

Volume 2, No. 1

April 2006

The Magazine of Effective Compartmentation

Life Safety DIGEST

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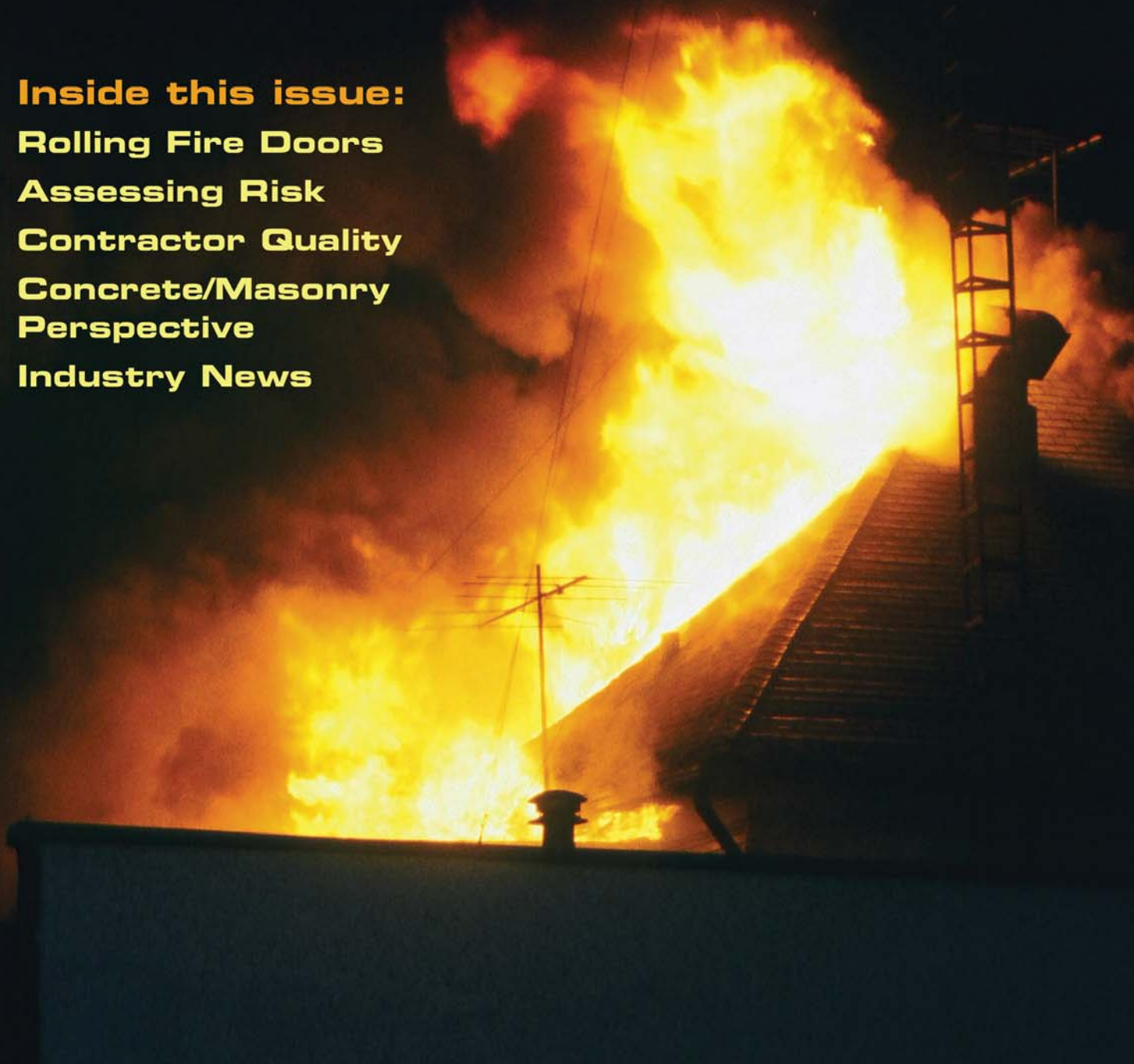
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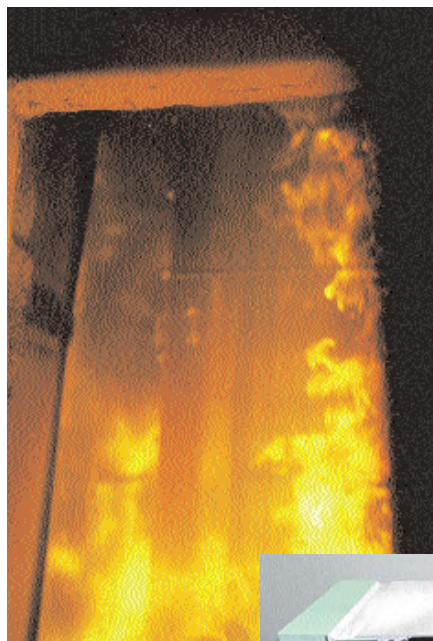
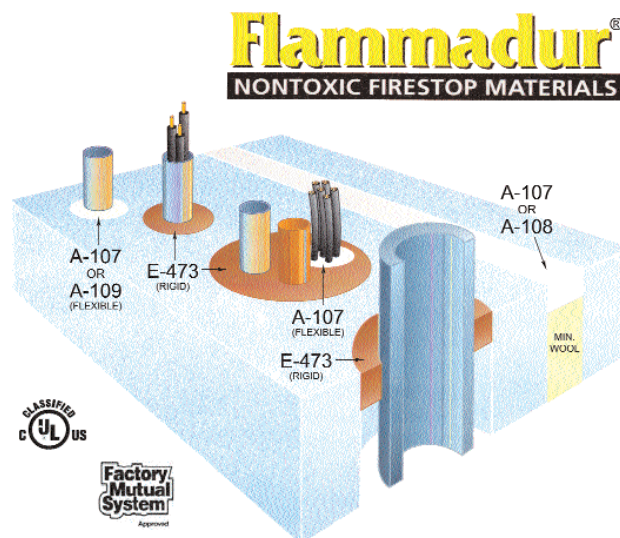


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Editors' Message



The Firestop Contractors International Association is pleased to present the second issue of Life Safety Digest, the Magazine of Effective Compartmentation.

Compartmentation is the centuries' old fire-protection system for structures, ships and other structures because people, property and operations need security. The concept involves dividing buildings into sections to contain a fire if one happens and to reduce the chance that a blaze could spread to other building areas, causing damage and/or loss of life.

Compartmentation includes fire-resistance-rated walls and floors and the fire protection features that complete the compartment.

Elements include rolling and swinging fire doors and hardware, fire and smoke dampers in air ducts, fire-resistance-rated glazing and the firestopping around plumbing, piping, cabling, expansion joints, heads of walls and perimeter joints. Protecting fire-resistance-rated assemblies with all of these features makes compartmentation work.

FCIA and Life Safety Digest believe in the National Fire Protection Association's Total Fire Protection concept. Compartmentation, detection and alarms, suppression systems and education of designers, installation firms, quality inspectors, AHJs (Authorities Having Jurisdiction), occupants, maintenance personnel and others are the keys to excellence in fire and life-safety performance.

Life Safety Digest's purpose is to offer an educational forum about effective compartmentation while acknowledging that all types of fire protection are needed for success. We believe in the importance of education to understand

the Total Fire Protection concept, because *compartmentation saves lives*.

We appreciate the responses and great support for the first Life Safety Digest issue. We're excited to present this issue, one of four for 2006. Use it as a reference tool and pass it to others who should know about the

Compartmentation is the centuries' old fire-protection system for structures...involves dividing buildings into sections to contain a fire if one happens and to reduce the chance that a blaze could spread to other building areas, causing damage and/or loss of life.

importance of compartmentation.

For easy reference, visit <http://www.fcia.org>, and you'll find an archive of past publications.

And, join the associations that support effective compartmentation and the FCIA because as a group, our education will help establish more fire and life safety through effective compartmentation programs.

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The Old Rolling Fire Door Ain't What She Used To Be . . . and That's a **GOOD** Thing!

By Steve Hahn



The elimination of spring tension release and the use of more efficient drive systems, combined with significant improvements in governor designs to control the rate of descent, mean rolling fire doors are now much more reliable than previous generations.

Chain, crank and motor operated fire doors are now commonly available with closing systems that can be easily reset by simply reconnecting the fusible link release- or automatically reset by merely clearing the alarm and restoring power - and reopening the door.



Wham! Clack! Clack! Clack, clack, clack, clack, clack!

Those are the old familiar sounds of a traditional rolling fire door automatic closing system - the impact of spring tension loss and the rattle of a mechanical governor struggling to prevent the door from crashing closed. And then, of course, came the hassles of raising the door, rewinding spring tension, re-engaging the gearing and governor, reconnecting the fusible links, etc.

Rolling fire doors have changed a lot over the years. Twenty years ago, it was estimated that approximately 20 percent of fire doors failed to close.

Today, rolling fire doors are available with a "new generation" of closing systems - and their failure rate is now estimated to be approximately 2 percent! Code mandated drop testing and maintenance requirements, coupled with increased awareness through industry educational efforts, have played a role in improving performance.

Fire doors with traditional spring tension loss were intended to release when the door was open and would often be damaged if released when the door was closed. With the "new generation" of fire doors, this is no longer a concern. Rolling fire doors can be designed to close automatically upon separation of a fusible link or after initiation by a smoke detector or alarm,

without a loss of spring tension.

Traditional automatic closing systems also required separation of the gear train used to operate the door. This often meant a multitude of reduction gears that were prone to wear after repeated operation and drop testing. The simpler, more efficient designs integrated into today's "new generation" systems mean that rolling fire doors can now con-

door. The most advanced detector/alarm activated systems will even close the door through the motor operator, stop the door if it contacts an obstruction during closing, continue closed when the obstruction is removed or revert to failsafe operation if power is lost.

Changes in test standards over the years have resulted in many fire doors being approved for installa-

Twenty years ago, it was estimated that approximately 20 percent of fire doors failed to close. Today, rolling fire doors are available with a "new generation" of closing systems - and their failure rate is now estimated to be approximately 2 percent!

fidently be used even in applications where high-frequency operations of 50,000 or 100,000 cycles may be required.

The elimination of spring tension release and the use of more efficient drive systems, combined with significant improvements in governor designs to control the rate of descent, mean rolling fire doors are now much more reliable than previous generations, provide repeatable performance and result in much slower and safer closing speeds. Another major benefit is that they eliminate the need for traditional mechanical resetting of the door after automatic closing.

Chain, crank and motor operated fire doors are now commonly available with closing systems that can be easily reset by simply reconnecting the fusible link release and reopening the door. Other systems that close the door after detector or alarm activation or are failsafe closing upon a loss of power can be automatically reset by merely clearing the alarm, restoring power and reopening the

tion on masonry and nonmasonry wall construction. Some doors can be fire rated up to four hours, and some can even be provided with an S-Label as an air-leakage rated door assembly.

The old rolling fire door definitely ain't what she used to be. She's developed into a sophisticated piece of fire protection equipment - one that is often relied on to protect the largest opening in a fire wall. And as with any other element of effective compartmentation, when properly designed, installed, inspected and maintained, she does her job well! 

Steve Hahn is product manager for Los Angeles-based Lawrence Roll-Up Doors, Inc. He has been in the rolling door industry for more than 30 years, is a member of the NFPA-80 Standard for Fire Doors and Fire Windows Technical Committee, serves on three UL Standards Technical Panels and is past-president of the American Rolling Door Institute. shahn@lawrencedoors.com.

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Assessing Risk: The Need for Training

by Mike Wood
Pilkington plc

Editor's Note: This article is written for a new law, 'Regulatory Reform Order', for Fire Safety requirements in the United Kingdom, where there is a person designated in each building to be responsible for fire and life safety of people in that structure. This person is to make assessments about the building's fire protection features and occupant education and safety. The concept of a regulated responsible person in buildings is not currently implemented in North America.



Fire resistive glass is important for use in fire doors. (Photo courtesy of Pilkington)

Risk assessment is rapidly becoming the basis for the provision of fire protection in buildings. This risk-based approach applies alike to the provision and effectiveness of fire precautions in buildings reference the Regulatory Reform [Fire Safety] Order (RRO), the allocation of emergency response fire and rescue services Integrated Risk Management Plans, (IRMP's), and to fire protection building design. An Integrated Risk Management Plan is part of the UK Regulatory Reform Order (statute) on Fire Safety. Each fire authority and service undertakes this integrated risk management plan every year using historical and current incident data and potential risks to evaluate the effectiveness of prevention, protection, and intervention activities.

Unfortunately, risk assessment is experience based and inevitably subjective, being dependent on knowledge and possibly attitude. There is

as yet no common methodology for the uninitiated to follow, although different suggestions are making their appearance.

Making the right judgments in such risk-based assessments on fire will therefore depend on having the necessary knowledge to hand covering all relevant matters. This should include different fire protection systems and different fire protection strategies.

Unfortunately, any single expert is unlikely to have at his or her command the full scope of necessary competencies and knowledge base, spanning the range of modern technologies and systems.

The Regulatory Reform (Fire Safety) Order (RRO) places responsibility for fire safety squarely on the shoulders of someone defined within the order as "The Responsible Person." This person in most cases will be either the building owner or the employer.

To give fire safety the necessary focus, that Responsible Person will in many cases most likely delegate authority to another person, called within the provisions of the order "A Competent Person" to carry out most of the work, reference RRO, section 18, para (5).

"A person is to be regarded as competent where he has sufficient training and experience or knowledge and other qualities to enable him properly to assist in undertaking the preventive and protective measures."

The competent person is expected to be a person with the necessary knowledge, who either carries out inspections of the premises without assistance or ensures that someone, who has the appropriate competency, is contracted to do that work as directed by the competent person.

It is also implicit in the order that a prime duty of the responsible person is to ensure that the competent per-

son has the correct level of training, has adequate knowledge, and is supported by sufficient resource to satisfactorily carry out the requirements under the order.

So, it is a central strand of the government's fire safety strategy that more people who have never really thought very much about fire protection now fall within the shadow of fire safety law. Fire certificates will be withdrawn when the new order comes into force.

More buildings come under the provisions of the order than was formerly the cases: Any building that is essentially not a privately owned dwelling will need a fire risk assessment. And it is implicit within the assumption of the duties incumbent upon both "The Responsible Person" and "The Competent Person" that the risk assessment is based on the proper information.

In all cases, inspection of the fire precautions, protective and preventive measures is expected to be carried out with due diligence taking all reasonable and practicable means. Enforcement is subject to the sanction of the law, acted on by the fire authority. If noncompliance should come down to a challenge in court, demonstrating due diligence may well depend on tabling the evidence that all reasonable and practicable means had in the event actually been taken.

It is implicit in the requirements of the RRO that nonspecialists will now have to pay more attention to the details of fire protection systems, being more aware of details that they may have either previously ignored or taken for granted. Part of due dili-



Fire protection glass barrier in concrete block at Holmes Place, Manchester, England. (Photo courtesy of Pilkington)

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gence may well be demonstrating that advantage has been properly taken of the sources of advice and information that are available within the public domain. Ignorance and inactivity is likely to be a difficult defence to sustain when tested in court.

A fire risk assessment should be more than just making sure that clutter is removed from escape ways, that obvious sources of ignition are controlled, that exit signage and emergency lighting are appropriately positioned and working, that the alarm system is audited and regularly checked and that fire exits are not locked. It needs to contain a review of all the measures in place to ensure a proper response against fire, should it break out. That is including the mix of measures for detection, alarm, fire containment, suppression, extinguishing and safe assisted escape.

But, before the detail of the added on measures can be considered, it is appropriate to ask some basic questions, which are far too often neglected, about the basic, underlying structure:

- Is the basic structure sound and sufficiently resistant against the spread of fire?
- Do I know exactly what structural fire protection measures are provided for in the building's construction?
- Are structural drawings and an escape layout plan to hand?
- Has anyone checked above ceilings and in the roof space for fire stopping and the continuation of appropriate fire barriers?
- Is the design for escape and fire containment appropriate when judged against the latest standards? What are the latest standards?
- Is the provision of fire resistance integrity or integrity and insulation performance where it needs to be?
- Are the spread of fire ratings of the materials used in fixtures, fittings and furnishings appropriate?

• Are the fire doors proper fire doors that can be relied upon in a fire (or are they standard doors magically transformed by a fire exit label)?

• Are the doors properly installed and in good condition, for example, concerning fittings, gaps, fire and smoke seals?

• Am I sure that the glazing in fire doors, compartments and escape ways is appropriately installed as an approved fire-resistant glass in a fire-resistant glazed system?

• Does the glass carry a visible and legible mark indicating name, manu-

It is a central strand of the government's fire safety strategy that more people who have never really thought very much about fire protection now fall within the shadow of fire safety law.

facturer and performance?

• Are the fire compartments properly provided for and not breached by refurbishment or rebuilding work?

• Is the compartmentation maintained by appropriate fire stopping around services and penetrations through the compartment walls?

• Do I actually have the right information and sufficient detail on the structure for me to carry out a reliable risk assessment?

• Above all, where do I go for the appropriate specialist advice on structural fire protection systems if my risk assessment indicates that there are some problems, or if I do not have the appropriate expertise to hand to carry out such an assessment?

There is clearly going to be an important role for industry to carry out in helping with guidance on where to access the right information on training and appropriate knowledge.

In answering the questions that arise, it is likely that the input from

more than one specialist may well be needed. Given the complexity of modern fire protection materials and systems, it is maybe not possible that the sufficient knowledge for all questions can be found in one individual.

The various fire protection associations are going to have an important role to play in making that knowledge available through a variety of communication means. This information will potentially include guidance on approved systems, performance criteria, installation, maintenance and refurbishment or modernization

methods as well as basic design.

Associations and companies can also be a good source for guidance and advice on the requirements of the new regulations and legislation on fire safety. A number of associations now have published best practice guides available through their websites.

Living under a risk-based fire safety regime is going to be critically dependent on information, knowledge and training. The first port of call for this type of guidance should be the representative associations for each of the relevant technology sectors. So, have a look at the Web sites and consult the associations. 

Mike Wood is a fire protection engineer with Pilkington plc, based in St. Helens, United Kingdom. The article is submitted by Bret Penrod, Pilkington Fire Protection, North America. He can be reached at 419-478-0165 or e-mail bret.penrod@us.pilkington.com.

Contractor Quality Programs vs. Manufacturing: What's Different and Why?

by Bob LeClair and
Bill McHugh, CSI

There is a new trend in the construction industry. Construction quality has been a topic of discussion for many years in our industry. The industry is unique from an economics and company structure basis from the manufacturing industry.



Construction and manufacturing environment differences are clear in this photo.
(Photo courtesy of Specialty Firestop Systems Inc.)

What's different about construction?

From a structural industry standpoint, manufacturing is different than construction. In manufacturing, there is typically a controlled, indoor climate regulated environment. Working and controlling variances is easy at room temperature with no wind, rain, snow and sleet. Also, manufacturing typically has a consistent workforce of employees working together everyday in the same controlled environment.

In construction, each project is different. It's like bringing the factory to a plot of land and starting the process of "manufacturing a building".

Only in this case, there's no controlled environment. Rain, snow, wind, sleet, hail, heat, cold all occur on many construction projects during the process of building.

And, workers come together from several different firms to construct as a team, minus the everyday, multi-year relationship and economies that come from working on the same thing together day in and day out.

Variations to procedure and defective products happen in environments, manufacturing and construction.

However, the opportunity for variation may be more apparent in construction due to the lack of controlled environment and the differing players that come together, without the effect of the economies of scale that come from the manufacturing environment...after producing an amount of output, it gets easier to construct and has to happen on each jobsite vs. the one time startup at a

continuous manufacturing facility.

Other factors contributing to variability include the number of profit centers on a project, from design, to general construction, construction management, owners representatives, subcontractors, subs of subcontractors, insurance firms, inspection firms, the building owner and manager who hopes to earn a profit on the finished product. Certainly in manufacturing there's many suppliers who must come together to produce component parts, but none of them really works outside like in construction.

Differences between manufacturing and construction have been discussed many times in the construction industry press magazines and papers. The question about construction quality and variability has been asked many times over...with answers pointing to multiple places and more questions about how the building process can be better.

Oh Really....

The construction contracting and subcontracting industry has been an entrepreneurial business, from contracting to design and inspection. It is believed that there are more small firms employing people in construction than in any other industry.

Look at architectural firms, where small firms make up about 80 percent of employment. Small subcontracting firms sprout up in each specialty, with new businesses splitting off from existing firms or starting up daily due to a relatively low barrier to entry to the marketplace. With employment not concentrated in a few employers,

consistency becomes an issue amongst firms providing services in the industry building structures.

The construction industry, with all its uniqueness, still accomplishes huge feats.

"Look at Hoover Dam, Sears Tower in Chicago, the Empire State Building in New York, Petronas Towers in Kuala Lumpur...all architectural, engineering and construction successes, thanks to vision, creativity and constructability," said FCIA President, Don Murphy.

Part of the reason for success is the ability to have vision, and the freedom to create and construct something unique that delivers as an investment as well. The construction industry's entrepreneurial spirit, whether at the developer, architect/engineer or constructor level, is unmatched.

However, in some structures, there is a constant debate about how we can control quality in our construction industry with weather, small firm size and still keep the creative juices that make this industry efficient and innovative.

Solutions

One solution has been to introduce the quality process into the industry, like the process in the manufacturing environment.

The advantage is that the ISO program introduces a consistent documented process into the building construction market. A controlled process can control errors and point out where the defect may have come from, allowing the process to be fixed preventing the error in the first place.

Since each building is unique, there is difficulty in "standardizing" every process of construction. Plus, since the industry works in varied weather and environmental conditions, with new people on each project, it's difficult to totally "ISO 9000

the industry" from the top down.

To meet the demands of owners for better construction quality and introduce a consistent process to the contracting industry, the Firestop Contractors International Association worked with Factory Mutual, Approvals Division (FM), to develop FM 4991, Standard for the Approval of Firestop Contractors, in 2000. This subcontracting industry first brought a quality process similar to the manufacturing environment to the subcontracting industry.

And, in late 2005 and early 2006, FCIA began working with Underwriters Laboratories on a Qualification of Firestop Contractors Program to be introduced later this year.

The FCIA Accreditation Committee, Board of Directors and UL are excited about this new Firestop Contractor Qualification Program as it adds further credibility to the industry. This new program helps the fire and life safety process to protect people in buildings.

"FCIA & UL can really make a difference together," said the FCIA's Aedan Gleeson, accreditation chair and board member.

The new UL Program will be a qualification of contractors, where the key person, like the Designated Responsible Individual [DRI], is tested on the FCIA Manual of Practice, industry knowledge and systems selection.

UL's quality program auditors then visit the firestop contractor to inspect the firm based on ISO 17020 Inspection Protocol standardized review of the firms' operations.

The Door & Hardware Institute (DHI) is also working on quality process programs with UL and Intertek Testing Services, (ITS) for annual inspection and maintenance issues in the door industry.

"The compartmentation maintenance quality process is important to the success of our industry to pro-

vide value for the long haul," said DHI Executive Director and CEO Jerry Heppes.

"The FCIA has been writing about maintenance of effective compartmentation as well through an FCIA attachment in the FCIA Manual of Practice," said Don Murphy, FCIA president.

With the advent of FM 4991 and the UL Qualification of Firestop Contractors Program, the manufacturing ISO 9000 quality process has become adapted to the unique construction industry.

There are several parallels between the construction industry's quality programs and manufacturing, with the flexibility to operate in a different environment: the construction job-site. Variability is a constant in this complicated project site.

With a consistent contractor quality process, efficiencies result from defined roles and repeatability of similar, but unique operations.

Designated Responsible Individual

"In the FM Program, a person from the contracting firm becomes a DRI, and is the primary point from which the qual-



Firestop Systems markings are spelled out in the contractor's quality manual. (Photos courtesy of Multicon Fire Containment)



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ity process is managed," said FM Senior Engineering Specialist Jeff Gould.

Everything from the time a set of plans arrives at the contractors' office to the final systems review during certificate of occupancy including several different pieces of the quality process to manage this key DRI individual at the contracting firm really controls the implementation of the quality process.

"This DRI person is very important as firestopping contractors are responsible for selecting the firestopping systems for submittal to the architect, engineer and authority having jurisdiction (AHJ)," Gould adds.

UL's new qualification of firestop contractors program will follow the guidelines as set forth in the quality control section of the 2005 edition of the FCIA Manual of Practice. The

nonconforming conditions.

- Describe company policy for training personnel.
- Describe company policy for documentation.

The firestop contracting firm's quality assurance manual serves as a permanent reference for installed firestop tested and listed systems. The quality control program should require the development and maintenance of sufficient records to demonstrate achievement of the objectives described in the quality control program of the firestopping contractor.

To obtain FM approval or UL qualification, the contracting company will be audited to verify that the structure described in the QA Manual is actually being implemented by the firm from the office to the field.

The auditor/inspector actually visits the firm, asking questions from a

"Every year, we've had auditors from FM come and inspect our quality process to be sure we're following the quality manual we wrote...it's a good check on our process."

process is much defined that when implemented by the firestop contractor, it can ensure the installed firestop systems are qualified to meet the specification, authority having jurisdiction, fire and life safety code requirements.

The outline for the quality control program follows the flow of documentation, which provides evidence that firestop systems were selected and installed correctly. Here's an overview of what's included in a quality manual for a firestopping contractor:

- Define individual responsibilities within the organization.
- Describe how the system designs were chosen.
- Describe how the company controls materials.
- Describe in-house inspection policy.
- Describe procedures to correct

checklist to verify that the procedures are in place to manage the firestopping systems installation process. This ensures that tested and listed systems or engineering judgments/equivalent fire resistance rated assemblies are installed exactly as stated in the firestop system requirements.

"Every year, we've had auditors from FM come and inspect our quality process to be sure we're following the quality manual we wrote...it's a good check on our process," said the FCIA's Gleeson.

The true quality of a firestop installation is established by the approach, attitude and ethics of the organization installing firestop systems.

Once contractors understand the philosophy of quality, they must ask themselves if they are ready to spend



Compartmented walls are sealed for continuity around fireproofed beam. (Photo courtesy of NexLevel Construction Solutions Inc.)

the time and effort necessary to develop their own in-house quality program. This is an important decision, because it entails a considerable amount of work and expense to implement, maintain and verify compliance with a written quality program.

In contracting, by embracing the quality process, contractors have achieved their mission to provide a quality service and, most important, save lives.

"Plus, we're a better company for operating in a more uniform manner, with responsibilities written and understood by all in our company," said Bob Svoboda, FCIA director and secretary.

Specialty firestop contractors are in a very important fire and life safety service, meaning that their quality programs in general, whether FM Approved or UL Qualified, need to be stringent to protect lives from fire and smoke spread.

To learn more about Firestopping Quality Programs, visit the Contractor Quality Section of the FCIA Website, www.fcia.org. 🔥

Bob LeClair is General Manager of A.F. Underhill, Inc., Canton, MA and Past President of FCIA. Bill McHugh, CSI, is Executive Director, FCIA. Reach them at info@fcia.org.

Fire Resistance Rated Compartmentation Walls: A Concrete/Masonry Perspective

by Steve Szoke

Fire breaks out in the unit next to you in your building. There may, or may not be, a sprinkler system installed in the structure.

Fire alarms go off, and you high-tail it to the exit, hoping the fire is contained wherever it is - so you can get out. Upon reaching the parking lot, you reach for your cell phone, and call loved ones and say, "Yes, I'm safe."

Compartmentation can create safe havens from fire burning next to you at home, in the office, at the theater, the stadium or wherever you are. Compartmentation is made from many base materials, as fire resistance-rated walls can be assembled from concrete masonry units, concrete, dry-wall, plaster and other materials that make fire resistance-rated systems.

These assemblies protect us as we try to exit a building, keep our important office equipment, files and business separated from fire and smoke, while acting as separations from the person next door.

Compartmentation is part of Total Fire Protection, including education of building occupants and building operations/service personnel, sprinklers and alarms and detection. Compartmentation has a history of success in many environments from marine applications with steel bulkheads for fire and water protection, to forest fires where another wall of fire "contains" a brush or forest fire. Masonry and concrete fire walls,

smoke barriers, fire barriers and fire partitions have been used for centuries successfully as a vital part of compartmentation.

Worldwide Use

Compartmentation is used worldwide for protection in buildings.

In Canada, the Ontario Building Code requirements call for the use of smoke detectors and fire alarms combined with fire separations. The premise is that it is the fire alarms providing adequate evacuation time and fire separations provide protection from the spread of fire.

Masonry Canada advises that its provisions remain in place because life safety and property protection have been demonstrated to be no more at risk with fire alarms and fire resistive compartmentation of the building than as with fire alarms and fire sprinklers. International Code Council and National Fire Protection Association codes use some degree of compartmentation, but the trend has been for reductions in this important fire protection feature.

Unfortunately, in the United States, data on the performance of building construction with regard to life safety and property protection has not been accurately provided in the past and is not currently required by the United States Fire Administration or the National Fire Incidence Reporting System because they do not reference compartmentation anywhere on information gathering forms used by fire services.

Therefore, we do not have accu-



Aftermath of the Santana Row Project in San Jose, Calif. A lower level of concrete and masonry intended for retail space was supporting four stories of light frame construction. This construction would not have met the provisions of international building codes.



Precast concrete and masonry are often selected to satisfy minimum code requirements and provide superior construction, offering durable, safer and comfortable housing. (Photos courtesy of the Portland Cement Association)

rate, substantiated data on actual building performance of compartmentation, as it is not listed as a factor in controlling fire occurrences.

Sprinklers may be reported to have controlled a fire only because the fire was contained to one room by the building construction, but since the compartmentation information is not gathered, we may never know what effect it has in Total Fire Protection.

Unfortunately, the trend is such that this type of data will only become available after detailed investigations of fires resulting in large losses, especially lives. For example the recommendations of the National Institute of Standards and Technology (NIST) Investigation of The Station Nightclub Fire included: "Model codes and standards should require redundancy in passive and active fire protection systems to ensure adequate performance of the structure when one or more of the protective systems is compromised..."

Balanced Design Concepts

There is a debate named "Balanced Design" at the ICC's Code Technology Committee public hearings.

Balanced design is the appropriate consideration of compartmentation, automatic fire and smoke detection systems and automatic fire suppression systems.

The concept does not suggest that all three components need to be incorporated in all building types. Analysis using the balanced design approach may result in only the use of smoke detectors, smoke detectors and fire sprinklers, smoke detectors and compartmentation or all three components. In the case of small buildings with low risk to occupants and property, none of the components could be used. Education is encouraged for whatever the occupancy.

The concrete and masonry industries generally recommend that for all

multi-family dwellings including hotels dormitories, assisted living facilities, nursing homes and senior citizen housing a minimum two-hour fire resistive construction be provided between all dwelling units and between public spaces and dwelling units in combination with automatic fire and smoke detection systems and fire sprinklers. These minimum requirements should apply to all paths of egress and to appropriate areas within other occupancies.

For particular building occupancies the concrete and masonry industries recommend an important redundant system, as is expected in cars, airplanes, computers and tires. The Portland Cement Association generally encourages balanced design for all buildings. Areas where people work, sleep or are educated for example, multi-family dwellings, hotels, schools and office structures should include the appropriate levels of redundancy and should include compartmentation with automatic detection and suppression systems.

These redundancies are likely to increase the cost of initial construction compared with construction that exercises sprinkler trade-offs where fire resistance rated assemblies are eliminated. Recent cost estimates for multi-family dwellings published by the New York and New England, Pennsylvania, and Mid-Atlantic Fire Safe Construction Advisory Councils demonstrated that multi-family dwellings constructed with minimum two-hour fire resistance-rated concrete and masonry walls and floors might cost as little as 2 percent more and in some locations may not cost any more than similar structures built of combustible wood framing. This will be discussed in a subsequent article. In addition, the concrete and masonry construction offers:

- Sound transmission is reduced through walls and floors.
- Structural integrity means less bouncy or creaky floors.
- Improved thermal comfort due to less temperature swing vulnerability.
- Less owner maintenance means lower operating expenses.
- Durability and sustainability are enhanced because masonry and concrete may be structures exist that are hundreds of years old, and may be reused and reoccupied after a fire.
- Use Change Cost Savings - it costs less to construct originally than adding later! Insurance rates may be reduced.

Using compartmentation results in savings in the life cycle of the building when it's installed during the initial construction of the building.

First, it's not much more material to build a wall continuous to the ceiling above. The labor is already onsite, equipment mobilized and materials delivered.

Additionally, there are no services in the way to build around, compared with construction of a continuous wall from floor to ceiling.

For example, a school facility five years after construction might change the use of a classroom from general use to laboratory. Without a continuous fire-resistance-rated assembly initially installed, it becomes a nightmare to construct a new wall with the ceiling tile, piping, ductwork and all other building services in the way.

The sound transmission and security benefits of continuous walls extending above ceiling tile, with excellent mass, can make the difference in any occupancy.

Cost Increases with Code Requirements?

We continue to see the adoption of more stringent minimum structural design and construction provisions

which generally increase the cost of construction.

Recently, there has been considerable emphasis on increasing design and construction requirements and related cost increases for earthquake resistance, and fewer than seven people per year have died in buildings as

environment and reduce our dependency on foreign sources of fossil fuels - with little or no direct impact on life safety or property protection.

According to the latest analysis of then NFIRS analysis by the NFPA, more than 500 individuals die on average per year due from fire in

always first in line.

Multi Family Construction Emphasis

The cement-based products industry has an emphasis on multi-family construction. Why the emphasis on this type of construction?

There is a reliance on data from the USFA NFIRS that shows the number for fire deaths in multi-family construction are considerably less than for one-and two-family dwellings.

The cement-based products industries current concerns are focused on multi-family dwellings. While NFIRS data shows that there are considerably more deaths in one-and two-family dwellings than in multi-family dwellings, the data does not reveal that that there are many more household

For particular building occupancies the concrete and masonry industries recommend an important redundant system, as is expected in cars, airplanes, computers and tires.

a result of seismic events in the United States over the last 10 years.

Minimum requirements for energy conservation in building codes also continues to become more stringent to conserve energy, improve our

multi-family structures.

Maybe adequate prioritization is not provided on the development of and necessary cost increases associated with improved codes and standards since fire and life safety are not

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sin one- and two-family dwellings than in multi-family dwellings. A ration based on the number of apartment units shows that:

- Fires occur 2.6 times more often in these multi-family dwelling units than in one- and two-family dwelling units.
- 1.6 times more deaths occur.
- 3.6 more injuries occur and
- Property damage is nearly twice as high in apartments than in one- and two-family dwelling fires.

Dwellings

While hourly fire-resistance rated construction will improve property protection in almost all building occupancies, property protection does not seem to be a priority consideration for minimum model building code development. Yes, more lives are lost in one- and two-family dwellings, but the role of fire protection with compartmentation is limited for such applications. However, both life safety and property protection are provided with concrete and masonry as fire separations for living units in multi-family construction.

These concerns are heightened with the knowledge that the United States has an aging population.

Our seniors may have hearing, vision, mental or physical impairments that may prevent rapid evacuation of a building.

The average age of American citizens is expected to peak around 2030. Most of them will be living in the buildings already constructed or being built today.

Many seniors are moving to multi-family dwellings for retirement to escape the demands of maintenance of one- and two-family dwellings due to the limitations of age or other changes in lifestyle.

Without appropriate minimum fire protection requirements in our build-

ing codes, our housing stock may not be able to provide the safety and protection for our aging population.

Redundancies in fire protection systems for occupancies other than multifamily construction may be crucial in buildings where egress paths are lengthy, such as high-rise buildings, or when the mobility of the occupants is limited.

For most business occupancies, evacuation is usually improved because there are alert individuals present who can react to the threat of fire and assist in evacuation. From a life-safety standpoint, the emphasis for redundancies clearly needs to be in multi-family construction.

However, the work force includes more senior citizens and an increased number of individuals with mental and physical handicaps are permitted to participate in our society through the Americans with Disabilities Act. Plus, our nation has a growing obese population that may increase the time to exit a building. The trend in minimum model building code requirements to relax fire protection provisions may not reflect the needs of our current and future building occupants.

The cement-based products industry, including masonry and precast/prestressed concrete and ready-mixed concrete producers need to work with designers, builders, developers, owners building and fire officials and community leaders to provide education on the importance of compartmentation with minimum 2 hour fire resistance-rated construction containment in buildings and the life cycle cost benefits that come with these assemblies.

The Masonry Alliance for Codes and Standards, Alliance for Concrete Codes and Standards, Alliance for Fire and Smoke Containment and Control and others are working to with code authorities to implement



All two-hour fire-resistance-rated construction is not the same. If they were the same, why doesn't the fire service build "fire test burn buildings" and towers out of two-hour-rated frame construction? The reason is that they want the fire tower to be available for the next "test fire" and the 200th! Masonry, cast-in-place concrete and precast concrete do not burn, produce smoke or fumes or add fuel to a fire.

these important provisions.

Using concrete and masonry has advantages such as low maintenance, reduced insurance, improved occupant comfort and other benefits inherent to these time-proven systems.

Through continued education and awareness programs by the cement-based industries, the industry anticipates code changes that include appropriate fire-resistive construction in combination with smoke detectors and fire sprinklers, especially multi-family dwellings, before there are catastrophic events with loss of life in dormitories, nursing homes, senior housing, hotels apartments and condominiums. 🔥

Steve Szoke is Director of Codes and Standards for the Portland Cement Association. He can be reached at sszoke@cement.org

Reader comments should be directed to:
Multi-Family Construction Advisory Council - Masonry Advisory Council-
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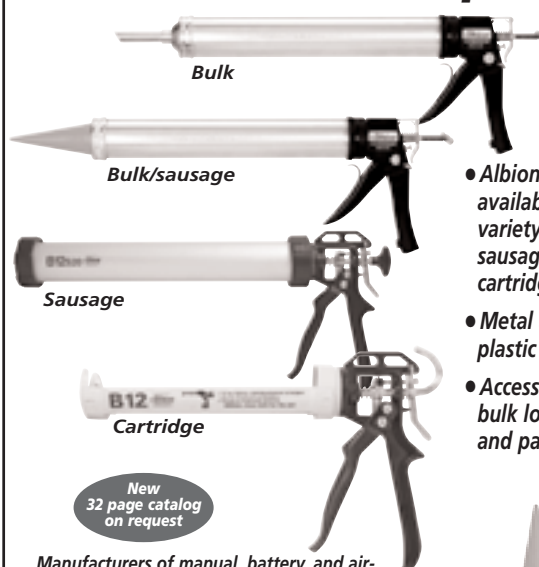
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Industry News

Code Corner

ICC Code Hearings Continue

The International Code Council Code Technology Committee continues to meet and analyze policy toward various issues.

Passive vs. active fire protection, climbable guard railing design and debate on mandating carbon monoxide detectors have generated the most discussion in the International Code Council's Code Technology Committee. The Passive Fire Protection debate vs. Active Protection is the discussion about "Trade Offs". Trade offs involve substituting sprinklers for effective compartmentation and structural fire protection systems. The debate will continue at public hearings March 9 & 10, in the Chicago Area. Visit <http://www.iccsafe.org/cs/cc/ctc/index.html> for more information.

In a separate ICC committee, the International Code Council has been studying National Institute for Science & Technology (NIST) reports on the World Trade Center disaster.

They included recommendations for more compartmentation and better structural steel fire protection. As a result, ICC has added more structural fire protection in high-rise structures during the 2006 Code Development Cycle.

NIST's Dick Bukowski, P.E., FSFPE, Standards and Codes Coordinator for the Building and Fire Research Laboratory of the

National Institute of Standards and Technology and Senior Engineer in the Integrated Performance Assessment Group, spoke at the Firestop Contractors International Association's Firestop Industry Conference and Trade Show, November 9, 2005 presented World Trade Center disaster research that showed compartmentation had provided some protection before the towers collapsed. Through the 1 hour assemblies, that apparently were not continuous above the ceilings, there was evidence of the compartmentation slowing spread of fires.

ICC's 2006/2007 Code-Change Cycle

The International Code Council, the publisher of the International Family of Codes, will start its 2006/2007 Code Development cycle on March 24, 2006, its deadline for accepting proposed code changes Hearings will be held in Orlando, Fla., in September.

After the process is completed, a 2007 supplement to the 2006 International Codes will be published.

For information about how to submit a code change, visit www.iccsafe.org on the Internet and click on "Codes & Standards." FCIA Members say that states and local jurisdictions are evaluating the adoption of code options, including the ICC's International Codes and the National Fire Protection Association's NFPA 5000.

NFPA Completes 2006 Cycle

A 2006 version of the National Fire Protection Association's NFPA 5000 and NFPA 101 publications is available.

The NFPA's Life Safety Code, Building Construction and Safety Code and Technical Committee on Health Care Occupancies completed the work.

NFPA Allies with Canadian Partner

The National Fire Protection Association has formed a relationship with the Canadian Standards Association (CSA).

The CSA is a membership-based association that serves industry, government, consumers and other parties in Canada and the world. A leading developer of standards and codes, CSA aims to enhance public safety, improve quality of life, preserve the environment and facilitate trade.

In the groups' first joint endeavor, the NFPA has licensed the CSA to use NFPA 1600, the Standard on Disaster/Emergency Management and Business Continuity Programs.

Under the formal agreement, the organizations will work together to improve public safety and quality of life by promoting awareness, knowledge and the application of standards and industry best-practices in the community and workplace.

Life Safety Digest 2006 Industry Calendar

March 28 to April 1

The CSI Show, Las Vegas

April 26 to 28

FCIA Education & Committee Action Conference
Montreal, Quebec, Canada - info, <http://www.fcia.org>

June 4 to 6

NFPA World Safety Conference & Expo
Orlando, Fla.

June 8 to 10

American Institute of Architects National Convention
and Design Expo, Los Angeles

June 24 to 27

BOMA North American Commercial Real Estate
Congress and the Office Building Show, Dallas

Aug. 10 to 13

National Association of State Fire Marshals
Washington, D.C.

Sept. 14 to 16

Fire and Rescue International (IAFC), Dallas

Sept. 17 to 30

ICC Annual Conference & Code Development
Hearings, Lake Buena Vista, Fla.

Sept. 24 to 26

IAPMO Annual Conference
Doubletree Oakbrook, Chicago

November 8 to 10

FCIA Firestop Industry Conference
Charleston, S.C.

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Industry News

Testing & Qualification News

New UL Quality Program

UL Laboratories has announced its Qualification of Firestop Contractors Program.

Dan Kaiser, Business Development & Pricing Manager at UL, and Betsy Titus, Worldwide Business Development the lead contact in the new program, recently announced a new service to qualify a firestop contracting firm's quality programs.

The program, similar to ISO 9000 but tailored for the contracting environment, will be launched with a seminar and testing at the Firestop Contractors International Association's Education and Committee Action Conference in Montreal April 26-28.

Visit FCIA's website for more details, www.fcia.org.

ASTM Happenings

ASTM Task Groups are continuing their work on ASTM E 119, ASTM E 814, standards for perimeter fire containment, smoke barriers and partitions and fire resistance-rated Ductwrap.

ASTM Task Group E5.11.02 for ASTM E 814 is considering the addition of a leakage standard to E 814. The air leakage standard could be similar to what exists in Underwriters Laboratories' UL 1479 Firestop Systems standard for simulation of smoke movement through firestopping in compartmentation.

John Valiulis, PE, Manager of Codes and Standards at HILTI

Inc., is chairing the task group.

"The Perimeter Fire Containment 'leap frog' standard task group E.11.20 development committee is continuing to refine requirements in 2006," said Thermafiber's Jim Shriver, chair of the committee.

In another task group headed by Firestop Contractors International Association's Randy Bosscawen of Multicon Fire Containment, a new standard for qualifications of firestop inspectors of penetrations and joint systems is under development. The task group sent an early edition of the standard for ballot receiving several negatives, most of which were included in the next draft.

Another meeting will take place to bring additional viewpoints into the standard development.

DHI Pursues Quality

Jerry Heppes, executive director of the Door and Hardware Institute, says that the DHI is pursuing development of a quality program, much like FM 4991 and UL's new Qualification of Firestop Contractors...but for the swinging door industry.

Heppes said, "DHI is very excited about this new development for the swinging door industry quality process through conversations with UL and ITS about maintenance."

FCIA Manual of Practice Updated

The Firestop Contractors International Association's Firestop Industry Manual of Practice had more than 100 pages updated in 2005.

The sections on testing, products and maintenance were rewritten by the FCIA Technical Committee.

Mike Dominguez, chair of the FCIA Technical Committee, said "FCIA will be working on three more sections in 2006 because the Manual of Practice is a living document that changes as new processes and technologies arise."

Firestopping Apprentice Program

Bob Hasting, President of Portland, Ore.-based Specialty Firestop Systems, said that the U.S. Department of Labor has recognized a new classification for a firestop worker.

The classification number, 47.2131.00, means there is now a Davis Bacon Wage Rate set for prevailing wage projects in the United States.

Previous to this classification, contractors were at the mercy of interpretation about what wage rate was to be assigned to firestopping on Davis Bacon Prevailing Wage Projects, causing much confusion.

The Firestop Contractors International Association Apprentice Training Program Outline was also approved by the U.S. Department of Labor and will soon be submitted for approval in Canada as well.

"We're excited about making Firestopping a trade worldwide," Hasting said.

Industry News

New Compartmentation Presentation

Over the past several years, there has been little education offered by the compartmentation industry for architects, engineers, building officials, fire marshals, building owners, managers and other construction professionals.

FCIA's new Compartmentation Symposium was held for the first time ever in November at the Firestop Contractors International Association's Firestop Industry Conference and Trade Show to start a new education initiative.

Compartmentation industry associations joined together to provide information and education about the components of effective compartmentation.

Here's a summary of the people and their roles on this cutting edge panel of industry leaders who have been involved in many ASTM, National Fire Protection

Association and International Code Council committees and have taught their discipline for years.

- **Fire Walls and Floors:** Paul Bambauer of the Concrete and Masonry Association of California and Nevada discussed real examples of compartmentation success.

- **Drywall Fire Barriers:** Nestor Sanchez of U.S. Gypsum discussed drywall's role in compartmentation.

- **Swinging Doors & Hardware:** Jerry Heppes of the Door & Hardware Institute provided an update on the position of doors and hardware for openings in compartmented walls.

- **Rolling Fire Doors:** Steve Hahn of Lawrence Doors, Inc. and the Association of Rolling Door International presented information on NFPA 80's new requirements for openings in compartmentation and the rolling door industry view.

- **Fire Glass:** Renee Woodruff of Safti-First, Inc., represented the Fire Glass Industry and new design flexibility with innovative materials.

- **Fire & Smoke Dampers:** Sam Dardano, a Colorado Building Official/Fire Damper Expert, presented information on fire-damper technology and its importance in fire and smoke protection in compartmentation.

- **Firestopping & Code Requirements:** FCIA Executive Director Bill McHugh presented the compartmentation code requirements and firestopping's unique quality programs through FM 4991 and ASTM E 2174/ASTM E 2393. (See Life Safety Digest, Volume 1, No. 1 at www.fcia.org for more information.)

Look for this new compartmentation education program to be presented at the Construction Specifications Institute's convention in Las Vegas on March 30, 2006. The program will be widely available after the presentation for use educating the industry about the importance of effective compartmentation. The FCIA is also an Education Partner at the CSI show again for the third year in a row.

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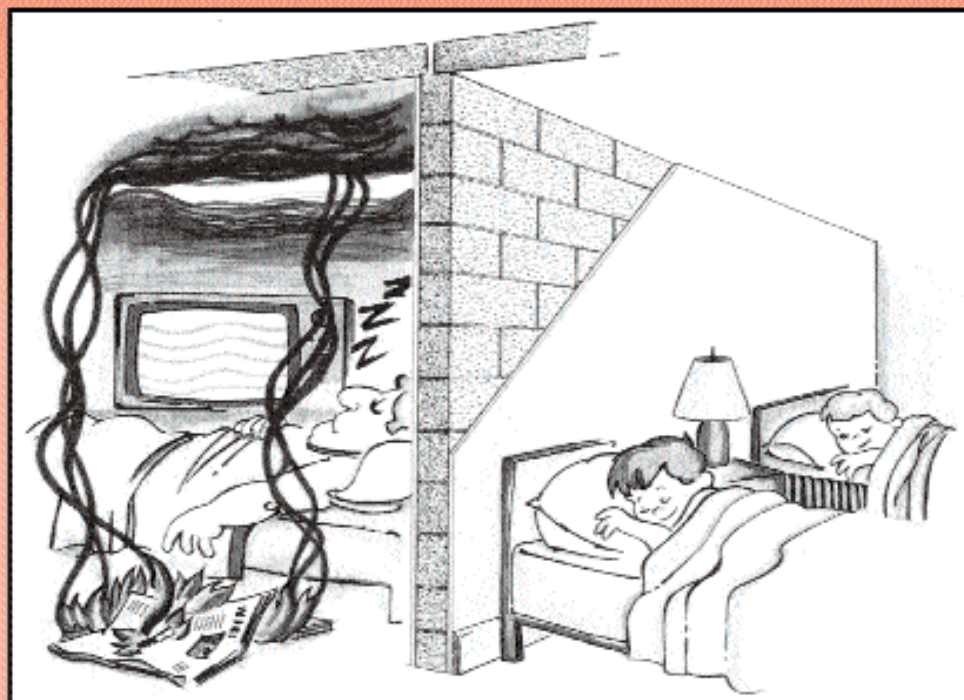
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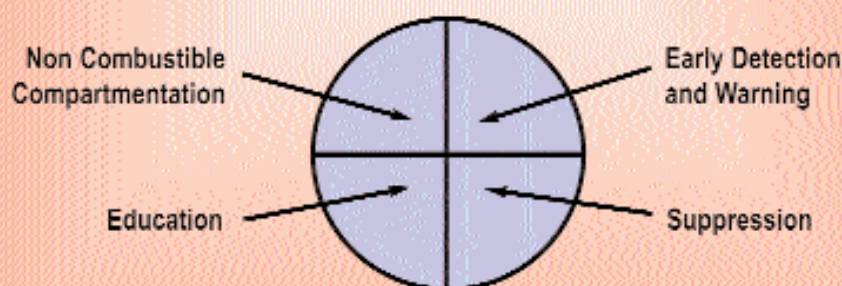


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Balanced Design for Lifesafety

The solution is clear - adequate firesafe buildings depend upon noncombustible construction and containment of fire; early detection, warning and suppression of fires; and the education of the general public and occupants of these buildings, provided by the fire department and/or building owners, as to the hazards of fire and the procedures to follow in case of fire.



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