



WARREN

**THE WARREN GROUP, INC.** FORENSIC ENGINEERS & CONSULTANTS  
7805 ST. ANDREWS ROAD | PO BOX 1608 | IRMO, SOUTH CAROLINA 29063  
TEL 803.732.6600 FAX 803.732.7576 ↓↓ WARRENF0RENSICS.COM

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*Jeffery H. Warren, Ph.D., P.E., CSP*

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Engineer: Mechanical, Machine Design & Safety

**Failure Analysis**

**Fire and Explosion Analysis: Origin and Cause**

**Industrial Accident Reconstruction**

**Machine Design**

**Machine Safeguarding**

**Machinery and Equipment Damage Appraisals**

**Products Liability**

**SAFETYTHROUGHDESIGN®**

**Training**

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## EDUCATION

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- 1977**                    **Doctor of Philosophy in Mechanical Engineering**  
Virginia Polytechnic Institute and State University
- 1975**                    **Master of Science in Mechanical Engineering**  
Virginia Polytechnic Institute and State University
- 1973**                    **Bachelor of Science in Mechanical Engineering**  
University of North Carolina at Charlotte, North Carolina

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## EXPERIENCE

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**JANUARY, 1997**    The Warren Group, Inc., Columbia, South Carolina. CEO and Chief Engineer  
**TO PRESENT**       performing specialized consulting and training related to property loss analysis  
and the unintentional injuries involving mechanical engineering, machine  
design and safety.

**Property 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)**

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

**Accident Prevention**

Hazard identification, risk assessment, SAFETYTHROUGHDESIGN<sup>®</sup>, component testing, OSHA compliance, standards and codes compliance and products liability.

**Training**

Hazard identification, risk assessment, SAFETYTHROUGHDESIGN<sup>®</sup>, standards and codes, machine safeguarding and products liability.

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**EXPERIENCE (Continued)**


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- 1992 TO 1997** Summit Engineering, L.L.P., Columbia, South Carolina. Founding Partner and Consulting Engineer performing specialized consulting in the areas of: Hazards Identification and Analysis; Analysis and Evaluation of Designs, Component Testing, Operating Instructions, Guards and Warnings, Standards and Codes Compliance; Accident Evaluation (Machinery, Equipment and Consumer Products); Machine Design, Controls, Guards, Warnings, Human Factors, OSHA Standards, Code Compliance and Maintenance; Property Loss Claims Consultations; Cause of The Loss, Repair or Replacement Analysis, Scope of Repair, Estimate of Repair, Actual Cash Value, Salvage Value and Time to Repair.
- 1992** Engineering Design & Testing Corp., Columbia District Office. Southeastern Regional Manager and consulting engineer performing specialized consulting in the areas of machinery, equipment and construction regarding both products liability and property loss issues.
- 1991 TO 1992** Engineering Design & Testing Corp., Charlotte District Office. Engineering Manager and consulting engineer performing specialized consulting in the areas of machinery, equipment and construction regarding both products liability and property loss issues.
- 1987 TO 1991** Engineering Design & Testing Corp., Columbia District Office. Consulting engineer performing specialized consulting in the areas of design, analysis, and appraisal of machinery, failure analysis, and accident reconstruction. Clients included industrial manufacturing facilities, attorneys, insurance companies and adjusters.
- 1983 TO 1987 (FULL TIME)**  
**1980 TO 1983 (PART TIME)** Warren Engineering Co., Inc. President and chief machine designer. (A Summary of Typical Machine Design Jobs is included). Responsible for the design and fabrication of complete machines, including sales, quotation preparation, layout, components selection, following fabrication and assembly, debug, proof of function, operator training and service.
- 1980 TO 1983** The University of South Carolina, Aiken, South Carolina. Assistant Professor of Engineering.
- 1979** Tull Manufacturing Company, Ivy, Virginia. Project engineer involved in design and manufacture of special machinery.

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**EXPERIENCE (Continued)**

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- 1979** E.I. Du Pont de Nemours & Co., Inc., Savannah River Laboratory, Aiken, South Carolina. Research supervisor of Mechanical Development Group (3 Ph.D. engineers, 3 B.S. engineers, and 3 technicians). Involved in the design and specification of a canister for solidified high-level radioactive waste. Also design and testing of full size prototypic equipment capable of remote handling, welding, leak checking and ultrasonic testing of canister.
- 1976 TO 1978** E.I. Du Pont de Nemours & Co., Inc., Savannah River Laboratory, Aiken, South Carolina. Research engineer working on prototype design, fabrication and testing of incinerator to burn high specific activity radioactive alpha contaminated solid waste. Coauthored U.S. Patent #4,259,910. "Electric Controlled Air Incinerator for Radioactive Waste."
- 1977  
(PART TIME)** Aiken Technical College, Aiken, South Carolina. Taught course in heat transfer and thermodynamics.
- 1974 TO 1976** Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Graduate research assistant while enrolled as a graduate student in Ph.D. program in mechanical engineering. Participated in an U.S. Army sponsored project involving the friction and wear of polymers sliding against steel surfaces. This work was in support of a dissertation entitled: "A Prediction of the Wear of Polymers from Surface Characterization Parameters." Dissertation Advisor, Dr. N. S. Eiss, Jr. This work included the analysis, design and implementation of wear experiments using neutron activation analysis and the scanning electron microscope.
- 1973 TO 1974** Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Graduate research assistant while enrolled as a graduate student in M.S. program in mechanical engineering. Participated in a project sponsored by the Middle Atlantic Power Research Committee involving drilled geothermal power generation. This work supported a M.S. thesis entitled: "Design Analysis of A Drilled Geothermal Well." Thesis Advisor: Professor R. L. Whitelaw. This work included the analysis, design and specification of the system associated with a drilled geothermal well.
- 1973  
(PART TIME)** Collins and Aikman Corporation, Machinery and Equipment Division, Corporate Engineering Staff, Charlotte, North Carolina. Performed engineering work consisting of design, specification and drafting of textile machinery under supervision of Mr. Gerald K. Miller.
- 1969 TO 1973  
(PART TIME)** Automobile mechanic under supervision of Mr. A. E. Watts.

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**Warren Engineering Company, Inc., Summary of Machine Design Jobs**

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**Lockheed-Georgia Company**

Design and fabrication of two C-130 aircraft wing spar automatic drilling machines. These two semi-automatic machines replaced two modified drill presses that drilled 4700 holes every 5 hours. With the new machines, operator fatigue is greatly reduced and hole quality is significantly improved. (i.e., burrs are reduced by controlled feed rate.) Received order for two additional machines after these machines were proven.

**Cummins Engine Company**

Design and fabrication of a drilling machine to automatically feed, orient, clamp and drill 12 holes and discharge fuel ejector tappet sleeves. Cycle time was one part every 30 seconds. Production was increased from 200 to 2000 parts/day.

**Rockwell International**

Design and fabrication of fixture to tighten the head bolts on a General Electric locomotive engine to a torque of 2000 foot pounds.

**Rockwell International**

Design and fabrication of a 10-spindle fixture to tighten the main bearing caps on a Cadillac automobile engine. Design of a 16-spindle and a 2-spindle fixture to tighten the intake manifold bolts and connecting rod bolts, respectively, on a Cadillac engine.

**Adler Instruments**

Produced product design drawings for surgical instrument sterilizer including detailed design of latching handle mechanism.

**Union Carbide Corporation**

Design and fabrication of capacitor inspection tables for shipment to Greenwood and Greenville, South Carolina, and Matamoros, Mexico.

**Westinghouse Nuclear**

Redesign, fabrication and installation supervision of uranium roll compactor.

**Southeastern Tool**

Design of a bridge beam splice plate-drilling machine. Finished unit drilled two 3/4-inch diameter holes at the same time through 4 inches of steel in 1-1/2 minutes.

**E.I. Du Pont de Nemours & Co., Inc., SRL**

Installation of Heating-6 program on University of South Carolina, Aiken, computer. Used program to calculate radioactive waste canister temperatures when buried in a repository.

**E.I. Du Pont de Nemours & Co., Inc., SRL**

Design and fabrication of feed and discharge system, and off gas heater for calcination process to convert uranyl nitrate resin into uranium oxide. Purchased and modified a 6-inch diameter calciner for above process. The unit was designed to operate at 1000 degrees centigrade.

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## Warren Engineering Company, Inc., Summary of Machine Design Jobs (Cont.)

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**E.I. Du Pont de Nemours & Co., Inc., SRL**

Design and fabrication of automatic storage retrieval and monitoring system for plutonium canisters. System included a personal computer and programmable controller for monitoring and control.

**E.I. Du Pont de Nemours & Co., Inc., SRL**

Design and fabrication of robotic end-of-arm tooling.

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### PROFESSIONAL ORGANIZATIONS

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American Society of Safety Engineers  
 International Association of Arson Investigators  
 National Academy of Forensic Engineers  
 National Association of Fire Investigators  
 National Fire Protection Association  
 National Safety Council (Company Membership)  
 National Society of Professional Engineers

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### NATIONAL COMMITTEE/GROUP AFFILIATION

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National Safety Council, Institute for Safety Through Design (Member)  
 ANSI B11.TR 3 Sub-Committee on Hazard Identification and Risk Assessment (Member)

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### PATENTS

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"Electric Controlled Air Incinerator for Radioactive Waste," U.S. Patent #4,259,910,  
 April 7, 1981, with Harry E. Hootman.

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### REGISTRATIONS

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Professional Engineer in South Carolina, (#7515)  
 Professional Engineer in North Carolina, (#17219)  
 Professional Engineer in Virginia, (#011337)  
 Professional Engineer in Alabama, (#24406)  
 Professional Engineer in Tennessee, (#00107285)  
 Professional Engineer in Florida, (#57753)  
 Professional Engineer in Arkansas (#10757)  
 Professional Engineer in Kentucky (#2212)  
 Professional Engineer in West Virginia (#15013)  
 Professional Engineer in Georgia (#15362)  
 Professional Engineer in Texas (# 90598)  
 Professional Engineer in Delaware (#13453)  
 Certified Safety Professional in Engineering Aspects (#12811)  
 Certified Fire and Explosion Investigator (#4830-1036)  
 Certified Fire Investigation Instructor (#4830-1036I)

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## CONTINUING EDUCATION

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**Winter Quarter, 1976**

Basic Welding, Aiken Technical College

**Spring Quarter, 1977**

Machine Shop, Aiken Technical College

**October 19 - 20, 1983**

Two-day Course on Square D Programmable Controllers, Augusta, Georgia

**June 3 - 5, 1985**

Three-day Course entitled: "Designing Advanced Production Machines," Atlanta, Georgia

**October, 1986**

One-day Seminar entitled: "Creativity, Innovation, and Entrepreneurship," Los Angeles, California

**June 20 - 24, 1988**

International School of Construction Estimating, Dallas, Texas

**September 1988 to November 1988**

S.C. Residential Home Builder's Licensing Exam Course, Midlands Technical College, Columbia, South Carolina

**April 7, 1989**

General Contractor Licensing Seminar, Columbia, South Carolina

**January 18 - 21, 1990**

American Society of Appraisers, ME1: Introduction to Machinery & Equipment Valuation, Philadelphia, Pennsylvania

**February 22 - 25, 1990**

American Society of Appraisers, ME2: Machinery and Equipment Valuation Methodology, Chicago, Illinois

**March 22 - 25, 1990**

American Society of Appraisers, ME3: Machinery and Equipment Valuation: Advanced Topics & Case Studies, San Francisco, California

**April 19 - 22, 1990**

American Society of Appraisers, ME4: Machinery and Equipment Valuation: Advanced Topics and Report Writing, White Plains, New York

**July 17 - 18, 1993**

ASM International Course: Quantitative Characterization of Microstructure, Charleston, South Carolina

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**CONTINUING EDUCATION (Continued)**

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**September 6 - 8, 1994**

American Society of Safety Engineers Course: Certified Safety Professional Specialty/Comprehensive Examination Preparation Workshop, Richmond, Virginia

**July 31, 1995**

1995 National Fire, Arson, and Explosion Investigation Training Program: Mathematical Computer Fire Modeling Training Seminar, Chicago, Illinois

**August 1 - 4, 1995**

National Fire, Arson, and Explosion Investigation Training Program: Determining the Cause and Origin of Fires and Explosions Training Seminar, Chicago, Illinois

**September 17-19, 1996**

Integrating Safety Through Design Symposium, National Safety Council, Institute for Safety Through Design, Bloomingdale, Illinois

**November 14-15, 1996**

Eighth Annual Products Liability Conference, University of Wisconsin-Madison

**August 19-20, 1997**

Benchmarks for World Class Safety Through Design Programs, National Safety Council, Institute for Safety Through Design, Bloomingdale, Illinois

**April 6-8, 1998**

Property Loss Research Bureau, 1998 Claims Conference, Chicago, Illinois

- Investigating Liability Claims Course,
- Property Valuation & Loss Settlements Course
- Boiler v. All-Risks Coverage and Loss Adjusting Issues
- Advanced Property Subrogation Course

**May 4-5, 1998**

Fire Findings Laboratories: Investigation of Gas and Electric Appliance Fires Course, Benton Harbor, Michigan

**January 6-8, 1999**

National Seminar on Fire Analysis Litigation sponsored by The National Association of Fire Investigators, Sarasota, Florida

**March 29-30, 1999**

Property Loss Research Bureau, 1999 Claims Conference, New Orleans, Louisiana

- Y2K Training for Claims, New Orleans, Louisiana
- Y2K Session 1-What is Y2K? An Expert Overview,
- Advanced Property Subrogation



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**CONTINUING EDUCATION (Continued)**

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**October 18-22, 1999**

National Safety Council, 1999 Congress & Expo, New Orleans, Louisiana

- Safe 24-7: Safety on the Web,
- Behavior Based Safety: Get Off the Workers' Back
- Machine Guarding in the Plastics Industry
- The Web as Part of a Safety Program
- New Solutions for Measuring Safety and Health Performance
- Trends in Manufacturing and Redesign for Improvements in Productivity
- Stop Wasting Time, Resources and Lives with Your Fall Protection Program
- 8-hour seminar entitled Safety Through Design: Principles and Practices
- 8-hour seminar entitled De-Mystifying the MSDS Doesn't Require Magic – But it Doesn't Hurt

**March 21-25, 2000**

- Eastern Kentucky University, 2000 National Advanced Fire, Arson and Explosion Investigation Science and Technology Program
- Certified Fire Instructor Program
- Electrical Fire Causes
- Explosion Investigation
- Fire Scene Analysis
- Computer Fire Modeling

**November 6-7, 2000**

National Association of Subrogation Professionals, 2000 Annual Conference, Orlando, Florida

- Roofing Subrogation
- Advanced Concepts in Workers' Compensation
- Water Loss Claims
- Subrogation Resulting from Chemical Fires & Explosions
- Subrogation Technology

**October 15-22, 2001**

National Safety Council, 2001 Congress & Expo, Atlanta, Georgia

**April 7-10, 2002**

Property Loss Research Bureau, 2002 Claims Conference, Anaheim, California

- Advanced Subrogation Techniques in Complex Property Claims
- Controlling Fire Investigation Costs
- Advanced Fire Litigation Skills
- Admissible Evidence-Gathering and Preservation for First and Third Party

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## CONTINUING EDUCATION (Continued)

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**November 10-13, 2002**

National Association of Subrogation Professionals, 2002 Annual Conference, Tampa, Florida

- How to Develop Subrogation Training That Really Rocks
- Fire Scene Spoliation, Have We Gone Too Far?
- Subrogation and Product Defects – Is There a Duty to Fail Safe?

**March 30-April 2, 2003**

Property Loss Research Bureau, 2003 Claims Conference, Anaheim, California

- Report Writing for Claims Adjusters
- Digital Image Capture in Investigations
- Best Impression Skills for Adjusters
- Daubert Issues in Third Party Litigation
- Daubert: Defending Your Experts Against Challenge in Fire Litigation

**October 1, 2003**

Cozen & O’Conner Subrogation Seminar, Atlanta, Georgia

- Origin and Cause Considerations in Complex Subrogation Claims
- Mechanical Engineering Issues in Complex Subrogation Losses
- Spread Claims: How to Recover Even If You Don’t Know the Cause of the Loss
- Selection and Use of Expert Witnesses

**October 7, 2003**

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

**October 9, 2003**

Law School for Experts, Columbia, South Carolina

**March 14 – 17, 2004**

Property Loss Research Bureau, 2004 Claims Conference, Chicago, Illinois

- Fire Investigations: The First Days
- Managing Remote Employees
- Subrogation: Marriage of Property Subrogation Unit and the Branch or Field Office
- Fire Litigation: Advanced Skills
- Machinery and Equipment Recovery: Steps for Minimizing the Loss
- Collapse: Applying the Law to the Facts

**August 24, 2004**

Scaffold Training Institute, “Frame, Tube & Coupler & System Scaffolding Competent Person/Builder Training”, Orlando, Florida

**September 16, 2004**

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

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## CONTINUING EDUCATION (Continued)

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**November 8 – 9, 2004**

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

- NFPA 921 – 2004 Edition: An Update
- Don't Get Burned By Burn Patterns
- Subrogation Of Explosion Losses
- Current Trends In Electrical Fires – Unintended Paths to Destruction
- The Right Tools Add Value And Operational Efficiency
- How to Engage The Right Expert For The Right Case
- Workers' Compensation Subrogation By Region
- Safety In An Industrial Plant
- Document Management: The Scanning Solution – The Why, How And Economics Of Scanning Paper Documents Into Electronic Form

**March 21 – 23, 2005**

“Fire Investigation Training,” International Association of Arson Investigators, Virginia Chapter, Virginia Beach, Virginia

**November 14-16, 2005**

National Association of Subrogation Professionals, 2005 Annual Conference, Austin, Texas

- To Stipulate or not to Stipulate – That's the Question (Workers Comp)
- Managing High Volume Litigation (Management)
- Visual Technology in the Courtroom (Technology)
- Looking Past the Obvious in Industrial Machine Accidents (Workers Comp)
- What do You Know About Pyrolysis (Property)
- Subrogating Marine and Inland Marine Claims (General)
- Subrogation and Electrical Failure: Forming the Circuit (Property)

**October 5, 2006**

“Recovery: Building Technical Skills to Prepare for Success,” 2006 Philadelphia Workers' Compensation Subrogation Seminar Philadelphia, Pennsylvania

**November 13-14, 2006**

National Association of Subrogation Professionals 2006 Annual Conference, Orlando, Florida

- Boom! Bang! Kapow! – Subrogating Explosion Losses
- Recent Developments, Trends and Odd-Ball Decision in Workers' Compensation
- The Anatomy of Product Liability Subrogation – It May Be Simple But...
- National Fire Science Multi-District Subrogation: The Benefits, Pitfalls, and Suspect Products
- Subrogating Hurricane Claims, Part 1
- Neither Wind, Nor Hail, Nor Rain, Nor Sleet, Nor Snow – Not The Creed When It Comes to Subrogating for Roofing Losses
- Sprinkler System Performance Design and Maintenance
- Valuation Of Machinery And Equipment Losses

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## CONTINUING EDUCATION (Continued)

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**February 22, 2007**

“Safety: Machine Operation & Safe Work Practices,” online course presented by RedVector.com, Inc., Tampa, Florida

**March 25, 2007**

“MagneTek: A Case Study in the Daubert Challenge,” online course presented by CFITrainer.net in conjunction with The International Association of Arson Investigators, Inc.

**April 20, 2007**

“Fires, Explosions and Electricity: Intensive Instruction in Irmo,” Inner Circle of Investigators, 2007 Annual Conference, Irmo, South Carolina

**May 21-26, 2007**

“Woodworking Essentials,” 6 day Intensive Course, Lonnie Bird's School of Fine Woodworking, Dandridge, Tennessee

**November 4-7, 2007**

National Association of Subrogation Professionals 2007 Annual Conference, New Orleans, Louisiana

- When Fire Protection Systems Fail: An Overview
- Spread Claims: Recovering from Parties Who Did Not Start the Fire

**November 2-5, 2008**

National Association of Subrogation Professionals 2008 Annual Conference, Hollywood, Florida

- Damages 101: From Loss Adjustment to Subrogation Recovery – How to Understand Damages and Recover Top Dollar
- The Inner Workings of the Subrogation Department: An In-Depth Symposium, Part I
- No way to Guard Against That (Workers Comp)
- The Mother of All Subrogation Cases – Subrogation Arising from the 9/11 Terrorist Attack
- Property Loss Subrogation: Building Collapse Symposium (Part I)
- Large Loss Property Subrogation: Building Collapse Symposium (Part II)
- A Review of NFPA 921 - 2008 and Its Changes from Prior Editions and How This Will Impact Subrogation Professionals
- Fires and Explosions in Industrial Ovens and Furnaces – Subrogation Potential

**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

**April 2009**

“Sea School,” U.S. Coast Guard approved 54 hour curriculum for *Operator of Uninspected Passenger Vessels, Near Coastal Course* which satisfies the examination requirements of CFR 10.205(i)

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## CONTINUING EDUCATION (Continued)

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**June 24-25, 2009**

National Association of Subrogation Professionals 2009 Regional Adjusters Conference, Providence, Rhode Island

- Estimating HVAC Claims
- Origin and Causes: Recent Trends in Successful Investigations

**September 9-10, 2009**

National Association of Subrogation Professionals 2009 Central Regional Adjusters Conference, Lombard, Illinois

- Green Building Adjustments and Challenges
- Residential Roofing (Hail Damage, etc.)
- Emerging Issues in Construction Defect Cases
- Advanced Property Claims Negotiation Strategies
- Water Damage Claims: Investigation and Mitigation Activity
- Auto Fraud Investigation: Use of Forensic Evidence

**September 27-29, 2010**

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

- Fire Damage or Equipment Breakdown?
- The Daubert Disaster: Unintended Consequences Affecting Expert Witnesses
- 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
- Fire Dynamics and Forensic Analysis of Liquid Fuel Fires
- 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

**October 11, 2010**

“Anti-Subrogation Efforts Through Made Whole: Threads and Pitfalls for Insurers,” presented by Daran Keifer, Kreiner & Peters Co., at the Southeastern Claim Executives Association Fall Workshop

**February 8, 2011**

“Ball Bearing Technology,” online course presented by SunCam.com, Inc., Florida

**October 21-22, 2011**

Inner Circle of Investigators, 2011 Educational Conference, Conroe, Texas

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## CONTINUING EDUCATION (Continued)

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**December 14, 2011**

Investigating Fires and Explosions: How to Avoid Getting Burned by a Bad Fire Investigation Seminar, The Warren Group, Irmo, South Carolina

- Tips for Investigating Fires & Explosions
- Fuel Gas Fires & Explosions
- Fire and Explosion Demonstrations
- Mobile Equipment Fires: Lawn Mower to Cotton Picker
- Fires & Explosions in Oven & Furnaces
- Gas Pipe Testing Demonstration

**March 23, 2012**

Trawler School Charters Safety and Seamanship Certificate under direction of Captain Robert L. Hamilton, USCG License # 1105724

- Successfully completed 3 day 4 night comprehensive hands on training course aboard Miami Mermaid, a 40 ft sundeck trawler powered by a single 165 hp Perkins engine equipped with generator, chart plotter, and auto-pilot. Waters of chartered navigation were from Port of Miami to Florida Keys and back. The subjects covered were piloting and navigation, long range cruising, engine room inspection, mechanical operating systems/generator, vessel maintenance, electrical and electronics, anchoring and rules of the road.

**November 13, 2012**

National Association of Subrogation Professionals, 2012 Cirque Du Subro Annual Conference, Las Vegas, Nevada

- Subrogating the Slip and Fall Claim
- Lightning and CSST: Overcoming the “Act of God” Defense Obtaining a Recovery
- Gas Explosions
- Proving General Contractor Liability for Negligence of a Subcontractor
- Writing Effective Contentions
- Fireplace Fires

**February 25, 2013**

“Safety: Material-Handling,” an online course presented by RedVector.com, Inc., Tampa, Florida

**February 26 - March 1, 2013**

International Consumer Product Health and Safety Organization (ICPHSO), 2013 Annual Meeting & Training Symposium, Arlington, Virginia

- Best Practices for Effective Compliance with an Increasing Number of International Safety Standards and Regimes
- The Roles of the Public & Private Sectors in Market Surveillance
- Pediatric Ingestion Hazards
- Will Improving Safety Standards Help or Hurt Your Business?
- Federal Government Partnerships at the Border

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## CONTINUING EDUCATION (Continued)

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### February 26 - March 1, 2013 (Continued)

- Navigating CPSC's Data Bases
- Testing Children's Products (Everything You Wanted To Know But Were Afraid To Ask)
- Office of Compliance and Field Operations (Second Session – Regulatory Enforcement Division – Regulatory Violations)

### August 16 - 17, 2013

Inner Circle of Legal Investigators (ICLI), 2013 Educational Conference, Milwaukee, Wisconsin

- Witness Location, Ethnic Considerations and Search Options to Find Witnesses
- Accident Reconstruction and Technology
- Use of English XL Tribometer in Premises Liability Incidents
- Investigation of UTV Injuries
- Accidental Death Investigations
- Tour of Medical Examiner's Facility and Discussion of Forensic Procedure for Death Investigation
- New Technical Analysis and Crash Reconstruction Software Tools
- Smart Device Apps, Digital Tools and Discussion regarding Cloud Services

### August 18, 2014

CAL-EMA Safety Assessment Program, 5-Year Damage Assessment Certification, presented by the CAL-EMA National Database in Irmo, South Carolina

### September 25 - 27, 2014

Inner Circle of Investigators, 2014 Educational Conference, Jackson Hole, Wyoming

- The Initial Approach to a Grieving (Potential) Client
- Carbon Monoxide Poisoning
- Autopsy Reports (for the Investigator) and Forensic Autopsy Protocols
- NHTSA: The Availability and Usefulness of Their Data
- CPSC, NHTSA, OSHA and ANSI: Defects, Recalls, Warnings and Standards
- Ethics and Leadership
- Advanced Accident Reconstruction
- Gadgets, Widgets, Apps and Websites
- Seat Belt Inspections and Documentation in the New Era of Technology: Documenting Low to High Speed Impacts

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## CONTINUING EDUCATION (Continued)

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### November 9 - 12, 2014

National Association of Subrogation Professionals, 2014 Annual Conference, Orlando, Florida

- Hiring, Training, and Motivating a New Generation of Employees
- Pursuing Foreign Manufacturers in Products Cases After the Supreme Court's Nicastro Case
- Dryer Fires: Cleaning Up on Subro
- Falling Down on the Job – Fall Prevention on Construction Sites
- Alternative Methods for Testing Expert Opinions While Still Complying with Daubert
- Successfully Climbing the Mountain in Your Subrogation Case: NFPA 921
- Work Site Safety: How the Mighty Could Fall? Potential Pitfalls and Interpretations of Workplace Safety Based Upon OSHA Guidelines (the Multi-Employer Work Site Policy) (Part I)
- Work Site Safety Explored: Real World Site Safety Examples Focusing on Keeping Our Industry Professionals Safe (Part II)
- Subrogation of Equipment Accident and Industrial Claims

### February 5, 2015

"OSHA Standards on Steel Erection," an online course presented by RedVector.com, Inc., Tampa, Florida

### February 5, 2015

"Worksite Safety 03: OSHA Fall Protection," an online course presented by RedVector.com, Inc., Tampa, Florida

### February 5, 2015

"Fall Protection (BBFPR00CEN)," an online course presented by RedVector.com, Inc., Tampa, Florida

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## COURSES, SEMINARS AND LECTURES PRESENTED

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### January 22 & 23, 1987

Two-day Course on "Manufacturing Automation, A Practical Guide to the Selection and Procurement of Automated Equipment for Manufacturing Processes," University of South Carolina, Aiken

### December 6, 1994

Three-hour, State of North Carolina Approved Continuing Education Course entitled "Identification of a Products Liability Claim," Harleysville Insurance, Charlotte, North Carolina

### July 11, 1996

Half-hour lecture entitled "Identification and Handling of a Products Liability Claim," given at the Property Loss and Recovery Seminar, Columbia, South Carolina



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**COURSES, SEMINARS AND LECTURES PRESENTED (Continued)**

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**September 4, 1997**

Four-hour course presented in conjunction with the University of South Carolina and the American Society of Mechanical Engineers student section on “Hazard Identification, Risk Assessment and Safety Through Design,” Columbia, South Carolina

**October 3, 1997**

Four-hour course entitled “Industrial Machine Safety: The Fundamentals of Hazard Identification, Risk Assessment and Safety through Design” presented to manufacturing engineers, Gaffney, SC

**November 12, 1997**

One-hour lecture on “Accident Investigation: What to do When an Accident Occurs in Your Facility” presented at the South Carolina Occupational Safety Council Fall 1997 Safety Seminar, Columbia, South Carolina

**December 12, 1997**

Three-hour seminar entitled “Fire Investigations: Identifying Cause and Responsibility” presented to the International Association of Arson Investigators, South Carolina Chapter, Columbia, South Carolina

**January 20, 1998**

One-hour lecture on “Incident Investigation” presented to the South Carolina Section, American Water Works Association’s seminar on “Safety Issues at Water Treatment Plants,” Columbia, South Carolina

**June 5, 1999**

One hour and thirty-minute seminar on “Machine Guarding” presented at the NALI National Convention & 1999 Super Conference, New Orleans, Louisiana

**September 21, 1999**

Lecture on “Machine Guarding” presented at the Columbia Claims Association Monthly Dinner Meeting, Columbia, South Carolina

**June 5, 2000**

Lecture on “Using Safety Through Design as the Basis for Analyzing Unintentional Injury Claims” presented at the Piedmont Claims Association Monthly Dinner Meeting, Greenville, South Carolina

**July 13, 2000**

Lecture on “Evaluating Machinery & Equipment Damage” presented at the Southern Loss Association Monthly Luncheon Meeting, Atlanta, Georgia

**October 4, 2000**

Lecture on “Who Else Owns This Loss?” presented at the Southeastern Claims Services, Columbia, South Carolina

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**COURSES, SEMINARS AND LECTURES PRESENTED (Continued)**

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**October 4, 2000**

Lecture on “Investigating Unintentional Machine Guarding Injuries” presented at the Southeastern Claims Services, Columbia, South Carolina

**November 6, 2000**

Lecture on “Property Loss Subrogation Essentials: Who Else Owns This Loss?” presented at the National Association of Subrogation Professionals 2000 Annual Conference, Orlando, Florida

**January 8, 2001**

Lecture on “Safety Through Design: The Correct Way to Keep Workers from Getting Hurt” presented at the South Carolina Chapter of the American Society of Safety Engineers, Monthly Luncheon Meeting, Columbia, South Carolina

**June 1, 2001**

Lecture on “Sulzer Hip Implants: Analysis of the Defect” presented to the American Trial Lawyers Association, Litigation Update: Pharmaceuticals and Medical Devices, Scottsdale, Arizona

**September 26, 2001**

Lecture on “Using Safety through Design to Investigate Unintentional Machine Guarding Injuries” presented at the National Safety Council’s Safety Congress in Atlanta, Georgia

**October 12, 2001**

Lecture entitled “Products Liability: Understanding the Language” presented at Palmetto Paralegal Seminar in Columbia, South Carolina

**April 8-9, 2002**

Three-hour presentation, “Identifying Product Liability Claims in Property Damage Losses,” presented at the Property Loss Recovery Bureau (PLRB) 2002 Conference, Los Angeles, California

**March 30-April 2, 2003**

Presentation, “Identifying Product Liability Claims in Property Damage Losses,” presented at the Property Loss Recovery Bureau (PLRB) 2003 Claims Conference, Orlando, Florida

**March 16 & 17, 2004**

Presentation, “Building Codes & Standards: A Key Component in Evaluating Fire Losses,” presented at the Property Loss Recovery Bureau (PLRB) 2004 Claims Conference, Chicago, Illinois

**November 15, 2005**

Presentation on “The Small Subrogation Claim: How to Maximize Recovery Results” presented at the National Association of Subrogation Professionals 2005 Annual Conference, Austin, Texas

**October 5, 2006**

Presentation on “Watch Out! Warnings versus Design: Issues in Personal Injury Cases” presented at 2006 Philadelphia Workers’ Compensation Subrogation Seminar, Philadelphia, Pennsylvania

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**COURSES, SEMINARS AND LECTURES PRESENTED (Continued)**

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**October 17, 2006**

Presentation on the engineering profession to the Introduction to Engineering class at Midlands Technical College, Columbia, South Carolina

**October 20, 2006**

Presentation on “Products Liability in Personal Injury and Property Damage Cases,” presented to Palmetto Paralegal Association, Columbia, South Carolina

**November 14, 2006**

Presentation on “Design Issues as a Cause of Workers’ Comp Injuries: How to Identify and Pursue third Party Workers’ Comp Subrogation Claims” presented at the National Association of Subrogation Professionals 2006 Annual Conference, Orlando, Florida

**April 17, 2007**

Presentation on “Product Design Issues as a Cause of Injury: As a Design Engineer, You Can Make a Difference,” presented at University of South Carolina Mechanical Engineering Product Safety Class, Columbia, South Carolina

**April 20-21, 2007**

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

- Low Temp Ignition of Wood
- Gas Water Heater Fires with Demonstration

**November 6, 2007**

“3-2-1 Ignition! Pyrolysis...Is It A Viable Recovery Theory? Part 1 and Part II, presented at the National Association of Subrogation Professionals 2007 Annual Conference, New Orleans, Louisiana

**April 9, 2009**

Presentation on “Products Liability in Personal Injury and Property Damage Cases,” presented to The Hartford, Charlotte, North Carolina

**June 24, 2009**

Presentation on “Products Liability Claims in Property Damage Losses: Understanding the Language,” presented to National Association of Subrogation Professionals 2009 Regional Adjusters Conference, Providence, Rhode Island

**September 9-10, 2009**

Presentation on “Products Liability Claims in Property Damage Losses: Understanding the Language,” presented to National Association of Subrogation Professionals 2009 Central Regional Adjusters Conference, Lombard, Illinois

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**COURSES, SEMINARS AND LECTURES PRESENTED (Continued)**


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***Lecture on “Machine Safeguarding and Safety through Design”***

**January 5, 1998:** American Society of Safety Engineers, South Carolina Chapter, monthly luncheon meeting, Columbia, South Carolina

**February 3, 1998:** Society of Manufacturing Engineers, Greater Columbia Chapter, monthly dinner meeting, Columbia, South Carolina

***Lecture on “Using an Engineer to Evaluate Wind versus Water Claims”***

**July 18, 2000:** Coastal Claims Association and the Independent Agents of Horry County breakfast meeting, Myrtle Beach, South Carolina

**August 17, 2000:** Charleston Claims Association Monthly Dinner Meeting, Charleston, South Carolina

***Lecture on “Experts: 20 Ways to Find, Hire and Work Effectively with Experts”***

**September 14, 2000:** Greenville Association of Legal Assistants Annual Seminar, Greenville, South Carolina

**November 21, 2000:** Horry/Georgetown Technical College Grand Strand Campus, Paralegal Program, Myrtle Beach, South Carolina

**February 21, 2001:** Palmetto Paralegal Association, Columbia, South Carolina

**October 16, 2001:** Horry/Georgetown Technical College Grand Strand Campus, Paralegal Program, Myrtle Beach, South Carolina

**March 8, 2002:** Inner Circle of Private Investigators, Atlanta, Georgia

***Lecture on “Subrogation in Workers’ Compensation: Identifying Third Party Potential in Workers’ Compensation Cases”***

**October 15, 2001:** South Carolina Workers’ Compensation Educational Conference in Myrtle Beach, South Carolina

**March 20, 2002:** Spring Industries, Inc. Workers’ Compensation Seminar, Rock Hill, South Carolina.

**April 3, 2002:** North Carolina Self Insured Conference, Wilmington, North Carolina

***Lecture on “Subrogation: Who Else Owns This Loss?”***

**January 8, 2004:** Charlotte Claims Association Monthly Meeting, Charlotte, North Carolina

**February 17, 2004:** Columbia Claims Association Monthly Meeting, Columbia, South Carolina

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**COURSES, SEMINARS AND LECTURES PRESENTED (Continued)**


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*Three-hour seminar, approved by the North Carolina Department of Insurance, Continuing Education Agency Services Division, entitled "Who Else Owns This Loss? How to Pursue or Defend Subrogation Claims for Property Damage Losses"*

**September 16, 1998:** Charlotte Claims Association, Charlotte, North Carolina  
**October 20, 1998:** The Warren Group, Columbia, South Carolina  
**November 20, 1998:** CGU Insurance, Greenville, South Carolina

*Three-hour seminar, approved by the North Carolina Department of Insurance, Continuing Education Agency Services Division, entitled "Who Else Owns This Loss? How to Pursue or Defend Subrogation Claims for Property Damage Losses"*

**March 24, 1999:** Harleysville Mutual Insurance Company, Charlotte, North Carolina  
**April 9, 1999:** South Carolina Claims Association Spring Meeting, Myrtle Beach, SC  
**October 7, 1999:** South Carolina Claims Managers' Fall Meeting, Myrtle Beach, SC  
**October 27, 1999:** ARI and InStaff Seminar, Charlotte, North Carolina  
**September 19-20, 2000:** Zurich Insurance Company, Charlotte, North Carolina  
**October 3, 2000:** Companion Property & Casualty, Columbia, South Carolina  
**June 20 & 21, 2001:** Liberty Mutual Insurance Group, Charlotte, North Carolina  
**February 28, 2002:** Travelers Insurance, Charlotte, North Carolina  
**April 23, 2002:** Sedgwick, Columbia, South Carolina  
**April 26, 2002:** North Carolina State Claims Conference, Charlotte, North Carolina  
**May 21, 2002:** Zurich Insurance Company, Charlotte, North Carolina  
**May 28, 2003:** The Hartford, Charlotte, North Carolina  
**November 17, 2003:** Crawford and Company, Charlotte, North Carolina  
**October 4, 2006:** St. Paul Travelers, Columbia, South Carolina  
**May 2, 2013:** Travelers Insurance, Charlotte, North Carolina

*Three-hour seminar, approved by the North Carolina Department of Insurance, Continuing Education Agency Services Division, entitled "Investigating Unintentional Machine Guarding Injuries: Questions to Ask and Pictures to Take"*

**April 14, 2000:** South Carolina Claims Association, Myrtle Beach, South Carolina  
**May 2, 2000:** Chubb Group of Insurance, Atlanta, Georgia  
**September 19-20, 2000:** Zurich Insurance Company, Charlotte, North Carolina.  
**October 3, 2000:** Companion Property & Casualty, Columbia, South Carolina  
**June 20-21, 2001:** Liberty Mutual Insurance Group, Charlotte, North Carolina  
**February 5, 2002:** AIG, Charlotte, North Carolina  
**February 28, 2002:** Travelers Insurance, Charlotte, North Carolina  
**March 21, 2002:** Sedgwick, Columbia, South Carolina  
**March 29, 2002:** Rysco, Charlotte, North Carolina  
**May 28, 2003:** The Hartford, Charlotte, North Carolina  
**November 17, 2003:** Crawford and Company, Charlotte, North Carolina

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**COURSES, SEMINARS AND LECTURES PRESENTED (Continued)**

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Large Loss and Complex Claims Investigation Seminar, The Warren Group, Irmo, South Carolina presented "*Low Temperature Ignition of Wood*"

- **August 27, 2009**
- **October 22, 2009**
- **March 18, 2010**
- **May 20, 2010**

**October 11, 2010**

Lecture on "*Who Else Owns This Fire Loss: CSST Fires and Low Temperature Ignition of Wood*" presented to Southeastern Claim Executives Association Fall Workshop

**October 21-22, 2011**

Presentation at the Inner Circle of Investigators 2011 Educational Conference, Conroe, Texas

- *Interlocked Guards versus Lockout/Tag-out: Design Defect, not Operator Error as a Cause of the Worker's Injury*

**December 14, 2011**

"*Analysis of a Double Fatality Fire Allegedly Caused by a Portable Electric Heater*" was presented at the Investigating Fires and Explosions: How to Avoid Getting Burned by a Bad Fire Investigation Seminar, The Warren Group, Irmo, South Carolina

**February 15, 2012**

"*From Interlocked Guards to Failure to Warn, Critical Components to Consider When Proving Your Worker's Compensation Subrogation Products Liability Case*" Webinar presented by the National Association of Subrogation Professionals

**November 13, 2012**

"*Legal and Engineering Aspects of Machinery and Equipment in Workers' Compensation Cases*" presented at the National Association of Subrogation Professionals, 2012 Cirque Du Subro Annual Conference

**September 26, 2014**

Presentation at the Inner Circle of Investigators 2014 Educational Conference, Jackson Hole, Wyoming

- *Using Risk Assessment to Determine if a Machine has Tolerable Risk or if it is Unreasonably Dangerous*

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## PUBLICATIONS

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*"Design Analysis of a Drilled Geothermal Well,"* M.S. Thesis, Virginia Polytechnic Institute & State University, August 1974

*"Design of an Insulated Coaxial Pipe Assembly for a Drilled Geothermal Well,"* ASME Paper No. 75-HT-56, AICHE-ASME Heat Transfer Conference, San Francisco, California, August 11-13, 1975, with R. L. Whitelaw

*"The Prediction of Polymer Wear Using Polymer Mechanical Properties and Surface Characterization Parameters,"* Ph.D. Dissertation, Virginia Polytechnic Institute & State University, August 1976

*"The Effect of Surface Finish on the Friction and Wear of PCTFE Plastic on Mild Steel,"* SME Paper No. IQ75-125, 1975, with N. S. Eiss, Jr.

*"An Application of Neutron Activation Analysis to the Measurement of the Wear of Polymers,"* Wear, 38 (1976) 125-139, with N.S. Eiss, Jr. and S.D. Doolittle

*"Current Advances in Surface Characterization,"* ASME paper 76-DET-88 presented at the Design Engineering Technical Conference, Montreal, Quebec, Canada, September 26-29, 1976, with N.S. Eiss, Jr.

*"Depth of Penetration as a Predictor of the Wear of Polymers on Hard, Rough Surfaces,"* Transactions of ASME, Journal of Lubrication Technology, Vol. 100, No.1, January 1978, with N.S. Eiss, Jr.

*"Design of an Experimental Incinerator for Alpha Waste,"* DP-1521, issued by E.I. Du Pont de Menours and Company, Inc. Savannah River Laboratory, Aiken, S.C. 29801 for U.S. Department of Energy, August 1979

*"Design of a Semi-Automatic Drilling Machine for the Outer Wing Beam of a C-130 Aircraft,"* ASME paper 88-WA/DE-11 presented at Winter Annual Meeting, Chicago, Illinois, December 2, 1988, with Donald L. Ellis

*"Identification of a Products Liability Claim,"* Materials for Department of Insurance, State of North Carolina, Approved Continuing Education Course No. 03489, Provider No. 0445, Date Approved: September 29, 1995, Orlando, Florida, with Woodrow M. Poplin

*"Dangerous Nip Points Can Be Guarded,"* ASSE Newsletter, December 1997.

*"Machine Injuries: Investigating the Cause,"* Safety Design Analysis Newsletter, October 1997.

*"Investigation Saves Money on Tank Explosion Claim,"* The Analyst Newsletter, July 1998.

*"How to Ask for Help When you Don't Know What You Need,"* The Analyst Newsletter, August 1998.

*"Quick Action Reduces Hurricane Expense,"* The Analyst Newsletter, November 1998.

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## PUBLICATIONS (Continued)

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*“Code Violations Result in Senseless Deaths,”* co-authored with Mr. Jerry Tindal, The Analyst Newsletter, February 1999

*“Investigation Saves Money on Tank Explosion Claim,”* Southern Loss Association, Inc. Newsletter, June 1999

*“Making a “Reel” Difference,”* The Analyst Newsletter, June 2000

*“Who Else Owns This Fire Loss?”* The Analyst Newsletter, December 2000

*“Who Else Owns This Fire Loss?”* 2001 Subrogator Volume II, Issue I, publication by the National Association of Subrogation Professionals

*“Sulzer Orthopedics Hip Implant Recall: An Analysis of the Defect,”* presented at the American Trial Lawyers Association, Litigation Update: Pharmaceuticals and Medical Devices, Scottsdale, Arizona, June 1, 2001

*“Who Else Owns This Workers’ Compensation Loss? Safety Through Design As the Basis for Subrogation,”* 2001 Subrogator Volume II, Issue II, publication by the National Association of Subrogation Professionals

*“Forensic Engineering Analysis of Low Temperature Ignition of Wood,”* co-authored with Jerry R. Tindal, 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 Jerry R. Tindal, P.E., CFEI and John B. Holecek, P.E., CFEI, proceedings of the International Symposium on Fire Investigation Science and Technology, September 2010