
John P. Cavaroc, Ph.D. P.E., CFEI

Engineer: Electrical

Control Systems

Electrical Equipment Analysis

Electrocution & Shock

Electromechanical Failure Analysis & Modeling

Fire and Explosion Analysis: Origin and Cause

Industrial Accidents, Electrical Related

Products Liability, Electrical Equipment and Devices

EDUCATION

- 2007** **Ph.D. Electrical Engineering**
North Carolina State University, Raleigh, North Carolina
- 1998** **M.S., Electrical Engineering**
North Carolina State University, Raleigh, North Carolina
- 1996** **B.S. Electrical Engineering**
Louisiana Tech University, Ruston, Louisiana

EXPERIENCE

- October 2008 to Present** Consulting Electrical Engineer, The Warren Group, Inc., Columbia, South Carolina.
- Determine the origin and cause of fires and explosions, the cause of personal injury, and the cause of property damage.
 - Analyze electrical equipment and devices, wiring, control systems, electrical connections, electrical service and power quality events, electromechanical systems, and electrical installations code compliance.
 - Analyze electrocution, electric shock, lightning strike, and arc flash events.
 - Perform electrical and electronic equipment and device testing
- 2007 - 2008** Consultant, Self Employed, Pittsboro, North Carolina
- Determined the failure mechanism of a mechanical failure involving a 9,875 HP induction motor and driven equipment. Used field data from induction motors, driven equipment, and plant electrical diagram to create a mathematical model of the system. Performed a parameter estimation and simulation of the system in order show the sequence of events and torques generated before, during, and after the failure.
 - Established communication between novel implantable medical sensor device and PC using USB and high speed networking protocols. Troubleshoot and repaired problems with implant circuit. Collaborated with engineers and medical doctors during surgery about implanted circuit data acquisition methods. Designed user interface for real time data acquisition.
 - Collaborated on the design of a portable data acquisition device for medical applications. Performed design, schematic capture, simulation, PCB layout, testing, troubleshooting, and repair of prototype circuits.
 - Created user interface and established communication between multiple instruments and PC in a test stand for novel optical device characterization.

EXPERIENCE, Continued

2004 - 2007

Group Leader/Research Engineer, Microcell Corporation,
Raleigh, North Carolina

- Directed a multi-disciplined team of engineers, technicians, and production personnel in the development and production of novel PEM hydrogen fuel cell modules and systems.
- Installed extrusion line exhaust system; shop lighting and HVAC system; conduit and feeders for electrical service to new addition; hydrogen detection system and alarm; hydrogen, air, and nitrogen distribution system; data and communication circuits; electrical infrastructure for extrusion line; and replaced damaged main breaker in distribution panel.
- Troubleshoot and repaired electronic loads, ultrasonic cleaners, ultrasonic welder, homogenizers, air compressor, custom lab equipment, and extrusion line equipment.
- Collaborated with electric utility on integration of backup power and distributed generation systems in substations, telecommunications facilities, and residences.
- Designed and constructed prototype hydrogen fuel cell power systems for stand alone and telecommunication backup power applications.
- Designed and constructed novel electromechanical automatic production equipment, replacing labor intensive production methods and causing a dramatic increase in production volume.
- Designed and constructed 1kW hollow fiber fuel cell module, delivered prototype to major Japanese automotive manufacturer and trained high level engineers on module operation.
- Solved fundamental problems in faulty manufacturing methods that caused early fuel cell failure and prevented large scale production and long term testing.
- Designed and constructed custom test stands for fuel cell testing, including data acquisition, online resistance measurement, gas flow management, thermal management, power management, remote access, and emergency shut down.
- Defined production methods, hired and trained production technicians and supervisors.
- Hired and trained research and development engineers and technicians.

EXPERIENCE, Continued

2000 - 2004

Consultant/Principle Investigator, Advanced Energy Corporation,
Raleigh, North Carolina

- Organized and directed electric utility driven study on induction motor ride-through performance during power supply disturbances.
- Presented data and ideas to industry, resulting in a commercial smart ride-through controller for induction motors.
- Designed and constructed custom portable 600VAC, 400A solid state point-on-wave interruption/sag generator.
- Conducted sag and interruption tests on industrial equipment located in the field.
- Designed and constructed data acquisition system capable of simultaneously sampling three phase voltage, three phase current, shaft torque, and shaft speed at 1MHz.
- Automated and synchronized interruption / sag generator with data acquisition system, allowing multiple tests without user input.
- Developed mathematical model and parameter estimation method for motor/load system.
- Conducted comprehensive voltage interruption tests on 10 HP, 50 HP, and 75 HP motors.
- Assisted with IEEE 112B motor efficiency tests on fractional HP motors up to 200 HP.
- Troubleshoot and repaired 600 VAC, 200 A three phase variacs, motor control circuits, and motor lab test equipment.

1996 - 2000

Research Assistant /Teaching Assistant, North Carolina State University,
Raleigh, North Carolina

- Conducted field trials of contactor ride through device.
- Acquired data for line impedance modeling.
- Conducted power electronic device characterization tests.
- Measured and characterized contact impedance of pressure contacts on prototype modules for the Power Electronic Building Block project.
- Troubleshoot and repaired power amplifier.
- Coordinated Circuits I lab. Trained teaching assistants, developed course material, managed 16 lab sections, and instructed labs.
- Periodically substituted as an instructor for graduate Power Electronics course, undergraduate Power Electronics course, Electromagnetic Fields course, Principles of Electrical Engineering course, Circuits I course, and Circuits II lab.

EXPERIENCE, Continued

**1999-Present
(Part Time)**

President, Wire Nuts, Inc., Chapin, South Carolina

- Wire new houses, re-wire existing houses, commercial fit-ups, provide outdoor lighting circuits, provide power to shops/garages.
- Troubleshoot and repair lighting, receptacle, and GFCI circuits, HVAC systems, septic systems, fire alarm systems, and lightning damaged equipment.
- Inspect electrical systems.

**2000 - 2001
(Part Time)**

Emergency Medical Technician, Garner EMS, Garner, North Carolina

- Provided emergency medical service for events at Walnut Creek Amphitheater.

**1996 - 2002
(Volunteer)**

Assistant Chief/Board Member/Captain /Engineer/Fire Fighter, Garner Volunteer Fire Department, Garner, North Carolina

- Assumed command on fire, rescue, HAZMAT, and EMS calls.
- Conducted fire suppression, search and rescue, ventilation, rescue tool operation, pumper and tanker operations on fire and rescue calls.
- Conducted emergency medical care on EMS calls.
- Organized and directed emergency medical First Responder program at Station 1.
- Provided interviews and information to the news media.
- Collaborated with Wake County Training Officers and Wake County Fire Investigators.
- Assessed applicants for promotion during Wake County Officer Assessment Centers.
- Managed annual budget.

**1992 - 1996
(Volunteer)**

Assistant Chief/Maintenance Supervisor/Engineer/Firefighter/Charter Member, Lincoln Parish Fire Protection District No. 1, Vienna, Louisiana

- Assumed command on fire calls.
- Conducted fire suppression, search and rescue, ventilation, pumper, tanker and water shuttle operations on fire calls.
- Organized and conducted training exercises.
- Installed and maintained mechanical and electrical equipment in 20 fire stations.
- Maintained fire apparatus and equipment.
- Retrofitted new vehicles for emergency service use.
- Rebuilt 20 defective 2500 gallon fiberglass tanker water tanks.

EXPERIENCE, Continued

1991 - 1995
(Summers)

Engineering Aid / Electrician's Apprentice, SECO Industries, Metairie, Louisiana

Locations and projects included:

- McDermott Fabrication Yard, Amelia, Louisiana ,Shell "Mars" Tension Leg Platform, Exxon "Mobile Bay Project", Freeport MacMoran "Main Pass Sulphur Mine"
Installed cable tray, high voltage cable, control cable, feeder cable, conduit, wires, process control instruments, stainless steel tubing, and tubing tray for process control and fire suppression systems. Updated tracking files, improved tracking software, updated drawings, processed data for progress reports, and performed correct mounting and installation Quality Assurance inspection of process control instruments.
- Amerada Hess Bulk Oil Storage Facility, Marrero, Louisiana.
Troubleshoot and corrected 480V lighting and motor starter problems, rebuilt 2400V oil submersed motor starters following lightning damage.
- Bender Ship Yard, Braithwaite, Louisiana "The Rouge" and "The Treasure Chest" riverboats casinos
Terminated controls for ship board fire protection system and Z, drive system, troubleshoot and corrected grounding problems identified by US Coast Guard, installed feeder and control cables.
- Louisiana Offshore Oil Port, Galliano, Louisiana
Constructed and installed new control cable termination panels for 6000 HP. 13.8KV motors, replaced lighting ballasts.
- Aker Gulf Marine Fabrication Yard, Ingleside, Texas, Dresser Rand "Portable Turbo Gas Compressor Station Project"
Installed stainless steel tubing and instruments for process monitoring, control, and fire protection systems, collaborated with welders on the installation of electrical equipment and instruments.
- Chevron Oronite Chemical Plant, Belle Chasse, Louisiana
Assisted with installation of conduit, wire, and 240V receptacle outlets on railroad loading dock.

ADDITIONAL SKILLS

- Analog, digital, electrical, electro; mechanical, and mechanical design, modeling, and simulation
- Schematic capture, Printed Circuit Board (PCB) layout
- Excellent troubleshooting skills
- Knowledge and understanding of the National Electric Code (NEC)
- Industrial, commercial, and residential electrical and instrumentation installation
- Computer Numerical Control (CNC) and manual machining of metal, plastics, composite materials, and wood
- Ultrasonic metal welding, brazing, soldering
- Experience using urethanes, epoxies, and silicones as adhesives, sealants, molds, encapsulants, and structural members.
- Software: Labview, TurboCAD/CAM, Visio, Mentor Graphics PADS and DxDesigner, Circad, SPICE, IGOR, Visual Basic, Matlab/SIMULINK, Mathcad, COMSOL

PROFESSIONAL ORGANIZATIONS

National Fire Protection Association (NFPA)
Institute of Electrical and Electronics Engineers (IEEE)
National Association of Fire Investigators (NAFI)
International Association of Arson Investigators (IAAI)
National Safety Council (Company Membership)

PATENTS

“Power supply systems and methods that can enable an electromagnetic device to ride-through variations in a supply voltage,” US Patent 6,847,515, January 25, 2005.

Multiple patents pending on hydrogen fuel cell assemblies and assembly methods.

REGISTRATIONS

Professional Engineer, Alabama (#31765)
Professional Engineer, Georgia (#035574)
Professional Engineer, Mississippi (#20161)
Professional Engineer, North Carolina (#029412)
Professional Engineer, South Carolina (#28866)
Electrical Contractor, North Carolina (#23164, I)
Certified Fire and Explosion Investigator (#13845, 6995)
The National Council of Examiners for Engineering and Surveying (NCEES) (#31492)

CONTINUING EDUCATION

Detailed Electrical Code Workshop

February 6-7, 2010, JCR Productions, Inc., 24 hours, Asheville, NC

Bonding & Grounding Electrical Code Workshop

February 5, 2010, JCR Productions, Inc., 8 hours, Asheville, NC

Expert Report Writing

January 20, 2010, International Association of Arson Investigators, Inc., 8 hours, Charlotte, NC

HAZWOPER Site Supervisor and Manager Certification

May 26, 2009, OSHA Hazardous Waste Operations and Emergency Response Training
Chicago Safety Institute, 8 hours, Chicago, IL

HAZWOPER Certification

May 26, 2009, OSHA Hazardous Waste Operations and Emergency Response Training
Chicago Safety Institute, 40 hours, Chicago, IL

Asbestos Awareness Course

May 22, 2009, National Environmental Trainers Inc., Online Curriculum, 2 hours, Irmo, SC

Electrical License Renewal Course

February 7, 2009, Asheville-Buncombe Technical Community College, 8 hours, Candler, NC

Advanced Fire, Arson, and Explosion Investigation Training Program

August 4-6, 2008, National Association of Fire Investigators, 24 hours, Sarasota, FL

Detailed Electrical Code Change Workshop

January 25, 2008, JCR Productions, Inc., 8 hours, Raleigh, NC

How to be a Successful Consultant and Get in on a Booming Market

November 10, 2007, Institute of Electrical and Electronics Engineers, 6 hours, Research Triangle Park, NC

National Electric Code Continuing Education Correspondence Course

February 20, 2007, JCR Productions, Inc., 8 hours, Online curriculum
December 8, 2005, JCR Productions, Inc., 8 hours, Online curriculum

Detailed National Electric Code Workshop

August 3 & 4, 2002, JCR Productions, Inc., 24 hours, Durham, NC
March 6 & 7, 1999, JCR Productions, Inc., 18 hours, Raleigh, NC

Current with the National Electric Code

July 16, 2001, JR Sears, 6 hours, Raleigh, NC
March 18, 2000, JR Sears, 6 hours, Raleigh, NC

CONTINUING EDUCATION, Continued

Structural Firefighting Operations

April 24, 2001, Wake Technical Community College, 3 hours, Raleigh, NC
 May 20, 2000, Wake Technical Community College, 8 hours, Raleigh, NC
 January 15 & 16, 2000, Wake Technical Community College, 16 hours, Raleigh, NC
 August 11, 1999, Wake Technical Community College, 4 hours, Raleigh, NC
 May 13, 1997, Garner Volunteer Fire Department, 3 hours, Garner, NC
 April 26, 1997, Garner Volunteer Fire Department, 6 hours, Garner, NC
 November 9 & 10, 1996, Wake Technical Community College, 16 hours, Raleigh, NC
 October 29, 1996, Garner Volunteer Fire Department, 4 hours, Garner, NC
 November 28, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
 April 18, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
 March 19, 1994, Lincoln Parish Fire Protection District No. 1, 7.5 hours, Vienna, LA
 March 8, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
 January 25, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
 May 1-2, 1993 Louisiana State University Firemen Training Program, 4 hours, Vienna, LA
 March 14-15, 1993 Louisiana State University Firemen Training Program, 12 hours, Baton Rouge, LA

Emergency Medical Technician

January 30 2001, Wake Technical Community College, 3 hours, Raleigh, NC
 September 26, 2000, Wake Technical Community College, 3 hours, Raleigh, NC
 June 27, 2000, Wake Technical Community College, 3 hours, Raleigh, NC
 May 30, 2000, Wake Technical Community College, 3 hours, Raleigh, NC
 March 28, 2000, Wake Technical Community College, 3 hours, Raleigh, NC
 November 30, 1999, Wake Technical Community College, 3 hours, Raleigh, NC
 November 10, 1999, Wake Technical Community College, 3 hours, Raleigh, NC
 October 13, 1999, Wake Technical Community College, 3 hours, Raleigh, NC
 August 31, 1999, Wake Technical Community College, 3 hours, Raleigh, NC
 June 29, 1999, Wake Technical Community College, 3 hours, Raleigh, NC
 May 12, 1999, Wake Technical Community College, 3 hours, Raleigh, NC
 February 10, 1999, Wake Technical Community College, 3 hours, Raleigh, NC
 January 13, 1999, Wake Technical Community College, 3 hours, Raleigh, NC
 July 22 - October 26, 1998, Wake Technical Community College, 126 hours, Raleigh, NC

Incident Command System

January 23 & 30, 2001, Wake Technical Community College, 6 hours, Raleigh, NC
 December 8 & 22, 1998, Wake Technical Community College, 6 hours, Raleigh, NC
 December 8 & 11, 1997, Wake Technical Community College, 12 hours, Raleigh, NC
 February 7, 1997, Wake Technical Community College, 8 hours, Raleigh, NC
 January 23, 1996, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
 December 21, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

Hazardous Materials Training

January 9 & 16, 2001, Wake Technical Community College, 6 hours, Raleigh, NC
 March 1 - 16, 1997, Wake Technical Community College, 32 hours, Raleigh, NC
 January 14, 1996, Wake Technical Community College, 3 hours, Raleigh, NC
 January 7, 1996, Wake Technical Community College, 3 hours, Raleigh, NC
 March 7, 1995, Louisiana State University Firemen Training Program, 4 hours, Vienna, LA
 April 23, 1994, Louisiana State University Firemen Training Program, 4 hours, Vienna, LA

CONTINUING EDUCATION, Continued

Fire Hose Handling, Fire Streams, Fire Appliances

November 15 & 24, 1999, Wake Technical Community College, 12 hours, Raleigh, NC
October 22, 1996, Garner Volunteer Fire Department, 2.5 hours, Garner, NC
May 20, 1996, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
May 7, 1996, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
May 9, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
May 2, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
March 21, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
January 11, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

Passenger Train Emergency Response

January 16, 1999, Amtrak, 8 hours, Garner NC

Sprinkler Systems

February 2 to March 10, 1998, Wake Technical Community College, 12 hours, Raleigh, NC

Rescue Tool Operation / Vehicle Extrication

June 24, 1997, Garner Volunteer Fire Department, 2.5 hours, Garner, NC
February 11, 1997, Garner Volunteer Fire Department, 2 hours, Garner, NC

Pumper Operations

June 14, 1997, Garner Volunteer Fire Department, 1.5 hours, Garner, NC
April 2, 1996, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
October 24, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
October 3, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
February 7, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
January 11, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
December 6, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
November 8, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
April 12, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
September 10, 1993, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

Foam Application

June 10 & 11, 1997, Garner Volunteer Fire Department, 5 hours, Garner, NC
February 4, 1997, Garner Volunteer Fire Department, 2.5 hours, Garner, NC

Military Aircraft

April 19, 1997, Garner Volunteer Fire Department, 2 hours, Garner, NC

Municipal Water Supplies and Codes

April 8, 1997, Garner Volunteer Fire Department, 2.5 hours, Garner, NC

Personal Protective Equipment

March 11, 1997, Wake Technical Community College, 4 hours, Raleigh, NC
March 4, 1997, Wake Technical Community College, 4 hours, Raleigh, NC
February 25, 1997, Wake Technical Community College, 4 hours, Raleigh, NC

CONTINUING EDUCATION, Continued

Fire Alarms and Communications

December 3, 1996, Garner Volunteer Fire Department, 1 hr., Garner, NC
November 5 - 7, 1996, Garner Volunteer Fire Department, 9 hours, Garner, NC
April 19, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

Essentials of Firefighting

October 26 - 27, 1996, Wake Technical Community College, 16 hours, Raleigh, NC
April 22, 1994, Fire and Emergency Training Network Online Curriculum, 1 hour, Vienna, LA
March 8, 1994, Fire and Emergency Training Network Online Curriculum, 2 hours, Vienna, LA
March 7, 1994, Fire and Emergency Training Network Online Curriculum, 1 hour, Vienna, LA
February 2, 1994, Fire and Emergency Training Network Online Curriculum, 4 hours, Vienna, LA

Ladders, Ventilation, Forcible Entry

September 24, 1996, Garner Volunteer Fire Department, 1.5 hours, Garner, NC
May 21, 1996, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
January 20, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
October 24, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

CPR for Certification

July 16, 1996, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
January 24, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

Tanker Operations

June 18, 1996, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
June 4, 1996, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
September 22, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
September 15, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
September 13, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
September 8, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
August 30, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

Self Contained Breathing Apparatus (SCBA), Search and Rescue

May 18, 1996, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
February 13, 1996, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
February 6, 1996, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
January 13, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
March 14, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
October 11 & 14, 1993 Louisiana State University Firemen Training, 12 hours, Vienna, LA
September 23, 1993 Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
March 22 & 25, 1993 Louisiana State University Firemen Training Program, 12 hours, Vienna, LA

Principles of Combustion

March 19, 1996, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
January 12, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

Officer Training

January 18, 1996, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

CONTINUING EDUCATION, Continued

Fire Department Organization/Administration

January 9, 1996, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
 October 11, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
 September 27, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

Arson Investigation

Fall 1995, Louisiana State University, Eunice, 3 Semester Hours, Vienna, LA

Property Insurance Association of Louisiana Grading Schedule

November 7, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
 September 19, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
 September 6, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

Vehicle Fire Training

November 4, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
 January 28, 1995, Lincoln Parish Fire Protection District No. 1, 4 hours, Vienna, LA
 March 17, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

Ladder Truck Operations

August 26, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
 October 26, 1993, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

Fire Cause and Origin Determination

February 28, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
 February 21, 1995, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA
 February 22, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

Fire Extinguisher Training

March 22, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

Salvage and Overhaul

February 7, 1994, Lincoln Parish Fire Protection District No. 1, 3 hours, Vienna, LA

Firefighter Safety and Survival

October 7, 1993, Louisiana State University Firemen Training Program/National Fire Academy,
 12 hours, Choudrant, LA

COURSES, SEMINARS AND LECTURES PRESENTED

“Electrical Fire Causes” presented at the Large Loss and Complex Claims Investigations Seminar, The Warren Group, Irmo, South Carolina

- August 27, 2009
- October 22, 2009
- March 18, 2010

PUBLICATIONS

J. Cavaroc “Assessment of Stresses on Induction Motors Due to Momentary Service Interruptions” PhD Dissertation, North Carolina State University, August 2007.

M. Baran, J. Cavaroc, A. Kelley, S. Peele, Z. Kellum “Stresses on Induction Motors Due to Momentary Service Interruptions” I&CPS Technical Conference, 2006, IEEE 30,05 April 2006. pp. 1, 8.

M. Baran, A. Kelley, S. Peele, J. Cavaroc “Zero Voltage Ride Through on Induction Motors” Power Systems World Conference 2002

A. Kelley, J. Cavaroc, J. Ledford, L. Vassalli, “Voltage Regulator for Contactor Ride Through” IEEE Transactions on Industry Applications, Vol. 36, No. 2, March/April 2000. pp. 697, 704.

A. Kelley, M. Harris, J. Cavaroc, M. Jones, R. Linkous, D. Hartzell, D. Darch, “Bus connector for Coordinated Interconnect: Laboratory Measurement and Finite Element Simulation” APEC 1999, Vol. 1, 14, 8, March. pp. 325 & 331.