

EDUCATION

- 2007 **Master of Science in Mechanical Engineering**
North Carolina State University, Raleigh, North Carolina
- 1989 **Bachelor Science in Aerospace Engineering**
North Carolina State University, Raleigh, North Carolina
- 1983 **Associates in Applied Science, Aircraft Maintenance Technology**
Spartan School of Aeronautics, Tulsa, Oklahoma

EXPERIENCE

- November 2007 **Engineering Design and Testing Corp.**
to Present **Columbia, South Carolina**

Consulting Engineer
Mechanical systems analysis
- March 1999 **Unison Engine Components, A Subsidiary of GE Aircraft Engines**
to November 2007 **(Previously Smiths Aerospace and NCI, Inc.)**
Asheville, North Carolina

Lead Senior Engineer, Special Processes
Special Processes, automated and CNC shot peening, CNC abrasive waterjet machining, abrasive flow machining, abrasive wet blast, parts cleaning, fluorescent dye penetrant testing, manual and CNC deburring, broaching, gear hobbing, electrochemical machining.
- June 1997 **Eaton Corporation, Fluid Division (Presently Borg-Warner Cooling Systems)**
to March 1999 **Fletcher, North Carolina**

Manufacturing Engineer
Viscous fan drive parts machining and assembly lines.
- October 1992 **Blue Ridge Metals Corporation**
to May 1997 **Fletcher, North Carolina**

Maintenance and Manufacturing Engineer
Steel wire pickling, drawing, annealing, machining, cold forming and parts machining processes.
- September 1992 **Maltry's Repair Service**
to June 2005 **Asheville, North Carolina**
Automotive and Truck Mechanic
Part time position in family business utilized to maintain exposure and mechanical repair skills.

-
- February 1990
to September 1992 **First Lieutenant, US Air Force**
Williams AFB, Phoenix, Arizona/ Offutt AFB, Omaha, Nebraska
Scientific Analyst
Flight Training and Missile Trajectory Analysis.
- February 1984
to January 1990 **Asheville and Raleigh Flying Services**
Asheville and Raleigh, North Carolina
Federal Aviation Administration (FAA) licensed Airframe and Powerplant (A&P)
Aircraft Maintenance Technician (AMT).
- March 1982
to October 1983 **Cameron Tempering**
Tulsa, Oklahoma
Manufacturing Technician
Glass cutting, finishing, and tempering. Machine and truck loading equipment operator.
- January 1980
to December 1986 **Staff Sergeant, Infantry, US Army Reserves**
Fort Benning, Georgia/ Fort Jackson, South Carolina/ Fort Sill, Oklahoma/
Fort Leonard Wood, Missouri
Basic Training Drill Instructor
- August 1977
to June 1981 **Mitchell Distributing Company**
Asheville, North Carolina
Intern (Unpaid)
Working as an apprentice to shop and field mechanics for heavy equipment servicing and repairs.

EXPERIENCE

Consulting (non-comprehensive listing)

- Fracture and material analysis
- Lightning damage assessment
- Machinery and equipment scope of damages
- Mechanical analysis of aircraft, land vehicles, equipment, machinery and processes, pressure vessels, piping, plumbing, heating ventilation and air conditioning (HVAC)
- Vehicle crash investigation and reconstruction
- Vehicle, structure and equipment fires, origin and cause
- Project management, work scope, and responsible party analysis

Design and Construction (non-comprehensive listing)

- Automated shot peen, automated turning lathe, parts cleaning and assembly line machines and their components
- Machine foundations, production area layouts
- Machining center, assembly line and special process tooling, part handling, part holding and reusable masking fixtures
- Whole part manufacturing processes, from raw stock to finished part or assembly

Software, Machine and Vehicle Operation (non-comprehensive listing)

- ANSYS Finite Element Analysis (FEA)
- Automated, CNC, and robotic machining centers
- Automobile performance driving
- Cold headers and presses
- Forklifts and man lifts
- Jet and reciprocating engine aircraft (ground and air operations)
- Programmable Logic Controllers (PLC) programming
- Trucks and heavy equipment
- Unigraphics 3D Modeling (and others) Computer Aided Drafting (CAD)

Manufactured Parts (non-comprehensive listing)

- Aircraft jet and land-based turbine engine components, to include compressor and turbine air seals, blade retainers, shafts, cooling plates, disks, combustor plates, spacers, and fuel nozzle sections
- Automobile suspension supports, steering gears, bearing components, and threaded plugs
- Injection molded fans for heavy trucks and automotive applications
- Intercontinental ballistic and ground-to-air missile components
- Viscous fan drive components and assemblies

Maintenance (non-comprehensive listing)

- Air compressors
- Automobile and truck troubleshooting and repairs to include brakes, drive train, engine, electrical, engine coolant and HVAC systems
- General, corporate and commercial aviation aircraft troubleshooting and repairs to include all airframe and powerplant systems and components
- Heavy equipment dump trucks, excavators, bulldozers, graders, front end loaders, air compressors, backhoe loaders
- Production equipment and machine installation, compressed air, water and electrical supply and distribution systems
- Steel sulfuric acid pickling, wire peeling, wire drawing, heat treating, cold forming, automated and CNC parts machining, and parts cleaning processes and equipment

Metals Testing (non-comprehensive listing)

- Fluorescent dye penetrant; ultrasonic flaw detection; x-ray diffraction; metallographic sampling, inspection and analysis; spark testing; hardness testing; and tensile testing for low carbon steels, alloy steels, tool steels, aircraft grade aluminum, titanium alloys and nickel chromium superalloys

Teaching and Instruction (partial listing)

- Accident Reconstruction
- Brake System Inspections
- Cold forming, wire and part machining operator training

-
- Combat and survival skills
 - Drill and ceremonies
 - Event Data Recorders (EDRs)
 - Firearm handling, maintenance and operation
 - Marksmanship
 - Physical readiness
 - Shot peening and abrasive flow machining operator training and certification
 - Spontaneous combustion, brass fitting defects detection, hail damage detection, fire origin and cause, brake system inspection

REGISTRATIONS and CERTIFICATIONS

Registered Professional Engineer in Alabama (#33915-E)

Registered Professional Engineer in Florida (#83967)

Registered Professional Engineer in Georgia (#PE033309)

Registered Professional Engineer in Mississippi (#30857)

Registered Professional Engineer in North Carolina (#032093)

Registered Professional Engineer in Pennsylvania (#PE090135)

Registered Professional Engineer in South Carolina (#26289)

Registered Professional Engineer in Tennessee (#00116818)

Registered Professional Engineer in Texas (#121189)

Registered Professional Engineer in Virginia (#0402049099)

Registered Professional Engineer in West Virginia (#25238)

Aircraft Accident Investigator

FAA Licensed Airframe and Powerplant Mechanic (Certificate # 3640029)

IPTM Certified Advanced Traffic Crash Investigator

IPTM Certified Traffic Crash Reconstructionist

NAFI Certified Fire and Explosion Investigator (CFEI #13585-7017)

National Council of Examiners for Engineering and Surveying, Model Law Engineer (#16-896-16)

PUBLICATIONS

“Case Study in Sensitization of Sensitization-Resistant Stainless Steels in Welded Joints”, The Journal of Failure Analysis and Prevention, November 12, 2024

“When Vehicles Appear to Function or Perform in Unexpected Ways”, The Stress Point Blog, March, 2022

“Is That Truck Driver Safe?”, The Stress Point Blog, April, 2021

“Wheel Separation Metallurgical Analysis”, The Stress Point Magazine, December 2020

“Turbines and Their Applications (Part 1)”, The Stress Point Blog, May, 2020

“Aircraft Accident Investigations: Purpose, Intent, and Methods”, The Stress Point, a periodical of EDT Forensic Engineering and Consulting, June 2018, Volume 31, Issue 1

"Airplane Crash Analysis", The Stress Point Blog, April 2018

"Characterization of Copper Tubing and Pipe Ruptures", The Materials Science and Technology (MS&T) Conference Proceedings, October, 2018

INVITED LECTURES, TUTORIALS, AND PRESENTATIONS

"Human Factors in Accident Reconstruction", EDT Seminar, February 2024 (Presenter)

"Sensitization of Sensitization-Resistant Stainless Steel (in welding)", International Materials Applications and Technologies (IMAT) World Conference, October 2024 (Presenter)

"Heavy Vehicle Laboratory Analysis", National Truck and Heavy Equipment Claims Counsel (NTHECC) Fall Meeting, October 2023 (Presenter)

"Fire Investigation Processes – Back to Basics", EDT Engineers Annual Meeting, February 2023

"Characterization of Copper Tubing and Pipe Ruptures", Materials Science & Technology, October 2018 (Presenter)

"Digital Forensics of Heavy Vehicle Event Data Recorders", EDT Seminar, February 2018 (Presenter)

"A Review of Typical Motorcycle – Vehicle Collision Scenarios", EDT Seminar, February 2017 (Presenter)

"Incomplete Melding (dealloying) of Leaded Brass", Materials Science & Technology, October 2013 (Presenter)

"Brass Fitting Water Leaks", EDT Seminar, February 2012 (Presenter)

"Characteristics for Automotive Hail Damage-How to Determine if Dents are Formed by Hail", South Carolina Insurance Fraud Investigators, Inc. Conference, November 2008 and South Carolina Claims Association Meeting, March 2009 (Presenter)

"Spontaneous Combustion", EDT Seminar, May 2008 (Presenter)

Special Process Instructor: *"Abrasive Blast Surface Conditioning, Turbine Engine Components,"* Unison Engine Components Operator Training Program, January 2002-November 2007

Special Process Instructor: *"Abrasive Flow Machining, Turbine Engine Components,"* Unison Engine Components Operator Training Program, January 2001-November 2007

Special Process Instructor: *"FAA Certified Shot Peening Level 1, Turbine Engine Components,"* Unison Engine Components Operator Training Program, October 2000-November 2007 Post-Fire Structural Evaluations, WNY Engineer, Issue 7, Volume 85, 2013 (a publication of The Engineering Society of Buffalo, New York)

CONTINUING EDUCATION

2026 *"NFPA 1033 and Your Career 2025"*, International Association of Arson Investigators (IAAI)

"6th Annual HVAC/R Training Symposium", Ocoee, Florida

"Selected Topics on Vehicle Fire Investigations", EDT Seminar

"Design Aspects of Repairs", EDT Seminar

"Busway Losses", EDT Seminar

"Drone Examinations & Techniques to Evaluate Damage of Very Large Solar Farms", EDT Seminar

-
- 2024 International Materials Applications and Technologies (IMAT) World Conference
“Texas Board of Professional Engineering & Surveying Practice Update/Ethics”, Texas Board of PELS Outreach
“Solar Panels”, South Carolina International Association of Arson Investigators (IAAI)
“Use of Finite Element Analysis & Fatigue Analysis in Root Cause Investigations”, EDT Seminar
“Utility Scale Solar Farm-Review of Curtailments and Operating Issues”, EDT Seminar
“Failure Analysis of Common Plastics”, EDT Seminar
“Hoses: Design, Construction Methods, and Modes of Failure”, EDT Seminar
“Large Loss, Root Cause and Scope: Challenges and Strategies”, EDT Seminar
“Selected Topics on Vehicle Fire Investigations”, EDT Seminar
“Fire Dynamics”, EDT Seminar
- 2023 “Monte Carlo Analysis”, National Association of Professional Accident Reconstruction Specialists (NAPARS)
National Truck and Heavy Equipment Claims Counsel (NTHECC), Fall Meeting
“Electric and Hybrid Vehicles”, SC International Association of Arson Investigators (IAAI)
World Reconstruction Exposition 2023 (WREX2023), National Association of Professional Reconstruction Specialist, Inc. (NAPARS)
“Human Resources”, National Association of Professional Accident Reconstruction Specialist, Inc. (NAPARS)
“Large Loss Assignments – Case Studies”, EDT Seminar
“Transformer Losses: Cause and Cost”, EDT Seminar
“This Old House-Dangers of Modern Electrical Upgrades to Older Homes”, EDT Seminar
“Greases and Oils: Preventing Lubrication Related Issues”, EDT Seminar
“Water Damage Assessment of Electrical System Components”, EDT Seminar
- 2022 *Advanced Tire Forensics*, National Association of Professional Accident Reconstruction Specialists (NAPARS)
“Circuit Breaker Types and Maintenance Requirements”, EDT Seminar
“Wildland Urban Interface & Mitigation Strategies”, EDT Seminar
“Hydraulic Systems and Components – Overview”, EDT Seminar
“Rotating Equipment Failure Modes”, EDT Seminar
“Investigating Internal Combustion Engine Failures”, EDT Seminar
- 2021 NC/SC International Association of Arson Investigators (IAAI) Virtual Spring Conference
“Corrugated Stainless Steel (CSST) Gas Line Service Failures”
“Electrical Connector Damages and Failures”
“Fire Investigations & NFPA921: An Education for Engineers”, EDT Seminar
“Power Factor & Correction Considerations”, EDT Seminar
“Photovoltaics & Energy Storage – How It Can All Go Wrong”, EDT Seminar

-
- "Finite Element Analysis and Its Use in Legal Consulting"*, EDT Seminar
- 2020 National Association of Professional Accident Reconstruction Specialists (NAPARS) Conference
- "Crash Test Review & Analysis, Global Positioning System (GPS) Data and Go Pro Applications in Accident Reconstruction"*
- "Perception-Reaction Times (PRT) For Various Crash Types"*
- "Tire Failures"*
- "Using New Freightliner Cascadia Data in Accident Reconstruction"*
- 2019 NC/SC International Association of Arson Investigators (IAAI) Conference
- 2018 *"Basic Aircraft Accident Investigation"*, Federal Aviation Administration, Traffic Safety Institute
- "Basic Fatigue Analysis"*, EDT Seminar
- "Characterization of Copper Tubing and Pipe Ruptures"*, Materials Science & Technology, (Presenter)
- "Understanding Programmable Logic Controller Language for Forensic Analysis"*, EDT Seminar
- 2017 *"Digital Forensics of Heavy Vehicle Event Data Recorders"*, The University of Tulsa
- "Engineering Analysis of Failure: Determination of Cause in a Legal Environment"*, EDT Seminar
- "Fire Retardant Treated Wood"*, EDT Seminar
- "Large Loss Report Writing"*, EDT Seminar
- "Metallographic Techniques"*, ASM International
- "Review of Texas Engineering Practice Act and Rules"*, Texas Board of Professional Engineers
- "Technical Review of Unmanned Aerial Vehicles and Their Uses"*, EDT Seminar
- "Twentieth Annual Insurance Fraud Training Seminar"*
- 2016 *"Arson for Profit, NICB Overview, and Vehicle Arson"*, International Association of Arson Investigators
- "Meth Lab and Improvised Explosives Identification"*, International Association of Arson Investigators
- "Panel Discussion – Revised NFPA 1033"*, EDT Seminar
- "Power System Protection and Fault Analysis"*, EDT Seminar
- "Requirements for Roadway Conditions"*, EDT Seminar
- "Variable Frequency Drives"*, EDT Seminar
- World Reconstruction Exposition 2016 (WREX2016), *"A World Crash Exposition"*, National Association of Professional Accident Reconstruction Specialist, Inc. (NAPARS)
- 2015 *"Applied Vehicle Dynamics"*, SAE International
- "Fire Investigative Approaches"*, International Association of Arson Investigators
- "Vehicle Crash Data Retrieval (CDR) Training Update"*, EDT Seminar

-
- "Wild Fire Origin & Cause"*, International Association of Arson Investigators
- 2014 *"Deception Detection & Interviewing Techniques"*, International Association of Arson Investigators
- "Investigating Electric and Hybrid Vehicles"*, EDT Seminar
- "Passenger Car – Motorcycle Collision Analysis"*, EDT Seminar
- "Traffic Crash Reconstruction"*, Institute of Police Technology and Management
- 2013 *"Advanced Traffic Crash Investigation"*, Institute of Police Technology and Management
- "Failure Analysis and Prevention-Environmentally Assisted Failures"*, MS&T
- "Failure Analysis and Prevention-Failure Analysis at the NTSB and TSB Canada"*, MS&T
- "Failure Analysis and Prevention-Failure Analysis in Oil & Gas Industry"*, MS&T
- "Failure Analysis and Prevention-Fatigue & Fracture I"*, MS&T
- "Failure Analysis and Prevention-Fatigue & Fracture II"*, MS&T
- "Quantifiable Driver Response Decisions: PRT and Gap Acceptance"*, EDT Seminar
- "Tire Construction and Defects"*, EDT Seminar
- 2012 *"At-Scene Traffic Crash/Traffic Homicide Investigation"*, Institute of Police Technology and Management
- "Crash Data Recording Training"*, EDT Seminar
- "Ethical Challenges for the EDT Engineer"*, EDT Seminar
- "HVAC Efficiency Improvement"*, Boiler Efficiency Institute
- 2011 *"Aircraft Maintenance Technician Day"*, SC Aviation Association
- "Dry Boilers"*, EDT Seminar
- "Engineering Ethics Seminar"*, EDT Seminar
- "Fire Investigative Approaches"*, International Association of Arson Investigators
- "Fractography"*, ASM International
- "N.F.P.A 921 (2011 Ed.) & N.F.P.A. 1033"*, International Association of Arson Investigators
- "Rotating Equipment and Predictive Maintenance"*, EDT Seminar
- "Turbomachinery Fires"*, EDT Seminar
- "Vehicle Control Systems Modern Technologies of Electronic Control"*, EDT Seminar
- 2010 *"HVAC Design and Components"*, EDT Seminar
- "Hydraulic Hose Failure Analysis"*, EDT Seminar
- "Investigating Solid Fuel-Burning Appliance Fires"*, Fire Findings Laboratories
- "Investigating Unusual Fire Causes"*, International Association of Arson Investigators
- "Investigation of Recreational Vehicle Fires"*, International Association of Arson Investigators
- "Lightning & Surge Protection"*, EDT Seminar
- "P&IDs-Piping and Instrumentation Diagrams"*, EDT Seminar
-

-
- "Principles of Failure Analysis"*, ASM International
- 2009 *"Agri-Specialized Heavy Equipment Fires"*, International Association of Arson Investigators
"Basic Fatigue Design Analysis", EDT Seminar
"New Fire/Arson Investigator Academy", Public Agency Training Council
"Oil Furnaces and Boilers", EDT Seminar
"Use of Metallurgical Analysis to Pinpoint a Brake Problem and the Cause of a Bus Fire", EDT Seminar
- 2008 Advanced National Fire, Arson, & Explosion Investigation Training Program, National Association of Fire Investigators
"Fire Suppression Systems", EDT Seminar
National Seminar on Fire Analysis Litigation, National Association of Fire Investigators
"Warnings vs. Instructions", EDT Seminar
- 2007 *"Coaching Skills for Managers and Supervisors"*, Fred Pryor Seminars
"Confined Space Compliance Training", National Safety Council
- 2001 FAA Certified Shot Peening Training, Level 3, Electronics, Inc.
- 2000 FAA Certified Shot Peening Training, Level 2, Electronics, Inc.
"Supervisor Training", Asheville Buncombe Technical Community College
- 1999 FAA Certified Shot Peening Training, Level 1, Electronics, Inc.
- 1996 ISO-9000 Leadership Training, Western Carolina Industries
"Technical Writing for ISO-9000", Western Carolina Industries
- 1995 AGMA Training School for Gear Manufacturing, Daley College
"Problem Solving Skills", Blue Ridge Community College
- 1994 *"Cold Forming Technology"*, Society of Manufacturing Engineers
- 1993 *"Metal Machining and Cutting Tools"*, Lehigh University
- 1991 *"Computer Programmer"*, US Air Force, Offutt AFB, March – November 1991