection of sprinklers, fittings, piping, valves, and all materials and accessories, including the private fire service mains.

All underground requirements including those for materials, installation, and acceptance testing were consolidated in Chapter 10 and two new chapters have been added. In one, all non-storage design requirements and approaches, including pipe schedule, density-area method, room design method, special design areas, residential sprinklers, exposure protection, and water curtains, have been consolidated.

The other chapter was created from other NFPA documents referenced in NFPA 13 as a resource for all sprinkler requirements.

NFPA 24, Private Water Service Mains and Their Appurtenances, has also been revised. This standard establishes the minimum requirements for installation of private fire service mains supplying automatic sprinkler systems, open sprinkler systems, water spray fixed systems, foam systems, private hydrants, monitor nozzles or standpipe systems with references to water supplies, private hydrants, and hose houses.

A new Chapter 10 identical to that of NFPA 13 has also been added to NFPA 24. This chapter addresses underground piping in the same language to make the standard more user-friendly.

NFPA 54
NFPA 54, National Fuel Gas Code, applies to the installation of fuel gas piping systems, fuel gas utilization equipment, and related accessories. The proposed revisions include several changes making the document more user-friendly and bringing it into conformance with the Manual of Style.

Revisions in the piping area include new pipe sizing methods, and a reformatting of the pipe size table to highlight piping material covered, gas used, pressure, and pressure drop.

Revisions in the appliance installation area cover air for appliance combustion and ventilation, water heaters in residential garages, gas appliance connectors, and fuel cells. Revisions in the appliance venting area include reformatting the vent sizing tables to highlight vent type and connector type, and new coverage requirements for mechanical draft systems.

According to Ted Lemoff, NFPA 54 staff liaison, the standard includes more than 20 tables and reformatting them, NFPA 54 becomes more user-friendly.

“This provides the user with consistency, and the best layout of the information is used,” says Lemoff.

NFPA 72
During the Report on Comments meetings last December, committee members processed 587 proposals and 422 comments on those proposals for the new edition of NFPA 72. The most visible changes are another restructuring of chapters to conform to the 2000 edition of the Manual of Style for technical committee documents.

Overall, the code has been reorganized and its appendices have been renamed “Annexes.” Annex A includes explanatory material, Annex B is an “Engineering Guide for Automatic Fire Detector Spacing,” and Annex C
contains nonmandatory references.

An overview of NFPA 72 appears on page 92, and this issue’s “Just Ask” column on page 45 covers it, too.

**NFPA 1981**

NFPA 1981, *Respiratory Protection and Personal Alarm Equipment*, covers the minimum documentation, design, and performance criteria, as well as test methods and certification, for open-circuit self-contained breathing apparatus (SCBA) used in firefighting rescue, and other hazardous duties.

The proposed revisions reflect an overall effort by the committee to update the standard to conform with industry requirements.

**NFPA 1001**

NFPA 1001, *Firefighter Professional Qualifications*, identifies the minimum job performance requirements for career and volunteer firefighters whose duties are primarily structural in nature. NFPA 1001 was revised to reflect the Manual of Style. In addition, the technical committee accepted a proposal to write a new definition of “personal protective clothing” and added language to require that those performing vertical ventilation operations act as a team.


**NFPA 402**

Members will be asked to vote on revisions to NFPA 402, *Aircraft Rescue and Fire Fighting Operations*, as well. This standard provides aircraft rescue and firefighting operational procedures for airport fire departments to assure the efficient use of the available aircraft rescue and firefighting equipment and personnel provided.

Among the revisions proposed for NFPA 402 is the recommendations that firefighters participate in regular training exercises and a refinement of definitions within the standard.

Also before members are NFPA 424, *Airport/Community Emergency Planning*, and NFPA 415, *Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways*.

---

**CODES AND STANDARDS UP FOR VOTE**

**Aerosol Products**

NFPA 30B, *Manufacture and Storage of Aerosol Products*

**Agricultural Dusts**

NFPA 61, *Prevention of Fires and Dust Explosions in Agricultural and Food Products Facilities*

**Air Conditioning**

NFPA 90A, *Installation of Air-Conditioning and Ventilating Systems*

NFPA 90B, *Installation of Warm Air Heating and Air-Conditioning Systems*

**Aircraft Rescue and Fire Fighting**

NFPA 402, *Aircraft Rescue and Fire Fighting Operations*

NFPA 424, *Airport/Community Emergency Planning*

**Airport Facilities**

NFPA 415, *Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways*

**Automotive and Marine Service Stations**

NFPA 395, *Storage of Flammable and Combustible Liquids at Farms and Isolated Sites*

**Cleanrooms**

NFPA 318, *Protection of Cleanrooms*

**Combustible Metals and Metal Dusts**

NFPA 480, *Storage, Handling and Processing of Magnesium Solids and Powders*

NFPA 481, *Production, Processing, Handling, and Storage of Titanium*

NFPA 482, *Production, Processing, Handling and Storage of Zirconium*

NFPA 484, *Combustible Metals, Metal Powders, and Metal Dusts*

NFPA 485, *Storage, Handling, Processing, and Use of Lithium Metal*

**Chemical Extinguishing Systems**

NFPA 17, *Dry Chemical Extinguishing Systems*

NFPA 17A, *Wet Chemical Extinguishing Systems*

**Equipment of Industrial Machinery**

NFPA 79, *Electrical Standard for Industrial Machinery*

**Electrical Equipment Maintenance**

NFPA 70B, *Electrical Equipment*

**Explosion Protection Systems**

NFPA 69, *Explosion Prevention Systems*

**Respiratory Protection**

NFPA 1981, *Open-Circuit Self-Contained Breathing Apparatus for the Fire Service*

**Fire Department Apparatus**

NFPA 1911, *Tests of Fire Pump Systems on Fire Apparatus*

NFPA 1914, *Fire Department Aerial Devices*

**Fire Risk Assessment Methods**

NFPA 550, *Fire Safety Concepts Tree*

**Fire Safety Symbols**

NFPA 170, *Fire Safety Symbols*

**Fire Service Occupational Safety**

NFPA 1521, *Fire Department Safety Officer*

**Fire Tests**

NFPA 262, *Test for Flame Travel and Smoke*
NFPA 232
Also up for adoption is NFPA 232, Protection of Records, which provides requirements for records protection equipment and facilities and record-handling techniques that provide protection from fire. Aside from revisions that allow the document to comply with the Manual of Style, the technical committee has recommended a new definition of the term “record.” A record is now defined as “Recorded information, regardless of medium or characteristics made or received by an organization ...”

The section of NFPA 232 dealing with records was also revised to better reflect the language and principles of the records-management profession.

NFPA 101B
NFPA 101B, Means of Egress for Buildings and Structures, identifies the minimum criteria for the design of egress facilities to permit prompt escape from buildings or, where desirable, into safe areas within buildings.

Proposed revisions include changes to the definitions section of the code to better reflect those in NFPA 101®. Life Safety Code®, and the addition of maximum and minimum sizes for handrails.

Subject to approval
Anyone dissatisfied with an action taken during the codes- and standards-making process can file an appeal with the Standards Council. Appeals may cover the Council’s decision to develop a certain document; the Association’s action on a proposed Committee Report at an NFPA meeting; the technical validity or fairness of a document or part of a document; and the Council’s decision to appoint a nominee to a committee.

Notification of an intent to file an appeal must be filed within 20 days of the debate that occurs at an Association meeting. The Standards Council considers all the information that was presented, as well as the vote of the membership and the disposition of any appeals, and decides whether to issue the document. If a code or standard is approved, it’s issued in the form of a pamphlet and published in the appropriate volume of NFPA’s National Fire Codes.
Learning from 9-11

Research organizations and other agencies eye wide-ranging safety improvements.

PAMELA R. WEIGER AND JOHN NICHOLSON

Last summer, Ken Catlow, operations group leader at the Pentagon Renovations Project, had a clear vision of the future of the Pentagon’s renovations: nine uninterrupted years of strengthening the blast resistance of one of the world’s biggest office structures. On September 11, however, all that changed.

In the wake of the tragedies at the Pentagon and the World Trade Center (WTC), Catlow and many other architects, structural engineers, fire protection engineers, and emergency response officials put their plans on hold to participate in numerous studies and investigations designed to assess the structural and fire protection performance of both targets and to define the lessons learned from the emergency response and evacuations. While recommendations from the teams studying the WTC collapse are expected to be more extensive than previously anticipated, thus delaying their release, many recommendations from the early Pentagon studies have been implemented.

Studying damage

Spurred by the urgent need to rebuild in the days following the attack, designers and engineers launched several preliminary structural-performance investigations of the Pentagon, independent of the long-range plans to renovate the 6.5-million-square-foot (604,000-square-meter) structure by the end of 2010. Among these was a 30-day Pentagon Rebuild Retrofit Study of the Pentagon’s blast resistance undertaken by members of the U.S. Army Corps of Engineers, who took advantage of the fact that the hijacked Boeing 757 hit the building between the already-renovated Wedge 1 and the older Wedge 2 to analyze the effectiveness of the renovations made before September 11. Wedge 1 was the only one of the building’s five wedges reinforced after the 1995 Oklahoma City bombing.

The study showed that Wedge 1’s newer windows and walls withstood the attack much better than Wedge 2’s structural components. Floor-to-floor, interconnected vertical steel beams, sturdier windows, and armored panels in the exterior wall are credited for slowing the plane as it slammed into the building and mitigating the effects of the explosion, saving lives by keeping more of the building intact.

“The new windows were superior and saved many lives,” says Catlow. The attack “validated a lot of the design in Wedge 1, and we felt good about that.”

Part of the design the engineers and designers were pleased with were the new strobe lights and sirens and Wedge 1’s new sprinkler system. They performed so well that officials are considering dividing the sprinkler areas into zones to keep portions of the system intact in the event of another attack.

With reports of concrete spalling at temperatures of 1,800°F (982°C) in some parts of the building, team members are investigating the feasibility of fireproofing the structural members and installing an automated smoke control system. Also under consideration are a river-water supply system that can be brought on line should the domestic water supply fail, as well as the standardization of office density and space.

In addition to the Pentagon Rebuild Retrofit Study, another Pentagon task force compiled a list of 105 areas of concern by interviewing those who escaped when the plane hit. The list was pared to 26 recommendations in the areas of fire protection, blast resistance, and chemical, biological, and radiological resistance. Some of these, such as the installation of photoluminescent signage, have already been implemented.

“When the plane hit, it took out our secondary power source, an emergency generator, so we lost primary and secondary power, making it very dark in parts of the building,” Catlow says.

The new photoluminescent signs, installed in the building’s baseboards, provide direction at floor level for people crawling through dense smoke. This recommendation was deemed so critical that baseboard lighting was installed in all portions of the Pentagon, even those not in the process of being renovated.

“We can’t ignore the rest of the building for eight years,” says Catlow.

Other life safety improvements include issuing flashlights, respirators, and exit directions to Pentagon employees; upgrading the building’s firefighting equipment and emergency notification system; establishing a fire
warden system; and strengthening the Pentagon’s Incident Response Teams to ensure the availability of trained people who can help the fire department.

Overall, the reconstruction of Wedge 1, known as the Phoenix Project, continues at a rapid pace. It’s scheduled to be completed by September 11, 2002.

**Arlington County response**

In the community around the Pentagon, located in Arlington, Virginia, across the Potomac River from Washington, D.C., the lessons taught by September 11 are also being heeded.

Arlington County Fire Chief Edward Plaugher, who has believed for years that the Pentagon would someday be the target of terrorists, commanded the fire department response for 10 days and calls the Pentagon “a stodgy old building that could, should, and did perform well.”

The logistics of the response alone were overwhelming. Plaugher cites the “miles of six-by-six timbers” needed for perimeter fencing, along with the boots, helmets, coats, and a “truckload of latex gloves that came with a police escort.” He’d like to see the creation of a Northern Virginia logistics response team that would be in charge of “just this sort of thing and would be available for anything.”

Plaugher, whose department was on site planning responses to the renovated portion when the terrorists struck, also envisions the creation of a system to guide a fire department’s interaction with the many players involved in incidents of this magnitude. Although his department responds to the Pentagon daily and works regularly with Defense Protective Services officials, the number of people from the federal, state, local, military, non-profit, and private sectors who came to assist overwhelmed him.

“There are so many more players, and a structured interaction with those players is where we’re headed,” says Plaugher.

To determine the impact of the incident on his personnel, Plaugher mounted a review of what happened. The investigation, funded by a Technical Assistance Grant from the U.S. Department of Justice, began immediately and focused on the performance of his firefighters and emergency personnel.

He hired an outside consultant to debrief all fire service personnel once the department cleared the incident, and asked a facilitator from the International Association of Fire Chiefs to lead the firefighters in a critique that excluded chief officers. Plaugher wanted to ensure that his personnel felt free to speak candidly about the incident without being influenced by their supervisors.

“Emotions were huge, and we needed to bring in someone from the outside to steer us in a non-emotional direction,” says Plaugher. “I’m hoping to have an after-action report that provides a blueprint to prepare the fire service for [future] catastrophic incidents, particularly terrorist-related incidents.”

**Congress spurs action**

Because the scope of the WTC disaster far exceeded that of the Pentagon disaster in terms of both lives lost and property destroyed, the investigations into it are expected to take much longer and be much more complicated than originally anticipated.

The House Committee on Science, chaired by New York Republican Sherwood Boehlert, recommended in March that a more comprehensive study of the WTC be undertaken and that enough federal funding be allocated to support it. Members of Congress particularly wanted an organization in charge that could produce a study leading to an evaluation and possible improvements in existing building codes, fire-testing standards, and fire codes. This lead agency is the National Institute of Standards and Technology (NIST).

NIST Director Arden L. Bement, Jr., told committee members that his agency has policy approval to undertake a national building and fire safety investigation of the World Trade Center and that NIST researchers will also conduct a series of short-term WTC studies. Both short- and long-term studies are supported by Secretary of Commerce Donald L. Evans, the Port Authority of New York and New Jersey, New York City Mayor’s Office of Emergency Management, the New York City Department of Design and Construction, and the Fire Department of New York.
As part of the national building and fire safety investigation of the World Trade Center, NIST researchers will examine why and how the WTC buildings collapsed; the technical aspects of fire protection, response, evacuation, and occupant behavior and emergency response; and procedures and practices used in the design, construction, operation, and maintenance of the buildings. They will also look at new technologies and procedures that might reduce the potential risks of such a collapse.

"The goal of this broader program is to produce cost-effective retrofit and design measures and operational guidance for building owners and emergency responders," Bement told committee members. "The program would develop and disseminate guidance and tools to assess, and produce the technical basis and recommendations for cost-effective changes to reduce vulnerabilities."

Bement explained that the NIST study will focus on the Twin Towers, not only because their collapse triggered the damage done to the surrounding structures, but also because many of the towers' design features are still used by the construction industry. The NIST study will try to determine what measures are needed to give buildings the strength to resist abnormal loads, such as the impact of an airplane and an ensuing fire. Researchers will also study the effectiveness of fire protection and firefighting technologies and practices for tall buildings.

WTC Building 7 may also be included in the study because it, too, collapsed.

NIST is expected to incorporate into its study information collected by the Federal Emergency Management Agency (FEMA) and the American Society of Civil Engineers (ASCE) Building Performance Assessment Team (BPAT), which is expected to be released soon. The national building and fire safety investigation of the World Trade Center is expected to be released in 2004.

"The results of the proposed investigation would be...meaningless unless we take the knowledge gained and put it to practical use," according to Bement. "That's why NIST, in partnership with FEMA and a number of private-sector organizations, has developed a broader response program.

"This broader program would address critically and urgently needed improvements to national building and fire standards, codes, and practices that have begun to be recognized in recent years."

While the NIST-led national building and fire safety investigation of the World Trade Center is being conducted, short-term and interim projects will be undertaken to provide facility owners, contractors, designers, and emergency personnel with guidance, tools, and technical assistance to prepare them better for future disasters.

Some of these projects are already underway. In February, for example, John Gross, leader of the structural systems and design group at NIST's Building and Fire Research Laboratory, and three private-sector and academic experts visited four scrapyards in New York and New Jersey where steel from the WTC is being stored to identify samples to be sent to NIST's Gaithersburg, Maryland, facility. NIST will store the samples to ensure that any future investigation, whether conducted by NIST or another organization, has secure steel samples ready for scientific study. The short-term studies NIST is undertaking will focus on fire, the buildings' progressive collapse, and threats to commercial and institutional buildings and facilities.

According to Bement, fire played a critical role in the collapse of the WTC buildings and contributed to the damage done at the Pentagon. Current building design practice doesn't consider fire a design condition. Instead, he says, building codes prescribe structural fire-endurance ratings based on standard tests of individual components.

"The current testing standards are based on work carried out at NIST in the 1920s," said Bement. "They don't represent real fire hazards in modern buildings. They also don't consider the fire performance of structural connections or of the structural system as a whole, or the multiple performance demands on fire-proofing materials. NIST now has the capability to simulate building fires on the computer to explain critical events and outcomes to an extent previously not possible."

Interim NIST studies will also examine progressive collapse, which refers to the spread of failure by a chain reaction that's disproportionate to the triggering event. According to Bement, current U.S. standards, codes, and practices don't address this type of collapse.

Finally, NIST will investigate ways of reducing the vulnerability of commercial and institutional buildings to chemical, biological, and radiological attack.

"Most (buildings) aren't protected against chemical, biological, and radiological (CBR) threats. While efforts are underway to protect military buildings through the Department of Defense's (DoD) 'immune buildings' program, there are no standards and practices for civilian buildings," Bement said. "NIST proposes to work with the DoD to develop guidelines and advanced technologies to reduce the vulnerability of such buildings to CBR attacks.

"NIST also proposes to work with industry
to develop standards for building information models and information exchange, and practicable tools for helping building owners make reasoned economic choices in reducing the vulnerabilities of their buildings."

The results of some of these studies will be disseminated within a year, and the rest when the investigation is completed, says Bement.

Future studies

Many, like Professor Glenn Corbett of John Jay College of Criminal Justice in New York City, agree that we need a governmental structure or protocol to investigate terrorist attacks.

In his testimony before the House Committee on Science, Corbett, who is also an engineer, recommended that to better assess the events of September 11 and produce meaningful future actions, a comprehensive plan to handle large-scale investigations is needed.

"We need to have a greatly enhanced national disaster investigation response protocol, providing for a systematic approach," he said. "We must bring in experts in a rapid, organized manner to extract all of the lessons from a disaster. Finally, and most importantly, we need to ensure that the lessons are actually applied."

According to Corbett, a variety of research projects undertaken for disasters, such as the Oklahoma City bombing and the Northridge earthquake produced very useful information, but were conducted independently, without the benefit of a central coordinating body to integrate all the information.

"In addition, it has become apparent that some of the very critical lessons never found their way into general design practice," Corbett said.

Furthermore, Corbett said, issues involving high-rise building construction, emergency evacuation procedures, firefighting operations, and other important concerns must be analyzed collectively so we can learn from the disaster and apply the lessons to the future.

Corbett recommends the establishment of a World Trade Center Disaster Commission, organized and led by FEMA, that would allow the various public and private research efforts currently underway to come together "under one roof," facilitating the sharing of information, a critical issue when studying a disaster as complex as the collapse of the WTC towers. The complexity of the WTC itself necessitates that the disaster be investigated in a multi-disciplinary context, allowing the interrelationships among the areas of concern to be identified.

National Science Foundation grants

Also playing a part in the WTC investigation is the National Science Foundation (NSF), which awarded engineers and social science researchers eight grants within weeks of the terrorist attacks to conduct post-disaster assessments. For the most part, the grants went to teams already in place as part of NSF's ongoing disaster response program, so funding was immediately supplied to quick-response research.

The teams funded by the eight grants produced their first findings at the end of 2001. Among those receiving NSF grants was Frederick Mowrer, associate professor in the Department of Fire Protection Engineering at the University of Maryland, who used the funding to look into the performance of fire protection materials and systems during the WTC fires and collapse of the Twin Towers.

Dr. Mowrer, who began by studying photographs taken during an inspection of the building's fireproofing between 1992 and 1996, drew public attention when his preliminary report suggested that this was an area that warranted further study.

"There are some indications that there were some deficiencies, but at this point we don't know if [the deficiencies] were corrected between the time they were observed and the 9-11 incident," Mowrer says. "We also don't know how many of the deficiencies were in the area of impact or the areas affected."

Within the next year, Mowrer plans to compare the WTC incident to two other multi-floor burnouts in high-rise buildings, the 1988 First Interstate Bank building fire in Los Angeles, California, and the 1991 fire at One Meridian Plaza in Philadelphia, Pennsylvania. Neither of these buildings collapsed, despite fire on multiple floors (see "Looking Back" on page 160).

Mowrer would like to analyze the effects the jets' impact, the jet fuel, and the structural design of the WTC had on the outcome on September 11, as compared to the outcomes of the 1988 and 1991 fires.

In other NSF-funded research, Abolhasan Astaneh-Asl of the University of California at Berkeley and a colleague are collecting data on the mechanical and structural properties of the WTC towers, particularly the steel, to determine how they were affected by heat, fire, and impact.

Like many of the researchers looking into the collapse of the WTC towers, Mowrer refuses to accept what he calls an "attitude of inevitability": if a plane hits a building, collapse is inevitable.
“I’m saying it may not be [inevitable], and we won’t know without a thorough analysis,” he said. “Clearly, these were extreme events and it’s impractical to design a building for no damage, but perhaps we could make improvements to reduce the probability.”

**Learning from the lessons**

In the months following the attacks, a number of engineers stated that they believed each tower could have withstood the impact of a single large airplane, as it was designed to. Once the aviation fuel in each Boeing 767 exploded into flames, however, it was just a matter of time before the towers collapsed.

The heat from the jet fuel fires, which are estimated to have reached temperatures of 2,000°F (1,093°C) are above temperatures that can reduce the structural strength of steel trusses used to hold up the concrete slab floors. The supports may have pulled away from the walls as the steel began to weaken.

The skyscrapers had two means of defense against normal fire damage. One, thick layers of insulation sprayed onto the steel beams, could have been breached by the initial crash. The other, the building’s sprinkler system, may have been disabled as well, or it may simply have been useless in the heat of the fire. In a conventional fire, the towers’ sprinkler systems could have been sufficient to control the blaze, but these unconventional fires would have overwhelmed the suppression systems if they were still operational.

The initial impacts probably rendered the sprinkler and standpipe systems inoperative on the fire floors and displaced any fire-resistance coatings on the structural steel. This exposed the steel to temperatures in the range of 1,600°F (871°C) and higher. Even if the fire protection systems had remained operative, it’s unlikely they’d have discharged enough water to protect the structural steel.

**WHAT NFPA IS DOING**

Two representatives of NFPA serve on international teams examining the September 11 collapse of the WTC towers. Robert E. Solomon, P.E., NFPA’s assistant vice-president of Building and Life Safety Codes, is a member of the special task force on the Future of Tall Buildings, formed by the Council on Tall Buildings and Urban Habitat (CTBUH). And Robert F. Duval, NFPA’s senior fire investigator, serves on the American Society of Civil Engineers (ASCE)/Federal Emergency Management Agency (FEMA) Building Performance Assessment Team (BPAT) for the WTC.

The BPAT team is examining building performance in the towers and surrounding buildings. Duval serves on BPAT’s support team, collecting and organizing data related to several buildings in the WTC complex. He’s also a liaison with the New York fire service and responsible for gathering relevant information from past NFPA studies.

Other BPAT team members include representatives of various structural and fire protection engineering groups, as well as the concrete, steel, and masonry industries.

**BPAT report**

According to Dr. W. Gene Corley, WTC BPAT team leader, the collection of data and information pertinent to the study began while the team was assembled and the supporting coalition organized. A significant part of this data collection took place from October 7 to 12, when the team conducted an on-site examination of the debris and the buildings affected by the collapse. The City of New York granted the team access to the site on September 29.

The team was provided with unrestricted access to all areas of the site, except those in which their presence might have impeded rescue and recovery efforts and those that had been determined to be too hazardous.
Experts in the field are optimistic that some of the lessons learned from the attacks on the WTC and the Pentagon may translate into changes and refinements of life safety and fire prevention codes and standards.

According to David A. Lucht, P.E., professor and director of the Center for Fire Safety Studies at Worcester Polytechnic Institute in Worcester, Massachusetts, the evacuation of the WTC on September 11 was a remarkable affirmation of NFPA 101®, Life Safety Code®.

"The evacuation was remarkable and a tribute to the Life Safety Code. It's remarkable that those on the floors below the areas of impact made it out; it shows that the exiting system works. The evacuation of the World Trade Center is a validation of the work being done, not simply a lesson learned," says Lucht.

One area that engineers will likely explore, Lucht says, is fireproofing.

"I'm sure it will be an area that NFPA technical committees will examine and review," says Lucht, who has also served on the NFPA Board of Directors and is a Fellow and past president of the Society of Fire Protection Engineers. "If the studies being done conclude there's a problem (with fireproofing) how could you avoid it?"

Duval explains that the WTC BPAT is much different that those traditionally deployed following natural disasters. For example, the BPAT sent to Puerto Rico following the Hurricane Georges inspected damage to residential and commercial buildings and other structures; evaluated local design practices, construction methods and materials, building codes, and building inspection and code enforcement processes; and made recommendations on design, construction, and code issues.

The WTC BPAT is taking the methods used for research and survey after a natural disaster and applying them to a terrorist attack. Unfortunately, the size and scope of the WTC is more complicated than most natural disasters.

As for the impact of the BPAT's report on U.S. building and fire codes, Duval says it's too early to tell what changes might result.

"Each [NFPA code] committee will have to decide if this is a watershed incident for code changes," he says. "Codes change to address a few individual incidents, but this is so extraordinary."

CTBUH response
Some groups are looking ahead. One such group is a task force of 24 leading building industry experts formed by the CTBUH, which is looking into actions that can be taken to enhance the emergency performance of buildings. NFPA has been a member of CTBUH, which comprises the architectural, engineering, and building profession communities, since 1997.

The task force, composed of architects, security officials, engineers, and property owners and managers, is finishing up an overview of items of which high-rise building operators need to be aware in the areas of physical properties, safety systems, and the education of building occupants. The resulting guide is expected in early summer.

"It's a reinforcement of things we've known for a long time," says Solomon.

Solomon says the task force is focusing on new strategies that may be considered in the design of tall building, including performance-based design, in hopes of increasing the performance of tall buildings subjected to extreme events. Also of interest to the task force are global changes for building design, the potential for enhanced use of vertical transportation systems, and the practicality of incorporating these measures in buildings in the future.

When the task force met last October, it concluded that there are several actions that can be taken to enhance the emergency performance of buildings, including the design of explicit egress strategies, the installation of multiply-redundant building systems and integrated building control systems, the use of performance-based design, education, and research.

NFPA's own studies
With funding from NIST, NFPA will undertake three studies of its own of the evacuation of the WTC. Rita F. Fahy, Ph.D., NFPA's manager of Fire Databases and Systems, will work on these studies with Guylène Proulx, Ph.D., a researcher at the National Research Council of Canada. NFPA and NRCC conducted a similar study of the WTC evacuations, using first-person accounts taken from the media. Fahy and Proulx will present the results of the third study at the NFPA World Safety Conference and Exposition™ in May.
Keeping You Informed of Critical Issues in Your Industry

"Section News" made its debut in our last issue of NFPA Journal, and in this issue, we've packed the next few pages with the latest news and information affecting your industry. Read expanded versions of these articles on each section's web site, where you can also find out how joining a section can enhance your career. If you haven't yet enrolled in a section, please download an application from the web site www.nfpa.org/membersections. Section membership, free to all NFPA members who qualify, helps target your benefits to your particular interests. If you're an NFPA member interested in contributing to "Section News," please contact the Executive Secretary of the section for which you'd like to write.

Architects, Engineers, and Building Officials

WEB SITE: http://www.nfpa.org/aebos
SECTION CHAIR: John Kampmeyer, Triad Protection Engineering Corp., Springfield, Pennsylvania
WHAT WE DO: Help increase expertise in fire and life safety design practices and bring together partners in the structural field to discuss cooperative fire and life safety efforts.
WHO WE ARE: Architects, engineers, building officials, code administrators, and others interested in building design, construction, and code enforcement.

HOT ISSUES

AEBO seminars at NFPA's World Safety Conference

EBO will sponsor several seminars at NFPA's World Safety Conference and Exposition™ in May. Among them is the two-part program, "Introducing NFPA 5000: The New Generation of Building Code," on May 22. This is an executive summary by several stakeholders in building design and construction intended to give building owners, design professionals, contractors, and code administrators a sense of the document and to highlight the issues and philosophies that went into its development.

The program moderator is Section Chair John Kampmeyer. Participants include Peter J. Wills, P.E., of the Structures Technical Committee; Nancy McNabb, AIA, of NFPA's Building Code field office; Steve Anderson from the city of Gillette, Wyoming; Sal Di Cristina of Rutgers University; Jerry Mallory of Johnson County, Kansas; Tom Scholten, C.B.O., of the Ada County Development Services; Steven Wydevel of the Will County Land Use Department; Robert O. Younger of the city of Colleyville, Texas; and Dave Martinez.

On May 20, NFPA's Allan Fraser will present "Code Provisions for Existing Buildings," which focuses on issues that arise when one proposes to work on an existing building and explores the challenges of creating codes for such buildings.

On May 22, NFPA Fire Modeling Specialist Doug Beller will address the "Theory and Concepts of Performance-Based Codes." He'll describe the development of performance-based codes and how they compare to prescriptive codes, and he'll discuss what's needed to implement a performance-based system. Beller chairs NFPA's Performance-Based Support Team, helping NFPA's technical committees incorporate performance-based options into their documents.

Aviation

WEB SITE: http://www.nfpa.org/aviation
SECTION CHAIR: Joseph Scheffey, Hughes Associates, Inc., Baltimore, Maryland
WHAT WE DO: Offer members who design, operate, or protect aircraft, aircraft facilities, and airports a forum in which to discuss fire and life safety concepts.
WHO WE ARE: Aircraft and airport designers, pilots, air traffic controllers, airport security personnel, and others interested in aviation fire and life safety.

HOT ISSUES

Ground-Based Fuel Tank Inerting

On May 22, at NFPA's World Safety Conference and Exposition, William Cavage of the FAA will discuss ground-based fuel tank inerting of commercial transport airplanes and the research that went into developing ground-based fuel tank inerting methods and equipment, giving a background on the concept's evolution. He'll also speak about the potential impact on commercial transport operations.

HOW TO REACH US: MARK CONROY, EXECUTIVE SECRETARY, +1-617-984-7410, MCONROY@NFPA.ORG

Building Fire Safety Systems

WEB SITE: http://www.nfpa.org/bfss
WHAT WE DO: Promote fire and life safety in buildings through fire safety systems and equipment, and provide a forum for education and training.
WHO WE ARE: Fire safety system designers, distributors, manufacturers, installers, inspectors, and maintenance personnel.

HOT ISSUES

BFSS Nominations for 2002 WSCE

The Nominating Committee has submitted the following nominations, to be voted on at the 2002 World Safety Conference:
May 2002 Educational Programs

The BFSSS will have a full agenda this May in Minneapolis, with five educational programs. The section continues its successful series of programs for two important documents up for adoption at the conference, NFPA 13, Installation of Sprinkler Systems, and NFPA 72®, National Fire Alarm Code®. The programs will highlight the changes in these documents that most affect the section membership.

The Industrial Section will co-sponsor three other programs. The first, "Automotive Protection for Automobile Manufacturing Facilities," will detail a research project sponsored by Ford Motor Company to develop new fire protection design criteria for exposed Group A plastic automotive component storage using K-25 sprinklers installed on extended coverage spacing. The second, "A Better Idea in Fire Protection," will review the features that must be provided for the automated vehicle spray paint processes associated with today's large vehicle assembly operations. The second, "A Better Idea in Fire Protection," will review the fire protection features that must be provided for the automated vehicle spray paint processes associated with today's large vehicle assembly operations. The second, "A Better Idea in Fire Protection," will review the fire protection features that must be provided for the automated vehicle spray paint processes associated with today's large vehicle assembly operations. The second, "A Better Idea in Fire Protection," will review the fire protection features that must be provided for the automated vehicle spray paint processes associated with today's large vehicle assembly operations. The second, "A Better Idea in Fire Protection," will review the fire protection features that must be provided for the automated vehicle spray paint processes associated with today's large vehicle assembly operations.

Membership Continues to Increase

The membership of the BFSSS continues to grow. In the three months between the fall meeting in November 2001 and February 2002, section membership grew 9 percent to 2,949 members, making it the sixth-largest NFPA membership section. By May, we should be well over the 3,000-member mark. Good job, everyone.

Education

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


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

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

HOT ISSUES
Close-Up of Jim Dalton
National Fire Sprinkler Association

Jim, tell us a little about yourself.

From 1960 to 1977, I rose through the ranks of the Montgomery County, Maryland, Department of Fire and Rescue Services to the rank of assistant chief. I spent my last eight years as chief of the Fire Prevention Division, retiring in 1985. During my tenure as Fire Prevention Division chief, I was invited to participate in one of the first national fire-safety education conferences sponsored by the National Fire Prevention and Control Administration, now the U.S. Fire Administration, in 1977. That's where I got involved in fire safety education. It literally changed my life, both professionally and personally. Since then, I've been a devout supporter of, advocate for, and practitioner of fire safety education as a means of reducing the nation's inexcusable fire death, injury, and property loss statistics. I realized that, through fire safety education, we could change behavior and implement early warning detection and residential fire sprinkler programs to achieve our goal.

I'm an old ballplayer and still love sports. I live out in the horse country of Virginia in sight of the Blue Ridge Mountains. I guess I'm a country boy at heart. I'm a poet and songwriter, and I've published a book titled Albuquerque Autumn Afternoon. I especially like cowboy poetry. I also love the Old West, and I'm a sucker for an old western movie. I guess I was born 100 years too late! But then, I wouldn't have met all of the friends I've made as I've traveled America, preaching the gospel of fire safety education.

How and why did you get involved in the Education Section?

As chief fire marshal for Montgomery County, I was a member of FMANA, but I later joined the Education Section, since education was always my first love. The section lets me keep in touch daily with the fire safety education network and practitioners all over the country. Through the section, I can also keep up with
the state of the art and explore the myriad other resources out there.

Tell us about your work with the National Fire Sprinkler Association (NFSA).

As director of Public Fire Protection for NFSA, I work with communities across the country to promote fire sprinklers as a means of reducing death, injury, and property loss numbers. To do this, we need to use all the tools in our fire protection toolbox.

The key to increasing the installation of sprinklers, especially residential sprinklers, is public education. Sprinkler adversaries have spread a lot of inaccurate information, and policymakers and the public need the facts. Public education is the key. I’m the NFSA representative to the Home Fire Sprinkler Coalition, and NFSA graciously gives me the time and means to participate as an Education Section Executive Board member, too.

What’s your biggest accomplishment while serving on the Education Section Board?

I was the author of our current five-year plan, which provides a road map for future section growth and direction. I’m a big believer in having a plan! I’ve also had the opportunity to work on the Program Committee with Peg Carson and to have a hand in bringing timely, quality topics before the section at the NFPA’s spring and fall meetings.

What do you see in the future for the Education Section?

We must work to keep the network together, but we must also work to increase section membership so that the network expands. One of our goals should be to make the NFPA fall meeting the place to be for fire safety educators. To do this, we have to work hand in hand with the NFPA Public Education Division and its flagship programs, such as the Champion Program and Risk Watch®, and use our combined resources to provide timely, quality programs that give educators continuing opportunities to increase their level of professionalism.

HOW TO REACH US: JUDY COMOLETTI, EXECUTIVE SECRETARY, +1-617-984-7287, JCOMOLETTI@NFPA.ORG

Jeff Sargent, executive secretary, +1-617-984-7442, JSARGENT@NFPA.ORG

Fire Service

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

SECTION CHAIR: Gordon Hartschuh, Chief (ret.), Akron, Ohio

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

HOT ISSUES

Performance-Based Design Talk

On May 21 at NFPA’s 2002 World Safety Conference and Exposition,™ Fire Science and Technology Educators Section Board Member Robert Gagnon will host a presentation on performance-based fire alarm design. He’ll demonstrate the application of the SFPE performance-based design methodology to fire alarm design, analyzing methodology components and providing examples.

Mr. Gagnon is president of Gagnon Engineering, a fire protection engineering consulting firm, and a registered professional engineer in Maryland, Virginia, Pennsylvania, and Washington, D.C. He has 32 years’ experience in design, calculation, specification, and consultation on fire protection systems, and serves on several NFPA technical committees. He also lectures at the University of Maryland Department of Fire Protection Engineering.
WHO WE ARE: Active and retired career and volunteer members of the fire service, as well as those involved in fire department training, fire apparatus and equipment manufacturing and sales, and educational institutions.

HOT ISSUES
Brunacini on Incident Command
At NFPA's World Safety Conference, Chief Alan Brunacini of the Phoenix Fire Department will present "Fire Command: What Has Changed in the Fire Service?," in which he'll discuss changes in incident management over the past 20 years. Chief Brunacini has written a second edition of Fire Command, available from NFPA, which addresses incident command through the eyes of the incident commander.

A member of the Phoenix Fire Department since 1958, Bruno has seen it all in his 40-plus years in the fire service. He was promoted through the ranks and appointed fire chief in 1978. Today, he heads a fire department with more than 1,400 members in a city with a population of more than one million. Chief Brunacini has taught at workshops and seminars dealing with fireground operations, health and safety, customer service and fire department management. He's a popular speaker at fire service conferences and meetings, and many organizations have recognized his accomplishments with awards and honors.

Don't miss this presentation!

HOW TO REACH US:
STEPHEN N. FOLEY, EXECUTIVE SECRETARY, +1-617-984-7468, SFOLEY@NFPA.ORG

Health Care
WEB SITE: http://www.nfpa.org/healthcare
SECTION CHAIR: Thomas Haynes, Woodpecker Hill Nursing Home, Greene, Rhode Island
WHAT WE DO: Exchange fire and life safety information, ideas, and experiences as they relate to the complex needs of health care facilities.

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

HOT ISSUES
Chair's Corner
By Mike Daniel, Immediate Past Chair
Hello, everyone! I hope the first months of 2002 were good to you. I know it's been difficult to keep up with Health Care Section activities, given the fact that Code Red has shifted locations over the past year, but I think it'll be a bit easier now that the electronic version is available online.

So, what's been happening? Perhaps the most important issue at present is the schedule of Health Care Section activities at the World Safety Conference and Exposition™ this May.

Vertical Smoke Migration Solved.

The standard 90-minute fire-rated hoistway door does not provide smoke protection for the elevator shaft. The Smoke Guard System provides a gasket for the elevator hoistway door. When used in conjunction with the fire-rated hoistway door, the system complies with the code requirements defining a tight-fitting smoke- and draft-control assembly. Use of the system may eliminate the need for an enclosed elevator lobby, freeing up valuable, usable space for the building owner.

For more information on this innovative solution, contact us at: 800.574.0330

INNOVATIVE SMOKE CONTAINMENT AT THE ELEVATOR HOISTWAY

Circle 060 on Reader Service Card
Please note that the schedule for section activities and the NFPA Technical Committee Report (TCR) sessions, at which members will vote on the codes and standards up for adoption at the meeting, has changed.

Normally, the Health Care Section's Codes and Standards Review Committee meets on Monday afternoon to discuss issues to be presented for adoption during the TCR sessions on Tuesday, Wednesday, and Thursday. This year, however, most of the codes and standards up for adoption will be voted on on Sunday afternoon, May 19. This will give members the time necessary to provide the necessary level of protection. Resources could be needed later to comply with your support during committee discussions to keep the codes both cost-effective and able to be available during the code-making process to avoid unnecessary requirements if your support isn't apparent. We hope to see you in Minneapolis.

HOW TO REACH US: RICHARD BIELEN, EXECUTIVE SECRETARY, +1-617-984-7279, RBIILEN@NFPA.ORG

Industrial Fire Protection
WEB SITE: http://www.nfpa.org/industrial
SECTION CHAIR: Mike Newman, Johnson & Johnson Company, New Brunswick, New Jersey
WHAT WE DO: Encourage information and industry-wide awareness to improve industrial fire and life safety programs.
WHO WE ARE: Professionals concerned with fire protection, prevention, and suppression in industrial settings.

HOT ISSUES
Chair's Corner
Mike Newman, Chair, Industrial Fire Protection Section

I always look forward to receiving NFPA Journal for the latest news and commentary about fire prevention, protection, and life safety. With the March/April issue, there was even more anticipation—it was the first issue containing “Section News!”

The addition of “Section News” to Journal enables sections to inform all NFPA members of their purpose, their activities, and the topics important to them. And the “Section News” web site allows the Industrial Fire Protection Section to maximize our communication with section members and NFPA members in general. It also helps us attract new members. Section membership is up 40 percent over last year, and we want it to continue to increase.

To help you participate in the code-making process, the Health Care Section and NFPA have addressed the issue of education. The section has worked hard to come up with meaningful education programs to make attendance at the NFPA meetings more useful and to enhance the value of your membership. NFPA has also worked hard to ensure that you get the proper credit for attending these sessions by providing continuing education units. Please be sure to note the valuable sessions that are being offered this May.

Thank you for your continued support of the section, NFPA, and the code-making process! I hope to see you in Minneapolis.

HOW TO REACH US: RICHARD BIELEN, EXECUTIVE SECRETARY, +1-617-984-7279, RBIILEN@NFPA.ORG

Property Insurance... A Hardening Market
By Ronald A. Stein P.E., CSP
Aon Risk Consultants, Kansas City, Missouri

If you haven't already experienced it, the property insurance market is "hardening." Essentially, this means that there is less capacity out there, that what's available will probably cost more, and that underwriters are pickier about those with whom they might share it. As a result, the quality of your property insurance submittal will have a direct bearing on the markets' reaction to your risk.

Even before the events of September 11, the property insurance market was hardening substantially, and the losses resulting from the terrorist attacks further eroded the marketplace, forcing conditions from bad to worse.

Underwriters are technically underwriting again, as opposed to quoting market pricing. Along with broader exclusions and the virtual elimination of "blanket" limits, increases in property insurance rates and deductibles may be expected in the range of 30 to 300 percent.

What does this mean to you? The need for comprehensive, accurate underwriting data is more acute than ever, and its compilation, interpretation, and delivery will probably fall to you. This means that:
• Accurate construction and protection data should be well documented.
• Compliance with NFPA and related codes should be recognized.
• Details of inspection, testing, and maintenance programs for fire protection systems should be compiled.
• Fire safety audit programs should be acknowledged.
• Business continuity plans, both locally and globally, should be validated.
• Building, content, and business interruption values may require substantiation.
• Fire loss scenarios and exposure to natural hazards should be modeled and quantified.
• Protection deficiencies may have to be identified.
• Risk improvement strategies may have to be studied and implemented.

Furthermore, industrial fire protection professionals may have to begin to recognize and analyze workplace hazards and exposures in the context of terrorist attacks.

In industry, we know that risk is seldom predictable and that protection has limits, but industrial fire protection should no longer be confined to prevention, mitigation, and recovery. It may now require scripting a good property risk control story line to leverage against increased retentions and premiums.

Nominating Committee Report
The Nominating Committee has prepared the following slate of candidates for the IFPS Board of Directors in 2002-3. Section members will act on them at the business meeting on May 21 at NFPA’s World Safety Conference and Exposition™.

Officers of the Board:
Chair: Michael Newman, Johnson & Johnson
Vice-Chair: Anthony Aguilera, Honeywell
Secretary: Mike Snyder, Dow Corning
Past Chair: Stephen Daily, Anheuser Busch

Directors of the Board (to be elected to a 3-year term):
Thomas Gray, Akzo Nobel
Craig P. Remsburg, The Boeing Company

Two affiliate positions remain to be filled, one for a one-year term and the other for a three-year term. The Board continues to seek candidates. Any updates to this slate will be posted on the IFPS page of the NFPA web site.

The Nominating Committee, chaired by Stephen Daily, prepared this report. Steve will also chair the 2003 committee, which includes Brian Denk and Bill Cary of the Illiana and Southern Ohio Chapters. The Board will appoint three additional committee members.

You’re all encouraged to join us during the business meeting in Minneapolis and participate in the Standards Forum discussion on key documents up for adoption. Please see the on-site program for the room assignment.

HOW TO REACH US: GUY COLONNA, EXECUTIVE SECRETARY,
NFPA, +1-617-984-7435, GCOLONNA@NFPA.ORG

CONCERNED ABOUT FIRE SAFETY?
Check out this web site for Fire Retardant Treated Wood
PYRO-GUARD
EXTERIOR FIRE-X
TAKE ADVANTAGE OF HOOVER'S TECHNICAL EXPERTISE AND SUPPORT
WWW.FRTW.COM
P.O. Box 746 • Thomson, GA. 30824 • 1-800-531-5558
Circle 032 on Reader Service Card
International Fire Marshals Association

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

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

WHAT WE DO: Minimize loss of life and property by advocating, promoting, and providing leadership in the prevention and mitigation of fire, explosions, and related hazards.

WHO WE ARE: Fire officials who enforce fire laws and regulations, such as property inspectors and public safety educators, as well as fire investigators.

HOT ISSUES

Professional Development


The two-day "Management Institute for Fire Marshals" consists of two sessions covering strategic planning for, and evaluation of, fire prevention programs. The course is open to those interested in learning how to manage a fire prevention program, advancing their careers, and becoming managers.

The "Principles of Fire Protection" is open to those interested in learning the basic to intermediate principles of fire protection engineering. Individuals who have design, enforcement, or advisory responsibilities are encouraged to attend, as are fire protection engineers, architects, and fire prevention personnel. The 10 subjects covered include combustion and ignition phenomena, fire endurance evaluation, construction and structural features, materials applications, fire protection design evaluation, life risk analysis, detection and alarm systems, sprinkler system developments, design of water suppression systems, and egress and exit engineering. You may take all 10 courses over four days or two two-day sessions covering five topics each.

The next "Principles of Fire Protection" seminars will be held June 10 to 13 in Auburn Hills, Michigan and September 16 to 19 in Baltimore, Maryland.

The "Process of Performance-Based Fire Protection Design" is open to anyone interested in understanding performance-based fire protection design, particularly those who have design, enforcement, or advisory responsibilities. Attendees will learn why performance-based designs are being used and the challenges and benefits they present. They will also learn about fire dynamics and computer fire modeling, as well as the terminology and concepts of performance-based design as defined by NFPA and other organizations.

Anyone interested in attending or sponsoring a program should contact Executive Secretary Steven F. Sawyer.

HOW TO REACH US: STEVEN SAWYER, EXECUTIVE SECRETARY, +1-617-984-7423, SSAWYER@NFPA.ORG

Latin American

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

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

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

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

HOT ISSUES

Americas' Fire Expo Unites Professionals

NFPA's Americas' Fire Expo (AFE), to be held in Miami in July, is the complete fire protection resource for those in Latin America, the Caribbean, and southeastern United States. The region's premier showcase for products and services, it's your access to the industry leaders who have the solutions to your challenges.

Each day, six professional development seminars will address a variety of topics, including fire safety and fire protection, fire protection systems and industrial hazards management, and aircraft rescue and firefighting. In addition, NFPA will offer professional development programs in Spanish before and after the AFE, covering NFPA 72®, National Fire Alarm Code®, NFPA 101®, Life Safety Code®, NFPA 13, Installation of Sprinkler Systems; the Certification of Fire Protection Specialist Examination (CEPS); and CEPI Primer, a 16-hour overview of the examination.

New for 2002 is the International Association of Hispanic Firefighters (IAHF) Track, which covers such topics as haz-mats, weapons of mass destruction, and technical rescue, and an IAHF Rescue Training Competition.

Register in advance, and you can visit the exhibit floor for free. For more information, visit www.nfpaamericasfire.com.

Subscribe Online


New Spanish Translations

Efforts to disseminate codes and standards in Latin America and Spain have resulted in the translation of more than 40 NFPA publications into Spanish. Among the latest are NFPA 101®, Life Safety Code®, NFPA 72®, National Fire Alarm Code®, and NFPA 20, Installation of Stationary Fire Pumps for Fire Protection.

NFPA in Mexico

The year 2002 has been very productive for NFPA in Mexico. We've met with several authorities, including Labor Secretary Dr. Alberto Aguilar; Miguel Aguilar Romo, director of General Direction of Norms (DGN); and Jose Antonio Cisneros, general manager of AMHSAC, to promote NFPA's codes and standards and to stress the importance of their use.

Our monthly Mexico Chapter technical breakfasts have been a great success, as well. More than 110 people attended the first on January 30, and the second attracted more than 115 people, mainly firefighters from Xalapa Veracruz, Guanajuato, the state of Mexico, and Mexico City and its surroundings. As a result, Xalapa Veracruz firefighters invited NFPA to...
participate in their first international congress in July 2003 and asked NFPA to support the Xalapa firefighter museum and the fire safety programs they're implementing in kindergartens and elementary schools.

In February, Mark Early, NFPA's assistant vice-president of Electrical Engineering, discussed the use of the 1999 edition of the National Electrical Code® in Mexico with NFPA Regional Representative Antonio Macias, Enrique Ruskee, Rafael Nava, and Abel Hernandez of ANCE. Mexican authorities, NFPA members, and UL of Mexico have asked NFPA to play a larger role in developing Mexican fire protection standards.

At the second meeting of the NFPA Mexico Chapter Advisory Council, a draft of the statutes was reviewed and work sections were finalized. To help Antonio in Mexico, NFPA has added Victor Espinola to the team. Antonio can be reached at amacias@ntpa.org.

HOW TO REACH US: OLGA CALEDONIA, EXECUTIVE SECRETARY, +1-617-984-7231, OCALEDONIA@NFPA.ORG

Lodging Industry
WEB SITE: http://www.nfpa.org/lodging
SECTION CHAIR: Robert Elliot, American Hotel and Lodging Association, Washington, D.C.
WHAT WE DO: Exchange information on fire and life safety in lodging facilities, focusing on codes, standards, education, and technology that contribute to safer facilities and better protection.
WHO WE ARE: NFPA members employed by lodging facilities or lodging management companies who are involved in life safety or fire-related activities.
HOT ISSUES
Candles!
By April L. Berkol
This weekend, the business of candle safety hit home—literally—when a sweater fell onto an unattended candle in the high-rise apartment building where I live and caught fire. Fortunately, the apartments in my building are sprinklered, and the sprinkler system activated.

I knew something was up when I saw the fire apparatus arrive and heard water flowing from the tank on the building's roof. Water from the sprinklers on the 21st floor and the fire hoses were all the way down to the lobby. As the fire occurred in the morning and most people were already awake, none of the building's occupants was harmed.

The popularity of candles has increased rapidly in the past few years, as have the number of ads in newspapers and magazines for 'mood' candles, scented candles, novelty candles, and the like. Unfortunately, the number of fires attributable to candles has also increased.

NFPA's most recent statistics show a dramatic jump in the number of fires caused by candles in the last decade, and the growth rate shows no signs of slowing. From 1980 to 1990, according to NFPA Journal, "candles were responsible for 1.1 percent of home structure fires. In 1997, however, they were responsible for 2.9 percent....In 1997,... there were a reported 11,600 home candle
fires...which caused 156 civilian deaths, 1,202 civilian injuries, and more than $171 million in direct property damage."

What does this have to do with hotels? Well, believe it or not, people often take candles with them when they go to a hotel. In a number of instances, guests trying to create a romantic mood or soothing atmosphere have lit numerous candles in their guestrooms or bathrooms and started a fire in the hotel!

What is a hotel operator to do? Search guests’ bags? Install candle detectors? Somehow, I don’t think that would lead to a very good guest satisfaction score for the hotels.

What we can do is be vigilant. Make sure housekeepers look for telltale signs of candles, such as wax on the furniture. If they find that candles are being used, they should leave a note on the bed advising the guest that any damage will be the guest’s responsibility. They should also inform the front desk, and a voice mail message repeating the warning should be left on the guest’s phone.

To minimize the potential for candle fires, we should look for ways to discourage guests from lighting candles in their rooms. Perhaps the most effective way is to talk about the cost of a fire. A fire caused by a single candle can damage furniture and soft goods, generate smoke that spreads from the guestroom to other floors, and cause the sprinkler system to activate—and all that damage will be billed to the guest. Most states allow this, but each hotel should determine what the law is in its area. A notice at the front desk informing guests that the management will hold them responsible for any damage caused by candles might be necessary, especially at resorts and spas.

Candle safety notices should be shared with your associates at work, too. Trained employees are our greatest asset, and their safety and health are important to us. The Massachusetts Public Fire and Safety Education Task Force has developed a “Candle Circle of Safety.” Its advice is to:

• Burn candles inside a 1-foot (0.30-meter) circle of safety, free of anything that can burn.
• Extinguish candles after use.
• Keep candles away from children and pets.
• Keep all matches and lighters out of children’s reach.
• Use a sturdy metal, glass, or ceramic candle holder.
• Never leave a burning candle unattended.

Help reduce the number of candle fires by following these simple guidelines.

APRIL L. BERKOL is director, Environmental Health, Fire and Life Safety for Starwood Hotels and Resorts Worldwide, Inc., and immediate past chair of the section.

In This Corner
Very Tall Buildings
By Thomas G. Daly, Vice-Chair of the Lodging Industry Section

Get used to it: very tall buildings (VTBs), including very tall hotels, may be built quite differently in the very near future. In the wake of the unprecedented act of terrorism at the World Trade Center (WTC), a report delivered on March 5 to a U.S. Senate subcommittee by the National Institute of Standards and Technology (NIST) suggests we need to change the design of such buildings to mitigate the effects of future terrorist acts.

The definition of ‘VTB’ has yet to be determined. While the Life Safety Code® and most building codes generally consider an eight-story building to be high-rise, a VTB is likely to be defined as something taller. Not all occupancies of the same height may be classified as VTBs, as occupancy type may influence such a determination. Issues such as evacuation time, number of exits, and construction and fire protection requirements could also make the VTB designation flexible, as it should be.

While not the direct targets of the WTC assault, four hotels, ranging from 22 to 55 stories, were within Ground Zero or the debris field on September 11. Their rapid and successful evacuation indicates that even the tallest hotel could be evacuated promptly, given the presence of appropriate emergency procedures and a trained staff. The evacuation of occupants from the floors below the points of impact in Towers I and II was also successful.

The NFPA technical committees serving both the Safety to Life project and the Building CodeSM project can provide much, but not all, of the expertise needed to evaluate necessary changes for VTBs in the future. As with other NFPA initiatives, a collaboration of experts may provide for more comprehensive criteria.

As we learned from the carnage at the WTC in 1993, the bombing of the Murrah Federal Building in Oklahoma City, eco-terrorist acts in several states, and the WTC and Pentagon attacks last September, terrorism is not going to go away. We have seen barbarians at our gates. Our gates need to be stronger.

Meeting Notice

The NFPA Lodging Industry Section will hold its Executive Committee and Annual Business Meetings on May 21 at 4:30 p.m. at the Minneapolis Convention Center, in conjunction with the NFPA World Safety Conference™. Section members and anyone interested in learning more about the section are welcome to attend. For details, please contact Section Executive Secretary Gregory Harrington at gharrington@nfpa.org.

HOW TO REACH US: GREG HARRINGTON, EXECUTIVE SECRETARY, +1-617-984-7471, GHARRINGTON@NFPA.ORG

Metropolitan Fire Chiefs

WEB SITE: http://www.nfpa.org/metro

SECTION CHAIR: Mario Trevino, San Francisco Fire Department, San Francisco, California

WHAT WE DO: Bring together fire chiefs from metropolitan fire departments to share information on issues to effect policy changes.

WHO WE ARE: Active and retired fire chiefs who are members of NFPA and the International Association of Fire Chiefs and who supervise departments with staffs of at least 400 fully paid career firefighters.
HOT ISSUES
A Busy, Emotional Year
By Chief Tim Fuller, Immediate Past Metro Section Chair

At our annual conference on April 17, I became immediate past chair of the Metropolitan Fire Chiefs Section. As chair, I enjoyed representing a remarkable group of leaders and professionals who, following the most tragic episode in fire service history, continued to lead, both at home and in our nation's capital, the effort to keep our firefighters and citizens safe.

As part of my duties as section chair, I attended the Chief and Assistant Chief Fire Officers' Association (CACFOA) meeting in Manchester, England, from September 4 to 6. The officers of CACFOA will attend the Metro annual conference this year, as well. This exchange has gone on for several years and has resulted in some true international relationships that have expanded the base of knowledge in the fire service community.

After the CACFOA meeting, we stayed on for a few days to visit Ireland, and it was there, on September 11, that we heard the news and watched the attack on Irish television. We paid a visit to the Dublin Fire Brigade and watched as the brigade's drummers and pipers prepared for a National Day of Mourning service held on September 14. We'll forever remember the kindness, warmth, and compassion of the Irish people during our extended stay.

On October 24 and 25, several other Metro Chiefs and I attended the United States Conference of Mayors meeting in Washington, D.C., where a National Action Plan for Safety and Security in America's Cities was drafted. With considerable input from the fire chiefs, the mayors addressed several issues related to the role of the fire service in emergency preparedness and identified the need for federal funding to assist in that preparation.

Our section met during the Fire-Rescue Conference in New Orleans on August 26, 2001, and again at the NFPA fall meeting in Dallas on November 11. At both meetings, we covered several issues, including a Memorandum of Understanding between the Metro Chiefs and the Federal Laboratory Consortium that would help get technology to the fire service and section participation in the NFPA/FEMA Evacuation Project. It's been a busy, productive, and at times emotional year.

I want to thank NFPA and the International Association of Fire Chiefs for their support. I also want to thank the Metro Section Executive Board and our members for their support and friendship during my tenure as chair. I look forward to my new role as immediate past chair.

HOW TO REACH US: RUSS SANDERS, EXECUTIVE SECRETARY, +1-502-894-0411, RSANDERS@NFAP.ORG

Study Fire Protection Engineering here...

Worcester Polytechnic Institute

Fire Protection Engineering education...advance your career wherever you live.

WPI, third oldest private engineering university in the United States, offers fire protection engineering programs that fit into your life...even if you live far from a WPI campus...even if your job requires a lot of travel. Using a variety of commonly available technological tools, WPI's Advanced Distance Learning Network brings to you the same high quality graduate courses our on-campus students enjoy. Call or e-mail us today to find out more about how we can bring our campus closer to you.

Visit us at booth #441 at the NFPA Exposition!
(508) 831-5220 • adln-nfpa@wpi.edu • www.wpi.edu/ADLN

Circle 077 on Reader Service Card

MAY/JUNE 2002  NFPA JOURNAL  115
Rail Transportation Systems

WEB SITE: http://www.nfpa.org/rail
SECTION CHAIR: James Gourley, Fire Protection Engineer, Glenside, Pennsylvania
WHAT WE DO: Promote fire protection and prevention on rail transportation properties and pursue improved methods for safely transporting passengers, freight, and hazardous materials by rail.
WHO WE ARE: Officers or full-time employees of a rail transportation company and of organizations directly supported by the rail industry.

HOT ISSUES
Section Seeks Input
Along with the other NFPA sections, the Rail Transportation Systems Section has grown, prompting us to ask what you expect from your section. To answer that question, we plan to survey our members so we can develop a section focus you’ll find beneficial.

We also plan to expand the information on the section web page to include news and legislative and other informational links, as well as updates on the revision of NFPA 130, Fixed Guideway Transit and Passenger Rail Systems, and on NFPA’s efforts to promote passenger rail safety using this standard.

Major Revision to NFPA 130
NFPA 130, Fixed Guideway Transit and Passenger Rail Systems, is currently in the annual 2003 revision cycle, and the new edition of the document will contain major changes. In the pre-ROP phase, six task groups considered changes in every chapter of the standard. In addition to the changes mandated by the Manual of Style, revisions are anticipated in the areas of means of egress, stations and tunnels, vehicles, tenability, and emergency response.

The committee heard the task groups’ final reports at the ROP meeting in March. Watch for the ROP in July so you can see the extent of these changes.

Research

WEB SITE: http://www.nfpa.org/researchsection
SECTION CHAIR: Jesse Beitel, Hughes Associates Inc., Baltimore, Maryland
WHAT WE DO: Provide a forum for communication between researchers and research users, and offer opportunities for more effective use of research to manage and reduce fire risks.
WHO WE ARE: NFPA members interested in research related to fire safety, fire science, fire codes and standards, and fire protection.

HOT ISSUES
Evacuation of the WTC
On May 21, the Research Section will sponsor an educational session at the 2002 World Safety Conference™ that compares the results of a human behavior study of the 1993 World Trade Center evacuation with media reports of first-person accounts of the 2001 evacuations. Presenting are Dr. Rita Fahy of NFPA and Dr. Guylène Proulx of the National Research Council (NRC). Changes to the stairwells after the 1993 bombing reportedly played an important role in what was, in many ways, a highly successful evacuation.

Dr. Fahy is manager of Fire Data Bases and Systems for NFPA’s Fire Analysis and Research Division. She has been lead analyst on NFPA’s annual study of on-duty firefighter fatalities for more than 15 years. Dr. Fahy has also been active in evacuation and fire modeling and analysis for more than a decade and was involved in statistical studies of human behavior in four major fires in high-occupancy properties, including the World Trade Center.

Dr. Proulx, a research officer at the NRC’s Fire Risk Management Program since 1992, investigates human response to alarms, evacuation movement, typical actions taken, timing of escape, time to start evacuation, and social interaction during a fire. Dr. Proulx is a member of NFPA, the Society of Fire Protection Engineers, the Human Factors and Ergonomics Society, and the International Association for Fire Safety Science.

Wildland Fire Management

WEB SITE: http://www.nfpa.org/wildland
SECTION CHAIR: Maggie Doherty, USDA Forest Service, Seeley Lake, Montana
WHAT WE DO: Bring together professionals interested in, and responsible for, wildland fire prevention, education, investigation, and management to share methods, experiences, ideas, and technology for managing fire in U.S. wildlands.
WHO WE ARE: NFPA members interested in, or responsible for, wildfire prevention, education, investigation, control, and management.

HOT ISSUES
Welcome, Michele!
Michele Steinberg joins NFPA to support the Firewise Communities Program. Communities wishing to undertake Firewise programs will soon be able to contact her for technical assistance in areas ranging from organizing local efforts to computerized mapping to formulating mitigation strategies.

Michele, who comes to us from the Institute for Business and Home Safety, has an extensive background in natural-hazard mitigation and land-use planning, community organization, and insurance.

Upcoming Workshops
Spearfish, South Dakota, May 29–31
Albuquerque, New Mexico, September 10–12
Lake George, New York, September 24–26

For more information, visit http://www.firewise.org.

HOW TO REACH US: JIM SMALLY, EXECUTIVE SECRETARY, +1-617-984-7483, JSMALLEY@NFPA.ORG

Research

WEB SITE: http://www.nfpa.org/researchsection
SECTION CHAIR: Jesse Beitel, Hughes Associates Inc., Baltimore, Maryland
WHAT WE DO: Provide a forum for communication between researchers and research users, and offer opportunities for more effective use of research to manage and reduce fire risks.
WHO WE ARE: NFPA members interested in research related to fire safety, fire science, fire codes and standards, and fire protection.

HOT ISSUES
Evacuation of the WTC
On May 21, the Research Section will sponsor an educational session at the 2002 World Safety Conference™ that compares the results of a human behavior study of the 1993 World Trade Center evacuation with media reports of first-person accounts of the 2001 evacuations. Presenting are Dr. Rita Fahy of NFPA and Dr. Guylène Proulx of the National Research Council (NRC). Changes to the stairwells after the 1993 bombing reportedly played an important role in what was, in many ways, a highly successful evacuation.

Dr. Fahy is manager of Fire Data Bases and Systems for NFPA’s Fire Analysis and Research Division. She has been lead analyst on NFPA’s annual study of on-duty firefighter fatalities for more than 15 years. Dr. Fahy has also been active in evacuation and fire modeling and analysis for more than a decade and was involved in statistical studies of human behavior in four major fires in high-occupancy properties, including the World Trade Center.

Dr. Proulx, a research officer at the NRC’s Fire Risk Management Program since 1992, investigates human response to alarms, evacuation movement, typical actions taken, timing of escape, time to start evacuation, and social interaction during a fire. Dr. Proulx is a member of NFPA, the Society of Fire Protection Engineers, the Human Factors and Ergonomics Society, and the International Association for Fire Safety Science.

Wildland Fire Management

WEB SITE: http://www.nfpa.org/wildland
SECTION CHAIR: Maggie Doherty, USDA Forest Service, Seeley Lake, Montana
WHAT WE DO: Bring together professionals interested in, and responsible for, wildland fire prevention, education, investigation, and management to share methods, experiences, ideas, and technology for managing fire in U.S. wildlands.
WHO WE ARE: NFPA members interested in, or responsible for, wildfire prevention, education, investigation, control, and management.

HOT ISSUES
Welcome, Michele!
Michele Steinberg joins NFPA to support the Firewise Communities Program. Communities wishing to undertake Firewise programs will soon be able to contact her for technical assistance in areas ranging from organizing local efforts to computerized mapping to formulating mitigation strategies.

Michele, who comes to us from the Institute for Business and Home Safety, has an extensive background in natural-hazard mitigation and land-use planning, community organization, and insurance.

Upcoming Workshops
Spearfish, South Dakota, May 29–31
Albuquerque, New Mexico, September 10–12
Lake George, New York, September 24–26

For more information, visit http://www.firewise.org.

HOW TO REACH US: JIM SMALLY, EXECUTIVE SECRETARY, +1-617-984-7483, JSMALLEY@NFPA.ORG
Now Wheelock has the broadest line of weatherproof notification appliances in the industry.

With our newest edition of weatherproof speaker strobes, Wheelock goes to extremes.

Wheelock's appliances designed for maximum performance inside and out have an extended temperature range of -31°F to 150°F (-35°C to 66°C). With a Wheelock appliance, whatever the weather you'll be ready.

Now get quality, reliability and cost-effective weatherproof appliances from the name you trust because, when there's an emergency the last thing you need to worry about is the weather.

Wheelock's expanded family of Weatherproof Strobes, Speaker Strobes, Horn Strobes, and Multitone notification appliances are available in Series RSSWP, ASWP, AHWP MTWP and ET70WP.

Corporate Office 273 Branchport Avenue Long Branch, NJ. 07740 • 1 800 631 2148 • Fax: # 732 222 2588 • www.wheelockinc.com

Circle 075 on Reader Service Card
Components of A-C Fire Pump protection systems are UL- and ULC-listed and FM-approved, and meet the requirements of NFPA standards. System capacities range from 35 to 5,000 gpm (132.5 to 18,927 lpm) with pressure to 600 psi. Factory-tested systems and house units use a full range of end suction horizontal split case, vertical turbine, and in-line centrifugal pumps. Visit www.acfirepump.com.

Circle Reader Card No. 088

Radio networks
AES•IntelliNet
Booth 1201
AES•IntelliNet is an operator-owned radio network for alarm transmission. Every radio is both a transceiver and a repeater, creating a multiple-path system without expensive towers, repeaters, or phone lines. The AES 7700 Series meets the requirements of NFPA 72®, National Fire Alarm Code®, and is UL/AAA-compliant for use with pull stations, water flow alarms, automatic fire alarms, and more.

Circle Reader Card No. 089

Cabling
AEI Cables, Incorporated
Booth 540
AEI MI cable is used to protect critical life safety circuits in commercial buildings from fire. It's suitable for use in power feeds for fire pumps and fire alarm power risers, and, in fire alarm and voice communication systems for data riser cables.

Circle Reader Card No. 090

Firefighting equipment
Akron Brass
Booth 1837
Akron Brass has been a leading manufacturer of high-performance firefighting equipment for the past 80 years. Products include industrial monitor systems, nozzles, valves, foam equipment, and related equipment. Akron Brass has extensive experience in industrial systems and system designs to handle today's changing and complex fire safety concerns.

Circle Reader Card No. 091

Power boosters
Alarm Saf
Booth 414
Alarm Saf manufactures agency-listed power boosters ideal for new or retrofit applications. We offer fully regulated ADA power boosters to 6 amps with Class 2 outputs. NAC power boosters, available at 12 or 24 volts, are an economical choice for system upgrades. Additional products include power supplies for access, closed-caption television, and security applications, relays, and accessories.

Circle Reader Card No. 092

Sprinkler pipe
Allied Tube and Conduit
Booth 1024
Allied Tube and Conduit is the leading manufacturer of steel fire sprinkler pipe in the United States and features a full line of products, including our engineered line of flow pipe featuring DynaFlow, Dynathread, XL, BLT, and standard Schedule 10 and 40. All products through 4.5 inches (11 centimeters) are internally coated with our patented, MIC-resistant ABF (antibacterial formula). Visit www.alliedtube.com.

Circle Reader Card No. 093
Did you know?

ADI's Fire Product Catalog is Hotter than Ever!!

- More than 30 premier manufacturers have state-of-the-art products featured inside!
- There’s 118 pages of the hottest products, to meet all of your fire protection needs!
- This is your one-stop source for all fire alarm products!

For the ADI branch nearest you, call 1-800-233-6261.

©2002, ADI. All Rights Reserved
**Power chargers**
Altronix Corporation
 Booth 407
Altronix is the leading manufacturer of power supply/chargers and UL-listed models for ADA-compliant fire alarm, burglar, and access control applications; video camera power supplies; a wide range of programmable seven-day, 24-hour, and annual event timers; a variety of multipurpose and UL-listed relay modules; high-output siren drivers; UL-listed transformers; and custom-designed electronics manufactured to your specification.
Circle Reader Card No. 094

**Fire extinguishers**
Amerex Corporation
 Booth 1231
Amerex offers a complete range of portable and wheeled fire extinguishers, including clean agent water mist and Halotron I. Restaurant and vehicle fire suppression systems, along with methane gas detection, round out the product line including Getz Manufacturing "service technician's dream" equipment.
Circle Reader Card No. 095

**Clean agent**
American Pacific Corporation
 Halotron Division
 Booth 1448
Halotron™ I, a clean replacement agent for Halon 1211, is available worldwide for use in fire extinguishers, aircraft rescue and firefighting vehicles, and limited flooding applications. It’s UL-approved and ULC-listed for use in extinguishers by Amerex, Badger, Buckeye, and Kidde and is approved by the EPA SNAP list for commercial, industrial, maritime, and military use. It’s also used by the U.S. Coast Guard and for airport firefighting. Visit www.halotron-inc.com.
Circle Reader Card No. 096

**Fittings and hangers**
Anvil International
 Booth 301
Anvil International is the largest, most complete fittings and hanger manufacturer in the world. We produce a package of quality UL-listed and FM-approved fire protection products including the new Fire-Rite Short Pattern elbows and tees, DRI-SEAL engineered lubeless gasket and couplings, flanges, check valves, Sock-it fittings, Mueller Tee-off, and more. We also comply with ISO 9002. Visit our booth or www.anvilintl.com.
Circle Reader Card No. 097

**Signaling devices**
American Security Equipment Company (AMSECO)
 Booth 1031
AMSECO is a leading manufacturer of quality audible and visual signaling devices for the fire alarm industry. The company features Select-A-Strobe and Select-A-Horn, a complete series of patented strobes and horns, and Select-A-Horn/Strobe, a series of combination strobes and horns. Features include field-selectable candela of 15/75 cd, 30/120 cd, 75 cd, and 110 cd, and selectable temporal and non-temporal sound output with electromechanical and 3KHz hi/low settings.
There’s also a complete line of low-profile, high- and low-wattage 25Vrms and 70.7Vrms speakers with multiple taps, patented motor-driven bells, and horns, as well as a new series of outdoor 120VAC and 24VDC strobes with four color lenses from which to choose. Other products include low-current-draw and mini-horns, a sync module bell/strobe combination, AC-driven bells, and strobes designed for new construction and retrofit projects.
Circle Reader Card No. 098

**Smoke vent**
Bilco Company
 Booth 725
Bilco’s new Lumivent translucent automatic smoke vent and its Type FR fire-rated floor door are UL-listed and maintain the fire rating of a 2-hour floor/ceiling assembly when access between building floors is required.
Circle Reader Card No. 103

**Leak detection**
AquaALERT—Water Leak Sensing
 Booth 1438
AquaALERT provides water leak detection systems to detect water leaks in high-value areas, such as data center sub-floors and telecommunications, records storage, mechanical, and electrical equipment rooms.
Circle Reader Card No. 100

**Fire pumps**
Aurora Pump Company
 Booth 427
Aurora Pump is exhibiting a complete line of fire protection pumps, including split case, in-line, and vertical turbines. They also feature a “Red Hot” Quick Ship Program and new stackable jockey pumps.
Circle Reader Card No. 101

**Control valves**
Bermad, Incorporated
 Booth 950
Bermad, a world-leading manufacturer of automatic control valves, offers a complete line of UL-listed and FM-approved pilot-operated pressure-reducing, pressure-relief, pump-suction, and deluge control valves designed for the fire protection industry. Bermad offers valves in sizes 2 to 10, with up to 300 psi inlet pressures.
Circle Reader Card No. 102

**Storage tanks**
Amfuel
 Booth 835
Amfuel manufactures aboveground water storage tanks in sizes ranging from 500 to 1 million gallons (1,893 to 3,785,344 liters). Our tanks, constructed of proven elastomer fabrics supported by earthen berms, have been in the market for more than 30 years, with 200 domestic installations. Visit us at www.amfuel.com.
Circle Reader Card No. 097
Amerex Corporation

"Quality is Behind the Diamond"

EXTINGUISHERS AND SYSTEMS
- Clean Agent
- Dry Chemical
- Wet Chemical
- Water Mist
- Water and Foam
- Carbon Dioxide
- Wheeled Units
- Class D
- Vehicle Systems
- Gas Detection
- High Performance
- Restaurant Systems

NEW! INDUSTRIAL SYSTEMS

Amerex Corporation
P.O. Box 81 Trussville, AL 35173
Ph: (205) 655-3271  Fax: (205) 655-5112
e-mail: sales@amerex-fire.com
Visit us online at: www.amerex-fire.com

Circle 003 on Reader Service Card
**Fire extinguishers**
Badger Fire Protection
Booth 1435A
Badger Fire Protection manufactures a wide range of UL-listed, stored-pressure and cartridge-operated hand-portable and wheeled fire extinguishers. Badger also manufactures pre-engineered wet chemical restaurant and dry chemical industrial fire suppression systems and sells a comprehensive range of photoluminescent fire extinguisher identification signs.
Circle Reader Card No. 104

**Fire sprinklers**
BlazeMaster® Fire Sprinkler Systems
Booth 1249
BlazeMaster fire sprinkler systems offer superior hydraulics, lasting fire protection performance, corrosion resistance, and low flame spread/smoke characteristics. BlazeMaster fire sprinkler systems can be used to protect ordinary-hazard rooms smaller than 400 square feet (37 square meters) in otherwise light-hazard occupancies and in sprinklered combustible, concealed, open wood-truss construction. Contact us at (888) 234-2436 or blazemaster@blazemaster.com.
Circle Reader Card No. 105

**Software**
CAD Zone, Incorporated
Booth 1153
For more than 10 years, CAD Zone has published industry standard diagramming software for loss control, fire protection, and the fire service. The Insurance Zone and The Fire Zone are the only diagram software programs available specific to your industry, easy to use, and affordable.
Circle Reader Card No. 106

**Extinguishing systems**
Cease Fire LLC
Booth 408
Cease Fire manufactures truly modular system extinguishing systems able to adapt to changing requirements and function even during extended power outages. They're simplified in design and easy to install and maintain. All products incorporate patented CF33 gelled powder and an EPA-approved gas. Licenses are available worldwide, and Factory Mutual approval is in progress.
Circle Reader Card No. 107

**Fire protection products**
Central Sprinkler
Booth 1101
Central Sprinkler, part of Tyco Fire Products, manufactures and supplies the world's most complete line of fire protection products, including sprinkler heads and devices, specialty valves, steel pipe, plastic pipe and fittings, and pipe couplings used in the fabrication of fire protection systems. Available worldwide, Central Sprinkler meets the fire protection needs of residential, commercial, industrial, institutional, and special-hazard applications.
Circle Reader Card No. 108

**Valves**
Cla-Val Company
Booth 824
 Cla-Val has a complete line of UL-listed and FM-approved fire pump relief, pressure-reducing, and deluge valves. These valves are available for freshwater and seawater service applications, and Cla-Val pours more than 40 alloys in our foundry. When protecting life and property, depend on Cla-Val.
Circle Reader Card No. 109

**Storage tanks**
Columbian TecTank
Booth 412
Columbian TecTank has manufactured bolted-steel liquid storage tanks for more than a century, providing superior quality in both product and service. Columbian TecTanks can be designed to meet AWWA D103-97, NFPA, and Factory Mutual standards for fire water storage.
Circle Reader Card No. 110

**Special hazard fire suppression**
Chemetron Fire Systems
Booth 1401

Software and web-based reporting tools for the building inspection industry. We're putting the world's first web-based fire inspection system in the palm of your hand. Please stop by our booth for a demonstration and to receive free software.
Circle Reader Card No. 111
Creating the benchmarks that set the highest standards

To ensure every Apollo product provides the best protection, we exceed industry standards in the development and testing of all our products.

So when you need to choose a fire detector, just look for the Apollo marque - you know you're choosing the most dependable name in fire detection.

Apollo, self assured.

For information on any Apollo product, ring us toll free on 888 332 2241 or click onto our web site - www.apollo-fire.co.uk
Chemtron Fire Systems is your single-source solution for special hazard fire suppression technology with worldwide distribution, expert engineering, technical support, consulting services, and field services. Chemtron offers a broad selection of hardware, agents, including high- and low-pressure CO₂, FM-200, water mist, and argonite, and controls.

Chemetron Fire Systems is your single-source solution for special hazard fire suppression technology with worldwide distribution, expert engineering, technical support, consulting services, and field services. Chemtron offers a broad selection of hardware, agents, including high- and low-pressure CO₂, FM-200, water mist, and argonite, and controls. Circle Reader Card No. 113

Safety signals
Commercial Products Group
Booth 818
Commercial Products Group offers a complete line of fire alarm and life safety signals for use in commercial and industrial applications. The company is exhibiting its full line of audible and visual signals, including UL 1971-listed strobe products, and its complete line of heavy-duty, hazardous-area, and explosion-proof signals for life safety applications. Circle Reader Card No. 114

Gas alternatives
Control Fire Systems Limited
Booth 1352
Now available in North America, a 100 percent argon inert gas alternative for Halon 1301 for use in occupied areas. Argon is zero ozone-depleting and has zero global-warming potential. It's UL- and ULC-listed and is distributed throughout the United States and Canada. Circle Reader Card No. 115

Communications systems
Cornell Communications, Incorporated
Booth 1801
Cornell is the expert in providing an effective communications system for your facility. Our emergency call, door monitoring, and evacuation assistance products have made thousands of customers feel secure. Our area-of-rescue communication systems exceed Americans with Disabilities Act (ADA) requirements. Stop at our booth for free ADA Accessibility Guidelines, or visit www.cornell.com. Circle Reader Card No. 116

Corrosion control systems
Corrpro Waterworks
Booth 202
Corrpro Waterworks provides turnkey cathodic protection, corrosion-control systems for steel fire protection water storage tanks. Cathodic protection is a highly effective, economical, long-term method of corrosion prevention. Corrpro provides custom design, installation, and maintenance services in compliance with NFPA, NACE, and AWWA standards. Circle Reader Card No. 117

Foam agent
Chemguard, Incorporated
Booth 744
Chemguard is a leading manufacturer of UL-listed and FM-approved foam agents and systems equipment. Our dedication to a high level of achievement is evident through our innovative patents and persistent delivery of superior products. Chemguard's blend of research, design, and manufacturing is found nowhere else in the industry. Circle Reader Card No. 118

Fire pump controls
Cutler-Hammer
Booth 1623
Cutler-Hammer has one of the most complete packages of fire pump controllers, jockey pump and remote alarm panels in the industry. Stop by our booth to see the newest additions to our family of controllers, including our new FDC series of compact controllers and Multi-Pack FPC. Sign up to receive our new CD-ROM and receive a free copy of our newsletter, too. Circle Reader Card No. 119

Sprinkler retrofits
DecoShield Systems, Incorporated
Booth 1237
DecoShield Systems has served the fire sprinkler retrofit industry for more than 10 years. Our UL/ULC-listed products provide a premier, modular cover, and support system for CPVC, steel, and copper piping. DecoShield systems are economical, attractive, and easy-to-install, and can be painted to match any decor. Circle Reader Card No. 120

Monitoring systems
Digitize, Incorporated
Booth 710
The Digitize System 3500, a new direction in integrated proprietary alarm monitoring, incorporates an enlarged, information-rich display, powerful hardware, and versatile software. The System 3500, which can be used to mix and match a variety of alarm input and output devices, monitors and controls campus-wide addressable and conventional alarm panels. Circle Reader Card No. 121

Cabling
Draka USA
Booth 1731
Lifeline cables provide easy-to-install, reliable methods of protecting circuits against attack by fire using silicone ceramification technology to maintain circuit integrity throughout its 2-hour UL fire-rating qualification. Lifeline RHH, a 600-volt power cable for use in feeder or branch circuits, has a 2-hour fire rating in conduit. Lifeline CIC, a type-FPL cable for use in fire alarm systems, has a 2-hour rating in conduit. Circle Reader Card No. 122

Clean agent
DuPont Company
Booth 1715
DuPont clean agent fire extinguishants are the agents of choice for replacing halon.
Proven superior by independent tests.

Buckeye Fire Equipment manufactures and markets a complete line of high-performance foams for every fire-fighting application. They are UL listed and FM approved; nontoxic and biodegradable.

Buckeye foams are inventoried in seven key locations across the United States to minimize cost and response time. Our Emergency Response Program is designed to provide quickly the products and service you need to deal with high-demand situations.

Buckeye Fire Equipment also manufactures a complete line of nozzles, proportioners, and eductors; engineered foam systems; and fire extinguishers in wheeled and portable types.

For detailed information, call us toll free:

800-438-1028

ISO 9001 certified

Buckeye Fire Equipment Co. • 110 Kings Road • Kings Mountain, NC 28086-0428
Tel 800-438-1028 • Fax 704-739-7418
e-mail: bfec@buckeyef.com • www.buckeyef.com

Circle 010 on Reader Service Card
DuPont FE-36™ replaces Halon 1211 as a streaming agent in portable extinguishers, and can be used in local and total flooding applications. DuPont FE-13™ is a clean, environmentally acceptable replacement for Halon 1301, which can be used in occupied areas. DuPont FE-25™ is a total flooding agent that can replace Halon 1301 in aircraft engine nacelles and other critical, unoccupied hazards. DuPont FE-227™ is a total flooding agent with zero ozone-depletion potential suitable for use in normally occupied enclosures, such as those found in the data processing and telecommunications industries. Circle Reader Card No. 123

Foam system service
Dyne Technologies
Booth 930
Dyne Technologies and Edward Wolff Company have teamed up to make it easy to keep your firefighting foam systems operating at peak design efficiency by providing complete, professional foam system services, including system inspections and maintenance, on-site training, foam concentrate testing, and proportioning testing.

Life safety equipment
EST
Booth 1601
EST is proud to offer the industry's most complete line of life safety equipment on the market. Audible and visual devices, multiple element detectors, control panels from one zone to the largest network systems round out our offering. Keep costs down and quality up with innovative products from EST.

Fire alarm systems
Detection Systems/Radiotics
Booth 915
Detection Systems, a leading manufacturer of security and fire alarm detection products and systems, offers a complete line of zoned and addressable fire panels, photoelectric and beam ionization smoke detectors, and accessories, such as power supplies, annunciators, and keypads. Detection Systems distributes products worldwide.

Firefighting equipment
Elkhart Brass Manufacturing
Booth 1011
Elkhart Brass manufactures a complete line of firefighting equipment, including Select-O-Matic Chief® and low-pressure nozzles, and appliances, such as monitors, gated appliances, and manual, gear-drive, and electric apparatus valves. Elkhart Brass also manufactures LDH appliances, as well as foam applications equipment, wildland/urban monitors, and master stream nozzles.

Pumps
Fairbanks Morse Pump Company
Booth 731
Fairbanks Morse Pump manufactures a complete line of horizontal split case pumps with rated capacities of 250 to 5,000 gpm (946 to 18,927 lpm), vertical in-line pumps with rated capacities of 500 through 4,500 gpm (1,893 to 17,034 lpm). Units are UL-listed and FM-approved and are driven by either electric motors or diesel engines.

Notification appliances
Faraday LLC
Booth 1543
Faraday is showing a full line of fire alarm notification appliances, including horns, horn strobes, stand-alone strobes, bells, and the new Clear-Speak™ line of speakers and speaker strobes. Faraday devices provide easy installation and a clean, modern look, and are recognized by approval agencies.

Control panel
Faraday LLC
Booth 1139
Faraday is introducing its new line of intelligent initiating devices and its new intelligent fire alarm control panels and voice-plus evacuation units.

Fire detection systems
Fenwal Protection Systems
Booth 1409
Fenwal Protection Systems provides 24/7 fire detection, suppression, and control for mission-critical facilities, including telecommunications sites, data processing facilities, process control complexes, and automated manufacturing plants. Integrated solutions involve SmartOne detection, AnaLASER air sampling, Fenwal FM-200 clean agent fire suppression, and FenwalNET control systems. Visit www.fenwalfire.com.

Circle Reader Card No. 126
Circle Reader Card No. 127
Circle Reader Card No. 128
Circle Reader Card No. 129
Circle Reader Card No. 130
Circle Reader Card No. 131
Circle Reader Card No. 132
Circle Reader Card No. 133
Circle Reader Card No. 134
GAME-SET-MATCH
CUTLER-HAMMER HAS THE COMPLETE PACKAGE

We understand the fire protection industry.

Cutler-Hammer has over 50 years' experience in manufacturing a complete line of Fire Pump Controllers, Jockey Pumps and Alarm Panels for both domestic and international markets.

We know that you need your controllers delivered on-time, on-site without fail. That's why we've streamlined our production and implemented an independent Diesel and Jockey Pump assembly line. This ensures that you're never left hanging on, wondering whether or not your specific deadline will be met.

And when deadlines change, you can depend on us to deliver. Our technical support and services department will ensure that your technical questions are answered and your support requirements are met. In addition, our factory-trained Fire Pump Controller Specialists have the expertise to assist you with your specific application.

Our 65 thousand square foot Fire Pump Controller facility, located in Airdrie, Alberta, has a 30-year, proven track record of on-time delivery, quality production and customer support - that is second to none.

When you're specifying your next Fire Pump Controller package, choose Cutler-Hammer... we have the complete package.

Phone: 403-948-7955 or 1-877-860-7955
Fax: 403-948-4817
www.chfire.com

Circle 013 on Reader Service Card
**Exhibition Showcase**

**Explosion detection**
Fenwal Safety Systems
Booth 1419A
Experts understand that explosions occur in all industries, including the food, pharmaceutical, and power generation arenas. Though they account for less than 4 percent of all incidents, explosions represent nearly 40 percent of all losses, with an average cost per explosion of $3,400,000. Fenwal Safety provides systems to address these hazards.
Circle Reader Card No. 135

**Fire protection systems**
Fike Corporation
Booth 1615
Fike is a global manufacturer of special hazard fire protection systems that feature FM-200, carbon dioxide, and water mist as principal extinguishing agents and provide the user with advanced technology. The U.S. Coast Guard has approved their Marine FM-200 and carbon dioxide systems.
Circle Reader Card No. 136

**Life safety systems**
Fire Control Instruments, Incorporated
Booth 901
For more than 25 years, Fire Control Instruments (FCI) has designed and engineered life safety systems for commercial, industrial, and institutional applications worldwide. This year, FCI introduces the latest technology in fire alarm systems using high-speed networking and fiber optic communications. Acclaimed for its world-class support, FCI combines intelligence with reliability to produce conventional and analog fire alarm control panels.
Circle Reader Card No. 137

**Control panels**
Fire-Lite Alarms, Incorporated
Booth 1224
Since 1952, Fire-Lite Alarms has been the leading manufacturer of quality fire alarm control panels sold through security equipment distributors. As we recognize 50 years of innovation and excellence, we celebrate being the leader in conventional control communications and the first to introduce addressable fire alarm systems to this market. We're still a leader in the marketplace, having added some new ideas to our addressable line of products, which includes the Fire Warden MS-9600 and Fire Warden MS-9200. Visit www.firelite.com.
Circle Reader Card No. 138

**Training program**
Fire Safety Displays Company
Booth 737
The Fire Safety Displays produces The System, an engineered emergency identification and training program that consists of evacuation displays, fire and safety identification signs, employee pamphlets, and fire department pre-incident plan prints. Other products include specialized fire system graphics, directory and way-finding systems, pedestrian safety sign programs, and other custom products.

**Fire detectors**
Fire Sentry Corporation
Booth 531
Fire Sentry manufactures the world's most technologically advanced electro-optical fire detector. Using digital solid-state electronics and real-time signal processing, Fire Sentry products can respond quickly to real fires and reject sources of false alarms. Products are available for a variety of applications, including oil, gas and petrochemical; semiconductor; finishing; automotive; munitions; and aviation applications.
Circle Reader Card No. 139

**Partitions**
Fire Trak Corporation
Booth 651
The Fire Trak System allows non-load-bearing, fire-rated partitions to deflect while maintaining their fire rating. The Fire Trak System is UL-listed for up to 6 inches (15 centimeters) of deflection.
Circle Reader Card No. 140

**Detection system**
Firetrace International
Booth 433
Firetrace International provides a proprietary system that detects and suppresses fires in critical equipment and enclosures. This cost-effective technology activates where it detects the most heat and discharges the fire-suppressing agent in that area. More than 25,000 installations protect enclosures around the world. Visit www.firetrace.com.
Circle Reader Card No. 141

**Network system**
Firecom, Incorporated
Booth 851
Firecom's LSN-2000 is a fully integrated, digital, addressable network system that can be customized for fire protection, smoke control, HVAC, communications, and security.
Circle Reader Card No. 142

**Extinguishing system**
Flames, Incorporated
Booth 241
The Flamex spark detection and extinguishing system prevents dust collector fires and explosions. Flamex infrared spark detectors rapidly identify sparks and burning embers in pneumatic ductwork and trigger an automatic extinguishing device to suppress the sparks before they can enter baghouses or dust bins where explosions are likely to occur.
Circle Reader Card No. 143

**Sprinkler system**
FlexHead Industries, Incorporated
Booth 1620
For more than 14 years, FlexHead Industries has manufactured its patented FM-approved flexible sprinkler system for exhaust ducts and cleanrooms. In 1999, FlexHead Industries was the first to bring this flexible connection to commercial suspended ceiling applications, and its patented system remains the only commercial system to pass Factory Mutual approval standards.
Circle Reader Card No. 144

**Monitor**
Firetrol, Incorporated
Booth 713
See the Firetrol D3ATA System Mark II, which monitors, displays, and records fire
The World's earliest, smartest and most discriminating air sampling fire detection system

IFD CIRRUS

21st CENTURY

Visit us at the NFPA World Safety Conference & Expo May 19-23, Booth #1815 Minneapolis Convention Center - Minneapolis, MN

Manufacturer & Worldwide Distribution

Protec Fire Detection (Export) Ltd

Head Office
Tel: +44 (0)1282 717171
Fax: +44 (0)1282 717273
web: www.profire.co.uk
email: sales@profire.co.uk

City of New York MEA APPROVAL PENDING

ISO 9001 Certificate No.s. 201, 188 & 268
BS EN ISO 9002 Cert. No. FM 1067

Safe Fire Detection
105 Corporate Blvd.
Indian Trail,
USA NC 28079
Tel: (704) 821-7920
Fax: (704)-821-4327
email: staff@safefiredetection.com
www.safefiredetection.com

Circle 081 on Reader Service Card
pump system status. This next-generation product offers many enhancements and user benefits. Also on display is Firetrol's FTA1100-D diesel engine fire pump controller with digital display and printer recorder. Firetrol is a major manufacturer of UL-listed, FM-approved diesel and electrical fire pump controllers. The company also provides controllers for industrial and commercial motor control applications.

Circle Reader Card No. 146

**Laboratory**
FM Global
Booth 1348
Factory Mutual Research is an internationally recognized and accredited laboratory that tests and approves products, materials, and services useful in limiting or preventing damage to property and public safety. For more than 160 years, Factory Mutual has partnered with business and industry to reduce property losses.

Circle Reader Card No. 147

**Water mist systems**
FOGTEC North America Corporation
Booth 1337
FOGTEC Fire Protection develops, manufactures, and markets fixed and stand-alone mobile high-pressure water mist systems that are approved by international authorities. FOGTEC North America in Lake Forest, California, serves our expanding customer base and supports our local partners in Canada, the United States, and Mexico.

Circle Reader Card No. 148

**Voice evacuation systems**
Gamewell
Booth 1513
Gamewell is displaying the new FireForce 8, the latest in voice evacuation systems. The FireForce 8 is an 8-amp notification appliance circuit power supply with built-in synchronization control. Also on display are the 600 Series fire alarm control panels, with many new enhancements, and the most unobtrusive, easy-to-install beam smoke detector.

Circle Reader Card No. 149

**Fire protection products**
Gem Sprinkler
Booth 1101
Gem Sprinkler, part of Tyco Fire Products, manufactures and supplies the world's most complete line of fire protection products, including sprinkler heads and devices, specialty valves, steel pipe, plastic pipe and fittings, and pipe couplings used in the fabrication of fire protection systems. Available worldwide, Gem Sprinkler meets the fire protection needs of residential, commercial, industrial, institutional, and special-hazard applications.

Circle Reader Card No. 150

**Testers**
Gemini Scientific Corporation
Booth 1651
Gemini manufactures testers for calibrated-sensitivity inspections of installed detectors that meet current NFPA standards for calibrated-sensitivity tests and functional tests. This universal UL-listed tester has an adjustable range of 0.3 to 4.0 percent and is harmless to detectors. Portable and easy to operate, with a new digital display, the tester allows you to complete your inspection in 30 seconds per test.

Circle Reader Card No. 151

**Compressed air**
General Air Products, Incorporated
Booth 1300
General Air Products, the compressed air specialists, celebrates 65 years of excellence this year. Since 1936, we've provided our customers with products and services of the highest quality. From our FM-approved Dry Air Pac, to our lubricated and oil-less air compressors, to our unparalleled customer service, we bring you the best. Visit our booth and www.generalairproducts.com.

Circle Reader Card No. 152

**Fire protection products**
Gentex Corporation
Booth 1636
Gentex offers a complete line of high-quality fire protection products, including photoelectric smoke detectors, visual and audible signals, speakers, and portable smoke detector/visual units. Our engineering department designs each product to meet or exceed all code and standards requirements, including the Americans with Disabilities Act, strict state and local codes, and the performance and installation requirements of NFPA and Underwriters Laboratories.

Circle Reader Card No. 153

**Sprinklers**
Globe Fire Sprinkler Corporation
Booth 336
Globe will feature the Millennium® residential and quick-response pendant sprinkler and the new residential concealed sprinkler. The Millennium flush-style sprinkler is UL-listed. The quick-response style is available in 135 to 200 degree and has a 5.6 K factor. The residential sprinkler carries a 155 degree with a 4.1 K factor. The residential concealed sprinkler has a push-on/screw-off cover plate featuring a full 1/2-inch (1.27-centimeter) adjustment.

Circle Reader Card No. 154

**Clean agent**
Great Lakes Chemical Corporation
Booth 1331
Great Lakes Chemical presents FM-200®, the most widely accepted clean agent fire suppression technology available today and the leading choice of top fire suppression equipment manufacturers worldwide. Learn how FM-200 systems can protect your critical equipment, employees, and business against fire-related losses.

Circle Reader Card No. 155

**Extinguishment systems**
GreCon, Incorporated
Booth 406
GreCon spark detection and extinguishment systems prevent fires and explosions in dust collection and pneumatic conveying systems
by detecting and extinguishing sparks instantaneously without interrupting production or adversely affecting the filter media. GreCon also offers new line and I/O cards for improved customization of system parameters to meet individual application needs. GreCon products are FM-approved.
Circle Reader Card No. 156

GRACE
Construction Products

Fire protection solutions
Grace Construction Products
Booth 1019
Grace Construction Products is a leading provider of passive fire protection solutions. In addition to supplying such quality products as Monokote® spray-applied fireproofing and FlameSafe® firestopping, Grace actively advocates a balanced approach to fire protection in the building community. For years, Grace has been a driving force in code and standards development, industry-wide training, and product innovation. Our complete line of Monokote and FlameSafe fire protection products will be displayed at our booth.
Circle Reader Card No. 157

Pipe covering
Grice Engineering, Incorporated
Booth 1306
The Soffi-Steel™ system is today's premier modular CPVC and steel pipe covering system, designed to provide a durable, attractive, and easily installed enclosure. The Soffi-Steel system accommodates all types of sprinkler devices and functions as a shield for utility lines, electrical, and HVAC. The Soffi-Steel system is secure, virtually irremovable. For information, call (800) 800-3213 or visit www.soffisteel.com.
Circle Reader Card No. 158

Standpipe equipment
Guardian Fire Equipment, Incorporated
Booth 1049
Guardian furnishes a full line of standpipe equipment for new construction and retrofit applications, with a large inventory of hose racks, reels, valves, hoses, adaptors, nozzles, cabinets, hydrant houses and equipment, monitors, and test equipment, as well as British fittings and special threads.
Circle Reader Card No. 159

Lightning protection
Heary Brothers Lightning Protection Company, Incorporated
Booth 1456
Heary Brothers Lightning Protection featur-
ing the LPA-2005 Lightning Preventer System, is the first in the company's line of early streamer emission lightning protection systems. Given the system's independent laboratory testing and documented customer satisfaction, this is the system of choice for building owners, architects, engineers, and contractors.

Circle Reader Card No. 160

**Detectors**
Halma Fire and Security
Booth 509

With Apollo Fire Detectors, Air Products and Controls, and Fire Fighting Enterprises, the Halma Fire and Security Division is one of the world's leading producers of detection equipment for the fire alarm industry. We provide a complete package of devices, including conventional and addressable smoke detectors, duct smoke detectors, and optical beam smoke detectors.

Circle Reader Card No. 161

**Alarm products**
Harrington Signal, Incorporated
Booth 719

Harrington Signal, an ISO 9001-certified company, offers a complete line of U.S.-manufactured fire alarm products and systems, including single- and multi-IDC conventional to single- and multi-SLC addressable control panels, explosion-proof notification appliances, Americans with Disabilities Act-compliant initiation devices, and a full line of accessories, including annunciators, guards, and relays.

Circle Reader Card No. 162

**Smoke control panels**
H.R. Kirkland Company
Booth 1349

H. R. Kirkland manufactures graphic, directory, exterior, and backlit annunciators; smoke control panels; and graphic maps. All interior Kirkland graphic displays are produced in full color for the same cost as black and white. H. R. Kirkland has been committed to providing outstanding product quality and service since 1930.

Circle Reader Card No. 163

**Firestop products**
Hilti, Incorporated
Booth 1051

Hilti offers support and expertise for every job site. A trained sales force, fire protection specialists, and fire protection engineers can
help you select the correct firestop products and systems to match your specific project needs. Hilti has a support package that's unmatched in the passive firestop industry. Circle Reader Card No. 164

**Corrosion control**
HERC Products, Incorporated
Booth 222
MIControl fps, HERC Products' four-step corrosion control program for sprinkler systems, includes assessment, rehabilitation with UL-certified Pipe-Klean fps, treatment, and maintenance. For additional information, visit www.hercprod.com.
Circle Reader Card No. 165

**Testing equipment**
Home Safeguard Industries, LLC
Booth 1043
Home Safeguard Industries offers low-cost, reliable products that test safety devices. Among them are Smoke Detector Tester, the first of its kind, approved by nearly all smoke detector manufacturers, and Heat Detector Tester, which lets you discard hair dryers and heat guns. Dustair allows you to clean smoke detectors at high elevations without ladders, and CO Check is an industry first for testing CO detectors with a non-toxic gas.
Circle Reader Card No. 166

**Wood products**
Hoover Treated Wood Products, Incorporated
Booth 1754
Hoover Treated Wood Products offers Pyro-Guard®, an interior-grade fire-retardant-treated lumber, and plywood, and Exterior Fire-X®, for weather-exposed applications.

FRTW will slow the advance of flame and give firefighters time to do their job. Building codes often allow FRTW to be used in lieu of noncombustible materials. Circle Reader Card No. 167

**Software**
HRS Systems, Incorporated
Booth 1136
HRS Systems presents the HASS® family of fire protection software, featuring the Win-

---

**Telguard Classic**

Telular products can detect when the telephone line is not in service and will automatically switch communications for voice, fax, data, security or fire alarm systems to the cellular network.

In a crisis situation, not only are you still connected, you can continue to conduct business and ensure that your personnel and facility are safe and protected. Call (800) 229-2326 today and find out how we can help you stay connected.

For more information on Telguard's complete line of secure cellular communication products that manage any application, call us today at 1-800-229-2326 or visit our web site at Telguard.com.

Circle 064 on Reader Service Card
dows and DOS versions of HASS for sprinkler system analysis, COOSA® for CO₂ system analysis, and cost estimators for each. Don't miss HASS House® for residential sprinkler system analysis. Windows and DOS versions use English or metric units and are available in Spanish.

**Pump controls**
Hubbell Industrial Controls
Booth 517

Hubbell Industrial Controls manufactures fire pump control components, transfer switches, and complete controllers, including electric FPC, diesel FPC, soft start/stop, alarm panels, jockey pump panels, manual drum controllers, power resistors, and industrial controls for pump systems. Visit [www.hubbell-icd.com](http://www.hubbell-icd.com).

**Software**
Hydratec, Incorporated
Booth 1013

HydraCAD, Hydratec's sprinkler design software for Windows 98/NT/2000 and AutoCAD r14/2000/2000I, confirms our commitment to remaining at the forefront of our industry by providing the most flexible and easy-to-use package available. Our HydraCALC Hydraulics and Windows HydraLIST Stocklisting programs complement HydraCAD or work independently. Visit [www.hydratecinc.com](http://www.hydratecinc.com).

**Test equipment**
Hydro Flow Products, Incorporated
Booth 237

The Hose Monster® is the safest and most accurate way to flow-test fire pumps, rooftop standpipes, and hydrants. The patented design makes it safe—no hold-downs required. The internal pilot, UL-listed nozzle inserts, and precise orifice make it accurate. Conduct flow tests any time of day without interfering with traffic or causing property damage.

**Suppression systems**
Industrial Protection Devices
Booth 318

IPD Explosion Suppression System III is designed for applications in industries, including the pharmaceutical, agricultural, and waste industries, in which product dust is collected, transferred, and processed. System III delivers a suppression agent into an enclosed area at the first sign of a fireball to effectively suppress an explosion in its earliest stages.
Jessup provides photoluminescent exit signs listed to UL 924, Emergency Lighting and Power Equipment, through ETL, with no electricity consumption. Jessup products are 100 percent reliable, maintenance-free, and easy to install.

Circle Reader Card No. 176

Controllers
Joslyn Clark Controls, Incorporated

Security hardware
Ingersoll-Rand Company
Booth 1737
Ingersoll-Rand Security and Safety is composed of the leading manufacturers of mechanical and electrical security hardware. Products include exit devices, door closers, metal doors, and other door control products, including a wide range of access control from simple key switches to biometrics handreaders. Ingersoll-Rand brands include Schlage, LCN, Locknetics, Von Duprin, Recognition Systems, and Steelcraft.
Circle Reader Card No. 173

Paint
International Fire Resistant Systems
Booth 245
Firefree 88 is the only paint product developed to upgrade substandard fire and party walls in commercial and residential construction to 1- and 2-hour-rated fire and party walls. Firefree 88 has passed the ASTME 119 and UBC 8-2 corner test on numerous substrates and has been approved by ICBO.
Circle Reader Card No. 174

Emergency lighting
Isolite Corporation
Booth 216
Isolite is the world’s leading manufacturer of energy-efficient emergency lighting. We supply a full line of self-luminous and electrical exit signs, egress lighting, and pathway markers necessary to meet fire safety codes.
Circle Reader Card No. 175

Signs
Jessup Manufacturing Company
Booth 944

---

Aurora Pump
WHEN YOU CAN’T AFFORD TO WAIT

If you require our standard labeled fire pumps, or a modified pump to meet your needs, we have the capability of satisfying any and all requirements.

HOTELS
INDUSTRIAL
OFFICES

For more information contact your local Aurora Fire Pump Distributor or 630-966-2732

Circle 079 on Reader Service Card

MAY/JUNE 2002
NFPA JOURNAL 135
Booth 1531
Joslyn Clark Controls is a world leader in the manufacture and supply of FM-approved and UL-listed controllers for stationary fire pump systems. Joslyn Clark electric controllers, which meet the rigid requirements of NFPA standards, are custom-built in a rigid, painted steel enclosure using reliable, heavy-duty components. Joslyn Clark diesel engine controllers combine relay logic with solid state logic to provide the most sophisticated and reliable control circuitry available. All Joslyn Clark controllers have features and options that provide added value and benefits to our customers. Joslyn Clark Controls also offers a complete line of electric motor starters for applications up to 7,200 volts.

Fire systems
Kidde Fire Systems
Booth 1441
Kidde Fire Systems offers the Circle of Protection for applications ranging from kitchen hoods and ducts to vehicles to computer complexes. Products include clean agent systems using FM-200 and FE-13; carbon dioxide systems; pre-engineered wet and dry chemical systems; Kidde Orion air sampling detection systems; and conventional detectors and control systems. Visit www.kiddefiresystems.com.

Alarms
King-Fisher Company
Booth 836
King-Fisher is a leading manufacturer of radio fire and security reporting systems serving the U.S. Department of Defense, municipal governments, and industry. King-Fisher systems protect life and property at facilities worldwide.

Bracing
Loos and Company, Incorporated

Sure Fire Valves For Reliable Fire Protection

When life and property are on the line, there's no better choice than OCV Control Valves for your fire protection system. Meeting all standards, OCV's wide selection of diaphragm-actuated valves offer advantages in many ways:

- Fully automatic operation using pilot controls and line pressure
- OCV-designed pilots for accurate control of valve operation/set-points
- Guided stem assembly/accurate throttling and positive closure
- Epoxy-coated ductile and steel valves for fresh or seawater service
- Easy on-line service/adjustments
- Drip-tight closure/renewable seal for extended valve service life
- No packing glands to service
- Globe or angle pattern/ductile iron, cast steel, bronze and stainless steel

Plus, count on the performance of OCV for support, engineering consultation and valves configured to your specific requirements today and years to come.

OCV Control Valves
Flowing Strong Since 1952
7400 East 42nd Place * Tulsa, Oklahoma 74145-4744 * USA
Phone: 1-888-628-6238 • 918-627-1942 • Fax: 918-622-5916
e-mail: sales@controlvalves.com • Internet: www.controlvalves.com

Circle 078 on Reader Service Card
Booth 1840
Loos and Company, manufacturer of wire, wire rope, cable hardware, related fittings, and machinery, is the innovator of pre-stretched, color-coded, seismic wire rope/cable bracing. Our UL-listed cable bracing is break-strength-certified and complies with NFPA standards, model building codes, and the California Building Code.
Circle Reader Card No. 182

**Water mist system**
Marioff, Incorporated
Booth 839
HI-FOG by Marioff is the world's leading water mist fire protection technology. HI-FOG systems are installed on more than half the new cruise ships and luxury ferries around the world, and FM-approved HI-FOG systems protect turbines and machinery spaces, light-hazard occupancies, and computer rooms in installations worldwide.
Circle Reader Card No. 183

**Controllers**
Master Control Systems, Incorporated
Booth 502
Master Control Systems is the complete fire pump controller company, offering UL-listed and FM-approved fire pump controllers that meet NFPA requirements. We offer electric controllers from 5 to 400 hp at 200 to 600 volts and from 20 to 1,900 hp at 2,300 to 7,200 volts. We also offer diesel fire pump controllers and accessories. Five-year warranties are standard on our EC-series controllers and paperless pressure and alarm recorders.
Circle Reader Card No. 184

**Lighting**
Maxi-Signal Products Company
Booth 850
Maxi-Signal Products is a distributor of strobe lighting, horns, bells, and sirens. Hazardous-location and explosion-proof strobes, as well as alarms, are also available.
Circle Reader Card No. 185

**Communication systems**
MEDC International
Booth 351
MEDC Design manufactures and markets a range of field devices for fire and gas and communications systems for use in marine and industrial environments and hazardous locations. The range includes call points, speakers, strobes, status lamps, steady lights, and control and distribution equipment. Certifications include ATEX/Centurion approvals, UL listing, and FM approval.

---

**WHAT A WAY TO CELEBRATE OUR 25th ANNIVERSARY!**

When the subject is proprietary alarm monitoring, more is definitely better. Digitize celebrates our Twenty-Fifth Anniversary with the amazing capabilities of the new System 3505, successor to the world renowned Systems 3000 and 3500. System 3505 has all the features of its predecessors and more! The 3505 supports more alarms, carries out more functions and gives more characters and information per line. And now even more accountability... System 3505 can print out entire alarm descriptions on its new graphic, logging printer. It also includes a new power supply, new CPU, new rear panel, new I/O and printer card and new battery units.

The 3505 is network compatible with Systems 3500 and 3000, which can be upgraded using available retrofit kits. Contact us by telephone, mail, fax or email and we'll be more than glad to tell you all about the new 3505.

**PERFECTING ALARM MONITORING**

**DIGITIZE**

ISO Certified 9001:2000
25th Anniversary
First... When Seconds Count® Since 1977

158 Edison Road
Lake Hopatcong, NJ 07849
Tel: (973) 663-1011
Fax: (973) 663-4333
E-mail: info@digitize-inc.com
www.digitize-inc.com
Circle 016 on Reader Service Card

Stop by Booth 0710 at the NFPA Show and see System 3505 in action.

MAY/JUNE 2002

NFPA JOURNAL 137
Histo~ has shown that, as one technology exhausts its potential, a new, more sophisticated paradigm emerges to propel us at an exponential rate toward a new technology. AutoSPRINK is that paradigm. Witness the future of CAD fire sprinkler and fire alarm design software today.

Circle Reader Card No. 187

Firestop material
Metraflex
Booth 443
MetraSeal 120, a UL-classified intumescent firestop, and the UL-listed Fireloop™ expansion joint for fire sprinkler systems in seismic applications are on display. MetraSeal 120 works with round pipe and has a 2-hour rating. The Fireloop is a streamlined, cost-effective joint for fire sprinkler systems that cross building seismic joints.

Circle Reader Card No. 188

Clean agent
Minimax GmbH
Booth 239
Minimax is a European manufacturer of fire protection systems. In North America, we focus on argon inert gas-clean agent fire suppression systems using pure argon, which is readily available, causes no chemical reaction, and is safe for humans and sensitive equipment. Multiple zones can be protected using one agent supply.

Circle Reader Card No. 190

Flame detectors
Meggitt Avionics, Incorporated
Booth 1116
Meggitt Avionics' Omniguard® flame detectors are known to be superior in fire detection and false alarm rejection. A patented, triple-spectrum detector that can detect an aviation fuel fire at 250 feet (76 meters) and respond within 3 seconds is available. It can also detect non-hydrocarbon fires such as those fueled by hydrogen and silane.

Circle Reader Card No. 191

Suppression systems
Modular Protection® Corporation
Booth 1112
Modular Protection manufactures clean extinguishing fire suppression systems featuring FE-36™ and Novec™ 1230. The SEVO and LOPRO technologies provide a reliable
and competitive alternative to current product lines.
Circle Reader Card No. 192

**Alarm systems**

National Time and Signal Corporation
Booth 1631
National Time and Signal is an 80-year-old manufacturer of fire detection and alarm systems, master clock systems, and tower clocks. Our wide array of fire alarm products is designed to fill virtually any need, including analog, addressable, voice evacuation, networks, and graphic command centers.
Circle Reader Card No. 193

**Control panel**

Notifier
Booth 1219
Visit Booth 1219 to see the latest member of Notifier’s new Onyx™ Series, the NFS-3030, our one-loop, expandable-to-10, networkable, addressable fire alarm control panel. This multi-faceted panel supports up to 3,180 addressable devices; includes a large, 640-character display; and is completely field-programmable from display keypad or off-line PC. We continue to deliver on our commitment to meet your anticipated life safety needs.
Circle Reader Card No. 194

**Firestop products**

Nelson Firestop Products
Booth 1452
Nelson Firestop Products offers the industry’s largest and most diverse firestop product line. Since 1963, Nelson Firestop Products have offered protection against fire, smoke, water, and explosions in industrial facilities, commercial buildings, military and commercial marine vessels, oil rigs, production platforms, and power generation facilities.
Circle Reader Card No. 195

**Testing**

NGC Testing Services
Booth 1243
For more than 35 years, NGC Testing Services has provided fast, cost-effective

---

Bermad’s **NEW** Model 700 E Deluge Valves are ready for business. Nine different UL Listed deluge models quickly and fully open when activated hydraulically, pneumatically or electrically and provide the optimum deluge valve solution for any fire protection and special hazard need. Each of these valves also feature an unobstructed flow path to ensure minimal pressure loss and maximum flow. And, after they’ve done their job they’re quickly and easily closed drip tight and reset to the standby mode ready for their next Grand Opening. Contact us for more information on Bermad’s complete line of UL Listed Deluge, Pressure Reducing and Pressure Relief Valves for fire protection service.

Bermad, Inc. 4070 Leaverton Court, Anaheim, California 92807 • Tel: 800.821.6825 • Fax: 714.666.2355 • E-mail: bermad@bermadusa.com

Circle 007 on Reader Service Card
evaluations of materials, products, and systems for fire endurance and flame spread, from development through certification. Accredited lab with full-scale, floor-ceiling and partition fire test capabilities. Acoustical testing also available. Call (716) 873-9750, or visit www.ngctestingservices.com.

Circle Reader Card No. 196

Communications
Mircom Technologies Limited
Booth 624
Mircom Technologies manufactures quality life safety and communication products. Our complete fire alarm product line ranges from small to large fire alarm systems, including a comprehensive variety of fire alarm devices and accessories. With more than 30 years experience in the life safety and communications industry, Mircom is committed to leading-edge technology and high-quality engineering.

Circle Reader Card No. 197

Pumps
Patterson Pump Company
Booth 615
Patterson Pump is the world’s number one supplier of stationary fire pumps. With a full line of heads and flows, our products include vertical-in-line, vertical turbine, end suction, horizontal split case, and pre-packaged systems. Our offices in Singapore, Athens, and Chiang Mai, Thailand, and our manufacturing facility in Mullingar, Ireland, serve Patterson customers worldwide.

Circle Reader Card No. 198

Test equipment
No Climb Products Limited
Booth 1343
Solo, a range of test and service equipment for smoke and heat detectors, is universal, fully integrated, and interchangeable. With Solo professional tools, maintenance engineers can test, access, and remove detectors up to 29.5 feet (9 meters) safely and accurately, saving considerable time. Trutest, our smoke detector sensitivity tester, is the only field test device that can measure smoke detector sensitivity in one test, enabling identification of over- and under-sensitive detectors. Trutest is Universal- and UL-listed. Solo Aerosol is a manufacturer-endorsed, plastic-compatibility-checked, non-flammable, oil-free formulation smoke aerosol for functional testing that has quicker response and clearing times.

Circle Reader Card No. 199

Laboratory
Omega Point Laboratories, Incorporated
Booth 1527
Omega Point is a nationally recognized, independent fire testing laboratory specializing in the performance characteristics of building materials, furniture, and building systems. We also provide listing and follow-up services and are accepted by ICBO and SBCCI, as well as federal, state, and local jurisdictions throughout the U.S.

Circle Reader Card No. 200

Design program
OmniCADD, Incorporated
Booth 1041
OmniCADD sprinkler design, hydraulic calculation, stocklisting, and fabrication software is the most complete and powerful package available in the fire protection industry. The OmniCADD design program requires AutoCAD 14 or 2000. OmniCADD software, fast and ready to take away your design worries, is the software that saves lives.

Circle Reader Card No. 201

Control valves
OCV Control Valves
Booth 401
OCV, your best automatic control valve source for more than 50 years, manufactures valves that have become known for their dependable performance, long-life, and simple maintenance. Professional engineering and sizing provided by OCV means you can expect quality products and support from specification to start-up. Globe and angle control valves are available in a wide range of materials in sizes ranging from 1¾ to 24 inches (3 to 61 centimeters) for all your fire protection application requirements.

Circle Reader Card No. 202

Extinguishers
Pem All Fire Extinguisher Corporation
Booth 934
Pem All Fire Extinguisher, which has served the fire protection industry with pride and excellence for more than 50 years, is again leading the industry with our products, such as engineered FM-200, FM-200 marine and gas station, and our soon-to-be-released industrial dry chemical. Visit www.pemall.com.

Circle Reader Card No. 203

Sprinkler monitoring devices
Potter Electric Signal Company
Booth 707
Potter Electric Signal is the premier manufacturer of sprinkler monitoring devices. Products include a complete line of water-flow, pressure, and supervisory switches, including explosion-proof devices. Now available, HydraTank, is a compact, self-contained water source for residential and light commercial applications that needs no electricity. Also offered are releasing control panels, including the PFC-4410, a multi-hazard control panel with features usually found on larger systems. Potter is an ISO-certified company.

Circle Reader Card No. 204
Fire control panels
Radionics
Booth 915
Radionics, a division of Detection Systems, Incorporated, a Bosch Group company, manufactures advanced electronic fire detection systems. Our company provides conventional-addressable and analog-addressable fire control panels with a full line of system components, software, smoke detection products, and accessories. We have an international dealer network that provides products worldwide.
Circle Reader Card No. 205

Sealants
Rectorseal Corporation
Booth 1030
Rectorseal is a 65-year-old company that manufactures specialty sealants and related products and runs a fire test laboratory under the UL Witness Test Program. It produces a broad range of economical firestopping products for through-penetrations and fire-rated construction joints, including new BlazeSeal intumescent strips for use in the fire-rated door and window industry.
Circle Reader Card No. 206

Halon reclamation
RemTec International
Booth 1541
RemTec International procures and sells halons and CFCs as part of its Halon and CFC Bank Program. RemTec’s complete in-house laboratory includes a Hewlett-Packard gas chromatograph to ensure purity and compliance with ASTM, ARI, and military specifications. All work is performed in compliance with the Clean Air Act, NFPA, and all other industry standards and guidelines. Contact RemTec at (800) 372-1301.
Circle Reader Card No. 207

Consultants
RJA Group, Incorporated
Booth 1313
The RJA Group provides fire protection, life safety, and security engineering consulting services; construction and maintenance management services; and knowledge transfer training products and services through four subsidiaries, Rolf Jensen and Associates, Sako and Associates, Fire Protection Management, and Protection Knowledge Concepts.
Circle Reader Card No. 208

Software
Retrotec, Incorporated
Booth 1821
Retrotec’s door fans and software measure enclosure integrity for predicting clean agent...
retention times, per NFPA. Peak enclosure pressure and wind losses can also be predicted. Every major fire protection company worldwide has completed Retrotec’s on-site and video training with certification.

Circle Reader Card No. 209

Fire Alarm/Releasing Panel, which is field-programmable and designed for small commercial detection and releasing applications. It offers many unique features, such as Protectowire Digital Alarm Point Location, multiple hazard release capabilities, and selectable Class A or B detection circuits, all in a standard, off-the-shelf package.

Circle Reader Card No. 210

Public education
Robotronics, Incorporated
Booth 1342
Robotronics offers fire prevention education remote control robots, including Freddy the Fire Truck, Patches and Pumper, Freckles, and Pluggie. We also offer the new Buzz E. Detector and his house of hazards, as well as robot educational material, such as coloring books, crayons, pencils, litterbags, and stickers. For more information, call (801) 489-4466.

Circle Reader Card No. 211

Cabling
Rockbestos-Surprenant Cable Corporation
Booth 1336
Rockbestos-Surprenant will feature VITALink® MC power cable for fire pump and emergency circuit applications, and VITALink® CI fire alarm cables for NFPA 70, National Electrical Code® Article 760 applications. Both products are 2-hour fire-rated by UL per UL 1724/2196.

Circle Reader Card No. 212

Cabling
Pyrotenax®
Booth 315
Pyrotenax is displaying mineral insulated cable (Type MI). Among the products available are System 1850 UL-listed, 2-hour fire-resistive electrical cables used for emergency feeders and fire alarm system; System 1850-SE service entrance cabling system; and Zero EMI system that ensures zero electromagnetic interference external to the electrical feeder system.

Circle Reader Card No. 213

Storage buildings
Safety Storage, Incorporated
Booth 444
Safety Storage is the premier manufacturer of prefabricated building systems used for storing, handling, and processing flammable liquids and other hazardous materials. Safety Storage offers hundreds of standard models. In addition, we provide custom modular solutions for specific applications.

Circle Reader Card No. 214

Security
Safety Technology International
Booth 823
Safety Technology manufactures products that help stop vandalism, false fire alarms, theft of fire extinguishers and other equipment, and misuse of emergency doors. Best
For more than a century, NFPA has developed standards and codes which save lives and protect communities. We’re continuing that tradition at our annual Fall Education Conference this November in Atlanta. It’s the most comprehensive fire protection meeting ever. Your colleagues – fire protection and life safety professionals from around the world – will be there to take advantage of more than 40 hands-on career development seminars in the latest techniques and technologies. Shouldn’t you?

For more information visit us at www.nfpa.org or call 617-984-7310
known is its unique and patented Stopper® II cover, which has helped stop false fire alarms in schools, hospitals, and other public buildings around the world for more than a decade. Safety Technology also manufactures protective covers for fire pull stations, strobe/horn signals, smoke detectors, clocks, bells, keypads, and products, many of them UL-listed and CUL- and FM-approved.

Circle Reader Card No. 215

**Detection systems**

Securiplex, Incorporated
Booth 809
Detection or suppression, Securiplex has a solution for you. Our PRO-2000’s unique, all-in-one fire and gas detection system eliminates the need for two separate control systems. Our Fire-Scope® 2000 fine water spray system is FM-approved for local application, thus eliminating the need for an enclosure when protecting high-risk equipment.

Circle Reader Card No. 216

**Gas detection products**

Sensor Electronics Corporation/Fire Combat Booth 319
Sensor Electronics manufactures highly intelligent combustible and toxic gas detection products that can detect more than 20 different gases. Our new infrared gas detector is on display, along with complete graphics and data logging software to monitor the gas and fire detection network. The new halon alternative Aero-K aerosol generator is also on display at our booth.

Circle Reader Card No. 217

**Piping**

Shurjoint Piping Products
Booth 831
Shurjoint Piping Products is a leading full-line, ISO-certified manufacturer and supplier of grooved pipe fittings and couplings, as well as ductile iron threaded-pipe fittings whose products are listed and approved by UL, ULC, FM, VdS, LPCB, WRc, CSTB, and others.

Circle Reader Card No. 218

**Detection systems**

Siemens Building Technologies
Fire Safety Division
Booth 1301
Siemens Building Technologies, Fire Safety, introduces Firefinder, a revolutionary, intelligent fire detection system featuring a graphic-based operator interface, integrated eight-channel digital voice evacuation, and building communication system. Also featured are the MXL Series detection systems, FM-200 suppression system, and our NCC-NT Command Center.

Circle Reader Card No. 219

**Station covers**

SigCom (Signal Communications)
Booth 1110
SigCom’s new Sentry™ Station Cover is a tough, rugged polycarbonate cover for use in protecting manual pull stations and other devices from false alarms, vandalism, dust, and weather. The unit meets current Americans with Disabilities Act requirements. Our DVS-25 and DVS-50 Series voice evacuation panels bring low-cost voice evacuation to
assembly occupancies.
Circle Reader Card No. 220

**Detector maintenance**
SDi
Booth 1343
SDi will show Trutest, the only device that can measure detector sensitivity in a genuine test, and the Solo range of fully integrated test and service equipment for heat and smoke detectors. These unique products are world leaders in detector maintenance and are now industry standards for professional fire alarm service companies interested in saving time and money.
Circle Reader Card No. 221

**Control panel**
Silent Knight
Booth 701
Silent Knight introduces the 5499 9-amp power supply with built-in synchronization capabilities. In addition, Silent Knight offers addressable and conventional fire alarm control panels, as well as digital fire communicators, power supplies, voice evacuation systems, and digital central station receivers.
Circle Reader Card No. 222

**Fire protection systems**
SimplexGrinnell
Booth 1701
SimplexGrinnell, the company resulting from the union of two industry-leading fire protection systems providers, has quickly emerged as a pre-eminent fire protection and life safety company. Featuring the combined strength of Simplex, the market leader in fire detection and alarm systems, and Grinnell Fire Protection, the premier North American fire suppression company, SimplexGrinnell offers top-quality products and comprehensive services. Visit www.simplexgrinnell.com
Circle Reader Card No. 223

**Vertical smoke protection**
Smoke Guard Corporation
Booth 732
The Smoke Guard System provides the most effective vertical smoke protection at the elevator hoistway on the market. This innovative gasketing system is well-suited for both renovation projects where space is limited and new construction where creative solutions are required to meet both code and aesthetic design requirements. The Smoke Guard System is listed and labeled, meeting all requirements of the model building codes and NFPA 101®, Life Safety Code®, for limiting vertical smoke migration at the elevator hoistway. To learn more about our product and to download complete system design details and technical information, visit www.smokeguard.com.
Circle Reader Card No. 224

**Sprinkler products**
Spears Manufacturing
Booth 1015
Spears FlameGuardTM CPVC fire sprinkler products provide a cost-effective alternative to metal systems, providing the advantages of high corrosion resistance, improved system hydraulics, and ease of installation. CPVC Spears FlameGuard products are approved by UL, FM Global, and LPCB; are listed for NFPA sprinkler standards.
Circle Reader Card No. 225

**Control systems**
Spectronics Corporation
Booth 225
Spectronics manufactures fire alarm and security monitoring and control systems for commercial and industrial applications, with integrated voice evacuation for high-rise life safety requirements. Conventional and analog addressable devices are supported through a wide range of modular equipment, allowing innovative solutions from small stand-alone panels through large networked systems. We also offer an extensive selection of signal-initiating devices, notification appliances, annunciators, custom graphics, power supplies, and accessories.
Circle Reader Card No. 226

---

**MetraSeal 120**
is a fireproof, waterproof, smoke-tight, 2-hour rated intumescent seal that stops a racing blaze dead in its tracks. Install in walls, floors and foundations, in any weather. It's a solid, verifiable, positive seal every time.
Place around any carbon steel pipe or PVC.* There is no waste and no mess. Call for more information.
www.metraflex.com/metraseal
1-800-621-4347;
Fax 312/738-0415

Metraflex
Chicago, IL

*PVC rated to 1-hour.
Sprinklers
Star Sprinkler
Booth 1101
Star Sprinkler, part of Tyco Fire Products, manufactures and supplies the world's most complete line of fire protection products, including sprinkler heads and devices, specialty valves, steel pipe, plastic pipe and fittings, and pipe couplings used in the fabrication of fire protection systems. Available worldwide, Star Sprinkler meets the fire protection needs of residential, commercial, industrial, institutional, and special-hazard applications.
Circle Reader Card No. 227

Firestopping products
Specified Technologies, Incorporated
Booth 1140
Specified Technologies (STI), a leading firestopping manufacturer, offers the industry's most complete line of UL-classified systems. STI's SpecSeal® product line is based on a unique, two-stage intumescent technology. STI specializes in difficult applications, offering not only a broad-based product line, but solutions, too.
Circle Reader Card No. 228

Pumps
Sterling/Peerless Pump Company
Booth 1037
Sterling Fluid Systems is the proud manufacturer of the Peerless Pump brand, which has been the industry leader in fire protection for more than 50 years. Peerless Pump provides a range of UL-listed and FM-approved horizontal, vertical, end-suction, and in-line fire pump equipment that complies with the requirements of NFPA standards, including complete packaged fire pump systems.
Circle Reader Card No. 229

Respiratory protection
Survivair
Booth 640
Survivair is a leading manufacturer of respiratory protection products for industrial, firefighting, and consumer applications. Our full product line includes air-purifying respirators, supplied-air respirator systems, self-contained breathing apparatus, and accessories.
Circle Reader Card No. 230

Detection systems
System Sensor
Booth 1025
System Sensor is a global manufacturer of fire detection and notification systems. System Sensor places a premium on research and development, resulting in products that are reliable, sophisticated, and designed for real-world applications. Our extensive product line includes system smoke detectors, sprinkler monitoring products, duct smoke detectors, strobes, horns, and horn/strobes.
Circle Reader Card No. 231

Pump systems
Talco Industries/Talgo Fire Systems
Booth 535
Talgo Fire Systems manufactures packaged pump systems for above and belowground use in sizes ranging from 1.5 to 7.5, covering a wide range of flows and pressures. Our professional-looking systems are bench-tested before shipment to eliminate installation problems. We offer quality with competitive pricing.
Circle Reader Card No. 232

Software
Tiscor
Booth 630
Tiscor's Fire and Life Safety Equipment Management System uses software and hand-held computers to schedule, track, and document inspection and maintenance procedures on equipment and locations. The system eliminates handwritten log sheets and manual data entry, while ensuring compliance with NFPA codes and standards, OSHA requirements, and other regulatory agencies.
Circle Reader Card No. 233
**Nozzles**
Task Force Tips
Booth 1148
Task Force Tips, Inc. has long been recognized as a leader in the design, manufacture, and distribution of high-performance fire equipment. Now, TFT introduces a line of NFPA-compliant nozzles. Also on display are the newest high-flow portable device and the popular Res-Q-Rench. Compare apples to apples, then make the automatic choice.
Circle Reader Card No. 234

**Gas detection**
Thermo GasTech, Incorporated
Booth 751
Thermo GasTech designs, manufactures, markets, and services a complete line of portable and fixed system gas detection instruments, transmitters, and sensors. Our instruments monitor and check for the presence of combustible gases, toxic gases, and oxygen content to ensure worker safety.
Circle Reader Card No. 237

**Transmission products**
Telular Corporation
Booth 1026
Telular has been the leading manufacturer of cellular transmission products since 1985. Three Telular products with commercial fire listings have been approved by the California State Fire Marshal: the TG-200, TG-300, and the T-3100UL. These products also satisfy NFPA requirements as the secondary path of communications for UL-listed fire systems.
Circle Reader Card No. 238

**Fasteners**
Textron Fastening Systems
Booth 933
Textron Fastening Systems specializes in manufacturing a variety of Elco®, Camcar®, and Fabco® products that are UL-listed and FM-approved. Our HangerMate® threaded rod anchoring system is a unique, one-piece, cold-formed and machined alloy steel anchor made in a variety of styles to meet the specific needs of steel, concrete, or wood building materials. It can be installed in seconds. For product information, visit www.fastenersforconstruction.com.
Circle Reader Card No. 239

**Pump controls**
Tomatech, Incorporated
Booth 413
Tomatech manufactures fire pump controllers built to NFPA and UL 218 standards. Among our products are electric fire pump controllers, electric fire pump controllers c/w automatic transfer switch, diesel engine fire pump controllers, and miscellaneous pump controllers such as jockey pump controllers, alarm panels, and booster pump controllers.
Circle Reader Card No. 240

**Clean agent**
Vesta, SRL
Booth 949
Vesta supplies clean-agent gaseous fire suppression systems.
Circle Reader Card No. 241

**Hangers**
Tolco, Incorporated
Booth 726
Tolco is a major manufacturer of pipe hangers, supports, and seismic bracing. We are a world leader in seismic bracing technology. Based in southern California, a living seismic laboratory, we’ve developed unique seismic bracing products that address the specific needs of the fire sprinkler industry.
Circle Reader Card No. 235

**Extinguishers**
Twenty-First Century Fire Equipment
Booth 300
The Guardian III is designed to detect and extinguish stove-top cooking fires on electric and gas ranges. A quantum leap forward in stove-top fire protection, this system uses...
advanced electronics and wireless technology. In addition to extinguishing the fire, this system produces an acoustic signal that activates the electric or gas shut-off.

Circle Reader Card No. 241

**Suppression systems**

Tyco Suppression Systems
Booth 1501
To fulfill our customers' global fire protection and safety needs, the companies of Tyco Suppression Systems continuously strive to provide the world's finest products through shared innovation, strict quality standards, worldwide distribution, and strong financial backing. Tyco Suppression Systems is part of the Fire and Security Division of Tyco International Limited.

Circle Reader Card No. 242

**Software**

Tyco Fire Products
Booth 1119
Tyco Fire Products introduces SprinkCAD™ Fire Protection Software for the design professional. SprinkCAD is a complete fire sprinkler system design. SprinkCALC™ is an advanced hydraulic calculations system. SprinkCODE™ is an interactive NFPA 13 Code Selector. SprinkSHC™ is a complete fire sprinkler stock listing. For more information, visit www.sprinkcad.com or call (800) 495-5541 for a free demonstration.

Circle Reader Card No. 243

**Laboratory**

Underwriters Laboratories, Incorporated
Booth 1640
Underwriters Laboratories (UL), a global leader in product safety testing and certification, has evaluated products, materials, and systems for more than 100 years. The “UL-listed” mark on a product means that representative samples have been evaluated to recognized safety standards for fire, electric shock, or related safety hazards.

Circle Reader Card No. 244

**Pipe joining products**

Virotec, Incorporated
Booth 1941
Virotec manufactures pipe joining products for sprinkler systems. Our main products are the Flexarm, Tele-scope pipe with adjustable drop nipple and galvanized mechanical tees. The Flexarm allows an installer to turn the sprinkler head 360 degrees to the exact position desired in the ceiling tile. Both the

---

**Measure Wall Thickness of Installed Fire Sprinkler Piping... From One-Side... with the StressTel T-Mike E Thickness Gauge**

Internal corrosion in fire sprinkler piping can lead to annoying drips or major breaks.

The StressTel T-Mike E ultrasonic thickness gauge lets you quickly and easily measure remaining piping wall thickness. After a simple two-step gauge calibration, just put the probe on the pipe O.D.; thickness is instantly displayed. Key T-Mike E features include a rugged metal case, industrial keypad, and over 300 hours of battery life on four alkaline 'AA' batteries.

Check-out the T-Mike E and all of our thickness gauges at www.stresstel.com

Circle 043 on Reader Service Card
Circle 061 on Reader Service Card
telescope-pipe and mechanical tees come in a variety of sizes with fast friendly service and delivery out of our warehouse.

Circle Reader Card No. 245

**Fire barrier products**

Vesuvius
Booth 1207
Through distributors worldwide, Vesuvius supplies high-quality, cost-effective Pyroscat® passive fire barrier products and systems for the commercial construction markets.

Circle Reader Card No. 246

**Fire protection products**

Victaulic Company of America
Booth 745
Victaulic is displaying its complete line of fire protection products, including couplings, fittings, valves, devices, and sprinkler heads. Several new products will also be introduced, including the Testmaster II Alarm Module, the Victaulic Riser Manifold, and a new ball valve offered with grooved and threaded ends.

Circle Reader Card No. 247

**Fire protection equipment**

Viking Corporation
Booth 815
Viking is a global leader in the manufacture and distribution of fire protection equipment. The Viking integrated distribution network is committed to providing a full line of quality and innovative products in more than 70 countries. To see the latest products and services, visit our booth or www.vikingcorp.com.

Circle Reader Card No. 248

**Backflow preventers**

Watts/Ames Company
Booth 634
Ames produces stainless steel backflow preventers and fittings for pipeline and fire suppression systems. Ames combines advanced manufacturing techniques with high-quality workmanship to produce products, such as our portable hydrant backflow preventers and UL-listed and FM-approved fire service strainers, that meet the challenge of the most rigorous fire protection conditions.

Circle Reader Card No. 249

**Notification appliances**

Wheelock, Incorporated
Booth 501
Wheelock is exhibiting the industry's widest selection fire and life safety notification appliances, including the SPEC 1 FIRE family of multi-candela appliances with field-selectable candela settings of 15, 30, 75, and 110 cd.
Also featured are 150- and 177-candela ceiling-mount strobes and speaker strobes, 185-candela wall-mount strobes and speaker strobes, weatherproof strobes, audible strobes, and speaker strobes. SAFEPATH's 4 multifunction supervised facility communications system combines emergency voice evacuation, general paging, voice messaging, and background music will also be demonstrated.

Circle Reader Card No. 250

**Booth 749**

Wilkins, a Zurn Company, manufactures an extensive line of water control products, specializing in approved backflow prevention and water pressure reduction for the fire protection market. Fire protection products include in-line, N-pattern or vertical-pattern double-check and reduced-pressure principle assemblies; detector check products; and Pressure-Tru Fire System control valves.

Circle Reader Card No. 251

**Alarm cables**

West Penn Wire/CDT

Booth 1130

West Penn Wire manufactures riser-rated fire alarm cable (FPLR), plenum-rated (FPLP) data-grade shielded and non shielded fire alarm cable, and Aquaseal® cable that is FPL-rated for direct burial and outdoor applications using water-blocking tape. We also offer fiber optic cables for indoor and outdoor cabinets and connectors, as well as security coax and cables.

Circle Reader Card No. 252

**Professional development**

Worcester Polytechnic Institute

Booth 441

Worcester Polytechnic Institute offers continuing professional development in the field of fire protection engineering. Practitioners can further their knowledge and careers with our graduate-level courses, certificates, and degrees. All course work is available through distance learning. WPI has offered fire protection engineering programs since 1979.

Circle Reader Card No. 253

**Fire apparatus**

W.S. Darley and Company

Booth 1302

W.S. Darley manufactures fire apparatus and fire pumps, and offers a complete line of fire-
The First Fire Safety Event to Bring Buyers and Decision-Makers From Three Major Markets Together Under One Roof

2nd Annual Americas' Fire Expo

Miami Beach Convention Center
July 9-11, 2002

- State-of-the-Art Fire Safety Products and Services
- 3 Days of Cutting-Edge Industry Educational Sessions
- Co-Locating with the 8th Annual Americas' Security Expo & Americas' Building & Home Automation Expo

Destined to be a major international event for the fire protection industry, NFPA Americas' Fire Expo brings together state-of-the-art products/services and end users from Latin America, the Caribbean Basin and the Southeastern United States.

Access to the exhibit floor is FREE when you register in advance. Plus, our conference program features cutting edge industry educational sessions offered in English, Spanish and Portuguese.

If you're involved with Fire Protection Systems and Equipment, Special Hazards, Chemical and Hazardous Material Storage and Handling, Building Fire Protection, Life Safety or Electrical Installations, you can't afford to miss this event.

Reach your fire safety objectives at NFPA America's Fire Expo.

For full information complete and return [by fax or mail] the coupon below to:

ROC Exhibitions, Inc. • 1963 University Lane
Lisle, IL 60532 • USA • Fax: +1-630-241-4375

You can also phone or e-mail your request to:
Tel: +1-630-271-8210 • Email: fire@rocexhibitions.com

www.AmericasSecurity.com/fire.html

Americas' Security Expo (ASE) - Now in its eighth year, ASE is an international, exciting and culturally rich marketplace featuring the state-of-the-art in security products, systems and services.

Americas' Building & Home Automation Expo - If you're in Audio/Video Control Systems, Communications, Control Devices and Sensors, Home Automation, Home Theater/Satellites, HVAC & Energy Management, Lighting Devices and Sensors, Whole House Control Systems, or Wiring and Cabling, you should be at Americas' Building & Home Automation Expo!
Call for Presentations

2003 World Safety Conference and Exposition
May 18-22, 2003 - Dallas Convention Center

We are now accepting proposals for educational presentations at NFPA's 2003 World Safety Conference and Exposition (WSC&E). We invite you to share your experience and expertise with your peers in the field of fire and life safety as a presenter in Dallas, Texas, May 18-22, 2003. Please complete the form below in full and return, via mail, email, or fax to NFPA by September 27, 2002.

Presentations should be non-commercial in nature and specific brand names should not be mentioned. All presentation proposals will be reviewed by the Sessions Committee and selections will be made based on quality, relevance, focus, practical application, timeliness and on the presenter's experience and credentials.

Presentation Submission Form (Please type or print clearly.)

Title of presentation: ____________________________

Description of presentation (50 words or less):

__________________________________________

__________________________________________

Presentation Length: [ ] 1 hour [ ] 1-1/2 hours [ ] Other (please specify): ____________

To be considered, a resume and short description of the presenter's and any co-presenter's credentials must be attached.

Learning Objectives:

__________________________________________

__________________________________________

Important: A handout will be required 4 weeks in advance of the conference. NFPA does not pay for travel expenses, but speakers will receive a complimentary conference registration.

Presenter Information:

Name: ____________________________

Title: ____________________________

Company: ____________________________

Address: ____________________________

City: ____________________________State: ____________Zip: ____________Country: ____________________________

Phone: ____________________________Fax: ____________________________

E-Mail: ____________________________

If you plan on someone presenting this topic with you, please complete the information below. Use additional pages if necessary.

Co-presenter Information:

Name: ____________________________

Title: ____________________________

Company: ____________________________

Address: ____________________________

City: ____________________________State: ____________Zip: ____________Country: ____________________________

Phone: ____________________________Fax: ____________________________

E-Mail: ____________________________

Deadline for submission is September 27, 2002.

Return form to:
NFPA
Attn: Linda Bailey
One Batterymarch Park
Quincy, MA 02269
Fax: +1-617-984-7030
Email: lbailey@nfpa.org
fighting equipment through their world famous catalogs. Stop by our booth for your free firefighting catalog.
Circle Reader Card No. 254

Pump accessories
Williams Fire and Hazard Control
Booth 848
Williams Fire and Hazard Control holds the world's record for a fully involved storage tank extinguishment at 270 feet (82 meters) high. This accomplishment is the result of generations of dedicated research and direct application of battle experience into methodology and equipment engineering unrivaled by its peers. Williams' foams and equipment aren't concepts, they're proven instruments of firefighting success. When you want to be successful, choose Williams for nozzles, monitors, extinguishing agents, ThunderStorm ATC and PKW, pumps, hose, and accessories.
Circle Reader Card No. 255

Surge protection
API Systems Group, Incorporated
Booth 251
API specializes in special-hazards and low-voltage system integration, including transient and lightning surge protection. An affiliate, Halon Banking Systems, offers a full range of services for Halon 1301 and 1211, including recycling and buying decommissioned halon and selling certified recycled halon for your recharge needs.
Circle Reader Card No. 256

Storage tanks
Xerxes Corporation
Booth 1145
Well-known for decades as a major tank supplier to the petroleum industry, Xerxes also supplies underground storage tanks for the collection and storage of fire-protection, potable, and non-potable water. Capacities range from 600 to 50,000 gallons (2,271 to 189,267 liters). The structural integrity and watertight design of a Xerxes tank distinguishes it from other underground water storage options. Given the rustproof benefits of fiberglass construction, owners and designers of water storage systems can be confident that a Xerxes tank will stand the test of time. Five strategically located manufacturing facilities allow Xerxes to provide cost-effective and high-quality service throughout the United States. Visit www.xerxescorp.com.
Circle Reader Card No. 257

Fire testing
BRE/LPC
Booth 1753
BRE/LPC will provide information on fire testing facilities available following LPC's move to BRE, Garston, as well as details of the training and professional development courses it offers to fire industry professionals and others. News of the latest research and publications will be available at the booth.
Circle Reader Card No. 258

WE PUT THE EYE IN FIRE DETECTION

FM APPROVED CCTV VISUAL FLAME DETECTION
SUPERIOR FALSE ALARM IMMUNITY
LIVE VIDEO IMAGES
ENHANCED COVERAGE
LONG DETECTION RANGE

THE INFORMED APPROACH TO FLAME DETECTION

API Systems Group
Tel: 1 800 840 7698
Fax: 281 243 9011
www.apisystemsgroup.com

Micropack
Tel: +44 1224 784055
Fax: +44 1224 784056
www.micropack.co.uk

Come and see us at NFPA Stand 251

Circle 080 on Reader Service Card

The Online Source For Gas Detection is:

www.MACURCO.com

The Professional's Choice Since 1972

MACURCO GAS DETECTORS
3946 S. Mariposa Street, Englewood CO 80110
PH: 303-781-4062 FX: 303-761-6640

Circle 041 on Reader Service Card
Toronto Fire Services High-Rise Seminar
May 13–15 • Toronto, Ontario, Canada
NFPA will cosponsor this seminar designed for members of the fire and emergency services, engineers, building owners and managers, and insurance and security industry representatives. Information on state-of-the-art emergency services practices for high-rise buildings will be presented. To register, visit www.torontohighrise.com or call (416) 223-9938.

NFPA Life Safety Code® Seminar
June 3–5 • Fort Lauderdale, Florida
Attend a 5-, 3-, or 2-day seminar on NFPA 101®, Life Safety Code®, and get a better understanding of the 2000 edition. Quality for 0.7 CEUs for each day you attend.

NFPA National Electrical Code® Seminar
June 4–6 • Fort Lauderdale, Florida
Learn about the latest revisions to NFPA 70, National Electrical Code®, and learn more about the 2002 edition. Quality for 0.7 CEUs for each day you attend.

NFPA Facility Fire Safety Seminar
June 3–7 • Fort Lauderdale, Florida
Attend this five-day conference designed specifically for building owners and managers and gain skills to protect your facility against devastating losses.

Fire Risk and Hazard Assessment Research Application Symposium
July 24–26 • Baltimore, Maryland
Hear cutting-edge technical papers on new technologies and test methods related to building contents and furnishings, wire and cable, and transportation vehicles. A special speaker session and panel discussion on the implications of 9/11 will also be held. For more information, go to www.nfpa.org/foundation or contact Eric Peterson of the Fire Protection Research Foundation at (617) 984-7281 or epeterson@nfpa.org.

For registration, further information or a complete list of NFPA's continuing education seminars and workshops, contact NFPA, Continuing Education Department, P.O. Box 9101, Quincy, MA 02269-9101; www.nfpa.org; or (800) 344-3555.

Construction Safety Conference
May 21–23 • Rosemont, Illinois
This conference, sponsored by the Construction Safety Council and Center to Protect Workers' Rights, will be held at the Donald E. Stephens Convention Center. For more information, call Gayla Bockrath, conference manager, at (800) 552-7744 or (708) 544-2082 or E-mail her at gbockrath@buildsafe.org. Register online at www.buildsafe.org.
Institution of Fire Engineers
Professional Development Seminar
May 22 • Toronto, Ontario, Canada
The topic of the one-day seminar is disaster and preoperational planning. For more information, contact Adam W. Burns, manager, Corporate Fire and Life Safety, Scotiabank, 44 King Street West, Toronto, Ontario, M5H 1H1; call him at (416) 933-1219; or visit www.ife.ca.

Energy Efficiency Workshop and Exposition
June 2–4 • Palm Springs, California
This program, sponsored by the U.S. Department of Energy, is for private-sector companies interested in learning more about the technological advances the federal government is making in energy efficiency. Visit www.energy2002.eere.doe.gov for information.

Society of Fire Protection Engineers Principles of Fire Engineering
June 10–13 • Detroit, Michigan
Gain basic to intermediate knowledge of the principles of fire protection engineering. For more information, go to www.sfpe.org.

Workshop on Aviation Terrorism
June 13–14 • Salzburg, Austria
The workshop, sponsored by Emergency and Disaster Management, is being held in cooperation with the Salzburg Airport, the Salzburg State Fire Association, and the Red Cross in the Salzburg State. For information, visit www.emergency-management.net.

7th International Association for Fire Safety Science (IAFSS) Symposium, June 16–21 • Worcester, Massachusetts
This is the premier scientific conference for fire safety/protection scientists, engineers, technical managers, educators, and students. The symposium will be held at Worcester Polytechnic Institute and is hosted by FM Global Research, NFPA, and WPI. For more information or to register online, visit www.wpi.edu/+IAFSS or call WPI at (508) 831-6222.

Responding to Major Incidents
June 17–19 • London, England
This seminar includes a presentation on aviation terrorism and biological agents by Gunnar J. Kuepper of Emergency and Disaster Management. Visit www.emergency-management.net.

World Congress on Drowning Prevention, Rescue, and Treatment
June 22–28 • Amsterdam, Netherlands
This is the first conference of its kind to be offered to those involved in life safety. The goal of the congress is to create a network and to share information. For more information, visit www.drowning.nl.

Fire Australia 2002
June 26–28 • Brisbane, Australia
This three-day conference and exhibition covers the latest developments in fire safety management and fire engineering. For more information, E-mail events@fpaa.com.au.

Circle 031 on Reader Service Card
You built your reputation on the NEC®, a Code trusted throughout the world for responsiveness to industry changes. That's why your NEC® and its Handbook are "standard equipment" for every installation, inspection, or design.

Keep your advantage: With the 2002 editions you'll know you're using the latest safety requirements for arc flash hazards and exit doors...expanded rules for AFCIs and GFCIs...reformatted raceway and cable articles...new requirements for TVSS...and hundreds of other up-to-date rules.

To maintain your foundation for success, you need the 2002 NEC® and its expanded Handbook. They'll keep you connected in a constantly changing field!

Save 15% when purchased together

Order at 1-800-344-3555 or www.necdirect.org
Reference Mail Code Y6-007-1Z
implementing and directing emergency procedures. As an example, private mode operation may be used to alert attendants or others to evacuate occupants incapable of evacuating themselves.

NFPA 72 provides separate rules for notification appliances in each mode in Sections 4-3.2, 4-3.3, 4-4, and 4-5.

What's "central station" service?
The term "central station" is widely used in the fire alarm industry and is often used incorrectly to refer to any off-premises monitoring service. In NFPA 72 however, the term refers only to service provided to a subscriber under the structured contractual arrangements specified in Section 5-2.2.2. These arrangements involve providing six distinct elements: installation of fire alarm transmitters, monitoring of signals, retransmission of signals to the public fire service communications center, record-keeping and reporting, testing and maintenance, and runner service. These elements can be provided by a "listed central station," by a listed central station that subcontracts certain local elements, or by a "listed fire alarm service-local company" that provides certain local elements and subcontracts certain remote and other elements to a listed central station.

The other two types of supervising stations the code recognizes are proprietary supervising stations and remote supervising stations. A proprietary supervising station is operated by the owner of the premises being monitored. A remote supervising station, while providing monitoring for variously owned premises, doesn't include the more structured contractual arrangements and other requirements specific to central stations. Sections 5-2, 5-3, and 5-4 include separate code requirements for each type of supervising station.

Only service that complies with all the requirements of Section 5-2 should be called "central station service." The requirements of Section 5-2 don't prohibit a central station service provider from offering service as a remote supervising station under different contractual arrangements. In doing so, however, the central station service intended to be in accordance with Section 5-2 must not be compromised.

In addition to those who avoid seminars, are an equal number who oppose further training or any form of certification that would allow them to develop credentials "proving" their knowledge of fire alarm systems. And then there are those employers and supervisors who just don't understand that the benefits of attending a seminar can outweigh its cost.

Several organizations, including NFPA, offer certification programs for individuals in the fire alarm industry. These programs ensure a more complete understanding of the codes and standards and the ways they apply, a broader knowledge of equipment operation, and more technical competency.

Are you qualified to do your job? Have you attended a seminar lately?

although an obstruction investigation could be triggered by indirect evidence, such as debris coming from the inspector's test connection. Two new indirect triggers have been added in this edition: evidence of pinhole leaks and a 50 percent increase in the water delivery time for a dry-pipe system. Random internal inspection is a proactive change, making use of the flushing connections that have been required on the ends of mains for more than 20 years.

Will this requirement be onerous? Not really. This new inspection can be done when the system is shut down for some other reason, such as a modification. In fact, NFPA 25 already requires that systems be shut down for maintenance at least once every five years for internal inspection of the check valves. Dry-pipe valves must be internally inspected every year.

As NFPA publishes the fourth edition of NFPA 25, the fire protection community will be pleased that the standard has already been widely adopted. The task at hand is to make sure that it becomes a widely enforced standard. Only with proper inspection, testing, and maintenance will automatic sprinkler and other water-based fire protection systems truly fulfill their potential.
Can Your Customers Find You?

www.nfpabuyersguide.org

Banner advertising that will get you front and center!

Our Online Buyer’s Guide offers:
- Category keyword searches
- FREE listing in up to 10 categories
- FREE link to your company web site
- Search by state or company name
- Now covering the Electrical Industry

PLUS… Special discounts for print and online advertisers
Ad tracking and statistical analysis
FREE featured product listing for advertisers

They will if you advertise on the NFPA Journal Buyer’s Guide Website
looking back

JOHN NICHOLSON

...at fires in high-rise office buildings

MERIDIAN PLAZA
Philadelphia, Pennsylvania
February 23, 1991
FOR THE FULL STORY, GO TO WWW.NFPA.ORG/NFAJOURNAL.
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Website/Link</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADI (RSC 001)</td>
<td><a href="http://www.adilink.com">www.adilink.com</a></td>
<td>119</td>
</tr>
<tr>
<td>Altronix (RSC 002)</td>
<td><a href="http://www.altronix.com">www.altronix.com</a></td>
<td>13</td>
</tr>
<tr>
<td>Amerex (RSC 003)</td>
<td><a href="http://www.amerex.com">www.amerex.com</a></td>
<td>121</td>
</tr>
<tr>
<td>Ansul (RSC 004)</td>
<td><a href="http://www.ansul.com">www.ansul.com</a></td>
<td>IFC</td>
</tr>
<tr>
<td>Anvil (RSC 005)</td>
<td><a href="http://www.anvilintl.com">www.anvilintl.com</a></td>
<td>33</td>
</tr>
<tr>
<td>Apollo Fire Detectors (RSC 006)</td>
<td><a href="http://www.apollo-fire.co.uk">www.apollo-fire.co.uk</a></td>
<td>123</td>
</tr>
<tr>
<td>Aurora Pump (RSC 079)</td>
<td><a href="http://www.aurorapump.com">www.aurorapump.com</a></td>
<td>135</td>
</tr>
<tr>
<td>Bermad (RSC 007)</td>
<td><a href="http://www.bermad.com">www.bermad.com</a></td>
<td>139</td>
</tr>
<tr>
<td>Bilco Co. (RSC 008)</td>
<td><a href="http://www.bilco.com">www.bilco.com</a></td>
<td>18</td>
</tr>
<tr>
<td>Blazemaster (RSC 009)</td>
<td><a href="http://www.blazemaster.com">www.blazemaster.com</a></td>
<td>15</td>
</tr>
<tr>
<td>Buckeye Fire Equipment Co. (RSC 010)</td>
<td><a href="http://www.buckeye.com/fire">www.buckeye.com/fire</a></td>
<td>125</td>
</tr>
<tr>
<td>Cla-Val (RSC 011)</td>
<td><a href="http://www.cla-val.com">www.cla-val.com</a></td>
<td>144</td>
</tr>
<tr>
<td>Concealite (RSC 012)</td>
<td><a href="http://www.concealite.com">www.concealite.com</a></td>
<td>142</td>
</tr>
<tr>
<td>Cutler Hammer (RSC 013)</td>
<td><a href="http://www.chfire.com">www.chfire.com</a></td>
<td>127</td>
</tr>
<tr>
<td>Decoshield Systems (RSC 014)</td>
<td><a href="http://www.decoshield.com">www.decoshield.com</a></td>
<td>150</td>
</tr>
<tr>
<td>Detector Electronics (RSC 015)</td>
<td><a href="http://www.detronics.com">www.detronics.com</a></td>
<td>44</td>
</tr>
<tr>
<td>Digitize, Inc. (RSC 016)</td>
<td><a href="http://www.digitize-inc.com">www.digitize-inc.com</a></td>
<td>137</td>
</tr>
<tr>
<td>Draka USA (RSC 017)</td>
<td><a href="http://www.drakausa.com/lifeline">www.drakausa.com/lifeline</a></td>
<td>17</td>
</tr>
<tr>
<td>DuPont Fire Extinguishing (RSC 018)</td>
<td><a href="http://www.dupont.com/fire">www.dupont.com/fire</a></td>
<td>11</td>
</tr>
<tr>
<td>DuPont Nomex (RSC 019)</td>
<td><a href="http://www.dupont.com/nomex">www.dupont.com/nomex</a></td>
<td>53</td>
</tr>
<tr>
<td>Edwards Systems Technology (RSC 020)</td>
<td><a href="http://www.est.net">www.est.net</a></td>
<td>7</td>
</tr>
<tr>
<td>Faraday (RSC 021)</td>
<td><a href="http://www.faradayllc.com">www.faradayllc.com</a></td>
<td>91</td>
</tr>
<tr>
<td>Fike Corp. (RSC 083)</td>
<td><a href="http://www.fike.com">www.fike.com</a></td>
<td>5</td>
</tr>
<tr>
<td>Firecom (RSC 022)</td>
<td><a href="http://www.firecominc.com">www.firecominc.com</a></td>
<td>BIC</td>
</tr>
<tr>
<td>Fire Control Instruments (RSC 023)</td>
<td><a href="http://www.firecontrolinstruments.com">www.firecontrolinstruments.com</a></td>
<td>43</td>
</tr>
<tr>
<td>Firetrace (RSC 024)</td>
<td><a href="http://www.firetrace.com">www.firetrace.com</a></td>
<td>23</td>
</tr>
<tr>
<td>Gamewell (RSC 025)</td>
<td><a href="http://www.gamewell.com">www.gamewell.com</a></td>
<td>51</td>
</tr>
<tr>
<td>Great Lakes Chemical (RSC 027)</td>
<td><a href="http://www.fm-200.com">www.fm-200.com</a></td>
<td>65</td>
</tr>
<tr>
<td>Halotron (RSC 028)</td>
<td><a href="http://www.halotron-inc.com">www.halotron-inc.com</a></td>
<td>14</td>
</tr>
<tr>
<td>Harrington Signal (RSC 029)</td>
<td><a href="http://www.harringtonfire.com">www.harringtonfire.com</a></td>
<td>35</td>
</tr>
<tr>
<td>Heary Bros. (RSC 030)</td>
<td><a href="http://www.lightningpreventor.com">www.lightningpreventor.com</a></td>
<td>134</td>
</tr>
<tr>
<td>Home Safeguard Industries (RSC 031)</td>
<td><a href="http://www.homesafeguard.com">www.homesafeguard.com</a></td>
<td>155</td>
</tr>
<tr>
<td>Hoover Treated Wood Products (RSC 032)</td>
<td><a href="http://www.FRTW.com">www.FRTW.com</a>..</td>
<td>111</td>
</tr>
<tr>
<td>HRS Systems (RSC 033)</td>
<td><a href="http://www.hrssystems.com">www.hrssystems.com</a></td>
<td>141</td>
</tr>
<tr>
<td>Hydro Flow Products (RSC 034)</td>
<td><a href="http://www.hosemonster.com">www.hosemonster.com</a></td>
<td>150</td>
</tr>
<tr>
<td>IPMA (RSC 035)</td>
<td><a href="http://www.ipma-hr.org">www.ipma-hr.org</a></td>
<td>158</td>
</tr>
<tr>
<td>Isolite (RSC 068)</td>
<td><a href="http://www.isolite.com">www.isolite.com</a></td>
<td>146</td>
</tr>
<tr>
<td>Jessup Mfg. Co. (RSC 036)</td>
<td><a href="http://www.jessupmfg.com">www.jessupmfg.com</a></td>
<td>10</td>
</tr>
<tr>
<td>Johnsonite (RSC 026)</td>
<td><a href="http://www.safe-t-first.com">www.safe-t-first.com</a></td>
<td>37</td>
</tr>
<tr>
<td>Kidde Fire Systems (RSC 037)</td>
<td><a href="http://www.kiddefiresystems.com">www.kiddefiresystems.com</a></td>
<td>BC</td>
</tr>
<tr>
<td>Knox Co. (RSC 038)</td>
<td><a href="http://www.knoxbox.com">www.knoxbox.com</a></td>
<td>149</td>
</tr>
<tr>
<td>Link Instruments (RSC 039)</td>
<td><a href="http://www.linkinst.com">www.linkinst.com</a></td>
<td>149</td>
</tr>
<tr>
<td>Loos &amp; Co. (RSC 040)</td>
<td><a href="http://www.earthquakebrace.com">www.earthquakebrace.com</a></td>
<td>154</td>
</tr>
<tr>
<td>Macurco (RSC 041)</td>
<td><a href="http://www.detectgas.com">www.detectgas.com</a></td>
<td>153</td>
</tr>
<tr>
<td>Matticks (RSC 042)</td>
<td><a href="http://www.matticks.com">www.matticks.com</a></td>
<td>157</td>
</tr>
<tr>
<td>MEDC (RSC 043)</td>
<td><a href="http://www.medic.com">www.medic.com</a></td>
<td>148</td>
</tr>
<tr>
<td>Metraflex (RSC 045)</td>
<td><a href="http://www.metraflex.com">www.metraflex.com</a></td>
<td>145</td>
</tr>
<tr>
<td>Micropack Engineering Ltd. (RSC 080)</td>
<td><a href="http://www.micropack.co.uk">www.micropack.co.uk</a></td>
<td>153</td>
</tr>
<tr>
<td>National Time &amp; Signal Co. (RSC 046)</td>
<td><a href="http://www.natsco.net">www.natsco.net</a></td>
<td>39</td>
</tr>
<tr>
<td>NGC Testing Services (RSC 047)</td>
<td><a href="http://www.ngctestingservices.com">www.ngctestingservices.com</a></td>
<td>154</td>
</tr>
<tr>
<td>Notifier (RSC 049)</td>
<td><a href="http://www.notifier.com">www.notifier.com</a></td>
<td>31</td>
</tr>
<tr>
<td>OCV Control Valves (RSC 078)</td>
<td><a href="http://www.controlvalves.com">www.controlvalves.com</a></td>
<td>136</td>
</tr>
<tr>
<td>Patterson Pump Co. (RSC 050)</td>
<td><a href="http://www.pattersonpumps.com">www.pattersonpumps.com</a></td>
<td>21</td>
</tr>
<tr>
<td>Plasteco (RSC 051)</td>
<td><a href="http://www.plasteco.com">www.plasteco.com</a></td>
<td>113</td>
</tr>
<tr>
<td>Protec Fire Detection (RSC 081)</td>
<td><a href="http://www.profire.co.uk">www.profire.co.uk</a></td>
<td>129</td>
</tr>
<tr>
<td>Protectowire Co., Inc. (RSC 052)</td>
<td><a href="http://www.protectowire.com">www.protectowire.com</a></td>
<td>12</td>
</tr>
<tr>
<td>Pyrotenax (RSC 053)</td>
<td><a href="http://www.pyrotenax.com">www.pyrotenax.com</a></td>
<td>1</td>
</tr>
<tr>
<td>Rockbestos Suprenant Cable (RSC 054)</td>
<td><a href="http://www.vitalinkcable.com">www.vitalinkcable.com</a></td>
<td>22</td>
</tr>
<tr>
<td>Siemens, Fire Safety (RSC 057)</td>
<td><a href="http://www.cerbpyro.com">www.cerbpyro.com</a></td>
<td>24-25</td>
</tr>
<tr>
<td>Silent Knight (RSC 058)</td>
<td><a href="http://www.silentknight.com">www.silentknight.com</a></td>
<td>29</td>
</tr>
<tr>
<td>SimplexGrinnell (RSC 059)</td>
<td><a href="http://www.simplexgrinnell.com">www.simplexgrinnell.com</a></td>
<td>2</td>
</tr>
<tr>
<td>Smoke Guard Corp. (RSC 060)</td>
<td><a href="http://www.smokeguard.com">www.smokeguard.com</a></td>
<td>109</td>
</tr>
<tr>
<td>StressTel (RSC 061)</td>
<td><a href="http://www.stresstel.com">www.stresstel.com</a></td>
<td>148</td>
</tr>
<tr>
<td>System Sensor (RSC 062)</td>
<td><a href="http://www.systemsensor.com">www.systemsensor.com</a></td>
<td>49</td>
</tr>
<tr>
<td>3M - Novac (RSC 063)</td>
<td><a href="http://www.3m.com">www.3m.com</a></td>
<td>55</td>
</tr>
<tr>
<td>Telular Corp. (RSC 064)</td>
<td><a href="http://www.Telguard.com">www.Telguard.com</a></td>
<td>133</td>
</tr>
<tr>
<td>Tisco (RSC 065)</td>
<td><a href="http://www.tisco.com">www.tisco.com</a></td>
<td>147</td>
</tr>
<tr>
<td>Twenty-First Century (RSC 066)</td>
<td><a href="http://www.21centuryfire.com">www.21centuryfire.com</a></td>
<td>132</td>
</tr>
<tr>
<td>Tyco Flow Control (RSC 067)</td>
<td><a href="http://www.centralsprinkler.com">www.centralsprinkler.com</a></td>
<td>41</td>
</tr>
<tr>
<td>Tyco Fire &amp; Security (RSC 070)</td>
<td><a href="http://www.tycofireandsecurity.com">www.tycofireandsecurity.com</a></td>
<td>71</td>
</tr>
<tr>
<td>Underwriters Laboratories (RSC 071)</td>
<td><a href="http://www.ul.com">www.ul.com</a></td>
<td>47</td>
</tr>
<tr>
<td>Victaulic (RSC 072, 073)</td>
<td><a href="http://www.victaulic.com">www.victaulic.com</a></td>
<td>8,9</td>
</tr>
<tr>
<td>Viking Corp. (RSC 074)</td>
<td><a href="http://www.vikingcorp.com">www.vikingcorp.com</a></td>
<td>27</td>
</tr>
<tr>
<td>Wheelock Inc. (RSC 075)</td>
<td><a href="http://www.wheelockinc.com">www.wheelockinc.com</a></td>
<td>117</td>
</tr>
<tr>
<td>Wilkins/Zurn (RSC 076)</td>
<td><a href="http://www.zurn.com">www.zurn.com</a></td>
<td>131</td>
</tr>
<tr>
<td>Worcester Polytechnic Institute (RSC 077)</td>
<td><a href="http://www.wpi.edu/Academics/ADLN">www.wpi.edu/Academics/ADLN</a></td>
<td>115</td>
</tr>
</tbody>
</table>
Firecom's Life Safety Net 2000® is the only UL listed Fire Alarm System based on the LonWorks® platform. Firecom has paid careful attention to the growing need for integrated building solutions that include fire alarm systems. The LSN-2000® gives the integrator the ability to generate truly interoperable, multi vendor control systems today that are low cost to install, flexible and easily scaleable to meet changing needs.

The Life Safety Net 2000® is a fully integrated digital addressable network system. The system can be customized for fire protection, smoke control, HVAC, communications and security. The LSN-2000® open architecture will seamlessly interface with other LonWorks® based systems such as BMS, security, lighting and elevators.

Firecom can provide your integration solution today, contact:
Howard Kogen, Executive Vice President
Phone: (718) 899-6100

FIRECOM, INC.™
Technology Protecting Life®

Circle 022 on Reader Service Card
Who Offers More Choices in Clean Agent Fire Protection?
Only Kidde.

**Kidde Carbon Dioxide Systems** for economical protection of machinery and normally unoccupied areas.

**Kidde FM-2000 Systems** for people-safe, environmentally-friendly protection of facilities most vital to a company’s business continuity.

**Kidde FE-13™ Systems** for protection of special hazards that require a fire inert environment.

**Only Kidde** offers the Circle of Protection™, the right clean agent system for every application.

**Only Kidde** has the brand of fire protection preferred by risk management professionals the world over.

**Only Kidde** backs every system with a worldwide network of Kidde design, installation and service experts.