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# Society of Fire Protection Engineers

## New Jersey Chapter

# FUSIBLE LINK

JANUARY 2009

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## President's Message...



At our December 1<sup>st</sup> meeting, our guest speaker was Jeffrey Zwirn, President of IDS Research & Development, Inc. and a security and alarm expert witness. He presented the Chapter members with a detailed analysis regarding the serious defects and irregularities that occur during alarm system installations.

According to the National Fire Protection Association (NFPA), U.S. fire departments responded to **146,400** home structure fires that involved cooking equipment in 2005. (Homes are dwellings, duplexes, manufactured homes, apartments, townhouses, rowhouses and condominiums). These fires caused 480 civilian fire deaths, 4,690 civilian fire injuries, and \$876 million in direct property damage. Some important facts include:

- Cooking equipment fires are the leading cause of home structure fires and associated civilian injuries.
- Ranges accounted for the largest share (67%) of home cooking fire incidents in 2005. Ovens accounted for 19%.
- Thanksgiving is the peak day for home cooking fires.
- In 2002-2005, unattended cooking equipment was the leading factor contributing to home cooking fires (38%), deaths (45%), injuries (46%) and direct property damage (37%).
- Twelve percent of the fires occurred when something that could catch fire was too close to the equipment.
- Three-fifths (59%) of reported home cooking fire injuries occurred when victims tried to fight the fire themselves.
- In a 1999 study of range fires by the U.S. Consumer Product Safety Commission, 83% of frying fires began in the first 15 minutes of cooking.
- Only 1% of cooking fires began with clothing but these clothing fires caused 12% of the cooking fire deaths.
- One out of every five cooking fires that began with clothing resulted in a death.
- In 2006, hospital emergency rooms treated around 29,850 thermal burns and 8,460 burns caused by cooking equipment. Ranges accounted for 62% of these thermal burns and grills 28%. Microwaves accounted for 41% of the scald burns.

Our next meeting is on Monday, January 5 and I look forward to seeing everyone at the Hanover Manor.

David Gluckman  
NJSFPE Chapter President

<http://www.sfpe.org/Chapters/NewJersey.aspx>

# NJ SFPE Membership Meeting Minutes

## December 1, 2008

The December meeting was held at the Hanover Manor our usual venue, Chapter President Dave Gluckman presided. The November meeting minutes were read as published by e-mail by Secretary Rich Reitberger and accepted by the membership. The October, November and December Treasurer's reports were read and accepted by the membership. The guest speaker for the meeting was Jeff Zwirn, President of IDS Research & Development. Mr. Zwirn is an experienced consultant and expert

testimonial witness in alarm science and systems, premises liability, as well as alarm and security related matters for insurance companies, law firms, government and law enforcement agencies, public and private institutions, and nationally recognized alarm and central station companies. As an instructor to the technical community of the alarm and security industry, Mr. Zwirn has authored questions which have been accepted by The American Society for Industrial

Security for their coveted and internationally recognized Certified Protection Professional Certification Examination. Mr. Zwirn's presentation was on the problems and resulting failures that could and have occurred with faulty installed and /or maintained fire alarm systems. The presentation was well received by those in attendance and was very informative. The company's web site is <http://www.alarmexpert.com>. The meeting concluded after the presentation.

### **PAUL McGRATH OF CITY FIRE EQUIPMENT COMPANY HONORED BY NEW JERSEY FIRE PREVENTION & PROTECTION ASSOCIATION**

#### **Dedication to fire prevention education and training connects firefighters, property owners, building managers and citizens alike**



*Photo – City Fire Award - Paul McGrath, President of City Fire Equipment Company, pictured with his wife, Laura, recently earned a 2008 President's Award for ongoing commitment to improving fire prevention and safety training from the New Jersey Fire Prevention & Protection Association*

East Hanover, NJ – November 12, 2008 – City Fire Equipment Company president Paul McGrath has been honored by the New Jersey Fire Prevention & Protection Association with a 2008 President's Award in recognition of his ongoing commitment to improving fire prevention and safety training. McGrath was presented with the award at the association's annual dinner held November 1 at Baltusrol Golf Club in Springfield, NJ.

City Fire Equipment Company twice annually holds free "FIRE FACTS SEMINARS" on fire safety and prevention open to all New Jersey fire officials and fire code inspectors, as well as property owners and building managers in the residential, commercial, government and education sectors. The seminars allow firefighting professionals and those responsible for building and association safety to remain current in the latest fire safety developments.

McGrath is a well-known figure in the New Jersey fire prevention and fire equipment arenas, as well as in the engineering and construction, building and association, government and restaurant sectors. He is affiliated with more than a dozen associations dedicated to fire prevention and building safety, including the New Jersey Fire Prevention & Protection Association (NJFPPA); Building Owners and Managers Association; the New Jersey Restaurant Association; the American Fire Sprinklers Association of New Jersey; the Automatic Fire Alarm Association of New Jersey; the New Jersey Apartment Association; and the Society of Fire Protection Engineers of New Jersey.

The NJFPPA presents its Presidents Award to "individuals, firms or organizations that have shown a dedication to activities that provide for increased fire safety for the state's citizens."

City Fire's seminars, which draw 200-300 participants from throughout New Jersey and provide continuing education unit credits, are held at Seton Hall University in coordination with the South Orange Fire Department. "FIRE FACTS SEMINAR #15," NJ Fire Prevention Code Update to the IFC 2006: NJ Edition, is scheduled for January 8, 2009, and will include Robert Davidson of Davidson Code Concepts as the featured speaker.

McGrath has been with City Fire Equipment Company since 1981, when he started with the company as a technician servicing fire extinguishers. He became president in 1996. He resides in Union Township.

#### **About City Fire Equipment Company**

City Fire Equipment Company designs, installs and maintains all types of fire protection equipment, including fire alarm systems, fire extinguishers, fire sprinklers and special hazard fire systems. The company is fully insured and licensed as a fire protection contractor and maintains an intimate knowledge of local, state and national fire codes. City Fire Equipment Company serves more than 3,400 customers and 5,000 sites. For information about service or the next training seminar, call 973. 560.1600. Visit us at [www.cityfire.com](http://www.cityfire.com).

# Fire and Explosion Loss Investigation - Portable IBC FL Tank

The attached is a loss investigation report conducted by US Chemical Safety and Hazard Investigation Board in Sept 2008



## Static Spark Ignites Flammable Liquid during Portable Tank Filling Operation

No. 2008-02-I-IA (September 2008)



### Key Lessons for Safe Handling and Storage of Flammables

- Ensure that equipment, such as fill nozzles and hoses, is bonded and grounded and designed for flammable service
- Use dip pipes when top-filling portable tanks
- Install fire suppression systems in flammable packaging areas
- Separate flammable packaging areas from bulk storage areas

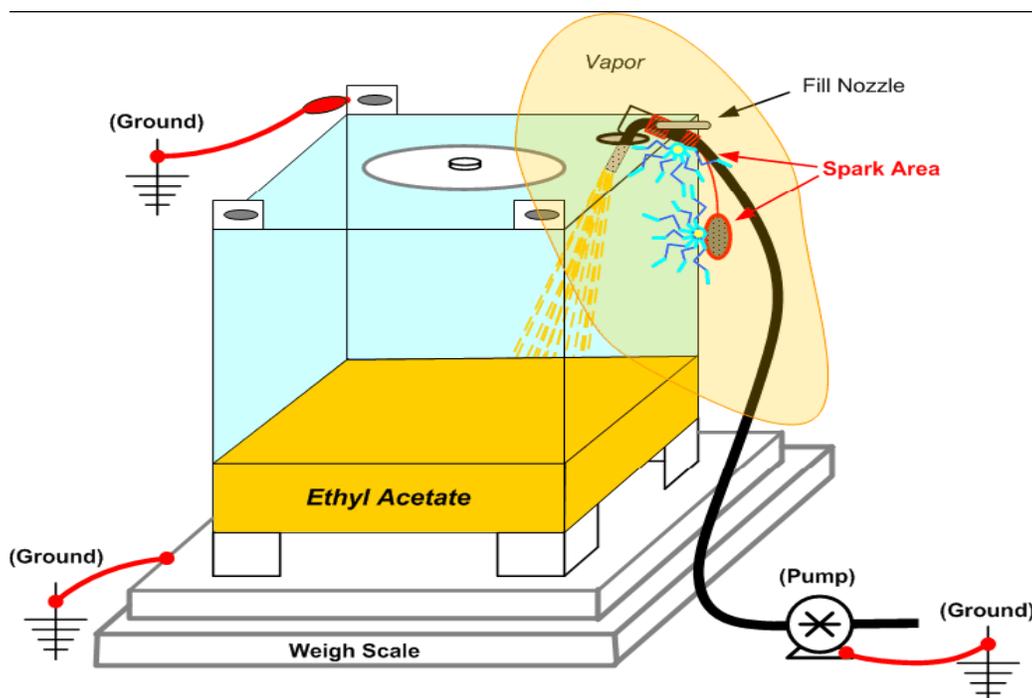
**Who's at Risk...**

Companies that transfer (pump) flammable liquids.

**Incident Description**

On October 29, 2007, at about 1 p.m., a fire and series of explosions occurred at the Barton Solvents Des Moines, Iowa, chemical distribution facility. The initial fire started in the packaging area while a 300-gallon portable steel tank, known as a tote, was being filled with ethyl acetate, a flammable solvent (Figure 1).

FIGURE 1.  
300-gallon steel tote



An operator placed the fill nozzle in the fill opening on top of the tote and suspended a steel weight on the nozzle to keep it in place.<sup>1</sup> After opening the valve to begin the filling process, the operator walked across the room to do other work. As the tote was filling, he heard a “popping” sound and turned to see the tote engulfed in flames and the fill nozzle laying on the floor discharging ethyl acetate. Before evacuating, employees tried unsuccessfully to extinguish the fire with a handheld fire extinguisher. The

<sup>1</sup> Pressure from the liquid flowing through the nozzle can cause it to dislodge during filling. Hanging the steel weight over the nozzle helped stabilize the nozzle in place.

fire spread rapidly to the wood-framed warehouse, igniting a large volume of flammable and combustible liquids. One employee received minor injuries and one firefighter was treated for a heat-related illness. A large plume of smoke and rocketing barrels and debris triggered an evacuation of the businesses surrounding the facility. The main warehouse structure was destroyed and Barton's business was significantly interrupted.

The Chemical Safety Board (CSB) is publishing this Case Study to underscore the need for effective bonding and grounding and for fire protection practices that should be observed when handling flammable liquids.<sup>2</sup>

### Flammability of Ethyl Acetate<sup>3</sup>

The criteria outlined in National Fire Protection Association (NFPA) 30, *Flammable and Combustible Liquid Code*,<sup>4</sup> state that ethyl acetate is a Class IB flammable liquid. In addition, NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, indicates that ethyl acetate has an elevated flammability hazard rating of "3."<sup>5</sup>

Under the conditions the ethyl acetate was being handled at the time of the incident, the CSB determined that an ignitable vapor-air mixture formed near the tote fill opening. A static discharge (spark) between the tote body and a metal component on the fill nozzle/hose assembly, which included the steel weight, likely ignited the vapor-air mixture.<sup>6</sup>

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<sup>2</sup> On July 17, 2007, about three months before this incident, a large portion of Barton's Wichita, Kansas, facility was destroyed by a fire that the CSB believes was ignited by a static electric spark inside a flammable liquid storage tank. See the CSB Case Study *Barton Solvents: Static Spark Ignites Explosion Inside Flammable Liquid Storage Tank*.

<sup>3</sup> Ethyl acetate is generally considered a conductive flammable liquid. However, fire and explosion incidents involving ethyl acetate have been reported that may be attributable to static electric sparks, which are usually associated with non-conductive or low conductivity flammables. In this incident, however, the CSB determined that a spark likely originated from accumulated static on the metal parts of the plastic fill nozzle and rubber hose assembly, which were not properly bonded and grounded. The Information Resources section at the end of this Safety Advisory includes resources about the static electricity hazards associated with transferring non-conductive flammable liquids.

<sup>4</sup> The NFPA develops widely recognized consensus fire protection codes and standards.

<sup>5</sup> The NFPA classifies the degree of hazard of a material on a scale of 0-4, with 4 being the most hazardous or "severe." Flammable materials rated "3" on this scale are defined as either liquids or solids that can be ignited under nearly all ambient temperatures. The flashpoint for ethyl acetate is approximately 25oF (-4oC), and its boiling point is approximately 172oF (78oC). See NFPA 30, Section 4.3 "Classification of Liquids" and NFPA 704 (2007 ed.), Chapter 6, for a detailed discussion of NFPA's classification and flammability hazard rating systems.

<sup>6</sup> A local exhaust ventilation system to remove vapors generated during filling operations was available, but was not turned on at the time of the incident. This system was severely damaged during the incident. As no design plans or specifications were available for review, the CSB was unable to determine if its use could have prevented the initial fire by reducing the concentration of the flammable vapors below the ignitable range.

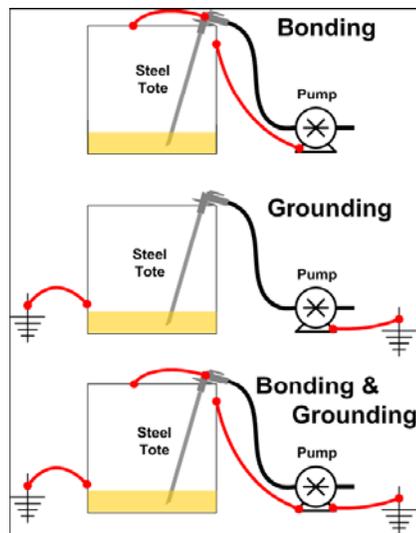
## Bonding and Grounding

Static electricity is generated as liquid flows through pipes, valves, and filters during transfer operations. Proper bonding and grounding ensures that static electricity does not accumulate and spark. Static sparks can readily ignite the vapor-air mixtures of many flammable and combustible liquids.

Bonding is the process of electrically connecting, by wiring or direct contact, conductive objects (e.g., fill nozzles to steel tanks) to equalize their individual electrical potentials to prevent sparking.

Grounding is connecting a conductive object (e.g., tanks, totes) to the earth to dissipate electricity from accumulated static, lightning strikes, and equipment faults into the ground, away from employees and equipment (Figure 2).

FIGURE 2.  
Bonding and grounding



### Fill Nozzle and Hose

Because the steel parts of the fill nozzle and hose assembly (and the steel weight) were not bonded and grounded, the CSB concluded that static electricity likely accumulated on these parts and sparked to the stainless steel tote body, igniting the vapor that accumulated around the fill opening during filling.

The tote was sitting on a grounded weigh scale while being filled, and according to witnesses, the operator attached a grounding clamp to the tote before he started filling it. However, the metal components of the nozzle, the synthetic rubber fill hose, and the pump were not bonded to the tote.<sup>7</sup>

*The remaining portion of this report will be in the February Fusible Link*

<sup>7</sup> Bonded hoses contain a conductive wire or fibers that bond the nozzle to the pump and prevent static from accumulating as liquid flows through the hose and nozzle.

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## MEETING NOTICE

**Date:** January 5, 2009

**Place:** Hanover Manor  
16 Eagle Rock Avenue  
East Hanover, NJ

**Price:** \$26.00

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

**Speaker(s):** Robert Davidson, Code Concepts

**Topic:** Introduction to the International Fire Code

**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.

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

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OR PAY AT THE DOOR

NAME: \_\_\_\_\_

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# Meeting Dates/Programs 2008-2009

DATE	TOPIC
January 5	Introduction to the International Fire Code—Robert Davidson, Code Concepts
February 2	Case Study: Saw Mill Dust Explosion—John Cholin
March 2	MIC—Microbiological Corrosion—Prevention & Inspection Requirement—Pete Carey, Potter Signal
April 24	Seminar
May 4	Installation Issues with CPVC Piping
June 1	High Volume, Low Speed Ceiling Fans vs. AS Activation

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Consulting - Peter Rullo

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John Cholin, Chairman

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Chuck Gandy  
Glenn Buser

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Ed Armm  
Mike Machette  
Alternates: Rich Reitberger, Jim Tolos

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Nicole Smith

#### Historian

Jim Tolos

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Ana Crisostomo—Coordinator  
Mailing/Automation/e-mail—Vicki Serafin, Chairperson

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