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Society of Fire Protection Engineers

New Jersey Chapter

FUSIBLE LINK

NOVEMBER 2011

President's Message…

Summer is behind us and winter is rapidly approaching. The record rains robbed us of a vibrant fall this year but we will have others. It's time to close pools, patios and fill bags with leaves. While we get the snow blowers ready for winter we also prepare the lawn mowers and blowers for hibernation. These snow blowers will start first pull if they were properly maintained when put away after last year's busy winter .

Proper commissioning, acceptance and reacceptance testing and a continued inspection, test and maintenance program are code mandated for life safety systems.

Each year countless millions of dollars are spent on new fire alarm and suppression system installations; these systems are often accepted with little to no testing and just as little documentation. Even when full testing and documentation are provided as the system is added to and modified the original documents become next to useless. As-builts are referred to in NFPA as living documents; typically they are frequently lost or quite dead.

A poorly or untested system can never be expected to perform as it was designed. In the same token a inadequately documented system can never be maintained as is required by code. Proper commissioning of life safety systems must begin in the specification; if we are called upon to witness the acceptance testing of a system that did not have as-builts, IOM manuals and such written into the specification how then can we demand the documents at its acceptance testing?

Acceptance and reacceptance testing are clearly defined in Chapter 14 of NFPA 72 2007 and 2010 editions, Chapter 10 of NFPA 72, 2002 edition and Chapter 7 of the 1996 and 1999 editions. Reacceptance testing was originally defined in the 1996 edition and has become more clearly defined in current editions.

Systems that are not regularly and properly inspected and tested per the frequencies and methodologies defined in NFPA 72 cannot **and do not** perform as designed. The longer a system goes without proper maintenance the less likely the system will perform in an emergency.

I recently performed a third party review of the test/inspection/maintenance being performed at a NJ University. With my report the university was able to terminate the service & maintenance agreement with the 'Low Bid Contractor.' Further action was taken against the contractor within the NJ Division of Fire Safety to terminate the contractor's license and certification. This University was lucky as one of the contractor's other clients had a fire two months later that became untenable with no response by the fire detection or annunciation systems.

I'm taking a liberty using the above as a parable for professional organizations. It's easy to understand the need to start off correctly in order to meet the tax codes and stay within the law. By-Laws, operational manuals as well as Robert's Rules of Order, give the organization guidelines and boundaries for proper operation. However, without maintenance the organization can die! Think of your support and meeting attendance as doing your part to maintain your Society.

Ed Armm
Chapter President

November 7 Chapter Meeting - Technical Presentation - Fire and Smoke Curtains, a Discussion on the Latest Standards and How to Apply Them

Our presenter will be: John W. Collins, MBA from Smoke Guard

His education includes a Masters of Business Administration, BA in Facility Design & Management, and AS in Architectural Engineering.

He has taught college course work at the Masters level. He has over 27 years of architectural / commercial construction industry experience. This instructor has been extensively trained in the relevant IBC 2003, code requirements as well as IBC 2006 & 2009 requirements, smoke migration in multi- story building and the architectural methods to meet those requirements and knowledge of UL requirements of smoke control at doors as well as and relevant NFPA Life Safety Code requirements. Atriums and open stairs are beautiful architectural features but unfortunately present challenging and costly smoke evacuation issues. Wouldn't you or your architect clients love it if you could avoid the unsightly roof top fans and make up air vents? New technology from Europe using smoke and fire rated curtains are growing in popularity here in the US because they meet the code requirements and save thousands of dollars for you or your client. Be present at our educational program and learn how the challenges of smoke control in vertical openings such as elevator hoist ways, ornamental stairs and atriums can be solved using new innovative architecturally specified products.

AFAA I sponsoring a free NFPA 3 Webinar Nov 18

IT'S FREE!!!!!
Automatic Fire Alarm Association's September Webinar
You can earn 1.5 hours of CEU's with this webinar

FRIDAY
November 18th 2011, 1:00pm - 2:30pm EST

NFPA 3
Recommended Practice on Commissioning and Integrated Testing of Fire Protection and Life Safety Systems

Presented by:
Shane M. Clary, Ph.D, Bay Alarm Company
David R. Hague, P.E., CFPS, CET, Liberty Mutual

Sponsored By:

This new NFPA document is sure to have a significant impact on fire protection systems in the future. Learn what it is all about and how it affects you. Our two presenters, both members of the Technical Committee, will provide insight from the insurance company and the installer point of view. Not to be missed! This is a FREE webinar!

Register Now!

This is a FREE! webinar to all attendees thanks to this months sponsor Simplex Grinnell. Register early, space will be limited. However, if a certificate of attendance for continuing education is desired, there will be a $20 administration fee. To pay for your CEU's please click here.

John McCormick to Receive 2011 Society of Fire Protection Engineers Harold E. Nelson Service Award at its 2011 Annual Meeting - John was one of our NJ Chapter members and served on our Board of Directors

John McCormick P.E.

At its Annual Awards Luncheon in Portland, Oregon on October 24, 2011, the Society of Fire Protection Engineers (SFPE) awarded the Harold E. Nelson Service Award to John McCormick, P.E., FSFPE. McCormick served as the Society's treasurer and as the President of the SFPE Tennessee Valley Chapter.

The SFPE Board of Directors established the Nelson Award in 1987 to recognize dedicated and inspired service toward the ideals and goals of the Society. The award is named after Harold E. "Bud" Nelson, P.E., FSFPE, whose parallel fire protection engineering and Society careers are truly worthy of emulation.

McCormick will receive the award for chairing the SFPE Task Group that was responsible for updating the SFPE Position Statement entitled, *The Engineer and Technician: Designing Fire Protection Systems*. This position statement is frequently used by engineering boards and code officials (AHJs) throughout the United States to define requirements for the proper roles and responsibilities for those who participate in the layout and design of fire protection systems.

Additionally, McCormick was responsible for implementing the Society's ABET program. **ABET** is the accreditation organization dedicated to assuring quality in applied science, computing, engineering, and technology education. By joining ABET in 2009, SFPE made a vital step to making certain that fire protection higher educational programs meet the educational standards set by the profession.

Some Brief Information on the SFPE - It's Mission and Various Services Available to Its Members

"The Society of Fire Protection Engineers was established in 1950 and incorporated as an independent organization in 1971. ***It is the professional society representing those practicing the field of fire protection engineering****. The Society has over 4000 members in the United States and abroad, and over 60 regional chapters.*

The purpose of the Society is to advance the science and practice of fire protection engineering and its allied fields, to maintain a high ethical standard among its members and to foster fire protection engineering education.

The Society supports the development of the annual Professional Engineer licensing exam in fire protection and the grading of those exams under the auspices of the National Council of Examiners for Engineering and Surveying. Several volunteer committees and task groups work under the Society's auspices on technical projects to further advance the state of the art.

The Society's activities include a series of educational seminars and short courses, technical symposia and conferences, books and publications, designed to advance the state of the art of fire protection engineering and provide technical information to the fire protection community*. The Society publishes a quarterly newsletter SFPE Today, a peer reviewed quarterly Journal, and a quarterly technical magazine Fire Protection Engineering."*

September 22, 2008

History of Fire Protection Engineering

By Arthur E. Cote, P.E., FSFPE—

EARLY HISTORY[1, 2]

SFPE defines "fire protection engineering" as the application of science and engineering principles to protect people and their environment from destructive fire. The earliest examples of fire protection engineering can be found in the various regulations that were established as a result of catastrophic historic conflagrations.

After Rome burned in 64 AD, Emperor Nero had regulations drawn up after the fire requiring fireproof materials be used for external walls in rebuilding the city. This was perhaps the first recorded example of using the science and engineering of the day in the practice of fire protection engineering.

After the collapse of the Roman Empire and the onset of the Dark Ages, it wasn't until the 17th century, during the Renaissance, that a technical approach to fire protection again emerged. After the Great London Fire of 1666, which destroyed over 80 percent of the city, London adopted its first building regulations requiring stone and brick houses with fire-resisting party wall separations. The London fire also spurred interest in the development of fire-suppression equipment in the form of hand-pumper fire apparatus. The design of this equipment is another example of early fire protection engineering.

Throughout the Industrial Revolution in Great Britain in the 18th century and in the United States in the early 19th century, conflagrations continued but began to decline as combustible construction was replaced by masonry, concrete and steel; public fire departments were formed; public water supplies with underground water mains and fire hydrants were installed; and fire apparatus improved. During this same period, the focus of fire protection engineering shifted from addressing multiple building conflagrations to dealing with specific buildings and their contents. New industrial processes and material storage practices resulted in greater fire risks, and a number of spectacular building fires occurred during this period as engineering solutions were being developed to address the new fire hazards.

During the middle of the 19th century, a number of severe fires occurred in textile and paper mills in New England. Caused by lint and paper debris, these fires spread so rapidly that they could not be controlled by traditional manual firefighting. The fire protection engineering solution was to install a system of manually operated perforated pipes at the ceiling, thereby creating one of the first fixed fire-suppression systems. The desire to make such a water extinguishing system automatic ultimately led to the development of one of the most important innovations in fire protection engineering - the automatic sprinkler. The first patent for an automatic sprinkler was awarded to Henry S. Parmelee in 1874. Frederick Grinnell further refined the sprinkler design in the early 1880s.

During the 19th century, many of the advancements in fire protection engineering were brought about by the influence of the insurance industry and the desire to minimize property insurance losses.

THE FOUNDING ORGANIZATIONS[3]

A handful of organizations were formed by the insurance industry in the U.S. that were responsible for establishing the concept of fire protection engineering, putting it into practice and facilitating its growth and recognition as a profession. These were Factory Mutual in 1835, National Board of Fire Underwriters in 1866, Factory Insurance Association in 1890, Underwriters Laboratories in 1893 and the National Fire Protection Association in 1896. These were the founding organizations of fire protection engineering. They were founded in large measure to reduce the loss of life and property from destructive fire. In doing so, they applied the principles of science and engineering, and launched fire protection engineering.

Factory Mutual (FM)

Zachariah Allen, a prominent mill owner in Rhode Island in 1835, combined the concepts of mutual insurance and property protection to form Manufacturers Mutual Fire Insurance Company. This insurance company was based on the concept of insuring only factories that were good risks and that would ultimately pay less for insurance because there would likely be fewer and smaller losses.

By utilizing proper fire prevention methods and regular fire inspections, the concept proved to be successful and the Factory Mutual (FM) system was born. In 1878, MIT engineer C.J.H. Woodbury was hired as an inspector for Boston Manufacturers Mutual, one of the FM insurance companies. This use of a graduate engineer as a fire inspector makes Woodbury one of the first (if not THE first) true fire protection engineers. The second MIT engineer to join Factory Mutual was John R. Freeman in 1886. He gathered around him a corps of engineers and began for the first time to put fire protection and prevention on a truly scientific basis.

A small laboratory was established to test fire protection equipment. This laboratory was the humble beginning of Factory Mutual's research efforts to support fire protection engineering.

With the development of the automatic sprinkler, Factory Mutual encouraged the installation of this new fire protection tool, and by 1901, most FM properties were protected by automatic sprinklers.

FM grew in influence and size to become one of the major insurers of highly protected risks (HPRs) worldwide, continuing the concept of using fire protection engineering to achieve property loss prevention. FM also continued to expand its research activities to meet the needs of fire protection engineering, including continued expansion of its large-scale fire testing capability.

Factory Insurance Association (FIA)

In 1890, 11 stock insurance companies banded together to form the Factory Insurance Association (FIA) for the purpose of writing insurance on sprinklered risks in competition with Factory Mutual. FIA had the same basic premise as FM: Industrial properties could be profitably insured if losses are kept to a minimum by utilizing good fire protection practices, that is, good construction, full automatic sprinkler protection and frequent inspections by qualified individuals. FIA became a major insurer of HPR facilities.

In 1975, FIA merged with the Oil Insurance Association and became Industrial Risk Insurers (IRI), and continued to expand its loss prevention services as a major HPR insurer. Throughout its growth and expansion, loss prevention through engineering inspection remained the cornerstone of IRI. In 1998, IRI was purchased by GE and became GE Global Asset Protection Services (GAPS). In 2006, GAPS was acquired by Swiss Re, and in 2007, Swiss Re was purchased by XL Insurance based in London.

National Board of Fire Underwriters (NBFU)
A conflagration in Portland, ME, in 1866 prompted the establishment of the National Board of Fire Underwriters (NBFU). Initially formed to control fire insurance rates, NBFU, in response to a series of conflagrations in the U.S. from 1871 to 1889, became one of the major fire prevention organizations in the country. It was ultimately responsible for the development of the first model building code in the U.S., the National Building Code®, in 1905 and the first National Electrical Code in 1897.

In response to the Baltimore, MD, conflagration in 1904, NBFU created a municipal inspection system utilizing engineers to assess the ability of major cities and towns in the U.S. to prevent multiblock conflagrations. This evolved by 1916 into a system for grading cities and towns with reference to their fire defenses - the National Board Grading Schedule. The National Board survey engineers were also some of the early fire protection engineers.

From 1900 until 1965, the National Board of Fire Underwriters (NBFU) printed and distributed free of charge the standards developed by the National Fire Protection Association (NFPA). In 1965, NBFU became the American Insurance Association (later the American Insurance Services Group), ultimately phasing out its technical activities and its contributions to fire protection engineering.

Underwriters Laboratories (UL)
Insurance companies' concerns about the fire risk of the electrical wiring of 100,000 Edison incandescent light bulbs at the Palace of Electricity at the World's Columbian Exposition (World's Fair) of 1893 in Chicago resulted in the hiring of a young electrical engineer from Boston, William Henry Merrill, to ensure that the exhibition was safe. The success of this venture led Merrill, with the financial support of NBFU, to set up a laboratory to test the safety of electrical products which became Underwriters Laboratories. In 1901, the NBFU agreed to sponsor UL's work beyond electrical, and by 1903, UL had begun fire performance testing of wired glass windows and tin-clad fire doors.

Throughout the remainder of the 20th century, UL grew to become a major independent, not-for-profit testing organization in North America and a leader in advancing the science of fire protection engineering.

National Fire Protection Association (NFPA)
In 1896, in response to concerns about the reliability of automatic sprinkler systems due to a lack of standardization, a group of insurance company representatives formed the National Fire Protection Association (NFPA) to provide the science and improve the methods of fire protection and to circulate information on this subject. NFPA organized technical committees of experts to establish consensus on the design of fire protection systems and fire protection safeguards for various hazardous occupancies.

Throughout the 20th century, many of the advances in fire protection were brought about as a reaction to disastrous fires, and NFPA and its technical committees were instrumental in shaping the foundation of fire protection engineering. The rationale for fire protection engineering solutions was published in the *NFPA Fire Protection Handbook*.

Much of the knowledge base for fire protection engineering came from loss experience, the development of property loss prevention innovations and fire research conducted by these founding organizations.

TRAINING AND EDUCATION 4
FM and FIA were the first insurance organizations to utilize engineers as inspectors of highly protected risks (HPRs). The need for loss-control engineers forced both FM and FIA to create training programs in which graduate engineers could be educated as fire protection engineers. Many practicing FPEs got their fire protection engineering education and experience through these training programs.

A formal degree program in fire protection engineering was first established in 1903, when several prominent fire insurance executives and UL founder William Merrill joined forces to propose the establishment of the first FPE program in the U.S. at Armour Institute of Technology in Chicago, IL. In 1940, Armour became the Illinois Institute of Technology (IIT).

The IIT program was discontinued in 1985, but during its 82-year history, it produced over 1,000 FPE graduates. In 1956, the fire protection engineering program at the University of Maryland was established under the direction of Dr. John L. Bryan, and in 1979, the first master of science program in fire protection engineering was begun at Worcester Polytechnic Institute under the direction of David A. Lucht.

Over the years, a number of FPE degree programs have been established around the world, including programs in Canada, New Zealand, Sweden, Australia, Scotland, Hong Kong and Northern Ireland. Today, however, there are still fewer than a dozen FPE degree programs worldwide.

FIRST HALF OF THE 20TH CENTURY
During the first half of the 20th century, building and fire codes and standards became the primary means of applying fire protection engineering for life safety and property protection. Lessons learned from catastrophic fires were applied to revise codes and standards, and improve fire regulations.

During this period, the body of knowledge to support fire protection engineering continued to grow. Much of this knowledge was influenced by and borrowed from other professions, including civil and mechanical engineering, architecture, psychology, and electrical and electronic engineering. Knowledge specific to fire protection engineering also began to emerge. It is impossible to cover all of the advancements, but some of the key ones are detailed below. The rapid development of tall iron- and steel-framed buildings coupled with the performance of some buildings during the Baltimore conflagration of 1904 led to a desire to quantify fire resistance. The initial effort in the U.S. was led by Ira Woolson of the Civil Engineering Dept. of Columbia University. He set forth for the first time the technical basis for predicting fire behavior in buildings, the time-temperature curve. Standardized fire test methods for building elements were subsequently developed and became ASTM and NFPA standards. Similar efforts with similar results were undertaken in Europe.5

In 1914, the U.S. Congress authorized funds for the National Bureau of Standards (NBS) to study fire resistance. Led by Simon Ingberg, significant advances were made in understanding the performance of building systems and elements when exposed to high-temperature fires. Fire resistance moved from detailed specification to a component performance approach tied to the occupancy classification, and heights and area limitations established by building codes.5

The Iroquois Theater fire of 1903, which killed 602 people and was the deadliest fire in U.S. history until the World Trade Center terrorist attack, brought attention to the ignition and flame spread of curtains, drapery and scenery. A series of pass/fail tests were initially developed, and in 1922, Albert Steiner of UL developed a test method whereby the fire hazards of materials could be measured and classified with reference to the rate of spread of fire, the amount of fuel contributed to the fire and the production of smoke. The Steiner Tunnel Test ultimately became both an ASTM and NFPA standard.6

The first efforts to study human decisions and the movement of people in a building as a result of fire came about primarily due to disastrous major loss-of-life fires, including the Iroquois Theater fire, the Triangle Shirtwaist fire of 1911 that killed 145 and the Coconut Grove fire of 1942 that killed 492. To prevent the recurrence of such tragedies, codes and standards were developed to address the number, location and availability of exits and their design, construction and interior finish materials. The NFPA Safety to Life Committee was formed in 1913, and NFPA's Building Exits Code (later named the *Life Safety Code*®) was one of the first codes to address these issues in 1927.7

SECOND HALF OF THE 20TH CENTURY

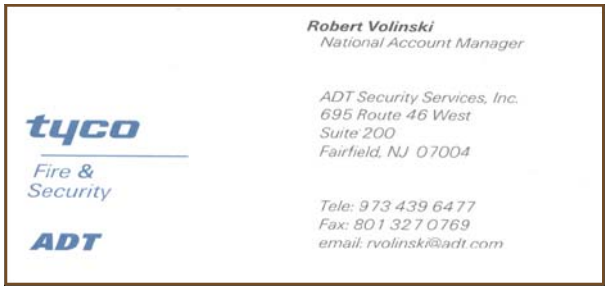
During the latter half of the 20th century, fire protection engineering as a unique engineering profession emerged. This emergence was primarily due to the development of a body of knowledge specific to fire protection engineering that occurred after 1950. The formation of a professional society, the beginnings of independent fire protection engineering consulting and the development of engineering guidelines for fire protection reinforced the profession.

Much of the body of knowledge supporting fire protection engineering was developed as a result of full-scale fire testing conducted to determine the appropriate fire protection needed to protect new industrial hazards and warehouse storage techniques. Some of the most important were tests on insulated metal deck roofs, palletized and other high-piled storage, heat and smoke vents, transformer protection, high-expansion foam, library book stacks, roll paper storage, rubber tire storage, high-rack storage and aerosol storage.

To be continued in the December Edition of the Fusible Link

Meeting Dates/Programs 2011-2012

November 7	Fire & Smoke Curtains—A discussion of what the latest standards are and how to apply them—John W. Collins, MBA from Smoke Guard
December 5	NFPA Combustible Dust Standard
January 9	Ignitable liquids—results of the recent FM testing—John Leblanc who is from FM Research Corporation
February 6	Hazards of solar panels
March 5	Forensic view of the fire sprinkler failures
April 20	3rd Annual NJSFPE/AFAANJ Symposium and Trade Show a full day of presentations and vendors. CEU's to be had.
May 7	Tyco trailer/Preaction Testing
June 4	Annual Meeting—NFPA 3
June 18	Golf Outing—West Point Big fund raiser for the joint NY & NJ Scholarship.



2008-2009 Chapter Committees

STANDING COMMITTEES

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Consulting - Peter Rullo
Richard Ravaioli
Arrangements
Vicki Serafin, Chairperson

Membership
John Cholin, Chairman

Nominating
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Glenn Dietz
Chuck Gandy

Scholarship Fund
Chuck Gandy, Chairman
Ed Armm
Mike Machette
Alternates: Rich Reitberger, Jim Tolos

Auditing
Joe Janiga, Chairman
John Warnet

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Rich Reitberger, Chairman
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Historian
Jim Tolos

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Ana Crisostomo—Coordinator
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Facebook & Twitter Coordinator—Todd Vazquez

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Dave Kurasz

Finance
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HELPFUL LINKS

ADAAG http://www.access-board.gov/adaag/about/index.htm
AFAA National http://www.afaa.org/
AFSA http://www.firesprinkler.org/
ANSI http://web.ansi.org/
ASHRAE http://www.ashrae.org/
Campus-Firewatch http://www.campus-firewatch.com/
Coffee Break Training http://www.usfa.dhs.gov/nfa/coffee-break/
CPSC http://www.cpsc.gov/
CSAA http://www.csaaul.org/
Municipal Codes (E Codes) http://www.generalcode.com/Webcode2.html
FDNY http://nyc.gov/html/fdny/html/home2.shtml
FM Global http://www.fmglobal.com/
FSDANY http://www.fsdany.org/regs.htm
FSI http://www.firesprinklerinitiative.org/
FSSA http://www.fssa.net/
Fire Tech Productions—Nicet Training (FTP) http://www.firetech.com/
Home Fire Spklr Coalition http://www.homefiresprinkler.org/
HVAC Bld. Control Fire Safety http://www.iklimnet.com/hotelfires/hotelfiresmain.html
AFAA-NJ http://www.afaanj.org/
International Code Council - http://www.iccsafe.org/
International Code Council Residential Sprinkler Exam - http://www.iccsafe.org/news/nr/2009/0709_ResidentialSprinklerExam.pdf
The Joint Commission (JCAHO) - http://www.jointcommission.org/www.JointCommission.org/
Material safety data Sheets (MSDS-OSHA Site) - http://www.osha.gov/SLTC/hazardcommunications/index.html
National of Fire Equipment Distributors (NAFED) - http://www.nafed.org/index.cfm