



Editor Fusible Link:
Brad Hart &
Ana Crisostomo
Tel: 646-572-3920
Fax: 646-871-3920

Society of Fire Protection Engineers

New Jersey Chapter

FUSIBLE LINK

October 2006

Chapter Officers

President

Glenn Deitz - 908-298-2199

First V.P.

Dave Gluckman - 973-410-4635

Second V.P.

John Cholin - 201-337-8621

Past President

Rich Reitberger - 973-541-6776

Treasurer

Bob Murray - 732-205-9440

Asst. Treasurer

Richard Ravaioli - 908-272-0066

Secretary

Ed Armm - 212-695-6670

Asst. Secretary

Brad Hart - 646-572-3920

Director

Vinnie Fichera - 201-493-0999

Director

Glenn Buser - 201-891-1405

Director

John Warnet - 212-384-6200

Director

Jerry Naylis - 201-384-2059

Special Executive Assistant to The Board

Vicki Serafin

President's Message

The new year for the New Jersey Chapter of the Society of Fire Protection Engineers started on Monday September 11, 2006 to commemorate all those that were lost. A moment of silence was held for the fallen heroes of September 11, 2001.

Our own John Cholin gave an excellent presentation on "Duct Type Smoke Detection". All those in attendance learned a great deal at this well-received presentation. Our next meeting is scheduled for Monday October 2, 2006 with a presentation on "New Foam Technology" by a representative from Fireflex and appears to be equally informative. We are also planning a field trip to the Continental Hangar at Newark Airport on November 6. Seating will be limited with more explanation to come shortly.

We are looking for articles for the "Fusible Link" to continue to bring information to the membership. If there is an article or topic that is of interest, feel free to contact any of the board members. Contact information is listed on the front of the *Fusible Link*.

If someone is interested in advertising their business in the *Fusible Link* we are accepting advertisements.

I look forward to seeing you all at the meeting.

Best Regards
Glenn Deitz

NJ SFPE Membership Meeting Minutes Sept. 11, 2006

The meeting was called to order at 6:00 by Glenn Deitz, Chapter President. Introductions followed the salute to the flag as is our custom. As this is the anniversary of the September 11, 2001 attacks on our country a moment of silence was offered in remembrance of those that perished on that day, those that have since perished while protecting our freedoms abroad and those currently serving in harm's way.

The General Meeting Minutes for our June Meeting were approved as published in the *Fusible Link*. The Treasurer's Report for September was read and accepted.

We had one application for membership tonight, an employee of Code Consultants New York City office Laurence 'LJ' Dallaire. I am happy to report that LJ's application for membership was accepted unanimously.

Joe Janiga of FM Global started off this evening's presentations with a short update on our chapter's web site. Currently the site is available by going to the National SFPE site at www.sfpe.org, clicking on the box for "SFPE Chapters" selecting "Chapters in the US" and finally clicking at the icon for the NJ Chapter. You can go there directly by entering <http://www.sfpe.org/Chapters/NewJersey.aspx> on your computer. As our AOL site has finally been disconnected you will soon be redirected to the new site by simply entering www.NJSFPE.org or www.NJSFPE.com. Joe has done a

wonderful job on our new site it has a very professional look, valuable information as to our chapter and is a resource during bad weather to get up to date information if a meeting is canceled. Joe is not charging the chapter for his hard work and National is hosting us for free.

The speaker at tonight's meeting was our own John Cholin, P.E. FSFPE, of JM Cholin Consultants. John's presentation was the final report from the Fire Detection Institute's "Investigation into the Application of Duct Smoke Detectors in Heating, Ventilating and Air Conditioning Systems". A proposal was made to delete the requirements for duct smoke detectors from NFPA 90A-1996. The proposal alleged that there was no basis for it and that these devices do not provide the performance purported. The Fire Detection Institute (FDI) was requested to develop a research proposal to address the issues raised in the public proposal.

The FDI issued a RFP to the research community in August of 1997. As a result of the replies, the FDI developed a collaborative research program using both the University of Maryland and the National Research Council – CANADA as both offered sections of the RFP and satisfied the total proposal by working both separately and together. The FDI received commitments for the requisite funding and executed the research contracts in May, 1999.

In a nutshell, the organization had the University of Maryland and the National Research Council – CANADA working independently while reporting to a Project Manager who was responsible to the SDI. The research program worked on six issues uncovered after an analysis of the public proposal; Comparative Driving Forces, Dilution Effects, Effects of Smoke Aging on Detector Performance, Stratification in Ducts and Efficiency of Sampling Tubes.

The comparative driving forces were numerous, predominately was the allegation that a fire produces a driving force that dominates the movement of air in a building, if this is the case the shutdown of the HVAC system was alleged to be superfluous and unnecessary. Driving forces acting upon smoke in a building include; the Stack Effect, the Wind Effect, Buoyancy of Hot Combustion Gases, Mechanical Ventilation Systems, and to a lesser degree thermal expansion and the elevator piston effect. The CONTAM computer model which is usually used to analyze specific buildings for specific design fire scenarios was used. CONTAM was developed by NIST and designed to evaluate flow of atmospheric contaminants within large buildings. It does not include a nested fire of compartment model; however, it does calculate flow based upon pressure differentials and equivalent area of flow path. Finally, CONTAM can be used to model smoke spread in very complex, multi-compartment structures including high-rise

A parametric analysis was performed by the University of Maryland Fire Protection Engineering Department as part of the project. The analysis was based upon the work of Klote & Milke in "Design of Smoke Management Systems" 1992 which is still the standard for smoke movement and management. The parametric analysis compared the rate of smoke flow and ultimate flow from the fire floor to other floors based on two scenarios: flow due to mechanical ventilation and flow due to passive stack, wind and buoyancy effects. John provided excellent explanations and visual examples of the various effects. It was determined that the shutdown of HVAC systems does in fact retard the spread of smoke. This determination was based on both the University of Maryland and the National Research Council – CANADA findings.

John next addressed dilution effects where it was determined that while dilution does occur and the extent of dilution is proportional to the HVAC system air change rate, the commercially available detectors appear to be capable of detecting fires sufficiently early to make a positive impact on the management of the interior tenability of a building.

The next effect studied was that of smoke aging, it was alleged that the aging of smoke as it traveled through the duct system made the response of some detectors questionable. It was learned that smoke does age rapidly and there were substantial changes in relative concentrations of particles occurring in short distances of duct travel. However, testing indicated

that both ionization and photoelectric smoke detectors provided appropriate response after long duct runs. The effect of filters was tested and the results showed that filters do reduce the response of smoke detectors.

Stratification was looked at and common myths currently used in the installation of duct smoke detection and sampling tube orientation were dispelled. The single biggest impact, as I see it, in this study was that sampling tubes should be mounted vertically and not horizontally as is the current custom. This is the only way to overcome the effects of stratification, the mounting of detectors 6 duct widths from bends (which is spelled out by most manufacturers, however, hardly ever complied with) has no increased benefit than mounting the detector 1 duct width from a bend.

The last effect investigated was that of efficacy, there was a concern that the commercially available duct detectors were not capable of providing design performance over the range of air velocities currently found in HVAC systems. This was also determined to be a myth as there was no significant variation in analog output versus optical density with testing at velocities ranging from 4m/sec to 19m/sec.

John summarized by stating that the comparative driving forces from a fire during the time that duct smoke detectors are intended to operate are small compared to the other forces acting on the interior air mass. Further, the response of most smoke detectors is not directly proportional to optical density. Aging of smoke occurs very

quickly with substantial particulate agglomeration; the speed of aging was of some surprise, however, the fact that the most efficient filters removing particulate in a size range that includes larger smoke particles was not a surprise. Stratification will occur in ducts where the buoyancy exceeds flow inertia, however, vertically installed sampling tubes cancelled out any effect of stratification. Finally most duct smoke detectors are installed with out regard to the recommendations found in the National Fire Alarm Code[®], however the range of velocities selected by UL for testing reflects the range of velocities found in the spectrum of the many buildings analyzed. John stated that the most valuable result from this research project is that properly managed collaborative research can produce results.

After a Q & A period, the meeting was adjourned at approximately 8:30.

SFPE Professional Development Conference and Exposition will be held October 16-20, 2006 at the Turf Valley Resort and Golf in Ellicott City, Maryland (south of Baltimore). This event provides an opportunity to learn new developments in the fire protection engineering profession. The SFPE Annual Meeting, a one-day, complimentary event allows attendees to hear and influence the direction of the Society. The Annual Meeting will also feature technical presentations on topics of interest to the fire protection engineer and allied professionals. Following the Annual Meeting there will be a series of seminars and a first of its kind symposium entitled, "*Partners for Protection: Fire Protection Engineers and the Fire Service*." The keynote speaker for this symposium will be FDNY Battalion Chief Gerald Tracey. To register for an event or more information [click here](#) or contact **Julie Gordon** at (301) 718-2910 ext. 104.

The following article was taken from the Fire Protection Research Foundation's Fire Risk and Hazard Assessment Research Application Symposium. This is the first part of a series of portions of this paper.

THE PHYSIOLOGY AND BIOCHEMISTRY OF COMBUSTION TOXICOLOGY

James M. Feld, P.E.
Feld Engineering
Fairfield, CA

INTRODUCTION

The current state of Fire Protection Engineering allows the Fire Protection Engineer to determine, to a limited degree, quantitatively and qualitatively the toxic species produced in a fire given the type and quantity of fuels and environmental conditions. Knowing the specific toxic species produced and the quantity allows the Fire Protection Engineer to determine if concentrations resulting in incapacitation or death are achieved. This article will explore what is not typically presented in the fire protection literature, the physiological and biochemical effects of the toxic species produced in a fire.

TOXIC SPECIES

Products of combustion include light, heat, gases, aerosols, and particulates. The NFPA Fire Protection Handbook and the SFPE Handbook of Fire Protection Engineering include sections on combustion toxicology. The reader is encouraged to read these sections to understand the basics of the production of toxic species and the concentrations necessary to cause incapacitation and death. It should be noted that the concentration of toxicant necessary to cause incapacitation is more important than that to cause death. Once the fire victim is incapacitated, self preservation is not possible and death will follow if assistance is not available. Lethal concentrations are typically 2 to 3 times that of incapacitating concentrations.

The key toxic products produced in a fire include:

Carbon Monoxide (CO) Carbon Dioxide (CO₂)

Cyanide (i.e. Hydrogen Cyanide - HCN)

Oxides of Sulfur (SO₂, SO₃) Hydrogen Sulfide (H₂S) Oxides of Nitrogen (NO₂, NO₃)

Acrolein

Formaldehyde

Unburned Hydrocarbons

O₂ Depletion (Although O₂ depletion is not typically regarded as a *product* of combustion, it is an environmental condition resulting from combustion in an enclosed space and does have an effect on the physiology of the body).

The toxic species produced by a fire exert certain physiological and biochemical effects on the body. These effects are dependent not only on the species produced and their respective quantities but also on the physiological condition of the victim. Victims are more or less affected based on age, physical condition, body weight, blood alcohol content, whether or not the victim is a smoker, proximity to the fire, and the characteristics of the fire, fuel, and ventilation rate which dictate the species and quantities produced. A qualitative representation of the progression of the effects of toxic species is presented in Figure 1. To progress from psychological distress, to physiological distress, to incapacitation, and ultimately to death, the biochemical processes of the body are affected in an increasing amount. It must be realized that the concentration of toxic products varies during the course of the fire. In addition, the toxic species may vary during the course of the fire depending on the fuels ignited and ventilation rate (which may also vary).

The location of the victim with respect to the fire is important as the concentration of the toxic species decreases as the products of combustion move through the building and entrain air.

To study the effects of toxic gases on the body, a brief discussion of physiology and biochemistry is necessary.

October 2, 2006 NJ Chapter Technical Presentation
Integrated Compressed Air Foam

Our October 2 technical session presentation will be on a new technology called ICAF (Integrated Compressed Air Foam) suppression system for Class B Hydrocarbons, using fixed system piping. The subjects to be covered are:

1. History
2. Description
3. Videos of fire tests
4. System components
5. Application / Approvals
6. Case study
7. Conclusion

Our speaker is Louis Bergeron. He has been working in the sprinkler industry since 1980, at the manufacturing and distribution level in Canada. Lou started employment at FireFlex in 1997, in the technical service department providing information and support for the Viking TotalPac product line, and now the new ICAF systems.

His hobbies includes outdoor sports and currently the renovation of an old log cabin in the deep woods of the Maine forest.



Permit# P00072
Lic # 154162

CITY FIRE EQUIPMENT CO., INC.
Paul J. Mc Grath
 President
 paul@cityfire.com
 733 Ridgedale Avenue • East Hanover, NJ 07936
 (973) 560-1600 Ext. 204 • Fax (973) 781-1099
 Cell (973) 476-6132

SURVIVOR
FIRE & SECURITY SYSTEMS
 SERVICE • DESIGN • INSTALLATION
RICHARD RAVAIOLI - SALES MANAGER
 39A Myrtle Street • Cranford, NJ 07016-3456
 Tel. (908) 272-0066 • Fax (908) 272-8144



Associated Consulting Engineers, P.C.
A Professional Corporation

Robert E. Murray, P.E.
 President

*1910 Oak Tree Road, Suite 2B, Edison, New Jersey 08820
 (732) 205-9410 FAX (732) 205-9442 Email rmurray@ace.com
 Fire Protection/Life Safety Systems/Security/Code Consulting/Loss Control*



Glenn D. Buser, P.E.
 201-891-1405
 201-394-4266 (Cell)

GB Risk Consulting, LLC
 155 Moramarco Court
 Mahwah, NJ 07430
 Email: gbriskconsulting@aol.com



FRANK SAVINO

United Fire Protection Corporation
 403 Lehigh Ave., Union, NJ 07083
 (908) 688-0300 Ext. 223 • FAX (908) 688-0218

Associated fire Protection

ROLAND STRATEN, P.E.

100 Jackson Street
 Paterson, NJ 07501
 (973) 684-7250 Ext. 150
 Fax: (973) 684-4511
 rstraten@afpfire.com



www.afpfire.com

Meeting Dates/Programs 2006-2007

DATE	TOPIC
October 2, 2006	ICAF (Integrated Compressed Air Foam) Presentation - Louis Bergeron, FireFlex Systems
November 6, 2006	Field Trip - Newark Airport Continental Hangar Fire Protection - Rich Reitberger
December 4, 2006	Life Safety in Health Care Facilities - Ed Armm
January 8, 2007	Industrial Post Fire Restoration - Rich Reitberger
February 5, 2007	NIST Station Night Club Fire Analysis - Dan Madrowski - Chuck Gandy
March 5, 2007	Commodity Classification Changes - Joe Janiga
April Meeting/Seminar Day	Homeland Security/Disaster Protection of gas and chemical plants
May 7, 2007	Insurance Industry Update
June 11, 2007	J&J Explosion - Mike Newman
June 25, 2007	Golf Outing - Rich & Joe

Robert Volinski
National Account Manager

tyco
Fire & Security

ADT

ADT Security Services, Inc.
695 Route 46 West
Suite 200
Fairfield, NJ 07004

Tel: 973 439 6477
Fax: 801 327 0769
email: rvolinski@adts.com

SLICER & ASSOCIATES, L.L.C.
Fire Protection and Loss
Prevention Consulting

J. Sargent "Sarge" Slicer

22 Laurel Street
Morris Plains, NJ 07950

Office 973-993-5947
Mobile 973-493-0369
VM & Fax 866-395-6172

Member - SFPE & NFPA sargeslicer1@myitocs.com

EDWARD B. ARMM, SET

RJA

ROLF JENSEN & ASSOCIATES, INC.
FIRE PROTECTION ENGINEERING CONSULTANTS

380 WEST 31ST STREET
SUITE 1104
NEW YORK, NY 10001-4082 USA

+1 212 695-6670
FAX +1 212 695-6671
earmm@rjagroup.com

A SUBSIDIARY OF THE RJA GROUP, INC.

JMCC

John M. Cholin P.E., S.F.P.E.

J.M.Cholin Consultants, Inc.
Fire Protection Engineering and Consulting Services
101 Roosevelt Drive, Oakland NJ 07436 USA
Telephone: 201-337-8621 Fax: 201-337-5603

Vicki Serafin
Affiliated FM
400 Interpace Parkway, Bldg C
3rd Floor
Parsippany, NJ 07054-1196
Phone: (973) 541-6771
Fax: (973) 541-6909

MEETING NOTICE

- Date:** October 2, 2006
- Place:** Hanover Manor
16 Eagle Rock Avenue
East Hanover, NJ
- Price:** In Advance - \$22 At door - \$25
- Dinner:** 5:00-6:00 (Cash bar for mixed drinks)
Dinner at 6 PM
- Speaker(s):** Louis Bergeron, FireFlex
- Topic:** ICAF (Integrated Compressed Air Foam) Presentation

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:

Vicki Serafin
Affiliated FM
400 Interpace Parkway, Bldg C - 3rd Floor
Parsippany, NJ 07054-1196
vicki.serafin@affiliatedfm.com

NAME: _____

COMPANY: _____ TELEPHONE: _____

ALL RESERVATIONS SHOULD BE RECEIVED BY FRIDAY, SEPTEMBER 29, 2006. TELEPHONE RESERVATIONS OR CANCELLATIONS SHOULD BE RECEIVED BY NOON OF THE MEETING DAY.



2006-2007 Chapter Committees

STANDING COMMITTEES

Program

John Cholin, Chairman
Consulting - Nick Chergotis & Peter Rullo

Arrangements

Vicki Serafin, Chairperson

Membership

Dave Gluckman, Chairman

Nominating

Rick Reitberger, Chairman
Chuck Gandy
Glenn Buser

Scholarship Fund

Chuck Gandy, Chairman
Robert Hall
Mike Machette
Dave Gluckman

Auditing

Joe Janiga, Chairman
John Warnet

Archivist

Rich Reitberger, Chairman
Nicole Davidowitch

Historian

Jim Tolos

Communications

Fusible Link—Brad Hart
Ana Crisostomo—Coordinator
Mailing/Automation/e-mail—Vicki Serafin, Chairperson

SPECIAL COMMITTEES

Bylaws

Jim Tolos, Chairman
Joe Janiga - Co-Chairman

Career Recruitment

Al Doport, Chairman
Glenn Deitz
Dave Gluckman

Golf Outing

Richard Reitberger, Chairman
Joe Janiga

Awards

Frank Savino, Chairman
Rich Reitberger

PE Examination

John Cholin, Chairman
Joe Janiga
Mike Newman
Chuck Gandy

Chapter Seminar/Field Trip

Richard Reitberger, Chairman
Dave Gluckman
Joe Janiga

Legislative

Rich Reitberger, Chairman
Vinnie Fichera
Jerry Naylis

Finance

Rich Reitberger - Chairman
John Cholin
Bob Murray