
Jerry R. Tindal, M.S.M.E., P.E., CFEI

Engineer: Mechanical & Fire Protection

Failure Analysis

Fire and Explosion Analysis: Origin and Cause

Fire and Life Safety Standards and Codes Compliance

Industrial Accident Reconstruction

Machine Design

Machinery and Equipment Damage Appraisals

Premises Liability

Products Liability

Training

EDUCATION

- 1995** **Master of Science in Mechanical Engineering**
University of South Carolina
- 1993** **Bachelor of Science in Mechanical Engineering**
University of South Carolina

EXPERIENCE

November 1998 to Present The Warren Group, Inc., Columbia, South Carolina. Engineer performing specialized consulting and training related to property loss analysis and the analysis of designs with regard to safety.

Fire & Explosion Analysis

Determine origin and cause of fire spread, cause of the injury or property damage and establish involvement of parties.

Fire and Life Safety Standards and Codes Compliance

Building, fire protection and life safety codes and standards analysis and compliance evaluation. National Fire Protection Association (NFPA) Codes, Southern Standard Building Codes, International Building Codes, Fire Prevention, Mechanical, Plumbing and Gas Codes, Uniform Building and Fire Codes, materials and product codes and standards.

Property & Machinery Loss Analysis

Determine the cause of the loss, establish scope of damage, estimate cost to repair, evaluate replacement cost, establish actual cash value, estimate salvage value, estimate time required to complete repair.

Safety Design Analysis (both personal injury and property damage)

Fire and explosion analysis, industrial accident reconstruction, machine controls, warnings, OSHA compliance, standards and codes compliance, maintenance, products liability, product failures, premises liability, failure analysis, consumer products.

Training

Fire and life safety, standards and codes, hazard identification, risk assessment, engineering design for safety and products liability.

EXPERIENCE, Continued

- 1998** ArctiChill, Inc., Newberry, South Carolina. Project Engineer performing analysis and design of chilled water systems used in medical, industrial, process and commercial applications. Responsibilities included analytical problem solving utilizing computer solutions. Problem types included conduction, convection and radiation heat transfer, solar load analysis, vibration and shock analysis and stress failures.
- Design responsibilities included component selection and integration into customized chiller units. Additional responsibilities included the production of Auto-Cad drawings for client submittal and approval (including cabinet, water piping, and refrigeration piping, electrical and three-dimensional drawings).
- 1995 to 1998** Office of the State Fire Marshal, Columbia, South Carolina. Engineering Associate II responsible for plan review, building and system inspections, flammable liquid storage system design review and evaluation, fire protection systems design review and inspection, interpretation and application of building and fire codes to applicable situations, code consulting services to engineers and architects performing design work in South Carolina as well as to local and state code enforcement agencies in South Carolina. Additional responsibilities included supervision of junior engineers, instructor for the State Fire Marshal Certification Course and development and instructor of code compliance training courses for Deputy State Fire Marshals.
- 1994 to 1995** University of South Carolina, Columbia, South Carolina. Graduate Research and Teaching Assistant while enrolled as a student in Master's program in mechanical engineering. Lab instructor of measurements and instrumentation to second and third year mechanical engineering students. Graduate work included research into the various alternate fuels and drive trains available for automobiles today. This research resulted in a proposal paper to the U.S. Department of Energy, a Master Thesis and a fuel economy computer program. Thesis advisor: Dr. Jeffery Morehouse.
- 1994
(Part Time)** Palmetto Industrial Construction, West Columbia, South Carolina. Mechanic assistant and commercial truck driver working under Alvin Baughman.
- 1987 to 1995** Shumpert Oil Company, Pelion, South Carolina. General Manager of warehouse and mercantile store as well as supervisor of 10 to 15 employees per shift. Additional responsibilities included design and layout of fuel storage and dispensing systems for retail station and bulk plant facilities, commercial truck driver, and forklift operator.

PROFESSIONAL ORGANIZATIONS

American Society of Heating, Refrigeration and Air-Conditioning Engineers
International Association of Arson Investigators
National Academy of Forensic Engineering
National Association of Fire Investigators
National Fire Protection Association
National Safety Council
National Society of Professional Engineers
Society of Fire Protection Engineers, Central Savannah River Area Chapter (Charter Member)
International Code Council
The National Council of Examiners for Engineering and Surveying
South Carolina Liquefied Petroleum Gas Board (Member) Current

REGISTRATION

Professional Engineer in South Carolina (#19870)
Professional Engineer in Tennessee (#106508)
Professional Engineer in North Carolina (#25783)
Professional Engineer in Alabama (#23885)
Professional Engineer in Mississippi (#14736)
Professional Engineer in Kentucky (#21562)
Professional Engineer in Virginia (#35143)
Professional Engineer in West Virginia (#14573)
Professional Engineer in Florida (#56521)
Professional Engineer in Georgia (#26539)
Professional Engineer in Michigan (#6201053897)
Professional Engineer in Connecticut (#25943)
Professional Engineer in Louisiana (#0032779)
Professional Engineer in Maryland (#35025)
Professional Engineer in Pennsylvania (#79359)
Certified Fire & Explosion Investigator (#6576-2677)
Certified Fire Investigation Instructor (#6576-2677I)
Certified National Academy of Forensic Engineers Member (#642)
Certified State Fire Marshal (During Employment with South Carolina State Fire Marshal's Office)

CONTINUING EDUCATION

November 14, 1995

Basic Liquefied Petroleum Gas Course, South Carolina Fire Academy, Columbia, South Carolina.

November 18-22, 1996

South Carolina Fire Academy, Columbia, South Carolina

- National Fire Protection Association (NFPA) 13, Installation of Sprinkler Systems,
- Plan Review for Fire Sprinkler and Standpipe
- Sprinkler and Standpipe System Hydraulic Calculation
- National Fire Protection Association (NFPA) 25, Water-based Fire Protection Systems

March 19-20, 1997

National Fire Protection Association (NFPA) 231/231C, General Storage/Rack Storage of Materials Seminar, South Carolina Fire Academy, Columbia, South Carolina

October 19 21, 1999

IAAI Fire Investigative Approaches Training Seminar, Myrtle Beach, South Carolina

- The Forensic Value of a Competent Fire Scene Examination,
- Advanced Interviewing Techniques
- Electricity Fire Causes

March 22 - 25, 2000

Eastern Kentucky University, 2000 National Advanced Fire, Arson and Explosion Investigation Science and Technology Program,

- Electrical Fire Causes
- Explosion Investigation
- Fire Scene Analysis
- Computer Fire Modeling

March 12 -14, 2001

Property Loss Research Bureau (PLRB) 2001 Claims Conference, Atlanta, Georgia

- Forensic Fire Investigation: Understanding the Changing Role of Origin & Cause Investigators
- Premises Liability/Civil Liability
- Machinery Loss Adjusting: Production Equipment Loss
- Catastrophe - Mother Nature Up Close and Personal: The Science Behind the Disasters
- Subrogation: Advanced Property
- Sudden Damage vs. Maintenance Problems in Buildings

CONTINUING EDUCATION, Continued

July 22 - 27, 2001

2001 National Fire, Arson and Explosion Investigation Training Program, National Seminar on Fire Analysis Litigation, Certified Fire Investigation Instructor Seminar, Sarasota, Florida

- Philosophy of Fire Analysis
- The NFPA Code Making Process and NFPA 921-2001
- Fire Dynamics for Fire Investigators
- Dynamics and Pattern Analysis
- Electrical Fires
- Explosion
- Processing the Fire Scene – Diagramming, Evidence and Note Taking
- Fire Scene Photography
- Determining Origin – Heat and Flame Vector Analysis
- Determining Cause
- Using 921 – Fire Science and Fire Analysis
- Fire Analysis Litigation, Fire Litigation Issues
- “Daubert,” “Benfield,” and “Kuhmo/Carmichael”
- Expert Testimony, Preparation, Direct and Cross
- Spoliation of Evidence
- Computer Modeling in Testimony
- Expert – Selection, Use and Control

September 25, 2002

South Carolina Society of Professional Engineers, Columbia, South Carolina Seminar on Department Overviews of:

- South Carolina Building Code Council
- Columbia City Building Official’s Office
- South Carolina State Fire Marshal’s Office
- South Carolina DHEC
- South Carolina State Engineer’s Office

April 22, 2003

Society of Fire Protection Engineers, Central Savannah River Area Seminar

- “Overview of ATF Fire Laboratory,” presented by the Department of Alcohol, Tobacco and Firearms

May 13, 2003

Society of Fire Protection Engineers, Central Savannah River Area Seminar

- “Overview of Fire Protection Sprinkler Systems in the Carolina Center at the University of South Carolina,” presented by South Carolina State Engineer’s Office

CONTINUING EDUCATION, Continued

September 23, 2003

Society of Fire Protection Engineers, Central Savannah River Area Seminar

- “The Fire Protection Engineering Profession and SFPE”

October 7, 2003

Root Cause Failure Analysis, ASME Seminar, Columbia, South Carolina

October 9, 2003

Law School for Experts, Columbia, South Carolina

October 21, 2003

Society of Fire Protection Engineers, Central Savannah River Area Seminar

- “3M Fire Resistant Products,” presented by Mike Martin, with 3M Corporation.

April 20-22, 2004

Boiler Efficiency Institute, Institute for Energy Efficiency Improvement, “Fundamentals of Energy Engineering,” Columbia, South Carolina

June 15-16, 2004

Boiler Efficiency Institute, Institute for HVAC Efficiency Improvement, “Improving the Efficiency and Operation of Heating Ventilation and Air Conditioning Systems,” Columbia, South Carolina

September 16, 2004

Report Writing, SEAK, Inc., Columbia, South Carolina

November 8-9, 2004

National Association of Subrogation Professionals, NASP 2004 Conference, Atlanta, Georgia

- “Current Trends in Electrical Fires – Unintended Paths to Destruction”
- “Safety In an Industrial Plant”
- “Why Do Plumbing Fittings, Fixtures and Parts Fail”
- “Construction Defect Claims: Methodology, Management and Mitigation”

May 3, 2005

HVAC Systems and Indoor Air Quality, online course presented by RedVector.com

May 3, 2005

Fire! Designing Means of Escape, online course presented by RedVector.com

August 13, 2005

Mold in the Building Environment, American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc., Columbia, South Carolina

CONTINUING EDUCATION, Continued

September 29, 2005

Inspection, Testing & Maintenance of Water-Base Fire Protection Systems, National Fire Protection Association, Charlotte, North Carolina

June 30, 2006

Online courses presented by Red Vector, Inc., Tampa, Florida

- Coastal Engineering: Hurricanes – The Basics
- Coastal Engineering: Storm Surge
- Hot-Dip Galvanizing: Corrosion Protection
- Interior Codes 6: Fire Protection Systems
- Personal Protective Equipment
- PVC Pipe – Which type should I use?

August 9, 2006

Magne Tek: A case Study in the Daubert Challenge, online course presented CFITrainer.net

August 10, 2006

An Analysis of the Station Nightclub Fire, online course presented CFITrainer.net

August 23, 2006

Ethics and the Fire Investigator, online course presented CFITrainer.net

October 16-20, 2006

10th Annual Fire Investigative Approaches, North Carolina/South Carolina International Association of Arson Investigators (IAAI), Myrtle Beach, South Carolina

- Forensic Fire Scene Reconstruction
- Dust Explosions
- Advanced Digital Photography
- Fire Deaths; Exploding Skulls and Other Myths
- Case Presentations

November 12-15, 2006

2006 National Conference of the National Association of Subrogation Professionals (NASP), Orlando Florida

- Sprinkler System Performance Design and Maintenance
- Valuation of Machinery and Equipment Losses

February 16, 2007

Florida Engineers' Laws and Rules, online course presented by RedVector.com

October 4, 2007

“The Scientific Method for Fire and Explosion Investigation,” online course presented by CFITrainer.net

CONTINUING EDUCATION, Continued

October 5, 2007

Online courses presented by RedVector.com

- Chemical Engineering: Pyrophoric Iron Fires
- Homeland Security 1: Protecting vs. CBR Attacks
- Hurricane Damage: Wind vs. Water Determination

October 10, 2007

“Pump Suction Characteristics,” online course presented by RedVector.com, Inc.,

November 28, 2007

“IAQ: Humid Climate Issues,” online course presented by RedVector.com

December 4, 2007

“Introduction to Evidence,” online course presented by CFITrainer.net

May 18-21, 2008

International Symposium on Fire Investigation Science and Technology, University of Cincinnati, Cincinnati, Ohio

- Ignition of Gases, Vapors, and Liquids by Hot Surfaces
- Full-Scale Single Fuel Package Fire Pattern Study
- Did a Dust Explosion Occur?
- Microscopic and Thermogravimetric Techniques To Determine if Dust Participated in an Explosion Event
- Analysis and Model Testing of a Dual Origin Natural Gas Fire with Remote Fuel Source and Remote Piloted Ignition Mechanism
- Comparison of Measured and Calculated Gas Concentrations from Flammable Gas Leaks in a Manufactured Home
- Toward a More Scientific Determination: Minimizing Expectation Bias in Fire Investigation
- Dispersed Fuel Explosions and the Investigation of Such
- Death by Design: The Monster in the Kitchen (Refrigerator Fires)
- Intra-Appliance (Electric Clothes Dryer) Arc Mapping to Assist Fire Origin and Cause Determinations
- Analysis of Cook Top Fires
- Coconut Grove and Station Night Club Fire Analysis Comparisons
- Computer Fire Models for Fire Investigation and Reconstruction
- Fire Pattern Persistence and Predictability in Pre and Post Flashover Compartment Fires
- The Use of Computer Fire Modeling in Fire Investigation: A Forensic Tool in Search of Qualified Users
- The Use of Smoke Detector Sequence of Activation in Determining the Area of Origin of a Fire: Investigation of the Fedex DC-10 Fire
- Full-Scale Validation Tests of a Forensic Methodology to Determine Smoke Alarm Response

CONTINUING EDUCATION, Continued

January 18-19, 2009

National Academy of Forensic Engineers (NAFE) Forensic Engineering Seminar, Austin, Texas

- Information Gathering, Storing, Analyzing, Etc.
- General Topics in Forensic Engineering

November 4, 2009

“Arc Mapping Basics,” online course presented by CFITrainer.net

November 4, 2009

“Documenting the Event,” online course presented by CFITrainer.net

November 5, 2009

“Fire and Explosion Investigations: Utilizing NFPA 1033 and 921,” online course presented by CFITrainer.net

November 16, 2009

“Moisture Problems in Buildings,” American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., (ASHRAE), Columbia, South Carolina

March 22, 2010

“Humidity Control: Basic Principles, Loads,” American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., (ASHRAE), Columbia, South Carolina

March 24, 2010

“Humidity Control: Applications, Control Levels and Mold Avoidance,” American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., (ASHRAE), Columbia, South Carolina

February - April, 2010

“Air-Conditioning System Design Manual - IP,” American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., (ASHRAE), ELearning Course, Columbia, South Carolina

- The Design Process
- HVAC System Selection Issues
- Occupant Comfort & Health
- Load Calculations
- Air Conditioning System Components – Source Equipment
- Air Conditioning System Components – Heat Transfer Equipment
- Air Conditioning System Components – Pumps, Valves, Piping & Ductwork
- Introduction to All-Air Systems
- Single Zone and All-Air Variable-Air-Volume Systems

- All-Air Reheat Systems
- Dual Duct and Multi-Zone All-Air Systems
- Simple Rooftop All-Air Systems
- Air-And-Water Systems
- All Water Systems
- Special HVAC Systems
- HVAC&R Controls

April 15, 2010

“Bimodal MDPE and HDPE – Strong Choices for Gas Pipe,” online webcast course presented by Dow Industries, Pipeline & Gas Journal, and P3 Consulting, Columbia, South Carolina

September 15, 2010

“Introduction to Fire Dynamics and Modeling,” online course presented by CFITrainer.net

September 17, 2010

“A Ventilation-Focused Approach to the Impact of Building Structures and Systems on Fire,” online course presented by CFITrainer.net

September 27-29, 2010

International Symposium on Fire Investigation Science and Technology, University of Maryland, Adelphi, Maryland

- Preferential Gas Flow Around A Snowcovered Pipe: Empirical Evidence and Modeling
- Forensic Failure Analysis And Fire Ignition Sequence Of Fractional Horsepower, Shaded Pole Motors Used In Appliances
- How Does Air Get Into A Sealed Gas System – Testing vs. Theory
- Investigation Techniques Used To Determine The Massive Vapor Cloud Explosion at the Buncefield Fuel Depot
- Investigative Reports and the 2010 Amendments to The Federal Rules of Civil Procedure
- Low Voltage The Incompetent Ignition Source Dispelling the Myth
- Fuel Gas Overpressure as it Relates to Regulator Function
- Space Heaters as an Ignition Source: Possible, Plausible, or Probable
- Analysis of a Double Fatality Fire Allegedly Caused by a Portable Electric Heater: How Poor Methodology Can Lead to the Wrong Conclusion
- Telltale Signs of Water Heater Gas Control Valve Over-Pressurization

July 29, 2011

“Explosion Dynamics,” online course presented by CFITrainer.net

July 29, 2011

“Charleston Sofa Super Store Fire,” online course presented by CFITrainer.net

CONTINUING EDUCATION, Continued

August 23, 2011

“Combustible Dust Hazard Assessment Webinar,” online course presented by National Fire Protection Association (NFPA)

August 24, 2011

“Critical Thinking Solves Cases,” online course presented by CFITrainer.net

October 13, 2011

“Postflashover Fires,” online course presented by The International Association of Arson Investigators, Inc., on CFITrainer.Net

COURSES, SEMINARS AND LECTURES PRESENTED

1995 to 1998

Forty-hour course presented over a five-day period, entitled “*The State Fire Marshal Certification Course*.” The course was presented several times throughout the state each year as assigned.

October 4, 2001

Lecture entitled “*Identifying, Collecting and Preserving Evidence*” presented at Southeastern Claims Services, Inc. in Columbia, South Carolina.

December 4, 2003

Presentation entitled “*Property Subrogation*,” presented at Auto Owners Insurance, Columbia, South Carolina

October 29, 2004

Presentation entitled “Using Reconstruction to Defend Your Claim,” presented at Morris York Williams Surlis & Barringer’s 2004 Seminar, entitled “Achieve the Best Outcome: Tools for Successful Defense & Resolution of Claims,” Charlotte, North Carolina

November 3, 2004

Presentation entitled “Building & Fire Codes Enforcement & Education: Two Critical Keys to Fire Prevention & Loss Mitigation,” presented at the South Carolina Fire Marshal Association 2004 Fall Conference, Columbia, South Carolina

November 8, 2004

Presentation entitled “*Subrogation of Explosion Losses*,” presented at National Association of Subrogation Professionals, NASP 2004 Conference, Atlanta, Georgia

COURSES, SEMINARS AND LECTURES PRESENTED, Continued

April 20, 2005

Presentation entitled "Explosions: Subrogation Potential," presented at Property Loss Research Bureau, PLRB 2005 Conference, San Antonio, Texas.

November 13, 2006

Presentation entitled, "BOOM! BANG! KAPOW! Subrogating Explosion Losses," at the 2006 National Association of Subrogation Professionals (NASP)

April 20-21, 2007

Presentations at the Inner Circle of Investigators 2007 Annual Conference, Irmo, South Carolina

- Investigation of Explosions
- Spontaneous Ignition and Self Heating with Demonstration

Three-hour course, approved by the North Carolina Department of Insurance, Continuing Education Agency Services Division, entitled "Fire Loss: Building & Fire Code Violations."

September 12, 2005: North Carolina League of Municipalities, Raleigh, North Carolina
October 11, 2005: Liberty Mutual Insurance, Matthews, North Carolina
February 16, 2006: Montgomery Mutual Insurance, Charlotte, North Carolina
April 27, 2006: South Carolina Claims Association, Myrtle Beach, South Carolina
December 14, 2006: Liberty Mutual, Charlotte, North Carolina

Three-hour course approved by the North Carolina Department of Insurance, Continuing Education Agency Services Division, entitled "NFPA 921 & Fire Origin Determination."

August 29, 2002: Liberty Mutual Insurance, Matthews, North Carolina.
September 11, 2002: Companion Property and Casualty, Columbia, South Carolina.
November 19, 2002: Columbia Claims Services, Columbia, South Carolina.
May 21, 2003: Travelers Insurance, Charlotte, North Carolina
May 30, 2003: The Hartford, Charlotte, North Carolina
February 2, 2005: Montgomery Mutual Insurance, Charlotte, North Carolina
April 29, 2005: South Carolina State Claims Association, Myrtle Beach, South Carolina
May 5, 2005: North Carolina State Claims Association, Charlotte, North Carolina
August 30, 2005: Horace Mann, Raleigh, North Carolina
April 19, 2006: Kemper Auto & Home, Charlotte, North Carolina
October 4, 2006: St. Paul Travelers, Columbia, South Carolina

COURSES, SEMINARS AND LECTURES PRESENTED, Continued

One-hour course, approved by the North Carolina Department of Insurance, Continuing Education Agency Services Division, entitled “Investigating Explosion Losses”

March 4, 2008: Kemper Auto, Charlotte, North Carolina

One-hour course, approved by the North Carolina Department of Insurance, Continuing Education Agency Services Division, entitled “Spontaneous Ignition”

March 4, 2008: Kemper Auto, Charlotte, North Carolina

One-hour course, approved by the North Carolina Department of Insurance, Continuing Education Agency Services Division, entitled “Using Fire Reconstruction to Defend Your Claim”

March 4, 2008: Kemper Auto, Charlotte, North Carolina

One-hour presentation “Tips for Working with Fire & Explosion Experts”

March 4, 2010 Preventing Explosions: Properly Managing the Fire Loss Case, Fire Loss Seminar, Richmond, Virginia

April 29, 2010 Utica National Insurance Group, Richmond, Virginia

May 2, 2011 Claims Service Corporation, Fire and Explosion Presentation, Richmond, Virginia

PUBLICATIONS

“Advanced Vehicle Technologies,” M.S. Thesis, University of South Carolina, 1995.

“Water Supply Data for Sprinkler Systems Critical,” South Carolina Fire & Life Safety News, Volume 2, Number 3, Fall 1996.

“Requirements for Sprinklers in Elevator Shafts,” South Carolina Fire & Life Safety News, Volume 2, Number 4, Winter 1996.

“Sprinkler System Requirements in Residential Occupancies: Part I,” South Carolina Fire & Life Safety News, Volume 3, Number 1, Spring 1997.

“Sprinkler System Requirements in Residential Occupancies: Part II,” South Carolina Fire & Life Safety News, Volume 3, Number 2, Summer 1997.

“Code Violations Result in Senseless Deaths,” co-authored with Dr. Jeffery H. Warren, *The Analyst Newsletter*, February 1999.

“Fires involving Bearing Failures,” *The Analyst Newsletter*, July 1999.

“Fire & Explosion Investigations Data Collection Part I,” *The Analyst Newsletter*, April 2001

PUBLICATIONS, Continued

“Controlling the Spread of Attic Fires,” *The Analyst Newsletter*, October 2001.

“X” Marks the Spot: Using NFPA 921 to Determine the Origin Area,” *The Warren Group 2002 Year in Review*, March 2003.

“Natural Gas Explosion-Improper Piping Leads to Trouble,” *The Warren Group 2003 Year in Review*, March 2004.

“*Forensic Engineering Analysis of Low Temperature Ignition of Wood*,” co-authored with Dr. Jeffery H. Warren, *Journal of the National Academy of Forensic Engineers*, Vol. XXVI No.1, June 1, 2009.

“*Analysis of a Double Fatality Fire Allegedly Caused by a Portable Electric Heater: Poor Methodology Can Lead to the Wrong Conclusion*,” co-authored with Dr. Jeffery H. Warren and John B. Holecek, proceedings of the International Symposium on Fire Investigation Science and Technology, September 2010.