nfpa JOURNAL

THE NATIONAL FIRE PROTECTION ASSOCIATION

THE AUTHORITY ON FIRE, ELECTRICAL, & BUILDING SAFETY

50 Illuminating Editions of the NEC®

NASA Fire Safety

Residential Sprinklers

Boston Convention and Exposition Center

MAY/JUNE 2004

WWW.NFPAJOURNAL.ORG

The Clean Green Team

Ansul signs rookie clean agent to veteran squad!

Promising Rookie...

The SAPPHIRE™ Suppression System features 3M™ Novec™ 1230 Fire Protection Fluid.

Stats: *Sustainable Fluoroketone with 0.0 ODP, 1.0 GWP and 5-day Atmospheric Lifetime.*

Proven Veteran...

Leading the league since 1991, the INERGEN® Fire Suppression System contains the only inert gas with added CO2 for a breathable atmosphere.

Stats: *Sustainable Agent with 0.0 ODP, 0.0 GWP and 0.0 Atmospheric Lifetime.*

Call:

1-800-346-3626
(USA/Canada)

1-715-735-7411
(International)

www.ansul.com

ANSUL®

Innovative Fire Solutions

ISO 9001 Registered

Circle 005 on Reader Service Card

EST.

Delivering tomorrow's life safety technology today.

Edwards Systems Technology is proud to offer the industry's most advanced fire and security products to help create a safer world. EST life safety systems are the first choice of industry professionals around the corner and around the world.

From the smallest component to the entire Synergy Enabled EST3 life safety system, EST's commitment to ISO 9000 international quality standards is unwavering. EST life safety technology: *world class solutions to a universal challenge.*

EDWARDS SYSTEMS TECHNOLOGY™

A world leader in fire and security technology.

FIRE • EMERGENCY EVACUATION • SECURITY • ACCESS CONTROL • CCTV

For additional information visit us online at www.est.net/NFPA or call 1-888-EST2Day.

Circle 014 on Reader Service Card

The most extraordinary people are sometimes found in rather ordinary places.

Like your local fire station.

At this year's National Fire Protection Association World Safety Conference and Expo in Salt Lake City, we're proud to be supporting Firefighters National Trust. This national organization helps the families of firefighters who die in the line of duty.

Firefighters National Trust

Partners in Fire Protection

The fire protection products and services we provide make us partners to the firefighting community. And in our eyes, firefighting is a noble profession. The men and women who protect our communities are a special breed. Courageous. Committed. Extremely compassionate about their work. Whether fighting wild fires in California, dousing a chimney fire up the street, or teaching our children to stop, drop and roll, they're an inspiration to all of us.

Support Our Nation's Heroes

SimplexGrinnell, Tyco Fire & Security and all the businesses of Tyco hope you'll feel inspired to join us in supporting the families of our nation's heroes. You can stop by our booth (#501) or visit the Firefighters National Trust web site at www.firedonations.org

We thank you, on behalf of the men and women who risk their lives for us each and every day.

tyco
Fire & Security

SimplexGrinnell

www.simplexgrinnell.com

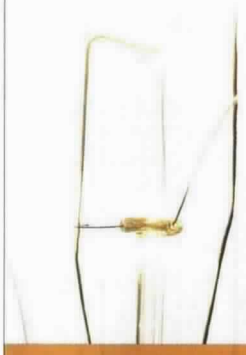
BOOTH #501

Circle 049 on Reader Service Card

CONTENTS

MAY/JUNE 2004 | VOL. 98, NO. 3

nfpa JOURNAL®



COVER STORY

A Living Document

As the 50th edition of the *National Electrical Code®* is about to roll off the presses, its clear some things have remained the same.

FEATURES

COLUMNS & DEPARTMENTS

68

ABOUT THE COVER: The cover photograph was produced by Jon Chomitz (www.chomitz.com) with the direction of Dave Yount and consultation from Paul Tepperman of Tepperman/Ray Design (www.trdesign.com). Ed Moriarty at the MIT Edgerton Center provided NiChrome wire and useful instructions. The original idea was to make the NEC logo out of NiChrome wire—making it glow by running current through it—but the thin wire was difficult to work with. So Chomitz recreated the NEC logo in Photoshop to look like glowing filament. He then took the original filament out of the photo of the bulb, and extracted the connecting posts from the bulb photo, putting them back together to make connectors between the parts of the logo to "complete the circuit." Obviously, artistic license was taken in order to illustrate the idea.

 NFPA Journal (ISSN 1054-8793) is a membership magazine published bimonthly, plus a Buyers' Guide annually in February, by NFPA, One Batterymarch Park, Quincy, MA 02269-9101. NFPA annual dues: members, $135 (includes $40.50 subscription to *NFPA Journal*), organization membership, $500. Periodicals postage rates paid at Boston, MA, and at additional mailing offices. POSTMASTER: Send address changes to *NFPA Journal*, NFPA, P.O. Box 9101, 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.

nfpa JOURNAL®

Volume 98/Number 3

Publisher
Kathleen M. Robinson

Executive Editor
Stephen D. Murphy

Managing Editor
John Nicholson

Art Director
David Yount

Production Manager
Adrienne M. Albrecht

Editorial Secretary
Liz MacDonald

Associate Publisher/Director of Marketing and Sales
T. R. Fitzpatrick

Advertising Traffic Manager
Dorinda Fergason

Advertising Systems Manager
Susan Richard

Online Advertising
Lynne Grant

Advertising Sales Assistant
Maureen Kean
(617) 984-7520

Advertising Sales Offices

New England
Merrie Lynch
CEL Associates
(781) 848-9306
Fax (781) 848-2063
adsalesml@nfpa.org

Southeast/ Southwest
Blake & Michelle Holton
Holton Enterprises
(407) 971-6286
Fax (407) 971-8598
adsalesbh@nfpa.org

Midwest
Tom Fitzpatrick
T.F. Marketing Associates
(630) 482-3394
Fax (630) 482-3396
tfitzpatrick@nfpa.org

West
Cynthia Louis
Louis Media
(970) 223-3911
Fax (970) 223-3991
adsalescl@nfpa.org

2002 AWARD WINNER
ASBPE
American Society of Business Publication Editors

2001, 2002 SNAP AWARD WINNER
SOCIETY OF NATIONAL SNAP ASSOCIATION PUBLICATIONS

2001, 2002 AWARD WINNER
ozzie

ABOUT NFPA

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

MEMBER BENEFITS

Membership in NFPA gives you access to the most current fire and life safety research, professional contacts and code updates you need in your job. *Benefits include:*

Code Newsletter: Enter your preferred e-mail address at www.nfpa.org for access to your online issue of *NFPA News* for the latest codes and standards activities. Be sure to also register for *NFPA Update*, a supplementary e-mail newsletter delivered monthly to your desktop.

Free Section Membership: Get additional benefits targeted to your profession. Joining one of NFPA's 16 specialty sections connects you to other industry experts worldwide. Trade tips and ideas, solve problems and build a network of peers you'll value throughout your career.

Subscription to *NFPA Journal*®: NFPA's official members-only bi-monthly magazine helps you stay on top of the latest news and trends in fire and life safety, prevention techniques, post-fire investigations, and code developments.

Advisory Service and Technical Help: Save time searching for answers to your compliance questions with free technical assistance from NFPA fire and life safety staff specialists.

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

Online Privileges at www.nfpa.org: Enjoy members-only access to online features, special reports and code information, which is especially useful if you're preparing reports or presentations. Sign up for special e-mail bulletins on jobs posted in our Career Center or search for qualified employees for your organization.

Voting Rights: Have a voice in codes and standards you work with. Vote on proposed changes to codes and standards at the May and November meetings. Voting privileges begin after 180 days of individual membership.

Member Discounts: Get a 10 percent discount on all NFPA workshops, services, code books, field guides, continuing education seminars, handbooks, and manuals.

To join NFPA, or to update your membership information, call TOLL FREE 1-800-344-3555, or write NFPA, One Batterymarch Park, Quincy, MA 02169-7471.

WHAT'S IN A NAME?
Everything!

20th Anniversary

BlazeMaster®

BLAZEMASTER® FIRE SPRINKLER SYSTEMS

With more Listings and Approvals than any other non-metallic system, BlazeMaster® CPVC sprinkler systems provide more of what contractors need most:

- Proven installed performance since 1984
- The industry standard for reliability and ease of installation
- Lightweight material and one-step solvent cement joining system decreases installation time
- Available in 3/4" to 3"
- No pre-fabrication necessary
- Formal installation training program
- Dedicated service and technical support

Ideal for all Light Hazard, new or retrofit installations with multi-family housing, hospitals, hotels, university housing, office and government buildings without disruption to residents or activities. BlazeMaster® CPVC systems meet the highest safety standards and are approved for use in all NFPA 13 Light Hazard applications. In addition, no pre-fabrication is necessary and alterations can be handled on-site, significantly reducing installation time.

The most advanced piping system available today, BlazeMaster® CPVC is Listed and Approved for more applications than any other non-metallic alternative.

With frequent enhancements, new Listings for BlazeMaster® pipe and fittings now include use with:*

- Tyco Fire & Building Products Specific Application Attic Sprinklers
- Soffi-Steel™ System Factory Mutual Approval as fire resistant barrier for use with BlazeMaster® CPVC pipe & fittings
- Exposed Listed light hazard, horizontal sidewall, quick response sprinklers with deflectors 12" from the ceiling
  - at 14' spacing with up to 200°F standard spray sprinklers
  - at 16' spacing with up to 175°F extended coverage sprinklers
  - at 18' spacing with up to 165°F extended coverage sprinklers
  - at 24' spacing with 155°F extended coverage sprinklers

What's more, BlazeMaster® fire sprinkler systems are backed by an extensive field support organization that provides proven installation recommendations, expert consultation and design assistance.

Dependable. Fast. Fully Listed and Approved. Supported. Call us today at **888-234-2436**, or visit us on-line at **www.blazemaster.com**.

HARVEL PLASTICS, INC.

IPEX Committed to Excellence

THOMPSON You'll Like What We're Made Of.

tyco Fire & Building

BlazeMaster®
FIRE SPRINKLER SYSTEMS

*As manufactured by Harvel, IPEX, Thompson Plastics and Tyco.
Refer to manufacturer's installation instructions for product listings and limitations prior to use.

Circle 008 on Reader Service Card

BY JAMES M. SHANNON

National Electrical Code® is a national standard

THIS YEAR AT NFPA, we celebrate an event that is at the heart of our mission. In July we will issue the 50th edition of the *National Electrical Code*® (*NEC*), and there is no better example of how big a contribution NFPA has made to a safer world then the *NEC*.

Every cycle, the *NEC* is the product of tens of thousands of hours of work by members of our code-writing panels, our correlating committee, our Standards Council, and countless others who work in our system. We are assisted enormously in our development and adoption efforts by dedicated volunteers from organizations such as the International Association of Electrical Inspectors, the National Electrical Manufacturers Association, the National Electrical Contractors Association, the International Brotherhood of Electrical Workers, Underwriters Laboratories, the Independent Electrical Contractors, and Edison Electrical Institute, just to name a few.

The *NEC* goes all the way back to 1897 and was developed to deal with the growing problem of fires attributed to an electrical origin. Since 1959, it has been revised every three years.

The *NEC* is recognized (almost) universally in the United States, and every electrical apprentice and training program places a heavy emphasis on its provisions.

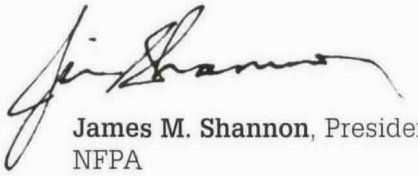
The *NEC* has been officially adopted in Mexico, Venezuela, Panama, and Ecuador; is used throughout Latin America and Asia; and has been translated into Spanish, Korean, Thai, and Japanese. In fact, the *NEC* is the most widely accepted building construction code in the world.

The number of lives and the amount of property saved every year because of the *NEC* are incalculable. While electrical installations have been around for a long time, the pace of change in technology has required that the venerable *NEC* not stand pat, but be open to constant change in how electricity is used and how safety can be maintained around electrical installations.

Look around your office or your home or into your child's room. Consider the increased uses of electricity in the last years. PCs, VCRs, DVDs, microwave ovens, powerful hair dryers, electric garage door openers, air conditioning, a whole array of helpful appliances for consumers that create a demand for electricity beyond what anyone might have imagined just a few years ago. An even greater growth in electrical applications has taken place in industrial applications. All of this has been made possible because the *NEC* has established the rules that allow for the safe use of so much electricity. Individuals and business don't have to worry about the safety of electrical installations if they know that the premises have been properly inspected and meet the requirements of the *NEC*.

The universal acceptance of the *NEC* should not lead us to take the issue of electrical safety for granted. The *NEC* holds its unique place in the nation's and much of the world's safety system because hundreds of people who work in the NFPA process and thousands who work in the electrical industries, labor unions, and academia are constantly studying ways to keep pace with changes in technology and society to make the *NEC* even better. This dynamic process, combining NFPA's tradition of achieving consensus based on sound technical analysis with a commitment to accommodating progressive technological change, is what makes the *NEC* as vital today as it has ever been.

I have always believed that the *NEC* shows NFPA at its best as an organization focused on its mission to save lives and protect property and dedicated to serving the public. All of those involved with the *NEC*, the participants in the development process, the electrical inspectors, and other members of the enforcement community and the professionals in labor and industry who work with the *NEC* every day, all share the credit for this landmark document and its gargantuan contribution to safety, and they all deserve our thanks.



James M. Shannon, President and CEO
NFPA

PHOTOGRAPH: JOEL W. BENJAMIN

SIEMENS

Fire Safety

The world's only BIG-SCREEN fire detection system now has "*Surround Sound*."

Introducing the Siemens FireFinder with VOICE EVACUATION.

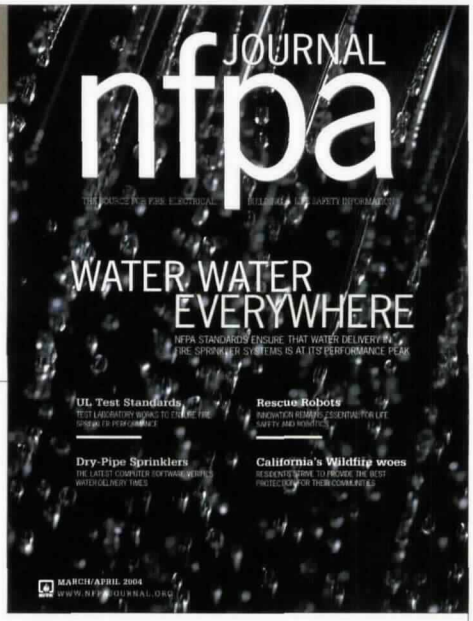
Building Evacuation just got better. The Siemens FireFinder System now offers Integrated Digital Emergency Voice Evacuation. The FireFinder XLSV is ideal for highly populated buildings and complexes. It can deliver crystal-clear, multiple and simultaneous messages to various locations, live or prerecorded.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

Learn more. Call Siemens Building Technologies, Fire Safety Division at 800-222-0108 or visit sbt.siemens.com/fis. Siemens FireFinder with "*Surround Sound*." You've got to hear it to believe it.

BUILDINGS magazine Editors' Choice TOP 100 PRODUCTS 2003

Visit us at Booth #701

Circle 047 on Reader Service Card



A COMPELLING CASE

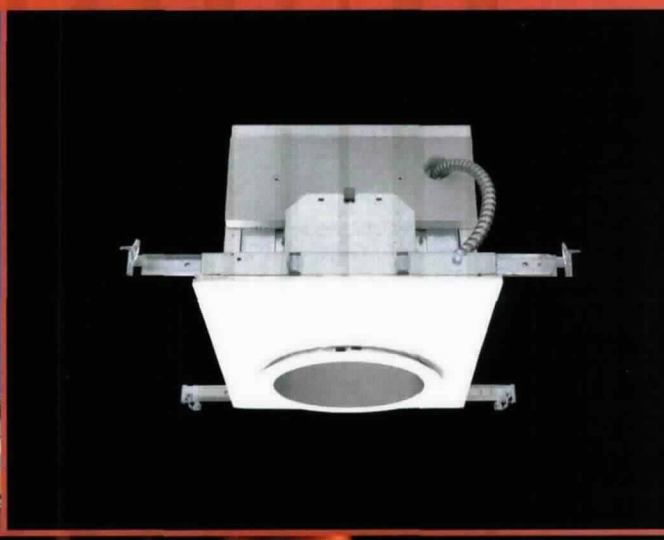
In the March/April 2004 issue of the *NFPA Journal*®, NFPA President and CEO James Shannon makes a compelling case for the mandatory sprinkling of all U.S. nursing facilities. Representing the majority of our nation's 16,000 plus nursing facilities and the more than one-and-one-half-million frail, elderly, and disabled individuals receiving long-term care, we could not agree more that protecting our nursing facility patients and residents from fires is of paramount importance.

In fact, the American Health Care Association (AHCA) formally recommended just this past October that the NFPA's 2006 edition of NFPA 101®, *Life Safety Code*® include a call for mandatory sprinkling of all nursing facilities. We agree that all possible steps should be taken to avoid tragedies like the ones in Connecticut and Tennessee.

Let me be clear: AHCA believes that installing full sprinkling in all nursing homes has the potential to eliminate multiple-death nursing home fires, and we salute NFPA for shining a spotlight on this issue. Now it is our responsibility to convince government, the fire safety community, and the public to join in this critical endeavor.

As many as 25 percent of our nation's nursing homes remain without full sprinkler systems, and the cost of retrofitting these facilities with the proper equipment is enormously expensive. It is estimated that the task could actually cost up to $1 billion. At a time when Medicaid, which pays for the care of two-thirds of nursing home patients nationwide, reimburses roughly $11 less per patient day than what it costs to deliver care, the skilled nursing profession is ill-

LOSS PREVENTION.



DON'T LOSE MONEY. DON'T LOSE LIVES.

INTRODUCING PRESCOLITE'S NEW SERIES OF FIRE-RESISTANT DOWNLIGHTS, FIRETIGHT.

Now there's a better solution to costly and ineffective custom-built enclosures for fire rated recessed downlighting applications. FireTight is a simpler, less expensive alternative that is patented, tested, and UL approved for most one and two-hour fire rated ceiling assemblies. FireTight is ideal for multi-story commercial and residential applications that require continuous fire rated ceiling barriers, such as apartment buildings, hospitality, and assisted living facilities. Contact your Prescolite representative or log on to **www.prescolite.com** to learn how you can incorporate this new budget saving and lifesaving technology into your projects.

prescolite

FireTight™

HUBBELL
Hubbell Lighting, Inc.

CLASSIFIED c UL us c UL us LISTED

Circle 040 on Reader Service Card

equipped to shoulder the massive cost of retrofitting for sprinklers.

AHCA has made a sustained commitment toward achieving the goal of mandatory sprinkling, but the nursing profession cannot bear this burden alone. The federal government must contribute the necessary resources, and the stakeholder community must make sure it does. Furthermore, any sprinkling mandate, whether legislated or regulated, must allow for the appropriate phase-in period that will be needed to comply without jeopardizing current levels of care. Including the recommendation in the 2006 *Life Safety Code*, to be published in 2007, would provide for an adequate phase-in period.

Nursing home providers hold very sacred the faith and confidence families place in them when they entrust the care for a loved one to a nursing facility. There's no greater priority in a skilled nursing setting than ensuring patient safety and well-being, and AHCA members are ready and willing to step up to the plate on the issue of sprinkling. Is our government?

STEVEN CHIES
Chairman,
American Health Care Association
Washington, D.C.

FIRST-HAND EXPERIENCE

I just finished reading the column by NFPA President Jim Shannon, calling for all nursing homes to be equipped with fire sprinkler systems. I would like to attest to his statement from the recent experience in one of our facilities. On January 2, 2004, I received a call that we had just experienced a fire in one of our facilities in northern Indiana. Upon arrival, our corporate directors and I found that the facility had a large area of fire damage in the attic portion of the building, not counting the water damage throughout that wing of the facility. After investigation we discovered in that wing there were 27 fire sprinklers that had opened in the attic, at the area of the fire. By the time the fire department arrived, the fire had been extinguished by the fire sprinkler system. During this experience there were no injuries to residents or staff who were evacuated to

The Eclipse protocol is available in select panels like the CyberCat™ Series from Fike Corporation.

Testing Eclipse devices is easy with the configuration tool.

How Do You Realize the Full Potential of Your Fire Protection Strategy?

System Sensor's new Eclipse™ protocol provides faster device response time, with more flexibility than ever possible before. This digital, peer-to-peer protocol enables pinpoint accuracy in as little as one-half second – without interference problems that can plague other systems.

How Fast is Fast?

NFPA 72® now requires alarm notification appliance actuation within 10 seconds of the initiating device being activated. The new Eclipse protocol squeezes response time between pull station and strobe to as little as one-half second. With Eclipse, no special communication cables are required, making it ideal for retrofit applications.

True Flexibility

Eclipse allows many design possibilities by managing fire, security, access and HVAC control through variable data length messages and priority management. Through the powerful programming capability of the Eclipse Configuration Tool, installers can:

- *Communicate to devices bi-directionally* and transmit up to 30 feet.
- *Configure devices* by setting the address, loop and branch plus receive information such as the serial number, date serviced and date code.
- *Initiate the "guard tour" mode,* enabling devices to receive IR messages and create a record (time, location) at the control panel.
- *Initiate the "walk test" mode,* offering messages via IR sent to a detector or module, generating broadcast on the communication line and signaling the panel to enter the walk test.
- *Initiate the "remote test" mode,* allowing the installer to simply aim the Configuration Tool at any Eclipse device on the loop to initiate a self-test.

Survival of the Fittest

The Eclipse system distributes intelligence to the networked devices. As a result, if the main fire alarm control panel is damaged, the system will remain operational. In fact, Eclipse turns every networked device into a peer, capable of generating messages readable by the system and freeing up the fire alarm control panel to focus on critical network communications and essential user interface functions.

For Speed, Flexibility and Survivability, Turn to Eclipse from System Sensor

Superior power delivery . . . half second device response time . . . enhanced detection capabilities . . . distributed intelligence . . . greater system design freedom . . . Eclipse has it all. Find out how Eclipse can give you the solution for your application. Circle the reader service card for more information on Eclipse, visit *eclipse.systemsensor.com,* or call 866/787-3924.

SYSTEM SENSOR®

advanced ideas. advanced solutions.™

866/787-3924

www.systemsensor.com

Circle 050 on Reader Service Card

other wings of the building and to outside facilities.

Can a fire sprinkler system make a difference? From this experience and after speaking with the residents, their families, and staff, they wouldn't want to be at another facility. They have a great sense of safety and security because TLC Management and their facilities require fire sprinkler systems in their buildings and the staff is trained on responding to such emergencies.

PHIL RUDY
Director of property maintenance
Marion, Indiana

PUBLIC AND PRIVATE

As a member of the NFPA Technical Committee on Emergency Management and Business Continuity, I was very pleased when "our" standard was given prominent mention in the article "21st Civil Defense" [January/February 2004]. Along with the pleasure came the "pain" of reading: "NFPA 1600 provides guidance that cities and towns can use to develop their own disaster programs..."

From a three-year stint on the TC, from using NFPA 1600 "on the job" in a steel plant, and from using NFPA 1600 as a university text, I can assure you that this statement is only partially true. The commercial (or business or non-governmental, whatever term you choose) sector and a much larger government sector than is narrowly defined in the article need the NFPA 1600 guidance as much as cities and towns do.

My first exposure to NFPA 1600 came in early 1999 when searching for a suitable text for an introductory emergency management (EM) course that was being planned for presentation as part of the safety curriculum offered in the Organizational Leadership and Supervision program at Purdue University Calumet in Hammond, Indiana.

Emergency management courses were planned for the safety curriculum because of the perceived need for safety personnel, with either full or part-time responsibilities for safety, [who] needed formal education in the requirements for an effective, efficient program to address emergency needs of an

organization, any organization. It is important to note that a few of these students were destined to enter or were presently working in the public sector.

NFPA 1600 has proven to be the "umbrella" guidance needed in these introductory courses. Though three different course texts have been used to supplement NFPA 1600 and provide additional information on the purpose and management of an EM program, NFPA 1600 continues to be the text of choice. The reason that it is appropriate for the diverse audience of learners is that it is neither government nor private sector specific.

Later, I used it as a text in an introductory emergency management course taught in another university with similar results.

At the same time I was using NFPA 1600 in the college classroom, we were able to use the guidance for the emergency program planning for U. S. Steel's Gary Works in Gary, Indiana. A fully integrated steel mill over 7 miles [11.2 kilometers] long and 1.5 miles [2.4 kilometers] wide on the shore of Lake Michigan provides unique challenges to planning for emergency response and business continuity. Again, the guidance provided by NFPA 1600 was a valuable input to our planning and programming.

A look at the TC responsible for NFPA 1600 will reveal a mix of private and public expertise. Being a relatively new member of this committee, I can attest to the discussions, albeit "heated," that surface when members representing the public sector (or the private as the issue may dictate) feel that the tone of the standard is potentially shifting to an unbalanced viewpoint; objections are raised in the name of making the standard applicable to both private AND public sectors.

We may have philosophical differences but share one very important viewpoint: NFPA 1600 MUST be appropriate for both the public AND private sectors if the standard will ever achieve its stated purpose.

DEAN R. LARSON
Purdue University Calumet
Hammond, Indiana

Two Wires, A Hundred Stories.

NetSOLO® BROADBAND

The Power of Distributed Audio.

NetSOLO Broadband is a network that brings the power of Distributed Multi-Channel Audio and Digital Messaging to your most challenging applications:

- **Capability** – Live voice paging, multi-channel audio, firefighter phone and network control all on a single pair of conductors.
- **Flexibility** – Scalable architecture combines up to 64 network nodes including fire command centers, transponders, and fire alarm control panels.
- **Survivability** – True peer-to-peer architecture utilizing distributed intelligence combined with regenerating communication.
- **Reliability** – Utilizes state-of-the-art Digital Signal Processors (DSP) and proven circuitry.

If you demand a system that can grow with you into the future, choose the future of Distributed Audio. NetSOLO Broadband.

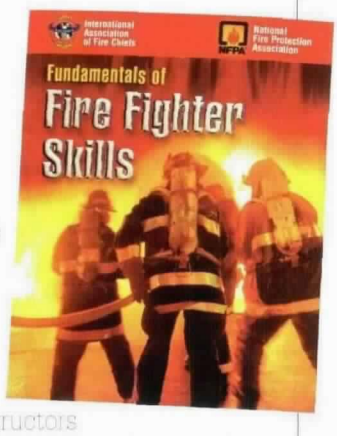
For a free product CD, visit www.firecontrolinstruments.com/netsoload.htm or contact us at (781) 471-3000.

FIRE CONTROL INSTRUMENTS
A Honeywell Company

Circle 017 on Reader Service Card

PUBLICATIONS

NFPA and IAFC develop fundamentals textbook for firefighters



IN AN EFFORT to provide today's firefighters with the most accurate and current information, NFPA has joined with the International Association of Fire Chiefs to produce a textbook, *Fundamentals of Fire Fighter Skills*.

The 37-chapter text covers numerous topics from structural fires to emergency medical care, haz-mat response, and mass casualty/terrorism.

The goal behind the new book is ensuring that future firefighters measure up to the skills and knowledge needed to meet the challenges of this demanding and dangerous profession. As today's firefighters respond to all types of crises from fires to medical emergencies and terrorist attacks, it's imperative that no knowledge gaps compromise their effectiveness or their safety in protecting the public. "Fundamentals of Fire Fighter Skills" thoroughly addresses the job performance requirements and the knowledge and skill objectives presented in the 2002 NFPA 1001, *Fire Fighter Professional Qualifications*.

In addition to chapters on fire behavior and preincident planning, NFPA 1001 and the NFPA 1001 correlation guide are included as appendix material. Each chapter also includes numerous references to applicable NFPA codes and standards.

Among the advisers, contributors, and reviewers are NFPA staff and numerous members of NFPA's fire service technical committees.

High-quality, full-color, user-friendly design and logical content organization and make this impressive text's wealth of information easy to access for instructors and students alike. Extensive use of figures and tables aids comprehension and improves mastery of skills. In addition, a variety of Web-based learning tools reinforces and builds on the solid foundation of knowledge presented in the *Fundamentals of Fire Fighter Skills* text.

Fire chiefs, state training directors, department and academy training directors, fire service instructors, and anyone involved with training at the I and II level need this resource. Visit www.nfpa.org/catalog.

ADOPTIONS

Montana adopts NFPA 1

MONTANA HAS ADOPTED the widely used NFPA 1, *Uniform Fire Code™ (UFC)*. NFPA 1 protects people and property in new and existing buildings by establishing reasonable levels of fire safety and property protection from potential hazards created by fire and explosion. NFPA 1, UFC integrates NFPA 1, *Fire Prevention Code*, and the *Uniform Fire Code*.

"Keeping pace with the latest developments in fire code safety is essential," said Acting State Fire Marshal Allen Lorenz. "Updates to these codes reflect advancing safety knowledge, and it's our job to make sure the people of Montana have the best protection possible."

Local jurisdictions will have 90 days to adopt the code. Montana code enforcers have already participated in NFPA's training program that covers the code requirements and the ways it can best be utilized. NFPA makes this training and the relevant code books free to government code enforcement officials, which reduces costs for Montana taxpayers. Training ensures that enforcers have the latest reference materials.

PUBLIC EDUCATION

Illinois champions safety for older adults

FIRE DEPARTMENTS IN the Glenwood, Carpentersville, and Rolling Meadows communities of Illinois are well underway in their efforts to provide fire and fall safety for older adults using NFPA's *Remembering When™* program.

The pilot program, which began in June 2003, is being coordinated through the Office of the State Fire Marshal, the Illinois Department of Public Health, and the Illinois Department on Aging. The initial state grant project is being funded and supported through the NFPA Center for High-Risk Outreach and the Illinois Department of Public Health.

Community activities will include safety presentations to groups of older adults. During individual home visits, 10-year lithium battery smoke alarms and night lights are being installed. In addition, those conducting home visits will review fire- and fall-prevention messages taught in the *Remembering When* program and distribute NFPA brochures. They will also review the 16 fire- and fall-safety behaviors with the older adult in the home.

APPOINTMENTS

Three appointed to research foundation

THE NFPA BOARD of Directors has appointed three trustees to the Fire Protection Research Foundation effective immediately. They are Davis R. Parsons of Lakewood, California; Mickey Shiver of Lake Buena Vista, Florida; and Catherine L. Stashak, C.S.P., of Deerfield, Illinois. Each will serve a three-year term on the 12-member board.

The Foundation, a charitable, nonprofit fire research group, is an affiliate of NFPA, and its work has included projects on the storage of flammable liquids, quick-response sprinklers, firefighting foam, and electrical safety.

Parsons, a fire and life safety consultant, served with the Los Angeles City Fire Department for 35 years. He retired as deputy chief in 1998. During his career, he was the city's fire marshal and then commander of the Bureau of Emergency Services. Parsons is a past member of NFPA's Standards Council, the Aviation Section executive board, and the Aircraft Rescue and Fire Fighting Technical Committee.

Shiver began his career as a firefighter and is currently deputy district administrator/executive director for the Reedy Creek Improvement District in Lake Buena Vista. He's responsible for enforcing building, electrical, and mechanical codes and oversees fire and emergency medical services and fire prevention codes and inspections.

Stashak, senior fire protection consultant for Schirmer Engineering, chairs the Technical Committee on Educational and Day-Care Occupancies and serves on the Life Safety Code Technical Correlating Committee.

2004 May Meeting Report on Comments

LISTED BELOW ARE documents that received comments and would, therefore, have reports appearing in the 2004 May Meeting Report on Comments (ROC).

NFPA 32, *Drycleaning Plants*;
NFPA 45, *Fire Protection for Laboratories Using Chemicals;*
NFPA 91, *Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*;
NFPA 96, *Ventilation Control and Fire Protection of Commercial Cooking Operations*;
NFPA 120, *Coal Preparation Plants*;
NFPA 121, *Fire Protection for Self-Propelled and Mobile Surface Mining Equipment*;
NFPA 122, *Fire Prevention and Control in Underground Metal and Nonmetal Mines*;
NFPA 123, *Fire Prevention and Control in Underground Bituminous Coal Mines*;
NFPA 241, *Safeguarding Construction, Alteration, and Demolition Operations*;
NFPA 271, *Test for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*;
NFPA 302, *Pleasure and Commercial Motor Craft*;
NFPA 405, *Recommended Practice for the Recurring Proficiency Training of Aircraft Rescue and Fire-Fighting Services*;
NFPA 408, *Aircraft Hand Portable Fire Extinguishers*;
NFPA 409, *Aircraft Hangars*;
NFPA 410, *Aircraft Maintenance*;
NFPA 422, *Guide for Aircraft Accident Response*;
NFPA 423, *Construction and Protection of Aircraft Engine Test Facilities*;
NFPA 430, *Storage of Liquid and Solid Oxidizers*;
NFPA 450, *Guide for Emergency Medical Services and Systems*;
NFPA 502, *Road Tunnels, Bridges, and Other Limited Access Highways*;
NFPA 555, *Guide on Methods for Evaluating Potential for Room Flashover*;
NFPA 701, *Fire Tests for Flame Propagation of Textiles and Films*;
NFPA 780, *Installation of Lightning Protection Systems*;
NFPA 1150, *Fire-Fighting Foam Chemicals for Class A Fuels in Rural, Suburban, and Vegetated Areas*;
NFPA 1201, *Developing Fire Protection Services for the Public*;
NFPA 1250, *Recommended Practice in Emergency Service Organization Risk Management*;
NFPA 1710, *Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*;
NFPA 1720, *Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments*;
NFPA 1931, *Design of and Design Verification Tests for Fire Department Ground Ladders*, and
NFPA 1932, *Maintenance and Service Testing of Fire Department Ground Ladders.*

The 2004 May Meeting Report on Comments is available on the NFPA Web site at http://www.nfpa.org.

BY KENNETH J. TREMBLAY

Construction workers installing a new roof started a fire that destroyed this building.

PHOTOGRAPH: ANDERSON INDEPENDENT-MAIL/KEN RUINARD

MERCANTILE

Propane torch ignites store roof

SOUTH CAROLINA–Construction workers installing a new roof on a carpet store with a propane torch started a fire that destroyed the building. Investigators found that work crews failed to provide a fire watch and ignored the manufacturer's installation instructions prohibiting the use of direct flame during the roofing process, which is against NFPA 51B, *Fire Prevention During Welding, Cutting, and Other Hot Work.* NFPA 51B provides requirements for the proper permitting of hot work, as well as fire watch procedures.

The single-story, unsprinklered building, which was 100 feet (30 meters) long and 150 feet (46 meters) wide, had masonry-block walls and a steel bowstring-truss roof. A fire detection system in the retail space didn't activate because the heat and smoke didn't initially enter the store.

Earlier in the day, construction crews used the torch to melt tar before installing a new roof. Shortly after noon, they stopped work to have lunch, returning 30 to 45 minutes later to find the roof on fire. They called the fire department using a cell phone at 1:15 p.m. and left the roof.

The building, valued at $1,200,000, and its contents, valued at $70,000, were destroyed. One construction worker injured his thumb while leaving the roof, and two firefighters suffered heat exhaustion.

RESIDENTIAL

Sprinkler extinguishes unattended cooking fire

WASHINGTON—Cooking oil left heating unattended in a pan overheated, starting a fire that spread to cabinets above the stovetop. A sprinkler in the kitchen and another in an adjacent hallway operated and extinguished it, limiting fire damage to the area of origin.

The fire occurred in a third-floor apartment in a three-story, wood-framed apartment building protected by a wet-pipe automatic residential sprinkler system. The building also had single-station smoke detectors, but their location and coverage weren't reported.

One of the apartment's occupants had put a pan of cooking oil on the stove while making dinner and left the kitchen. When the oil ignited, the fire alarm activated, alerting the apartment complex's caretaker, who investigated and saw smoke around the apartment's balcony. The caretaker reported that the fire, which filled the apartment with smoke, had been extinguished, but that the stove was still on. He shut off the burner and evacuated the building's occupants. By the time firefighters responded to the 7:53 p.m. call, the fire had been extinguished and the occupants had been safely evacuated.

Investigators determined that the heat from the burning oil damaged an overhead ventilation hood and the ceiling panels, causing the panels to drop to the floor.

Damage to the structure was estimated at $10,000 and to the building's contents at $500. No one was injured.

Temporary lighting starts hotel fire

CALIFORNIA–A sprinkler in a hotel storage room quickly extinguished a fire that started when temporary lighting strung up in the room fell onto a plastic container and ignited the cover.

The three-story, steel-framed hotel, which was 400 feet (122 meters) long and 200 feet (61 meters) wide, had concrete walls,

Flexible, Expandable, Networkable

Advanced Technology from NOTIFIER

ONYX™ SERIES

The Onyx™ 3030 Fire Alarm Control Panel

The Onyx 3030's unique modular design provides the flexibility and capacity to increase your level of fire protection and allow for future expansion as your needs grow. Supporting up to ten Signaling Line Circuits (SLC) and up to 3,180 devices makes the Onyx 3030 ideal for demanding large-scale applications.

Combined with the backward-compatible Onyx Series network, advanced detection and voice technology the versatile Onyx 3030 stands in a class by itself.

For more information, or to find a NOTIFIER Distributor near you, email us at usnfpa@notifier.com.

Visit us at booth 1001 during the NFPA World Safety Conference & Exposition.

NOTIFIER®

A Honeywell Company

Circle 037 on Reader Service Card

floors, and roof. A wet-pipe sprinkler system provided full coverage, as did an automatic fire detection system monitored by a central station alarm company. The building was occupied at the time of the fire.

The fire department received the alarm at 10:13 a.m. and responded with a full first alarm assignment. When firefighters arrived, building maintenance personnel told them that the sprinkler had already extinguished the fire and that they had shut down the affected portion of the system. They then led firefighters to a first-floor storage room loaded with plastic audio-visual storage containers and other combustibles.

A string of temporary lights for the room was plugged into an extension cord that reached an outlet outside the room. One light had fallen onto the containers, causing it to ignite.

Fire damage was estimated at $3,500, and damage to its contents was estimated at $5,000. The fire department told hotel staff that the temporary lighting had to be converted to permanent wired lighting and warned them never to shut the sprinkler system down unless the fire department determined it was safe to do so.

Four children die in house fire

FLORIDA—Despite rescue attempts by family and firefighters, four children sleeping in a single bedroom of a single-story, wood-framed house all died of smoke inhalation in an early-morning fire. Their parents and another child escaped.

The house, which was approximately 40 feet (12 meters) long and 30 feet (9 meters) wide, had an apartment at one end, but it wasn't involved in the fire. Smoke alarms, which the fire department installed the previous year, hadn't been maintained and failed to operate. At the time of the fire, all the residents but a 5-year-old child were asleep in the bedrooms; the child was sleeping in the living room.

A passerby discovered the fire and drove to a nearby fire station to report it at 6:15 a.m., just as another person used a cell phone to dial 911.

When they arrived, firefighters reported that the house was nearly 80 percent involved in flames and that the parents were frantically trying to reach the children trapped in a rear-facing bedroom. The children's father rescued the 5-year-old sleeping in the living room, but neither parent could reach the children asleep in the bedroom before the interior of the home became involved.

Fire crews enlarged a window in an uninvolved bedroom and advanced a 1-3/4-inch hose line to protect the unburned section of the home, followed by a 2-1/2-inch hose line to control the flames. Interior crews found the four children, ages 9, 7, 5, and 2, in the bedroom and passed them out the window to rescuers. EMTs from four advanced-life-support ambulances tried to revive the children without success. The children's 34-year-old parents suffered burns injuries and were taken to the hospital.

Investigators determined that the fire was started by two extension cords that had been spliced together and run under the carpet to a wall-mounted air conditioner in the first-floor living room to power the compressor and fan separately. The occupants reported that the unit hadn't been running properly the evening before the fire, and investigators found that the fan had frozen and was unable to operate.

The home, valued at $60,000, and its contents, valued at $10,000, were destroyed.

Combustibles too close to heater ignite

OREGON—A mother and her two children died of smoke inhalation in a fire that started when fabric on a changing table that had been placed too close to an electric wall heater in their single-family home ignited.

The wood-framed house had an asphalt-shingle-covered roof. Battery-operated smoke alarms installed in the hallway near the two bedrooms, in one bedroom, and in a shop area appear to have operated.

The fire spread to the wooden furniture and other combustibles in a 1-year-old boy's bedroom, eventually burning through the closed door. A passerby reported the fire at 3:24 a.m.

Arriving within seven minutes of the alarm, firefighters found the fire confined to the bedroom and light smoke showing from the home. They advanced a hose line to the bedroom, where they found the infant boy.

Additional crews found his 3-year old sister in her bed in another bedroom and his 36-year-old mother in the kitchen. All three were unresponsive and they were transported to the hospital, where they died.

Damage to the house, valued at $120,000, came to $20,000. The contents were a total loss.

Sprinkler protects homeless shelter

NEW HAMPSHIRE—A pan of oil left cooking unattended in the kitchen of a homeless shelter ignited, and the ensuing fire spread to kitchen cabinets and curtains when an occupant tried to douse the flaming pan in the sink. Fortunately, a sprinkler activated and extinguished the flames.

The shelter was located in a two-story, wood-framed building 40

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

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

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

DuPont Fire Extinguishants
1-800-473-7790 DuPont.com/fire

DUPONT
The miracles of science™

Circle 012 on Reader Service Card

feet (12 meters) long and 24 feet (7 meters) wide. The structure, which had an asphalt-shingled roof, was equipped with an automatic fire detection system and a wet-pipe automatic sprinkler system.

A shelter resident, heating the cooking oil to deep-fry some chicken, left the pan unattended, and the hot oil ignited, tripping the fire detection system. This alerted the resident, who returned to the kitchen and tried to extinguish the fire with water in the kitchen sink. A violent reaction occurred, igniting nearby curtains and an upper cabinet.

Firefighters responding to the alarm at 4:08 p.m. arrived four minutes later to discover that a sprinkler had activated and already extinguished the fire. According to the fire department report, the "sprinkler system safely extinguished this particular fire using approximately 300 gallons (1,136 liters) of water over an 8-minute period, compared to the 1,600 gallons (6,066 liters) of water the fire department would have used in the same time frame from a single hose."

Damage to the building, valued at $12,000, was estimated at $3,000, while damage to its contents, valued at $20,000, was estimated at $500. There were no injuries.

ASSEMBLY

Fire in concealed space damages restaurant

OKLAHOMA—A fire in concealed wall voids damaged an occupied restaurant, although sprinklers kept the fire from spreading to the interior of the structure. The building's wall voids narrowed from 18 inches (46 centimeters) wide at the base to 6 inches (15 centimeters) at the roof and contained no firebreaks.

The single-story, wood-framed structure, which was 100 feet (30 meters) wide and 160 feet (49 meters) long, had a wood-and-steel roof covered with clay tiles, and its exterior walls were covered with wire mesh and stucco. The building had a wet-pipe automatic sprinkler system but no smoke alarm.

Firefighters responded to a 6:53 p.m. call reporting the fire to find that the restaurant's occupants had evacuated and that smoke and fire was coming from the front of the building. Firefighters used a hose line to extinguish the visible fire and opened up the walls to reveal the fire spreading horizontally and vertically to two sides of the building. Eventually, the incident commander ordered backhoes to the scene to help fire crews open up the exterior walls so they could complete extinguishment. Two sprinklers prevented serious fire spread into the interior of the restaurant.

Investigators found the point of origin in the area of an electrical junction box that fed power to an exterior light, but they couldn't determine the cause of the fire. Once the blaze started, it spread undetected along wooden construction in the void until it became well involved in several areas.

Damage to the building, valued at an estimated $1.8 million, is estimated at $316,000. Damage to its contents, valued at of $261,000, is estimated at $209,000. There were no injuries.

Lightning ignites church

TEXAS—A motorist driving by a church during an intense thunderstorm noticed flames coming from the roof above the sanctuary and called the fire department at 12:46 a.m. Despite firefighters' efforts, the blaze quickly engulfed the church, whose roof collapsed.

The one-story, wood-framed building, which measured 100 feet (30 meters) by 40 feet (12 meters), had brick-veneer exterior walls. It had no fire detection or suppression system.

Firefighters arrived seven minutes after the 911 call to find flames coming from the roof above the sanctuary. They entered the burning building to fight the fire from inside, but the incident commander ordered them out in just five minutes just before the roof collapsed.

Investigators determined that the fire started in the attic and quickly spread to other areas of the church. After eliminating other sources of ignition, they determined lightning was responsible for the blaze.

Building losses were estimated at $600,000.

HEALTH CARE

Emergency procedures limit losses in nursing home fire

CONNECTICUT—The staff of a nursing home responded immediately to a fire alarm activation, removing two patients from danger and shutting the door to their room to limit fire spread. The staff then shut the doors to all the patients' rooms as thick, acrid smoke filled one wing of the building, which was equipped with full-coverage fire detection and sprinkler systems.

Fire crews responding to the automatic fire alarm at 2:53 a.m. were advised that a follow-up call from the nursing home had reported a fire in the west wing. Two additional engines were quickly dispatched and met by the nursing home staff, who advised the firefighters that some residents had been evacuated, but that heavy smoke in the corridor had prevented them from removing all occupants, who were still in their rooms.

The first-in engine crew advanced a 1-3/4-inch hose line into the building and down the corridor, where it came upon the room of origin. Firefighters from a

Circle 029 on Reader Service Card

second engine assisted in a primary search, as a third engine established a water supply. Fire crews quickly extinguished the fire, which was confined to the room of origin. A defend-in-place approach was used for most residents until the smoke cleared.

Investigators determined that electrical arcing or a short circuit in the air conditioning unit ignited its plastic housing. Smoke quickly filled the room, tripping the detector, but the fire wasn't hot enough to activate the room's two sprinklers.

Damage to the building, valued at $5,600,000, was estimated at $25,000. None of the patients and only two staff members had to be taken to the hospital.

Youths began a fire in this vacant three-story Victorian mansion. The fire was set on the third floor and heavily damaged the building.

PHOTOGRAPH: CENTRAL FALLS FIRE DEPT.

SPECIAL

Vacant home burns

RHODE ISLAND—Unauthorized use of a Victorian mansion that was being converted into a group home as a clubhouse led to a fire in a knee wall on the third floor that heavily damaged the building.

The three-story, wood-framed house, which was 50 feet (15 meters) long and 30 feet (9 meters) wide, had a pitched wooden roof covered by slate shingles. Its heat and smoke detection systems had been disconnected during the renovation, and the sprinklers designed for the project had not yet been installed.

A 6:10 p.m., calls brought two fire departments to the scene, as the house was on the line between two cities. Arriving within minutes, firefighters saw heavy smoke coming from the building's upper floors and entered the house to find fire on the third floor. However, they were pushed back to the stairwell by the heat and flames, which were held within the building by its heavy slate roof and planking.

On their second attempt to reach the third floor, firefighters discovered that the fire had spread from the third floor to the attic. Within 30 minutes, and the roof collapsed.

Neighbors told investigators that youths had been seen entering the building on a regular basis. The investigators found drug paraphernalia, smoking materials, and other items throughout the house. The enclosed space had no windows, which may have concealed the fire from neighbors, allowing it to burn for some time before it was detected. Once the fire broke out of the knee wall and into a room with windows, it spread rapidly throughout the entire floor and up to the attic.

Two firefighters received minor injuries. Damage to the building is estimated at $150,000.

MANUFACTURING

Sprinklers save wood-finishing company

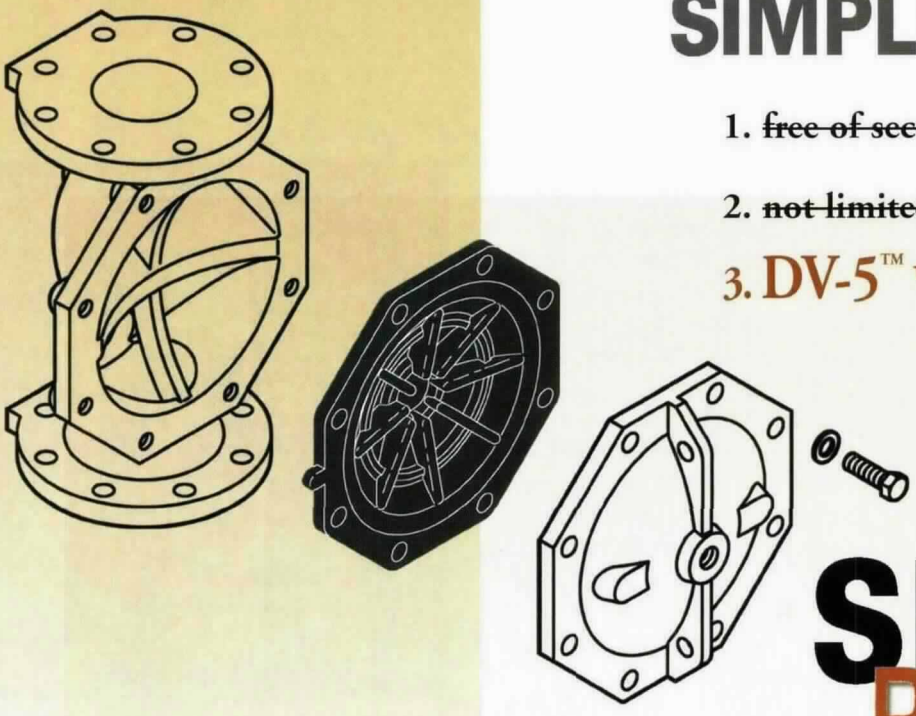
NEW HAMPSHIRE—Two sprinklers controlled a fire that began when cardboard, pallets, insulation, and empty containers of oil-based paints and thinners spontaneously ignited in room on the loading dock of a wood-finishing company that had closed for the night.

The one-story building had concrete block walls and a bowstring wooden-truss roof covered in rolled asphalt. It was protected by a wet-pipe automatic sprinkler system monitored by the municipal fire alarm system.

The fire department received the alarm at about 8:30 p.m. and arrived within minutes to find the exterior water motor gong operating and light smoke coming from the roof on one side of the building. Using keys from a key safe, firefighters entered the building and advanced a hose line to the loading dock and trash room. There, they found two sprinklers controlling the flames and extinguished the fire using the hose line and portable pressurized water extinguishers.

Investigators determined that oil-laden waste ignited spontaneously.

Neither the building, valued at $907,700, nor its contents, valued at $150,000, was damaged. There were no injuries.



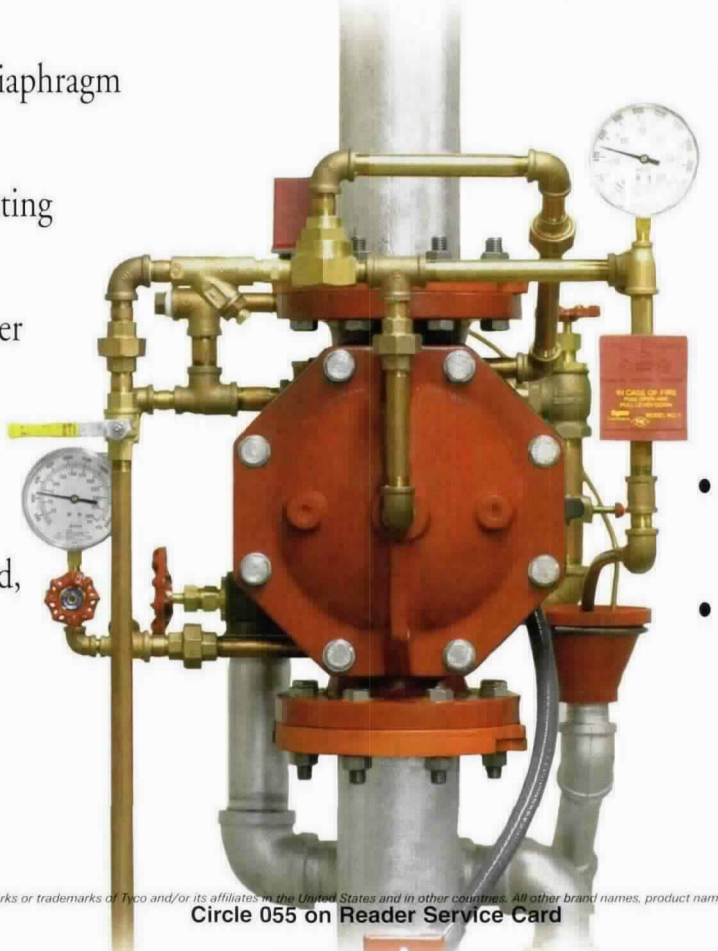
SIMPLE ('sim•pəl):

1. ~~free of secondary complications~~
2. ~~not limited or restricted~~
3. DV-5™ VALVE

SIMPLE Redefined

Redefining the industry standard, Tyco Fire Products introduces the *DV-5 valve* – first in a series of deluge valves featuring a distinctive diaphragm operation for horizontal and vertical installations. Coupled with external resetting and a super-lightweight design, the DV-5 valve redefines *simple*.

- One-piece diaphragm operation
- Quick external resetting feature
- No linkage or clapper assembly
- Innovative light-weight design
- UL and C-UL Listed, FM Approved



- Horizontal or vertical installation flexibility
- Internally and externally coated for corrosion resistance
- Deluge, preaction and foam applications
- 1½ through 8 inch sizes available
- Multiple end & trim configurations available

Tyco Fire Products
Ph: 800-523-6512
Fax: 215-362-5385
www.Tyco-Fire.com

tyco
Fire Products

ERIK HOLDEN

June a big month for seminars

IN JUNE, NFPA will offer a wide variety of training and professional development seminars in three locations across the United States.

Six seminars, including the NFPA 5000™, *Building Construction and Safety Code*™, seminar, will be held in San Francisco, California, from June 7 to 11. This two-day seminar should be of particular interest to building officials, architects, engineers, designers, building inspectors, and plan examiners in jurisdictions that have recently adopted NFPA 5000.

From June 14 to 18, the seminars will move to New Orleans, Louisiana, to provide outstanding practical training in NFPA 101®, *Life Safety Code*®; automatic sprinkler systems; NFPA 72®, *National Fire Alarm Code*®, and the primer for Certified Fire Protection Specialist certification.

From June 21 to 25, it's on to Schaumburg, Illinois, just outside Chicago. Here, you can choose from five seminars: *Life Safety Code*, automatic sprinkler systems, *National Fire Alarm Code*, fire alarm inspection, and facility fire safety.

To register or for the complete schedule of NFPA seminars in 2004, call toll-free (800) 344-3555 or log on to www.nfpalearn.org.

One-day electrical programs

To help you understand Occupational Safety and Health Administration (OSHA) regulations and implement your electrical safety plan with confidence, NFPA is offering seminars on NFPA 70E, *Electrical Safety Requirements for Employee Workplaces*, and on developing an electrical safety program from June 21 to 22 at the Chicago Marriott Schaumburg, in Schaumburg, Illinois, and at the Holiday Inn Dulles International Airport in Dulles, Virginia, from August 16 to 17. You may register for either or both.

The NFPA 70E seminar focuses on how to use OSHA regulations and interpret NFPA 70E to create a safe work environment. Practical information on identifying electrical hazards, developing safe work habits, and understanding lock out/tag out procedures are among the topics to be covered.

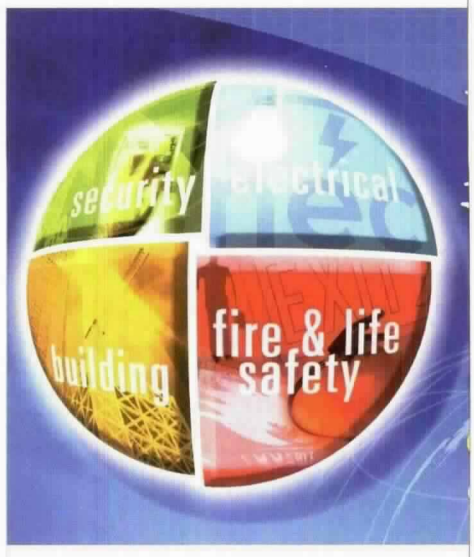
Developing an Electrical Safety Program focuses on meeting OSHA regulations by using NFPA 70E. Topics include the elements of an electrical safety program, site assessment, hazard risk analysis, and budgetary and record-keeping issues.

To register or for more information, call toll-free (800) 344-3555 or log on to www.nfpalearn.org.

World Safety Conference and Exposition™

Have you registered yet for the 2004 NFPA World Safety Conference and Exposition (WSCE) in Salt Lake City, Utah? This preeminent industry gathering will take place at the Salt Palace Convention Center from May 23 to 26. If you missed the early-bird registration deadline of May 7, you can still register at the show.

The WSCE is expected to attract more than 8,000 industry professionals, and there are numerous networking events during the show, too, including the grand opening reception in the exhibit hall at which beer, wine, and finger foods will be served. Take advantage of this venue to expand your network of personal and professional contacts.

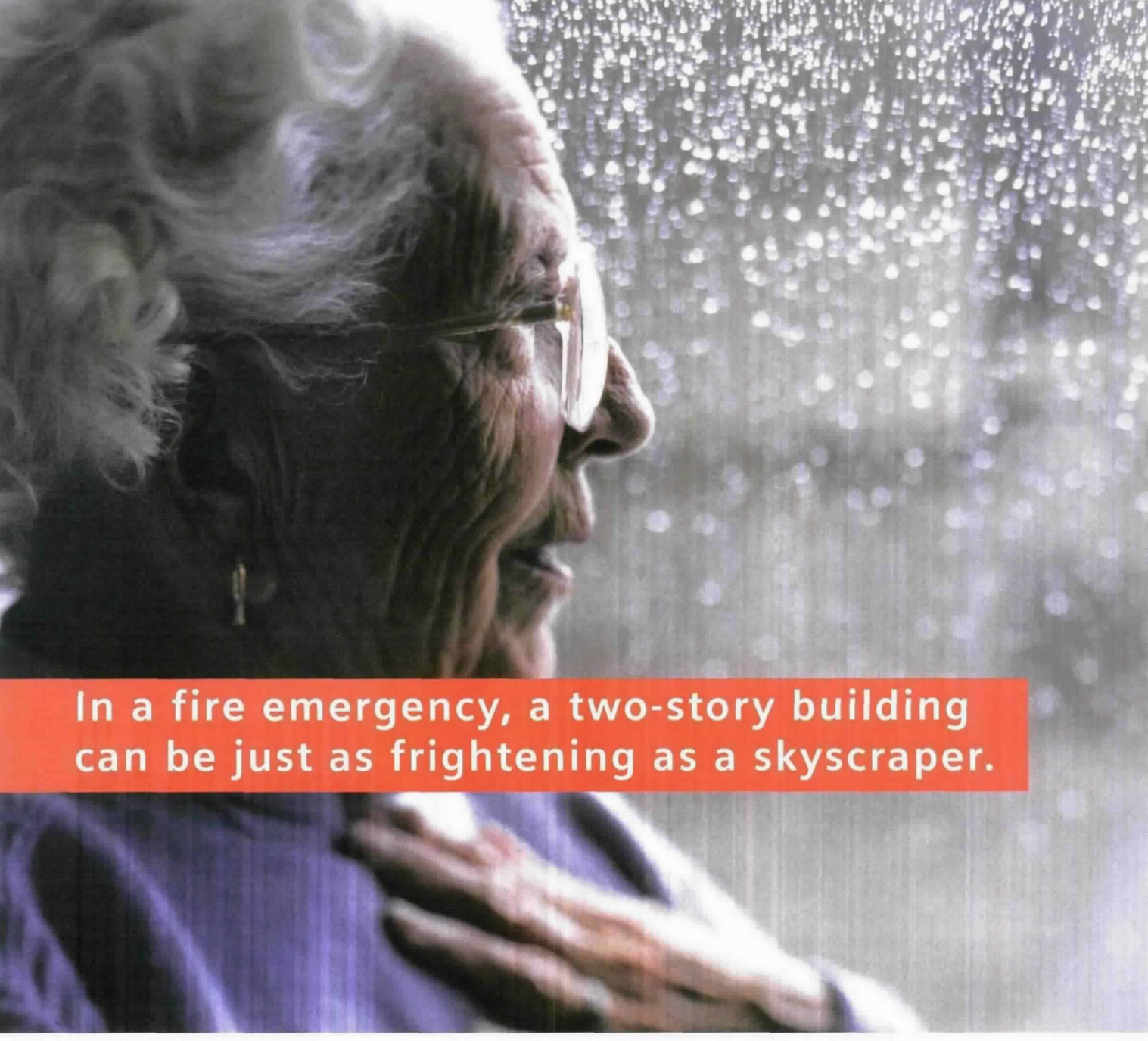


The exposition is a valuable three-day opportunity to meet with more than 250 companies that develop the technology and provide the services you rely on regularly. These companies have a unique perspective on the industry and can serve as an indispensable resource and partner. While at the exposition, be sure to visit the Exhibitor Presentation Theater at Booth 1242, where select exhibitors will showcase the latest products and services in half-hour presentations. This is an excellent opportunity to ask questions and see the latest technology first-hand. The Exhibitor Presentation Theater is open to all attendees.

New NFPA training video

Help ensure the reliability of your organization's automatic sprinkler systems with NFPA's new training video, "Inspection and Testing of Automatic Sprinkler Systems." Give your staff the knowledge needed to keep your sprinkler system in peak condition and ensure compliance with NFPA 25, *Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

ILLUSTRATION: NFPA



That's why you need a Faraday Intelligent Fire Detection System.

New Faraday intelligent systems offer the world's fastest detection speed and the same advanced technology that protects many of the world's most sophisticated structures. But, they can be sized to fit the specific safety needs and budget of most fire safety applications. In an average of 3 seconds, they detect fire, initiate alarms and engage emergency control operations. They work with proven devices like our Digital Voice Evacuation Systems, and FireSmart® Intelligent Detectors that can be set for 11 different environments. Plus, installation is up to 25%* faster than typical systems.

Faraday *Intelligent Fire Detection Systems.* Because fire safety is a top priority no matter what size the building. For details, visit faradayllc.com.

* Depending on size and type of building.

Visit us at Booth #601

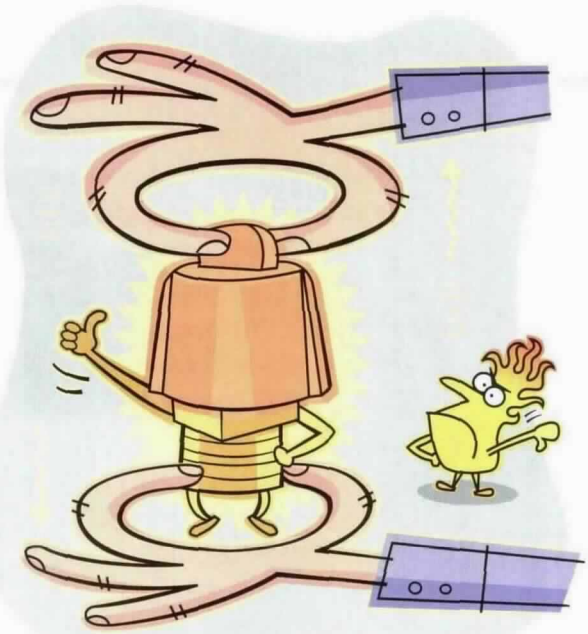
FARADAY

Analog/addressable and conventional fire control panels • Life-safety rated audio and visual alarms

Circle 015 on Reader Service Card

RUSSELL P. FLEMING, P.E.

Sprinkler caps and straps



A TENTATIVE INTERIM amendment (TIA) to NFPA 13, *Installation of Sprinkler Systems*, addressing the subject of fire sprinkler protective caps and straps is currently under review. If approved, it would implement an emergency change to the sprinkler standard to provide rules governing the removal of such protective covers and give additional guidance for the proper handling of sprinklers.

The TIA proposal was jointly developed by the fire sprinkler manufacturers and listing organizations in response to a recent change in the ANSI/UL standard for sprinklers that requires protective covers for all glass-bulb sprinklers. This change is intended to reduce the potential for damage to the bulbs during handling and installation. Most sprinkler manufacturers already fit glass-bulb sprinklers with protective covers and, at a future effective date, all UL-listed glass-bulb sprinklers will be required to have such covers. This means that the majority of sprinklers will be shipped with orange protectors that, according to the manufacturers' literature, should be removed from the sprinklers only when the system is "placed in service."

NFPA 13 doesn't currently address the timing of their removal, and the standard isn't clear as to when a system can actually be said to have been placed in service. Some may interpret this as the point at which the system is commissioned–that is, when the contractor's material and test certificate is signed. Since some systems are supplied with water and expected to provide protection during construction, however, this produces the potential for sprinklers to be expected to provide protection while the caps or straps are still in place. The presence of the protective caps or straps will impair sprinkler operation if not removed before the system is placed in service. Thus, the TIA calls for the removal of the protective covers "when the water supply, either temporary or permanent, is made available to the sprinklers for purposes of fire protection."

For upright sprinklers and those installed under ceilings more than 10 feet (3 meters) high that are unlikely to be accidentally struck following installation, the TIA would allow the protective covers to be removed at installation. By that time, the devices have served their purpose, and the additional cost to remove them when the system is placed in service is unnecessary. In addition, the practical difficulties of reaching caps or straps on a high ceiling may lead to attempts to remove them with poles or other instruments that could damage the sprinklers. Where construction work is expected to take place after the sprinklers have been installed, however, the proposed TIA recommends considering leaving protective caps and straps in place until a water supply is available to the sprinklers.

Finally, the proposed TIA would prohibit the installation of sprinklers in piping before the piping has been installed through structural members. This practice may damage parts of the sprinklers' heat-sensing mechanisms, allowing the sprinklers to activate in the absence of a fire.

Currently, NFPA 13 doesn't clearly state that sprinklers that have been dropped must be replaced, either, although such sprinklers could sustain changes in loading or cracks in the bulb tips that would eventually result in a loss of fluid. Because the presence of protective straps or caps might lead installers to assume that the sprinklers are less susceptible to damage when dropped, the need for requirements in the installation standard is clear.

The lack of guidance in NFPA 13 on these issues creates emergencies with respect to possible impairment of sprinklers. The proposed TIA addresses these emergencies and ensures that sprinkler caps and straps will be used in the most effective manner.

RUSS FLEMING is the executive vice-president of the National Fire Sprinkler Association.

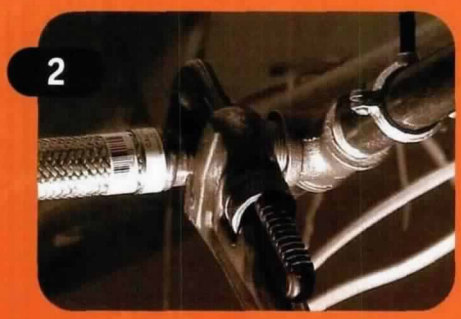
ILLUSTRATION: JACK DESROCHER

FlexHead Commercial Ceiling Sprinkler Connections...

A Profitable Connection.

FlexHead–pioneers of flexible fire sprinkler connections, now offer the same state-of-the-art technology that they invented for the semiconductor industry, to the commercial marketplace. These connections are designed for use in suspended ceilings and are fast and simple to install; requiring ***NO*** **measuring,** ***NO*** **cutting and** ***NO*** **in-field assembly.**

Installation is as easy as 1, 2, 3...



1. **Simply snap the bracket onto t-bar ceiling grid.**
2. **Quickly connect sprinkler drop to submain.**
3. **Easily secure sprinkler drop to bracket.**

FlexHead connections **install at least four times faster** than traditional hard-pipe, which translates into **lower installed costs and higher profits.** Call **(800) 829-6975** today or go online to **flexhead.com** for more information!

c UL us LISTED FM APPROVED

U.S. Patent #'s 5,396,959, 5,570,745, 6,076,608, 6,123,154, 6,119,784, 6,488,097

FLEXHEAD®
INDUSTRIES
FlexHead systems...the NEW tried-and-true.
800-829-6975 flexhead.com

Circle 019 on Reader Service Card

BEN KLAENE & RUSS SANDERS

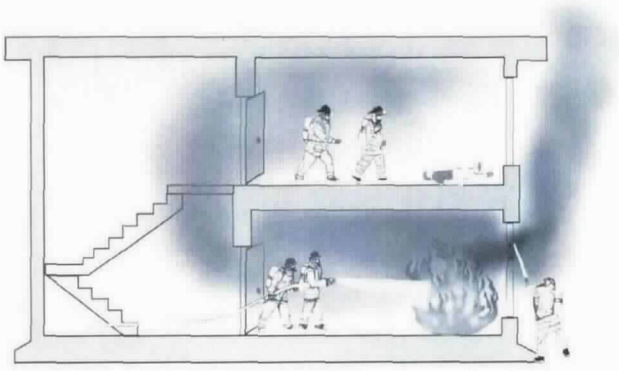
Firefighter safety and good tactics go together

THE GUIDING OBJECTIVE throughout our book *Structural Fire Fighting* is to prepare the fire officer to take command at structure fires, using available resources safely and effectively. Accomplishing this requires close attention to the proper application of safety principles on the fireground.

There's a direct correlation between the application of sound fire tactics and firefighter safety. The proficient incident commander will develop and revise his or her strategic plan based on information available through an ongoing size-up. When companies or crews, organized in accordance with the Incident Management System (IMS), are deployed to carryout a well-thought-out strategic plan, the incident commander has laid the groundwork for a safe and effective operation. Anything less can result in chaos that invites firefighter injuries and deaths.

Over the past 30 years, the fire service has made significant gains in bringing attention to the issue of firefighter safety. With the exception of the tragic loss of firefighters at the World Trade Center, recent NFPA statistics show that the number of firefighter fatalities has decreased by approximately 30 percent since 1977.

In explaining these improved statistics, we could point to the many safety improvements, such as better protective clothing and equipment that complies with NFPA standards, fire safety education, and code adoption and enforcement efforts that have successfully reduced the number of fires, thereby exposing firefighters to fewer fires and less risk. Also contributing is the attitude that the fire service no longer accepts firefighter injuries and deaths as inevitable.



Nonetheless, statistics indicate that firefighters are dying on the fireground at nearly the same rate they did in the late 1970s. The firefighter fatality rate remained virtually unchanged from the late 1970s to the late 1990s, and there has been only a 14 percent improvement in the early 2000s. In 2002, 47 percent of firefighter injuries and deaths occurred on the fireground, more than during any other activity.

In other words, the probability of death at a single fire hasn't changed much, despite all our good work. How can this be? Although a number of factors, such as lightweight construction that makes buildings more prone to collapse, more and higher calorific-value fuels, increased thermal insulation, and inexperienced firefighters, may all play a part, we'd like to focus on firefighters' lack of experience.

How do firefighters, company officers, and incident commanders gain the experience necessary to become and remain proficient when the number of fires to which they respond is dropping? The answer is clear: complement limited experience with more realistic training and better education.

It's unnecessary, even undesirable, to learn every lesson through personal experience. However, it's important to take maximum advantage of limited personal experience by coupling post-fire critiques with formal training and education sessions. Studying basic strategy and tactics during informal drills, department-wide training, state and national educational opportunities, and college courses can maximize the lessons learned on the job.

To complement these sessions and courses, firefighters should spend more time training with realistic scenarios. Fire reports from NFPA, the National Institute for Occupational Safety and Health, the U.S. Fire Administration, and other organizations provide a better understanding of fireground dynamics. Applying the lessons taught in these reports to similar buildings in their jurisdictions will provide firefighters and incident commanders with valuable insight.

We need to learn the "tricks of the trade" through training and experience. First-hand experience is an invaluable. However, firefighters and incident commanders who rely solely on experience will, without question, experience unnecessary loss of life and property.

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

PHOTOGRAPH: NFPA, FROM STRUCTURAL FIRE FIGHTING

Workhorse.

Hitch a Flex 400 to your building.

Flex400 Series Fire Alarm Control Panels.

Since 1852, Gamewell has set the standard for each generation of life safety systems, and then raised the bar. That's why the hard working, conventional Flex 400 Series is the superior choice for today's small and medium applications: sophisticated microprocessor technology, simple operation, versatile configurations plus a full range of detectors and peripherals.
For more information, visit www.gamewell.com

Gamewell. Setting the benchmark.
Opening the door to tomorrow.

Gamewell™
A 150-Year Tradition

A Honeywell Company

Circle 020 on Reader Service Card

ALLAN B. FRASER, CBI, CPCA

NFPA 900 just the first step

CODES AIMED AT saving energy and improving energy efficiency became common in the United States after the 1973 energy crisis. Since 1975, the premier standards on the subject have been ANSI/ASHRAE/IESNA 90.1 and 90.2, published by the American National Standards Institute; the American Society of Heating, Refrigerating and Air-Conditioning Engineers; and the Illuminating Engineering Society of North America. When Congress enacted the Energy Policy Act (EPACT) in 1992, it mandated the technical requirements of ANSI/ASHRAE/IESNA 90.1 as the minimum standard for all new commercial and high-rise residential buildings in the country. The most recent and comprehensive ANSI-accredited document for complying with EPACT is NFPA 900, *Building Energy Code*, which combines NFPA-developed administrative provisions with the technical standards provisions of ANSI/ASHRAE/IESNA 90.1 and 90.2 into one easy-to-use document.

What is the purpose of NFPA 900?
It's the first step in a well-planned process to create the nation's clearest, most comprehensive, and most cost-effective ANSI consensus energy code that building codes can reference or that jurisdictions can adopt and use as a stand-alone code.

What does it cover?
NFPA 900 has requirements for the minimum energy-efficient design and construction of all new buildings and their systems, new portions of existing buildings and their systems, and new systems and equipment in existing buildings, as well as criteria for determining compliance with these requirements.

The provisions of this code apply to the envelopes of buildings, provided the enclosed spaces are heated by a system whose output capacity is greater than, or equal to, 3.4 Btu/h·ft2 or cooled by a system whose sensible output capacity is greater than, or equal to, 5 Btu/h·ft2. They also apply to heating, ventilating, and air conditioning systems, service-water heating systems, electric power distribution and metering provisions, electric motors and belt drives, and lighting.

The provisions don't apply to single-family or multi-family houses with three stories or fewer above grade, manufactured houses, buildings that don't use either electricity or fossil fuel, or any equipment or portions of building systems that use energy primarily to power industrial, manufacturing, or commercial processes.

How is NFPA 900 different from other energy codes?
In general terms, NFPA 900 is unique because it is the only ANSI-accredited energy code and the only ANSI document covering energy efficiency issues that was jointly developed by two highly respected organizations. It is also the only code that directly incorporates all the specific technical standards mandated by the federal government as the required national minimum, as well as criteria for low-rise residential occupancies.

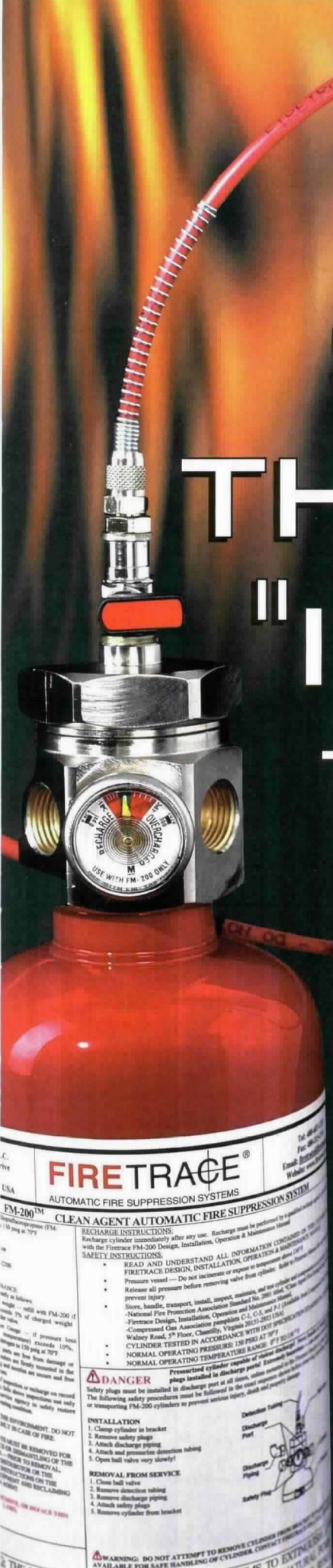
Why does this make a difference?
Other energy codes may include provisions that don't necessarily meet the federally mandated minimum requirements. Designers, code officials, and building owners know that when they comply with NFPA 900, they not only get a cost-effective, energy-efficient building, but they get a building that complies with all the federal minimum requirements.

Why is NFPA 900 so important?
Section 304 of the Energy Policy and Conservation Act (EPCA), as amended by EPACT, allows the Department of Energy (DOE) to determine whether revisions to the Council of American Building Officials 1995 Model Energy Code or to the 1989 edition of ANSI/ASHRAE/IESNA 90.1, would improve energy efficiency in residential and commercial buildings. DOE provides incentive funding and technical assistance to states to update and implement their building energy codes to meet or exceed the model codes that have been determined to improve efficiency.

After comparing the 1999 edition of ANSI/ASHRAE/IESNA 90.1 to the 1989 edition, DOE determined that the 1999 edition would improve commercial building energy efficiency and published its decision in the July 15, 2002, edition of the *Federal Register*, thus fulfilling DOE's mandate under the amended EPCA. As required by the act, all states have two years to adopt the 1999 edition of ANSI/ASHRAE/IESNA 90.1, or upgrade their existing commercial building codes to meet or exceed its requirements. The standard applies to all new commercial buildings and all major remodels or renovations of existing commercial buildings. With NFPA 900, the administrative code requirements have been added to ASHRAE's technical requirements to provide all designers and code officials with one document.

PHOTOGRAPH: EYEWIRE

IT'S TIME TO START THINKING "INSIDE" THE BOX!



Firetrace takes fire protection ***"inside the box"*** by protecting critical equipment, cabinets and enclosures from the ***inside***. Your valuable assets, such as CNC machines, electrical control panels, fume hoods, computers and communication equipment, are safeguarded from the effects of a devastating fire when protected by a Firetrace system. Our cost-effective systems utilize a variety of agents including FM-200®, dry chemical powders, CO_2, foam and water. Firetrace systems are UL Listed* and FM Approved*, require no electricity and can be configured to cut off power or fuel supplies.

Learn more by calling 866.607.1218, e-mail info@firetrace.com or visit www.firetrace.com and see why it's time to start thinking inside the box.

UL LISTED ULC LISTED FM APPROVED

FIRETRACE®
AUTOMATIC FIRE SUPPRESSION SYSTEMS

*Listings and Approvals vary by system and agent.

Visit Us at the NFPA World Safety Conference and Exposition®, Booth #1128

Circle 018 on Reader Service Card

CHIP CARSON, P.E.

Operational requirements for sports venues

MANY REQUIREMENTS FOR the operation of assembly occupancies are included in NFPA 101®, *Life Safety Code®*. Assembly occupancies are those with 50 or more occupants gathered together for eating, drinking, amusement, deliberation, entertainment, or awaiting transportation. NFPA 1, *Uniform Fire Code*™ also includes requirements for the operation of assembly occupancies in Chapter 20, section 20.1, but these requirements are extracted from NFPA 101. NFPA 1 also includes requirements for grandstands, bleachers, tents, and membrane structures in Chapter 25. These requirements were extracted from NFPA 102, *Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures*, 1995 Edition. The requirements contained in NFPA 102 are now included in the 2003 edition of NFPA 101 and NFPA 102 is no longer updated.

ILLUSTRATION: DAVE EMBER

Beyond fire

Concern for occupant safety in sports venues is not restricted to fires. Injuries from crowd crushing, trampling, or violence can occur any time during entry to, and exit from, a facility, during an event, or during an emergency evacuation. As a result, management, employees, and attendants of sports venues need to understand emergency procedures and be skilled in implementing them. The operational requirements in NFPA 101 include a wide variety of topics, such as food service operations, open-flame devices and pyrotechnics, furnishings, decorations, and scenery, exposition facilities, crowd managers, drills, smoking, seating, and storage of clothing.

The operational requirements affecting the management will be discussed here. These are the people who need to understand the emergency procedures and be skilled in implementing them in an emergency.

Crowd management is a major concern, and any assembly occupancy that can hold 50 or more occupants must now have one crowd manager for every 250 occupants, although the authority having jurisdiction (AHJ) may reduce the number of managers based on the presence of automatic sprinklers and the nature of the event. The only exception to this requirement is religious establishments, where the threshold is 2,000. Crowd managers must be trained in crowd management techniques, and the training must be approved by the AHJ. This training should include information on factors affecting crowd dynamics, such as space, energy, and evacuation time, as well as specific crowd management techniques, such as metering. Additional information may be found in Section 3, Chapter 13, of the *Society of Fire Protection Engineers Handbook of Fire Protection Engineering*.

Drills, designed in cooperation with the local authorities, are also required in assembly occupancies. These drills are not for the attendees, but for the employees who must practice their duties to ensure an orderly evacuation in case of fire, panic, or other emergency. NFPA 101 does not stipulate the frequency of such drills, but they should be conducted often enough to allow all employees and attendants to become familiar with the procedures. They should also be conducted under varying conditions to simulate unusual circumstances. Employees should also be taught how to use portable fire extinguishers and other manual fire suppression equipment properly.

Remember, the purpose of a drill is to practice emergency procedures. It's not a test. When the real emergency occurs, will the employees and attendants know what to do and perform their duties well? These employees or attendants are also to be instructed in the proper use of portable fire extinguishers and other manual fire suppression equipment provided.

EACH DAY BLUEPRINTS ARE REVIEWED, WIRING IS INSPECTED, EQUIPMENT IS TESTED AND DANGER HAS ONE LESS PLACE TO HIDE.

At Underwriters Laboratories, we're proud to partner with you in your commitment to public safety, and we understand your responsibility requires you to leave no stone unturned. That's why our dedicated regulatory services staff offers technical services and support that include everything from online information to on-site field evaluations. This wide range of resources is available to assist your work in any built environment. For more than a century, UL and the integrity of the UL Mark have offered you something important when making compliance decisions: peace of mind.

UL Working for a safer world®

www.ul.com/regulators

Circle 057 on Reader Service Card

STEPHEN BARLAS

TIA cleans up hand-sanitizer controversy

NOTHING BETTER REFLECTS NFPA's willingness and ability to respond quickly to public health and safety exigencies than the Standard Council's April approval of a tentative interim amendment (TIA) to the 2000 and 2003 editions of NFPA 101®, *Life Safety Code*®.

The TIA allows hospitals and other health-care facilities to install alcohol-based hand sanitizer dispensers in corridors and other public areas, helping them step up their efforts to combat infections, a goal avidly pursued over the past few years by the Centers for Disease Control and Prevention (CDC).

The CDC decided to make these alcohol-based hand sanitizers a cause célèbre of sorts and for good reason. The agency believes more than 88,000 patient deaths per year can be attributed to hospital-acquired infections. Washing with plain soap can result in paradoxical increases in bacterial counts on the skin.

That's where the alcohol sanitizers come in. They're faster to use, and they're more effective than soap and water.

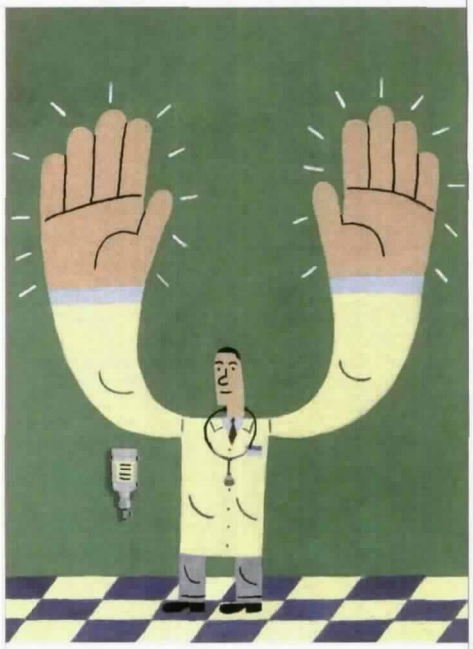
In October 2002, the agency, part of the U.S. Department of Health and Human Services, released new guidelines to promote the use of hand sanitizers in health-care settings, especially hospitals. Among the recommendations "to improve hand-hygiene adherence among personnel who work in areas in which high workloads and high intensity of patient care are anticipated" was to "make an alcohol-based hand rub available at the entrance to the patient's room or at the bedside, in other convenient locations, and in individual pocket-sized containers to be carried by HCWs (health care workers)."

However, hospitals and, to a lesser extent, ambulatory surgical centers have been wary about expanding the use of alcohol-based hand-rub sanitizers for one main reason: Medicare inspections. In its conditions of participation (COP) for Medicare or Medicaid funding, the Center for Medicare and Medicaid Services (CMS) essentially bars the use of hand sanitizers outside hospital rooms, based on its interpretation of NFPA 101, which carefully regulates placement of chemical contents in areas where they might jeopardize egress from a building. There are exemptions for storage of alcohol-based sanitizers in some locations in certain quantities, if certain conditions are met. Some interpretations of the code even seem to allow dispensers in patient rooms.

But CMS rules out corridors and other public areas, even though NFPA 101 has no specific criteria regulating such material dispensed in small amounts, as from wall dispensers.

As a result, many hospitals have delayed full use of alcohol-based hand sanitizers for fear the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) or local or state enforcement agencies would cite them for violating Medicare or Medicaid COPs. In a worst-case scenario, that could lead to a loss of federal funding.

While the scientific and medical benefits of alcohol-based hand cleaners have been clear for some time, the perception of their potential as a fire-starter fell precipitously after the publication of a survey of 840 health-care facilities in the August 2003 issue of *Infection Control and Hospital Epidemiology*. The study found no fires



attributable to hand sanitizers. Yet 11 percent of the facilities reported that they had been told by a fire marshal to remove dispensers from hallways.

CDC asked for help from the American Society for Healthcare Engineering (ASHE), one of whose members, Doug Erickson, sits on the NFPA Technical Committee on Health Care Occupancies. Erickson brought the issue to the Standards Council, which directed the technical committee to see whether it could develop a TIA to the 2003 version of NFPA 101 that would clear the way for hospitals to place alcohol-based hand-sanitizer dispensers in hallways, near elevators, in waiting rooms, and elsewhere.

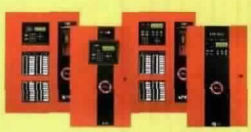
The first TIA the technical committee reviewed failed to achieve the necessary three-quarters support of the committee to pass. The committee revised the TIA, mostly in the area of quantities of fluid in each dispenser, their spacing from one another, and total amounts permitted in specific areas of the facility.

ILLUSTRATION: JAMES KACZMAN

Looking for innovative fire solutions?

From a flexible network of providers?

You're getting warmer.



The Farenhyt family includes Silent Knight's intelligent fire panels with or without voice evac capabilities.

Farenhyt is brought to you by

SILENT KNIGHT
A Honeywell Company

Farenhyt.™ A Higher Degree of Fire Protection.

Farenhyt is the only line of fire protection solutions engineered to be as flexible as it is capable. With Farenhyt, you can choose from our national network of qualified Farenhyt Engineered Systems Distributors (ESDs) to create the system that's right for your needs. If you're looking for a flexible, capable fire system, look to Farenhyt.

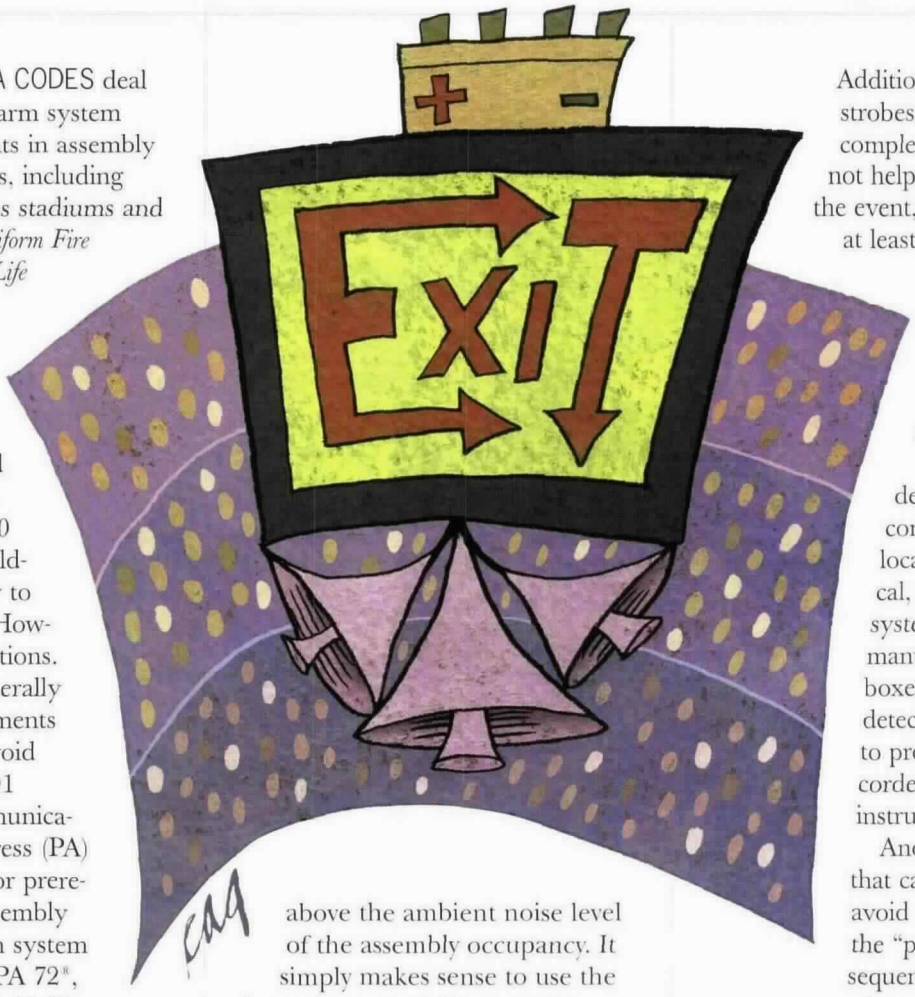
For more information and a FREE brochure, call 1-800-446-6444.

Farenhyt™
By Silent Knight

Circle 048 on Reader Service Card

WAYNE D. MOORE, P.E., FSFPE

Sports venues and the fire alarm systems challenge



THREE NFPA CODES deal with fire alarm system requirements in assembly occupancies, including sports venues such as stadiums and arenas: NFPA 1, *Uniform Fire Code*™; NFPA 101®, *Life Safety Code*®; and NFPA 5000™, *Building Construction and Safety Code*™. All have similar detection and alarm requirements, although NFPA 5000 and other model building codes apply only to new sports venues. However, there are exceptions.

Sports venues generally use voice announcements in emergencies to avoid panic, and NFPA 101 exempts voice communication and public address (PA) systems, either live or prerecorded, from the assembly occupancy fire alarm system requirements of NFPA 72®, *National Fire Alarm Code*®, if the alarm is initiated by someone in a constantly attended location. They are also exempt from these requirements if, in the judgment of the authority having jurisdiction (AHJ), there are adequate alternative provisions for discovering a fire and alerting occupants promptly.

Clear announcements

Most large stadiums or arenas have well-designed, state-of-the-art PA systems to ensure the attendees clearly hear announcements and play calls, and the AHJ can approve these "non-fire alarm" systems for use during a fire emergency, since they are audible above the ambient noise level of the assembly occupancy. It simply makes sense to use the best system available to notify attendees when the fire alarm signals are transmitted to a central, constantly attended location during an event. Any concerns about supervision of the wiring can generally be overcome with common sense and the owner's commitment to maintaining a quality PA system. In fact, this type of PA system will often provide better audibility and intelligibility than a fire alarm system. In these special cases, then, the AHJ should review the PA system design and consider using it for fire alarm notification.

Additional requirements, such as emergency power, should also be applied to the PA system to ensure it is as reliable as a fire alarm system.

Additional high-intensity strobes throughout the complex may or may not help, depending on the event, but they should at least be located in all common areas, such as corridors, rest rooms, and concession areas.

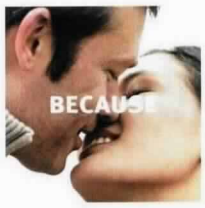
Where the AHJ determines that a constantly attended location is impractical, a fire alarm system initiated by manual fire alarm boxes or automatic detection can be used to provide prerecorded evacuation instructions.

Another method that can be used to avoid false alarms is the "positive alarm sequence" or a pre-signal system that gives those in charge time to determine the best methods for evacuation in each alarm scenario.

The best option

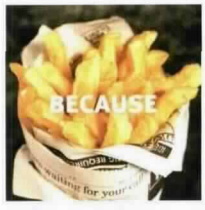
Because sports venues present many challenges, AHJs are encouraged to avail themselves of additional third-party reviewers to ensure they understand the best options to enforce. It may be difficult to enforce the letter of the fire alarm code in a sports venue, which may not meet the performance required by the code unless alternative means are allowed. Using the design alternatives allowed in NFPA 5000 and NFPA 101 may be the best option.

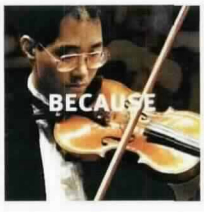
ILLUSTRATION RICHARD GOLDBERG

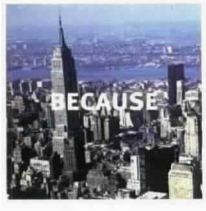


BECAUSE protective coveralls should be able to resist microscopic airborne viruses in Class 100 cleanrooms.

why.dupont.com/TYVEK





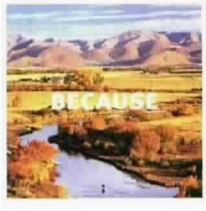


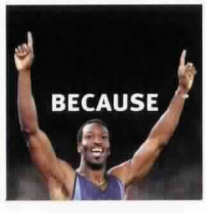
BECAUSE a bullet-resistant vest should be 5x stronger than steel.

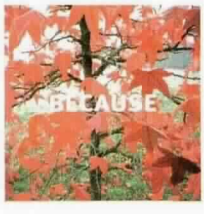
why.dupont.com/KEVLAR

BECAUSE a firefighter's coat should not melt, drip, or ignite in 500°F oven tests.

why.dupont.com/NOMEX

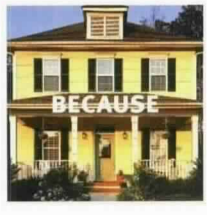


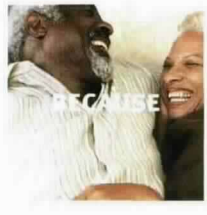




BECAUSE a chemical suit should be able to endure over 8 hours of exposure to toxic chemical warfare agents.

why.dupont.com/TYCHEM





Why invest in the proven quality, strength, and research that go into DuPont™ Kevlar,® Nomex,® Tyvek,® and Tychem®? *Because life is worth protecting.*

To reach a representative, call 1-800-931-3456.

DUPONT

The miracles of science®

Circle 013 on Reader Service Card

JOHN NICHOLSON

Canada mandates fire-safe cigarettes

TAKING THE LEAD from New York State, Canada this year became the first nation to pass a cigarette fire safety standard.

On March 31, the Canadian Parliament passed a bill that requires all cigarettes sold in Canada to self-extinguish if left unsmoked. The Canadian Association of Fire Chiefs estimates that smoking materials started 14,030 fires in Canada between 1995 and 1999 that killed 356 people, injured 1,615, and caused more than $200 million of property damage.

The Canadian standard is based on New York's historic cigarette fire safety standard, the first such standard to be passed into law. By the end of this June, New York will require that all tobacco companies that sell cigarettes certify that no more than 25 percent of the cigarettes sold fail the ignition propensity test established by the American Society of Testing and Materials. That means that cigarettes are far less likely to start a fire if they are left unattended.

Smoking materials are the number-one cause of fire fatalities in the United States, resulting in approximately 800 deaths each year, as well as 2,200 injuries and nearly $560 million in property damage.

"It is common knowledge that smoking is considered one of the nation's leading causes of preventable death, but it's less widely known that cigarettes are also the leading cause of fatal fires," said U.S. Representative Ed Markey (D-MA), who, with Representative Peter King (R-NY), introduced the bipartisan *Cigarette Fire Safety Act of 2004* (HR 4155) on April 2. Markey introduced similar legislation in 2002.

According to Markey, New Yorkers and Canadians should not be the only ones who are protected from "these little torches."

"Everyone in the United States deserves the same level of protection from fires caused by cigarettes. That is why…I am proposing a bill that requires that the Consumer Product Safety Commission (CPSC) adopt the New York cigarette fire safety standard as the national standard," he said. *The Cigarette Fire Safety Act of 2004* sets an ignition standard for cigarettes.

NFPA, the Congressional Fire Services Institute, the National Association of State Fire Marshals, The National Volunteer Fire Council, the American Cancer Society, the American Heart Association, the American Lung Association, and the Campaign for Tobacco-Free Kids all endorse this legislation.

According to "The Smoking-Material Fire Problem," a report issued in May 2003 by the NFPA Fire Analysis and Research Division, smoking materials are the leading unintentional cause of fire deaths in the United States and every other country where fire deaths can be analyzed by cause. During the 1980s, lighted tobacco products caused more than 200,000 fires per year and resulted in more than 1,000 civilian deaths, more than 3,000 civilian injuries, and more than $300 million in direct property damage per year.

The study further states that more civilians die in smoking-material fires than in any other type of fire in the United States. In 1999, the 776 civilians who died in residential structure fires caused by lighted tobacco products represented 27 percent of the 2,920 civilian deaths in residential structure fires that year. Overall, the 807 civilian deaths due to all smoking-material fires, including those started by matches or lighters, represented 23 percent of the 3,570 fire deaths in 1999.

More than 20 years ago, Massachusetts Congressman Joe Moakley became involved in this issue when a family of seven perished in a fire ignited by a cigarette in his Congressional District. Five children–all under age 10–were burned to death along with their parents in 1979.

Through Moakley's relentless work on this issue, Congress passed two technical bills into law that laid the foundation for the proposed legislation. The first bill, the *Federal Cigarette Safety Act of 1984*, formed a Technical Study Group, which established that it was, contrary to the tobacco industry's assertions, technically and economically feasible to manufacture a cigarette that is less likely to ignite a fire without increasing the risk of health consequences. The second bill, the *Federal Safe Cigarette Act of 1990*, established the methodology for testing the ignition propensity of cigarettes.

Fire-safe cigarettes contain bands, or "speed bumps," along the length of the cigarette. If smokers don't draw on the cigarette when it burns down to a speed bump, the cigarette self-extinguishes.

If passed, this law will make great strides towards preventing the all-too-frequent, devastating cigarette-ignited fires in the United States.

PHOTOGRAPH: CORBIS

There's a difference between doing a job. And doing it right.

Viking has everything you need to get the job done right – every time.

It's simple: the more tools you have to choose from, the more likely you'll have the perfect tool for every job. That's why Viking offers more products and systems than any other supplier – along with the most comprehensive services for product support, system fabrication and customer assistance.

So, no matter what your requirements are, we can develop a complete solution that will minimize cost and complexity, and maximize peace of mind – before, during and after the installation.

Contact Viking. We'll make sure you get all the right tools – and results.

No Doubt. Viking.

800-968-9501 • 269-945-9501 • www.vikingcorp.com

Worldwide Fire Protection

VIKING®

Circle 061 on Reader Service Card

JENNA PADULA

International NFPA chapters get boost

INTERNATIONAL MEMBERS HAVE long been a part of NFPA's constituency. In fact, NFPA has several regional offices throughout the world designed to support these members and NFPA-related issues in these areas. Now, according to the international strategic plan approved by NFPA's Board of Directors in December 2003, NFPA has targeted specific areas of the world in which we will step up efforts to increase the critical mass of membership.

To support this initiative, NFPA will develop more chapters in membership countries, an effort that began in 2002 with the development of the Mexican Chapter. That chapter was officially chartered in June 2003, and in September 2003, the Colombian Chapter was formed.

Ahead of the game

The Colombian Chapter was ahead of the game in terms of organization because it had a preliminary working board a year before the NFPA Board of Directors granted its charter. The purpose of the preliminary board was to set the groundwork for the chapter, thus ensuring the approval last fall.

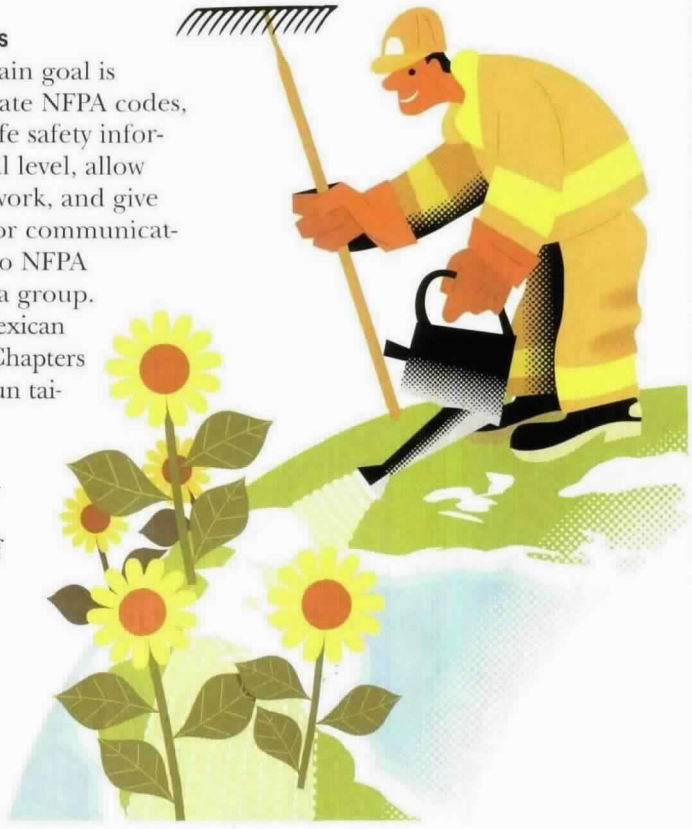
In March 2004, the Argentine Chapter became the third official NFPA country chapter when the NFPA Board of Directors granted the chapter's charter. Once a chapter's charter is approved, the chapter can begin holding regular meetings, which for most chapters means meeting monthly.

The number of NFPA membership chapters is expected to grow with chapters already in the works in areas such as Puerto Rico, the Dominican Republic, and Venezuela.

Power in numbers

The chapters' main goal is to help disseminate NFPA codes, standards, and life safety information on a local level, allow members to network, and give them a vehicle for communicating their needs to NFPA headquarters as a group.

To date, the Mexican and Colombian Chapters have already begun tailoring NFPA's offerings to their own needs, working with headquarters staff on member programs and retention campaigns. In turn, the chapters are helping NFPA increase membership in their respective areas.



Jose Figueroa, the recently elected chair of the Latin American Section, has made supporting the chapter initiative the main objective of his two-year term. He sees the section as playing a parental role to the chapters, providing guidance, and acting as a direct link to NFPA headquarters. That said, section events, such as those at the Americas' Fire Expo in Miami in July, will reflect Figueroa's commitment.

"Our section is unique compared to other NFPA sections in that we aren't specific to a technical area or field of activity, i.e., the Industrial Section or the Electrical Section. We cover all interests, professionally and geographically," says Figueroa.

Because the Latin American region is so large, Figueroa says that the section "can only promote the use of NFPA codes if it has strong local leadership or a group of people that will work to understand the local market, practices, and regulations."

"Chapters," says Figueroa, "seem to be the only way to promote a better understanding of NFPA codes, thus creating an opportunity for NFPA to deliver services to this part of the world."

As an added measure of support, NFPA has developed a Web site dedicated to Country Chapter activities and goals. The site includes those chapters in the works, as well as those that have been established and have begun their work. The Web site, www.capitulosnfpa.org, also gives information on starting a chapter.

ILLUSTRATION: ROB DUNLAVEY

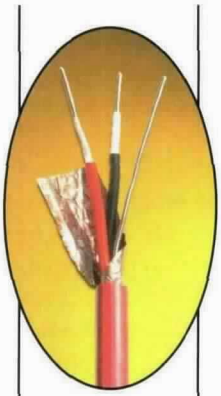
Fire safety is more than a matter of code.

It's a matter of conscience.

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

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

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



PyroCiC™ 2-hour fire-rated cable. Triple-barrier PyroCiC fire alarm cable meets the revised NFPA 72 survivability requirements, and makes installation and retrofit easy and economical.

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

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

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

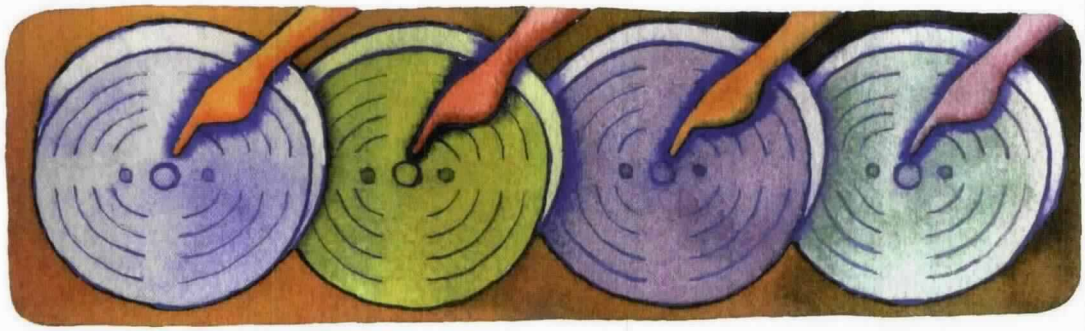
Pyrotenax

tyco / Flow Control / Tyco Thermal Controls

Circle 043 on Reader Service Card

SANDRA ARAÚJO

'To-do' lists should include smoke alarm tests



"BRUSH YOUR TEETH, change your underwear, and exercise. Some things must be done." I drive by this sign, which belongs to a gym, several times a week during my commute to and from NFPA. It wasn't until I stepped into NFPA's Public Education Division, though, that it occurred to me that "test your smoke alarms" should be added to the sign.

I've worked at NFPA for more than four years, but I've never been so aware of fire and life safety as I've become since I began working in public education. The department has allowed me to see first hand the positive effect NFPA has on people's lives, whether they realize it or not.

Risk Watch®, the Champion Program, *Learn Not to Burn*®, Remembering When™, and the Mississippi Project are equally important, but the Mississippi Project has had the greatest impact on me.

Working smoke alarms

The Mississippi Project brought NFPA, the U.S. Fire Administration (USFA), and the Mississippi High-Risk Fire Safety Task Force together with volunteers in Holmes County to ensure that every home in the county has working smoke alarms. The goal is to install nearly 9,000 smoke alarms throughout the area. Volunteers, who drive the project, received certificates for helping install the alarms in a January 29 recognition ceremony NFPA, USFA, and the Mississippi High-Risk Fire Safety Task Force held in Lexington, Mississippi.

The Center for High-Risk Outreach also helped develop a smoke alarm installation program for Yazoo City, Mississippi, in response to a home fire on October 6, 2003, that killed five children. Sharon Gamache, executive director of NFPA's Center for High-Risk Outreach, and I went to Yazoo City in March to meet with 23 firefighters from three local fire departments who installed 1,500 smoke alarms in three weeks. When we asked them what motivated them to install the alarms, Firefighter Joe Freeman said, "You get involved because you have a love for the people, you have to make it personal: 'What if it was your family?'"

Part of the team

Though I truly appreciated the opportunity to participate in the ceremony and was proud to be surrounded by such a dedicated group, I couldn't help feeling a little homesick. It was my birthday and I was anxious to get home. Towards the end of the event I was surprised with a birthday cake and everyone joined in singing "Happy Birthday." I was moved. I was the new kid on the block and, at times, felt I didn't have much to offer. However, project members were appreciative of the support I had given during my visit and welcomed me.

The committed participants in the Mississippi Project and the Yazoo City alarm program are teaching residents how to test their smoke alarms and the importance of having two ways out of every room in their home in the event of a fire. They are educating their communities so they'll be fire safe. What an opportunity to work with a terrific group of people who are committed to fire and life safety education! I look forward to working with the Public Education Division in contributing to the significant cause of educating the public about fire safety.

Make the time

We make time in our busy schedules to get a haircut, shop for groceries, pay bills, and watch our favorite TV shows. Sometimes, it seems impossible to add another task to our already long to-do list. But if we neglect to install and test smoke alarms, the gym probably won't add "Test your smoke alarms" to its sign. But I've added it to my monthly to-do list to ensure the alarms in my home are tested regularly.

SANDRA ARAUJO is a public education specialist at NFPA.

ILLUSTRATION: CYNDY PATRICK

Harrington Signal Fire Alarm

Because Lives, Property and Businesses Aren't Fireproof!

Stop by Booth #1335 At the NFPA Convention in Salt Lake to see our new 1 & 2 loop Addressable Control Panels

www.harringtonfire.com - 1-800-577-5758

We are the one-stop Fire Alarm Shop.

One PO, one call. We have it all.

- Intelligent and Conventional Control
- Voice Evacuation
- Indoor and Outdoor Notification Appliances
- Hazardous Location and Explosion Proof
- Power Supplies, Communicators and more

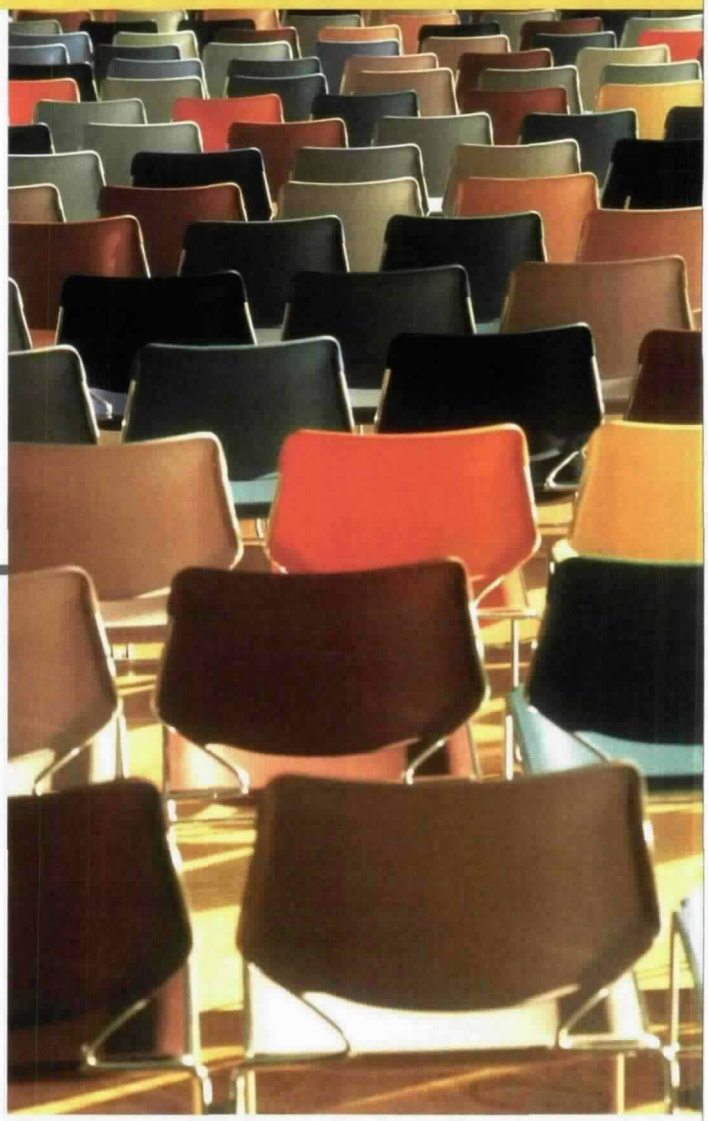
HARRINGTON SIGNAL INC.
FIRE ALARM

Circle 065 on Reader Service Card

Consolidating NFPA's membership meetings

Changes to code and standards process approved

By **John Nicholson**



In March, the NFPA Board of Directors voted to approve the consolidation of the Fall Education Conference and the World Safety Conference & Exposition™ (WSCE) into a single event, as of 2005. The 2004 Fall Education Conference, to be held this November in Miami, will be the last NFPA fall membership meeting. The 2005 WSCE, to be held in Las Vegas, will shift to June, instead of May, and all subsequent WSCEs will be held in June. The board also approved significant revisions to various NFPA code- and standards-making procedures that directly relate to the meeting change.

"We are extremely pleased to offer these changes to our members," says James M. Shannon, NFPA president. "Most recently, we have heard from members who have found attending two conferences very difficult, given demanding work and family schedules. This consolidation will provide needed relief without compromising our mission and important NFPA programs."

For those participating in our codes- and standards-development process, the difficulty of attending two Technical Committee Report (TCR) sessions a year has been reflected in declining attendance at the Fall Education Conference.

"The decision to attend one meeting or the other may be driven by interest in documents that are in cycle, educational offerings, pre-conference seminars, or section activities," says Robert Vondrasek, NFPA vice president of Code and Standards Operations. "In a way, our two membership conferences have been competing with each other."

According to Vondrasek, the Fall Conference was added in 1948, but it wasn't until 1974 that documents began to be processed through a fall TCR session.

Task force concern

NFPA began looking at the feasibility of holding one membership conference a year in 2003, forming a task group, which included staff and Standards Council members, to examine the issues. The biggest concern the group faced was how to deal with the documents that would normally report at the fall TCR session.

Vondrasek, task group chair, says 75 to 80 percent of documents reporting at a typical TCR have no floor action, and most larger committee projects and key standards have already been shifted to the Annual document cycle culminating at the WSCE.

"The *NEC*® has long come to the floor of the TCR session at the WSCE," he says. "After NFPA 5000™, *Building Construction and Safety Code*™, was adopted, NFPA 101®, *Life Safety Code*®, and NFPA 1, *Uniform Fire*

ILLUSTRATION: VEER

Code™, elected to report at the same WSCE TCR session."

The decision was made to maintain the two revision cycles per year, annual and fall, but with a single TCR session in conjunction with the WSCE to hear motions on documents.

Revised regulations and procedures now in effect for all NFPA documents processed in the 2005 Fall cycle and in subsequent revision cycles will help eliminate unnecessary time expenditures during the TCR sessions and provide management tools that will increase these sessions' efficiency.

Among the new procedures is one requiring those who wish to make a motion at a TCR session to file in advance of the session a "notice of intent to make a motion." This will allow the technical committees to identify "consent documents," non-controversial documents with no motions that can bypass the TCR session and go directly to the Standards Council for issuance. This applies to approximately 80 percent of all processed NFPA documents.

Having advanced notice of what motions will be made on documents presented at the TCR session will also allow them to be processed much more efficiently.

Under the revised procedures, a Motions Committee, made up of three Standards Council members, will review all notices of intent to make a motion and certify all properly noticed motions. The Motions Committee will also have the authority, in consultation with the makers of the motions, to clarify the motions' intent and, in certain circumstances, combine motions that depend on each other so that they can be made together. A Motions Committee report listing all certified motions will be made available to the membership in advance of the meeting.

To make a certified motion at the TCR session, an individual will have to sign in at the TCR session an hour before it begins, and only those motions on the final list can be made and debated during the session. Following all the certified motions on a particular document, attendees will have time to make follow-up motions that have become necessary as a result of successful floor motions.

Another streamlining move is the suspension of the presentation of non-controversial documents on which no motions were made at the TCR session. On average, says Vondrasek, 30 non-controversial documents are processed in a typical revision cycle, taking about one hour at each TCR session.

The revisions package also contain a number of measures that will give the Presiding Officer more control over the TCR session agenda, giving him or her more flexibility in managing the debate and ensuring that all documents can be fairly and efficiently processed in the available time. The Presiding Officer will be able to limit speakers to five minutes, or such other time as he or she, in consideration of the available time, may designate. He or she will also be able to alternate debate between proponents and opponents of the motion. In addition, the Presiding Officer will be able to resort to a set of non-exclusive guidelines at his or her discretion. These include avoiding recognizing speakers more than once, limiting repetitive or irrelevant debate, and, to encourage speakers to coordinate their presentations, allocating time to each side in groups or allowing a side wishing to make a presentation as a group to yield additional time to one speaker.

"Not only will the revision package enable the processing of documents at a single yearly TCR session, it should make that session more interesting and productive, and allow for fuller and fairer debate by the membership of the important issues before them," Vondrasek says.

Regulations adapt

The NFPA Board of Directors approved a new revised version of the Regulations Governing Committee Projects, effective for all NFPA documents entering the fall 2005 and all subsequent revision cycles. The current regulations, approved by the board in October 1996 and amended in November 2003, remain in effect for all NFPA documents processed in the May 2005 and preceding revision cycles.

The Board also approved a revised version of the Convention Rules, effective for all NFPA documents entering the fall 2005 and all subsequent revision cycles. The current "rules, approved by the board in September 1993 and amended in November 2002, remain in effect for all NFPA documents being processed in the May 2005 and preceding revision cycles."

In addition, the current rules have been revised, effectively immediately, to read, "Limit or Extend Debate. Each speaker shall be limited to five minutes, or such other time as the Presiding Officer, in consideration of the available time, may designate, to present his or her arguments."

Impact on the WSCE

Another thing the task group considered when consolidating the two conferences was how a single annual conference would affect the content of the WSCE educational program, and membership sections. The group concluded that program content could expand somewhat, since the slightly larger attendance the WSCE is expected to draw could justify adding educational tracks and pre-meeting seminars.

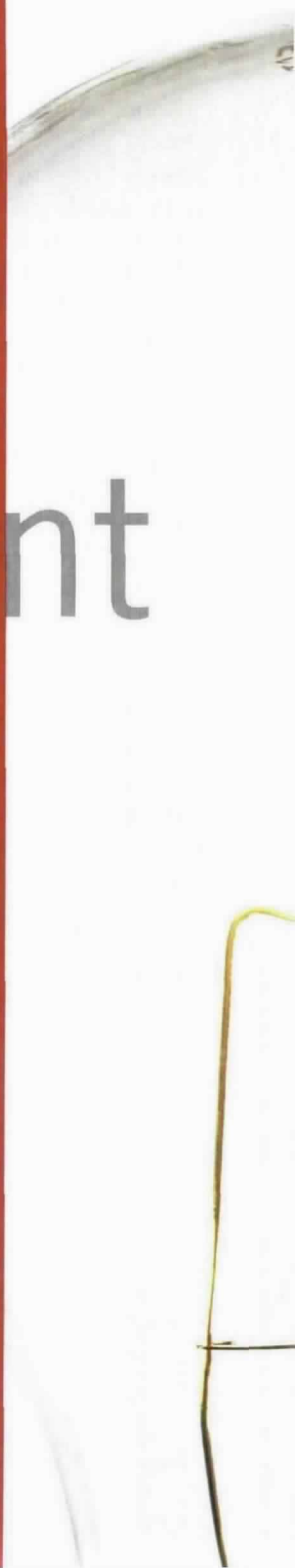
Some sections' bylaws will have to be revised to reflect changes in section executive board elections, and some section boards may choose to hold an additional working meeting each year to conduct business they formerly handled at the Fall Conference.

BY **ALAN R. EARLS**

PHOTOGRAPH BY **JON CHOMITZ**

A living document

MANY THINGS HAVE CHANGED in the 100-plus years since the first edition of NFPA 70, *National Electrical Code®* (*NEC*), was published in 1897. But as the **50th edition of the code** prepares to roll off the presses, it's clear that some things have remained much the same.



"THE *NEC* IS THE BIBLE of the electrical industry," says James T. Pauley, an executive at Square D, an electrical manufacturer in Lexington, Kentucky. "The document is likely quoted and cited more than any other construction code in the world."

In the United States alone, almost 3.8 trillion kilowatts of electricity flow through an electrical system regulated in accordance with the safety requirements of the *NEC,* which, says Pauley, is probably the least amended code in the construction industry. Some states and localities do amend the code, but the changes are generally minimal when compared to the breadth of the document.

"This is a testament to the process used to develop the *NEC,*" he says. "It represents consensus at the highest level, and that is reflected in the level of adoption achieved."

To have an effective electrical safety system, says Pauley, you must have three key components: an installation code, product standards and a program that certifies products to those standards, and an effective inspection and enforcement system.

"The installation code is the keystone to this system and is the link from an electrical product to safe installation and use by the consumer," he says.

In the United States, the *NEC* is that installation code.

Best practices

"The *National Electrical Code* not only promotes best practices, it is also a nearly universal document, which helps everyone in the business achieve the safest possible results," says home-improvement television personality Bob Vila.

As written, the code, which has been adopted in all 50 states, covers electric conductors and equipment installed in or on public and private buildings or other structures, including mobile homes and recreational vehicles, floating buildings, and such premises as yards, carnivals, parking lots, and industrial substations. It also covers conductors that connect the installations to an electrical supply; other outside conductors and equipment on the premises; optical fiber cable; and buildings used by an electric utility, such as office buildings, warehouses, garages, machine shops, and recreational buildings that are not an integral part of a generating plant, substation, or control center.

Writing the *NEC*

The *NEC* is developed by more than 450 volunteer panel members and alternates, representing electrical contractors, designers, inspectors, and manufacturers; electrical testing laboratories; electricity suppliers and utilities; enforcing authorities; insurance organizations; labor; and other users. These volunteers participate in 19 code-making panels set up to ensure fair representation for all affected interests, and these code-making panels are managed by an 11-member correlating committee.

At the heart of their work is a process that promotes full and open discussion, since no one interest group can dominate a code-making panel. Indeed, any individual or organization can respond to proposals for public comment or offer suggestions for future editions of the code.

To ensure that no voice is ignored and no idea missed, the panels are required to respond to every proposal or comment by reviewing it, commenting on it, and preparing a report for the rest of the NFPA membership. And before any new edition of the *NEC* is published, members of the public are invited to provide further input, and all NFPA members, even those without a direct stake in the *NEC,* can vote on the proposed edition. The resulting code, built upon the expertise of such a diverse and expert group, does a good job pro-

PHOTOGRAPH: VEER

tecting the public while remaining open to innovation that promotes advances in design and development.

But openness isn't the only attribute of the *NEC* code-making process. The panels are also given considerable responsibility and are expected to work on issues in detail. And they are given ample time to do so. That is in part to ensure that the panel has sufficient opportunity to gather information and weigh ideas, but it's also to ensure that interested parties have the opportunity to review and comment on any proposed code revision. The process depends on the professionalism of the many volunteers who serve on the panels. The result is a forward-looking and thorough "living" document that provides the most up-to-date electrical safety code available in the United States.

The *NEC* is also part of the American National Standards Institute (ANSI) structure. ANSI is a private, nonprofit organization that administers and coordinates the U.S. voluntary standardization and conformity assessment system.

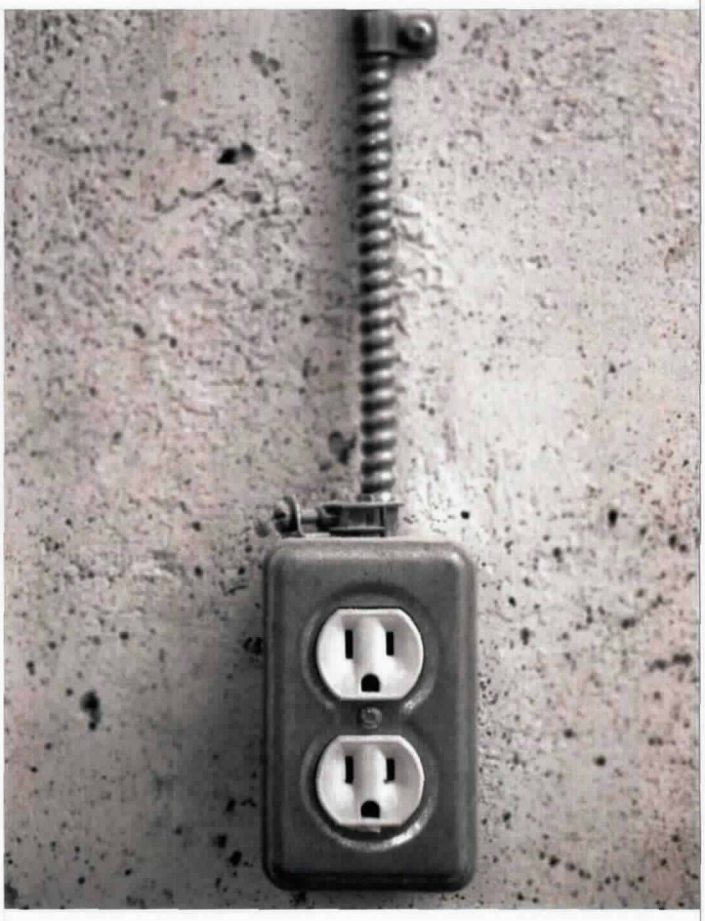
Dr. Mark W. Hurwitz, ANSI president and CEO, says ANSI congratulates NFPA on its publication of the 50th edition of the *NEC* and notes that, since its first edition, the *NEC* has directly contributed to improved convenience, enhanced safety, and lower prices for all consumers.

"Its widespread implementation and use have had a significant and positive impact on today's society," he says.

Hurwitz notes that, as an ANSI-accredited standards developer, NFPA operates under a set of procedures based upon openness, balance, consensus, and due process. Voluntary standards, especially safety standards, serve and protect the public interest, he says, because they are developed through the cooperative efforts of government, consumers, and industry.

"Such a process not only promotes a public-private partnership and provides more flexibility than a simple government rule-making process, but it also promotes U.S. business products and practices globally," he says. "This is evidenced in the widespread use of the *NEC* and its adoption into law in many jurisdictions both in the U.S. and around the world."

The process depends on the professionalism of the many volunteers who serve on the panels. The result is a forward-looking and thorough "living" document that provides the most up-to-date electrical safety code available in the United States.



PHOTOGRAPH: VEER

Hurwitz lauded NFPA for continuing to maintain the *NEC* as an American national standard.

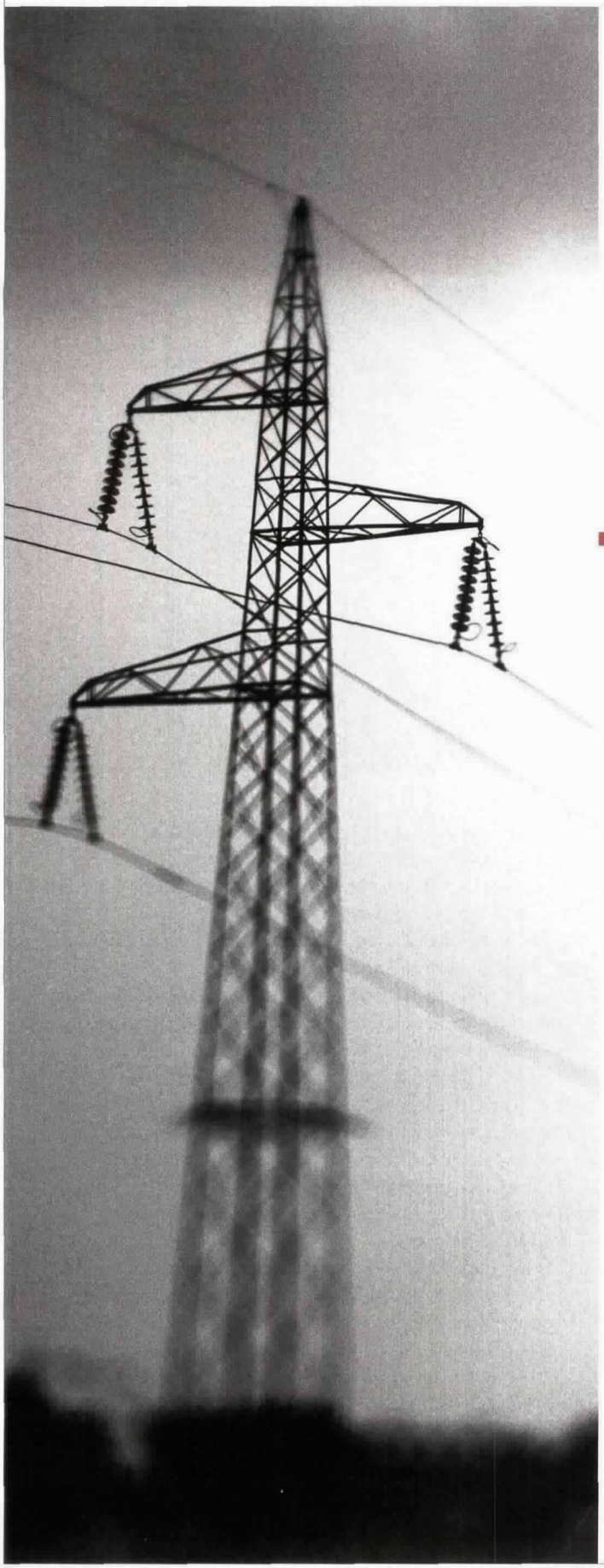
Aside from achieving the high safety standards set by the code, the uniformity it provides also has many benefits. Brooke Stauffer, executive director of standards and safety for the National Electrical Contractors Association (NECA), says it's extremely important for NECA members working in areas that may involve multiple municipalities or states to have a shared standard.

"If every time they cross a certain border line they have to deal with significantly different rules, that's a problem," he says.

The result can be extra trips to bring in more supplies or having to assign additional people to a particular job. And, because the differences could be confusing from one jurisdiction to another, the results could be reduced safety.

"For safety and business reasons, it is important for contractors to have uniform wiring rules," he says.

Stauffer says that's one of the factors that have motivated NECA to stay involved with the code-creation process for most of its existence. NECA, founded in 1901, is the leading representative of a segment of the



"Over time, we'd developed additional materials and new code articles that we didn't always have room to include where they might have fit best. So we did a major reorganization to place them more logically and to make them easier to find."

construction market composed of more than 70,000 electrical contracting firms. The industry employs more than 650,000 electrical workers and produces annual revenues of more than $95 billion.

"We have representatives on each of the code panels," says Stauffer, "and we support *NEC* wholeheartedly and without reservation."

Jack Wells, vice president of corporate development at Syracuse, New York-based Pass & Seymour/Legrand, a manufacturer of wiring products, says the *NEC*'s significance lies in the fact that it is the foundation for the entire electrical system in the United States.

"It really doesn't have any competition," he says.

"It is the single most widely adopted code in the country, if not in the world," he notes. "It is used directly or indirectly in a number of countries, such as Mexico, Venezuela, Columbia, the Philippines, and others, which is why it is also published in Spanish."

In addition, it was the basis for the Canadian electrical code and for the Japanese installation code, he says. Along with NFPA 5000™, *Building Construction and Safety Code*™; and NFPA 1, *Uniform Fire Code*™, it is also part of the *Comprehensive Consensus Codes*™ (C3), the only full set of construction codes for the built environment developed through processes accredited by ANSI.

According to Mark W. Earley, P.E., assistant vice president and chief electrical engineer at NFPA, the 50th edition of the *NEC* contains many changes, some quite substantial. Earley serves as secretary of the National Electrical Code Committee and is the chief editor of the *National Electrical Code Handbook*. He is co-author of *Electrical Installations in Hazardous Locations* and has published numerous technical articles on the fire protection of electrical equipment. He is also the executive editor of *necdigest*®.

PHOTOGRAPH: VEER

"Actually, the 2005 edition provides a further refinement of our 2002 edition, which included some of the most substantive changes in the history of the code," he says. "Over time, we'd developed additional materials and new code articles that we didn't always have room to include where they might have fit best. So we did a major reorganization to place them more logically and to make them easier to find. We used a common format among articles so that a user can find the same kinds of information in the same place in each article. We also rearranged a lot of the articles. To some extent it was simply a reshuffling and reorganizing.

"We also did something new with the Panel 16 articles. There is now some parallel structure in those articles so they follow a common template. We did that with chapters of the 2002 *NEC*, but this is a similar initiative for Chapters 7 and 8."

Among new or revised items in the 2005 edition is Article 220, which covers load calculation and was revised primarily from a usability standpoint. Also revised were Articles 409, which focuses on industrial control panels; 506, a zone classification scheme for locations that are hazardous because of the presence of dust or flyings such as lint; and 682, which looks at "other bodies of water." Article 682 parallels the current Article 680 as far as addressing hazards near water, but it also covers things 680 doesn't.

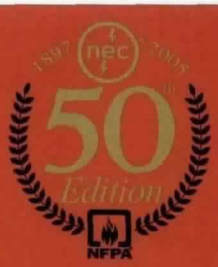
This edition also contains some expanded ground fault circuit interrupter requirements. For instance, it now covers boat lift installations and vending machines. There was a particular concern about the rugged environments vending machines are often exposed to and the limited maintenance they receive.

The arc fault circuit interrupter (AFCI) requirements have also been revised to reflect new technology. Reference to AFCIs first appeared in the 1999 edition, and their role has been expanded in the 2005 edition, which requires that they be added to existing branch circuits in homes whenever the electrical panel is replaced.

"We believe the new, more usable structure should help *NEC* enter additional markets," says Earley. "We are constantly finding out about new places that it has been adopted, either formally or de facto. For instance, I was at a conference recently when a delegate from an Asian country came and told me how much he liked the code and how they had been using it for years–although it appears there were copyright issues involved with that because we had never heard anything about it!"

"NFPA is proud to continue producing a document that is used by so many segments of the electrical community," says Earley.

"It is very gratifying that industry puts so much time and effort into this," he says. "The quality of this reflects the industry's dedication. It is a good solid document that can be relied on to provide electrical safety."



Organizations Participating in *NEC* Development

The Aluminum Association, Inc.
American Chemistry Council
Associated Builders and Contractors, Inc.
Association of Home Appliance Manufacturers
American Iron and Steel Institute
American Lighting Association
American Petroleum Institute
The Association of Higher Education Facilities Officers
Air-Conditioning & Refrigeration Institute
American Society of Anesthesiologists
The American Society of Agricultural Engineers
Alliance for Telecommunications Industry Solutions
Building Industry Consulting Services International
Copper Development Association Inc.
Consulting Engineers and Land Surveyors of California
Canadian Standards Association International
Electrical Generating Systems Association
Edison Electric Institute
FM Global
Grain Elevator and Processing Society
International Association of Electrical Inspectors
International Association of Theatrical Stage Employees
The International Brotherhood of Electrical Workers
Insulated Cable Engineers Association Inc.
Independent Electrical Contractors
The Institute of Electrical and Electronics Engineers, Inc.
Illuminating Engineering Society of North America
Industrial Risk Insurers
International Sign Association
International Society for Measurement and Control
International Electrical Testing Association Inc.
Information Technology Industry Council
Manufactured Housing Institute
Motion Picture Association of America, Inc.
National Association of Home Builders
National Association of RV Parks & Campgrounds
National Cable Television Association
National Electrical Contractors Association
National Elevator Industry Inc.
National Electrical Manufacturers Association
National Spa and Pool Institute
New York Board of Fire Underwriters
Outdoor Amusement Business Association, Inc.
Power Tool Institute, Inc.
Solar Energy Industries Association

A LOT OF SPACE TO COVER

LOCATED ON AN AREA of 140,000 acres on Florida's east coast, **The Kennedy Space Center** and the adjoining **Cape Canaveral Air Force Station** have been home to the United States' space program since the 1950s. With a wildlife refuge home to hundreds of species of wildlife and thousands of species of plants also part of the site, the complex presents unique challenges to fire protection engineers.

BY **ED COMEAU**

ILLUSTRATIONS BY **JOE LEONE**

THE KENNEDY SPACE CENTER (KSC) and the adjoining Cape Canaveral Air Force Station (CCAS) have been home to the United States' space program since the 1950s. From the early days of space flight to today's shuttle program, the spaceport has sent manned and unmanned rockets into space to orbit the Earth, to the moon, to the other planets, and deep into space.

Located on Florida's east coast, KSC and CCAS cover an area of 140,000 acres (56,656 hectares) divided into two operational areas by the Banana River. Also on the site is the Merritt Island Wildlife Refuge, home to 500 species of wildlife and 1,000 species of plants, as well as 25 miles (65 kilometers) of undeveloped beachfront. The presence of the spaceport in the middle of this refuge creates not only an environmental risk to the wildlands, but also a wildland/urban interface risk to the facility.

Fortunately, the spaceport is well equipped for these and other potential situations.

Fire protection engineering

Fire protection engineers face a number of unique challenges when designing systems for the KSC complexes. Although many of the buildings at KSC were built during the heyday of the Apollo program in the 1960s and some of the fire protection in these buildings is still of that vintage, fire protection systems in other structures have been upgraded to cope with the unique hazards inside.

Among these structures is the Vehicle Assembly Building (VAB), an enormous structure with a volume of 129,482,000 cubic feet (3,884,460 cubic meters), in which components of the shuttle are joined before transport to Launch Pads 39A or B. At 525 feet (160 meters) tall, VAB can withstand winds of up to 125 miles (201 kilometers) per hour.

During the Apollo program, the rockets assembled in the VAB were transported to the launch pad, where they were filled with fuel. With the advent of the space shuttle program, however, the solid rocket boosters, external tank, and orbital shuttle are mated in the VAB, resulting in a fueled vehicle inside the building. And if that fuel should ignite, nothing will stop the resulting fire.

How do you provide protection for this type of hazard?

A rigorous inspection program is key. According to KSC fire officials, the National Aeronautics and Space Administration (NASA) minimizes ignition sources as much as possible.

"Fine to say you are going to put out any fire, but if the solids ignite, you are not going to put them out. That is the hazard," says Doug Carraway, KSC's chief fire protection engineer. "So we have had to do a lot of emphasis on housekeeping, limiting the type of materials and flammables you can have in there, keeping the areas clear and clean.

"We visit every facility at least once a year," he continues. "The processing facilities are visited four times a year. We also have all of the burn permits we issue, flammable liquid storage, anything like that's tied into the design agencies on both sides of the river."

Ten fire inspectors work daily at KSC.

"Once we got into (inspector) certification per NFPA 1031 [*Fire Inspector Professional Qualifications*], we developed an NFPA 1031 program for those inspectors that did not have a state or Department of Defense certification," Carraway says.

In addition, everyone who receives clearance to work in a given area must go through mandatory training and orientation for that facility, which includes fire safety. Regular fire drills are conducted, although they are a challenge to schedule because they can't interfere with ongoing operational activities.

Along with the 10 inspectors, there are three fire protection engineers on staff who review all fire protection system plans and conduct all acceptance testing. They also design customized solutions for unique situations, such as the one they drew up for the mobile launch platform (MLP).

Protecting the two-story MLP is essential, since it is the vehicle on which the assembled shuttle is moved from the VAB to the launch pad and from which the shuttle actually launches. The MLP is 25 feet (7.6 meters) tall, 160 feet (49 meters) long, and 135 feet (41 meters) wide. Unloaded, it weighs 8.23 million pounds (3.73 million kilograms); with an unfueled shuttle on board, the combined weight is 11 million pounds (5 million kilograms). Within the MLP are a number of rooms that must be constantly monitored for fire conditions, as well as hydraulic fluids and exotic fuels that can present significant hazards during transportation and fueling operations.

With the fueled shuttle on board, the MLP is taken to the pad by the crawler-transporter, which is 20 feet (6.1 meters) high, 131 feet (40 meters) long, and 114 feet (34.7 meters) wide. It rides on eight tracks, powered by four 1,000-kilowatt generators that are driven, in turn, by two 2,750-horsepower diesel engines. Loaded, the 6-million-pound (2.7-million-kilogram) crawler moves at 1 mile (1.6 kilometers) per hour over the 3-mile (4.8-kilometer) trip from the VAB to the launch pad.

"One of the challenges was that the NFPA standard requires the halon system to dump within seconds," says Carraway. "At a critical part of the launch … you can't go near [the launch pad] for 30 minutes."

The engineers figured out how to allow the halon system to discharge and provide protection for up to 30 minutes while the shuttle systems were placed in a safe mode so that firefighters could approach the platform.

How did they do this? It was quite a challenge, according to Carraway.

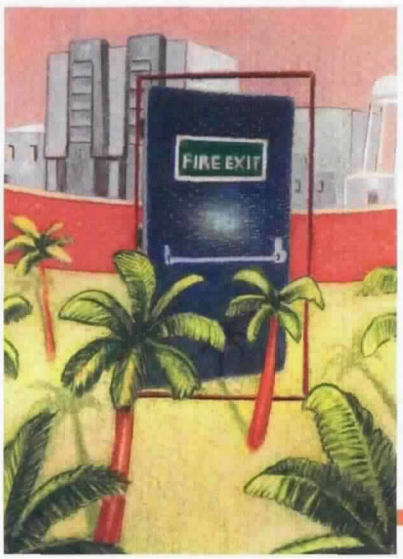
"We got a lot of halon, and we phased it," he reports. "We have the initial dump. Then we did a lot of testing

and measurement to find out the leakage rate (for the room being protected). And then there is a second bank of bottles that discharge at the same time that are orificed down so the nozzles don't freeze but will maintain the concentration, given the leakage rate."

Because the operations at KSC have been designated as critical, the spaceport can still use halon, but in significantly reduced amounts. When Carraway first came to KSC, there were 84 halon systems. Now, there are only six, and they're all at the launch pad. KSC serves as a centralized halon repository to which supplies can be shipped from other facilities.

Another important fire protection component is fire detectors.

"As you know, water is the firefighter's friend, and it is the most used component out here," says Carraway.



IF THE SHUTTLE has to be evacuated in an emergency, the deluge system is activated while the rescue and shuttle crews are moving from the orbiter to the evacuation slides. A series of 8,000-gallon-per-minute (30,280-liter-per-mminute) pumps at the pad supply the water.

"However, we have a lot of sophisticated equipment [to which] a teacup of water can cause $10 billion in damage."

As a result, says Carraway, "we've made a lot of headway in regards to detectors."

"Some are designed specifically for hypergols [hypergolic fuels that will ignite when in contact with each other]," he says. "For the most part, we would want two activations for anything that has to do with flight hardware, so we have UV/IR [ultraviolet/infrared] and the new triple IR detectors to activate any suppression systems."

Manual activations

Manual activations require double-action devices to ensure that they are not accidentally activated. In addition to detectors, the VAB is equipped with a deluge fire suppression system designed to allow the building's 1,000 occupants to evacuate the building as quickly as possible should a problem occur. A series of six fire-rated stair towers that extend the height of the building contain standpipes that allow the KSC fire department to fight fires on the upper floors of the building, as they would in a high-rise.

A deluge system is also in place in the towers of Launch Pads 39A and B, from which the shuttles are launched. The system, which can be activated manually by the rescue team leader at the base of the launch pad, on the upper level of the pad, or remotely by the launch control center (LCC), covers the open floor areas on the 195-foot (59-meter) level and the level below, as well as the swing arm that extends from the tower to the orbital capsule. It's fed by a 366,000-gallon (1,385,461-liter) water supply.

If the shuttle has to be evacuated in an emergency, the deluge system is activated while the rescue and shuttle crews are moving from the orbiter to the evacuation slides. A series of 8,000-gallon-per-minute (30,280-liter-per-minute) pumps at the pad supply the water.

There's also a deluge system at the base of the shuttle designed to suppress sound and to keep the MLP from being destroyed by the shuttle's fiery blast. Water from a 300,000-gallon (1,135,623-liter) tank is fed through a series of 96-inch (2.4-meter) pipes and discharged through 48-inch (1.2-meter) nozzles at the base of the shuttle within seconds of launch.

While some of the spaceport's structures, such as the VAB and the launch pads, are among the more technically sophisticated buildings at the complex, they do not necessarily present the greatest fire protection challenges.

"We have dog pounds, child-care facilities, office facilities, banks, credit union.... We have just about everything you find in a city," says Carraway. "Some of the more challenging issues that we get involved with

have to do with those type of facilities. Most of the facilities on the Cape were constructed as hangars. The requirements for an aircraft hangar are a lot different than those being used as office facilities."

The fire department

Providing firefighting support for the complex is Space Gateway Support (SGS), a private contractor that also provides security for KSC and CCAS and is responsible for the facility's infrastructure.

"If it is pumped or associated with energy, we are responsible for it," says Bill Sample, president of SGS. "We have a propellant farm that pumps liquid and high-pressure gases such as oxygen, nitrogen, and helium."

SGS transports a number of other items and products throughout the complexes as well, using buses, cars, trucks, helicopters, airplanes, and a railroad with three engines.

As for security, SGS is "responsible for astronaut protection and their families," says Sample. "Our SWAT (strategic weapons and tactics) team finished sixth in an international competition of SWAT teams, which we are very proud of." Patrolling the complexes both on land and at sea are police and security officers who have full police powers.

SGS provides firefighters at KSC and CCAS from seven fire stations spread throughout the two complexes.

"We provide fire protection to 2,500 facilities that house 25,000 people," says Sample.

"There are a total of 153 firefighters that make up the fire department," says Fire Chief Gerald Wimberly. Forty-three firefighters staffing 10 fire apparatus are on duty daily, and all are required to meet certification compliant with NFPA standards, through the state of Florida or the U.S Department of Defense.

Many of the firefighters come to the department with extensive experience in the military or municipal fire departments, which prepares them not only for the special hazards at KSC, but also for many of the risks any community has.

"We are like a small city in that we take care of the very things that happen to citizens of any city," says Chief Wimberly. "However, we do not fight a lot of fire. One of the reasons is the safety measures at the center and the Air Force side. There's a good inspection and engineering program that keeps our fire loss at a very low level."

Even with the presence of extremely toxic and volatile materials, fire loss at KSC in 2003 only came to $400, according to Wimberly, who attributes this to a strong safety culture and to the fact that people are knowledgeable about the work they do.

Along with structural firefighting, the fire department also provides aircraft rescue and firefighting (ARFF) protection at two airstrips. While one of the most dramatic aircraft to land at KSC is the shuttle, many other aircraft also land and take off regularly. The department uses ARFF vehicles just as any airport fire department would, but the vehicles have some specialized uses as well.

"We use them for standby on hazardous situations, such as at a launch pad when they are offloading tanker cars of liquid oxygen or hydrogen," Wimberly says. "We will place an ARFF vehicle there because of its unique abilities of carrying its own water supply and rapid response."

The department is responsible for controlling hazardous materials spills, both on land and in the adjacent waterways as well, using boats outfitted with booms that can be quickly deployed to contain a spill.

In addition, the department is heavily involved in wildland firefighting. Since a large, environmentally sensitive area surrounds the facilities at KSC, there's extensive coordination among several different agencies to handle a fire should one break out.

ALONG WITH STRUCTURAL firefighting, the fire department also provides aircraft rescue and firefighting (ARFF) protection at two airstrips. While one of the most dramatic aircraft to land at KSC is the shuttle, many other aircraft also land and take off regularly.

"U.S. Fish and Wildlife and the Forest Service take care of any firefighting outside of the pads or facilities that we have....We only become involved if it encroaches on any of the facilities or pads," Wimberly says.

Nonetheless, the spaceport firefighters are trained and equipped for basic wildland firefighting, and the NASA helicopter fleet is equipped with Bambi Buckets® for airborne firefighting.

The fire department also provides emergency medical services (EMS) to the large number of employees on the site, as well as the 2.2 million people who visit the facility every year. Two paramedics staff each of the three ambulances, as well as the fire engines, which augment the ambulances, Wimberly says.

Because firefighters are expected to respond to so many different types of incidents, five instructors use a number of props and facilities to train the facility's firefighters and command officers extensively. Every response is composed, at a minimum, of a pumper with three firefighters and an advanced life support ambulance with two firefighter/paramedics. This gives firefighters the flexibility to provide either fire suppression or EMS at any incident.

Special training

The two major events the fire department trains, equips, and prepares for are shuttle launches and landings, which approximately two-thirds of the department attends. If an incident should occur during either procedure, the entire efforts of the pad team are focused on rescue, not on fire suppression. Firefighters must prepare for rescue operations during the launch itself, as well as the possibility that the shuttle may be forced to return to KSC immediately after takeoff. If an emergency occurs onboard within the first 70 seconds of flight, the shuttle may be able to return to KSC, so crews have to be positioned at both the launch and landing sites.

For the launch, a specially trained 15-member pad rescue team is staged 0.9 miles (1.4 kilometers) from the launch. This team is outfitted in reflective Nomex® ARFF turnout gear and uses liquefied air-breathing apparatus "developed specifically for us at NASA," according to Fire Captain George Hoggard, who is in charge of the pad rescue crews. Rescuers are transported to the launch pad in two surplus M113 armored personnel carriers to minimize their exposure to significant fire or explosion.

As launch time nears, the number of personnel on the launch pad is reduced until only a seven-member closeout crew on the tower remains, along with the seven astronauts. If an emergency occurs before launch, the NASA test director, located in the LCC, immediately directs the pad rescue team leader to initiate a rescue.

There are eight different rescue modes. Modes 1 to 4 pertain to incidents at the pad, while Modes 5, 6, and 7 involve emergencies with the shuttle in the 70 seconds after launch, once it has cleared the tower and is still within the response capabilities of KSC emergency forces. The Department of Defense is responsible for conducting Mode 8 rescue operations, which involve an over-water rescue in which the astronauts have to bail out of the shuttle.

There are also several emergency landing sites for the shuttle around the globe, including one in Morocco and two in Spain.

When the LCC notifies the pad rescue team leader of an emergency during launch, both M113s race to the pad. One vehicle, with its crew of eight, heads towards the base of the basket rescue lines, while the seven members of the other vehicle head to the high-speed elevator that will take them up to the 195-foot level of the tower. When they reach this level, the team leader notifies the M113 driver, who heads to the base of the basket rescue lines.

On the 195-foot level, two team members search the area to determine whether anyone is on the tower or the level below, while the other team members remove the rescue equipment from a locker next to the swing arm and head towards the shuttle orbiter.

In a worst-case scenario in which all of the astronauts have been incapacitated, the rescue crew has to remove them from the shuttle and transport them to the slide basket in stair chairs located in the rescue equipment locker on the 195-foot level. A rescuer climbs into the basket and slides an unconscious astronaut into it. When a second rescuer climbs into the basket, the release mechanism is tripped, and the basket races down a 1,200-foot (366-meter) cable at 55 miles (89 kilometers) per hour to an arresting system, a ride that takes about 35 seconds. The second rescue crew then removes the victim from the basket and transfers him or her to an adjacent bunker. This continues until everyone has been removed from the shuttle orbiter. The last person off of the tower is the pad rescue team leader.

The maximum number of people who could conceivably have to be removed from the tower before a launch is 21. This includes seven astronauts, the seven-member closeout crew, and the seven rescuers. All the astronauts know how to operate the basket rescue system in the event that they can extricate themselves before the fire department arrives.

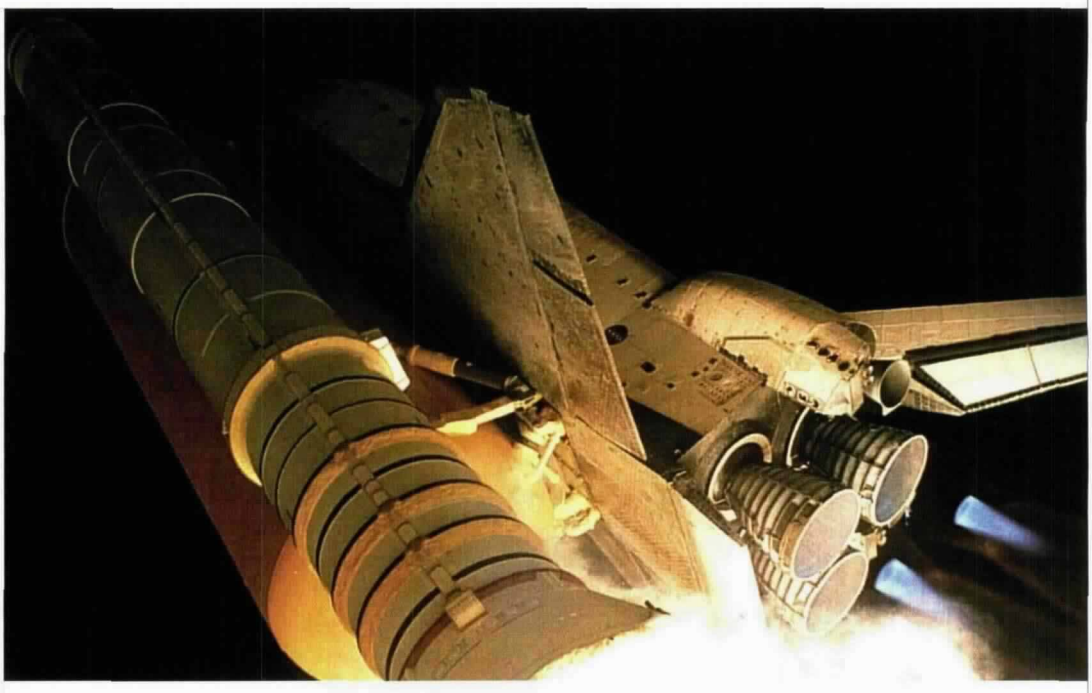
At the base of the basket rescue system is a hardened bunker that provides a safe haven for the astronauts and rescuers. Before entering the bunker, the rescue team uses meters to determine whether the astronauts have been contaminated by any hazardous materials. If they have, they are immediately decontaminated in a drench shower outside the bunker.

Inside the bunker is a series of aircraft-type connections for the astronauts, who are still wearing their flight

suits, to plug into. The crews can communicate directly with the LCC by telephone, or the astronauts can plug into a hard-wired communication line.

Injured astronauts can be transported by ambulance or by NASA or Air Force helicopters to one of three area medical facilities.

If the shuttle should ditch after launch in the water near KSC, the rescue becomes the responsibility of the Department of Defense SAR teams, which are positioned at the rescue helicopters near the landing facility.



The Shuttle Discovery

Should the orbiter land right side up in the water, the SAR team shoots lines over the top of the orbiter, and a Jacob's ladder is pulled up from the water, giving rescuers access to a hatch at the top of the orbiter. The teams remove the astronauts from the shuttle, inflate the life vests on their parachute harnesses, and place them in the water to be lifted into the rescue helicopters.

Because the shuttle can return to the landing site for 70 seconds after launch, another rescue crew stands by at the shuttle landing facility during launch with a number of conventional ARFF and structural firefighting vehicles. These same crews stand by during a normal shuttle landing on the 15,000-foot (4,572-meter) runway, which is twice the length and width of runways at many commercial airports. Some of the crew are positioned in a nearby fire department substation with the air conditioning set low to ensure that the firefighters' core temperature is low should they be called into action.

Other specialty teams

In addition to the teams responsible for shuttle launch rescue, the fire department has a number of other specialty teams, including an 18-member technical rescue team. These firefighters train for technical rescues, such as high-angle, confined-space, trench, and myriad other types of incidents that may occur.

While there are no mountains at KSC that require high-angle rescue, the height of some of the structures, such as the VAB and the launch pads, may necessitate these skills. One of the fastest ways to remove an injured person from the top level of a new 85-foot (26-meter) control tower being built at the shuttle launch facility will be to lower him or her down the outside of the tower.

Despite the presence of a large amount of exotic fuels and hazardous materials, the KSC fire department responded to only 60 hazardous materials incidents in 2003, including a number of suspected anthrax scares.

"We don't do a lot of responses, and that goes back to the safety aspect of what goes on here at KSC and the Air Force side," says Wimberly.

When a hazardous materials incident does occur, the department takes advantage of the KSC work force, which is very knowledgeable about controlling such incidents.

"When there is a release, we respond and set up incident command," says Wimberly. "We use their (civilian employees') services because they are the most knowledgeable persons to go in and turn a valve. That way, we don't have to have a firefighter spending an hour figuring out what valve to turn. The worker can do it right away."

These employees often work in fully encapsulated ensembles called SCAPE (self-contained atmospheric protective ensemble) with two-hour rebreather units that allow them to work safely in a potentially contaminated atmosphere.

The department's hazardous materials team is made up of 48 firefighters, 16 per shift.

The fire protection challenges at the nation's spaceport are varied and complex.

Through the use of codes and standards, technology, and ingenuity, however, solutions have been developed that provide a safe environment for the United States' space program.

PHOTOGRAPH: NASA

GASES AND LIQUIDS USED EITHER IN THE SHUTTLE OR FOR THE LAUNCH

The propellants on the shuttle can be divided into three categories:

• Cryogenic
Extremely cold liquids are compressed into a much smaller space. The two cryogenics used are liquid oxygen and liquid hydrogen.

• Hypergolic
Fuels and oxidizers that ignite upon contact are suited for use in the vacuum of space.

• Solid
Solid chemicals that burn at a rapid rate cannot be stopped once ignited.

Hydrogen
The external tank contains 384,071 gallons (1,453,867 liters).
It is shipped to KSC in 13,000-gallon (49,210-liter) tankers.

Oxygen
The external tank contains 141,750 gallons (536,582 liters).
It is trucked to KSC via 6,000-gallon (22,712-liter) tankers.

Helium
One million cubic feet (28,316 cubic meters) are used for purging and pressurization.
The shuttle carries 30,000 cubic feet (850 cubic meters).
It is transported in 11,000-gallon (41,640-liter) cryogenic tankers.

Hydrazine
129.2 gallons (489 liters) are shipped in specially designed containers.

Monomethylhydrazine (MMH)
1,480 gallons (5,602 liters) are used to provide maneuvering thrust in the vacuum of space.

Nitrogen Tetroxide
1,378 gallons (5,216 liters) are used to provide maneuvering thrust in the vacuum of space.

Nitrogen textroxide and MMH are classified as hypergolic fuels that will ignite when in contact with each other. This makes them ideally suited for use in space, but extremely hazardous on the ground. During fueling, extreme safety measures are in place to prevent accidents involving these volatile fuels.

Nitrogen
Large amounts are used for ground processing, and 30 million cubic feet (849,505 cubic meters) are used during a typical launch.
It is piped through 34 miles (55 kilometers) of 6,000-psi (414-bar) pipelines.

KENNEDY SPACE CENTER FACILITIES

Shuttle Landing Facility
15,000 feet long (4572 meters)
300 feet wide (91.4 meters)
16 inches thick (40.6 centimeters)

Orbiter Processing Facility
Used to process the shuttle immediately after a mission.

Three identical bays measuring 197 feet (60 meters) long, 150 feet (46 meters) wide and 95 feet (29 meters) high. Covers 29,000 square feet (2,695 square meters).

Logistics Facility
324,640 square feet (30,159 square meters).
Contains 150,000 components for the space shuttle.
Uses an automated parts retrieval system.

Spacecraft Assembly and Encapsulation Facility 2
17,098 square feet (1,588 square meters)

Used for processing and sterilizing large payloads and spacecraft in a class-100,000 clean work area. Includes an airlock, high bay, two low bays, test cells, and support areas.

Vertical Processing Facility
105 feet (32 meters) high covering 26,940 square feet (2,503 square meters)

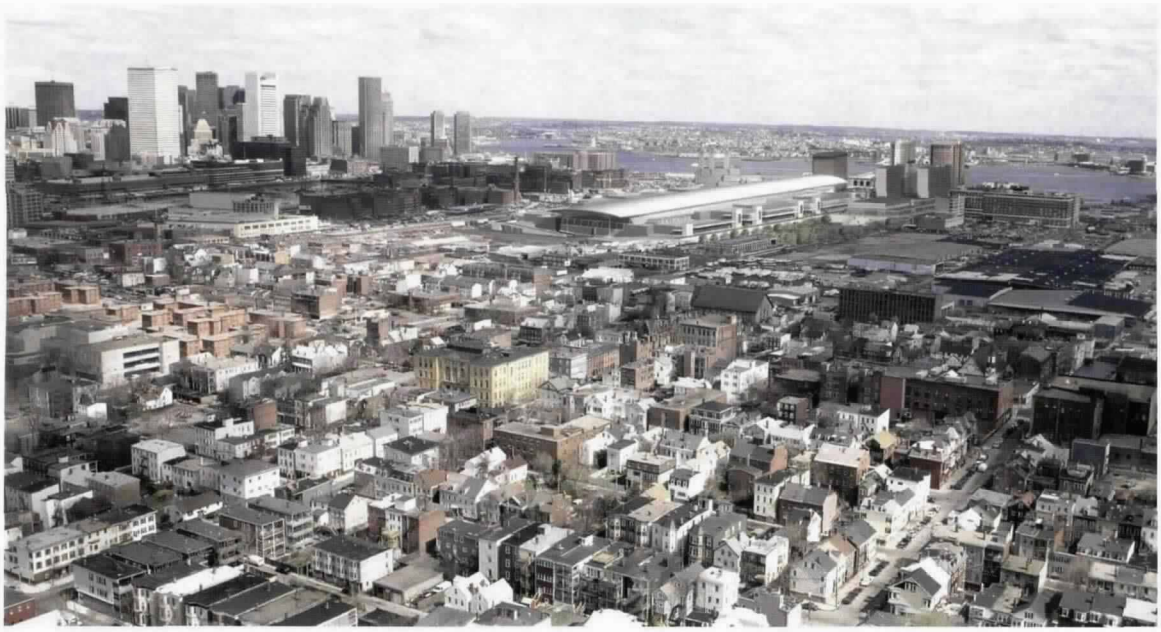
Used to process and integrate vertical payloads in a class-100,000 clean work area.

Solid Rocket Booster Processing Facilities *and* Solid Rocket Booster Disassembly Facility
After being jettisoned during a launch, the solid rocket boosters are retrieved from the ocean and towed back to KSC. They are lifted out of the water, cleaned, and disassembled.

Solid Rocket Booster Assembly and Refurbishment Facility
This is actually seven different buildings, where the solid rocket boosters are prepared for their next flight.

Rotation Processing and Surge Facility
New and reloaded solid rocket booster segments shipped by rail are processed in this facility.

Vehicle Assembly Building
525 feet (160 meters) tall
716 feet (218 meters) long
518 feet (158 meters) wide
129,482,000 cubic feet (3,884,460 cubic meters) volume



Fire and Life Safety Challenges at the

BOSTON CONVENTION AND EXHIBITION CENTER

Longer than the Empire State Building is high.
Ceilings that are 100 feet high.
How do you come up with the best safety solutions?

By **John Nicholson**

When you speak with the various professionals and trades who worked on the new Boston Convention and Exhibition Center (BCEC), everyone has a fact about the project they want to share.

According to the owner and operator, the Massachusetts Convention Center Authority (MCCA), the 1.6-million-square-foot (148,645-square-meter) BCEC is the largest convention center in the Northeast and features 515,000 square feet (47,845 square meters) of contiguous exhibition space on one level, plus 165,000 square feet of meeting space and a 41,000-square-foot (3,809-square-meter) ballroom. The overall complex is 1,540 feet (469 meters) long and 770 feet (234 meters) wide and occupies 42 acres (16 hectares) of a 60-acre (24-hectare) site in the city's South Boston neighborhood.

The construction management company, Clark/Huber, Hunt & Nichols/Berry, says with pride that the BCEC is longer than the Empire State Building is high.

The architects, HNTB Corporation of Boston and Rafael Vinoly Architects of New York, boast of the convention center's futuristic look, use of colors, natural lighting, distinctive lines, open spaces, and floating-roof design.

Not to be outdone, the life safety consultants point out the cutting-edge performance-based design aspects of the new exhibition center, while the fire protection engineers point out the approximately 17,124 sprinklers fed by more than 12,000 feet (3,657 meters) of 10-inch (25-centimeter) prefabricated pipe protecting the more than a million square feet (92,900 square meters) the structure covers.

Construction began May 2000, and the facility was substantially completed on March 24, 2004. The BCEC opens on June 24.

When asked about the biggest challenge they encountered during construction, fire protection engineers say it was the BCEC's 100-foot (30-meter) ceilings and their associated technical demands. For the life safety and code consultants, the challenge was coming up with the best and safest safety solutions.

Fire sprinkler system

"Originally, there was some thought given to applying for a variance to eliminate sprinklers in the high-bay areas of the convention center," says Michael DeMascio, formerly of Solutions Engineering, the code consultants on the project. DeMascio is now with Arup.

"Previous thinking on sprinkler systems at this height (above 50 feet [15 meters]) was that it was too high to extinguish the fire and, therefore, sprinklers would not be effective," he says.

Not installing sprinklers in the high-bay areas left some designers feeling uneasy, however. They remembered the results of the January 1967 fire in Chicago's 6-year-old McCormick Place. That fire, which started during the National Housewares Manufacturers Association 46th Semi-Annual Exhibit, severely damaged the structure, 92 percent of which was unsprinklered, and killed a security guard. When the new McCormick Place opened on the foundations of the old in January 1971, it had sprinklers throughout.

To assist in the design of the BCEC and to better gauge insurance concerns, FM Global of Johnston, Rhode Island, tested various sprinkler designs, developing a new set of sprinkler installation criteria for the project.

The tests used various types, densities, and spacing configurations along with an array of commodities ranging from Class II through Group A plastics. In all, nine tests were conducted with some operating as many as 26 sprinklers. In all nine tests, sprinklers activated and in some cases the tests had to be aborted.

Because FM Global didn't have a test facility with 100-foot (30-meter) ceilings, it conducted the tests in their facility with 60-foot (18-meter) ceilings and then used computer modeling to generate and extrapolate the results for the convention center with clearances of up to 100 feet. These results led FM Global to develop recommended protection criteria including sprinklers with a K factor of at least 11.2 along with high discharge densities and areas.

"FM came to the conclusion that the sprinklers would be effective," DeMascio says. "Because of this, FM wouldn't support a variance that would eliminate the sprinklers."

As FM did its work, DeMascio developed a complete analysis and formulated an additional set of recommendations for the sprinkler system in the high-bay areas.

"We looked at various-sized fires that involved RVs [recreational vehicles], boats, and trucks that would be the types on display during a trade show or convention," he says. "We also confirmed the need for sprinklers, detection, and suppression systems. We developed a model that had a potential fire size of 50 megawatts. That's a good-size fire. Numerous items [on display at a trade show] would fall into that category of fire."

The criteria FM developed for the convention center calls for a discharge of 0.45-gallons per minute (gpm)/square foot (sf) [1.7 liters per minute (lpm)/square meter (sm)], a design area of 5,000 square feet (464 square meters), extra-large orifice heads (K=11.0), quick-response sprinklers, a hose stream allowance of 500 gpm (1,892 lpm), and a maximum sprinkler pressure requirement of 30 psi (2.07 bar).

This also led FM Global to develop recommendations for light hazard atrium-type occupancies such that sprinkler

Aerial view

systems with clearances up to 35 feet (10 meters) high to have a 0.15-gpm/sf (0.56-lpm/sm) discharge over a 2,500 square feet (232 square meters). Atriums with clearances up to 60 feet (18 meters) high should be 0.15-gpm/sf (0.56-lpm/sm) density over a 3,000-square-feet (278-square-meter) area. In both instances, the sprinklers should have a K factor of at least 8.

The research done, the fire protection engineers worked with the City of Boston, the architects, and the code consultants to develop a performance-based design for the sprinkler system.

Sprinkler system design

"The convention center's arched and sloped roof is 100 feet [30 meters] above the exhibition hall floor. The concern we had was designing a sprinkler system to meet FM Global criteria," says Paul Theriault, P.E., manager of the fire protection division at J.C. Cannistraro of Watertown, Massachusetts.

To add to the system's potential complexity, the roof sloped in two directions, and there were pressure limitations at the sprinklers, high-density requirements, and concerns about fire pump discharge pressure, pipe sizing, and hanging.

Theriault and fire protection designer John Hebert were asked to design a system that would operate properly from such a height and control a fire.

"Having enough pressure to reach the exhibition hall roof height while satisfying the high discharge density requirements without exceeding the pressure limitations of 30 psi set by FM Global to maintain large droplet size," Theriault says.

The maximum design pressure of 30 psi (2.068 bar), Theriault says, is intended to prevent excess pressure on any one sprinkler and minimize the potential for very fine water droplets. That amount of pressure also reduces the potential for sprinkler skipping and keeps the water droplets large enough to reach the fire.

Following NFPA 13, *Installation of Sprinkler Systems*, fire safety system designer Keith E. Garrant, P.E., of R.G. Vanderweil Engineers in Boston, partnered with Theriault and Hebert to develop a high-clearance suppression system design that features a large-drop sprinkler system throughout the exhibit halls supplied by redundant 2,000-gpm (7,570-lpm) diesel-driven fire pumps.

NFPA 13 doesn't allow exemptions for height, so developing a system that complied with the standard was a priority.

The fire protection engineers and the life safety consultants tout the cutting-edge performance-based design aspects of the new convention and exhibition center.

ILLUSTRATION: MCCA

The first challenge they faced was determining sprinkler demand. They came up with the pipe size and the settings for the pressure-regulating valves, which allow a predetermined quantity of water to pass through a system at some established pressure. Then, they had to determine whether the fire pumps provided adequate flow and pressure to satisfy the pressure-regulating valve settings without exceeding the 175-psi (12-bar) discharge at the pump.

For Garrant, coming up with a layout proved to be a minor obstacle. It was getting the proper spray and keeping it all in the truss work that provided the biggest fire protection challenge.

"We had a phased approach to the project, with each aspect needing some modifications and changes to the original plans," he says.

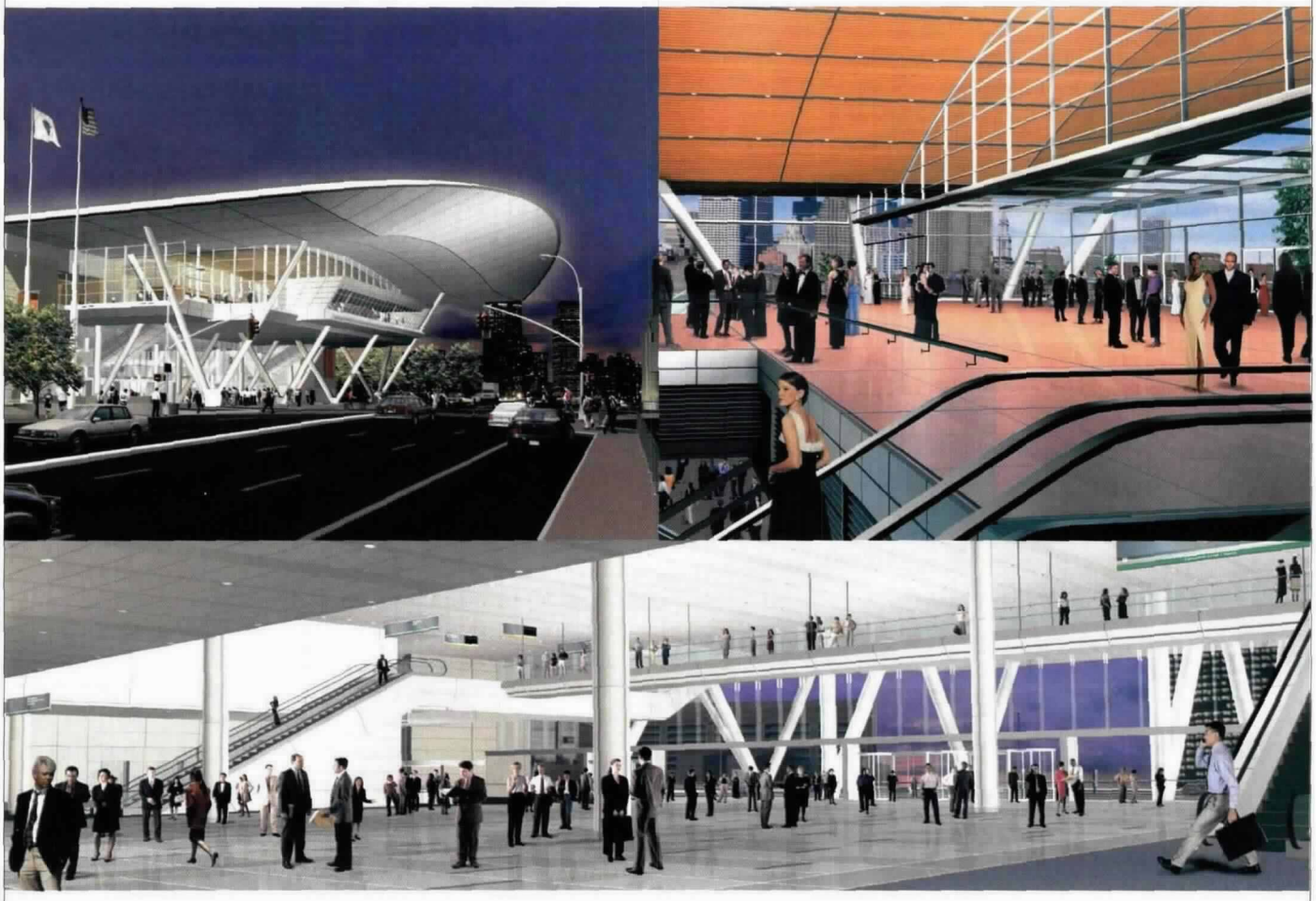
The BCEC's final $7 million sprinkler design uses extra-large-orifice heads and quick-response sprinklers that can provide a minimum of 45 gpm of water while maintaining a maximum pressure of 30 psi (2.068 bar). According to Theriault, the pressure was kept down to maintain the largest water droplets possible. The hydraulic calculations included 50 sprinklers operating in a 5,000-square-foot area requiring over 2,250 gpm sprinkler demand.

There are more than 70 wet-pipe systems in the exhibition hall, conference rooms, ballroom, mechanical rooms, offices, administration areas, loading docks, and storage areas, and more than 12 dry-pipe and pre-action systems elsewhere in the convention center.

The exhibition hall system is supplied by a series of 10-inch (25-centimeter) feed mains leading to 8-inch (20-centimeter) risers that connect to 6-inch (15-centimeter) grid mains with 3-inch (7-centimeter) branch lines. All the piping is neatly hidden in the ceiling truss work.

The fire protection system is supplied by two city water connections, which feed two fire pump systems, one at the north end of the center and the other at the south end. Each is diesel-driven. One can pump 2,000 gallons (7,570 liters) of water per minute at 70 psi (4.8 bar), while the other can pump 2,000 gallons per minute at 95 psi (6.5 bar). The total discharge pressure for the pumps is up to 175 psi (12 bar).

An internal fire hydrant distribution main with 10-inch (25-centimeter) piping feeds external wall hydrants for fire department use. The internal fire system distribution



Clockwise from top left: Summer Street entrance; Grand Ballroom lobby; Main Lobby.

ILLUSTRATIONS: MCCA

The Exhibition Hall.

main also uses 10-inch piping that connects the fire pump systems and feeds the sprinkler and standpipe systems.

Once the design of the system was complete, Garrant and Hebert had several meetings with the architects to figure out how to hang the piping without detracting from the architect's vision of the convention center's interior and roof design.

Inside the BCEC, V-shaped columns along both sides of the exhibition space, which is divided into three halls, support the meeting rooms and social spaces on the upper floors. A pair of bridges floats above the space to connect the two sides of the building and provide more efficient circulation. The arching roof and exposed trusses make the space extremely configurable and suitable for large installations.

The BCEC's shimmering metal roof is specially designed for Boston's weather and wind conditions. In the winter, the roof may have to support 42 acres (16 hectares) of snow; in the city's strong winds, it acts like a kite. To simultaneously hold the roof up and keep it tied down while providing a column-free exhibition floor, the diagonal columns are reinforced by overhead tensile truss work.

There are more than 70 wet-pipe systems in the exhibition hall, conference rooms, ballroom, mechanical rooms, offices, loading docks, and administration areas.

According to Hebert, the fire protection designer, the two-directional slope of the roof makes it difficult to hang piping, and the only steel available for hanging the sprinkler system's unique design was spaced 15 feet (4.5 meters) apart, which is the the largest possible span allowed by NFPA 13.

"Working with the architects, we came up with numerous applications and tried to use each one to determine its adequacy. It was truly a cooperative effort," Hebert says.

"If aesthetics weren't a concern, the system would have been dropped down closer to the floor," Garrant says.

Eventually, the designers chose grooved piping because it's easily assembled and provides a limited amount of flexibility within each joint. As part of their negotiations with the architect, the designers agreed not to hang the sprinkler system with truss-spanning supplemental steel, so they used seismic cable to hang and brace some sections where typical hanging methods weren't available, Hebert says.

"Despite all the restrictions, we were able to make it work to everyone's satisfaction," Hebert says.

Fire alarm system

If the height of the ceiling presented the sprinkler designers with a challenge, the size of the convention center and the din a trade show or exhibition can gener-

ILLUSTRATION: MCCA

ate presented a challenge for Robert F. Russell, an electrical engineer with Vanderweil, who designed the alarm and detection system.

An overbuilt system specially manufactured for the BCEC by Siemens offers strobes, alarms, and a voice annunciation system. According to Russell, the original system design had to be modified when NFPA 72®, *National Fire Alarm Code®*, was revised in 1999 to place more emphasis on voice intelligibility and voice intelligibility testing.

As they did for the sprinkler system installation, everyone involved in the alarm system got together to develop a performance-based design.

"This is one of the first of its kind that had to meet the intelligibility requirements outlined in the Annex of NFPA 72. It was a condition of the variance we sought for excess travel distance," DeMascio says. "The distance from the exhibit hall to the exit uses up all the travel distance [outlined in NFPA 72].

"It had always been a requirement of the code, but before the 1999 edition, there was no guidance. The reference we followed was in [Paragraph] A-4-3.1.5 [of the code's Annex]," he says. Normally, information in the Annex of the code is seen as only a recommendation.

Appendix A references International Electrotechnical Commission standard IEC 60849, *Testing Sound Systems for Emergency Purposes*, which, in turn, refers to IEC 60268-16, *Objective Rating of Speech Intelligibility by Speech Transmission Index*.

The large speakers used for the audio system in the exhibition hall, unobtrusively installed in the truss work near the lighting, double as alarm speakers. The system, which is zoned and managed out of a control room, consists of 2 network control centers, 14 nodes of MXL voice, and 9 remote annunciators with paging capabilities. It interfaces with the building's audio sound system, building controls, and lighting controls.

Similar systems are used elsewhere. For example, one was designed for Gillette Stadium, the New England Patriots' stadium in Foxboro, Massachusetts. As at the convention center, the goal at Gillette was to ensure that evacuation messages over key sound systems were clearly intelligible. In what could presage a trend for other public event spaces in the United States, Gillette's system designers objectively measured the sound systems to prove they could deliver the specified intelligibility rating.

Although the BCEC PA system is used to broadcast fire alarm voice evacuation messages, the system isn't a fire alarm component, so the Boston Fire Department required that the alarm system be supervised. The PA system is also "supervised," though in another sense, DeMascio notes. Unlike a normal alarm system, the convention center operators know the system's speakers are working every time they use the PA system.

"It doesn't sit there like a normal system that's only activated in a test or in an emergency. If a problem develops, it can be addressed right away," DeMascio says. "The speakers are used for every exhibit."

In addition to the fire department's review of the alarm system, the system was peer-reviewed.

"There were many eyes looking at this, and the city is a big supporter of the alarm system," DeMascio says.

Life safety issues

Performance-based design was used again when it came to egress. The designers' first inclination was to see the convention center as being similar to a high-rise. However, the convention center doesn't have a phased evacuation plan, like most high-rises have. It's totally evacuated.

When devising the evacuation plan, DeMascio assumed there would be no manual fire suppression from the fire department, even though a fire station is only a block away. He also assumed the convention center would be at its 25,000-person capacity.

Using these as givens, a timed egress analysis was conducted. Computer-based egress models tracked individuals throughout the entire egress system, providing times for room and floor evacuation, as well as total building evacuation. The analysis also provided graphical outputs that allowed visual analysis of the egress system and enabled designers to identify potential problem areas.

The analysis was designed so people could safely evacuate in an unlimited amount of time. If a 5-megawatt fire developed while meetings were being held in the outer conference rooms, people would have about 45 minutes to evacuate, although actual evacuation would take less than a few minutes.

All the built-in passive-protection features made this possible, DeMascio says. For example, there's a two-hour firewall between the exhibition hall and the loading dock and the offices and outer conference rooms. The loading dock and the other outlying areas are protected, so people are considered to have evacuated the exhibit hall once they enter them.

During the review process, the fire department was particularly concerned about continuity of operations after a fire at the convention center.

"Our goal was to make sure a smoke layer would not go lower than the bridges. We want to keep the smoke in a confined area, and this would allow the convention center to stay in business," DeMascio says.

To keep the smoke above the bridges, which are about 24 feet (7.3 meters) above the ground, a smoke evacuation system was installed," he says. "This was not for egress but strictly for continuity of operations; however, it can be used to assist with the egress. It wasn't required for egress purposes so the fans are not on emergency power."

Home Safe

Increased density for residential sprinklers and why it was changed.

By **Roland Huggins, P.E.**

Illustration by **Dave Wheeler**

OVER THE LAST 20 YEARS, advances in the residential sprinkler have provided steadily decreasing discharge densities. In May 2000, however, a tentative interim amendment (TIA) to NFPA 13, *Installation of Sprinkler Systems*, required residential sprinklers to have a minimum density of 0.1 gallons per minute/square foot (gpm/sf), or 0.3785 liters per minute/square meter (lpm/sm), an increase of 210 percent. In July 2002, the minimum density for systems designed to NFPA 13R, *Installation of Sprinkler Systems in Residential Occupancies Up to and Including Four Stories in Height*, and NFPA 13D, *Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*, increased by 56 percent to 0.05 gpm/sf (0.18 lpm/sm).

Why?

Let's start with a little background. The four-sprinkler design option for residential sprinklers first appeared in NFPA 13 in 1985. As referenced in NFPA 13D, the original residential sprinklers had a spacing of 12 by 12 feet (3.7 by 3.7 meters) and a minimum required flow of 18 gpm (68 lpm) for a single sprinkler and 13 gpm (49 lpm) for all sprinklers in the hydraulic design. This correlates to a discharge density of 0.125 gpm/sf (0.47 lpm) for a single sprinkler and 0.09 gpm/sf (0.34 lpm/sm) for multiple sprinklers in the design.

Full-scale testing

These flow rates and the area of coverage stemmed from full-scale fire testing with which the NFPA 13D subcommittee was involved. A significant part of these tests was the Los Angeles Residential Test Program funded by the U. S. Fire Administration and conducted in actual homes with a combination of furnishings, ventilation modes, sprinkler application rates, and response sensitivities.

It's also important to know a little about the Underwriters Laboratories, Inc. (UL) sprinkler test standards, since the change in minimum densities is directly related to the evolution of the residential sprinkler in response to the test criteria and differences between the test standards for residential and spray sprinklers. The Los Angeles tests formed the foundation for UL 1626, *Residential Sprinklers for Fire-Protection Service*, which was developed in 1980 and published in 1988. Many of the tests are similar to those described in UL 199, *Automatic Sprinklers for Fire-Protection Services*, although they differ significantly in the areas of water distribution and fire tests. In considering these differences, keep in mind that the primary objective of residential sprinklers is not to protect property, but to maintain tenability in the room of fire origin, thus improving the occupants' chances for escape.

Residential sprinklers are required to wet the walls within 28 inches (71 centimeters) of the ceiling. This is a much flatter discharge pattern than that produced by spray sprinklers. There are restrictions on how much water standard upright and pendent spray sprinklers can discharge beyond an 8-foot (2.43-meter) radius 4 feet (1 meter) below the deflector. Even extended-coverage sprinklers' discharge patterns aren't as flat as those of residential sprinklers: in light-hazard occupancies, they have to wet the wall a minimum of 30 inches (76 centimeters) above the floor.

The flatter residential pattern was driven by the need to wet the walls to keep wall paneling and curtains from burning. As an additional benefit, the flatter discharge cools the upper layer of air in the room, improving tenability, which is reflected by the UL 1626 test criteria on upper-layer temperature.

UL 199 for spray sprinklers uses several tests, depending upon the sprinkler type. The primary test is the 350-pound (159-kilogram) wood-crib fire test. All spray sprinklers except those with K-factors smaller than 5.6 and extended-coverage sprinklers for light-hazard occupancies must pass this test.

To succeed, the sprinkler must limit the weight loss of the wood crib to no more than 20 percent and reduce the ceiling temperature to 530°F (277°C) above ambient within five minutes after the start of water discharge. The temperature can exceed this value for no more than three consecutive minutes, and the average temperature for this period must be no more than 530°F (277°C) above ambient.

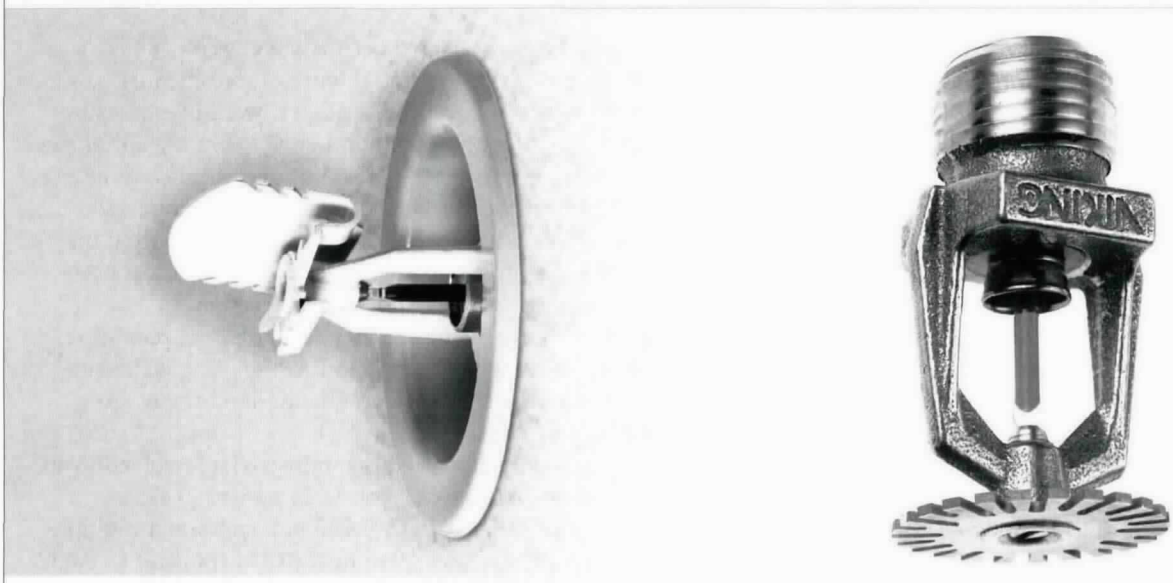
The wood test crib is centered among four sprinklers. An atomizing nozzle 42 inches (1,078 centimeters) below the crib support discharges heptane, a highly flammable liquid hydrocarbon, upward at a rate of 1 gallon (3.8 liters) per minute for the entire 30 minutes of the test. The clock starts when the heptane torch is ignited, and the water application starts after one minimum free burn or after the temperature at the ceiling reaches 1,400°F (760°C), whichever occurs last.

Fire test for extended-coverage sprinklers

The fire test for extended-coverage sprinklers, which also uses a wood crib, is significantly different. It consists of three fire tests at different locations in the same room; the average weight loss of the three cribs cannot exceed 35 percent.

There are 11 potential locations for the 33-pound (15-kilogram) wood cribs. In the first test, one crib is placed in the upper left corner away from the wall, which would contain a sidewall sprinkler. The other locations are in the room corners; against the wall halfway between the corners; and in the center of each quadrant of the room.

Because the root cause of the test variability had been identified and the test standard was modified, related changes to NFPA 13R and NFPA 13D could be done in the normal cycle for the 2002 edition.



The sprinkler on the left is a residential sidewall sprinkler and the sprinkler on the right is an example of a frame-style residential pendent.

To select the next two locations, a distribution test is performed. A minimum flow rate produces a density of at least 0.1 gpm/sf (0.4 lpm/sm), and water collection pans are placed at each of the potential crib locations. For the second test, the crib is placed on the room perimeter where the least amount of water was collected, and for the third test, the crib is placed in the middle of the quadrant with the least amount of water. Heptane is again used as a fuel, but instead of a torch, 1 quart (96 deciliters) is placed in a pan beneath the crib. The test lasts 10 minutes.

Residential fire test

As described in the Annex material of both NFPA 13D and NFPA 13R, the fire test is based on the most challenging fire scenario in the Los Angeles fire tests. The characteristics of this fire include fast fire growth involving combustible vertical surfaces, combined with a fire in an upholstered chair that is partially shielded from the sprinkler discharge.

To meet the criteria for the UL 1626 test, a maximum of two residential sprinklers must operate and limit temperatures 3 inches (7.62 centimeters) below the ceiling to a maximum of 600°F (316°C). In addition, temperatures 5.25 feet (1.6 meters) above the floor may not exceed 200°F (93°C), nor may they exceed 130°F (54.44°C) for more than any continuous two-minute interval. Finally, the maximum ceiling material temperature 0.25 inches (0.63 centimeters) behind the finished ceiling surface may not exceed 500°F (260°C).

The test set-up existed when the TIA was evaluated. The fire is located in the corner, allowing radiant feedback from the walls to create the most aggressive fire growth and to reduce air entrainment to produce the hottest fire plume. The fire source consists of a 12- to-13-pound (5.4- to-5.9-kilogram) wood crib enclosed on both open sides by simulated furniture. The simulated furniture consists of two uncovered polyether foam cushions of an exposed, expanded Group A plastic 3 inches (7.62 centimeters) thick that's wrapped around and attached to plywood backing 0.5 inches (1.27 centimeters) thick. Each cushion measures 36 by 40 inches (91 by 102 centimeters).

Eight ounces (236.58 milliliters) of heptane are placed in a pan beneath the crib, and 4 ounces (113 grams) of fine, curled wood shavings are put on the floor next to each section of foam cushion. Forty seconds after the heptane is ignited, the shavings are ignited. To allow the fire to spread vertically, the walls in the corner are covered with wood paneling 0.125 inches (3.17 millimeters) thick with a flame-spread index of 200. In addition, the ceiling is covered with acoustical panels 0.5 inches (12.7 millimeters) thick with a flame-spread index of 25.

This is a challenging fire, given the combustible walls and the foam cushion's ability to produce a high rate of heat release. In addition, the sprinkler location on the centerline of the room creates a partially shielded fire, and the high-discharge pattern increases the challenge by decreasing the amount of water directly wetting the fuel or attacking the fire.

Differences in these two test standards

In considering the differences in these two test standards, one should keep in mind the objective of the system in which the tested sprinkler is to be used. UL 199 spray sprinklers provide both life safety and property protection for all types and sizes of facilities. UL 1626 was developed for NFPA 13D sprinkler systems in

PHOTOGRAPHS: VIKING CORPORATION

one- and two-family dwellings where life safety is paramount and a lesser degree of property protection is acceptable. Although the objective of property protection is mostly a function of the installation standard—that is, the areas required to be protected and water supply requirements—it's reflected in the test standard. The 350-pound (159-kilogram) UL 199 crib test evaluates the sprinklers' ability to control the fire for 30 minutes, as indicated by the amount of fuel consumed and the temperature developed at the ceiling. Limiting the temperature to no more than 530°F (276°C) indicates that the sprinkler can prevent flashover, which is important to both life safety and property protection. The 33-pound UL 199 crib test also looks at controlling the fire based on the amount of fuel consumed. Even though this test is only 10 minutes long, it still provides a relative comparison of the sprinklers' ability to control the fire.

When the objective is life safety, it's even more apparent in the test standard. UL 1626 is only concerned about controlling the impact of a fire on the environment of the room, and the ceiling temperature must be cooled rapidly to avoid activating more than two sprinklers. In successful tests, only one sprinkler typically activates. While restricting the upper layer to no more than 600°F (315°C) is a measure of avoiding flashover, restricting the temperature at 5.3 feet (1.6 meters) above the floor is exclusively a tenability issue. There are no criteria for the amount of fuel consumed. Controlling the fire is, without question, an integral part of controlling the environment, but the test focus is on allowing individuals time to get out of the room.

Developed for NFPA 13D systems

A particularly important consideration is that the test can still be successful if the shielded fire increases in size at the end of the test period. This isn't a negative characteristic. It simply emphasizes that the test was developed for NFPA 13D systems, the objective of which is to control the fire impact for no more than 10 minutes. Even though the tests last the same length of time, this test differs from the 10-minute UL 199 test for extended-coverage light-hazard sprinklers because it focuses on fuel consumed, not environmental conditions.

If UL 1626 was developed for NFPA 13D systems, why did NFPA 13 start using it in 1985? The *NFPA Sprinkler Handbook* identified three factors that influenced the decision: The sprinklers were designed and tested to protect against residential fires; four operating sprinklers are required instead of two; and minimum discharge densities were 0.125 gpm/sf (0.473 lpm/sm) for a single sprinkler and 0.09 gpm/sf (0.341 lpm/sm) for multiple sprinklers

Considering that small-orifice sprinklers, which are restricted to light-hazard occupancies, aren't subject to a full-scale UL 199 fire test, the use of a residential sprinkler and its associated full-scale test would be a positive factor. And doubling the number of operating sprinklers must have increased the NFPA 13 technical committee's level of comfort. But I suspect the real driving factor was the density. There's a long history supporting the use of 0.1 gpm/sf (0.379 lpm/sm) for light-hazard occupancies, the typical NFPA 13 classification for residential areas. With residential sprinklers providing similar or greater densities and a 30-minute water supply per NFPA 13, the residential design option was a reasonable decision.

By that time, however, the industry had evolved from a single-sprinkler density of 0.125 gpm/sf (0.473 lpm/sm) to 0.034 gpm/sf (0.129 lpm/sm) and a multiple-sprinkler density of 0.09 gpm/sf (0.341 lpm/sm) to 0.032 gpm/sf (0.121 lpm/sm).

In hindsight, one could ask why the NFPA 13 committee didn't reevaluate the decision to apply UL 1626 as the densities dropped. I suspect the predominant reason was that there were no indications that these sprinklers weren't performing as desired.

Initiate the change

So what did initiate the change in densities? Actually, it started when UL 1626 was submitted to ANSI to become an ANSI standard. As a part of this process, a comment was provided indicating that the fire test protocol should be modified to enhance consistency of the test results. This led to a cooperative effort by Factory Mutual Research Corporation (FMRC), UL, and sprinkler manufacturers to identify the elements of the test that contribute to the variability and modify UL 1626 to improve repeatability. The most significant elements were identified as the ignition and burning characteristics of the foam cushions and wall-covering materials.

Calorimeter testing of the foam cushions with shavings ignition indicated a broad range of both peak and total heat release characteristics. The tests clearly showed that density and environmental conditioning have an impact on burning characteristics. Even foam of the same density can vary, however. Polyether foam isn't manufactured for fire-testing purposes but for functionality in products such as furniture. They can vary daily since they can be made with different filler materials; the composition changes with the availability and cost of raw materials; and the production process changes. The flame spread index and ignition times of the wood paneling, also tested but in accordance with UL 723, *Test for Surface Burning Characteristics of Building Materials*, were found to vary significantly as well.

After confirming that these elements were the principal cause of the variations, the group worked to modify

Use these Reader Service cards to receive FREE information on products and services valuable to you and your business at no cost or obligation. Complete the required information, then circle the numbers that correspond to the numbers on the advertisements or editorial listings in this issue.

Visit our website today!

Visit www.nfpa.org/productinfo, fax to 1-239-213-2199, or mail this postpaid card today.

SEND FOR FREE INFORMATION TODAY!

SEND FOR FREE INFORMATION - MAY/JUNE 2004 NFPA JOURNAL

Please print. Mail by September 1, 2004

NAME _____

TITLE _____ COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____ COUNTRY _____

E-MAIL _____ PHONE ( ) _____

Please send me information about the following circled items:

001	002	003	004	005	006	007	008	009	010	011	012	013	014
015	016	017	018	019	020	021	022	023	024	025	026	027	028
029	030	031	032	033	034	035	036	037	038	039	040	041	042
043	044	045	046	047	048	049	050	051	052	053	054	055	056
057	058	059	060	061	062	063	064	065	066	067	068	069	070
071	072	073	074	075	076	077	078	079	080	081	082	083	084
085	086	087	088	089	090	091	092	093	094	095	096	097	098
099	100	101	102	103	104	105	106	107	108	109	110	111	112
113	114	115	116	117	118	119	120	121	122	123	124	125	126
127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154
155	156	157	158	159	160	161	162	163	164	165	166	167	168
169	170	171	172	173	174	175	176	177	178	179	180	181	182
183	184	185	186	187	188	189	190	191	192	193	194	195	196
197	198	199	200	201	202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219	220	221	222	223	224
225	226	227	228	229	230	231	232	233	234	235	236	237	238
239	240	241	242	243	244	245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261	262	263	264	265	266

Job Title:
- ☐ A Architect, Engineer, Consultant, Contractor
- ☐ B Owner, President, Manager, Administrator
- ☐ C Fire Chief, Other Fire Service
- ☐ D Facilities Safety Officer
- ☐ E Inspector, Building Official, Fire Marshal
- ☐ F Loss Control, Risk Manager
- ☐ G Other:_____

Reason for Inquiry:
- ☐ H Immediate Purchase
- ☐ I Future Project

Type of Organization:
- ☐ J Architecture, Engineering, Contracting
- ☐ K Government
- ☐ L Fire Service, Public and Private
- ☐ M Industrial Firm (Factory, Warehouse)
- ☐ N Commercial Firm (Office, Retail, Lodging, Restaurant)
- ☐ O Institutional (Health Care, Education, Detention, Museums)
- ☐ P Electrical Services, Installation
- ☐ Q Insurance, Risk Management
- ☐ R Utilities
- ☐ S Other_____

Purchasing Authority:
- ☐ T Recommend
- ☐ U Specify
- ☐ V Approve

www.nfpa.org/productinfo

SEND FOR FREE INFORMATION - MAY/JUNE 2004 NFPA JOURNAL

Please print. Mail by September 1, 2004

NAME _____

TITLE _____ COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____ COUNTRY _____

E-MAIL _____ PHONE ( ) _____

Please send me information about the following circled items:

001	002	003	004	005	006	007	008	009	010	011	012	013	014
015	016	017	018	019	020	021	022	023	024	025	026	027	028
029	030	031	032	033	034	035	036	037	038	039	040	041	042
043	044	045	046	047	048	049	050	051	052	053	054	055	056
057	058	059	060	061	062	063	064	065	066	067	068	069	070
071	072	073	074	075	076	077	078	079	080	081	082	083	084
085	086	087	088	089	090	091	092	093	094	095	096	097	098
099	100	101	102	103	104	105	106	107	108	109	110	111	112
113	114	115	116	117	118	119	120	121	122	123	124	125	126
127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154
155	156	157	158	159	160	161	162	163	164	165	166	167	168
169	170	171	172	173	174	175	176	177	178	179	180	181	182
183	184	185	186	187	188	189	190	191	192	193	194	195	196
197	198	199	200	201	202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219	220	221	222	223	224
225	226	227	228	229	230	231	232	233	234	235	236	237	238
239	240	241	242	243	244	245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261	262	263	264	265	266

Job Title:
- ☐ A Architect, Engineer, Consultant, Contractor
- ☐ B Owner, President, Manager, Administrator
- ☐ C Fire Chief, Other Fire Service
- ☐ D Facilities Safety Officer
- ☐ E Inspector, Building Official, Fire Marshal
- ☐ F Loss Control, Risk Manager
- ☐ G Other:_____

Reason for Inquiry:
- ☐ H Immediate Purchase
- ☐ I Future Project

Type of Organization:
- ☐ J Architecture, Engineering, Contracting
- ☐ K Government
- ☐ L Fire Service, Public and Private
- ☐ M Industrial Firm (Factory, Warehouse)
- ☐ N Commercial Firm (Office, Retail, Lodging, Restaurant)
- ☐ O Institutional (Health Care, Education, Detention, Museums)
- ☐ P Electrical Services, Installation
- ☐ Q Insurance, Risk Management
- ☐ R Utilities
- ☐ S Other_____

Purchasing Authority:
- ☐ T Recommend
- ☐ U Specify
- ☐ V Approve

www.nfpa.org/productinfo

We would appreciate your comments...

LETTER TO THE EDITOR _____

NAME _____

TITLE _____ COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____ COUNTRY _____

E-MAIL _____ PHONE ( ) _____

NFPA®

No Postage Necessary if Mailed in the United States

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 868 CINNAMINSON, NJ

POSTAGE WILL BE PAID BY ADDRESSEE

NFPA JOURNAL
P.O. Box 11149
Naples, FL 34101-6898

No Postage Necessary if Mailed in the United States

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 868 CINNAMINSON, NJ

POSTAGE WILL BE PAID BY ADDRESSEE

NFPA JOURNAL
P.O. Box 11149
Naples, FL 34101-6898

No Postage Necessary if Mailed in the United States

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 5347 QUINCY, MA

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN: KATHLEEN ROBINSON
NFPA JOURNAL MAGAZINE
P.O. BOX 9101
QUINCY MA 02269-9101

Visit www.nfpa.org/productinfo, fax to 1-239-213-2199, or mail this postpaid card today.

SEND FOR FREE INFORMATION TODAY!

Use these Reader Service cards to receive FREE information on products and services valuable to you and your business at no cost or obligation. Complete the required information, then circle the numbers that correspond to the numbers on the advertisements or editorial listings in this issue.

Visit our website today!

NFPA®

Residential sprinklers are required to wet the walls within 28 inches (71 centimeters) of the ceiling. This is a much flatter discharge pattern than that produced by spray sprinklers. The flatter pattern was driven by the need to wet the walls to keep paneling and curtains from burning.

UL 1626. This effort became easier when additional testing indicated that the fire growth characteristic of the UL 1626 fire test is significantly faster than that of actual upholstered furniture representing a living-room fuel package. The modified UL 1626 closely represents the fire-growth characteristic of the three living-room tests FMRC conducted. This is appropriate since the test is supposed to reflect the most challenging fire observed in the Los Angeles fire tests. The modified UL 1626 will use thicker wood paneling and denser foam cushions to provide a more repeatable fire growth characteristic and still present a sufficiently challenging fire scenario for study.

Task group work

A residential sprinkler task group of the NFPA 13 Technical Correlating Committee evaluated this issue in October 1999, and FMRC and UL presented an overview and an update on changes to UL 1626 that focused on the need for consistency in laboratory fire test results.

Because the root cause of the test variability had been identified and the test standard was being modified, related changes to NFPA 13R or NFPA 13D could be done in the normal cycle for the 2002 edition. Early testing also showed that the modified fuel package would probably require a slightly higher density to pass the fire test.

Even though the concerns about repeatability had been resolved, the task group had reservations about whether it was still appropriate to use UL 1626 as a basis for an NFPA 13 design option. The group decided to propose a TIA requiring that residential sprinklers in an NFPA 13 system be calculated based on the greater demand of either its listed discharge requirements or a minimum density of 0.1 gpm/sf (0.379 lpm/sm). Committee members wanted to retain the use of a sprinkler that was not only developed specifically for the typical contents and arrangement of a dwelling, but that also had a successful record. In addition, the history of a 0.1 gpm/sf (0.379 lpm/sm) density in light-hazard occupancies and the fact that this density would be much greater than that required to comply with UL 1626 created a reasonable level of comfort.

As part of the activities for the 2002 edition, the full NFPA 13R and NFPA 13D Technical Committee on Residential Sprinkler Systems met in March 2000. Again, FMRC and UL representatives presented comprehensive laboratory test data on this issue, and FMRC suggested that NFPA 13D specify a minimum design density of 0.07 gpm/sf (0.26 lpm/sm). Considering the excellent field record residential sprinkler systems have demonstrated over the years and the need for cost-effective protection to encourage their use in residential occupancies, the committee believed that a minimum design density of 0.05-gpm/sf (0.198 lpm/sm) was appropriate for NFPA 13D and NFPA 13R.

Changes can be seen

The UL 1626 test fire has changed notably since the task group met. The wood paneling and polyether foam now have much more tightly defined burning characteristics. The wood crib is lighter at 5.5 to 7 pounds (2.49 to 3.17 kilograms). The foam cushions are slightly smaller at 30 by 32 inches (76.2 by 81.28 centimeters). The space between the wood crib and simulated furniture has increased by 6 inches (15.24 centimeters). The shavings have been replaced by cotton wicks soaked in heptane. There's no longer a delay before igniting the simulated furniture. And the length of the test was increased to 30 minutes, although it may be stopped at 10 minutes if the fire is extinguished or only the wood crib is burning.

Now that UL 1626 is a 30-minute test, it begs the question of whether the 0.10 gpm/sf (0.379 lpm/sm) minimum density will be deleted. As a member of the original NFPA 13 task group, I don't think so. Even though the test could last 30 minutes, the limited amount of fuel is not intended to reflect the impact of a fire of longer duration.

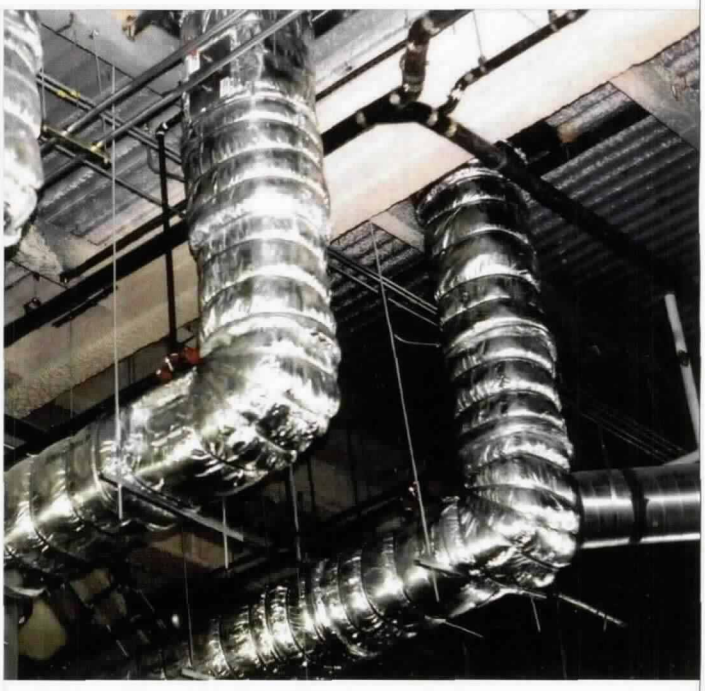
ROLAND HUGGINS, P.E., is Vice President of engineering for the American Fire Sprinkler Association and a member of numerous NFPA technical committees, which include the NFPA 5000 and NFPA 13 technical correlating committees.

FOR MORE INFORMATION ON THE STANDARDS DISCUSSED, VISIT WWW.NFPA.ORG. FOR MORE INFORMATION ON THE AMERICAN FIRE SPRINKLER ASSOCIATION, VISIT WWW.SPRINKLERNET.ORG.

Something is cooking for NFPA 96

At NFPA's World Safety Conference and Exposition™ this May, NFPA members will vote on a revision to NFPA 96, *Ventilation Control and Fire Protection of Commercial Cooking Operations*, that aims to simplify the code by moving toward a unified test standard.

By **Chris Eden**



Some duct wraps are foil-encapsulated to help insulation from absorbing leaked grease.

The food service industry is big business in the United States. Just look around. Restaurants are popping up everywhere. Sports stadiums offer more choices of food, and the mall food court concept is well established. More and more people trade home-cooked meals for a quick bite out.

According to the National Restaurant Association's 2004 Industry Forecast, the United States will have 878,000 food establishments by the end of 2004, an increase of almost 80 percent from 1972. And the number of establishments is expected to hit more than 1 million within six years.

According to NFPA 96 staff liaison Jim Lake, NFPA data show that the biggest property protection issue for the restaurant industry is grease fires because of the significant expense per fire.

Every vaporized or coagulated drop of grease in a duct is tremendously flammable, and duct fires can reach temperatures of 1,600°F (871°C) to 2,000°F (1,093°C) within minutes, hot enough to melt aluminum and ignite surrounding combustibles within seconds.

"The duct system is but one component of the safety intervention associated with grease risk factor. But it's a crucial factor–it must be hermetic and designed in a fashion that it can be cleaned and doesn't leak," says Tom Johnson, owner of Johnson Diversified Products, a consulting and manufacturer's representative firm.

Johnson serves on the NSF Joint Committee for Food Equipment, as well as Underwriters Laboratories, Inc.'s User Advisory Council.

NSF provides product certification and safety audits for the food and water industries.

Types of systems

Several types of grease duct systems are currently available. For years, the rectangular site-built system, made of carbon steel, welded on site, and enclosed in a constructed, fire-rated shaft, was the only system allowed. Various building codes specify the construction, building materials are easy to come by, and the system can be customized on site.

In the early 1960s, the rectangular, site-built, duct-wrapped system made its debut. Instead of being enclosed in a constructed shaft, the duct is wrapped in layers of insulation, and the seams are taped or clamped. This type of system reduces code-prescribed clearances to combustibles, in some cases to zero.

Finally, there's the factory-built, insulated, integral-chased duct system that came into being when manufacturers of insulated chimneys realized the product they used for industrial chimneys could also be used to replace welded grease ducts, duct wraps, and constructed shafts. The components of this type of system are manufactured and inspected off site, and assembled

PHOTOGRAPH: COURTESY THERMAL CERAMICS

on site, without welding. The stainless steel duct is cylindrical, wrapped with insulation, and enclosed with a stainless-steel casing.

Each system design has different weaknesses and strengths

Among the weaknesses are inconsistent welds, which expand at different rates and often fracture or contort the duct system. If the torsion is too great, the duct can separate itself from supporting braces. At best, the system must be repaired; at worst, the shaft may be damaged or the duct may move too close to surrounding combustibles.

When welds are inconsistent or fractured, or when adjoining components aren't sealed and assembled according to manufacturers' specifications, the duct may also leak, depositing more grease that can produce hotter, longer-lasting fires.

"The closer we get to zero for a deposition rate, the safer the assembly," Johnson says. "The safest assemblies are totally insulated [so] there is no temperature change in the side wall. When you have a stream of air that is hotter than the duct wall, you end up with condensation and precipitation. It's basic physics. Just like stepping out of the shower in the morning and seeing condensation on the windows."

A consistent cleaning schedule for grease ducts is essential. Depending on use, ducts can be cleaned monthly, quarterly, or semi-annually, as prescribed by the NFPA 96, *Ventilation Control and Fire Protection of Commercial Cooking Operations*.

According to 11.3 Inspection of Exhaust Systems, "The entire exhaust system shall be inspected by a properly trained, qualified, and certified company or person(s) acceptable to the authority having jurisdiction in accordance with Table 11.3."

When welds in grease duct systems are inconsistent or fractured, or when adjoining components aren't sealed and assembled according to manufacturers' specifications, the duct may also leak, depositing more grease that can produce hotter, longer-lasting fires.

Factory-built grease duct undergoes extreme heat testing.

Table 11.3, Exhaust System Inspection Schedule, dictates that systems serving solid fuel cooking operations should be cleaned monthly. Systems serving high-volume cooking operations such as 24-hour cooking, charbroiling, or wok cooking should be inspected quarterly. Those systems serving moderate-volume cooking operations should be inspected semi-annually and systems serving low-volume cooking operations, such as churches, day camps, seasonal businesses, or senior centers should be inspected annually.

Cylindrical, stainless-steel ducts are generally easy to clean with rotary cleaning systems that push the grease down the inside walls towards cleanouts. Welded rectangular ducts are cleaned with a pressure wash system or by scraping deposits where they pool in corners, which may create leaks.

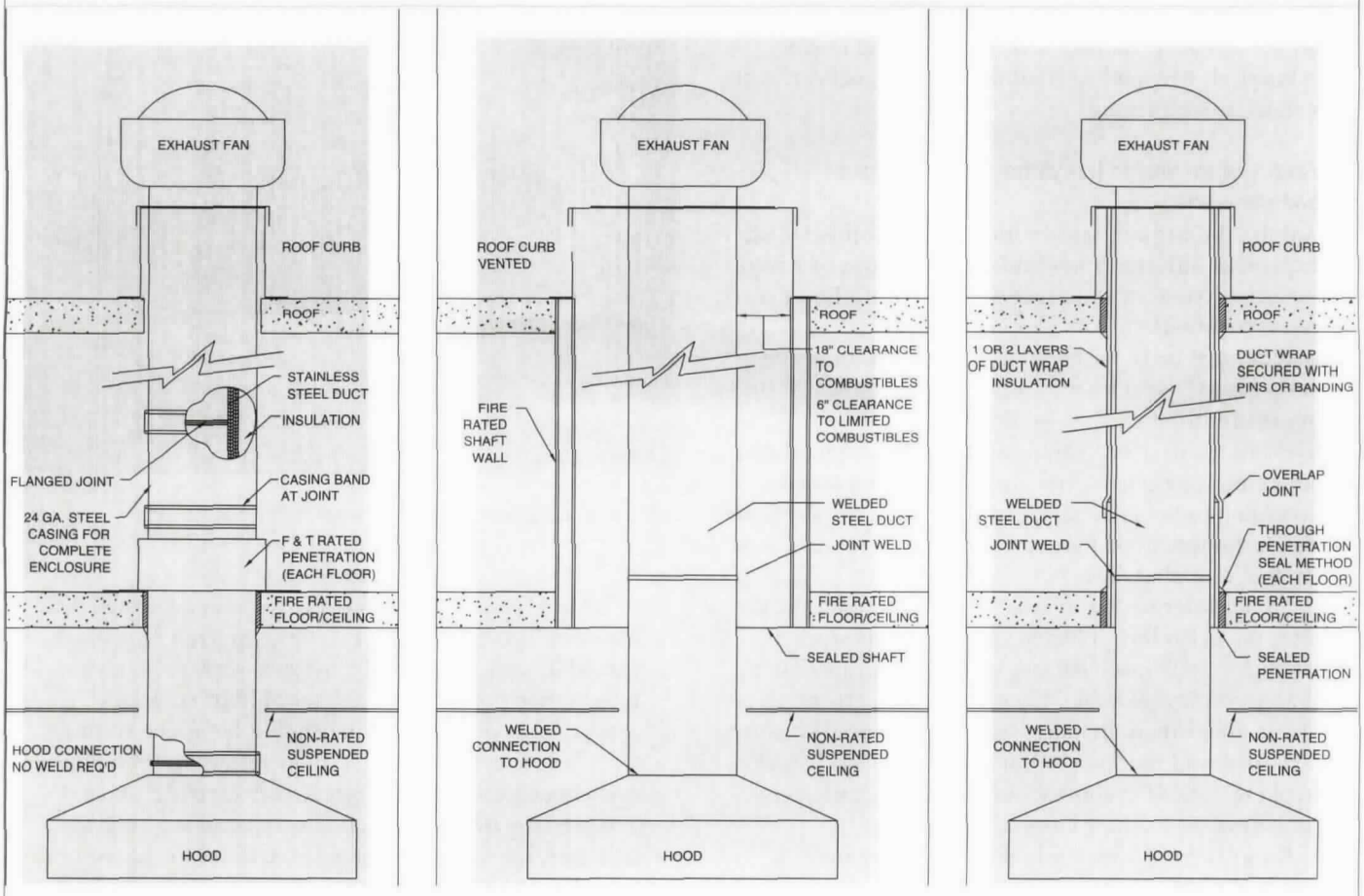
Another problem results when duct enclosures are damaged. In areas where damage can occur, extra protection is required.

Duct system designers must also consider the surrounding combustibles, especially when penetrating fire-rated walls, floors, or ceilings. Codes and test standards specify the clearances between duct systems and combustibles, which engineers and architects usually prefer to be as small as safely possible.

"Space is a premium. If you can save just 1 square foot (0.09 square meters) of space in an overall building, you are saving dollars," says Vicky Floyd, a senior marketing manager for the duct-wrap manufacturer Thermal Ceramics.

Other factors designers must take into consideration are the possible structural effects of a grease fire. After a fire has been extinguished, inspectors must look at the system to see what failed and decide whether the system needs to be replaced. The cost of replacing a system may be significant, but it's nothing compared to the cost of fire that escapes confinement.

PHOTOGRAPH: COURTESY METAL FAB



Three grease duct systems

Code complexities

NFPA 96 is the installation standard that regulates the way grease duct systems are installed in a structure once they have met the requirements of the various product standards. Perhaps the most widely accepted grease duct product standard is UL 1978, *Standard for Grease Ducts.* However, there are other product testing standards, and authorities having jurisdiction (AHJs) can accept all or none of them. No single product is accepted everywhere.

This makes it expensive and labor-intensive for manufacturers to go to market, since they must test to multiple standards and adhere to code requirements that vary by area of the country and sometimes conflict. It also limits engineers' and installers' choices.

"The lack of conformity or harmonization from one region to another gets confusing for the industry," says Shaun Ray, director of Engineering for Metal-Fab Inc., a manufacturer of factory-built grease duct products. "The industry has been looking for one type of test for all products, a unified standard for a safe system that simplifies the approval process."

In 2000, industry experts began developing a new UL test standard that, combined with UL 1978, would do just that: evaluate an entire grease duct system from hood to roof, regardless of fire-rated structure penetrations. The new standard would be one that code-making bodies could accept, would apply to both factory-built and duct-wrapped systems, would be easy to reference, and could be confidently enforced. After three years and three sets of revisions, UL 2221, *Tests of Fire Resistive Duct Enclosure Assemblies,* was published.

The next step in the simplification process occurred in 2003, when the NFPA 96 committee decided to incorporate UL 2221 into the next edition of NFPA 96.

"UL 2221 is a test to determine the fire resistance of grease duct enclosures and is used to evaluate classified grease duct enclosures as required in NFPA 96," says Roy Meacham, principal engineer, Solid Fuel, Chimneys, and Venting, for UL.

The standard is a rigorous one that requires that tested samples retain 75 percent of their structural integrity after they've been subjected to a severe internal fire test, an external fire-engulfment test, and a through-penetration test.

When discussing how incorporating UL 2221 into NFPA 96 affects factory-built and duct-wrapped grease duct systems, David Demers, chair of the NFPA Technical Committee on Venting Systems for Cooking

ILLUSTRATION COURTESY CHRIS EDEN

Appliances, points out that the revision doesn't indicate equivalence in safety.

"Both are acceptable solutions. It's just that now there is a reliable way for evaluation based on a UL standard," says Demers.

The revised version of NFPA 96 is up for adoption at the 2004 World Safety Conference and Exhibition™ in Salt Lake City, Utah, this May.

The submitter of the NFPA 96 revision is the Technical Committee on Venting Systems for Cooking Applications and its recommendation reads: Revise Section 4.3.1 to read:

"Field-applied grease duct enclosures and factory-built grease duct enclosures shall be listed in accordance with UL 2221, *Standard for Tests of Fire Resistive Grease Duct Enclosure Assemblies*, or equivalent standard and installed in accordance with the manufacturers' instructions and the listing."

How will these changes affect the industry?

"Uniform standards can only help the industry," says Metal-Fab's Ray. "Providing that systems are designed to meet the standards, better safety is the result."

With consistent, industry-accepted standards, facility designers can use the duct design that best fits their goals, and inspectors can rely on UL listings for construction quality. A uniform test standard also gives insurance underwriters something by which to measure the long-term performance of different systems.

"When the risk management insurance society starts looking at the data of losses," Johnson says, "...maybe they'll start providing a break to building owners with duct systems that are tested for a specific use."

In a complex industry, any opportunity to consolidate standards, improve codes, and improve safety is a step forward. NFPA is poised to take that step, and the rest of the industry is ready to follow.

Origin and Development of NFPA 96

The subject of the ventilation of restaurant-type cooking equipment was first considered by the NFPA Committee on Blower and Exhaust Systems. That committee developed material on ventilation of restaurant-type cooking equipment to be included in NFPA 91, *Standard for the Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying*. This was adopted by the Association in 1946. Revisions to the applicable sections were adopted in 1947 and 1949.

Long history

When the NFPA Committee on Chimneys and Heating Equipment was organized in 1955, the material on ventilation of restaurant cooking equipment in NFPA 91 was assigned to this new committee with the suggestion that it be revised and published as a separate standard. Thus, in recent years this standard has been published as NFPA 96. Previous editions of the standard prepared by the Committee on Chimneys and Heating Equipment were adopted by the Association in 1961, 1964, 1969, 1970, 1971, 1973, 1976, 1978, 1980, and 1984.

The Correlating Committee on Chimneys and Other Heat and Vapor Removal Equipment was discharged by the Standards Council in 1986. The Technical Committee that prepared the 1987 edition became known as the Technical Committee on Venting Systems for Cooking Appliances.

Name change for standard

In the 1991 edition, clearance requirements to combustible material were revised and expanded, including appendix figures that illustrate examples. A new definition for limited-combustible was added to the standard, and an appendix table was included to show typical construction assemblies. Chapters 3 and 4 were totally revised.

In the 1994 edition, the Committee changed the name of the standard from Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment to Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations. The title change reflected other changes in the standard; two new chapters on recirculating systems and solid fuel cooking operations were added in 1994. A change to clearance and enclosure requirements in the 1994 edition allowed, for the first time, materials or products to be directly applied to a duct.

The Committee prepared a revision to the standard, reporting to the 1996 Fall Meeting, that was returned to the Committee at the Technical Committee Reports Session.

The 1998 edition of NFPA 96 contained new definitions, minor revisions throughout, and a completely revised Chapter 7 on fire-extinguishing equipment.

This 2001 edition revises the document scope to clarify the application of the standard regarding residential-type cooking equipment. Further technical changes clarify requirements for duct installation, roof top terminations, and fire protection equipment. This edition also contains a significant organizational and editorial revision based on the NFPA Manual of Style.

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

SECTIONNEWS

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

In This Issue

Architects, Engineers, and Building Officials

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

HOT ISSUES

AEBO Sponsors Training

AEBO will sponsor seven training opportunities at the 2004 World Safety Conference and Exposition™ (WSCE) in Salt Lake City. These are extremely timely, given that they all relate to NFPA 5000™, *Building Construction and Safety Code™*, which is currently in the middle of its revision cycle.

On Sunday, May 23, three programs will be presented. Sal DiCristina from Rutgers University will discuss Chapter 15 of NFPA 5000 and the application of building codes in the rehabilitation of existing buildings. Andrew Stuffler of Ventura City, California, and NFPA's Allan Fraser will discuss how to manage records and documents effectively in today's building departments. And Mike Ashley from the city of Rome, Georgia, will lead a panel discussion on "The Inspection Process," which will address the how, what, and when of building code inspections.

On Monday, May 24, Peter Willse of GE Global Asset Protection Services will review ASCE 7's structural requirements for code officials, contractors, designers, and owners. A. Hal Key, fire inspector for the city of Mesa, Arizona, and Lawrence Spielvogel, P.E., of L. G. Spielvogel, Inc., will address what first responders should know about HVAC systems. And John Kampmeyer of Triad Fire Protection Engineering, Inc. will lead a discussion of the ins and outs of applying NFPA 900, *Building Energy Code*.

Finally, Sal DiCristina and Robert Davidson of The DiCristina Group will present an AEBO-sponsored seminar on Tuesday afternoon entitled "A Wall Is Not a Wall," explaining the differences in design and construction of fire walls, fire barrier walls, partitions, and smoke barriers, and their proper uses, as described in NFPA 220, *Types of Building Construction*; NFPA 221, *Fire Walls and Fire Barrier Walls*; and NFPA 5000.

For a seminar schedule, please visit the section Web site at www.nfpa.org/aebo.

Revisions to NFPA 5000

An impressive 1,159 proposals to NFPA 5000 were submitted for the current cycle. They are available on line, and the ROP mailing date is scheduled for July 23, 2004. The comment closing date is October 1, 2004. A seminar at the WSCE will highlight many of these changes.

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

Aviation

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

HOT ISSUES

What's New This Summer?

Following the endorsement by NFPA membership and the approval of the NFPA Standards Council, the new editions of the aircraft rescue and firefighting (ARFF) and airport facilities standards should be available this summer. Here's what's new.

Aircraft painting

Painting in hangars is a common practice among all airframe manufacturers and many companies that retrofit aircraft. The two committees responsible for NFPA 409, *Aircraft Hangars*, and NFPA 410, *Aircraft Maintenance*, share some members, so they coordinated the revisions to both documents between them. NFPA 409 covers the construction and fire protection criteria for hangars, while NFPA 410 expands upon the safety requirements for painting operations. Some of the important topics covered are fire protection systems, ventilation and air movement, internal separations, electrical equipment, interlocks and shutdowns, vapor concentrations, control of flammable and combustible liquids, cleaning of spraying equipment, static electricity, housekeeping, inspection, and maintenance.

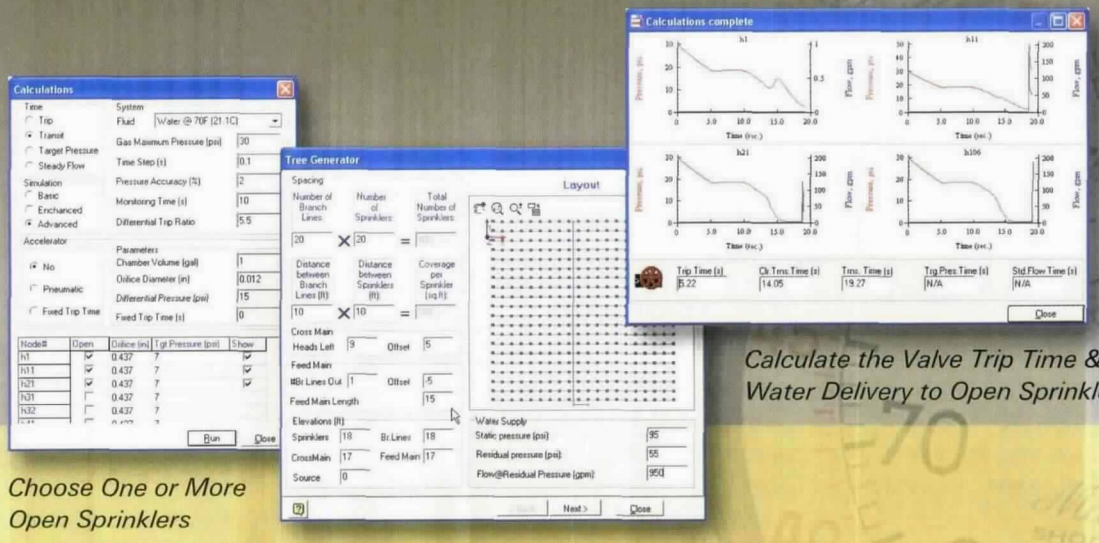
ARFF

Three NFPA ARFF documents were also updated. NFPA 405, *Recommended Practice for the Recurring Proficiency Training of Aircraft Rescue and Fire-Fighting Service*, became a standard, allowing airports to determine quickly how proficient firefighters should be in these areas. The document expands the outline provided in the FAA airport certification document with detailed requirements on topics such as airport and aircraft familiarization, firefighter safety, communications systems, extinguishing agents, vehicle and firefighter operations, protective clothing and breathing apparatus, live firefighting, and water rescue.

NFPA 422, *Guide for Aircraft Accident Response*, which is used by airport fire departments to document incidents and accidents, now contains a new aircraft incident report form that is shorter and easier to use than the previous version. With the new form, the committee hopes to collect more data it can use to keep the other ARFF standards current and useful.

It's about Time!

SprinkFDT– Dry Pipe System Water Delivery Calculations



Calculate the Valve Trip Time & Water Delivery to Open Sprinklers

Choose One or More Open Sprinklers

Fast, Easy Data Entry

SprinkFDT™

DESIGN SOLUTIONS SprinkCAD® SINCE 1986

For the First Time Ever:

- Design dry sprinkler system layouts with confidence
- Calculate exact time for water delivery
- Calculate one or more open sprinklers on the system
- UL Listed, FM Approved
- Patent Pending

For additional information or to purchase software from the SprinkCAD® Software Suite call (800) 495-5541 *or visit our website at:* **www.sprinkcad.com**

tyco
Fire Products

VISA MasterCard

The World's Leader in Fire Protection Equipment & Software – www.Tyco-Fire.com

Circle 056 on Reader Service Card

Aircraft cabin fire extinguishers
NFPA 408, *Aircraft Hand Portable Fire Extinguishers*, which covers onboard fire extinguishers, has new testing and listing criteria that will allow halon alternative extinguishers to be installed in aircraft. This change was enabled by research the FAA conducted at its research center in Atlantic City, New Jersey. Previously, only halon extinguishers could be used for many aircraft cabin applications.

The new editions of these standards should be available in August in several formats, including print, CD, and on-line.

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

Building Fire Safety Systems

WEB SITE: http://www.nfpa.org/bfss
CHAIR: Neal Krantz, Siemens Fire Safety, Livonia, Michigan

HOT ISSUES

Executive Board Nominations
The Building Fire Safety Systems Section Nominating Committee, chaired by Neal Krantz, has nominated Raymond Grill as chair of the section Executive Board, Roland Huggins as vice-chair, and Art Black as secretary. Grill is currently vice-chair, Huggins is secretary, and Black is a director.

The committee also submitted the name of Kevin Kelly for section director, Joe McElvaney for a second two-year term, and William Fries, Robert Kroll, Shane Cleary, and Thomas Harned for a first two-year term. Dean Wilson, David Pelton, Thomas Hammerberg, and Black have completed their terms.

Other members of the nominating committee are Thomas Antal, April Berkol, David Pelton, and Ronald Mengel.

Voting will take place during the section business meeting on Tuesday, May 25, from 2 to 3 p.m. at the NFPA World Safety Conference and Exposition™ in Salt Lake City. All section members are strongly encouraged to attend.

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

Education

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

HOT ISSUES

An Informed Citizenry
By PEG CARSON
Many fire departments in the United States have instituted a "Citizen Academy" or some other training mechanism that builds the fire- and life-safety skills of teens and adults, then uses them to benefit the larger community. This great effort adds trained, knowledgeable volunteers who are ready to assist the department in many tasks that do not require a uniformed member, allowing them to extend services not otherwise available.

Another benefit of a trained community of volunteers is an increased appreciation for, and knowledge of, fire and emergency services. This cadre of volunteers becomes an advocate for safety in their own homes and in their neighbors'. What a great, cost-effective, win-win idea!

At our October meeting in Reno, Cindy Giedraitis, public education officer for the College Station, Texas, Fire Department, presented her department's experience organizing a Community Action Response Team. We thank her for sharing the information here with those of you who couldn't join us in Reno.

Community Action Response Teams
By CINDY GIEDRAITIS
The College Station, Texas, Fire Department established the Community Action Response Team (CART) to provide assistance and emotional support to those dealing with stressful situations following a fire or other emergency that requires evacuation.

The CART's 15 volunteers, all graduates of the College Station Citizen's Fire Academy, provide victims with ongoing assistance, such as recovery information, shelter, packing boxes, clothes, and any other service needed during and after an incident. Members take monthly rotation schedules and are alerted to situations by the fire department paging system.

The CART has responded to more than 20 fires since its inception in 2002,

The College Station, Texas, Community Action Response Team in action.

several of which involved Texas A&M University students. On November 20, 2003, for example, the team helped seven students whose apartments were damaged by a fire ignited by an improperly discarded cigarette.

When a Texas A&M University student is involved in a fire, the CART coordinates assistance from the university's critical incident response team and connects victims with support from community and social service organizations such United Way's 211 or the Red Cross. We stand by victims for as long as necessary and follow up regularly. We even bring a "tool kit" to all fire scenes, stocked with "After the Fire" information kits, blankets, water bottles, cell phones, phone books, flashlights, and gift cards to replenish lost clothing.

For more information about the program, visit the College Station Fire Department web site at www.cstx.gov or contact Cindy Giedraitis, public education officer, at (979) 764-3712 or cgiedraitis@cstx.gov.

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

Electrical

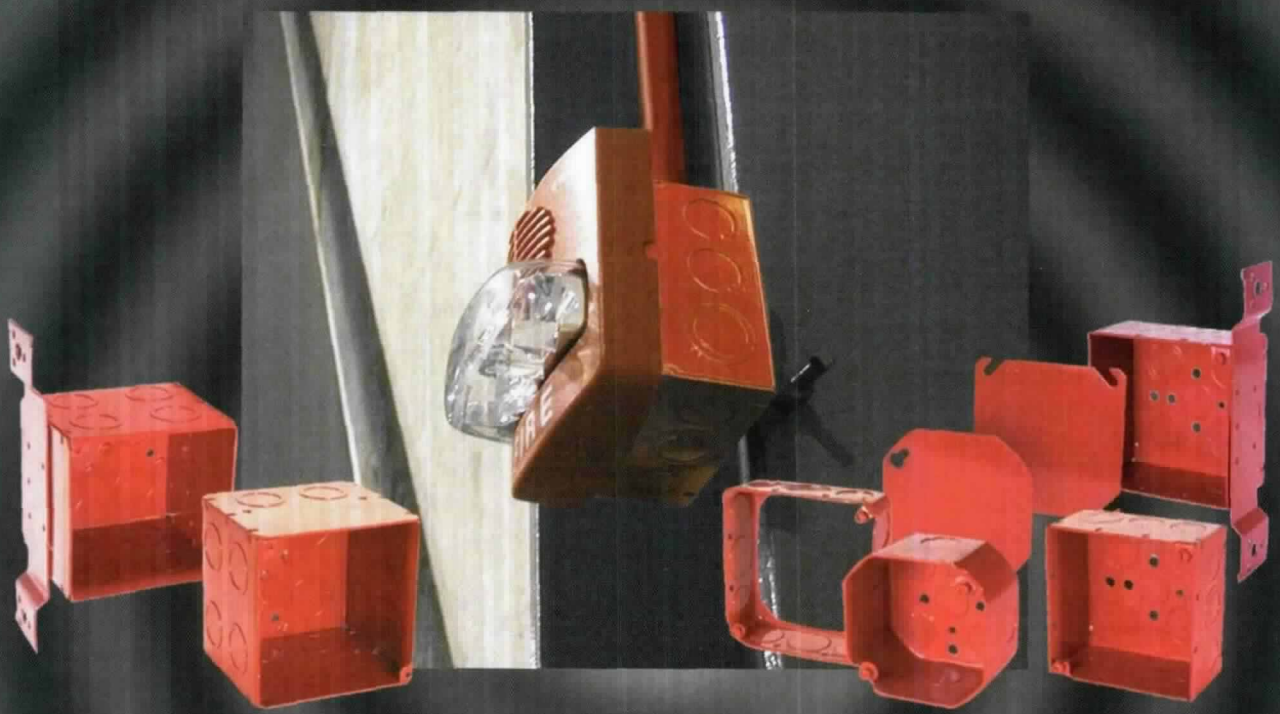
WEB SITE: http://www.nfpa.org/electrical
CHAIR: Richard Loyd, R&N Associates

HOT ISSUES

Supporting Floor Amendments
One time-honored function of the Electrical Section is to provide its members with the opportunity at the Electrical Section Codes and Standards Forum to solicit support and offer technical background for amending the National Electrical Code Committee's

RED ALERT™

RACO® Introduces a custom series of products designed for the installation of alarm/fire or life safety systems.



911-1 and 911-2

New large capacity boxes are designed to fit oversized alarm devices.

911-3 through 911-10

Standard products are also available, powder coated red, for general alarm and security applications.

- Easy identification of products containing cabling relative to life safety systems
- Prevents the need for painting or labeling on the job site
- For industrial, commercial or residential applications

HUBBELL®

ELECTRICAL PRODUCTS

A Division of Hubbell Incorporated (Delaware)

For more information call **574-234-7151** or visit **www.hubbell-electrical.com**

RACO® BELL® KILLARK® HAWKE® CHALMIT®

Circle 026 on Reader Service Card

report, presented to NFPA membership for adoption at the May Technical Committee Report (TCR) session. In the past, the forum has been part of the section's business meeting. This year, however, it will be part of the *necforum* educational symposium, to be held on Tuesday, May 25, from 1:30 to 5:30 p.m. at this year's World Safety Conference and Exposition™ in Salt Lake City. The TCR session will be held on Wednesday at 8 a.m.

What is the TCR session?
The penultimate step in the three-year development schedule of the 2005 *National Electrical Code®* is the membership vote on the report of the National Electrical Code Committee at the May TCR session. Those who have been members of NFPA for not less than 180 days before the a TCR session may vote to recommend the adoption of the committee's report, consisting of the 2005 *Report on Proposals* (ROP) and *Report on Comments* (ROC).

In accordance with the *Regulations Governing Committee Projects*, those who submit a proposal or comment, or their designated representative, can make a motion to amend the portion of the TCR that is the subject of their proposal or comment. There is an opportunity to discuss these motions, which pass only if must they receive a majority affirmative vote of the voting members attending the TCR session. The outcome of voting on TCRs is one of the components the Standards Council will consider when deciding which documents to adopt when it meets in July for the final step in the code-development process.

What is the Codes and Standards Forum?
At the Codes and Standards Forum, section members who wish to make an amendment motion on the floor of the TCR session can solicit support for the proposal from the section. An affirmative vote to support the motion is non-binding, but it is reported to the general voting membership as an action the Electrical Section officially supports, demonstrating to the general membership that the proposed amendment has technical merit. This session is open to all registered conference attendees, but only section members may make motions.

Something different for 2004
In the past, the Electrical Section has sponsored reports from the *NEC* code-making panel chairs as part of the educational program. This year, the chairs will instead present short overviews of their activities at the *necforum* and answer questions from the floor. This will allow section members to solicit support for their proposed amendments.

To provide enough time for all proposed motions to be discussed, the Electrical Section Executive Committee asks that information about the motions be submitted before the Codes and Standards Forum starts. This can be done at any time up to the start of the meeting. Those who want to get on the agenda should submit their proposed amendment to Electrical Section Executive Secretary Jeff Sargent at jsargent@nfpa.org. Please include the proposal and comment number on which you intend to speak.

What happens between the TCR session and the Standards Council meeting?
At the TCR session, floor amendments must receive a majority affirmative vote to pass. Successful floor amendments are re-balloted through the respective code-making panel and the NEC Technical Correlating Committee (TCC).

To be approved by the National Electrical Code Committee, a successful floor amendment must receive a two-thirds affirmative vote from the code-making panel responsible for the text the amendment affects, as well as an affirmative vote from the TCC. Motions that do not pass the code-making panel and TCC ballot may be appealed to the Standards Council at its meeting in July.

For more information on the NFPA codes-and standards-making process and the TCR session, visit www.nfpa.org.

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

Fire Science and Technology Educators

WEB SITE: http://www.nfpa.org/firescience
CHAIR: Ronald Hopkins, Eastern Kentucky University

HOT ISSUES
Section Executive Board Meeting
The Fire Science and Technology Educators Section Executive Board will meet in Salt Lake City at the NFPA World Safety Conference and Exposition™ on Sunday, May 23, to plan section business for the coming year. At the section business meeting on May 24 from 5:30 to 6:30 p.m., the Section Nominating Committee will present the slate of officer for the coming year. All section members are encouraged to attend.

The section will also sponsor two education seminars during the conference. From 8 to 9:30 a.m. on Sunday, May 23, Richard Bennett will discuss "Emotional Intelligence: A Futuristic Promotional Technique," and from 2:30 to 4 p.m. on Monday, May 25, Patrick Kennedy will present "Flashover and Fire Analysis—A Discussion of the Practical Use of Flashover Analysis."

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

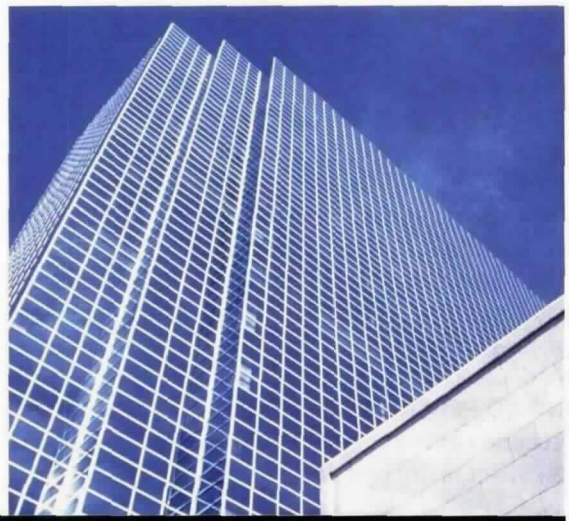
Fire Service

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

HOT ISSUES
Nominating Committee Report
The section Nominating Committee, chaired by Murrey E. Loflin, has submitted the following individuals for election to the section Board of Directors:

Chair: Terry Allen, Cambridge Fire Department, Cambridge, Ontario, Canada
Vice-Chair: Kirk Owen, Plano Fire Department, Plano, Texas
Secretary: Peter McMahon, Grand Island Fire Department, Grand Island, New York

If You Want "No Problem" Installation and Performance From the Sprinkler Components You Install, You Need AGF RiserPACK®



COMMERCIAL RISERPACK® TESTANDRAIN®

Commercial Models 8000/8011 **(1-1/4", 1-1/2", 2")**

AGF Manufacturing Inc. manufacturers high quality specialty products for Fire Sprinkler Systems.

- Fully assembled, easy to install compact unit saves time and money
- UL listed, domestically produced cast bronze body has 300 psi rating
- Every **RiserPACK®** and **TESTanDRAIN®** product is tested before it leaves AGF
- Prefabricated riser includes water flow switch, gauge, 3-way gauge valve and appropriate drain valve and complies with NFPA 13
- Optional relief valve can be installed or serviced without draining the system
- Available in NPT or grooved

For complete specifications, call **(610) 240-4900**. Our experts are always on hand to assist you with your needs. Thank you for considering AGF.

Commercial Floor Control

- Built-in test port allow hydrostatic testing without *draining the system*
- Unique configuration eliminates need to drain system before installing relief valve
- Available with PRV to meet NFPA 13 *requirements* for gridded systems and any system requiring a pressure regulating valve
- 1-1/4 - 2" sizes available in cast bronze bodies with TESTanDRAIN® valve
- *All sizes include mandated* NFPA 13 Inspectors Test connection (3/8" to 14K ESFR) and flow switch, gauge and gauge valve
- Threaded connection to 2" and grooved connection in 1-1/2 and 2"

Model 8000

	1-1/4"	1-1/2"	2"
A	14-1/2"	15-1/2"	15-1/2"
B	14"	14-1/4"	14-3/4"
C	4-3/4"	4-3/4"	5"
D	6-1/2"	6-3/4"	7"
E	11"	12"	12"

Model 8011

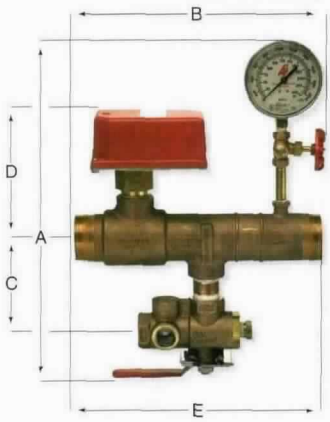
	1-1/4"	1-1/2"	2"
A	11"	12"	12"
B	12-1/4"	2-1/2"	13"
C	4"	4-1/8"	4-3/8"
D	6-1/2"	6-5/8"	6-7/8"
E	11"	12"	12"

Not pictured, but also available:

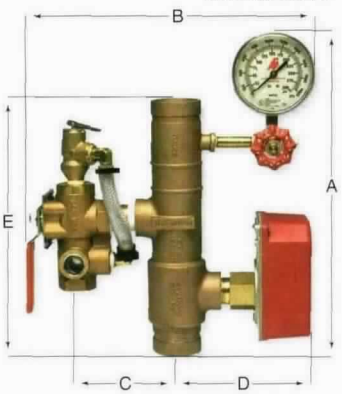
Commercial "Shot Gun"

- Complete, prepackaged assembly of all equipment required for commercial applications
- Prefabricated riser *includes water flow switch*, gauge, 3-way gauge valve and appropriate drain valve.

Model 8000



Model 8011



MADE IN U.S.A.

AGF Manufacturing Inc.
100 Quaker Lane, Malvern, PA 19355

T: (610) 240-4900 / F: (610) 240-4906
Email: info@testandrain.com
Web: www.testandrain.com

Reliability, Versatility, Code Compatibility

Director: Michael A. Wieder, Fire Protection Publications, Stillwater, Oklahoma
Director: Sandy Bogucki, Yale University, New Haven, Connecticut
Director: Stephen E. Norris, United Firefighters of Los Angeles City, Los Angeles, California

Murrey E. Loflin of the Virginia Beach Fire Department, Virginia Beach, Virginia, has been nominated for election to chair of 2005 Nominating Committee. Other nominees to the committee are Glenn Benarick of Fairfax County Fire and Rescue, Fairfax County, Virginia, and David Kerr of the Plano Fire Department, Plano, Texas.

Members of the 2004 Nominating Committee also include Bill Donahue and Monique Cardwell.

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

Health Care

WEB SITE:
http://www.nfpa.org/healthcare
CHAIR: Richard Strub, Grace Healthcare, Chattanooga, Tennessee

HOT ISSUES

Chair's Corner
By DICK STRUB

The health-care industry has been the subject of two tentative interim amendments (TIAs) to NFPA 101®, *Life Safety Code®*, in the last few months. One was directed at the nursing home industry, while the other would have affected both long-term care facilities and hospitals, with the major emphasis on hospitals. The first, proposed by the International Fire Marshal's Association (IFMA), dealt with the retroactive installation of sprinklers in existing nursing homes, and the second involved regulated, strategic placement of alcohol-based hand sanitizers in health-care facility corridors.

The TIA requiring sprinkler systems in all existing nursing homes did not pass ballot of the committee by the required majority on the emergency nature of the issue and barely met the required technical aspect. Neither issue met the required majority during re-balloting, either, so the Standards Council did not issue the TIA.

The Standards Council's decision will give the nursing home industry the time it needs to determine sources of funding and develop specification/bid packages for submittal to multiple contractors. It will also give the fire sprinkler industry time to gear up to handle the approximately 3,500 facilities that will be affected over three to four years.

It is worth mentioning that the American Health Care Association (AHCA) has submitted a proposal to the Health Care Occupancy Technical Committee of the Life Safety Code that makes the installation of sprinklers mandatory in all existing nursing homes in the 2006 edition of the code. The AHCA recommended this position to its Executive Board before the second multiple-death nursing home fire of 2003 occurred in Nashville, Tennessee.

The other proposed TIA would have permitted the placement of regulated alcohol-based hand-sanitizer dispensers in corridors, a subject on which the existing code is silent. It, too, was defeated, and the Standards Council did not issue the TIA. This means that the current code language neither permits nor prohibits placement in corridors, giving the authority having jurisdiction the responsibility for the decision.

I feel, however, that it is critically important that enabling language be incorporated into the *Life Safety Code* so as to remove any doubt. Statistics indicate that as many as 90,000 deaths occur each year because of infections patients contract in a hospital or, to a lesser degree, a nursing home. It is estimated—and testing results support the estimate—that as many as one-third of these infections could have been prevented had staff had easier access to alcohol-based sanitizers through strategic placement in the corridors.

The Centers for Disease Control are extremely interested in this issue because of the life-saving potential. Meanwhile, the Joint Commission on Accreditation of Healthcare Organizations is revising its current stance, which doesn't allow new installations of alcohol-based sanitizers in corridors. This decision is supported by the results of fire-modeling testing undertaken by ASHE/AHA.

Long-Term Care Renovation: A Simple Process

Most people have misconceptions about renovating or remodeling a long-term care building full of elderly residents. You might think the process is the same as that for any other type of building, but this is not the case. With a building full of elderly residents, things are different.

Although some residents may be quite alert, others will exhibit different stages of dementia, memory loss, and physical challenges. They may be friendly or ask you to get out of their rooms. After all, their rooms are their homes, and intruders must treat them as such. This is one of the least-understood concepts about long-term care, as a maintenance company hired to work in long-term care buildings discovered.

The company was excited about the challenge and the contract. During the first field meeting, the contractors said they would do the heavy maintenance after hours, just as they did for other clients. When they learned that the buildings operated 24-7, however, and understood that they would have to work with and around the residents, they pulled out of the contract.

The long-term care environment requires that workers be patient and courteous to the elderly residents. There are other differences, too.

Health care is one of the most highly regulated industries in the United States. In most states, the local building officials do not issue permits for the work or inspect the project, or they have a very limited hand in these processes. Permits and approvals are usually up to the state, and most states have a plan review process that must be completed before the project begins. In some instances, the state offices notify city or county governments, which also review documents, issue permits, and inspect projects.

Generally, plans must comply with the state and city building and disability codes, as well as NFPA fire- and life-safety codes. The federal government has adopted the 2002 edition of NFPA 101, *Life Safety Code*, as the code all states must use for life-safety reviews, unless a state has an approved alternate statute. However, getting these approvals can be a formidable process that takes months and alters the overall concept and scope of the project.

While some states have their own inspectors who are present on a regular basis, others rely on the city and county officials. In extreme situations, some

Low Draw Wins!

Introducing our new
Low Draw Explosion Proof Strobe

Our model LSEX is a sure bet at a draw of only 500mA.

- Made in the USA
- UL Listed
- Div 1 & 2
- Class 1, Groups C,D
- Class 2, Groups E, F, G
- Clear, Red, Blue, or Amber lens
- Ceiling or wall mounting units

For a complete deal on all our explosion proof and life safety equipment, visit our website at www.cpglifesafety.com or call us at 1-800-521-8219.

CPG Signals

WWW.CPGLifeSafety.com

Circle 069 on Reader Service Card

Commercial Products Group
2519 4th Avenue
Moline, Illinois 61265
1-800-521-8219

state agencies require the building owner to hire a special inspector, whom they must approve, to be on site at all critical times during construction. This inspector provides daily written reports to the state agency for review, as well as written approval for all stages of the project as it progresses. Other states require architects and engineers to review the work and never visit the project at all.

To further complicate the matters, most states have cut their plan review departments' budgets, making the review process much longer than expected. This does not help keep costs low.

If you want your bid pricing to include all the changes, it is best to wait until after the plan review has been completed and approvals granted. Some plan reviewers are notorious for interpreting codes differently than the norm, and their final review may add significant costs and change the project as originally planned.

During a remodel to an existing building, for example, the plan reviewer could require that the entire building and all building systems be brought up to new construction standards. Although this might be contrary to normal interpretations of the codes, it does happen. The owner must then decide whether to challenge the authority having jurisdiction or abandon the project. It can be a very costly decision.

After the plans are approved and the decision to proceed is made, a pre-approved contractor prices the project or the project is distributed for bidding. The bidding process is generally the same as that for all building types. After a contractor is selected and the contracts are signed, the architect or owner issues a Notice to Proceed that triggers a series of events.

The building management sends a notice to the residents' families, informing them that the renovation process is to start on a given date, and the owner, architect, and contractor set up a pre-construction meeting to review the preliminary work schedule and set project parameters.

Communication between the contractor and the building operator is essential. Most projects in existing buildings involve removing and replacing building finishes, which, with a building full of residents, takes a lot of coordination among all parties. Residents have to be moved from rooms and their personal belongings taken care of by a staff member. Some projects only move residents during the day so they can return to their rooms in the evening. Others require that they relocate to another room until their rooms have been remodeled.

Ideally, the building will have a group of vacant rooms that can be sealed off from all but the construction team in which the contractor can work. However, most buildings do not have this luxury so most renovations take place around residents.

A primary concern in a long-term care building project is safety, a priority that requires special efforts by residents, staff, visitors, and workers. All contractors must have special safety and work rules that are absolute and are grounds for dismissal of those who do not follow them. Basic safety procedures include closing doors to rooms in which the contractors are working, installing plastic dust barriers, picking up tools, and watching out for each other and the residents at all times.

After the facility has been remodeled, final approvals by all agencies are required. Some states require their own inspectors to review and approve all construction to make sure that no changes were made that were not part of the approved documents, or, if changes were made, that approvals for them were documented and approved. Generally, all parties require that the final project match the approved plans. Most agencies also require certified cost and final documents signed by all professionals and inspecting agencies other than their own.

The renovation process that seems simple at first glance usually takes at least one year to complete.

Schedule of Events for 2004 WSCE

The Health Care Section has a very full agenda this May, sponsoring seven events:

Sunday, May 25

8 to 9:30 a.m.	Special-Care Area Fires
10 to 11 a.m.	Safety During Surgery–Ambulatory Facilities
11:30 a.m. to 12:30 p.m.	Code Compliance Issues

Monday, May 24

8 to 11 a.m.	Codes and Standards Review
2:30 to 4 p.m.	Security Issues and Concerns
4:30 to 5:30 p.m.	Wiring in Health Care Facilities
5:45 to 8 p.m.	HCS Executive Board/Business Meeting

Tuesday, May 25

1:30 to 2:30 p.m.	HCS Town Meeting

Please visit www.nfpa.org for a detailed look at all conference activities, events, and schedules.

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

Industrial Fire Protection

WEB SITE: http://www.nfpa.org/industrial
CHAIR: Mike Newman, Johnson & Johnson

HOT ISSUES

Chair's Corner
By MIKE NEWMAN

It's hard to believe, but the time has come. This will be my last "Chair's Corner" as chair of the IFPS, and I'll be moving on to join the ranks of past chairs. Before I do, though, I want to express my gratitude for the opportunity to serve the section over the past several years, especially the last three as section chair. I'd also like to thank all the Board members past and present whose hard work and dedication made my tenure as chair all the easier. They truly are a great group of people, and the proposed slate of incoming officers and board members will continue that tradition. Finally, a most important thanks to Executive Secretary Guy Colonna and his assistant Patti Mucci. They do an outstanding job for the section, both in the day-to-day details and in providing that educated opinion when needed.

At the last board meeting, held in Las

Finally, products to fight sprinkler system corrosion from

Automatic Air Release
(shown with optional trim)

VSR-F Flow Switch

Corrosion Monitoring Station

Chemical Delivery System

a company that knows sprinkler systems.

Over 10 years ago, Potter Electric Signal Co. recognized the problems corrosion can cause in a sprinkler system. Since then, Potter has been the exclusive provider of a Vane Type Flow Switch **(VSR-F)** that includes corrosion proof wetted materials, eliminating potentially catastrophic problems.

Today, Potter offers three new corrosion-fighting products.

- The **PAAR** (Potter Automatic Air Release) helps eliminate trapped air in a sprinkler system. Eliminating trapped air reduces the air/water interface where corrosion often thrives. The PAAR also includes a secondary automatic water shutoff valve that can be fully supervised.

- The **PCMS** (Potter Corrosion Monitoring Station) replicates the condition in the cross main or branch line of a wet pipe system, allowing the system to be regularly inspected for signs of corrosion. Water sampling, visual inspection, coupon analysis, and sprinkler analysis are easily achieved without disabling and draining the sprinkler system.

- The **PCDS** (Potter Chemical Delivery System) utilizes a patented process that allows a corrosion-inhibiting agent to be added to the water supply as it enters the sprinkler system. This system is fully supervised, and comes complete with a local alarm and digital communicator.

POTTER
The Symbol of Protection

800.325.3936 www.pottersignal.com

Circle 039 on Reader Service Card

Vegas in January, we began discussing an exciting event: the section's 40th anniversary in 2005. Stay tuned for details on how we plan to commemorate the occasion.

Section chairs and executive secretaries recently attended an advisory meeting in Quincy that gave both groups a forum in which to discuss section issues. Incoming Chair Mike Snyder represented our section, and I'll leave it to Mike to update you on the results in a future "Chair's Corner."

So thanks again to all, and we'll see you down the road!

NFPA 101 and 5000 Address Industrial Topics

By WAYNE D. HOLMES

P.E., HSB Professional Loss Control, Chair, BLD/SAF-IND

Industrial Fire Protection Section members may be interested in the activities of the NFPA Technical Committee on Industrial, Storage, and Miscellaneous Occupancies, which has historically been responsible for safety to life in industrial and storage occupancies in NFPA 101, *Life Safety Code®*. The technical committee is also responsible for occupancies in special structures, such as windowless buildings, underground structures, towers, and high-rise buildings.

With the introduction of NFPA 5000™, *Building Construction and Safety Code™*, the technical committee, a member of which is Industrial Section member Larry Garrett of Delphi Automotive Systems, has taken on increased responsibility. In addition to protecting human life, the committee is responsible for property protection in the building code in general and for Chapter 34, "High Hazard Contents," in particular.

The inclusion of Chapter 34 in NFPA 5000 introduces into NFPA documents the concepts of control areas, maximum allowable quantities (MAQ's) per control area, and protection levels for high-hazard contents, including hazardous materials such as flammable and combustible liquids, flammable gases, oxidizers, reactives, and corrosives. Among the NFPA documents with which Chapter 34 is being coordinated are NFPA 30, *Flammable and Combustible Liquids Code*; NFPA 45, *Laboratories Using Chemicals;* NFPA 55, *Compressed and Liquefied Gases*; NFPA 430, *Liquid and Solid Oxidizers*; NFPA 664, *Wood Processing and Woodworking Facilities*; and many others. The technical committee is seeking to ensure that these and other NFPA documents are compatible through direct communication with other NFPA technical committees and through the NFPA Construction Document Coordinating Advisory Group (CDCAG).

The *Report on Proposals* (ROP) for the 2005 editions of the *Life Safety Code* and NFPA 5000 will be published in July 2004. Industrial Fire Protection Section members are encouraged to review the ROPs and submit appropriate comments by October 1, 2004. Broad input and participation is important in the development of NFPA consensus documents.

For more information on this technical committee, contact NFPA Staff Liaison Milosh Puchovsky.

American Petroleum Institute Initiates Certification Program

In 2000, the American Petroleum Institute's (API) Safety and Fire Prevention Committee recognized the importance of establishing valid procedures and guidelines for petroleum storage tank entry and maintenance. As a result, API published two groundbreaking documents, API/ANSI 2015, *Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks,* and ANSI/API RP 2016, *Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks.* These documents were well received by the industry, which used them to develop safe operating practices for planning, managing, and conducting tank cleaning work in atmospheric and low-pressure storage tanks.

In March 2003, API started developing an Individual Certification Program (ICP) to qualify participants as having the minimum knowledge, experience, and skills necessary to perform safely the duties required by tank entry supervisors.

The course includes proper management of petroleum storage tank entry and maintenance work, including tank decommissioning, isolation, ventilation, atmospheric testing and analysis, work permitting, OSHA confined-space regulatory requirements, emergency response, and tank recommissioning. The program is based primarily on the practices and procedures defined in API 2015 and API 2016, which are consistent with OSHA's requirements for confined-space safety in its general industry standard for permit-required confined spaces.

The ICP's objective is to improve the quality of tank entry and maintenance activities, to minimize the risks of confined space hazards, and to improve the overall safety of tank maintenance operations.

NFPA, API, and OSHA recently signed an alliance promoting safe and healthy working conditions in the petroleum and petrochemical liquid storage industries. This alliance will promote safe tank entry, cleaning, maintenance, and rescue operations, as well as work in and around petroleum and petrochemical liquid storage tanks. NFPA's primary contribution to this alliance is training that complements the API certification program.

Contact IFPS Executive Secretary Guy Colonna for more information.

IFPS Holds Winter Board Meeting in Las Vegas

In February, the section's Board of Directors met in Las Vegas to complete preparation for the activities that take place during NFPA's World Safety Conference and Exposition™, being held this year in Salt Lake City. The section will sponsor five educational sessions starting Sunday, May 23, and wrap up with a session on electrical safety in the workplace on Tuesday. We hope all who attend will stay after this session for the section's annual business meeting and Standards Forum.

During the business meeting, the following slate of officers and directors will be presented for election by the membership:
Chair: Mike Snyder, Dow Corning
Vice-Chair: Craig Remsburg, The Boeing Company
Secretary: Tom Gray, RJA Consulting Group
Past Chair: Mike Newman, Johnson &

IFPS Board members tours Treasure Island in Las Vegas.

Johnson
Director: Neal Krantz (2007)
Director: Ron Stein, Aon Risk Services (2007)
Director: Joe Navarra, PEPCO Holdings (2007) (to replace Rick Schartel)
Mike Newman was nominated chair of the 2004-05 Nominating Committee, along with Steve Daily and William Cary of Niagara Frontier. Three others will be appointed.

The section directory sign-up process is in full swing. To protect your privacy, you must opt into the directory. If you haven't yet signed up to, please stop by the section booth and do so. And while you're at the booth, you can talk to section Board members, who will be there to meet current and prospective section members.

The Las Vegas meeting concluded with the Treasure Island Hotel and Casino's special effects show, "Sirens of TI," a nightly pyrotechnics show. Steve Frey of Treasure Island and June Fields of the Clark County Fire Marshal's office (retired) and member of NFPA's Special Effects Technical Committee also gave the Board a tour of the hotel and casino.

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

International Fire Marshals Association

WEB SITE: http://www.nfpa.org/ifma
CHAIR: John Bender, Maryland State Fire Marshal, Towson, Maryland

HOT ISSUES

Nominating Committee Report
The section Nominating Committee submitted its report to the Executive Secretary by November 30. The committee consists of Ronald Farr, immediate past president; Tony Sanfilippo, deputy director, Michigan Bureau of Construction Code and Fire Safety; and Alabama State Fire Marshal John Robison. IFMA members will act on the report at the annual business meeting, at 9 a.m. on May 24 at the World Safety Conference and Exposition™ in Salt Lake City.

Nominees are:
President: Scott Adams, Park City Fire Department, Utah
First Vice-President: Jon Nisja, Minnesota State Fire Marshal's Office
Second Vice-President Jimmy Hill, Los Angeles City Fire Department, California
Secretary: Charles "Ed" Altizer, Virginia State Fire Marshal
Director: R.T. "Whitey" Leicht, Delaware State Fire Marshal's Office (term expires May 2006)
Director: Ken Crews, Durham Fire Department, North Carolina (term expires May 2006)

Other candidates may be nominated by petition of 10 NFPA members, provided the executive secretary receives the petitions no fewer than 5 and no more than 45 days after the Nominating Committee's nominations are published. All nominees for office must be NFPA members.

Professional Development
The International Fire Marshals Association Fire Protection Institute *Principles of Fire Protection Engineering* Course will be offered from June 21 to 24 in Parker, Colorado, and from September 21 to 24 in Chicago. Those interested in

attending or sponsoring a program may contact Section Executive Secretary Steven Sawyer. Check www.nfpa.org/ifma for complete details.

Exhibition Schedule Salt Lake City

Saturday May 22

8 a.m. to 5 p.m.	IFMA Chapter President/ IFMA Executive Board Meeting

Sunday May 23

7 a.m. to 1 p.m.	IFMA Executive Board
10 to 11 a.m.	Fire Safety Evaluation System (FSES) for Educational Occupancies
11 a.m. to 12:30 p.m.	Inspection of Places of Assembly
1:30 to 3:30 p.m.	General Session
4 to 7 p.m.	Exhibits

Monday May 24

9 to 10 a.m.	IFMA Business Meeting
10 to 11 a.m.	IFMA Codes and Standards Forum
10:30 a.m. to 3:30 p.m.	Exhibits
2:30 to 4 p.m.	Citizens and Firefighters... How They Die and How Can We Stop It?
4:30 to 5:30 p.m.	An Update on Proposed Changes to NFPA 96

Tuesday May 25

8 a.m. to 12:30 p.m.	Exhibits

From left, Olga Caledonia, director of NFPA's Latin American Operations; Art Cote, NFPA executive vice-president; Juan Lecanda, chair, CEPREVEN Board of Directors; Manuel Acero, COIIN; and Miguel Saldaña, director, CEPREVEN.

Mrs. García Valdecasas, Spain's Minister for Public Administration, talks with NFPA Executive Vice President Art Cote and Miguel Saldaña, director of CEPREVEN, during the inauguration of the SICUR expo.

1:30 to 2:30 p.m.	Fire Protection Engineering Distance Learning for the Fire Service

Wednesday May 26

8 a.m. to completion	Technical Committee Report Session

And don't forget...

IFMA turns 100 in 2006. If you have any ideas how to celebrate the occasion, please contact Committee Chair John Robison at firemarshal@insurance.state.al.us.

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

Latin American

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

HOT ISSUES

SICUR Held in Spain

The fourteenth annual International Security, Safety and Fire Exhibition (SICUR) took place in Madrid, Spain, from February 24 to 27. With 550 exhibitors and approximately 30,000 attendees, this gathering is one of the most important expos in Europe, exhibiting a wide range of safety and security products and services.

NFPA shared a booth with CEPREVEN, our strategic ally in Spain, and sponsored several presentations about NFPA codes and standards in the conference program. Art Cote, NFPA's executive vice-president; Olga Caledonia, NFPA's director for Latin American Operations; and Miguel Saldaña, director of CEPREVEN, inaugurated the conference, titled "New American, European, and Spanish Specifications on Fire Safety," highlighting the new NFPA/CEPREVEN publications in Spanish. Among these are NFPA 921, *Guide for Fire and Explosion Investigations;* NFPA 51B, *Fire Prevention During Welding, Cutting, and Other Hot Work; The SFPE Engineering Guide to Performance-Based Fire Protection Analysis and Design of Buildings*; and NFPA's *Fire Protection Systems Inspection, Test and Maintenance Manual.*

Following the seminars there was a luncheon for members of both organizations, as well as important leaders in the industry in Madrid and Barcelona. Also present was Walter Grijalvo, editor of *NFPA Journal Latinoamericano.*

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

Lodging Industry

WEB SITE: http://www.nfpa.org/lodging
CHAIR: vacant

HOT ISSUES

Nominating Committee Report

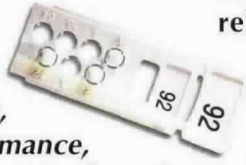
Elections for the section Executive Committee will take place at the section business meeting, to be held at 5:30 p.m. on Tuesday, May 25, in conjunction with the NFPA World Safety Conference and Exposition™. Nominating Committee Chair April Berkol submitted the following nominations:
Chair: Richard Anderson, Chimney Hill Inn, Lambertville, New Jersey
Vice-Chair: Jeffrey Shearman, Zurich Insurance, Johnstown, Pennsylvania
Secretary: Byron Briese, Rolf Jensen & Associates, Fairfax, Virginia
Director: Kevin Maher, American Hotel & Lodging Association., Washington, D.C.
Director: Charles Gouldner, Hotel Hershey, Hershey, Pennsylvania
Director: Richard Kabele, North Lake Tahoe Fire Protection District, Incline

The NFPA-CEPREVEN booth.

XPERT EASE

COMES FROM **XP**ERIENCE

Intelligent fire detectors – advanced in design, improved in performance, with unique features that benefit the installer and end user.



Experience always make things look easy, reliable and safe.

Take the **XPERT** card: by keeping the address on a simply coded plastic card, you get an electronics free base, plenty of room for termination and a unique address that never changes.

XP95 operates using an OPEN PROTOCOL which offers freedom of choice for the fire system specifier, installer and end user.

You only want to choose a fire system once–one with trusted technology, advanced features, that is simple to install and service, yet remains open for future developments–the Apollo XP95 range of intelligent fire detectors makes that decision EASY.

For information on the XPERT card, XP95 range of detectors or open digital protocol, ring us on +44 (0)23 9249 2412 or click onto our web site – **www.apollo-fire.co.uk**

Digital technology, simply addressed

apollo
FIRE DETECTORS LIMITED

USA: Halma Fire & Safety Division, 1749 E, Highwood, Pontiac, MI 48340. Toll Free No: 888 332 2241. Fax: 248 332 8807.

Other Countries: Apollo Fire Detectors Limited, 36 Brookside Road, Havant, Hampshire PO9 1JR, England.
Tel: +44 (0)23 9249 2412. Fax: +44 (0)23 9249 2754. Website: www.apollo-fire.co.uk

Circle 006 on Reader Service Card

Village, Nevada

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

Metropolitan Fire Chiefs

WEB SITE: http://www.nfpa.org/metro
CHAIR: Wes Shoemaker, Fire and Paramedic Chief, Winnipeg, Manitoba, Canada

HOT ISSUES

California Metro Chiefs Lead California Wildland Fire Commission Efforts

In October 2003, Southern California experienced one of the most devastating series of wildland fires in history. A total of 739,597 acres burned, destroying 3,631 homes and killing 22 people, including a firefighter.

In the aftermath, the California Fire Chiefs Association, in conjunction with the California Metro Chiefs, proposed forming a Blue Ribbon Fire Commission, sponsored by the governor, to review the fires, address operational and policy issues, and make recommendations for improvement. Because the fires occurred as California waited for newly elected-Governor Arnold Schwarzenegger to take office, replacing recalled Governor Gray Davis, the Fire Chiefs had to convince both the governor and the governor-elect of the merits of such a commission.

The Fire Chiefs successfully convinced both the governor-elect and the governor, who established the commission with the support of the governor-elect. The commission, chaired by retired State Senator William Campbell, who has a long history of working on fire service issues, began meeting last November. Its 34 members represented federal, state, and local elected officials, as well as federal, state, and local agencies involved in suppression operations.

Six Metro Chiefs on the commission represented various state and local agencies and professional associations. Representing the state agencies were Chip Prather, fire chief of Orange County Fire Authority, who sits on the California Emergency Council; Rick Martinez, deputy director/fire chief of the Sacramento Metropolitan Fire Department, representing the California Office of Homeland Security; and Fire Chief P. Michael Freeman of Los Angeles County Fire Department, representing FIRESCOPE. Fire Chief Jeff Bowman of San Diego Fire and Life Safety Services represented local agencies, while City of Los Angeles Fire Chief William Bamattre, chair of the California Metropolitan Fire Chiefs Association, and Alameda County Fire Chief William McCammon, president of the California Fire Chiefs Association, represented fire service associations.

The commission met six times and heard testimony on a wide range of issues, including the use of military assets, mutual aid, reimbursement, fuels management, building codes, and interoperability. Consultants working for the commission distilled the testimony into 69 recommendations for the commission to consider.

The fire chiefs and the representatives of organized labor on the commission met before the final commission to review the recommendations and set priorities. This work became the document the commission used in its final deliberations, during which it pared the 69 recommendations to 47 that will appear in the final report to be presented to Governor Schwarzenegger. The Metro Chiefs played a pivotal rule in the formulation of these final recommendations.

The commission also hopes to present the recommendations, most of which have universal application, to the California Congressional delegation and move some of them on to the federal government, since communities throughout the United States face the issue of managing fuels in the wildland/urban interface and the operational issues of fighting these types of fires.

Metro Fire Chiefs 'Facing Great Expectations'

The Metro Fire Chiefs will meet in Sacramento, California, from May 22 to 27, for the 2004 Metro Fire Chiefs Conference. The conference theme, "Facing Great Expectations," characterizes the significant challenges confronting today's fire chief and reflects the strategic initiatives that have engaged the Metro Chiefs Section since the 2003 conference in Calgary.

From an emergency response perspective, the public expects fire departments to acquire the necessary tools, equipment, and trained personnel to respond effectively to a variety of emergencies. The public also expects public safety agencies, including law enforcement and building and health officials, to maintain effective working relationships that allow them to share information and resources, coordinate activities, and promote best practices.

To this end, the Metro Chiefs are pursuing a formal relationship with the Major Cities Chiefs of Police, helping develop the newly established National Incident Management System, and focusing on international recruitment. Expectations that response capabilities can be improved through technology have resulted in numerous other initiatives, as well, including an MOU with the Federal Laboratory Consortium and participation in efforts to improve the public safety radio interference problem.

Even more challenging, though, are our "great expectations" of doing everything we can to prevent fires and injuries before they occur. It is no longer sufficient to focus solely on establishing an aggressive emergency response capability. Fire prevention, public education, and injury prevention programs must become top priorities. The development, adoption, and enforcement of fire and building codes are an important step towards protecting both firefighters and communities, a step that highlights the importance of relationships between the Metro Chiefs and valuable partners such as NFPA. They also explain why the Metro Chiefs plan to become more involved over the coming year in building support for residential sprinkler initiatives.

As an employer, today's fire chiefs also face "great expectations" of improving the health, well-being, and safety of their personnel. To meet these expectations, the Metro Fire Chiefs are involved in the IAFC/IAFF wellness-fitness initiative, taking a leadership role in proposing changes to the Candidate Physical Ability Test (CPAT), and collaborating with the IAFC in promoting leadership and officer development in our departments.

In the major cities and counties the members of the Metro Chiefs Section serve, challenges continue and expectations increase. To meet these expectations, the Metro Chiefs will continue collaborating with public- and private-sector partners to ensure that

our communities remain safe places in which to live, work, and play.

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

Rail Transportation Systems

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

HOT ISSUES

UN Economic Commission on Europe's Inland Transport Committee Issues Final Report

The Ad Hoc Group of Multidisciplinary Group of Experts on Safety in Tunnels (rail) of the United Nations Economic Commission on Europe's (UNECE) Inland Transport Committee finalized its recommendations on rail tunnel safety in a report published in December 2003. The report was developed using a brief survey of the tunnel safety laws and regulations member European governments have enacted for railway systems, as well as all available information about accidents in rail tunnels. The group was presented with numerous copies of NFPA 130, *Fixed Guideway Transit and Passenger Rail Systems*, for review during their deliberations.

Based on the statistics submitted, the report notes the low occurrence of accidents in main line railway tunnels. However, it also notes the potentially significant consequences of such hazardous events, especially fire. The report concludes that the safety objectives in railway tunnels are, in order of priority, accident prevention, mitigation of the consequences of accidents, facilitation of escape, and facilitation of rescue.

The report describes approximately 50 safety measures in railway tunnels and distinguishes 20 the group considers minimal standards for all new tunnels. The recommendations, which apply to all railway tunnels, can be reduced for tunnels shorter than 0.6 miles (1 kilometer) and adapted for tunnels over 9.3 miles (15 kilometers).

The following measures are considered minimal safety features for all new tunnels:

- Speed monitoring and signaling systems
- Regular inspections
- Fire protection measures
- Fire protection requirements for structures
- Train radios
- Emergency brake neutralization
- Maintaining movement
- First-aid equipment on board every train
- Taking the train out of the tunnel
- Not following or passing trains out of the tunnel during an incident
- Escape routes
- Tunnel markings
- Emergency tunnel lighting
- Training of railway staff
- Firefighting and rescue water supplies
- Radios for rescue service
- Reliable electrical installations
- Emergency and rescue plans
- Exercises with rescue services

Information on dangerous goods

The report also recommends establishing safety plans for existing tunnels, assessing their safety levels and raising them, if necessary, through measures that can be realized at reasonable cost. The group expects the first priority will be given to nonstructural measures.

Although the UNECE has no statutory authority, its reports are considered by the European Union when developing laws.

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

Research

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

HOT ISSUES

Ninth Fire Risk & Hazard Research Application Symposium Scheduled for June

Fire protection engineers and fire prevention officers are urged to mark their calendars for The Fire Protection Research Foundation's ninth annual Fire Risk & Hazard Assessment Symposium, to be held from June 23 to 25 at the Loews Annapolis Hotel in Annapolis, Maryland. The symposium will feature around 25 presentations by researchers and practitioners on fire risk and hazard evaluation procedures and techniques, fire and the environment, and new laboratory capabilities and resources.

Dr. John Hall, Jr. of NFPA's Fire Analysis and Research Division, will deliver the keynote address.

Attendees will be credited with professional development contact hours, and a wallet service will be available so that organizations can distribute their literature to attendees.

For more information, contact Conference Coordinator Eric Peterson at epeterson@nfpa.org or (617) 984-7281.

HOW TO REACH US: John Hall, Executive Secretary, (617) 984-7460, jhall@nfpa.org

Wildland Fire Management

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

Changes in *Wildfire News & Notes*

Since 1988, *Wildfire News & Notes* (*WN&N*) has been an important source of information on a variety of topics in wildland fire, including the NFPA Wildland Management Section. For the past several years, *WN&N* has published a print version twice a year, mailing issues to more than 16,000 readers, and an online version twice a year.

In 2004, *WN&N* will become an online-only newsletter that can deliver essential wildland fire news directly to your desktop.

"The overall response to the online version has been very positive, and we hope to continue bringing the issue to an ever-

increasing audience," says Jim Smalley, executive secretary for the Wildland Section.

WN&N's primary mission of providing general wildland information and news from the NWCG and the NFPA Wildland Management Section will continue. Smalley hopes the information to on-the-ground firefighters and officers will help keep them in the loop on national developments and provide a way to share local news and accomplishments. To register, visit www.firewise.org.

Fall Meeting Review

The Wildland Fire Management Section sponsored four educational seminars and held its section meeting at the NFPA Fall Annual Meeting in Reno, Nevada, last November.

During the first day of the conference, Firewise Communities Support Manager Michele Steinberg presented an overview of the Firewise Communities/USA Recognition Program. The program's goal is to encourage and acknowledge action that minimizes the loss of homes to wildfire by preparing homeowners for fire before it occurs. The program can easily be adapted to different locales and is especially appropriate for small communities, housing developments, and residential associations of all types. More than 40 U.S. communities have been recognized, and many are applying for a second year.

Jamie Rittenhouse and Don West of the Florida Division of Forestry and Chuck Vance of the Institute for Business & Home Safety presented a case study of a home retrofit project that used a Firewise approach. Rittenhouse, West, and Vance took attendees through each stage of the renovation, illustrating the broad range of Firewise techniques used to transform it from a high-risk property to a more fire-resistant home ignition zone. Speakers also discussed Florida's growing wildland/urban interface fire problem and the multiple agencies involved in selecting, designing, and renovating the house. Every phase of the project was documented with photographs and videos for future distribution to the public. You can see the house at www.firewise.org or by visiting www.firewise.org/vrhome.

Also at the meeting, Lee Schmunk of the U.S. Department of the Interior provided a training workshop on firefighter safety in the wildland/urban interface designed to introduce firefighters and line officers from municipal and wildland fire agencies to the Firefighter Safety Series developed by the National Wildland/Urban Interface Program. The series addresses problems firefighters face in battling wildland/urban interface fires, especially those threatening structures. The program is available from the Firewise Web site.

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

Section News online is now for members only

On March 5, the news pages of NFPA's section Web site became an exclusive member benefit. Non-members may still learn about section goals and benefits, but only NFPA members can access their section's news updates online.

EXHIBITOR SHOWCASE

TEST EQUIPMENT
Retrotec Inc.
Booth 418
Retrotec manufactures door-fan test equipment for measuring the leakage rate of enclosures being protected with clean agent to determine retention times and the adequacy of relief vents. Door-fans are used for measuring the leakage rates of floor slabs, elevator shafts and pressurized stairwells for the purpose of controlling smoke.
Circle Reader Card No. 075

EXTINGUISHANTS
DuPont Company
Booth 823
DuPont developed the FE family of clean-agent fire extinguishants to replace and eliminate the need for halon in the protection of people, assets, and the continuity of business.
Circle Reader Card No. 076

PUMPS
Armstrong Pumps
Booth 1702
Armstrong is supplier of HVAC and fluid flow equipment for residential, commercial, and industrial applications. For additional information on Armstrong products, visit www.armstrongpumps.com.
Circle Reader Card No. 077

SECURITY EQUIPMENT
Edwards Systems Technology
www.est.net
Booth 901
EST is proud to offer the industry's most innovative line of fire and security equipment on the market. Audible visual devices, multiple element detectors and control panels from one zone to the largest network systems round out our offering.
Circle Reader Card No. 078

TRADE ASSOCIATION
International Municipal Signal Association
www.imsasafety.org
Booth 1321
The association's objective, through education and certification, is to improve the efficiency, installation, construction, and maintenance of public safety equipment and systems by providing information and training in the areas of life safety systems that include fire detection and alerting, system monitoring, municipal fire alarm, radio communications, traffic signals, signs and markings, and roadway lighting.
Circle Reader Card No. 079

FIRE SPRINKLER SYSTEM
Advanced Fire Technology, Inc.
www.advancedfiretechnology.com
Booth 1634
Aqua Fire Tank is a self-contained residential fire sprinkler system that's pre-assembled, compact design, and features NFPA 13D, NFPA 13R package systems. The UL-listed pump assembly system is affordable, standalone, and prepackaged.
Circle Reader Card No. 080

CONTROL VALVES
Cla-Val
www.cla-val.com
Booth 1125
Whether your requirements call for standard pressure control valves or valves with sophisticated electronic and hydraulic trim, Cla-Val, with more than 40 years of application and design experience, guarantees that your system will perform to your satisfaction. Cla-Val offers a complete line of pressure, flow, pump, surge, and level control valves.
Circle Reader Card No. 081

FABRICATOR
Amfuel
www.amfuel.com
Booth 1632
Amfuel is a designer and fabricator of composite material products used for the aviation aerospace, military ground forces, and commercial transport industry. Amfuel's quality policy is to ensure complete customer satisfaction. We will strive for excellence in our products, through manufacturing, competitive pricing, on-time deliveries, and continuous improvements in our systems.
Circle Reader Card No. 082

POWER SUPPLY CHARGERS
Altronix Corporation
Booth 417
The leading manufacturer of power supply chargers with UL-listed models for fire alarm (ADA compliant)/burglar alarm/CCTV, and access control applications, programmable annual, on-shot timers, and relay modules. Custom-designed products to your specifications are available upon request.
Circle Reader Card No. 083

CIRRUS PRO SERIES
ASPIRATING FIRE DETECTORS

The Worlds

Most Versatile

Range Of Fire

Detection Devices

Cirrus Pro RDP

Cirrus Pro 100

Cirrus Pro 200

Cirrus Pro 200D

Cirrus Pro X4

VISIT BOOTH 513 AT NFPA 2004
FOR A LOOK AT THE NEW GENERATION OF ASPIRATING FIRE DETECTORS

www.newcirrus.com

Protec Fire Detection plc

Worldwide Manufacturer
Protec Fire Detection (Export) Ltd
Churchill Way, Nelson, Lancs, BB9 6RT. England
Tel: ++ 44 1282 717171 Fax: ++ 44 1282 717273

SAFE FIRE DETECTION, INC. ...leaders in early warning fire technology...

USA & Canada Distributor
Safe Fire Detection Inc.,
5915 Stockbridge Drive, Monroe, NC 28110, USA
Tel: ++1 704 8217 7290 Fax: ++1 704 8217 4327

Circle 041 on Reader Service Card

EXHIBITOR SHOWCASE

CLOTHING
Workrite Uniform Company
www.workrite.com
Booth 337
Workrite Uniform Company is the leading manufacturer of flame-resistant work apparel. Workrite manufactures flame-resistant clothing from more than 15 different flame-resistant fabrics, giving us a complete offering to meet a wide range of thermal hazards.
Circle Reader Card No. 084

HALON PROCUREMENT
Halon Banking Systems
www.halonbankingsystems.com
Booth 710
Halon Banking Systems specializes in Halon supply and procurement. We can deal with any of your halon needs and our sister company Vipond Inc. can handle fire protection contracts worldwide.
Circle Reader Card No. 085

FIRE SUPPRESSION
Chemetron Fire Systems
www.chemetron.com
Booth 1511
Chemetron is a single, dependable source for special hazard fire suppression. We design systems that protect people and property through integrating fire hazard evaluations, hardware, innovative computer software, advanced engineering, technical and service support, a worldwide distribution and service network, and a commitment to environmental safety. With more than 60 years of experience, we are ready to meet any special hazard specification today or in the future.
Circle Reader Card No. 086

PUMP SYSTEM

Talco Fire Systems
Booth 1235
Talco manufactures several types of packaged pump systems for NFPA 13D and NFPA 13R applications. A new stand-alone pump system that requires no power to operate is on display at our booth. The system removes concern over the loss of power that occurs with most fires.
Circle Reader Card No. 087

EDUCATIONAL ROBOTS
Robotronics
www.robotronics.com
Booth 224
Robotronics has manufactured and sold nearly 4,000 educational robots and thousands of costumes worldwide with trademark characters, such as Sparky the Fire Dog®, Smokey Bear®, Pluggie™, Freddie™, and Buzz E. Smoke Alarm™. Robtronics has a character for every need. We also carry a complete line of educational materials to enhance your program.
Circle Reader Card No. 088

SYSTEM SUPPORT
ADI
www.ADIlink.com
Booth 217
ADI is North America's largest fire, security, and low voltage wholesale distributor with more than 100 locations. We offer our customers exclusive value-added services that are unmatched in the industry today. In addition to life safety, ADI offers more products, more training, and more systems support in the areas of burglar alarm, structured cabling, CCTV, and access control.
Circle Reader Card No. 089

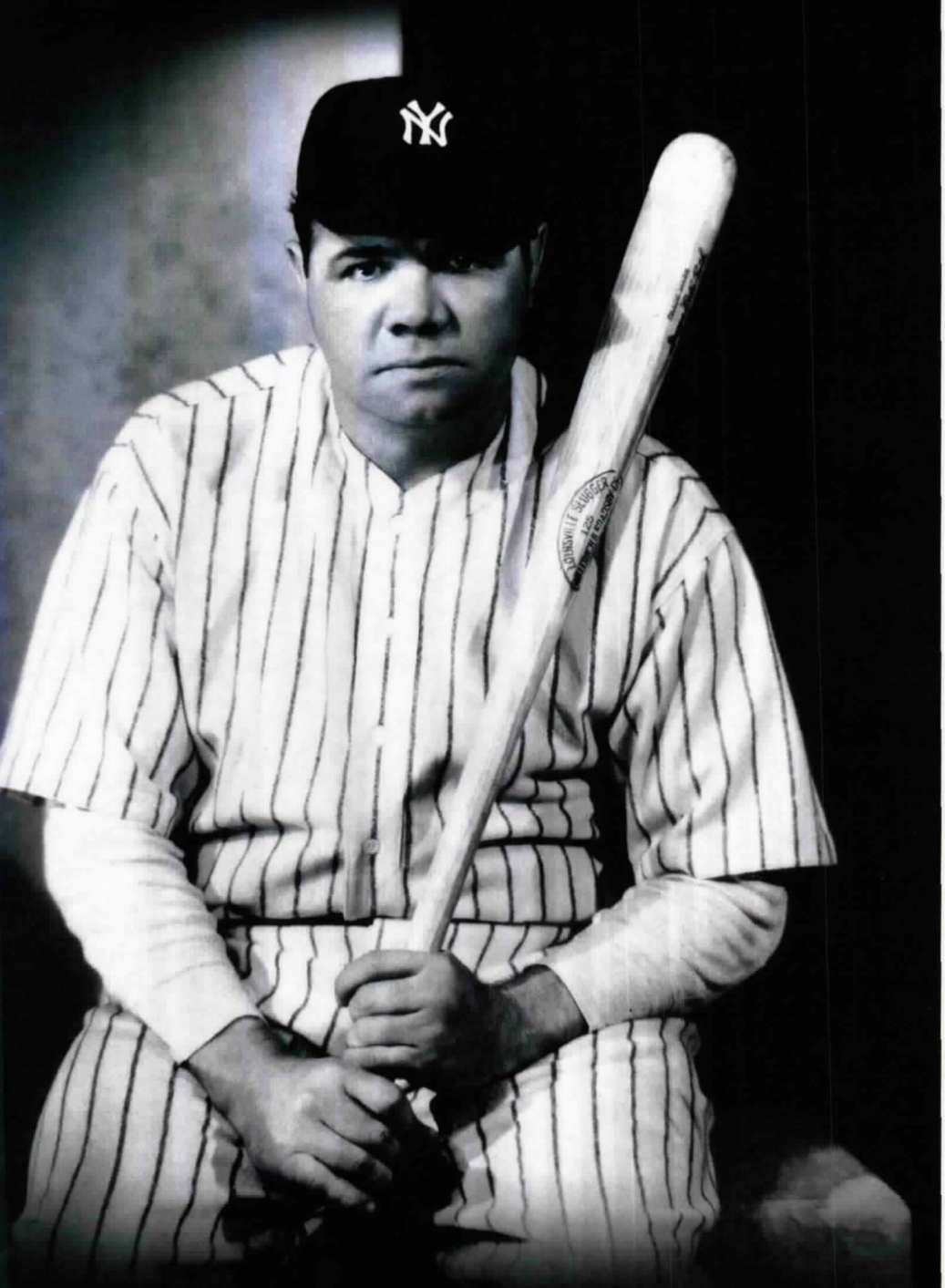
LIGHTING SYSTEM
Egress Marking Systems
www.egressmarking.com
Booth 200
The Egress Marking System, E-Lume-A-Path™ Lighting System uses electroluminescent lamps to clearly indicate exit path in dark or smoke-filled passages. People who may be unfamiliar with the building layout will have a better chance of seeing and finding existing emergency exits.
Circle Reader Card No. 090

FIRE SPRINKLER SYSTEM
Rehau Incorporated
www.rehau-na.com/fire protection
Booth 735
Rehau manufactures a UL-listed fire sprinkler system consisting of crosslinked polyethylene (PEXa) plastic pipe and EVER-LOC fittings in 3/4 inch and 1 inch sizes for use in residential systems.
Circle Reader Card No. 091

STORAGE TANKS
Xerxes Corporation
www.xerxescorp.com
Booth 1520
Xerxes manufactures fiberglass underground tanks in sizes ranging from 600 to 50,000 gallons for storage of water for fire protection. Tanks are constructed of rust-proof material.
Circle Reader Card No. 092

FIRE PROTECTION PRODUCTS
Ansul
www.ansul.com
Booth 401
Discover the quality fire protection products offered by Tyco Safety Products – Fire Suppression Business. This year, we're presenting an array of portable fire extinguishers, restaurant and industrial systems, clean-agent fire suppression systems, and foam agents/hardware featuring the Ansul, Pyro-Chem, and flag Fire brands.
Circle Reader Card No. 093

Be A Winner



Put Us On Your Team

A winning professional has been added to our roster! RemTec International would like to introduce you to *RT-227™, (HFC-227ea) Heptafluoropropane. Like other HFC-227ea agents that you may be familiar with, RT-227 meets or exceeds the same exacting requirements. RT-227 is a fire suppressant that won't damage sensitive, high-tech equipment because it is a clean agent leaving no particulates, water, oily residue or corrosive materials behind. And, RT-227 is environmentally safe because it is non-ozone depleting.

Now is your chance to become a free agent! RemTec offers RT-227 to all users of **FM-200® and ***FE-227™. Our agent is listed as a Recognized UL Component and is marked c UL us. This gives you the competitive edge, because RemTec's RT-227 can be used in any UL Listed product containing HFC-227ea but at a lower cost.

It's the bottom of the ninth, the bases are loaded . . . join our team and hit a home run! **Call RemTec today at 800-372-1301 or visit our website at www.remtec.net**

RemTec International

6150 Merger Drive
Holland, Ohio 43528 U.S.A.

800-372-1301
www.remtec.net

*RT-227 is a trademark of RemTec International
**FM-200 is a registered trademark of Great Lakes Chemical Corporation
***FE-227 is a trademark of DuPont

Circle 044 on Reader Service Card

EXHIBITORSHOWCASE

EMERGENCY VOICE SYSTEM
Evax Systems
www.evax.com
Booth 1234
Our conventional systems range in power from 25 to 200W in a single cabinet with multi zone capability. Up to 2000W in multiple cabinet systems. For large applications and high- rise our EVAX HMX series provides multi-channel voice, emergency phones, area of rescue and building control system interface. All of our voice systems incorporate ANSI/NFPA temporal pattern tones and are compatible with all UL-Lister 12 and 24 volt fire alarm control panels. UL-Listed, CSFM, MEA.
Circle Reader Card No. 094

FIRESTOP
Hilti, Inc.
www.us.hilti.com
Booth 934
With worldwide firestop expertise, Hilti provides a complete system of firestop product to meet specific project needs. Hilti also offers a support package that is unmatched in the passive firestop industry, including a highly trained direct sales force, Fire Protection Specialists and Fire Protection Engineers.
Circle Reader Card No. 095

LIGHTNING PROTECTION
Heary Bros. Lightning Protection Co. Inc.
www.hearybros.com
Booth 1436
Manufacturers of ESE Air Terminal and Faraday systems. We offer free design and budget pricing of lightning protection systems. Please stop by for our latest catalog.
Circle Reader Card No. 096

FIRE ALARM SIGNAL
Harrington Signal Inc.
www.harringtonsignal.com
Booth 734
Harrington Signal Fire Alarm is a progressive privately owned ISO 9001 certified manufacturing company ready to provide you with the best solutions for your commercial, institutional, military or industrial fire alarm needs. We have earned a reputation for providing quality products and services at a cost competitive price.
Circle Reader Card No. 097

VISUAL SIGNAL
CPG Signals
www.harringtonsignal.com
Booth 734
At CPG Signals, we offer high quality audible and visual signals with innovative design features for a wide variety of life safety applications. We specialize in high dB, hazardous- and explosion-proof equipment. Excellent service provided by our seasoned staff, coupled with ISO 9001 certified manufacturing will meet your needs.
Circle Reader Card No. 098

STROBE
AMSECO
www.amesco-kai.com
Booth 1122
The Select-A-Horn/Strobe SH24W features a unique candela intensity field selector switch for alternating the candela output 15cd or 30cd (75cd axis). The Horn provides two different field selectable tones, and a High/Low output setting. This is available in red or white housing 24V DC models.
Circle Reader Card No. 099

POWER MANAGEMENT SYSTEM
AlarmSaf, Inc.
www.alarmsaf.com
Booth 225
AlarmSaf is a full-line manufacturer of highly reliable, highly efficient power management systems. New this year is the Beacon Power line of power supplies and power distribution modules. The Beacon products were developed to integrate fire and access applications and are fully compliant with the new NFPA 731 and UL 864.
Circle Reader Card No. 100

FIRE SUPRESSION PRODUCTS

Sensor Electronics Corporation
www.sensorelectronics.com
Booth 1613
Manufacturer of Fire Suppression and Gas Detection products. ULC Approved Aerosol Generator called Aero-K on display. This product is 10 times more effective than gaseous agent alternatives. Other fire suppression products include: CAFS or Twin Agent Systems that can be mounted on a truck, trailer or skid. Also on display CSA Approved Infrared Gas Detector. No Mirrors or beam splitter used. Low cost and virtually maintenance free.
Circle Reader Card No. 101

TESTERS
Gemini Scientific Corporation
www.geminiscientific.com
Booth 1121
The Gemini 501 Testers are Underwriters Laboratories (UL) listed. If you are in the smoke alarm testing industry, the Gemini testers can help you perform sensitivity tests that can satisfy the National Fire Alarm Code requirements. We have been serving the industry for more than 25 years.
Circle Reader Card No. 102

FIRE PUMP
National Diesel Corporation
www.nationaldieselcorp.com
Booth 1717
Diesel engine drives for centrifugal fire pumps.
Circle Reader Card No. 103

EVACUATION PLANS
Booth 1343
Terminal Velocity FM, LLC
www.instantevac.com

EXHIBITOR SHOWCASE

What shape are your evacuation plans in? InstantEvac offers professional, easy to read evacuation plans. Additional fire safety products include evacuation plan software, evacuation door markers and fire blankets. We also offer CAD services, as-builts and ARCHIBUS facilities management software solutions.
Circle Reader Card No. 104

FIRE SUPPRESSION SYSTEMS
Fike Corporation
www.fike.com
Booth 821
Dedicated to protecting you from fire, Fike has a complete line of fire suppression systems, including the best, most cost effective clean agent system, ECARO-25. Fike also has quality fire detection/alarm systems. We're introducing the fastest, most advanced addressable system available, CyberCat, featuring System Sensor's Eclipse protocol.
Circle Reader Card No. 105

HOSE
Guangxi Materials General Group Corp.
www.gmggc.com
Booth 1039
This product is made by adoption of high-strength synthetic fiber, a woven outer jacket lined with rubber. It features good pressure resistance, anti-wear, anti-erosion, impermeability, little water-flow resistance, quick water output, lightness and softness long service life. Can be used with fireplug, pump, or vehicles.
Circle Reader Card No. 106

CABLE
Houston Wire & Cable Company
www.houwire.com
Booth 321
Houston Wire & Cable (HWC) is the nation's largest value-added supplier of electrical wire and cable. HWC has a $60 million inventory of over 12,000 products from the industry's leading manufacturers. The HWC team is committed to providing great customer service and quality products shipped correctly and on time.
Circle Reader Card No. 107

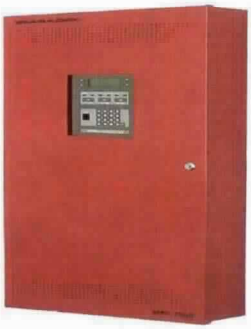
APPROVALS
LPCB/BRE
www.redbooklive.com
Booth 1528
LPCB offers approvals of fire and security products to national, international, and industry recognized loss prevention standards. The LPCB mark is accepted in more than 45 countries. LPCB is a notified body for the construction products directive, the marine equipment directive, the pressure equipment directive, and the transportable pressure equipment directive.
Circle Reader Card No. 108

PIPE
Shurjoint Piping Products
www.shurjoint.com
Booth 623
Shurjoint is a world leader in the design and manufacture of groove, hole-cut threaded, plain-edge, and flow-control components used in fire protection systems. Shurjoint is an ISO 9001 certified manufacturer and the company's products are listed and/or approved by UL, ULC, and FM.
Circle Reader Card No. 109

DETECTION AND SUPPRESSION
Firetrace International
www.firetrace.com
Booth 1128
Firetrace International provides a proprietary system for detecting and suppressing fires inside critical equipment and enclosures. This cost-effective technology activates where the most heat is detected and then discharges the fire-suppressing agent in the same area.
UL-listed, FM-approved, and more than 30,000 installations worldwide.
Circle Reader Card No. 110

SYSTEM SUPPLEMENT
Signalink Technologies Inc.
www.signalink.com
Booth 537
Fire-Link® is a system designed to supplement the signaling capabilities, in sleeping

areas, of a building's existing fire alarm system. By using the existing wiring infrastructure, Signalink offers the fire protection industry a solution that is easy to install without the expense of additional wiring.



Circle Reader Card No. 111

CONTROL PANEL
Faraday
Booth 601
Many have just started to rethink life safety; Faraday never stopped. With our 130-year history of analog/addressable and conventional fire control panels and life-safety rated audio and visual alarms we will continue to protect people and business continuance. New Faraday intelligent systems offer the world's fastest detection speed and the same advanced technology that protects many of the world's most sophisticated structures.
Circle Reader Card No. 113

HOSE
5Elem Fire Hose Company, Limited
www.chinafire.com
Booth 329
Manufacturer of fire hose, mill hose, couplings, and nozzles.
Circle Reader Card No. 114

MONITORING SYSTEM
Spectronics Corporation

AMEREX®

Amerex Corporation

"We make your needs today's priority"

P.O. Box 81 Trussville, Alabama 35173
Ph: (205) 655-3271 Fax: 1-800-654-5980
email: sales@amerex-fire.com
web: www.amerex-fire.com

Hand Portable Extinguishers
Wheeled Extinguishers
Vehicle Systems
Methane Gas Detection
Industrial Systems
Restaurant Systems

Circle 004 on Reader Service Card

SEE US AT NFPA BOOTH #913 - SALT LAKE CITY, UT

www.spectronics.com
Booth 634
Spectronics designs and manufactures fire and security monitoring and control systems for commercial, industrial (including special hazards) and institutional markets. Products range from small conventional panels to large engineered voice evacuation systems with thousands of zones. Spectronics also sells initiating devices, notification appliances, annunciators (including graphic), power supplies and accessories.
Circle Reader Card No. 115

AIR-SAMPLING DETECTION

Safe Fire Detection, Inc.
www.safefiredetection.com
Booth 513
Laser air-sampling detectors are now obsolete. SAFE has re-invented early warning air-sampling fire detection by combining the benefits of laser, cloud chamber and spot detection into a new revolutionary hybrid detector. The six new IFD Cirrus "PRO Series" detectors cost less, have less maintenance, and outperform laser air-sampling detectors.
Circle Reader Card No. 116

PIPE

Victaulic
www.victaulic.com
Booth 1034
Victaulic, a leading manufacturer of fire protection systems for over 50 years, provides a full line of products for wet, dry, deluge, and pre-action systems. Victaulic fire protection products are manufactured according to the most stringent quality standards in the industry and are UL/ULC listed and FM Approved.
Circle Reader Card No. 117

DETECTION AND SUPPRESSION

Twenty First Century International Fire Equipment
www.21centuryfire.com
Booth 1112
The Guardian system will detect an unattended cooking fire, extinguish it and turn the stove off. The Guardian can also be interfaced with an alarm system to notify the fire department.
Circle Reader Card No. 118

INSPECTION

Wet or Dry Tank Inspection & Consulting
Booth 332
Fire suppression tank inspection, consulting, and engineering firm. Let us show you how to meet the NFPA 25 standard the cost effective, safe, efficient way. Our staff of Highly trained NACE inspectors and engineers assess your structures inside out and provide comprehensive detailed reports, recommendations and video of your tank and needs. Now utilizing Remotely Operated Vehicles for evaluations also.
Circle Reader Card No. 119

BUILDING PRODUCT

TVM Building Products
www.NuFlex.com
Booth 432
NUFLEX 814® GG-266 is a single-component, neutral cure, non-slumping intumescent 100 percent silicone caulk. This patented "caulk and walk" firestop is designed to collapse and seal combustible service penetrations up to 2" in diameter, quickly and easily. The cured silicone rubber composition exhibits excellent performance stability and provides a pressure tight seal that will prevent the spread of fire, smoke and toxic gases.
Circle Reader Card No. 120

FIRE DETECTION

King-Fisher Company
www.kfco.com
Booth 919
King-Fisher designs, develops, and manufactures state-of-the-art emergency communication, fire detection, fire protection, and personal evacuation systems. We also provide installation service. We have approvals from FCC, UL, California Fire Marshals, and FM.
Circle Reader Card No. 121

LIGHTING

Big Beam Emergency Systems
www.bigbeam.com
Booth 218
Big Beam is a full-line manufacturer of emergency lighting systems, exit signs, and portable hand lanterns.
Circle Reader Card No. 122

LIFE SAFETY

Siemens Building Technologies
www.sbt.siemens.com
Booth 701
The focus of the fire safety division of Siemens Building and Technologies is on the protection of life, property, and business continuance from the threat of fire. Our commitment is to provide the best in design, manufacture, and distribution of quality, cost effective products and services in the life safety industry to meet our customers' expectations and surpass industry standards.
Circle Reader Card No. 123

CLEANING PRODUCT

HERC Products Incorporated
www.hercprod.com
Booth 1529
HERC Products Inc. supplies patented products and processes that uses UL and NSF Standard 60 certified chemicals to chemically clean biological, corrosion by-products and mineral deposits from fire protection sprinkler systems. The prod-

If It Doesn't Say FM-200®

It's Not.

There's no substitute for genuine FM-200® Waterless Fire Protection. You may hear some companies claim that their fire suppressant is the same as FM-200, but it's not. FM-200 is the original Heptafluoropropane developed to replace ozone-depleting halon fire suppressants. Only FM-200 brand Heptafluoropropane is the original Waterless Fire Protection gas submitted for EPA SNAP Listing and for inclusion in NFPA 2001. FM-200 has been approved safe for use in occupied spaces for over ten years.

Accepted and respected worldwide, FM-200 is only sold by the leading fire system manufacturers as their choice for critical asset protection. Tested and approved for component use by the major regulatory organizations including UL, ULC, FM, IMO, and USCG, only FM-200 has over a decade of unmatched field performance with an unsurpassed safety record. Today, FM-200 Waterless Fire Protection Systems are protecting more than 100,000 critical applications in over 70 countries.

Get the facts

So when choosing a fire suppressant, get the facts straight. Find out if it has been selected by most of the top fire system manufacturers for use in their systems. Ask for customer lists, approvals, test data, and manufacturing standards. The truth is, when you have all the facts, it's easy to make the right choice. All fire suppressants are not like FM-200. No other system can stop a fire faster.

Free FM-200 video

Take the guesswork out of fire suppressants. Send for our free FM-200 video CD and find out how you can protect your people and valuable assets and reduce your risk safely, without water. Just call 877-686-7888 or visit **www.fm-200.com** to request your copy today.

Circle 021 on Reader Service Card

FM-200® WATERLESS FIRE PROTECTION

ucts are also labeled "Green Cross" and certified biodegradable by Scientific Certification Systems.
Circle Reader Card No. 124

SOFTWARE
HRS Systems, Inc.
www.hrssystems.com
Booth 1424
HRS Systems presents the Hass® family of fire protection Windows™ software: HASS for hydraulic analysis of sprinkler systems, Hass-Estimator for cost estimating, HASS House® for residential sprinkler system analysis, and Coosa® for CO2 system analysis. Each is available in English or metric units; HASS is also available in metric Spanish.
Circle Reader Card No. 125

EDUCATION
Worcester Polytechnic Institute
www.wpi.edu
Booth 1444
WPI offers education to fire protection engineers worldwide through its distance-learning network. Engineering professionals can enroll in continuing education course, graduate certificate programs, or a Master of Science.
Circle Reader Card No. 126

FIRESTOP
Metraflex Company
www.fireloop.com
Booth 233
The Metraseal 120 is a fast installing, waterproof, intumescent mechanical firestop made of interconnected rubber links available in a variety of sizes to fill annular space. Metraseal 120 only takes minutes to install around any round pipe, saving time and money. No curing time is needed, so it instantly meets code.
Circle Reader Card No. 127

SOFTWARE
Hydratec Incorporated
www.hydracad.com
Booth 1419
Since 1972, Hydratec has supplied the finest software for the fire sprinkler industry. Stop by the booth and see what we have done to our estimating and hydraulics programs. We will also be demonstrating Autocad 2005 and the latest version of Hydracad.
Circle Reader Card No. 128

STANDPIPE
Potter Roemer
www.potterroemer.com
Booth 435
Potter Roemer will be exhibiting a full line of standpipe equipment, including cabinets, hose and accessories, fire extinguishers, pressure regulating valves, fire department connections, and fire pro monitors and nozzles.
Circle Reader Card No. 129

FABRIC
Milliken and Company
www.Milliken.com
Booth 436
Milliken introduces its new line of flame resistant fabrics and fabric specific to NFPA 70 level two protection.
Circle Reader Card No. 130

DISCHARGE DEVICE
Williams Fire and Hazard Control
www.williamsfire.com
Booth 1334
Williams Fire and Hazard Control, the patent holder for specialty discharge devices and foam system proportioning equipment, is the leading special hazard contract fire fighting company is the world. Williams also manufactures, designs, and supplies foam concentrates, specialty discharge devices, and fixed-foam system components to customers worldwide.
Circle Reader Card No. 131

VALVES
OCV Control Valves
www.controlvalves.com
Booth 835
OCV Control Valves is known for quality engineering, expert support, exacting control, simple maintenance in global and angle applications: reducing (UL), relief (UL/FM), deluge (UL), and pump suction control (FM).
Circle Reader Card No. 132

TESTING
NGC Testing Services
www.ngctestingservices.com
Booth 1442
Over 35 years of providing fast, cost effective evaluations of materials, products, and systems of fire endurance and flame spread from the developmental stage through the certification process. Accredited lab with full-scale floor-ceiling and partition fire test capabilities. Acoustical testing is also available.

Circle Reader Card No. 133

LIGHTNING
East Coast Lightning Equipment, Inc.
www.ecle.biz
Booth 234
East Coast Lightning Equipment manufactures UL-listed lightning protection system components including air terminals, mounting hardware, conductors, connectors, fasteners and grounding products. All products comply with UL and NFPA requirements for lightning protection systems. Our nationwide network of lightning protection design and installation specialists are available to help with projects of all types.
Circle Reader Card No. 134

GAS PROCESSING
RemTec International
www.remtec.net
Booth 1020

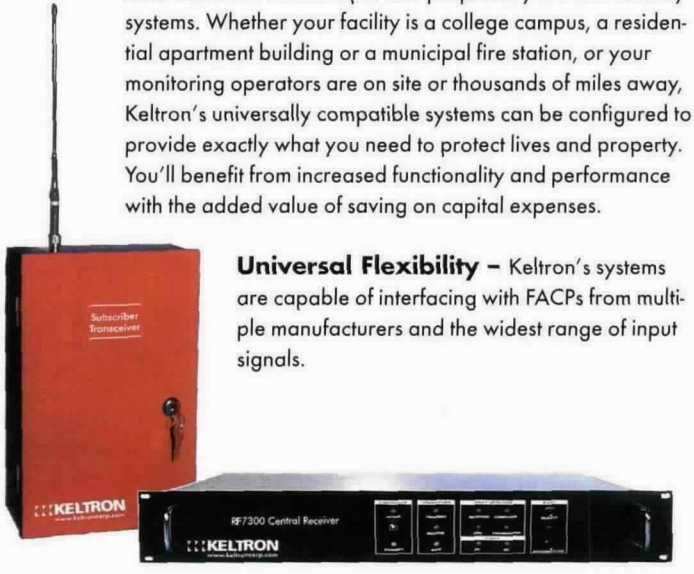
www.keltroncorp.com

We learned a thing or two in grade school about getting along well with others.

We put it into practice with universally compatible life safety event management solutions.

Accepting every type of alarm input, Keltron's unique alarm monitoring systems manage the monitoring and control functions that occur in municipal and proprietary fire and security systems. Whether your facility is a college campus, a residential apartment building or a municipal fire station, or your monitoring operators are on site or thousands of miles away, Keltron's universally compatible systems can be configured to provide exactly what you need to protect lives and property. You'll benefit from increased functionality and performance with the added value of saving on capital expenses.

Universal Flexibility – Keltron's systems are capable of interfacing with FACPs from multiple manufacturers and the widest range of input signals.



Universal Reception - In campus or multi-building complex environments, Keltron's systems can monitor signals via wire, fiber or radio.

Universal Accuracy - Our systems add point-specific remote event reporting to addressable FACPs that lack that capability.

Universal Savings - Keltron's systems' compatibility enables facilities managers to save capital expense by using existing equipment and enabling optimal purchasing.

If you need to monitor multiple buildings with different fire alarm control panels that receive different types of signals, call 800-966-6123 X26 or visit www.keltroncorp.com - to learn how Keltron's systems can get along with you.

Visit Keltron's booth #519 at the
2004 NFPA World Safety Conference

KELTRON

Circle 030 on Reader Service Card

RemTec International is a world leader of processing gaseous agents such as Halon 1211, Halon 1301, Halon 2402, HFC-23, HFC-125, HFC-227, and other gaseous halocarbons. All gases are laboratory certified to strict industry specifications. RemTec is also an approved U.S. DoT recertification facility that professionally reclaims, refurbishes, and recharges fire protection system bottle and bulk tanks.
Circle Reader Card No. 135

FIRESTOP
Specified Technologies, Inc.
www.stifirestop.com
Booth 1308
Specified Technologies Inc. is a leading manufacturer of firestop products with more than 650 UL classified systems. The SpecSeal® product line includes intumescent and endothermic sealants, intumescent wrap strips, collars and pillows, mortar, and elastomeric joint sealants. The newly introduced EZ-Path™ fire-rated pathway allows cabling moves, adds, and changes without firestopping. It provides superior fire and smoke leakage versus conventional sleeve and putty systems.
Circle Reader Card No. 136

FIRE PUMP
Patterson Pump Company
www.pattersonpumps.com
Booth 617
Patterson pumps continues to be the world leader in FM-approved and UL-listed fire pumps and systems. Capacities from 50 to 5,000 gallons per minute and up to 400 psi. End suction, vertical in-line, horizontal split case, and vertical turbine models available. Offices in Ireland, Greece, UK, and Thailand serve Patterson world-wide.
Circle Reader Card No. 137

PUMP CONTROLLER
Master Control Systems, Inc.
www.mastercontrols.com
Booth 422
Master Control Systems introduces the world's first variable speed electric fire pump controller. Master offers NFPA 20, UL-listed, and FM-approved fire pump controllers in all sizes. 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.
Circle Reader Card No. 138

WOOD PRODUCTS
Hoover Treated Wood Products
www.frtw.com
Booth 1641
Hoover Treated Wood Products, Inc. is the largest producer of fire retardant treated wood in the world. Our products are used for sheathing, siding, decks, and hundreds of other applications where fire resistant construction is required. We produce Pyro-Guard interior and exterior Fire-X fire retardant treated wood.
Circle Reader Card No. 139

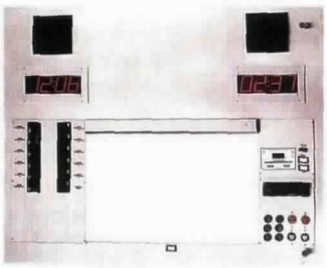
LIFE SAFETY
SimplexGrinnell
www.simplexgrinnell.com
Booth 501
SimplexGrinnell, a business unit of Tyco Fire & Security, is a leader in fire protection and life safety. The SimplexGrinnell portfolio includes fire alarm, fire sprinkler, fire suppression, integrated security and healthcare communications systems and services. SimplexGrinnell serves the architect and engineering community with a new A&E support organization.
Circle Reader Card No. 140

DETECTOR
Apollo Fire Detectors
www.Apollo-fire.co.uk
Booth 1407
Apollo Fire Detectors, one of the world's top three detector manufacturers, is showing its sophisticated "Discovery" range of intelligent fire detectors. These have five panel-selected operating modes to suit all environments and include a carbon monoxide fire detector. Also on show is the new "Orbis" conventional detector range.
Circle Reader Card No. 141

PIPING
Viega NA
www.viega.com
Booth 1213
ProPress copper-piping system
Circle Reader Card No. 142

COMPRESSOR
General Air Products, Inc.
www.generalairproducts.com
Booth 328
Since 1936, General Air Products, Inc. has been providing our customers with products and services of the highest quality. From our UL 2125 Oil Less Air Compressors, to our FM approved Dry Air Pac to our unparalleled customer service and technical support, we bring you only the best. Visit our booth or our Web site, www.generalairproducts.com, for more information.
Circle Reader Card No. 143

CONTROLS
Air Products and Controls
www.ap-c.com
Booth 1407
A leader in quality and innovation continues to exceed expectations again. Additions include the recently enhanced SL-2000 duct smoke detectors, featuring specialized "No-Tools" systems and new multi-function remote accessories. Debuting are the MR-300 series relays, and the "On-Track" PCB mounting system.



Circle Reader Card No. 144

POWER SYSTEM
Post Glover Lifelink
www.postgloverlifelink.com
Booth 437
Post Glover Lifelink manufactures isolated power systems for operating rooms and all patient care facilities. We make OR

Quality Proven. Code Approved.

New construction or retrofit, in multiple critical applications, **Harvel® CPVC fire sprinkler piping** meets the highest standards of quality manufacture and demanding code approvals. College dormitories, hi-rise construction, hotels/motels, hospitals, retirement communities, prisons, government buildings, apartment buildings and private residences – BlazeMaster® pipe, manufactured by Harvel,® is listed for more applications than any other non-metallic system.

And with clean, fast installation, you'll get a lower installed cost than any metallic sprinkler piping system.

Meet the code approvals you need for important applications, with the quality that has always been Harvel's trademark. Harvel® CPVC fire sprinkler pipe is the one to choose and install with total confidence.

- In conformity with all major model codes
- Meets NFPA light hazard applications (NFPA 13, 13R & 13D systems)
- Compliant to ASTM standards
- Listed by UL and LPCB
- Factory Mutual approved
- NSF certified for potable water use

HARVEL®
PLASTICS, INC.

HarvelSprinklerPipe.com
610-252-7355 FAX 610-253-4436
300 Kuebler Rd., P.O. Box 757, Easton, PA 18044-0757

AFSA
NFPA
NFSA

ISO 9002 CERTIFIED


Dormitories • Hotels • Barracks • Government Bu


Hospitals • Nursing Homes • Retirement Commun


Apartment High-Rises • Private Residences • Pris

Circle 070 on Reader Service Card

power pedestals, digital clock/timers and line isolation monitors. Versa-Duct is an anodized aluminum raceway for containment of power, communication, and fiber optic lines.
Circle Reader Card No. 145

FIRE EXTINGUISHER
Badger Fire Protection
www.badgerfire.com
Booth 1505
Badger is a premier manufacturer of portable fire extinguishers, pre-engineered commercial kitchen and pre-engineered industrial fire protection systems. We are an OEM supplier for paint spray booths.
Circle Reader Card No. 146

NOZZLES
Elkhart Brass Manufacturing Company
www.elkhartbrass.com
Booth 618
Elkhart Brass is a worldwide leader in design, manufacture, and distribution of high-performance firefighting equipment. Elkhart offers a complete line of nozzles, appliances specializing in fixed, selectable, and automatic hand-held and master stream nozzles and appliances. Elkhart Brass is a family-owned and operated company and is ISO 9000 (2000) certified.
Circle Reader Card No. 147

PIPE
Blazemaster Fire Sprinkler Systems
www.blazemaster.com
Booth 1115
Blazemaster® CPVC fire sprinkler systems are now listed for more types of applications than any other non-metallic systems. Faster: No prefabrication, lightweight material and solvent cement joining system decreases installation time. Cost effective: Decreased labor and maintenance costs compared to metal systems. Reliable: Corrosion resistant with low flame spread and low smoke emissions.
Circle Reader Card No. 148

CONTROL SYSTEM
ASCO Power Technologies
/Firetrol Products
www.firetrol.com
Booth 1018
For over 30 years, Firetrol products have delivered innovative technology to the UL Listed, FM Approved fire pump market. Our latest offering is the Mark II logic control system with fluorescent display and data logging of all operational and alarm functions.
Circle Reader Card No. 149

LIFE SAFETY
H.R. Kirkland Company, Inc.
www.hrkirkland.com
Booth 1329
H.R. Kirkland manufactures high-quality UL-listed annunciators, smoke control panels, custom control panels, and graphic maps.

Circle Reader Card No. 150

WATER MIST
Marioff
www.hi-fog.com
Booth 423
Hi-Fog is a water mist fire protection technology, which is fast, efficient, and totally safe for the environment. Hi-Fog makes use of attributes of the only truly environmentally benign agent—water. Hi-Fog has therefore become the first choice for many marine and land-based applications around the world.
Circle Reader Card No. 151

RISK MANAGEMENT
GE Global Asset Protection Services
www.gegapservices.com
Booth 1635
Loss prevention and risk management services including industry-leading data analysis and graphical web tools for large and mid-sized global organizations, insurance companies, and brokers.
Circle Reader Card No. 152

LIFE SAFETY
Fire-Lite Alarms
www.firelite.com
Booth 1108
Fire-Lite Alarms, part of Honeywell's Fire Systems Group and the leading manufacturer of quality life safety systems, offers a complete line of solutions and comprehensive range of fire protection technology for professional security equipment distributors, dealers, installers, and members of the fire alarm and life safety industries.
Circle Reader Card No. 153

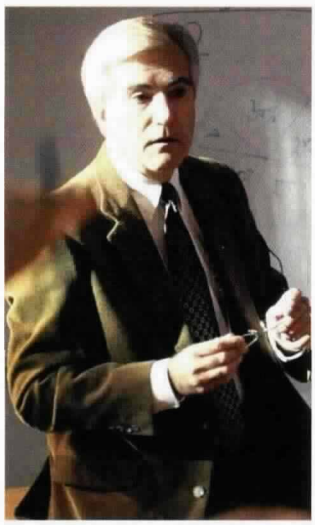
SIGNALS AND LIGHTING
Maxi-Signal Products
www.maxi-signal.com
Booth 229
Distributor of signals, lighting, and safety equipment, which includes UL-listed explosion-proof strobes and explosion-proof programmable multi-sound signals.
Circle Reader Card No. 154

FIRE DETECTION
axonX LLC
www.axonx.com
Booth 1531
axonX, LLC has developed a proprietary machine vision-based fire detection technology marketed under the SigniFire™ trademark. With axonX technology, it is possible to implement an entire fire detection system with one microchip that resides inside a surveillance camera.
Circle Reader Card No. 155

FIRE SPRINKLER PRODUCT
Spears Manufacturing Company
www.spearsmfg.com
Booth 1323
Spears FlameGuard™ CPVC fire sprinkler products provide a cost-effective alternative to metal systems, providing the advantages of high corrosion resistance,

CALL FOR PRESENTATIONS

We are now accepting proposals for educational presentations at NFPA's 2005 World Safety Conference and Exposition® (WSCE). We invite you to share your experience and expertise with your peers in the field of fire and life safety as a presenter in Las Vegas, Nevada, June 6-10, 2005. Please complete the form below in full and return, via mail, email, or fax to NFPA by September 24, 2004. 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.



Return this form to:
NFPA
Attn: Linda Bailey
One Batterymarch Park
Quincy, MA 02169
Fax: 1-617-984-7030
Email: lbailey@nfpa.org

Deadline for submission is September 24, 2004

NFPA World Safety conference & exposition®

2005 Las Vegas

Presentation Submission Form (Please type or print clearly.)

Title of presentation: _____

Description of presentation (50 words or less): _____

_____

_____

_____

_____

Presentation length: ☐ 1 hours ☐ 1.5 hours ☐ Other _____

To be considered, a resume and short description of the presenter's and any co-presenter's credentials must be attached.

Learning Objectives (required for accreditation): _____

_____

_____

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: _____

Email: _____

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: _____

Email: _____

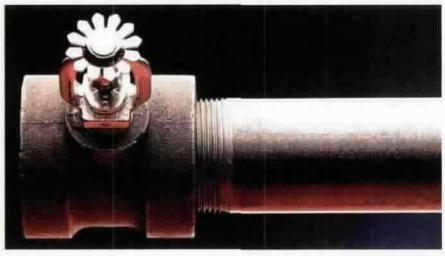
improved system hydraulics, and easy installation. CPVC Spears FlameGuard products are approved by UL, FM Global, and LPCB, listed for NFPA 13, NFPA 13R, and NFPA 13D systems, and certified by NSF.
Circle Reader Card No. 156

FIRE CONTROL
Mircom
www.mircom.com
Booth 1711
Mircom manufactures and markets a full line of high quality fire control and communication products dedicated to the life safety and telephone access markets. Mircom is committed to providing high
Circle Reader Card No. 157

NOZZLES
Task Force Tips, Inc.
www.tft.com
Booth 912
Since 1969, Task Force Tips, Inc. has led the industry in the innovative design of high performance fire suppression nozzles, monitors, foam applicators, injection equipment, industrial fixed systems, large diameter hose hardware, and accessories.
Circle Reader Card No. 158

CABLES
AEI Cables
www.AEICables.com
Booth 1431
AEI 2-hour rated cable is used for commercial fire protection of critical life safety circuits in commercial buildings. It is suitable for power feeds for fire pumps and emergency generators, and in fire alarm and voice communication systems.
Circle Reader Card No. 159

SPRINKLER SYSTEM
Flexhead Industries
www.flexhead.com
Booth 1418
The Flexhead® fire sprinkler connection is designed for use as the final connection between the fire sprinkler piping and the sprinkler head installed in suspended and gypsum board ceilings. The system comes complete with a fully braided and welded, leak checked flexible metal hose assembly and a mounting bracket for tile installations.
Circle Reader Card No. 160



PIPE
Bull Moose Tube Company
www.bullmoosetubes.com
Booth 813
Bull Moose Tube's "Eddy Pipe" brand sprinkler pipe is produced to meet sprinkler pipe standards of ASTM A-135 and A-795. All pipe is UL listed and FM approved. Exceptional production and coating capabilities, tighter tolerances, make Bull Moose Pipe excellent for roll grooving, welding threading, and plain-end fittings.
Circle Reader Card No. 161

PASSIVE PROTECTION
Abesco
www.abesco.net
Booth 1339
Abesco is a manufacturer of passive fire protection that includes pipe collars, pipe wraps, caulks, cable transits, and mortar.
Circle Reader Card No. 162

FABRIC
Westex Inc.
www.westexinc.com
Booth 1035
Westex manufactures *INDURA®*, *Ultra Soft®* flame resistant fabrics that offer industry leading balance of protection, comfort, and value and offer excellent protection from electrical arc and flash fire.
Circle Reader Card No. 163

SPRINKLERS
Viking Corporation
www.vikingcorp.com
Booth 1400
Visit the Viking booth to see the latest innovations in fire sprinklers including the COIN™ Combustible Interstitial Space sprinkler, dry-concealed heads, and expanded residential and storage sprinkler lines. Straight-through valves, TotalPac2 options, and a new Integrated Compressed Air Foam system for fixed piping networks are also among the quality products on display.
Circle Reader Card No. 164

EVACUATION SYSTEM
Telex Communications
www.telex.com
Booth 943
Pro-announce paging and life safety voice evacuation systems.
Circle Reader Card No. 165

COMMUNICATIONS
Cornell Communications, Inc.
www.cornell.com
Booth 607
Cornell is the expert in providing effective communications systems. Customers

often select several of our integrated systems to improve the communications, security, or efficiency with their communities. Our Emergency Response, Pocket Paging, Access Control, and Area of Rescue Assistance Emergency Evacuation systems have helped thousands of customers feel safe and secure.
Circle Reader Card No. 166

SIGNAGE

Safetysign.com, A division of Brimar
www.safetysign.com
Booth 216
Safetysign.com is an online e-commerce warehouse signs. There are more than 2,000 stock signs to choose from and the ability to create and order custom signs online. Save money, save time, and shop online at Safetysign.com.
Circle Reader Card No. 167

BRACING

Loos & Company
www.earthquakebrace.com
Booth 1139
Earthquake sway bracing and seismic wire rope/cable bracing from Loos & Company Inc, is UL listed and included in NFPA 13. Prestretched, color-coded, break-strength certified, and code compliant.
Circle Reader Card No. 168

CABLES

Draka USA
www.drakausa.com/lifeline
Booth 1229
The Lifeline™ family of cables by Draka USA is the practical approach to fire-rated electrical systems. Lifeline cables use ceramified silicone technology. The Lifeline family of cables is reliable, flexible, easily installed with standard procedures and terminations, and they are cost efficient.
Circle Reader Card No. 169

COATING

Shanghai Special TEX Company, Limited
www.specialtex.com
Booth 1036
Fire prevention and fire protection glass fiber fabrics possess the characteristics of lightweight, high strength, corrosion resistance, and leak-proof. Our company can supply fiberglass refractory coating, PV coating fiberglass fabrics, vermiculate coating, graphite coating, and mica coating fiberglass fabrics.
Circle Reader Card No. 170

SIGNAGE

EXHIBITOR SHOWCASE

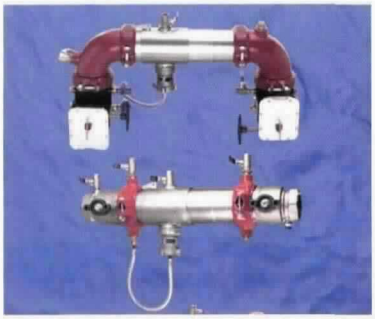
Active Safety
www.activesafety.com
Booth 930
A manufacturer of emergency evacuation systems and non-electrical exit signs.
Circle Reader Card No. 171

FIRE PROTECTION

No-Burn Inc.
www.noburn.com
Booth 1237
No-Burn Inc. is committed to making the risk from fires a thing of the past. No-Burn® Wood Gard can be applied during construction. No-Burn® Original can be applied to pre-finished wood. No-Burn® Fabric Gard can be used on upholstered furniture. No Burn® Plus can be applied to any paintable surface.
Circle Reader Card No. 172

FIRE DETECTION

System Sensor
www.systemsensor.com
Booth 1412
System Sensor is a global manufacturer of fire detection and notification devices, specializing in smoke detection and notification technology. System Sensor places a premium on research and development, resulting in products that are reliable, sophisticated and designed for real-world applications. Sales, service, and manufacturing facilities are throughout the Americas, Europe, and Asia.
Circle Reader Card No. 173



REGULATORS

Watts Regulator/
Ames Fire and Waterworks
www.wattsreg.com
www.amesfirewater.com
Booth 1035
The Ames Colt/Maxim is the first backflow preventer with approved UL/FM butterfly shutoffs. Together with extremely low head loss, 70 percent lighter weight than traditional designs, ease of serviceability, and the versatility of shutoff valve options. It is the all-around best valve money can buy.
Circle Reader Card No. 174

MONITORING

Potter Electric Signal Company
www.pottersignal.com
Booth 1017
Potter Electric Signal Company manufactures a full line of fire sprinkler monitoring devices, fire panels, and security devices. The sprinkler monitoring devices consist of flow, pressure, and valve tamper switches, and releasing panels. Potter also provides a full line of alarm panels and peripheral devices.
Circle Reader Card No. 175

LIGHTING

Prescolite
www.prescolite.com
Booth 1312
Prescolite's patented FireTight downlights provide energy efficient high-output lighting in a recessed fixture that is UL classified for installation in a range of fire-rated ceiling types. It is ideal for residential, commercial, and institutional environments such as office complexes, apartment buildings, assisted living and health care facilities, and other multi-story buildings.
Circle Reader Card No. 176

NOTIFICATION

Wheelock, Inc.
www.wheelockinc.com
Booth 201
Wheelock, Inc. will be exhibiting the industries widest selection of fire life safety notification appliances including multi-candela appliances with field selectable candela setting including new high-intensity models. SAFEPATH® 4 multi-function supervised facility communications systems combines emergency voice evacuation, general paging, voice messaging, and background music with added enhancements including six message and power boosters.
Circle Reader Card No. 177

TESTING

Omega Point Laboratories, Inc.
www.opl.com
Booth 741
Omega Point Laboratories is a nationally recognized, independent testing laboratory specializing in the performance characteristics of building materials, systems, and interior products. Since 1985, we dedicated ourselves to being responsive to client needs by providing the best possible quality in every service we offer. Visit www.opl.com for more information.
Circle Reader Card No. 178

EXTINGUISHANT

American Pacific/Halotron Division
www.halotron-inc.com
Booth 534
Halotron® I, a clean fire extinguishing agent that leaves no powder residue and replaces Halon 1211, is available worldwide for fire extinguishers, aircraft rescue and firefighting vehicles from E-One, Oshkosh, and Fire Combat, and limited flood applications. Approved: UL and ULC listed portables and wheeled units from Amerex, Badger, Buckeye, and Kidde; U.S. EPA SNAP list for commercial/industrial maritime and military use; U.S. Coast Guard; airport firefighting. FAA approved

for use on board commercial aircraft.
Circle Reader Card No. 179

STROBE

Gentex Corporation
www.gentex.com
Booth 523
Commander3 (GE3) series is a wall-mount 12 or 24 volt selectable candela strobe and horn strobe combination. The series offers selectable strobes of 15, 30, 60, 75, and 110 candela settings. This unit offers synchable Temporal 3 tones, as well as chime, whoop, high/low frequency, and high/low dbA tones.
Circle Reader Card No. 180

EGRESS SYSTEM
Jessup Manufacturing Company
www.globritesystem.com
Booth 428
Glowbrite® brand is a complete photoluminescent egress system consisting of UL 924 lighted exit signs, egress strips, stair markers, dots and arrows, film and tape, and non-slip tape. Globrite products meet all current standards and codes. Made in the U.S.A.
Circle Reader Card No. 181

CONSULTING
Conrady Consultant Services
www.conradyconsultants.com
Booth 712
Fire water and potable water storage tank inspection underwater without draining your tank. Also drained tank inspections. All inspections by a registered professional engineer. Most comprehensive inspection report in the industry.
Circle Reader Card No. 182

STORAGE TANK
USA Tank Storage Systems
www.usatanksales.com
Booth 1311
USA Tank Storage Systems delivers quality fire protection tank ranging in size from 4,000 gallons to 2.5 million gallons. For your fire protection needs, we offer complete turnkey operation, including foundations, erection, tank heaters, insulation, and measuring devices. We look forward to seeing you in any capacity.
Circle Reader Card No. 183

IDENTIFICATION SYSTEM
Polaroid ID Systems
www.Polaroid-ID.com
Booth 908
Polaroid ID offers a digital ID card system for any small or large business. The system includes a card printer, ID card maker software and a digital camera to make your identification process simple and easy to use.
Polaroid ID Systems also includes a

full-service ID card production bureau.
Circle Reader Card No. 184

FIRE RESISTANT SYSTEM
International Fire Resistant Systems, Inc.
www.firefree.com
Booth 937
Firefree 88 has the ability to contain fire to its room of origin by protecting walls and ceilings and preventing them from contributing to the fire, thus resulting in saving lives and preserving the structural integrity of the property. FF88 is non-toxic, environmentally friendly, and applies as easily as paint.
Circle Reader Card No. 185

FLAME DETECTION
Vibro-Meter, Inc.
www.vibro-meter.com
Booth 1023
Complete family of explosion-proof optical flame detectors for hazardous area applications that include the Model 660 UV detector, available in both industrial and special high-temperature versions; the Model 860 UV/IR detector, available in hydrocarbon and non-hydrocarbon fire versions; and the new Model 760 Multi-Spectrum IR detector.
Circle Reader Card No. 186

ELECTRICAL SAFETY
Technology Research Corporation (TRC)
www.trci.net
Booth 240
TRC is recognized as a world leader in electrical safety products that prevent electrocution, electrical fires, and protect against serious injuries from electrical shock. TRC's Fire Shield® products are the world's first and only surge strips and cords that prevent cord fires, ground faults, surges, and overloads.
Circle Reader Card No. 187

NOZZLES
Akron Brass Company
www.akronbrass.com
Booth 738
Akron Brass is a leading manufacturer of high-performance firefighting equipment. Products include nozzles, monitors, turrets, valves, and foam equipment.
Circle Reader Card No. 188

WATERLESS FIRE PROTECTION
Great Lakes Chemical Corporation
www.fm-200.com
Booth 1413
Fast-acting FM-200® Waterless Fire Protection Systems protect data centers, electronics, records, art, marine vessels, and other high-value assets from fire and water damage. Safe for people, equipment, and the environment, FM-200 systems cause no collateral damage. Free CD shows why so many hospitals, museums, manufacturers, and technology organizations choose FM-200.
Circle Reader Card No. 189

RISK MANAGEMENT
TVA Fire & Life Safety, Inc.
www.tvafiresafety.com
Booth 1135
TVA offers comprehensive services in fire protection, life safety, security, engineering, and risk management and loss control. With 200 employees and nine regional offices (plus one European location), TVA is one of the largest fire protection-engineering firms in the world.
Circle Reader Card No. 190

STORAGE TANK
Containment Solutions, Inc.
www.containmentsolutions.com
Booth 5625
Containment Solutions (CSI) manufactures underground fiberglass storage tanks (500-50,000 gal.) CSI tanks will not rust or corrode and are the perfect solution for fire protection. We design our tanks to meet NFPA specifications. Typical Applications include dry hydrant tanks and surge tanks for fire sprinkler systems.
Circle Reader Card No. 191

WIRELESS NETWORK
AES-IntelliNet
www.aes-intellinet.com
Booth 947
AES-IntelliNet is the leader in delivering high quality wireless mesh networks to the fire and security industry for commercial, municipal and educational applications. Users of AES-IntelliNet networks have gained significant communications and cost advantages while continuing to meet the high standards of reliability required for the fire and security industry.
Circle Reader Card No. 192

CONTROL
Tyco Thermal Controls
www.tycothermal.com
Booth 412
Pyrotenax is the leading brand of 2-hour, fired-rated electrical cables. Pyro CiC is a 2-hour, fire-rated FPL and NPLF fire alarm cable that connects the main fire alarm panel with data-gathering panels (transponders) throughout the building. Pyro CiC's tubed jacket makes it the easiest cable on the market to terminate.
Circle Reader Card No. 193

STORAGE TANK
Columbian TecTank
www.columbiantectank.com
Booth 620
Columbian TecTank manufacturers bolted and factory-welded steel tanks for storage of fire protection water. Our new coating, Trico-Bond EP — is a high performance modified epoxy powder that has undergone five years and more than 9,000 hours of laboratory and field-testing. Tanks are manufactured in ISO 9000 Quality Certified facilities.
Circle Reader Card No. 194

INSPECTION REPORTS
BuildingReports.com
www.buildingreports.com
Booth 723
BuildingReports.com is the industry leader in web-based wireless inspection reporting. Our system allows building owners

and property managers to instantly access critical life safety compliance data.Our reports are consistent, reliable and uniform worldwide. BRC provides trademarked and customized products and services that enable real-time collaboration utilizing mobile handheld technology.
Circle Reader Card No. 195

FIRE DETECTION
Kidde Fire Systems
www.kiddefiresystems.com
Booth 1521
Kidde Fire Systems protects people and business assets by providing automatic fire detection, suppression and control for special hazard applications ranging from data centers, robotics and marine vessels to commercial cooking appliances, mining vehicles and manufacturing processes. Visit our exhibit for a free copy of the Kidde PROTECT-SPEC Specifications CD.
Circle Reader Card No. 196

SEALING
CSD Sealing Systems
www.dorncsd.com
Booth 1534
CSD Sealing Systems manufactures fire stop devices for cable and cable-tray applications using Actifoam technology. These UL-classified devices can be opened and closed for cable modifications and last the life of the building.
Circle Reader Card No. 197

RESEARCH
Combustion Science & Engineering, Inc.
www.csefire.com
Booth 831
CSE specializes in combustion research and technology (fundamental and applied, analytical and experimental), performance-based and fire hazard code equivalency analyses, fire protection research and development (small and large scale), fire investigation and reconstruction (cause and origin), process hazard analyses, computer fire modeling and CFD analysis of reacting flows.
Circle Reader Card No. 198

FIRE ALARM SYSTEM
Silent Knight
www.silentknight.com
Booth 1200

Our fire products integrate digital communication technology with the sophisticated control functions your job demands. With a complete line of systems that range from the powerful Farenhyt analog/addressable fire alarm systems, to the economical conventional panels, we have a fire protection solution to satisfy your demanding applications.
Circle Reader Card No. 199

SOFTWARE

OmniCADD, Inc.
www.omnicadd.com
Booth 1220
Custom software designers
Circle Reader Card No. 200

PREVENTION

Combustion Safety, Inc.
www.combustionsafety.com
Booth 611
Combustion Safety, Inc. specializes in the prevention of explosions and fires by promoting awareness and better implementation of operational procedures for fuel-fired equipment. Services include third-party testing, comprehensive inspections, burner tuning, custom training programs, root cause analysis, and 24-hour emergency engineering support.
Circle Reader Card No. 201

CONDUIT

Allied Tube & Conduit
www.alliedtube.com
Booth 313
Allied Tube & Conduit has been manufacturing high quality galvanized steel conduit and tubing for over 40 years, including an engineered line of sprinkler pipe featuring brands such as DynaFlow, DynaThread, XL, BLT and standard Schedule 10 & 40. Allied also recently introduced Fire Alarm EMT, an innovative conduit for fire alarm systems that eliminates the need to spray paint, powder coat or tape installations in the field.
Circle Reader Card No. 202

DETECTION

Detector Electronics Corporation
www.detronics.com
Booth 1501
A world leader in optical fire detection, gas detection, and hazard mitigation systems. Det-Tronics designs, builds, tests and commissions safety systems that range from conventional panels to fault-tolerant, addressable. Our flame and gas

detectors are globally certified to the latest approvals standards. Det-Tronics is a member company of Kidde International.
Circle Reader Card No. 203

EDUCATION
Modeltech International
www.modeltech.com
Booth 737
Hazard House is an interactive portable simulator that will make your next fire safety presentation more striking and most memorable. This 3-D-miniature home illustrates typical fire hazards and injury prevention situations inside and outside the house. The display features special effects using smoke, arcing sounds, life-like figures, and moveable accessories.
Circle Reader Card No. 204

FIRE PROTECTION
Fenwal Protection Systems
www.fenwalfire.com
Booth 1519
Fenwal combines innovative fire protection solutions instant detection, waterless suppression and integrated control with unmatched client services to safeguard the assets and business continuity of mission critical facilities. Visit our exhibit for a free copy of the Fenwal Guide to Mission Critical Fire Protection CD.
Circle Reader Card No. 205

RESIDENTIAL SPRINKLER SYSTEM
Uponor Wirsbo
www.wirsbo.com
Booth 330
Uponor Wirsbo's AQUASAFE is a revolutionary residential sprinkler system that provides a cost-effective solution for reliable and safe fire protection. Using Uponor Wirsbo's AQUASAFE tubing, the plumbing system and the fire sprinkler system can be combined into one low-cost, multi-purpose water supply system.
Circle Reader Card No. 206

FIELD DEVICES
MEDC International
www.medc.com

Booth 1434
MEDC design, manufacture and market a range of field devices for fire & gas and communications systems with worldwide certifications including ATEX/UL/FM/GOST/CSA/CQST. The range includes call points, horns, speakers, strobes, status lamps, heat detectors, lighting and control & distribution equipment for use in harsh environments/potentially explosive atmospheres.
Circle Reader Card No. 207

PIPE CONSEALMENT
Grice Engineering, Inc.
www.soffisteel.com
Booth 1633
The Soffi-Steel System is the premier modular pipe concealment system, custom designed to provide a durable, facing that is attractive and quickly installed. It can be used to conceal fire sprinkler, plumbing, HVAC, and hydronic piping. The Soffi-Steel System is available in various finishes and sizes. Call Grice Engineering 800-800-3213 or www.soffisteel.com.
Circle Reader Card No. 208

FIRE DETECTOR
Fire Sentry Corporation
www.firesentry.com
Booth 1433
Multi-Spectrum Electro-Optical Radiant Energy fire detectors specifically manufactured for petrochemical, oil & gas, semiconductor clean rooms, automotive, and finishing industries. Fire Sentry's unique wide-band quantum sensor technology coupled with advanced digital signal processing software algorithms, makes these detectors superior to the conventional Electro-Optical fire detectors.
Circle Reader Card No. 209

LIFE SAFETY
Notifier
www.notifier.com
Booth 1001
Notifier, the technology leader in commercial fire alarm and life safety systems provides state-of-the-art products and services through its local distributors. Notifier solutions facilitate orderly evacuation of personnel in the event of a fire while reducing nuisance alarms. Notifier systems are also upgradeable providing the industry its lowest cost of ownership.
Circle Reader Card No. 210

DETECTION

Spectrex, Inc.
www.spectrex-inc.com
Booth 1619
Spectrex is a leader in innovative optical gas and flame detection products. The new Mini IR3 (20/20MI) is a small, lightweight (2.5 lb.), low-power (25 mA), inexpensive, general-purpose flame detector that will see a 1x1 foot gasoline fire at 125 feet, with highest false alarm immunity. View product details at www.spectrex-inc.com.
Circle Reader Card No. 211

SUPPRESSION

FirePak Oil and Gas Industries (FO&GI)
PYROGEN
www.pyrogen.com
Booth 1331
FO&GI is the leader in aerosol suppression systems. Master distributor for PYROGEN in the Americas. NFPA 2010, total flooding and pre-engineered aerosol systems. TEXASCOOLVEST personal cooling systems. Fire Caddy residential and urban interface systems. BlazeTammer USFS5700-306a wildland water enhancer. energy, marine, transportation and offshore industries design installation and consulting services.
Circle Reader Card No. 212

PROTECTION

Knox Company

www.knoxbox.com
Booth 1429
Knox FDC Protection Program, long-term FDC protection against vandalism and fire department control over FDC equipment is now possible. Locking Knox FDC Caps prevent foreign matter from entering sprinkler systems. Knox FDC Caps are quickly and easily removed with a Knox Keywrench.
Circle Reader Card No. 213

SOFTWARE

M.E.P.CAD, INC.

www.mepcad.com
Booth 1309
Learn about the world's most comprehensive, concise, and easy-to-use fire sprinkler sales, design, and field labor reduction system. AutoSPRINK's VR suite of programs is designed to provide automated effective interaction between sales, engineering, and construction. AutoSPRINK's programs can and will dramatically increase profitability by increasing productivity in all areas.
Circle Reader Card No. 214

DETECTION

FLAMEX, INC.
Booth 829
The FLAMEX Spark Detection and Extinguishing System is the most cost effective solution for prevention of bag house fires and explosions. It identifies and extinguishes a spark in a pneumatic duct in a fraction of a second, preventing the spark from entering filtration and storage units where the hazards can occur. The FLAMEX is Factory Mutual approved.
Circle Reader Card No. 215

LIGHTING

Day-Brite Capri Omega Lighting
www.daybrightlighting.com
www.capriomegalighting.com
Booth 1530
Day—Brite Capri Omega Lighting introduces several important products for emergency situations. NFPA members must see the Capri "Firedome" down light, a recessed lighting fixture with 60-minute fire rating. McPhilben exit and emergency products feature "X-test" self-diagnostics, our exclusive system aiding building managers in meeting NEC requirements for periodic testing and written records.
Circle Reader Card No. 216

MONITOR

Comark Corporation
www.comarkcorp.com
Booth 323
Comark manufactures UL864-recognized computers and displays. We provide configuration control, as well as UL864 File submission and maintenance. Based on Intel PIII or P4 processors, all systems are high-temp tested and burned-in to ensure reliable operation. We have your fire alarm, access control, and building automation solutions. Call (800) 280-8522,x105.
Circle Reader Card No. 217

CONTROL VALVE

Bermad Control Valves

www.bermad.com
Booth 635
A world-leading manufacturer of automatic control valves, Bermad offers a complete line of UL Listed & FM Approved Pilot Operated Pressure Reducing, Pressure Relief, Pump Suction, and Deluge Control Valves.
Circle Reader Card No. 218

RESISTOR

IPC Resistors Inc
www.ipc-resistors,com
Booth 1238
Ground fault relays amd power resistors providing protection from electrical hazards such as shock and arc flash.
Circle Reader Card No. 219

VENTS

The Bilco Company
www.bilco.com
Booth 1317
Bilco will exhibit its line of UL-listed, FM-approved automatic fire vents, as well as

the construction industry's only UL-listed fire-rated floor door.
Circle Reader Card No. 220

AUTOMATIC EXTINGUISHER

Dis-Cover, Inc.
www.dis-coverinc.com
Booth 1313
Dis-Cover has developed the most sophisticated "Matrix" solution, which allows fire professionals to quickly, and properly determines the correct, self contained, automatic extinguisher from the baffling 5,000 combinations available to chose from. Dis-Cover both manufacturers and distributes all major brands of automatic extinguishers. Dis-Cover is introducing the new, FM approved CeaseFire.
Circle Reader Card No. 221

FOAM

Chemguard, Inc.
www.chemguard.com
Booth 320
Chemguard, Inc. is a leading manufacturer of fire fighting foams, foam and dry chemical systems, portable equipment, and specialty chemicals. The specialty chemicals include the former Ciba Lodyne fluorosurfactants line and Chemguard's proprietary fluorosurfactant line used in the manufacture of AFFF's and other

chemicals.
Circle Reader Card No. 222

TRADE ASSOCIATION
American Pyrotechnics Association
www.americanpyro.com
Booth 1224
As the leading trade association for the fireworks industry, APA develops training programs, videos and guidelines for the safe manufacture, transportation, storage and use of consumer and display fireworks, and indoor proximate pyrotechnics.
Circle Reader Card No. 223

TESTING
FM Approvals
Booth 706
FM Approvals is recognized worldwide as an independent, third party testing organization-providing companies with certification for the global marketplace. With our many international relationships in Europe and Asia, we have the expertise to assist manufacturers through the certification process in a timely and efficient manner.
Circle Reader Card No. 224

PUMPS
Edwards Manufacturing
www.edwardsmfg.com
Booth 535
UL/FM Foam Pumps for special and high hazard products. Water-mist pumps and systems for critical areas and installations. EMI is a leader in both, please stop by our both and find out more. Custom pump assemblies are a specialty.
Circle Reader Card No. 225

SOFTWARE
FPE Software, Inc.
www.fpesoftware.com
Booth 1123
Fire Pump Evaluation Program 2002 is designed for recording pump tests and developing performance histories for fire pumps. The Sprinkler Program 2001 is a user-friendly sprinkler hydraulics program.Capabilities include supply/demand calculations, 600-pipe/node capacity, error checking, user modifiable pipe diameters and fitting equivalent lengths, supply/demand graph output, and more.
Circle Reader Card No. 226

TRAINING
Fire Safety Displays Company
Booth 1022
The Fire Safety Displays Company produces "The System", an engineered emergency identification/training program that consists of evacuation displays, fire/safety identification signs, employee pamphlets, and fire department pre-plan prints.Other products include specialized fire system graphics, directory/way finding systems, and other custom products.
Circle Reader Card No. 227

NOZZLE INSERTS
Hydro Flow Products, Inc
www.HoseMonster.com
Booth 1412
The Hose Monster® makes fire pump testing and rooftop standpipe testing safe, accurate and professional. UL Nozzle Inserts and built-in pitot ensure accuracy while discharge water is safely diffused. Fireflow testers avoid landscape damage and traffic interference with consistent accuracy. Use Fire Flow Tester™ software compute and report on results.
Circle Reader Card No. 228

EXTINGUISHING SYSTEM
GreCon, Inc.
www.grecon-us.com
Booth 325
GreCon Spark Extinguishing System significantly reduces bag house and other dust collector fires. System detects process produced sparks in pneumatic conveying ducts and extinguishes them before they

cause fires or explosions. System eliminates costly shutdowns, property damage, personal injury, can favorably affect user's insurance premiums and is Factory Mutual Approved.
Circle Reader Card No. 229

LIGHTNING PROTECTION
Harger Lightning & Grounding
www.harger.com
Booth 440
Harger Lightning & Grounding, pioneers in total systems integration, couples extraordinary service with high quality products providing the ultimate in lightning protection systems. Harger also offers unique grounding products such as Ultraweld® exothermic connections, electrolytic ground rods, UL listed ground bars and other specialized ground electrodes. Contact us at (800) 842-7437.
Circle Reader Card No. 230

INSTALLATION
Fire Materials Group, LLC
www.1fmg.com
Booth 1134
Fire Materials Group, LLC is a national company specializing in fire protection systems installation, testing and inspection, and corrective maintenance services.
Circle Reader Card No. 231

PIPE
Harvel Plastics, Inc.
www.harvel.com
Booth 1335
Harvel Plastics, Inc. is a leading manufacturer of high quality CPVC fire sprinkler piping products tested and designed specifically for use in wet systems per NFPA 13 Light Hazard, 13R and 13D systems. Please visit www.harvel.com for additional information.
Circle Reader Card No. 232

SPRINKLER PRODUCT
AFCON
www.afcon.org
Booth 1533
Since 1952, we have manufactured UL, FM products for the fire sprinkler industry. Our line of hanger products and sway brace products is the largest in our industry. Our booth will feature sway brace products, sway brace software, backflow products.
Circle Reader Card No. 233

CONTROL PANEL
Gamewell
www.gamewell.com
Booth 1109
Intelligent fire alarm control panels, large campus style fire alarm networks, graphic interface and building system integration products, and conventional fire alarm detection and notification systems.
Circle Reader Card No. 234

INSPECTION SOFTWARE
Tiscor
www.tiscor.com
Booth 1408
Tiscor's Inspection Manager FLX combines powerful software with hand-held technology to completely automate fire code inspections. The system allows users to record code violations electronically onsite with a hand-held computer, eliminating handwritten paperwork and time-consuming follow-up data entry. Data is easily uploaded to a database, increasing productivity and efficiency.
Circle Reader Card No. 235

FIRE PUMP CONTROL
Eaton Cutler-Hammer
www.chfire.com
Booth 1223
Eaton Cutler-Hammer microprocessor based fire pump controllers are available in both Electric and Diesel Engine models. Electric controllers are Full or Limited Service, and can be supplied with an integral or stand alone Automatic Transfer Switch.
Diesel controllers are available with

120Vac or 220Vac supply and 12Vdc or 24Vdc output.
Circle Reader Card No. 236

EXTINGUISHER

Amerex Corporation
www.amerex-fire.com
Booth 913
Amerex offers a complete range of hand-portable and wheeled fire extinguishers, including extinguishers using clean agents; Water Mist and Halotron I. Restaurant, Industrial, and Vehicle Suppression Systems, and Methane Gas Detection Systems round out the products. Amerex is introducing EN-Gauge, electronically monitored fire extinguishers capable of integrating with alarm systems.
Circle Reader Card No. 237

CONTROLLER

Tornatech
www.tornatech.com
Booth 541
Tornatech manufactures fire pump controllers built to NFPA 20 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. 238

ENGINEERING

Rolf Jensen & Associates (RJA)
www.rjainc.com
Booth 1428
Rolf Jensen & Associates, Inc. is a professional engineering consulting firm providing an integrated package of engineering consulting services from master planning and systems design to on-site construction and maintenance management to systems commissioning and third-party inspection. RJA works with the latest in computer technology and utilizes their propriety software programs to create unique solutions to project challenges.
Circle Reader Card No. 239

CLEAN AGENT EQUIPMENT

SEVO Systems
www.sevosystems.com
Booth 910
SEVO Systems is a manufacturer of clean agent equipment and developer of Fire Fluid Technologies, featuring 3M; Novec 1230 Fire Protection Fluid. SEVO offers the greener solution to halocarbon alternatives. Products featured: portable extinguishers, pump systems, small and large capacity total flooding hardware.
Circle Reader Card No. 240

HEAT DETECTION

The Protectowire Company, Inc.
www.protectowire.com
Booth 1425
The Protectowire Company will be introducing a new linear heat detector, Model PHSC-220-EPC designed for a wide-range of commercial and industrial applications. Also featured is the new SRP-4x4 Fire Alarm/Releasing Panel that offers unique features, such as Alarm Point Location and field selectable Class A or B detection circuits in a standard off-the-shelf package.
Circle Reader Card No. 241

BUILDING MATERIAL

Weyerhaeuser Composite Panels
www.weyerhaeuser.com
Booth 1138
Weyerhaeuser's Class-1 fire-rated Duraflake particleboard and Premier MDF panels are ideally suited for non-structural interior applications where fire safety is important, such as in hotels, schools, hospitals, airports, restaurants, malls, offices, elevators, case goods, and architectural wall panels. Moisture-resistant panels are also available.
Circle Reader Card No. 242

DIESEL ENGINE

Clarke Fire Protection Products Inc.
www.clarkefire.com
Booth 629
Clarke Fire Protection Products provides FM and UL certified diesel engines direct to pump manufacturers worldwide for their

assembly into fire protection systems. Introduced in 2004, Clarke's new Pressure Limiting Driver (PLD) uses variable speed to control system overpressure. Clarke has production facilities in Cincinnati, Ohio and Coatbridge, United Kingdom.
Circle Reader Card No. 243

VALVE
NIBCO Inc.
www.nibco.com
Booth 809
NIBCO manufactures UL, ULC, FMRC, NYC valves for the fire protection market and its valve package has expanded to include TOLCO pipe hangers, supports and seismic bracing. products including pipe hangers, supports and seismic bracing. For more information, visit www.nibco.com.
Circle Reader Card No. 244

NETWORK SYSTEM
Fire Control Instruments
www.firecontrolinstruments.com
Booth 1300
Fire Control Instruments (FCI), a Honeywell Company, is a performance and technology leader in the life safety systems industry for commercial, industrial and educational applications worldwide. Utilizing high-speed networking and fiber optic communications, FCI is pleased to release NetSOLO CLASSIC, their new addition to the NetSOLO Series of networking systems. Fire Control Instruments combines intelligence with high reliability to produce an exceptional line of fire alarm systems.
Circle Reader Card No. 245

FIRESTOP
Rectorseal Corporation
www.rectorseal.com
Booth 1628
RectorSeal, manufacturer of firestopping products, maintains one of the largest listings of systems in UL's Fire Resistance Directory. Our products include: sealants, putty, mortars, sprays, putty pads, inserts, gaskets, pillows, collars, wrap strips and composite sheets.
We also have a Fire Test Laboratory recognized under UL's Witness Test Lab Program.
Circle Reader Card No. 246

HANGERS
TOLCO, a brand of NIBCO Inc.
www.tolco.com
Booth 811
TOLCO is a manufacturer of quality, UL, ULC, FMRC, NYC products including pipe hangers, supports, seismic bracing and TOL-Strut Channel. TOLCO has over 35 years of experience in the residential and commercial fire protection markets. For more information, visit www.tolco.com.
Circle Reader Card No. 247

CONTROL PANEL
Automation Displays Inc.
www.adipanel.com
Booth 316
Listed FireFighter's Smoke Control Panels for Johnson Controls, Siemens, Alerton, Andover, SimplexGrinnell, Notifier, Trane, Invensys, EST, Delta Controls, Carrier & Honeywell. UL Listed Fire Alarm panels and annunciators. Control panels for Security and Life Safety. Serial Interface for many Building Automantion systems. Custom panels and enclosures. UL 508 Control Panels.
Circle Reader Card No. 248

SAW
Doringer Cold Saws
www.doringer.com
Booth 712
The Doringer D-350 Cold Saw us a steel sawblade turning at only 54 rpm to saw steel structures. There is no dust, sparks, heat or noise. The sawblade mills thru the metal leaving a stright, accurate cut with a burr-free finish.
Circle Reader Card No. 249

RESEARCH
Southwest Research Institute
www.swri.org
Booth 1637
SwRI's® Department of Fire Technology is a leader in the areas of engineering, research, testing, quality system audits,

and product surveillance. SwRI services national and international government and commercial clients by providing multidisciplinary technologies in support of the construction, telecommunications, transportation, chemical, petrochemical, utility, and nuclear industries.
Circle Reader Card No. 250

WELDING OUTLET
Merit Manufacturing
A Division of Anvil/Star
www.meritmfg.com
Booth 221
Merit Manufacturing manufactures the "Weld-Miser Tee-Let" line of welding outlets for the fire protection industry, as well as low pressure piping systems. In addition, Merit manufactures the "Eliminator" adjustable drop nipple. We are the industry leader in the products we make with a state-of-the-art cold forming facility.
Circle Reader Card No. 251

CABLE
Rockbestos-Surprenant
www.v-scc.com
Booth 841
Rockbestos-Surprenant (RSCC) manufactures Vitalink 2-hour rated (per UL 2196) circuit integrity cable. RSCC will be exhibiting its full line of 2-hour rated cable including Vitalink CI – low voltage circuit integrity cable used on fire alarm and sprinkler and voice evacuation controls and Vitalink MC and RHW 600-volt power cable.
Circle Reader Card No. 252

CONSULTANT
Sako & Associates
www.sakosecurity.com
Booth 1430
Sako & Associates Inc. is the largest, independent security consulting firm providing planning, design, and management of security and communications systems for the built environment. Working with owners, designers, and facility managers to achieve their security goals, Sako emphasizes the combination of technical and operational security consulting to achieve optimal security without impeding the operations of a facility.
Circle Reader Card No. 253

SECURITY
Bosch Security Systems
www.boschsecurity.com
Booth 209
Bosch Security Systems is the premier supplier of security solutions worldwide. Incorporating the strong histories and reputations of Detection Systems, Radionics and Philips CSI, Bosch Security Systems builds upon a foundation of excellence. Bosch is the single source for intrusion, fire, access control, communications, CCTV systems and components.
Circle Reader Card No. 254

ALARM MANAGEMENT
Keltron Corporation

www.keltroncorp.com
Booth 519
Keltron develops and manufactures secure, reliable, UL-listed fire and security alarm response management solutions for the municipal and proprietary life safety markets. Universally compatible systems include PC-based alarm systems, radio fire alarm networks, FACP networking solutions, digital alarm communicator receivers, coded fire alarm and high-line security systems, and alarm annunciators.
Circle Reader Card No. 255

VALVES

Discover Trading Company Inc.
www.discovertrading.net
Booth 925
California-based Discover Trading Company Inc., direct importers of valves and valve products, offers numerous ball valve, gate valve, Y-strainer, check valve, stop valve and pipe fitting designs available in brass, bronze, SS, cast iron, and ductile iron. Our design or yours. UL FM CSA listed valves available.
Circle Reader Card No. 256

MONITORING

Digitize, Inc.
www.digitize-inc.com
Booth 1217
Proprietary alarm monitoring systems. New remote annunciator provides multiple redundant operator interfaces for one or more System 3505 controllers. Features programmable color and sound schemes. New strategic alliance with Johnson Controls offers enhanced integrated solutions.
Circle Reader Card No. 257

ASSOCIATION

WFCA/Uniform Fire Code Association
www.wfca.net
Booth 1629
The mission of the Western Fire Chiefs Association, Inc. (WFCA) is to respond to the challenges of a changing industry to ensure greater protection of life and property from fire, natural and man-made disasters, or sudden emergencies by providing leadership, direction, and education to its members and affiliate organizations.
Circle Reader Card No. 258

ASSEMBLIES

Witzermann GmbH
www.witzemann.com
Manufacturers of sprinkler hose assemblies.
Booth 1338
Circle Reader Card No. 259

LIFE SAFETY

Tyco Fire & Building Products
www.Tyco-Fire.com
Booth 301
Tyco Fire & Building Products is a global manufacturer of water-based fire suppression system components and ancillary building products. It continually expands its capabilities through aggressive

research and product development to provide its customers effective fire protection and construction solutions for residential, commercial, industrial, and institutional buildings. Its products are sold worldwide under the following brand names: Acrobe, Ancon, Central, Central SpraySafe, GEM, SprinkCAD, Grinnell, Lindapter, Star, Unistrut, and Wopf.
Circle Reader Card No. 260

PROTECTION
Safety Technology International
www.sti-usa.com
Booth 913
The Stopper® II has been helping stop false alarms for more than 20 years without restricting legitimate alarms. Cover mounts directly to the wall over an existing pull station. When cover is lifted, a self-contained alarms sounds, drawing attention to the area. UL/Ulc listed, FM-approved.
Circle Reader Card No. 261

NOTIFICATION APPLIANCE
Space Age Electronics
www.1sae.com
Booth 822
A no excuses manufacturer for the building automation industry, UL-listed control relays, notification appliances for life safety systems. We are the premier manufacturer of UUKL smoke control, graphic and directory annunciators, complete line of display frames featuring innovative UL-listed equipment enclosure such as battery storage cabinets, terminal cabinets, and custom NEMA-rated cabinets, and a complete line of protective device guards.
Circle Reader Card No. 262

FIRESTOP SYSTEM
3M
www.3M.com/novec1230fluid
www.3M.com/firestop
Booth 801
Innovative technologies for passive and active fire protection featuring Firestop systems that include intumescent caulks, wraps, cast-in devices, composite sheets, and more for containing fire, smoke, and toxic fumes. 3M™ Novec™ 1230 Fire Protection Fluid is sustainable clean agent technology, combining extinguishing efficiency and safety with zero ODP, five-day lifetime and GWP of 1.
Circle Reader Card No. 112

EMERGENCY SERVICES
Alert Disaster Control
www.alertdisastercontrol.com
Booth 722
Emergency Response Services include oilfield engineering and blowout control; well control engineering and management; marine and industrial firefighting; hazardous material control. Integrated risk management solutions include QHSE Management Systems Development; risk assessments; QHSE audits; safety and

survival training; onsite HSE representatives; toxic environmental protection; fire and safety OEM and product sales.
Circle Reader Card No. 263

COVER SYSTEM
DecoShield Systems, Inc.
www.decoshield.com
Booth 1432
UL/ULC listed DecoShield systems provide you with lightweight, attractive, affordable modular cover/support systems for sprinkler piping, hydronics, plumbing, cable, and conduit.
DecoShield products are manufactured using an engineered resin of a Class I/A material meeting most model code requirements, and are clean, paintable, easy to install, tamper-resistant, durable, and economical.
Circle Reader Card No. 264

BARRIERS
FDL-USA
www.fdl-usa1.com
Booth 1639
Firefly fire and smoke barriers are designed specifically to halt the passage of smoke and flame by providing 30 minutes and up to 120 minutes integrity. They are manufactured from clean lightweight, non-respirable materials. They are quick and easy to install using standard equipment and simple fitting procedures.
Circle Reader Card No.265

FOUNDATION
National Fallen Firefighters Foundation
www.firehero.org
Booth 1044
In 1992, congress created the National Fallen Firefighters Foundation to lead a nationwide effort to remember America's fallen firefighters. The tax-exempt, nonprofit Foundation has developed and expanded programs to honor our fallen fire heroes and assist their families and the fire service, including a training class, "Taking care of Our Own."
Circle Reader Card No. 071

PUBLISHER
Jones and Bartlett Publishers
www.jbpub.com
Booth 1438
Jones and Bartlett Publishers and our distinguished partners are committed to providing you with the most accurate and innovative teaching and learning solutions available. Now, we are pleased to introduce "Fundamentals of Fire Fighting Skills," our first offering with NFPA and the International Association of Fire Chiefs.
Circle Reader Card No. 266

CODE DEVELOPER
IAPMO
www.iapmo.com
Booth 1643
Plumbing and mechanical code developer commencing with the 2003 editions of the UPC and UMC, these documents bear ANSI's designation as an American

Bringing Safety SOLUTIONS to a HIGH-RISK WORLD

Americas' Fire Expo

NFPA®

www.nfpaamericasfire.com

10th Annual

Americas' SECURITY

Expo Miami 2004

www.americasssecurity

Convention Center
MIAMI BEACH
JULY 20 - 22, 2004

Three days of information-packed educational seminars and workshops all focused and applied specifically to Latin America.

Over 250 Exhibitors, making it the premiere showcase for products and services, and your access to the innovators and industry leaders who have the solutions to your real world challenges.

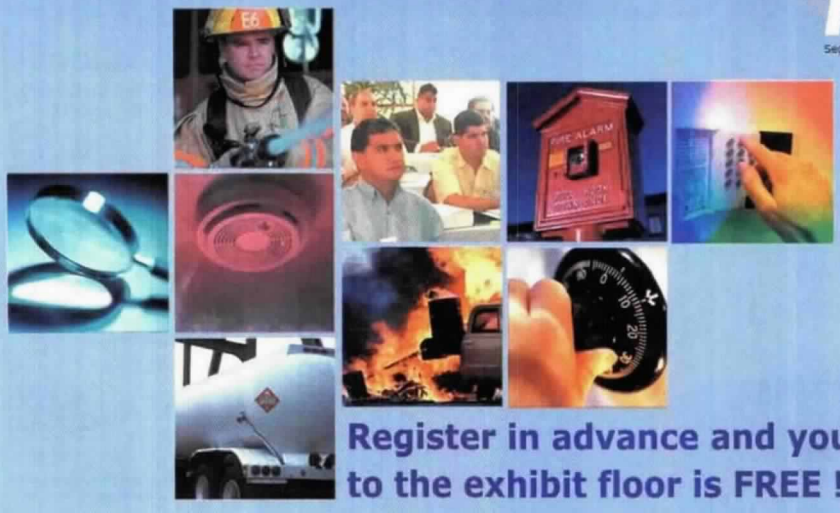
Cultivate new business relationships and strengthen your knowledge of fire safety issues and practices!

Organized by

NFPA® ALAS

Official Publication

NFPA Journal® Segurança e Proteção contra Incêndios - Seguridad y Protección contra Incendios latinoamericana



Register in advance and your access to the exhibit floor is FREE !!!

Advance
VIP Registration

Miami Beach Convention Center • July 20–22, 2004

Complete and return this form for free admission to *NFPA's Americas' Fire and Security Expo* and discounted conference registration fees. *(U.S. Attendee credentials will be mailed. International Attendee credentials will be held for onsite pickup.)*

- ☐ Please register me now for *NFPA's Americas' Fire Expo.*
- ☐ Please send me information on exhibiting at *NFPA's Americas' Fire Expo.*
- ☐ Please send more details on NFPA/AFE Conference Sessions.

To register in advance, fax this form by July 9, 2004. After this date, use this form to register onsite for admission to *NFPA's Americas' Fire Expo.*

Name: _____

Title: _____

Organization: _____

Address 1: _____

Address 2: _____

City: _____

State: _____ Zip: _____

Country: _____

Fax: _____

Telephone: _____

E-mail: _____

Registration Options

☐ Full Conference Package

Includes three days of educational seminars, exhibitor presentations and admission each day to *NFPA's Americas' Fire Expo.*

- NFPA Member. Membership# _____ $200
  After July 9, 2004 . . . . . $240
- Non NFPA Member. $250
  After July 9, 2004 . . . . . $300
- Fire Fighters. $100
  After July 9, 2004 . . . . . $150

Interested in membership? Contact NFPA at +1-617-984-7238

☐ Single Day Conference Registration

Includes one day (Tuesday, Wednesday or Thursday) of education seminars, exhibitor presentations and admission to *NFPA's Americas' Fire Expo.*

- NFPA Member. Membership# _____ $90
  After July 9, 2004 must register onsite $113
- Non NFPA Member. $100
  After July 9, 2004 must register onsite $125

Please note which day you will attend:

☐ Tuesday ☐ Wednesday ☐ Thursday

☐ Expo Only

FREE admission to the exhibit floor & exhibitor presentations.
(Does not include accredited education sessions.)

- After July 9, 2004 must register on-site $20

TOTAL REGISTRATION AMOUNT . . . . . $_____

Payment Information

Payment by Credit Card:

☐ Visa ☐ Mastercard ☐ American Express

Card Number: _ _ _ _ - _ _ _ _ - _ _ _ _ - _ _ _ _

Expiration Date: _____

Name on the card: _____

Signature: _____

Payment by Check: Make check payable to: ROC Exhibitions, Inc. Mail to: ArSystems International, 908 Niagara Falls Blvd, PMB 650, North Tonawanda, NY 14120-2060. Note: Checks must be drawn against a U.S. bank in U.S.A. dollars.

Please answer these questions

A. Primary Business
(please check one only)

• Suppliers of Fire Safety Products & Services

- ☐ (01) Association/Publication
- ☐ (02) Consulting Firm
- ☐ (03) Dealer/Installer
- ☐ (04) Distributor
- ☐ (05) Manufacturer
- ☐ (06) Manufacturer's Representative
- ☐ (07) Other (specify) _____

• Buyers/End Users of Fire Safety Products & Services

- ☐ (08) Architecture/Engineering
- ☐ (09) Building Management
- ☐ (10) Commercial (Retail, Restaurant)
- ☐ (11) Consulting
- ☐ (12) Contractor/Installer
- ☐ (13) Fire Service
- ☐ (14) Government
- ☐ (15) Hotels/Entertainment
- ☐ (16) Healthcare
- ☐ (17) Industrial/Manufacturing
- ☐ (18) Insurance/Risk Management
- ☐ (19) Transportation
- ☐ (20) Utilities
- ☐ (21) Other (specify) _____

B. Primary Job Function

- ☐ (22) Architect
- ☐ (23) Building Owner/Manager
- ☐ (24) Consultant/Consulting Engineer
- ☐ (25) Contractor
- ☐ (26) Engineer
- ☐ (27) Fire Chief, Fire Marshal, Educator
- ☐ (28) Inspector, Building Official
- ☐ (29) Loss Control
- ☐ (30) Manufacturer
- ☐ (31) Safety/Security Manager
- ☐ (32) Other (specify) _____

C. Number of Employees

- ☐ (33) 1-10
- ☐ (34) 11-24
- ☐ (35) 25-49
- ☐ (36) 50-99
- ☐ (37) 100-499
- ☐ (38) 500-999
- ☐ (39) 1000-2999
- ☐ (40) 3000+

D. Products & Services Purchased by your Organization
(please check all that apply)

- ☐ (41) Alarm/Detection Systems
- ☐ (42) Building Construction Materials
- ☐ (43) Education/Training
- ☐ (44) Electrical Equipment/Services
- ☐ (45) Extinguishers/Foams
- ☐ (46) Fire Department Equipment/Services
- ☐ (47) Hazmat Storage/Handling
- ☐ (48) Pumps/Controls/Valves
- ☐ (49) Security Products/Services
- ☐ (50) Sprinklers/Sprinkler Systems
- ☐ (52) Signaling Systems
- ☐ (52) Other (specify) _____

E. Involvement in Purchasing Decision

- ☐ (53) Make final purchasing decision
- ☐ (54) Specify
- ☐ (55) Recommend
- ☐ (56) No Involvement

Conference Refund/Cancellation Policy
Registration fee less a $50 administrative fee will be refunded for written cancellations received by 07/09/04. No refunds will be made after that date; however the registration may be transferred to a colleague with written notification. Refunds will be processed after 08/02/04. Mail request to:
NFPA's Americas' Fire Expo Cancellation
ROC Exhibitions, Inc.
1963 University Lane, Lisle, IL 60532
Fax: +1-630-241-4375 Email: fire@rocexhibitions.com

THIS FORM CAN BE COPIED FOR ADDITIONAL REGISTRANTS

Fax your registration form to the following:
From the US:
+1-888-889-4662
From outside the US:
+1-416-756-4242

Or mail to:
NFPA's Americas' Fire Expo
c/o ARsystems International
60 Industrial Pkwy. PMB # 650
Cheektowaga, N.Y. 14227

Or register on-line:
www.nfpaamericasfire.com

Questions? Please contact NFPA at +1-617-984-7238

The information you supply may be used by ROC Exhibitions, Inc. and its associates for promotional purposes. To opt out of this list call 630-271-8210.

Reg. Code: MJ

Register Online at www.nfpaamericasfire.com

CLASSIFIEDS

SALES POSITION

District Sales Manager for Western Region with emphasis on in-depth sales coverage of San Francisco, Las Vegas, Los Angeles and Seattle. Product is two-hour fire-rated cable sold to electrical contractors and used in high-rise buildings, hospitals, transit systems and government buildings. Travel requirements are 2 to 3 weeks per month. Successful candidates will ideally have a working knowledge of the fire protection market, including working with electrical engineers to specify the product, local electrical inspectors to approve the product, electrical contractors to install the product, and electrical distributors to purchase the product. Requirements: BA or BS degree, outward personality and a desire to succeed. Please apply to: Human Resources, Rockbestos-Surprenant, 20 Bradley Park Road, East Granby, CT 06026 or via email to paula.graffam@r-scc.com. EOE M/F/H/V.

ADINDEX

McCormick Place Exhibition Hall fire, 1967

For more information, visit www.nfpajournal.org.

BYE, BYE M.I.

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.*

lifeline
WHEN SURVIVABILITY IS ON THE LINE

TWO HOUR FIRE-RATED RHH

UL LISTED RHH - POWER CABLE
UL CLASSIFIED TWO-HOUR FIRE RATED CABLE WHEN USED IN CONDUIT

Call your LIFELINE™ friend at:

800-333-4248 x2600

or visit ***www.drakausa.com/lifeline***

Draka USA
Member of the Draka Holding Group

BIW Cable Systems, Inc.
Helix/Hi Temp Cables, Inc.
Chromatic Technologies, Inc.
Tamaqua Cable Products Corp.
Draka Elevator Products, Inc.

Circle 011 on Reader Service Card

CHEMETRON

Fire Systems™

For more than 60 years Chemetron Fire Systems™ has been committed to providing our customers with the latest in fire suppression technology to protect your valued assets.

Chemetron has already brought you **Argonite®** (IG-55) - an effective, people safe and environmentally friendly inert gas based suppression system.

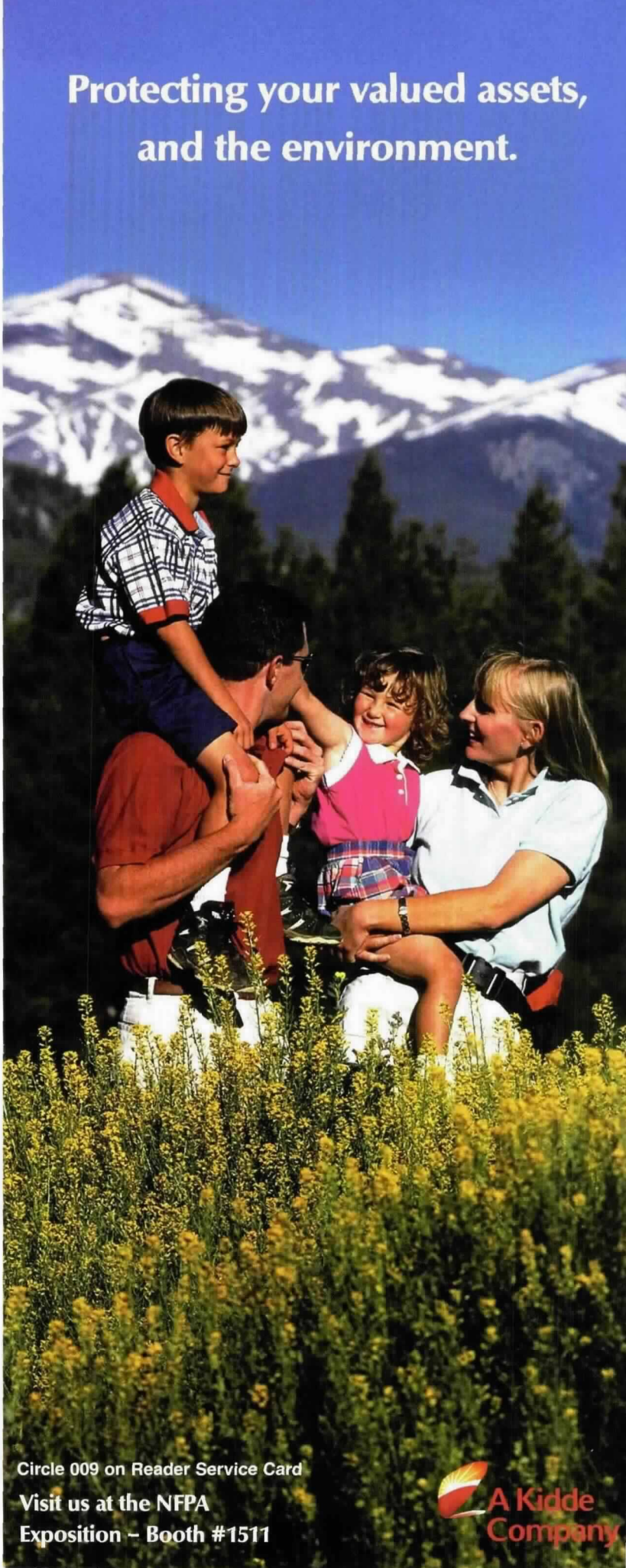
And now Chemetron is proud to announce the introduction of the next generation in Clean Agent fire suppression systems utilizing **3M™ Novec™ 1230 Fire Protection Fluid** - an agent that atomizes readily to provide rapid fire suppression for occupied spaces, while achieving an excellent environmental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

- Very low Global Warming Potential (GWP) of just one
- Atmospheric lifetime of about 5-days
- Ozone Depleting Potential (ODP) of zero

The addition of Novec 1230 fluid and Argonite inert gas suppression systems enables Chemetron to provide you with a full array of **sustainable** fire suppression systems for all your needs today and into the future.

4801 Southwick Drive, 3rd Floor, Matteson, IL 60443 USA
Phone: (+1) 708-748-1503 • Fax: (+1) 708-748-2847
www.chemetron.com

Protecting your valued assets, and the environment.



Circle 009 on Reader Service Card

Visit us at the NFPA Exposition – Booth #1511

A Kidde Company