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Society of Fire Protection Engineers

New Jersey Chapter

FUSIBLE LINK

DECEMBER 2011

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President's Message…

On Monday November 21, Jerry Naylis represented the NJ SFPE in Trenton in front of the NJ State Assembly Housing & Local Government Committee. He was there to speak in favor of the IRC requirement for fire sprinklers in new one and two family residences. I thanked Jerry both personally and on behalf of the Board and members of the NJ SFPE for providing his time and expertise in representing the balanced approach to fire/life safety which starts with education. His testimony is posted elsewhere within this edition of the *Fusible Link*.

My 40 plus years of experience in life safety dealt predominantly with detection and clean agent suppression. When it came to fire sprinklers the first 5 years of my fire alarm experience was installing appurtenances and supervising them with McCulloh transmitters. After leaving Pyrotronics and moving to NICET in 1999 I got firsthand experience with NFPA 13 and 25, and with the help of a panel of experts learned quite a bit about automatic fire sprinklers. After leaving NICET to work as a senior consultant for Rolf Jensen & Associates I got a real education in water based fire suppression.

Working as a Fire Protection Engineering Technician or Technologist I've learned the single most important thing we can do in regards to life safety and fire protection is to educate the public. What good is an FPE, MEE, or any degree if we cannot take what we learned and pass it on to the general public?

Are residential fire sprinklers a panacea? Of course not! Should we simply build two hour walls around rooms people smoke in; again no. Should the fire sprinkler take the place of a smoke detector? That's fine except if people are asleep they will not survive the smoke. Funny, as I get older, I see balance in life as a very good thing, just like fire protection. It takes an education and then once people are educated they will understand that the prohibitive building codes are to protect them and if not them at the very least the people next door or upstairs.

One of my mentors, Mr. Harry Newell, taught me that there was more to fire than a triangle; in fact for a fire to take place three things are just not enough. It takes four and the triangle becomes a tetrahedron. In geometry, a tetrahedron is a polyhedron composed of four triangular faces; three of which meet at each vertex. It takes oxygen, fuel, heat, and the presence of the chemical reaction. It appears life safety really requires a polyhedron composed of education, the built environment, detection, and suppression.

I love being president of the NJSFPE; how else could I take the above and use it to remind all of our members that it is never too late to learn, change, or grow. I hope everyone had a wonderful Thanksgiving surrounded by their loved ones and that everyone's football team won and that we get a great turnout for our meeting December 5th.

Don't forget that SFPE is offering free webinars on December 7th and the 14th. The first is on general gas detection and the second specifically on CO detection. Also the SFPE national board voted to keep membership the same and finally they updated their website, www.sfpe.org, which reminds me when is the last time you visited www.njsfpe.org? It is your society!

If you are on the web stop at www.afaa.org as the Automatic Fire Alarm Association is also offering free webinars.

Ed Armm
Chapter President

MINUTES OF NOVEMBER 7, 2011 NJ-SFPE MEETING

President Armm convened the meeting at 6:00 PM with a salute to the flag and customary introductions.

The Treasurer's report was not available.

The Secretary's report for the September 12 meeting was discussed and accepted by the members.

Three new applications for membership were read and accepted. Our newest members are Justin Schwartz, Roy Polizzi and James Convery.

Chuck Gandy gave a brief explanation of the scholarship fund that is managed by the NJ and NY Chapters including the scope of the program and how it operates.

Our technical presentation was titled, "Fire and Smoke Curtains, a Discussion on the Latest Standards and how to Apply Them." Our speaker was John W. Collins from Smoke Guard. His program included the following subjects:

- Smoke movement in multi-story buildings needs to take into consideration vertical smoke movement, IBC 2006 and 2009 requirements and architectural options. This is due to the "stack effect" pressure that exists which acts like a chimney inside buildings.
- As noted in the MGM Hotel fire, most people died from smoke inhalation on the upper floors.
- Statistics were presented demonstrating the dangers of smoke.
- Ways to control fire and smoke in buildings is via compartmentalization of the building, sprinklers and detection systems.
- Smoke protection options for elevator lobbies and elevator hoist ways are required per the IBC.
- Smoke Guard products are available in various sizes and fabrics which are tested to EN standard tests for thermal integrity which are comparable to UL standard tests for thermal integrity in the US. The Standard Time Temperature Curve (STTC) used in the US and in Europe is very similar.
- Smoke Guard products are available to seal large openings in walls and to create fire compartments, seal large openings in ceilings, protect intersecting building exteriors, maintain fire-rating between buildings, in a roof with penetrations, and between floors and a fire compartment for hazardous materials and equipment.

The meeting was adjourned at 7:40 PM.

Official Testimony by Jerry Naylis, one of our Chapter Directors in Trenton on the Proposed Bill to Require Sprinklers in New One and Two Family Dwellings in New Jersey

Testimony in favor of A-3278 before the Assembly Housing and Local Government Committee on Monday November 21, 2011 by Gerard Naylis

Mr. Chairman, and members of the committee, thank you for the opportunity to make some brief remarks in favor of A-3278. My name is Gerard Naylis and I represent the New Jersey Chapter of the Society of Fire Protection Engineers. I am also here testifying in my capacity as a member of the New Jersey Fire Safety Commission, chaired by Assemblyman Wisniewski and as chair myself, of the commission's Residential Sprinkler Committee.

The following are irrefutable facts. Most people that die in fires in this state and in the United States do so in their own homes, where people believe, albeit falsely, they are the safest. Fact two, fires today are burning hotter and faster than fires that happened years ago. This is because of changes to the product make up in today's living environment. This means that a room that took 30 to 45 minutes to reach a flashover stage in 1970 will reach that same point in under 5 minutes today. Depending on type and variety of the contents, a room could reach flashover in under one minute. This is faster than any fire department could respond.

Putting water on a fire in the fire's earliest stage and working in conjunction with the early warning provided by smoke and fire detectors and alarms, provides occupants with the best opportunity for self evacuation than any other form of fire protection. And we need to be clear that residential sprinklers are intended as a life safety issue. Pure and simple, this is about taking steps today to save lives for generations to come. You also need to remember this is also about the safety of firefighters.

Building codes have evolved over the years that today allow for the use of lightweight building components, lightweight truss construction and plastics in construction. Model codes addressed these changes by adding fire protection features such as automatic sprinkler protection. Unfortunately, when New Jersey adopted the model ICC building code, the Department of Community Affairs removed the requirement for residential sprinklers. In effect, we have even more dangerous buildings being built today because newer homes have all of the hazards created by lightweight construction, but none of the fire protection features contemplated to provide for the safety of occupants and firefighters. That is what this bill would change.

I urge the committee to recognize the research and testing done by the National Institute of Science and Technology (NIST), the United States Fire Administration (USFA), Factory Mutual (FM Global), fire data collection and analysis by the New Jersey Division of Fire Safety's NFIRS unit and the New Jersey Fire Safety Commission's Statistic and Information Council that residential fire sprinklers would have a major impact on fires in new homes by passing this bill and urging your colleagues to do the same when the bill comes to floor for a vote before the entire General Assembly.

Fire at Power Station in NSW Ignited Eight Thousand Liters of Oil

October 29, 2011

An explosion ripped through one of the four transformers of the Eraring power station on the central coast of New Zealand. The explosion ignited about 8000 litres of oil inside the steel vessel that houses the plant's Unit 2 transformer, sparking a massive emergency services response. The fire had been contained within 10 hours, but such is the heat inside the transformer that firefighters said the explosion could flare at the weekend, and an operation to keep dousing it was continuing over night.

This is certainly the worst fire and explosion event in recent history of Eraring Energy. The crippled plant, which at its peak can produce a quarter of the state's electricity, is running at about half its capacity. But the Minister for Energy and Resources said there would be no interruption to the state's power supply.

About 7 million litres of water was used to quell the flames, and some contaminated water spilled into Lake Macquarie, causing an oily sheen that slowly faded during the day. Due to a change in the wind, the oil has blown into Whiteheads Lagoon, which is next to the power station's outlet canal at Lake Macquarie.

About 12 staff were in the power station when a "loud bang" was heard. The event didn't give any warning - there was an explosion and staff immediately knew there was a serious event. A NSW Fire and Rescue worker was treated for smoke inhalation and another injured an ankle while battling to contain the fire. A worker close to the explosion showed symptoms of shock.

The cause of the explosion is unclear, but the transformers contain electrical coils that carry a huge amount of power. An investigation will take place once fire crews declare the area safe. Officials did explain that this sort of incident is not unknown and transformers are at risk of fire and explosions. When one is detected, the transformer shuts down. The quick use of booms is credited for preventing a major oil spill into Lake Macquarie.

The explosion was the most serious incident at the plant since a fire in a separate area 25 years ago, but there have been ongoing problems with pollution.

The Office of Environment and Heritage had staff on the scene monitoring the clean up, and said it was working with Eraring Energy to reduce ongoing pollution from the plant.

Grain Elevator Explodes, Three Dead and Three Missing in Atchison, KA

October 30, 2011

An explosion at Bartlett Grain, in Atchison Kansas killed three and three others are still unaccounted for. The grain elevator exploded just before 7 p.m. Shortly after the explosion, officials from all over Northwest Missouri, Kansas City and Leavenworth, assisted the Atchison Police, Fire and Sheriff's departments in recovery efforts of missing employees of the grain elevator. Around 8:45 p.m., fire officials ordered personnel away from the area for fear of another explosion. As recovery efforts were underway, the elevator was lit up and the roof appeared as though it was blown completely off. A piece of the elevator appeared to have been hanging on to the side. Locals in Atchison reported hearing a loud explosion, almost bomb-like, as it happened.

Bartlett Grain is located at 320 Riverfront Road in Atchison and handles wheat, corn and sorghum.

The Occupational Safety and Health Administration reported more than 600 explosions at U.S. grain handling facilities in the last 40 years, resulting in 250 fatalities and more than 1,000 injuries. OSHA said grain dust is combustible and is the main source of fuel for explosions. OSHA said the majority of deaths at grain elevators come from suffocation when workers are engulfed by stored grain. There were 26 such fatalities in 2010.

Coffee Break Training – Fire Protection Series

Fire Pumps: Batteries for Diesel-Engine Drivers

No. FP-2011-48 November 29, 2011

Learning Objective: *The student shall be able to recite the requirements for batteries connected to diesel-engine fire pump drivers.*

Stationary fire pumps that use diesel-engine drivers may be required to have batteries for emergency starting.[1]

Batteries may be lead-acid type (as illustrated) or nickel cadmium if approved by the engine manufacturer's requirements. When batteries are used for diesel-engine drivers, there must be two battery units for each engine, and if an engine has two cranking motors it should have one cranking motor dedicated to each battery.

Batteries should be sized on a calculated capacity of 72 hours of standby power followed by three 15-second attempt-to-start cycles per battery unit, without alternating current power being available for battery charging. At 40 °F (4.4 °C), each battery unit should have twice the capacity needed to maintain the cranking speed recommended by the engine manufacturer through a 3-minute attempt-to-start cycle. The 3-minute cycle consists of six consecutive cycles of 15 seconds of cranking and 15 seconds of rest.

Essential electrical loads, including the engine, controller, and all combined pump equipment, should not exceed 0.5 ampere each for a total of 1.5 amperes on a continuous basis. Nonessential loads, such as emergency lighting or alarm systems, should not be powered from the engine starting batteries. Storage batteries should be supported on a rack above the floor, protected from displacement, and located where they will not be subject to excessive temperature, vibration, mechanical injury, or flooding with water. Current-carrying parts should not be less than 12 inches (305 mm) above the floor level.

Batteries should be located where they are easily accessible for servicing, but not located in front of the engine-mounted instruments and controls.

For additional information, refer to National Fire Protection Association (NFPA) 20, *Standard for the Installation of Stationary Pumps for Fire Protection*, Chapter 11.

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[1] Some diesel-engine drives are started by hydraulic or pneumatic methods.

September 22, 2008

History of Fire Protection Engineering (Cont'd from November Fusible Link)

By Arthur E. Cote, P.E., FSFPE—

As a result of this testing, new sprinklers were developed with a wide variety of orifice sizes, thermal elements, special distribution patterns and operating pressure criteria. With the aid of the computer to analyze complex looped and gridded systems, hydraulic design of sprinkler systems virtually replaced pipe schedule systems. During this period, a number of new fixed fire protection systems were developed for use by fire protection engineers. These include halogenated fire extinguishing agents (halons) and later clean-agent halon alternatives, hi-ex foam and water mist. Smoke control systems were developed, and smoke detectors replaced heat detectors as the primary fire alarm system initiating device.

Although a professional society for fire protection engineers was originally proposed by NFPA Technical Secretary Robert Moulton in 1924, it wasn't until 1950 that the Society of Fire Protection Engineers (SFPE) was formed as a section of NFPA. SFPE's first chapter, the Chicago Chapter, was formed in 1953. In 1971, SFPE separated from NFPA and became an autonomous technical-professional society. [8]

On Jan. 27, 1967, a fire in the Apollo 1 command module claimed the lives of three NASA astronauts during a routine launch pad test. This fire, which received worldwide attention, showed the lack of knowledge of NASA engineers of the hazards posed by the oxygen-rich environment of the module and pointed to the need for fire protection engineering expertise on the space project. As a result of this fire, fire protection engineers were hired as part of the NASA team.

Less than two weeks earlier, on Jan. 16, 1967, a fire at the McCormick Place exhibition hall in Chicago, IL, resulted in a multimillion-dollar loss during the National Housewares Manufacturers' Association show. The building, which was the largest exhibition hall in the U.S. at the time and was thought to be "fireproof," had been built in 1960 under a Chicago building code that allowed it to be not sprinklered on the basis of "limited combustibles" and the belief that the roof's structure was sufficiently high to be out of danger from collapse due to fire.

The unprotected steel truss roof 37 feet (11 meters) above the floor collapsed in less than 30 minutes. The blue ribbon panel appointed by Chicago Mayor Richard J. Daly to investigate the fire was chaired by then-IIT professor and head of the Fire Protection Engineering Department Rolf Jensen. Under the panel's direction, UL conducted a series of full-scale tests on simulated exhibit booths which showed the need for automatic sprinkler protection and established the fire-suppression criteria for exhibition halls throughout the world. These tests reinforced the need for full-scale fire research test data for fire protection engineering solutions. Two years later, Jensen formed his fire protection engineering consulting firm, Rolf Jensen and Associates (RJA). [9]

In February 1971, a fire occurred above the 30th floor of the office building at One New York Plaza in New York City. The difficulty encountered by the fire department in combating this fire highlighted growing concerns within the fire protection engineering community for fire safety in modern high-rise office buildings.

As a result of this fire, the General Services Administration (GSA) convened an international conference to develop solutions to the fire problem in high-rise buildings. Harold "Bud" Nelson, then with GSA, was the conference organizer and coordinator. The conference, known as the Airlie House Conference, concluded that fire protection for high-rise buildings was not keeping pace with high-rise building design.

In addition to establishing the basic fire protection engineering design parameters for high-rise buildings, including the need for automatic sprinklers, the conference determined that there was a need for a total systems concepts approach for high-rise fire safety. [10]

Under Nelson's direction, GSA implemented many of the conference recommendations into the final design of the 32-story Seattle Federal Building, which became a model for high-rise fire protection design around the world. The Sears Tower in Chicago (at that time, the world's tallest building) was under construction, and Chet Schirmer, president of Schirmer Engineering, utilized the systems concept in developing its total fire protection and life safety design, which included full automatic sprinkler protection. The GSA design approach led to the formal development and use of event logic trees for risk assessment and formation of the NFPA committee on Systems Concepts for Fire Protection that developed the NFPA *Fire Safety Concepts Tree*. [1]

In the late 1970s, the state of California established an examination for a P.E. registration in fire protection engineering (FPE). In 1981, as a result of the efforts of SFPE, the National Council of Examiners for Engineering and Surveying (NCEES) made the FPE exam available on a national basis. Today, 46 states in the U.S. license FPEs.

The application of fire dynamics - the study of how materials ignite and burn, how heat is transferred in fires, how smoke moves in buildings and how fire grows from ignition to full-room involvement - emerged as the foundation for fire protection engineering solutions. The publishing in 1985 of Introduction to Fire Dynamics by Dougal Drysdale [11] as a textbook for FPEs helped to further define the profession.

The publication of the *SFPE Handbook of Fire Protection Engineering*[12] in 1988 was a major step toward broad distribution of the body of knowledge on fire protection engineering calculation methods.

In 2000, SFPE published the *SFPE Engineering Guide to Performance-Based Fire Protection*, [13] which defined the overall process of performance-based fire protection engineering design.

ENTERING THE 21ST CENTURY

At the onset of the 21st century, computational methods for determining a quantitative evaluation of fire protection continue to improve. These include fire severity and fire resistance to determine structural fire protection requirements; fire properties of materials such as rates of heat release, fire spread, smoke developed and smoke movement; and egress flow, and sprinkler and detector response. These methods, coupled with the computational power of today's computers, have in turn resulted in the development of more user-friendly fire models for use by the fire protection engineer.

As the knowledge base expands and the models improve, there continues to be greater worldwide acceptance of the performance-based design approach to fire protection engineering. The review of fire scenarios and design fires have now become major elements of fire protection engineering design.

Performance-based design is currently used primarily for unique structures that cannot be adequately protected utilizing the existing prescriptive building and fire codes, or to determine engineering alternatives to prescriptive code requirements. More universal use and acceptance of performance-based design will come about as consensus is established on the performance objectives required for particular occupancies and hazards, as well as the design fires and scenarios that must be considered by the fire protection engineer.

Arthur Cote, P.E., FSFPE, is with Prometheus Fire LLC.
[Author's note: The primary source of information for this article is Richardson, K. (Ed.) History of Fire Protection Engineering, National Fire Protection Association, Quincy, MA, 2003.]

References:

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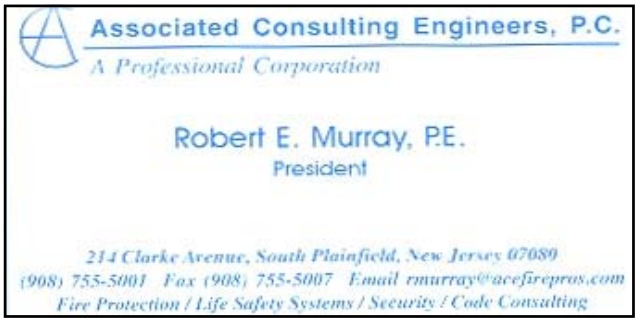
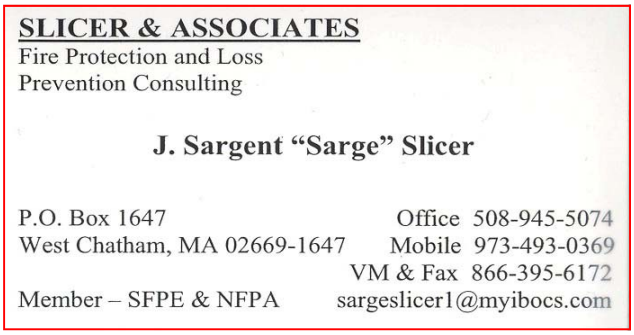
Engineering Guide to Performance-Based Fire Protection Analysis and Design of Buildings, National Fire Protection Association, Quincy, MA, 2000.





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MEETING NOTICE

Date: December 5, 2011—Field Trip

Place: 400 Interpace Parkway
Parsippany, NJ 07054

Price: $30.00

Dinner: 5:00-6:00 (Cash bar for mixed drinks)
Dinner at 6 PM

Topic: NFPA Combustible Dust Standard

Speaker: John Cholin, JM Cholin Associates

Please note for this meeting:
All officers, directors and committee chairman are requested to attend a meeting at 4:00 p.m. at the Hanover Manor.

PLEASE COMPLETE AND RETURN WITH YOUR CHECK PAYABLE TO "SFPE NJ CHAPTER" TO:

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OR PAY AT THE DOOR

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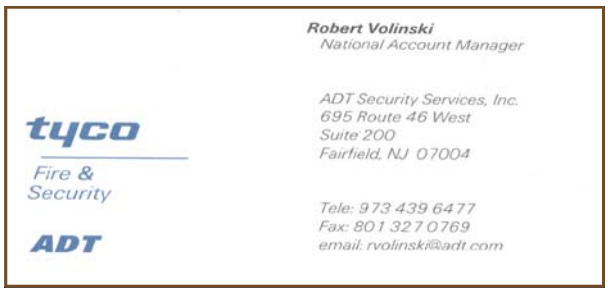
Meeting Dates/Programs 2011-2012

December 5	NFPA Combustible Dust Standard—John Cholin, JM Cholin Associates
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	NFPA 3
June 4	Annual Meeting/Tyco trailer/Preaction Testing
June 18	Golf Outing—West Point Big fund raiser for the joint NY & NJ Scholarship.



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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