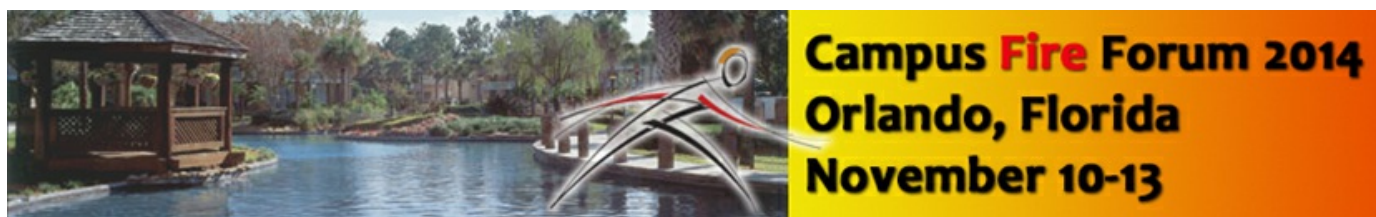


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Campus Fire Safety e-NewZone Monthly Newsletter ... April 2014, Volume 4, Issue 4
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Center Activity Announcements

New Student Committee to bring Campus Fire Safety Message to Students ...

The Center for Campus Fire Safety®, (The Center) ... today announced the formation of their new Student Committee. The Student Committee will be guided by The Center's Vice President, Michael J. Swain, Campus Fire Marshal from the University of Massachusetts, Amherst. The committee management team will consist of students from The University of New Haven's Fire Science Club. "The Fire Science Club has been with us for several years helping The Center at our annual Campus Fire Forum" said Michael Swain. "They are a natural to kick-off the new Student Committee and to spread the fire and life safety message to students nationwide and even worldwide" [MORE](#)

From The President

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About The Center for Campus Fire Safety

The Center is the Voice of over 4000 colleges and universities. As nationwide non-profit, membership based, organization devoted to reducing the loss of life from fire at our nation's campuses, we offer an abundance of free resources to help fire and life safety officials working on college campuses and fire departments with responsibility for a college campus/university.

[Leadership](#)|[Committees](#)|[Sponsors](#)|[Advisory Council](#)|[Members](#)

Welcome to all of our New Center Members (month to date)

Lepore, Dennis, Stockton College; Meckler, Tim, Iselin #11 Bureau of Fire Prevention ; Draina, Bill, Iselin #11 Bureau of Fire Prevention; Nordtveit, Helge, Monge, Edwin, Washington Adventist University; Gundlach, Brian, Nassau Community College; Serrano,

John, Nassau Community College; Blum, Keith, Nassau Community College; Caracciolo, Anthony, SUNY Canton; Vivekanand, Laurie, Hudson Valley Community College; Loh, Scott, Princeton.

➔ Thanks to those that joined our April Board of Director's meeting. We appreciate your interest. Next public Board meeting: 8/5/14

➔ Our Off Campus Fire & Life Safety Alliance is growing. If you are a member and did NOT receive your invitation to join, contact: supportteam@campusfiresafety.org or [click to learn more](#)



**The Inspector,
by Phil Chandler**

The Invention of the Door

As I have stated countless times on these pages, the invention of the door has been the single most significant event in our long battle with fire in the built environment. Simply closing the door on a fire, any door, slows down fire's deadly progression, buying precious time for occupant escape. Not too long ago, FDNY hit the airwaves with a simple public plea ... [MORE](#)



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**Fire Smart Campus
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Fire Smart Campus Training is available! The Center instructor(s) will come to your campus or town. Price varies depending upon location.

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NEMA Library ...

Life Safety Systems Guides and Manuals Fire Detection, Alerting and Signaling Ideal for Designers, Installers, Code Officials, Owners and Users of Fire and Life Safety Systems ... [MORE](#)

Crowd Manager Training ...

2 hour on line course @ \$19.95 ... Presented by ICC, NAFSM & CCFS, this course provides valid, credible training to those charged with crowd management at facilities including higher education. This meshes with The Center's mission of providing resources to our community. [MORE](#)



C+S and more

Codes, Standards & More



**Living with Sprinklers
by Audrey Goldstein, Engineer,
NFPA**

Sprinklers are a staple of almost every college dorm room today but how many college students know how they work or what they really do? Prior to getting involved in the fire protection field, I certainly didn't understand them. We all know the scene from movies: a fire breaks out, flames lick up against the ceiling, and all of a sudden it's raining indoors ... [MORE](#)



908 Emergency Alarm Systems

908.1 Group H occupancies. Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be provided as required in Chapter 50. >> Emergency alarm systems provide indication and warning of emergency situations involving hazardous ... [MORE](#)



MEMBER NEWS, MAJOR FIRE LOSS, FIRE INCIDENT NEWS & MASS

NOTIFICATION INFO

MAJOR FIRE LOSS NEWS

April 24, Early-morning apartment fire kills 1 near campus, others injured .

Update to April 24 fire death: At the time the student was not identified. He has since been identified as Cody Day, a 22 year old student from Ivy Tech, a school about one-hour away from the incident site. It appears Cody was visiting friends where this fire broke out.

[About the Fire](#) | [About Cody Day](#)

[➔ Breaking News - Click here to Sign up!](#)

ON/OFF CAMPUS FIRE INCIDENTS

Fire reported at Norfolk State University dorm. [MORE](#)

A fire at the Campus Center kept students out for 40 minutes on Monday. [MORE](#)

Student burned in residence hall grease fire. Press release from the Humboldt State University [MORE](#)

University of Central Florida Streamlines Life Safety for New Dorms [MORE](#)

Fire Damages Fraternity Home Near San Diego State University [MORE](#)

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MEMBER NEWS

Job Opp:

Auburn University Position Announcement; Manager, Safety & Health (Fire & Life Safety) [MORE](#)

University of Delaware; Environmental Health and Safety-Fire/IH Technician II [MORE](#)

ICC News Update:

Building Safety Month Promotional Materials Available
ICC's annual safety campaign held each May includes educational and informational resources to help ICC Members and others increase public awareness of building safety.
MORE: <http://www.buildingsafetymonth.org>

[➔ Submit Member News or Job Opps](#)

MASS NOTIFICATION TECHNOLOGY IN THE NEWS

Tornadoes at SIUE: What to do, where to go ... [MORE](#)

The Great ISC West Roundup 2014 - Security Systems News [MORE](#)

Rave Mobile Safety Expands Higher Ed Market Lead to Protect more than 1000 [MORE](#)

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Fire Fatality Statistics

The Center for Campus Fire Safety provides basic information about fire fatalities that occurred on a university or college campus, or that occurred within the town where the campus is located.

[➔ Fatalities Defined | Fatality Statistics](#)



Center Resources & Activities

(... more coming soon!)

- **Library** ... best practices, white papers, technology, codes,++
- **Data Collection** ... help us collect fire incident data here!
- **Membership** ... become a member or visit our member website!
- **Shopping** ... DVD's, Logo items + more. Members login for discounts!

[➔ All Center Activities](#)



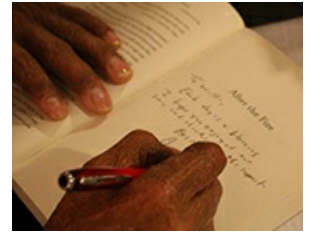
Center Honory Lifetime Members ... (Shawn & Al)



After The Fire ...

Bring the After The Fire experience to your campus ...

Shawn and Al, Seton Hall burn survivors, are lifetime members of The Center for Campus Fire Safety and have been with us for several years now. Many of you have met them at our annual Forum(s). Learn more about their experience and their willingness to speak at your campus.



- ➔ [MEET SHAWN & AL](#)
- ➔ [PURCHASE AFTER THE FIRE VIDEO](#)

Thanks to our Annual Sponsors for their support and dedication to campus fire and life safety.

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FOR IMMEDIATE RELEASE

New Student Committee to bring Campus Fire Safety Message to Students

April 30, 2014 Newburyport, Massachusetts ... The Center for Campus Fire Safety®, (The Center) the nation's only nationwide, non-profit, member-based organization dedicated to campus fire and life safety in the higher education community today announced the formation of their new Student Committee.

The Student Committee will be guided by The Center's Vice President, Michael J. Swain, Campus Fire Marshal from the University of Massachusetts, Amherst. The committee management team will consist of students from The University of New Haven's Fire Science Club. "The Fire Science Club has been with us for several years helping The Center at our annual Campus Fire Forum" said Michael Swain. "They are a natural to kick-off the new Student Committee and to spread the fire and life safety message to students nationwide and even worldwide".

Over the next few months the Student Committee will be working in social media to spread The Center's message to other students and fire safety educators. But that's not all - the Student Committee will also guide The Center by submitting their ideas to develop sales tools that reach the higher education community including parents, students and educators. According to The Center's President, Paul D. Martin, "This new committee will help expand The Center's outreach. Additionally the committee will interact with several of our ongoing programs and committees".



As Michael Swain points out, “Examples of areas where the Student Committee will interact with other Center programs include our Off-Campus Fire and Life Safety Alliance where we discuss fire safety issues and concerns in off-campus housing; our Passport to Fire Safety coalition of organizations dedicated to protecting exchange students leaving the United States on a study program or travelling to countries where fire safety is not necessarily as prevalent as it is in the United States; Our Campus Fire Safety Month activities and much more.”

To learn more about The Center and its programs, visit www.campusfiresafety.org.

About The Center for Campus Fire Safety (The Center)

The Center for Campus Fire Safety (The Center) is the voice of over 4000 campuses nationwide. It is a non-profit, membership based, organization devoted to reducing the loss of life from fire at our nation's campuses. The Center serves as an advocate for the promotion of campus fire safety.

Media Contacts

The Center for Campus Fire Safety | 978.961.0410

Paul D. Martin, President, pmatin@campusfiresafety.org

Cathy Tabor, Director of Marketing Communications, ctabor@campusfiresafety.org



FROM THE PRESIDENT

By Paul D. Martin

April 2014

This week several members of The Center for Campus Fire Safety (The Center) Board of Directors, along with some special guests, will get together at the Congressional Fire Service Institute's (CFSI) 26th Annual National Fire and Emergency Services Dinner in Washington D.C.

You might ask "how does this relate to campus fire safety?" The answer is simple ... it provides The Center yet one more avenue to engage Congressional leaders and Administration officials in discussions about federal programs and legislation addressing campus fire safety, and the needs of those professionals protecting America's campuses.

The United States Congress is more aware of our concerns because of the Congressional Fire Services Institute. Established in 1989 as a nonprofit, nonpartisan policy institute, CFSI is designed to educate members of Congress about the needs and challenges of fire safety so that the federal government can provide the types of training and

funding needed to address the complex issues associated with it. Because of its nonpartisan nature, CFSI is a proven source for accurate and objective information on fire issues. The Center shares the honor and distinction with other allied fire and life safety organizations to be a member of the CFSI National Advisory Committee, "the NAC." The NAC provides CFSI with insight on issues of federal concern, legislative or programmatic, so that CFSI may work with Congress to see them addressed. And with one of CCFS' core missions being to inform public policy makers about campus fire and life safety issues, our partnership with CFSI and participation on the NAC are a perfect fit.

As we head into May, commencement is undoubtedly rising to the top of importance for campus administrators and faculty. But for those of us devoted to fire and life safety we know all too well that commencement takes on a different meaning. For us it is more likely indicative of a launch into overdrive of

summer construction, rehab, renovation, testing and maintenance. While each of these activities will present its own challenges and demands on our already over tasked staff, we cannot afford to be unengaged. Will Rodgers said *"Even if you are on the right track, you will get run over if you just sit there."* So despite the anxiety of balancing this rush of work, it is important that we be front and center in its planning and execution. This can seem overwhelming, but take heart in knowing that your peers share your stress and frustration; but even more importantly, embrace the improvements to the overall level of campus fire and life safety that will be the ultimate result of the madness.

On a related topic, I hope that our readers helped recognize May as **Building Safety Month**. A project of the ICC Foundation, **Building Safety Month** is intended to elevate the awareness in the importance of a safe and sustainable built environment and the critical roles of building and fire codes and those



FROM THE PRESIDENT

By Paul D. Martin

April 2014

who work to ensure they are effectively applied. This year's theme is **BUILDING SAFETY: Maximizing Resilience, Minimizing Risks** -- a theme clearly applicable to our roles on campus.

Now to the future - please join The Center at the NFPA Conference and Expo, June 9th-12th at the Mandalay Bay Convention Center in Las Vegas. The Center is thankful for our partnership with NFPA and their support of our important mission. Because of this great relationship we are pleased to be able to continue our outreach and networking efforts at this premier fire and life safety event. Please stop and visit The Center's booth during the Expo.

I close this month's column with a most important message that being to mark your calendars now! We are bringing **Campus Fire Forum 2014™** to Orlando, Florida, November 10-13. **Campus Fire Forum™**, the flagship of The Center's educational mission, is the only national conference focused exclusively on campus fire/life safety issues. It continues to

offer unequalled opportunities to learn from the experts and interact with your colleagues from across the country (and beyond).

I look forward to seeing everyone in the Florida sunshine!

Paul

Paul Martin, President

Paul D. Martin is Chief of Inspections and Investigations for the New York State Office of Fire Prevention and Control where he served as a principle architect of New York State's nationally acclaimed Campus Fire Safety Program.

Under Paul's leadership, the staff of the Inspections and Investigations Branch is responsible for: fire and life safety inspections in a very diverse collection of facilities throughout New York State, including all colleges and universities; performing fire investigations statewide of fatal, large loss or other significant fires;

providing fire safety education and information dissemination intended to elevate the public's understanding of the danger of fire; and enforcement of the laws and regulations of the state regarding fire safety, including the world's first standard for reduce ignition propensity cigarettes.

Paul is active in the National Association of State Fire Marshals, where he serves as Vice-Chair of their Model Codes Committee and works on issues associated with fire and life safety for special needs occupancies. Additionally, he serves as co-chair of Prevention, Advocacy, Resource and Data Exchange (PARADE), a program of the United States Fire Administration designed to foster the exchange of fire-related prevention/ protection information and resources among Federal, State, and local levels of government.

He serves on the International Building Code - Means of Egress



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By Paul D. Martin

April 2014

Committee for the International Code Council, where he is active in the development of the Codes promulgated under the auspices of the ICC. Additionally he is a principle member of the NFPA technical committee currently drafting a new standard on Fire Prevention Unit Organization and Deployment.

Paul holds an associate degree in fire science, a bachelor of science in public administration and has an extensive portfolio of professional development education. During his fire service career spanning more than thirty years, Paul has served in multiple line and administration positions and has received several awards of valor, including the 2000 Firehouse Magazine® national grand prize for heroism.



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THE INSPECTOR

By Phil Chandler

April 2014

The invention of the door has been the single most significant event in our long battle with fire

As I have stated countless times on these pages, the invention of the door has been the single most significant event in our long battle with fire in the built environment. Simply closing the door on a fire, any door, slows down fire's deadly progression, buying precious time for occupant escape. Not too long ago, FDNY hit the airwaves with a simple public plea for all those encountering fire: Close the door! And no wonder; every firefighter is taught from day one to never lose control of the door. When the fire owns the door, people die.

Fire protection specialists have understood the importance of opening protectives for over a century. As early as 1912, we have had a national standard, a forerunner of NFPA 80, the current gold standard of fire doors. Our model codes require

the design, specification and installation of opening protectives used in building compartmentation to adhere to this standard. Property owners are further adjured to maintain these fire doors in their original condition. Thus we find the following in the International Fire Code: "Opening protective shall be maintained in an operative condition in accordance with NFPA 80. Fire doors and smoke barriers shall not be blocked or obstructed or otherwise made inoperable...Fire door assemblies shall not be modified (IFC 703.2)."

Great! So far so good! Who could contest putting up buildings with built-in passive fire protection features proven effective for over a hundred years. And who would not understand the logic of maintaining life-saving devices and systems that have already been paid for? We maintain our family automobiles, replacing worn brake

linings every so often. Why? Because we know lives depend on simple maintenance, and at the very least, we understand that preventive maintenance of all types and of all things pays in the end.

Nonetheless, something strange happens when we descend from the world of pure logic and good ideas. Our own experience informs us of a different reality—a reality where buildings don't get built exactly as designed—a reality of shoddy workmanship and corner-cutting—a reality of lax, poorly trained or non-existent code enforcement—a reality that many of us confront daily on the college campus. So too are we deterred by real-world circumstances that rob us of the resources needed to keep our life safety systems in peak operating condition, when we are fortunate to get them in the first place. In the struggle for ever diminishing dollars, preventive maintenance will lose every time, regardless of how counterintuitive such shortsightedness is.



THE INSPECTOR

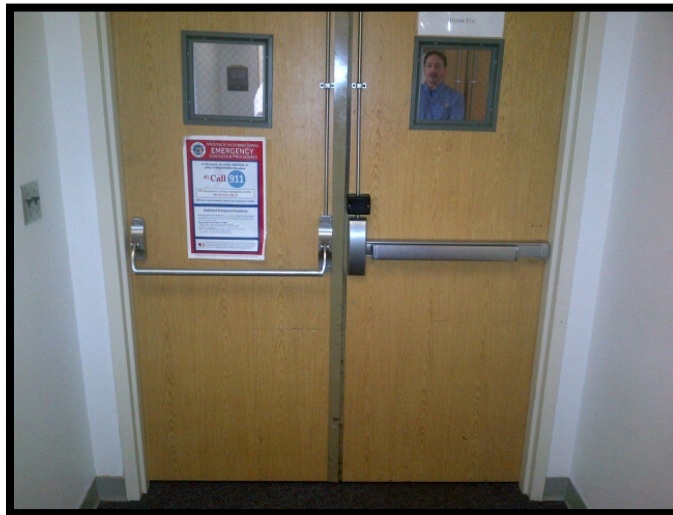
By Phil Chandler

April 2014

It is against this backdrop that the fire inspector struggles to enforce what are universally accepted by law in many states as “minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire... (IFC 101.3).” Inspectors requiring annual inspection and functional testing of all opening protectives by “individuals with knowledge and understanding of the operating components of the type of door being subject to testing, ” as required by the referenced standard NFPA 80, are met with reactions ranging from absolute disbelief to threats of physical violence. “Are you {expletive deleted} kidding me?” was one response I received, soon to be echoed by others in one fashion or another.

You would think I wrote the code and adopted it into law! What’s an inspector to do?

The initial reactions from most college officials, disheartening as they may be, are not totally without merit. Two local institutions, one a large research university, the other a community college, engaged the services of a nationally



What's wrong with this picture?

accredited fire door assembly inspector to provide a sample inspection of a few buildings for the purposes of getting an accurate understanding of what it is that the International

Fire Code actually requires—no more and no less. The results were startling. Of over two hundred doors inspected, three passed—three!

Many of the failed doors were newly installed in newly commissioned buildings. While many of the doors failed due to years of neglect or obvious obsolescence, a large number were simply never installed properly in the first place. Apparently, which comes as no surprise, building code officials were remiss in verifying that doors and hardware were installed as specified before granting certificates of occupancy.

Whether talking about new buildings or those around for decades, the same issue presents itself: Who is going to pay for bringing college buildings into “minimal standards” of compliance? The cost of conducting the code-



THE INSPECTOR

By Phil Chandler

April 2014

required inspection and testing of opening protectives alone averages around \$25.00 per door leaf, per annum. Do the math and cringe! Bringing the doors into compliance will in most cases, require complete replacement. Yes, that's right—the cost of repairing doors and replacing hardware and then field labeling the new assembly may exceed the cost of an entirely new installation.

It has been suggested that the inspector might exercise discretion when it comes to the wholesale inspection, testing and maintenance of opening protectives.

Notwithstanding the clearly written and publicly adopted standard, inspectors are routinely asked by regulated parties to compromise, if not simply look the other way. In the environment in which I work, that authority is not granted to the inspector on the street. Nor should it be. There are enough inspectors of all types and

in all places that are willing to turn a blind eye—even when public safety is at stake. Neither I, nor my colleagues, see this as an option.

Nonetheless, NFPA 80 itself, suggests some level of compromise by offering a short list of items, “as a minimum,” that should be inspected annually (5.2.4.2). But even among this bare bones group of important safety criteria are enough to disqualify a majority of the doors in many buildings. For instance: “No parts are missing or broken.” This would fail all doors in which the bottom rod of exit hardware was removed so as not to damage the floor covering—a common occurrence. Or: “No field modifications to the door assembly have been performed that void the label.” This would eliminate doors in which panic hardware was installed instead of fire exit hardware, as specified on the label, to accommodate an opener. And so it is with most

items on the list. Our opening protectives on every campus I visit are in a really sorry state.

So what is the answer? We of course cannot in good conscience allow for conditions that endanger the public good. Nor, however, as good citizens, can we put our colleges and universities out of business by requiring adherence to standards that we as a society simply cannot afford. What say you, readers? This one is bigger than the Inspector.

Philip Chandler is a long time firefighter and a fulltime government fire marshal working extensively in the college environment - from large public university centers to small private colleges.

His primary responsibilities include code enforcement and education. Phil welcomes your comments, thoughts and opinions (whether in agreement or opposition) to his viewpoints. He may be reached at:



THE INSPECTOR

By Phil Chandler

April 2014

<mailto:theinspector@campusfiresafety.org>

Ask the Inspector

Now Members can log onto the Member Website and have an online discussion with “The Inspector”.

Simply visit the [MEMBER LOGIN](#) section of our public website. Once logged in, look for the Town Hall Discussions and ask “The Inspector”.

Note: The viewpoints expressed in The Inspector are those of the author alone. They are offered to initiate thought and debate, however, they do not necessarily represent the views or opinions of The Center for Campus Fire Safety, its officers, directors or its editorial staff.



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OFF-CAMPUS

By Tim Knisely

April 2014

False or Unwanted Alarms: Manual Fire Alarm Boxes

We have all heard the excuses why tenants don't evacuate their apartment during a fire alarm. Most believe alarms to be false because they don't see smoke or fire. Or, they think it is only a fire drill. Even some in the fire service have similar apathy towards fire alarms. How did they come to think this way?

Was it the frequency of malicious alarms in the apartment complex they lived in last year? Was it the state required fire drills in the residence halls? Or, was the system poorly designed or not being maintained? No matter what the cause it will be difficult to change this mindset until the tenants experience a fire. To avoid a continuation of this pattern we can look at some ways to make current or future installations better and to avoid some of the unintentional and

malicious alarms from occurring. Part 1 of this series looks at the manual fire alarm box.

In many municipalities the adopted building code will specify the type of alarm system that is required for new construction or new system installation based on the use and occupancy of the building. Then, the fire alarm standard referenced by the building code will outline the components necessary for compliance. But, this is where it gets tricky.

The International Building Code offers exceptions for alarm system components if other fire protection systems are present. For example, manual fire alarm boxes may be omitted from nearly every use group if the building is protected by sprinklers and the fire alarm will alert occupants upon the sprinkler water flow. By removing the manual fire alarm boxes I can remove the temptation

from the intoxicated tenant who is leaving a party a 2:30 AM.

Now, consider an existing apartment building that was built 10 or 15 years prior to this code change. If the building was built with sprinklers and the water flow switch causes the fire alarm to sound, can you retroactively remove the manual fire alarm boxes from this building? If the only difference in the buildings is the code edition that was adopted at the time of construction, I'd suggest that you could.

A recent case study of two similar student housing structures built using modern building codes showed the benefit of using these code approved exceptions.

- Building #1 is a 10-year old, seven story non-combustible building with sprinklers throughout, a monitored fire alarm system including



OFF-CAMPUS

By Tim Knisely

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manual fire alarm boxes located at the entrance to every exit. In a two year period the building averaged two malicious fire alarms per week during the semester. Most of these were caused by someone pulling the manual fire alarm box.



- Building #2 is a new 8-story non-combustible building with sprinklers throughout, a monitored fire alarm system with only one manual fire alarm box located at the Fire Alarm Control Unit (FACU). This building did not have any malicious fire alarm activations in this same two year period.

Some could, and have argued that we are making a building less safe by removing the manual fire alarm devices, or not installing these during construction? You can imagine how many tenants evacuated the building that averaged eight alarms per month. When the new building had an unintentional alarm from burnt food, many of the tenants had never heard the alarm before and a significant number evacuated.

This is a decision for the local AHJ, the building owner and their insurance company to consider at the time of construction, or to address a malicious fire alarm problem. This needs to be looked at as a purely a risk management decision. But, we should consider all options to make the fire alarm activation an unusual event so the tenants will not ignore the warning.





OFF-CAMPUS

By Tim Knisely

April 2014

Tim Knisely

Tim Knisely is on the Board of Directors for The Center and the Senior Fire Inspector for the Centre Region Code Administration in State College, PA. In this position he manages the Existing Structures Division that administers the fire and property maintenance code in all existing commercial and residential rental properties, and coordinates the life safety education for the community including off-campus and Greek housing.

Tim has been active with The Center for Campus Fire Safety since its inception and served as treasurer from 2007 to 2010.

He is a frequent presenter at Campus Fire Forum, an instructor for the Fire-Wise Campus program and served as project manager for Campus Fire Data.



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C+S and more

ICC CODE CORNER

2012 IFC Code & Commentary

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SECTION 908

EMERGENCY ALARM SYSTEMS

908.1 Group H occupancies. Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be provided as required in Chapter 50.

♦ Emergency alarm systems provide indication and warning of emergency situations involving hazardous materials. An emergency alarm system is required in all Group H occupancies as indicated in Sections 5004.9 and 5005.4.4 as well as Group H-5 HPM facilities as indicated in Section 908.2. The Group H occupancy classification assumes

the storage or use of hazardous materials exceeds the maximum allowable quantities specified in Tables 5003.1.1(1) and 5003.1.1(2).

An emergency alarm system should include an emergency alarm-initiating device outside each interior door of hazardous material storage areas, a local alarm device and adequate supervision.

Even though ozone gas-generator rooms (Section 908.4), repair garages (Section 908.5) and refrigeration systems (Section 908.6) are not typically classified as Group H occupancies, the potential hazards associated with these occupancy conditions are great enough to

require additional means of early warning detection.

908.2 Group H-5 occupancy. Emergency alarms for notification of an emergency condition in an HPM facility shall be provided as required in Section 2703.12. A continuous gas detection system shall be provided for HPM gases in accordance with Section 2703.13.

♦ In addition to hazardous material storage areas as regulated by Section 5004.9, Section 2703.12.1 also requires emergency alarms for service corridors, exit of the potential transport of hazardous materials through these



ICC CODE CORNER

2012 IFC Code & Commentary

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areas. Section 2703.13 requires a continuous gas detection system for early detection of leaks in areas where HPM gas is used. Gas detection systems are required to initiate a local alarm and transmit a signal to the emergency control station upon detection (see commentary, Sections 2703.12 and 2703.13).

908.3 Highly toxic and toxic materials. Where required by Section 6004.2.2.10, a gas detection system shall be provided for indoor storage and use of highly toxic and toxic compressed gases.

♦ A gas detection system in the room or area utilized for indoor

storage or the use of highly toxic or toxic gases provides early notification of a leak that is occurring before the escaping gas reaches hazardous exposure concentration levels. The exception recognizes that certain toxic compressed gases do not pose a severe exposure hazard. Those toxic gases whose properties under standard conditions are still below the 8-hour weighted average concentration for the permitted exposure limit (PEL) are exempt from the requirement for a gas detection system.

This section also specifies the discharge requirements for treatment system performance to

establish a maximum allowable concentration of highly toxic or toxic gases at the point of discharge to the atmosphere.

The concentration level of one-half the immediately dangerous to life and health (IDLH) limit represents a minimum acceptable level of dilution at the point of discharge where the location of discharge is away from the general public. Where the treatment system processes more than one type of compressed gas, the maximum allowable concentration must be based on the release rate, quantity and IDLH for the gas that poses the worst-case release scenario.

908.4 Ozone gas-



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generator rooms. A gas detection system shall be provided in ozone gas-generator rooms in accordance with Section 6005.3.2.

♦ To monitor the potential buildup of dangerous levels of ozone, a gas detection system is required to, upon actuation, shut off the generator and sound a local alarm. Ozone gas generators are commonly used in water treatment applications. The ozone gas-generator room should not be a normally occupied area or be used for the storage of combustibles or other hazardous materials.

Section 6005 contains additional requirements for ozone gas generators.

908.5 Repair garages. A flammable-gas detection system shall be provided in repair garages for vehicles fueled by nonodorized gases in accordance with Section 2311.7.2.

♦ As indicated in Section 2311.7.2, an approved flammable-gas detection system is required for garages used for repair of vehicles fueled by nonodorized gases, such as hydrogen and nonodorized LNG. To prevent a hazardous potential buildup of flammable gas caused by normal leakage and use conditions, the flammable-gas detection system is required to activate when the level of flammable gas exceeds 25 percent of the lower

explosive limit (LEL) (see commentary, Section 2311.7.2).

908.6 Refrigeration systems. Refrigeration system machinery rooms shall be provided with a refrigerant detector in accordance with Section 606.8.

♦ A refrigerant-specific detector is required for leak detection, early warning and actuation of emergency exhaust systems. Because most general machinery rooms are unoccupied for long periods of time, a refrigeration leak may go undetected, allowing a buildup of refrigerant that can pose a threat to building occupants and the maintenance personnel who must enter the machinery



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room. Also, the refrigerants may or may not be detectable by the sense of smell, depending on the chemical nature and concentration in the air of the refrigerant. This can be especially critical when a toxic refrigerant is used in the refrigeration system (see commentary, Section 606.8). Even where the refrigerant is not toxic, sufficient quantities can displace oxygen and create an untenable environment.

Detection is necessary to avoid a condition where the oxygen level drops below safe levels.

908.7 Carbon monoxide alarms. Group I or R occupancies located in a building containing a

fuel-burning appliance or in a building which has an attached garage shall be equipped with single-station carbon monoxide alarms. The carbon monoxide alarms shall be listed as complying with UL 2034 and be installed and maintained in accordance with NFPA 720 and the manufacturer's instructions. An open parking garage, as defined in Chapter 2 of the International Building Code, or an enclosed parking garage ventilated in accordance with Section 404 of the International Mechanical Code shall not be considered an attached garage.

Exception: Sleeping units or dwelling units which do not

themselves contain a fuel-burning appliance or have an attached garage, but which are located in a building with a fuel-burning appliance or an attached garage, need not be equipped with single-station carbon monoxide alarms provided that:

1. The sleeping unit or dwelling unit is located more than one story above or below any story which contains a fuel-burning appliance or an attached garage;
2. The sleeping unit or dwelling unit is not connected by duct work or ventilation shafts to any room containing a fuel-burning appliance or to an attached garage; and
3. The building is



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equipped with a common area carbon monoxide alarm system.

♦ Section 908.7 of both the 2012 code and the IBC contains requirements for carbon monoxide (CO) detectors in all residential (Group R) and institutional (Group I) occupancies. These provisions apply to new construction and a similar requirement was added into the IFC to deal with existing buildings. The retroactive provisions in Section 1106.1 apply to existing buildings classified as Group R or I in jurisdictions adopting the 2012 code.

These provisions were added to the IBC and the code to be

consistent with the requirements for carbon monoxide (CO) detectors in all new construction of one- and two-family dwellings that had been added to the IRC in the 2009 edition. Another reason for its approval was technical data in a 1998 article published by the Journal of the American Medical Association.

The particular paper stated that approximately 2,100 deaths occur annually as a result of CO poisoning.

That annual number is based on the findings of a paper prepared by the U.S. Department of Health Centers for Disease Control (CDC). The referenced paper documented

epidemiological research by two CDC physicians who examined 56,133 death certificates over a 10-year period. Excluding suicides, homicides, structure fires and deaths resulting from CO poisoning in motor vehicles, the death rate steadily decreased for the sample period, from a value of 1513 people in 1979 to 878 in 1988. The highest death rates occurred in winter and among males, African Americans, the elderly and residents in northern states.

CO is a colorless, tasteless, odorless gas that interrupts the attachment of oxygen molecules to hemoglobin in blood cells and can cause headaches, confusion



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and dizziness. At higher concentrations CO can cause loss of consciousness and eventual death.

Exposures above 100 parts/million are dangerous to human health. It is not a Toxic or Highly Toxic gas as defined in Chapter 2 but is classified as a Flammable gas.

Section 908.7 requires the installation of a CO alarm in any new Group I or R occupancy when it contains a fuel-burning appliance or it has an attached garage. As mentioned previously, Section

1103.9 retroactively prescribes the installation of CO alarms in existing Group I and R occupancies. CO alarms are not required

in open or enclosed parking garages ventilated in accordance with Section 404.

The wording of Sections 908.7 and Section 1106.1 do not require the installation of single-station CO alarms when the building does not contain fuel-burning appliances or have an attached garage. The exception indicates that a single-station CO alarm is not required in each sleeping or dwelling unit when they are located one or more stories above or below the floor or level housing the fuel-burning appliance or an attached garage and there are no ducts or ventilation shafts that connect between the unit and the fuel-

burning appliance or attached garage. However, in such a building, a common area CO detection system is required. Such a system would be required to comply with the requirements of NFPA 72 and NFPA 720, Standard for the Installation of Carbon Monoxide (CO) Warning Equipment in Dwelling Units, including the installation of listed detectors and occupant notification devices.

CO alarms installed in accordance with the code are listed in accordance with UL 2034, Standard for Single and Multiple Station Carbon Monoxide Alarms.

They are designed to initiate an audible alarm when the level of



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CO is below that which can cause a loss of the ability to react to the dangers of CO exposure.

UL specifies that CO alarms activate at a level where the CO concentration over a given period of time can achieve 10 percent carboxyhemoglobin (COHb) in the body. 10 percent COHb will not cause physiological injury, but is a level at which increases in the CO concentration will begin to affect the human body.

Unless listed as low-power wireless, CO alarms require a primary and secondary power supply. The primary power supply is utility power and secondary power supply is typically a battery. NFPA 720 requires a CO

alarm outside of each sleeping unit in the immediate vicinity of the bedroom and on every occupiable level of a dwelling, including basements. CO alarms are not required in attics or crawl spaces.

When a combination CO/smoke alarm is provided, the fire alarm signal takes precedence over any other alarm signals. NFPA 720 requires the CO alarm be capable of transmitting a distinct audible signal that is different than the smoke alarm signal.

908.7.1 Carbon monoxide detection systems. Carbon monoxide detection systems, which include carbon monoxide

detectors and audible notification appliances, installed and maintained in accordance with this section for carbon monoxide alarms and NFPA 720 shall be permitted. The carbon monoxide detectors shall be listed as complying with UL 2075.

♦ The purpose of this section is simply to recognize that a carbon monoxide detection system can be used in lieu of carbon monoxide alarms. This is allowed when in compliance with NFPA 720 and the listing of the detectors is in compliance with UL 2075. Note that CO detectors have a different listing requirement than CO alarms.



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The International Code Council, a membership association dedicated to building safety and fire prevention, develops the codes used to construct residential and commercial buildings, including homes and schools. Most U.S. cities, counties and states that adopt codes choose the International Codes developed by the International Code Council.



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Living with Sprinklers

by Audrey Goldstein, Engineer, NFPA

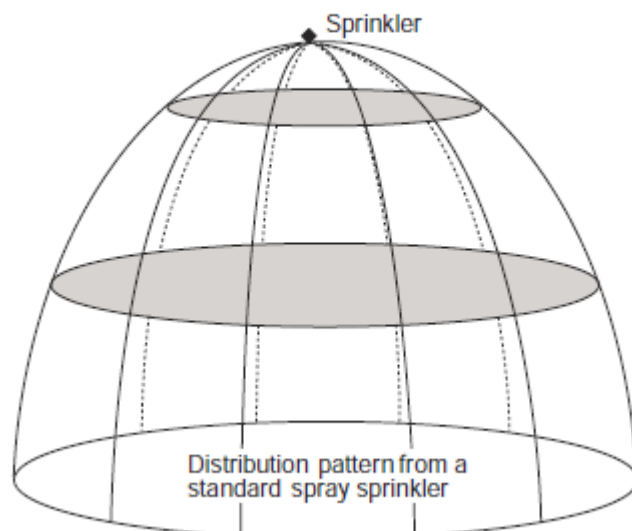
Sprinklers are a staple of almost every college dorm room today but how many college students know how they work or what they really do? Prior to getting involved in the fire protection field, I certainly didn't understand them.

We all know the scene from movies: a fire breaks out, flames lick up against the ceiling, and all of a sudden it's raining indoors as all the sprinklers in the room go off.

It doesn't work that way in real life.

An automatic sprinkler will operate when its heat-activated element reaches a certain temperature, allowing water to discharge through the sprinkler head over the fire. Each sprinkler activates independently to provide water to control the fire. Only those sprinklers close enough to the fire whose heat-actuated elements reach the necessary temperature will activate. In fact, a sprinkler system is designed assuming a finite number of heads will activate during a given fire incident. If all the heads go off at once - as Hollywood likes to suggest - the water pressures required to control the fire couldn't be achieved.

Sprinklers work by performing a few functions. Water discharge provides a cooling effect to the fire, drives away the oxygen the fuel needs to continue burning, and pre-wets nearby combustibles to ensure they will not ignite, preventing the fire from spreading.





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Residential sprinklers are specifically tested to demonstrate their ability to improve tenability in the event of a fire and are listed for use in dwelling units such as homes, apartments, and dorms. Whereas all sprinklers are tested and listed to control or suppress fires, residential sprinklers have specific spray patterns developed for the types of hazards one might find in a home.

Sprinklers have an umbrella shaped pattern. The exact geometry of the spray pattern will vary with the type of sprinkler used, however.

Think of your typical office layout. The majority of the fuel load (quantity of combustibles) can be found towards the center of the room. In a home, the fuel load can generally be found against the walls, such as on bookshelves. The spray pattern for residential sprinklers was developed to accommodate for this type of fuel load. Residential sprinklers spray higher than standard spray sprinklers to pre-wet combustibles along the walls.

Because residential heads have a higher, flatter pattern than standard spray sprinklers, obstructions located near the sprinkler are more able to prevent the water distribution pattern from forming properly than standard spray sprinkler heads located the same distance away from an obstruction. Residential heads must be located further away from obstructions such as beams and columns for this reason. Exact spacing requirements and obstruction rules for different types of sprinklers can be found in NFPA 13, *Standard for the Installation of Sprinkler Systems*.

As mentioned previously, residential sprinklers are tested to demonstrate that they will improve tenability in the room of origin. In other words, sprinklers save lives. Sprinklers not only improve the likelihood that the occupants will be able to evacuate safely, but they also protect our fire service.

Lightweight construction is used in building most of today's homes. This type of construction, although desirable due to its affordability to homebuyers, can be a nightmare for firefighters. Firefighters often cannot be sure of the structural integrity of the building in home fires of buildings with lightweight construction. The strategies



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that must be employed to perform search-and-rescue operations are affected accordingly.



Examples of residential sprinklers.

Because residential sprinklers are so effective at controlling a fire and preventing its spread, sprinklers are able to offset some of the increased hazards posed by this type of construction to members of the fire service. In one- and two-family homes with working sprinkler systems, approximately 85% of the time the fire is controlled with a single sprinkler, often limiting damage to a single room. If the fire is controlled while it

is still small, firefighters will be able to perform rescue operations with increased confidence.

On Wednesday, March 26, two members of the fire service were killed in a home structure fire in Boston. Fueled by strong winds, the fire blazed out of control. One cannot help but think of the different ending this fire may have had if this home was protected by a sprinkler system able to limit the fire's growth.

We are a long ways from requiring every home to be retrofitted with a sprinkler system, if that day ever comes. Today, all model building codes require sprinklers in new home construction due to their proven effectiveness of improving occupant safety. Despite the model code requirements, only two states have adopted legislation actually requiring home fire sprinklers in all new residences. Most states require sprinklers in apartment complexes and residential high-rises, but only two require fire sprinklers in single family homes. Although fire sprinklers are a proven technology, there is significant pushback from the home builder lobby.



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By familiarizing ourselves with how sprinklers work and disputing sprinkler myths, we are able to take steps towards improving our overall safety. Sprinklers are a relatively simple technology. Although they are increasingly present in our everyday lives - whether in offices, classrooms, malls, or dorms - they often go unnoticed. In the event of a fire, the difference a sprinkler system can make is indisputable.



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